Metering Technology

Product catalogue 2021

ProMinent®

Focus on
YOU



Volume 1/3

Issued by:

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Heidelberg, June 2021

Product Catalogue Volume 1

Metering Pumps, Components and Metering Systems



Metering technology for professionals

The heart of metering technology is quite clearly the pump.

With its optimum capacity range and functionality adapted to the feed chemical, it is responsible for smooth-running metering processes.

Chapter 1

Solenoid metering pumps, which cover all metering tasks, ranging from micro-metering up to 75 l/h at a maximum back pressure of 60 bar, and our new **peristaltic metering pumps.**

Universally applicable **motor-driven metering pumps** in the low-pressure range up to a capacity of 1,000 l/h, to ensure that your processes operate safely even when meeting maximum requirements.

Durable and easy-to-operate **transfer and peristaltic pumps** for pure pump capacities, as well as the matching components, like sturdy tanks and retaining tanks.

Completely pre-assembled **metering systems**, standard or made-to-measure – thanks to their perfect interaction, the precisely coordinated components ensure a safe complete solution ready for immediate use.

Chapter 2

Process metering pumps for hazardous production processes in the petrochemical industry or in the oil and gas industry, tailored specifically to high-end applications. They are tried and tested, including under very high pressure and extreme temperatures, to safely and reliably meter even toxic, corrosive and inflammable liquids.

We're happy to help

The selection of a product depends on a number of different factors.

Our team will be happy to be of assistance should you have any questions about our metering technology. Give us a call! We look forward to hearing from you.

Monday to Friday 8:00 – 16:30

Sales at ProMinent Deutschland GmbH
0049 6221 842 - 1800
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Pump Guide

You can also find information online. Try out the ProMinent Pump Selection Guide on our website. Just enter the required pump capacity and back pressure, and the Pump Guide will show you a list of suitable metering pumps. This is the quick and easy way to track down just the right pump for your needs.

www.pump-guide.com

We can also support you by phone in selecting the right products and, in many cases, optimising entire applications. For more complex requirements, our advisers will forward the task to a colleague in field sales, who will then be happy to clarify your questions in a personal on-site consultation.

Our customer service

Our service technicians are on hand to help you. Whether for the initial installation or for maintenance and repair work. We're happy to help!

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Step by Step to the Right Product

Metering tasks come in all shapes and sizes! Provide us with your data and we'll provide you with the optimum solution!

The following data sheet will help in solving your metering problem. Please enter your requirements and conditions and return it to info@prominent.com. Our Service Centre will use your data to deliver the best result – the optimum metering pump and matching accessories for your application.

Step by Step to the Right Product

Required Data for Designing Metering Pumps and Accessories

Min./max. required feed rate	l/h _____
Available power supply	_____ V, _____ Hz
Min./max. operating temperature	°C _____
Properties of process chemical	_____
Name, concentration %	_____
Solids content %	_____
Dynamic viscosity mPa (= cP)	_____
Vapour pressure at operating temperature	bar _____
Remarks, e.g. abrasive,	_____
gaseous, flammable,	_____
corrosive towards	_____

Suction conditions:

Min./max. suction lift	m _____
Min./max. positive suction head	m _____
Pressure in chemical tank	bar _____
Suction line length	m _____
Suction line diameter	mm _____

Discharge conditions:

Min./max. back pressure	bar _____
Min./max. discharge head	m _____
Min./max. negative discharge head	m _____
Discharge line length	m _____
Discharge line diameter	mm _____
Number of valves and fittings in suction and discharge line	_____

Data required for proportional dosing:

Water flow Q min./max.	m^3/h _____
Required final concentration	g/m^3, ppm _____

Example:

A required dose in mg/l = g/m^3 = ppm

(Water flow Q max. 50 m^3/h)

Pulse spacing (flow volume per pulse) of water meter 5 l.

Process fluid = sodium hypochlorite solution Na OCl with 12 % chlorine (by weight) = 120 g/kg = 150 g/l = 150 mg/ml

Selected dosing pump GMXa 1604NPT2 NPB2 with 0.3 ml/per stroke volume, at max. 10800 strokes/h.

Variables: pump type, pulse spacing and concentration. The stroke rate (max. throughput l/h: pulse spacing l/pulse = 50,000 l/h : 5 l/pulse = 10000 pulses/h) must not exceed the max. stroke frequency (10800 strokes/h) of the dosing pump.

$$\text{Feed quantity} = \frac{\text{water throughput Q max. (l/h) x stroke volume (l)}}{\text{pulse spacing (l)}} = \frac{50{,}000\ \text{l} \times 0.0003\ \text{l}}{\text{h} \times 5\ \text{l}} = 3\ \text{l/h}$$

$$\text{Final dose} = \frac{\text{concentration (mg/l) x stroke volume (l)}}{\text{pulse spacing (l)}} = \frac{150\ \text{mg} \times 0.3\ \text{l}}{\text{ml} \times 5\ \text{l}} = 9\ \text{mg/l}$$

$= 9\ g/m^3$

$= 9$ ppm chlorine Cl_2

We'd be pleased to go through these points with you by phone. We're there to help!

Free Choice with the Identity Code

Use the identity code to determine the properties and features of your low-pressure metering pump. Simply select, enter the code in the bottom row and you've configured your product!

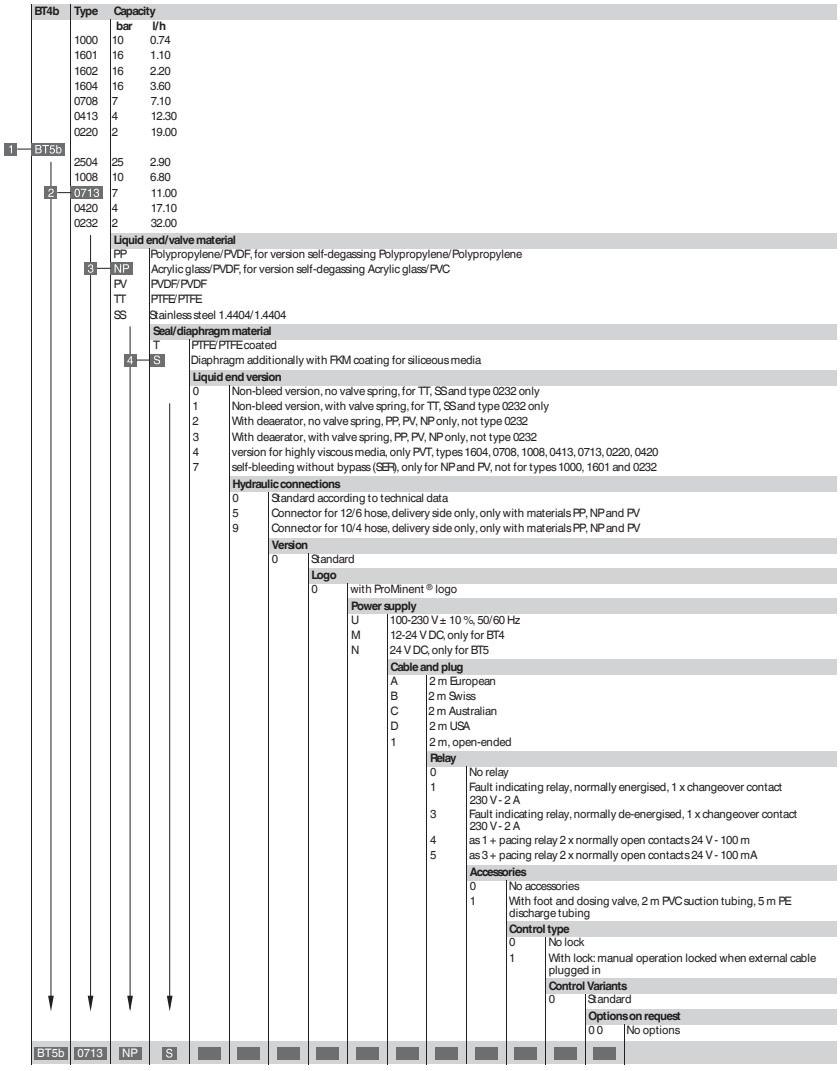
You've opted for a pump product range. It's now up to you to configure the pump exactly to meet your individual needs.

First determine the **pump type (1)**. This is based on the pump capacity you require and the back pressure present. Enter the result at the very bottom in the grey row of the identity code.

The medium to be metered is crucial when it comes to the **material of the dosing head (2)** and the **seals (3)**. Once again enter the selected code in the bottom row.

With a few restrictions, the features and properties of the pump can be freely selected.

Work through column by column, generating the identity code for your own individual metering pump.



BT4b	Type	Capacity bar	Capacity l/h
	1000	10	0.74
	1601	16	1.10
	1602	16	2.20
	1604	16	3.60
	0708	7	7.10
	0413	4	12.30
	0220	2	19.00
1 BT5b			
	2504	25	2.90
	1008	10	6.80
2	0713	7	11.00
	0420	4	17.10
	0232	2	32.00

Liquid end/valve material

PP	Polypropylene/PVDF, for version self-degassing Polypropylene/Polypropylene
3 NP	Acrylic glass/PVDF, for version self-degassing Acrylic glass/PVC
PV	PVDF/PVDF
TT	PTFE/PTFE
SS	Stainless steel 1.4404/1.4404

Seal/diaphragm material

T	PTFE/PTFE coated
4 S	Diaphragm additionally with FKM coating for siliceous media

Liquid end version

0	Non-bleed version, no valve spring, for TT, SS and type 0232 only
1	Non-bleed version, with valve spring, for TT, SS and type 0232 only
2	With deaerator, no valve spring, PP, PV, NP only, not type 0232
3	With deaerator, with valve spring, PP, PV, NP only, not type 0232
4	version for highly viscous media, only PVT, types 1604, 0708, 1008, 0413, 0713, 0220, 0420
7	self-bleeding without bypass (SERI), only for NP and PV, not for types 1000, 1601 and 0232

Hydraulic connections

0	Standard according to technical data
5	Connector for 12/6 hose, delivery side only, only with materials PP, NP and PV
9	Connector for 10/4 hose, delivery side only, only with materials PP, NP and PV

Version

0	Standard

Logo

0	with ProMinent® logo

Power supply

U	100-230 V ± 10 %, 50/60 Hz
M	12-24 V DC, only for BT4
N	24 V DC, only for BT5

Cable and plug

A	2 m European
B	2 m Swiss
C	2 m Australian
D	2 m USA
1	2 m, open-ended

Relay

0	No relay
1	Fault indicating relay, normally energised, 1 x changeover contact 230 V - 2 A
3	Fault indicating relay, normally de-energised, 1 x changeover contact 230 V - 2 A
4	as 1 + pacing relay 2 x normally open contacts 24 V - 100 m
5	as 3 + pacing relay 2 x normally open contacts 24 V - 100 mA

Accessories

0	No accessories
1	With foot and dosing valve, 2 m PVC suction tubing, 5 m PE discharge tubing

Control type

0	No lock
1	With lock: manual operation locked when external cable plugged in

Control Variants

0	Standard

Options on request

0 0	No options

BT5b	0713	NP	S												

We'll be happy to advise you on your metering task.

Give us a call should you still have any questions!

Sales at ProMinent Deutschland GmbH
0049 6221 842 – 1800
info-de@prominent.com

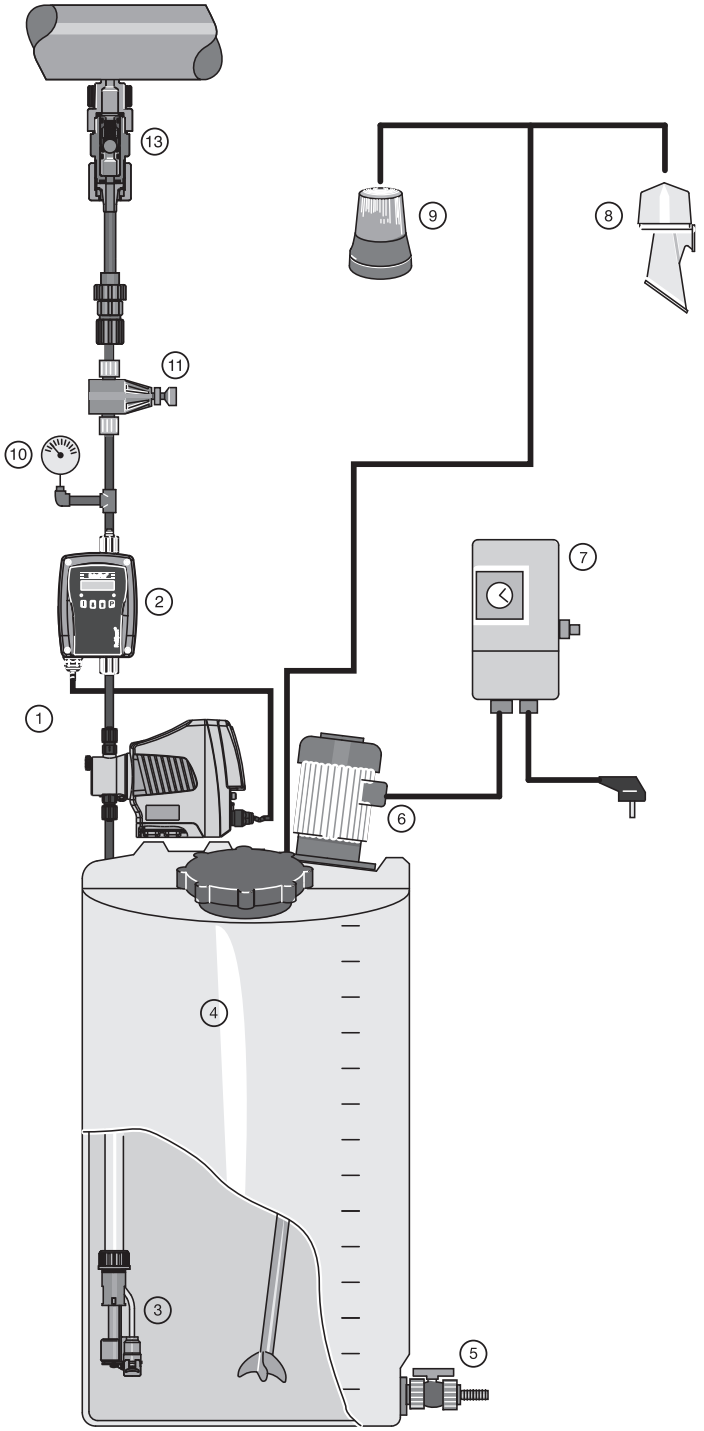
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Metering Pumps also Need Accessories

Examples of metering tasks illustrate which components and accessories can be used for different metering processes.

A pump alone is often simply not enough. A metering process requires further **components and accessories**. ProMinent provides all the products you need to guarantee **optimum process flows** for metering liquid media. Expertise and advice are, of course, included!

1 Metering pump
2 Flow meter DFMa with single stroke monitor and feedback to the metering pump
3 Suction assembly with level switch
4 Dosing tank
5 Drain valve
6 Stirrer
7 Timer for stirrer
8 Signal horn
9 Display lamp
10 Manometer for precise adjustment of the back pressure valve
11 Back pressure valve
13 Injection valve



Metering Pumps also Need Accessories

1 Metering pump
3 Suction assembly with level switch
4 Dosing tank
5 Drain valve
6 Stirrer
7 Timer for stirrer
12 Multifunctional valve
13 Injection valve

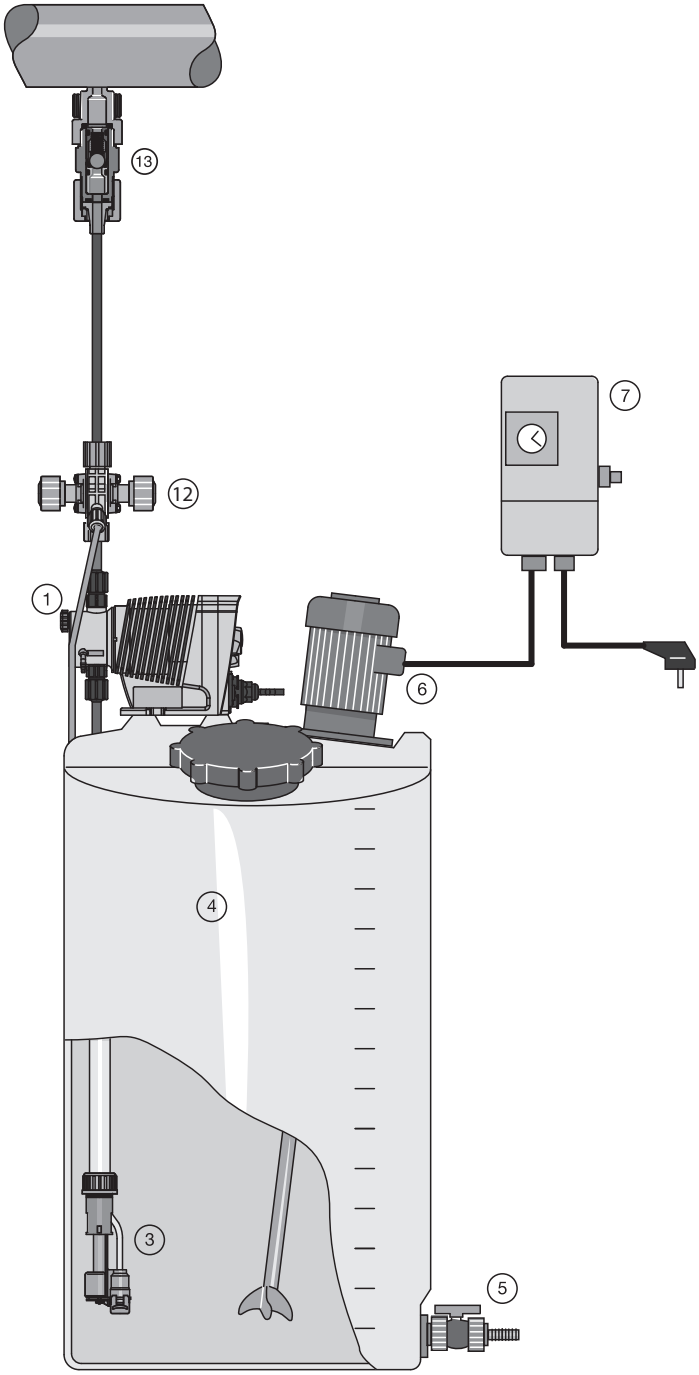


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NEW

Peristaltic pump DULCO flex Control - DFXa

Feed rate of 6 ml/h to 65 l/h at up to 7 bar back pressure



DULCOflex-Control-DFXa

The new DULCO flex Control DFXa meters reliably and is simple to operate. This sees the addition of an intelligent peristaltic metering pump to the ProMinent product range. ProMinent is making use of its decades-long experience in the metering pump sector to bring together the best of two worlds. Valve-free metering with the accuracy of a diaphragm metering pump, with full use of the properties of a peristaltic pump. The applications of this metering pump include strongly gaseous, high-viscosity, abrasive, shear-sensitive or chemically aggressive fluids.

The liquid end developed and patented by ProMinent makes quick and straightforward hose replacement possible with a unique exchange technique. The display provides the fitter with precise instructions about the steps to be completed when replacing the hose. The high-performance hoses used guarantee exceptional chemical resistance and a long service life.

The order information required for hose replacement can be found on the pump's operating menu.

The intuitive user interface with click wheel ensures simple operation of the peristaltic pump.

A brushless direct current motor forms the heart of the DULCO flex Control DFXa. Its ingenious control provides for precise metering and reduced pump capacity with continuous metering up to 6 ml/h. What's more, the new peristaltic metering pump is IoT-enabled, meaning that it is fully connectible and can be connected to ProMinent's in-house developed DULCONNEX Platform, which enables it to work even smarter.

- Adjustment of the metering rate directly in l/h or gph
- Simple hose change
- No problems with very outgassing media or air locks
- Suitable for viscosities of up to 200,000 mPas (with VPT0530)
- Sole contact with media in the hose
- Many different control options, such as using an analogue 0/4-20 mA signal, contact controller, timer or via process control systems

For more information see page→ 43

Metering technology product innovations

Peristaltic metering pump DULCO flex Control - DFYa

Feed rate of 5.1 l/h to 410 l/h at up to 8 bar back pressure



The new metering pump DFYa, the big brother of the DFXa, adds an intelligent peristaltic pump to the top capacity range of the ProMinent portfolio.

The new generation of peristaltic metering pumps is now controlled electronically. It meters without the need for a valve, with precision hitherto impossible. All the benefits of a peristaltic pump are retained, which is why seriously gaseous, high-viscosity, abrasive or shear-sensitive fluids, sometimes containing particles, can also be perfectly metered with the DFYa.

As with the DFXa, hose replacement on the DFYa is also assisted by the pump. When the hose needs to be changed, the pump displays exact instructions for the steps to be followed and automatically moves into the correct positions for hose replacement. The different hose materials (NR, NBR, NBR-A, EPDM Hypalon) enable the DFYa to work with a very wide range of media to be metered.

The peristaltic pump DFYa is simple to operate from the intuitive user interface with 4 keys and the click wheel. The DFYa thus joins the remaining ProMinent product range of intelligent metering pumps, which all share the same menu structure and user interface.

The new peristaltic metering pump is even IoT-capable. This means that it is fully connectible and can be connected to ProMinent's in-house developed DULCONNEX platform, which enables it to work even smarter.

- Operation by contact, batch, manual, analogue or BUS control
- Adjustment of the metering rate directly in l/h or gph
- Connection to process control systems via a BUS interface, such as PROFIBUS®, Profinet or CANopen
- No problems with very gaseous media or air locks
- Simple, menu-guided hose change
- Reversible direction of rotation
- Direct input of the required final concentration in concentration mode with volume-proportional metering tasks
- Automatic mode – volume settings only (l/h, ml/contact etc.)
- Pump can run dry
- Suitable for viscosities of up to 40,000 mPas
- Sole contact with media in the hose

For more information see page→ 47

Metering technology product innovations



Hydraulic diaphragm metering pump Hydro/ 4 API 675

Capacity range of single head pump: 252 – 1,506 l/h; 40 – 7 bar

The Hydro/ 4 API 675 hydraulic diaphragm metering pump (HA4a), together with the Hydro/ 2 and Hydro/ 3 pumps, represents an integrated product range with stroke lengths of 15 and/or 20 mm. The Hydro API 675 family, equipped with full-motion drive and automatic bleeding, therefore covers the capacity range of 4 to 1,506 l/h at 100 – 7 bar. They also meet the requirements of API 675.

Excellent process reliability:

- PTFE multi-layer diaphragm with integrated diaphragm monitoring with condition signals sent via contact
- Integrated hydraulic relief valve with ventilation function
- Metering reproducibility is better than ± 1% in the 10-100% stroke volume range under defined conditions and with correct installation.

Excellent flexibility:

- The modular construction with single and double head versions permits a wide range of applications, with the double head designs (boxer principle) being operated in push-pull mode
- It is possible to combine up to 5 metering units, even with different pump capacities, in multiple pump systems
- 5 different gear ratios are available
- Customised designs are available on request



Hydraulic Diaphragm Metering Pump Evolution mikro

Capacity range 0.02 – 18.0 l/h, 400 – 16 bar

With a capacity range of 0.02 – 18 l/h at pressures of up to 400 bar, the hydraulic diaphragm metering pumps Evolution mikro EMFa and EMHa are extremely suitable for ultra-precise micro-metering in gas metering and filling processes of all kinds. They are also used for additive metering in oil, gas and chemical applications, etc.

Typical applications include the metering of additives in gas metering and filling processes.

The Evolution mikro is the first of its kind with an electronically regulated direct power end. It can be ideally adapted to the respective application, thanks to an adjustment range of 1:200 and the combination of individually independent metering profiles with 3-parameter control.

Maximum process reliability:

- Precise micro-metering at high pressures
- Hermetically sealed by PTFE multi-layer safety diaphragm or metal diaphragm
- Long service life thanks to its sturdy construction with low-wear, contact-less power end
- High positional accuracy guarantees reproducibility of better than ±1%

Excellent flexibility:

- Seriously extended adjustment range of up to 1:200
- Universally controllable with electronically integrated overload protection
- Individually process-dependent metering profiles combined with 3-parameter control are possible
- Space-saving, easy-to-fit solution

For more information see page→ 386

Metering technology product innovations



Hygienic design of motor-driven metering pump Sigma

Capacity range of the Sigma: 25 – 1,000 l/h, 10 – 4 bar

The Hygienic Design version of the Sigma diaphragm metering pumps is optimised in terms of dead space, features as few gaps as possible and has smooth, wetted surfaces for flexible and easy use in hygienically sensitive applications.

The simple construction and smooth surface make easy CIP possible and allow the device to be dismantled at speed. Ball non-return valves and EPDM seals ensure gentle and reliable metering for tasks with strict hygiene requirements (when working with aqueous foods or food additives).

Like all intelligent ProMinent metering pumps, the Sigma product range can be flexibly controlled using a highly diverse range of signals. Designed for continuous operation, hermetically sealed and without a shaft passage into the metering chamber, providing simple and reliable handling. The standard PTFE multi-layer diaphragm with diaphragm rupture control offers additional process reliability.

- Process reliability thanks to PTFE multi-layer safety diaphragm with condition monitoring
- Fast CIP, reliable operation and easy handling
- Simple construction, optimised in terms of dead space and small number of parts, reliable operation, no shaft passage into the media chamber
- Precise metering thanks to the option for adjusting the metering volume in 1% steps by means of stroke rate and stroke length
- Physiologically safe wetted materials (FDA and 1935/2004); reliable and flexible Sigma motor-driven metering pump with ball non-return valves enables a wide range of applications
- Flexibly connectible: connection to process control systems via integrated PROFIBUS®, CANopen interface

DULCOnneX

DULCONNEX - the total solution for your digital fluid management

ProMinent's DULCONNEX is the smart overall solution for digitally networking your system components. The DULCONNEX is based on robustly networked products that can be individually adapted to operating conditions. As all the components of a system are networked, metering pumps, disinfection systems, controllers and sensors can interact in an optimised manner – increasing process reliability and system efficiency.

Location-independent system monitoring in real time

With DULCONNEX, you always have access to all key data and measured values for your installations. Monitor the status of your system in real time and benefit from continuous documentation. Check your device data safely and reliably when you're out and about. Simply use the terminal device of your choice: smartphone, tablet or PC. Configurable alarms and messages inform you of relevant events 24/7.

Be in a position to act promptly at all times with DULCONNEX. Whether potable water, waste water, industrial and process water, cooling water or swimming pool water – DULCONNEX supports you in ensuring the reliable treatment of your fluids.

DULCONNEX – the total solution for your digital fluid management

Smart process monitoring – any time, anywhere

Improved process safety, reliability and transparency due to real-time monitoring, individual alarms and automated reports.

ProMinent's DULCONNEX is the smart overall solution for digitally networking your system components. The DULCONNEX is based on robustly networked products that can be individually adapted to operating conditions. As all the components of a system are networked, metering pumps, disinfection systems, controllers and sensors can interact in an optimised manner – increasing process reliability and system efficiency.

Location-independent system monitoring in real time

You always have all the key data and measured values about your pump installations in sight at all times with DULCONNEX. Monitor the status of your system in real time and benefit from continuous documentation. Check your unit data safely and reliably when you're out and about. Simply use the terminal device of your choice: smartphone, tablet or PC. Configurable alarms and messages inform you of relevant events 24/7.

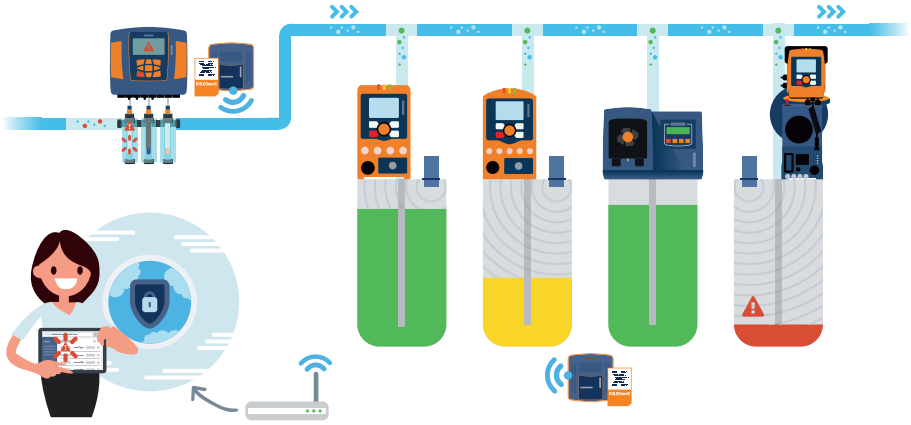
Be in a position to act promptly at all times with DULCONNEX. Whether industrial and process water, cooling water, potable water or swimming pool water – DULCONNEX supports you in ensuring the reliable treatment of your fluids.

Reference - chemical metering

Whether you are concerned about conformity with regulatory requirements governing the metering of chemicals, or about guaranteeing efficient and effective metering: DULCONNEX continuously provides you with automatic evidence of the metering performed by the connected metering pumps.

Using individually configurable alarms, DULCONNEX monitors a series of pump parameters on your behalf, from the metering volume to any error and warning messages that occur. E-mail notifications allow you to react immediately to potential faults, thereby guaranteeing seamless processes. By networking the liquid level measurement to the metering stations you can avoid shortages in the metering of hydrogen peroxide, sulfuric acid, chloride dioxide, flocculants or corrosion inhibitors, among others.

DULCONNEX also continuously logs the operating parameters of all connected components and makes them available to you in the form of value diagrams and summarised reports to ensure that you always retain an overview of your processes.



The benefits with DULCONNEX



- **Complete overview of all your devices and installations** – any time and from anywhere.
- **Reliable saving of your complete value history** including alarms and warnings that occur.
- **Individual alarms by e-mail** – Keep up to date at all times.
- **Continuous logging and automatic reports** – Documentation and evidence of correct operation.
- **Clear visualisation** – Graphic display of value and parameter combinations.
- **Access via the web** – Simply use any of your smart devices with an installed browser. You do not need an additional app nor a permanent link to the connected device.

The DULCONNEX Platform can be accessed via **https://dulconnex.prominent.com**. Please contact us for a demonstration and e-mail any questions you might have to **dulconnex@prominent.com**. We'd be delighted to help in any way we can.

DULCONNEX – the total solution for your digital fluid management



Privacy and data security

The architecture of DULCONNEX is already designed to achieve maximum safety and reliably protect your data. For example, there is a systematic separation of user-specific data and measured values. In addition, all measured values are anonymised internally and the entire system is regularly inspected by professional IT safety service providers for possible safety gaps.

Examples of relevant safety measures:

- Encryption in accordance with the latest state of the art
- Multiple redundant data memories
- Systematic control of the equipment ownership

Constantly growing portfolio of supported devices

We are continuously and relentlessly working to extend our range of solutions. The list below contains just some of the units and systems supported as standard to date. We also support the connection of additional components via flexibly combinable modules with digital or analogue inputs. This enables older units (such as the chlorine dioxide system Bello Zon® CDLb) or other manufacturers' components (such as liquid level gauges, water meters, gas detectors) to be connected.

- **Pumps**
  - gamma/ X
  - gamma/ XL
  - DULCO flex Control – DFXa
  - DULCO flex Control – DFYa
  - Sigma X
  - DULCO®flex DF4a
- **Controllers**
  - AEGIS II / SlimFLEX 5a
  - DULCOMETER® diaLog DACb
- **Disinfection systems**
  - UV systems Dulcodes LP/MP
  - Chlorine dioxide systems Bello Zon® CDKd and CDVd
- **Standard signals via dedicated modules**
  - Digital inputs (relays, also with counter)
  - Analogue inputs (4…20 mA)

DULCONNEX Gateway

Our DULCONNEX Gateway enables all smart products to be connected to our web-based fluid management platform.

The prerequisite for the correct operation of DULCONNEX is a DULCONNEX Gateway" compatible with the relevant product, which communicates with the DULCONNEX Platform" via a Wi-Fi internet connection provided by the customer.



	Suitable for system types	Order no.
DULCONNEX Gateway AGIb	AEGIS II	1098723
DULCONNEX Gateway DACb	DULCOMETER® diaLog DACb	1098756
DULCONNEX Gateway DLTa, GMXa, GXLa	gamma/ X, gamma/ XL, delta®, DULCO®flex DF4a, DULCO flex Control DFXa, DULCO flex Control DFYa, I and M module (DULCOMARIN® II), Frenzel+Berg modules (CIO50, CIO57, CIO58, CIO60, CIO300), Sigma X	1098754
DULCONNEX Gateway DF4a, SxCb	gamma/ X, Sigma X, DULCO®flex DF4a	1098755
DULCONNEX Gateway UVCb	Dulcodes LP/MP, gamma/ X, Sigma X	1098757

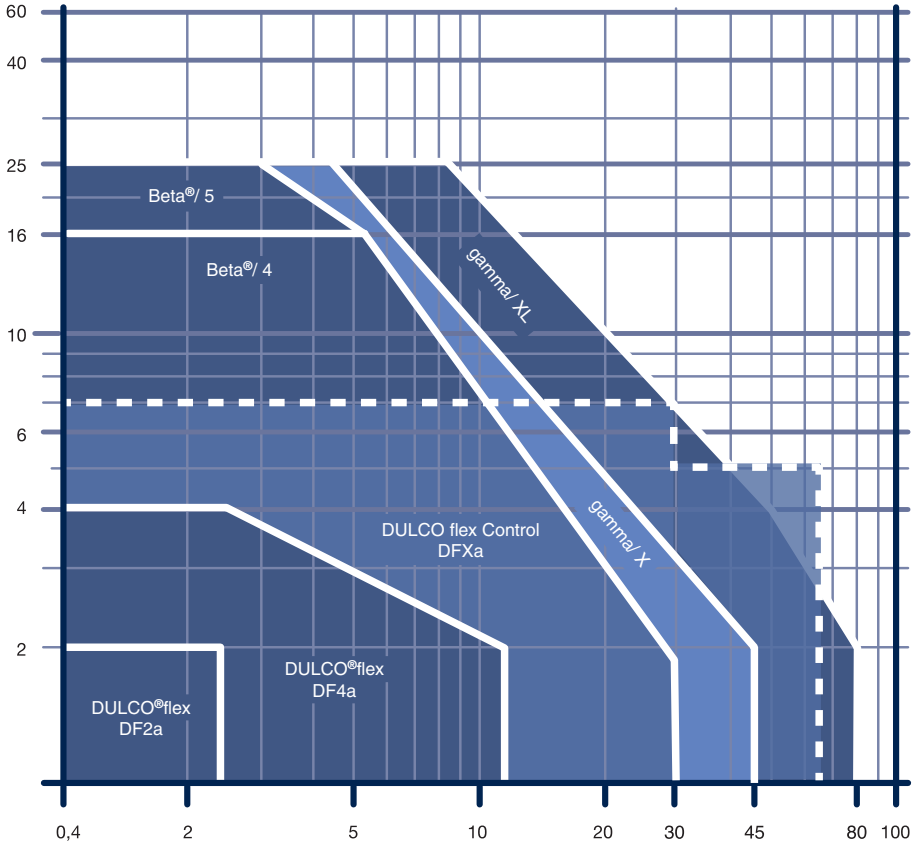
1.1 Solenoid-Driven Metering Pumps

1.1.1 How to Find the Right Pump Type?

Low-pressure metering pumps for practically all liquid chemicals:

The wide range of materials and extremely reliable function make these pumps veritable all-rounders – even under the toughest conditions. You will find the optimum metering pump for your application in the broad product range in a capacity range from **0.74 to 80 l/h at a back pressure of 25 to 2 bar**.

Tip
The performance overview is the quick way to short list potential products. Determine the right product range of metering pumps based on a given back pressure (bar) and pump capacity (l/h).
All our low-pressure metering pumps are self-priming!



Back pressure [bar] as a function of feed rate [l/h]

Note
You will find higher metering rates in the Motor-driven metering pumps chapter or under Process technology.
For help in quickly selecting the right pump, please consult our Pump Guide: www.pump-guide.com.

1.1 Solenoid-Driven Metering Pumps

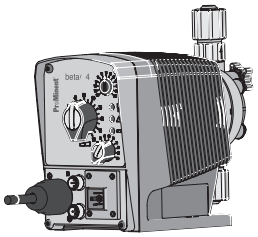
1.1.2 Solenoid-Driven Metering Pump Beta®

Equipped with all the features and properties for superior process management.

Capacity range 0.74 – 32 l/h, 25 – 2 bar

All-purpose solenoid-driven metering pump for metering liquid media in water treatment and chemical processes: Solenoid-driven metering pump Beta®. Cost-effective, overload-proof, adaptable to existing signal transducers.

A range of different pump types and material combinations are available for virtually all metering applications. The virtually wear-free solenoid drive guarantees an exceptionally long service life even under maximum load.



Beta® b

Your benefits

- Optional external control via 0/4 – 20 mA and potential-free contacts with pulse step-up and step-down of 64:1 to 1:64
- Simple adjustment of metering capacity via stroke rate and stroke length
- Adaptation to existing signal transducers by external control via potential-free contacts with pulse step-up and step-down
- Suitable for use with almost all liquid chemicals thanks to the available material combinations: PP, PVDF, clear acrylic, PTFE and stainless steel
- Self-bleeding dosing head design in clear acrylic/PVC and PP
- Virtually wear-free solenoid drive: economical and overload-proof
- Economical operation with up to 50% energy-savings, thanks to higher pump efficiency
- Everything in sight and under control: 3 LED display for operating, warning and error messages

Technical Details

- External control via potential-free contacts with pulse step-up and step-down to adapt to existing signal transducers of 64:1 to 1:64
- Optional external control via 0/4 – 20 mA and potential-free contacts with pulse step-up and step-down of 32:1 to 1:32
- Stroke rate adjustment in 10% increments of 10 – 100% corresponds to 18 – 180 strokes/minute
- Continuous stroke length adjustment of 0 – 100% (recommended 30 – 100%)
- Connector for 2-stage level switch
- Wide-range electrical connection: 100 – 230 V, 50/60 Hz
- Optional relay module, can also be retrofitted easily and securely
- Low voltage design 12 – 24 V DC

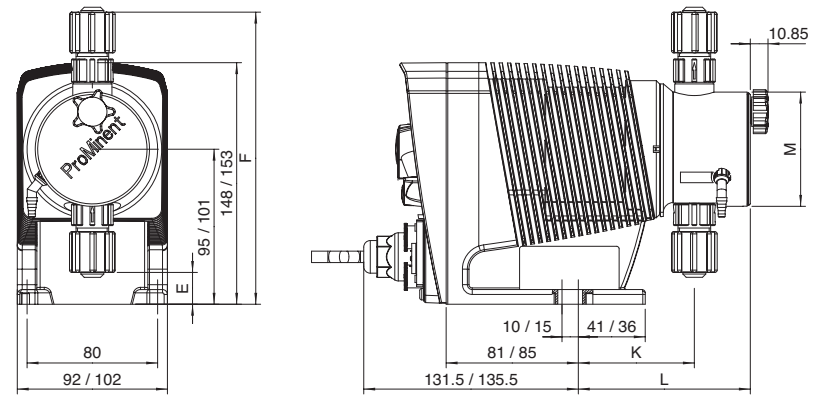
Field of application

- Metering liquid media in water treatment and chemical processes

Dimensional drawing of Beta®, PP material version

Typ	E	F
1000 - 1604	19.5	179
0708 - 0220	7	186.5
1008 - 0420	14	191.5
0232	1.5	200.5

Typ	K	L	Ø M
1000 - 1604	71	105.5	70
0708 - 0220	77.5	111	90
1008 - 0420	74	107.5	90
0232	77.5	94.5	110

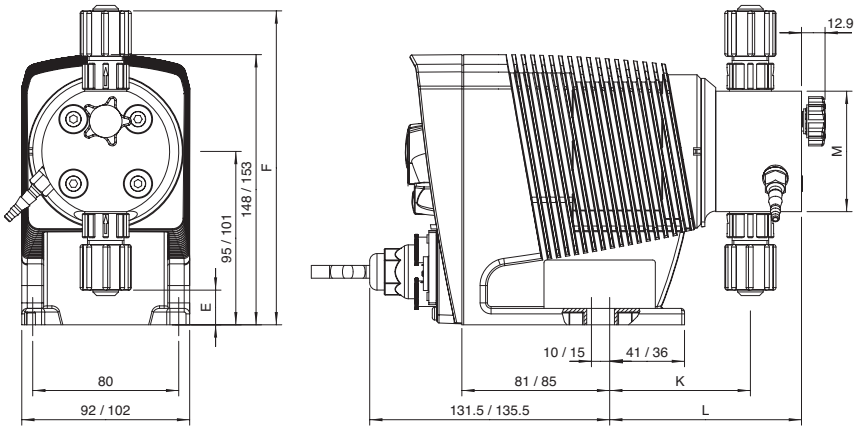


Dimensional drawing of Beta®, Material version PP - dimensions in mm

Dimensional drawing of Beta®, material version NP

Typ	E	F
1000 - 1604	19	172
0708 - 0220	7.2	183
2504	24.5	178.5
1008 - 0420	14	188
0232	3.2	199

Typ	K	L	Ø M
1000 - 1604	77	105	70
0708 - 0220	77.5	105.5	90
2504	77	105	70
1008 - 0420	74	102	90
0232	76	104.5	110

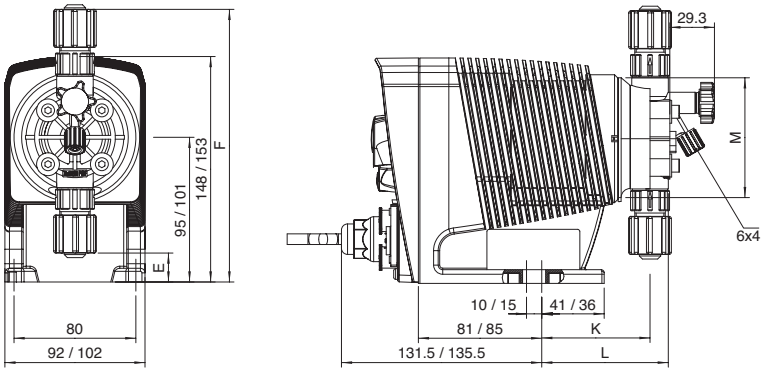


Dimensional drawing of Beta®, Material version NP - dimensions in mm

Dimensional drawing of Beta®, material version PV

Typ	E	F
1000 - 1604	19	179
1602	19	172
0708 - 0220	8	185.5
1008 - 0420	14	191.5
0232	3.2	199

Typ	K	L	Ø M
1000 - 1604	71	83	70
1602	77	105	70
0708 - 0220	73	90	90
1008 - 0420	73	90	90
0232	76	93	110



Dimensional drawing of Beta®, Material version PV - dimensions in mm

1.1 Solenoid-Driven Metering Pumps

Technical Data

Pump type	Pump capacity at max. back pressure			Delivery rate at medium back pressure			Stroke rate	Connector size outside Ø x inside Ø	Suction lift*	Average power consumption	Shipping weight	
	bar	l/h	ml/stroke	bar	l/h	ml/stroke	Strokes/min	mm	m WC	W	PP, NP, PV, TT kg	SS kg
Metering pumps with non-self-bleeding dosing head												
BT4b 1000 **	10	0.74	0.07	5.0	0.82	0.08	180	6 x 4	6.0	7.2	2.9	3.6
BT4b 1601 **	16	1.1	0.10	8.0	1.4	0.13	180	6 x 4	6.0	9.6	2.9	3.6
BT4b 1602 **	16	2.2	0.20	8.0	2.5	0.24	180	6 x 4	6.0	11.2	2.9	3.6
BT4b 1604 **	16	3.6	0.33	8.0	4.3	0.40	180	6 x 4	5.0	15.2	3.1	3.9
BT4b 0708 **	7	7.1	0.66	3.5	8.4	0.78	180	8 x 5	4.0	15.2	3.1	3.9
BT4b 0413	4	12.3	1.14	2.0	14.2	1.31	180	8 x 5	3.0	15.2	3.1	3.9
BT4b 0220	2	19	1.76	1.0	20.9	1.94	180	12 x 9	2.0	15.2	3.3	4.4
BT5b 2504	25	2.9	0.27	10.0	5	0.46	180	8 x 4	4.0	19.2	4.5	5.3
BT5b 1008	10	6.8	0.63	5.0	8.3	0.76	180	8 x 5	3.0	19.2	4.5	5.3
BT5b 0713	7	11	1.02	3.5	13.1	1.21	180	8 x 5	3.0	19.2	4.5	5.3
BT5b 0420	4	17.1	1.58	2.0	19.1	1.77	180	12 x 9	3.0	19.2	4.7	5.8
BT5b 0232	2	32	2.96	1.0	36.2	3.35	180	12 x 9	2.0	19.2	5.1	6.6
Metering pumps with self-bleeding dosing head												
BT4b 1602 **	10	1.4	0.13	8.0	1.7	0.16	180	6 x 4	1.8	11.2	2.9	-
BT4b 1604 **	10	2.7	0.25	8.0	3.6	0.33	180	6 x 4	1.8	15.2	3.1	-
BT4b 0708 **	7	6.6	0.61	3.5	7.5	0.69	180	8 x 5	1.8	15.2	3.1	-
BT4b 0413	4	10.8	1.00	2.0	12.6	1.17	180	8 x 5	1.8	15.2	3.1	-
BT4b 0220	2	16.2	1.50	1.0	18	1.67	180	12 x 9	2.0	15.2	3.3	-
BT5b 1008	10	6.3	0.58	5.0	7.5	0.69	180	8 x 5	1.8	19.2	4.5	-
BT5b 0713	7	10.5	0.97	3.5	12.3	1.14	180	8 x 5	1.8	19.2	4.5	-
BT5b 0420	4	15.6	1.44	2.0	17.4	1.61	180	12 x 9	1.8	19.2	4.7	-

* Suction lift with a filled dosing head and filled suction line, with a self-bleeding dosing head with air in the suction line.

** Pressure-reduced pump types are available in the pressure stages 4, 7 and 10 bar for special applications, for example in the swimming pool sector. More detailed information is available upon request.

! Beta® b metering pumps with dosing heads for higher-viscosity media have a 10 – 20 % lower capacity and are not self-priming with all feed chemicals. G 3/4-DN 10 connector with d 16-DN 10 hose nozzle.

All data calculated with water at 20 °C.

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	Ball seat	Seals	Balls
PPT	Polypropylene	PVDF	PVDF	PTFE	Ceramic
NPT	Clear acrylic	PVDF	PVDF	PTFE	Ceramic
SST	Stainless steel 1.4404	Stainless steel 1.4404	Ceramic	PTFE	Ceramic
PVT	PVDF	PVDF	PVDF	PTFE	Ceramic
TTT	Carbon-filled PTFE	Carbon-filled PTFE	Ceramic	PTFE	Ceramic

Metering reproducibility: ± 2% when used according to the operating instructions.

Permissible ambient temperature –10 °C to +45 °C.

Degree of protection: IP 66, insulation class F

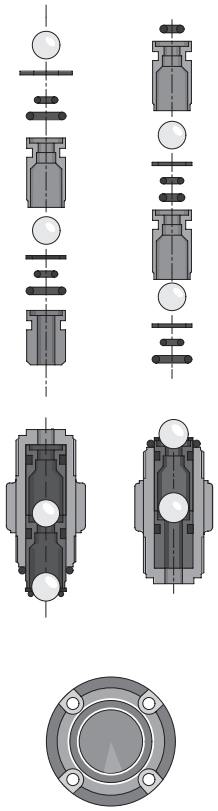
✓ **Scope of supply**
Metering pump with mains cable, connector kit for hose/tube connector as per table.

Identity Code Ordering System for Product Range Beta®, Version b

BT4b	Type	Output													
	1000	10 bar	0.74 l/h												
	1601	16 bar	1.10 l/h												
	1602	16 bar	2.20 l/h												
	1604	16 bar	3.60 l/h												
	0708	7 bar	7.10 l/h												
	0413	4 bar	12.30 l/h												
	0220	2 bar	19.00 l/h												
		Liquid end/valve material													
		PP	Polypropylene/PVDF												
		NP	Clear acrylic/PVDF												
		PV	PVDF/PVDF												
		TT	PTFE with carbon, PTFE												
		SS	Stainless steel 1.4404/1.4404												
			Material of seals/diaphragm												
			T	PTFE/PTFE coated											
			F	FDA-compliant design, only for PV and SS											
			M	With vPTFE diaphragm + PTFE valve seats. Design for PV heads only											
				Liquid end version											
				0	Non-bleed, without valve spring , for TT, SS and type 0232 only										
				1	Non-bleed, with valve spring, for TT, SS and type 0232 only										
				2	With bleed valve, without valve spring , PP, PV, NP only, not type 0232										
				3	With bleed valve, with valve spring , PP, PV, NP only, not type 0232										
				4	Design for higher-viscosity media (10-20 % lower metering rate possible), only PVT, types 1604, 0708, 1008, 0413, 0713, 0220, 0420										
				7	self-bleeding without bypass, Only for NPT and PVT, not for types 1000 and 1601										
					Hydraulic connections										
					0	Standard according to technical data									
					5	Connector for 12/6 hose, delivery side only									
					9	Connector for 10/4 hose, delivery side only									
						Version									
						0	standard								
							logo								
							0	with ProMinent logo							
								Electrical Connection							
								U	100-230 V, ±10%, 50/60 Hz						
								M	12 – 24 V DC, Only for BT4b						
									Cable and plug						
									A	2 m European					
									B	2 m Swiss					
									C	2 m Australian					
									D	2 m USA					
									1	2 m, open-ended					
										Relay					
										0	No relay				
										1	Fault indicating relay, normally energised, 1 x changeover contact 230 V - 2 A				
										3	Fault indicating relay, normally de-energised, 1 x changeover contact 230 V - 2 A				
										4	as 1 + pacing relay 2 x normally open contacts 24 V - 100 m				
										5	as 3 + pacing relay 2 x normally open contacts 24 V - 100 mA				
											Accessories				
											0	no accessories			
											1	with foot and metering valve, 2 m PVC suction line, 5 m PE metering line			
											5	1+ universal control cable			
												Control type			
												0	No lock		
												1	With lock: manual operation locked when external cable plugged in		
													Control Variants		
													0	without analogue control	
													A	with analogue control 0/4 – 20 mA	
														Options on request	
														00	No options

1.1 Solenoid-Driven Metering Pumps

BT5b	Type	Output	
	2504	25 bar	2.90 l/h
	1008	10 bar	6.80 l/h
	0713	7 bar	11.00 l/h
	0420	4 bar	17.10 l/h
	0232	2 bar	32.00 l/h
		Liquid end/valve material	
		PP	Polypropylene/PVDF
		NP	Clear acrylic/PVDF
		PV	PVDF/PVDF
		TT	PTFE with carbon, PTFE
		SS	Stainless steel 1.4404/1.4404
			Material of seals/diaphragm
			T PTFE/PTFE coated
			F FDA-compliant design
			Liquid end version
			0 Non-bleed, without valve spring, for TT, SS and type 0232 only
			1 Non-bleed, with valve spring, for TT, SS and type 0232 only
			2 with bleed valve, without valve spring, PP, PV, NP only, not type 0232
			3 Bleed version, with valve spring, PP, PV, NP only, not type 0232
			4 Design for higher-viscosity media (10-20 % lower metering rate possible), only PVT, types 1604, 0708, 1008, 0413, 0713, 0220, 0420
			7 self-bleeding without bypass, Only for NPT and PVT, not for types 1000 and 1601
			Hydraulic connections
			0 Standard according to technical data
			5 Connector for 12/6 hose, delivery side only
			9 Connector for 10/4 hose, delivery side only
			Version
			0 standard
			logo
			0 with ProMinent logo
			Electrical Connection
			U 100-230 V, ±10%, 50/60 Hz
			M 12 – 24 V DC, Only for BT4b
			N 24 V DC, Only for BT5b
			Cable and plug
			A 2 m European
			B 2 m Swiss
			C 2 m Australian
			D 2 m USA
			1 2 m, open-ended
			Relay
			0 No relay
			1 Fault indicating relay, normally energised, 1 x changeover contact 230 V - 2 A
			3 Fault indicating relay, normally de-energised, 1 x changeover contact 230 V - 2 A
			4 as 1 + pacing relay 2 x normally open contacts 24 V - 100 m
			5 as 3 + pacing relay 2 x normally open contacts 24 V - 100 mA
			Accessories
			0 no accessories
			1 with foot and metering valve, 2 m PVC suction line, 5 m PE metering line
			Control type
			0 No lock
			1 With lock: manual operation locked when external cable plugged in
			Control Variants
			0 without analogue control
			A with analogue control 0/4 – 20 mA



Spare Parts Kits for Solenoid-Driven Metering Pump Beta®

Spare parts kits for Beta® b, consisting of:

- 1 metering diaphragm
- 1 suction valve assembly
- 1 discharge valve assembly
- 1 connector kit

Stainless steel design without suction valve assembly and without discharge valve assembly, with valve seats, seals and valve balls

	Materials in Contact With the Medium	Order no.
1000	PPE2	1001644
	PPB2	1001652
	NPE0, NPE2	1001713
	NPB0, NPB2	1001721
	NPT0, NPT2, PPT2, PVT2, PVT4	1023107
	PVF2, PVF4	1083549
	TTT0	1001737
	SST0	1001729
1601	PPE2	1001645
	PPB2	1001653
	NPE0, NPE2	1001714
	NPB0, NPB2	1001722
	NPT0, NPT2, PPT2, PVT2	1023108
	PVF2	1083547
	TTT0	1001738
	SST0	1001730
1602	PPE2	1001646
	PPB2	1001654
	NPE0, NPE2	1001715
	NPB0, NPB2	1001723
	NPT0, NPT2, PPT2, PVT2	1023109
	PVF2	1083550
	TTT0	1001739
	SST0	1001731
1604	PPE2	1039989
	PPB2	1039987
1604, 2504	NPE0, NPE2	1039988
	NPB0, NPB2	1039986
	NPT0, NPT2, PPT2, PVT2	1035332
	PVF2, PVF4	1083548
	PVT4	1035342
	TTT0	1035330
	SST0	1035331
0708, 1008	PPE2	1001648
	PPB2	1001656
	NPE0, NPE2	1001717
	NPB0, NPB2	1001725
	NPT0, NPT2, PPT2, PVT2, PVT4	1023111
	PVF2, PVF4	1083564
	PVT2, PVT4	1019067
	TTT0	1001741
	SST0	1001733
0413, 0713	PPE2	1001649
	PPB2	1001657
	NPE0, NPE2	1001718
	NPB0, NPB2	1001726
	NPT0, NPT2, PPT2, PVT2	1023112
	PVF2, PVF4	1083551
	PVT4	1019069
	TTT0	1001742
	SST0	1001734
0220, 0420	PPE2	1001650
	PPB2	1001658
	NPE0, NPE2	1001719
	NPB0, NPB2	1001727
	NPT0, NPT2, PPT2, PVT2, PVT4	1023113
	PVF2	1083552

1.1 Solenoid-Driven Metering Pumps

	Materials in Contact With the Medium	Order no.
	PVT2, PVT4	1019070
	TTT0	1001754
	SST0	1001735
0232	PPE2	1001651
	PPB2	1001659
	NPE2	1001720
	NPB2	1001728
	NPT0, NPT2, PPT0, PVT0, PVT2	1023124
	PVF2	1083553
	TTT0	1001755
	SST0	1001736

Spare Parts Kits for Solenoid-Driven Metering Pump Beta® with Self-Bleeding Dosing Head

Spare parts kits for Beta® with self-bleeding dosing head, consisting of:

- 1 metering diaphragm
- 1 suction valve assembly
- 1 discharge valve assembly
- 1 connector kit

	Materials in Contact With the Medium	Order no.
1602	NPT7, PVT7	1047830
1604	NPT7, PVT7	1047858
0708, 1008	NPT7, PVT7	1047832
0413, 0713	NPT7, PVT7	1047833
0220, 0420	NPT7, PVT7	1047837

Spare Diaphragms for Solenoid-Driven Metering Pump Beta®

	Materials in Contact With the Medium	Order no.
1000	all materials	1000244
1601	all materials	1000245
1602	all materials	1000246
1604, 2504	all materials	1034612
0708, 1008	all materials	1000248
0413, 0713	all materials	1000249
0220, 0420	all materials	1000250
0232	all materials	1000251

Accessories

- Foot valves for low-pressure metering pumps, see page → 151
- Injection valves for low-pressure metering pumps, see page → 153
- Hoses and pipework for low-pressure metering pumps, see page → 208
- Suction lances, suction assemblies without level switches, see page → 232
- Connectors, fittings, connector kits, seals, see page → 212

Spare Parts

- Special valve balls/special valve springs, see page → 248

1.1.3 Solenoid-Driven Metering Pump gamma/ X

gamma/ X – the proven best-seller intelligently extended

Feed rate of product range 1 ml/h – 45 l/h; 25 – 2 bar

The solenoid-driven diaphragm metering pump gamma incorporates a wealth of e**X**cellent ingenuity! With integrated pressure measurement, it ensures the smooth running of your metering process. The gamma/ X is ideal for all metering work involving liquid media.



The new solenoid-driven diaphragm metering pump gamma/ X is user-friendly and has an outstandingly long service life, just like its predecessor. An ingenious solenoid control measures the back pressure and protects the system from overload. This technology makes a pressure sensor superfluous, meaning that operating safety can be significantly increased: no additional parts come into contact with the feed chemical, there are no additional sealing surfaces and no electronic components come into contact with the feed chemical. Whether the metering volume fluctuates or hydraulic failures affect the metering process – the gamma/ X keeps everything at your fingertips.

It independently ensures a trouble-free metering process and should the pump ever need maintenance its service module draws attention to this.

DULCOnneX

Your benefits

- Simple adjustment of the metering rate directly in l/h
- Direct input of the required final concentration in concentration mode with volume-proportional metering tasks
- Integrated pressure measurement and display for greater safety during commissioning and in the process
- Control range for metering rate 1:40,000
- Virtually wear-free solenoid drive, overload-proof and economical
- Suitable for continuous micro-metering from approx. 1 ml/h, thanks to the regulated solenoid drive
- Detection of hydraulic malfunctions, such as gas in the dosing head, and no or too high back pressure, ensures smooth processes
- Bluetooth interface for simple parameter configuration and access to diagnostic data using the Android and IOS app - DULCONNEX Blue (optional)
- Adaptation to existing signal transducers by external control via potential-free contacts with pulse step-up and step-down
- External control via 0/4-20 mA standard signal with adjustable assignment of signal value to stroke rate (optional)
- Integrated 1-month timer for timed metering tasks
- Guaranteed metering by means of automatic bleeding
- Connection to process control systems via Bus interface, such as PROFIBUS®, PROFINET, CANopen, Modbus

Technical Details

- Illuminated LCD and 3-LED display for operating, warning and error messages, visible from all sides.
- Factor with external contact control 99:1 - 1:99.
- Batch operation with max. 99,999 strokes/start pulse.
- Stroke rate adjustment in 1 stroke/h increments from 1 – 12,000 strokes/h.
- In non-automatic mode, stroke rate setting 1 stroke/h – 12,000 strokes/h, stroke length electronically continuously variable 0 – 100%, recommended 30 – 100%
  In automatic mode, an even finer setting in ml.
- Connector for 2-stage level switch.
- Available material combinations: PP, PVDF, clear acrylic, PTFE and stainless steel.
- Special dosing head designs for outgassing and higher-viscosity media.
- Degree of protection IP 66 and/or NEMA 4X indoor.
- Optional 0/4 – 20 mA output for remote transmission of actual dosing rate and error messages.
- Universal power supply unit 100 - 230 V, 50/60 Hz.
- Optional 230 V relay module, can be retrofitted easily and securely.
- Optional 24 V combined relay, can be retrofitted easily and securely.

Field of application

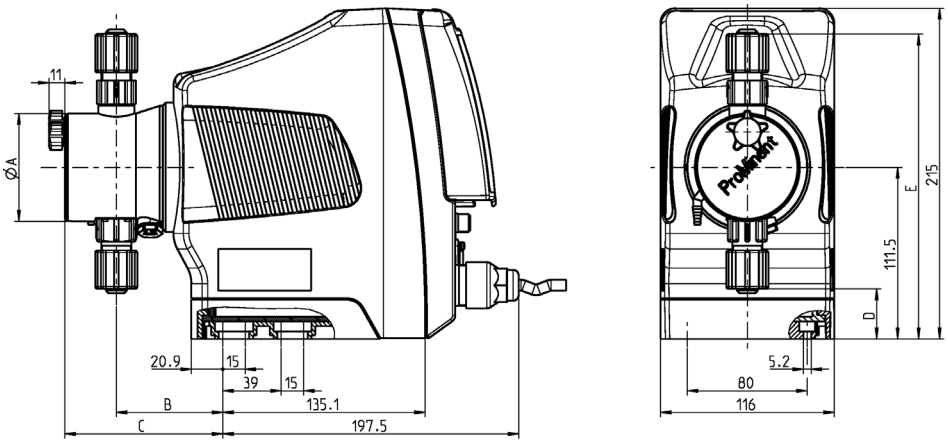
- Can be integrated into automated processes and used in all industries.
- The pump can work as a control unit with the timer, for example in cooling water treatment.

1.1 Solenoid-Driven Metering Pumps

Dimensional drawing of gamma/ X, material version PPT

Typ	Ø A	B
1602, 1604	70	71
0708, 1009	90	74
0414, 0715	90	74
0220, 0424	90	76

Typ	C	D	E
1602, 1604	106	32	198
0708, 1009	108	24	202
0414, 0715	107	24	202
0220, 0424	110	24	202

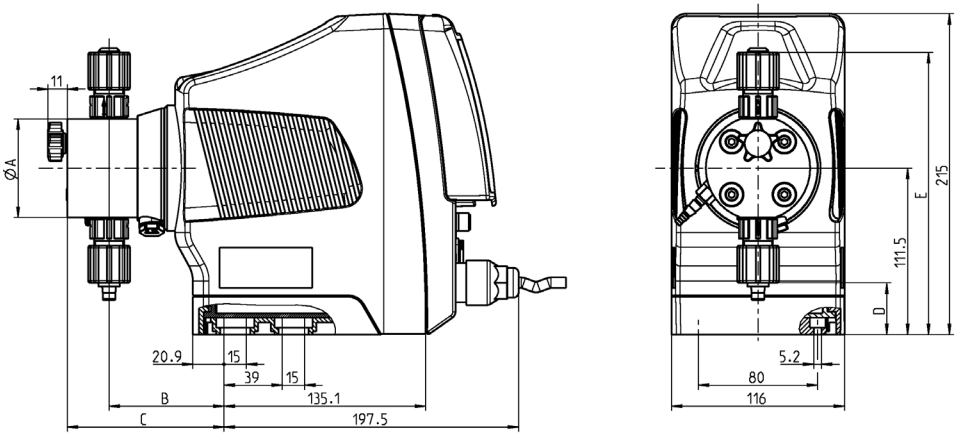


Dimensional drawing of gamma/ X, Material design PPT – dimensions in mm

Dimensional drawing of gamma/ X, material version NPT

Typ	Ø A	B
1602 - 2504	70	77
0708, 1009	90	74
0414 - 0424	90	76

Typ	C	D	E
1602 - 2504	105	33	191
0708, 1009	102	23	200
0414 - 0424	104	23	200

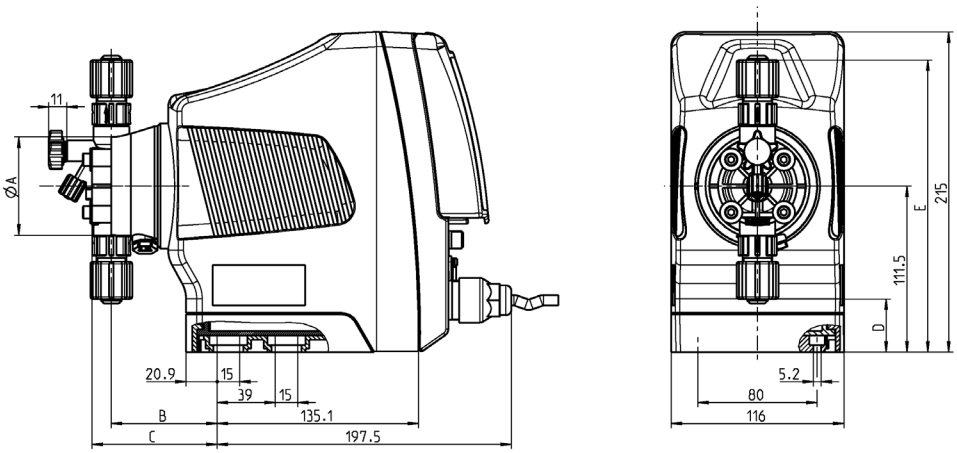


Dimensional drawing of gamma/ X, Material design NPT – dimensions in mm

Dimensional drawing of gamma/ X, material version PVT

Typ	Ø A	B
1602, 1604	70	71
0708, 1009	90	75
0414, 0715	90	73
0220, 0424	90	79

Typ	C	D	E
1602, 1604	84	36	196
0708, 1009	92	25	203
0414, 0715	90	25	203
0220, 0424	90	25	203



Dimensional drawing of gamma/ X, Material design PVT – dimensions in mm

1.1 Solenoid-Driven Metering Pumps

Technical Data

Pump type	Pump capacity at max. back pressure			Stroke rate	Connector size outside Ø x inside Ø	Suction lift*	Shipping weight	
	bar	l/h	ml/stroke	Strokes/min	mm	m WC	PP, NP, PV, TT kg	SS kg
Metering pumps with non-self-bleeding dosing head								
GMXa 1602	16	2.3	0.19	200	6 x 4	6.0	3.6	4.1
GMXa 1604	16	3.6	0.30	200	6 x 4	5.0	3.6	4.1
GMXa 0708	7	7.6	0.63	200	8 x 5	4.0	3.7	5.0
GMXa 0414	4	13.5	1.13	200	8 x 5	3.0	3.7	5.0
GMXa 0220	2	19.7	1.64	200	12 x 9	2.0	3.7	5.0
GMXa 2504	25	3.8	0.32	200	8 x 4	4.0	4.9	5.5
GMXa 1009	10	9.0	0.75	200	8 x 5	3.0	5.1	6.5
GMXa 0715	7	14.5	1.21	200	8 x 5	3.0	5.1	6.5
GMXa 0424	4	24.0	2.00	200	12 x 9	3.0	5.1	6.5
GMXa 0245	2	45.0	3.70	200	12 x 9	2.0	5.2	7.0
Metering pumps with self-bleeding dosing head								
GMXa 1602	10	1.5	0.08	200	6 x 4	1.8	3.6	-
GMXa 1604	10	2.2	0.13	200	6 x 4	1.8	3.6	-
GMXa 0708	7	5.6	0.48	200	8 x 5	1.8	3.7	-
GMXa 1009	10	6.6	0.50	200	8 x 5	1.8	5.1	-
GMXa 0414	4	12.2	1.00	200	8 x 5	1.8	3.7	-
GMXa 0715	7	13.0	1.08	200	8 x 5	1.8	5.1	-
GMXa 0220	2	18.0	1.45	200	12 x 9	1.8	3.7	-
GMXa 0424	4	22.0	1.60	200	12 x 9	1.8	5.1	-

* Suction lift with a filled dosing head and filled suction line, with a self-bleeding dosing head with air in the suction line.

! gamma/ X metering pumps with dosing heads for higher-viscosity media have a 10 – 20 % lower capacity and are not self-priming with all feed chemicals. G 3/4-DN 10 connector with d 16-DN 10 hose nozzle.

All data calculated with water at 20 °C.

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	Ball seat	Seals	Balls
PPT	Polypropylene	PVDF	PVDF	PTFE	Ceramic
NPT	Clear acrylic	PVDF	PVDF	PTFE	Ceramic
PVT	PVDF	PVDF	PVDF	PTFE	Ceramic
TTT	Carbon-filled PTFE	Carbon-filled PTFE	Ceramic	PTFE	Ceramic
SST	Stainless steel 1.4404	Stainless steel 1.4404	Ceramic	PTFE	Ceramic

Metering reproducibility: ±2% when used according to the instructions in the operating instructions

Permissible ambient temperature: -10 °C to +45 °C

Mean power consumption: 25/30 W

Degree of protection: IP 66, NEMA 4X, insulation class F

✓ **Scope of supply**
Metering pump with mains cable, connector kit for hose/tube connector as per table.

1.1 Solenoid-Driven Metering Pumps

Identity code ordering system for gamma/ X product range

GMXa	Type	Output																
	1602	16 bar	2.3 l/h															
	1604	16 bar	3.6 l/h															
	0708	7 bar	7.6 l/h															
	0414	4 bar	13.5 l/h															
	0220	2 bar	19.7 l/h															
	2504	25 bar	3.8 l/h															
	1009	10 bar	9.0 l/h															
	0715	7 bar	14.5 l/h															
	0424	4 bar	24.0 l/h															
	0245	2 bar	45.0 l/h															
		Liquid end/valve material																
		PP	Polypropylene/PVDF															
		NP	Clear acrylic/PVDF															
		PV	PVDF/PVDF															
		TT	PTFE															
		SS	Stainless steel 1.4404/1.4404															
			Material of seals/diaphragm															
			T	PTFE/PFTE coated														
			F	FDA-compliant design, Only for PV and SS														
			M	With vPTFE diaphragm + PTFE valve seats. Design for PV heads only														
				Liquid end version														
				0	Non-bleed, without valve spring, only with NP, TT and SS and type 0245													
				1	Non-bleed, with valve spring, only with NP, TT and SS and type 0245													
				2	with bleed valve, without valve spring, only with PP, PV, NP not for type 0245													
				3	Bleed version, with valve spring, only with PP, PV, NP not for type 0245													
				4	Design for higher-viscosity media (10-20 % lower metering rate possible), only with PV, types 1604, 0708, 0414, 1009, 0715, 0424													
				7	self-bleeding without bypass, only for NPT and PVT. With type 0245 without vent screw.													
					Hydraulic connections													
					0	Standard according to technical data												
					5	Connector on discharge side for 12/6 hose, standard on suction side, Only with materials PP, NP and PV												
					9	Discharge side connection for hose 10/4, suction side standard , Only with materials PP, NP and PV												
						Diaphragm Rupture Indicator												
						0	without diaphragm rupture indicator											
						1	With diaphragm rupture indicator, not for type 0245											
							Version											
							0	standard										
								logo										
								0	with ProMinent logo									
									Electrical Connection									
									U	100-230 V, ±10%, 50/60 Hz								
										Cable and plug								
										A	2 m European							
										B	2 m Swiss							
										C	2 m Australian							
										D	2 m USA							
										E	2 m Great Britain							
										1	2 m, open-ended							
											Relay, pre-set to							
											0	no relay						
											1	Fault indicating relay (230 V, 8 A)						
											4	Fault indicating relay (24 V, 100 mA) + pacing relay (24 V, 100 mA)						
											C	0/4 – 20 mA analogue output + fault indicating / pacing relay (24 V - 100 mA)						
											F	with automatic bleed valve 230 V AC, not for pump type 0245						
											G	with automatic bleed valve 24 V DC and relay output, not for pump type 0245						
												Accessories						
												0	no accessories					
												1	with foot and metering valve, 2 m PVC suction line, 5 m PE metering line, Only for PP, PV, and NP, not for PVT4					
												5	1+ universal control cable					
													Control Variants					
													0	Manual + external with pulse control				
													3	Manual + external with pulse control + analogue (0/4-20 mA)				
													C *	As 3 + CANopen				
													D *	As 3 + CAN open DULCOMARIN® II				
													E *	As 3 + Profinet				
													R *	As 3 + PROFIBUS® DP interface M12				
													M *	As 3 + Modbus				
														Metering monitor				

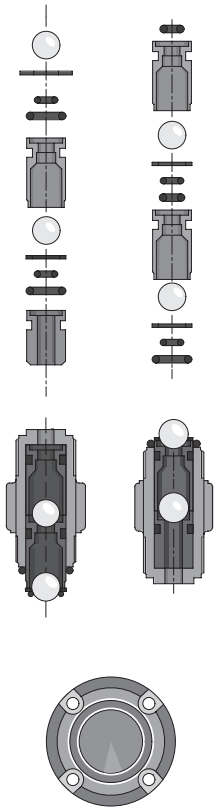
* A relay cannot be used with these options.

1.1 Solenoid-Driven Metering Pumps

0	Pulse signal input		
	Remote stop		
	0	without Bluetooth	
	B	with Bluetooth	
		Language	
		DE	German
		EN	English
		FR	French
		ES	Spanish

* A relay cannot be used with these options.

1.1 Solenoid-Driven Metering Pumps



Spare Parts Kit for gamma/ X

Spare parts kits for gamma/ X, consisting of:

- 1 metering diaphragm
- 1 suction valve assembly
- 1 discharge valve assembly
- 1 connector kit

Stainless steel design without suction valve assembly and without discharge valve assembly, with valve seats, seals and valve balls

	Materials in Contact With the Medium	Order no.
1602	NPT0, NPT2, PPT2, PVT2, PVT4	1023109
	TTT0	1001739
	SST0	1001731
	PVF2, PVF4	1083550
	SSF0	1107472
1604, 2504	NPT0, NPT2, PPT2, PVT2	1035332
1604	PVT4	1035342
	TTT0	1035330
	SST0	1035331
	PVF2, PVF4	1083548
	SSF0	1107505
0708, 1009	NPT0, NPT2, PPT2, PVT2	1023111
	PVT4	1019067
	TTT0	1001741
	SST0	1001733
	PVF2, PVF4	1083564
	SSF0	1107493
0414, 0715	NPT0, NPT2, PPT2, PVT2	1023112
	PVT4	1019069
	TTT0	1001742
	SST0	1001734
	PVF2, PVF4	1083551
	SSF0	1107492
0220, 0424	NPT0, NPT2, PPT2, PVT2	1051129
	PVT4	1051134
	TTT0	1051151
	SST0	1051139
	PVF2, PVF4	1083566
	SSF0	1107504
0245	NPT0, NPT1, PPT0, PVT0	1051130
	TTT0	1051152
	SST0	1074650
	SSF0	1098649

Spare Parts Kits for Solenoid-Driven Metering Pump gamma/ X with Self-Bleeding Dosing Head

Spare parts kits for gamma/ X with self-bleeding dosing head, without bypass, consisting of:

- 1 metering diaphragm
- 1 suction valve assembly
- 1 discharge valve assembly
- 1 connector kit

	Materials in Contact With the Medium	Order no.
1602	NPT7, PVT7	1047830
1604	NPT7, PVT7	1047858
0708, 1009	NPT7, PVT7	1047832
0414, 0715	NPT7, PVT7	1047833
0220, 0424	NPT7, PVT7	1051111

Spare Diaphragms for Solenoid-Driven Metering Pump gamma/ X

	Materials in Contact With the Medium	Order no.
1602	all materials	1000246
1604, 2504	all materials	1034612
0708, 1009	all materials	1000248
0414, 0715	all materials	1000249
0220, 0424	all materials	1045456
0245	all materials	1045443

Accessories

- Foot valves for low-pressure metering pumps, see page → 151
- Injection valves for low-pressure metering pumps, see page → 153
- Hoses and pipework for low-pressure metering pumps, see page → 208
- Suction lances, suction assemblies without level switches, see page → 232
- Connectors, fittings, connector kits, seals, see page → 212

Spare Parts

- Special valve balls/special valve springs, see page → 248

1.1.4 Solenoid-Driven Metering Pump gamma/ XL

gamma/ XL – large output, great features

Feed rate of product range 4 ml/h – 80 l/h; 25 – 2 bar

The gamma/ XL is a smart, connectible solenoid-driven metering pump that is setting new standards in terms of productivity, reliability and cost-effectiveness.



The new solenoid-driven metering pump gamma/ XL extends the capacity range of the proven gamma/ X to 80 l/h. In addition to the familiar relays and bus interfaces, the gamma/ XL provides a socket with 3 more configurable inputs and outputs. This allows the gamma/ XL to network with all common systems, devices and platforms. Like the gamma/ X, the gamma/ XL has an intuitive operating concept. The pump is adjusted using a click wheel and 4 additional operating keys. Pressure detection without wetted parts ensures maximum operational safety. Hydraulic error statuses, like “Gas in the dosing head”, “Overpressure” and “No pressure” can be detected.

Pressure fluctuations in the system are detected and compensated for, achieving a high level of dosing precision and reducing chemical consumption to the required level.

The last 300 events are retrospectively saved in the integral log book, which permits rapid analysis of the cause and troubleshooting.

Deviations from the metering volume or hydraulic fault statuses are immediately detected and corrected by the gamma/ XL. The pump’s operating menu includes ordering information for the wear parts required.

Designed as a smart product, it can also be connected to our web-based DULCONNEX fluid management platform. The user can use this to monitor his metering process in real time, avoid downtimes and generate reports fully automatically.

DULCOnneX

Your benefits

- Simple adjustment of the metering rate directly in l/h or gph
- Integrated pressure measurement and display for greater safety during commissioning and in the process
- Remote control and simple configuration using the Bluetooth app named “DULCONNEX Blue” (option)
- Control range for metering rate 1:40,000
- Direct input of the required final concentration in concentration mode with volume-proportional metering tasks
- Virtually wear-free solenoid drive, overload-proof and economical
- Suitable for continuous micro-metering from approx. 5 ml/h thanks to the regulated solenoid drive
- Detection of hydraulic malfunctions, such as gas in the dosing head, and no or too high back pressure, ensures smooth processes
- External control via potential-free contacts with pulse step-up and step-down
- External control via 0/4-20 mA standard signal, scalable
- Integrated 1-week/1-month timer
- Guaranteed metering by means of automatic bleeding
- Connection to process control systems via BUS interface, such as PROFIBUS®, PROFINET®, CANopen and Modbus
- Automatic mode – setting via desired quantity (l/h, ml/contact etc.)
- Non-automatic mode – settings via stroke length and stroke rate

Technical Details

- Illuminated 3” LCD and 3-LED display for operating, warning and error messages, visible from all sides
- In non-automatic mode, stroke rate setting 1 stroke/h – 12,000 strokes/h, stroke length electronically continuously variable 0 – 100%, recommended 30 – 100%
- Factor with external contact control 99:1 – 1:99
- In automatic mode, an even finer setting in ml
- Batch operation with max. 99.99 l or 99,999 strokes/start pulse
- Connector for 2-stage level switch
- 3 additional ports, switched as digital inputs or outputs
- Optional 0/4 – 20 mA output for remote transmission of actual dosing rate and error messages
- Optional relay module with 1 x switch-over contact, 230 V – 8 A
- Optional relay module with 2 x On, 24 V – 100 mA

1.1 Solenoid-Driven Metering Pumps

Field of application

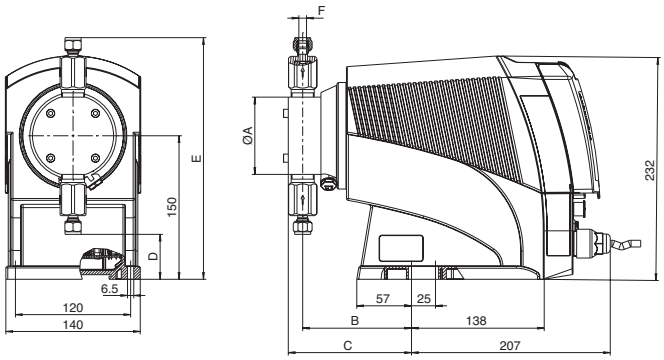
- Chemical distributors
- Systems engineering
- Food and beverage industry
- Potable water
- Waste water
- Chemical industry
- Electroplating
- Bottling processes, e.g. ink cartridges or highlighter pens
- With an integrated process timer, suitable as a control unit for simple processes, e.g. biocide metering in cooling water
- All industrial applications, either as a stand-alone unit or integrated in a complete system

1.1 Solenoid-Driven Metering Pumps

Dimensional drawing of gamma/ XL, material version SST

Typ	Ø A	B
2508, 1608	90	108
1612	90	110
1020	90	110
0730	90	112
0450, 0280	100	115

Typ	C	D	E
2508, 1608	128	63	240
1612	130	63	240
1020	130	63	240
0730	132	63	240
0450, 0280	135	29	281

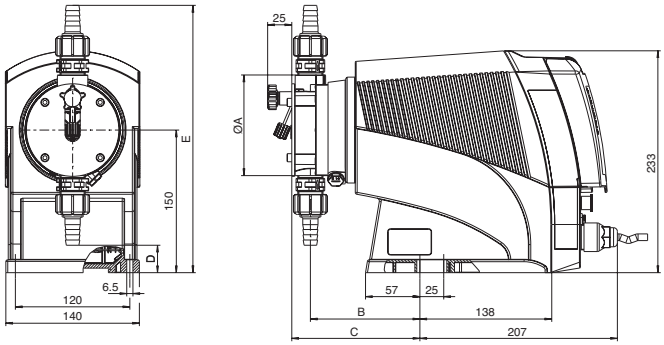


Dimensional drawing of gamma/ XL, material version SST – dimensions in mm

Dimensional drawing of gamma/ XL, material version PV DN 10

Typ	Ø A	B
0450, 0280	100	115

Typ	C	D	E
0450, 0280	135	29	281



Dimensional drawing of gamma/ XL, material version PV DN 10 – dimensions in mm

1.1 Solenoid-Driven Metering Pumps

Technical Data

Pump type	Pump capacity at max. back pressure	Pump capacity at max. back pressure	Theor. stroke volume	Max. stroke rate	Nominal diam-eter	Suction lift*	Shipping weight NPE, NPB, PVT / SST
	bar	l/h	ml/stroke	Strokes/min		m WC	kg
Metering pumps with non-self-bleeding dosing head							
GXLa 2508	25	7.5	0.63	200	8 x 4 mm **	5	10/11
GXLa 1608	16	7.8	0.65	200	8 x 5 mm **	5	10/11
GXLa 1612	16	12	1	200	8 x 5 mm	6	10/11
GXLa 1020	10	19.6	1.63	200	12 x 9 mm	5	10/11
GXLa 0730	7	29.4	2.4	200	12 x 9 mm	5	10/11
GXLa 0450	4	49	4.08	200	G 3/4 - DN 10	3	10/11
GXLa 0280	2	78.5	6.54	200	G 3/4 - DN 10	2	10/11
Metering pumps with self-bleeding dosing head							
GXLa 1608	10	7	0.6	200	8 x 5 mm	1.8	10
GXLa 1612	10	10	0.8	200	8 x 5 mm	1.8	10
GXLa 1020	10	15	1.25	200	12 x 9 mm	1.8	10
GXLa 0730	7	27.5	2.3	200	12 x 9 mm	1.8	10

* Suction lift with a filled dosing head and filled suction line, with a self-bleeding dosing head with air in the suction line.

** With stainless steel design, 6 mm connector width.

gamma/ XL metering pumps with dosing heads for higher-viscosity media have a 10 – 20 % lower capacity and are not self-priming with all feed chemicals. G 3/4 - DN 10 connector with d 16 - DN 10 hose nozzle.

All data calculated with water at 20 °C.

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	Ball seat	Seals	Balls
NPT	Clear acrylic	PVDF	PVDF	PTFE	Ceramic
PVT	PVDF	PVDF	PVDF	PTFE	Ceramic
SST (8 - 12 mm)	Stainless steel 1.4404	Stainless steel 1.4404	Ceramic	PTFE	Ceramic
SST (DN 10)	Stainless steel 1.4404	Stainless steel 1.4404	Carbon-filled PTFE	PTFE	Ceramic

Connectors

Plastic	8 – 12 mm	Hose squeeze connector
	DN 10	d16 DN 10 hose sleeve
Stainless steel	6 – 12 mm	Swagelok system
	DN 10	Rp 3/8 insert

Metering diaphragm with PTFE coating.

Repeatability of metering ±2% when used in accordance with the operating instructions.

Permissible ambient temperature –10 °C to 45 °C.

Mean power consumption 78 W.

Degree of protection IP 66, insulation class F.

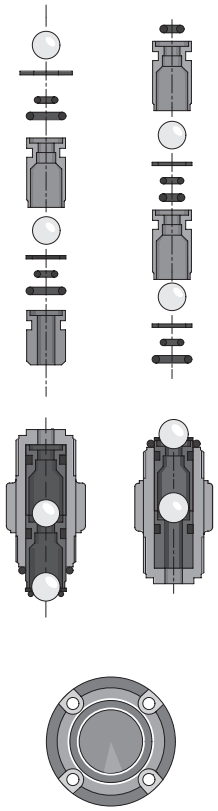
Scope of supply
Metering pump with mains cable, connector kit for hose/tube connector as per table.

1.1 Solenoid-Driven Metering Pumps

Identity Code Ordering System for Product Range gamma/ XL

GXLa	Regional design																
	EU	Europe															
	US	USA															
		Type	Output														
		2508	25 bar	7.5 l/h													
		1608	16 bar	7.8 l/h													
		1612	16 bar	12 l/h													
		1020	10 bar	19.6 l/h													
		0730	7 bar	29.4 l/h													
		0450	4 bar	49 l/h													
		0280	2 bar	78.5 l/h													
			Liquid end/valve material														
			PV	PVDF/PVDF , not for pump type 2508													
			NP	Acrylic/PVC, Only for pump types 2508, 1608, 1612, 1020 and 0730													
			SS	Stainless steel/stainless steel													
				Material of seals/diaphragm													
				T	PTFE/PFTE coated												
				F	FDA-compliant design, Only for PV and SS												
					Liquid end version												
					0	Non-bleed, without valve spring, Only with TT and SS materials											
					1	Non-bleed, with valve spring, Only with TT and SS materials											
					2	with bleed valve, without valve spring, Only with NP and PV materials											
					3	Bleed version, with valve spring, Only with NP and PV materials											
					4	HV version for higher-viscosity media, HV design for higher-viscosity media only for PV types 1608, 1612, 1020 and 0730											
					7	self-bleeding without bypass, only for types 1608, 1612, 1020 and 0730, only for material NP and PV											
						Hydraulic connections											
						0	Standard according to technical data										
						5	Connector on discharge side for 12/6 hose, standard on suction side, Only with NP and PV materials										
						F	Connector on discharge side for 8/4 hose, standard on suction side, Only with NP material										
							Diaphragm Rupture Indicator										
							0	without diaphragm rupture indicator									
							1	With diaphragm rupture indicator									
								Version									
								0	Housing RAL 5003, cover RAL 2003								
									logo								
									0	with ProMinent logo							
									2	without ProMinent logo							
										Electrical Connection							
										U	100 - 230 V ±10%, 50/60 Hz						
											Cable and plug						
											A	2 m European					
											B	2 m Swiss					
											C	2 m Australian					
											D	2 m USA / 115 V					
											1	2 m, open-ended					
												Relay, pre-set to					
												0	no relay				
												1	Fault indicating relay (230 V, 8 A)				
												4	Fault indicating relay (24 V, 100 mA) + pacing relay (24 V, 100 mA)				
												C	0/4 – 20 mA analogue output + fault indicating / pacing relay (24 V - 100 mA)				
												F	with automatic bleed valve, 230 V , not for pump type 2508				
												G	with automatic bleed valve, 24 V DC and relay output, not for pump type 2508				
													Accessories				
													0	no accessories			
													1	With foot and metering valve, 2m suction line and 5 m discharge line			
													5	1+ universal control cable			
														Control Variants			
														0	manual + external contact with pulse control		
														3	Manual + external contact with pulse control + analogue 0/4-20 mA		
														C *	as 3 + CANopen		
														P *	As 3 + PROFINET® interface		
														R *	as 3 + PROFIBUS® interface, M12		
														M *	As 3 + Modbus		
															Communication		
															0	without interface	
															B	with Bluetooth	

* A relay cannot be used with these options.



Spare Parts Kits for Solenoid-Driven Metering Pump gamma/ XL

Spare parts kits for gamma/ XL, consisting of:

- 1 metering diaphragm
- 1 suction valve assembly
- 1 discharge valve assembly
- 1 connector kit

Stainless steel design without suction valve assembly and without discharge valve assembly, with valve seats, seals and valve balls

	Materials in Contact With the Medium	Order no.
2508	NPE2	1033172
	NPB2	1033171
	NPT2	1095912
	SSF0	1107362
1608	NPE2	1030620
	NPB2	1030611
	NPT2, PVT2	1030225
	PVF2	1083565
1608, 2508	SST0	1030226
1612	NPE2	1030536
	NPB2	1030525
	NPT2, PVT2	1027081
	PVT4	1019067
	PVF2	1083569
	SST0	1027086
1020	NPE2	1030537
	NPB2	1030526
	NPT2, PVT2	1027082
	PVT4	1019069
	PVF2	1083570
	SST0	1027087
0730	NPE2	1095701
	NPB2	1095700
	NPT2, PVT2	1095626
	PVT4	1095499
	SST0	1095501
	PVF2	1096089
0450	PVT2	1095502
	PVF2	1096090
	SST0	1095625
	SSF0	1098651
0280	PVT2	1095500
	PVF2	1096088
	SST0	1095624
	SSF0	1098648

Spare parts kits for gamma/ XL with self-bleeding dosing head, consisting of:

- 1 metering diaphragm
- 1 suction valve assembly
- 1 discharge valve assembly
- 1 connector kit

	Materials in Contact With the Medium	Order no.
1608	PVT7	1047831
1612	PVT7	1047832
1020	PVT7	1047833
0730	PVT7	1095503

1.1 Solenoid-Driven Metering Pumps

Spare Diaphragms for Solenoid-Driven Metering Pump gamma/ XL

	Materials in Contact With the Medium	Order no.
1608, 2508	all materials	1030353
1612	all materials	1000248
1020	all materials	1000249
0730	all materials	1045456
0450	all materials	1045443
0280	all materials	1059691

Accessories

- Foot valves for low-pressure metering pumps, see page → 151
- Injection valves for low-pressure metering pumps, see page → 153
- Hoses and pipework for low-pressure metering pumps, see page → 208
- Suction lances, suction assemblies without level switches, see page → 232
- Connectors, fittings, connector kits, seals, see page → 212

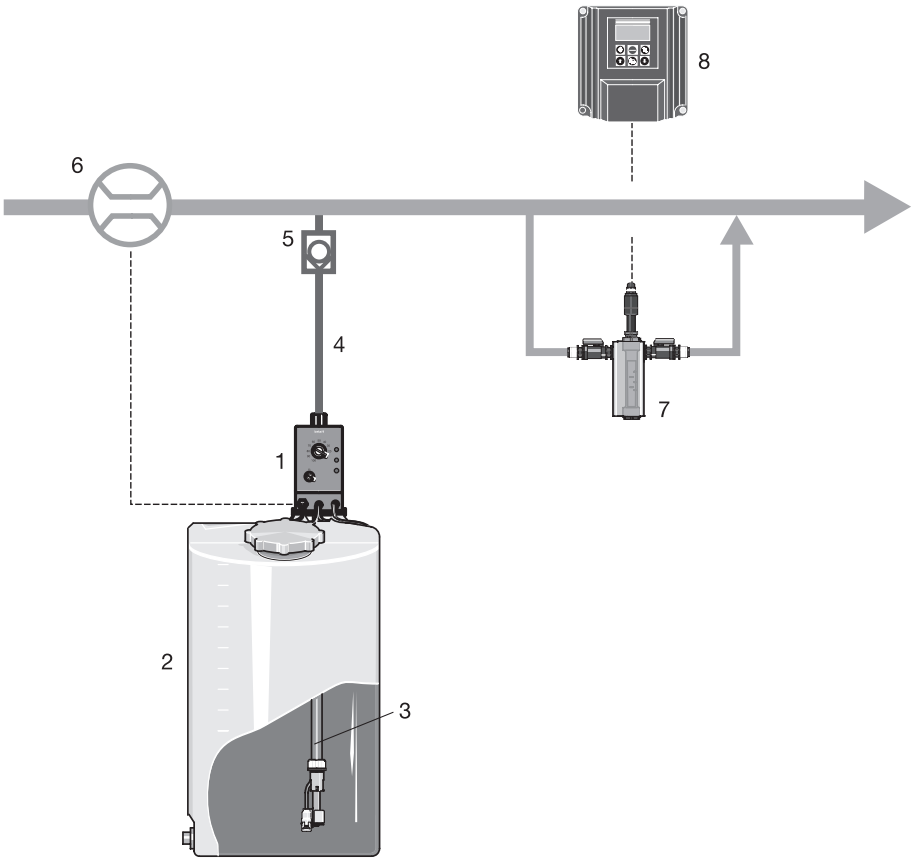
Spare Parts

- Special valve balls/special valve springs, see page → 248

1.1.5 Application Examples

Volume-proportional Metering of Chlorine Bleach Solution in Potable Water

Product: **Beta®**
Feed chemical: **NaOCl**
Industry: **Potable water**
Application: **Disinfection**



1 Beta®/ 4 with self-bleeding dosing head, PMMA/PVC (clear acrylic)
2 Dosing tank
3 Suction assembly with foot valve and level switch
4 PVC metering line - soft with woven layer or PTFE
5 Injection valve
6 Contact water meter
7 Chlorine measuring probe
8 Control measurement

Problems and requirements

- Volume-proportional addition of sodium hypochlorite to the main water flow
- Monitoring of chlorine content after metering

Operating conditions

- Alternating flow
- Installation in closed buildings

Notes on use

- The feed chemical is outgassing. If the pump has been stationary for long periods, an air bubble may therefore form in the suction line, resulting in an interruption to metering.
- Metering should be fully automatic and trouble-free because operating staff are not always present at waterworks or fountains.

Solution

- Solenoid-driven metering pump Beta® with self-bleeding dosing head
- Contact water meter in the main line to control the pump
- DULCOMETER® measuring and control technology for final check

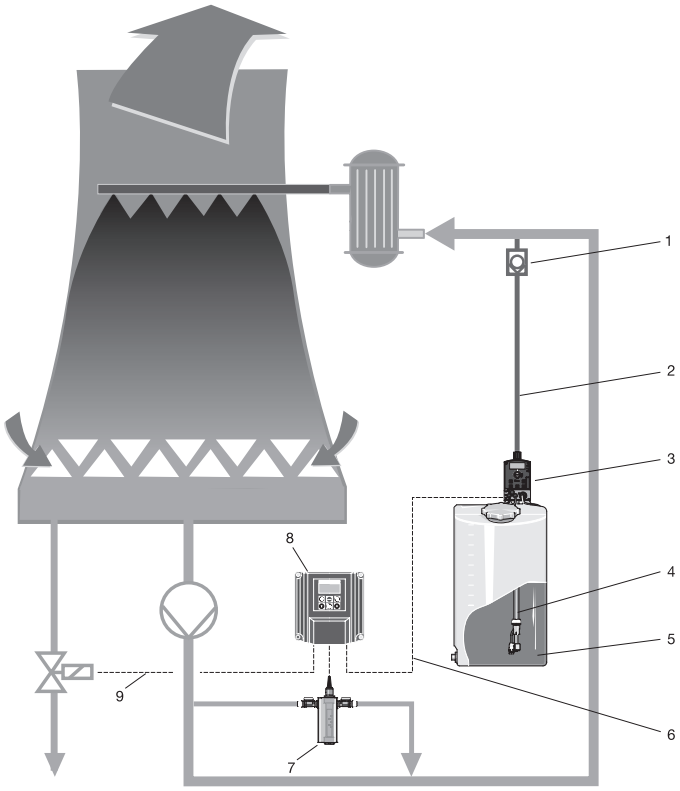
Benefits

- Excellent safety due to self-bleeding dosing head
- Maximum protection from over-metering or under-metering thanks to downstream final check

Shock Metering of Biocide in Cooling Water Circuit

Product: **gamma/ X**
Feed chemical: **Biocide**
Industry: **Cooling water treatment**
Application: **Disinfection**

1 Injection valve
2 Dosing line
3 gamma/ X with process timer
4 Suction assembly with foot valve and level switch
5 Dosing tank
6 Relay output for deactivation of conductance-controlled bleeding during biocide shock metering
7 Conductivity sensor
8 D1C conductivity
9 Control of solenoid valve for bleeding
10 Waste water



Problems and requirements

- Increasing the biocide content, possibly in a weekly cycle, leads to the destruction of all biology in the cooling water.
- However, this can lead to local increased concentration, which can result in conductance-controlled bleeding. They disappear again following complete distribution in the cooling water.
- Therefore, conductance-controlled bleeding needs to be disabled during shock metering and for a reasonable time thereafter.

Operating conditions

- Aggressive chemicals (oxidising)
- Installation of the metering pump in the building

Notes on use

- Shock metering is done at periodic intervals, e.g. weekly.
- In smaller cooling circuits, the metering pump with the integral process timer replaces the PLC.
- Conductance-controlled bleeding needs to be disabled via a potential-free contact regardless of the metering times set.
- In many cases, bleeding is performed before each shock metering. This bleeding needs to be controlled by a second relay contact in the pump.

Solution

- gamma/ X with process timer and the corresponding relay outputs
- The relays can be assigned to the process timer, if required, and perform the necessary switching functions.
- The pump itself meters at the required metering times.
- Dosing head made of PVDF for high levels of chemical resistance

1.1 Solenoid-Driven Metering Pumps

Benefits

- Integration of the process timer into the pump results in a high degree of protection of IP65 for the control
- Saving of the cost of a PLC
- Saving of installation costs due to compact construction

1.1.6 DULCONNEX – digital fluid management

Location-independent system monitoring in real time

You always have all the key data and measured values in sight at all times with DULCONNEX. Monitor and document the status of your system in real time. Check your unit data, regardless of where you are, safely and reliably when you're out and about. Simply use the terminal device of your choice: smartphone, tablet or PC.

Refer to our catalogue or website for more information and references.



1.2.1 Peristaltic metering pump DULCO flex Control - DFXa

A peristaltic pump that brings together the best qualities of ProMinent metering pumps.

Feed rate of 6 ml/h to 65 l/h at up to 7 bar back pressure

DULCO flex Control – DFXa meters gaseous, viscous, abrasive or shear-sensitive media and sets new standards in metering. Linear and reproducible metering (± 2%) is guaranteed with this peristaltic pump under all process conditions. With it's painted design, the tube is easily replaced preventing losses in valuable production down time.



DULCOflex-Control-DFXa

The new DULCO flex Control DFXa meters reliably and is simple to operate. This sees the addition of an intelligent peristaltic metering pump to the ProMinent product range. ProMinent is making use of its decades-long experience in the metering pump sector to bring together the best of two worlds. Valve-free metering with the accuracy of a diaphragm metering pump, with full use of the properties of a peristaltic pump. The applications of this metering pump include strongly gaseous, high-viscosity, abrasive, shear-sensitive or chemically aggressive fluids.

The liquid end developed and patented by ProMinent makes quick and straightforward hose replacement possible with a unique exchange technique. The display provides the fitter with precise instructions about the steps to be completed when replacing the hose. The high-performance hoses used guarantee exceptional chemical resistance and a long service life.

The order information required for hose replacement can be found on the pump's operating menu.

The intuitive user interface with click wheel ensures simple operation of the peristaltic pump.

A brushless direct current motor forms the heart of the DULCO flex Control DFXa. Its ingenious control provides for precise metering and reduced pump capacity with continuous metering up to 6 ml/h. What's more, the new peristaltic metering pump is IoT-enabled, meaning that it is fully connectible and can be connected to ProMinent's in-house developed DULCONNEX Platform, which enables it to work even smarter.

DULCOnneX

Your benefits

- Adjustment of the metering rate directly in l/h or gph
- Simple hose change
- No problems with very outgassing media or air locks
- Suitable for viscosities of up to 200,000 mPas (with VPT0530)
- Sole contact with media in the hose
- Many different control options, such as using an analogue 0/4-20 mA signal, contact controller, timer or via process control systems

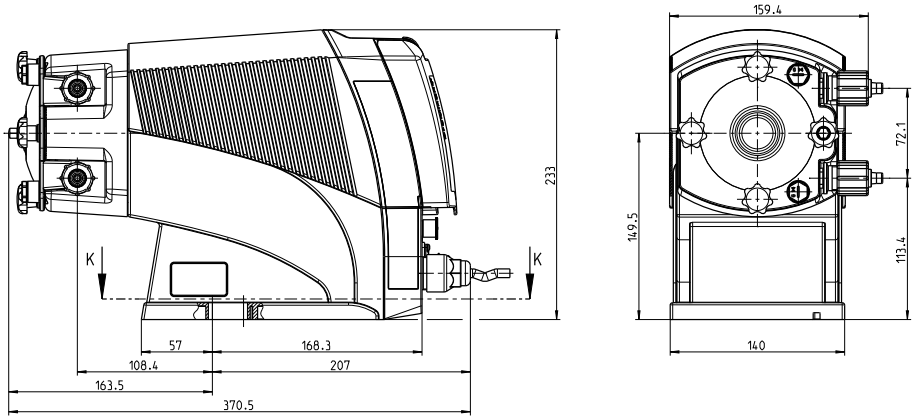
Technical Details

- Illuminated 3" LCD and 3-LED display for operating, warning and error messages, visible from all sides
- Adjustable feed rate between 30 l/ and 10 ml/h
- Connector for 2-stage level switch or continuous level measurement
- 3 additional freely configurable inputs and outputs on one port
- Optional 0/4–20 mA output for remote transmission of actual dosing rate and error messages
- Optional relay module with 1 x switch-over contact, 230 V – 8 A
- Optional relay module with 2 x On, 24 V – 100 mA
- Pump is available as an FDA design
- DULCONNEX-compatible
- Connection to process control systems via a BUS interface, such as PROFIBUS®, Profinet, CANbus or Modbus
- CIP (cleaning in place)-enabled system
- Reverse flow is possible

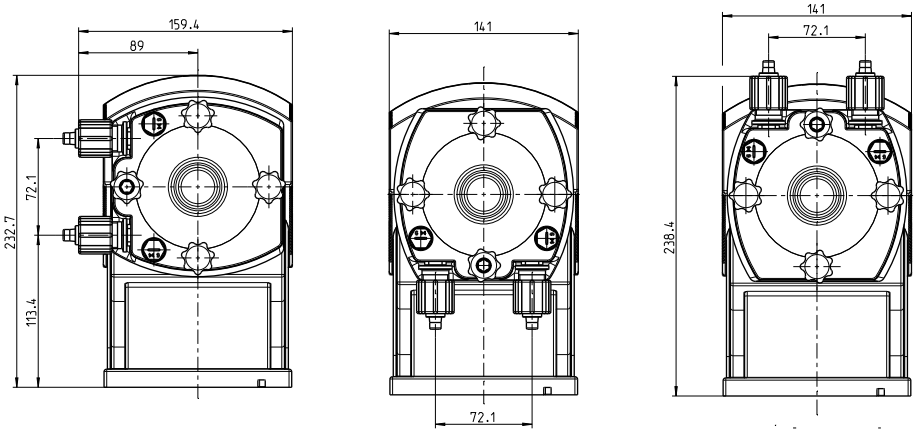
Field of application

- Potable water and waste water treatment
- Food and beverage industry
- Paper industry
- Chemical industry
- Chemical distributors
- Electroplating
- Swimming pools
- All industrial applications, either as a stand-alone unit or integrated in a complete system

Dimensional drawing of DULCO flex Control DFXa without hose rupture alarm

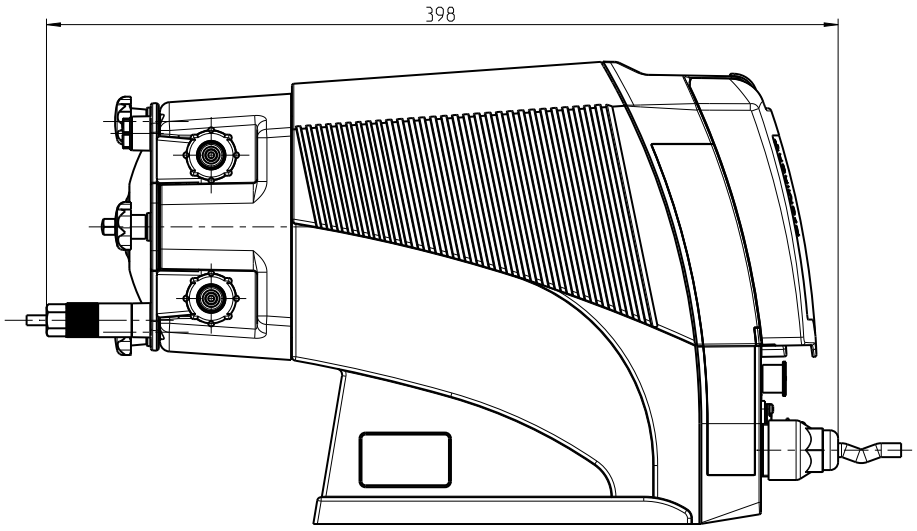


Dimensional drawing of DFXa, dosing head orientation on the right, dimensions in mm



Dimensional drawing of DFXa, dosing head orientation (from left to right) left/bottom/top, dimensions in mm

Dimensional drawing of DULCO flex Control DFXa with hose rupture alarm



Dimensional drawing of DFXa, dimensions in mm

Identity code ordering system for product range DULCO flex Control - DFXa

DFXa	Type	Output																
	0518	5 bar	18 l/h															
	0530	5 bar	30 l/h															
	0730	7 bar	30 l/h															
	0565	5 bar	65 l/h															
		Tube material																
		SP	Thermoplastic vulcanisate (TPV/PVDF), the tube is ideally suited for NaOCl...															
		VP	Polyurethane (PUR/PVDF), the tube is ideally suited to oils, fats, polymers...															
			Seal material															
			T	PTFE														
			F	FDA-compliant (PTFE)														
				Dosing head orientation														
				R	right (view from behind)													
				L	left (view from behind)													
				U	top													
				D	bottom													
					Hydraulic connections													
					0	Standard connector (12x9)												
					2	Connector 8x5												
					5	Connector 12x6 discharge side												
					7	no connector kit												
					8	Connector 9x5												
					E	Connector DN 10 with nozzle												
						Tube rupture alarm												
						0	none											
						1	with tube rupture alarm. Stops the pump and warns the user if a tube has ruptured											
							Version											
							0	Housing RAL 5003 / cover RAL 2003										
								logo										
								0	with ProMinent logo									
								2	without ProMinent logo									
									Power unit version									
									U	Universal 100-240 V								
										Cable and plug								
										A	2 m European							
										D	2 m USA 115 V							
										E	2 m Great Britain							
										1	2 m European, open end							
											Relay							
											0	no relay						
											1	Fault indicating relay (230 V, 8 A)						
											4	Fault indicating relay (24 V, 100 mA) + pacing relay (24 V, 100 mA)						
											C	0/4 – 20 mA analogue output + fault indicating / pacing relay (24 V - 100 mA)						
												Accessories						
												0	no accessories					
												1	With foot and injection valve, 2 m suction line and 5 m discharge line					
												5	1+ universal control cable					
													Control Variants					
													0	Manual + external with pulse control				
													3	Manual + external with pulse control + analogue 0/4 - 20 mA				
													C *	As 3 + CANopen				
													P *	As 3 + Profinet				
													R *	As 3 + PROFIBUS® DP interface M12				
													M *	As 3 + Modbus				
														Communication interface				
														0	none			
															Language			
															DE	German		
															EN	English		
															ES	Spanish		
															FR	French		
																Approvals		
																01	CE	
																	Documentation language	
																	DE	German
																	EN	English
																	ES	Spanish
																	FR	French

* No relay can be selected with these options.

1.2 Peristaltic Metering Pumps

Technical Data

Type	Maximum back pressure bar	Delivery rate	Frequency rpm	Connector size outer Ø x inner Ø	Suction lift m WC	Shipping weight kg
0518	5	6 ml/h – 18 l/h	100	12 x 9	9	5.8
0530	5	10 ml/h – 30 l/h	100	12 x 9	9	5.8
0730	7	10 ml/h – 30 l/h	100	12 x 9	9	5.8
0565	5	22 ml/h – 65 l/h	100	12 x 9	9	5.8

Tube material:	Thermoplastic vulcanisate (TPV), polyurethane (PUR)
Tube connectors:	PVDF/PTFE
Metering reproducibility:	±2% with retracted tube (after approx. 200 revolutions)
Electrical connection:	100 - 230 V ±10%, 50/60 Hz
Nominal power:	approx. 50 W
Degree of protection:	IP 66, NEMA 4X Indoor
Permissible ambient temperature:	0 … 45 °C
Viscosities:	The DFXa0530VPT has successfully metered viscosities of up to 200,000 mPas in testing. If you are working with viscosities of more than 10,000 mPas, please contact our technical consulting department, who will be able to assist you.

All data calculated with water at 20 °C.

Spare parts kits for DULCO flex Control - DFXa

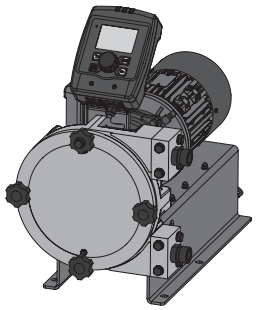
	Order no.
Spare parts kit for DFXa 0730 SPT	1114522
Spare parts kit for DFXa 0730 SPT	1114521
Spare parts kit for DFXa 0530 SPT	1103100
Spare parts kit for DFXa 0530 SPF	1103101
Spare parts kit for DFXa 0730 SPT	1108859
Spare parts kit for DFXa 0530 VPT	1104954
Spare parts kit for DFXa 0730 SPT	1103102
Spare parts kit for DFXa 0730 SPF	1103099
Spare parts kit for DFXa 0730 SPT	1112765
Spare parts kit for DFXa 0730 SPT	1112764
Spare parts kit for DFXa 0518/ 0565, rotor assembled	1116468
Spare parts kit for DFXa 0530/ 0730, rotor assembled	1103249
Star screw knob DIN 6336 L M 5x15xd25 A2	1102764
Spare screw kit for DFXa	1104952
Tube rupture alarm for DFXa	1044477
Dosing head cover	1115678
Dosing head (black plastic part)	1115677
DIN 7991 M 5x20 countersunk screw	1027519

1.2.2 Peristaltic metering pump DULCO flex Control - DFYa

The peristaltic pump DULCO flex Control - DFYa combines the properties of top products from the ProMinent product range

Feed rate of 5.1 l/h to 410 l/h at up to 8 bar back pressure

The valveless peristaltic pump DULCO flex Control - DFYa guarantees precise, linear and reproducible metering in all process conditions. It meters gaseous, viscose, shear-sensitive media, possibly containing particles, with ease – ProMinent is therefore setting new standards in metering with peristaltic pumps.



The new metering pump DFYa, the big brother of the DFXa, adds an intelligent peristaltic pump to the top capacity range of the ProMinent portfolio.

The new generation of peristaltic metering pumps is now controlled electronically. It meters without the need for a valve, with precision hitherto impossible. All the benefits of a peristaltic pump are retained, which is why seriously gaseous, high-viscosity, abrasive or shear-sensitive fluids, sometimes containing particles, can also be perfectly metered with the DFYa.

As with the DFXa, hose replacement on the DFYa is also assisted by the pump. When the hose needs to be changed, the pump displays exact instructions for the steps to be followed and automatically moves into the correct positions for hose replacement. The different hose materials (NR, NBR, NBR-A, EPDM Hypalon) enable the DFYa to work with a very wide range of media to be metered.

The peristaltic pump DFYa is simple to operate from the intuitive user interface with 4 keys and the click wheel. The DFYa thus joins the remaining ProMinent product range of intelligent metering pumps, which all share the same menu structure and user interface.

The new peristaltic metering pump is even IoT-capable. This means that it is fully connectible and can be connected to ProMinent's in-house developed DULCONNEX platform, which enables it to work even smarter.

DULCOnneX

Your benefits

- Operation by contact, batch, manual, analogue or BUS control
- Adjustment of the metering rate directly in l/h or gph
- Connection to process control systems via a BUS interface, such as PROFIBUS®, Profinet or CANopen
- No problems with very gaseous media or air locks
- Simple, menu-guided hose change
- Reversible direction of rotation
- Direct input of the required final concentration in concentration mode with volume-proportional metering tasks
- Automatic mode – volume settings only (l/h, ml/contact etc.)
- Pump can run dry
- Suitable for viscosities of up to 40,000 mPas
- Sole contact with media in the hose

Technical Details

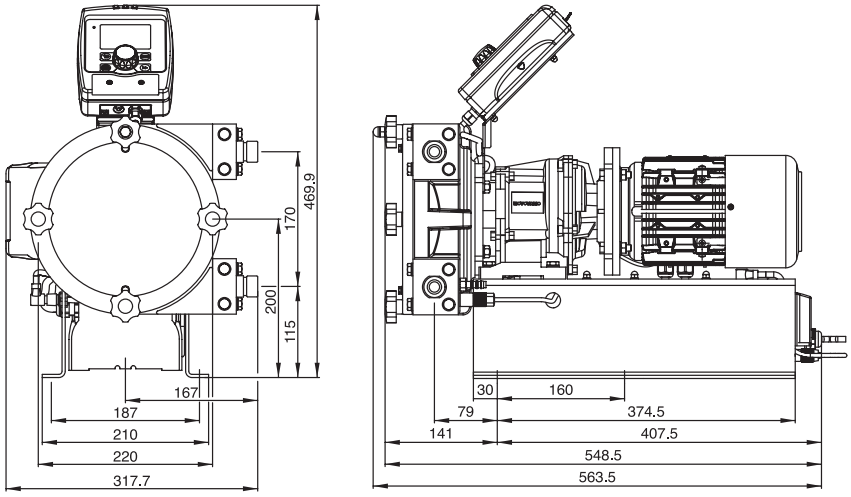
- Illuminated 3" LCD and 3-LED display for operating, warning and error messages, visible from all sides
- Adjustable feed rate between 5.1 l/ and 410 l/h
- Batch operation with max. 999.9 l/pulse
- Connector for 2-stage level switch
- Optional relay module with 1 x switch-over contact, 230 V – 8 A
- Optional relay module with 2 x On, 24 V – 100 mA
- DULCONNEX-compatible

Field of application

- Mining
- Potable water and waste water industry
- Chemical industry
- Paper industry
- Food and beverage industry

All industrial applications, either as a stand-alone unit or integrated in a complete system

Dimensional drawing of DULCO flex Control - DFYa



Dimensional drawing of DFYa, dimensions in mm

Technical Data

Type	Maximum back pressure bar	Delivery rate	Frequency rpm	Suction lift m WC	Intake head m WC
04410	4	410 l/h ± 10 %	80	8	8
06410	6	410 l/h ± 10 %	80	8	8
08410	8	410 l/h ± 10 %	80	8	8

Hose material:	NR, NBR, EPDM, NBR-A, Hypalon
Self-priming:	Up to 8 m
Rollers/shoes:	Rollers
Metering reproducibility:	± 2 % ±25ml with retracted hose after 500 revolutions
Electrical connection:	100 - 230 V ±10%, 50/60 Hz
Electrical power consumption:	Max. 400 W
Degree of protection:	IP 55
Weight:	30 kg
Permissible ambient temperature:	0 … 45 °C

All data calculated with water at 20 °C.

Spare parts for DULCO flex Control - DFYa

	Order no.
Hose NR	1037164
Hose NBR	1037165
Hose EPDM	1037166
Hose NBR-A	1037168
Hose HYPALON	1037171

Identity code ordering system for product range DULCO flex Control - DFYa

DFYa	Type	Output																		
	04410	4 bar	410 l/h																	
	06410	6 bar	410 l/h																	
	08410	8 bar	410 l/h																	
		Hose material																		
		0	NR																	
		B	NBR																	
		C	NBR-A																	
		E	EPDM																	
		H	Hypalon																	
		G	NBR-A (with FDA + EU 1935/2004 certificate), only in combination with G or H connection																	
			Dosing head orientation																	
			R	right																
			L	left																
				Hydraulic connections																
				A	SS (stainless steel) BSP 3/4“															
				B	SS (stainless steel) NPT 3/4“															
				C	PP BPS 3/4“															
				D	PVDF BSP 3/4“															
				E	PVDF NPT 3/4“															
				F	PVC NPT 3/4“															
				G	Tri-clamp, SS (stainless steel), 1“															
				H	DIN 11851, SS (stainless steel), NW20															
					Tube rupture alarm															
					0	without hose rupture alarm														
					1	with hose rupture alarm														
						Version														
						P	ProMinent design													
						M	modified													
							Special version													
							0	standard												
							H	Chemically high-resistance version (Halar-coated)												
								logo												
								0	with logo											
								1	without logo											
								M	modified											
									Power unit version											
									U	universal 100–230 V ± 10 %, 50/60 Hz										
										Cable and plug										
										A	2 m Europe									
										A	2 m Europe									
										D	2 m USA 115V									
										E	2 m Great Britain									
											Relay function									
											0	no relay								
											1	Fault indicating relay (230 V, 8 A)								
											3	Fault indicating relay (24 V, 100 mA) + pacing relay (24 V, 100 mA)								
											8	0/4 – 20 mA analogue output + fault indicating/pacing relay								
												Accessories								
												0	no accessories							
													Control Variants							
													0	Manual + External contact with Pulse control						
													1	Manual + external contact with pulse control + ana-logue 0/4-20 mA						
													6	Profibus M12 plug + analogue 0/ 4- 20 mA						
													7	CANopen + analogue 0/4-20 mA						
														Operating unit						
														0	HMI with Click Wheel 0.5 m					
														4	HMI with Click Wheel 2 m					
														5	HMI with Click Wheel 5 m					
														6	HMI with Click Wheel 10 m					
															Access code					
															0	without access control				
															1	with access control				
																Communication				
																0	none			
																	Language			
																	DE	German		
																	EN	English		
																		Approvals		
																		01	CE	

1.2.3 DULCONNEX – digital fluid management

Location-independent system monitoring in real time

You always have all the key data and measured values in sight at all times with DULCONNEX. Monitor and document the status of your system in real time. Check your unit data, regardless of where you are, safely and reliably when you're out and about. Simply use the terminal device of your choice: smartphone, tablet or PC.

Refer to our catalogue or website for more information and references.



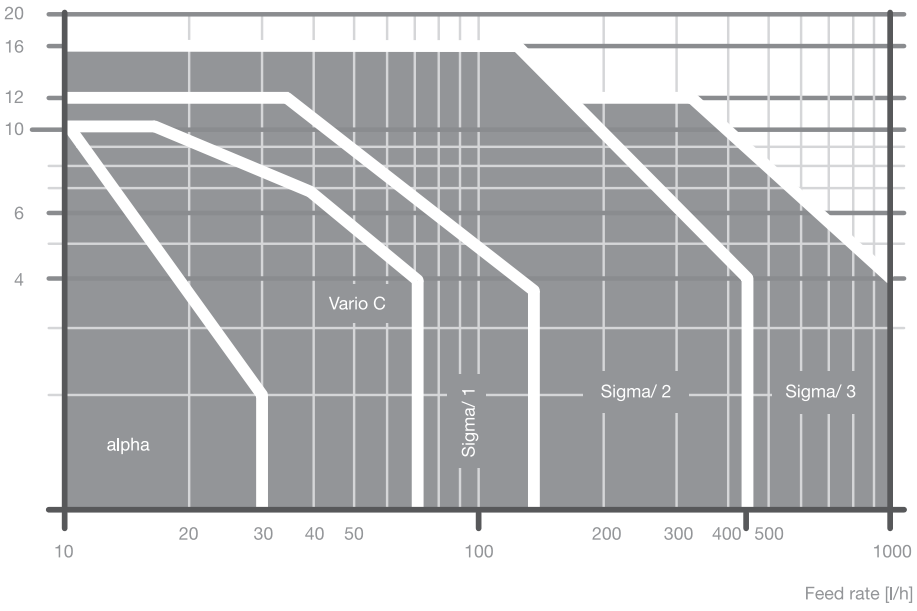
1.3.1 How to Find the Right Pump Type?

Low-pressure metering pumps for almost all liquid and low-viscosity chemicals.

ProMinent motor-driven metering pumps offer a wide range of drive versions, including 3-phase AC and ATEX motors or 1-phase AC motors or intelligent motor-driven metering pumps with integrated microprocessor control and wide-range voltage power unit.

Simple to operate and universally applicable, thanks to the many control options and broad adjustment range. Reliable, thanks to their excellent process reliability and maintenance-friendly due to the small number of versions.

In the capacity range of 1.0 to 1040 l/h at a back pressure of 10 to 4 bar

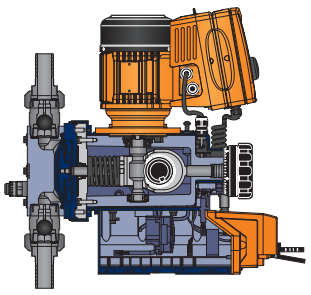


Back pressure [bar] as a function of feed rate [l/h]

ProMinent offers an extensive range of metering pumps with a capacity rating of up to 1,000 l/h. All oscillating positive-displacement pumps feature a leak-free, hermetically sealed metering chamber and an identical operating structure.

Applications

- General: Chemical metering up to 1,000 l/h
- Drinking water treatment: Metering of disinfectants
- Cooling circuits: Metering of disinfectants
- Waste water treatment: Metering of flocculants
- Paper industry: Metering of additives
- Plastics production: Metering of additives
- Textile industry: Metering of dyeing additives
- Electroplating: Metering of acids/lyes
- Automotive industry: Metering of cleaning agents
- Food industry: Metering of food additives, concentrates, CIP cleaning agents
- Pool & wellness: Metering of disinfectants



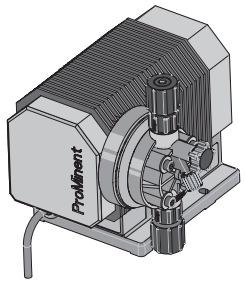
1.3.2 Motor-Driven Metering Pump alpha

The cost-effective solution for simple applications in the lower performance range.

Capacity range 1.0 – 30.6 l/h, 10 – 2 bar

The motor-driven metering pump alpha is the metering pump for liquid media and the optimum solution for simple applications. Robust, low-noise, chemical-resistant, with precise metering and good suction capacity.

Various pump types are available as a combination of 2 gears and 4 sizes of dosing head in materials PVDF and clear acrylic/PVC, enabling you to match the pump perfectly to your metering process.



Your benefits

- Precise metering and good suction capacity by soft controlled suction and compression strokes
- Tough plastic housing – shock-proof and chemical-resistant
- Suitable for higher viscosity media, thanks to spring-loaded valves
- Low-noise operation

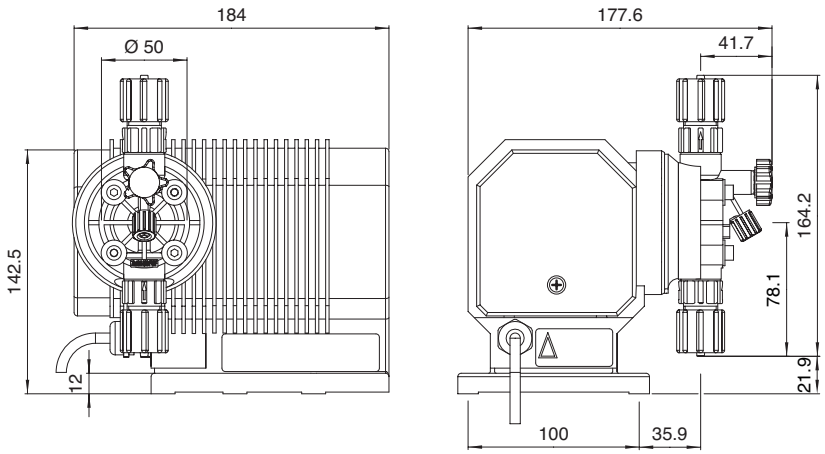
Technical Details

- Stroke length adjustment by changing the eccentricity on the pump drive when the pump is idle
- Stroke length adjustment in 10% steps
- Diaphragm deflection from the centre position
- Soft controlled suction and compression strokes

Field of application

All low capacity applications where constant metering is required.

Dimensional drawing of the alpha



Dimension drawing of alpha – dimensions in mm

1.3 Motor-Driven Metering Pumps

Technical Data

Pump type	Pump capacity at max. back pressure			Delivery rate at medium back pressure			Stroke rate	Stroke length	Connector size outside Ø x inside Ø	Suction lift	Shipping weight
	bar	l/h	ml/stroke	bar	l/h	ml/stroke	Strokes/min	mm	mm	m WC	kg
50 Hz											
ALPc 1001	10	1.0	0.29	5	1.1	0.32	30	2	6 x 4	5.1	3.0
ALPc 0230	2	30.6	3.98	1	32.7	4.26	128	3	12 x 9	3.1	3.0
ALPc 0417	4	17.0	2.51	2	18.3	2.76	128	3	8 x 5	4.1	3.0
ALPc 0707	7	6.9	1.98	3	7.7	2.21	58	3	8 x 5	4.1	3.0
ALPc 1002	10	1.8	0.52	5	2.1	0.60	58	2	6 x 4	5.1	3.0
ALPc 1004	10	3.5	1.01	5	3.9	1.12	58	3	8 x 5	5.1	3.0
ALPc 1008	10	7.7	1.00	5	8.6	1.12	128	3	8 x 5	5.1	3.0
60 Hz											
ALPc 0230	2	34.4	3.72	1	39.2	4.24	154	3	12 x 9	3.1	3.0
ALPc 0417	4	20.6	2.45	2	21.9	2.75	154	3	8 x 5	4.1	3.0
ALPc 0707	7	8.3	2.00	3	9.2	2.22	69	3	8 x 5	4.1	3.0
ALPc 1001	10	1.2	0.29	5	1.3	0.31	36	2	6 x 4	5.1	3.0
ALPc 1002	10	2.2	0.53	5	2.6	0.63	69	2	6 x 4	5.1	3.0
ALPc 1004	10	4.1	0.99	5	4.7	1.14	69	3	8 x 5	5.1	3.0
ALPc 1008	10	8.9	0.96	5	10.4	1.13	154	3	8 x 5	5.1	3.0

All data calculated with water at 20 °C.

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	Ball seat	Seals	Balls
PPE	Polypropylene	Polypropylene	EPDM	EPDM	Ceramic
PPB	Polypropylene	Polypropylene	FKM A	FKM A	Ceramic
NPE	Clear acrylic	PVC	EPDM	EPDM	Ceramic
NPB	Clear acrylic	PVC	FKM A	FKM A	Ceramic
PVT	PVDF	PVDF	PVDF	PTFE	Ceramic

Metering diaphragm with PTFE coating for all designs

FKM = fluorine rubber

Motor Data

Type	Split pole motor with integrated thermal overload protection
Electrical connection	220 – 240 V, 50/60 Hz (variant A)
Output	50 W (at 230 V/50 Hz)
Power consumption	0.4 A (at 230 V/50 Hz)

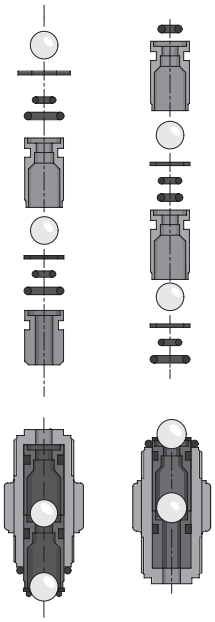
Warranty: The warranties listed in the General Terms and Conditions of Sale apply; there is a warranty period of 12 months for the alpha pump drive.

1.3 Motor-Driven Metering Pumps

Identity Code Ordering System for Product Range alpha, version c

ALPc	Type	Output							
	1001	10 bar	1.0 l/h	10 bar	1.2 l/h				
	1002	10 bar	1.8 l/h	10 bar	2.2 l/h				
	1004	10 bar	3.5 l/h	10 bar	4.1 l/h				
	1008	10 bar	7.7 l/h	10 bar	8.9 l/h				
	0707	7 bar	6.9 l/h	7 bar	8.3 l/h				
	0417	4 bar	17.0 l/h	4 bar	20.6 l/h				
	0230	2 bar	30.6 l/h	2 bar	34.4 l/h				
		Liquid end material							
		PP	Polypropylene/polypropylene						
		NP	Acrylic/PVC						
		PV	PVDF/PVDF						
			Seal material						
			E	EPDM					
			B	FKM A					
			T	PTFE					
				Valve springs					
				2	without valve spring, with bleeding				
				3	with 2 valve springs approx. 0.1 bar, material 1.4571, with bleeding				
					Hydraulic connections				
					0	Standard according to technical data			
						Version			
						0	with ProMinent logo		
							Electrical Connection		
							A	230 V, 50/60 Hz, 2 m, Euro. plug	
							B	230 V, 50/60 Hz, 2 m, Swiss plug	
							C	230 V, 50/60 Hz, 2 m, Austral. plug	
								Accessories	
								0	no accessories
								1	with foot and metering valve, 2 m PVC suction line, 5 m PE metering line

FKM = fluorine rubber

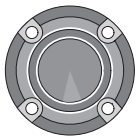


Spare Parts Kits for Motor-Driven Metering Pump alpha

Spare parts kits for alpha, consisting of:

- 1 diaphragm
- 1 suction valve assembly
- 1 discharge valve assembly
- 1 connector kit

	Materials in contact with the medium	Order no.
1001, 1002, 1004, 1008	PPE	1001647
	PPB	1001655
	NPE	1001716
	NPB	1001724
	PVT	1023110
0417, 0707	PPE	1001649
	PPB	1001657
	NPE	1001718
	NPB	1001726
	PVT	1023112
0230	PPE	1001650
	PPB	1001658
	NPE	1001719
	NPB	1001727
	PVT	1023113



Spare Diaphragms for Motor-Driven Metering Pump alpha

	Order no.
0417, 0707	1000249
0230	1000250
1001, 1002, 1004, 1008	1000247

Accessories

- Foot valves for low-pressure metering pumps, see page → 151
- Injection valves for low-pressure metering pumps, see page → 153
- Hoses and pipework for low-pressure metering pumps, see page → 208
- Suction lances, suction assemblies without level switches, see page → 232
- Connectors, fittings, connector kits, seals, see page → 212

Spare Parts

- Special valve balls/special valve springs, see page → 248

1.3 Motor-Driven Metering Pumps

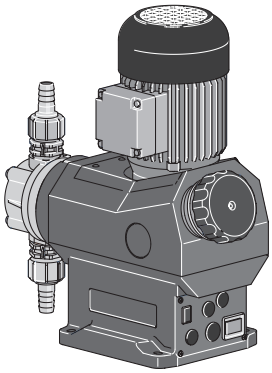
1.3.3 Motor-Driven Metering Pump Vario C

The basic pump for simple applications

Capacity range 8 – 76 l/h, 10 – 4 bar

The motor-driven metering pump Vario C delivers a high level of process quality for continuous metering within simple metering tasks. It can be used, for example, in the metering of additives or flocculants in chemical metering.

With 4 gear reduction ratios, 2 dosing head sizes and 2 dosing head materials, the Vario C motor-driven metering pump is well adapted to basic metering tasks. It is available with a three-phase or single-phase AC motor. Its pump capacity is adjusted via the stroke length, in 1% increments, with a self-locking rotary dial.



Vario C

Your benefits

- Excellent suction capacity, gentle metering stroke and consistently precise metering
- Excellent process quality: Metering reproducibility is better than ± 2% within the stroke length adjustment range of 30 to 100%
- Flexible adjustment of the pump capacity by means of the stroke length in 1% increments
- Fibreglass-reinforced plastic housing
- Good adaptation to the specific application, thanks to 4 different gear reduction ratios and 2 sizes of liquid ends in 2 material versions
- Power end optionally available with three-phase or single-phase AC motor
- Customised designs are available on request

Technical Details

- Stroke length: 3 mm
- Stroke length adjustment range: 0 – 100 %
- Stroke length adjustment: manually by means of self-locking rotary dial
- Metering reproducibility is better than ±2% in the 30 – 100% stroke length adjustment range under defined conditions and with correct installation
- Wetted materials: PVDF, stainless steel 1.4571/1.4404
- DEVELOPAN® diaphragm (single diaphragm with PTFE)
- Motor: Three-phase AC motor (0.07 KW, 230/400 V, 50/60 Hz) or single-phase AC motor (0.06 kW, 230 V 50 Hz or 115 V 60 Hz)
- Degree of protection: IP 55
- Fibreglass-reinforced plastic housing
- Provide suitable overload protection in all motor-driven metering pumps during installation for safety reasons.

Field of application

- Chemical metering in potable water, cooling and waste water circuits
- Metering of additives, flocculants etc.

1.3 Motor-Driven Metering Pumps

Technical Data

Type	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Pump capacity at max. back pressure with 1800 rpm motor at 60 Hz			Suction lift	Perm. pre-pressure suction side	Connector Suction/ Discharge Side
	l/h	bar	ml/stroke	Max. stroke rate Strokes/ min	l/h/gph (US)	psi	Max. stroke rate Strokes/ min	m WC	bar	G-DN
10008	8	10	4	38	9.6/2.5	145	45	7	2.8	3/4–10
10016	16	10	4	77	19.2/5.0	145	92	7	2.8	3/4–10
07026	26	7	4	120	31.2/8.2	100	144	7	2.8	3/4–10
07042	42	7	4	192	50.4/13.3	100	230	7	2.8	3/4–10
07012	12	7	5	38	14.4/3.8	100	45	6	1.7	3/4–10
07024	24	7	5	77	28.8/7.6	100	92	6	1.7	3/4–10
04039	40	4	5	120	48.0/12.6	58	144	6	1.7	3/4–10
04063	64	4	5	192	76.8/20.2	58	230	6	1.7	3/4–10

The shipping weight of all pump types is 6/7.2 kg (PVDF/SS)

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	Seals	Valve balls	Ball seat
PVT	PVDF	PVDF	PTFE	Ceramic	PTFE
SST	stainless steel 1.4404	stainless steel 1.4404	PTFE	stainless steel 1.4404	PTFE

Motor Data

Identity code specification		Power supply		Remarks
S	3-phase, IP 55	220 – 240 V/380 – 420 V	50 Hz	0.07 kW
		250 – 280 V/440 – 480 V	60 Hz	0.07 kW
M	1-phase AC, IP 55	230 V ± 5 %	50/60 Hz	0.06 kW
N	1-phase AC, IP 55	115 V ± 5 %	60 Hz	0.06 kW

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

Motors less than 0.75 kW and motors designed for speed-controllable operation are not subject to the IE3 standard in compliance with the Ecodesign Directive 2009/125/EC.

1.3 Motor-Driven Metering Pumps

Identity Code Ordering System for Vario Diaphragm Metering Pump

VAMc	Type *	Output									
	10008	10 bar	8 l/h								
	10016	10 bar	16 l/h								
	07026	7 bar	26 l/h								
	07042	7 bar	42 l/h								
	07012	7 bar	12 l/h								
	07024	7 bar	24 l/h								
	04039	4 bar	40 l/h								
	04063	4 bar	64 l/h								
		Liquid end material									
		PVT	PVDF								
		SST	Stainless steel								
			Seal material								
			T	PTFE							
				Liquid end version							
				0	No valve springs (standard)						
				1	with 2 valve springs. Hastelloy C4						
					Hydraulic connections						
					0	standard connection					
					1	PVC union nut and insert					
					2	Union nut and insert PP					
					3	PVDF union nut and insert					
					4	Stainless steel union nut and insert					
					5	PP union nut and hose nozzle					
					7	Union nut and PVDF hose nozzle					
					8	Stainless steel union nut and hose nozzle					
						Version					
						0	With ProMinent® logo (standard)				
						1	without ProMinent logo				
						M	Modified				
							Electrical power supply				
							S	3 ph, 230 V / 400 V; 50/60 Hz			
							M	1 ph AC 230 V; AC 50/60 Hz			
							N	1 ph AC 115 V; AC 60 Hz			
								Stroke sensor			
								0	No stroke sensor		
								3	With stroke sensor (Namur)		
									Stroke length adjustment		
									0	Manual (Standard)	

* Digits 1 and 2=back pressure [bar]; digits 3, 4, 5=pump capacity [l/h]

Spare Parts

The spare parts kit generally includes the wear parts for the liquid ends.

Scope of delivery with PPE, PCB, PVT material versions:

- 1 diaphragm
- 1 suction valve assembly
- 1 discharge valve assembly
- 2 valve balls
- 1 complete sealing set (O-rings or cover rings with PVT design)

Scope of delivery with SST material version:

- 1 diaphragm
- 2 valve balls
- 1 complete sealing set (cover rings, flat seals, ball seat)

Spare parts kits for motor-driven metering pump Vario C

Identity code for type VAMc 10008, 10016, 07026, 07042

Liquid end	Materials in contact with the medium	Order no.
FM 042 - DN 10	PCB Version	910754
FM 042 - DN 10	PPE	910753
FM 042 - DN 10	PVT	1003641
FM 042 - DN 10	SST	910751

Identity code for type VAMc 07012, 07024, 04039, 04063

Liquid end	Materials in contact with the medium	Order no.
FM 063 - DN 10	PCB Version	910759
FM 063 - DN 10	PPE	910758
FM 063 - DN 10	PVT	1003642
FM 063 - DN 10	SST	910756



Spare Diaphragms for Motor-Driven Metering Pump Vario C

	Order no.
Vario with FM 063 Type VAMc 07012, 07024, 04039, 04063	811459
Vario with FM 042 Type VAMc 10008, 10016, 07026, 07042	811458

Accessories

- Foot valves for motor-driven metering pumps, see page
- Injection valves for motor-driven metering pumps, see page
- Hoses and pipework for motor-driven metering pumps, see page
- Suction lances, suction assemblies without level switches, see page
- Connectors, fittings, connector kits, seals, see page
- Speed controllers, see page

Spare Parts

- Special valve balls/special valve springs, see page → 248

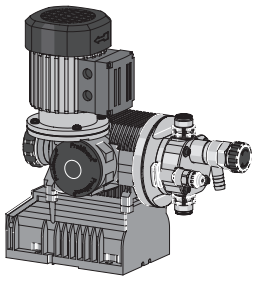
1.3.4 Motor-Driven Metering Pump Sigma/ 1 (Basic type)

The robust pump for safe and reliable use

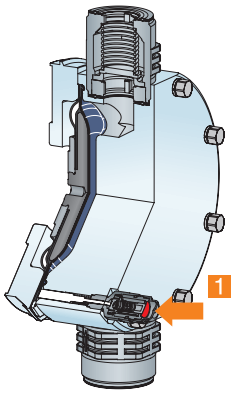
Capacity range 17 – 144 l/h, 12 – 4 bar

The Sigma/ 1 Basic is an extremely robust motor-driven metering pump with patented multi-layer safety diaphragm for excellent process reliability. It offers a wide range of power end designs, such as three-phase or 1-phase AC motors, also for use in areas at risk from explosion.

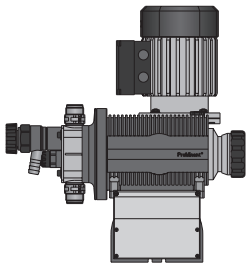
The Sigma/ 1 diaphragm metering pump, together with pumps of type Sigma/ 2 and Sigma/ 3, represents an integrated product range. They cover the capacity range from 17 to 1,030 l/h, with a consistent operating concept, control concept and spare parts management. A wide range of power end versions is available, including some for use in areas at risk from explosion.



Sigma/ 1 Basic version



1: Diaphragm rupture sensor



Sigma / 1 liquid end on left

Your benefits

Excellent process reliability:

- In the event of an accident, the feed chemical does not escape to the outside nor into the pump's power end, thanks to the patented multi-layer safety diaphragm with optical (optionally electric) signalling.
- Integrated relief valve to protect the pump from overloading.
- Reliable operation by bleed option during the suction process.

Flexible adaptation to the process:

- The entire Sigma product range is available as standard in a "Physiologically safe in respect of wetted materials" design.
- Metering pumps with electro-polished stainless steel metering head enable them to be used in hygienically challenging applications.
- Adaptation to specific installation situations, as the "Liquid end on left" option can be selected as standard.
- Wide range of power end versions, also for use in ATEX areas and different flange designs for the use of customised motors.
- Customised designs are available on request.

Technical Details

- Stroke length: 4 mm.
- Stroke length adjustment range: 0 – 100%.
- Stroke length adjustment: manually by self-locking rotary dial in 1 % increments (optionally with actuator or control drive).
- Metering reproducibility is better than ±2% in the 30 – 100% stroke length adjustment range under defined conditions and with correct installation.
- Wetted materials: PVDF, stainless steel 1.4571/1.4404, special materials on request.
- Patented multi-layer safety diaphragm with optical diaphragm rupture display (optionally with diaphragm rupture warning system via a contact).
- Integrated hydraulic relief and bleed valve.
- A wide range of power end versions is available: Three-phase standard motor, 1-phase AC motor, motors for use in areas at risk from explosion and different flange designs for use in customer-specific motors.
- For use in areas at risk from explosion II 2G Ex h IIC T3 Gb X or II 2G Ex h IIC T4 Gb X (optional).
- Degree of protection IP 55.
- Fibreglass-reinforced plastic housing.
- Liquid end on left is available as standard.
- For reasons of safety, provide suitable overload protection mechanisms when installing all mechanically deflected diaphragm metering pumps.

Field of application

- Volume-proportional addition of chemicals in water treatment, e.g. sodium-calcium hypochlorite for the disinfection of potable water
- Addition of chemicals depending on the measured value, e.g. metering of acid and alkali for pH neutralisation in waste water treatment
- Time-controlled addition of chemicals in the cooling water circuit
- Pulse-controlled metering in the bottling of different volumes e.g. glycerin filling of manometers

Sigma Basic Type Control Functions (S1Ba)

Stroke length actuator/control drive

Actuator: Electronically controlled actuator with contactless position detection for automatic stroke length adjustment, actuating period approx. 1 second for 1% stroke length, return potentiometer 1 kΩ, degree of protection IP65.

Control drive: Electronically controlled actuator with contactless position detection consisting of an actuator and integral servo controller for stroke length adjustment via a standard signal. Standard current input 0/4-20 mA corresponds to stroke length 0 – 100%, switch-over for manual/automatic operation, stroke adjustment in manual mode, electronic stroke length position display, wide-range voltage power unit 85 - 265 V 50/60 Hz, degree of protection IP65, actual value output 0/4-20 mA for remote display.

Speed controllers with frequency converter (identity code specification Z)

The speed controller assembly consists of a frequency converter and a variable speed motor with 0.09 kW (Sigma 1 Ba), 0.37 kW (Sigma 2 Ba) or 0.55 kW (Sigma 3 Ba).

“Physiologically safe” designs in respect to wetted sealing material

FDA

The wetted materials in the “FDA” (F) design comply with the FDA guidelines.

FDA guidelines: PTFE material: FDA No. 21 CFR § 177.1550, PVDF material: FDA No. 21 CFR § 177.2510

Available for plastic (PV) and stainless steel (SS) pump designs

Identity code example: S1BaH04084PV F S000S000

EU Regulation 1935/2004

Sealing materials in accordance with Regulation (EC) 1935/2004 are available in the “Physiologically safe for wetted material in accordance with Regulation (EC) 1935/2004” stainless steel material version. Available for stainless steel (SS) pump design.

Hygienic Design

Hygienic Design dosing heads are available in 1.4435 (AISI 316L) for hygienically demanding applications. Optimised in terms of dead space, feature as few gaps as possible and have smooth, wetted surfaces, easy to clean using CIP. Get in touch with us, we would be happy to advise you.

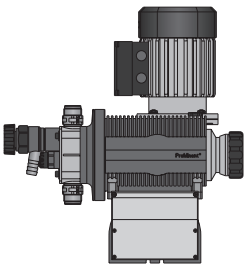
Identity code example: S1BAH07065SSHAHC0S000

Connection type: Aseptic clamp unions DN11864-3

Sigma / 1 Basic Type “liquid end on left” design

This version offers additional adaptability to special installation situations, e.g. in combination with storage tanks, brackets, etc.

Identity code example: S1BaH07042PVTS00 **5** S000



Sigma / 1 liquid end on left

1.3 Motor-Driven Metering Pumps

Technical Data

Type	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Pump capacity at max. back pressure with 1800 rpm motor at 60 Hz			Suction lift	Perm. pre-pressure suction side	Connector Suction/ Discharge Side	Shipping weight
S1Ba	l/h	bar	ml/stroke	Max. stroke rate Strokes/ min	l/h/gph (US)	psi	Max. stroke rate Strokes/ min	m WC	bar	G-DN	kg
12017 PVT	17	10	3.8	73	20.4/5.3	145	88	7	1	3/4–10	9
12017 SST	17	12	3.8	73	20.4/5.3	174	88	7	1	3/4–10	12
12035 PVT	35	10	4.0	143	42.0/11.0	145	172	7	1	3/4–10	9
12035 SST	35	12	4.0	143	42.0/11.0	174	172	7	1	3/4–10	12
10050 PVT	50	10	4.0	205	60.0/15.8	145	246	7	1	3/4–10	9
10050 SST	50	10	4.0	205	60.0/15.8	145	246	7	1	3/4–10	12
10022 PVT	22	10	5.0	73	26.4/6.9	145	88	6	1	3/4–10	9
10022 SST	22	10	5.0	73	26.4/6.9	145	88	6	1	3/4–10	12
10044 PVT	44	10	5.1	143	52.8/13.9	145	172	6	1	3/4–10	9
10044 SST	44	10	5.1	143	52.8/13.9	145	172	6	1	3/4–10	12
07065 PVT	65	7	5.2	205	78.0/20.6	102	246	6	1	3/4–10	9
07065 SST	65	7	5.2	205	78.0/20.6	102	246	6	1	3/4–10	12
07042 PVT	42	7	9.5	73	50.4/13.3	102	88	3	1	1–15	10
07042 SST	42	7	9.5	73	50.4/13.3	102	88	3	1	1–15	14
04084 PVT	84	4	9.7	143	100.8/26.6	58	172	3	1	1–15	10
04084 SST	84	4	9.7	143	100.8/26.6	58	172	3	1	1–15	14
04120 PVT	120	4	9.7	205	144.0/38.0	58	246	3	1	1–15	10
04120 SST	120	4	9.7	205	144.0/38.0	58	246	3	1	1–15	14

Performance data for TTT, see type PVT

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	Seals/ball seat	Balls	Integral relief valve
PVT	PVDF	PVDF	PTFE/PTFE	Ceramic	PVDF/FKM or EPDM
SST	Stainless steel 1.4404	Stainless steel 1.4581	PTFE/PTFE	Stainless steel 1.4404	Stainless steel/ FKM or EPDM
TTT *	PTFE + 25% carbon	Carbon-filled PTFE	PTFE/PTFE	Ceramic	-

* Specifically for areas at risk from explosion

Sealing material “F“ - “FDA” ball seat version: PVDF

Sealing material “G” - (EC) Regulation 1935/2004” ball seat version: 1.4404

1.3 Motor-Driven Metering Pumps

Motor Data

Identity code specification	Power supply	Δ/Y			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V	50 Hz	0.09 kW	
		265 – 280 V/440 – 480 V	60 Hz	0.09 kW	
T	3-phase, IP 55	220 - 240 V/380 - 420 V	50 Hz	0.09 kW	With PTC, speed control range 1:5
		265 – 280 V/440 – 480 V	60 Hz	0.09 kW	
R	3-phase, IP 55	220 - 240 V/380 - 420 V	50 Hz	0.09 kW	With PTC, speed control range 1:20 with external fan (1-phase 230 V; 50/60 Hz, 20 W)
M	1-phase AC, IP 55	230 V ± 5 %	50/60 Hz	0.12 kW	
N	1-phase AC, IP 55	115 V ± 5 %	60 Hz	0.12 kW	
L1	3-phase, II2GExellT3	220 – 240 V/380 – 420 V	50 Hz	0.12 kW	
L2	3-phase, II-2GExdIICT4	220 – 240 V/380 – 420 V	50 Hz	0.18 kW	With PTC, speed control range 1:5
P1	3-phase, II2GExellT3	250 – 280 V/440 – 480 V	60 Hz	0.12 kW	
P2	3-phase, II-2GExdIICT4	250 – 280 V/440 – 480 V	60 Hz	0.18 kW	With PTC, speed control range 1:5

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

Motors less than 0.75 kW and motors designed for speed-controllable operation are not subject to the IE3 standard in compliance with the Ecodesign Directive 2009/125/EC.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.



1.3 Motor-Driven Metering Pumps

Identity code ordering system for Sigma/ 1 Basic type (S1Ba)

S1Ba	Drive type													
	H	Main drive, diaphragm												
		Type		Output										
		12017 *		12 bar	17 l/h									
		12035 *		12 bar	35 l/h									
		10050		10 bar	50 l/h									
		10022		10 bar	22 l/h									
		10044		10 bar	44 l/h									
		07065		7 bar	65 l/h									
		07042		7 bar	42 l/h									
		04084		4 bar	84 l/h									
		04120		4 bar	120 l/h									
			Liquid end material											
			PV	PVDF (max. 10 bar)										
			SS	Stainless steel										
			TT	PTFE + 25% carbon (max. 10 bar)										
				Seal material										
				T	PTFE seal									
				F	FDA-compliant									
					Diaphragm									
					S	Multi-layer safety diaphragm with optical rupture indicator								
					A	Multi-layer safety diaphragm with rupture signalling (contact)								
						Liquid end version								
						0	No spring							
						1	With 2 valve springs, Hastelloy C, 0.1 bar							
						4 **	With pressure relief valve, FKM seal, no valve spring, Only with PV and SS							
						5 **	With pressure relief valve, FKM seal with valve springs, Only with PV and SS							
						6 **	With pressure relief valve, EPDM seal, without valve spring, Only with PV and SS							
						7 **	With pressure relief valve, EPDM seal, with valve spring, Only with PV and SS							
							Hydraulic connections							
							0	standard						
							1	PVC union nut and insert						
							2	Union nut and insert PP						
							3	PVDF union nut and insert						
							4 ***	SS union nut and insert						
							7	Union nut and PVDF hose nozzle						
							8	Union nut and SS hose nozzle						
							9	Union nut and stainless steel hose nozzle						
								Version						
								0	With ProMinent® logo (standard)					
								1	without ProMinent logo					
								M	Modified					
								5	Left liquid end					
									Electrical power supply					
									S	3 ph, 230 V/400 V 50/60 Hz, 0.09 kW				
									T	3 ph, 230 V/400 V 50/60 Hz, with PTC				
									R	Variable speed motor 3 ph, 230/400 V, with PTC, with external fan 1 ph 230 V 50/60 Hz				
									Z	Speed control compl 1 ph 230 V, 50/60 Hz (variable speed motor + FC)				
									M	1 ph, AC, 230 V/50/60 Hz, 0.09 kW				
									N	1 ph, AC 115 V 60 Hz, 0.09 kW				
									L	3 ph, 230 V/400 V, 0.37 kW, 50 Hz, (Exe, Exd)				
									P	3 ph, 265 V/440 V, 0.37 kW, 60 Hz, (Exe, Exd)				
									2	No motor, C 42 flange (NEMA)				
									3	No motor, B 5, size 56 (DIN)				
										Enclosure rating				
										0	IP 55 (standard)			
										1	Ex-design ATEX-T3			
										2	Ex-design ATEX-T4			
											Stroke sensor			
											0	No stroke sensor (standard)		
											2	Pacing relay (reed relay)		
											3	Stroke sensor (Namur) for hazardous locations		
												Stroke length adjustment		
												0	Manual (Standard)	
												1	with servomotor, 85…265 V AC 50/60 Hz	
												3	with stroke control motor 0...20 mA 85…265 V AC 50/60 Hz	
												4	with stroke control motor 4...20 mA 85…265 V AC 50/60 Hz	

* 10 bar for PVDF and TTT version.

** Standard with hose sleeve in the bypass. Threaded connection on request.

*** Internal thread of insert SS DN10-Rp 3/8, DN15-Rp 1/2

Metering pumps with sealing material in compliance with Regulation (EC) 1935/2004 or Hygienic Design dosing heads are available for hygienically demanding applications.

Spare parts for Sigma/ 1 Basic type (S1Ba)

The spare parts kit generally includes the wear parts for the liquid ends.

Scope of delivery for PVT material version:

- 1 metering diaphragm
- 2 valve assemblies
- 2 valve balls
- 2 ball seats
- 4 composite seals
- 1 elastomer sealing set (EPDM, FKM-B)

Scope of delivery for SST material version:

- 1 metering diaphragm
- 2 valve balls
- 4 complete sealing sets (cover rings, ball seat discs)
- 4 composite seals

Spare parts kit for Sigma/ 1

(applies to identity code for types 12017, 12035 and 10050)

Liquid end	Materials in contact with the medium		Valve	Order no.
with multi-layer safety diaphragm				
FM 50 - DN 10	PVT	-	-	1035964
FM 50 - DN 10	SST	-	with 2 valves cpl.	1035965
FM 50 - DN 10	SST	-	-	1035966
FM 50 - DN 10	TTT	-	with 2 valves cpl.	1077570
with old metering diaphragm				
FM 50 - DN 10	SST	-	-	1010554
FM 50 - DN 10	PVT	-	-	1010541
FM 50 - DN 10	SST	-	with 2 valves cpl.	1010555
FDA and Regulation (EC) 1935/2004				
FM 50 - DN 10	PVT	FDA	-	1046466
FM 50 - DN 10	SST	FDA	with valve	1046467
FM 50 - DN 10	SST	FDA	without valve	1046468
FM 50 - DN 10	SST	Regulation (EC) 1935/2004	with valve	1105286
FM 50 - DN 10	SST	Regulation (EC) 1935/2004	without valve	1105291

(applies to identity code for types 10022, 10044 and 07065)

Liquid end	Materials in contact with the medium		Valve	Order no.
with multi-layer safety diaphragm				
FM 65 - DN 10	PVT	-	-	1035967
FM 65 - DN 10	SST	-	with 2 valves cpl.	1035968
FM 65 - DN 10	TTT	-	with 2 valves cpl.	1077571
FM 65 - DN 10	SST	-	-	1035969
with old metering diaphragm				
FM 65 - DN 10	SST	-	with 2 valves cpl.	1010557
FM 65 - DN 10	SST	-	-	1010556
FM 65 - DN 10	PVT	-	-	1010542
FDA and Regulation (EC) 1935/2004				
FM 65 - DN 10	PVT	FDA	-	1046469
FM 65 - DN 10	SST	Regulation (EC) 1935/2004	with valve	1105287
FM 65 - DN 10	SST	FDA	without valve	1046471
FM 65 - DN 10	SST	Regulation (EC) 1935/2004	without valve	1105288
FM 65 - DN 10	SST	FDA	with valve	1046470

(applies to identity code for types 07042, 04084 and 04120)



1.3 Motor-Driven Metering Pumps

Liquid end	Materials in contact with the medium		Valve	Order no.
with multi-layer safety diaphragm				
FM 120 - DN 15	PVT	-	-	1035961
FM 120 - DN 15	SST	-	with 2 valves cpl.	1035962
FM 120 - DN 15	TTT	-	with 2 valves cpl.	1077572
FM 120 - DN 15	SST	-	-	1035963
with old metering diaphragm				
FM 120 - DN 15	SST	-	with 2 valves cpl.	1010559
FM 120 - DN 15	SST	-	-	1010558
FM 120 - DN 15	PVT	-	-	1010543
FDA and Regulation (EC) 1935/2004				
FM 120 - DN 15	PVT	FDA	-	1046453
FM 120 - DN 15	SST	Regulation (EC) 1935/2004	with valve	1105289
FM 120 - DN 15	SST	FDA	without valve	1046465
FM 120 - DN 15	SST	Regulation (EC) 1935/2004	without valve	1105290
FM 120 - DN 15	SST	FDA	with valve	1046464

Multi-layer Safety Diaphragm (Standard)

	Order no.
FM 50 (type 12017; 12035; 10050)	1030114
FM 65 (type 10022; 10044; 07065)	1030115
FM 120 (type 07042; 04084; 04120)	1035828

Metering diaphragm (old version)

	Order no.
Sigma/ 1 FM 50 (12017; 12035; 10050)	1010279
Sigma/ 1 FM 65 (10022; 10044; 07065)	1010282
Sigma/ 1 FM 120 (07042; 04084; 04120)	1010285

Spare parts kit for integrated overflow valve

Consisting of two compression springs made from Hastelloy C and four FKM-A and EPDM O-rings each

	For material	Seals	Order no.
Spare parts kits for integrated relief valve 4 bar	PVT/SST	FKM-A/ EPDM	1031199
Spare parts kits for integrated relief valve 7 bar	PVT/SST	FKM-A/ EPDM	1031200
Spare parts kits for integrated relief valve 10 bar	PVT	FKM-A/ EPDM	1031201
Spare parts kits for integrated relief valve 12 bar	PVT/SST	FKM-A/ EPDM	1031202

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 50 - DN 10	PVT	-	1035964	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 65 - DN 10	PVT	-	1035967	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 120 - DN 15	PVT	-	1035961	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 50 - DN 10	PVT	-	1010541	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 65 - DN 10	PVT	-	1010542	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 120 - DN 15	PVT	-	1010543	

Liquid end	Materials in contact with the medium		Valve	Order no.
FM 50 - DN 10	PVT	FDA	-	1046466

Liquid end	Materials in contact with the medium		Valve	Order no.
FM 65 - DN 10	PVT	FDA	-	1046469

Liquid end	Materials in contact with the medium		Valve	Order no.
FM 120 - DN 15	PVT	FDA	-	1046453

Accessories

- Foot valves for motor-driven metering pumps, see page → 176
- Injection valves for motor-driven metering pumps, see page → 181
- Hoses and pipework for motor-driven metering pumps, see page → 208
- Suction lances, suction assemblies without level switches, see page → 232
- Connectors, fittings, connector kits, seals, see page → 212
- Speed controllers, see page → 259
- Metering monitor Flow Control, can be set for motor-driven metering pumps, see page → 252

Spare Parts

- Special valve balls/special valve springs, see page → 248

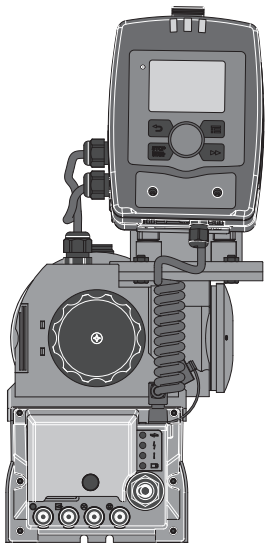
1.3 Motor-Driven Metering Pumps

1.3.5 Motor-Driven Metering Pump Sigma X Control Type – Sigma/ 1 - S1Cb

The new Sigma X range – reliable, smart and connectible

Capacity range S1Cb: 21 – 117 l/h, 12 – 4 bar

The Sigma control type is a smart motor-driven metering pump that is setting new standards in terms of productivity, reliability and safety.



Sigma/ 1 control type

The Sigma X diaphragm metering pump covers a capacity range of 21 to 1,040 l/h in versions S1Cb, S2Cb and S3Cb. Its patented multi-layer safety diaphragm guarantees maximum process reliability. Efficient protection of the power end from overloading by means of an integral frequency converter with microprocessor control(ler).

One highlight is the standardised operating concept with click wheel and 4 additional operating keys on a removable operating unit. A large illuminated LCD and a 3-LED display for operating, warning and error messages, visible from all sides, offers additional operating convenience.

The Sigma, like all smart ProMinent metering pumps, can be flexibly connected to various bus systems.

It has a large adjustment range thanks to a combination of frequency and stroke length adjustment. The pump works with high precision across the entire frequency range. Accurate and complication-free metering of viscous and gaseous media by adjustment of the movement profile.

Operating statuses are simply remotely transmitted via an additional output or relay module. A built-in timer, included as standard, controls time-dependent metering cycles.

Relevant spare parts can be shown in the display. The integral log book significantly improves process management, optimisation and troubleshooting.

Your benefits

- Safe: In the event of an accident, the feed chemical does not escape to the outside nor into the pump's power end, thanks to the patented multi-layer safety diaphragm with optical (optionally electric) signalling.
- Integrated relief valve protects the pump against overloading and reliable operation by means of a bleed option during the metering process.
- External control is scalable via potential-free contacts with pulse step-up and step-down, batch mode or via a 0/4-20 mA standard signal.
- Flexibly connectible: Connection to process management systems via integral PROFIBUS®, CANopen interface.
- Integral log book saves up to 300 events and simplifies troubleshooting and analysis of the cause.

DULCOnneX

Technical Details

- Stroke length: 4 mm
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually using self-locking rotary dial in 1% increments
- Metering reproducibility is better than ± 2% in the 30 – 100% stroke length adjustment range under defined conditions and with correct installation
- Wetted materials: PVDF, stainless steel 1.4571/1.4404 (special materials on request)
- Power supply: 1 pH, 100 – 230 V ±10%, 240 V ±6%, 50/60 Hz (220 W)
- Degree of protection IP 65
- Fibreglass-reinforced plastic housing
- The liquid end on the left of the standard version can be selected for special installation situations or in combination with storage tanks, brackets etc.
- Settable manual or external contact mode, factor with external contact control 99:1 – 1:99; batch mode with max. 99,999 strokes/start pulse.
- Metering profiles for optimum metering results.
- Display of wear parts in the Service menu.
- Connector for 2-stage level switch.
- Connection to PROFINET using the ProMinent DULCOnvert PROFIBUS®-PROFINET converter.
- Time-dependent control of the metering volume via integral timer.
- Relay module with 1 x switchover contact, 230 V – 8 A
- Relay module with 2 x On, 24 V – 100 mA
- Output / relay module: 0/4- 20 mA analogue output for remote transmission of the stroke rate plus relay module with 1 x On, 24 V – 100 mA
- The Sigma product range is available in a “Physiologically safe in respect of wetted materials” design.
- Dosing heads with electro-polished stainless steel for aqueous media are available with hygienically challenging applications.
- Customised designs are available on request.

For reasons of safety, provide suitable overload protection mechanisms when installing all mechanically deflected diaphragm metering pumps.

Field of application

- All industrial applications, either as a stand-alone unit or integrated in a complete system
- Volume-proportional addition of chemicals in water treatment, e.g. sodium hypochlorite for the disinfection of potable water
- Neutralisation in waste water treatment
- Pulse-controlled metering in the bottling of different volumes e.g. glycerol filling of manometers
- With an integrated timer as a control unit for simple processes, e.g. biocide metering in cooling water

Operating unit

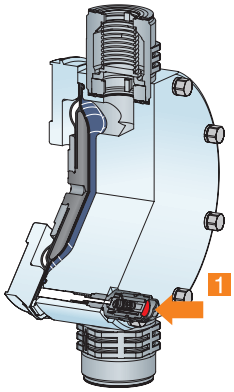


One highlight is the standardised operating concept with gamma and Sigma metering pumps with click wheel and 4 additional operating keys on a removable operating unit. A large illuminated LCD and a 3-LED display for operating, warning and error messages, visible from all sides, offers additional operating convenience.

The Sigma metering pump (control type), like all smart ProMinent metering pumps, can be flexibly connected to various bus systems. Operating statuses are simply remotely transmitted via an additional output or relay module. A built-in timer, included as standard, controls time-dependent metering cycles.

Relevant spare parts can be shown in the display. The integral log book significantly improves process management, optimisation and troubleshooting.

Multi-layer safety diaphragm



The Sigma X represents a durable motor-driven metering pump with integral control and patented multi-layer safety diaphragm, standing out on account of its excellent process reliability. In the event of an accident, the feed chemical does not escape to the outside nor into the pump’s power end, thanks to the multi-layer safety diaphragm with optical (optionally electric) signalling.

An additional rear PTFE layer prevents medium from leaking in the event of a diaphragm rupture. In the event of a diaphragm rupture, a simple contact is mechanically triggered by the multi-layer diaphragm. The dosing head remains leak-free during this time, ensuring emergency operation. Simpler technology than the double diaphragm system and independent of the feed chemical, hence a benefit for maintenance / service.

The optical diaphragm rupture warning system is available in the standard scope of delivery.

1: Diaphragm rupture sensor

1.3 Motor-Driven Metering Pumps

Metering profiles

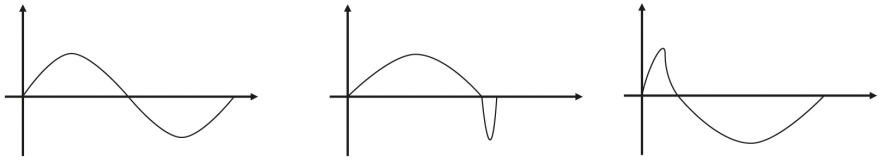
Metering profiles guarantee optimum metering results by adapting the metering behaviour of the metering pump to the application or chemical used.

The combination of frequency and stroke length adjustment permits a large adjustment range, with the pump working with excellent precision over the entire frequency range. Adjustment of the movement profile also guarantees precise and trouble-free metering even with viscous and gaseous media.

The stroke motion of the displacement body is continually recorded and regulated so that the stroke is made in line with the desired metering profile. The pump can be operated in normal mode (Diagram 1), with optimised discharge stroke (Diagram 2) or with optimised suction stroke (Diagram 3).

Three typical metering profiles are shown schematically with progress over time.

1 Discharge stroke, suction stroke equal
2 Long discharge stroke, short suction stroke
3 Short discharge stroke, long suction stroke



“Physiologically safe” designs in respect to wetted sealing material

FDA

Wetted materials in the “FDA” (F) design comply with the FDA guidelines.

FDA guidelines: PTFE material: FDA No. 21 CFR § 177.1550, PVDF material: FDA No. 21 CFR § 177.2510

Available for plastic (PV) and stainless steel (SS) pump designs

Identity code example: S1CbH07042PV F S010S0DE

EU Regulation 1935/2004

Sealing materials in accordance with Regulation (EC) 1935/2004 are available in the “Physiologically safe for wetted material in accordance with Regulation (EC) 1935/2004” stainless steel material version. Available for stainless steel (SS) pump design.

Hygienic Design

Hygienic Design dosing heads are available in 1.4435 (AISI 316L) for hygienically demanding applications. Optimised in terms of dead space, feature as few gaps as possible and have smooth, wetted surfaces, easy to clean using CIP. Get in touch with us, we would be happy to advise you.

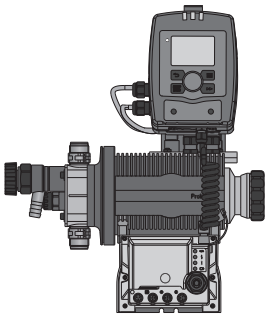
Identity code example: S1CBH10022SSHAHC0UA00000

Connection type: Aseptic clamp unions DN11864-3

Sigma/ X (Control) “liquid end on left” design

This version offers additional adaptability to special installation situations, e.g. in combination with storage tanks, brackets, etc.

Identity code example: S1CbH07042PVTS01 **5** UA1000EN



Sigma / 1 Control type design, liquid end on left

1.3 Motor-Driven Metering Pumps

Technical Data

Type	Capacity at max. back pressure			Max. stroke rate	Capacity at max. back pressure		Suction lift	Perm. pre-pressure suction side	Connector Suction/ Discharge Side	Shipping weight
S1Cb	bar	l/h	ml/stroke	Strokes/ min	psi	gph (US)	m WC	bar	G-DN	kg
12017 PVT	10	21	3.8	90	145	5.5	7	1	3/4–10	9
12017 SST	12	21	3.8	90	174	5.5	7	1	3/4–10	12
12035 PVT	10	42	4.0	170	145	11.1	7	1	3/4–10	9
12035 SST	12	42	4.0	170	174	11.1	7	1	3/4–10	12
10050 PVT	10	49	4.0	200	145	12.9	7	1	3/4–10	9
10050 SST	10	49	4.0	200	145	12.9	7	1	3/4–10	12
10022 PVT	10	27	5.0	90	145	7.1	6	1	3/4–10	9
10022 SST	10	27	5.0	90	145	7.1	6	1	3/4–10	12
10044 PVT	10	53	5.1	170	145	14.0	6	1	3/4–10	9
10044 SST	10	53	5.1	170	145	14.0	6	1	3/4–10	12
07065 PVT	7	63	5.2	200	102	16.6	6	1	3/4–10	9
07065 SST	7	63	5.2	200	102	16.6	6	1	3/4–10	12
07042 PVT	7	52	9.5	90	102	13.7	3	1	1–15	10
07042 SST	7	52	9.5	90	102	13.7	3	1	1–15	14
04084 PVT	4	101	9.7	170	58	26.7	3	1	1–15	10
04084 SST	4	101	9.7	170	58	26.7	3	1	1–15	14
04120 PVT	4	117	9.7	200	58	30.9	3	1	1–15	10
04120 SST	4	117	9.7	200	58	30.9	3	1	1–15	14

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	Seals/ball seat	Balls	Integral relief valve
PVT	PVDF	PVDF	PTFE/PTFE	Ceramic	PVDF/FKM or EPDM
SST	Stainless steel 1.4404	Stainless steel 1.4581	PTFE/PTFE	Stainless steel 1.4404	Stainless steel/ FKM or EPDM

Sealing material “F“ - “FDA” ball seat version: PVDF

Sealing material “G” - (EC) Regulation 1935/2004” ball seat version: 1.4404

Motor Data

Identity code specification		Power supply			Remarks
U	1-phase, IP 65	100 – 230 V ±10 % / 240 V ±6 %	50/60 Hz	220 W	

Motors less than 0.75 kW and motors designed for speed-controllable operation are not subject to the IE3 standard in compliance with the Ecodesign Directive 2009/125/EC.

Identity Code Ordering System for the Sigma/ 1 Control Type (S1Cb)

S1Cb	Drive type																			
	H	Main drive, diaphragm																		
		Type		Output																
		12017 *		12 bar	21 l/h															
		12035 *		12 bar	42 l/h															
		10050		10 bar	49 l/h															
		10022		10 bar	27 l/h															
		10044		10 bar	53 l/h															
		07065		7 bar	63 l/h															
		07042		7 bar	52 l/h															
		04084		4 bar	101 l/h															
		04120		4 bar	117 l/h															
			Liquid end material																	
			PV	PVDF (max. 10 bar)																
			SS	Stainless steel																
				Seal material																
				T	PTFE seal															
				F	FDA-compliant															
					Diaphragm															
					S	Multi-layer safety diaphragm with optical rupture indicator														
					A	Multi-layer safety diaphragm with electrical signal														
						Liquid end version														
						0	No valve springs (standard)													
						1	With 2 valve springs, Hastelloy C, 0.1 bar													
						2	with bleed valve, FKM seal, no valve spring													
						3	with bleed valve, FKM seal, with valve spring													
						4 ***	With pressure relief valve, FKM seal, no valve spring													
						5 ***	with relief valve, FPM seal, with valve springs													
						6 ***	With pressure relief valve, EPDM seal, without valve spring													
						7 ***	With pressure relief valve, EPDM seal, with valve spring													
						8	with bleed valve, EPDM seal, no valve spring													
						9	with bleed valve, EPDM seal, with valve spring													
							Hydraulic connections													
							0	Standard connection												
							1	PVC union nut and insert												
							2	Union nut and insert PP												
							3	PVDF union nut and insert												
							4 ****	Stainless steel union nut and insert												
							7	Union nut and PVDF hose nozzle												
							8	Stainless steel union nut and hose nozzle												
							9	Union nut and stainless steel welding sleeve												
								Version												
								0	with ProMinent logo											
								1	without ProMinent logo											
								5	Left liquid end											
									Electrical power supply											
									U	1 ph, 100 – 230 V ±10%, 240 V ±6%, 50/60 Hz, 110 W										
										Cable and plug										
										A	2 m European									
										B	2 m Swiss									
										C	2 m Australian									
										D	2 m USA									
											Relay									
											0	no relay								
											1	Fault indicating relay (230 V, 8 A)								
											3	Fault indicating relay (24 V, 100 mA) + pacing relay (24 V, 100 mA)								
											8	0/4-20 mA analogue output + fault indicating / pacing relay (24 V - 100 mA)								
												Control Variants								
												0	Manual + External contact with Pulse control							
												1	as 0 + analogue + metering profiles							
												6	as 1 + PROFIBUS® DP interface, M 12							
												7 **	As 1 + CANopen (CiA 402, M12 plug), pump without operating unit (HMI)							
													Operating unit (HMI)							
													0	Operating unit with Click Wheel (0.5 m cable)						
													4	Operating unit with Click Wheel + 2 m cable						
													5	Operating unit with Click Wheel + 5 m cable						
													6	Operating unit with Click Wheel + 10 m cable						
													X	without operating unit (HMI)						

* 10 bar for PVDF version.

** An HMI order no. 1042550 is required for manual operation, e.g. in the event of CAN bus failure

*** Standard with hose sleeve in the bypass. Threaded connection on request.

**** Internal thread of insert SS DN10-Rp 3/8, DN15-Rp 1/2

1.3 Motor-Driven Metering Pumps

Access code	
0	without access control
1	with access control
Language	
DE	German
EN	English
ES	Spanish
FR	French
IT	Italian
NL	Dutch
PL	Polish
PT	Portuguese
CS	Czech
RU	Russian
ZH	Chinese
SV	Swedish

* 10 bar for PVDF version.

** An HMI order no. 1042550 is required for manual operation, e.g. in the event of CAN bus failure

*** Standard with hose sleeve in the bypass. Threaded connection on request.

**** Internal thread of insert SS DN10-Rp 3/8, DN15-Rp 1/2

Metering pumps with sealing material in compliance with Regulation (EC) 1935/2004 or Hygienic Design dosing heads are available for hygienically demanding applications.

Spare parts for Sigma/ 1 Control type (S1Cb)

The spare parts kit generally includes the wear parts for the liquid ends.

Scope of delivery for PVT material version:

- 1 metering diaphragm
- 2 valve assemblies
- 2 valve balls
- 2 ball seats
- 4 composite seals
- 1 elastomer sealing set (EPDM, FKM-B)

Scope of delivery for SST material version:

- 1 metering diaphragm
- 2 valve balls
- 4 complete sealing sets (cover rings, ball seat discs)
- 4 composite seals

Spare parts kit for Sigma/ 1

(applies to identity code for types 12017, 12035 and 10050)

Liquid end	Materials in contact with the medium		Valve	Order no.
with multi-layer safety diaphragm				
FM 50 - DN 10	PVT	-	-	1035964
FM 50 - DN 10	SST	-	with 2 valves cpl.	1035965
FM 50 - DN 10	SST	-	-	1035966
FM 50 - DN 10	TTT	-	with 2 valves cpl.	1077570
with old metering diaphragm				
FM 50 - DN 10	SST	-	-	1010554
FM 50 - DN 10	PVT	-	-	1010541
FM 50 - DN 10	SST	-	with 2 valves cpl.	1010555
FDA and Regulation (EC) 1935/2004				
FM 50 - DN 10	PVT	FDA	-	1046466
FM 50 - DN 10	SST	FDA	with valve	1046467
FM 50 - DN 10	SST	FDA	without valve	1046468
FM 50 - DN 10	SST	Regulation (EC) 1935/2004	with valve	1105286
FM 50 - DN 10	SST	Regulation (EC) 1935/2004	without valve	1105291

(applies to identity code for types 10022, 10044 and 07065)

Liquid end	Materials in contact with the medium		Valve	Order no.
with multi-layer safety diaphragm				
FM 65 - DN 10	SST	-	with 2 valves cpl.	1035968
FM 65 - DN 10	SST	-	-	1035969
FM 65 - DN 10	PVT	-	-	1035967
FDA and Regulation (EC) 1935/2004				
FM 65 - DN 10	SST	FDA	with valve	1046470
FM 65 - DN 10	SST	Regulation (EC) 1935/2004	with valve	1105287
FM 65 - DN 10	SST	FDA	without valve	1046471
FM 65 - DN 10	SST	Regulation (EC) 1935/2004	without valve	1105288
FM 65 - DN 10	PVT	FDA	-	1046469

(applies to identity code for types 07042, 04084 and 04120)

Liquid end	Materials in contact with the medium		Valve	Order no.
with multi-layer safety diaphragm				
FM 120 - DN 15	SST	-	with 2 valves cpl.	1035962
FM 120 - DN 15	SST	-	-	1035963
FM 120 - DN 15	PVT	-	-	1035961
FDA and Regulation (EC) 1935/2004				
FM 120 - DN 15	SST	FDA	with valve	1046464
FM 120 - DN 15	SST	Regulation (EC) 1935/2004	with valve	1105289
FM 120 - DN 15	SST	FDA	without valve	1046465
FM 120 - DN 15	SST	Regulation (EC) 1935/2004	without valve	1105290
FM 120 - DN 15	PVT	FDA	-	1046453

Spare Parts Kits for Integrated Relief Valve (S1Ca, S1Cb)

Consisting of two compression springs made from Hastelloy C and four FKM-A and EPDM O-rings each

	For material	Seals	Order no.
Spare parts kits for integrated relief valve 4 bar	PVT/SST	FKM-A/EPDM	1031199
Spare parts kits for integrated relief valve 7 bar	PVT/SST	FKM-A/EPDM	1031200
Spare parts kits for integrated relief valve 10 bar	PVT	FKM-A/EPDM	1031201
Spare parts kits for integrated relief valve 12 bar	PVT/SST	FKM-A/EPDM	1031202

Spare Parts Kits for Integrated Bleed Valve (S1Cb)

Consisting of a compression spring made from Hastelloy C and four FKM-A and EPDM O-rings each

For identity code specification “Dosing head version” with characteristic “2”, “3”, “8”, “9”

Product designation	Description	Seals	Order no.
ETS	PVT/SST	FKM-A/EPDM	1043785

Multi-layer Safety Diaphragm (Standard)

	Order no.
FM 50 (type 12017; 12035; 10050)	1030114
FM 65 (type 10022; 10044; 07065)	1030115
FM 120 (type 07042; 04084; 04120)	1035828

Metering diaphragm (old version)

	Order no.
Sigma/ 1 FM 50 (12017; 12035; 10050)	1010279
Sigma/ 1 FM 65 (10022; 10044; 07065)	1010282
Sigma/ 1 FM 120 (07042; 04084; 04120)	1010285

Protective cowling

Protection of the operating unit (HMI) of Sigma metering pumps against contamination; made from transparent silicone rubber. For Sigma X control types S1Cb, S2Cb and S3Cb.

	Order no.
Protective cowling for operating unit (S1Cb, S2Cb, S3Cb)	1083680

Wall Mounting for Accumulator

Wall bracket with operating lever for wall mounting of the operating unit (HMI) without any fittings. For Sigma control types S1Cb / S2Cb / S3Cb.

	Order no.
Wall bracket for operating unit (S1Cb, S2Cb, S3Cb)	1036683

Extension cable for operating unit (HMI)

	Order no.
Connecting cable - CAN M12 5-pole 1 m	1022139
Connecting cable - CAN M12 5-pole 2 m	1022140
Connecting cable - CAN M12 5-pole 5 m	1022141
Connecting cable - CAN M12 5-pin. 10 m	1046383

Accessories of CANopen operation

An operating unit is needed for the manual operation of a CANopen pump.

	Order no.
Operating unit (HMI) Sigma X - S1Cb	1092956

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 50 - DN 10	PVT	-	1035964	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 65 - DN 10	PVT	-	1035967	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 120 - DN 15	PVT	-	1035961	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 50 - DN 10	PVT	-	1010541	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 65 - DN 10	PVT	-	1010542	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 120 - DN 15	PVT	-	1010543	

Liquid end	Materials in contact with the medium		Valve	Order no.
FM 50 - DN 10	PVT	FDA	-	1046466

Liquid end	Materials in contact with the medium		Valve	Order no.
FM 65 - DN 10	PVT	FDA	-	1046469

Liquid end	Materials in contact with the medium		Valve	Order no.
FM 120 - DN 15	PVT	FDA	-	1046453

Accessories

- Foot valves for motor-driven metering pumps, see page → 176
- Injection valves for motor-driven metering pumps, see page → 181
- Hoses and pipework for motor-driven metering pumps, see page → 208
- Suction lances, suction assemblies without level switches, see page → 232
- Connectors, fittings, connector kits, seals, see page → 212
- Speed controllers, see page → 259
- Metering monitor Flow Control, can be set for motor-driven metering pumps, see page → 252

Spare Parts

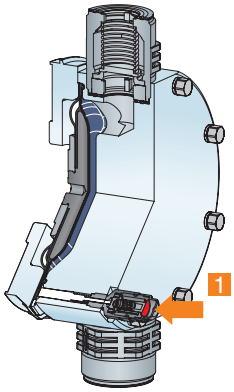
- Special valve balls/special valve springs, see page → 248

1.3.6 Motor-Driven Metering Pump Sigma/ 2 (Basic Type)

The robust pump for safe and reliable use.

Capacity range 50 – 420 l/h, 16 – 4 bar

Robust motor-driven metering pumps like the Sigma/ 2 Basic guarantee excellent process reliability with their patented multi-layer safety diaphragm. The diaphragm metering pump offers a number of power end versions, also suitable for use in areas at risk from explosion.



1: Diaphragm rupture sensor

The Sigma/ 2 diaphragm metering pump, together with pumps of type Sigma/ 1 and Sigma/ 3, represents an integrated product range. They cover the capacity range from 17 to 1,030 l/h, with a consistent operating concept, control concept and spare parts management. A wide range of power end versions is available, including some for use in ATEX areas.

Your benefits

Excellent process reliability:

- In the event of an accident, the feed chemical does not escape to the outside nor into the pump's power end, thanks to the patented multi-layer safety diaphragm with optical (optionally electric) signalling
- Integrated relief valve protects the pump against overloading
- Reliable operation by bleed option during the suction process

Flexible adaptation to the process:

- The Sigma product range is available as standard in the "Physiologically safe in respect of wetted materials" "F" design.
- Metering pumps with electro-polished stainless steel metering head enable them to be used in hygienically challenging applications
- Wide range of power end versions, also for use in areas at risk from explosion, and different flange designs for the use of customised motors
- Customised designs are available on request

Technical Details

- Stroke length: 5 mm,
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually by self-locking rotary dial in 1 % increments (optionally with actuator or control drive)
- Metering reproducibility is better than ± 2% in the 30 – 100 % stroke length adjustment range under defined conditions and with correct installation.
- Wetted materials: PVDF, stainless steel 1.4571/1.4404, special materials on request
- Patented multi-layer safety diaphragm with optical diaphragm rupture display (optionally with diaphragm rupture warning system via a contact)
- Integrated hydraulic relief and bleed valve
- A wide range of power end versions is available: Three-phase standard motor, 1-phase AC motor, motors for use in areas at risk from explosion and different flange designs for use in customer-specific motors
- For areas at risk from explosion II 2G Ex h IIC T3 Gb X or II 2G Ex h IIC T4 Gb X (optional)
- Degree of protection IP 55
- Highly rigid fibreglass-reinforced plastic housing with excellent chemical resistance
- For reasons of safety, provide suitable overload protection mechanisms when installing all mechanically deflected diaphragm metering pumps.

Field of application

- Volume-proportional addition of chemicals in water treatment, e.g. sodium-calcium hypochlorite for the disinfection of potable water
- Addition of chemicals depending on the measured value, e.g. metering of acid and alkali for pH neutralisation in waste water treatment
- Time-controlled addition of chemicals in the cooling water circuit
- Pulse-controlled metering in the bottling of different volumes e.g. glycerin filling of manometers

Sigma Basic Type Control Functions (S2Ba)

Stroke length actuator/control drive

Actuator: Electronically controlled actuator with contactless position detection for automatic stroke length adjustment, actuating period approx. 1 second for 1% stroke length, return potentiometer 1 kΩ, degree of protection IP65.

Control drive: Electronically controlled actuator with contactless position detection consisting of an actuator and integral servo controller for stroke length adjustment via a standard signal. Standard current input 0/4-20 mA corresponds to stroke length 0 – 100%, switch-over for manual/automatic operation, stroke adjustment in manual mode, electronic stroke length position display, wide-range voltage power unit 85 - 265 V 50/60 Hz, degree of protection IP65, actual value output 0/4-20 mA for remote display.

Speed controllers in metal housing (identity code specification Z)

The speed controller assembly consists of a frequency converter and a variable speed motor of 0.37 kW.

“Physiologically safe” designs in respect to wetted sealing material

FDA

Wetted materials in the “FDA” (F) design comply with the FDA guidelines.

FDA guidelines: PTFE material: FDA No. 21 CFR § 177.1550, PVDF material: FDA No. 21 CFR § 177.2510

Available for plastic (PV) and stainless steel (SS) pump designs

Identity code example: S2BaHM07220PV F S000S000

EU Regulation 1935/2004

Sealing materials in accordance with Regulation (EC) 1935/2004 are available in the “Physiologically safe for wetted material in accordance with Regulation (EC) 1935/2004” stainless steel material version.

Available for stainless steel (SS) pump design.

Hygienic Design

Hygienic Design dosing heads are available in 1.4435 (AISI 316L) for hygienically demanding applications. Optimised in terms of dead space, feature as few gaps as possible and have smooth, wetted surfaces, easy to clean using CIP. Get in touch with us, we would be happy to advise you.

Identity code example: S2BAHM07220SSHAHC0S000

Connection type: Aseptic clamp unions DN11864-3

1.3 Motor-Driven Metering Pumps

Technical Data

Type	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Pump capacity at max. back pressure with 1800 rpm motor at 60 Hz			Suction lift	Perm. pre-pressure suction side	Connector Suction/ Discharge Side	Shipping weight
S2Ba	l/h	bar	ml/stroke	Max. stroke rate Strokes/ min	l/h/gph (US)	psi	Max. stroke rate Strokes/ min	m WC	bar	G-DN	kg
16050 PVT	50	16	11.4	73	60.0/15.8	145	87	7	3	1–15	15
16050 SST	47	16	11.4	73	56.0/14.7	232	87	7	3	1–15	20
16090 PVT	88	16	11.4	132	106.0/28.0	145	158	7	3	1–15	15
16090 SST	82	16	11.4	132	98.4/25.9	232	158	7	3	1–15	20
16130 PVT	135	16	10.9	198	162.0/42.8	145	238	7	3	1–15	15
16130 SST	124	16	10.9	198	148.0/39.0	232	238	7	3	1–15	20
07120 PVT *	126	7	27.4	73	150.0/39.6	102	87	5	1	1 1/2–25	24
07120 SST *	126	7	27.4	73	150.0/39.6	102	87	5	1	1 1/2–25	24
07220 PVT *	220	7	27.7	132	264.0/69.7	102	158	5	1	1 1/2–25	24
07220 SST *	220	7	27.7	132	264.0/69.7	102	158	5	1	1 1/2–25	24
04350 PVT *	350	4	29.4	198	420.0/110.9	58	238	5	1	1 1/2–25	24
04350 SST *	350	4	29.4	198	420.0/110.9	58	238	5	1	1 1/2–25	24

* For the Sigma types 07120, 07220 and 04350, the dosing head is fitted with DN 25 (G 1 1/2) valves. As DN 20 is generally sufficient for the pipework for these types (see technical data, suction/discharge side connector), the connector parts that can be ordered with the identity code (e.g. inserts) are already reduced to DN 20, i.e. DN 20 pipework and accessories can be installed.

Performance data for TTT, see type PVT

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	Seals/ball seat	Balls	Integral relief valve
PVT	PVDF	PVDF	PTFE/PTFE	Ceramic/glass *	PVDF/FKM or EPDM
SST	Stainless steel 1.4404	Stainless steel 1.4581	PTFE/PTFE	Stainless steel 1.4404	Stainless steel/ FKM or EPDM
TTT **	PTFE + 25% carbon	Carbon-filled PTFE	PTFE/PTFE	Ceramic/glass *	-

* With 07120, 07220, 04350

** Specifically for areas at risk from explosion

Sealing material “F“ - “FDA” ball seat version: PVDF

Sealing material “G” - (EC) Regulation 1935/2004” ball seat version: 1.4404

1.3 Motor-Driven Metering Pumps

Motor Data

Identity code specification	Power supply	Δ/Y			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V	50 Hz	0.25 kW	
T	3-phase, IP 55	220 - 240 V/380 - 420 V	50 Hz	0.25 kW	With PTC, speed control range 1:5
R	3-phase, IP 55	220 - 240 V/380 - 420 V	50 Hz	0.37 kW	With PTC, speed control range 1:20 with external fan (1-phase 230 V; 50/60 Hz, 134 W)
M	1-phase AC, IP 55	230 V ± 5 %	50/60 Hz	0.18 kW	
N	1-phase AC, IP 55	115 V ± 5 %	60 Hz	0.18 kW	
L1	3-phase, II2GExellT3	220 – 240 V/380 – 420 V	50 Hz	0.18 kW	
L2	3-phase, II-2GExdIICT4	220 – 240 V/380 – 420 V	50 Hz	0.18 kW	With PTC, speed control range 1:5
P1	3-phase, II2GExellT3	250 – 280 V/440 – 480 V	60 Hz	0.18 kW	
P2	3-phase, II-2GExdIICT4	250 – 280 V/440 – 480 V	60 Hz	0.21 kW	With PTC, speed control range 1:5

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

Motors less than 0.75 kW and motors designed for speed-controllable operation are not subject to the IE3 standard in compliance with the Ecodesign Directive 2009/125/EC.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

1.3 Motor-Driven Metering Pumps

Identity Code Ordering System for Sigma/ 2 Basic Type (S2Ba)

S2Ba	Drive type													
	HM	Main drive, diaphragm												
		Type		Output										
		16050 *		16 bar	47 l/h									
		16090 *		16 bar	82 l/h									
		16130 *		16 bar	124 l/h									
		07120		7 bar	126 l/h									
		07220		7 bar	220 l/h									
		04350		4 bar	350 l/h									
			Liquid end material											
			PV	PVDF (max. 10 bar)										
			SS	Stainless steel										
			TT	PTFE + 25% carbon (max. 10 bar)										
				Seal material										
				T	PTFE seal									
				F	FDA-compliant									
					Diaphragm									
					S	Multi-layer safety diaphragm with optical rupture indicator								
					A	Multi-layer safety diaphragm with rupture signalling (contact)								
						Liquid end version								
						0	No spring							
						1	With 2 valve springs, Hastelloy C, 0.1 bar							
						4 **	With pressure relief valve, FKM seal, no valve spring, Only with PV and SS							
						5 **	With pressure relief valve, FKM seal with valve springs, Only with PV and SS							
						6 **	With pressure relief valve, EPDM seal, without valve spring, Only with PV and SS							
						7 **	With pressure relief valve, EPDM seal, with valve spring, Only with PV and SS							
							Hydraulic connections							
							0	standard						
							1	PVC union nut and insert						
							2	Union nut and insert PP						
							3	PVDF union nut and insert						
							4 ***	SS union nut and insert						
							7	Union nut and PVDF hose nozzle						
							8	Union nut and SS hose nozzle						
							9	Union nut and stainless steel hose nozzle						
								Version						
								0	With ProMinent® logo (standard)					
								1	Without ProMinent logo					
								M	Modified					
									Electrical power supply					
									S	3 ph, 230 V/400 V 50/60 Hz				
									T	3 ph, 230 V/400 V 50/60 Hz, with PTC				
									R	Variable speed motor 3 ph, 230/400 V, with PTC, with external fan 1 ph 230 V 50/60 Hz				
									Z	Speed control compl 1 ph 230 V, 50/60 Hz (variable speed motor + FC)				
									M	1 ph, AC, 230 V/50/60 Hz				
									N	1 ph, AC 115 V 60 Hz				
									L	3 ph, 230 V/400 V, 0.37 kW, 50 Hz, (Exe, Exd)				
									P	3 ph, 265 V/440 V, 0.37 kW, 60 Hz, (Exe, Exd)				
									1	No motor, with B14 flange, Gr. 71 DIN				
									2	No motor, with flange NEMA 56 C				
									3	No motor, with B5 flange, Gr. 63 DIN				
										Enclosure rating				
										0	IP 55 (standard)			
										1	Ex-design ATEX-T3			
										2	Ex-design ATEX-T4			
											Stroke sensor			
											0	No stroke sensor (standard)		
											2	Pacing relay (reed relay)		
											3	Stroke sensor (Namur) for hazardous locations		
												Stroke length adjustment		
												0	Manual (Standard)	
												1	With servomotor, 85…265 V AC 50/60 Hz	
												3	With stroke control motor 0...20 mA 85…265 V AC 50/60 Hz	
												4	With stroke control motor 4...20 mA 85…265 V AC 50/60 Hz	

* 10 bar for PVDF and TTT version.

** Standard with hose sleeve in the bypass. Threaded connection on request.

*** Internal thread of the insert SS DN15-Rp 1/2, DN25/20-G 3/4

Metering pumps with sealing material in compliance with Regulation (EC) 1935/2004 or Hygienic Design dosing heads are available for hygienically demanding applications.

Spare parts for Sigma/ 2 Basic type (S2Ba)

The spare parts kit generally includes the wear parts for the liquid ends.

Scope of delivery for PVT material version:

- 1 metering diaphragm
- 2 valve assemblies
- 2 valve balls
- 2 ball seats
- 4 composite seals
- 1 elastomer sealing set (EPDM, FKM-B)

Scope of delivery for SST material version:

- 1 metering diaphragm
- 2 valve balls
- 2 ball seat discs
- 4 composite seals

Spare parts kit for Sigma/ 2

(applies to identity code for types 16050, 16090 and 16130)

Liquid end	Materials in contact with the medium		Valve	Order no.
with multi-layer safety diaphragm				
FM 130 - DN 15	TTT	-	with 2 valves cpl.	1077573
FM 130 - DN 15	SST	-	with 2 valves cpl.	1035954
FM 130 - DN 15	SST	-	-	1035957
FM 130 - DN 15	PVT	-	-	1035951
with old metering diaphragm				
FM 130 - DN 15	PVT	-	-	740324
FM 130 - DN 15	SST	-	with 2 valves cpl.	740328
FM 130 - DN 15	SST	-	-	740326
FDA and Regulation (EC) 1935/2004				
FM 130 - DN 15	SST	FDA	with valve	1046474
FM 130 - DN 15	SST	Regulation (EC) 1935/2004	with valve	1105332
FM 130 - DN 15	SST	FDA	without valve	1046473
FM 130 - DN 15	SST	Regulation (EC) 1935/2004	without valve	1105335
FM 130 - DN 15	PVT	FDA	-	1046472

(applies to identity code for types 07120, 07220 and 04350)

Liquid end	Materials in contact with the medium		Valve	Order no.
with multi-layer safety diaphragm				
FM 350 - DN 25	TTT	-	with 2 valves cpl.	1077574
FM 350 - DN 25	SST	-	with 2 valves cpl.	1035959
FM 350 - DN 25	SST	-	-	1035960
FM 350 - DN 25	PVT	-	-	1035953
with old metering diaphragm				
FM 350 - DN 25	PVT	-	-	740325
FM 350 - DN 25	SST	-	with 2 valves cpl.	740329
FM 350 - DN 25	SST	-	-	740327
FDA and Regulation (EC) 1935/2004				
FM 350 - DN 25	SST	FDA	with valve	1046477
FM 350 - DN 25	SST	Regulation (EC) 1935/2004	with valve	1105333
FM 350 - DN 25	SST	FDA	without valve	1046476
FM 350 - DN 25	SST	Regulation (EC) 1935/2004	without valve	1105334
FM 350 - DN 25	PVT	FDA	-	1046475

Multi-layer Safety Diaphragm (Standard)

	Order no.
FM 130 (type: 16050, 16090, 16130)	1029771
FM 350 (type: 07120, 07220, 04350)	1033422

Metering diaphragm (old version)

	Order no.
Sigma with FM 130 identity code: Type 16050, 16090, 16130	792495
Sigma with FM 350 identity code: Type 07120, 07220, 04350	792496

Spare parts kit for integrated overflow valve

Consisting of two compression springs made from Hastelloy C and four FKM-A and EPDM O-rings each

	For material	Seals	Order no.
Spare parts kits for integrated relief valve 4 bar	PVT/SST	FKM-A/ EPDM	1031199
Spare parts kits for integrated relief valve 7 bar	PVT/SST	FKM-A/ EPDM	1031200
Spare parts kits for integrated relief valve 10 bar	PVT	FKM-A/ EPDM	1031201
Spare parts kit for relief valve 16 bar	SST	FKM-A/ EPDM	1031203

Gear Oil

	Volume	Order no.
Mobilgear 634 VG 460 gear oil	1	1004542

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 130 - DN 15	PVT	-	1035951	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 350 - DN 25	PVT	-	1035953	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 130 - DN 15	PVT	-	740324	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 350 - DN 25	PVT	-	740325	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 130 - DN 15	PVT	-	1046472	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 350 - DN 25	PVT	-	1046475	

Accessories

- Foot valves for motor-driven metering pumps, see page → 176
- Injection valves for motor-driven metering pumps, see page → 181
- Hoses and pipework for motor-driven metering pumps, see page → 208
- Suction lances, suction assemblies without level switches, see page → 232
- Connectors, fittings, connector kits, seals, see page → 212
- Speed controllers, see page → 259
- Metering monitor Flow Control, can be set for motor-driven metering pumps, see page → 252

Spare Parts

- Special valve balls/special valve springs, see page → 248

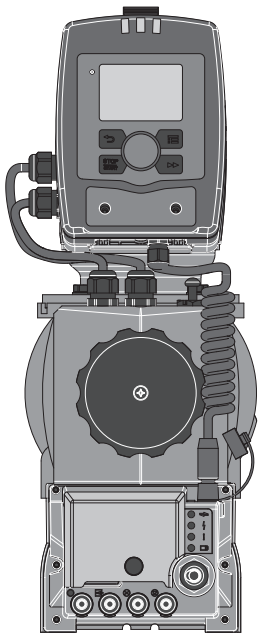
1.3 Motor-Driven Metering Pumps

1.3.7 Motor-Driven Metering Pump Sigma X Control Type – Sigma/ 2 - S2Cb

The new Sigma X range – reliable, smart and connectible

Capacity range S2Cb: 61 – 353 l/h, 16 – 4 bar

The Sigma control type is a smart motor-driven metering pump that is setting new standards in terms of productivity, reliability and safety.



Sigma/ 2 control type

The Sigma X diaphragm metering pump covers a capacity range of 21 to 1,040 l/h in versions S1Cb, S2Cb and S3Cb. Its patented multi-layer safety diaphragm guarantees maximum process reliability. Efficient protection of the power end from overloading by means of an integral frequency converter with microprocessor control(ler).

One highlight is the standardised operating concept with click wheel and 4 additional operating keys on a removable operating unit. A large illuminated LCD and a 3-LED display for operating, warning and error messages, visible from all sides, offers additional operating convenience.

The Sigma, like all smart ProMinent metering pumps, can be flexibly connected to various bus systems.

It has a large adjustment range thanks to a combination of frequency and stroke length adjustment. The pump works with high precision across the entire frequency range. Accurate and complication-free metering of viscous and gaseous media by adjustment of the movement profile.

Operating statuses are simply remotely transmitted via an additional output or relay module. A built-in timer, included as standard, controls time-dependent metering cycles.

Relevant spare parts can be shown in the display. The integral log book significantly improves process management, optimisation and troubleshooting.

Your benefits

- Safe: In the event of an accident, the feed chemical does not escape to the outside nor into the pump's power end, thanks to the patented multi-layer safety diaphragm with optical (optionally electric) signalling.
- Integrated relief valve protects the pump against overloading and reliable operation by means of a bleed option during the metering process.
- External control is scalable via potential-free contacts with pulse step-up and step-down, batch mode or via a 0/4-20 mA standard signal.
- Flexibly connectible: Connection to process management systems via integral PROFIBUS®, CANopen interface.
- Integral log book saves up to 300 events and simplifies troubleshooting and analysis of the cause.

DULCOnneX

Technical Details

- Stroke length: 4 mm
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually using self-locking rotary dial in 1% increments
- Metering reproducibility is better than ± 2% in the 30 – 100% stroke length adjustment range under defined conditions and with correct installation
- Wetted materials: PVDF, stainless steel 1.4571/1.4404 (special materials on request)
- Power supply: 1 pH, 100 – 230 V ±10%, 240 V ±6%, 50/60 Hz (220 W)
- Degree of protection IP 65
- Fibreglass-reinforced plastic housing
- The liquid end on the left of the standard version can be selected for special installation situations or in combination with storage tanks, brackets etc.
- Settable manual or external contact mode, factor with external contact control 99:1 – 1:99; batch mode with max. 99,999 strokes/start pulse.
- Metering profiles for optimum metering results.
- Display of wear parts in the Service menu.
- Connector for 2-stage level switch.
- Connection to PROFINET using the ProMinent DULCOnvert PROFIBUS®-PROFINET converter.
- Time-dependent control of the metering volume via integral timer.
- Relay module with 1 x switchover contact, 230 V – 8 A
- Relay module with 2 x On, 24 V – 100 mA
- Output / relay module: 0/4- 20 mA analogue output for remote transmission of the stroke rate plus relay module with 1 x On, 24 V – 100 mA
- The Sigma product range is available in a “Physiologically safe in respect of wetted materials” design.
- Dosing heads with electro-polished stainless steel for aqueous media are available with hygienically challenging applications.
- Customised designs are available on request.

For reasons of safety, provide suitable overload protection mechanisms when installing all mechanically deflected diaphragm metering pumps.

Field of application

- All industrial applications, either as a stand-alone unit or integrated in a complete system
- Volume-proportional addition of chemicals in water treatment, e.g. sodium hypochlorite for the disinfection of potable water
- Neutralisation in waste water treatment
- Pulse-controlled metering in the bottling of different volumes e.g. glycerol filling of manometers
- With an integrated timer as a control unit for simple processes, e.g. biocide metering in cooling water

Operating unit

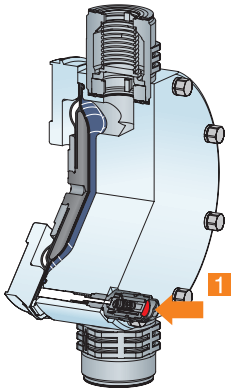


One highlight is the standardised operating concept with gamma and Sigma metering pumps with click wheel and 4 additional operating keys on a removable operating unit. A large illuminated LCD and a 3-LED display for operating, warning and error messages, visible from all sides, offers additional operating convenience.

The Sigma metering pump (control type), like all smart ProMinent metering pumps, can be flexibly connected to various bus systems. Operating statuses are simply remotely transmitted via an additional output or relay module. A built-in timer, included as standard, controls time-dependent metering cycles.

Relevant spare parts can be shown in the display. The integral log book significantly improves process management, optimisation and troubleshooting.

Multi-layer safety diaphragm



1: Diaphragm rupture sensor

The Sigma X represents a durable motor-driven metering pump with integral control and patented multi-layer safety diaphragm, standing out on account of its excellent process reliability. In the event of an accident, the feed chemical does not escape to the outside nor into the pump’s power end, thanks to the multi-layer safety diaphragm with optical (optionally electric) signalling.

An additional rear PTFE layer prevents medium from leaking in the event of a diaphragm rupture. In the event of a diaphragm rupture, a simple contact is mechanically triggered by the multi-layer diaphragm. The dosing head remains leak-free during this time, ensuring emergency operation. Simpler technology than the double diaphragm system and independent of the feed chemical, hence a benefit for maintenance / service.

The optical diaphragm rupture warning system is available in the standard scope of delivery.

Metering profiles

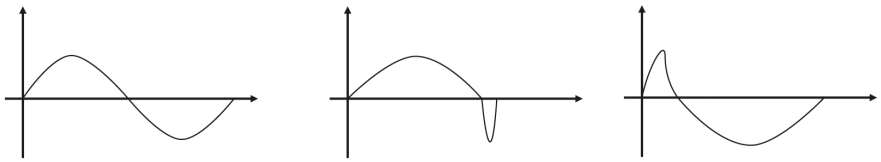
Metering profiles guarantee optimum metering results by adapting the metering behaviour of the metering pump to the application or chemical used.

The combination of frequency and stroke length adjustment permits a large adjustment range, with the pump working with excellent precision over the entire frequency range. Adjustment of the movement profile also guarantees precise and trouble-free metering even with viscous and gaseous media.

The stroke motion of the displacement body is continually recorded and regulated so that the stroke is made in line with the desired metering profile. The pump can be operated in normal mode (Diagram 1), with optimised discharge stroke (Diagram 2) or with optimised suction stroke (Diagram 3).

Three typical metering profiles are shown schematically with progress over time.

1 Discharge stroke, suction stroke equal
2 Long discharge stroke, short suction stroke
3 Short discharge stroke, long suction stroke



“Physiologically safe” designs in respect to wetted sealing material

FDA

Wetted materials in the “FDA” (F) design comply with the FDA guidelines.

FDA guidelines: PTFE material: FDA No. 21 CFR § 177.1550, PVDF material: FDA No. 21 CFR § 177.2510

Available for plastic (PV) and stainless steel (SS) pump designs

Identity code example: S1CbH07042PV F S010S0DE

EU Regulation 1935/2004

Sealing materials in accordance with Regulation (EC) 1935/2004 are available in the “Physiologically safe for wetted material in accordance with Regulation (EC) 1935/2004” stainless steel material version. Available for stainless steel (SS) pump design.

Hygienic Design

Hygienic Design dosing heads are available in 1.4435 (AISI 316L) for hygienically demanding applications. Optimised in terms of dead space, feature as few gaps as possible and have smooth, wetted surfaces, easy to clean using CIP. Get in touch with us, we would be happy to advise you.

Identity code example: S1CBH10022SSHAHC0UA00000

Connection type: Aseptic clamp unions DN11864-3

1.3 Motor-Driven Metering Pumps

Technical Data

Type	Capacity at max. back pressure			Max. stroke rate	Capacity at max. back pressure		Suction lift	Perm. pre-pressure suction side	Connector Suction/ Discharge Side	Shipping weight
S2Cb	bar	l/h	ml/stroke	Strokes/ min	psi	gph (US)	m WC	bar	G-DN	kg
16050 PVT	10	61	11.4	90	145	16.1	7	2	1–15	15
16050 SST	16	56	10.4	90	232	14.8	7	2	1–15	20
16090 PVT	10	109	11.4	160	145	28.8	7	2	1–15	15
16090 SST	16	99	10.3	160	232	26.2	7	2	1–15	20
16130 PVT	10	131	10.9	200	145	34.6	7	2	1–15	15
16130 SST	16	129	10.9	200	232	34.1	7	2	1–15	20
07120 PVT	7	150	27.4	90	102	39.6	5	1	1 1/2–25 *	16
07120 SST	7	150	27.4	90	102	39.6	5	1	1 1/2–25	24
07220 PVT	7	271	27.7	160	102	71.6	5	1	1 1/2–25	16
07220 SST	7	271	27.7	160	102	71.6	5	1	1 1/2–25	24
04350 PVT	4	353	29.4	200	58	93.3	5	1	1 1/2–25	16
04350 SST	4	353	29.4	200	58	93.3	5	1	1 1/2–25	24

* For the Sigma types 07120, 07220 and 04350, the dosing head is fitted with DN 25 (G 1 1/2) valves. As DN 20 is generally sufficient for the pipework for these types (see technical data, suction/discharge side connector), the connector parts that can be ordered with the identity code (e.g. inserts) are already reduced to DN 20, i.e. DN 20 pipework and accessories can be installed.

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	Seals/ball seat	Balls	Integral relief valve
PVT	PVDF	PVDF	PTFE/PTFE	Ceramic/glass *	PVDF/FKM or EPDM
SST	Stainless steel 1.4404	Stainless steel 1.4581	PTFE/PTFE	Stainless steel 1.4404	Stainless steel/ FKM or EPDM

* With 07120, 07220, 04350

Sealing material “F“ - “FDA” ball seat version: PVDF

Sealing material “G” - (EC) Regulation 1935/2004” ball seat version: 1.4404

Motor Data

Identity code specification		Power supply			Remarks
U	1-phase, IP 65	100 – 230 V ±10 % / 240 V ±6 %	50/60 Hz	220 W	

Motors less than 0.75 kW and motors designed for speed-controllable operation are not subject to the IE3 standard in compliance with the Ecodesign Directive 2009/125/EC.

Identity Code Ordering System for the Sigma/ 2 Control Type (S2Cb)

S2Cb	Drive type																		
	H	Main drive, diaphragm																	
		Type		Output															
		16050 ****		16 bar	47 l/h														
		16090 ****		16 bar	82 l/h														
		16130 ****		16 bar	124 l/h														
		07120		7 bar	126 l/h														
		07220		7 bar	220 l/h														
		04350		4 bar	350 l/h														
			Liquid end material																
			PV	PVDF (max. 10 bar)															
			SS	Stainless steel															
				Seal material															
				T	PTFE seal														
				F	FDA-compliant														
					Diaphragm														
					S	Multi-layer safety diaphragm with optical rupture indicator													
					A	Multi-layer safety diaphragm with electrical signal													
						Liquid end version													
						0	No valve springs (standard)												
						1	With 2 valve springs, Hastelloy C, 0.1 bar												
						2	With bleed valve, FKM seal, no valve spring												
						3	With bleed valve, FKM seal, with valve spring												
						4 *	With pressure relief valve, FKM seal, no valve spring												
						5 *	With relief valve, FPM seal, with valve springs												
						6 *	With pressure relief valve, EPDM seal, without valve spring												
						7 *	With pressure relief valve, EPDM seal, with valve spring												
						8	With bleed valve, EPDM seal, no valve spring												
						9	With bleed valve, EPDM seal, with valve spring												
							Hydraulic connections												
							0	Standard connection											
							1	PVC union nut and insert											
							2	Union nut and insert PP											
							3	PVDF union nut and insert											
							4 **	Stainless steel union nut and insert											
							7	Union nut and PVDF hose nozzle											
							8	Stainless steel union nut and hose nozzle											
							9	Union nut and stainless steel welding sleeve											
								Version											
								0	with ProMinent logo										
								1	without ProMinent logo										
									Electrical power supply										
									U	1 ph, 100 – 230 V ±10%, 240 V ±6%, 50/60 Hz, 220 W									
										Cable and plug									
										A	2 m European								
										B	2 m Swiss								
										C	2 m Australian								
										D	2 m USA								
											Relay								
											0	no relay							
											1	Fault indicating relay (230 V, 8 A)							
											3	Fault indicating relay (24 V, 100 mA) + pacing relay (24 V, 100 mA)							
											8	0/4-20 mA analogue output + fault indicating / pacing relay (24 V - 100 mA)							
												Control Variants							
												0	Manual + External contact with Pulse control						
												1	as per 0 + analogue						
												6	As 1 + PROFIBUS® DP interface, M 12						
												7 ***	As 1 + CANopen (CiA 402, M12 plug), pump without operating unit (HMI)						
													Overload switch-off						
													0	without overload switch-off					
														Operating unit (HMI)					
														0	Operating unit with Click Wheel (0.5 m cable)				
														4	Operating unit with Click Wheel + 2 m cable				
														5	Operating unit with Click Wheel + 5 m cable				
														6	Operating unit with Click Wheel + 10 m cable				
														X	without operating unit (HMI)				
															Access code				
															0	without access control			

* Standard with hose sleeve in the bypass. Threaded connection on request.

** Internal thread of the insert SS DN15-Rp 1/2, DN25/20-G 3/4

*** An HMI order no. 1042549 is required for manual operation, e.g. in the event of CAN bus failure

**** 10 bar for PVDF version.

1	with access control	
	Language	
	DE	German
	EN	English
	ES	Spanish
	FR	French
	IT	Italian
	NL	Dutch
	PL	Polish
	PT	Portuguese
	CS	Czech
	RU	Russian
	ZH	Chinese
	SV	Swedish

* Standard with hose sleeve in the bypass. Threaded connection on request.
** Internal thread of the insert SS DN15-Rp 1/2, DN25/20-G 3/4
*** An HMI order no. 1042549 is required for manual operation, e.g. in the event of CAN bus failure
**** 10 bar for PVDF version.

Metering pumps with sealing material in compliance with Regulation (EC) 1935/2004 or Hygienic Design dosing heads are available for hygienically demanding applications.

Spare parts for Sigma/ 2 Control type (S2Cb)

The spare parts kit generally includes the wear parts for the liquid ends.

Scope of delivery for PVT material version:

- 1 metering diaphragm
- 2 valve assemblies
- 2 valve balls
- 2 ball seats
- 4 composite seals
- 1 elastomer sealing set (EPDM, FKM-B)

Scope of delivery for SST material version:

- 1 metering diaphragm
- 2 valve balls
- 2 ball seat discs
- 4 composite seals

Spare parts kit for Sigma/ 2

(applies to identity code for types 16050, 16090 and 16130)

Liquid end	Materials in contact with the medium		Valve	Order no.
with multi-layer safety diaphragm				
FM 130 - DN 15	TTT	-	with 2 valves cpl.	1077573
FM 130 - DN 15	PVT	-	-	1035951
FM 130 - DN 15	SST	-	with 2 valves cpl.	1035954
FM 130 - DN 15	SST	-	-	1035957
with old metering diaphragm				
FM 130 - DN 15	SST	-	-	740326
FM 130 - DN 15	PVT	-	-	740324
FM 130 - DN 15	SST	-	with 2 valves cpl.	740328
FDA and Regulation (EC) 1935/2004				
FM 130 - DN 15	SST	Regulation (EC) 1935/2004	without valve	1105335
FM 130 - DN 15	PVT	FDA	-	1046472
FM 130 - DN 15	SST	FDA	without valve	1046473
FM 130 - DN 15	SST	FDA	with valve	1046474
FM 130 - DN 15	SST	Regulation (EC) 1935/2004	with valve	1105332

(applies to identity code for types 07120, 07220 and 04350)

Liquid end	Materials in contact with the medium		Valve	Order no.
with multi-layer safety diaphragm				
FM 350 - DN 25	TTT	-	with 2 valves cpl.	1077574
FM 350 - DN 25	PVT	-	-	1035953
FM 350 - DN 25	SST	-	with 2 valves cpl.	1035959
FM 350 - DN 25	SST	-	-	1035960
with old metering diaphragm				
FM 350 - DN 25	SST	-	-	740327
FM 350 - DN 25	PVT	-	-	740325
FM 350 - DN 25	SST	-	with 2 valves cpl.	740329
FDA and Regulation (EC) 1935/2004				
FM 350 - DN 25	SST	Regulation (EC) 1935/2004	without valve	1105334
FM 350 - DN 25	PVT	FDA	-	1046475
FM 350 - DN 25	SST	FDA	without valve	1046476
FM 350 - DN 25	SST	FDA	with valve	1046477
FM 350 - DN 25	SST	Regulation (EC) 1935/2004	with valve	1105333

Multi-layer Safety Diaphragm (Standard)

	Order no.
FM 130 (type: 16050, 16090, 16130)	1029771
FM 350 (type: 07120, 07220, 04350)	1033422

Metering diaphragm (old version)

	Order no.
Sigma with FM 130 identity code: Type 16050, 16090, 16130	792495
Sigma with FM 350 identity code: Type 07120, 07220, 04350	792496

Spare Parts Kit for Integrated Relief Valve (S2Ca, S2Cb)

	For material	Seals	Order no.
Spare parts kits for integrated relief valve 4 bar	PVT/SST	FKM-A/ EPDM	1031199
Spare parts kits for integrated relief valve 7 bar	PVT/SST	FKM-A/ EPDM	1031200
Spare parts kits for integrated relief valve 10 bar	PVT	FKM-A/ EPDM	1031201
Spare parts kit for relief valve 16 bar	SST	FKM-A/ EPDM	1031203

Gear Oil

Product designation	Volume l	Order no.
Mobilgear 634 VG 460 gear oil	1	1004542

Spare Parts Kits for Integrated Bleed Valve (S2Cb)

Consisting of a compression spring made from Hastelloy C and four FKM-A and EPDM O-rings each

For identity code specification “Dosing head design” with characteristic “2”, “3”, “8”, “9”

	For material	Seals	Order no.
ETS	PVT/SST	FKM-A/ EPDM	1043785

Protective Cowling for Operating Unit (HMI)

Protection of the operating unit (HMI) of Sigma metering pumps against contamination; made from transparent silicone rubber. For Sigma X control types S1Cb, S2Cb and S3Cb.

	Order no.
Protective cowling for operating unit (S1Cb, S2Cb, S3Cb)	1083680

Wall Bracket for Operating Unit (HMI)

Wall bracket with operating lever for wall mounting of the operating unit (HMI) without any fittings. For Sigma control types S1Cb / S2Cb / S3Cb.

	Order no.
Wall bracket for operating unit (S1Cb, S2Cb, S3Cb)	1036683

Extension cable for operating unit (HMI)

	Order no.
Connecting cable - CAN M12 5-pole 1 m	1022139
Connecting cable - CAN M12 5-pole 2 m	1022140
Connecting cable - CAN M12 5-pole 5 m	1022141
Connecting cable - CAN M12 5-pin. 10 m	1046383

Accessories of CANopen operation

An operating unit is needed for the manual operation of a CANopen pump.

	Order no.
Operating unit (HMI) Sigma X - S2Cb, S3Cb	1092957

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 130 - DN 15	PVT	-	1035951	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 350 - DN 25	PVT	-	1035953	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 130 - DN 15	PVT	-	740324	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 350 - DN 25	PVT	-	740325	

Liquid end	Materials in contact with the medium		Valve	Order no.
FM 130 - DN 15	PVT	FDA	-	1046472

Liquid end	Materials in contact with the medium		Valve	Order no.
FM 350 - DN 25	PVT	FDA	-	1046475

Accessories

- Foot valves for motor-driven metering pumps, see page → 176
- Injection valves for motor-driven metering pumps, see page → 181
- Hoses and pipework for motor-driven metering pumps, see page → 208
- Suction lances, suction assemblies without level switches, see page → 232
- Connectors, fittings, connector kits, seals, see page → 212
- Speed controllers, see page → 259
- Metering monitor Flow Control, can be set for motor-driven metering pumps, see page → 252

Spare Parts

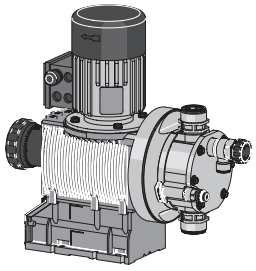
- Special valve balls/special valve springs, see page → 248

1.3.8 Motor-Driven Metering Pump Sigma/ 3 (Basic Type)

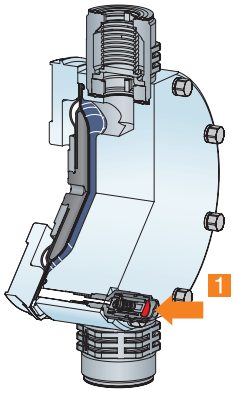
The robust pump for safe and reliable use

Capacity range 146 – 1,030 l/h, 12 – 4 bar

The patented multi-layer safety diaphragm for excellent process reliability is just one feature of the extremely robust motor-driven metering pump Sigma/3 Basic. It also offers a wide range of power end versions, such as three-phase or 1-phase AC motors, also for use in ATEX areas.



Sigma/ 3



1: Diaphragm rupture sensor

The Sigma/ 3 diaphragm metering pump together with pumps of type Sigma/ 1 and Sigma/ 2 represent an integrated product range. They cover the capacity range from 17 to 1,030 l/h, with a consistent operating concept, control concept and spare parts management. A wide range of power end versions is available, including some for use in areas at risk from explosion.

Your benefits

Excellent process reliability:

- In the event of an accident, the feed chemical does not escape to the outside nor into the pump's power end, thanks to the patented multi-layer safety diaphragm with optical (optionally electric) signalling
- Integrated relief valve protects the pump against overloading
- Reliable operation by bleed option during the suction process

Flexible adaptation to the process:

- The entire Sigma product range is available as standard in a "Physiologically safe in respect of wetted materials" design.
- Metering pumps with electro-polished stainless steel metering head enable them to be used in hygienically challenging applications
- Wide range of power end versions, also for use in areas at risk from explosion, and different flange designs for the use of customised motors
- Customised designs are available on request

Technical Details

- Stroke length: 6 mm,
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually by self-locking rotary dial in 1 % increments (optionally with actuator or control drive)
- Metering reproducibility is better than ± 2% in the 30 – 100 % stroke length adjustment range under defined conditions and with correct installation.
- Wetted materials: PVDF, stainless steel 1.4571/1.4404, special materials on request
- Patented multi-layer safety diaphragm with optical diaphragm rupture display (optionally with diaphragm rupture warning system via a contact)
- Integrated hydraulic relief and bleed valve
- A wide range of power end versions is available: Three-phase standard motor, 1-phase AC motor, motors for use in Exe and Exde areas and different flange designs for use in customer-specific motors
- For areas at risk from explosion II 2G Ex h IIC T3 Gb X or II 2G Ex h IIC T4 Gb X (optional)
- Degree of protection IP 55
- Highly rigid fibreglass-reinforced plastic housing with excellent chemical resistance
- For reasons of safety, provide suitable overload protection mechanisms when installing all mechanically deflected diaphragm metering pumps.

Field of application

- Volume-proportional addition of chemicals in water treatment, e.g. sodium-calcium hypochlorite for the disinfection of potable water
- Addition of chemicals depending on the measured value, e.g. metering of acid and alkali for pH neutralisation in waste water treatment
- Time-controlled addition of chemicals in the cooling water circuit
- Pulse-controlled metering in the bottling of different volumes e.g. glycerin filling of manometers

Sigma Basic Type Control Functions (S3Ba)

Stroke length actuator/control drive

Actuator: Electronically controlled actuator with contactless position detection for automatic stroke length adjustment, actuating period approx. 1 second for 1% stroke length, return potentiometer 1 kΩ, degree of protection IP65.

Control drive: Electronically controlled actuator with contactless position detection consisting of an actuator and integral servo controller for stroke length adjustment via a standard signal. Standard current input 0/4-20 mA corresponds to stroke length 0 – 100%, switch-over for manual/automatic operation, stroke adjustment in manual mode, electronic stroke length position display, wide-range voltage power unit 85 - 265 V 50/60 Hz, degree of protection IP65, actual value output 0/4-20 mA for remote display.

Speed controllers with frequency converter (identity code specification Z)

The speed controller assembly consists of a frequency converter and a variable speed motor of 0.55 kW.

“Physiologically safe” designs in respect to wetted sealing material for pump type: DN25 - 120145, 120190, 120270

FDA

Wetted materials in the “FDA” (F) design comply with the FDA guidelines.

FDA guidelines: PTFE material: FDA No. 21 CFR § 177.1550, PVDF material: FDA No. 21 CFR § 177.2510

Available for plastic (PV) and stainless steel (SS) pump designs and DN 25 ball valve.

Identity code example: S3BaH120330PV F S000S000

EU Regulation 1935/2004

Sealing materials in accordance with Regulation (EC) 1935/2004 are available in the “Physiologically safe for wetted material in accordance with Regulation (EC) 1935/2004” stainless steel material version.

Available for stainless steel (SS) pump design and DN 25 ball valves.

Hygienic Design

Hygienic Design dosing heads are available in 1.4435 (AISI 316L) for hygienically demanding applications. Optimised in terms of dead space, feature as few gaps as possible and have smooth, wetted surfaces, easy to clean using CIP. Get in touch with us, we would be happy to advise you.

Identity code example: S3BAH070410SSHAHC0S000

Connection type: Aseptic clamp unions DN11864-3

1.3 Motor-Driven Metering Pumps

Technical Data

Type	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Capacity at max. back pressure with 1800 rpm motor at 60 Hz				Suction lift	Perm. pre-pressure suction side	Connector Suction/Discharge Side	Shipping weight
S3Ba	l/h	bar	ml/stroke	Max. stroke rate Strokes/min	l/h	psi	gph (US)	Max. stroke rate Strokes/min	m WC	bar	G-DN	kg
120145 PVT	146	10	33.7	72	174	145	45.9	86	5	2	1 1/2–25	22
120145 SST	146	12	33.7	72	174	174	45.9	86	5	2	1 1/2–25	26
120190 PVT	208	10	33.7	103	251	145	66.3	124	5	2	1 1/2–25	22
120190 SST	208	12	33.7	103	251	174	66.3	124	5	2	1 1/2–25	26
120270 PVT	292	10	33.8	144	351	145	92.7	173	5	2	1 1/2–25	22
120270 SST	292	12	33.8	144	351	174	92.7	173	5	2	1 1/2–25	26
120330 PVT *	365	10	33.8	180	-	-	-	-	5	2	1 1/2–25	22
120330 SST *	365	12	33.8	180	-	-	-	-	5	2	1 1/2–25	26
070410 PVT	410	7	95.1	72	492	102	129.9	86	4	1	2–32 **	24
070410 SST	410	7	95.1	72	492	102	129.9	86	4	1	2–32 **	29
070580 PVT	580	7	95.1	103	696	102	183.8	124	4	1	2–32 **	24
070580 SST	580	7	95.1	103	696	102	183.8	124	4	1	2–32 **	29
040830 PVT	830	4	95.1	144	1,000	58	264.1	173	3	1	2–32 **	24
040830 SST	830	4	95.1	144	1,000	58	264.1	173	3	1	2–32 **	29
041030 PVT *	1,030	4	95.1	180	-	-	-	-	3	1	2–32 **	24
041030 SST *	1,030	4	95.1	180	-	-	-	-	3	1	2–32 **	29

* Only available for 50 Hz.

** DN32 plate valves with valve spring

Performance data for TTT, see type PVT

Materials in Contact With the Medium

Identity code of material	Seals	Suction/pressure connector on dosing head DN 25			Suction/pressure connector on dosing head DN 32			
PVT	PTFE	PVDF	Glass	PTFE **	PVDF	Ceramic/Hastelloy C + CTFE *	PTFE	PVDF/FKM or EPDM
SST	PTFE	Stainless steel 1.4581	Stainless steel 1.4404	PTFE **	Stainless steel 1.4581	Stainless steel 1.4404/Hastelloy C	PTFE	Stainless steel/FKM or EPDM
TTT ***	PTFE	PTFE + 25% carbon	Ceramic	PTFE **	PVDF	Ceramic/Hastelloy C + CTFE *	PTFE	-

* The valve spring is coated with CTFE (resistance similar to PTFE)

** With design “F”, the ball seat is made of PVDF, only for DN 25 ball valves

*** Specifically for areas at risk from explosion

1.3 Motor-Driven Metering Pumps

Motor Data

Identity code specification	Power supply	Δ/Y			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V	50 Hz	0.37 kW	
T	3-phase, IP 55	220 - 240 V/380 - 420 V	50 Hz	0.37 kW	With PTC, speed control range 1:5
R	3-phase, IP 55	220 - 240 V/380 - 420 V	50 Hz	0.55 kW	With PTC, speed control range 1:20 with external fan (1-phase 230 V; 50/60 Hz, 134 W)
M	1-phase AC, IP 55	230 V ± 5 %	50/60 Hz	0.55 kW	
N	1-phase AC, IP 55	115 V ± 5 %	60 Hz	0.55 kW	
L1	3-phase, II2GExellT3	220 – 240 V/380 – 420 V	50 Hz	0.37 kW	
L2	3-phase, II-2GExdIICT4	220 – 240 V/380 – 420 V	50 Hz	0.37 kW	With PTC, speed control range 1:5
P1	3-phase, II2GExellT3	250 – 280 V/440 – 480 V	60 Hz	0.37 kW	
P2	3-phase, II-2GExdIICT4	250 – 280 V/440 – 480 V	60 Hz	0.37 kW	With PTC, speed control range 1:5

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

In accordance with the Eco Design Directive 2009/125/EC, motors of less than 0.75 kW and motors designed for operation with variable speed are not subject to the IE3 standard.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

Identity Code Ordering System for Sigma/ 3 Basic Type (S3Ba)

S3Ba	Drive type												
	H	Main drive, diaphragm											
		Type		Output									
		120145 *		12 bar	146 l/h								
		120190 *		12 bar	208 l/h								
		120270 *		12 bar	292 l/h								
		120330 *		12 bar	365 l/h								
		070410		7 bar	410 l/h								
		070580		7 bar	580 l/h								
		040830		4 bar	830 l/h								
		041030		4 bar	1,030 l/h								
			Liquid end material										
			PV	PVDF (max. 10 bar)									
			SS	Stainless steel									
			TT	PTFE + 25% carbon (max. 10 bar)									
				Seal material									
				T	PTFE seal								
				F	FDA-compliant (only with 12 bar version)								
					Diaphragm								
					S	Multi-layer safety diaphragm with optical rupture indicator							
					A	Multi-layer safety diaphragm with rupture signalling (contact)							
						Liquid end version							
						0	No spring						
						1	With 2 valve springs, Hastelloy C 4; 0.1 bar (standard for DN 32)						
						4 **	With pressure relief valve, FKM seal, no valve spring, Only with PV and SS						
						5 **	With pressure relief valve, FKM seal with valve springs (standard at DN 32), Only with PV and SS						
						6 **	With pressure relief valve, EPDM seal, without valve spring, Only with PV and SS						
						7 **	With pressure relief valve, EPDM seal, with valve springs (standard at DN 32), Only with PV and SS						
							Hydraulic connections						
							0	Standard threaded connector (according to technical data)					
							1	PVC union nut and insert					
							2	Union nut and insert PP					
							3	PVDF union nut and insert					
							4 ***	SS union nut and insert					
							7	Union nut and PVDF hose nozzle					
							8	Union nut and SS hose nozzle					
							9	Union nut and stainless steel hose nozzle					
								Version					
								0	with ProMinent logo				
								1	without ProMinent logo				
								M	Modified				
									Electrical power supply				
									S	3 ph, 230 V/400 V			
									T	3 ph, 230 V/400 V, with PTC			
									R	Variable speed motor 3 ph, 230/400 V, with PTC, with external fan 1 ph 230 V 50/60 Hz			
									Z	Speed control compl 1 ph 230 V//400 V (variable speed motor + FC)			
									M	1-phase, 230 V, 50/60 Hz			
									N	1-phase, 115 V, 60 Hz (not for pump type 041030)			
									L	3 ph, 230 V/400 V, 0.37 kW, 50 Hz, (Exe, Exd)			
									P	3 ph, 265 V/440 V, 0.37 kW, 60 Hz, (Exe, Exd)			
									V2	Variable speed motor with integr. FC Exd (delivery with frame)			
									1	No motor, with B14 flange, size 80 (DIN)			
									2	No motor, with C56 NEMA flange			
									3	No motor, with B5 flange, size 71 (DIN)			
										Enclosure rating			
										0	IP 55 (standard)		
										1	Ex-design ATEX-T3		
										2	Ex-design ATEX-T4		
											Stroke sensor		
											0	No stroke sensor (standard)	
											2	Pacing relay (reed relay)	
											3	Stroke sensor (Namur) for hazardous locations	
												Stroke length adjustment	
												0	Manual (Standard)
												1	with servomotor, 85…265 V AC 50/60 Hz
												3	with stroke control motor 0...20 mA 85…265 V AC 50/60 Hz
												4	with stroke control motor 4...20 mA 85…265 V AC 50/60 Hz

* 10 bar for PVDF and TTT version.

** Standard with threaded connector in the bypass. Hose sleeve on request.

*** Internal thread of insert SS DN25-Rp 1, DN32-Rp 1 1/4

Metering pumps with sealing material in compliance with Regulation (EC) 1935/2004 or Hygienic Design dosing heads are available for hygienically demanding applications.

1.3 Motor-Driven Metering Pumps

We are happy to supply alternative material versions to comply with export conditions for pump capacities of > 600 l/h and PVDF.



Spare parts for Sigma/ 3 Basic type (S3Ba)

The spare parts kit generally includes the wear parts for the liquid ends.

Scope of delivery for PVT/TTT material version:

- 1 metering diaphragm
- 2 valve assemblies
- 2 valve balls and/or valve plate with spring for DN 32
- 1 elastomer sealing set (EPDM, FKM-B)
- 2 ball seat housings
- 2 ball seat discs
- 4 composite seals

Scope of delivery for SST material version:

- 1 metering diaphragm
- 2 valve balls and/or valve plate with spring for DN 32
- 2 ball seat discs
- 4 composite seals

Spare parts kit for Sigma/ 3

(valid for identity code: types 120145, 120190, 120270, 120330)

Liquid end	Materials in contact with the medium		Valve	Order no.
with multi-layer safety diaphragm				
FM 330 - DN 25	PVT	-	-	1034678
FM 330 - DN 25	SST	-	-	1034679
FM 330 - DN 25	TTT	-	with 2 valves cpl.	1077575
FM 330 - DN 25	SST	-	with 2 valves cpl.	1034680
with old metering diaphragm				
FM 330 - DN 25	SST	-	with 2 valves cpl.	1005312
FM 330 - DN 25	SST	-	-	1005310
FM 330 - DN 25	PVT	-	-	1005308
FDA and Regulation (EC) 1935/2004				
FM 330 - DN 25	PVT	FDA	-	1046478
FM 330 - DN 25	SST	Regulation (EC) 1935/2004	with valve	1105336
FM 330 - DN 25	SST	FDA	with valve	1046480
FM 330 - DN 25	SST	Regulation (EC) 1935/2004	without valve	1105337
FM 330 - DN 25	SST	FDA	without valve	1046479

(valid for identity code: types 070410, 070580, 040830, 041030)

Liquid end	Materials in contact with the medium	Valve	Order no.
with multi-layer safety diaphragm			
FM 1000 - DN 32	PVT/PPT/PCT	-	1034681
FM 1000 - DN 32	SST	-	1034682
FM 1000 - DN 32	SST	with 2 valves cpl.	1034683
with old metering diaphragm			
FM 1000 - DN 32	SST	with 2 valves cpl.	1005313
FM 1000 - DN 32	SST	-	1005311
FM 1000 - DN 32	PVT/PPT/PCT	-	1020032

Multi-layer Safety Diaphragm (Standard)

	Order no.
FM 330 Identity code: Type 120145, 120190, 120270, 120330	1029604
FM 1000 Identity code: Type 070410, 070580, 040830, 041030	1029603

Metering diaphragm (old version)

	Order no.
FM 330 Identity code: Type 120145, 120190, 120270, 120330	1004604
FM 1000 Identity code: Type 070410, 070580, 040830, 041030	1002835

Spare parts kit for integrated overflow valve

Consisting of two compression springs made from Hastelloy C and four FKM-A O-rings each

	For material	Seals	Order no.
Spare parts kit for relief valve 4 bar	PVT/SST	FKM-A/ EPDM	1031204
Spare parts kit for relief valve 7 bar	PVT/SST	FKM-A/ EPDM	1031205
Spare parts kits for integrated relief valve 10 bar	PVT	FKM-A/ EPDM	1031201
Spare parts kits for integrated relief valve 12 bar	PVT/SST	FKM-A/ EPDM	1031202

Gear Oil

Product designation	Order no.
Mobilgear 634 VG 460 gear oil	1004542

Accessories

- Foot valves for motor-driven metering pumps, see page → 176
- Injection valves for motor-driven metering pumps, see page → 181
- Hoses and pipework for motor-driven metering pumps, see page → 208
- Suction lances, suction assemblies without level switches, see page → 232
- Connectors, fittings, connector kits, seals, see page → 212
- Speed controllers, see page → 259
- Metering monitor Flow Control, can be set for motor-driven metering pumps, see page → 252

Spare Parts

- Special valve balls/special valve springs, see page → 248

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 330 - DN 25	PVT	-	1034678	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 1000 - DN 32	PVT/PPT/ PCT	-	1034681	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 330 - DN 25	PVT	-	1005308	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 1000 - DN 32	PVT/PPT/ PCT	-	1020032	

Liquid end	Materials in contact with the medium		Valve	Order no.
FM 330 - DN 25	PVT	FDA	-	1046478

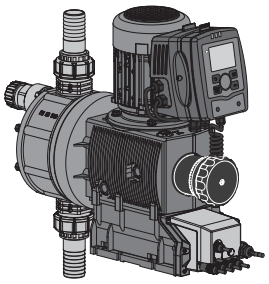
1.3 Motor-Driven Metering Pumps

1.3.9 Motor-Driven Metering Pump Sigma X Control Type – Sigma/ 3 - S3Cb

The new Sigma X range – reliable, smart and connectible

Capacity range S3Cb: 182 – 1,040 l/h, 12 – 4 bar

The Sigma control type is a smart motor-driven metering pump that is setting new standards in terms of productivity, reliability and safety.



Sigma/ 3 control type

The Sigma X diaphragm metering pump covers a capacity range of 21 to 1,040 l/h in versions S1Cb, S2Cb and S3Cb. Its patented multi-layer safety diaphragm guarantees maximum process reliability. Efficient protection of the power end from overloading by means of an integral frequency converter with microprocessor control(ler).

One highlight is the standardised operating concept with click wheel and 4 additional operating keys on a removable operating unit. A large illuminated LCD and a 3-LED display for operating, warning and error messages, visible from all sides, offers additional operating convenience.

The Sigma, like all smart ProMinent metering pumps, can be flexibly connected to various bus systems.

It has a large adjustment range thanks to a combination of frequency and stroke length adjustment. The pump works with high precision across the entire frequency range. Accurate and complication-free metering of viscous and gaseous media by adjustment of the movement profile.

Operating statuses are simply remotely transmitted via an additional output or relay module. A built-in timer, included as standard, controls time-dependent metering cycles.

Relevant spare parts can be shown in the display. The integral log book significantly improves process management, optimisation and troubleshooting.

Your benefits

DULCOnneX

- Safe: In the event of an accident, the feed chemical does not escape to the outside nor into the pump's power end, thanks to the patented multi-layer safety diaphragm with optical (optionally electric) signalling.
- Integrated relief valve protects the pump against overloading and reliable operation by means of a bleed option during the metering process.
- External control is scalable via potential-free contacts with pulse step-up and step-down, batch mode or via a 0/4-20 mA standard signal.
- Flexibly connectible: Connection to process management systems via integral PROFIBUS®, CANopen interface.
- Integral log book saves up to 300 events and simplifies troubleshooting and analysis of the cause.

Technical Details

- Stroke length: 4 mm
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually using self-locking rotary dial in 1% increments
- Metering reproducibility is better than ± 2% in the 30 – 100% stroke length adjustment range under defined conditions and with correct installation
- Wetted materials: PVDF, stainless steel 1.4571/1.4404 (special materials on request)
- Power supply: 1 pH, 100 – 230 V ±10%, 240 V ±6%, 50/60 Hz (220 W)
- Degree of protection IP 65
- Fibreglass-reinforced plastic housing
- The liquid end on the left of the standard version can be selected for special installation situations or in combination with storage tanks, brackets etc.
- Settable manual or external contact mode, factor with external contact control 99:1 – 1:99; batch mode with max. 99,999 strokes/start pulse.
- Metering profiles for optimum metering results.
- Display of wear parts in the Service menu.
- Connector for 2-stage level switch.
- Connection to PROFINET using the ProMinent DULCOnvert PROFIBUS®-PROFINET converter.
- Time-dependent control of the metering volume via integral timer.
- Relay module with 1 x switchover contact, 230 V – 8 A
- Relay module with 2 x On, 24 V – 100 mA
- Output / relay module: 0/4- 20 mA analogue output for remote transmission of the stroke rate plus relay module with 1 x On, 24 V – 100 mA
- The Sigma product range is available in a “Physiologically safe in respect of wetted materials” design.
- Dosing heads with electro-polished stainless steel for aqueous media are available with hygienically challenging applications.
- Customised designs are available on request.

For reasons of safety, provide suitable overload protection mechanisms when installing all mechanically deflected diaphragm metering pumps.

Field of application

- All industrial applications, either as a stand-alone unit or integrated in a complete system
- Volume-proportional addition of chemicals in water treatment, e.g. sodium hypochlorite for the disinfection of potable water
- Neutralisation in waste water treatment
- Pulse-controlled metering in the bottling of different volumes e.g. glycerol filling of manometers
- With an integrated timer as a control unit for simple processes, e.g. biocide metering in cooling water

Operating unit

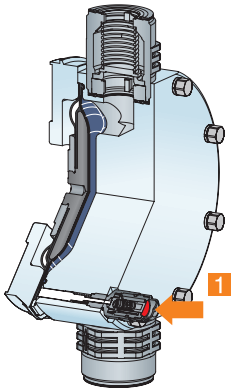


One highlight is the standardised operating concept with gamma and Sigma metering pumps with click wheel and 4 additional operating keys on a removable operating unit. A large illuminated LCD and a 3-LED display for operating, warning and error messages, visible from all sides, offers additional operating convenience.

The Sigma metering pump (control type), like all smart ProMinent metering pumps, can be flexibly connected to various bus systems. Operating statuses are simply remotely transmitted via an additional output or relay module. A built-in timer, included as standard, controls time-dependent metering cycles.

Relevant spare parts can be shown in the display. The integral log book significantly improves process management, optimisation and troubleshooting.

Multi-layer safety diaphragm



1: Diaphragm rupture sensor

The Sigma X represents a durable motor-driven metering pump with integral control and patented multi-layer safety diaphragm, standing out on account of its excellent process reliability. In the event of an accident, the feed chemical does not escape to the outside nor into the pump’s power end, thanks to the multi-layer safety diaphragm with optical (optionally electric) signalling.

An additional rear PTFE layer prevents medium from leaking in the event of a diaphragm rupture. In the event of a diaphragm rupture, a simple contact is mechanically triggered by the multi-layer diaphragm. The dosing head remains leak-free during this time, ensuring emergency operation. Simpler technology than the double diaphragm system and independent of the feed chemical, hence a benefit for maintenance / service.

The optical diaphragm rupture warning system is available in the standard scope of delivery.

Metering profiles

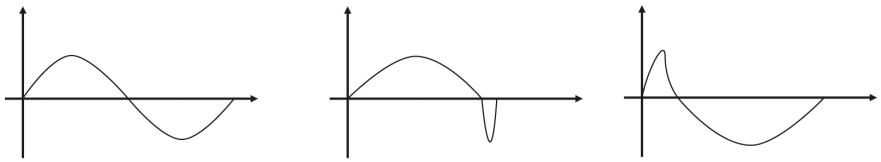
Metering profiles guarantee optimum metering results by adapting the metering behaviour of the metering pump to the application or chemical used.

The combination of frequency and stroke length adjustment permits a large adjustment range, with the pump working with excellent precision over the entire frequency range. Adjustment of the movement profile also guarantees precise and trouble-free metering even with viscous and gaseous media.

The stroke motion of the displacement body is continually recorded and regulated so that the stroke is made in line with the desired metering profile. The pump can be operated in normal mode (Diagram 1), with optimised discharge stroke (Diagram 2) or with optimised suction stroke (Diagram 3).

Three typical metering profiles are shown schematically with progress over time.

1 Discharge stroke, suction stroke equal
2 Long discharge stroke, short suction stroke
3 Short discharge stroke, long suction stroke



“Physiologically safe” designs in respect to wetted sealing material

FDA

Wetted materials in the “FDA” (F) design comply with the FDA guidelines.

FDA guidelines: PTFE material: FDA No. 21 CFR § 177.1550, PVDF material: FDA No. 21 CFR § 177.2510

Available for plastic (PV) and stainless steel (SS) pump designs

Identity code example: S1CbH07042PV F S010S0DE

EU Regulation 1935/2004

Sealing materials in accordance with Regulation (EC) 1935/2004 are available in the “Physiologically safe for wetted material in accordance with Regulation (EC) 1935/2004” stainless steel material version. Available for stainless steel (SS) pump design.

Hygienic Design

Hygienic Design dosing heads are available in 1.4435 (AISI 316L) for hygienically demanding applications. Optimised in terms of dead space, feature as few gaps as possible and have smooth, wetted surfaces, easy to clean using CIP. Get in touch with us, we would be happy to advise you.

Identity code example: S1CBH10022SSHAHC0UA00000

Connection type: Aseptic clamp unions DN11864-3

1.3 Motor-Driven Metering Pumps

Technical Data

Type	Pump capacity at max. back pressure			Max. stroke rate	Pump capacity at max. back pressure		Suction lift	Perm. pre-pressure suction side	Connector Suction/ Discharge Side	Shipping weight
S3Cb	bar	l/h	ml/stroke	Strokes/ min	psi	gph (US)	m WC	bar	G-DN	kg
120145 PVT	10	182	33.7	90	145	48.0	5	2	1 1/2–25	22
120145 SST	12	182	33.7	90	174	48.0	5	2	1 1/2–25	26
120190 PVT	10	243	33.7	120	145	64.1	5	2	1 1/2–25	22
120190 SST	12	243	33.7	120	174	64.1	5	2	1 1/2–25	26
120270 PVT	10	365	33.8	180	145	96.4	5	2	1 1/2–25	22
120270 SST	12	365	33.8	180	174	96.4	5	2	1 1/2–25	26
070410 PVT	7	500	95.1	90	102	132.0	4	1	2–32 *	24
070410 SST	7	500	95.1	90	102	132.0	4	1	2–32 *	29
070580 PVT	7	670	95.1	120	102	176.9	4	1	2–32 *	24
070580 SST	7	670	95.1	120	102	176.9	4	1	2–32 *	29
040830 PVT	4	1,040	95.1	180	58	274.7	3	1	2–32 *	24
040830 SST	4	1,040	95.1	180	58	274.7	3	1	2–32 *	29

* DN32 plate valves with valve spring

Materials in Contact With the Medium

Identity code of material	Suction/pressure connector on dosing head	Seals DN 25	Valve balls	Valve seats	Seals DN 32
PVT	-	PTFE	Glass	PTFE **	PTFE
SST	Stainless steel 1.4581	PTFE	Stainless steel 1.4404	PTFE **	PTFE

* The valve spring is coated with CTFE (resistance similar to PTFE)
** With design “F”, the ball seat is made of PVDF, only for DN 25 ball valves

Motor Data

Identity code specification		Power supply			Remarks
U	1-phase, IP 65	100 – 230 V ±10 % / 240 V ±6 %	50/60 Hz	420 W	

Motors less than 0.75 kW and motors designed for speed-controllable operation are not subject to the IE3 standard in compliance with the Ecodesign Directive 2009/125/EC.

1.3 Motor-Driven Metering Pumps

Identity Code Ordering System for the Sigma/ 3 Control Type (S3Cb)

S3Cb	Drive type																		
	H	Main drive, diaphragm																	
		Type	Output																
		120145 ****	12 bar	146 l/h															
		120190 ****	12 bar	208 l/h															
		120270 ****	12 bar	292 l/h															
		120330 ****	12 bar	365 l/h															
		070410	7 bar	410 l/h															
		070580	7 bar	580 l/h															
		040830	4 bar	830 l/h															
		041030	4 bar	1,030 l/h															
			Liquid end material																
			PV	PVDF (max. 10 bar)															
			SS	Stainless steel															
				Seal material															
				T	PTFE seal														
				F	FDA-compliant (only with 12 bar version)														
					Diaphragm														
					S	Multi-layer safety diaphragm with optical rupture indicator													
					A	Multi-layer safety diaphragm with electrical signal													
						Liquid end version													
						0	No valve springs (standard)												
						1	With 2 valve springs, Hastelloy C 4; 0.1 bar (standard for DN 32)												
						2	With bleed valve, FKM seal, no valve spring												
						3	With bleed valve, FKM seal, with valve spring												
						4 *	With pressure relief valve, FKM seal, no valve spring												
						5 *	With relief valve, FPM seal, with valve springs												
						6 *	With pressure relief valve, EPDM seal, without valve spring												
						7 *	With pressure relief valve, EPDM seal, with valve spring												
						8	With bleed valve, EPDM seal, no valve spring												
						9	With bleed valve, EPDM seal, with valve spring												
							Hydraulic connections												
							0	Standard connection											
							1	PVC union nut and insert											
							2	Union nut and insert PP											
							3	PVDF union nut and insert											
							4 **	Stainless steel union nut and insert											
							7	Union nut and PVDF hose nozzle											
							8	Stainless steel union nut and hose nozzle											
							9	Union nut and stainless steel welding sleeve											
								Version											
								0	with ProMinent logo										
								1	without ProMinent logo										
									Electrical power supply										
									U	1 ph, 100 – 230 V ±10%, 240 V ±6%, 50/60 Hz, 420 W									
										Cable and plug									
										A	2 m European								
										B	2 m Swiss								
										C	2 m Australian								
										D	2 m USA								
											Relay								
											0	no relay							
											1	Fault indicating relay (230 V, 8 A)							
											3	Fault indicating relay (24 V, 100 mA) + pacing relay (24 V, 100 mA)							
											8	0/4-20 mA analogue output + fault indicating / pacing relay (24 V - 100 mA)							
												Control Variants							
												0	Manual + External contact with Pulse control						
												1	as 0 + analogue + metering profiles						
												6	As 1 + PROFIBUS® DP interface, M 12						
												7 ***	As 1 + CANopen (CiA 402, M12 plug), pump without operating unit (HMI)						
													Overload switch-off						
													0	without overload switch-off					
														Operating unit (HMI)					
														0	Operating unit with Click Wheel(0.5 m cable)				
														4	Operating unit with Click Wheel + 2 m cable				
														5	Operating unit with Click Wheel + 5 m cable				
														6	Operating unit with Click Wheel + 10 m cable				
														X	without operating unit (HMI)				

* Standard with threaded connector in the bypass. Hose sleeve on request.

** Internal thread of insert SS DN25-Rp 1, DN32-Rp 1 1/4

*** An HMI order no. 1042549 is required for manual operation, e.g. in the event of CAN bus failure

**** 10 bar for PVDF version.

1.3 Motor-Driven Metering Pumps

Access code		
0	without access control	
1	with access control	
	Language	
	DE	German
	EN	English
	ES	Spanish
	FR	French
	IT	Italian
	NL	Dutch
	PL	Polish
	PT	Portuguese
	CS	Czech
	RU	Russian
	ZH	Chinese
	SV	Swedish

* Standard with threaded connector in the bypass. Hose sleeve on request.
** Internal thread of insert SS DN25-Rp 1, DN32-Rp 1 1/4
*** An HMI order no. 1042549 is required for manual operation, e.g. in the event of CAN bus failure
**** 10 bar for PVDF version.

Metering pumps with sealing material in compliance with Regulation (EC) 1935/2004 or Hygienic Design dosing heads are available for hygienically demanding applications.

We are happy to supply alternative material versions to comply with export conditions for pump capacities of > 600 l/h and PVDF.

Spare parts for Sigma/ 3 Control type (S3Cb)

The spare parts kit generally includes the wear parts for the liquid ends.

Scope of delivery for PVT/TTT material version:

- 1 metering diaphragm
- 2 valve assemblies
- 2 valve balls and/or valve plate with spring for DN 32
- 1 elastomer sealing set (EPDM, FKM-B)
- 2 ball seat housings
- 2 ball seat discs
- 4 composite seals

Scope of delivery for SST material version:

- 1 metering diaphragm
- 2 valve balls and/or valve plate with spring for DN 32
- 2 ball seat discs
- 4 composite seals

Spare parts kit for Sigma/ 3

(valid for identity code: types 120145, 120190, 120270, 120330)

Liquid end	Materials in contact with the medium		Valve	Order no.
with multi-layer safety diaphragm				
FM 330 - DN 25	PVT	-	-	1034678
FM 330 - DN 25	SST	-	-	1034679
FM 330 - DN 25	SST	-	with 2 valves cpl.	1034680
FM 330 - DN 25	TTT	-	with 2 valves cpl.	1077575
with old metering diaphragm				
FM 330 - DN 25	SST	-	-	1005310
FM 330 - DN 25	PVT	-	-	1005308
FM 330 - DN 25	SST	-	with 2 valves cpl.	1005312
FDA and Regulation (EC) 1935/2004				
FM 330 - DN 25	PVT	FDA	-	1046478
FM 330 - DN 25	SST	FDA	without valve	1046479
FM 330 - DN 25	SST	FDA	with valve	1046480
FM 330 - DN 25	SST	Regulation (EC) 1935/2004	with valve	1105336
FM 330 - DN 25	SST	Regulation (EC) 1935/2004	without valve	1105337

(valid for identity code: types 070410, 070580, 040830, 041030)

Liquid end	Materials in contact with the medium	Valve	Order no.
with multi-layer safety diaphragm			
FM 1000 - DN 32	PVT/PPT/PCT	-	1034681
FM 1000 - DN 32	SST	-	1034682
FM 1000 - DN 32	SST	with 2 valves cpl.	1034683
with old metering diaphragm			
FM 1000 - DN 32	SST	with 2 valves cpl.	1005313
FM 1000 - DN 32	SST	-	1005311
FM 1000 - DN 32	PVT/PPT/PCT	-	1020032

Multi-layer Safety Diaphragm (Standard)

	Order no.
FM 330 Identity code: Type 120145, 120190, 120270, 120330	1029604
FM 1000 Identity code: Type 070410, 070580, 040830, 041030	1029603

Metering diaphragm (old version)

	Order no.
FM 330 Identity code: Type 120145, 120190, 120270, 120330	1004604
FM 1000 Identity code: Type 070410, 070580, 040830, 041030	1002835

Spare Parts Kit for Integrated Relief Valve (S3Ca, S3Cb)

Consisting of two compression springs made from Hastelloy C and four FKM-A O-rings each

	For material	Seals	Order no.
Spare parts kit for relief valve 4 bar	PVT/SST	FKM-A/ EPDM	1031204
Spare parts kit for relief valve 7 bar	PVT/SST	FKM-A/ EPDM	1031205
Spare parts kits for integrated relief valve 10 bar	PVT	FKM-A/ EPDM	1031201
Spare parts kits for integrated relief valve 12 bar	PVT/SST	FKM-A/ EPDM	1031202

Gear Oil

Product designation	Volume l	Order no.
Mobilgear 634 VG 460 gear oil	1	1004542

Spare Parts Kits for Integrated Bleed Valve (S3Cb)

Consisting of a compression spring made from Hastelloy C and four FKM-A and EPDM O-rings each

For identity code specification “Dosing head design” with characteristic “2”, “3”, “8”, “9”

	For material	Seals	Order no.
ETS	PVT/SST	FKM-A/ EPDM	1043785
ETS	PVT/SST	FKM-A/ EPDM	1043786

Protective Cowling for Operating Unit (HMI)

Protection of the operating unit (HMI) of Sigma metering pumps against contamination; made from transparent silicone rubber. For Sigma X control types S1Cb, S2Cb and S3Cb.

	Order no.
Protective cowling for operating unit (S1Cb, S2Cb, S3Cb)	1083680

Wall Bracket for Operating Unit (HMI)

Wall bracket with operating lever for wall mounting of the operating unit (HMI) without any fittings. For Sigma control types S1Cb / S2Cb / S3Cb.

	Order no.
Wall bracket for operating unit (S1Cb, S2Cb, S3Cb)	1036683

Extension cable for operating unit (HMI)

	Order no.
Connecting cable - CAN M12 5-pole 1 m	1022139
Connecting cable - CAN M12 5-pole 2 m	1022140
Connecting cable - CAN M12 5-pole 5 m	1022141
Connecting cable - CAN M12 5-pin. 10 m	1046383

Accessories of CANopen operation

An operating unit is needed for the manual operation of a CANopen pump.

	Order no.
Operating unit (HMI) Sigma X - S2Cb, S3Cb	1092957

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 330 - DN 25	PVT	-	1034678	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 1000 - DN 32	PVT/PPT/PCT	-	1034681	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 330 - DN 25	PVT	-	1005308	

Liquid end	Materials in contact with the medium		Order no.	Price/€
FM 1000 - DN 32	PVT/PPT/PCT	-	1020032	

Liquid end	Materials in contact with the medium		Valve	Order no.
FM 330 - DN 25	PVT	FDA	-	1046478

Accessories

- Foot valves for motor-driven metering pumps, see page → 176
- Injection valves for motor-driven metering pumps, see page → 181
- Hoses and pipework for motor-driven metering pumps, see page → 208
- Suction lances, suction assemblies without level switches, see page → 232
- Connectors, fittings, connector kits, seals, see page → 212
- Speed controllers, see page → 259
- Metering monitor Flow Control, can be set for motor-driven metering pumps, see page → 252

Spare Parts

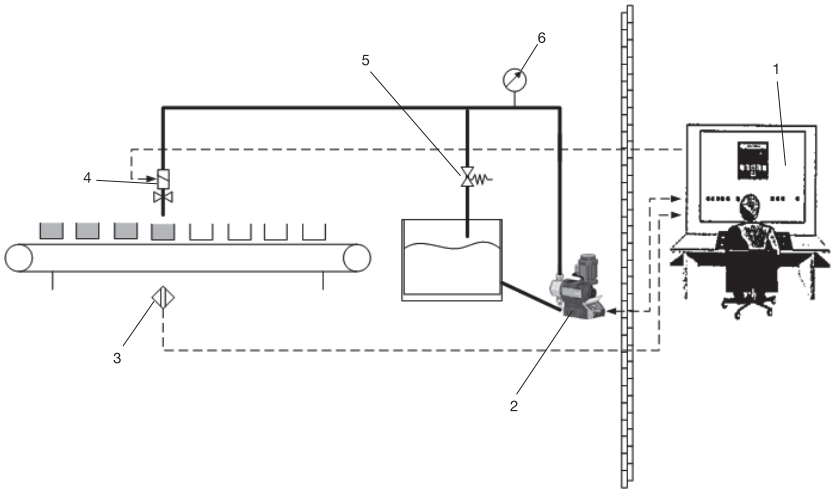
- Special valve balls/special valve springs, see page → 248

1.3.10 Application Examples

Metering Of Highly Viscous Substances

Product:	**Motor-driven metering pumps**
Feed chemical:	**Viscous filler**
Industry:	**Electronics sector**
Application:	**Filling parts**

1 Process control system PLS (Master)
2 Metering pump, Sigma type (field device)
3 Proximity switch
4 Solenoid valve
5 Relief valve
6 Manometer



Problems and requirements

- Metering of a viscous filler into moulds
- Dosing precision ± 2 %
- Changing filling quantities

Operating conditions

- The moulds run on a conveyor belt in “Stop and Go” mode past the point of injection.
- The pump is started by a proximity switch on the conveyor belt (external contact controller).

Notes on use

- The process should always start with a compression stroke, i.e. controlled stopping of the diaphragms at the end of the suction stroke.
- If the filling volume varies, select as large a stroke length as possible to improve precision.
- Short and stable suction and metering lines, no pulsation damper - thus reducing the flexible (moving) volume.
- If possible, work with feed, so that the suction line is always filled with liquid even after long periods of idleness.
- A solenoid valve is needed for filling to prevent residual quantities from dripping.

Solution

- Metering pump type Sigma X with PROFIBUS® connection
- Relief valve, solenoid valve

1.3 Motor-Driven Metering Pumps

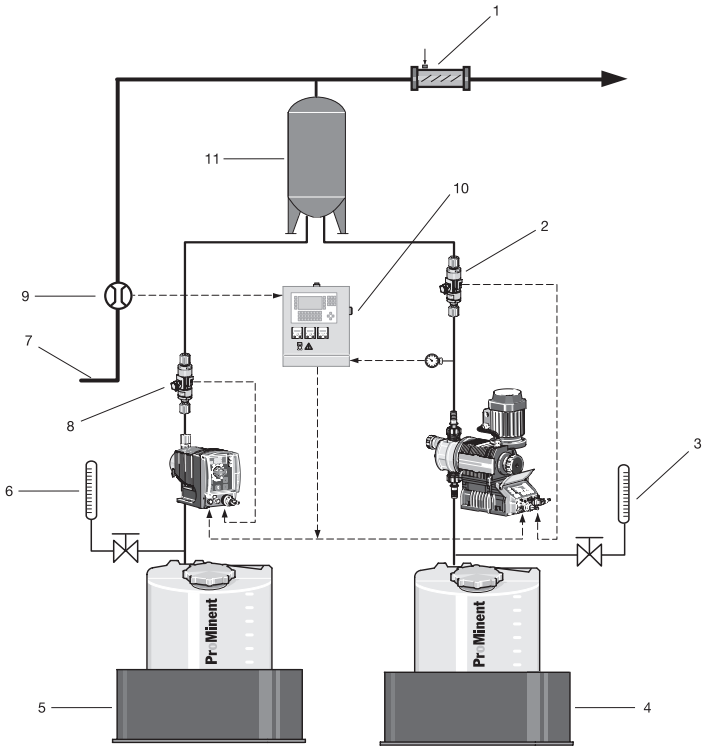
Benefits

- Monitoring of the metering pump and adjustment of the metering volume (number of strokes) by PLS in the Control Room
- Lower electrical installation cost
- Integration into the complete process flow thanks to PROFIBUS®
- Safe and precise metering with relief and solenoid valves

Mixing Two Reagents

Product:	**Motor-driven metering pumps, solenoid-driven metering pumps**
Feed chemical:	**Chlorine activator, oxidant (NaOCl)**
Industry:	**Process industry, power plants**
Application:	**Biocide treatment of cooling water systems**

1 Static mixer
2 Flow Control
3 Metering measuring unit
4 NaOCl solution
5 Chlorine activator
6 Metering measuring unit
7 Process water
8 Flow Control
9 Flow measurement
10 Control cabinet
11 Reaction tank



Problems and requirements

- Biocide treatment of cooling water systems, used in conjunction with chlorination.
- Chlorine activator is mixed with NaOCl, forming hypobromous acid (HOBr), as an active biocide compound. HOBr is especially effective with pH values within a range of 7.5 to 9.0.
- Provide for a content of 0.5 g/m³ of active HOBr for 1 hour twice daily for disinfection of the cooling water.

Operating conditions

- Biologically contaminated water
- Automatic control of the metering pumps

1.3 Motor-Driven Metering Pumps

Notes on use

- Mixing ratio of chlorine activator and NaOCl (12.5%) is 10 l to 26 - 52 l. Undertake tests to determine the precise composition (by the customer).
- Metering pump with timer function controls the second pump and is therefore responsible for batch metering.
- Motor-driven metering pump is protected against overload by a manometer with pressure switch. The manometer is connected to the control system.
- The control system monitors the system and switches it off on receipt of a corresponding signal (error message) from the flow meter.

Solution

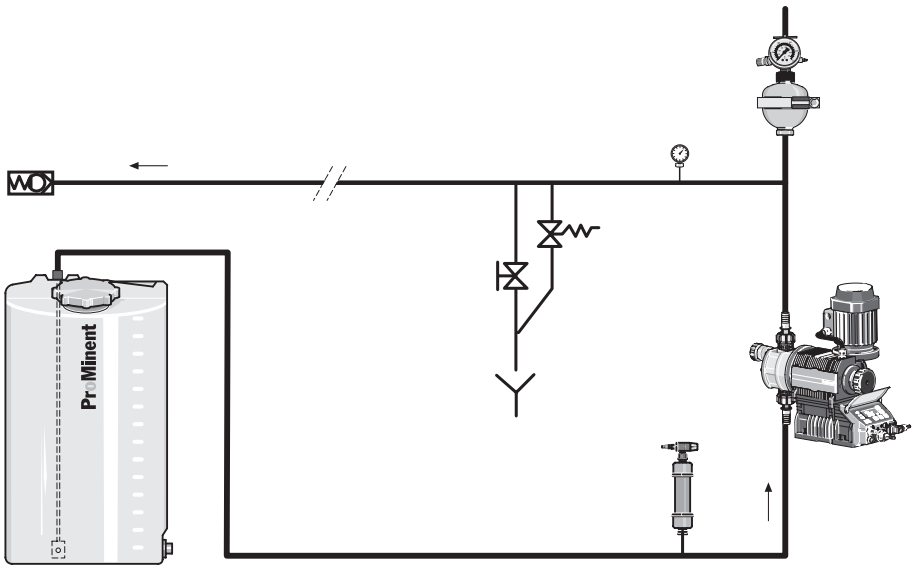
- Metering pump type gamma/ L with timer function (possibly external time switch)
- Metering pump Sigma X - S1Cb
- Metering monitor Flow Control
- Metering equipment
- Manometer with pressure switch

Benefits

- Good disinfection in alkaline water and water containing ammonia
- Cost-effective raw material base, which is also stable and non-corrosive
- Excellent safety due to flow control
- Simple and effective set-up for optimising the chemical composition through metering equipment.

Safe And Reliable Chemical Metering With Reduced Pulsation

Product:	**Metering pumps, accessories**
Feed chemical:	**Chemicals of higher viscosity**
Application:	**Use of pulsation damper (PD)**



Problems and requirements

- Due to the technical procedures involved, customers want a metering flow with very little pulsation.
- Acceleration inertial forces during metering, resulting from the oscillating movement of the displacement body in conjunction with the pipework geometry, need to be reduced.
- Process management without cavitation

1.3 Motor-Driven Metering Pumps

Operating condition/environment

- Long suction/discharge lines
- Line cross-sections with tight dimensions
- Metering of inert media of higher viscosity

Notes on use

- Surges increase as the length of the metering line increases and the diameter narrows, leading to impermissible pressure peaks.
- Check whether it is necessary to use a PD when using a pipe calculation program with longer pipework and with more highly viscous media.
- With an oscillating motor-driven metering pump, the maximum flow speed is roughly 3 times that of mean speed, and with a solenoid-driven metering pump, it is approx. 5 times greater. This should be taken into account when configuring lines without a PD.
- PD should be pre-stressed with compressed air or nitrogen to around 60-80 % of the anticipated operating pressure.

Solution

- ProMinent metering pumps
- Back pressure / relief valves
- Pulsation damper

Benefits

- Reliable installation that prevents damage to pumps and pipework
- Precise metering since cavitation is avoided
- Compensation of fluctuations in the delivery flow

1.3.11 DULCONNEX – digital fluid management

Location-independent system monitoring in real time

You always have all the key data and measured values in sight at all times with DULCONNEX. Monitor and document the status of your system in real time. Check your unit data, regardless of where you are, safely and reliably when you're out and about. Simply use the terminal device of your choice: smartphone, tablet or PC.

Refer to our catalogue or website for more information and references.



1.4 Peristaltic Pumps DULCO® flex

1.4.1 Peristaltic Pumps DULCO® flex

The virtually universal pump for many applications.

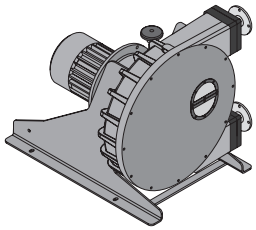
Capacity range up to 15,000 l/h, up to 15 bar

ProMinent peristaltic pumps operate on a simple functional principle and stand out thanks to their compact and robust design. They are self-priming and operate without seals and valves.

The peristaltic pumps of product range DULCO®flex are ideal for almost all metering and pumping tasks in laboratories and industry. The reason: their extensive pump capacity range and the large number of different hose materials.

This is how they work: The feed chemical is pumped by the rotor clamping the hose in the direction of flow. No valves are needed. Abrasive, viscous and gaseous media can thereby be gently conveyed.

The pumping process is triggered by an elastomer hose, pressed by two rotating rollers or shoes against the pump housing. Once the rollers or shoes have passed by, the hose immediately returns to its original shape and creates a vacuum at the pump inlet. Atmospheric pressure causes the medium to flow in. The feed rate is proportional to the pump speed. A vacuum device can optionally be used to assist the hose to return to its position on product range DFCa and DFDa pumps, improving their suction behaviour and ensuring the even feed of viscose media.



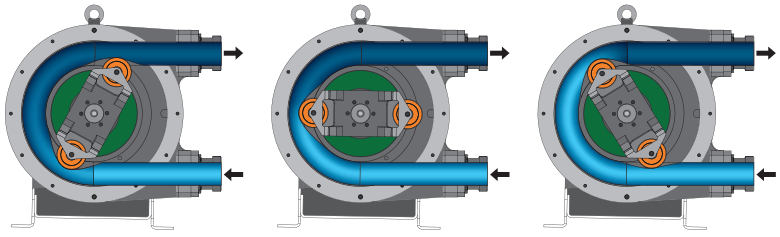
Whereas the pumps are fitted with roller technology for low pressures of up to 8 bar, they have shoes for higher pressures of up to 15 bar.

Your benefits

- Simple to operate
- Reversible pumping direction
- Hose materials suitable for various chemicals
- Simple and quick hose change
- Safeguarded against running dry
- Self-priming
- Ideal for pumping pasty, viscous, abrasive and gaseous media

Field of application

Chemical industry, clarification plants, mining



DULCO®flex peristaltic pumps can be used to convey media with the following properties:

- pasty and containing solids
- viscous
- abrasive
- shear-sensitive
- outgassing
- corrosive

The most suitable pumps can be selected with the aid of an identity code.

1.4 Peristaltic Pumps DULCO® flex

Overview

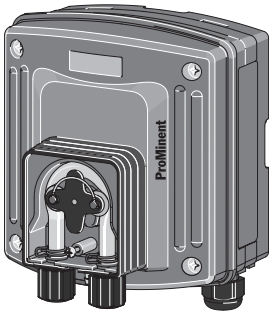
Typ	Application	Feed rate at max. pressure	Max. pressure	Rollers/shoes
DFBa	Industry	650	8	Rollers
DFCa	Industry	8,900	8	Rollers
DFDa	Industry	15,000	15	Shoes

1.4.2 Peristaltic Pump DULCO®flex DF2a

The optimum pump product range for use in swimming pools, hot tubs, and spa zones.

Capacity range 0.4 – 2.4 l/h at max. 1.5 bar back pressure

The peristaltic pump DULCO®flex DF2a meters chemicals functionally, cost-effectively and quietly – ideal for use in swimming pools, hot tubs, and in spa and wellness facilities.



The feed chemical is transported by the rotor squeezing the hose in the direction of flow. This explains why there is no need for valves. The feed chemical is thus handled with care. Typical applications: wherever lower pump pressure is sufficient. For example when metering conditioners in private pools.

Your benefits

- Smooth inner wall reduces deposits.
- Hose materials: PharMed® or Viton®
- Virtually silent operation
- Simple handling
- Enhanced service life of the hose due to spring-loaded rollers, which keep the rolling pressure constant
- Robust and protected against spray water from all sides: Housing made of impact-resistant and chemical-resistant PPE

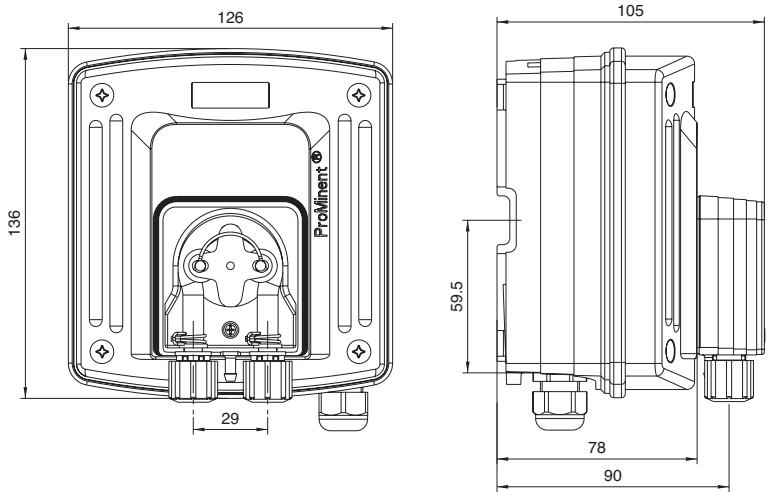
Technical Details

- Self-priming against max. 1.5 bar
- Control or flow control via ON/OFF power supply
- Degree of protection IP 65
- OEM versions on request

Field of application

- Meters conditioners in private pools
- Meters belt lubricants in bottling machines
- Meters cleaning agents in dishwashers

Dimensional drawing of DULCO®flex DF2a



Dimensional drawing of DULCO®flex DF2a - dimensions in mm

Identity Code Ordering System for Product Range DULCO®flex, Version DF2a

DF2a	Type	Output								
	0204	1.5 bar	0.4 l/h							
	0208	1.5 bar	0.8 l/h							
	0216	1.5 bar	1.6 l/h							
	0224	1.5 bar	2.4 l/h							
		Hose material								
		P	PharMed®							
		V	Viton® for fragrances (special version)							
			Version							
			0	with ProMinent logo						
			1	without ProMinent logo						
				Hydraulic connections						
				0	Connector for hose 6/4 mm suction and discharge side					
				9	Connector for hose 10/4 mm discharge side only					
					Operating voltage					
					A	230 V ± 10%, 50/60 Hz				
						Cable and plug				
						0	No mains lead			
						1	With 2 m mains lead, open ended			
						A	With mains cable, European plug			
							Drive			
							0	Mains ON/OFF		
								Type of mounting		
								W	Wall mounting	
									Accessories	
									0	no accessories

Viton® and PharMed® are registered trademarks.

Technical Data

Type	Pump capacity at max. back pressure		Frequency	Connector size	Suction lift	Intake head
	bar	l/h	rpm	outer Ø x inner Ø	m WC	m WC
0204	1.5	0.4	5	6x4/10x4	4	3
0208	1.5	0.8	10	6x4/10x4	4	3
0216	1.5	1.6	20	6x4/10x4	4	3
0224	1.5	2.4	30	6x4/10x4	4	3

Permissible ambient temperature: 10-45 °C

Approx. power consumption: 5 W

Switching-on duration: 100%

Degree of protection: IP 65

All data calculated with water at 20 °C.

Spare Hoses

	Order no.
Hose, complete 4.8 x 8.0 PharMed	1009480
Spare hose assembly Viton®	1023842



1.4 Peristaltic Pumps DULCO® flex

1.4.3 Peristaltic Pump DULCO®flex DF4a

The optimum pump for use in swimming pools, hot tubs and spa and wellness facilities.

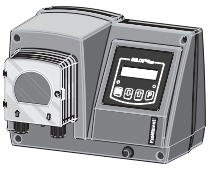
Capacity range 1.5 – 12 l/h, 4 – 2 bar

The peristaltic pump DULCO®flex DF4a for metering flocculants and activated charcoal treats water precisely and accurately. It is ideal for use in swimming pools, hot tubs or spa and wellness facilities. An operating pressure up to 4 bar is possible.

There are three designs of DULCO®flex DF4a available:

1. Metering of chemicals
2. Metering of active carbon
3. Metering of flocculants

This guarantees that the operating menu, inputs and outputs are always adapted to the respective application.



DULCOnneX

Your benefits

- Language-neutral user navigation
- Continuous adjustment of capacity
- Hose material in PharMed®
- Full control, as the capacity is shown in l/h in the display
- Safe and reliable operation: Flow volume and concentration can be entered reproducibly
- Long service life: Spring-loaded rollers stabilise rolling pressure and reduce wear and tear on the hose
- No irritating noise: low-noise stepper motor with ball bearing drive shaft
- Fast to use: simple installation and retrofitting, even with existing systems
- Guaranteed safety: Hose rupture monitoring system and fault indicating relay register and report all problems.
- Suitable for use around the clock – 100% switch-on time
- Operating hours counter for the peristaltic pump - always stay informed.

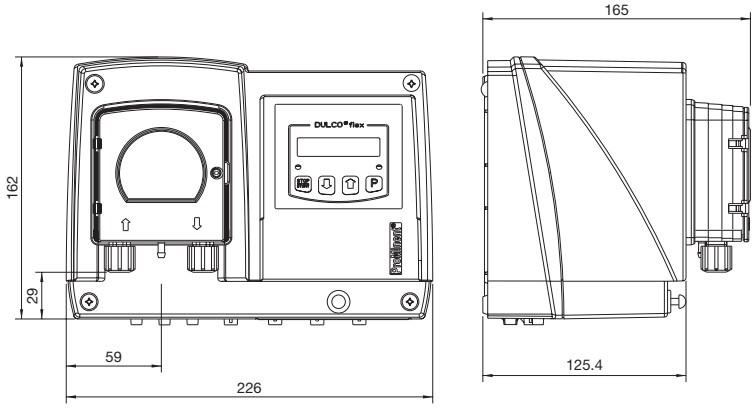
Technical Details

- Priming function
- Night setback
- Inputs for contacts and analogue signals
- Housing degree of protection IP 65
- Connector for 2-stage level switch with round plug
- Operating hour counter
- CANopen interface

Field of application

- Swimming pool water treatment

Dimensional drawing of DULCO®flex DF4a



Dimensional drawing of DULCO®flex DF4a - dimensions in mm

1.4 Peristaltic Pumps DULCO® flex

Identity Code Ordering System for Product Range DULCO®flex, Version DF4a

DF4a	Application																			
	0	Chemical pump																		
	A	Activated charcoal metering																		
	F	Flocculant metering																		
		Type of mounting																		
		W	Wall mounting																	
			Version																	
			0	with ProMinent logo																
			1	without ProMinent logo																
				Type	Output															
				04004	4.0 bar	0.35 l/h														
				04015	3.0 bar	1.5 l/h														
				03060	2.0 bar	6.0 l/h														
				02120	1.5 bar	12.0 l/h														
					Hose material															
					P	PharMed®														
						Hydraulic connections														
						0	Standard connector 6x4													
						9	Special connector 10x4 discharge side													
							Operating voltage													
							U	100 - 240 VAC, 50/60 Hz												
								Cable and plug												
								0	No mains lead											
								1	With cable 2.0 m; open end											
								A	With cable 2.0 m; Euro connector											
								B	With cable 2.0 m; Swiss connector											
									Accessories											
									0	no accessories										
									2	With lip-seal metering valve PCB and 10 m PE metering line										
										Hardware extension										
										0	none									
											Preset language									
											00	Language-neutral								
												Relay								
												1	Fault signalling relay, drop-out action							
												3	Fault signalling relay, pick-up action							
													Control Variants							
													8	manual + external contact and analogue 0/4 - 20 mA + 0 - 10 V						
													C	as “8” and CANopen						
													D	such as “8” and CANopen and CAN connector						
														Further input						
														1	Pause + 2-stage level + AUX1					
														2	Pause + 1-stage level + AUX1 + AUX2					
															Pause/level					
															0	Pause break contact + level break contact				
																Approvals				
																01	CE mark			

PharMed® is a registered trademark.

Technical Data

Priming lift:	3 mWS	Approx. power consumption:	24 W
Suction lift:	4 mWS	Switching-on duration:	100%
Speed:	0 – 85 rpm	Degree of protection:	IP 65
Permissible ambient temperature:	10 – 45 °C		

All data calculated with water at 20 °C.

Spare Hoses

	Order no.
For type 04004 PharMed®	1034997
For type 04015 PharMed®	1030722
For type 03060 PharMed®	1030723
For type 02120 PharMed®	1030774

1.4.4 Peristaltic Pump DULCO®flex DFBa

Low and medium pump capacities

Feed rates of up to 649 l/h at 8 bar

The peristaltic pump DULCO®flex DFBa is designed for low and medium pump capacities of up to 649 l/h at 8 bar.

The peristaltic pump DULCO®flex DFBa is equipped with rollers and fabric-reinforced hoses for tough industrial use. Pumps with a Halar-coated pump housing can be produced for use in the chemical industry.

Your benefits

- Simple to operate
- Reversible pumping direction
- Hose materials suitable for various chemicals
- Simple and quick hose change
- Ideal for pumping pasty, high-viscosity, abrasive and gaseous media
- Self-priming
- Safeguarded against running dry

Technical Details

- Connector sizes 3/8 - 1”
- Feed rates of 0.023 - 0.24 l/rev
- Hose materials NR, NBR, EPDM, NR-A, Norprene, NBR-A, Hypalon, Tygon
- Self-priming up to 8 m
- Back pressure up to 8 bar**Options**
- Stainless steel base plate
- Available as a mobile unit
- Various connectors, such as BSP, NPT, Tri-Clamp and DIN 11851
- Pulsation damper
- Leak sensor
- Housing with Halar coating
- Food approval EU 1935/2004

Field of application

- Chemical industry
- Waste water
- Mining

Technical Data

Hose	NR, NBR, EPDM, NR-A, Norprene, NBR-A, Hypalon, Tygon
Self-priming	up to 8 m
Rollers / shoes	Rollers

Type	Feed rate / revolution	Pump capacity at max. back pressure		Diameter Ø	Max. solids	Weight	Connection size
	l/rev	bar	l/h	mm	mm	kg	
DFBa 010	0.02	8	60	10	2.5	6	3/8”
DFBa 013	0.04	8	100	13	3.3	6	3/8”
DFBa 016	0.09	8	188	16	4.0	13	3/4”
DFBa 019	0.12	2	671	19	4.8	13	1”
DFBa 022	0.24	8	649	22	5.5	22	1”

A Resistance List of hose materials can be found at www.prominent.com.

1.4 Peristaltic Pumps DULCO® flex

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFBa 010

DFBa	Type											
	010	DFBa 010, 0.023 l/revolution										
		Drive *										
		000	without drive unit									
		A10	0.12 kW, 15 rpm, 21 l/h, 8 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		A11	0.12 kW, 20 rpm, 28 l/h, 8 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		A12	0.18 kW, 29 rpm, 40 l/h, 6 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		A13	0.18 kW, 46 rpm, 63 l/h, 4 bar, (Reduction gear system), 3-phase, 230/400 V AC									
		A14	0.25 kW, 57 rpm, 79 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		A15	0.25 kW, 70 rpm, 97 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		A21	0.12 kW, 3 - 16 rpm, 4-22 l/h, 8 bar , (Manual adjustment gear), 3-phase, 230/400 V AC									
		A22	0.25 kW, 5 – 29 rpm, 7 – 40 l/h, 6 bar , (Manual adjustment gear), 3-phase, 230/400 V AC									
		A23	0.25 kW, 10 - 53 rpm, 14-73 l/h, 4 bar , (Manual adjustment gear), 3-phase, 230/400 V AC									
		A24	0.25 kW, 15 - 80 rpm, 21-110 l/h, 2 bar , (Manual adjustment gear), 3-phase, 230/400 V AC									
		A31	0.37 kW, 9 - 34 rpm, 12 – 47 l/h, 20 – 75 Hz, 6 bar , (Gear motor with integrated frequency converter), 1-phase, 230 V AC									
		A32	0.37 kW, 16 - 60 rpm, 22-83 l/h, 20-75 Hz, 4 bar , (Gear motor with integrated frequency converter), 1-phase, 230 V AC									
		A41	0.18 kW, 1 - 34 rpm, 1 – 47 l/h, 3 – 75 Hz, 6 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
		A42	0.18 kW, 2 - 44 rpm, 3 – 60 l/h, 3 – 75 Hz, 4 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
		A43	0.25 kW, 3-69 rpm, 4-95 l/h, 3-75 Hz, 4 bar, (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
			Hose material									
			0	NR (natural rubber)								
			B	NBR								
			E	EPDM								
			N	Norprene (max. 2 bar back pressure)								
			A	NBR-A								
			H	Hypalon								
				Hydraulic connections								
				A	VA BSP 3/8”							
				B	VA NPT 3/8”							
				C	PP BSP 3/8”							
				D	PVDF BSP 3/8”							
				E	PVDF NPT 3/8”							
				F	PVC NPT 3/8”							
				G	Tri-Clamp, VA, 1/2”							
				H	DIN 11851, VA, NW 10							
					Base plate							
					0	Base plate, painted steel						
					1	Base plate, stainless steel						
					2	Portable unit + painted steel base plate						
					3	Portable unit + stainless steel base plate						
						Leakage sensor						
						0	Without leakage sensor					
						L	With leakage sensor					
						M	As “L” + relay output					
							Rotor					
							0	Rotor with 2 rollers				
								Batch controller				
								0	Without controller			
									Special version			
									0	standard		
									H	Halar-coated housing		
										Vacuum system		
										0	none	
											Approvals	
											01	CE mark
											02	CE+Food approval EU 1935/2004

* The pumps are factory-set to a maximum back pressure of 4 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFBa 013

DFBa	Type												
	013	DFBa 013, 0.038 l/revolution											
		Drive *											
		000	without drive unit										
		B10	0.12 kW, 15 rpm, 34 l/h, 8 bar, (Reduction gear system), 3-phase, 230/400 V AC										
		B11	0.12 kW, 20 rpm, 46 l/h, 8 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		B12	0.18 kW, 29 rpm, 66 l/h, 6 bar, (Reduction gear system), 3-phase, 230/400 V AC										
		B13	0.18 kW, 46 rpm, 105 l/h, 4 bar, (Reduction gear system), 3-phase, 230/400 V AC										
		B14	0.25 kW, 57 rpm, 130 l/h, 4 bar, (Reduction gear system), 3-phase, 230/400 V AC										
		B15	0.25 kW, 70 rpm, 160 l/h, 2 bar, (Reduction gear system), 3-phase, 230/400 V AC										
		B21	0.12 kW, 3 – 16 rpm, 7 – 36 l/h, 8 bar, (Manual adjustment gear), 3-phase, 230/400 V AC										
		B22	0.25 kW, 5 – 29 rpm, 11 – 66 l/h, 6 bar, (Manual adjustment gear), 3-phase, 230/400 V AC										
		B23	0.25 kW, 10 – 53 rpm, 23 – 121 l/h, 4 bar, (Manual adjustment gear), 3-phase, 230/400 V AC										
		B24	0.25 kW, 15 – 80 rpm, 35 – 182 l/h, 2 bar, (Manual adjustment gear), 3-phase, 230/400 V AC										
		B31	0.37 kW, 9 – 34 rpm, 21 – 78 l/h, 20 – 75 Hz, 6 bar, (Gear motor with integrated frequency converter), 1-phase, 230 V AC										
		B32	0.37 kW, 16 – 60 rpm, 36 – 137 l/h, 20 – 75 Hz, 4 bar, (Gear motor with integrated frequency converter), 1-phase, 230 V AC										
		B41	0.18 kW, 1 - 34 rpm, 2 – 78 l/h, 3 – 75 Hz, 6 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC										
		B42	0.18 kW, 2 - 44 rpm, 5 – 100 l/h, 3 – 75 Hz, 4 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC										
		B43	0.25 kW, 3-69 rpm, 7-157 l/h, 3-75 Hz, 4 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC										
			Hose material										
			0	NR (natural rubber)									
			B	NBR									
			E	EPDM									
			N	Norprene (max. 2 bar back pressure)									
			A	NBR-A									
			H	Hypalon									
				Hydraulic connections									
				A	VA BSP 3/8”								
				B	VA NPT 3/8”								
				C	PP BSP 3/8”								
				D	PVDF BSP 3/8”								
				E	PVDF NPT 3/8”								
				F	PVC NPT 3/8”								
				G	Tri-Clamp, VA, 3/4”								
				H	DIN 11851, VA, NW 15								
					Base plate								
					0	Base plate, painted steel							
					1	Base plate, stainless steel							
					2	Portable unit + painted steel base plate							
					3	Portable unit + stainless steel base plate							
						Leakage sensor							
						0	Without leakage sensor						
						L	With leakage sensor						
						M	As “L” + relay output						
							Rotor						
							0	Rotor with 2 rollers					
								Batch controller					
								0	Without controller				
									Special version				
									0	standard			
									H	Halar-coated housing			
										Vacuum system			
										0	none		
											Approvals		
											01	CE mark	
											02	CE+Food approval EU 1935/2004	

* The pumps are factory-set to a maximum back pressure of 4 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFBa 016

DFBa	Type											
	016	DFBa 016, 0.092 l/revolution										
		Drive *										
		000	without drive unit									
		C10	0.18 kW, 15 rpm, 82 l/h, 8 bar, (Reduction gear system), 3-phase, 230/400 V AC									
		C11	0.18 kW, 20 rpm, 110 l/h, 8 bar, (Reduction gear system), 3-phase, 230/400 V AC									
		C12	0.25 kW, 32 rpm, 177 l/h, 4 bar, (Reduction gear system), 3-phase, 230/400 V AC									
		C13	0.25 kW, 46 rpm, 254 l/h, 4 bar, (Reduction gear system), 3-phase, 230/400 V AC									
		C14	0.37 kW, 57 rpm, 315 l/h, 4 bar, (Reduction gear system), 3-phase, 230/400 V AC									
		C15	0.37 kW, 70 rpm, 386 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		C21	0.37 kW, 8 - 50 rpm, 44-276 l/h, 4 bar , (Manual adjustment gear), 3-phase, 230/400 V AC									
		C22	0.37 kW, 10 – 61 rpm, 55 – 337 l/h, 2 bar, (Manual adjustment gear), 3-phase, 230/400 V AC									
		C23	0.37 kW, 16 - 91 rpm, 88-502 l/h, 1 bar , (Manual adjustment gear), 3-phase, 230/400 V AC									
		C31	0.37 kW, 9 – 34 rpm, 50 – 188 l/h, 20 – 75 Hz, 4 bar, (Gear motor with integrated frequency converter), 1-phase, 230 V AC									
		C32	0.37 kW, 16 - 60 rpm, 88-331 l/h, 20-75 Hz, 2 bar , (Gear motor with integrated frequency converter), 1-phase, 230 V AC									
		C41	0.25 kW, 1 – 34 rpm, 5 – 188 l/h, 3 – 75 Hz, 4 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
		C42	0.25 kW, 2-48 rpm, 11-265 l/h, 3-75 Hz, 4 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
		C43	0.37 kW, 3-69 rpm, 16-381 l/h, 3-75 Hz, 2 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
			Hose material									
			0	NR (natural rubber)								
			B	NBR								
			E	EPDM								
			N	Norprene (max. 2 bar back pressure)								
			A	NBR-A								
			H	Hypalon								
				Hydraulic connections								
				A	VA BSP 3/4”							
				B	VA NPT 3/4”							
				C	PP BSP 3/4”							
				D	PVDF BSP 3/4”							
				E	PVDF NPT 3/4”							
				F	PVC NPT 3/4”							
				G	Tri-Clamp, VA, 1”							
				H	DIN 11851, VA, NW 20							
					Base plate							
					0	Base plate, painted steel						
					1	Base plate, stainless steel						
					2	Portable unit + painted steel base plate						
					3	Portable unit + stainless steel base plate						
						Leakage sensor						
						0	Without leakage sensor					
						L	With leakage sensor					
						M	As “L” + relay output					
							Rotor					
							0	Rotor with 2 rollers				
								Batch controller				
								0	Without controller			
									Special version			
									0	standard		
									H	Halar-coated housing		
										Vacuum system		
										0	none	
											Approvals	
											01	CE mark
											02	CE+Food approval EU 1935/2004

* The pumps are factory-set to a maximum back pressure of 4 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4 Peristaltic Pumps DULCO® flex

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFBa 019

DFBa	Type											
	019	DFBa 019, 0.123 l/revolution										
		Drive *										
		000	without drive unit									
		D10	0.18 kW, 15 rpm, 111 l/h, 2 bar, (Reduction gear system), 3-phase, 230/400 V AC									
		D11	0.18 kW, 20 rpm, 148 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D12	0.25 kW, 32 rpm, 236 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D13	0.25 kW, 46 rpm, 339 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D14	0.37 kW, 57 rpm, 421 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D15	0.37 kW, 70 rpm, 517 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D21	0.37 kW, 8 - 50 rpm, 59-369 l/h, 2 bar , (Manual adjustment gear), 3-phase, 230/400 V AC									
		D22	0.37 kW, 10 - 61 rpm, 74-450 l/h, 2 bar , (Manual adjustment gear), 3-phase, 230/400 V AC									
		D23	0.37 kW, 16 - 91 rpm, 118-671 l/h, 2 bar , (Manual adjustment gear), 3-phase, 230/400 V AC									
		D31	0.37 kW, 9 - 34 rpm, 66-251 l/h, 20-75 Hz, 2 bar , (Gear motor with integrated frequency converter), 1-phase, 230 V AC									
		D32	0.37 kW, 16 - 60 rpm, 118-443 l/h, 20-75 Hz, 2 bar , (Gear motor with integrated frequency converter), 1-phase, 230 V AC									
		D41	0.25 kW, 1-34 rpm, 7-251 l/h, 3-75 Hz, 2 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
		D42	0.25 kW, 2-48 rpm, 15-354 l/h, 3-75 Hz, 2 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
		D43	0.37 kW, 3-69 rpm, 22-509 l/h, 3-75 Hz, 2 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
			Hose material									
			N	Norprene (max. 2 bar back pressure)								
			T	TYGON (max. 2 bar)								
				Hydraulic connections								
				A	VA BSP 1”							
				B	VA NPT 1”							
				C	PP BSP 1”							
				D	PVDF BSP 1”							
				E	PVDF NPT 1”							
				F	PVC NPT 1”							
				G	Tri-Clamp, VA, 1”							
				H	DIN 11851, VA, NW 25							
					Base plate							
					0	Base plate, painted steel						
					1	Base plate, stainless steel						
					2	Portable unit + painted steel base plate						
					3	Portable unit + stainless steel base plate						
						Leakage sensor						
						0	Without leakage sensor					
						L	With leakage sensor					
						M	As “L” + relay output					
							Rotor					
							0	Rotor with 2 rollers				
								Batch controller				
								0	Without controller			
									Special version			
									0	standard		
									H	Halar-coated housing		
										Vacuum system		
										0	none	
											Approvals	
											01	CE mark
											02	CE+Food approval EU 1935/2004

* The pumps are factory-set to a maximum back pressure of 4 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4 Peristaltic Pumps DULCO® flex

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFBa 022

DFBa	Type												
	022	DFBa 022, 0.246 l/revolution											
		Drive *											
		000	without drive unit										
		E10	0.25 kW, 17 rpm, 251 l/h, 8 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		E11	0.37 kW, 23 rpm, 339 l/h, 8 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		E12	0.55 kW, 38 rpm, 561 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		E13	0.55 kW, 45 rpm, 664 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		E14	0.55 kW, 54 rpm, 797 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		E15	0.75 kW, 66 rpm, 974 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		E21	0.37 kW, 4-20 rpm, 59-295 l/h, 8 bar , (Manual adjustment gear), 3-phase, 230/400 V AC										
		E22	0.55 kW, 6 - 32 rpm, 89-472 l/h, 4 bar , (Manual adjustment gear), 3-phase, 230/400 V AC										
		E23	0.75 kW, 9 - 48 rpm, 133-708 l/h, 2 bar , (Manual adjustment gear), 3-phase, 230/400 V AC										
		E31	0.55 kW, 12 - 44 rpm, 177-649 l/h, 20-75 Hz, 4 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC										
		E32	0.75 kW, 18 - 67 rpm, 266-989 l/h, 20-75 Hz, 2 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC										
		E41	0.55 kW, 2 - 44 rpm, 30 – 649 l/h, 3 – 75 Hz, 4 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC										
		E42	0.75 kW, 2-57 rpm, 30-841 l/h, 3-75 Hz, 4 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC										
		E43	1.1 kW, 3 - 81 rpm, 44-1196 l/h, 3-75 Hz, 2 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC										
			Hose material										
			0	NR (natural rubber)									
			B	NBR									
			E	EPDM									
			N	Norprene (max. 2 bar back pressure)									
			A	NBR-A									
			H	Hypalon									
				Hydraulic connections									
				A	VA BSP 1”								
				B	VA NPT 1”								
				C	PP BSP 1”								
				D	PVDF BSP 1”								
				E	PVDF NPT 1”								
				F	PVC NPT 1”								
				G	Tri-Clamp, VA, 1”								
				H	DIN 11851, VA, NW 25								
					Base plate								
					0	Base plate, painted steel							
					1	Base plate, stainless steel							
					2	Portable unit + painted steel base plate							
					3	Portable unit + stainless steel base plate							
						Leakage sensor							
						0	Without leakage sensor						
						L	With leakage sensor						
						M	As “L” + relay output						
							Rotor						
							0	Rotor with 2 rollers					
								Batch controller					
								0	Without controller				
									Special version				
									0	standard			
									H	Halar-coated housing			
										Vacuum system			
										0	none		
											Approvals		
											01	CE mark	
											02	CE+Food approval EU 1935/2004	

* The pumps are factory-set to a maximum back pressure of 4 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4.5 Peristaltic Pump DULCO®flex DFCa

High pump capacities and long service life

Feed rates of up to 8,900 l/h at 8 bar

High pump capacities are not a problem with the peristaltic pump DULCO®flex DFCa. It is equipped with extra rollers and fabric-reinforced hoses for industrial use.

It is ideal for heavy-duty industrial applications and pump capacities of up to 8,900 l/h at 8 bar back pressure.

A ball-bearing mounted rotor ensures extremely smooth running and a long service life.

Pumps with a Halar-coated pump housing can be produced for use in the chemical industry.

A vacuum unit can optionally be used to help the hose to return to its original shape with pumps of the product range DFCa, thereby improving their suction behaviour and ensuring the even feed of high-viscosity media.

Your benefits

- Simple to operate
- Reversible pumping direction
- Hose materials suitable for various chemicals
- Simple and quick hose change
- Ideal for pumping pasty, high-viscosity, abrasive and gaseous media
- Self-priming
- Safeguarded against running dry

Technical Details

- Connector sizes 1 1/4”- DN 80
- Feed rates of 0.43 - 6.72 l/rev
- Hose materials NR, NBR, EPDM, Norprene, NR-A, NBR-A
- Self-priming up to 8 m
- Back pressure up to 8 bar**Options**
- Stainless steel base plate
- Available as a mobile unit
- Various connectors, such as BSP, NPT, Tri-Clamp, DIN 11851 and flange
- Pulsation damper
- Leak sensor
- Housing with Halar coating
- Vacuum system
- Food approval EU 1935/2004

Field of application

- Chemical industry
- Waste water
- Mining

Technical Data

Hose	NR, NBR, EPDM, NR-A, Norprene, NBR-A
Self-priming	up to 8 m
Rollers / shoes	Rollers

Type	Feed rate / revolution	Pump capacity at max. back pressure		Diameter Ø D1	Max. solids	Weight	Connection size
	l/rev	bar	l/h	mm	mm	kg	
DFCa 030	0.43	8	727	28	7.0	62	DN 32
DFCa 040	0.86	8	1,495	35	8.8	89	DN 40
DFCa 050	1.47	8	1,852	40	10.0	140	DN 40
DFCa 060	3.16	8	5,100	55	13.8	235	DN 50
DFCa 070	6.72	8	8,900	65	16.3	440	DN 65

1.4 Peristaltic Pumps DULCO® flex

A Resistance List of hose materials can be found at www.prominent.com.

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFCa 030

DFCa	Type											
	030	DFCa 030, 0.433 l/revolution										
		Drive *										
		000	without drive unit									
		A11	0.25 kW, 18 rpm, 468 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		A12	0.37 kW, 29 rpm, 753 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		A13	0.55 kW, 38 rpm, 987 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		A14	0.55 kW, 55 rpm, 1429 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		A31	0.55 kW, 11 - 39 rpm, 286-1,013 l/h, 20-75 Hz, 4 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC									
		A32	0.75 kW, 18 - 63 rpm, 468 - 1,637 l/h, 20-75 Hz, 2 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC									
		A41	0.37 kW, 2 - 28 rpm, 52 – 727 l/h, 3 – 50 Hz, 4 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
		A42	0.75 kW, 3 - 59 rpm, 78-1,533 l/h, 3-65 Hz, 2 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
			Hose material									
			0	NR								
			B	NBR								
			E	EPDM								
			A	NBR-A								
			N	Norprene (max. 2 bar back pressure)								
				Hydraulic connections								
				A	VA BSP 1 1/4”							
				B	VA NPT 1 1/4”							
				C	PP BSP 1 1/4”							
				D	PVDF/PTFE BSP 1 1/4”							
				F	PVC NPT 1 1/4”							
				G	Tri-Clamp, VA, 1 1/2”							
				H	DIN 11851, VA, NW 32							
				I	DIN flange VA DN 32							
				L	ANSI flange VA, 1 1/4”							
				P	ANSI flange PVC, 1 1/4”							
					Base plate							
					0	Base plate, painted steel						
					1	Base plate, stainless steel						
					2	Portable unit + painted steel base plate						
					3	Portable unit + stainless steel base plate						
						Leakage sensor						
						0	Without leakage sensor					
						L	With leakage sensor					
						M	As “L” + relay output					
							Rotor					
							0	Rotor with 2 rollers				
								Batch controller				
								0	Without controller			
									Special version			
									0	standard		
									H	Halar-coated housing		
										Vacuum system		
										0	none	
										V	with vacuum system	
											Approvals	
											01	CE mark
											02	CE+Food approval EU 1935/2004

* The pumps are factory-set to a maximum back pressure of 4 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4 Peristaltic Pumps DULCO® flex

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFCa 040

DFCa	Type												
	040	DFCa 040, 0.86 l/revolution											
		Drive *											
		000	without drive unit										
		B11	0.55 kW, 18 rpm, 928 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		B12	0.55 kW, 29 rpm, 1,495 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		B13	0.75 kW, 38 rpm, 1,960 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		B14	1.1 kW, 54 rpm, 2,786 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		B31	1.1 kW, 12 - 36 rpm, 619-1,857 l/h, 20-70 Hz, 4 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC										
		B32	1.5 kW, 15 - 53 rpm, 774-2,735 l/h, 20-70 Hz, 2 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC										
		B41	1.1 kW, 2 - 49 rpm, 103-2,528 l/h, 3-65 Hz, 2 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC										
		B42	1.5 kW, 3 - 53 rpm, 154-2,735 l/h, 3-65 Hz, 2 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC										
			Hose material										
			0	NR									
			B	NBR									
			E	EPDM									
			A	NBR-A									
			N	Norprene (max. 2 bar back pressure)									
				Hydraulic connections									
				A	VA BSP 1 1/2”								
				B	VA NPT 1 1/2”								
				C	PP BSP 1 1/2”								
				D	PVDF/PTFE BSP 1 1/2”								
				G	Tri-Clamp, VA, 1 1/2”								
				H	DIN 11851, VA, NW 40								
				I	DIN flange VA DN 40								
				L	ANSI flange VA, 1 1/2”								
				P	ANSI flange PVC, 1 1/2”								
					Base plate								
					0	Base plate, painted steel							
					1	Base plate, stainless steel							
					2	Portable unit + painted steel base plate							
					3	Portable unit + stainless steel base plate							
						Leakage sensor							
						0	Without leakage sensor						
						L	With leakage sensor						
						M	As “L” + relay output						
							Rotor						
							0	Rotor with 2 rollers					
								Batch controller					
								0	Without controller				
									Special version				
									0	standard			
									H	Halar-coated housing			
										Vacuum system			
										0	none		
										V	with vacuum system		
											Approvals		
											01	CE mark	
											02	CE+Food approval EU 1935/2004	

* The pumps are factory-set to a maximum back pressure of 4 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4 Peristaltic Pumps DULCO® flex

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFCa 050

DFCa	Type												
	050	DFCa 050, 1.47 l/revolution											
		Drive *											
		000	without drive unit										
		C11	0.55 kW, 14 rpm, 1,235 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		C12	0.75 kW, 21 rpm, 1,852 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		C13	1.1 kW, 30 rpm, 2,646 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		C14	1.5 kW, 38 rpm, 3,352 l/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		C15	1.5 kW, 48 rpm, 4,234 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		C16	2.2 kW, 58 rpm, 5,116 l/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC										
		C31	1.5 kW, 8 - 29 rpm, 706-2,558 l/h, 20-70 Hz, 4 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC										
		C32	2.2 kW, 17 - 60 rpm, 1,499-5,292 l/h, 20-70 Hz, 2 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC										
		C41	1.5 kW, 1 - 27 rpm, 88-2,381 l/h, 3-65 Hz, 4 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC										
		C42	2.2 kW, 3 - 55 rpm, 265-4,851 l/h, 3-65 Hz, 2 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC										
			Hose material										
			0	NR									
			B	NBR									
			E	EPDM									
			A	NBR-A									
			N	Norprene (max. 2 bar back pressure)									
				Hydraulic connections									
				I	DIN flange VA DN 40								
				G	Tri-Clamp, VA, 2”								
				H	DIN 11851, VA, NW 50								
				J	DIN flange PP DN 40								
				K	DIN flange PVDF/PTFE DN 40								
				L	ANSI flange VA, 1 1/2”								
				M	ANSI flange PP 1 1/2”								
				N	ANSI flange PVDF/PTFE 1 1/2”								
					Base plate								
					0	Base plate, painted steel							
					1	Base plate, stainless steel							
					2	Portable unit + painted steel base plate							
					3	Portable unit + stainless steel base plate							
						Leakage sensor							
						0	Without leakage sensor						
						L	With leakage sensor						
						M	As “L” + relay output						
							Rotor						
							0	Rotor with 2 rollers					
								Batch controller					
								0	Without controller				
									Special version				
									0	standard			
									H	Halar-coated housing			
										Vacuum system			
										0	none		
										V	with vacuum system		
											Approvals		
											01	CE mark	
											02	CE+Food approval EU 1935/2004	

* The pumps are factory-set to a maximum back pressure of 4 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4 Peristaltic Pumps DULCO® flex

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFCa 060

DFCa	Type											
	060	DFCa 060, 3.16 l/revolution										
		Drive *										
		000	without drive unit									
		D11	2.2 kW, 18 rpm, 3.4 m^3/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D12	2.2 kW, 22 rpm, 4.2 m^3/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D13	3.0 kW, 27 rpm, 5.1 m^3/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D14	3.0 kW, 33 rpm, 6.3 m^3/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D15	3.0 kW, 42 rpm, 8.0 m^3/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D16	3.0 kW, 47 rpm, 8.9 m^3/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D31	3.0 kW, 7 – 25 rpm, 1.3 – 4.7 m^3/h, 4 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC									
		D32	4.0 kW, 17 - 59 rpm, 3,2-11.2 m^3/h, 2 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC									
		D41	3.0 kW, 1 – 24 rpm, 0.2 – 4.5 m^3/h, 4 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
		D42	4.0 kW, 2 - 55 rpm, 0,4-10.4 m^3/h, 2 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
			Hose material									
			0	NR								
			B	NBR								
			E	EPDM								
			A	NBR-A								
			N	Norprene (max. 2 bar back pressure)								
				Hydraulic connections								
				I	DIN flange VA DN 50							
				G	Tri-Clamp, VA, 2 1/2”							
				H	DIN 11851, VA, NW 50							
				J	ANSI flange PP DN 50							
				K	DIN flange VA, Halar-coated + PVDF inserts DN 50							
				L	ANSI flange VA 2”							
				M	ANSI flange PP 2”							
				N	ANSI flange VA, Halar-coated + PVDF inserts 2”							
					Base plate							
					0	Base plate, painted steel						
					1	Base plate, stainless steel						
					2	Portable unit + painted steel base plate						
					3	Portable unit + stainless steel base plate						
						Leakage sensor						
						0	Without leakage sensor					
						L	With leakage sensor					
						M	As “L” + relay output					
							Rotor					
							0	Rotor with 2 rollers				
								Batch controller				
								0	Without controller			
									Special version			
									0	standard		
									H	Halar-coated housing		
										Vacuum system		
										0	none	
										V	with vacuum system	
											Approvals	
											01	CE mark
											02	CE+Food approval EU 1935/2004

* The pumps are factory-set to a maximum back pressure of 4 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4 Peristaltic Pumps DULCO® flex

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFCa 070

DFCa	Type													
	070	DFCa 070, 6.72 l/revolution												
		Drive *												
		000	without drive unit											
		E11	2.2 kW, 13 rpm, 5.2 m^3/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC											
		E12	3.0 kW, 22 rpm, 8.9 m^3/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC											
		E13	4.0 kW, 26 rpm, 10.5 m^3/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC											
		E14	4.0 kW, 32 rpm, 12.9 m^3/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC											
		E15	5.5 kW, 37 rpm, 14.9 m^3/h, 4 bar , (Reduction gear system), 3-phase, 230/400 V AC											
		E16	5.5 kW, 46 rpm, 18.5 m^3/h, 2 bar , (Reduction gear system), 3-phase, 230/400 V AC											
		E31	5.5 kW, 8 - 27 rpm, 3.2 - 10.9 m^3/h, 20-60 Hz, 4 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC											
		E32	7.5 kW, 13 - 38 rpm, 5.2 - 15.3 m^3/h, 20-60 Hz, 2 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC											
		E41	5.5 kW, 1 - 25 rpm, 0.4 - 10.1 m^3/h, 3-65 Hz, 4 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC											
		E42	7.5 kW, 2 - 42 rpm, 0.8 - 16.9 m^3/h, 3-65 Hz, 2 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC											
			Hose material											
			0	NR										
			B	NBR										
			E	EPDM										
			A	NBR-A										
				Hydraulic connections										
				I	DIN flange VA DN 65									
				G	Tri-Clamp, VA, 3”									
				H	DIN 11851, VA, NW 65									
				J	DIN flange PP DN 65									
				L	ANSI flange VA 2 1/2”									
				M	ANSI flange PP 2 1/2”									
				Q	DIN flange VA Halar-coated DN 65									
				R	ANSI flange VA Halar-coated 2 1/2”									
					Base plate									
					0	Base plate, painted steel								
					1	Base plate, stainless steel								
					2	Portable unit + painted steel base plate								
					3	Portable unit + stainless steel base plate								
						Leakage sensor								
						0	Without leakage sensor							
						L	With leakage sensor							
						M	As “L” + relay output							
							Rotor							
							0	Rotor with 2 rollers						
								Batch controller						
								0	Without controller					
									Special version					
									0	standard				
									H	Halar-coated housing				
										Vacuum system				
										0	none			
										V	with vacuum system			
											Approvals			
											01	CE mark		
											02	CE+Food approval EU 1935/2004		

* The pumps are factory-set to a maximum back pressure of 4 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4 Peristaltic Pumps DULCO® flex

1.4.6 Peristaltic Pump DULCO®flex DFDa

Maximum pump capacities and high pressures

Feed rates of up to 15,000 l/h at 15 bar

The peristaltic pump DFDa is designed for maximum pump capacities and high pressures and is winning customers over with its noiselessness and long service life. It is fitted with shoes and fabric-reinforced hoses – perfect for industrial use.

The pump housing is filled with glycerine to reduce friction. A ball-bearing mounted rotor ensures extremely smooth running and a long service life. In tough industrial use, the DFDa conveys volumes of up to 15,000 l/h with back pressures of up to 15 bar.

A vacuum unit can optionally be used to help the hose to return to its original shape with pumps of the product range DFDa, thereby improving their suction behaviour and ensuring the even feed of high-viscosity media.

Your benefits

- Simple to operate
- Reversible pumping direction
- Hose materials suitable for various chemicals
- Simple and quick hose change
- Ideal for pumping pasty, high-viscosity, abrasive and gaseous media
- Self-priming
- Safeguarded against running dry

Technical Details

- Connector sizes DN 25 – DN 100
- Feed rates of 0.3 - 20.0 l/rev
- Hose materials NR, NBR, EPDM
- Self-priming up to 8 m
- Back pressure up to 15 bar**Options**
- Stainless steel base plate
- Available as a mobile unit
- Various connectors, such as Tri-Clamp, DIN 11851 and flange
- Pulsation damper
- Leak sensor
- Vacuum system

Field of application

- Chemical industry
- Waste water
- Mining

Technical Data

Hose	NR, NBR, EPDM
Self-priming	up to 8 m
Rollers / shoes	Shoes

Type	Feed rate / revolution	Pump capacity at max. back pressure		Diameter Ø	Max. solids	Weight	Connection size
	l/rev	bar	l/h	mm	mm	kg	
DFDa 025	0.30	15	504	25	6.3	57	DN 25
DFDa 032	0.62	15	787	32	8.0	89	DN 32
DFDa 040	1.33	15	2,075	40	10.0	150	DN 40
DFDa 060	2.90	15	3,800	57	14.3	252	DN 50
DFDa 070	6.70	15	7,200	65	16.3	530	DN 65
DFDa 080	11.70	15	8,700	80	20.0	900	DN 80
DFDa 100	20.00	15	14,400	100	25.0	1,100	DN 100

A Resistance List of hose materials can be found at www.prominent.com.

1.4 Peristaltic Pumps DULCO® flex



Identity Code Ordering System for Peristaltic Pump DULCO®flex DFDa 025

DFDa	Type											
	025	DFDa 025, 0.3 l/revolution										
		Drive *										
		000	without drive unit									
		A11	0.37 kW, 18 rpm, 324 l/h, 15 bar, (Reduction gear system), 3-phase, 230/400 V AC									
		A12	0.55 kW, 28 rpm, 504 l/h, 15 bar, (Reduction gear system), 3-phase, 230/400 V AC									
		A13	0.75 kW, 39 rpm, 702 l/h, 10 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		A14	0.75 kW, 45 rpm, 810 l/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		A15	1.1 kW, 55 rpm, 990 l/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		A31	1.1 kW, 16 - 55 rpm, 288-990 l/h, 20-70 Hz, 5 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC									
		A32	1.5 kW, 18 - 63 rpm, 324-1,134 l/h, 20-70 Hz, 5 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC									
		A41	0.55 kW, 4 – 36 rpm, 72 – 648 l/h, 7 – 65 Hz, 15 bar, (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
		A42	1.1 kW, 6 - 58 rpm, 108-1,044 l/h, 7-65 Hz, 5 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
		A43	1.5 kW, 9 - 86 rpm, 162-1,548 l/h, 7-65 Hz, 5 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
			Hose material									
			0	NR								
			B	NBR								
			E	EPDM								
				Hydraulic connections								
				I	DIN flange VA DN 25							
				J	DIN flange PP DN 25							
				K	DIN flange PVDF DN 25							
				L	ANSI flange VA DN 25							
					Base plate							
					0	Base plate, painted steel						
					1	Base plate, stainless steel						
					2	Portable unit + painted steel base plate						
					3	Portable unit + stainless steel base plate						
						Leakage sensor						
						0	Without leakage sensor					
						L	With leakage sensor					
						M	As “L” + relay output					
							Rotor					
							0	Rotor with 2 shoes				
								Batch controller				
								0	Without controller			
									Special version			
									0	standard		
									H	Halar-coated housing		
										Vacuum system		
										0	none	
										V	with vacuum system	
											Approvals	
											01	CE mark

* The pumps are factory-set to a maximum back pressure of 5 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFDa 032

DFDa	Type											
	032	DFDa 032, 0.625 l/revolution										
		Drive *										
		000	without drive unit									
		B11	0.75 kW, 21 rpm, 787 l/h, 10 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		B12	1.1 kW, 21 rpm, 787 l/h, 15 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		B13	1.1 kW, 30 rpm, 1,125 l/h, 10 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		B14	1.1 kW, 38 rpm, 1,425 l/h, 10 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		B15	1.5 kW, 47 rpm, 1,762 l/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		B16	1.5 kW, 58 rpm, 2,175 l/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		B31	1.5 kW, 12 - 42 rpm, 450 – 1,575 l/h, 20 – 70 Hz, 7.5 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC									
		B32	2.2 kW, 19 - 66 rpm, 712 – 2,475 l/h, 20-70 Hz, 5 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC									
		B41	1.1 kW, 4 - 39 rpm, 150 – 1,462 l/h, 7 – 65 Hz, 7.5 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
		B42	1.5 kW, 5 - 49 rpm, 190 – 1,837 l/h, 7 – 65 Hz, 7.5 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
		B43	2.2 kW, 8 - 75 rpm, 300 – 2812 l/h, 7-65 Hz, 5 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC									
			Hose material									
			0	NR								
			B	NBR								
			E	EPDM								
				Hydraulic connections								
				I	DIN flange VA DN 32							
				J	DIN flange PP DN 32							
				K	DIN flange PVDF/PTFE DN 32							
				L	ANSI flange VA, 1 1/4”							
					Base plate							
					0	Base plate, painted steel						
					1	Base plate, stainless steel						
					2	Portable unit + painted steel base plate						
					3	Portable unit + stainless steel base plate						
						Leakage sensor						
						0	Without leakage sensor					
						L	With leakage sensor					
						M	As “L” + relay output					
							Rotor					
							0	Rotor with 2 shoes				
								Batch controller				
								0	Without controller			
									Special version			
									0	standard		
									H	Halar-coated housing		
										Vacuum system		
										0	none	
										V	with vacuum system	
											Approvals	
											01	CE mark

* The pumps are factory-set to a maximum back pressure of 5 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4 Peristaltic Pumps DULCO® flex

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFDa 040

Code	Description
DFDa	**Type**
040	DFDa 040, 1.33 l/revolution
	Drive *
000	without drive unit
C11	1.1 kW, 21 rpm, 1,676 l/h, 10 bar , (Reduction gear system), 3-phase, 230/400 V AC
C14	1.5 kW, 26 rpm, 2,075 l/h, 15 bar , (Reduction gear system), 3-phase, 230/400 V AC
C15	1.5 kW, 38 rpm, 3,032 l/h, 7.5 bar , (Reduction gear system), 3-phase, 230/400 V AC
C16	1.5 kW, 43 rpm, 3,431 l/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC
C17	2.2 kW, 48 rpm, 3,830 l/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC
C31	2.2 kW, 17 - 60 rpm, 1,356 – 4,788 l/h, 20-70 Hz, 5 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC
C41	1.5 kW, 4 - 34 rpm, 320 – 2,713 l/h, 7-65 Hz, 5 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC
C43	2.2 kW, 5 – 49 rpm, 400 – 3,910 l/h, 7 – 65 Hz, 5 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC
C44	3.0 kW, 7 - 62 rpm, 558 – 4,948 l/h, 7 – 64 Hz, 5 bar , (Gear motor, external frequency converter required), 3-phase, 230/400 V AC
	Hose material
0	NR
B	NBR
E	EPDM
	Hydraulic connections
I	DIN flange VA DN 40
J	DIN flange PP DN 40
K	DIN flange PVDF DN 40
L	ANSI flange VA, 1 1/2”
M	ANSI flange PP 1 1/2”
N	ANSI flange PVDF/PTFE 1 1/2”
	Base plate
0	Base plate, painted steel
1	Base plate, stainless steel
2	Portable unit + painted steel base plate
3	Portable unit + stainless steel base plate
	Leakage sensor
0	Without leakage sensor
L	With leakage sensor
M	As “L” + relay output
	Rotor
0	Rotor with 2 shoes
	Batch controller
0	Without controller
	Special version
0	standard
H	Halar-coated housing
	Vacuum system
0	none
V	with vacuum system
	Approvals
01	CE mark

* The pumps are factory-set to a maximum back pressure of 5 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4 Peristaltic Pumps DULCO® flex

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFDa 060

DFDa	Type											
	060	DFDa 060, 2.9 l/revolution										
		Drive *										
		000	without drive unit									
		D11	2.2 kW, 22 rpm, 3.8 m^3/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D12	3.0 kW, 26 rpm, 4.5 m^3/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D15	4.0 kW, 32 rpm, 5.6 m^3/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D16	4.0 kW, 37 rpm, 6.4 m^3/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D17	5.5 kW, 47 rpm, 8.2 m^3/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		D31	5.5 kW, 10 – 36 rpm, 1.7 – 6.3 m^3/h, 20 – 70 Hz, 5 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC									
		D32	7.5 kW, 19 – 66 rpm, 3.3 – 11.5 m^3/h, 20 – 70 Hz, 5 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC									
		D41	5.5 kW, 4 – 34 rpm, 0.7 – 5.9 m^3/h, 20 – 70 Hz, 5 bar , (Gear motor, external frequency converter required), 3-phase, 400/660 V AC									
		D42	7.5 kW, 7 – 61 rpm, 1.2 – 10.6 m^3/h, 20 – 70 Hz, 5 bar , (Gear motor, external frequency converter required), 3-phase, 400/660 V AC									
			Hose material									
			0	NR								
			B	NBR								
			E	EPDM								
				Hydraulic connections								
				I	DIN flange VA DN 50							
				J	ANSI flange PP DN 50							
				L	ANSI flange VA DN 50							
				M	ANSI flange PP DN 50							
				U	DIN flange VA, Halar-coated + PVDF inserts DN 50							
				V	ANSI flange VA, Halar coated + PVDF inserts DN 50							
					Base plate							
					0	Base plate, painted steel						
					1	Base plate, stainless steel						
					2	Portable unit + painted steel base plate						
						Leakage sensor						
						0	Without leakage sensor					
						L	With leakage sensor					
						M	As “L” + relay output					
							Rotor					
							0	Rotor with 2 shoes				
								Batch controller				
								0	Without controller			
									Special version			
									0	standard		
									H	Halar-coated housing		
										Vacuum system		
										0	none	
										V	with vacuum system	
											Approvals	
											01	CE mark

* The pumps are factory-set to a maximum back pressure of 5 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFDa 070

DFDa	Type											
	070	DFDa 070, 6.7 l/revolution										
		Drive *										
		000	without drive unit									
		E11	3.0 kW, 13.5 rpm, 5.4 m^3/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		E12	4.0 kW, 18 rpm, 7.2 m^3/h, 7.5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		E14	5.5 kW, 26 rpm, 10.4 m^3/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		E17	7.5 kW, 32 rpm, 12.8 m^3/h, 7.5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		E18	7.5 kW, 40 rpm, 16 m^3/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		E31	7.5 kW, 10 - 36 rpm, 4 - 14.4 m^3/h, 20-70 Hz, 5 bar , (Gear motor with integrated frequency converter), 3-phase, 400 V AC									
		E41	7.5 kW, 4 - 34 rpm, 1.6 - 13.7 m^3/h, 7-65 Hz, 5 bar , (Gear motor, external frequency converter required), 3-phase, 400/660 V AC									
			Hose material									
			0	NR								
			B	NBR								
			E	EPDM								
				Hydraulic connections								
				I	DIN flange VA DN 65							
				J	DIN flange PP DN 65							
				L	ANSI flange VA 2 1/2”							
				M	ANSI flange PP 2 1/2”							
				Q	DIN flange VA Halar-coated DN 65							
				R	ANSI flange VA Halar-coated 2 1/2”							
					Base plate							
					0	Base plate, painted steel						
					1	Base plate, stainless steel						
						Leakage sensor						
						0	Without leakage sensor					
						L	With leakage sensor					
						M	As “L” + relay output					
							Rotor					
							0	Rotor with 2 shoes				
								Batch controller				
								0	Without controller			
									Special version			
									0	standard		
									H	Halar-coated housing		
										Vacuum system		
										0	none	
										V	with vacuum system	
											Approvals	
											01	CE mark

* The pumps are factory-set to a maximum back pressure of 5 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4 Peristaltic Pumps DULCO® flex

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFDa 080

DFDa	Type												
	080	DFDa 080, 11.7 l/revolution											
		Drive *											
		000	without drive unit										
		G11	4 kW, 12 rpm, 8.4 m^3/h, 5 bar, (Reduction gear system), 3-phase, 230/400 V AC										
		G12	5.5 kW, 17 rpm, 11.9 m^3/h, 5 bar, (Reduction gear system), 3-phase, 230/400 V AC										
		G15	7.5 kW, 23 rpm, 16.1 m^3/h, 7.5 bar, (Reduction gear system), 3-phase, 230/400 V AC										
		G16	7.5 kW, 27 rpm, 18.9 m^3/h, 5 bar, (Reduction gear system), 3-phase, 230/400 V AC										
		G17	11 kW, 30 rpm, 21.1 m^3/h, 5 bar, (Reduction gear system), 3-phase, 230/400 V AC										
			Hose material										
			0	NR									
			B	NBR									
			E	EPDM									
				Hydraulic connections									
				I	DIN flange VA DN 80								
				J	DIN flange PP DN 80								
				L	ANSI flange VA 3”								
				M	ANSI flange PP 3”								
				Q	DIN flange VA Halar-coated DN 80								
				R	ANSI flange VA Halar-coated 3”								
					Base plate								
					0	Base plate, painted steel							
						Leakage sensor							
						0	Without leakage sensor						
						L	With leakage sensor						
						M	As “L” + relay output						
							Rotor						
							0	Rotor with 2 shoes					
								Batch controller					
								0	Without controller				
									Special version				
									0	standard			
										Vacuum system			
										0	none		
										V	with vacuum system		
											Approvals		
											01	CE mark	

* The pumps are factory-set to a maximum back pressure of 5 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4 Peristaltic Pumps DULCO® flex

Identity Code Ordering System for Peristaltic Pump DULCO®flex DFDa 100

DFDa	Type											
	100	DFDa 100, 20.0 l/revolution										
		Drive *										
		000	without drive unit									
		F11	7.5 kW, 12 rpm, 14.4 m^3/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		F14	15 kW, 18 rpm, 21.6 m^3/h, 10 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		F15	15 kW, 23 rpm, 27.6 m^3/h, 7.5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		F16	15 kW, 28 rpm, 33.6 m^3/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
		F17	18.5 kW, 30 rpm, 36 m^3/h, 5 bar , (Reduction gear system), 3-phase, 230/400 V AC									
			Hose material									
			0	NR								
			B	NBR								
			E	EPDM								
				Hydraulic connections								
				I	DIN flange VA DN 100							
				J	DIN flange PP DN 100							
				L	ANSI flange VA 4”							
				M	ANSI flange PP 4”							
				Q	DIN flange VA Halar-coated DN 100							
				R	ANSI flange VA Halar-coated 4”							
					Base plate							
					0	Base plate, painted steel						
						Leakage sensor						
						0	Without leakage sensor					
						L	With leakage sensor					
						M	As “L” + relay output					
							Rotor					
							0	Rotor with 2 shoes				
								Batch controller				
								0	Without controller			
									Special version			
									0	standard		
										Vacuum system		
										0	none	
										V	with vacuum system	
											Approvals	
											01	CE mark

* The pumps are factory-set to a maximum back pressure of 5 bar, unless the stated pressure is lower. Please state any deviating pressures when ordering.

1.4.7 Spare Parts

Spare Parts for DFAa 003

	Order no.
DFAa 003 silicone tube	1037107
DFAa 003 Norprene tube A-60-F	1037144
DFAa 003 Solva tube	1037145

Spare Parts for DFAa 008

	Order no.
DFAa 008 silicone tube	1037146
DFAa 008 Norprene tube A-60-G	1037147
DFAa 008 silicone tube	1037148
DFAa 008 Solva tube	1037149

Spare Parts for DFBa 010

	Order no.
DFBa 010 NORPRENE tube	1037155
DFBa 010 NBR tube	1037151
DFBa 010 EPDM tube	1037152
DFBa 010 HYPALON tube	1037156
DFBa 010 NBR-A tube	1037154
DFBa 010 NR tube	1037150

Spare Parts for DFBa 013

	Order no.
DFBa 013 NORPRENE tube	1037162
DFBa 013 NBR tube	1037158
DFBa 013 EPDM tube	1037159
DFBa 013 HYPALON tube	1037163
DFBa 013 NBR-A tube	1037161
DFBa 013 NR tube	1037157

Spare Parts for DFBa 016

	Order no.
DFBa 016 NBR-A tube	1037168
DFBa 016 NORPRENE tube	1037169
DFBa 016 NBR tube	1037165
DFBa 016 EPDM tube	1037166
DFBa 016 HYPALON tube	1037171
DFBa 016 NR tube	1037164

Spare Parts for DFBa 019

	Order no.
DFBa 019 TYGON tube	1037172
DFBa 019 NORPRENE tube	1037173

Spare Parts for DFBa 022

	Order no.
DFBa 022 hose NORPRENE	1037181
DFBa 022 NBR tube	1037176
DFBa 022 EPDM tube	1037178
DFBa 022 HYPALON tube	1037182
DFBa 022 NBR-A tube	1037180
DFBa 022 NR tube	1037175

Spare Parts for DFCa 030

	Order no.
DFCa 030 NBR-A tube	1037187
DFCa 030 NBR tube	1037184
DFCa 030 EPDM tube	1037185
DFCa 030 NORPRENE tube	1045073
DFCa 030 NR tube	1037183

Spare Parts for DFCa 040

	Order no.
DFCa 040 NBR-A tube	1037196
DFCa 040 NBR tube	1037193
DFCa 040 EPDM tube	1037194
DFCa 040 NORPRENE tube	1037198
DFCa 040 NR tube	1037192

Spare Parts for DFCa 050

	Order no.
DFCa 050 NBR-A tube	1037204
DFDa 040/DFCa 050 NBR tube	1037201
DFDa 040/DFCa 050 EPDM tube	1037202
DFCa 050 NORPRENE tube	1045084
DFDa 040/DFCa 050 NR tube	1037199

Spare Parts for DFCa 060

	Order no.
DFCa 060 NBR-A tube	1037211
DFCa 060 NBR tube	1037208
DFCa 060 EPDM tube	1037209
DFCa 060 NORPRENE tube	1045085
DFCa 060 NR tube	1037206

Spare Parts for DFCa 070

	Order no.
DFCa 070 NBR-A tube	1037217
DFDa 070/DFCa 070 NBR tube	1037214
DFDa 070/DFCa 070 EPDM tube	1037215
DFDa 070/DFCa 070 NR tube	1037213

Spare Parts for DFDa 025

	Order no.
DFDa 025 NR tube	1037219
DFCa 025 NBR tube	1037220
DFDa 025 EPDM tube	1037221

Spare Parts for DFDa 032

	Order no.
DFCa 032 NBR tube	1037226
DFDa 032 EPDM tube	1037227
DFDa 032 NR tube	1037225

Spare Parts for DFDa 040

	Order no.
DFDa 070/DFCa 070 NBR tube	1037214
DFDa 070/DFCa 070 EPDM tube	1037215
DFDa 070/DFCa 070 NR tube	1037213

Spare Parts for DFDa 060

	Order no.
DFCa 060 NBR tube	1037237
DFDa 060 EPDM tube	1037238
DFDa 060 NR tube	1037236

Spare Parts for DFDa 070

	Order no.
DFDa 070/DFCa 070 NBR tube	1037214
DFDa 070/DFCa 070 EPDM tube	1037215
DFDa 070/DFCa 070 NR tube	1037213

Spare Parts DFDa 080

	Order no.
DFDa 080 NBR tube	1041678
DFDa 080 EPDM tube	1041679
DFDa 080 NR tube	1041677

Spare Parts for DFDa 100

	Order no.
DFCa 100 NBR tube	1037248
DFDa 100 EPDM tube	1037249
DFDa 100 NR tube	1037247



1.5 Chemical Transfer Pumps

1.5.1 Selection Guide

The right accessories offer even more: they increase the performance range, application options or the feed rates.

This chapter includes chemical transfer pumps, which enable you to define the pump capacity precisely.

The table will assist with quick selection. It is sorted by relevant key figures and details.

Selection Guide - Transfer Pumps:

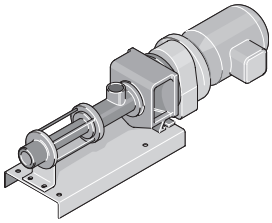
	Capacity range	see page
Eccentric screw pump Spectra	up to 12,000 l/h	→ 151
Centrifugal pump von Taine®	up to 22,500 l/h	→ 153
Air-operated diaphragm pump Duodos	up to 12,000 l/h, 7 bar	→ 158
Barrel pump DULCO®Trans	up to 6,600 l/h	→ 165
Rotary lobe pump ROTADOS	25 – 100 m3/h	→ 168

1.5.2 Eccentric Screw Pump Spectra

Pump ultra-gently, meter precisely and with a wealth of applications.

Capacity range 2.4 – 12,000 l/h, 12 – 3 bar

The eccentric screw pump Spectra meters liquid polyelectrolytes in concentrated and dilute form. It can be used, for example, in waste water treatment or sludge dewatering.



The eccentric screw pump Spectra has been designed for the transport of polymer solutions with a viscosity of up to 5,000 mPas. It is low-maintenance and can even be used if polymer solutions containing oil are to be metered.

The pumps are equipped with gear motors and external fans and can be operated via an external frequency converter. Protect the pump from running dry.

Your benefits

- Low-pulsation pumping
- Feed rate is proportional to the speed
- Reversible pumping direction

Technical Details

- FKM stator
- Stainless steel rotor (1.4571)
- Stainless steel housing for AFJ06 - AFJ10
- Grey cast iron housing for AFJ15.1 - AFJ50.1
- Axial face seal
- Voltage: 3-phase, 230/400 V AC
- Degree of protection: IP55

Field of application

Waste water treatment, sludge dewatering

Without base plate

The frequency converters do not form part of the Spectra scope of supply.

Product designation	Delivery rate at 3 bar l/h	Maximum back pressure bar	Power uptake kW	Order no.
Spectra AFJ06	2.5…31	12	0.37	1113128
Spectra AFJ08	8…70	12	0.37	1113129
Spectra AFJ10	21…200	12	0.55	1113130
Spectra AFJ15.1	80…580	3	0.55	1113131
Spectra AFJ20.1	290…1,320	3	0.55	1113132
Spectra AFJ30.1	230…2,600	3	0.75	1113133
Spectra AFJ40.1	1,000…5,400	3	1.50	1113134
Spectra AFJ50.1	3,500…12,000	3	3	1113135

With base plate

Product designation	Delivery rate at 3 bar l/h	Maximum back pressure bar	Power uptake kW	Order no.
Spectra AFJ06BP	2.5…31	12	0.37	1113090
Spectra AFJ08BP	8…70	12	0.37	1113091
Spectra AFJ10BP	21…200	12	0.55	1113092
Spectra AFJ15.1BP	80…580	3	0.55	1113093
Spectra AFJ20.1BP	290…1,320	3	0.55	1113124
Spectra AFJ30.1BP	230…2,600	3	0.75	1113125
Spectra AFJ40.1BP	1,000…5,400	3	1.50	1113126
Spectra AFJ50.1BP	3,500…12,000	3	3	1113127

1.5 Chemical Transfer Pumps

Technical Data

Product designation	Weight kg	Dimensions L x W x H mm	Housing material	Rotating parts material	Suction/discharge connection
Spectra AFJ06	24	660 x 193 x 175	1.4574	1.4571	1″/3/8″
Spectra AFJ08	18.5	739 x 200 x 182	1.4571	1.4571	1″/3/4″
Spectra AFJ10	21.2	874 x 223 x 192	1.4571	1.4571	1″/3/4″
Spectra AFJ15.1	28	874 x 223 x 192	Grey cast iron	1.4057	3/4″/3/4″
Spectra AFJ20.1	29	874 x 223 x 192	Grey cast iron	1.4057	1 1/4″/1 1/4″
Spectra AFJ30.1	44	950 x 223 x 193	Grey cast iron	1.4057	DN50
Spectra AFJ40.1	66	1,172 x 237 x 224	Grey cast iron	1.4057	DN60
Spectra AFJ50.1	84	1,487 x 264 x 244	Grey cast iron	1.4057	DN80

Spare Parts

	Order no.
FKM stator for Spectra AFJ06	1010734
FKM stator for Spectra AFJ08	1010735
FKM stator for Spectra AFJ10	1010736
FKM stator for Spectra AFJ15	1010737
FKM stator for Spectra AFJ15	1010738
FKM stator for Spectra AFJ30	1010739
FKM stator for Spectra AFJ40	1010740
FKM stator for Spectra AFJ50	1113193
1.4571 rotor for Spectra AFJ06	1010727
1.4571 rotor for Spectra AFJ08	1010728
1.4571 rotor for Spectra AFJ10	1010729
1.4571 rotor for Spectra AFJ15	1010730
1.4571 rotor for Spectra AFJ20	1010731
1.4571 rotor for Spectra AFJ30	1010732
1.4571 rotor for Spectra AFJ40	1010733
1.4571 rotor for Spectra AFJ50	1113193
Axial face seal spare parts kit, Spectra AFJ06, AFJ08, AFJ10	1023276
Axial face seal spare parts kit, Spectra AFJ15, AFJ20	1023278
Axial face seal spare parts kit, Spectra AFJ30	1023279
Axial face seal spare parts kit, Spectra AFJ40	1023280
Axial face seal spare parts kit, Spectra AFJ50	1113204

1.5.3 Centrifugal Pump von Taine®

The safe and high-quality solution when liquid media need to be pumped leak-free.

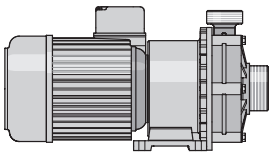
Capacity range up to 22,500 l/h, discharge lift up to 23.5 m WC

The solenoid-coupled centrifugal pump von Taine® for the pumping of liquid media works safely and reliably: liquid media are pumped leak-free.

The von Taine® pump is a solenoid-coupled centrifugal pump. Thanks to the solenoid coupling, the pump transports the liquid medium from storage tank to storage tank without any leaks or even from a tank to a discharge line. The von Taine® centrifugal pump transports media at up to 22,500 l/h and up to a discharge lift of 23.5 metres. As the pump capacity is highly dependent on the back pressure, always observe the performance curve.

Important note

Check the material tolerability when selecting your pump. Take into consideration the density, viscosity and temperature of the medium to be transported. Please also note: The transported media should not contain any solid fractions. The pump is not self-priming and requires a feed.



Your benefits

- Safe and reliable: Leak-free pumping of liquid chemicals
- Coupling between motor and impeller via magnetic coupling

Technical Details

- Pump head made of PP or PVDF
- FKM or EPDM seal
- The pump is not self-priming and requires a feed
- Protect the pump from running dry
- Hydraulic connectors with pipe threading as per DIN ISO 228-1

Field of application

Leak-free pumping of liquid chemicals

von Taine®, PP/FKM Version

Product designation	Feed rate at max. pressure l/h	Feed lift max. m	Power uptake kW	Voltage / frequency	Weight kg	Order no.
von Taine® 0502 PP/FKM	1,800	4.5	0.06	1~/230 V/50 Hz	2.7	1023089
von Taine® 0807 PP/FKM	6,600	7.9	0.25	3~/400 V/50 Hz	5.0	1023090
von Taine® 1010 PP/FKM	9,600	10.0	0.37	3~/400 V/50 Hz	7.6	1023091
von Taine® 1313 PP/FKM	13,200	13.2	0.65	3~/400 V/50 Hz	8.7	1023092
von Taine® 1820 PP/FKM	19,500	18.1	1.10	3~/400 V/50 Hz	16.0	1023093
von Taine® 2323 PP/FKM	22,500	23.5	1.50	3~/400 V/50 Hz	17.0	1023094

1.5 Chemical Transfer Pumps

von Taine®, PVDF/FKM Version

Product designation	Feed rate at max. pressure	Feed lift max.	Power uptake	Voltage / frequency	Weight	Order no.
	l/h	m	kW		kg	
von Taine® 0502 PVDF/FKM	1,800	4.5	0.06	1~/230 V/50 Hz	2.8	1023095
von Taine® 0807 PVDF/FKM	6,600	7.9	0.25	3~/400 V/50 Hz	5.2	1023096
von Taine® 1010 PVDF/FKM	9,600	10.0	0.37	3~/400 V/50 Hz	8.0	1023097
von Taine® 1313 PVDF/FKM	13,200	13.2	0.65	3~/400 V/50 Hz	9.0	1023098
von Taine® 1820 PVDF/FKM	19,500	18.1	1.10	3~/400 V/50 Hz	16.7	1023099
von Taine® 2323 PVDF/FKM	22,500	23.5	1.50	3~/400 V/50 Hz	17.7	1023100

von Taine®, PP/EPDM Version

Product designation	Feed rate at max. pressure	Feed lift max.	Power uptake	Voltage / frequency	Weight	Order no.
	l/h	m	kW		kg	
von Taine® 0502 PP/EPDM	1,800	4.5	0.06	1~/230 V/50 Hz	2.7	1028551
von Taine® 0807 PP/EPDM	6,600	7.9	0.25	3~/400 V/50 Hz	5.0	1028552
von Taine® 1010 PP/EPDM	9,600	10.0	0.37	3~/400 V/50 Hz	7.6	1028553
von Taine® 1313 PP/EPDM	13,200	13.2	0.65	3~/400 V/50 Hz	8.7	1028564
von Taine® 1820 PP/EPDM	19,500	18.1	1.10	3~/400 V/50 Hz	16.0	1028565
von Taine® 2323 PP/EPDM	22,500	23.5	1.50	3~/400 V/50 Hz	17.0	1028566

von Taine®, PVDF/EPDM Version

Product designation	Feed rate at max. pressure	Feed lift max.	Power uptake	Voltage / frequency	Weight	Order no.
	l/h	m	kW		kg	
von Taine® 0502 PVDF/EPDM	1,800	4.5	0.06	1~/230 V/50 Hz	2.8	1028567
von Taine® 0807 PVDF/EPDM	6,600	7.9	0.25	3~/400 V/50 Hz	5.2	1028568
von Taine® 1010 PVDF/EPDM	9,600	10.0	0.37	3~/400 V/50 Hz	8.0	1028569
von Taine® 1313 PVDF/EPDM	13,200	13.2	0.65	3~/400 V/50 Hz	9.0	1028570
von Taine® 1820 PVDF/EPDM	19,500	18.1	1.10	3~/400 V/50 Hz	16.7	1028571
von Taine® 2323 PVDF/EPDM	22,500	23.5	1.50	3~/400 V/50 Hz	17.7	1028572

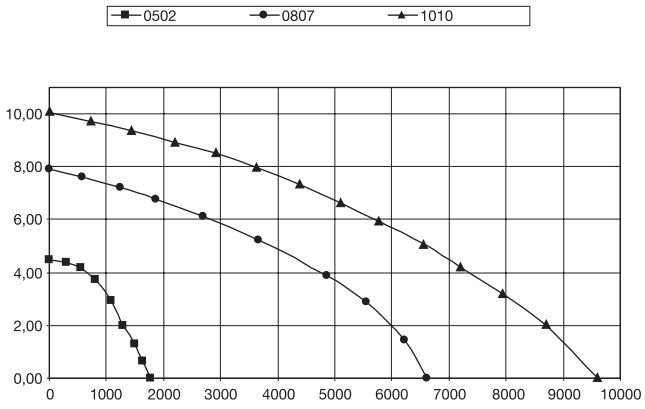
1.5 Chemical Transfer Pumps

Parameters For Use

Product designation	Medium temperature max. °C	Max. density kg/dm³	Max. viscosity mPas	Max. system pressure at 20° C bar
von Taine® 0502 PP/ FKM	80	1.25…1.35	20	1.0
von Taine® 0807 PP/ FKM	80	1.20…1.80	20	2.5
von Taine® 1010 PP/ FKM	80	1.60…2.00	20	2.5
von Taine® 1313 PP/ FKM	80	1.60…1.90	20	2.5
von Taine® 1820 PP/ FKM	80	1.10…1.80	20	5.0
von Taine® 2323 PP/ FKM	80	1.00…2.00	20	5.0
von Taine® 0502 PVDF/FKM	95	1.25…1.35	20	1.0
von Taine® 0807 PVDF/FKM	95	1.20…1.80	20	2.5
von Taine® 1010 PVDF/FKM	95	1.60…2.00	20	2.5
von Taine® 1313 PVDF/FKM	95	1.60…1.90	20	2.5
von Taine® 1820 PVDF/FKM	95	1.10…1.80	20	5.0
von Taine® 2323 PVDF/FKM	95	1.00…2.00	20	5.0

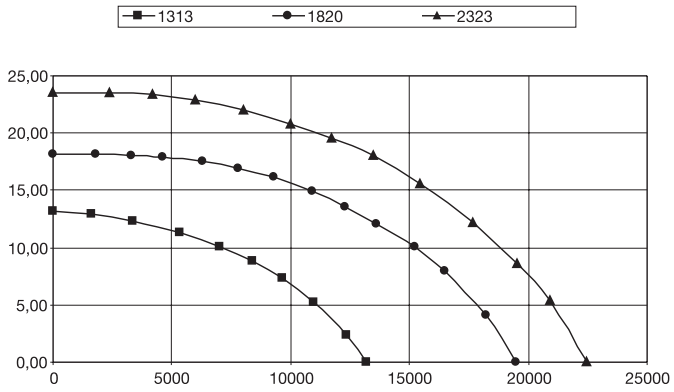
Characteristic Curves

Delivered quantity [l/h] as a function of the delivery head [m WC]

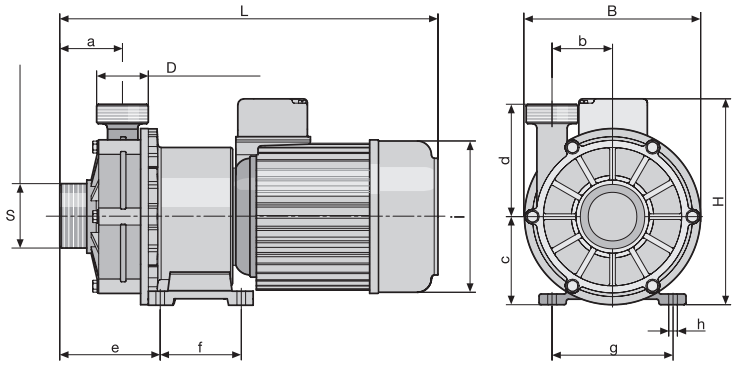


1.5 Chemical Transfer Pumps

Delivered quantity [l/h] as a function of the delivery head [m WC]



Dimensions



		von Taine® 0502 PVDF/ FKM	von Taine® 0807 PVDF/ FKM	von Taine® 1010 PVDF/ FKM	von Taine® 1313 PVDF/ FKM	von Taine® 1820 PVDF/ FKM	von Taine® 2323 PVDF/ FKM
Pressure connector		1″	1 1/4″	1 1/2″	1 1/2″	2″	2″
Suction connector		1 1/4″	1 1/4″	2″	2″	2 1/4″	2 1/4″
L dimension	mm	240	283	346	350	455	455
B dimension	mm	120	138	163	163	205	205
H dimension	mm	145	185	181	191	216	216
Dimension a	mm	37.0	45.0	58.5	58.5	70.0	70.0
Dimension b	mm	29.5	29.5	56.0	56.0	70.0	70.0
Dimension c	mm	60.0	70.0	82.0	82.0	104.5	104.5
Dimension d	mm	65.5	86.0	104.0	104.0	134.5	134.5
Dimension e	mm	129	50	106	106	115	115
Dimension f	mm	78	71	74	74	100	100
Dimension g	mm	91	91	114	114	130	130
Dimension h	mm	6.5	8.5	8.5	8.5	10.0	10.0
Dimension i	mm	92	135	136.5	135	160	160
Enclosure rating		IP 55	IP 55	IP 55	IP 55	IP 55	IP 55
Min. flow	l/h	30	60	60	60	90	120

Spare Parts Kits

	Order no.
PP/FKM liquid end for von Taine® 0502	1023978
PP/FKM liquid end forr von Taine® 0807	1023979
PP/FKM liquid end for von Taine® 1010	1023980
PP/FKM liquid end for von Taine® 1313	1023981
PP/FKM liquid end for von Taine® 1820	1023982
PP/FKM liquid end for von Taine® 2323	1023983
PVDF/FKM liquid end for von Taine® 0502	1023994
PVDF/FKM liquid end for von Taine® 0807	1023995
PVDF/FKM liquid end for von Taine® 1010	1023996
PVDF/FKM liquid end for von Taine® 1313	1023997
PVDF/FKM liquid end for von Taine® 1820	1023998
PVDF/FKM liquid end for von Taine® 2323	1023999

	Order no.
PP/EPDM liquid end for von Taine® 0502	1028573
PP/EPDM liquid end for von Taine® 0807	1028574
PP/EPDM liquid end forvon Taine® 1010	1028575
PP/EPDM liquid end for von Taine® 1313	1028576
PP/EPDM liquid end for von Taine® 1820	1028577
PP/EPDM liquid end for von Taine® 2323	1028578
PVDF/EPDM liquid end for von Taine® 0502	1028579
PVDF/EPDMliquid end for von Taine® 0807	1028580
PVDF/EPDM liquid end for von Taine® 1010	1028581
PVDF/EPDM liquid end for von Taine® 1313	1028582
PVDF/EPDM liquid end for von Taine® 1820	1028583
PVDF/EPDM liquid end for von Taine® 2323	1028584

	Order no.
Motor for von Taine® 0502	1024000
Motor for von Taine® 0807	1024001
Motor for von Taine® 1010	1024002
Motor for von Taine® 1313	1024003
Motor for von Taine® 1820	1024004
Motor for von Taine® 2323	1024005

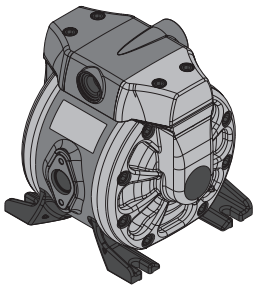
1.5.4 Air-Operated Diaphragm Pump Duodos

Duodos pumps are air-driven double diaphragm transfer pumps. No electrical components are required.

Capacity range up to 6,700 l/h, discharge lift up to 70 m WC

Air-operated Diaphragm Pump Duodos for pumping liquid media.

The pump capacity of the pump can be controlled by changing the pressure in the air supply. The air control is designed for oil-free operation. Duodos pumps are ideally suited for the transport of liquid chemicals. Duodos pumps transport media at up 6,700 l/h and up to a discharge lift of 70 m. As the pump capacity is highly dependent on the back pressure, the performance curve must always be observed. At the same time, the differential pressure between the hydraulic and pneumatic sides should not exceed 2 bar. Higher values reduce the service life of the pump. When selecting pumps, check the material compatibility. In addition, consider the density, viscosity and temperature of the transported medium.



Your benefits

- No electrical components are required because the pumps are air-operated
- Duodos pumps are run-dry safe and self-priming

Technical Details

- Maximum air pressure 7 bar
- The air control is designed for oil-free operation
- If the back pressure is greater than the air pressure in the pump, the pump remains stationary

Field of application

- Pumping of liquid chemicals

The following materials are available:

- PP pump chambers with Santoprene® diaphragms and valves
- PVDF pump chambers with PTFE diaphragms and valves

Duodos PP

Product designation	Housing material	Material of diaphragms, valves	Delivery rate (2 bar differential pressure) l/h	Order no.
Duodos 20 PPS	PP	Santoprene®	0…1,200	1103381
Duodos 50 PPS	PP	Santoprene®	0…3,000	1103384
Duodos 100 PPS	PP	Santoprene®	0…6,000	1103383
Duodos 200 PPS	PP	Santoprene®	0…12,000	1103377

Duodos PVDF

Product designation	Housing material	Material of diaphragms, valves	Delivery rate (2 bar differential pressure) l/h	Order no.
Duodos 20 PVT	PVDF	PTFE	0…1,200	1103378
Duodos 50 PVT	PVDF	PTFE	0…3,000	1103382
Duodos 100 PVT	PVDF	PTFE	0…6,000	1103379
Duodos 200 PVT	PVDF	PTFE	0…12,000	1103380

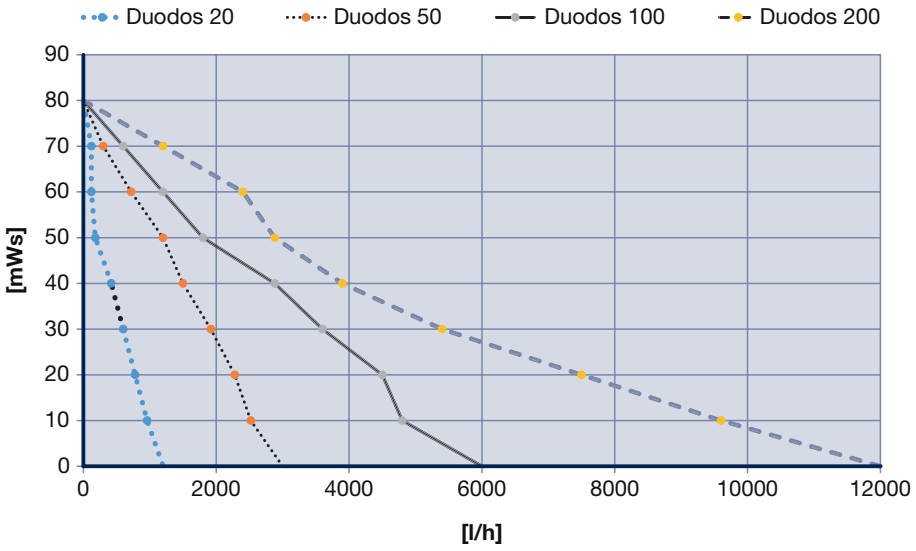
1.5 Chemical Transfer Pumps

Parameters For Use

	Min. temperature °C	Max. temperature °C	Max. viscosity mPas
Duodos 20 PPS	10	80	200
Duodos 50 PPS	10	80	200
Duodos 100 PPS	10	80	200
Duodos 200 PPS	10	80	200
Duodos 20 PVT	-13	93	200
Duodos 50 PVT	-13	93	200
Duodos 100 PVT	-13	93	200
Duodos 200 PVT	-13	93	200

Characteristic Curves

Feed lift [m WC] over feed rate [l/h] at 7 bar air supply



Spare Parts Kits

Spare part kits for pneumatics comprising

- Seals
- O-rings
- Clamp rings
- Air control valve

	Order no.
Spare parts kit, pneumatics for Duodos 20 PPS/PVT	1103386
Spare parts kit, pneumatics for Duodos 50 PPS/PVT	1103387
Spare parts kit, pneumatics for Duodos 100 PPS/PVT	1103388
Spare parts kit, pneumatics for Duodos 200 PPS/PVT	1103389

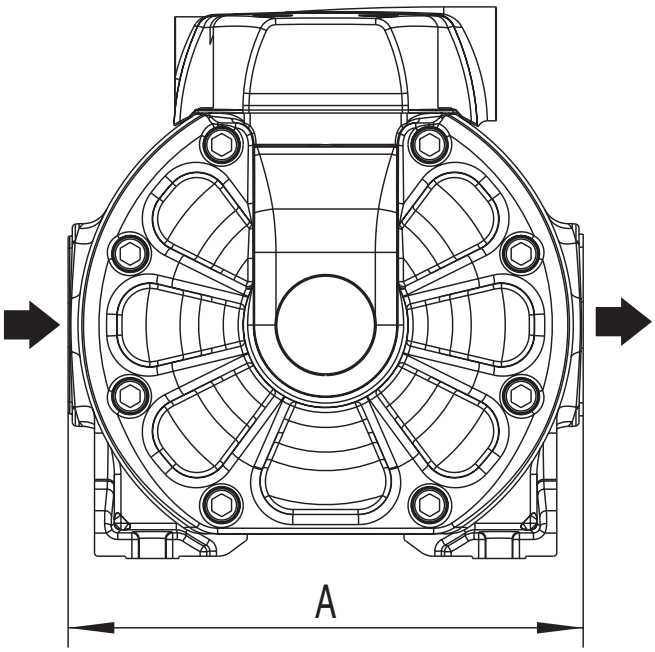
Spare part kits for the liquid end comprising

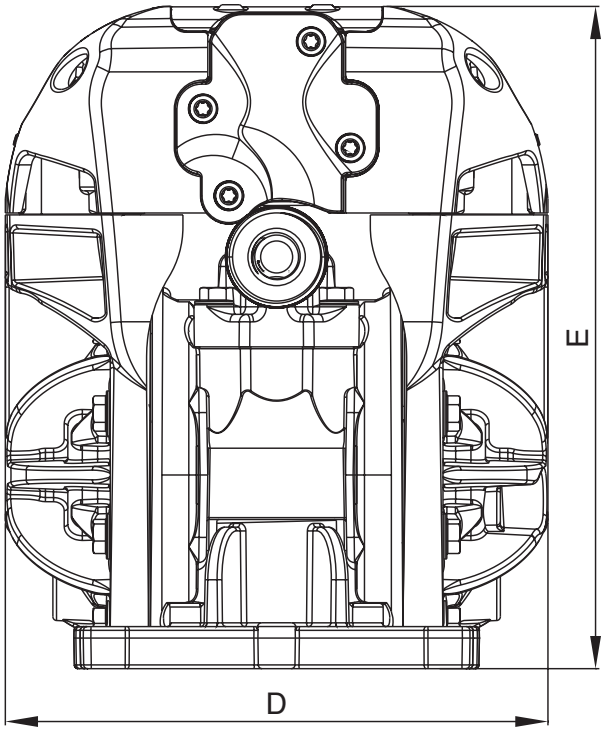
- Diaphragms
- Valve balls
- Seals

	Order no.
Spare parts kit, liquid end for Duodos 20 PPS	1103391
Spare parts kit, liquid end for Duodos 50 PPS	1103390
Spare parts kit, liquid end for Duodos 100 PPS	1103393
Spare parts kit, liquid end for Duodos 200 PPS	1103392
Spare parts kit, liquid end for Duodos 20 PVT	1103394
Spare parts kit, liquid end for Duodos 50 PVT	1103396
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Spare parts kit, liquid end for Duodos 200 PVT	1103397

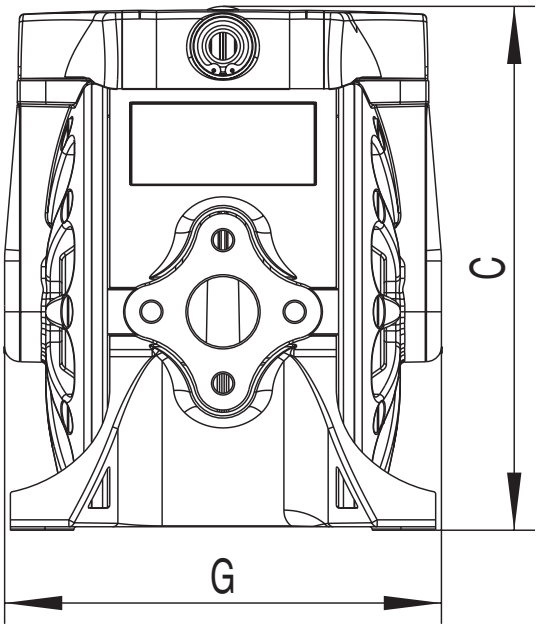
Dimensions

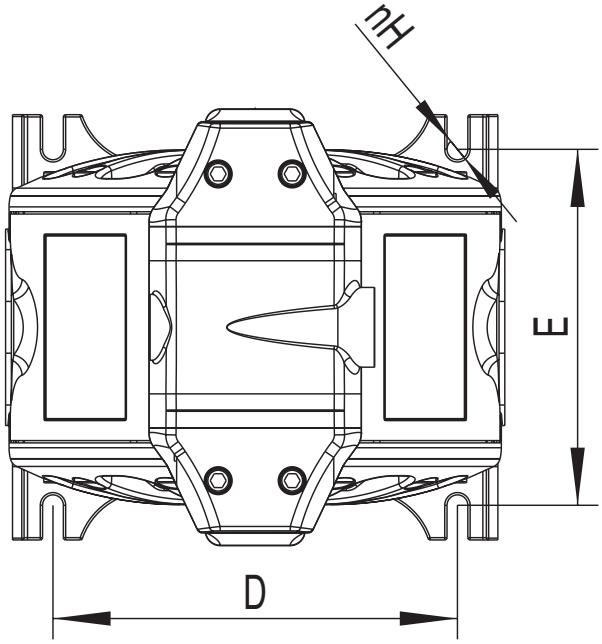
		Duodos 20	Duodos 50	Duodos 100	Duodos 200
Dimension A	mm	108	156	216	311
B dimension	mm	142	160	218	320
Dimension C	mm	29	185	230	60
Dimension D	mm	142	105	175	295
Dimension E	mm	173	122	154	364
Dimension F	mm	86	8	8	9
Dimension G	mm	96	141	184	-
H dimension	mm	9	70	95	-
Dimension K	mm	-	166	212	-
Dimension M	mm	-	24	62	-
Pressure connector		1/4″ NPT (F)	1/2″ BSP	1″ BSP	DN 25
Suction connector		3/4″ NPT (M)	1/2″ BSP	1″ BSP	DN 25
Air consumption	m³/h	0.6…18	1.2…24	1.8…30	3.0…78
Differential pressure	bar	2	2	2	2
Air connection		3/8″ NPSM (F)	3/8″ NPSM (F)	3/8″ NPSM (F)	3/8″ NPSM (F)
Weight (PP)	kg	1.2	2.2	5.1	10.5
Weight (PVDF)	kg	1.7	2.7	5.6	11

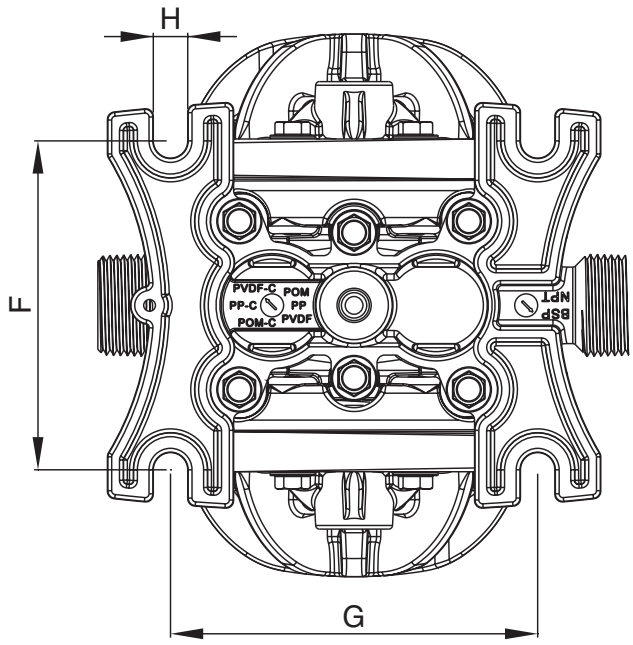




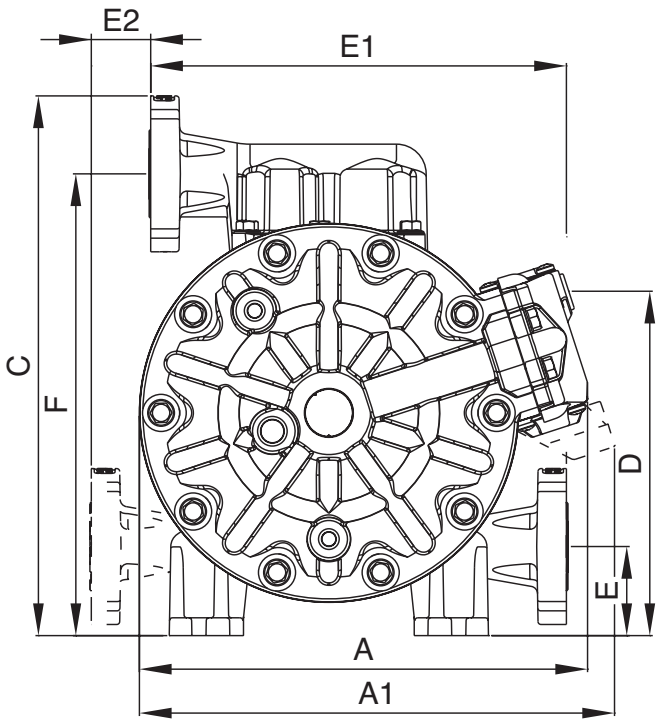
Duodos 50, 100

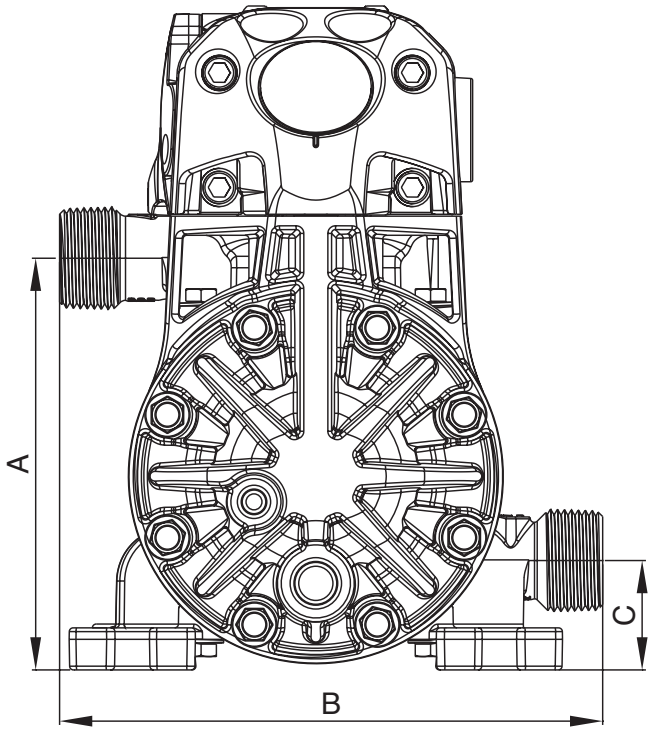



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BSP

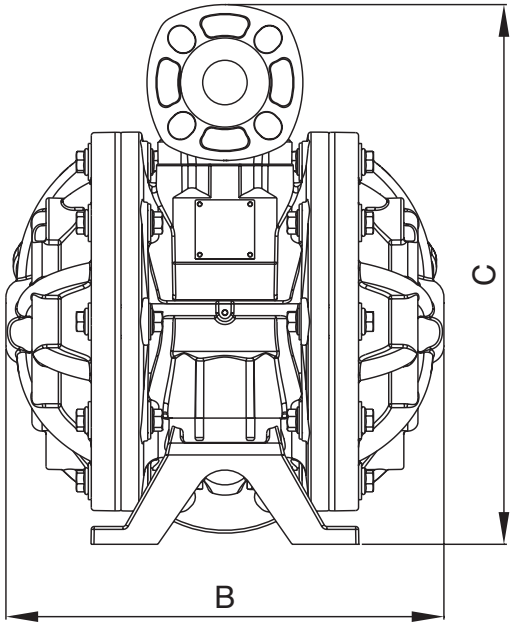
Duodos 200





Duodos 20

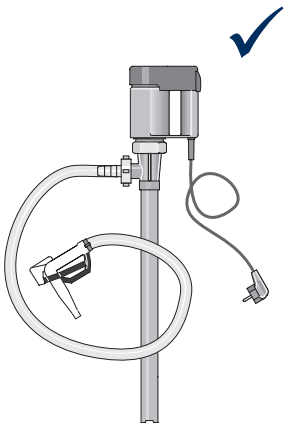
1.5 Chemical Transfer Pumps



1.5.5 Barrel Pump DULCO®Trans

Barrel pumps are the ideal solution for moving liquids.

Pump capacity according to size from 2,800 – 6,600 l/h



The application range of the DULCO®Trans depends on the chemical resistance of the materials used.

DULCO®Trans is used for bottling, draining and transferring liquids from canisters, hobbocks, drums, storage tanks and containers.

Included in the scope of supply: Metering hose with pump nozzle.

Your benefits

- Reliable pumping of liquid chemicals
- Pump sets available for different delivery containers
- Pump nozzle for convenient filling of liquids
- Undervoltage trigger prevents unintentional start-up after an interruption to the operating voltage.
- The overcurrent safety switch prevents overloading of the motor.

Technical Details

- Pump available in PP or PVDF
- PVC hose or multi-purpose chemical hose
- PP or PVDF pump nozzle
- Protect the pump from running dry
- Pumps cannot be remotely controlled

Field of application

Barrel pump for bottling, emptying and transferring liquids from canisters, drums and containers.

Materials in Contact With the Medium

The following materials come into contact with the liquids:

	PP design	PVDF design
External and internal pipe, pump nozzle	Polypropylene	PVDF
Drive shaft	Hastelloy C	Hastelloy C
Rotor	PP	PVDF
Axial face seal	PTFE	PTFE
O-rings	FKM	FKM
Metering hose	PVC	Multi-purpose chemical hose

DULCO®Trans PP Version

	Feed rate at max. pressure l/h	Feed lift max. m	Order no.
DULCO®Trans 32/700 PP	2.800	10	1098490
DULCO®Trans 41/1000 PP	5.400	11	1098491
DULCO®Trans 41/1200 PP	6.600	16	1098489

DULCO®Trans PVDF Version

	Feed rate at max. pressure l/h	Feed lift max. m	Order no.
DULCO®Trans 32/700 PVDF	2.800 *	10	1098492
DULCO®Trans 41/1000 PVDF	5.400 *	11	1098493
DULCO®Trans 41/1200 PVDF	6.600 *	16	1098494

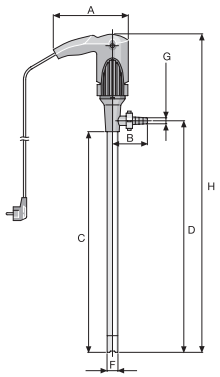
* The pump capacity is understood as including the hose and pump nozzle, determined using water at room temperature as the medium.

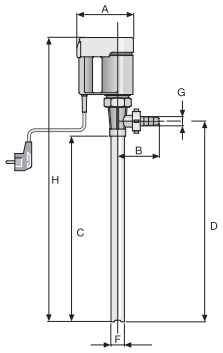
Technical Data

Type		DULCO®Trans 32/700	DULCO®Trans 41/1000	DULCO®Trans 41/1200
Max. density	kg/dm³	1.3	1.5	1.9
Max. viscosity	mPas	400	600	1,000
Media temperature PP	°C	50	50	50
Media temperature PVDF	°C	90	90	90
Suction pipe outer diameter	mm	32	41	41
Hose connection		d19	d25	d25
Discharge hose		2 m, DN 19	2 m, DN 25	2 m, DN 25
Motor rating	W	450	640	825
Enclosure rating		IP 24	IP 24	IP 24
Voltage / frequency		1~/230 V/50 Hz	1~/230 V/50 Hz	1~/230 V/50 Hz
Under-voltage cut-out		with	with	with
Overvoltage safety switch		with	with	with
Temperature monitoring		none	none	none
Speed control		none	none	none
Connecting cable	m	5 m, EUR plug	5 m, EUR plug	5 m, EUR plug
Drum adapter		G 2”	G 2”	G 2”
Weight	kg	5.9/7.9	7.6/9.2	8.3/9.7
Dimensions H x W x D	mm	986 x 170 x 90	1,315 x 220 x 90	1,515 x 220 x 90

Dimensions

Product designation		DULCO®Trans 32/700 PP	DULCO®Trans 41/1000 PP	DULCO®Trans 41/1200 PP
Dimension A	mm	170	220	220
Dimension C	mm	656	996	1,016
Dimension D	mm	700	1,000	1,200
Dimension F	mm	32	41	41
Dimension G	d	19	25	25
B dimension	mm	90	90	90
H dimension	mm	986	1,315	1,515





Spare parts kits for the barrel pump DULCO®Trans

	Order no.
Spare parts kit for DULCO®Trans 32/700 PP	1098502
Spare parts kit for DULCO®Trans 32/700 PVDF	1098503
Spare parts kit for DULCO®Trans 41/1000 PP	1098500
Spare parts kit for DULCO®Trans 41/1000 PVDF	1098498
Spare parts kit for DULCO®Trans 41/1200 PP	1098501
Spare parts kit for DULCO®Trans 41/1200 PVDF	1098499

1.5.6 Rotary Lobe Pump ROTADOS

The robust solution for the pumping of viscose media and media containing solids

Capacity range 25–100 m³/h, 10–4 bar

The compact rotary lobe pump pumps viscose and even abrasive media at up to 100 m³/h and also with reversible pumping direction thanks to its valveless construction. Housing, plunger and seals are available in different materials to match the medium.

The rotary lobe pump is robust and surprisingly powerful given its compact dimensions: depending on the model it can pump up to 100 m³/h viscose media and media containing solids, even containing larger particles of solids. It can be used with ease as a self-priming pump with reversible pumping direction. And naturally it is absolutely safe to operate as an intermediate chamber reliably separating the pumped medium from the gear oil.

The carefully selected materials, high-grade workmanship and maintenance-friendly construction make the rotary lobe pump into a low-wear endurance pump. A three-phase motor drives the two rotary pistons via a precision gear perfectly synchronised and thus also quietly. Corresponding drive versions enable the pump to be connected to bus systems and thus integrated into modern production environments.



Your benefits

- Compact pump with good pump capacity
- Ideal for viscous, abrasive and shear-sensitive media containing solids
- High-grade seals and the reliable separation of gears and medium enhance the pump's operational safety
- Feed rate can be controlled via motor speed
- Connection to bus system is possible
- Low-wear and maintenance-friendly

Technical Details

- Pump complete with drive motor, reduction gear system, clutch and base plate
- Housing material AISI-316 or AISI 420, rotary piston and shaft seals made of NBR, EPDM or FKM
- Constant i.e. non-pulsing feed rates
- Valveless construction enables reversed pump direction
- Different versions of power end/drive via three-phase motor (On/Off mode, adjustable motor with integrated frequency converter or external fan)
- Connection to bus system is possible (integrated frequency converter needed)
- Hydraulic connection as standard by means of DIN flange (DN 50, 65, 80, 100, 125), other connectors available
- Simple replacement of wear discs thanks to maintenance-friendly construction

Field of application

- Waste water and sludge pumping
- Food and beverage industry

Rotary Lobe Pump ROTADOS

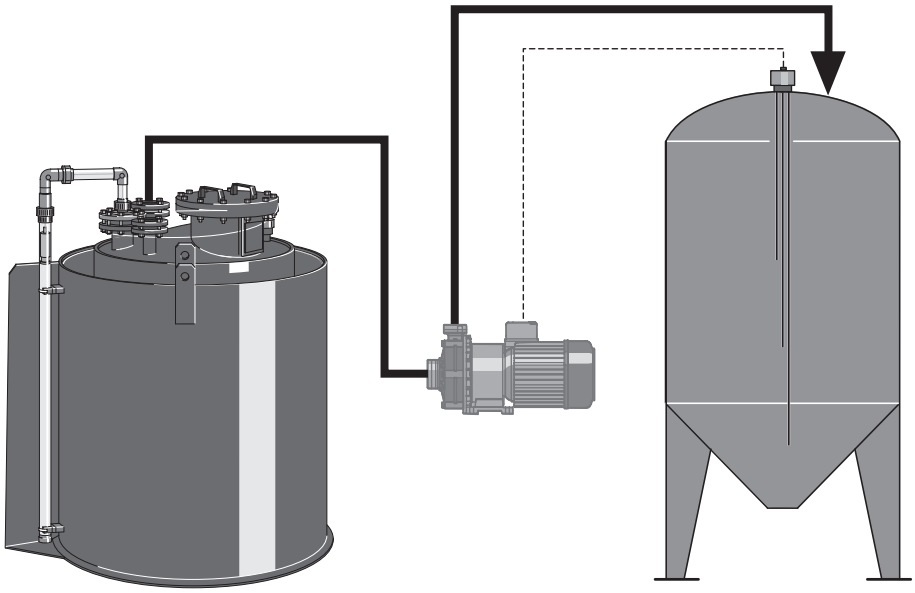
	Flange	Max. pump volume m³/h	Max. pressure bar	Weight kg	Order no.
ROTADOS type 070	DN 65	25	10	80	on request
ROTADOS type 090	DN 80	35	6	85	on request
ROTADOS type 100	DN 100	80	8	185	on request
ROTADOS type 125	DN 125	100	4	195	on request

1.5.7 Application Examples

Filling a Day Tank

Product:	**Centrifugal pump von Taine®**
Feed chemical:	**32 % hydrochloric acid**
Industry:	**Food**
Application:	**Transfer of chemicals**

The von Taine® centrifugal pump is automatically switched on and off via the level control in the day pump.



Problems and requirements

- Automatic filling of day tanks with 32 % hydrochloric acid

Operating conditions

- Installation indoors
- Automatic pump control

Notes on use

- Centrifugal pump controlled via a level control in dosing tank
- The centrifugal pump is not self-priming and requires a feed.
- Compatibility of material with hydrochloric acid should be noted (PP, PVDF; EPDM).
- Ensure that centrifugal pump has dry-running protection

Solution

- von Taine® 1820 PP centrifugal pump
- Day tank with level control

Benefits

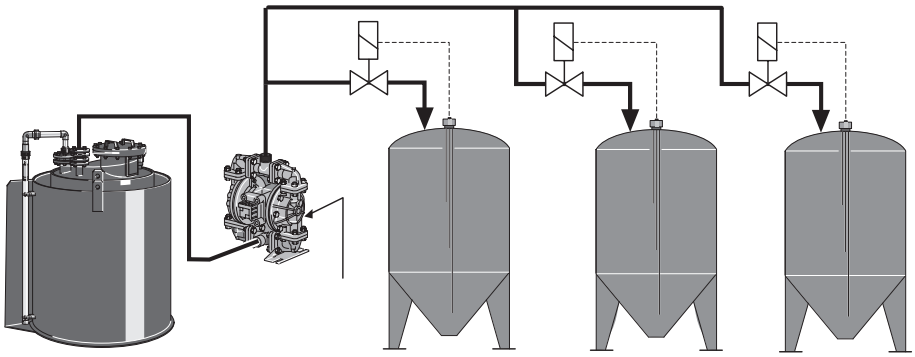
- Safe handling of hydrochloric acid
- Fully automatic operation with minimum personnel and maintenance requirements

1.5 Chemical Transfer Pumps

Filling Day Tanks

Product:	**Air-operated diaphragm pump Duodos**
Feed chemical:	**Cleaning agent**
Industry:	**Laundry**
Application:	**Transfer of chemicals**

The level control in the day tanks opens the solenoid valves when the level falls below the minimum level. As back pressure in the dosing line falls, the Duodos pump starts to pump automatically and switches off when the maximum level is reached in the tank and the solenoid valve has been closed.



Problems and requirements

- Automatic filling of day tanks with cleaning agent

Operating conditions

- Compressed air is needed to operate the air-operated diaphragm pump
- Automatic filling of day tanks

Notes on use

- Air-operated diaphragm pump controlled via a level control in dosing tank
- Air-operated diaphragm pump is self-priming.
- Also suitable for viscous media

Solution

- Duodos air-operated diaphragm pump
- Day tank with level control

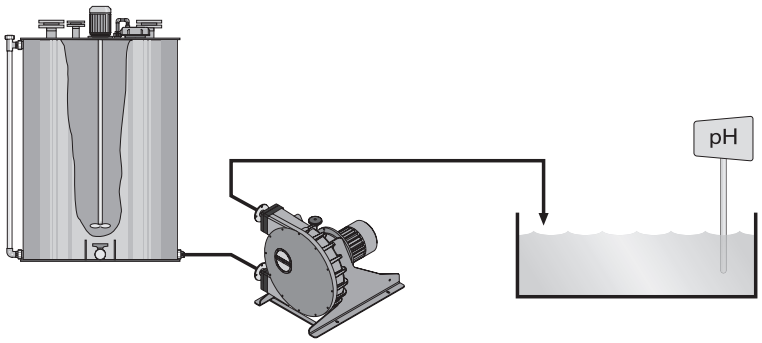
Benefits

- Simplified logistics thanks to central storage
- Fully automatic operation with minimum personnel and maintenance requirements

Deacidification of Potable Water

Product:	**Peristaltic pump DULCO®flex**
Feed chemical:	**10 % lime milk**
Industry:	**Potable water**
Application:	**Feed of abrasive chemicals**

1.5 Chemical Transfer Pumps



Problems and requirements

- Feed of abrasive lime milk into potable water tanks
- Deacidification of the potable water

Operating conditions

- The lime milk comes as a 10% suspension
- The pH in the application tank is continuously measured

Notes on use

- The peristaltic pump is self-priming
- The pump is controlled by a pH measuring unit
- Speed reduction to extend the service life of the hose

Solution

- DULCO®flex DFCa 040 type peristaltic pump
- Hose material: NR (natural rubber)

Benefits

- Reliable feed of lime milk
- Fully automatic operation with minimum personnel and maintenance requirements

1.6 Accessories for low-pressure metering pumps

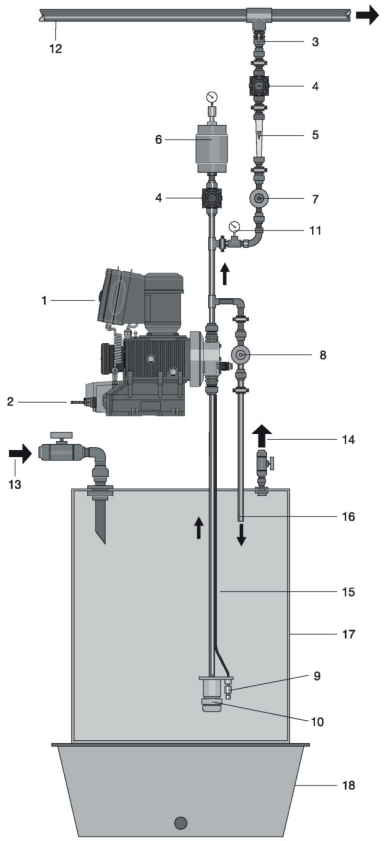
1.6.1 How to find the right accessories

Apart from a correctly selected metering pump, individually combined accessories, installed in accordance with all pertinent regulations, are needed for the perfect operation of metering systems. This drawing below shows a number of accessories. Not all of them are of course always needed but the drawing provides a brief overview of what is possible and may be useful.

The tips provide initial orientation guidelines and a simple option for selection of the right accessories.

We would be happy to assist with the selection of the correct accessories for your metering task and also to provide ongoing plant engineering advice (e.g. pipework calculations).

1 Metering pump
2 Activation and control option
3 Injection valve
4 Shut-off valve
5 Flow meter/monitor
6 Pulsation damper
7 Back pressure valve
8 Relief valve in the bypass line
9 Level switch
10 Foot valve
11 Manometer
12 System
13 Filling
14 Bleeding
15 Suction line
16 Bypass
17 Dosing tank
18 Collecting pan



Tips

- **No. 2 Activation and control option** intelligent motor-driven metering pumps: Direct control, e.g. via analogue signal or potential-free contacts, external pause or via universal control cable.
- **No. 3 Injection valves** are used to connect the metering line at the point of injection. They protect against backflow and generate a defined back pressure.
- **No. 6 Pulsation dampers:** To lower the flow resistance with long lines and for low-pulsation metering.
- **No. 7 Back pressure valve:** With fluctuating back pressure or to generate a constant back pressure to protect against over-metering or to improve dosing precision with a free outlet and priming pressure on the suction side.
- **No. 8 Relief valves:** For reasons of safety, provide suitable overload protection mechanisms when installing all mechanically deflected motor-driven metering pumps.
- **No. 9 Level switches** are used in conjunction with foot valves or suction lances for level monitoring in dosing tanks. There is no need for re-priming of the chemical as the suction line remains filled.
- **No. 17/18 Dosing tanks and collecting pans:** PE storage tanks for feed chemicals, simple and reliable installation with sintered threaded sockets and matching collecting pans. Combinable with suction assemblies and stirrers from 35 to 1,500 l.

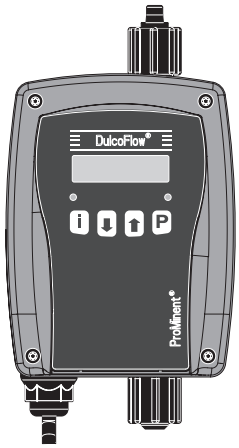
1.6.2 Flow Meter DulcoFlow®

Your reliable control unit: unobtrusively measures, monitors and detects faults.

For the measurement of pulsating volumetric flows within the range of 0.03 ml/stroke to 10 ml/stroke

The flow meter DulcoFlow® reliably measures pulsating flows in the range above 0.03 ml/stroke based on the ultrasound measuring principle. The flow meter achieves maximum chemical resistance, as all wetted parts are made of PVDF and PTFE.

The device works on the ultrasound measuring principle. It was developed specifically for measuring small pulsating volumetric flows. It is installed around 30 cm downstream of the metering pump, so that there is still sufficient pulsation in the flow. All liquids that conduct ultrasound waves can be measured.



Your benefits

- Maximum chemical resistance by the use of PVDF and PTFE
- No electrical conductivity of the medium is needed
- Measurement above stroke volumes of approx. 30 µl
- Detection of gas bubbles in the feed chemical
- No bottlenecks in the measuring tube. Media with small undissolved particles or with increased viscosity can be measured
- A 0/4 -20 mA current output and a frequency output are available for remote transmission of the measured values.
- Use as a single stroke monitor with feedback to the pump. This ensures that the metering stroke is performed within an adjustable lower and upper limit
- Summation of the metering volume measured with stroke counter
- Intuitive user guidance and simple programming

Technical Details

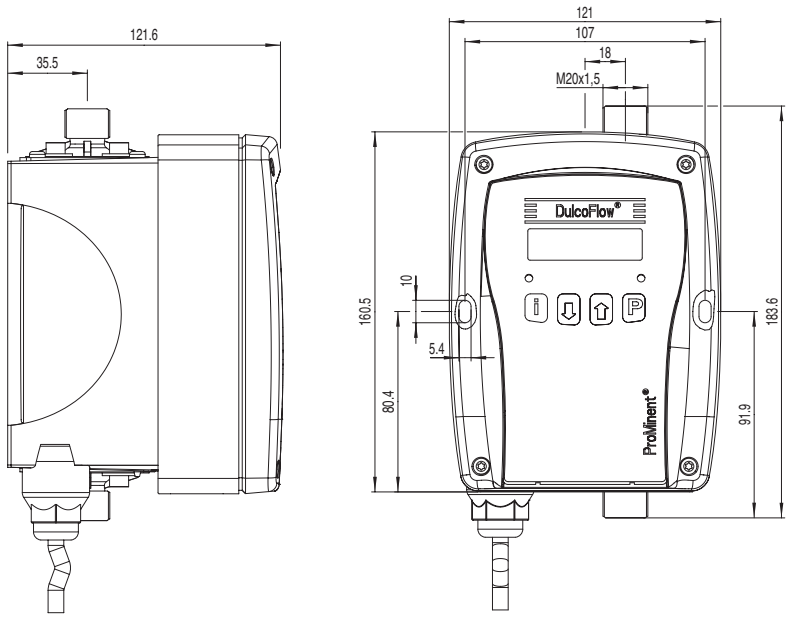
- 2 LEDs for status display and stroke feedback
- 2-line graphic display
- 0/4-20 mA standard signal and 0 – 10 kHz frequency output for remote transmission of the measured value
- Compact, chemically-resistant plastic housing
- Measuring accuracy ± 2 % if the device has been calibrated to the chemical to be measured. Max. operating pressure 16 bar.

Field of application

- Measurement of the chemical consumption, for example in surface treatment.
- Guaranteed metering, for example in the paper industry.
- Measured value transmission and pump control by the central control system.
- Measurement of aggressive chemicals.
- Not suitable for liquids, which have minimal acoustic conductivity, e.g. sodium hydroxide (NaOH) with a concentration of greater than around approx. 20%.
- **We recommend first testing the measurability with emulsions and suspensions.**
- **Media like chlorine dioxide liquids, which can penetrate through PVDF, can lead to shorter lifetime of the transducers.**

1.6 Accessories for low-pressure metering pumps

Dimensional drawing of DulcoFlow®



Dimensional drawing of DulcoFlow® - dimensions in mm

Technical Data

Type	Type 05	Type 08
Max. operating pressure	16 bar	16 bar
Smallest measurable stroke volume	Approx. 0.03 ml/stroke, pulsing	Approx. 0.05 ml/stroke, pulsing
Min. pressure	3 bar	3 bar
Contact output with individual stroke detection	Open collector, 1 contact per stroke	Open collector, 1 contact per stroke
Frequency output	Open collector, up to 10 kHz at maximum flow (parametrisable)	Open collector, up to 10 kHz at maximum flow (parametrisable)
Analogue output	Parameters can be set, max. load 400	Parameters can be set, max. load 400
Type	Beta® 1000 – 0413/0713, gamma/ X 1602 – 0414/0715, gamma/XL 1608 – 1612	Beta® 1604 – 0420, gamma/ X 1604 – 0424, delta® 1020 – 0450, Sigma/ 1

Identity Code Ordering System for DulcoFlow® Ultrasound Flow Meter

DFMa	Type (for pump series)							
	05	Beta® 1000 – 0413/0713, gamma/ X 1602 – 0414/0715, gamma/XL 1608 – 1612						
	08	Beta® 1604 – 0420, gamma/ X 1604 – 0424, delta® 1020 – 0450, Sigma/ 1						
		Seal material						
		E	EPDM					
		V	FKM A					
		T	PTFE					
		F	FDA-compliant					
			Hydraulic connections					
			1	6/4 mm				
			2	8/5 mm				
			3	12/9 mm				
			4	with G 3/4 external thread for DN 10 connector				
				Electrical connection, cable				
				A	100 - 230 V AC, 2 m European			
				B	100 - 230 V AC, 2 m Swiss			
				C	100 - 230 V AC, 2 m Australian			
				D	100 – 230 V AC, 2 m USA			
					Signal output			
					0	No output		
					1	Current output		
					2	Contact output		
					3	Current output and contact output		
					4	Current output for delta® with control module		
						Version		
						0	with ProMinent logo	
							Accessories	
							0	no accessories

1.6 Accessories for low-pressure metering pumps

1.6.3 Hydraulic/Mechanical Accessories

Foot Valves for Low-Pressure Metering Pumps

Foot valves are fitted at the end of the suction line to prevent contamination and backflow.

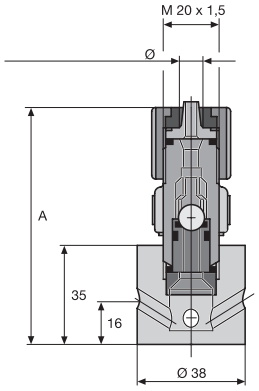
Foot valves include filter mesh and ball check – ceramic weight with connectors 6/4, 8/5, 12/6, 12/9.

During installation, ensure that there is a sufficient gap between the foot valve and the pump foot and between the foot valve and the lowest suction water level.

Union nuts and inserts/hose nozzles are included in the scope of delivery with DN 10 and DN 15 foot valve sizes

Important: Foot valves are not completely sealed shut-off devices!

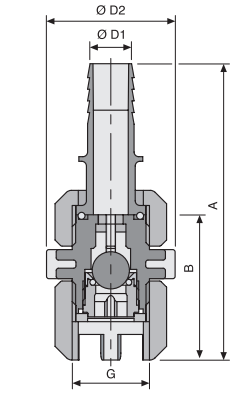
PPE foot valves



pk_1_038

Housing made of PP, seals made of EPDM.

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 for hose	6 x 4	84	pk_1_038	924558
8/5 for hose	8 x 5	84	pk_1_038	809468
12/9 for hose	12 x 9	87	pk_1_038	809470
10/4 for hose	10 x 4	87	pk_1_038	1002916
12/6 for hose	12 x 6	87	pk_1_038	809469
6/4 for hose	6 x 4	57	P_AC_0207_SW	914554



P_AC_0206_SW

Housing made of PP, seals made of EPDM, with filter meshes and ball check (glass).

DN 10, DN 15 With union nut and hose sleeve

DN 20 to DN 40 No connection parts

	Dimension G	B dimension mm	Diameter Ø D2 mm	Dimension A mm	Diameter Ø D1 mm	Order no.
DN 10	3/4	59	40	101	16	809465
DN 15	1	66	47	142	20	924516
DN 20	1 1/4	77	55	-	-	803721
DN 25	1 1/2	84	60	-	-	803722
DN 32 *	2	98	74	-	-	1006434
DN 40	2 1/4	113	90	-	-	1004204

* PVDF/Teflon design

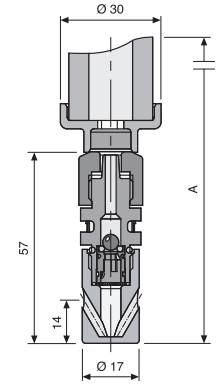
PPB Foot Valve

Housing made of PP, seals made of FKM.

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 for hose	6 x 4	84	pk_1_038	924559
8/5 for hose	8 x 5	84	pk_1_038	924683
12/9 for hose	12 x 9	87	pk_1_038	924684
10/4 for hose	10 x 4	87	pk_1_038	1002915
12/6 for hose	12 x 6	87	pk_1_038	924685

1.6 Accessories for low-pressure metering pumps

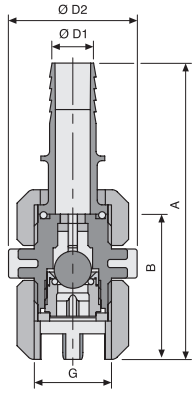
PCB Foot Valve



P_AC_0207_SW

Housing made of PVC, seals made of FKM.

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 for hose	6 x 4	84	pk_1_038	924557
8/5 for hose	8 x 5	84	pk_1_038	924562
12/9 for hose	12 x 9	87	pk_1_038	924564
10/4 for hose	10 x 4	87	pk_1_038	1002917
12/6 for hose	12 x 6	87	pk_1_038	924563
6/4 for hose	6 x 4	57	P_AC_0207_SW	914505



Housing made of PP, seals made of FKM, with filter meshes and ball check (glass).

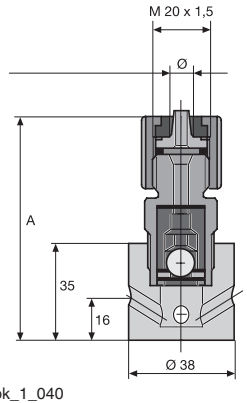
DN 10, DN 15 With union nut and hose sleeve

DN 20 to DN 40 No connection parts

	Dimension G	B dimension mm	Diameter Ø D2 mm	Dimension A mm	Diameter Ø D1 mm	Order no.
DN 10	3/4	59	40	101	16	809464
DN 15	1	66	47	142	20	924515
DN 20	1 1/4	77	55	-	-	803723
DN 25	1 1/2	84	60	-	-	803724
DN 32 *	2	98	74	-	-	1006434
DN 40	2 1/4	108	83	-	-	1029475

* PVDF/Teflon design

PVT Foot Valve

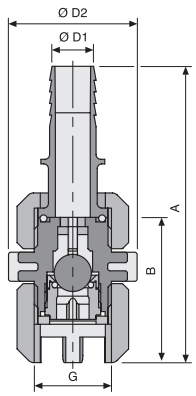


pk_1_040

Housing made of PVDF, seals made of PTFE.

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 for hose	6 x 4	79	pk_1_040	1024705
8/5 for hose	8 x 5	79	pk_1_040	1024706
12/9 for hose	12 x 9	82	pk_1_040	1024707
Universal, FDA-compliant	6 x 4 - 12 x 9	79 – 82	pk_1_040	1081422

1.6 Accessories for low-pressure metering pumps

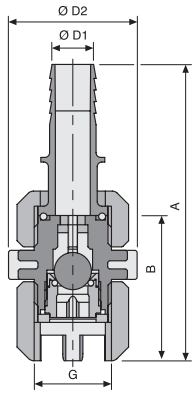


Housing made of PVDF, ball seat made of PTFE + 25% carbon, PTFE seals, with filter mesh and ball check (ceramic DN 10 - 20, glass DN 25 - 40).

DN 10, DN 15 With union nut and hose sleeve
DN 20 to DN 40 No connection parts

	Dimension G	B dimension mm	Diameter Ø D2 mm	Dimension A mm	Diameter Ø D1 mm	Order no.
DN 10	3/4	58	36	92	16	1029471
DN 15	1	64	48	131	20	1029472
DN 20	1 1/4	78	58	-	-	1029473
DN 25	1 1/2	81	65	-	-	1029474
DN 32	2	98	74	-	-	1006434
DN 40	2 1/4	108	83	-	-	1029475

Foot valve PVT-FDA



"Physiologically safe (FDA) in respect of wetted materials" design.

All wetted materials in the "Physiologically safe (FDA) in respect of wetted materials" design comply with the FDA guidelines:

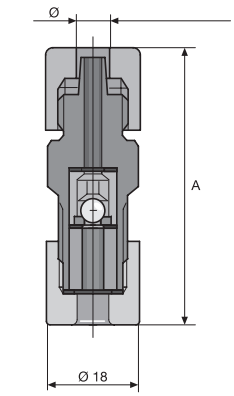
- Material PTFE: FDA No. 21 CFR § 177.1550
- Material PVDF: FDA No. 21 CFR § 177.2510

Housing made of PVDF, seals made of PTFE, with filter mesh and ball check (ceramic DN 10 - 20, glass DN 25).

DN 10, DN 15 With union nut and hose sleeve
DN 20 to DN 40 No connection parts

	Dimension G	B dimension mm	Diameter Ø D2 mm	Dimension A mm	Diameter Ø D1 mm	Order no.
DN 10	3/4	58	36	92	16	1078269
DN 15	1	64	48	131	20	1078270
DN 20	1 1/4	78	58	-	-	1078271
DN 25	1 1/2	81	65	-	-	1078272

Foot Valve TTT

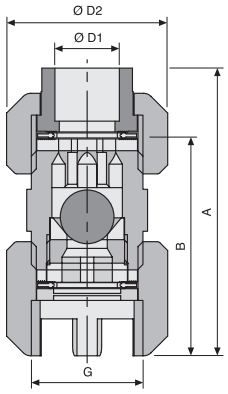


pk_1_039

Housing made of PTFE, seals made of PTFE. With 6/4, 8/5, 12/6, 12/9 connectors with ceramic weight.

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 for hose	6 x 4	79	pk_1_040	809455
8/5 for hose	8 x 5	79	pk_1_040	809471
12/9 for hose	12 x 9	82	pk_1_040	809473
12/6 for hose	12 x 6	82	pk_1_040	809472
6/4 for hose	6 x 4	52	pk_1_039	914349

1.6 Accessories for low-pressure metering pumps



Housing made of PTFE, seals made of PTFE, with filter meshes and ball check (ceramic).

DN 10, DN 15 With union nut and insert

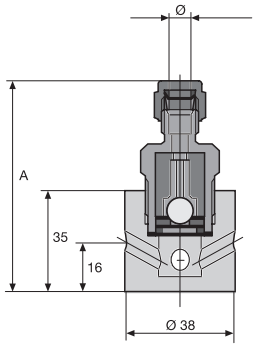
DN 20 to DN 40 No connection parts

	Dimension G	B dimension mm	Diameter Ø D2 mm	Dimension A mm	Diameter Ø D1 mm	Order no.
DN 10	3/4	59	40	101	16	809466
DN 15	1	66	47	142	20	924517
DN 20	1 1/4	81	57	-	-	803725
DN 25	1 1/2	86	64	-	-	803726
DN 32 *	2	98	74	-	-	1006434
DN 40	2 1/4	116	89	-	-	1004205

* PVDF/Teflon design

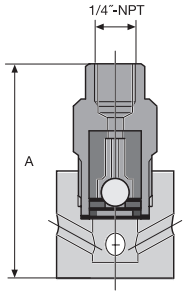
Foot Valve SST

Housing made of stainless steel no. 1.4404, seals made of PTFE. 6/4, 8/5, 12/9 hose connectors require a support insert.



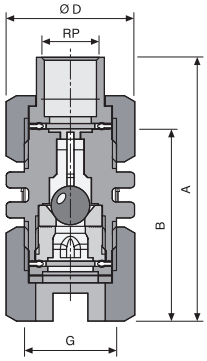
P_AC_0229_SW1

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 for pipe 6 x 5 mm / hose	6 x 4	74	P_AC_0229_SW1	924568
8/5 for pipe 8 x 7 mm / hose	8 x 5	74	P_AC_0229_SW1	809474
12/9 for pipe 12 x 10 mm / hose	12 x 9	77	P_AC_0229_SW1	809475
1/4" NPT for SS2	-	70	pk_1_031_SW1	924567
6/4 FDA-compliant	6 x 5, 6 x 4	74	P_AC_0229_SW1	1081505
8/5 FDA-compliant	8 x 7, 8 x 5	74	P_AC_0229_SW1	1081506
12/9 FDA-compliant	12 x 10, 12 x 9	77	P_AC_0229_SW1	1081507



pk_1_031_SW1

1.6 Accessories for low-pressure metering pumps



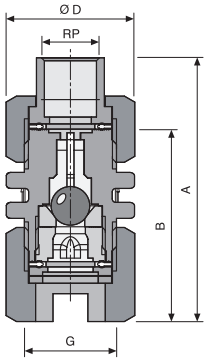
Housing made of SS, PTFE + 25% ball seat, PTFE seals, with filter meshes and ball check (1.4571/1.4581).

DN 10, DN 15 With union nut and insert

DN 20 to DN 40 No connection parts

	Dimension G	Dimension A	B dimension	Dimension Rp	Diameter Ø D	Order no.
		mm	mm		mm	
DN 10	3/4	75	56	3/8	37	809467
DN 15	1	83	59	1/2	48	924518
DN 20	1 1/4	-	73	-	55	803727
DN 25	1 1/2	-	82	-	63	803728
DN 32	2	-	92	-	75	1006435
DN 40	2 1/4	-	109	-	90	1004206

Foot valve SST-FDA



"Physiologically safe (FDA) in respect of wetted materials" design.

All wetted materials in the "Physiologically safe (FDA) in respect of wetted materials" design comply with the FDA guidelines:

- PTFE material: FDA No. 21 CFR § 177.1550
- PVDF material: FDA No. 21 CFR § 177.2510

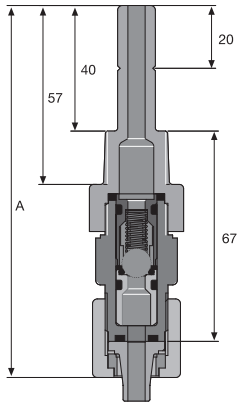
Housing made of SS, ball seat made of PVDF, seals made of PTFE, with filter mesh and ball check (ceramic DN 10 - 20, glass DN 25).

DN 10, DN 15 With union nut and insert

DN 20 to DN 40 No connection parts

	Dimension G	Dimension A	B dimension	Dimension Rp	Diameter Ø D	Order no.
		mm	mm		mm	
DN 10	3/4	75	56	3/8	37	1078275
DN 15	1	83	59	1/2	48	1078289
DN 20	1 1/4	-	73	-	55	1078290
DN 25	1 1/2	-	82	-	63	1078291

Injection Valve for Low-Pressure Metering Pumps



pk_1_105

Injection valves are mounted at the point of injection to connect the metering line. They protect against backflow and generate a defined back pressure.

With the PP, PVC, PVDF and stainless steel version, the injection valve with ball check is spring-loaded with a Hastelloy C spring, priming pressure approx. 0.5 bar (with R1/4 connector, spring made of stainless steel no. 1.4571, priming pressure approx. 1 bar). They may be fitted in any position.

The TT version without a spring is suitable for vertical installation from below. Valve springs can be retrofitted.

Injection valve sizes DN 10 and 15 have union nuts and inserts / hose nozzles in the scope of delivery.

Important: Injection valves are not absolutely leak-tight shut-off devices!

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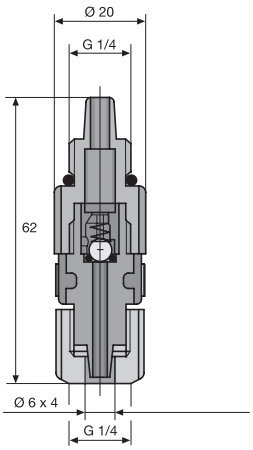
With the PP, PVC, PVDF and stainless steel version, the injection valve with ball check is spring-loaded with a Hastelloy C spring, priming pressure approx. 0.5 bar (with R1/4 connector, spring made of stainless steel no. 1.4571, priming pressure approx. 1 bar). They may be fitted in any position.

The TT version without a spring is suitable for vertical installation from below. Valve springs can be retrofitted.

Injection valve sizes DN 10 and 15 have union nuts and inserts / hose nozzles in the scope of delivery.

Important: Injection valves are not absolutely leak-tight shut-off devices!

PPE Injection Valve



pk_1_042

PP housing, EPDM seals with non-return ball, spring-loaded with Hastelloy C spring, prepressure approx. 0.5 bar with extended screwed socket.

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 - R 1/2 for PE/ PTFE pipe	6 x 4	119	pk_1_105	924681
8/5 - R 1/2 for PE/ PTFE pipe	8 x 5	119	pk_1_105	809476
12/9 - R 1/2 for PE/ PTFE pipe	12 x 9	119	pk_1_105	809478
10/4 - R 1/2 for PVC hose	10 x 4	119	pk_1_105	1002920
12/6 - R 1/2 for PVC hose	12 x 6	119	pk_1_105	809477
6/4 - G 1/4 for PE/ PTFE pipe *	6 x 4	62	pk_1_042	914184

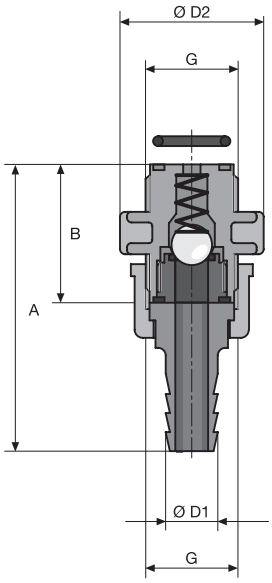
* Valve spring made from stainless steel 1.4571, priming pressure approx. 0.8 bar

Application when using an appropriate dosing line

25 °C – max. operating pressure 16 bar

45 °C – max. operating pressure 9 bar

1.6 Accessories for low-pressure metering pumps



PPE Injection Valve

PP housing, EPDM seals with spring-loaded ball check (glass), priming pressure approx. 0.5 bar.

DN 10, DN 15 With union nut and hose sleeve

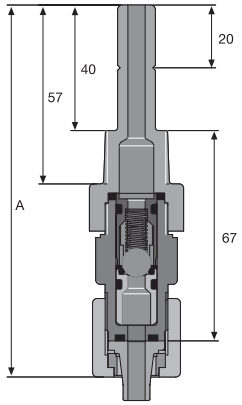
DN 20 to DN 40 No connection parts

	Dimension G	B dimension mm	Diameter Ø D2 mm	Dimension A mm	Diameter Ø D1 mm	Order no.
DN 10	3/4	41	40	83	16	809461
DN 15	1	43	47	108	20	924521
DN 20	1 1/4	55	55	-	-	803710
DN 25	1 1/2	60	58	-	-	803711
DN 32	2	68	70	-	-	1002783
DN 40	2 1/4	85	84	-	-	804761

Application

25 °C - max. operating pressure 16 bar

50 °C - max. operating pressure 9 bar



PPB Injection Valve

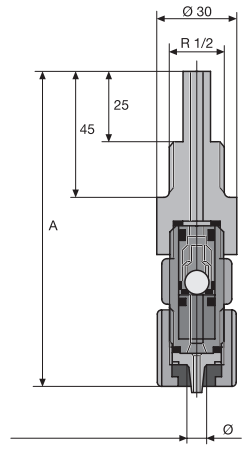
PP housing, FKM seals with spring-loaded non-return ball, prepressure approx. 0.5 bar.

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 - R 1/2 for PE/ PTFE pipe	6 x 4	119	pk_1_105	924682
8/5 - R 1/2 for PE/ PTFE pipe	8 x 5	119	pk_1_105	924687
12/9 - R 1/2 for PE/ PTFE pipe	12 x 9	119	pk_1_105	924688
10/4 - R 1/2 for PVC hose	10 x 4	119	pk_1_105	1002921
12/6 - R 1/2 for PVC hose	12 x 6	119	pk_1_105	924689

Application when using an appropriate dosing line

25 °C – max. operating pressure 16 bar

45 °C – max. operating pressure 9 bar



pk_1_046

PP/PTFE Injection Valve

For prevention of chemical deposits. PP body, PTFE mounting insert, EPDM seals with ball check and Hastelloy C spring approx. 0.5 bar priming pressure (Fig. pk_1_046).

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 - R 1/2 for PE/ PTFE pipe	6 x 4	103	pk_1_046	924588
8/5 - R 1/2 for PE/ PTFE pipe	8 x 5	103	pk_1_046	924589
12/9 - R 1/2 for PE/ PTFE pipe	12 x 9	106	pk_1_046	924590
10/4 - R 1/2 for PVC hose	10 x 4	106	pk_1_046	1002923
12/6 - R 1/2 for PVC hose	12 x 6	106	pk_1_046	924591

Application when using an appropriate dosing line

25 °C – max. operating pressure 16 bar

45 °C – max. operating pressure 9 bar

PVC/PTFE Injection Valve

PVC body, PTFE mounting insert, FKM□B seals, spring loaded ball check with Hastelloy C spring, approx. 0.5 bar priming pressure.

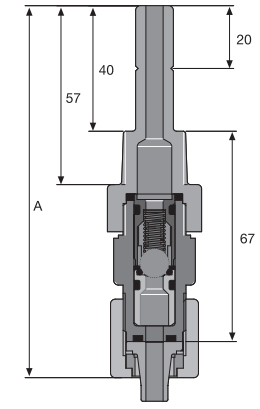
Application when using an appropriate dosing line

25 °C – max. operating pressure 16 bar

45 °C – max. operating pressure 7 bar

Connection size	oØ x iØ mm	Fig.	Order no.
6/4 - R 1/2 for PE/PTFE pipe	6 x 4	pk_1_046	809450
8/5 - R 1/2 for PE/PTFE pipe	8 x 5	pk_1_046	809451
12/9 - R 1/2 for PE/PTFE pipe	12 x 9	pk_1_046	809452
10/4 - R 1/2 for PVC hose	10 x 4	pk_1_046	1002924
12/6 - R 1/2 for PVC hose	12 x 6	pk_1_046	809453

PCB Injection Valve



pk_1_105

PVC housing, FKM seals, with Hastelloy C spring-loaded check ball, priming pressure approx. 0.5 bar, with extra-long screw-in fitting.

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 - R 1/2 for PE/PTFE pipe	6 x 4	119	pk_1_105	924680
8/4 - R 1/2 for PTFE line	8 x 4	119	pk_1_105	1034621
8/5 - R 1/2 for PE/PTFE pipe	8 x 5	119	pk_1_105	924592
12/9 - R 1/2 for PE/PTFE pipe	12 x 9	119	pk_1_105	924594
10/4 - R 1/2 for PVC hose	10 x 4	119	pk_1_105	1002919
12/6 - R 1/2 for PVC hose	12 x 6	119	pk_1_105	924593
6/4 - G 1/4 for PE/PTFE pipe *	6 x 4	62	-	914559

* Valve spring made from stainless steel 1.4571, priming pressure approx. 0.8 bar

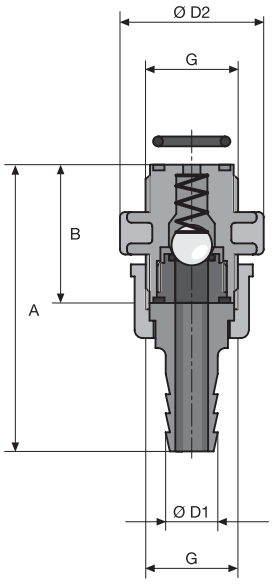
Application when using appropriate metering line

25 °C – max. operating pressure 25 bar for 8/4 design

25 °C – max. operating pressure 16 bar

45 °C – max. operating pressure 7 bar

PCB Injection Valve



PVC housing, FKM seals with spring-loaded ball check (glass), priming pressure approx. 0.5 bar.

DN 10, DN 15 With union nut and hose sleeve

DN 20 to DN 40 No connection parts

	Dimension G	B dimension mm	Diameter Ø D2 mm	Dimension A mm	Diameter Ø D1 mm	Order no.
DN 10	3/4	41	40	83	16	809460
DN 15	1	43	47	108	20	924520
DN 20	1 1/4	55	55	-	-	803712
DN 25	1 1/2	60	58	-	-	803713
DN 32	2	68	70	-	-	1002783
DN 40	2 1/4	85	84	-	-	804760

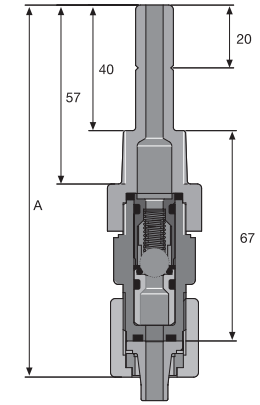
1.6 Accessories for low-pressure metering pumps

Application

25 °C - max. operating pressure 16 bar

45 °C - max. operating pressure 7 bar

PVT injection valve + PVT FDA injection valve



pk_1_105

PVDF housing, PTFE seals, with Hastelloy C spring-loaded ball check, priming pressure approx. 0.5 bar, with extra-long screw-in fitting. In the FDA-compliant design, the spring is made from 1.4571.

DN 10, DN 15	With union nut and hose sleeve
DN 20 to DN 40	No connection parts

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/3 - R 1/2 for PTFE pipe	6 x 3	119	pk_1_105	1024713
6/4 - R 1/2 for PE/ PTFE pipe	6 x 4	119	pk_1_105	1024708
8/4 - R 1/2 for PTFE line	8 x 4	119	pk_1_105	1034619
8/5 - R 1/2 for PE/ PTFE pipe	8 x 5	119	pk_1_105	1024710
12/9 - R 1/2 for PE/ PTFE pipe	12 x 9	119	pk_1_105	1024711
10/4 - R 1/2 for PVC hose	10 x 4	119	pk_1_105	1024709
12/6 - R 1/2 for PVC hose	12 x 6	119	pk_1_105	1024712
Universal – R 1/2 FDA-compliant	6 x 4 - 12 x 9	119	pk_1_105	1081423

Application when using appropriate metering line

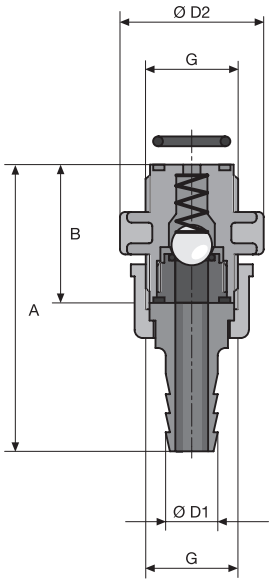
25 °C – max. operating pressure 25 bar for 8x4 design

25 °C – max. operating pressure 20 bar for 6x3 design

25 °C – max. operating pressure 16 bar

45 °C – max. operating pressure 12 bar

Injection valve PVT



PVDF housing, PTFE + 25% carbon ball seat, PTFE seals, with spring-loaded ball check (ceramic DN 10 - 20, glass DN 25 - 40), priming pressure approx. 0.5 bar.

	Dimension G	B dimension mm	Diameter Ø D2 mm	Dimension A mm	Diameter Ø D1 mm	Order no.
DN 10	3/4	40	36	84	16	1029476
DN 15	1	43	48	110	20	1029477
DN 20	1 1/4	55	52	-	-	1029478
DN 25	1 1/2	61	56	-	-	1029479
DN 32	2	68	70	-	-	1002783
DN 40	2 1/4	85	81	-	-	1029480

Application

25 °C - max. operating pressure 16 bar

65 °C - max. operating pressure 10 bar

Injection valve PVT-FDA

“Physiologically safe (FDA) in respect of wetted materials” design.

All wetted materials in the “Physiologically safe (FDA) in respect of wetted materials” design comply with the FDA guidelines.

FDA guidelines:

- Material PTFE: FDA-No. 21 CFR § 177.1550
- Material PVDF: FDA-No. 21 CFR § 177.2510

PVDF housing, PTFE seals, with spring-loaded ball check (ceramic), priming pressure approx. 0.5 bar.

DN 10, DN 15 With union nut and hose sleeve

DN 20 to DN 40 No connection parts

	Dimension G	B dimension mm	Diameter Ø D2 mm	Dimension A mm	Diameter Ø D1 mm	Order no.
DN 10	3/4	40	36	84	16	1078237
DN 15	1	43	48	110	20	1078238
DN 20	1 1/4	55	52	-	-	1078239
DN 25	1 1/2	61	56	-	-	1078240

Application

25 °C - max. operating pressure 16 bar

65 °C - max. operating pressure 10 bar

PVT Injection Valve with Tantalum Spring

Injection valve specially designed for metering sodium-calcium hypochlorite, with universal hose connector kit 6 x 4, 8 x 4, 8 x 5, 12 x 9, 10 x 4 and 12 x 6 mm.

PVDF housing, PTFE seals, with tantalum spring-loaded check ball, priming pressure approx. 0.5 bar, with extra-long screw-in fitting.

Connection size	Dimension A mm	Fig.	Order no.
Universal connector, R 1/2	119	pk_1_105	1044653

Application when using appropriate metering line

25 °C – max. operating pressure 25 bar for 8x4 design

25 °C – max. operating pressure 20 bar for 6x3 design

25 °C – max. operating pressure 16 bar

45 °C – max. operating pressure 12 bar

PVT injection valve with FEP-coated spring

Injection valve, with universal hose connector kit 6 x 4, 8 x 4, 8 x 5, 12 x 9, 10 x 4 and 12 x 6 mm. PVDF housing, PTFE seals, with spring-loaded ball check with FEP-coated spring, priming pressure approx. 1 bar, with extra-long screw-in fitting.

Connection size	Dimension A mm	Fig.	Order no.
Universal connector, R 1/2	119	pk_1_105	1110471

Application when using appropriate metering line

25 °C – max. operating pressure 25 bar for 8x4 design

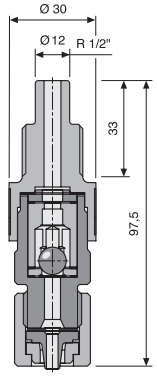
25 °C – max. operating pressure 20 bar for 6x3 design

25 °C – max. operating pressure 16 bar

45 °C – max. operating pressure 12 bar

TTT Injection Valve

Vertical installation from below. With ball check, without spring. Valve spring (Order No. 469404) can be retrofitted. Body and seals made of PTFE.



P_AC_0184_SW

1.6 Accessories for low-pressure metering pumps

Connection size	oØ x iØ		Fig.	Order no.
6/4 - R 1/2 for PE/ PTFE pipe	6 x 4	98	P_AC_0184_SW	809488
8/5 - R 1/2 for PE/ PTFE pipe	8 x 5	98	P_AC_0184_SW	809479
12/9 - R 1/2 for PE/ PTFE pipe	12 x 9	101	P_AC_0184_SW	809481
12/6 - R 1/2 for PVC hose	12 x 6	101	P_AC_0184_SW	809480

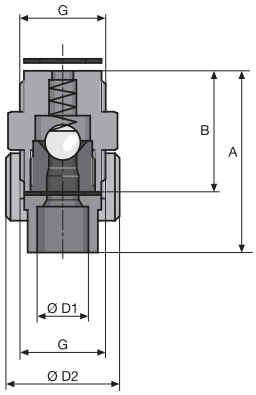
Application when using an appropriate dosing line

25 °C – max. operating pressure 10 bar

45 °C – max. operating pressure 5 bar

TTT Injection Valve

PTFE housing and seals with spring-loaded ball check (ceramic, glass DN 25), priming pressure approx. 0.5 bar.



DN 10, DN 15 With union nut and insert

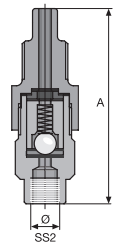
DN 20 to DN 40 No connection parts

	Dimension G	B dimension mm	Diameter Ø D2 mm	Dimension A mm	Diameter Ø D1 mm	Order no.
DN 10	3/4	38	36	57	16	809462
DN 15	1	43	48	63	20	924522
DN 20	1 1/4	55	50	-	-	803714
DN 25	1 1/2	60	58	-	-	803715
DN 32	2	68	70	-	-	1002783
DN 40	2 1/4	85	84	-	-	804762

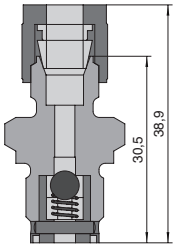
Application

25 °C - max. operating pressure 10 bar

90 °C - max. operating pressure 5 bar



pk_1_032_2



P_AC_0253_SW

SST Injection Valve

Housing made of stainless steel no. 1.4404, PTFE seals, with Hastelloy C spring-loaded check ball, priming pressure approx. 0.5 bar, with R 1/4 spring made of stainless steel no. 1.4571, priming pressure approx. 1 bar. A support insert is required to connect PE / PTFE lines. 1.4571 spring with FDA-compliant design.

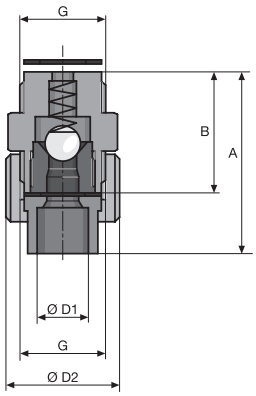
Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6 mm - R 1/2 for pipe	6 x 5	93	pk_1_032_1	809489
8 mm - R 1/2 for pipe	8 x 7	93	pk_1_032_1	809482
12 mm - R 1/2 for pipe	12 x 10	96	pk_1_032_1	809483
1/4" NPT - R 1/2 for pipe	R 1/4" NPT	89	pk_1_032_2	924597
6 mm - R 1/4 for pipe	-	-	P_AC_0253_SW	914588
6 mm - R 1/2 for pipe, FDA-compliant	6 x 5	93	pk_1_032_1	1081482
8 mm - R 1/2 for pipe, FDA-compliant	8 x 7	93	pk_1_032_1	1081483
12 mm - R 1/2 for pipe, FDA-compliant	12 x 10	96	pk_1_032_1	1081504

Application when using an appropriate dosing line

45 °C – max. operating pressure 30 bar

1.6 Accessories for low-pressure metering pumps

SST Injection Valve



Housing made of stainless steel, PTFE + 25% carbon ball seat, PTFE seals non-return sphere (stainless steel material no. 1.4571 / stainless steel no. 1.4581) spring-loaded, priming pressure approx. 0.5 bar.

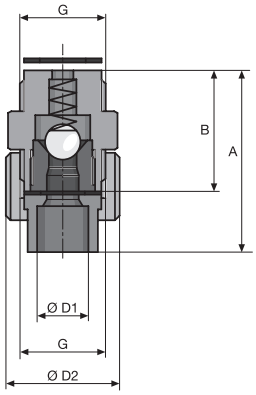
DN 10, DN 15	With union nut and insert
DN 20 to DN 40	No connection parts

Product designation	Dimension G	Max. pressure	B dimension	Diameter Ø D2	Dimension A	Diameter Ø D1	Order no.
		bar	mm	mm	mm	mm	
DN 10	3/4	320	38	36	55	3/8	809463
DN 15	1	240	43	48	63	1/2	924523
DN 20	1 1/4	130	55	55	-	-	803716
DN 25	1 1/2	70	60	58	-	-	803717
DN 32	2	45	69	68	-	-	1002801
DN 40	2 1/4	25	85	84	-	-	804763

Application

90 °C - max. operating pressure, see table

Injection valve SST - FDA



“Physiologically safe (FDA) in respect of wetted materials” design.

All wetted materials in the “Physiologically safe (FDA) in respect of wetted materials” design comply with the FDA guidelines.

FDA guidelines:

- Material PTFE: FDA No. 21 CFR § 177.1550
- Material PVDF: FDA No. 21 CFR § 177.2510

Housing made of stainless steel, PVDF ball seat, PTFE seals with non-return sphere (stainless steel material no. 1.4571 / stainless steel no. 1.4581) spring-loaded, priming pressure approx. 0.5 bar.

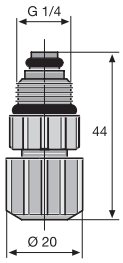
Application

90 °C - max. operating pressure, see table

Product designation	Dimension G	Max. pressure	B dimension	Diameter Ø D2	Dimension A	Diameter Ø D1	Order no.
		bar	mm	mm	mm	mm	
DN 10	3/4	320	38	36	55	3/8	1078251
DN 15	1	240	43	48	63	1/2	1078252
DN 20	1 1/4	130	55	55	-	-	1078266
DN 25	1 1/2	70	60	58	-	-	1078267

DN 10, DN 15	With union nut and insert
DN 20 to DN 40	No connection parts

PPB Injection Valve O-Ring Loaded



P_AC_0008_SW

PP body, FKM seals. Priming pressure approx. 0.5 bar.

Connection size	oØ x iØ mm	Fig.	Order no.
6/4 - G 1/4 short	6 x 4	P_AC_0008_SW	914754
6/4 - G 1/4 long	6 x 4	P_AC_0009_SW	741193

Application when using an appropriate dosing line

25 °C – max. operating pressure 16 bar

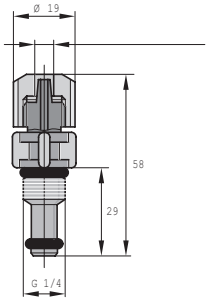
45 °C – max. operating pressure 9 bar

1.6 Accessories for low-pressure metering pumps

PCB Injection Valve O-Ring Loaded

PVC body, FKM seals, priming pressure approx. 0.5 bar.

Connection size	oØ x iØ mm	Fig.	Order no.
6/4 - G 1/4 short	6 x 4	P_AC_0008_SW	914558
6/4 - G 1/4 long	6 x 4	P_AC_0009_SW	915091



P_AC_0009_SW

Application when using an appropriate dosing line

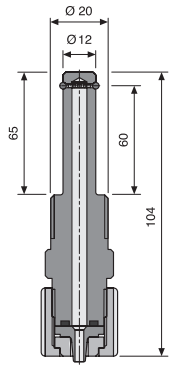
25 °C – max. operating pressure 16 bar

45 °C – max. operating pressure 7 bar

PTFE Injection Valve O-Ring Loaded

PTFE housing, FKM seals.

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 – for PE/PTFE line	6 x 4	104	P_AC_0183_SW	809484
8/5 – for PE/PTFE line	8 x 5	104	P_AC_0183_SW	809485
10/4 – for PVC hose	10 x 4	104	P_AC_0183_SW	1002925
12/6 – for PVC hose	12 x 6	104	P_AC_0183_SW	809487
12/9 – for PE/PTFE line	12 x 9	104	P_AC_0183_SW	809486



P_AC_0183_SW

Application when using appropriate metering line

25 °C – max. operating pressure 10 bar

45 °C – max. operating pressure 6 bar

Lip Seal Injection Valve PCB

Body PVC, seals FKM, inlet pressure approx. 0.05 bar. For metering sodium hypochlorite and for use in conjunction with the peristaltic pump DF2a.

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 - R 1/2 - 1/4 for PE/PTFE pipe	6 x 4	90	pk_1_070	1019953
10/4 - R 1/2 - 1/4 for PE/PTFE pipe	10 x 4	90	pk_1_070	1024697

Application when using appropriate metering line

25 °C – max. operating pressure 2 bar

45 °C – max. operating pressure 2 bar

Metering Connector for Warm Water up to 200 °C

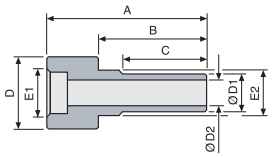
Consists of stainless steel 1.4404 injection valve, 1 m stainless steel 1.4571 discharge line and threaded connector with reinforcing sleeve for connection of PE/PTFE pipe to stainless steel pipe.

1.6 Accessories for low-pressure metering pumps

Connection size	Fig.	Order no.
Warm water 6 mm - R 1/4	pk_1_049	913166
Warm water 6 mm - R 1/2	pk_1_049	913167
Warm water 8 mm - R 1/2	pk_1_049	913177
Warm water 12 mm - R 1/2	pk_1_049	913188

Operating pressure max. 30 bar

PVDF Metering Valve Adapter



For the installation of injection valves into pipework with straight unions. The adapter extends into the pipework or storage tank and can be adjusted (shortened) to various cross-sections. Direct contact between the chemicals being metered and the wall can be avoided by installing the adapter. Metering into the centre of the pipework improves how the metering solution is mixed and other aspects.

Material: PVDF

Application

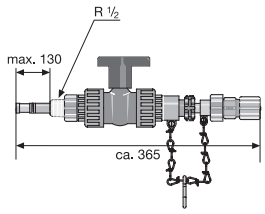
25 °C - max. operating pressure 16 bar

65 °C - max. operating pressure 10 bar

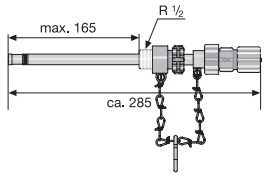
G1	Dimension G	Dimension A	B dimension	Dimension C	Dimension D	Diameter Ø D1	Diameter Ø D2	Order no.
Rp 3/4	R 3/4	93	63	49	32	22	15	1022052
Rp 1	R 1	95	65	50	41	27	18	1022053
G 1 1/4	G 1 1/4 A *	150	119	104	50	27	18	1040722
G 1 1/2	G 1 1/2 A *	171	135	118	60	31	20	1040723

1.6 Accessories for low-pressure metering pumps

Injection Lances, Non-Return Valves for Low-Pressure Metering Pumps



pk_1_007

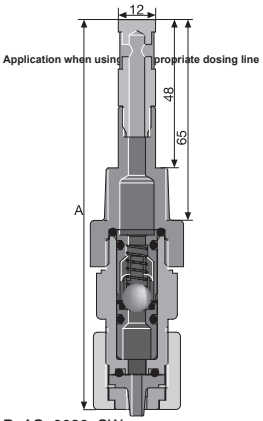


pk_1_062

PPE Injection Lance

For immersion depths of 20 - 165 mm, in large diameter pipe to prevent chemical deposition at the point of injection. Consists of spring-loaded metering valve, Hastelloy C spring, ceramic ball, adjustable immersion rod and hose valve. With connectors for all hose sizes used with solenoid-driven metering pumps: 6/4, 8/5, 12/9, 10/4 and 12/6.

Version	Seals	Max. pressure bar	Fig.	Order no.
PPE without stopcock	EPDM/silicone	6	pk_1_062	1021530
PPE with stopcock	EPDM/silicone	6	pk_1_007	1021531
PCB without stopcock	FKM/silicone	6	pk_1_062	1021528
PCB with stopcock	FKM/silicone	6	pk_1_007	1021529



P_AC_0020_SW

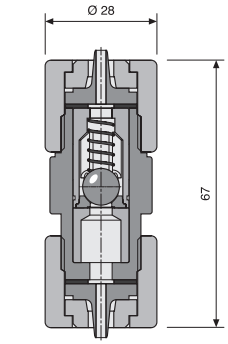
Short Injection Lance

Injection lance with universal connector kit, thereby enabling various hose sizes from 6/4 to 12/9 to be connected. Hastelloy C spring, ceramic ball and silicone hose. Material of screwed socket: PVDF.

25 °C - max. operating pressure 16 bar

45 °C - max. operating pressure 12 bar

Version	Material, valve body	Max. pressure	Seals	Dimension A	Fig.	Order no.
PPE	PP	16	EPDM	126	P_AC_0020_SW	1028383
PCB Version	PVC	16	FKM-B	126	P_AC_0020_SW	1028363
PVT	PVDF	16	PTFE	126	P_AC_0020_SW	1028081



P_AC_0181_SW

PVDF Non-Return Valve for Hose Installation

With connector kit on both sides for installation in the hose line

With ball check, spring-loaded with Hastelloy C spring, priming pressure approx. 0.5 bar

PVDF housing, PTFE seals

The use of different connector kits allows hoses of various sizes between 6/4 and 12/9 to be joined together.

Application when using appropriate metering line

25 °C – max. operating pressure 16 bar

45 °C – max. operating pressure 12 bar

Connection size	oØ x iØ mm	Dimension A mm	Fig.	Order no.
6/4 for PE/PTFE line	6 x 4	67	P_AC_0181_SW	1030463
8/5 for PE/PTFE line	8 x 5	67	P_AC_0181_SW	1030975
10/4 for PE/PTFE line	10 x 4	67	P_AC_0181_SW	1030977
12/6 for PVC hose	12 x 6	67	P_AC_0181_SW	1030978
12/9 for PE/PTFE line	12 x 9	67	P_AC_0181_SW	1030976

1.6 Accessories for low-pressure metering pumps

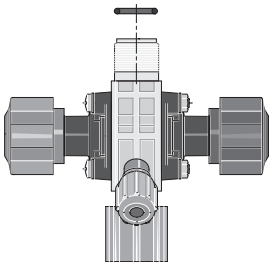
Back Pressure Valves / Relief Valves for Low-Pressure Metering Pumps

Back pressure valves are used to generate a constant back pressure to ensure precise metering and protect against over-metering or metering imprecision through a free outlet and priming pressure on the suction side. They are also used in conjunction with pulsation dampers to generate low-pulsation metering. We recommend back pressure valves type DHV-U with fluctuating back pressure.

The DHV listed below are designed for different applications. Please note the relevant notes for the different mounting forms.

Important:
Back pressure valves are not absolutely leak-tight shut-off devices. Take appropriate precautions when handling hazardous media.

Relief valves are used to protect pumps, pipes and fittings from overpressure, in the event of incorrect operation or blockages in the bypass. In the event of a malfunction, the pump pumps back into the supply tank.



Multifunctional Valve Type MFV-DK, PVDF

Back pressure valve / relief valve for fitting directly on the pump's dosing head with the functions:

- Back pressure valve, opening pressure approx. 1.5 bar with free outlet or priming pressure at the suction end (black rotary dial)
- Relief valve, opening pressure approx. 6, 10 or 16 bar (red rotary dial)
- Priming aid for pending back pressure, no need to release discharge line
- Discharge line relief, e.g. prior to service work

The multifunctional valve is operated by free-moving rotary dials that automatically return to their original position when released by the operator. This means operation is possible even when access is difficult. The multifunctional valve is made of PVDF and can be used to meter almost any chemical.

Caution: Back pressure valves are not absolutely leak-tight shut-off devices! It is essential that you observe the installation notes in the operating instructions!

Caution: The bypass line should always be connected.

For hoses see page → 208

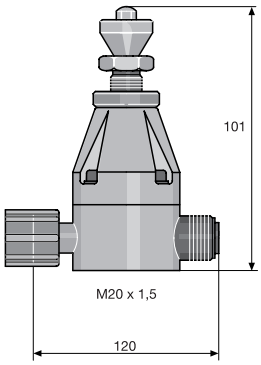
Valve body	PVDF
Diaphragm	PTFE-coated
Seal	FKM and EPDM (loose)

Type	Relief opening pressure*	Connector size	Bypass connector	Order no.
Size I	16 bar	6-12	6 x 4	792011
Size I	10 bar	6-12	6 x 4	791715
Size I	6 bar	6-12	6 x 4	1005745
Size II	10 bar	6-12	12 x 9	792203
Size II	6 bar	6-12	12 x 9	740427
Size III	10 bar	DN 10	12 x 9	792215

* The relief opening pressure given above is the pressure at which the valve starts to open. The pressure may be up to 50% more than this before the valve is fully open depending on the type of pump.

	Application: multifunctional valves
Size I	ALPc 1001, 1002, 1004, 1008, 0708
	Beta®, type 1000, 1601, 1602, 1604, 1605, 1005, 1008, 0708, 0413, 0220
	gamma/ X type 1602, 1604, 1009, 0708, 0414, 0220
	gamma/ XL type 1608, 1612
Size II	ALPc 0417, 0230
	Beta®, type 1605, 1008, 0713, 0420, 0232
	gamma/ X type 1009, 0715, 0424, 0245
	gamma/XL type 1020, 0730
Size III	gamma/ XL type 0450, 0280

For material version PP, PV, NP, TT



Back Pressure Valve Type DHV-S-DK, 0-10 bar Adjustable

Adjustable back pressure valve for fitting directly onto the dosing head to generate a constant back pressure. For accurate metering with a free outlet and with priming pressure on the suction side.

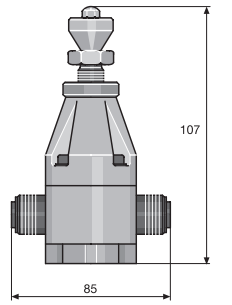
Please note: Back pressure valves are not absolutely leak-tight shut-off devices! It is essential that you observe the installation notes in the operating instructions!

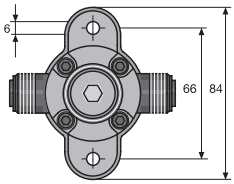
Applications: Metering pump alpha, Beta®, gamma/ X, gamma/XL, Pneumados b, EXtronic®

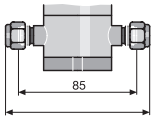
Type	adjustable pressure max. bar	Connector width DIN / ANSI	Material	Order no.
DHV-S-DK	10	6 to 12 mm	PP	302320
DHV-S-DK	10	6 to 12 mm	PC/FKM	302321
DHV-S-DK	10	6 to 12 mm	TT	302322
DHV-S-DK	10	6 mm	SS	1003793
DHV-S-DK	10	8 mm	SS	1003795
DHV-S-DK	10	12 mm	SS	1003797

*** Caution:** The product contains adhesive joints with Tangit. Please note the resistance of Tangit adhesive.

1.6 Accessories for low-pressure metering pumps







Back Pressure Valve / Relief Valve Type DHV-S-DL, 0-10 bar Adjustable

Adjustable back pressure valve for installation in the metering line to generate a constant back pressure for precise metering with a free outlet and with priming pressure on the suction side

When used as a back pressure valve in long lines to avoid resonance vibrations: Install at the end of the metering line or select a set pressure greater than the line pressure loss

Use in conjunction with pulsation damper only with a free outlet and short metering line. Use type DHV-U when using a pulsation damper with back pressure or long lines.

Please note: Back pressure valves are not absolutely leak-tight shut-off devices! It is essential that you observe the installation notes in the operating instructions!

Applications: Metering pumps alpha, Beta® , gamma/ X, gamma/XL, Pneumados b, EXtronic®

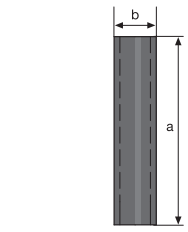
Type	adjustable pressure max. bar	Connector width DIN / ANSI	Material	Order no.
DHV-S-DL	10	6 to 12 mm	PP	302323
DHV-S-DL	10	6 to 12 mm	PC/FKM	302324
DHV-S-DL	10	6 to 12 mm	TT	302325
DHV-S-DL	10	6 mm	SS	302326
DHV-S-DL	10	8 mm	SS	302327
DHV-S-DL	10	12 mm	SS	302328

2 connector kits of the required hose size should be ordered as extras for the connection.

*** Please note:** The product contains connections bonded with Tangit. Always note the durability of Tangit adhesive.

(single connector kit, see page → 213)

Pipe Nipples



pk_1_017

For the direct connection of the pressure maintenance valve DHV-S-DL in stainless steel (SS) to the liquid end.

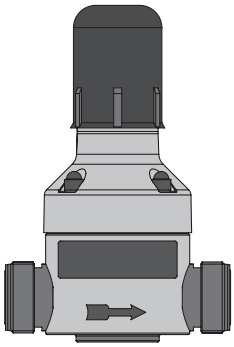
Type	Dimension A mm	B dimension mm	Order no.
1.4571 pipe nipple	6	40	818537
1.4571 pipe nipple	8	40	818538
1.4571 pipe nipple	12	40	818539

Back Pressure Valve / Relief Valve Type DHV-U

Universal back pressure valves of the DHV-U product range are back pressure-free piston diaphragm valves with an internal flow. They are used to generate a constant back pressure and also as relief valves. They can be installed at any location in the pipework system.

Back pressure valves are used to generate a constant back pressure for precise pumping and to protect against over-metering where there is a free outlet, fluctuating back pressure or priming pressure on the suction side. They are also used in conjunction with pulsation dampers to generate low-pulsation metering.

Relief valves are used to protect pumps, pipes and fittings from overpressure, in the event of incorrect operation or blockages in the bypass. In the event of a malfunction, the pump pumps around the circuit or back into the supply tank.



Important: Back pressure valves cannot be used as absolutely leak-tight shut-off devices. Take appropriate safety precautions when handling hazardous media. Relief valves are not safety valves by their definition as per DIN EN ISO 4126-1.

Important: Take appropriate safety measures (e.g. flushing after possible response) when using as relief valves in conjunction with viscous media (e.g. lime milk).

Adjustable pressure 0.5 - 10 bar

Application of PPE/PPB/PCE/PCB

20 °C - max. operating pressure 10 bar

Application of PVT/SST

1.6 Accessories for low-pressure metering pumps

30 °C - max. operating pressure 10 bar

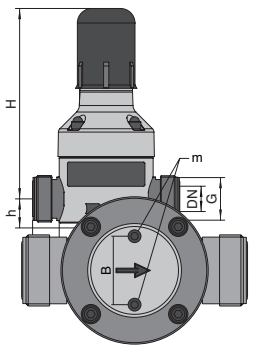
Version	Nominal diameter	Dimension G	Order no.
PPB	DN 10	3/4	1038133
PPE	DN 10	3/4	1037285
PCB Version	DN 10	3/4	1037765
PVT	DN 10	3/4	1037767
PCE	DN 10	3/4	1038144
SST	DN 10	3/4	1043194
PPB	DN 15	1	1038145
PPE	DN 15	1	1036816
PCB	DN 15	1	1037764
PVT	DN 15	1	1037766
PCE	DN 15	1	1038146
SST	DN 15	1	1043193
PPB	DN 20	1 1/4	1038147
PPE	DN 20	1 1/4	1037284
PCB	DN 20	1 1/4	1037775
PVT	DN 20	1 1/4	1037777
PCE	DN 20	1 1/4	1038148
SST	DN 20	1 1/4	1043192
PPB	DN 25	1 1/2	1038149
PPE	DN 25	1 1/2	1036633
PCB	DN 25	1 1/2	1037774
PVT	DN 25	1 1/2	1037776
PCE	DN 25	1 1/2	1038150
SST	DN 25	1 1/2	1043191
PPE	DN 32	2	1051517
PVT	DN 32	2	1051503
PCE	DN 32	2	1051514
SST	DN 32	2	1051516
PCB	DN 32	2	1051520
PPB	DN 32	2	1051522
PPE	DN 40	2 1/4	1051518
PCE	DN 40	2 1/4	1051501
PVT	DN 40	2 1/4	1051502
SST	DN 40	2 1/4	1051515
PCB	DN 40	2 1/4	1051519
PPB	DN 40	2 1/4	1051521

Materials used

Version	Housing/Connectors	Plungers	Plunger Seal	Seal/Connectors
PPE	PP	PVDF	EPDM	EPDM
PPB	PP	PVDF	FKM	FKM
PCE	PVC	PVDF	EPDM	EPDM
PCB	PVC	PVDF	FKM	FKM
PVT	PVDF	PVDF	PTFE *	FKM
SST	1.4404	PTFE	PTFE *	PTFE

* Cover ring made from PTFE/FKM

Dimensions of DHV-U (PP, PVC, PVDF design)



DN	G	H mm	L mm	h mm	D mm	m	B mm
10	3/4	144	118	24	79	M6	40
15	1	144	118	24	79	M8	40
20	1 1/4	196	150	37	99	M8	46
25	1 1/2	196	150	37	99	M6	46
32	2	252	200	54	139.5	M8	65
40	2 1/4	252	200	54	139.5	M8	65

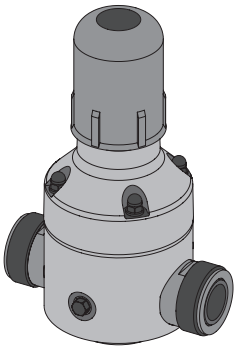
Dimensions of DHV-U (SS version)

1.6 Accessories for low-pressure metering pumps

DN	G	H* mm	L mm	h mm	D mm	m	B mm
10	3/4	144	118	20	79	M6	40
15	1	144	118	20	79	M6	40
20	1 1/4	196	150	30	99	M6	46
25	1 1/2	196	150	30	99	M6	46
32	2	252	200	37	139.5	M8	65
40	2 1/4	252	200	37	139.5	M8	65

* Approximate values

Back pressure valve/relief valve type DHV-U M configured for a manometer



The relief valves DHV-U M are configured with a plug for manometer installation.

Manometers with threaded socket G 1/4“ (ISO 228) can be fitted by the customer directly to the relief valve via the additional housing opening. Standard manometers with part number are available for neutral media. This also enables savings in terms of installation.

Adjustable pressure 0.5 - 10 bar

Application of PPE/PPB/PCE/PCB

20 °C - max. operating pressure 10 bar

Application of PVT/SST

30 °C - max. operating pressure 10 bar

Version	Nominal diameter	Dimension G	Order no.
PPB	DN 10	3/4	1077878
PPE	DN 10	3/4	1077866
PCE	DN 10	3/4	1077872
PCB	DN 10	3/4	1077884
PVT	DN 10	3/4	1077890
PPB	DN 15	1	1077877
PPE	DN 15	1	1077865
PCE	DN 15	1	1077871
PCB	DN 15	1	1077883
PVT	DN 15	1	1077889
PPB	DN 20	1 1/4	1077876
PPE	DN 20	1 1/4	1077864
PCE	DN 20	1 1/4	1077870
PCB	DN 20	1 1/4	1077882
PVT	DN 20	1 1/4	1077888
PPB	DN 25	1 1/2	1077875
PPE	DN 25	1 1/2	1077863
PCE	DN 25	1 1/2	1077869
PCB	DN 25	1 1/2	1077881
PVT	DN 25	1 1/2	1077887
PPB	DN 32	2	1077874
PPE	DN 32	2	1077862
PCE	DN 32	2	1077868
PCB	DN 32	2	1077880
PVT	DN 32	2	1077886
PPB	DN 40	2 1/4	1077873
PPE	DN 40	2 1/4	1077861
PCE	DN 40	2 1/4	1077867
PCB	DN 40	2 1/4	1077879
PVT	DN 40	2 1/4	1077885

1.6 Accessories for low-pressure metering pumps

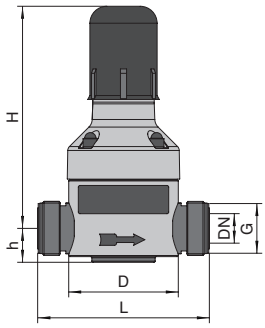
Materials used

Version	Housing/Connectors	Plungers	Plunger Seal	Seal/Connectors
PPE	PP	PVDF	EPDM	EPDM
PPB	PP	PVDF	FKM	FKM
PCE	PVC	PVDF	EPDM	EPDM
PCB	PVC	PVDF	FKM	FKM
PVT	PVDF	PVDF	PTFE *	FKM

* Cover ring made from PTFE/FKM

FDA design (21CFR177...)

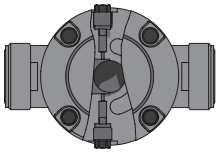
We are happy to supply physiologically harmless (FDA) material designs of wetted materials for PPE, PVT and SST.



Dimensions of DHV-U M (PP, PVC, PVDF design)

DN	G	H* mm	L mm	h mm	D mm	m	B mm
10	3/4	144	118	24	79	M6	40
15	1	144	118	24	79	M8	40
20	1 1/4	196	150	37	99	M8	46
25	1 1/2	196	150	37	99	M6	46
32	2	252	200	54	139.5	M8	65
40	2 1/4	252	200	54	139.5	M8	65

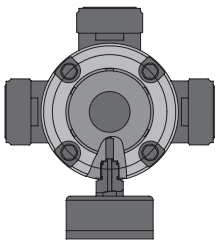
* Approximate values



Dimensions of DHV-U M (SS design)

DN	G	H* mm	L mm	h mm	D mm	m	B mm
10	3/4	144	118	24	79	M6	40
15	1	144	118	24	79	M8	40
20	1 1/4	196	150	37	99	M8	46
25	1 1/2	196	150	37	99	M6	46
32	2	252	200	54	139.5	M8	65
40	2 1/4	252	200	54	139.5	M8	65

* Approximate values



Pipe spring manometer

Pipe spring manometers in accordance with DIN EN 837-1 for neutral media for use with relief valves DHV-UR design M. When ordered, the manometer is supplied with the relief valve.

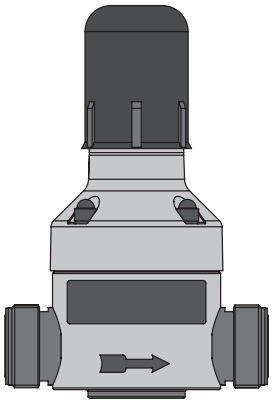
Nominal width	63 mm
Display range	0 - 16 bar
Housing material	1.4571
Connector material	Brass
Connector	Threaded assembly G 1/4" (ISO 228)
Connector position	Radial at bottom
Filling liquid	Glycerol

	Order no.
Pipe spring manometer	792726

Back Pressure Valve / Relief Valve Type DHV-U in physiologically safe design (FDA)

Back pressure valves for motor-driven metering pumps are designed for different applications. Please refer to the relevant notes for the different designs.

Relief valves are used in the bypass to protect pumps, pipes and fittings from overpressure in the event of incorrect operation or blockages. In the event of a malfunction, the pump pumps back into the storage tank.



Adjustable pressure 0.5 - 10 bar

Application of PPE/PPB/PCE/PCB

20 °C - max. operating pressure 10 bar

Application of PVT/SST

30 °C - max. operating pressure 10 bar

Version	Nominal diameter	Dimension G	Order no.
PPE	DN 10	3/4	1076578
SST	DN 10	3/4	1076532
PVT	DN 10	3/4	1076579
PPE	DN 15	1	1076580
SST	DN 15	1	1076531
PVT	DN 15	1	1076581
PVT	DN 20	1 1/4	1076583
PPE	DN 20	1 1/4	1076582
SST	DN 20	1 1/4	1076597
PPE	DN 25	1 1/2	1076585
SST	DN 25	1 1/2	1076584
PVT	DN 25	1 1/2	1076586
PVT	DN 32	2	1076588
PPE	DN 32	2	1076587
SST	DN 32	2	1076589
PPE	DN 40	2 1/4	1076590
PVT	DN 40	2 1/4	1076591
SST	DN 40	2 1/4	1076592

Materials used

Version	Housing/Connectors	Plungers	Plunger Seal	Seal/Connectors
PPE	PP	PVDF	EPDM	EPDM
PVT	PVDF	PVDF	PTFE *	FKM
SST	1.4404	PTFE	PTFE *	PTFE

* Cover ring made from PTFE/FKM

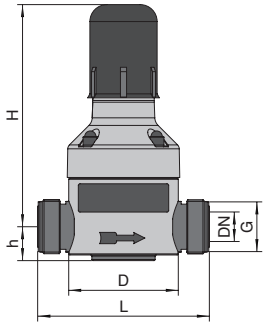
All wetted materials in the “Physiologically safe (FDA) in respect of wetted materials” design comply with the following FDA guidelines:

Material	Guideline
PTFE	21CFR177.1510
PVDF	21CFR177.2510
PP	21CFR177.1520
EPDM/FKM	21CFR177.2600

We are happy to supply back pressure valves and relief valves DHV-U/DHV-UR in stainless steel and wetted EC 1935/2004 on request.

1.6 Accessories for low-pressure metering pumps

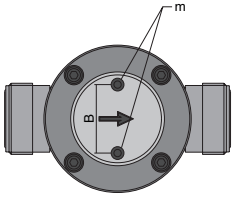
Dimensions of DHV-U (FDA) (PP, PVC, PVDF design)



DN	G	H* mm	L mm	h mm	D mm	m	B mm
10	3/4	144	118	24	79	M6	40
15	1	144	118	24	79	M8	40
20	1 1/4	196	150	37	99	M8	46
25	1 1/2	196	150	37	99	M6	46
32	2	252	200	54	139.5	M8	65
40	2 1/4	252	200	54	139.5	M8	65

* Approximate values

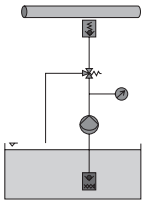
Dimensions of DHV-U (FDA) (SS design)

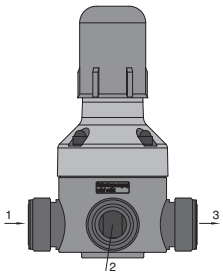


DN	G	H* mm	L mm	h mm	D mm	m	B mm
10	3/4	144	118	20	79	M6	40
15	1	144	118	20	79	M6	40
20	1 1/4	196	150	30	99	M6	46
25	1 1/2	196	150	30	99	M6	46
32	2	252	200	37	139.5	M8	65
40	2 1/4	252	200	37	139.5	M8	65

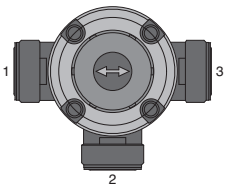
* Approximate values

1.6 Accessories for low-pressure metering pumps





1 Inlet
2 Relief outlet
3 Outlet



1 Inlet
2 Relief outlet
3 Outlet

Relief valve type DHV-UR

The universal relief valves type DHV-UR, like all valves of the DHV-U product range, are infinitely adjustable piston diaphragm valves with internal flow. In the event of impermissible overpressure, the internal piston diaphragm opens the second outlet line, the relief outlet. It can be installed at any location in the pipework system. Very low pressure losses with a closed relief valve due to virtually free pipe cross-section Simple spare parts management, the wear parts (pressure spring, diaphragms, plunger seal, seal connection set) correspond to the DHV-U range of valves.

The benefits of the new relief valves DHV-UR include simpler assembly due to the saving of installation material/connection parts etc. and a reduction of adhesion points. The new installation method permits a slimmer design of metering stations.

Relief valves for fitting directly into the discharge line of the motor-driven metering pump with the functions:

- Installation at any location in the pipework system.
- Very low pressure losses with a closed relief valve due to virtually free pipe cross-section

Adjustable pressure

0.5 – 10 bar

Application of PP and PVC (PPE/PPB/PCE/PCB)

20 °C - maximum operating pressure 10 bar

Application of PVDF and stainless steel (PVT/SST)

30 °C - maximum operating pressure 10 bar

The benefits for you:

- Simpler installation due to saving of installation material/connecting parts
- Reduced adhesion points.
- Slimmer construction type of metering stations.
- Simple spare parts management, wear parts conform to the DHV-U valve product range.

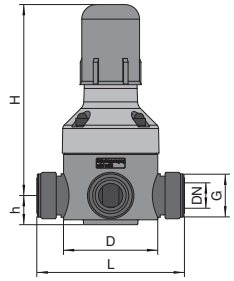
Version	Nominal diameter	Dimension G	Order no.
PVT	DN 10	3/4	1061365
PPE	DN 10	3/4	1061337
PCE	DN 10	3/4	1061339
PPB	DN 10	3/4	1061341
PCB	DN 10	3/4	1061343
SST	DN 10	3/4	1061550
PCB	DN 15	1	1061342
PPE	DN 15	1	1061336
PCE	DN 15	1	1061338
PPB	DN 15	1	1061340
PVT	DN 15	1	1061364
SST	DN 15	1	1061551
PCE	DN 20	1 1/4	1061369
PPE	DN 20	1 1/4	1061367
PPB	DN 20	1 1/4	1061371
PCB	DN 20	1 1/4	1061373
PVT	DN 20	1 1/4	1061375
SST	DN 20	1 1/4	1061569
PCE	DN 25	1 1/2	1061368
PPE	DN 25	1 1/2	1061366
PPB	DN 25	1 1/2	1061370
PCB	DN 25	1 1/2	1061372
PVT	DN 25	1 1/2	1061374
SST	DN 25	1 1/2	1061570

1.6 Accessories for low-pressure metering pumps

Materials used

Version	Housing/Connectors	Plungers	Plunger Seal	Seal/Connectors
PPE	PP	PVDF	EPDM	EPDM
PPB	PP	PVDF	FKM	FKM
PCE	PVC	PVDF	EPDM	EPDM
PCB	PVC	PVDF	FKM	FKM
PVT	PVDF	PVDF	PTFE *	FKM
SST	1.4404	1.4404	PTFE *	PTFE

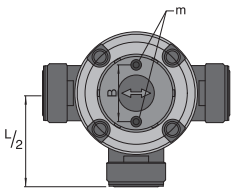
* Cover ring made from PTFE/FKM



Dimensions of DHV-UR (PP, PVC, PVDF design)

DN	G	H* mm	L mm	h mm	D mm	m	B mm
10	3/4	144	118	24	79	M6	35
15	1	144	118	24	79	M6	35
20	1 1/4	196	150	37	99	M6	46
25	1 1/2	196	150	37	99	M6	46

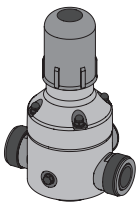
* Approximate values



Dimensions of DHV-UR (SS design)

DN	G	H* mm	L mm	h mm	D mm	m	B mm
10	3/4	144	118	24	79	M6	35
15	1	144	118	24	79	M6	35
20	1 1/4	196	150	37	99	M6	46
25	1 1/2	196	150	37	99	M6	46

* Approximate values



Relief valve type DHV-UR, FDA design

Back pressure valves for motor-driven metering pumps are designed for different applications. Please refer to the relevant notes for the different designs.

Relief valves are used in the bypass to protect pumps, pipes and fittings from overpressure in the event of incorrect operation or blockages. In the event of a malfunction, the pump pumps back into the storage tank.

Adjustable pressure 0.5 - 10 bar

Application of PPE/PPB/PCE/PCB:

20 °C - max. operating pressure 10 bar

Application of PVT/SST:

30 °C - max. operating pressure 10 bar

Version	Nominal diameter	Dimension G	Order no.
PVT	DN 10	3/4	1075830
PPE	DN 10	3/4	1075828
SST	DN 10	3/4	1075847
PVT	DN 15	1	1075829
PPE	DN 15	1	1075827
SST	DN 15	1	1075846
PPE	DN 20	1 1/4	1075833
PVT	DN 20	1 1/4	1075845
SST	DN 20	1 1/4	1075849
PVT	DN 25	1 1/2	1075844
PPE	DN 25	1 1/2	1075832
SST	DN 25	1 1/2	1075848

1.6 Accessories for low-pressure metering pumps

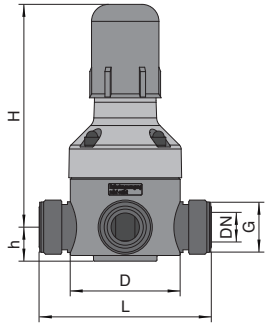
Materials used

Version	Housing/Connectors	Plungers	Plunger Seal	Seal/Connectors
PPE	PP	PVDF	EPDM	EPDM
PVT	PVDF	PVDF	PTFE *	FKM
SST	1.4404	PTFE	PTFE *	PTFE

* Cover ring made from PTFE/FKM

All wetted materials in the “Physiologically safe (FDA) in respect of wetted materials” design comply with the following FDA guidelines:

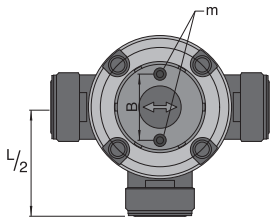
Material	Guideline
PTFE	21CFR177.1510
PVDF	21CFR177.2510
PP	21CFR177.1520
EPDM/FKM	21CFR177.2600



Dimensions of DHV-UR (FDA) (PP, PVC, PVDF design)

DN	G	H*	L	h	D	m	B
		mm	mm	mm	mm		mm
10	3/4	144	118	24	79	M6	35
15	1	144	118	24	79	M6	35
20	1 1/4	196	150	37	99	M6	46
25	1 1/2	196	150	37	99	M6	46

* Approximate values



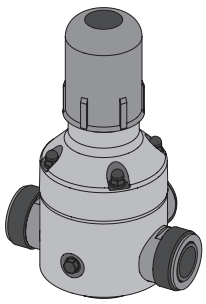
Dimensions of DHV-UR (FDA) (SS design)

DN	G	H*	L	h	D	m	B
		mm	mm	mm	mm		mm
10	3/4	144	118	24	79	M6	35
15	1	144	118	24	79	M6	35
20	1 1/4	196	150	37	99	M6	46
25	1 1/2	196	150	37	99	M6	46

* Approximate values

We are happy to supply back pressure valves and relief valves DHV-U/DHV-UR in stainless steel and wetted EC 1935/2004 on request.

Relief valve type DHV-UR M configured for manometer



The relief valves DHV-UR with M designs are configured with a plug for manometer installation. Manometer with threaded socket G 1/4“ (ISO 228) can be fitted by the customer directly to the relief valve via the additional housing opening. Standard manometers with part number are available for neutral media. This also enables savings in terms of installation.

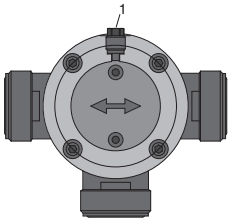
Adjustable pressure 0.5 - 10 bar

Application of PPE/PPB/PCE/PCB

20 °C - max. operating pressure 10 bar

Application of PVT/SST

30 °C - max. operating pressure 10 bar



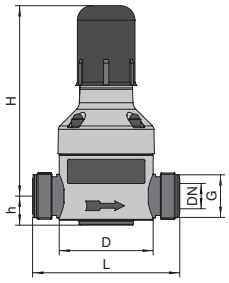
1.6 Accessories for low-pressure metering pumps

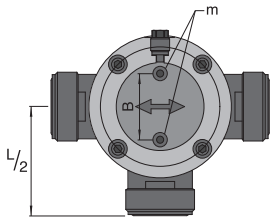
Version	Nominal diameter	Dimension G	Order no.
PPE	DN 10	3/4	1077221
PPB	DN 10	3/4	1077259
PCE	DN 10	3/4	1077255
PVT	DN 10	3/4	1077267
PCB	DN 10	3/4	1077263
PPE	DN 15	1	1077220
PPB	DN 15	1	1077258
PCE	DN 15	1	1077254
PCB	DN 15	1	1077262
PVT	DN 15	1	1077266
PPE	DN 20	1 1/4	1077219
PCE	DN 20	1 1/4	1077223
PCB	DN 20	1 1/4	1077261
PVT	DN 20	1 1/4	1077265
PPB	DN 20	1 1/4	1077257
PPE	DN 25	1 1/2	1077218
PPB	DN 25	1 1/2	1077256
PCE	DN 25	1 1/2	1077222
PCB	DN 25	1 1/2	1077260
PVT	DN 25	1 1/2	1077264

Materials used

Version	Housing/Connectors	Plungers	Plunger Seal	Seal/Connectors
PPE	PP	PVDF	EPDM	EPDM
PPB	PP	PVDF	FKM	FKM
PCE	PVC	PVDF	EPDM	EPDM
PVT	PVDF	PVDF	PTFE *	FKM
PCB	PVC	PVDF	FKM	FKM

* Cover ring made from PTFE/FKM



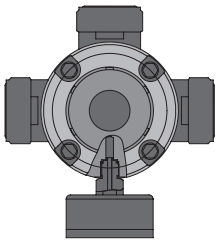


Dimensions of DHV-UR M (PP, PVC, PVDF design)

DN	G	H* mm	L mm	h mm	D mm	m	B mm
10	3/4	144	118	24	79	M6	35
15	1	144	118	24	79	M6	35
20	1 1/4	196	150	37	99	M6	46
25	1 1/2	196	150	37	99	M6	46

* Approximate values

1.6 Accessories for low-pressure metering pumps



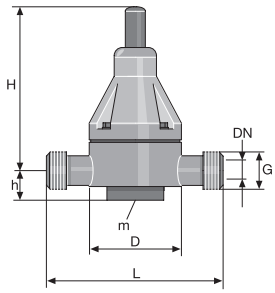
Pipe spring manometer

Pipe spring manometers in accordance with DIN EN 837-1 for neutral media for use with relief valves DHV-UR design M. When ordered, the manometer is supplied with the relief valve.

Nominal width	63 mm
Display range	0 - 16 bar
Housing material	1.4571
Connector material	Brass
Connector	Threaded assembly G 1/4" (ISO 228)
Connector position	Radial at bottom
Filling liquid	Glycerol

	Order no.
Pipe spring manometer	792726

Back Pressure Valve / Relief Valve Type DHV 712-R



Adjustable pressure 0.5 - 10 bar

Application of PPE/PCB

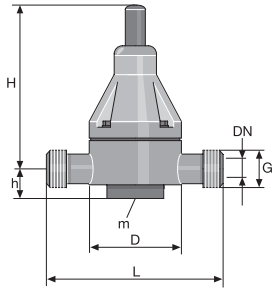
20 °C - max. operating pressure 10 bar

Application of PVT/TT/SS

30 °C - max. operating pressure 10 bar

Version	Nominal diameter	Dimension G	Order no.
TT	DN 10	3/4	1000059
TT	DN 15	1	1000060
TT	DN 20	1 1/4	1000061
TT	DN 25	1 1/2	1000062
TT	DN 32	2	1000063
TT	DN 40	2 1/4	1000064

*** Caution:** The product contains adhesive joints with Tangit. Please note the resistance of Tangit adhesive.

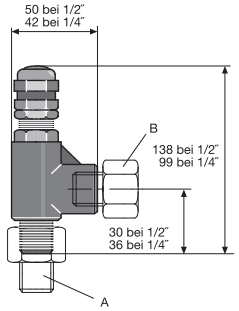


Dimensions of DHV 712-R

DN	G	H mm	L mm	h mm	D mm	m
10	3/4	173	120	-	81	M6
15	1	173	120	-	81	M6
20	1 1/4	201	150	-	107	M6
25	1 1/2	201	150	-	107	M6
32	2	260	205	59 / 37	147	M8
40	2 1/4	260	205	59 / 37	147	M8

Materials used

Version	Housing/Connectors	Plungers	Plunger Seal	Seal/Connectors
TT	Carbon-filled PTFE	PTFE	PTFE	PTFE



Back Pressure Valve / Relief Valve for High-Pressure Systems

Use as a pressure relief valve (adjustable) and as a back pressure valve. Overflow valve and corresponding spring must be ordered separately.

Material: stainless steel 316/FKM

Temperature range: -18 °C to 120 °C

1.6 Accessories for low-pressure metering pumps

Recommended use up to 200 l/h

	Connector size	Order no.
Overflow valve	1/4″ NPT inner and outer thread	202505

Spring counter pressure min.	Spring counter pressure max.	Spring colour	Order no.
3.4	24	blue	202519
24.0	52	yellow	202520
52.0	103	violet	202525
103.0	155	orange	202524
155.0	207	brown	202523
207.0	276	white	202522
276.0	345	red	202521

Recommended use up to 300 l/h

	Connector size	Order no.
Overflow valve	1/2″ NPT inner and outer thread	1005499

Spring counter pressure min.	Spring counter pressure max.	Spring colour	Order no.
3.4	24	blue	1005500
24.0	50	yellow	1005501
50.0	100	violet	1005502

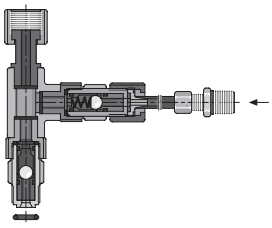
Reducing pipe nipple

Connector size	Order no.
1/4” NPT internal – 1/4” NPT external (A)	359378
1/4” NPT external – 1/4 Rp internal (B)	359379
1/2” NPT internal – 1/2” NPT external (A)	1005503
1/2” NPT external – 1/2 Rp internal (B)	1005504

For use as an adjustable safety relief valve and as a back pressure valve. Relief valve and corresponding spring must be ordered separately

1.6 Accessories for low-pressure metering pumps

Flushing Assemblies and Overload Protection Assemblies for Low-Pressure Metering Pumps



pk_1_056

Flushing Assembly

For flushing and cleaning dosing heads, metering lines and injection valves

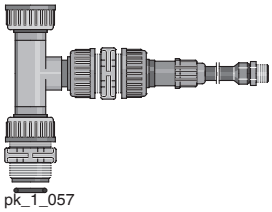
As a manual or automatic, time-controlled design. Installation, even retrospectively, on the suction connector of the metering pump. Supplied with 2 m flushing pipe and R 3/8 connection nipple.

Automatic flushing equipment for the fully automatic flushing of the pump head is possible on request.

PPE Flushing Assembly

Material: PP, EPDM seal.

	Fig.	Order no.
For 6/4, 8/5, 12/6, 12/9 connectors	pk_1_056	809909
For G 3/4 -DN 10 connector	pk_1_057	809917
For G 1 -DN 15 connector	pk_1_057	809919



pk_1_057

PCB Flushing Assembly

Material: PVC, FKM seal.

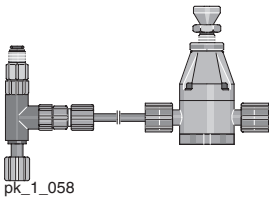
	Fig.	Order no.
For 6/4, 8/5, 12/6, 12/9 connectors	pk_1_056	809925
For G 3/4 -DN 10 connector	pk_1_057	809926
For G 1 -DN 15 connector	pk_1_057	803960

*** Caution:** The product contains adhesive joints with Tangit. Please note the resistance of Tangit adhesive.

Relief Valve Assembly

Consisting of a back pressure valve, which can be set from 1 - 10 bar, type DL, complete with connecting parts, installation directly on the dosing head.

Connector size 6 - 12 mm, depending on the pressure connector on the metering pump.

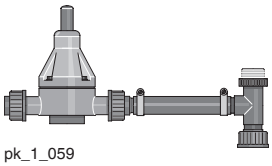


pk_1_058

PPE Relief Valve Assembly

Material: PP, EPDM seal.

	Fig.	Order no.
For 6/4, 8/5, 12/6, 12/9 connectors	pk_1_058	809990
For G 3/4 -DN 10 connector	pk_1_059	809991
For G 1 -DN 15 connector	pk_1_059	809992



pk_1_059

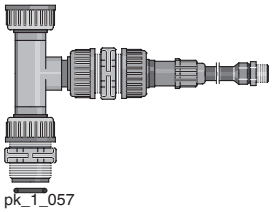
PCB Relief Valve Assembly

Material: PVC, FKM seal.

	Fig.	Order no.
For 6/4, 8/5, 12/6, 12/9 connectors	pk_1_058	809989
For G 3/4 -DN 10 connector	pk_1_059	809993
For G 1 -DN 15 connector	pk_1_059	914745

Please note: All vacuum cylinders with EPDM seal material are glued with Tangit. It is essential that the durability of Tangit adhesive is observed. All vacuum cylinders with FKM seal material are glued with DTX.

1.6 Accessories for low-pressure metering pumps


pk_1_057

Flushing Assemblies for Motor-Driven Metering Pumps

Flushing assemblies for flushing and cleaning liquid end, metering line and metering valve as well as for preventing deposits.

PPE Flushing Device

	Dimension G	Order no.
DN 10	3/4	809917
DN 15	1	809919
DN 20	1 1/4	809921
DN 25	1 1/2	809923

PCB Flushing Assembly

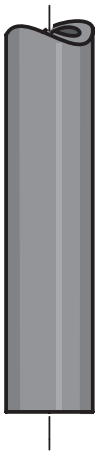
	Dimension G	Order no.
DN 10	3/4	809926
DN 15	1	803960
DN 20	1 1/4	803961
DN 25	1 1/2	803962
DN 40	2 1/4	803963

*** Caution:** The product contains adhesive joints with Tangit. Please note the resistance of Tangit adhesive.

1.6 Accessories for low-pressure metering pumps

Hoses and pipework for low-pressure metering pumps

For metering pumps and accessories



We recommend that only original lines are used so that the mechanical connection of the compression fitting and the pressure rating and chemical resistance can be ensured.

Soft PVC Suction Line

For metering pumps and accessories. We recommend that only original tubing is used so that the mechanical connection of the compression fitting and the pressure rating and chemical resistance are ensured.

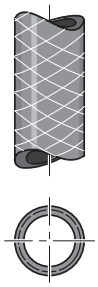
Supply with food-use certification is available upon request.

Material	Length m	oØ x iØ mm	permitted operating pressure* bar	Order no.
PVC flexible	5	6 x 4	0.5	1004520
	5	8 x 5	0.5	1004521
	5	12 x 9	0.5	1004522
	10	6 x 4	0.5	1004523
	10	8 x 5	0.5	1004524
	10	12 x 9	0.5	1004525
	25	6 x 4	0.5	1004526
	25	8 x 5	0.5	1004527
	25	12 x 9	0.5	1004528
	50	6 x 4	0.5	1004529
	50	8 x 5	0.5	1004530
	50	12 x 9	0.5	1004531
	Sold in metres	19 x 15	0.5	37020
	Sold in metres	22 x 18	0.5	37022

* Permissible operating pressure at 20 °C as per DIN EN ISO 7751 subject to chemical resistance and correct connection

Caution:

The resistance of soft PVC hoses is not identical to that of hard PVC. Please observe the resistance for soft PVC as well as the cleaning instructions when using the equipment for food applications (see homepage).



Soft PVC Suction and Discharge Line with Woven Fabric Core

Supply with food-use certification is available upon request.

Material	Length	oØ x iØ	Descrip-tion	permitted operating pressure*	Order no.
	m	mm		bar	
Soft PVC with woven inner layer	5	10 x 4		18	1004533
	5	12 x 6		17	1004538
	10	10 x 4		18	1004534
	10	12 x 6		17	1004539
	25	10 x 4		18	1004535
	25	12 x 6		17	1004540
	50	10 x 4		18	1004536
	50	12 x 6		17	1004541
	Sold in metres	24 x 16	for DN 10	15	37040
	Sold in metres	27 x 19	for DN 15	15	37041
	Sold in metres	34 x 25	for DN 20	12	37043
	Sold in metres	40 x 30	for DN 25	10	1000527
	Sold in metres	52 x 40	for DN 32	7	1005508

* Permissible operating pressure at 20 °C as per DIN EN ISO 7751 subject to chemical resistance and correct connection

Caution:

The resistance of soft PVC hoses is not identical to that of hard PVC. Please observe the resistance for soft PVC as well as the cleaning instructions when using the equipment for food applications (see homepage).

For socket welded and PVC cemented rigid PP and PVDF pipe, pipes and fittings with a pressure rating of PN 16 or PN 10 bar are to be used.

1.6 Accessories for low-pressure metering pumps

Soft PVC Suction and Metering Line with Woven Inner Layer Approved for Food Use

Material	Length m	oØ x iØ mm	permitted operating pressure bar	Order no.
Soft PVC with woven inner layer approved for food use	5	10 x 4	10	1037556
	5	12 x 6	10	1037561
	10	10 x 4	10	1037557
	10	12 x 6	10	1037562
	25	10 x 4	10	1037558
	25	12 x 6	10	1037563
	50	10 x 4	10	1037559
	50	12 x 6	10	1037564

Important:

Soft PVC hoses do not offer the identical resistance to rigid PVC. Always note the resistance of soft PVC hoses and the cleaning instructions for use in food applications.

Temperature dependency

Operating temperature in °C	Permissible pressure temperature factor in %
+20 °C	100%
+30°C	85%
+40°C	73%
+50°C	60%
+60°C	46%

PE Suction and Discharge Line

Material	Length m	oØ x iØ mm	permitted operating pressure* bar	Order no.
Polyethylene	5	6 x 4	10	1004492
	5	8 x 5	10	1004493
	5	12 x 9	7	1004504
	10	6 x 4	10	1004505
	10	8 x 5	10	1004506
	10	12 x 9	7	1004507
	25	6 x 4	10	1004508
	25	8 x 5	10	1004509
	25	12 x 9	7	1004510
	50	6 x 4	10	1004511
	50	8 x 5	10	1004512
	50	12 x 9	7	1004513

* Permissible operating pressure at 20 °C as per DIN EN ISO 7751 subject to chemical resistance and correct connection

Temperature dependency

Operating temperature in °C	Permissible pressure temperature factor in %
+23°C	100%
+40°C	75%
+50°C	50%

PTFE Suction and Discharge Lines

Material	Length m	oØ x iØ mm	permitted operating pressure* bar	Order no.
PTFE	Sold in metres	1.75 x 1.15	12	37414
	Sold in metres	3.2 x 2.4	8	37415
	Sold in metres	6 x 3	20	1021353
	Sold in metres	6 x 4	14	37426
	Sold in metres	8 x 4	25	1033166
	Sold in metres	8 x 5	16	37427
	Sold in metres	12 x 9	10	37428

* Permissible operating pressure at 20 °C as per DIN EN ISO 7751 subject to chemical resistance and correct connection

Temperature dependency

Operating temperature in °C	Permissible pressure temperature factor in %
+20 °C	100%
+50°C	75%
+75°C	55%
+100°C	45%

Stainless Steel Pipes

Material	Length m	oØ x iØ mm	permitted operating pressure* bar	Order no.
Stainless steel pipe 1.4435	Sold in metres	1.58 x 0.9	400	1020774
	Sold in metres	3.175 x 1.5	400	1020775
	Sold in metres	6 x 5	175	15738
	Sold in metres	6 x 4	185	15739
	Sold in metres	8 x 7	160	15740
	Sold in metres	12 x 10	200	15743

* Permissible operating pressure at 20 °C as per DIN EN ISO 7751 subject to chemical resistance and correct connection

Hose Cutting Kit

Hose Cutting Set for Plastic Pipes up to a Diameter of 25 mm. Manufacturer: Gedore.

	Order no.
Hose Cutting Kit	1038571



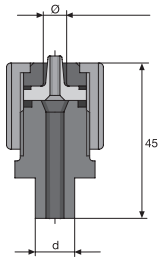
1.6 Accessories for low-pressure metering pumps

Connectors, Fittings, Connector Kits, Seals

Hose adhesive nipple

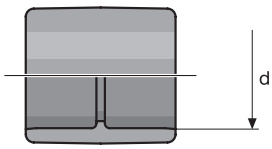
With union nut to connect PVC, PE and PTFE hose to PVC fittings, for creation of own connection systems.

Material	PCB	PCE
PVC housing	PVC	PVC
Seals	FKM	EPDM



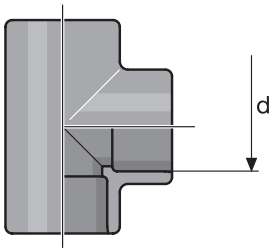
	Material	Dimension d mm	Hose oØ x iØ mm	Order no.
PCB hose adhesive nipple	PCB	12	6 x 4	817088
	PCB	12	8 x 5	817089
	PCB	12	12 x 9	817090
	PCB	12	12 x 6	817091
	PCB	16	6 x 4	817092
	PCB	16	8 x 5	817093
	PCB	16	12 x 9	817094
	PCB	16	12 x 6	817095
PCE hose adhesive nipple	PCE	12	6 x 4	1077673
	PCE	12	8 x 5	1077674
	PCE	12	12 x 9	1077675
	PCE	12	12 x 6	1077676
	PCE	16	6 x 4	1077677
	PCE	16	8 x 5	1077678
	PCE	16	12 x 9	1077679
	PCE	16	12 x 6	1077680

PVC straight solvent union



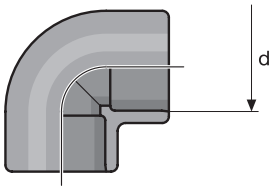
Description	Material	Dimension d mm	Ohne Titel (durchmesser)	Order no.
PVC straight solvent union	PVC	12	DN 8	356608
	PVC	16	DN 10	356609
	PVC	20	DN 15	356610
	PVC	25	DN 20	356611

PVC T-joint



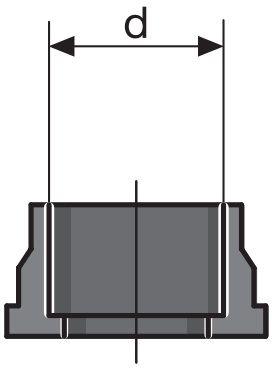
Description	Material	Dimension d mm	Ohne Titel (durchmesser)	Order no.
PVC T-joint	PVC	12	DN 8	356406
	PVC	16	DN 10	356407
	PVC	20	DN 15	356408
	PVC	25	DN 20	356409

90° PVC elbow joint



Description	Material	Dimension d mm	Ohne Titel (durchmesser)	Order no.
90° PVC elbow joint	PVC	12	DN 8	356315
	PVC	16	DN 10	356316
	PVC	20	DN 15	356317
	PVC	25	DN 20	356318

1.6 Accessories for low-pressure metering pumps



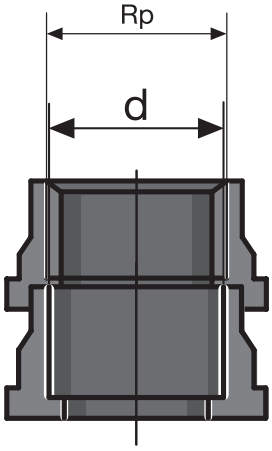
PVC insert (straight solvent union)

Description	Material	Dimension d mm	Ohne Titel (durch-messer)	Order no.
PVC insert (straight solvent union)	PVC	12	DN 8	356571
	PVC	16	DN 10	356572
	PVC	20	DN 15	356573
	PVC	25	DN 20	356574
	PVC	32	DN 25	356575
	PVC	40	DN 32	356576
	PVC	50	DN 40	356577
	PVC	63	DN 50	356578

Product designation [generated]	Material	Connector size	Order no.
Union coupler, grooved *	PVC	d 16 – DN 10	1001784
	PVC	d 20 – DN 15	1001394
	PVC	d 25 – DN 20	1036257
	PVC	d 32 – DN 25	1001786
	PVC	d 40 – DN 32	1005104
	PVC	d 50 – DN 40	1025961
	PVC	d 63 – DN 50	1019206

* Should be used in combination with ProMinent's PTFE shaped composite seals.

Product designation	Material	Connector size	Order no.
threaded pipe socket	1.4404	Rp 3/8 – DN 10	805285
	1.4404	Rp 1/2 – DN 15	805286
	1.4404	Rp 3/4 – DN 20	805287
	1.4404	Rp 1 – DN 25	805288
	1.4404	Rp 1 1/4 – DN 32	805289
	1.4404	Rp 1 1/2 – DN 40	805290
	1.4404	Rp 2 – DN 50	805291



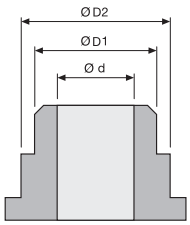
Inserts (welding sleeves)

Product designation	Material	Connector size	Order no.
Welding sleeve	PP	d 12 – DN 8	800666
	PP	d 16 – DN 10	358603
	PP	d 20 – DN 15	358604
	PP	d 25 – DN 20	358605
	PP	d 32 – DN 25	358606
	PP	d 40 – DN 32	358607
	PP	d 50 – DN 40	358608
	PP	d 63 – DN 50	358609
Welding sleeve, grooved	PVDF	d 16 – DN 10	358803
	PVDF	d 20 – DN 15	358804
Welding sleeve	PVDF	d 25 – DN 20	358805
	PVDF	d 32 – DN 25	358806
Welding sleeve, grooved	PVDF	d 40 – DN 32	1003640
Welding sleeve	PVDF	d 50 – DN 40	358808
	PVDF	d 63 – DN 50	358809

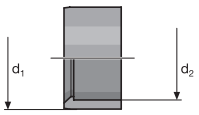
1.6 Accessories for low-pressure metering pumps

Product designation [generated]	Material	Connector size	Order no.
Welding sleeve, grooved *	PP	d 63 – DN 50	1019207
	PP	d 20 – DN 15	1001395
	PP	d 16 – DN 10	1001785
	PP	d 32 – DN 25	1001787
	PP	d 40 – DN 32	1005105
	PP	d 50 – DN 40	1025960
	PP	d 25 – DN 20	1036258
	PVDF	d 50 – DN 40	1025959
	PVDF	d 32 – DN 25	1001788
	PVDF	d 63 – DN 50	1019208
	PVDF	d 25 – DN 20	1036259

* Should be used in combination with ProMinent's PTFE shaped composite seals.

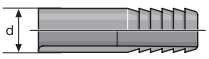


Product designation	Material	Diameter Ø D1 mm	Diameter Ø D2 mm	Connector size	Order no.
SS fusion coupler, grooved	1.4404	15.0	19.5	d 12 – DN 10	1006011
	1.4404	21.0	25.6	d 16 – DN 15	1006001
	1.4404	26.7	33.6	d 22 – DN 20	1031457
	1.4404	33.4	39.6	d 28 – DN 25	1031458
	1.4404	42.2	49.6	d 36 – DN 32	1031459
	1.4404	48.3	57.5	d 40 – DN 40	1023643
	1.4404	71.6	60.3	d 54 – DN 50	1031460



PVC short reducing union

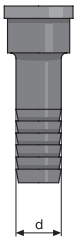
	Material	d1 mm	d2 mm	Order no.
PVC short reducing union	PVC	12	8	357025
	PVC	16	12	357026
	PVC	20	16	357027
	PVC	25	20	357028



PVC hose connection nozzle

Description	Material	Dimension d mm	Ohne Titel (durch-messer)	Order no.
PVC hose connection nozzle	PVC	12	DN 8	356655
	PVC	16	DN 10	356656
	PVC	20	DN 15	356657
	PVC	25	DN 20	356658

1.6 Accessories for low-pressure metering pumps

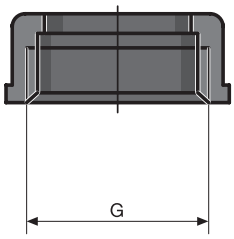


Pressure hose nozzles with seal

Product designation	Material	Connector size	Order no.
Hose nozzle, grooved	PVDF	d 40 – DN 32	1005106
Pressure hose nozzle	PVC	d 20 – DN 15	811407
	PVC	d 16 – DN 10	800554
	PVC	d 25 – DN 20	811408
	PVC	d 32 – DN 25	811409
	PTFE	d 16 – DN 10	811572
	PTFE	d 20 – DN 15	811424
	PP	d 32 – DN 25	811418
	PP	d 20 – DN 15	800655
	PP	d 25 – DN 20	800656
	PP	d 16 – DN 10	800657
	1.4571	d 25 – DN 20	810568
	1.4571	d 40 – DN 32	1005360
	1.4571	d 16 – DN 10	810536
	1.4571	d 20 – DN 15	810567
	1.4571	d 32 – DN 25	810569

Product designation [generated]	Material	Connector size	Order no.
Hose nozzle, grooved *	PVDF	d 16 – DN 10	1002288
	PVDF	d 20 – DN 15	740632
	PVDF	d 25 – DN 20	1006014
	PVDF	d 32 – DN 25	1005560
	PVDF	d 40 – DN 32	1005106

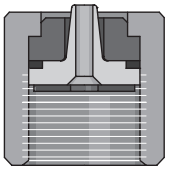
* Should be used in combination with ProMinent's PTFE shaped composite seals.



Union Nuts

Product designation	Material	Connector size	Order no.
Union nut	PP	G 5/8 – DN 8	800665
	PP	G 2 1/4 - DN 40	358618
	PP	G 2 - DN 32	358617
	PP	G 1 1/2 - DN 25	358616
	PP	G 1 1/4 – DN 20	358615
	PP	G 1 – DN 15	358614
	PP	G 3/4 - DN 10	358613
	1.4571	G 2 1/4 - DN 40	805275
	1.4571	G 2 3/4 - DN 50	805276

1.6 Accessories for low-pressure metering pumps



Single Connector Kit

Connection kit for fitting hoses of different sizes to the suction and pressure connector of the dosing head of alpha, Beta®, gamma, delta®, Pneumados b and accessories, consisting of hose nozzle, clamp ring, union nut and seal for one or two connectors.

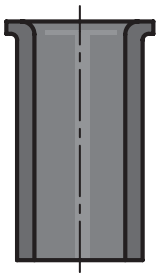
Material	Description	oØ x iØ mm	Order no.
PP/EPDM (PPE)	for hose	6 x 4	817160
PP/EPDM (PPE)	for hose	8 x 5	817161
PP/EPDM (PPE)	for hose	12 x 9	817162
PP/EPDM (PPE)	for hose	10 x 4	1002587
PP/EPDM (PPE)	for hose	12 x 6	817163
PP/EPDM (PPE)	for hose	6 x 4 – 12 x 6	1021475
PP/FKM (PPB)	for hose	6 x 4	817173
PP/FKM (PPB)	for hose	8 x 5	817174
PP/FKM (PPB)	for hose	12 x 9	817175
PP/FKM (PPB)	for hose	10 x 4	1002588
PP/FKM (PPB)	for hose	12 x 6	817176
PVC/EPDM (PCE)	for hose	6 x 4	791161
PVC/EPDM (PCE)	for hose	8 x 5	792058
PVC/EPDM (PCE)	for hose	12 x 9	790577
PVC/EPDM (PCE)	for hose	10 x 4	1002590
PVC/EPDM (PCE)	for hose	12 x 6	792062
PVC/FKM (PCB)	for hose	6 x 4	817065
PVC/FKM (PCB)	for hose	8 x 5	817066
PVC/FKM (PCB)	for hose	12 x 9	817067
PVC/FKM (PCB)	for hose	10 x 4	1002589
PVC/FKM (PCB)	for hose	12 x 6	817068
PVC/FKM (PCB)	for hose	6 x 4 – 12 x 6	1021476
PVDF (PVT)	for hose	6 x 3	1024583
PVDF (PVT)	for hose	6 x 4	1024619
PVDF (PVT)	for hose	8 x 4	1033148
PVDF (PVT)	for hose	8 x 5	1024620
PVDF (PVT)	for hose	12 x 9	1024618
PVDF (PVT)	for hose	10 x 4	1024585
PVDF (PVT)	for hose	12 x 6	1024617
PVDF (PVT)	for hose	6 x 4 – 12 x 6	1028082
PVDF (PVF) FDA-compliant	for hose	6 x 4 – 12 x 6	1080391
PTFE (TTT)	for hose	6 x 4	817205
PTFE (TTT)	for hose	8 x 5	817206
PTFE (TTT)	for hose	12 x 9	817207
PTFE (TTT)	for hose	12 x 6	817208

1.6 Accessories for low-pressure metering pumps

Double Connector Kit

Material	Description	oØ x iØ mm	Order no.
PP/EPDM (PPE)	for hose	6 x 4	817150
PP/EPDM (PPE)	for hose	8 x 5	817153
PP/EPDM (PPE)	for hose	12 x 9	817151
PP/EPDM (PPE)	for hose	12 x 6	817152
PP/FKM (PPB)	for hose	6 x 4	817166
PP/FKM (PPB)	for hose	8 x 5	817167
PP/FKM (PPB)	for hose	12 x 9	817168
PP/FKM (PPB)	for hose	12 x 6	817169
PVC/EPDM (PCE)	for hose	6 x 4	817060
PVC/EPDM (PCE)	for hose	8 x 5	817048
PVC/EPDM (PCE)	for hose	12 x 9	817049
PVC/EPDM (PCE)	for hose	12 x 6	791040
PVC/FKM (PCB)	for hose	6 x 4	817050
PVC/FKM (PCB)	for hose	8 x 5	817053
PVC/FKM (PCB)	for hose	12 x 9	817051
PVC/FKM (PCB)	for hose	12 x 6	817052
PVDF (PVT)	for hose	6 x 4	1023246
PVDF (PVT)	for hose	8 x 5	1023247
PVDF (PVT)	for hose	12 x 9	1023248
PVDF (PVT)	for hose	12 x 6	1024586
PTFE (TTT)	for hose	6 x 4	817201
PTFE (TTT)	for hose	8 x 5	817204
PTFE (TTT)	for hose	12 x 9	817202
PTFE (TTT)	for hose	12 x 6	817203

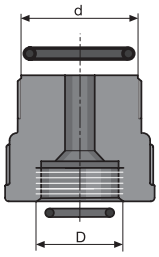
Support Insert Made of Stainless Steel No. 1.4571



For connection of PE or PTFE pipe to stainless steel connectors using Swagelock and Serto systems.

	oØ x iØ	Order no.
for hose	6 x 4	359365
for hose	8 x 5	359366
for hose	12 x 9	359368
for hose	8 x 6	359362
for hose	12 x 10	359363

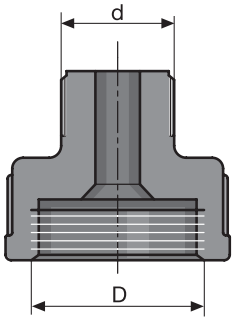
1.6 Accessories for low-pressure metering pumps



Single adapter kit

For connection of system + GF+ threaded connectors to metering pumps and accessories.

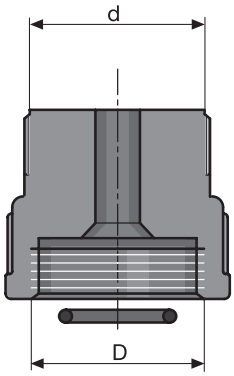
Material	Size for threaded connector	Internal thread D	External thread d	Order no.
PP	DN 8	M20 x 1.5	G 5/8	817164
PP/FKM	DN 8	M20 x 1.5	G 5/8	740604
PVC/EPDM	DN 8	M20 x 1.5	G 5/8	740583
PC/FKM	DN 8	M20 x 1.5	G 5/8	817069
PVDF/PTFE	DN 8	M20 x 1.5	G 5/8	1031073
PP	DN 10	M20 x 1.5	G 3/4	817165
PP/FKM	DN 10	M20 x 1.5	G 3/4	817178
PVC/EPDM	DN 10	M20 x 1.5	G 3/4	740585
PC/FKM	DN 10	M20 x 1.5	G 3/4	740601
PVDF/PTFE	DN 10	M20 x 1.5	G 3/4	1028409



Single adapter kit

For mounting accessory parts of the A, B, C and E product ranges on the current M20 x 1.5 connectors.

Material	Size	Internal thread D	External thread d	Order no.
PP	6-8 mm connector	M20 x 1.5	G 1/4	811904
PVC	6-8 mm connector	M20 x 1.5	G 1/4	811902



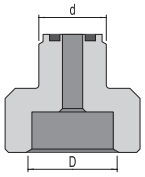
Single adapter kit

For mounting current accessories with M20 x 1.5 connector on metering pumps of the A, B, C and E product ranges.

Material	Size	Internal thread D	External thread d	Order no.
PC/FKM	6-8 mm connector	G 1/4	M20 x 1.5	741087
PP	12 mm connector	G 3/8	M20 x 1.5	741090
PC/FKM	12 mm connector	G 3/8	M20 x 1.5	741089
PTFE	12 mm connector	G 3/8	M20 x 1.5	741092

1.6 Accessories for low-pressure metering pumps

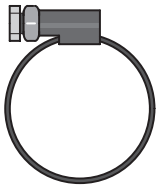
Adapter



Adapter suitable for connector kit for 12 x 9 hose.

Material	Internal thread D	External thread d	Order no.
PP	DN 10, G 3/4	M20 x 1.5	800815
PVC	DN 10, G 3/4	M20 x 1.5	800816
PVDF	DN 10, G 3/4	M20 x 1.5	1017406
PVDF	DN 15, G 1	M20 x 1.5	1028530
PVDF, FDA-compliant	DN 10, G 3/4	M20 x 1.5	1080408

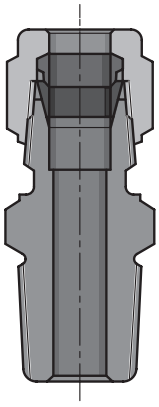
Stainless Steel Threaded Clip



For connecting suction and dosing line with pressure hose sleeve.

Product designation	bandwidth mm	Clamping range mm	Order no.
DN 10 clamping ring	9	16–25	359703
DN 15 clamping ring	9	20–32	359705
DN 20 clamping ring	9	25–40	359706
DN 25 clamping ring	9	32–50	359707
DN 32 clamping ring	9	40–60	1002777
Jubilee clip	18	21–23	1042885
Jubilee clip	18	25–27	1042886
Jubilee clip	18	31–34	1042887
Jubilee clip	18	37–40	1042888
Jubilee clip	20	51–55	1042889

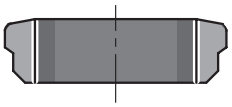
Straight Male Adapter Stainless Steel



Swagelock system, stainless steel SS 316 (1.4401) for fitting tubing to dosing heads and valves with inner threads and for SB versions.

Description	Order no.
6 mm - ISO 7 R 1/4	359526
8 mm - ISO 7 R 1/4	359527
12 mm - ISO 7 R 1/4	359528
12 mm - ISO 7 R 3/8	359520
16 mm - ISO 7 R 3/8	359521
16 mm - ISO 7 R 1/2	359529

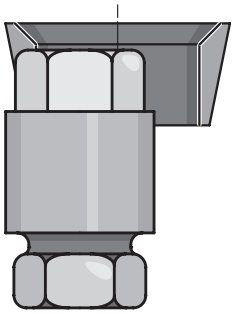
1.6 Accessories for low-pressure metering pumps



Stainless steel clamping ring sets

For use with stainless steel threaded connectors for metering pumps and Swagelok accessories. Both parts must be replaced at the same time. Set consists of back and front clamping rings.

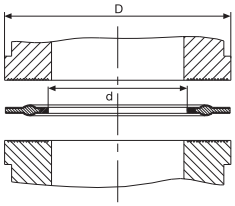
	Diameter (outer Ø)	Order no.
Set of rings Ø 6 for pipe	6	104232
Set of rings Ø 8 for pipe	8	104236
Set of rings Ø 12 for pipe	12	104244



Stainless steel threaded connector

Serto system for connecting PE or PTFE discharge line to stainless steel pipe, made from stainless steel with clamping ring, but without support insert (parts in contact with chemicals stainless steel 1.4571).

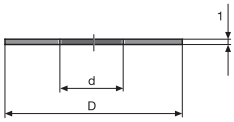
	Order no.
6 mm outer diameter to 6 mm outer diameter stainless steel pipe	359317
8 mm outer diameter to 8 mm outer diameter stainless steel pipe	359318
12 mm outer diameter to 12 mm outer diameter stainless steel pipe	359320



PTFE Formed Composite Seals

Formed composite seals to be used on grooved sealing surfaces (e.g. pump valve and grooved inserts from ProMinent).

Connector width DIN / ANSI	Material	Dimension D mm	Dimension d mm	Order no.
DN 10	PTFE	23.8	14.0	1019364
DN 15	PTFE	29.5	18.0	1019365
DN 20	PTFE	38.0	22.6	1019366
DN 25	PTFE	44.0	27.6	1019367
DN 32	PTFE	56.0	34.6	1019353
DN 40	PTFE	62.0	40.6	1019368



Set of Elastomer Flat Packing Seals

Comprising two EPDM and two FKM seals. An elastomer flat seal should be used with non-grooved sealing surfaces. Leaks may occur at the connection if a PTFE shaped composite seal is used.

Product designation	Seal material	Dimension d mm	Dimension D mm	Order no.
DN 10	(EPDM/ FKM)	14.0	23.5	1024159
DN 15	(EPDM/ FKM)	18.0	29.5	1024160
DN 20	(EPDM/ FKM)	22.6	38.0	1036254
DN 25	(EPDM/ FKM)	28.0	44.0	1024161
DN 32	(EPDM/ FKM)	36.0	56.0	1024162
DN 40	(EPDM/ FKM)	41.0	62.0	1029508

comprising two EPDM seals, physiologically safe (FDA). An elastomer flat seal must be used with smooth sealing surfaces. If a PTFE shaped composite seal is used, leakage may occur at the connection.

1.6 Accessories for low-pressure metering pumps

Product designation	Seal material	Dimension d	Dimension D	Order no.
		mm	mm	
DN 10	EPDM	14.0	23.5	1045440
DN 15	EPDM	18.0	29.5	1045441
DN 25	EPDM	28.0	44.0	1045442

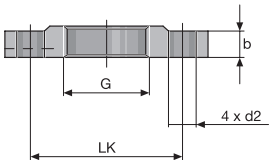
1.6 Accessories for low-pressure metering pumps

Flat seals for stainless steel liquid ends

consisting of two PTFE flat seals Gylon Style 3504, physiologically safe (EU Regulation 1935/2004).

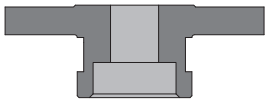
Product designation	Seal material	Dimension D mm	Dimension d mm	Order no.
DN 10	PTFE	23.8	14.0	1107282
DN 15	PTFE	29.5	18.0	1107281
DN 20	PTFE	38.0	22.6	1107299
DN 25	PTFE	44.0	27.6	1107280
DN 32	PTFE	56.0	34.6	1107300
DN 40	PTFE	62.0	40.6	1107301

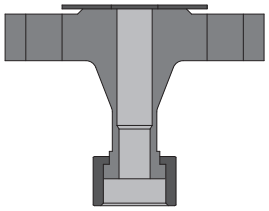
Flange Mountings



Flange connection for ProMinent valve sizes.

Material		Connector width DIN / ANSI	Pressure rating	Dimension b mm	Diameter (Ø HC) mm	d2 mm	Order no.
PVDF		G 3/4 - DN 10	PN 16	12.4	60	14	1036274
PVDF		G 1 - DN 15	PN 16	13.0	65	14	1036275
PVDF		G 1 1/4 - DN 20	PN 16	15.0	75	14	1036276
PVDF		G 1 1/2 - DN 25	PN 16	16.0	85	14	1036277
PVDF		G 2 - DN 32	PN 16	18.0	100	18	1036278
PVDF		G 2 1/4 - DN 40	PN 16	20.0	100	18	1039037
PVDF	With seal	G 3/4 - DN 10	PN 16	12.5	60	14	1036279
PVDF	With seal	G 1 - DN 15	PN 16	13.5	65	14	1036280
PVDF	With seal	G 1 1/2 - DN 25	PN 16	16.0	85	14	1036281
PVDF	With seal	G 2 - DN 32	PN 16	18.0	100	18	1036282
1.4404		G 3/4 - DN 15	PN 40	12.0	65	14	803946
1.4404		G 1 - DN 15	PN 40	12.0	65	14	803940
1.4404		G 1 1/4 - DN 20	PN 40	15.0	75	14	803941
1.4404		G 1 1/2 - DN 25	PN 40	15.0	85	14	803942
1.4404		G 2 - DN 32	PN 40	18.0	100	18	1036283
1.4404		G 2 1/4 - DN 40	PN 40	20.0	110	18	803943
1.4404		G 2 3/4 - DN 50	PN 40	25.0	125	18	1020453
1.4404		G 2 1/2 - DN 65	PN 40	20.0	145	18	1010700
1.4571	With seal	G 3/4 - DN 10 (DIN 2637)	PN 100	20.0	70	14	1006005
1.4571	With seal	G 1 - DN 15 (DIN 2637)	PN 40	16.0	65	14	1006006
1.4404	With seal	G 1 1/2 - DN 25 (DIN 1092-1)	PN 40	18.0	85	14	1041796
1.4404	With seal	G 2 - DN 32 (DIN 1092-1)	PN 40	18.0	100	18	1041797

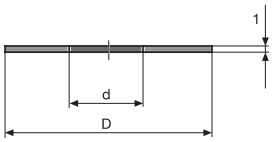




1.4571/1.4404 with collar

Further material versions and details available on request.

1.6 Accessories for low-pressure metering pumps



Flat Seals for Threaded Flange to DIN 2566

Material	Connector width DIN / ANSI	Dimension D mm	Dimension d mm	Order no.
PTFE	G 3/4 - DN 15	52	12	483938
PTFE	G 1 - DN 15	52	17	483924
PTFE	G 1 1/4 - DN 20	62	22	483925
PTFE	G 1 1/2 - DN 25	72	27	483926
PTFE	G 2 - DN 32	83	33	1007541
PTFE	G 2 1/4 - DN 40	92	40	483928
PTFE	G 2 3/4 - DN 50	108	50	483929
PTFE	G 3 - DN 65	130	60	1020466
FKM A	G 3/4 - DN 15	52	12	483939
FKM A	G 1 - DN 15	52	17	483942
FKM A	G 1 1/4 - DN 20	62	22	483943
FKM A	G 1 1/2 - DN 25	72	27	483944
FKM A	G 1 1/2 - DN 32	83	33	1007542
FKM A	G 2 1/4 - DN 40	92	40	483946
FKM A	G 3 - DN 65	130	60	1020467

Flange mountings as DIN 2629. To order for Meta HK and Makro TZ HK plunger metering pumps.

FKM = Fluorine Rubber

1.6 Accessories for low-pressure metering pumps

Pulsation Damper / Diaphragm Accumulator for Low Pressure Metering Pumps

Pulsation dampers are available in different versions: as in-line dampers and as accumulators.

Pulsation dampers are used for low-pulsation metering and to reduce the flow resistance with long metering lines. They are also ideally suited to viscous media. The gas cushion between the housing and hose is compressed when the metering pump has a pressure stroke, at the same time as a partial volume of the medium is metered into the metering line. The overpressure that forms in the gas cushion causes the compressed volume to be transported on at the following suction stroke and the original, relaxed volume of gas is present again

Important: Protect the pulsation dampers in principle with a relief valve.

PP In-Line Damper

Please note: Only use pulsation dampers in conjunction with an overflow device with adjustable back pressure / relief valve. With this: Dummy plugs to seal the output side of the damper in installations with a T-piece.

Application

5-30°C - max. operating pressure 10 bar

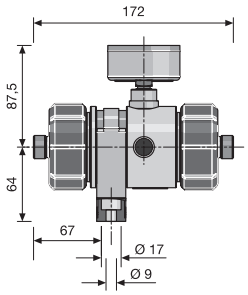
40 °C - max. operating pressure 8 bar

60 °C - max. operating pressure 4 bar

Damper diaphragm is replaceable, seals made of EPDM.

Medium temperature max. 50 °C

Pre-pressure is approx. 0.6 x operating pressure.



P_AC_0180_SW

Product designation	Volume l	Tubular diaphragms	Seal material	Connector size	Order no.
PPE in-line damper	0.05	CSM	EPDM	M20 x 1.5	1026768
PPB in-line damper	0.05	FKM A	FKM A	M20 x 1.5	1026771
PPE in-line damper	0.05	CSM	EPDM	G 3/4 - DN 10	1026769
PPB in-line damper	0.05	FKM A	FKM A	G 3/4 - DN 10	1026772
PDS 2.5	2.50	Hypalon	EPDM	G 2 – DN 32	1001344
PDS 2.5	2.50	FKM A	FKM A	G 2 – DN 32	1001345

For other sizes (0.2 l and 0.5 l), see PVDF inline pulsation damper.

Blanking threaded connector PP

Material	Connector size	Order no.
PP	M20 x 1.5	1030200
PP	G 3/4 - DN 10	1001352

PVC In-Line Damper

Please note: Only use pulsation dampers in conjunction with an overflow device with adjustable back pressure / relief valve.

With this: Dummy plugs to seal the output side of the damper in installations with a T-piece.

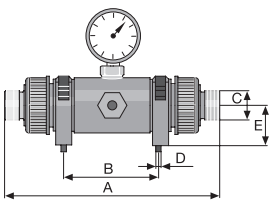
Application

5-20°C - max. operating pressure 10 bar

40 °C - max. operating pressure 6 bar

60 °C - max. operating pressure 2 bar

Removable hose, FKM seals.



A	541
B	525
C	G2
D	11
E	99,5

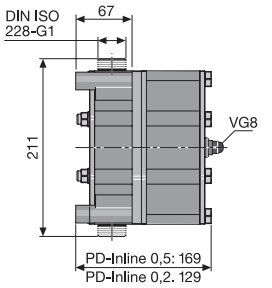
1.6 Accessories for low-pressure metering pumps

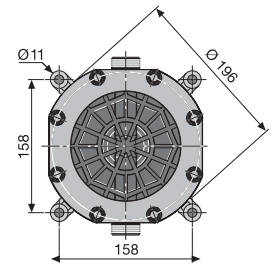
Product designation	Volume l	Tubular diaphragms	Seal material	Connector size	Order no.
PCE in-line damper	0.05	CSM	EPDM	M20 x 1.5	1026774
PCB in-line damper	0.05	FKM A	FKM A	M20 x 1.5	1026777
PCE in-line damper	0.05	CSM	EPDM	G 3/4 - DN 10	1026775
PCB in-line damper	0.05	FKM A	FKM A	G 3/4 - DN 10	1026778
PDS 2.5	2.50	Hypalon	FKM A	G 2 – DN 32	1001342
PDS 2.5	2.50	FKM A	FKM A	G 2 – DN 32	1001343

For other sizes (0.2 l and 0.5 l), see PVDF inline pulsation damper.

Blanking threaded connector PP

Material	Connector size	Order no.
PVC	M20 x 1.5	1030458
PVC	G 3/4 - DN 10	1001349





pk_2_106_1

PVDF In-Line Pulsation Damper

Function: Hydropneumatic reservoir with deflection

The PVDF reservoir with PTFE diaphragm offers excellent chemical resistance, making it suitable for a wide range of liquids. The pulsation damper has two liquid connections and can be installed either directly in the pipe or diagonally across with a set of blanking plugs. Deflection in the fluid valve aims the volume flow directly at the diaphragm. This causes the volume flow to come into direct contact with the diaphragm. In this way the trapped gas volume optimally balances out fluctuations in the volume flow.

Important: The pulsation dampers should always be protected by a relief valve.

Type	Volume l	Max. pressure bar	Connector size	Order no.
PD In-line	0.2	10	G 1 – DN 15	1026252
PD In-line	0.5	10	G 1 – DN 15	1026736
PD In-line	0.2	16	G 1 – DN 15	1033446
PD In-line	0.5	16	G 1 – DN 15	1033447
PD In-line	0.2	25	G 1 – DN 15	1036154
PD In-line	0.5	25	G 1 – DN 15	1036155

The preload pressure is approximately 0.6 x the operating pressure. Maximum medium temperature, 65 °C. Connection parts must be ordered separately.

The reservoir is filled with nitrogen via the VG8 gas filling connector or with compressed air using a standard filling valve (e.g. a car tyre valve).

Important: If using combustible liquids, nitrogen must be used as a filling gas. Do not use oxygen under any circumstances!

Configuration: DGRL97/23/EC, other acceptances / countries upon request

Fluid group: 1 and 2

Certificates: Manufacturer's test certificate M DIN55350 – 18
Wetted materials - FDA physiologically safe

Manufacturer: HYDAC Technology

Connection/adapter kits

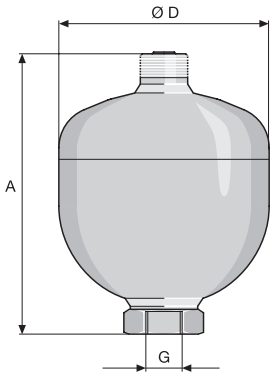
Consisting of a PTFE shaped composite seal, insert/adapter piece and union nut.

1.6 Accessories for low-pressure metering pumps

Connection size	Connection Piping	Material	Order no.
G 1 – DN 15	DN 10	PP	1029424
G 1 – DN 15	DN 10	PVC	1029425
G 1 – DN 15	DN 10	PVDF	1029426
G 1 – DN 15	DN 15	PP	1029443
G 1 – DN 15	DN 15	PVC	1029444
G 1 – DN 15	DN 15	PVDF	1029445
G 1 – DN 15	DN 20	PP	1029427
G 1 – DN 15	DN 20	PVC	1029428
G 1 – DN 15	DN 20	PVDF	1029429
G 1 – DN 15	DN 25	PP	1029430
G 1 – DN 15	DN 25	PVC	1029431
G 1 – DN 15	DN 25	PVDF	1029432

Accessories/Spare Parts

	Material	Order no.
Set of plugs	PVDF/PTFE	1029446
Valve tool for gas valve insert	Steel	1029661
Separating diaphragm	PTFE/NBR	1025235
Gas valve assembly	1.4571/FKM/PTFE/MS	1029513
Gas valve insert	FKM/PTFE /MS	1029514
Gas valve insert	FKM/PTFE /NIRO	1029515
Manometer with connection adapter	-	1031556
Charging hose with connector for compressed air system, 25 bar; 2.5 m	-	1036156
Charging hose with connector for nitrogen bottle or pressure reducer	-	1036157



Other accumulator/diaphragm materials available on request.

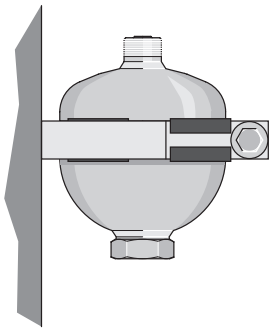
Response pressure: 2 bar (nitrogen).

Admissible operating temperature: -10 to +80 °C.

Stainless Steel Pulsation Damper

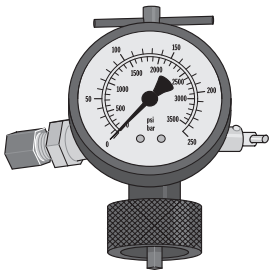
Volume	Max. pressure	Diaphragm material	Connector G	Dimension A	Diameter Ø D	Order no.
	bar			mm	mm	
0.16	180	NBR	Rp 1/2	124	74	1008609
0.16	180	Butyl	Rp 1/2	124	74	1008610
0.16	180	FKM A	Rp 1/2	124	74	1008611
0.32	160	NBR	Rp 1/2	137	93	1008612
0.32	160	Butyl	Rp 1/2	137	93	1008613
0.32	160	FKM A	Rp 1/2	137	93	1008644
0.75	140	NBR	Rp 1/2	168	121	1008645
0.75	140	Butyl	Rp 1/2	168	121	1008646
0.75	140	FKM A	Rp 1/2	168	121	1008647
2.00	100	NBR	Rp 3/4	224	167	1008648
2.00	100	Butyl	Rp 3/4	224	167	1008649
2.00	100	FKM A	Rp 3/4	224	167	1008650
0.75	140	NBR	Rp 1	168	121	1027617
0.75	140	Butyl	Rp 1	168	121	1027618
0.75	140	FKM A	Rp 1	168	121	1027619
2.00	100	NBR	Rp 1 1/2	224	167	1027620
2.00	100	Butyl	Rp 1 1/2	224	167	1027621
2.00	100	FKM A	Rp 1 1/2	224	167	1027622

1.6 Accessories for low-pressure metering pumps



Mounting clamp for stainless steel pulsation damper

Volume l	Number of Clamps	Diameter Ø D mm	Order no.
0.16	1	74	1008664
0.32	1	93	1008665
0.75	1	121	1008666
2.00	1	167	1008667
4.00	2	170	1008668



Inflation and testing unit for pulsation damper

The test and filling device is used to charge pressure reservoirs with nitrogen and to check or change the prevailing precharge pressure.

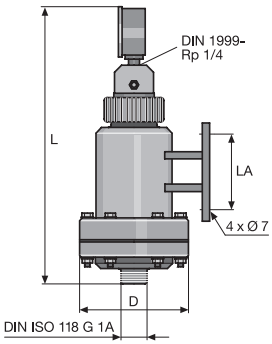
It includes:

- Test and filling device with manometer, check valve on charging connector, in-built bleeder valve, valve stem for opening the gas charging valve on the reservoir
- Charging hose, length 2 m

Adjustment range	Order no.
Up to 25 bar	1008769
Up to 100 bar	1008669
Up to 250 bar	1008670

1.6 Accessories for low-pressure metering pumps

Accumulators



Pulsation dampers with separating diaphragm / bubble for providing separation between the gas cushion and metered chemical are used for low-pulsation metering as well as for reducing the flow resistance in long metering lines and with viscous media. The preload pressure of the gas cushion should be approx. 60-80% of the operating pressure.

Important: A pressure relief valve should always be fitted with an adjustable back pressure valve when using a pulsation damper.

PVC Accumulators

Accumulator removable, FKM seals.

Application (0.5/1 l)

25 °C - max. operating pressure 10 bar

40 °C - max. operating pressure 6 bar

Application (2.5/5 l)

25 °C - max. operating pressure 6 bar

40 °C - max. operating pressure 4 bar

Volume	Diaphragm material	Connector size	L dimension	Diameter Ø D	Dimension LA	Order no.
			mm	mm	mm	
0.5	Butyl	G 1 - DN 15	361	145	100	791691
0.5	FKM A	G 1 - DN 15	361	145	100	791695
1.0	Butyl	G 1 1/4 - DN 20	411	170	100	791692
1.0	FKM A	G 1 1/4 - DN 20	411	170	100	791696
2.5	Butyl	G 1 1/2 - DN 25	571	170	190	791693
2.5	FKM A	G 1 1/2 - DN 25	571	170	190	791697

Please note: All vacuum cylinders with EPDM seal material are glued with Tangit. It is essential that the durability of Tangit adhesive is observed. All vacuum cylinders with FKM seal material are glued with DTX.

PP Accumulators

Accumulator removable, FKM seals.

Application (0.5/1 l)

25 °C - max. operating pressure 10 bar

40 °C - max. operating pressure 6 bar

Application (2.5/5 l)

25 °C - max. operating pressure 6 bar

40 °C - max. operating pressure 4 bar

1.6 Accessories for low-pressure metering pumps

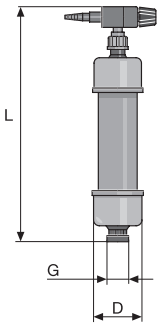
Volume	Diaphragm material	Connector size	L dimension mm	Diameter Ø D mm	Dimension LA mm	Order no.
1.0	Butyl	G 1 1/4 - DN 20	411	170	100	792129
1.0	FKM A	G 1 1/4 - DN 20	411	170	100	792133
2.5	Butyl	G 1 1/2 - DN 25	571	170	190	792130
2.5	FKM A	G 1 1/2 - DN 25	571	170	190	792134

1.6 Accessories for low-pressure metering pumps

Vacuum Cylinder

Pulsation dampers with no diaphragm separating the gas cushion and the chemical are used to produce minimal pulsation metering and to reduce flow resistance in long pipes and when metering viscous liquids.

Important: When using accumulators or pulsation dampers it is imperative that a relief valve with an adjustable back pressure valve is fitted.



PVC Vacuum Cylinder

Vacuum cylinder as priming aid for long suction line and viscous media. Housing – with PVC transparent middle section. With connector for vacuum pump.

Max. operating pressure: 2 bar at 40 °C operating temperature.

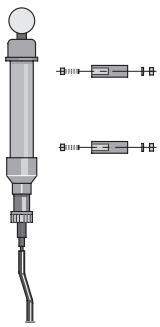
Max. permitted negative pressure 300 mbar absolute

With this: Vacuum pump assembly

Volume l	Connector size	Seal material	L dimension* mm	Dimension D mm	Order no.
0.5	G 1 – DN 15	FKM A	380	78	243591
0.5	G 1 – DN 15	EPDM	380	78	1025699
1.0	G 1 1/4 – DN 20	FKM A	440	86	243592
1.0	G 1 1/4 – DN 20	EPDM	440	86	1025701
2.5	G 1 1/2 – DN 25	FKM A	520	133	243593
2.5	G 1 1/2 – DN 25	EPDM	520	133	1025702
5.0	G 2 1/4 – DN 40	FKM A	630	155	243594
5.0	G 2 1/4 – DN 40	EPDM	630	155	1025703

* Approximate values

Please note: All vacuum cylinders with EPDM seal material are glued with Tangit. It is essential that the durability of Tangit adhesive is observed. All vacuum cylinders with FKM seal material are glued with DTX.

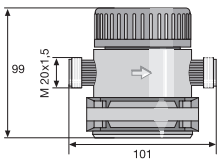


Vacuum Pump Assembly / Priming Aid

For pulsation dampers, suction side (vacuum cylinder accumulator).

Material	Seals	Order no.
PVC	EPDM	790019

*** Caution:** The product contains adhesive joints with Tangit. Please note the resistance of Tangit adhesive.



Suction pressure regulator

The suction pressure regulator is a spring-loaded diaphragm valve (max. 50 l/h), which is opened through the effect of the pump's suction pressure. This ensures that no medium can flow if the pump is not running or no vacuum can be produced as a result of a line rupture.

An adjustable spring can be used to set the maximum negative pressure needed for the respective operating situation up to 400 mbar. For pumps with a positive feed pressure, a very low vacuum of approx. 50 mbar is sufficient. In each instance, this vacuum must be generated by the pump, even if the feed is at atmospheric pressure.

1.6 Accessories for low-pressure metering pumps

An unwanted suction effect at the pump outlet (e. g. siphon effect) must be ruled out by using a back pressure valve.

Max. flow rate	50
Max. feed pressure	4
Max. intake pressure	0.3
Max. temperature	40
Housing material	PVC
Diaphragm material	FKM A
Seals	FKM A
Ball material	Glass
Spring material	Hastelloy C

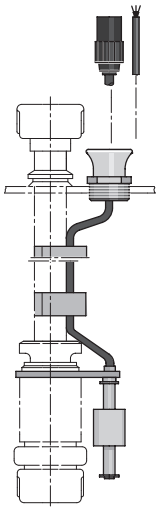
Type	Product designation	Connector size	Order no.
SDR 50	For solenoid-driven pumps	M20 x 1.5	1005505
SDR 50	For motor-driven pumps up to 50 l/h	G 3/4 - DN 10	1005506

Connectors must be ordered separately.

*** Caution:** The product contains adhesive joints with Tangit. Please note the resistance of Tangit adhesive.

1.6 Accessories for low-pressure metering pumps

Suction Lances, Suction Kit Without Level Switch



Level Switch Kit Complete, PVDF, Two-Stage with Round Connector or Lead

The level switch set can be ordered in conjunction with the DN 10 - DN 32 suction assemblies.

For level monitoring in the supply tank, two-stage with pre-warning alarm message and switch-off of the metering pump after a further 30 mm reduction in level.

Switching mode when liquid level low: 2 x N/C

Technical data:

Max. switching voltage: 24 V

Switching current: 0.5 A

Switching power: 5 W/5 VA

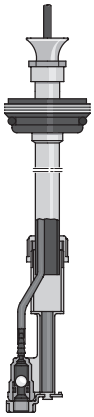
Temperature range: -10 °C to 65 °C

Degree of protection: IP 67

Material:

Body of level switch PVDF, float PE, fastening lug PVDF, cable holder PE, anti-kink protection PE, cable PE.

Connector size	Version	Lead length m	Order no.
DN10/15	with 3-pin round plug	3	1034879
DN 20	with 3-pin round plug	3	1034880
DN 25	with 3-pin round plug	3	1034881
DN 32	with 3-pin round plug	3	1034882
DN 10/15	with lead	5	1034883
DN 20	with lead	5	1034884
DN 25	with lead	5	1034885
DN 32	with lead	5	1034886



Variable suction lance without level switch for 200-litre barrel

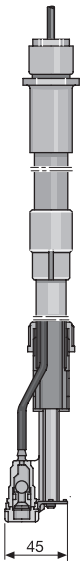
Variable suction lance without level switch for connection to 200 litre barrel, comprising a support pipe, foot valve, height-adjustable 2” screw plug (DIN S70x6) and 3 m long suction line. Length 1,000 mm.

Note: Adapters for other threads are available on request.

To fit metering pumps of the alpha and Pneumados product ranges.

Material	PPE	PCB
Support pipe and foot valve	PP	PVC
Seals and valve ball	EPDM/ceramic	FKM/ceramic
Hose	PE	Soft PVC

Material	Length mm	Hose oØ x iØ mm	For tank	Order no.
PPE	1,000	6 x 4	200 l / 2”	790545
PPE	1,000	8 x 5	200 l / 2”	790546
PPE	1,000	12 x 9	200 l / 2”	790547
PCB	1,000	6 x 4	200 l / 2”	790542
PCB	1,000	8 x 5	200 l / 2”	790543
PCB	1,000	12 x 9	200 l / 2”	790544



Variable suction assembly without level switch for PE 35 dosing tank up to 1,500 litres

Variable suction assembly without level switch for connection to 35 – 1,500 litre storage tanks, comprising a support pipe, foot valve, threaded connector and 2 m suction line. Adjustable length.

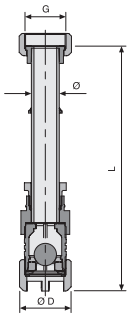
For 1,500-litre storage tanks, fixed length with 3-metre suction line.

To fit metering pumps of the alpha and Pneumados product ranges.

Material	PPE	PCB
Support pipe and foot valve	PP	PVC
Seals and valve ball	EPDM/ceramic	FKM/ceramic
Hose	PE	Soft PVC

Material	**Long support pipe mm**	**Hose oØ x iØ mm**	**For tank**	**Order no.**
PPE	375 – 550	6 x 4	35, 60 l	790333
PPE	375 – 550	8 x 5	35, 60 l	790334
PPE	375 – 550	12 x 9	35, 60 l	790335
PPE	655 – 1.060	6 x 4	100, 140, 250, 500 l	790336
PPE	655 – 1.060	8 x 5	100, 140, 250, 500 l	790337
PPE	655 – 1.060	12 x 9	100, 140, 250, 500 l	790338
PPE	1.085 – 1.425	6 x 4	1000 l	790453
PPE	1.085 – 1.425	8 x 5	1000 l	790454
PPE	1.085 – 1.425	12 x 9	1000 l	790455
PPE	fixed length	6 x 4	1500 l	1078653
PPE	fixed length	8 x 5	1500 l	1078685
PPE	fixed length	12 x 9	1500 l	1078687
PCB	375 – 550	6 x 4	35, 60 l	790327
PCB	375 – 550	8 x 5	35, 60 l	790328
PCB	375 – 550	12 x 9	35, 60 l	790329
PCB	655 – 1.060	6 x 4	100, 140, 250, 500 l	790330
PCB	655 – 1.060	8 x 5	100, 140, 250, 500 l	790331
PCB	655 – 1.060	12 x 9	100, 140, 250, 500 l	790332
PCB	1.085 – 1.425	6 x 4	1000 l	790450
PCB	1.085 – 1.425	8 x 5	1000 l	790451
PCB	1.085 – 1.425	12 x 9	1000 l	790452
PCB	fixed length	6 x 4	1500 l	1078652
PCB	fixed length	8 x 5	1500 l	1078684
PCB	fixed length	12 x 9	1500 l	1078686

1.6 Accessories for low-pressure metering pumps



Suction assembly PPE for tanks up to 1,500 litres

Connector size	Dimension G	Tank contents l	Diameter Ø mm	Diameter Ø D mm	L dimension mm	Order no.
DN 10	3/4	1,000	20	47	1,340	790389
DN 15	1	1,000	20	47	1,320	790394
DN 20	1 1/4	1,000	25	55	1,345	790395
DN 25	1 1/2	1,000	32	60	1,315	790396
DN 32	2	1,000	40	74	1,170	1005524
DN 10	3/4	1,500	20	47	1,830	1077554

Suction assembly without level switch comprising a support pipe, foot valve and threaded connector. The length L of the support pipe can be adjusted (shortened) by the customer.

Note: In applications with a hose, the suction assembly/hose connector kit, consisting of a PVDF screw-in nozzle and a PTFE shaped composite seal, can be used.

Suction assembly PCB for tanks up to 1,500 litres

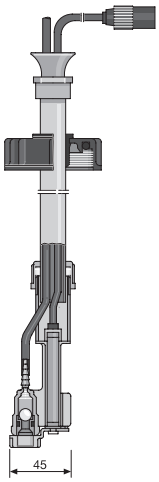
Connector size	Dimension G	Tank contents l	Diameter Ø mm	Diameter Ø D mm	L dimension mm	Order no.
DN 10	3/4	1,000	20	47	1,340	790387
DN 15	1	1,000	20	47	1,320	790391
DN 20	1 1/4	1,000	25	55	1,345	790392
DN 25	1 1/2	1,000	32	60	1,315	790393
DN 32	2	1,000	40	74	1,170	1005525
DN 10	3/4	1,500	20	47	1,830	1077555

Suction assembly without level switch comprising a support pipe, foot valve and threaded connector. The length L of the support pipe can be adjusted (shortened) by the customer.

Note: In applications with a hose, the suction assembly/hose connector kit, consisting of a PVDF screw-in nozzle and a PTFE shaped composite seal, can be used.

Important: The product contains connections bonded with Tangit. Always note the durability of Tangit adhesive.

Suction Lances, Suction Assemblies with Two-Stage Level Switch



Variable suction lance with two-stage level switch

Variable suction lance with two-stage level switch for connection to 5 - 60 litre disposable tanks, comprising a support pipe, foot valve, level switch with round plug, height-adjustable Ø 50 mm screw cap and 2 m long suction line. Length 640 mm.

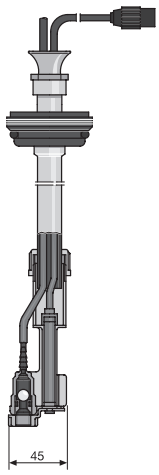
Switching mode when liquid level low: 2 x N/C

Suitable for metering pumps of the Beta®, gamma/ X, delta® and DULCO®flex DF4a (6 x 4) product ranges.

Note: For container openings with Ø 44, the required screw cap Ø 44 is available as an individual part and can be swapped for the screw cap Ø 50 by the customer.

Material	PPE	PCB
Support pipe and foot valve	PP	PVC
Seals and valve ball	EPDM	FKM
Hose	PE	Soft PVC

Material	Length mm	Hose oØ x iØ mm	For tank	Order no.
PPE	640	6 x 4	5–60 l / 50 mm	802277
PPE	640	8 x 5	5–60 l / 50 mm	802278
PPE	640	12 x 9	5–60 l / 50 mm	790372
PCB	640	6 x 4	5–60 l / 50 mm	802077
PCB	640	8 x 5	5–60 l / 50 mm	802078
PCB	640	12 x 9	5–60 l / 50 mm	790371



Variable suction lance with two-stage level switch for 200-litre barrel

Variable suction lance with 2-stage level switch for connection to 200 litre barrel, comprising a support pipe, foot valve, level switch with round connector, height-adjustable sealing stopper and 3 m suction line. Length 1,000 mm.

Switching mode when liquid level low: 2 x N/C

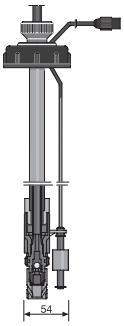
Suitable for metering pumps of the Beta®, gamma/ X and delta® product ranges.

Note: Adapters for other threads are available on request

Material	PPE	PCB
Support pipe and foot valve	PP	PVC
Seals and valve ball	EPDM	FKM
Hose	PE	Soft PVC

Material	Length mm	Hose oØ x iØ mm	For tank	Order no.
PPE	1,000	6 x 4	200 l	802279
PPE	1,000	8 x 5	200 l	802280
PPE	1,000	12 x 9	200 l	790374
PCB	1,000	6 x 4	200 l	802079
PCB	1,000	8 x 5	200 l	802080
PCB	1,000	12 x 9	200 l	790373

1.6 Accessories for low-pressure metering pumps



Suction lance with two-stage level switch for 60-litre canister, fixed length, gas-tight

Variable suction lance with 2-stage level switch for connection to 60 litre canister, gas-tight, comprising a support pipe, foot valve, level switch with round plug, Ø 55 mm screw cap and 2 m long suction line. Length 560 mm. Design with vent valve and bleed valve.

Switching mode when liquid level low: 2 x N/C

Suitable for metering pumps of the Beta®, gamma/ X and delta® product ranges.

Material	PPE	PCB
Support pipe and foot valve	PP	PVC
Seals and valve ball	EPDM	FKM
Hose	PE	Soft PVC

Material	**Length** **mm**	**Hose** **oØ x iØ** **mm**	**For tank**	**Order no.**
PPE	560	6 x 4	60 l / 55 mm	802285
PPE	560	8 x 5	60 l / 55 mm	802286
PPE	560	12 x 9	60 l / 55 mm	802287
PCB	560	6 x 4	60 l / 55 mm	802081
PCB	560	8 x 5	60 l / 55 mm	802082
PCB	560	12 x 9	60 l / 55 mm	802083



Suction lance with two-stage level switch

Fixed length suction lance made of PVDF with two-stage level switch, consisting of PVDF support pipe, foot valve, two-stage level switch with open end and PTFE suction line 8 x 6 mm.

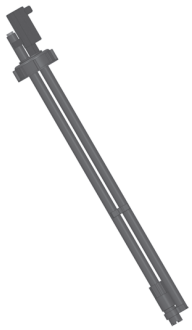
Note: A matching connector kit for hose 8/6 to standard 6/4, 8/5 and 12/9 connectors is included in the scope of delivery.

Switch mode when liquid level low: 2 x N/C

Suitable for metering pumps of the Beta®, gamma/ X and delta® product ranges using a 2 m level sensor cable, order no. 707715.

Material	PVT
Support pipe and foot valve	PVDF
Seals and valve ball	PTFE
Hose	PTFE

Material	**Length** **mm**	**Hose** **oØ x iØ** **mm**	**For tank**	**Order no.**
PVT	350	8 x 6	10–30 l	1038304
PVT	650	8 x 6	50–60 l	1038305



Suction lances with continuous level measurement

Suction lance with continuous level measurement for connection via the 3-pin level switch input to metering pumps of the gamma/ X and gamma/ XL product ranges. For precise consumption detection, prediction of chemical range and planning of subsequent deliveries web-based via DULCONNEX.

The scope of delivery includes a 3 m connecting cable with plug-in connectors for the suction lance and metering pump as well as a 3 m suction line

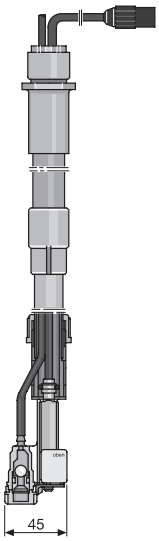
With adjustable screw cap 50 mm, length of suction lance to fit 30 l tank size.

Wetted materials PE, ceramic valve ball.

Material	PET
Support pipe and foot valve	PE/PVDF
Seals and valve ball	PTFE/ceramic
Hose	PE

Material	Length mm	Hose oØ x iØ mm	For tank	Order no.
PET	480	6 x 4	30 l	1094379
PET	480	8 x 5	30 l	1094382
PET	480	12 x 9	30 l	1094380

1.6 Accessories for low-pressure metering pumps



Suction assembly with two-stage level switch for PE 35 dosing tanks up to 1,500 litres

Variable suction assembly with two-stage level switch for connection to 35 to 1,500 litre tanks, comprising a support pipe, foot valve, level switch with 3-pin round connector and 2 m long suction line, or 3 m for 1,000 litre tanks. Adjustable length.

For 1,500-litre storage tanks, fixed length with 3-metre suction line.

Switching mode when liquid level low: 2 x N/C

Suitable for metering pumps of the Beta®, gamma/ X and delta® product ranges.

Material	PPE	PCB
Support pipe and foot valve	PP	PVC
Seals and valve ball	EPDM	FKM
Hose	PE	Soft PVC

Material	**Long support pipe mm**	**Hose oØ x iØ mm**	**For tank**	**Order no.**
PPE	375 – 550	6 x 4	35, 60 l	790365
PPE	375 – 550	8 x 5	35, 60 l	790366
PPE	375 – 550	12 x 9	35, 60 l	790367
PPE	655 – 1.060	6 x 4	100–500 l	790368
PPE	655 – 1.060	8 x 5	100–500 l	790369
PPE	655 – 1.060	12 x 9	100–500 l	790370
PPE	1.085 – 1.425	6 x 4	1000 l	790465
PPE	1.085 – 1.425	8 x 5	1000 l	790466
PPE	1.085 – 1.425	12 x 9	1000 l	790467
PPE	fixed length	6 x 4	1500 l	1077558
PPE	fixed length	8 x 5	1500 l	1077519
PPE	fixed length	12 x 9	1500 l	1077560
PCB	375 – 550	6 x 4	35, 60 l	790359
PCB	375 – 550	8 x 5	35, 60 l	790360
PCB	375 – 550	12 x 9	35, 60 l	790361
PCB	655 – 1.060	6 x 4	100–500 l	790362
PCB	655 – 1.060	8 x 5	100–500 l	790363
PCB	655 – 1.060	12 x 9	100–500 l	790364
PCB	1.085 – 1.425	6 x 4	1000 l	790462
PCB	1.085 – 1.425	8 x 5	1000 l	790463
PCB	1.085 – 1.425	12 x 9	1000 l	790464
PCB	fixed length	6 x 4	1500 l	1077559
PCB	fixed length	8 x 5	1500 l	1077520
PCB	fixed length	12 x 9	1500 l	1077561

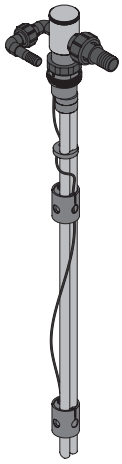


pk_1_066

Screw Cap

For container openings with Ø 44, the required screw cap Ø 44 is available as an individual part and can be swapped for the screw cap Ø 50 by the customer.

	Order no.
Ø 44 screw cap	811626



A Overall length
B Immersion depth
C Diameter of the immersion pipe
D Threaded connector adjustment range
E Warning level adjustment range
F Switch-off level adjustment range

PPE Universal Suction Lance

Universal suction lance made of PP in 4 sizes for use in canisters, barrels or containers. The suction lance is configured as standard with return, ventilation function and 2-stage level monitoring. The height-adjustable level switch and tank threaded connectors ensure flexible adaptation to the process or tank height. In addition, the suction tube length can easily be shortened by the customer. A PTFE ball check is incorporated and prevents the suction line from running dry. With IBC container suction lances (1039399, 1046672), the screw lid DN150 can be installed by the customer onto other G2" vent openings.

The suction lance is supplied with all additional parts in cardboard packaging.

Material version: PP with EPDM seals.

Suction connector is not supplied ready mounted. Fittings and pressure hose sleeves in DN 10, DN 15, DN 20, DN 25 (not for canisters) plus FKM seal form part of the scope of delivery.

Return connector is not supplied ready mounted. Fittings and pressure hose sleeves in DN 10, DN 15, plus an FKM blanking plug and seal form part of the scope of delivery. Max. flow 130 l/h, 2 bar.

Level: Level switches are protected by tube sections in drum and container lances. The lance level output is in the form of an M12 plug. Please place a separate order for the level signal cable for connection to ProMinent metering pumps or a PLC or terminal box.

Tank connection: 20 l and 20-60 l canisters: Ø 50 screw lid 200 l drum: 70x6 opening in plastic bung drum IBC container: DN150 IBC cap

Electrical accessories → 252

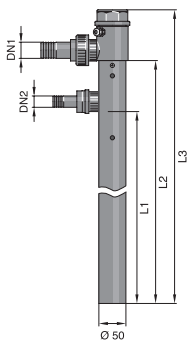
Version	Dimension A	B dimension	Dimension C	Dimension D			Order no.
	mm	mm	mm	mm	mm	mm	
For 20-litre canister	542	405	41	100	250	200	1039206
For 20 – 60-litre canister	584	447	41	100	300	200	1038817
For 200-litre drum	1,072	935	51	50	700	700	1039397
For container IBC	1,162	1,025	51	50	800	800	1039399

PPE universal suction lance, "physiologically safe" design

The universal suction lance is also available as a "Physiologically safe (FDA) in respect of wetted materials" design.

Version	Dimension A	B dimension	Dimension C	Dimension D			Order no.
	mm	mm	mm	mm	mm	mm	
For 20-litre canister	542	405	41	100	250	200	1046668
For 20 – 60-litre canister	584	447	41	100	300	200	1046670
For 200-litre drum	1,072	935	51	50	700	700	1046671
for IBC containers	1,162	1,025	51	50	800	800	1046672 *

* Replace the screw lid when using FDA containers.



Suction lance with two-stage level switch

Suction lance with two-stage level switch in PVC protective tube Ø 50 with check valve in DN 10-DN 25, flap valve in DN 32 (valve is not removable).

For sizes DN 10/15 and DN 20/25, connector components for both sizes plus a dummy panel for the return line are included in the scope of supply. A return line is not available for suction lances of size DN 32. Barrel suction lances are fitted with a barrel lid.

2-stage level switch is wired to a terminal in the head.

Level sensor cable must be ordered separately.

Special designs (materials, functions, Dytex adhesive etc.) are available on request.

1.6 Accessories for low-pressure metering pumps

Reed cable with round 3-pin connector, PE

*** Caution:** The product contains adhesive joints with Tangit. Please note the resistance of Tangit adhesive.

Suction lance for 200 l/600 l drum

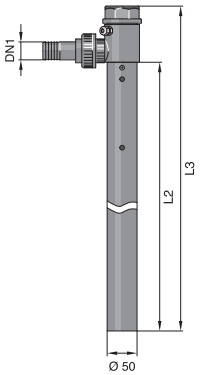
Version	Suction connector DN 1	Return DN 2	Seals	L1	L2	L3	Order no.
				mm	mm	mm	
PCB	10/15	10/15	FKM A	1,000	1,100	1,200	1037748
PCE	10/15	10/15	EPDM	1,000	1,100	1,200	1037749
PCB	20/25	20/25	FKM A	1,000	1,100	1,200	1037750
PCE	20/25	20/25	EPDM	1,000	1,100	1,200	1037751
PCB	32	-	FKM A	-	1,100	1,200	1037752
PCE	32	-	EPDM	-	1,100	1,200	1037753

L1: Length up to return

L2: Length up to suction connector

L3: Overall length

Suction lance for 1,000 l container



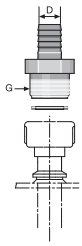
Version	Suction connector DN 1	Return DN 2	Seals	L1	L2	L3	Order no.
				mm	mm	mm	
PCB	10/15	10/15	FKM A	1,200	1,300	1,400	1037722
PCE	10/15	10/15	EPDM	1,200	1,300	1,400	1037723
PCB	20/25	20/25	FKM A	1,200	1,300	1,400	1037744
PCE	20/25	20/25	EPDM	1,200	1,300	1,400	1037745
PCB	32	-	FKM A	-	1,300	1,400	1037746
PCE	32	-	EPDM	-	1,300	1,400	1037747

L1: Length up to return

L2: Length up to suction connector

L3: Overall length

Intake Fitting – Hose Connection Kit

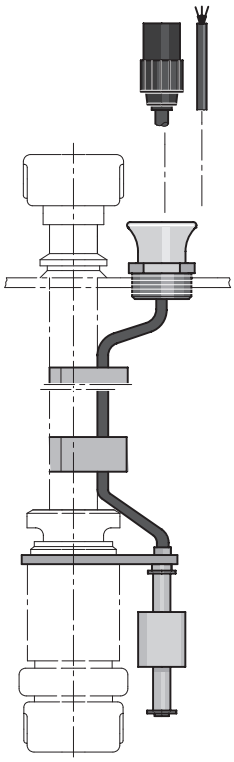


Comprising PVDF screw-in nozzle and a PTFE shaped composite seal.

Suitable for PPE suction assembly for 1000 l tank

Connector size	Material	Dimension G	Diameter Ø D	Order no.
			mm	
DN 10	PVDF	3/4	16	1029486
DN 15	PVDF	1	20	1029487
DN 20	PVDF	1 1/4	25	1029488
DN 25	PVDF	1 1/2	32	1029489
DN 32	PVDF	2	40	1029490

Level Switch, Ceramic Weight, Extension Cable



Level Switch Kit Complete, PVDF, Two-Stage with Round Connector or Lead

The level switch set can be ordered in conjunction with the DN 10 - DN 32 suction assemblies.

For level monitoring in the supply tank, two-stage with pre-warning alarm message and switch-off of the metering pump after a further 30 mm reduction in level.

Switching mode when liquid level low: 2 x N/C

Technical data:

Max. switching voltage: 24 V

Switching current: 0.5 A

Switching power: 5 W/5 VA

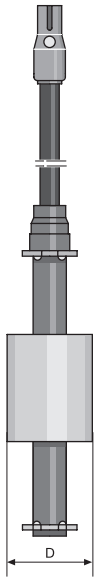
Temperature range: -10 °C to 65 °C

Degree of protection: IP 67

Material:

Body of level switch PVDF, float PE, fastening lug PVDF, cable holder PE, anti-kink protection PE, cable PE.

Connector size	Version	Lead length m	Order no.
DN10/15	with 3-pin round plug	3	1034879
DN 20	with 3-pin round plug	3	1034880
DN 25	with 3-pin round plug	3	1034881
DN 32	with 3-pin round plug	3	1034882
DN 10/15	with lead	5	1034883
DN 20	with lead	5	1034884
DN 25	with lead	5	1034885
DN 32	with lead	5	1034886



Level switch, single-stage with flat plug

Single-stage level switch with flat plug for level monitoring in the supply tank.

Suitable for metering pumps of the D_4a product range.

Technical data

Max. switching voltage 24 V

Switching current 0.5 A

Switching power 5 W/5 VA

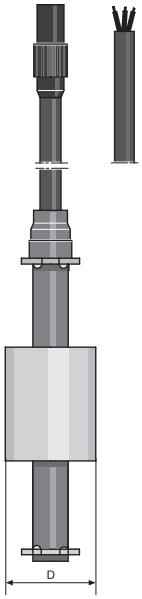
Temperature range -10 °C to 65 °C, degree of protection IP 67

Switching mode: at liquid level low 1 x N/O.

Material	PVDF/PE	PVDF/PVDF
Level switch	PVDF	PVDF
Float	PE foamed	PVDF
Cable	PE	PE

Material	Lead length	Order no.
PVDF/PE	2 m	1031588
PVDF/PE	5 m	1031590
PVDF/PVDF	2 m	1034695
PVDF/PVDF	5 m	1034696

1.6 Accessories for low-pressure metering pumps



Two-Stage Float Switch

Two-stage level switch for level monitoring in the storage tank with pre-warning alarm message and switch-off of the metering pump after a further 30 mm reduction in level.

With a 3-pin round connector for direct connection to metering pump or with 3 leads, e.g. in conjunction with relay control, order no. 914768.

Switch mode when liquid level low: 2 x N/C

Suitable for metering pumps of the Beta®, gamma/ X and delta® product ranges.

Technical data

Max. switching voltage: 24 V DC, Switching current: 0.5 A, Switching power: 5 W/5 VA,

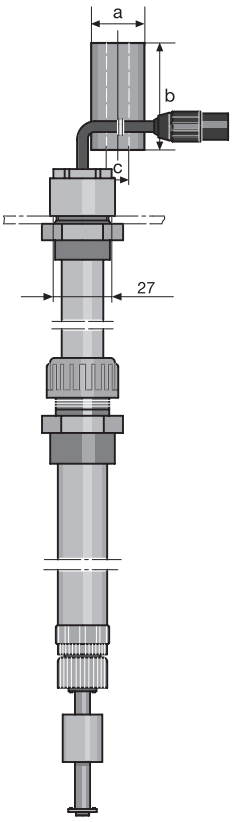
Temperature range: - 10 °C to 65 °C, Degree of protection IP 67.

Material	**PVDF/PE**	**PVDF/PVDF**
Level switch	PVDF	PVDF
Float	PE foamed	PVDF
Cable	PE	PE

Material		Lead length	Order no.
PVDF/PE	Round plug	2 m	1031604
PVDF/PE	Round plug	5 m	1031606
PVDF/PE	Open end	2 m	1031607
PVDF/PE	Open end	5 m	1031609
PVDF/PVDF	Round plug	2 m	1034697
PVDF/PVDF	Round plug	5 m	1034698
PVDF/PVDF	Open end	2 m	1034699
PVDF/PVDF	Open end	5 m	1034700

Cable assignment on 3-wire cable:

Colour	Function
black	Ground
blue	Minimum pre-warning
brown	Minimum limit stop



Ceramic Weight for Vertical Fixing of Float Switch

Product designation	Ø A mm	B dimension mm	Ø C mm	Weight g	Version	Order no.
Size 1	25	50	10	60	For round and latch plug	1019244
Size 2	39	32	-	65	For round plug/flat connector	404004
Size 3	40	50	24	70	For round plug/flat connector	1030189

13 x 27 mm slot

With the two-stage level switch with round connector, the weight is slid on from below after the float is removed.

Level switch with support pipe

Level switch for use in media which attack the PE cable of the level switch and/or for stable attachment in conjunction with electric stirrer, FKM seal. Adjustable length.

2-stage switch mode when liquid level low: 2 x N/C

1-stage switch mode when liquid level low: 1 x N/O

1.6 Accessories for low-pressure metering pumps

Material	**PCB**
Support pipe	PVC
Seals	FKM
Level switch	PVDF
Cable	PE

Material	Length mm	Length mm	Float switch	
PCB	350	550	two-stage with round connector	802010
PCB	660	1,160	two-stage with round connector	802011
PCB	350	550	single-stage with flat plug	801727
PCB	660	1,160	single-stage with flat plug	801728



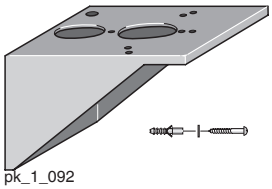
Extension Lead, 3-Core

Extension cable for level switch with 3-pin round plugs, comprising 3 m cable, plug and coupling.

	Order no.
Extension cable, 3-pin, 3 m length	1005559

1.6 Accessories for low-pressure metering pumps

Wall Brackets for Metering Pumps


pk_1_092

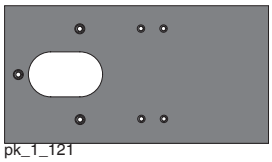
PPE Wall Mounting Bracket

Wall bracket made of fibreglass-reinforced PPE to hold metering pumps, including attachment fittings. Dimensions (L x W x H): 208 x 120 x 140 mm.

To fit all metering pumps of the alpha, Beta® and gamma/ X product ranges.

The metering pumps of the Beta®/ 4 and gamma/ X product ranges can either be mounted parallel or cross-wise to each other.

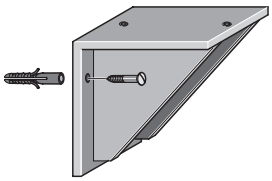
	Fig.	Order no.
for BT4, BT5, gamma/ X	pk_1_092	810164


pk_1_121

PP Adapter Plate

With fixing materials for vertical wall-mounting of Beta® or gamma pumps with self-degassing liquid ends. Used with PPE wall bracket.

	Fig.	Order no.
for BT4, BT5, gamma/ X	pk_1_121	1003030

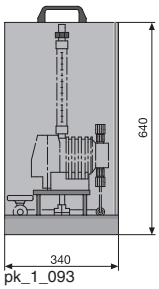


PP Wall Bracket

PP wall mounting, holds pump parallel to the wall, includes fixings.

Measurements: L x W x H, 230 x 220 x 220 mm

	Order no.
gamma/ XL, DFXa, Vario and Sigma	1001906



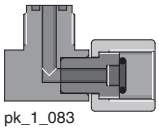
pk_1_093

Portable Plastic Pump Stand

To accommodate a metering pump of the product range beta® or gamma/ X. The pump stand can either be designed in PP or black PE. It is prepared for accommodating a fixed pipe and has collector equipment for escaping feed chemical, e.g. in the event of a leakage on the suction line or a rupture of the diaphragm.

Supplied with carrying handle, but without pump and pipework

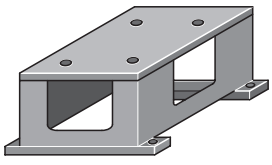
	Fig.	Order no.
Light grey PP	pk_1_093	1000180
Black PE	pk_1_093	1000181


pk_1_083

PVC Right-Angled Threaded Connector

For mounting multifunctional valve onto Beta® or gamma/ L models, self-degassing liquid end version.

Description	Material	Fig.	Order no.
PCE Version	PVC/EPDM	pk_1_083	1003472
PCB Version	PC/FKM	pk_1_083	1003318



PP Foot Bracket

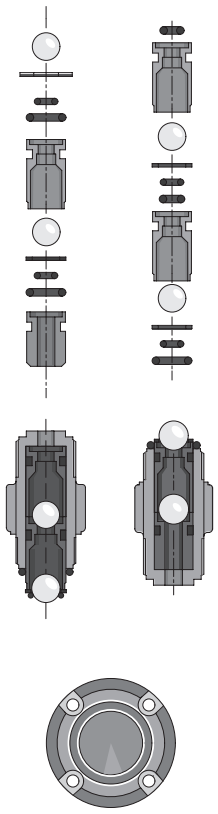
For mounting metering pump, includes fixings. Material PP.

Measurements: L x W x H 250 x 160 x 150 mm

	Order no.
PP foot brackets	809910

1.6.4 Mechanical/hydraulic special accessories

Spare Parts Kits



Spare Parts Kits for Solenoid-Driven Metering Pump Beta® a and gamma/ L

Spare parts kits for beta® a and gamma/ L, consisting of:

- 1 metering diaphragm
- 1 suction valve assembly
- 1 discharge valve assembly
- 2 valve balls
- 1 connector kit

Stainless steel design without suction valve assembly and without discharge valve assembly

1.6 Accessories for low-pressure metering pumps

Type selection	Materials in Contact With the Medium	Order no.
1000	PPE	1001644
	PPB	1001652
	NPE	1001713
	NPB	1001721
	NPT, PPT, PVT	1023107
	TTT	1001737
	SST	1001729
1601	PPE	1001645
	PPB	1001653
	NPE	1001714
	NPB	1001722
	NPT, PPT, PVT	1023108
	TTT	1001738
	SST	1001730
1602	PPE	1001646
	PPB	1001654
	NPE	1001715
	NPB	1001723
	NPT, PPT, PVT	1023109
	TTT	1001739
	SST	1001731
0708, 1008	PPE	1001648
	PPB	1001656
	NPE	1001717
	NPB	1001725
	NPT, PPT, PVT	1023111
	PVT4	1019067
	TTT	1001741
	SST	1001733
0413, 0713	PPE	1001649
	PPB	1001657
	NPE	1001718
	NPB	1001726
0220, 0420	PPE	1001650
	PPB	1001658
	NPE	1001719
	NPB	1001727
	NPT, PPT, PVT	1023113
	PVT4	1019070
	TTT	1001754
	SST	1001735
0232	PPE	1001651
	PPB	1001659
	NPE	1001720
	NPB	1001728
	NPT, PPT, PVT	1023124
	TTT	1001755
	SST	1001736
1005, 1605	PVT4	1019066
	TTT	1001740
	SST	1001732
	PPE	1001647
	PPB	1001655
	NPE	1001716
	NPB	1001724
	NPT, PPT, PVT	1023110

Spare Parts Kits for Solenoid-Driven Metering Pump Beta® a and gamma/ L

with Self-bleeding Dosing Head with Bypass (SEK)

Spare parts kits for beta® a and gamma/ L with self-bleeding dosing head, consisting of:

- 1 metering diaphragm
- 1 suction valve assembly
- 1 discharge valve assembly
- 1 bleed valve assembly
- 2 valve balls
- 1 connector kit

Type selection	Materials in Contact With the Medium	Order no.
1601	PPE9	1001756
	PPB9	1001762
	NPE9	1001660
	NPB9	1001666
1602	PPE9	1001757
	PPB9	1001763
	NPE9	1001661
	NPB9	1001667
1005, 1605	PPE9	1001758
	PPB9	1001764
	NPE9	1001662
	NPB9	1001668
0708, 1008	PPE9	1001759
	PPB9	1001765
	NPE9	1001663
	NPB9	1001669
0413, 0713	PPE9	1001760
	PPB9	1001766
	NPE9	1001664
	NPB9	1001670
0220, 0420	PPE9	1001761
	PPB9	1001767
	NPE9	1001665
	NPB9	1001671

Pump Diaphragms

Spare diaphragms for solenoid-driven metering pumps Beta® a and gamma/ L

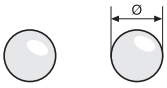
Type selection	Materials in Contact With the Medium	Order no.
1000		1000244
1601		1000245
1602		1000246
0708, 1008		1000248
0413, 0713		1000249
0220, 0420		1000250
0232		1000251
1005, 1605		1000247

1.6 Accessories for low-pressure metering pumps

Custom Valve Balls/Valve Springs

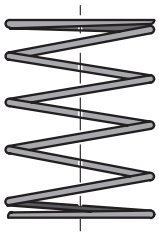
For on-site retrofitting of metering pumps and accessories, for applications where standard materials are unsuitable. Supplied loose only, not fitted.

Valve balls



Material	Diameter Ø mm	Description	Order no.
PTFE	4.7	for valve Ø 6 mm	404255
PTFE	9.5	for valve Ø 8 and 12 mm	404258
PTFE	11.0	for valve DN 10	404260
PTFE	16.0	to valve DN 15	404259
Ceramic	4.7	for valve Ø 6 mm	404201
Ceramic	9.2	for valve Ø 8 and 12 mm	404281
Ceramic	11.0	for valve DN 10	404277
Ceramic	16.0	to valve DN 15	404275
stainless steel 1.4404	4.7	for valve Ø 6 mm	404233
stainless steel 1.4404	9.5	for valve Ø 8 and 12 mm	404240
PTFE	20.0	to valve DN 20	404256
PTFE	25.0	to valve DN 25	404257
PTFE	38.1	to valve DN 40	404261
Ceramic	20.0	to valve DN 20	404273
Ceramic	25.0	to valve DN 25	404274
Ceramic	38.1	to valve DN 40	404278

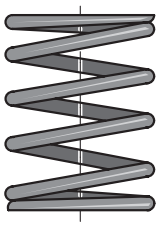
Valve springs for liquid ends



With approx. 0.1 bar priming pressure for spring loading of the valve balls in the liquid end. Recommended to improve the valve function and increase metering accuracy, in particular for viscous metering media above 50 mPas.

Material	Priming pressure bar	Description	Order no.
1.4571	0.1	for valve 4.7	469406
1.4571	0.1	for valve 9.2	469403
1.4571	0.1	for mikro g/ 5	469437
1.4571	0.1	for mikro g/ 5	469438
1.4571	0.1	for mikro g/ 5	469439
Hast. C	0.1	for valve DN 10	469114
Hast. C	0.1	for valve DN 15	469107
Hast. C	0.1	for valve DN 20	469451
Hast. C	0.1	for valve DN 25	469452
1.4571	0.1	for connector R 1/4" Meta/Makro TZ HK	469461
1.4571	0.1	for R 3/8" connector Makro TZ HK	469462

Valve springs for injection valves



Approx. 0.5/1/2 bar prepressure for increasing metering accuracy and preventing suction and siphoning effect.

1.6 Accessories for low-pressure metering pumps

Material	Priming pressure bar	Description	Order no.
Hast. C	0.5	for DN 20	469409
Hast. C	1.0	for DN 20	469135
Hast. C	0.5	for DN 25	469414
Hast. C	1.0	for DN 25	469136
Hast. C	0.5	for DN 40	469104
Hast. C	0.5	for DN 32	1002799
Hast. C	1.0	for DN 32	1002805
1.4568	0.5	for DN 10	1079882
1.4568	0.5	for DN 15	1079883
1.4568	0.5	for DN 20	1079894
1.4568	0.5	for DN 25	1079895
1.4568	1.5	for DN 25	1080071
1.4568	2.0	for DN 25	1080070

Valve spring made of Hastelloy C with FEP coating

The FEP-coated Hastelloy C valve spring is ideal for use with chemically aggressive products.

Material	Priming pressure bar	Description	Order no.
Hast. C/FEP	0.5	for R 1/2” connector – Ø 6, 8 and 12 mm	818590
Hast. C/FEP	1.0	for R 1/2” connector – Ø 6, 8 and 12 mm	818536
Hast. C/FEP	0.5	for DN 10	818515
Hast. C/FEP	0.5	for DN 15	818516
Hast. C/PVDF	0.5	for DN 20	818517
Hast. C/PVDF	0.5	for DN 25	818518

1.6 Accessories for low-pressure metering pumps

Adapter (complete) from M20 x 1.5 to G3/4 DN10

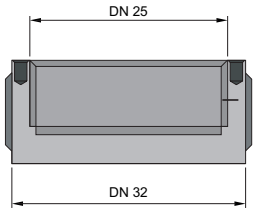
Consisting of an adapter and a PTFE, EPDM/P, FPM-A flat seal and PTFE shaped composite seal.

Suitable for connection of the flow meter DulcoFlow® to a Sigma/ 1.

	Material	Order no.
Adapter (complete) from M20 x 1.5 to G3/4 DN10	PVT	1028409

1.6 Accessories for low-pressure metering pumps

Valve adapter DN 32 - DN 25



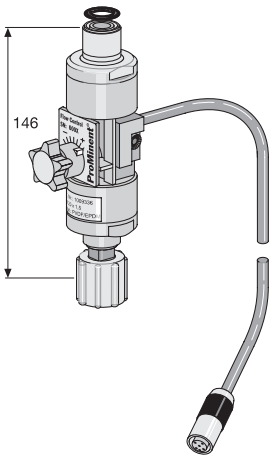
Suitable for the liquid end of the Sigma/ 3 metering pump FM 1000 up to 600 l/h.

	Material version	Material	Order no.
Valve adapter DN 32 - DN 25	SST	1.4404	1035729
Valve adapter DN 32 - DN 25	PVT	PVDF	1035732
Valve adapter DN 32 - DN 25	TT	PTFE	1040414

1.6 Accessories for low-pressure metering pumps

1.6.5 Electrical Accessories

Metering Monitor, Signal Cable



Flow Control Dosing Monitor for Discharge Side Installation

Metering monitor complete with connector cable for assembly directly on the dosing head to monitor individual strokes based on the float principle. The adjustment screw is used to match the partial flow flowing past the float to the respective stroke volume so that an alarm is emitted if the level is transgressed by approx. 20%. The permitted number of incompletely performed strokes on gamma/ X and gamma/ XL metering pumps can be selected as a figure between 1 to 127, ensuring optimum adaptation to process requirements.

Suitable for metering pumps of the gamma/ X and gamma/ XL product ranges in PP, NP, PV and TT material versions.

Important: It is essential that you observe the minimum values for the stroke length. The design of the pressure stroke must be set to “fast”.

Materials

Housing:	PVDF
Float:	PTFE-coated
Seals:	FKM/EPDM

Flow Control for Discharge Side Installation

Note the minimum values for the stroke length.

Flow Control	For pump type	Material	Order no.
Size I	GMXa 1602	PVDF/EPDM	1009229
Size I	GMXa 1602	PVDF/FKM	1009335
Size II	GMXa 1604-0245, GXLa 1608-0730	PVDF/EPDM	1009336
Size II	GMXa 1604-0245, GXLa 1608-0730	PVDF/FKM	1009338

Pump type	Mean operating pressure	Stroke length (scale division)	Maximum permissible operating pressure	Stroke length (scale division)
1602	8 bar	> 50 %	16 bar	> 60 %
1604	5 bar	> 30 %	16 bar	> 50 %
0708	4 bar	> 30 %	7 bar	> 40 %
1009	5 bar	> 30 %	10 bar	> 40 %
0414	2 bar	> 30 %	4 bar	> 30 %
0715	4 bar	> 30 %	7 bar	> 30 %
0220	1 bar	> 30 %	2 bar	> 30 %
0424	2 bar	> 30 %	4 bar	> 30 %

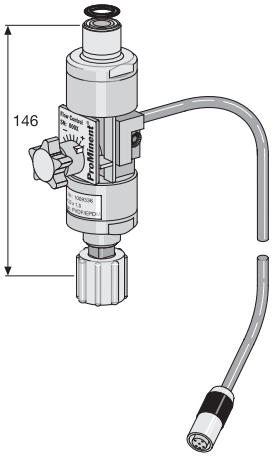
Flow Control for Suction Side Installation

Individual strokes are detected on the suction side where the flow velocity is sufficiently high. With water as the medium, the minimum stroke length is 30% and the suction stroke is normal, HV1 or HV2.

Suitable for metering pumps of the gamma/ X and gamma/ XL product ranges with slow compression stroke.

1.6 Accessories for low-pressure metering pumps

Flow Control	For pump type	Material	Order no.
Size II	GMXa 1604-0245, GXLa 1608-0730	PVDF/EPDM	1036407
Size II	GMXa 1604-0245, GXLa 1608-0730	PVDF/FKM	1036409
Size III	GXLa 0450 – 0280	PVDF/EPDM	1036439
Size III	GXLa 0450 – 0280	PVDF/FKM	1036440



Metering monitor Flow Control set up for motor-driven metering pumps

Suitable for GXLa 0450/0280 pumps and the Sigma 1/2/3 product range in the PVT and SST material versions. Complete with connector cable for assembly directly on the dosing head.

For monitoring the individual strokes based on the float principle. The adjustment screw is used to match the partial flow flowing past the float to the set stroke volume so that an alarm is emitted if the level falls significantly below the required level. The permitted number of incompletely performed strokes on the Sigma Control (S1Cb/S2Cb/S3Cb) can be selected as a figure between 1-150, ensuring optimum adaptation to process requirements.

Materials

Flow meter: PVDF
Float: PTFE-coated
Seals: FKM/EPDM

Measured variable	For pump type	Material	Nominal diameter	Order no.
Size III	Sigma/ 1, GXLa 0450 - GXLa 0280	PVDF/EPDM	DN 10	1021168
	Sigma/ 1, GXLa 0450 - GXLa 0280	PVDF/FKM	DN 10	1021169
	Sigma/1/2	PVDF/EPDM	DN 15	1021170
	Sigma/1/2	PVDF/FKM	DN 15	1021171
Size IV	Sigma/2/3	PVDF/EPDM	DN 25	1021164
	Sigma/2/3	PVDF/FKM	DN 25	1021165
Size V	Sigma/ 3	PVDF/EPDM	DN 32	1021166
	Sigma/ 3	PVDF/FKM	DN 32	1021167



Universal Signal Cable

Universal control cable with 5-pin plastic round plug and 5-wire cable with open end for external control of the metering pump via potential-free contacts, standard signals – analogue control and for potential-free switching on/off – connection function.

Suitable for metering pumps of the Beta®, gamma/ X, gamma/ XL, DFXa, DFYa and Sigma 1,2,3 product ranges

	Lead length	Order no.
Universal cable, 5-pin round plug	2 m	1001300
Universal cable, 5-pin round plug	5 m	1001301
Universal cable, 5-pin round plug	10 m	1001302

External Signal Cable

External control cable with 5-pin round plug, internally bridged, and 2-wire cable with open end.

1.6 Accessories for low-pressure metering pumps

Only for external control of metering pumps of the Beta®, gamma/ X, gamma/ XL, DFXa, DFYa and Sigma 1,2,3 product ranges via contacts.

	Lead length	Order no.
External cable 5-pin round plug	2 m	707702
External cable 5-pin round plug	5 m	707703
External cable 5-pin round plug	10 m	707707

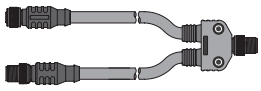
Control cable for configurable inputs and outputs

Control cable and round plug for configurable inputs and outputs for controlling the process timer or for additional alarm messages.

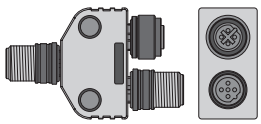
Suitable for metering pumps of the gamma/ XL and DFXa product ranges.

	Lead length	Order no.
Control cable for configurable inputs and outputs	2 m	1094091
Control cable for configurable inputs and outputs	5 m	1094093
Control cable for configurable inputs and outputs	10 m	1094092

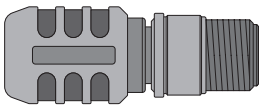
PROFIBUS® Adapter, Enclosure Rating IP 65



P_AC_0245_SW



P_AC_0230_SW



P_AC_0239_SW

Description		Fig.	Order no.
Y-adapter 2 x M12 x 1 male/female	M12 x 1 male	P_AC_0245_SW	1040956
PROFIBUS® termination assembly, comprising a Y-plug and terminating resistance	M12	-	1040955
PROFIBUS® Y-adapter	M 12 x 1	P_AC_0230_SW	1036621
PROFIBUS® termination resistor, plug-in	M 12 x 1	P_AC_0239_SW	1036622

Cabling accessories for CAN pumps

This BUS accessory can be used for all CAN pumps and Modbus pumps. Modbus and CAN are physically compatible.

	Order no.
T-distributor M12 5 pole CAN	1022155
Termination resistor M12 coupling	1022154
Termination resistor M12 plug	1022592
Connecting cable - CAN M12 5 pole 0.3 m	1024568
Connecting cable - CAN M12 5-pole 0.5 m	1022137
Connecting cable - CAN M12 5-pole 1 m	1022139
Connecting cable - CAN M12 5-pole 2 m	1022140
Connecting cable - CAN M12 5-pole 5 m	1022141
Connecting cable - CAN M12 5-pin. 10 m	1046383
Connecting cable - CAN M12 5-pole 25 m	1055588
Connecting cable - CAN M12 5-pole 50 m	1055589
Connecting cable - CAN, sold by the metre	1022160
Plug-CAN M12 5-pole screw terminal	1022156
Coupling-CAN M12 5-pole screw terminal	1022157
Coupling-CAN M12 5-pole screw terminal *	1113889

*

Reed cable with 3-pin round plug, PE



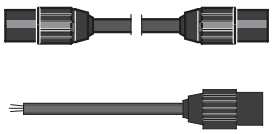
P_AC_0243_SW

For Sigma metering pumps with 3-pin round plugs and a 3-core cable with an open end for level control.

Suitable for suction lance for motor-driven metering pumps → 236

Lead length m	Order no.
2	1030334
3	1030335
5	1030336

Level sensor cable for connecting universal suction lance and motor-driven metering pump



P_AC_0243_SW

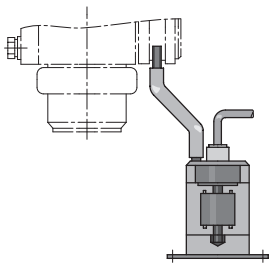
For connection of the level switch of the universal suction lance for Sigma metering pumps or the higher-level control system (e.g. PLS).

Suitable for PPE universal suction lance for motor-driven metering pumps → 236

	Lead length m	Fig.	Order no.
Round plug coupling for M12 3-pin round plug	2	pk_1_126	1040962
Round plug coupling for M12 3-pin round plug	5	pk_1_126	1040963
Round plug coupling for M12 open end	1.1	P_AC_0243_SW	1009873
Round plug coupling for M12 open end	5	P_AC_0243_SW	1022537

1.6 Accessories for low-pressure metering pumps

Safety Equipment



Diaphragm rupture indicator

To trigger an alarm and switch off the metering pump in the event of diaphragm rupture. Consisting of PVC/ PE level switch, clear acrylic storage tank, connecting sockets and connecting hose. Potential-free N/O switch, max. contact load 60 V AC, 300 mA, 18 W.

Fits all types of Beta® and gamma/ L, Meta, Makro TZ and Makro/5

Retrofitting is also possible

	Order no.
Diaphragm rupture indicator Beta®, gamma/ L, Meta, Makro TZ	803640
Diaphragm rupture indicator Makro/ 5	1019528

Diaphragm rupture indicator with optical sensor

To trigger an alarm and switch off the metering pump in the event of diaphragm rupture. Consisting of an optical sensor, which defines the changes to the refractive index when wetted with liquid. With connecting cable for connection to the pump.

Suitable for gamma/ X, gamma/ XL and DFXa pump product ranges

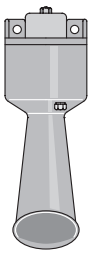
It can also be retrofitted in the backplate.

	Order no.
Diaphragm rupture indicator with optical sensor for pumps of the gamma/ X and gamma/ XL product ranges and DFXa	1044477

Horn

HUW 55, 230 V, 50-60 Hz, 165 x 60 x 65, 85 phon, for use indoors

(e.g. in connection with fault signalling relay)



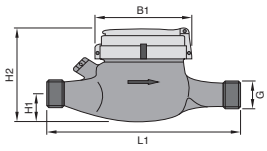
	Order no.
Horn	705002

Indicator Lamp

Red for wall mounting 230 V, 50-60 Hz (e.g. in connection with fault signalling relay, relay control or clock generator relay)

	Order no.
Indicator lamp, red	914780

1.6.6 Contact Water Meters for Use in Potable Water and Accessories



Contact water meter for cold water

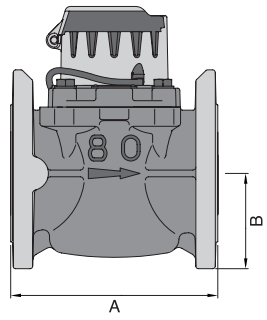
Multi-jet dry water meter, max. water temperature 50 °C.

Horizontal fitting position, laterally tilted up to 90° and vertically rising and falling. With reed switch and 2 m cable with injection-moulded round coupling for direct connection to the external contact input of the metering pump.

Pulse weight: 1/l

Fits product ranges beta, gamma, delta and Sigma control.

Threaded connector width	Connector thread	Continuous flow Q3	Overload flow Q4	Minimum flow Q1	Installed length L1	Weight	Order no.
		m³/h	m³/h	l/h	mm	kg	
R 3/4 - DN 20	1	4	5	50	190	1.3	1093919
R 1 - DN 25	1 1/4	10	12.5	125	260	2.1	1093921
R 1 1/2 - DN 40	2	16	20	200	300	4.0	1093922
R 2 - DN 50	2 1/2	25	31	310	300	4.0	1093923



Woltmann hybrid counter for cold water

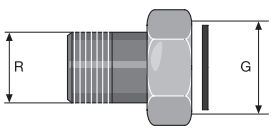
Max. water temperature 50°C, ambient temperature –25°C to +55°C, battery life 15 years, degree of protection IP 68

- Large measuring range
- Installation in every fitting position
- No calming sections needed
- Electronic counter with flow display
- Two electronic pulse outputs
- Issue of consumption and service data via M-bus

Performance data

Overload flow	200 m³/h
Continuous flow	160 m³/h
Transition flow	0.2 m³/h
Minimum flow	0.13 m³/h
Start-up value	0.05 m³/h
Pressure lose at Q_3	0.3 – 0.4 bar
Channel 3	Direction flag
Max. contact loading	30 V DC, 30 mA

Nominal diameter	Construction length WS form	Flange Ø	Weight	Pulse weight channel 1	Pulse weight channel 2	Pulse width channel 1	Pulse width channel 2	Order no.
mm		mm	kg	l/pulse	l/pulse	ms	ms	
DN 80	300	201	16.0	1	100	5	100	1078183
DN 100	360	228	21.3	1	100	5	100	1078184
DN 150	500	286	43.5	10	1,000	60	100	1078185



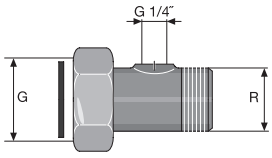
Union assembly set with seal

For threaded water meter, brass.

1.6 Accessories for low-pressure metering pumps

		Order no.
R 3/4	G 1	359029
R 1	G 1 1/4	801322
R 1 1/4	G 1 1/2 – (turboDOS®)	359034
R 1 1/2	G 2	359037
R 2	G 2 1/2	359039

Complete threaded connector with seal and connector for injection valve



For threaded water meter with G 1/4 connector for injection valve, brass.

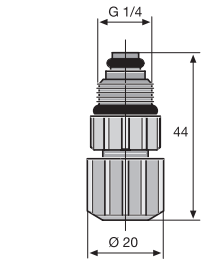
		Order no.
G 1 – 1/4	R 3/4	359030
G 1 1/4 – 1/4	R 1	359032
G 2 – 1/4	R 1 1/2	359038
G 2 1/2 – 1/4	R 2	801321

O-ring loaded injection valve

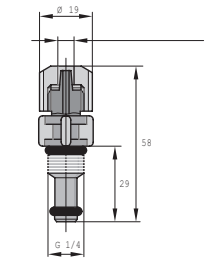
For use with threaded connectors on water meters

Short design for R 3/4 and R 1 threaded connectors, long design for R 1 1/2 and R 2 threaded connectors

Connection size	Material	oØ x iØ mm	Fig.	Order no.
6/4 - G 1/4 short	PP/FKM	6 x 4	P_AC_0008_SW	914754
6/4 - G 1/4 long	PP/FKM	6 x 4	P_AC_0009_SW	741193
6/4 - G 1/4 short	PC/FKM	6 x 4	P_AC_0008_SW	914558
6/4 - G 1/4 long	PC/FKM	6 x 4	P_AC_0009_SW	915091



P_AC_0008_SW



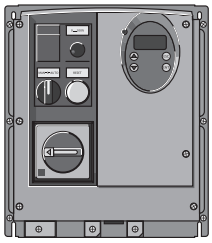
P_AC_0009_SW

Application when using appropriate metering line

25 °C – max. operating pressure 16 bar

45 °C – max. operating pressure 9 bar

1.6.7 Speed Controllers



Frequency Converters for Speed Control

Frequency converters are installed in an IP 55 rated protective housing and are suited for the motor capacity listed below.

Integrated control unit with many different functions, which are perfectly tailored to the ProMinent metering pumps: Switchover between external/internal control, internal/external reset, temperature monitoring and control by means of a PTC sensor, motor-external fan control and evaluation of diaphragm rupture control.

Internal control: via potentiometer
External control: 0/4-20 mA corresponding to 0-50 (60) Hz output frequency

Frequency converters can be used in the range of -10 °C to 40 °C.

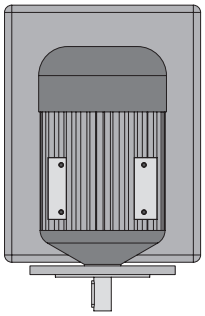
Max. motor output kW	For pump type	Voltage supply	Voltage supply, external fan	Control range	Order no.
0.37	Sigma/ 1, Sigma/ 2, Meta, Hydro/ 2, MF1a, DR15	1 ph 200 – 240 V	230 V 50/60 Hz	1:10	1030684
0.75	Sigma/ 3, Hydro/ 3, MF2a	1 ph 200 – 240 V	230 V 50/60 Hz	1:10	1030685
1.50	Makro TZ, MF2a, MF3a, DR150	1 ph 200 – 240 V	230 V 50/60 Hz	1:10	1030686
2.20	Makro TZ, MF3a, DR150	1 ph 200 – 240 V	230 V 50/60 Hz	1:10	1030687
4.00	MF3a, MF4a	3 ph 380 – 500 V	3-phase 380 V	1:5	1030688

Dimensions and weight

B dimension mm	H dimension mm	Dimension C mm	Weight kg	Order no.
210	240	163	6.3	1030684
210	240	163	6.3	1030685
215	297	192	8.8	1030686
230	340	222	10.7	1030687
230	340	222	10.7	1030688

Explosion-protected compact drive with integrated frequency converter Protection class II 2G Eexde II C T4

Power supply: 400 V, 50/60 Hz
Mains feed: 3-phase + neutral + earth
Mounting: IM B5
Inputs: 2 x analogue 4...20 mA
4 x digital (includes frequency input 0...100 kHz)
Outputs: 2 x analogue 4...20 mA
4 x digital 0/+20 V, 10 mA
1 x frequency output 0...10 kHz, 0/18...24 V, max. 5 mA
Terminal strip connectors: ON/OFF
Self-locking
RESET



Winding and temperature monitoring by PTC resistor with integral evaluation.

External control circuit: 230 V with internal fuse.

Note: These drives can only be ordered after consultation.

1.6 Accessories for low-pressure metering pumps

Max. motor output kW	For pump	Control range	Flange Ø mm	Order no.
0.55	Hydro/ 2, Sigma/ 3, Orlita MF	1:10	80	1024392
0.75	Hydro/ 3, Orlita MF	1:10	80	1114531
1.50	Makro TZ, Orlita MF	1:10	200	1024188
2.20	Makro TZ, Orlita MF	1:10	200	1024190
4.00	Makro/ 5, Orlita MF	1:10	250	1115008

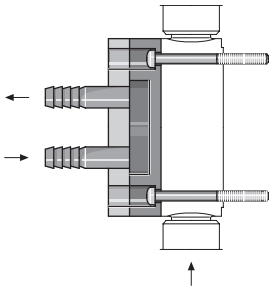
Pumps with compact drive are always delivered on a frame.

Motor data sheets can be requested for more information.

Special motors or special motor flanges and other control ranges are available on request.

Motors less than 0.75 kW and motors designed for speed-controllable operation are not subject to the IE3 standard in compliance with the Ecodesign Directive 2009/125/EC.

1.6.8 Cooling/Heating Device for Diaphragm Metering Pumps



for stainless steel dosing head. For installing on dosing head, retrofitting also possible. Connecting sockets for cooling/heating medium Ø 10 mm, complete with fixing bolts. Dimensions in mm, outer diameter (Ø O), hole circle diameter (Ø HC).

Temperature -10...80 °C

For pump	Ø A mm	Ø HC mm	Order no.
Sigma/ 1 FM 50/65 *	-	-	1025500
Sigma/ 1 FM 120 *	-	-	1025501
Sigma/ 2 FM 130 *	-	-	1002178
Sigma/ 2 FM 350 *	-	-	1002179
Sigma/ 3 FM 330 *	-	-	1006455
Sigma/ 3 FM 1000 *	-	-	1006456
Hydro/ 2/3 FMH 025/060	-	-	1024743
Hydro/ 3 FMH 150	-	-	1040112
Hydro/ 4 FMH 400	-	-	1047700
Meta, Makro TZ FM 130, FM 260	145	127	803751
Meta, Makro TZ FM 530	180	164	803752
Makro TZ FM 1500/2100	248	219	806005
Makro/ 5 FM 4000	-	-	1020683
Makro TZ FMH 70/20	-	-	1041263
Makro/ 5 FMH 85/50	-	-	1041261
Makro/ 5 FMH 60/50	-	-	1041260
Makro/ 5 FMH 130/50	-	-	1041262

* Adapted to the design with the new multi-layer safety diaphragm.

1.6 Accessories for low-pressure metering pumps

1.6.9 Fittings and Attachments for Dosing Tanks

Dosing Tanks

Anyone who works with chemicals, needs to store them safely. ProMinent® dosing tanks are tough and ideal for working with metering pumps.

Capacity 35 – 1,000 l

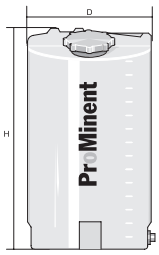
PE storage tanks produced in a rotation process. ProMinent metering pumps, suction lances and stirrers can all be added. The stackable PE collecting pans are available in matching sizes.

Your benefits

- Environmentally-friendly storage of liquid chemicals
- Robust and durable: stable design in UV-stabilised PE (polyethylene)
- Scale for litres and US gallons
- Simple to install: sintered threaded sockets for fixing ProMinent metering pumps and stirrers on storage tanks
- Safe storage: A screw cover closes safely (push-on lid for 35-litre storage tank)
- Flat sides to secure the storage tank.
- Standard colours: natural, black, blue, yellow and red.

Natural coloured/transparent PE metering tank

Threaded bush for the dosing pumps	Usable capacity	Dimension D	H dimension	Weight	Order no.
without threaded sockets	35	350	485	3.5	791993
gamma/ X, Beta®	60	410	590	5.0	791994
alpha, Beta®, gamma/ X	100	500	760	7.0	1001490
alpha, Beta®, gamma/ X	140	500	860	9.5	791995
alpha, Beta®, gamma/ X, Sigma/ 1/ 2/ 3, gamma/ XL	250	650	1,100	17.5	1023175
2 x gamma/ X, 2 x Sigma/ 1, 2, 3, 2 x gamma/ XL, 2 x Beta®	500	820	1,215	33.0	791997
2 x gamma/ X, 2 x Sigma/ 1, 2, 3, 2 x gamma/ XL, 2 x Beta®	1,000	1,070	1,260	51.0	1010909
2 x gamma/ X, 2 x Sigma/ 1, 2, 3, 2 x gamma/ XL, 2 x Beta®	1,500	1,150	1,735	80.0	1060975



Natural coloured/transparent PE metering tank

Designed for the installation of a manually operated or electric stirrer.

Usable capacity l	with an opening for	Order no.
60	manually operated stirrer	792104
60	electric stirrer	792105
100	manually operated stirrer	1002034
100	electric stirrer	1002033
140	manually operated stirrer	792106
140	electric stirrer	792107
250	manually operated stirrer	792108
250	electric stirrer	792109
500	manually operated stirrer	792110
500	electric stirrer	792111
1,000	manually operated stirrer	1010910
1,000	electric stirrer	1010911

1.6 Accessories for low-pressure metering pumps

The 35 – 1,000-litre storage tank have an R 3/4" threaded sleeve (1,500 l: R 1 1/4") for drainage that can be drilled to Ø 10 mm on site if required. A PE R 3/4" sealing stopper (1,500 l: R 1 1/4") with a seal is screwed in.

Dosing tanks without ProMinent logo are available on request.



Black PE metering tank

For light sensitive media.

Usable capacity	Order no.
35	791998
60	791999
100	1001322
140	792000
250	1023176
500	792002
1,000	1010912
1,500	1060976

Blue PE metering tank

Usable capacity	Order no.
35	1003812
60	1003813
100	1003814
140	1003815
250	1023177
500	1003817
1,000	1010913
1,500	1060977

Yellow PE metering tank

Usable capacity	Order no.
35	1003818
60	1003819
100	1003820
140	1003821
250	1023178
500	1003823
1,000	1010914
1,500	1060978

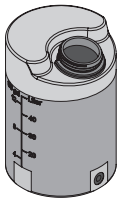
Red PE metering tank

Usable capacity	Order no.
35	1003824
60	1003825
100	1003826
140	1003827
250	1023179
500	1003829
1,000	1010915
1,500	1060979

1.6 Accessories for low-pressure metering pumps

Natural/transparent PE dosing tank with flat mounting surface

Threaded bush for the dosing pumps	Dimension D mm	H dimension mm	Usable capacity l	Weight kg	Order no.
without threaded sockets	410	590	60	5.0	1061060
without threaded sockets	500	760	100	7.0	1008599
without threaded sockets	650	1,100	250	17.5	1061061



Your benefits

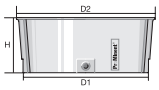
- "Natural/transparent PE dosing tank" design without sintered threaded socket
- Level mounting surface for the installation of metering pumps on the storage tank
- Additional installation of a manual or electric stirrer is possible

PE Stackable Collecting Pans For Metering Tanks

Made of UV-stabilised polyethylene in a stackable design with ProMinent logo. 2 flat sides for fixing the collecting pan.

PE colourless/transparent stackable collecting pans

Usable capacity l	D1 mm	D2 mm	H dimension mm	Weight kg	Order no.
35	507	565	220	3.0	1010879
60	607	680	270	4.3	1010880
100	727	802	320	6.5	1010881
140	727	811	370	7.0	1010882
250	807	917	520	11.0	1010883
500	1,009	1,155	670	16.0	1010884



Black PE Collecting Pan

Usable capacity l	D1 mm	D2 mm	H dimension mm	Weight kg	Order no.
35	507	565	220	3.0	1010885
60	607	680	270	4.3	1010886
100	727	802	320	6.5	1010887
140	727	811	370	7.0	1010888
250	807	917	520	11.0	1010889
500	1,009	1,155	670	16.0	1010890

PE blue stackable collecting pans

Usable capacity l	D1 mm	D2 mm	H dimension mm	Weight kg	Order no.
35	507	565	220	3.0	1010891
60	607	680	270	4.3	1010892
100	727	802	320	6.5	1010893
140	727	811	370	7.0	1010894
250	807	917	520	11.0	1010895
500	1,009	1,155	670	16.0	1010896

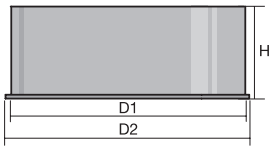
1.6 Accessories for low-pressure metering pumps

PE yellow stackable collecting pans

Usable capacity	D1	D2	H dimension	Weight	Order no.
l	mm	mm	mm	kg	
35	507	565	220	3.0	1010897
60	607	680	270	4.3	1010898
100	727	802	320	6.5	1010899
140	727	811	370	7.0	1010900
250	807	917	520	11.0	1010901
500	1,009	1,155	670	16.0	1010902

PE red stackable collecting pans

Usable capacity	D1	D2	H dimension	Weight	Order no.
l	mm	mm	mm	kg	
35	507	565	220	3.0	1010903
60	607	680	270	4.3	1010904
100	727	802	320	6.5	1010905
140	727	811	370	7.0	1010906
250	807	917	520	11.0	1010907
500	1,009	1,155	670	16.0	1010908



Natural PE Collecting Pan

Usable capacity	D1	D2	H dimension	Weight	Order no.
l	mm	mm	mm	kg	
1,000	1,200	1,280	980	34.0	740719
1,500	1,350	1,410	1,280	42.0	1060980

PE black stackable collecting pans

Usable capacity	D1	D2	H dimension	Weight	Order no.
l	mm	mm	mm	kg	
1,000	1,200	1,280	980	34.0	740726
1,500	1,350	1,410	1,280	42.0	1060981

Spare Parts

	Order no.
Push cap for 35 l tank	740708
Screw cap with seal for 60/100/140/250	1031429
Screw cap with seal for 500/1000	1030910
Sealing stopper with 3/4” PE seal	200692
Sealing stopper with 1 1/4” PE seal	1061779

1.6 Accessories for low-pressure metering pumps

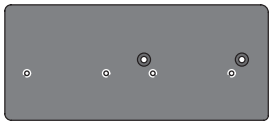
1.6.9 Fittings and Attachments for Dosing Tanks

Suction assemblies with and without level switch

The correct suction assemblies for installation in our PE dosing tanks can be found in the following chapter:

- Suction lances, suction assemblies without level switches, see page
- Suction lances, suction assemblies with level switches, see page

Attachment of pumps to metering tanks



PP mounting plates

For mounting metering pumps on dosing tanks (including screws for securing mounting plates to dosing tanks)

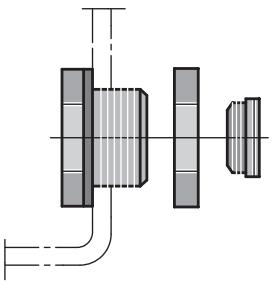
	Order no.
Mounting plate, Sigma/ 1/ 2/ 3	740476
Mounting plate, alpha	790850
Mounting plate for Beta®, gamma/ X	801575
Mounting plate 3 x gamma/ X, 3 x Beta®	801580
Mounting plate 2 x gamma/ X, 2 x Beta®	801583
Installation panel for gamma/ XL	801569

Please refer to the following table for the order numbers for the mounting plates.

	Dosing tank						
Metering pumps	**35 l**	**60 l**	**100 l**	**140 l**	**250 l**	**500 l**	**1000 l/1500 l**
alpha	790850	790850	x	x	x	2x790850	2x790850
Beta®, gamma/ X	801575	x	x	x	x	2x	2x
gamma/ XL	-	801569	801569	801569	x	2x	2x
Sigma/ 1	-	801569	740476	740476	x	2x	2x
Sigma/ 2, Sigma/ 3	-	-	-	-	x	2x	2x
2x Beta® or 2xgamma/ X	-	801583	801583	801583	801583	2x801583	2x801583
3x Beta® or 3xgamma/ X	-	-	801580	801580	801580	2x801580	2x801580

- x = Direct installation of one pump on a storage tank
- 2x = Direct installation of 2 pumps on a storage tank
- - = Pump cannot be installed on the storage tank

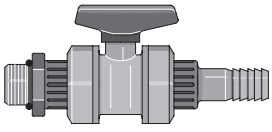
Tank connectors with PE plugs



	Order no.
R 1/2" as additional connecting option for PE 35 – 1000 l dosing tank	809755
R 3/4" as additional connecting option for PE 35 – 1000 l dosing tank	809756

- x = Direct installation of one pump on a storage tank
- 2x = Direct installation of 2 pumps on a storage tank
- - = Pump cannot be installed on the storage tank

PP discharge tap



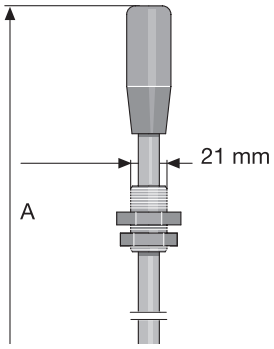
	Order no.
For metering tanks with d 20, Ø 20 mm hose nozzle and 3/4" nipple for direct connection to the threaded connector on the tank.	809714

PVC discharge tap

	Order no.
For metering tanks with d 16, Ø 16 mm hose nozzle and 3/4" nipple for direct connection to the threaded connector on the tank.	809745

Screw cap lock

	Order no.
Lock with key for screw cap	200683

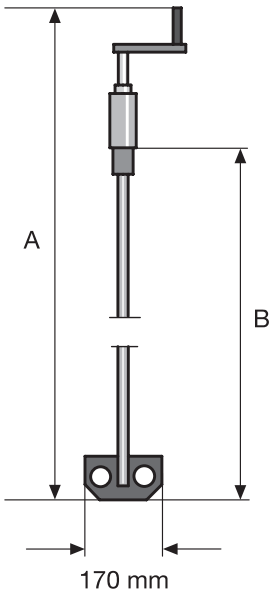


Stirrers

PP Hand mixer

Fully assembled.

	Dimension A mm	Diameter Ø mm	Order no.
Hand mixer made from PP for 35 and 60 l tanks	515	90	741118
Hand mixer made from PP for 100 and 140 l tanks	715	90	741119
Hand mixer made from PP for 250 and 500 l tanks	1,040	130	741120

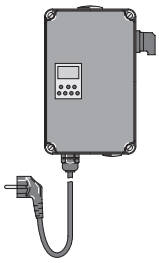


PP Hand stirrer

With crank, fully assembled

	Dimension A mm	B dimension mm	Order no.
For 60 l tanks	670	465	914701
For 100 l tanks	855	650	914738
For 140 l tanks	965	765	914702
For 250 and 500 l tanks	1,175	965	914703
For 1000 l tanks	1,240	1,040	914705

1.6 Accessories for low-pressure metering pumps



Timer with digital clock

	Order no.
In plastic housing for the control of a stirrer or a metering pump, 230 V, 50 Hz, max. 6A, IP 65. Day and week programs, shortest switching time 1 min. with 2 m power cable and euro plug.	1005561

Stirrers should only be operated via the motor protection switch!

Electric stirrers for dosing tanks

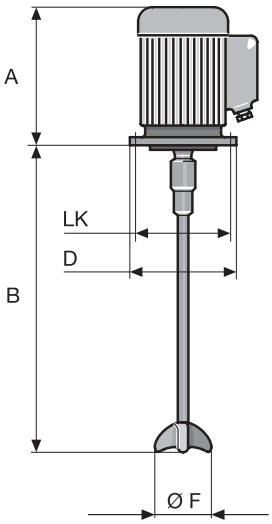
For the batching and mixing of liquids up to max. 500 mPas viscosity. Intermittent operation using timer recommended.

- Wide-range motor with insulation class F, insulated for use in hot climates
- Stainless steel or plastic-coated shaft
- Polypropylene propeller
- Provide a motor protection switch for all stirrers.
- Not suitable for gaseous media

Stainless steel electric stirrer

For tank	Power uptake W	Shaft	Propeller	Weight kg	Order no.
60 l	20	1.4571	PP	2.9	818576
100 l	180	1.4571	PP	3.0	1001566
140 l	180	1.4571	PP	7.3	791502
250 l	180	1.4571	PP	7.3	791503
500 l	250	1.4571	PP	8.5	791504
1000 l	750	1.4571	PVDF	18.0	791458
1500 l	550	1.4535	PVDF	22.0	1078647

Chemical resistant electric stirrer



For tank	Power uptake W	Voltage (50 Hz)	Nominal current (50 Hz)	Speed (50 Hz)	Enclosure rating
60 l	20	1-phase, 230 V	0.38 A	1400	IP 55
100 l	180	1-phase, 230 V	1.9 A	1440	IP 55
140 l	180	1-phase, 230 V	1.9 A	1440	IP 55
250 l	180	1-phase, 230 V	1.9 A	1440	IP 55
500 l	250	1-phase, 230 V	1.8 A	1440	IP 55
1000 l	750	3-phase, 230/400 V	2.96/1.71 A	1440	IP 55
1500 l	550	3-phase, 230/400 V	4.1/2.3 A	750	IP 55

Size	A	B	Ø D	Ø HC	Ø F
60	195	490	115	100	70
100	200	675	160	130	70
140	200	780	160	130	70
250	200	950	160	130	70
500	200	950	160	130	70
1000	230	1190	200	165	130
1500	282	1400	200	165	175

1.6 Accessories for low-pressure metering pumps

For tank	Power uptake W	Shaft	Propeller	Weight kg	Order no.
60 l	20	1.4571/ PVDF	PP	2.9	818577
100 l	180	1.4571/ PVDF	PP	3.0	1002035
140 l	180	1.4571/ PVDF	PP	7.3	791454
250 l	180	1.4571/ PVDF	PP	7.3	791455
500 l	250	1.4571/ PVDF	PP	8.5	791456
1000 l	750	1.4571/ PVDF	PVDF	18.0	791457
1500 l	550	Steel/PE	PVDF	22.0	1078646

1.7 Metering Systems

1.7.1 Overview of Metering Systems DULCODOS®

Metering systems are ready mounted complete solutions, which are immediately available and ready for use for the most important applications. Whether standard or customised – you'll find the right solution here.

Tip: The table provides a good overview.

Selection Guide for DULCODOS®

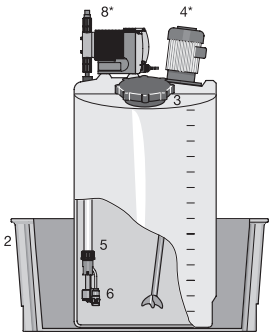
	Function	Capacity range	see page
Metering system DULCODOS® eco (DSBa)	Storage, metering	35 – 1,000 l	→ 271
Metering system DULCODOS® universal (DSUa)	Metering	up to 75 l/h	→ 279
Metering system DULCODOS® panel (DSWb)	Metering	0.74 – 1,000 l/h	→ 287
Metering system DULCODOS® modular (DSKa)	Metering	40 – 1,000 l/h	→ 295

1.7.2 Metering System DULCODOS® eco (DSBa)

Choose from a range of different components and adapt the metering system to your requirements.

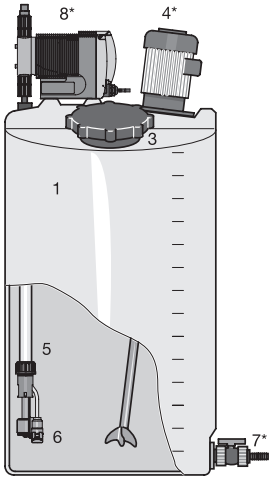
For storing and metering liquid chemicals Use a selection guide (identity code) to quickly and flexibly adapt your metering system to your metering task.

Two hydraulic connection points guarantee simple installation of the metering system. The ready mounted system consists of components that have been perfectly matched to each other to ensure problem-free operation. You obtain a complete system. Individually configure your metering system at the time of ordering. A simple selection system makes ordering easy and guarantees maximum efficiency even at the time of ordering.



Your benefits

- One to three metering pumps mounted on a storage tank, ready for connection with all the necessary accessories
- Short delivery time
- Outstanding value for money
- Compact construction
- Fast commissioning
- Versatile use
- All the components are perfectly matched to each other and fit precisely
- Environmentally-friendly handling of chemicals



Technical Details

- Dosing tanks: PE, various colours, 35 – 1,500 litres
- Collecting pan: PE, various colours, 35 – 1,500 litres
- Lock for screw top
- Hand mixer / stirrer: PP, PVDF or stainless steel, various outputs
- Suction assembly: PP, PVC, various connectors
- Level switch for suction assembly: 2-stage
- Drain tap: PP, PVC, with ball valve
- Metering pump: alpha, Beta®, gamma/ X, Sigma/ 1, Sigma/ 2, Sigma/ 3, gamma/ XL

Field of application

Treatment of cooling, process and swimming pool water

ProMinent metering systems with PE storage tanks can be selected and ordered with the help of an identity code system. First select the metering pump using the separate pump identity code.

Selectable components

1. PE dosing tanks (35 – 1,500 litres)
2. Stackable collecting pans (35 – 1,500 litres)
3. Lock for tank screw top
4. Hand mixer/stirrer (*)
5. Suction assembly
6. Level switch for suction assembly
7. Drain tap for storage tank (*)
8. Order metering pump (*) separately(Order the pump separately due to the large number of possible pumps that can be installed on storage tanks. Use the identity code for the pump you require.)

* These components are ready for subsequent installation, but are supplied separately to avoid damage in transit. Customers should fully install the system on site.

Identity Code Ordering System for Metering System with Storage Tank, 35 litres

DSBa	PE tank												
	0035N	35 l PE metering tank, neutral colour											
	0035S	35 l PE metering tank, black											
	0035B	35 l PE metering tank, blue											
	0035G	35 l PE metering tank, yellow											
	0035R	35 l PE metering tank, red											
		Collecting pan											
		0	without collecting pan										
		1	with collecting pan, neutral colour										
		2	with collecting pan, coloured (the same colour as the tank)										
			Version										
			0	with ProMinent logo									
				Lock for tank screw top									
				0	without lock								
					Hand mixer, stirrer								
					0	none							
					A	with PP hand mixer							
						Metering pump mounting							
						0	no pump						
						D	for alpha						
						E	for Beta®, gamma/ X						
							Suction assembly selection						
							0	without suction assembly					
							1	suction assembly with 6x4 suction hose					
							2	Suction assembly with suction hose 8 x 5					
							3	Suction assembly with suction hose 12 x 9					
								Suction assembly material					
								0	none				
								1	PVC				
								2	PP				
									Suction assembly float switch				
									0	without level switch			
									1	2-stage, round plug, (6 x 4, 8 x 5, 12 x 9) for Beta®, gamma/ X and XL			
										Accessories - discharge tap for tank			
										0	no accessories		
										1 **	With PVC ball valve, d16 hose sleeve		
										2 **	With PP ball valve, d20 hose sleeve		
											Calibration assembly		
											0	none	
												Information – pump *	
												-	e.g. GMXa 0414 PVT

* Please enter the identity code of the selected pump.

** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

Identity Code Ordering System for Metering System with Storage Tank, 60 litres

DSBa	PE tank							
	0060N	60 l PE metering tank, neutral colour						
	0060S	60 l PE metering tank, black						
	0060B	60 l PE metering tank, blue						
	0060G	60 l PE metering tank, yellow						
	0060R	60 l PE metering tank, red						
		Collecting pan						
		0	without collecting pan					
		1	with collecting pan, neutral colour					
		2	with collecting pan, coloured (the same colour as the tank)					
			Version					
			0	with ProMinent logo				
				Lock for tank screw top				
				1	with lock			
					Hand mixer, stirrer			
					0	none		
					A	with PP hand mixer		
					B	with PP hand stirrer		
					H	with stainless steel 0.02 kW electric stirrer		
					P	with PVDF 0.02 kW electric stirrer		

* Please enter the identity code of the selected pump.

** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

						Metering pump mounting								
						0	no pump							
						D	for alpha							
						A	for Beta®, gamma/ X							
						F	for Sigma/ 1							
						P	for gamma/ XL							
							Suction assembly selection							
							0	without suction assembly						
							1	suction assembly with 6x4 suction hose						
							2	Suction assembly with suction hose 8 x 5						
							3	Suction assembly with suction hose 12 x 9						
							4	DN 10 suction assembly						
							5	DN 15 suction assembly						
								Suction assembly material						
								0	none					
								1	PVC					
								2	PP					
									Suction assembly float switch					
									0	without level switch				
									1	2-stage, round plug, (6 x 4, 8 x 5, 12 x 9) for Beta®, gamma/ X and XL				
									2	2-stage, round plug, (DN 10 - 32) for Sigma/ 1/ 2/ 3, gamma/ XL				
										Accessories - discharge tap for tank				
										0	no accessories			
										1 **	With PVC ball valve, d16 hose sleeve			
										2 **	With PP ball valve, d20 hose sleeve			
											Calibration assembly			
											0	none		
												Information – pump *		
												-	e.g. GMXa 0414 PVT	

* Please enter the identity code of the selected pump.

** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

Identity Code Ordering System for Metering System with Storage Tank, 100 litres

DSBa	PE tank													
	0100N	100 l PE metering tank, neutral colour												
	0100S	100 l PE metering tank, black												
	0100B	100 l PE metering tank, blue												
	0100G	100 l PE metering tank, yellow												
	0100R	100 l PE metering tank, red												
		Collecting pan												
		0	without collecting pan											
		1	with collecting pan, neutral colour											
		2	with collecting pan, coloured (the same colour as the tank)											
			Version											
			0	with ProMinent logo										
				Lock for tank screw top										
				1	with lock									
					Hand mixer, stirrer									
					0	none								
					A	with PP hand mixer								
					C	with PP hand stirrer								
					I	with stainless steel 0.18 kW electric stirrer								
					R	with PVDF 0.18 kW electric stirrer								
						Metering pump mounting								
						0	no pump							
						A	for Beta®, gamma/ X							
						P	for gamma/ XL							
						L	for Sigma/ 1							
						N	for alpha							
							Suction assembly selection							
							0	without suction assembly						
							1	suction assembly with 6x4 suction hose						
							2	Suction assembly with suction hose 8 x 5						
							3	Suction assembly with suction hose 12 x 9						
							4	DN 10 suction assembly						
							5	DN 15 suction assembly						
								Suction assembly material						
								0	none					

* Please enter the identity code of the selected pump.

** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

1	PVC
2	PP
Suction assembly float switch	
0	without level switch
1	2-stage, round plug, (6 x 4, 8 x 5, 12 x 9) for Beta®, gamma/ X and XL
2	2-stage, round plug, (DN 10 - 32) for Sigma/ 1/ 2/ 3, gamma/ XL
Accessories - discharge tap for tank	
0	no accessories
1 **	With PVC ball valve, d16 hose sleeve
2 **	With PP ball valve, d20 hose sleeve
Calibration assembly	
0	none
Information – pump *	
-	e.g. GMXa 0414 PVT

* Please enter the identity code of the selected pump.

** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

Identity Code Ordering System for Metering System with Storage Tank, 140 litres

DSBa	**PE tank**
0140N	140 l PE metering tank, neutral colour
0140S	140 l PE metering tank, black
0140B	140 l PE metering tank, blue
0140G	140 l PE metering tank, yellow
0140R	140 l PE metering tank, red
Collecting pan	
0	without collecting pan
1	with collecting pan, neutral colour
2	with collecting pan, coloured (the same colour as the tank)
Version	
0	with ProMinent logo
Lock for tank screw top	
1	with lock
Hand mixer, stirrer	
0	none
A	with PP hand mixer
D	with PP hand stirrer
K	with stainless steel 0.18 kW electric stirrer
S	with PVDF 0.18 kW electric stirrer
Metering pump mounting	
0	no pump
D	for alpha
A	for Beta®, gamma/ X
P	for gamma/ XL
H	for Sigma/ 1
Suction assembly selection	
0	without suction assembly
1	suction assembly with 6x4 suction hose
2	Suction assembly with suction hose 8 x 5
3	Suction assembly with suction hose 12 x 9
4	DN 10 suction assembly
5	DN 15 suction assembly
Suction assembly material	
0	none
1	PVC
2	PP
Suction assembly float switch	
0	without level switch
1	2-stage, round plug, (6 x 4, 8 x 5, 12 x 9) for Beta®, gamma/ X and XL
2	2-stage, round plug, (DN 10 - 32) for Sigma/ 1/ 2/ 3, gamma/ XL
Accessories - discharge tap for tank	
0	no accessories
1 **	With PVC ball valve, d16 hose sleeve
2 **	With PP ball valve, d20 hose sleeve
Calibration assembly	
0	none
Information – pump *	
-	e.g. GMXa 0414 PVT

* Please enter the identity code of the selected pump.

** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

Identity Code Ordering System for Metering System with Storage Tank, 250 litres

DSBa	PE tank												
	0250N	250 l PE metering tank, neutral colour											
	0250S	250 l PE metering tank, black											
	0250B	250 l PE metering tank, blue											
	0250G	250 l PE metering tank, yellow											
	0250R	250 l PE metering tank, red											
		Collecting pan											
		0	without collecting pan										
		1	with collecting pan, neutral colour										
		2	with collecting pan, coloured (the same colour as the tank)										
			Version										
			0	with ProMinent logo									
				Lock for tank screw top									
				1	with lock								
					Hand mixer, stirrer								
					0	none							
					A	with PP hand mixer							
					E	with PP hand stirrer							
					L	with stainless steel 0.18 kW electric stirrer							
					T	with PVDF 0.18 kW electric stirrer							
						Metering pump mounting							
						0	no pump						
						A	for Beta®, gamma/ X						
						P	for gamma/ XL						
						N	for alpha						
						B	for Sigma/ 2/ 3						
						C	for Sigma/ 1						
							Suction assembly selection						
							0	without suction assembly					
							1	suction assembly with 6x4 suction hose					
							2	Suction assembly with suction hose 8 x 5					
							3	Suction assembly with suction hose 12 x 9					
							4	DN 10 suction assembly					
							5	DN 15 suction assembly					
							7	DN 25 suction assembly					
							8	DN 32 suction assembly					
								Suction assembly material					
								0	none				
								1	PVC				
								2	PP				
									Suction assembly float switch				
									0	without level switch			
									1	2-stage, round plug, (6 x 4, 8 x 5, 12 x 9) for Beta®, gamma/ X and XL			
									2	2-stage, round plug, (DN 10 - 32) for Sigma/ 1/ 2/ 3, gamma/ XL			
										Accessories - discharge tap for tank			
										0	no accessories		
										1 **	With PVC ball valve, d16 hose sleeve		
										2 **	With PP ball valve, d20 hose sleeve		
											Calibration assembly		
											0	none	
												Information – pump *	
												-	e.g. GMXa 0414 PVT

* Please enter the identity code of the selected pump.

** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

Identity Code Ordering System for Metering System with Storage Tank, 500 litres

DSBa	PE tank			
	0500N	500 l PE metering tank, neutral colour		
	0500S	500 l PE metering tank, black		
	0500B	500 l PE metering tank, blue		
	0500G	500 l PE metering tank, yellow		
	0500R	500 l PE metering tank, red		
		Collecting pan		
		0	without collecting pan	
		1	with collecting pan, neutral colour	

* Please enter the identity code of the selected pump.

** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

		2	with collecting pan, coloured (the same colour as the tank)											
		Version												
		0	with ProMinent logo											
			Lock for tank screw top											
			1	with lock										
				Hand mixer, stirrer										
				0	none									
				A	with PP hand mixer									
				F	with PP hand stirrer									
				M	with stainless steel 0.25 kW electric stirrer									
				U	with PVDF 0.25 kW electric stirrer									
					Metering pump mounting									
					0	no pump								
					D	for alpha								
					A	for Beta®, gamma/ X								
					P	for gamma/ XL								
					C	for Sigma/ 1								
					J	for Sigma/ 2/ 3								
						Suction assembly selection								
						0	without suction assembly							
						1	suction assembly with 6x4 suction hose							
						2	Suction assembly with suction hose 8 x 5							
						3	Suction assembly with suction hose 12 x 9							
						4	DN 10 suction assembly							
						5	DN 15 suction assembly							
						7	DN 25 suction assembly							
						8	DN 32 suction assembly							
							Suction assembly material							
							0	none						
							1	PVC						
							2	PP						
								Suction assembly float switch						
								0	without level switch					
								1	2-stage, round plug, (6 x 4, 8 x 5, 12 x 9) for Beta®, gamma/ X and XL					
								2	2-stage, round plug, (DN 10 - 32) for Sigma/ 1/ 2/ 3, gamma/ XL					
									Accessories - discharge tap for tank					
									0	no accessories				
									1 **	With PVC ball valve, d16 hose sleeve				
									2 **	With PP ball valve, d20 hose sleeve				
										Calibration assembly				
										0	none			
											Information – pump *			
											-	e.g. GMXa 0414 PVT		

* Please enter the identity code of the selected pump.

** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

Identity Code Ordering System for Metering System with Storage Tank, 1000 litres

DSBa	PE tank													
	1000N	1000 l PE metering tank, neutral colour												
	1000S	1000 l PE metering tank, black												
	1000B	1000 l PE metering tank, blue												
	1000G	1000 l PE metering tank, yellow												
	1000R	1000 l PE metering tank, red												
		Collecting pan												
		0	without collecting pan											
		1	with collecting pan, neutral colour											
		2	with collecting pan, coloured (the same colour as the tank)											
			Version											
			0	with ProMinent logo										
				Lock for tank screw top										
				1	with lock									
					Hand mixer, stirrer									
					0	none								
					G	with PP hand stirrer								
					N	with stainless steel 0.75 kW electric stirrer								
					W	with PVDF 0.75 kW electric stirrer								
						Metering pump mounting								
						0	no pump							

* Please enter the identity code of the selected pump.

** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

D	for alpha
A	for Beta®, gamma/ X
P	for gamma/ XL
B	for Sigma/ 2/ 3
C	for Sigma/ 1

Suction assembly selection

0	without suction assembly
1	suction assembly with 6x4 suction hose
2	Suction assembly with suction hose 8 x 5
3	Suction assembly with suction hose 12 x 9
4	DN 10 suction assembly
5	DN 15 suction assembly
7	DN 25 suction assembly
8	DN 32 suction assembly

Suction assembly material

0	none
1	PVC
2	PP

Suction assembly float switch

0	without level switch
1	2-stage, round plug, (6 x 4, 8 x 5, 12 x 9) for Beta®, gamma/ X and XL
2	2-stage, round plug, (DN 10 - 32) for Sigma/ 1/ 2/ 3, gamma/ XL

Accessories - discharge tap for tank

0	no accessories
1 **	With PVC ball valve, d16 hose sleeve
2 **	With PP ball valve, d20 hose sleeve

Calibration assembly

0	none

Information – pump *

-	e.g. GMXa 0414 PVT

* Please enter the identity code of the selected pump.

** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

Identity code ordering system for metering system with storage tank, 1500 litres

DSBa	PE tank													
	1500N	1500 l dosing tank, PE natural												
	1500S	1500 l dosing tank, PE black												
	1500B	1500 l dosing tank, PE blue												
	1500G	1500 l dosing tank, PE yellow												
	1500R	1500 l dosing tank, PE red												
		Collecting pan												
		0	without collecting pan											
		1	with collecting pan, neutral colour											
		2	with collecting pan, coloured (the same colour as the tank)											
			Version											
			0	with ProMinent logo										
				Lock for tank screw top										
				1	with lock									
					Hand mixer, stirrer									
					0	none								
					O	with stainless steel electric stirrer 0.55 kW								
					X	with electric stirrer ST./PE 0.55 kW								
						Metering pump mounting								
						0	no pump							
						D	for alpha							
						A	for Beta®, gamma/ X							
						P	for gamma/ XL							
						B	for Sigma/ 2/ 3							
						C	for Sigma/ 1							
							Suction assembly selection							
							0	without suction assembly						
							1	suction assembly with 6x4 suction hose						
							2	Suction assembly with suction hose 8 x 5						
							3	Suction assembly with suction hose 12 x 9						
							4	DN 10 suction assembly						
							5	DN 15 suction assembly						
							7	DN 25 suction assembly						
							8	DN 32 suction assembly						

* Please enter the identity code of the selected pump.

** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

1.7 Metering Systems

Code	Description
	Suction assembly material
0	none
1	PVC
2	PP
	Suction assembly float switch
0	without level switch
1	2-stage, round plug, (6 x 4, 8 x 5, 12 x 9) for Beta®, gamma/ X and XL
2	2-stage, round plug, (DN 10 - 32) for Sigma/ 1/ 2/ 3, gamma/ XL
	Accessories - discharge tap for tank
0	no accessories
	Calibration assembly
0	none
	Information – pump *
-	e.g. GMXa 0414 PVT

* Please enter the identity code of the selected pump.

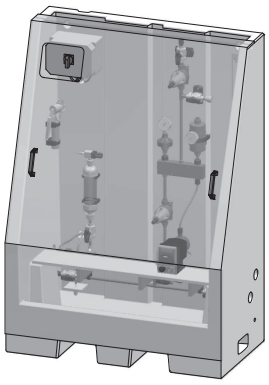
** Ball valve can only be selected if the metering station has been ordered without a collecting pan.

1.7.3 Metering system DULCODOS® universal

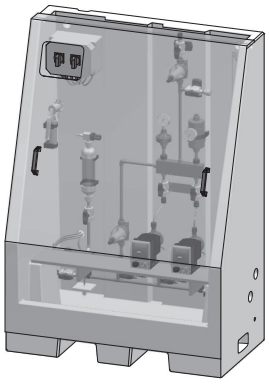
Liquid chemicals are metered conveniently, cost-effectively and reliably

Pump volume depending on the selected pump up to 75 l/h, back pressure 10 – 2 bar

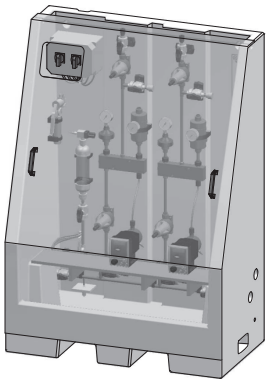
The metering system DULCODOS® universal combines carefully selected standard components with the solenoid-driven metering pump you have selected. This is your convenient method for the reliable metering of liquid chemicals – and is available cost-effectively and extremely quickly thanks to the preconfigured modules.



DULCODOS® Universal, type 1



DULCODOS® Universal, type 2



DULCODOS® Universal, type 3

Metering is dependent on the metering pump. Components, such as pipes, relief valves and electrics – indispensable, but scarcely variable – ensure the reliable operation of the system. That is why we have pre-configured the new metering system DULCODOS® universal with these standards. The benefits for you: low costs, fast delivery, simple commissioning.

Naturally you have a choice here as well: Should it be the solenoid driven metering pump Beta® 4 or 5, gamma/ X or gamma/ XL? Should the pipes and seals be made of PP/FKM or PVC/EPDM? And do you need one or two points of injection with one or two pumps?

The novel valve block gives every metering system a clearly arranged structure. Every system features two relief valves, a collecting pan with leak sensor and a calibration tank for controlled metering for complete operational safety.

Your benefits

- Reliable and precise metering of liquid chemicals with proven solenoid-driven metering pumps
- Safe operation, thanks to relief valves and collecting pan
- Stable installation frame rotationally sintered from a single piece
- Systems with 1 or 2 pumps and 1 or 2 points of injection
- Calibration unit with priming function for controlled metering
- Optional: Pulsation damper, spray guard
- Optional: DULCONNEX connection (Wi-Fi)

Technical Details

- ProMinent solenoid driven metering pumps Beta® 4/5, gamma/ X or gamma/ XL
- Dimensions: 1,700 x 1,200 x 635 mm (H x W x D)
- Material combinations: PP/FKM or PVC/EPDM (note compatibility with the feed chemical)
- Relief valves to protect the pipework
- Manometer
- Collecting pan with leak sensor
- Flushing connectors
- Terminal box with master switch
- Assembly frame available in 4 standard colours

Field of application

Metering of liquid chemicals, e.g.

- cooling water treatment
- Waste water and process water treatment
- Paper industry

Type selection

	Metering pumps	Points of injection	Material combinations	Hose materials
Type 1	1	1	PVC/EPDM or PP/FKM	PTFE
Type 2	2	1	PVC/EPDM or PP/FKM	PTFE
Type 3	2	2	PVC/EPDM or PP/FKM	PTFE

1.7 Metering Systems

Identity Code Ordering System for DULCODOS®universal

DSUa	Pipework / Seal / Function
1	PVC, EPDM, for 1 pump and 1 point of injection
2	PVC, EPDM, for 2 pumps and 1 point of injection
3	PVC, EPDM, for 2 pumps and 2 points of injection
4	PP, FKM, for 1 pump and 1 point of injection
5	PP, FKM, for 2 pumps and 1 point of injection
6	PP, FKM, for 2 pumps and 2 points of injection

	Mounting frame (900 x 660 x 440 mm – H x W x D)
0	Natural
1	PE Orange: 1,700 x 1,200 x 635 mm (HxWxD)
2	Yellow
3	Blue

	Version
00	with ProMinent® logo
01	without ProMinent® Logo

	Pulsation damper
0	none
1	1 x pulsation damper PVC/EPDM
2	1 x pulsation damper PP/FKM
3	2 x pulsation dampers PVC/EPDM
4	2 x pulsation dampers PP/FKM

	Hydraulic connectors
0	Insert
1	Hose nipple 6x4
2	Hose nipple 8x5
3	Hose nipple 12x9
4	Pressure hose nozzle DN10

	Flushing connectors
0	closed
1	Pressure hose nozzle DN10
2	Gardena

	Splash guard
0	none
1	with splash guard

	Stainless steel bracket
0	Floor bracket (2 x brackets)
1	Machine feet
2	Stainless steel bracket + machine feet
3	Wall installation

	Pump 1
00	no pump
41	10 bar / 0.74 l/h, BT4b 1000 PVT2000U1100000, 6x4
42	16 bar / 2.2 l/h, BT4b 1602 PVT2000U1100000, 6x4
43	16 bar / 3.60 l/h, BT4b 1604 PVT2000U1100000, 6x4
44	7 bar / 7.10 l/h, BT4b 0708 PVT2000U1100000, 8x5
45	4 bar / 12.30 l/h, BT4b 0413 PVT2000U1100000, 8x5
46	2 bar / 19.00 l/h, BT4b 0220 PVT2000U1100000, 12x9
51	10 bar / 6.80 l/h, BT5b 1008 PVT2000U1100000, 8x5
52	7 bar / 11.0 l/h, BT5b 0713 PVT2000U1100000, 8x5
53	4 bar / 17.10 l/h, BT5b 0420 PVT2000U1100000, 12.9
54	2 bar/32.00 l/h, BT5b 0232 NPE2000U1100000, 12x9
D1	16 bar / 12 l/h, GXLAEU1612PVT20000U11030DE, 8x5
D2	10 bar / 19.6 l/h, GXLAEU1020PVT20000U11030DE, 12x9
D3	7 bar / 29.4 l/h, GXLAEU0730PVT20000U11030DE, 12X9
D4	4 bar / 49.0 l/h, GXLAEU0450PVT20000U11030DE, DN10
D5	2 bar / 78.5 l/h, GXLAEU0280PVT20000U11030DE, DN10
X1	16 bar / 3.6 l/h, GMXa 1604 PVT20000U110300DE, 6x4
X2	7 bar / 7.6 l/h, GMXa 0708 PVT20000U110300DE, 8x5
X3	10 bar / 9.0 l/h, GMXa 1009 PVT20000U110300DE, 8x5
X4	4 bar / 13.5 l/h, GMXa 0414 PVT20000U110300DE, 8x5
X5	7 bar / 14.5 l/h, GMXa 0715 PVT20000U110300DE, 8x5
X6	2 bar / 19.7 l/h, GMXa 0220 PVT20000U110300DE, 12x9
X7	4 bar / 24.0 l/h, GMXa 0424 PVT20000U110300DE, 12x9
X8	2 bar / 45.0 l/h, GMXa 0245 PVT00000U110300DE, 12x9

	Pump 2
00	no pump
41	10 bar / 0.74 l/h, BT4b 1000 PVT2000U1100000, 6x4
42	16 bar / 2.2 l/h, BT4b 1602 PVT2000U1100000, 6x4
43	16 bar / 3.60 l/h, BT4b 1604 PVT2000U1100000, 6x4
44	7 bar / 7.10 l/h, BT4b 0708 PVT 2000U1100000, 8x5
45	4 bar / 12.30 l/h, BT4b 0413 PVT2000U1100000, 8x5
46	2 bar / 19.00 l/h, BT4b 0220 PVT2000U1100000, 12x9
51	10 bar / 6.80 l/h, BT5b 1008 PVT2000U1100000, 8x5

52	7 bar / 11.0 l/h, BT5b 0713 PVT2000U1100000, 8x5
53	4 bar / 17.10 l/h, BT5b 0420 PVT2000U1100000, 12x9
54	2 bar / 32.00 l/h, BT5b 0232 NPE2000U1100000, 12x9
D1	16 bar / 12 l/h, GXLAEU1612PVT20000U11030DE, 8x5
D2	10 bar / 19.6 l/h, GXLAEU1020PVT20000U11030DE, 12x9
D3	7 bar / 29.4 l/h, GXLAEU0730PVT20000U11030DE, 12x9
D4	4 bar / 49.0 l/h, GXLAEU0450PVT20000U11030DE, DN10
D5	2 bar / 78.5 l/h, GXLAEU0280PVT20000U11030DE, DN10
X1	16 bar / 3.6 l/h, GMXa 1604 PVT20000U110300DE, 6x4
X2	7 bar / 7.6 l/h, GMXa 0708 PVT20000U110300DE, 8x5
X3	10 bar / 9.0 l/h, GMXa 1009 PVT20000U110300DE, 8x5
X4	4 bar / 13.5 l/h, GMXa 0414 PVT20000U110300DE, 8x5
X5	7 bar / 14.5 l/h, GMXa 0715 PVT20000U110300DE, 8x5
X6	2 bar / 19.7 l/h, GMXa 0220 PVT20000U110300DE, 12x9
X7	4 bar / 24.0 l/h, GMXa 0424 PVT20000U110300DE, 12x9
X8	2 bar / 45.0 l/h, GMXa 0245 PVT00000U110300DE, 12x9

DULCONNEX (Wi-Fi)	
0	none
1	for 1 x GMXa/GXLa
2	for 2 x GMXa/GXLa

Operating instructions	
DE	German
EN	English
FR	French
ES	Spanish
PT	Portuguese
RU	Russian

Approvals	
01	CE mark

1.7.4 Metering system DULCODOS® universal mini PE

Compact metering system meters liquid chemicals cost-effectively and reliably

Up to 75 l/h (10 – 2 bar) pump volume depending on the pump selected



The metering system DULCODOS® universal mini PE combines reliable standard components, tailored precisely to your needs, in the most compact space.

The metering system DULCODOS® universal mini PE is supplied ready connected and its small footprint enables it to be easily integrated into the process. The construction is exceptionally well laid out with the new valve block.

The compact metering system DULCODOS® universal mini PE is optionally available with a solenoid-driven metering pump of the Beta® 4 or 5, delta®, gamma/ X and gamma/ XL product ranges. It is also easy to operate. The system is cost-effective and can be delivered extremely quickly.

Your benefits

- Compact and clearly laid out construction
- Reliable and precise metering of liquid chemicals with proven solenoid-driven metering pumps
- Systems with 1 pump and 1 point of injection
- Calibration unit with priming function for controlled metering
- Optional: Pulsation damper, spray guard
- Optional: DULCONNEX connection (Wi-Fi)

Technical Details

- ProMinent solenoid-driven metering pumps Beta® 4/5, gamma/ X or gamma/ XL
- Dimensions of metering frame: Type 1: 900 x 660 x 440 mm (H x W x D)
- Collecting pan with leak sensor
- Flushing connectors
- Terminal box with master switch
- Range of spray guards
- Mounting frame material: PE

Field of application

- Cooling water treatment
- Waste water and process water treatment
- Paper industry
- Food industry
- Beverage industry

Type selection

	Metering pumps	Points of injection	Material combinations	Hose materials
Type 1	1	1	PVC/EPDM or PP/FKM	PTFE

Identity code ordering system, DULCODOS®universal mini PE

DSUa	Pipework / Seal / Function													
	M	PVC, EPDM, for 1 pump and 1 point of injection												
	N	PP, FKM, for 1 pump and 1 point of injection												
		Mounting frame (900 x 660 x 440 mm – H x W x D)												
		5	PE Natural											
		6	PE Orange											
		7	PE Yellow											
		8	PE Blue											
			Version											
			00	with ProMinent® logo										
			01	without ProMinent® Logo										
				Pulsation damper										
				0	none									
				1	1 x pulsation damper PVC/EPDM									
				2	1 x pulsation damper PP/FKM									
					Hydraulic connectors									
					0	Insert								
					1	Hose nipple 6x4								
					2	Hose nipple 8x5								
					3	Hose nipple 12x9								
					4	Pressure hose nozzle DN10								
					5	Pressure hose sleeve 1/2" NPT								
						Flushing connectors								
						0	closed							
						1	Pressure hose nozzle DN10							
						2	Gardena							
						3	Pressure hose sleeve 1/2" NPT							
							Splash guard							
							0	none						
							2	with splash guard						
								Stainless steel bracket						
								5	Floor installation (without brackets)					
								6	Machine feet (4 no.)					
								8	Wall installation					
									Pump 1					
									00	no pump				
									41	10 bar / 0.74 l/h, BT4b 1000 PVT2000U1100000, 6x4				
									42	16 bar / 2.2 l/h, BT4b 1602 PVT2000U1100000, 6x4				
									43	16 bar / 3.60 l/h, BT4b 1604 PVT2000U1100000, 6x4				
									44	7 bar / 7.10 l/h, BT4b 0708 PVT2000U1100000, 8x5				
									45	4 bar / 12.30 l/h, BT4b 0413 PVT2000U1100000, 8x5				
									46	2 bar / 19.00 l/h, BT4b 0220 PVT2000U1100000, 12x9				
									51	10 bar / 6.80 l/h, BT5b 1008 PVT2000U1100000, 8x5				
									52	7 bar / 11.0 l/h, BT5b 0713 PVT2000U1100000, 8x5				
									53	4 bar / 17.10 l/h, BT5b 0420 PVT2000U1100000, 12.9				
									54	2 bar/32.00 l/h, BT5b 0232 NPE2000U1100000, 12x9				
									X1	16 bar / 3.6 l/h, GMXa 1604 PVT20000U110300DE, 6x4				
									X2	7 bar / 7.6 l/h, GMXa 0708 PVT20000U110300DE, 8x5				
									X3	10 bar / 9.0 l/h, GMXa 1009 PVT20000U110300DE, 8x5				
									X4	4 bar / 13.5 l/h, GMXa 0414 PVT20000U110300DE, 8x5				
									X5	7 bar / 14.5 l/h, GMXa 0715 PVT20000U110300DE, 8x5				
									X6	2 bar / 19.7 l/h, GMXa 0220 PVT20000U110300DE, 12x9				
									X7	4 bar / 24.0 l/h, GMXa 0424 PVT20000U110300DE, 12x9				
									X8	2 bar / 45.0 l/h, GMXa 0245 PVT00000U110300DE, 12x9				
										Pump 2				
										0	no pump			
											DULCONNEX (Wi-Fi)			
											0	none		
											1	for 1 x GMXa/GXLa		
												Operating instructions		
												DE	German	
												EN	English	
												FR	French	
												ES	Spanish	
												PT	Portuguese	
												IT	Italian	
													Approvals	
													01	CE mark

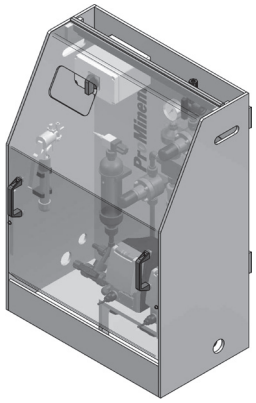
1.7 Metering Systems

1.7.5 Metering system DULCODOS® universal mini PP

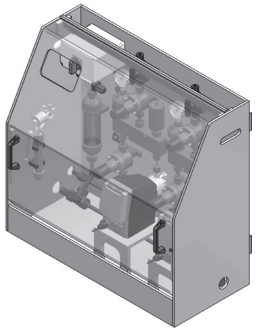
Compact metering system meters liquid chemicals cost-effectively and reliably

Up to 75 l/h (10 – 2 bar) pump volume depending on the pump selected

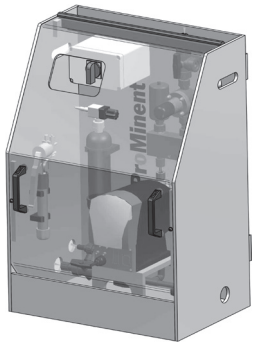
The metering system DULCODOS® universal mini PP combines reliable standard components, tailored precisely to your needs, in the most compact space.



DULCODOS® universal mini PP, type 1



DULCODOS® universal mini PP, type 2



DULCODOS® universal mini PP, type 3

The metering system DULCODOS® universal mini PP is supplied ready connected and its small footprint enables it to be integrated simply into the process. The construction is exceptionally well arranged with the new valve block.

The compact metering system is optionally available with up to two solenoid-driven metering pumps of the product range Beta® 4 or 5, gamma/ X and gamma/ XL. It is also unbelievably simple. The system is cost-effective and can be delivered extremely quickly.

Your benefits

- Compact and clearly laid out construction
- Reliable and precise metering of liquid chemicals with proven solenoid-driven metering pumps
- Systems with 1 or 2 pumps and 1 or 2 points of injection
- Calibration unit with priming function for controlled metering
- Optional: Pulsation damper, spray guard
- Optional: DULCONNEX connection (Wi-Fi)

Technical Details

- ProMinent solenoid-driven metering pumps Beta® 4/5, gamma/ X or gamma/ XL
- Dimensions of metering frame: Type 1: 850 x 600 x 520 mm (H x B x T) Type 2: 1,000 x 700 x 520 mm (H x B x T) Type 3: 850 x 900 x 520 mm (H x W x D)
- Collecting pan with leak sensor
- Flushing connectors
- Terminal box with master switch
- Range of spray guards
- Mounting frame material: PP

Field of application

- Cooling water treatment
- Waste water and process water treatment
- Paper industry
- Food industry
- Beverage industry

Type selection

	Metering pumps	Points of injection	Material combinations	Hose materials
Type 1	1	1	PVC/EPDM or PP/FKM	PTFE
Type 2	2	1	PVC/EPDM or PP/FKM	PTFE
Type 3	2	2	PVC/EPDM or PP/FKM	PTFE

Identity Code Ordering System, DULCODOS®universal mini

DSUa	Pipework / Seal / Function
A	PVC, EPDM, for 1 pump and 1 point of injection
B	PVC, EPDM, for 2 pumps and 1 point of injection
C	PVC, EPDM, for 2 pumps and 2 points of injection
D	PP, FKM, for 1 pump and 1 point of injection
E	PP, FKM, for 2 pumps and 1 point of injection
F	PP, FKM, for 2 pumps and 2 points of injection

	Mounting frame (900 x 660 x 440 mm – H x W x D)
A	Assembly frame, PP white, 850 x 600 x 520 mm (H x W x D)
B	Assembly frame, PP white, 1000 x 700 x 520 mm (H x W x D)
C	Assembly frame, PP white, 850 x 900 x 520 mm (H x W x D)

	Version
00	with ProMinent® logo
01	without ProMinent® Logo

	Pulsation damper
0	none
1	1 x pulsation damper PVC/EPDM
2	1 x pulsation damper PP/FKM
3	2 x pulsation dampers PVC/EPDM
4	2 x pulsation dampers PP/FKM

	Hydraulic connectors
0	Insert
1	Hose nipple 6x4
2	Hose nipple 8x5
3	Hose nipple 12x9
4	Pressure hose nozzle DN10

	Flushing connectors
0	closed
1	Pressure hose nozzle DN10
2	Gardena

	Splash guard
0	none
A	with splash guard, W= 600 mm
B	with splash guard, W= 700 mm
C	with splash guard, W= 900 mm

	Stainless steel bracket
D	none
A	Stainless steel bracket (H= 150 mm) + machine feet
B	Stainless steel bracket (H= 150 mm) + machine feet
C	Stainless steel bracket (H= 150 mm) + machine feet

	Pump 1
00	no pump
41	10 bar / 0.74 l/h, BT4b 1000 PVT2000U1100000, 6x4
42	16 bar / 2.2 l/h, BT4b 1602 PVT2000U1100000, 6x4
43	16 bar / 3.60 l/h, BT4b 1604 PVT2000U1100000, 6x4
44	7 bar / 7.10 l/h, BT4b 0708 PVT2000U1100000, 8x5
45	4 bar / 12.30 l/h, BT4b 0413 PVT2000U1100000, 8x5
46	2 bar / 19.00 l/h, BT4b 0220 PVT2000U1100000, 12x9
51	10 bar / 6.80 l/h, BT5b 1008 PVT2000U1100000, 8x5
52	7 bar / 11.0 l/h, BT5b 0713 PVT2000U1100000, 8x5
53	4 bar / 17.10 l/h, BT5b 0420 PVT2000U1100000, 12.9
54	2 bar/32.00 l/h, BT5b 0232 NPE2000U1100000, 12x9
D1	16 bar / 12 l/h, GXLAEU1612PVT20000U11030DE, 8x5
D2	10 bar / 19.6 l/h, GXLAEU1020PVT20000U11030DE, 12x9
D3	7 bar / 29.4 l/h, GXLAEU0730PVT20000U11030DE, 12X9
D4	4 bar / 49.0 l/h, GXLAEU0450PVT20000U11030DE, DN10
D5	2 bar / 78.5 l/h, GXLAEU0280PVT20000U11030DE, DN10
X1	16 bar / 3.6 l/h, GMXa 1604 PVT20000U110300DE, 6x4
X2	7 bar / 7.6 l/h, GMXa 0708 PVT20000U110300DE, 8x5
X3	10 bar / 9.0 l/h, GMXa 1009 PVT20000U110300DE, 8x5
X4	4 bar / 13.5 l/h, GMXa 0414 PVT20000U110300DE, 8x5
X5	7 bar / 14.5 l/h, GMXa 0715 PVT20000U110300DE, 8x5
X6	2 bar / 19.7 l/h, GMXa 0220 PVT20000U110300DE, 12x9
X7	4 bar / 24.0 l/h, GMXa 0424 PVT20000U110300DE, 12x9
X8	2 bar / 45.0 l/h, GMXa 0245 PVT00000U110300DE, 12x9

	Pump 2
00	no pump
41	10 bar / 0.74 l/h, BT4b 1000 PVT2000U1100000, 6x4
42	16 bar / 2.2 l/h, BT4b 1602 PVT2000U1100000, 6x4
43	16 bar / 3.60 l/h, BT4b 1604 PVT2000U1100000, 6x4
44	7 bar / 7.10 l/h, BT4b 0708 PVT 2000U1100000, 8x5
45	4 bar / 12.30 l/h, BT4b 0413 PVT2000U1100000, 8x5
46	2 bar / 19.00 l/h, BT4b 0220 PVT2000U1100000, 12x9

1.7 Metering Systems

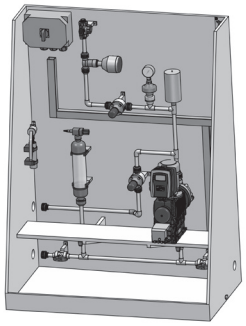
											51	10 bar / 6.80 l/h, BT5b 1008 PVT2000U1100000, 8x5			
											52	7 bar / 11.0 l/h, BT5b 0713 PVT2000U1100000, 8x5			
											53	4 bar / 17.10 l/h, BT5b 0420 PVT2000U1100000, 12x9			
											54	2 bar / 32.00 l/h, BT5b 0232 NPE2000U1100000, 12x9			
											D1	16 bar / 12 l/h, GXLAEU1612PVT20000U11030DE, 8x5			
											D2	10 bar / 19.6 l/h, GXLAEU1020PVT20000U11030DE, 12x9			
											D3	7 bar / 29.4 l/h, GXLAEU0730PVT20000U11030DE, 12x9			
											D4	4 bar / 49.0 l/h, GXLAEU0450PVT20000U11030DE, DN10			
											D5	2 bar / 78.5 l/h, GXLAEU0280PVT20000U11030DE, DN10			
											X1	16 bar / 3.6 l/h, GMXa 1604 PVT20000U110300DE, 6x4			
											X2	7 bar / 7.6 l/h, GMXa 0708 PVT20000U110300DE, 8x5			
											X3	10 bar / 9.0 l/h, GMXa 1009 PVT20000U110300DE, 8x5			
											X4	4 bar / 13.5 l/h, GMXa 0414 PVT20000U110300DE, 8x5			
											X5	7 bar / 14.5 l/h, GMXa 0715 PVT20000U110300DE, 8x5			
											X6	2 bar / 19.7 l/h, GMXa 0220 PVT20000U110300DE, 12x9			
											X7	4 bar / 24.0 l/h, GMXa 0424 PVT20000U110300DE, 12x9			
											X8	2 bar / 45.0 l/h, GMXa 0245 PVT00000U110300DE, 12x9			
												DULCONNEX (Wi-Fi)			
												0	none		
												1	for 1 x GMXa/GXLa		
													Operating instructions		
													DE	German	
													EN	English	
													FR	French	
													ES	Spanish	
													PT	Portuguese	
													IT	Italian	
														Approvals	
														01	CE mark

1.7.6 Metering System DULCODOS® panel (DSWb)

Our quickly available solution for your metering task.

Pump capacity depending on the selected pump up to 1,000 l/h, back pressure 10 – 2 bar

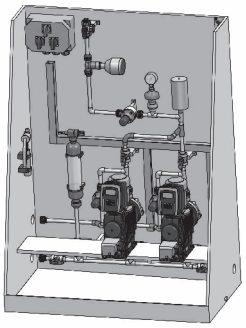
DULCODOS® panel is a complete metering system for reliable chemical metering. It is now even more space-saving and quickly available – our new standards ensure this. You can select perfectly coordinated components depending on material resistance, pump capacity and function.



The metering system DULCODOS® panel is a convenient method for reliably metering liquid chemicals – and can be obtained cost-effectively and quickly thanks to the preconfigured modules.

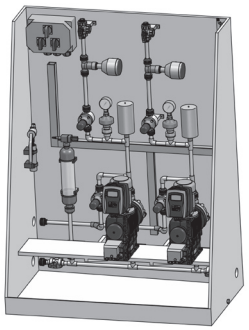
The metering pump is the heart of the metering system. The number of points of injection and metering pumps must be defined. There are several models to choose from. The right components, such as mounting plate, pipework, hydraulic and electric accessories, come from this.

The new valve block for solenoid metering pumps gives the metering systems a well arranged structure. Every system features two relief valves, a collecting pan with leak sensor and a calibration tank for controlled metering for complete operational safety. An inductive flow meter can also be selected. This simple configuration enables fast delivery and seamless commissioning.



Your benefits

- Reliable and precise metering of liquid chemicals with proven diaphragm metering pumps
- Safe operation thanks to relief valves and integrated collecting pan
- Stable assembly frame and assembly cabinets
- Systems with 1 or 2 pumps and 1 or 2 points of injection
- Material selection in PVC or PP with FKM or EPDM seals
- Selected adhesive for PVC: Tangit or DTX
- Calibration unit with priming function for controlled metering
- Optional: pulsation damper, spray guard, inductive flow meter, angled seat filter



Technical Details

- ProMinent diaphragm metering pumps of the product range Beta®, gamma/ X, gamma/ XL or Sigma
- Dimensions: 1,200 x 800 x 450 mm to 2,000 x 1,600 x 650 mm (H x W x D)
- Material combinations: PP/FKM, PP/EPDM or PVC/FKM, PVC/EPDM (note compatibility with the feed chemical)
- PVC adhesive selection: Tangit or DTX
- Relief valves to protect the pipework
- Manometer
- Collecting pan with leak sensor
- Flushing connectors
- Terminal box with master switch
- Assembly frame with spray guard or metering cabinet with sliding doors

Field of application

Metering of liquid chemicals, e.g.

- Cooling water treatment
- Waste water and process water treatment
- Paper industry

Identity code ordering system, plate-mounted metering systems for Beta® and gamma/ X, DN 10

DSWb	Metering pump / nominal width of pipework											
	SP10	Solenoid metering pump (Beta® 4b/ Beta® 5b/ gamma/ X/ gamma/ XL), DN10										
		Pipework / Function										
		1	PVC / 1 pump, 1 point of injection									
		2	PVC / 2 pumps, 1 point of injection									
		3	PVC / 2 pumps, 2 points of injection									
		4	PP / 1 pump, 1 point of injection									
		5	PP / 2 pumps, 1 point of injection									
		6	PP / 2 pumps, 2 points of injection									
			Seal									
			E	EPDM								
			B	FKM A								
				Adhesive								
				0	none							
				T	with extension for standby pump (same type as metering pump)							
				D	DTX							
					Version							
					0	with ProMinent logo						
					1	without ProMinent logo						
						Pulsation damper						
						0	none					
						1	1x pulsation damper (type: SP10)					
						A	2x pulsation damper (type: SP10); 2P-2D					
							Hydraulic connectors					
							0	Insert				
							1	Hose nipple 6 x 4, 8 x 5, 12 x 9, DN10				
								Flushing connectors				
								0	closed			
								1	DN 10 pressure hose sleeve			
								2	DN 15 pressure hose sleeve			
								3	DN 20 pressure hose sleeve			
								4	DN 25 pressure hose sleeve			
								5	DN 32 pressure hose sleeve			
								A	Gardena			
									Terminal box			
									0	No terminal box / no pumps		
									1	230 V, 1 pump (solenoid/Sigma Control)		
									2	230 V, 2 pumps (solenoid and Sigma Control)		
										Pump 1		
										00	no pump	
										41	10 bar / 0.74 l/h, BT4b 1000PVT2000U1100000, 6x4	
										42	16 bar / 2.2 l/h, BT4b 1602PVT2000U1100000, 6x4	
										43	16 bar / 3.60 l/h, BT4b 1604PVT2000U1100000, 6x4	
										44	7 bar / 7.10 l/h, BT4b 0708PVT2000U1100000, 8x5	
										45	4 bar / 12.30 l/h, BT4b 0413PVT2000U1100000, 8x5	
										46	2 bar / 19.00 l/h, BT4b 0220PVT2000U1100000, 12x9	
										51	10 bar / 6.80 l/h, BT5b 1008PVT2000U1100000, 8x5	
										52	7 bar / 11.0 l/h, BT5b 0713PVT2000U1100000, 8x5	
										53	4 bar / 17.10 l/h, BT5b 0420PVT2000U1100000, 12x9	
										54	2 bar / 32.00 l/h, BT5b 0232NPE2000U1100000, 12x9	
										D1	16 bar / 12 l/h, GXLAEU1612PVT20000U11030DE, 8x5	
										D2	10 bar / 19.6 l/h, GXLAEU1020PVT20000U11030DE, 12x9	
										D3	7 bar / 29.4 l/h, GXLAEU0730PVT20000U11030DE, 12x9	
										D4	4 bar / 49.0 l/h, GXLAEU0450PVT20000U11030DE, DN10	
										D5	2 bar / 78.5 l/h, GXLAEU0280PVT20000U11030DE, DN10	
										X1	16 bar / 3.6 l/h, GMXa 1604PVT20000U110300DE, 6x4	
										X2	7 bar / 7.6 l/h, GMXa 0708PVT20000U110300EN, 8x5	
										X3	10 bar / 9.0 l/h, GMXa 1009PVT20000U110300DE, 8x5	
										X4	4 bar / 13.5 l/h, GMXa 0414PVT20000U110300DE, 8x5	
										X5	7 bar / 14.5 l/h, GMXa 0715PVT20000U110300DE, 8x5	
										X6	2 bar / 19.7 l/h, GMXa 0220PVT20000U110300DE, 12x9	
										X7	4 bar / 24.0 l/h, GMXa 0424PVT20000U110300DE, 12x9	
										X8	2 bar / 45.0 l/h, GMXa 0245PVT00000U110300DE, 12x9	
											Pump 2	
											00	no pump
											41	10 bar / 0.74 l/h, BT4b 1000PVT2000U1100000, 6x4
											42	16 bar / 2.2 l/h, BT4b 1602PVT2000U1100000, 6x4
											43	16 bar / 3.60 l/h, BT4b 1604PVT2000U1100000, 6x4
											44	7 bar / 7.10 l/h, BT4b 0708PVT2000U1100000, 8x5
											45	4 bar / 12.30 l/h, BT4b 0413PVT2000U1100000, 8x5
											46	2 bar / 19.00 l/h, BT4b 0220PVT2000U1100000, 12x9
											51	10 bar / 6.80 l/h, BT5b 1008PVT2000U1100000, 8x5

52	7 bar / 11.0 l/h, BT5b 0713PVT2000U1100000, 8x5
53	4 bar / 17.10 l/h, BT5b 0420PVT2000U1100000, 12x9
54	2 bar / 32.00 l/h, BT5b 0232NPE2000U1100000, 12x9
D1	16 bar / 12 l/h, GXLAEU1612PVT20000U11030DE, 8x5
D2	10 bar / 19.6 l/h, GXLAEU1020PVT20000U11030DE, 12x9
D3	7 bar / 29.4 l/h, GXLAEU0730PVT20000U11030DE, 12x9
D4	4 bar / 49.0 l/h, GXLAEU0450PVT20000U11030DE, DN10
D5	2 bar / 78.5 l/h, GXLAEU0280PVT20000U11030DE, DN10
X1	16 bar / 3.6 l/h, GMXa 1604PVT20000U110300DE, 6x4
X2	7 bar / 7.6 l/h, GMXa 0708PVT20000U110300EN, 8x5
X3	10 bar / 9.0 l/h, GMXa 1009PVT20000U110300DE, 8x5
X4	4 bar / 13.5 l/h, GMXa 0414PVT20000U110300DE, 8x5
X5	7 bar / 14.5 l/h, GMXa 0715PVT20000U110300DE, 8x5
X6	2 bar / 19.7 l/h, GMXa 0220PVT20000U110300DE, 12x9
X7	4 bar / 24.0 l/h, GMXa 0424PVT20000U110300DE, 12x9
X8	2 bar / 45.0 l/h, GMXa 0245PVT00000U110300DE, 12x9
	Operating instructions
DE	German
EN	English
ES	Spanish
FR	French
PT	Portuguese
	Approvals
01	CE mark

Identity Code Ordering System for Plate-Mounted Metering Systems for Sigma/ 1, DN 10

DSWb	Metering pump / nominal width of pipework																				
	S110	Sigma/ 1, DN 10 (S1Cb/S1Ba 12017 - 07065: 20 - 65 l/h)																			
		Pipework / Function																			
		1	PVC / 1 pump, 1 point of injection																		
		2	PVC / 2 pumps, 1 point of injection																		
		3	PVC / 2 pumps, 2 points of injection																		
		4	PP / 1 pump, 1 point of injection																		
		5	PP / 2 pumps, 1 point of injection																		
		6	PP / 2 pumps, 2 points of injection																		
			Seal																		
			E	EPDM																	
			B	FKM A																	
				Adhesive																	
				0	none																
				T	with extension for standby pump (same type as metering pump)																
				D	DTX																
					Version																
					0	with ProMinent logo															
					1	without ProMinent logo															
						Pulsation damper															
						0	none														
						2	1x pulsation damper (type: S110)														
						B	2x pulsation damper (type: S110); 2 pumps - 2 points of injection														
							Hydraulic connectors														
							0	Insert													
							2	Hose nozzles DN10													
								Flushing connectors													
								0	closed												
								1	DN 10 pressure hose sleeve												
								A	Gardena												
									Terminal box												
									0	No terminal box / no pumps											
									1	230 V, 1 pump (solenoid/Sigma Control)											
									2	230 V, 2 pumps (solenoid and Sigma Control)											
									3	400 V, 1 pump (Sigma Basic)											
									4	400 V, 2 pumps (Sigma Basic)											
										Pump 1											
										00	no pump										
										11	12 bar / 17 l/h, S1BaH 12017PVTS000T000, 3/4-10										
										12	10 bar / 22 l/h, S1BaH 10022PVTS000T000, 3/4-10										
										13	12 bar / 35 l/h, S1BaH 12035PVTS000T000, 3/4-10										
										15	10 bar / 44 l/h, S1BaH 10044PVTS000T000, 3/4-10										
										16	10 bar / 50 l/h, S1BaH 10050PVTS000T000, 3/4-10										
										17	7 bar / 65 l/h, S1BaH 07065PVTS000T000, 3/4-10										

1.7 Metering Systems

Code	Description
1A	12 bar / 21 l/h, S1CbH 12017PVTS000U111000DE, 3/4-10
1B	10 bar / 27 l/h, S1CbH 10022PVTS000U111000DE, 3/4-10
1C	12 bar / 42 l/h, S1CbH 12035PVTS000U111000DE, 3/4-10
1D	10 bar / 49 l/h, S1CbH 10050PVTS000U111000DE, 3/4-10
1F	10 bar / 53 l/h, S1CbH 10044PVTS000U111000DE, 3/4-10
1G	7 bar / 63 l/h, S1CbH 07065PVTS000U111000DE, 3/4-10
	Pump 2
00	no pump
11	12 bar / 17 l/h, S1BaH 12017PVTS000T000, 3/4-10
12	10 bar / 22 l/h, S1BaH 10022PVTS000T000, 3/4-10
13	12 bar / 35 l/h, S1BaH 12035PVTS000T000, 3/4-10
15	10 bar / 44 l/h, S1BaH 10044PVTS000T000, 3/4-10
16	10 bar / 50 l/h, S1BaH 10050PVTS000T000, 3/4-10
17	7 bar / 65 l/h, S1BaH 07065PVTS000T000, 3/4-10
1A	12 bar / 21 l/h, S1CbH 12017PVTS000U111000DE, 3/4-10
1B	10 bar / 27 l/h, S1CbH 10022PVTS000U111000DE, 3/4-10
1C	12 bar / 42 l/h, S1CbH 12035PVTS000U111000DE, 3/4-10
1D	10 bar / 49 l/h, S1CbH 10050PVTS000U111000DE, 3/4-10
1F	10 bar / 53 l/h, S1CbH 10044PVTS000U111000DE, 3/4-10
1G	7 bar / 63 l/h, S1CbH 07065PVTS000U111000DE, 3/4-10
	Operating instructions
DE	German
EN	English
ES	Spanish
FR	French
PT	Portuguese
	Approvals
01	CE mark

Identity Code Ordering System for Plate-Mounted Metering Systems for Sigma/ 1, DN 15

Code	Description
DSWb	**Metering pump / nominal width of pipework**
S115	Sigma/ 1, DN 15 (S1Cb/S1Ba 07042 - 04120: 50 - 120 l/h)
	Pipework / Function
1	PVC / 1 pump, 1 point of injection
2	PVC / 2 pumps, 1 point of injection
3	PVC / 2 pumps, 2 points of injection
4	PP / 1 pump, 1 point of injection
5	PP / 2 pumps, 1 point of injection
6	PP / 2 pumps, 2 points of injection
	Seal
E	EPDM
B	FKM A
	Adhesive
0	none
T	with extension for standby pump (same type as metering pump)
D	DTX
	Version
0	with ProMinent logo
1	without ProMinent logo
	Pulsation damper
0	none
3	1x pulsation damper (type: S115/S215)
C	2x pulsation damper (type: S115/S215); 2 pumps - 2 points of injection
	Hydraulic connectors
0	Insert
3	Hose nozzles DN15
	Flushing connectors
0	closed
2	DN 15 pressure hose sleeve
A	Gardena
	Terminal box
0	No terminal box / no pumps
1	230 V, 1 pump (solenoid/Sigma Control)
2	230 V, 2 pumps (solenoid and Sigma Control)
3	400 V, 1 pump (Sigma Basic)
4	400 V, 2 pumps (Sigma Basic)
	Pump 1
00	no pump
14	7 bar / 42 l/h, S1BaH 07042PVTS000T000, 1-15
18	4 bar / 84 l/h, S1BaH 04084PVTS000T000, 1-15

19	4 bar / 120 l/h, S1BaH 04120PVTS000T000, 1-15
1E	7 bar / 52 l/h, S1CbH 07042PVTS000U111000DE, 1-15
1H	4 bar / 101 l/h, S1CbH 04084PVTS000U111000DE, 1-15
1J	4 bar / 117 l/h, S1CbH 04120PVTS000U111000DE, 1-15
Pump 2	
00	no pump
14	7 bar / 42 l/h, S1BaH 07042PVTS000T000, 1-15
18	4 bar / 84 l/h, S1BaH 04084PVTS000T000, 1-15
19	4 bar / 120 l/h, S1BaH 04120PVTS000T000, 1-15
1E	7 bar / 52 l/h, S1CbH 07042PVTS000U111000DE, 1-15
1H	4 bar / 101 l/h, S1CbH 04084PVTS000U111000DE, 1-15
1J	4 bar / 117 l/h, S1CbH 04120PVTS000U111000DE, 1-15
Operating instructions	
DE	German
EN	English
ES	Spanish
FR	French
PT	Portuguese
Approvals	
01	CE mark

Identity Code Ordering System for Plate-Mounted Metering Systems for Sigma/ 2, DN 15

DSWb	Metering pump / nominal width of pipework													
	S215	Sigma 2 / DN15												
		Pipework / Function												
		1	PVC / 1 pump, 1 point of injection											
		2	PVC / 2 pumps, 1 point of injection											
		3	PVC / 2 pumps, 2 points of injection											
		4	PP / 1 pump, 1 point of injection											
		5	PP / 2 pumps, 1 point of injection											
		6	PP / 2 pumps, 2 points of injection											
			Seal											
			E	EPDM										
			B	FKM A										
				Adhesive										
				0	none									
				T	with extension for standby pump (same type as metering pump)									
				D	DTX									
					Version									
					0	with ProMinent logo								
					1	without ProMinent logo								
						Pulsation damper								
						0	none							
						3	1x pulsation damper (type: S115/S215)							
						C	2x pulsation damper (type: S115/S215); 2 pumps - 2 points of injection							
							Hydraulic connectors							
							0	Insert						
							3	Hose nozzles DN15						
								Flushing connectors						
								0	closed					
								2	DN 15 pressure hose sleeve					
								A	Gardena					
									Terminal box					
									0	No terminal box / no pumps				
									1	230 V, 1 pump (solenoid/Sigma Control)				
									2	230 V, 2 pumps (solenoid and Sigma Control)				
									3	400 V, 1 pump (Sigma Basic)				
									4	400 V, 2 pumps (Sigma Basic)				
										Pump 1				
										00	no pump			
										21	10 bar / 50 l/h, S2BaHM 16050PVTS000T000, 1-15			
										22	10 bar / 88 l/h, S2BaHM 16090PVTS000T000, 1-15			
										24	10 bar / 135 l/h, S2BaHM 16130PVTS000T000, 1-15			
										2A	10 bar / 61 l/h, S2CbH 16050PVTS000U1110S0EN, 1-15			
										2B	10 bar / 109 l/h, S2CbH 16090PVTS000U1110S0EN, 1-15			
										2C	10 bar / 131 l/h, S2CbH 16130PVTS000U1110S0EN, 1-15			
											Pump 2			
											00	no pump		
											21	10 bar / 50 l/h, S2BaHM 16050PVTS000T000, 1-15		
											22	10 bar / 88 l/h, S2BaHM 16090PVTS000T000, 1-15		

24	10 bar / 135 l/h, S2BaHM 16130PVTS000T000, 1-15
2A	10 bar / 61 l/h, S2CbH 16050PVTS000U111000DE, 1-15
2B	10 bar / 109 l/h, S2CbH 16090PVTS000U111000DE, 1-15
2C	10 bar / 131 l/h, S2CbH 16130PVTS000U111000DE, 1-15
	Operating instructions
DE	German
EN	English
ES	Spanish
FR	French
PT	Portuguese
	Approvals
01	CE mark

Identity Code Ordering System for Plate-Mounted Metering Systems for Sigma/2, DN 20

DSWb	Metering pump / nominal width of pipework													
	S220	Sigma 2 / DN20												
		Pipework / Function												
		1	PVC / 1 pump, 1 point of injection											
		2	PVC / 2 pumps, 1 point of injection											
		3	PVC / 2 pumps, 2 points of injection											
		4	PP / 1 pump, 1 point of injection											
		5	PP / 2 pumps, 1 point of injection											
		6	PP / 2 pumps, 2 points of injection											
			Seal											
			E	EPDM										
			B	FKM A										
				Adhesive										
				0	none									
				T	with extension for standby pump (same type as metering pump)									
				D	DTX									
					Version									
					0	with ProMinent logo								
					1	without ProMinent logo								
						Pulsation damper								
						0	none							
						4	1x pulsation damper (type: S220)							
						D	2x pulsation damper (type: S220); 2 pumps - 2 points of injection							
							Hydraulic connectors							
							0	Insert						
							4	Hose nozzles DN20						
								Flushing connectors						
								0	closed					
								3	DN 20 pressure hose sleeve					
								A	Gardena					
									Terminal box					
									0	No terminal box / no pumps				
									1	230 V, 1 pump (solenoid/Sigma Control)				
									2	230 V, 2 pumps (solenoid and Sigma Control)				
									3	400 V, 1 pump (Sigma Basic)				
									4	400 V, 2 pumps (Sigma Basic)				
										Pump 1				
										00	no pump			
										23	7 bar / 126 l/h, S2BaHM 07120PVTS000T000, 1 1/2-25			
										25	7 bar / 220 l/h, S2BaHM 07220PVTS000T000, 1 1/2-25			
										26	4 bar / 350 l/h, S2BaHM 04350PVTS000T000, 1 1/2-25			
										2D	7 bar / 150 l/h, S2CbH 07120PVTS000U111000DE, 1 1/2-25			
										2E	7 bar / 271 l/h, S2CbH 07220PVTS000U111000DE, 1 1/2-25			
										2F	4 bar / 353 l/h, S2CbH 04350PVTS000U111000DE, 1 1/2-25			
											Pump 2			
											00	no pump		
											23	7 bar / 126 l/h, S2BaHM 07120PVTS000T000, 1 1/2-25		
											25	7 bar / 220 l/h, S2BaHM 07220PVTS000T000, 1 1/2-25		
											26	4 bar / 350 l/h, S2BaHM 04350PVTS000T000, 1 1/2-25		
											2D	7 bar / 150 l/h, S2CbH 07120PVTS000U111000DE, 1 1/2-25		
											2E	7 bar / 271 l/h, S2CbH 07220PVTS000U111000DE, 1 1/2-25		
											2F	4 bar / 353 l/h, S2CbH 04350PVTS000U111000DE, 1 1/2-25		
												Operating instructions		
												DE	German	
												EN	English	
												ES	Spanish	

FR	French
PT	Portuguese
Approvals	
01	CE mark

Identity Code Ordering System for Plate-Mounted Metering Systems for Sigma/ 3, DN 25

DSWb	Metering pump / nominal width of pipework													
	S325	Sigma/ 3, DN 25 (S3Cb 120145 - 120330: 174 - 324 l/h)												
		Pipework / Function												
		1	PVC / 1 pump, 1 point of injection											
		2	PVC / 2 pumps, 1 point of injection											
		3	PVC / 2 pumps, 2 points of injection											
		4	PP / 1 pump, 1 point of injection											
		5	PP / 2 pumps, 1 point of injection											
		6	PP / 2 pumps, 2 points of injection											
			Seal											
			E	EPDM										
			B	FKM A										
				Adhesive										
				0	none									
				T	with extension for standby pump (same type as metering pump)									
				D	DTX									
					Version									
					0	with ProMinent logo								
					1	without ProMinent logo								
						Pulsation damper								
						0	none							
						5	1x pulsation damper (type: S325)							
						E	2x pulsation damper (type: S325); 2 pumps - 2 points of injection							
							Hydraulic connectors							
							0	Insert						
							5	Hose nozzles DN25						
								Flushing connectors						
								0	closed					
								4	DN 25 pressure hose sleeve					
								A	Gardena					
									Terminal box					
									0	No terminal box / no pumps				
									1	230 V, 1 pump (solenoid/Sigma Control)				
									2	230 V, 2 pumps (solenoid and Sigma Control)				
									3	400 V, 1 pump (Sigma Basic)				
									4	400 V, 2 pumps (Sigma Basic)				
										Pump 1				
										00	no pump			
										31	10 bar / 208 l/h, S3BaH 120190PVTS000T000, 1 1/2-25			
										33	10 bar / 292 l/h, S3BaH 120270PVTS000T000, 1 1/2-25			
										34	10 bar / 365 l/h, S3BaH 120330PVTS000T000, 1 1/2-25			
										3A	10 bar / 182 l/h, S3CbH 120145PVTS000U111000DE, 1 1/2-25			
										3B	10 bar / 243 l/h, S3CbH 120190PVTS000U111000DE, 1 1/2-25			
										3C	10 bar / 365 l/h, S3CbH 120270PVTS000U111000DE, 1 1/2-25			
											Pump 2			
											00	no pump		
											31	10 bar / 146 l/h, S3BaH 120145PVTS000T000, 1 1/2-25		
											32	10 bar / 208 l/h, S3BaH 120190PVTS000T000, 1 1/2-25		
											33	10 bar / 292 l/h, S3BaH 120270PVTS000T000, 1 1/2-25		
											34	10 bar / 365 l/h, S3BaH 120330PVTS000T000, 1 1/2-25		
											3A	10 bar / 182 l/h, S3CbH 120145PVTS000U111000DE, 1 1/2-25		
											3B	10 bar / 243 l/h, S3CbH 120190PVTS000U111000DE, 1 1/2-25		
											3C	10 bar / 365 l/h, S3CbH 120270PVTS000U111000DE, 1 1/2-25		
												Operating instructions		
												DE	German	
												EN	English	
												ES	Spanish	
												FR	French	
												PT	Portuguese	
													Approvals	
													01	CE mark

Identity Code Ordering System for Plate-Mounted Metering Systems for Sigma/

3, DN 32

DSWb	Metering pump / nominal width of pipework													
	S332	Sigma/ 3, DN 32 (S3Cb 070410 - 041030: 492 - 1000 l/h)												
		Pipework / Function												
		1	PVC / 1 pump, 1 point of injection											
		2	PVC / 2 pumps, 1 point of injection											
		3	PVC / 2 pumps, 2 points of injection											
		4	PP / 1 pump, 1 point of injection											
		5	PP / 2 pumps, 1 point of injection											
		6	PP / 2 pumps, 2 points of injection											
			Seal											
			E	EPDM										
			B	FKM A										
				Adhesive										
				0	none									
				T	with extension for standby pump (same type as metering pump)									
				D	DTX									
					Version									
					0	with ProMinent logo								
					1	without ProMinent logo								
						Pulsation damper								
						0	none							
						6	1x pulsation damper (type: S332)							
						F	2x pulsation damper (type: S332); 2 pumps - 2 points of injection							
							Hydraulic connectors							
							0	Insert						
							6	Hose nozzles DN32						
								Flushing connectors						
								0	closed					
								5	DN 32 pressure hose sleeve					
								A	Gardena					
									Terminal box					
									0	No terminal box / no pumps				
									1	230 V, 1 pump (solenoid/Sigma Control)				
									2	230 V, 2 pumps (solenoid and Sigma Control)				
									3	400 V, 1 pump (Sigma Basic)				
									4	400 V, 2 pumps (Sigma Basic)				
										Pump 1				
										00	no pump			
										35	7 bar / 410 l/h, S3BaH 070410PVTS100T000, 2-32			
										36	7 bar / 580 l/h, S3BaH 070580PVTS100T000, 2-32			
										37	4 bar / 830 l/h, S3BaH 040830PVTS100T000, 2-32			
										38	4 bar / 1030 l/h, S3BaH 041030PVTS100T000, 2-32			
										3D	7 bar / 500 l/h, S3CbH 070410PVTS100U111000DE, 2-32			
										3E	7 bar / 670 l/h, S3CbH 070580PVTS100U111000DE, 2-32			
										3F	4 bar / 1040 l/h, S3CbH 040830PVTS100U111000DE, 2-32			
											Pump 2			
											00	no pump		
											35	7 bar / 410 l/h, S3BaH 070410PVTS100T000, 2-32		
											36	7 bar / 580 l/h, S3BaH 070580PVTS100T000, 2-32		
											37	4 bar / 830 l/h, S3BaH 040830PVTS100T000, 2-32		
											38	4 bar / 1030 l/h, S3BaH 041030PVTS100T000, 2-32		
											3D	7 bar / 500 l/h, S3CbH 070410PVTS100U111000DE, 2-32		
											3E	7 bar / 670 l/h, S3CbH 070580PVTS100U111000DE, 2-32		
											3F	4 bar / 1040 l/h, S3CbH 040830PVTS100U111000DE, 2-32		
												Operating instructions		
												DE	German	
												EN	English	
												ES	Spanish	
												FR	French	
												PT	Portuguese	
													Approvals	
													01	CE mark

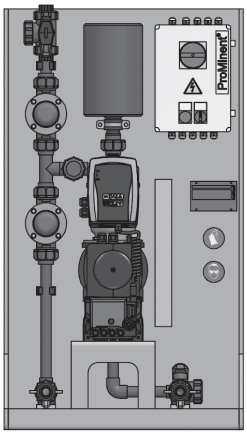
1.7.7 Metering system DULCODOS® modular (DSKa)

Modular and flexible for precise metering

Capacity: 40 – 1,000 l/h

The ready-wired modular metering system DULCODOS® is used for the ultra-precise metering of chemicals. It has a modular design and can be flexibly integrated into the most varied applications.





The construction of the DULCODOS® modular enables them to be flexibly tailored to your processes. The system is configured via an identity code. The metering systems are delivered ready mounted and can be quickly and easily installed.

Your benefits

- Simple and fast installation, thanks to its ready-wired design
- Flexible, practical process integration with the identity code “DSKa”
- Minimal space requirement, thanks to compact construction
- Short delivery times due to the use of standard components
- Minimal stock of spare parts

Technical Details

Selectable via the identity code:

- Metering system for the integration of a Sigma product range motor-driven metering pump
- Plastic or stainless steel brackets
- Splash guard
- PP, PVC or PVDF pipework
- EPDM or FPM seals
- VA base with machine feet
- Manometer for commissioning of the back pressure valves
- Hydraulic connectors, (d25 hose nozzles, welding/straight solvent unions, stainless steel sleeves)
- Electrical connectors
- Motor-driven metering pump Sigma

Included in the standard scope of delivery:

- Leak sensor (contained in the standard scope of delivery)
- Flushing connectors with 3-way ball valve
- Pulsation damper with back pressure valve
- Relief valve with return line
- Hose nozzles on suction side and return in d 25

Field of application

Metering of chemicals: cleaning agents, disinfectants, additives and auxiliary agents

1.7 Metering Systems

DSKa	DULCODOS modular DSKa											
	S	DULCODOS modular for the installation of a Sigma motor-driven metering pump										
		Assembly frame										
		0	PP assembly frame									
		1	Stainless steel assembly frame									
			Splash guard									
			0	without splash guard								
			1	with splash guard								
				Version								
				0	with ProMinent logo							
				1	without ProMinent logo							
					Stainless steel base frame							
					0	none						
					1	with stainless steel base including 4 machine feet						
						Pipework						
						PCEH	PVC / EPDM - with pulsation damper (Hidracar)					
						PCBH	PVC / FKM - with pulsation damper (Hidracar)					
						PPEH	PP / EPDM - with pulsation damper (Hidracar)					
						PVBH	PVDF / FKM - with pulsation damper (Hidracar)					
							Options					
							0	none				
							1	Test and filling device for diaphragm damper + gas filling adapter G14”-VGB				
								Manometer with diaphragm seal (for commissioning)				
								0	none			
								1	PVC			
								2	PP			
								3	PVDF			
									Hydraulic connectors discharge side			
									0	none (ball valve with straight union)		
									1	Nozzle d25 PVC, for hose 25x34		
									2	Nozzle d25 PP, for hose 25x34		
									3	Nozzle d25 PVDF, for hose 25x34 (1041960)		
									4	Straight solvent union d25, PVC-U (1030214)		
									5	Straight solvent union d25, PVC-C (1040280)		
									6	Welding sleeve d25 PP-H (1035825)		
									7	Welding sleeve d25 PVDF (1027466)		
									A	Insert for stainless steel pipe 19x1.5 (1040734)		
									B	Insert for stainless steel pipe 23x1.5 (1039507)		
									C	Insert for stainless steel pipe 29x1.5(1039549)		
										Electrical Connection		
										K	Terminal box	
										H	Master switch	
										R	Repair switch	
											Pump	
											00	no pump, no adapter
											01	no pump, with adapter set Sigma 1 to 65 l/h
											02	no pump, with adapter set Sigma 1 to 120 l/h
											03	no pump, with adapter set Sigma 2, Basic to 135 l/h
											04	no pump, with adapter set Sigma 2, Basic to 350 l/h
											05	no pump, with adapter set Sigma 2, Control to 131 l/h
											06	no pump, with adapter set Sigma 2, Control to 353 l/h
											07	no pump, with adapter set Sigma 3, to 365 l/h
											08	no pump, with adapter set Sigma 3, to 670 l/h
											09	no pump, with adapter set Sigma 3, to 1040 l/h
											11	12 bar / 17 l/h, S1BaH 12017PVTS000T000, 3/4-10
											12	10 bar / 22 l/h, S1BaH 10022PVTS000T000, 3/4-10
											13	12 bar / 35 l/h, S1BaH 12035PVTS000T000, 3/4-10
											14	10 bar / 44 l/h, S1BaH 10044PVTS000T000, 3/4-10
											15	10 bar / 50 l/h, S1BaH 10050PVTS000T000, 3/4-10
											16	7 bar / 65 l/h, S1BaH 07065PVTS000T000, 3/4-10
											17	7 bar / 42 l/h, S1BaH 07042PVTS000T000, 1-15
											18	4 bar / 84 l/h, S1BaH 04084PVTS000T000, 1-15
											19	4 bar / 120 l/h, S1BaH 04120PVTS000T000, 1-15
											1A	12 bar / 21 l/h, S1CbH 12017PVTS000U1110S0DE, 3/4-10
											1B	10 bar / 27 l/h, S1CbH 10022PVTS000U1110S0DE, 3/4-10
											1C	12 bar / 42 l/h, S1CbH 12035PVTS000U1110S0DE, 3/4-10
											1D	10 bar / 49 l/h, S1CbH 10050PVTS000U1110S0DE, 3/4-10
											1E	10 bar / 53 l/h, S1CbH 10044PVTS000U1110S0DE, 3/4-10
											1F	7 bar / 63 l/h, S1CbH 07065PVTS000U1110S0DE, 3/4-10
											1G	7 bar / 52 l/h, S1CbH 07042PVTS000U1110S0DE, 1-15
											1H	4 bar / 101 l/h, S1CbH 04084PVTS000U1110S0DE, 1-15
											1J	4 bar / 117 l/h, S1CbH 04120PVTS000U1110S0DE, 1-15
											21	10 bar / 50 l/h, S2BaHM 16050PVTS000T000, 1-15
											22	10 bar / 88 l/h, S2BaHM 16090PVTS000T000, 1-15
											23	10 bar / 135 l/h, S2BaHM 16130PVTS000T000, 1-15

24	7 bar / 126 l/h, S2BaHM 07120PVTS000T000, 1 1/2-25
25	7 bar / 220 l/h, S2BaHM 07220PVTS000T000, 1 1/2-25
26	4 bar / 350 l/h, S2BaHM 04350PVTS000T000, 1 1/2-25
2A	10 bar / 61 l/h, S2CbH 16050PVTS000U1110S0EN, 1-15
2B	10 bar / 109 l/h, S2CbH 16090PVTS000U1110S0EN, 1-15
2C	10 bar / 131 l/h, S2CbH 16130PVTS000U1110S0EN, 1-15
2D	7 bar / 150 l/h, S2CbH 07120PVTS000U1110S0DE, 1 1/2-25
2E	7 bar / 271 l/h, S2CbH 07220PVTS000U1110S0DE, 1 1/2-25
2F	4 bar / 353 l/h, S2CbH 04350PVTS000U1110S0DE, 1 1/2-25
31	10 bar / 146 l/h, S3BaH 120145PVTS000T000, 1 1/2-25
32	10 bar / 208 l/h, S3BaH 120190PVTS000T000, 1 1/2-25
33	10 bar / 292 l/h, S3BaH 120270PVTS000T000, 1 1/2-25
34	10 bar / 365 l/h, S3BaH 120330PVTS000T000, 1 1/2-25
35	7 bar / 410 l/h, S3BaH 070410PVTS100T000, 2-32
36	7 bar / 580 l/h, S3BaH 070580PVTS100T000, 2-32
37	4 bar / 830 l/h, S3BaH 040830PVTS100T000, 2-32
38	4 bar / 130 l/h, S3BaH 041030PVTS100T000, 2-32
3A	10 bar / 182 l/h, S3CbH 120145PVTS000U1110S0DE, 1 1/2-25
3B	10 bar / 243 l/h, S3CbH 120190PVTS000U1110S0DE, 1 1/2-25
3C	10 bar / 365 l/h, S3CbH 120270PVTS000U1110S0DE, 1 1/2-25
3D	7 bar / 500 l/h, S3CbH 070410PVTS100U1110S0DE, 2-32
3E	7 bar / 670 l/h, S3CbH 070580PVTS100U1110S0DE, 2-32
3F	4 bar / 140 l/h, S3CbH 040830PVTS100U1110S0DE, 2-32

Operating instructions		
	DE	German
	EN	English
	ES	Spanish
	FR	French
	PT	Portuguese
Approvals		
	01	CE mark

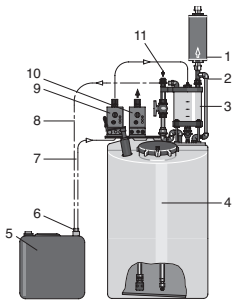
1.7.8 Metering System DULCODOS® Hydrazine

Corrosion is the last thing you need with the majority of applications. Hydrazin protects.

Chemical tank ranging from 140 to 250 litres

DULCODOS® Hydrazine batching and metering systems are used for manual batching and automatic metering of diluted hydrazine solutions. And, of course, they also comply with all environmental and safety requirements.

Hydrazine acts as an oxygen binding agent, is volatile in steam and prevents corrosion. As it is carcinogenic, the dispensing and metering systems need to be gas-tight so that no hydrazine vapours can escape. Our systems comply with these requirements.



1 Active carbon filter
2 Vent/bleed line
3 Metering device
4 Dosing tank
5 Hydrazin 15 re-usable container
6 Quick-lock coupling
7 Suction line
8 Vapour recovery line
9 Transfer pump
10 Metering pump
11 Fill-water

Your benefits

- Gas-tight design
- Precise metering
- Protects the environment

Field of application

- Steam circuits
- Power plants

Hydrazine is used as an oxygen binding agent in the process water sector, predominantly with steam generation. It is a carcinogenic agent and special care is therefore needed when handling it.

If closed and gas-tight systems are used as intended, it is not anticipated that the activation threshold for hydrazine will be exceeded.

Design

Ready-to-use assembled metering system, essentially consisting of:

- Gas-tight dosing tank made of PE with a litre scale, lockable screw lid and manual stirrer
- Each with a dispensing and metering pump with suction assembly, level switch as well as complete rigid PVC pipework with two ball valves, the measuring tank and active carbon filter

Accessories

5 m metering line 8/12 mm Ø and stainless steel injection valve 8 mm Ø/1/2”

Electrical connection 230 V ±10 %, 50…60 Hz

The metering system is supplied with a hose connection, which fits on a conventional drain system. This drain system is produced by MicroMatic, Gräfelfing/Munich.

Hydrazine Dispensing and Metering System, Completely Ready Mounted

Metering Tank Contents l	Metering pump Capacity l/h	Metering pump Feed Rate bar	Transfer Pump Discharge Flow l/h	Order no.
130	7.1	7.0	17	913018
250	11.0	7.0	32	913019

Accessories

Product designation	Order no.
Sampling set, stainless steel	1003964

1.7.9 Metering System DULCODOS® Ammonia

The metering system for the targeted dilution and metering of ammonia solution to prevent corrosion in the steam boiler.

Metering system DULCODOS® Ammonia for the low-odour and safe handling of ammonia solution. For a stable pH value and reduced corrosion in the vapour system.



Thousands of steam generators operate in industry. Corrosion in systems equates to idleness, which needs to be prevented. The DULCODOS® Ammonia metering system produces a usable solution of 0.1 to 2.5% from the maximum 25% commercial ammonia product. The transfer pump, measuring tank and mixing tank are important for production of the required solution. The Beta® metering pump meters the solution precisely into the steam system to be protected.

Your benefits

- Compact metering system
- Gas-tight application, no escape of ammonia vapours
- Operationally safe thanks to level switch in the measuring tanks, intrinsically safe design

Technical Details

Ready-to-use assembled metering system, essentially consisting of:

- PE dosing tank with a litre scale, with lockable screw lid and manual stirrer.
- Each with a dispensing and metering pump with suction assembly, level switch, as well as complete rigid PVC pipework with two ball valves, the measuring tank and active carbon filter.
- Terminal box for control of the metering pumps.
- Injection valve VA, ½“, 5 m PE hose, 12x9 mm.

The container with concentrated ammonia solution is not included in the scope of delivery.

Field of application

- Steam circuits
- Power plants
- Max. 25% commercial ammonia can be used
- Solution: 0.1 to 2.5%

Design

Ready-to-use assembled metering system, essentially consisting of:

- Dosing tank made of PE with a litre scale, with lockable screw lid and manual stirrer.
- Each with a dispensing and metering pump with suction assembly, level switch, as well as complete rigid PVC-U, pipework with two ball valves, the measuring tank and active carbon filter.
- Terminal box for control of the metering pumps.
- Injection valve VA, ½“, 5 m PE hose, 12x9 mm
- The container with the commercial product is not included in the scope of delivery

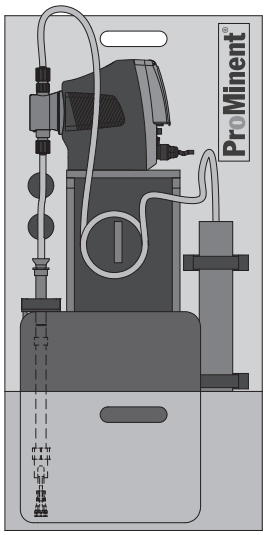
Metering Tank Contents l	Metering pump Capacity l/h	Metering pump Feed Rate bar	Transfer Pump Discharge Flow l/h	Order no.
130	7.1	7	17.1	1039192
250	11.0	7	32	1039193

Accessories

Product designation	Order no.
Gas-tight suction lance for the delivery container	on request

1.7.10 Metering System DULCODOS® Emergency Potable Water Disinfection

Fast and precise disinfection of potable water



Handy metering system for emergency potable water disinfection. For fast use against micro-organisms.

Water supply companies ensure high quality of potable water in accordance with the applicable Drinking Water Ordinance (TrinkwV 2001). In spite of this, emergency situations can nevertheless arise that require rapid disinfection.

ProMinent supplies a compact metering station, which is immediately ready for use and performs emergency disinfection, for instance after flooding or pipe ruptures, in compliance with the regulations.

All disinfectants permitted in accordance with the Drinking Water Ordinance 2001 and the List of Permitted Substances (§ 11) can be used. Emergency potable water disinfection can also be used when commissioning new pipes, after repairs or after long downtimes.

Your benefits

- Connection-ready handy metering system (0.02 – 1.55 l/h, 10 bar)
- Integrated metering and pressure monitoring
- Low-pulsation metering by guided discharge strokes
- Volume-proportional metering if customer has a water meter fitted
- Adequate for treatment of up to 372 m^3/h when adding between 0.5 mg/l and 155 m^3/h of chlorine with the addition of 1.2 mg/l (when using sodium hypochlorite 12%)

Technical Details

Ready-to-use assembled metering system, essentially consisting of:

- Assembly frame for installation of a container for disinfectant (e.g. sodium hypochlorite, 12 %). 500x500x1000 mm (LxWxH).
- Metering pump gamma/ X, GMXa 1604, 1.55 l/h, 10 bar.
- Injection lance, ½", 10 m PVC hose, 6x12 mm

Field of application

- Emergency disinfection of potable water
- Disinfection after downtimes
- Disinfection during commissioning

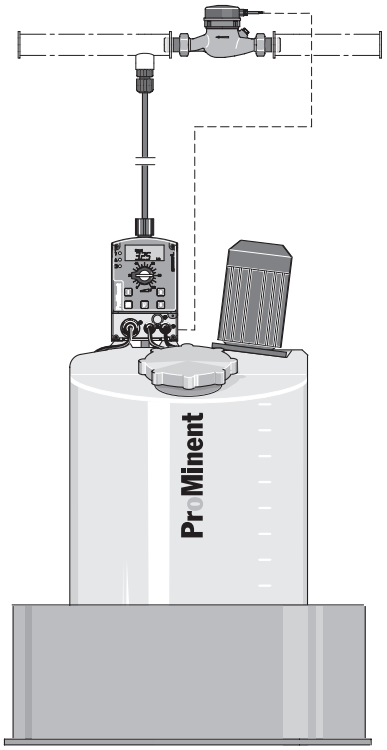
	Metering pump Capacity	Order no.
Potable water disinfection with GMXa 1604	1.6	1081318

1.7.11 Application Examples

Proportional Metering of Phosphate

Product:	**DULCODOS® eco**
Feed chemical:	**Phosphate**
Industry:	**Potable water**
Application:	**Potable water treatment**

The liquid phosphate is added to the potable water as a proportion of volume. The flow meter forwards pulses onto the gamma/ L pump. The metering volume is adjusted by stepping the incoming pulses up or down.



Problems and requirements

Metering phosphate in potable water to prevent limescale and corrosion in the pipework

Operating conditions

- Treatment of potable water
- Fluctuating water demand
- Water temperature of 4 – 30 °C

Notes on use

- Proportional metering of phosphate depending on water supply
- Metering pump is controlled via a contact water meter
- Gauge the metering pump during commissioning

Solution

- DULCODOS® eco with 140-litre dosing tank and collecting pan
- gamma/ L with contact input and Pulse Control
- Contact water meter

1.7 Metering Systems

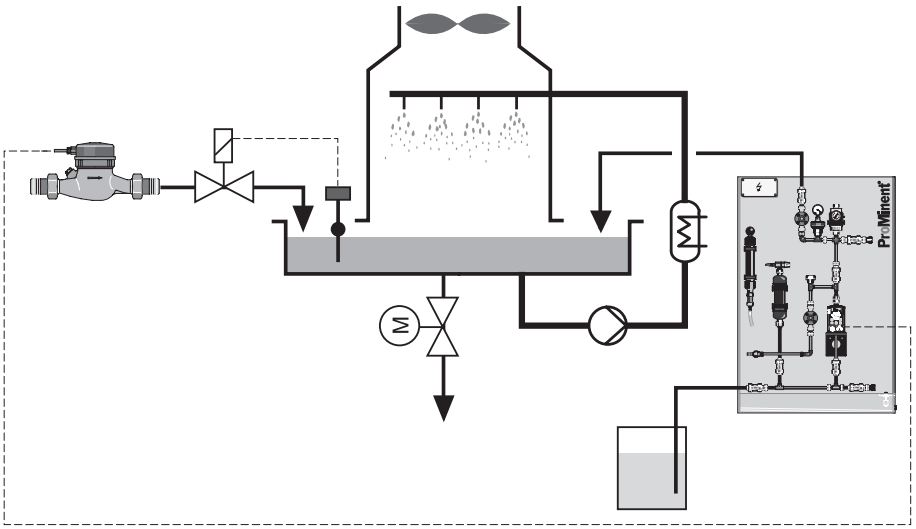
Benefits

- Constant solution concentration even if the water supply fluctuates
- Fully automatic operation with minimum personnel and maintenance requirements
- Versatile process configuration by adapting the pump to different concentration requirements

Inhibitor Metering in Cooling Water

Product:	**DULCODOS®panel / DULCODOS®universal**
Feed chemical:	**Corrosion inhibitor**
Industry:	**Process industry, power plants**
Application:	**Cooling water treatment**

The corrosion inhibitor is metered proportionally to the fresh water. The water meter detects the volume of feed water and transmits the pulses to the gamma/ L pump.



Problems and requirements

Metering corrosion inhibitors into supply water to prevent limescale and corrosion in the cooling water circuit

Operating conditions

- Treatment of river water
- Fluctuating water demand
- Water temperature of 4 to 20 °C

Notes on use

- Proportional metering of inhibitor depending on water supply
- Metering pump is controlled via a contact water meter
- Gauge the metering pump during commissioning

Solution

- DULCODOS® panel including stand-by pump
- gamma/ L with contact input and Pulse Control
- Contact water meter

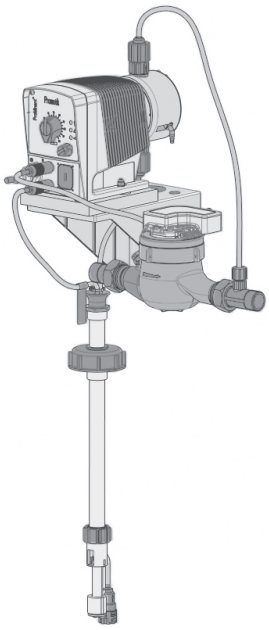
1.7 Metering Systems

Benefits

- Protection against corrosion in the pipework and heat exchanger
- Constant solution concentration even if the water supply fluctuates
- Fully automatic operation with minimum personnel and maintenance requirements
- Versatile process configuration by adapting the pump to different concentration requirements

1.8 Domestic Water Technology

1.8.1 Systems for Domestic Water Installations



Proportional Flow Dosing System for Liquid Dosing

Promatik®

Metering systems protect pipework, fittings, and appliances, such as boilers, washing machines and dishwashers, from corrosion and limescale. Active substances, like silicate, phosphate or silicate phosphate mixtures, can be metered here. These active substances form a protective layer in the pipework and reduce aggressiveness and sedimentation in the water.

Silicate

As a corrosion inhibitor to prevent rust formation: “brownish water” in galvanised pipework, “pitting”: needle-like holes in the pipework. Applications include soft, corrosive types of water with a high percentage of aggressive carbonic acid. The silicate is used to raise the pH value closer to a lime-carbonic acid equilibrium. Hydrolysis produces a silica gel that forms a thin protective layer in the pipework and fittings and thus prevents corrosion.

Phosphate

As ortho and polyphosphate to prevent limescale and corrosion in hard water up to max. 20 CH (carbonate hardness). Hard water salts, such as calcium and magnesium ions, responsible for limescale are thereby stabilised, i.e. these ions remain dissolved in the water and do not form limescale on the pipe walls. Growth on the pipes is thus prevented and there are no deposits of limescale on heating coils, dramatically reducing their efficiency. A thin, solid protective layer is formed. Mixtures containing silicate and phosphate act as corrosion and limescale inhibitors for soft and medium-hard water. Continuous top-up of the feed chemical is required to maintain this protective layer, otherwise it will degrade within a few days.

EXACTAPHOS®

EXACTAPHOS® metering solutions are matched to the metering rate of the Promatik® and DULCODOS® units. This ensures that the permitted proportions of max 40 mg/l SiO_2 silicate and/or 6.7 mg/l of phosphate PO_4 (5mg/l P_2O_5) are adhered to, as laid down by the “Drinking Water Ordinance”.

Function of the systems

In a flow of water, the contact water meter transmits pulses at a fixed pulse interval corresponding to the flow to the metering pump. Each of these pulses results in a metering stroke of the metering pump, thereby feeding the metering solution. The metering volume per stroke can thus be adjusted continuously between 100 and 50% using the stroke adjustment dial. Because of the very low starting limit and the short pulse interval, a constant volume-proportional addition of chemicals can always be maintained, from minimum water flow rate to maximum load, guaranteeing the best process result.

Promatik® proportional metering system

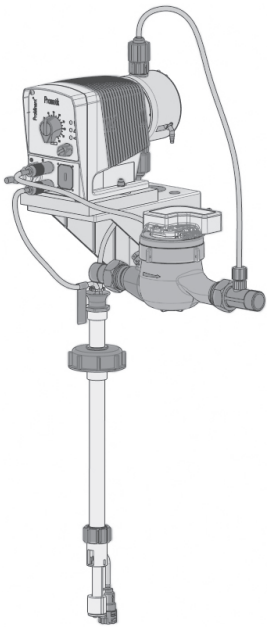
Consisting of a Beta® metering pump with sound insulation plate, contact water meter, suction assembly with foot valve and 2-phase level switch with pre-warning, acting as dry-running protection and empty signal, injection valve and metering line. With wall brackets to mount the metering pump. Fitting position of the contact water meter – horizontal and vertical. DVGW-tested in conjunction with the EXACTAPHOS® metering solution. DVGW No. NW-9101 CM 0179.

Metering system ProMatik®

Protects pipework, fittings, and appliances from corrosion and limescale.

For flows of 4 – 25 m³/h

The proportional metering system Promatik® is used in the potable water sector for the flow-dependent, adjustable metering of liquid media, like the EXACTAPHOS®. It consists of the metering pump Beta®, a contact water meter, a suction assembly with foot valve, level switch and wall bracket, and an injection valve and metering line.



In a flow of water, the contact water meter transmits pulses with a fixed pulse interval corresponding to the pulses to the metering pump in line with the flow. Each of these pulses results in a metering stroke of the metering pump, thereby feeding the metering solution. The metering volume per stroke can thus be adjusted continuously between 100 and 50% using the stroke adjustment dial. Because of the very low starting limit and short pulse interval, a constant volume-proportional addition of chemicals can always be maintained from minimum water flow rate to maximum load, thereby guaranteeing the best process result

Your benefits

- DVGW-tested in conjunction with the EXACTAPHOS® metering solution. DVGW No. NW-9101 CM 0179.
- The EXACTAPHOS® metering solutions are matched to the capacity of the Promatik® metering systems.
- Fitting position of the water meter – horizontal and vertical.

Your benefits

- DVGW-tested in conjunction with the EXACTAPHOS® metering solution. DVGW No. NW-9101 CM 0179.
- The EXACTAPHOS® metering solutions are matched to the capacity of the Promatik® metering systems.
- Fitting position of the water meter – horizontal and vertical.

Technical Details

- Consisting of a Beta® metering pump, contact water meter, suction assembly with foot valve and 2-phase level switch with pre-warning as dry-running protection and empty signal, injection valve and dosing line.
- In the “R” design compact metering system, the metering pump is built onto the contact water meter.
- In the “W” design split system, there are wall brackets for accommodating the metering pump. Contact cable and PE dosing line 2 m long. Horizontal fitting position of the contact water meter.

Field of application

Potable water treatment

Promatik® type		S 4	S 10	S 16	S 25
Maximum flow Q max.	m³/h	4	10	16	25
Lower operating limit (horizontal)	m³/h	0.025	0.063	0.1	0.16
Metering interval approx.	l/stroke	0.7	1.1	1.8	2.8
Metering rate 50 – 100 %	ml/m³	50 – 165	50 – 165	50 – 165	50 – 165
Operating pressure	bar	1 – 10	1 – 10	1 – 10	1 – 10
Metering pump type		BT4b 1000	BT4b 1601	BT4b 1602	BT4b 1604
Meter connecting thread		G 1 B	G 1 1/4 B	G 2 B	G 2 1/2 B
Connector width		R 3/4	R 1	R 1 1/2	R 2
Length without thread	mm	190	260	300	270

Product designation	Shipping weight	Order no.
S 4 split system	6	1078282
S 10 split system	7	1078283
S 16 split system	9	1078284
S 25 split system	11	1078285

1.8 Domestic Water Technology

Materials

- Dosing head/valves: Polypropylene (PP)
- Metering diaphragm EPDM with PTFE insert
- Seals: EPDM
- Valve balls: ceramic
- Float switches: PP
- Suction assembly: flexible PVC
- Discharge tube: PE

1.8.2 Chemicals

EXACTAPHOS® SP 210

Silicate phosphate liquid metering solution. Drinking water treatment for soft water. Promatik® compact metering system.

Product designation [generated]	Volume	Order no.
	l	
EXACTAPHOS® SP 210	20	950097
EXACTAPHOS® SP 210 *	200	950043

* 200l barrels are only available without DVGW approval.

EXACTAPHOS® P 612

Phosphate liquid metering solution. Drinking water treatment for medium hard water. Promatik® compact metering system.

Product designation [generated]	Volume	Order no.
	l	
EXACTAPHOS® P 612	20	950098
EXACTAPHOS® P 612 *	200	950048

* 200l barrels are only available without DVGW approval.

EXACTAPHOS® P 1020

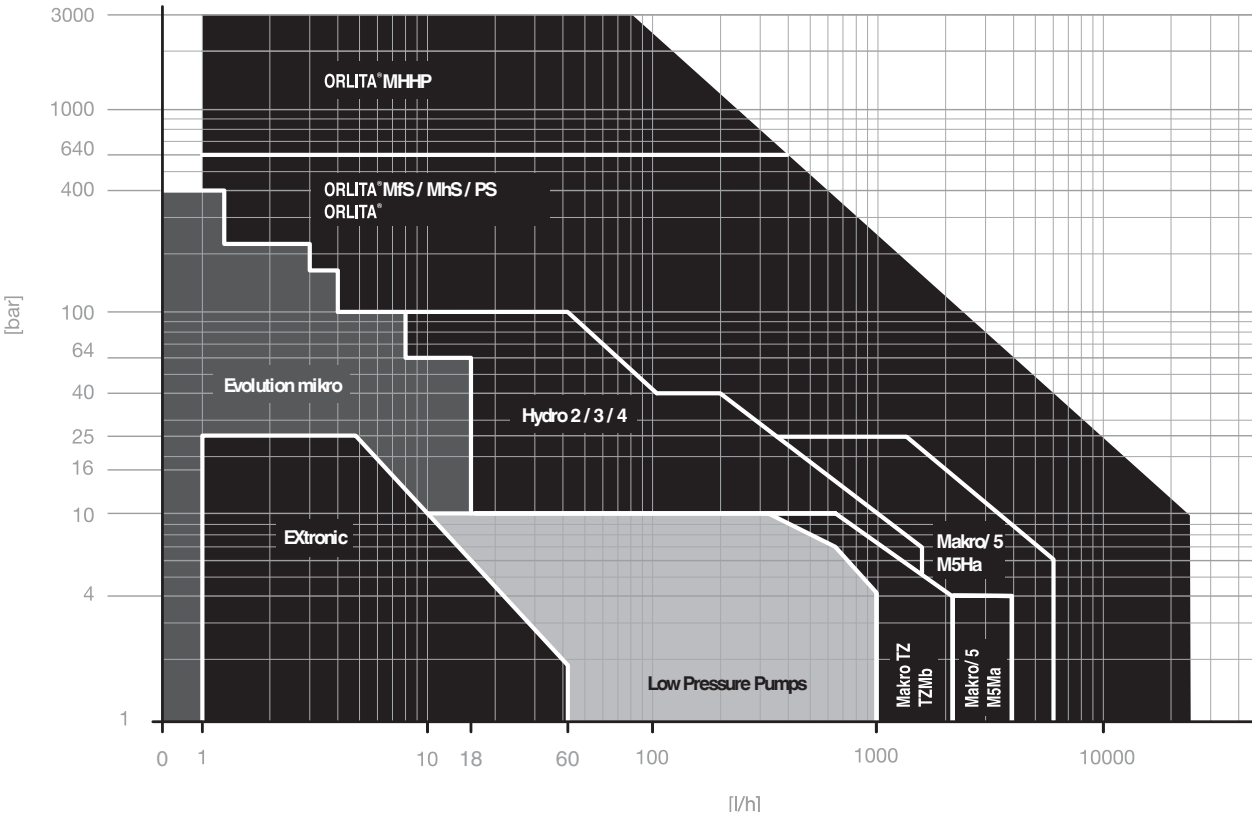
Phosphate liquid metering solution. Drinking water treatment for hard water. Promatik® compact metering system.

Product designation [generated]	Volume	Order no.
	l	
EXACTAPHOS® P 1020	20	950099
EXACTAPHOS® P 1020 *	200	950053

* 200l barrels are only available without DVGW approval.

2.1 Overview of Process Metering Pumps

2.1.1 Selection Guide



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Overview of Process Metering Pumps

Typ		EXBb	M5Ma	TZMb	HP2a / HA2a	HP3a / HA3a	HP4a / HA4a	M5Ha	M5Ka	MTKa	SBKa/ SCKa	TZKa
Stroke length	mm	1,25	0 – 20	0 – 10	15	15	20	0 – 50	0 – 50	0 – 15	0 – 15	0 – 20
Connecting rod force	N	2,000	10,000	8,000	2,000	4,200	5,800	10,000	10,000	2,500	1,700	8,000

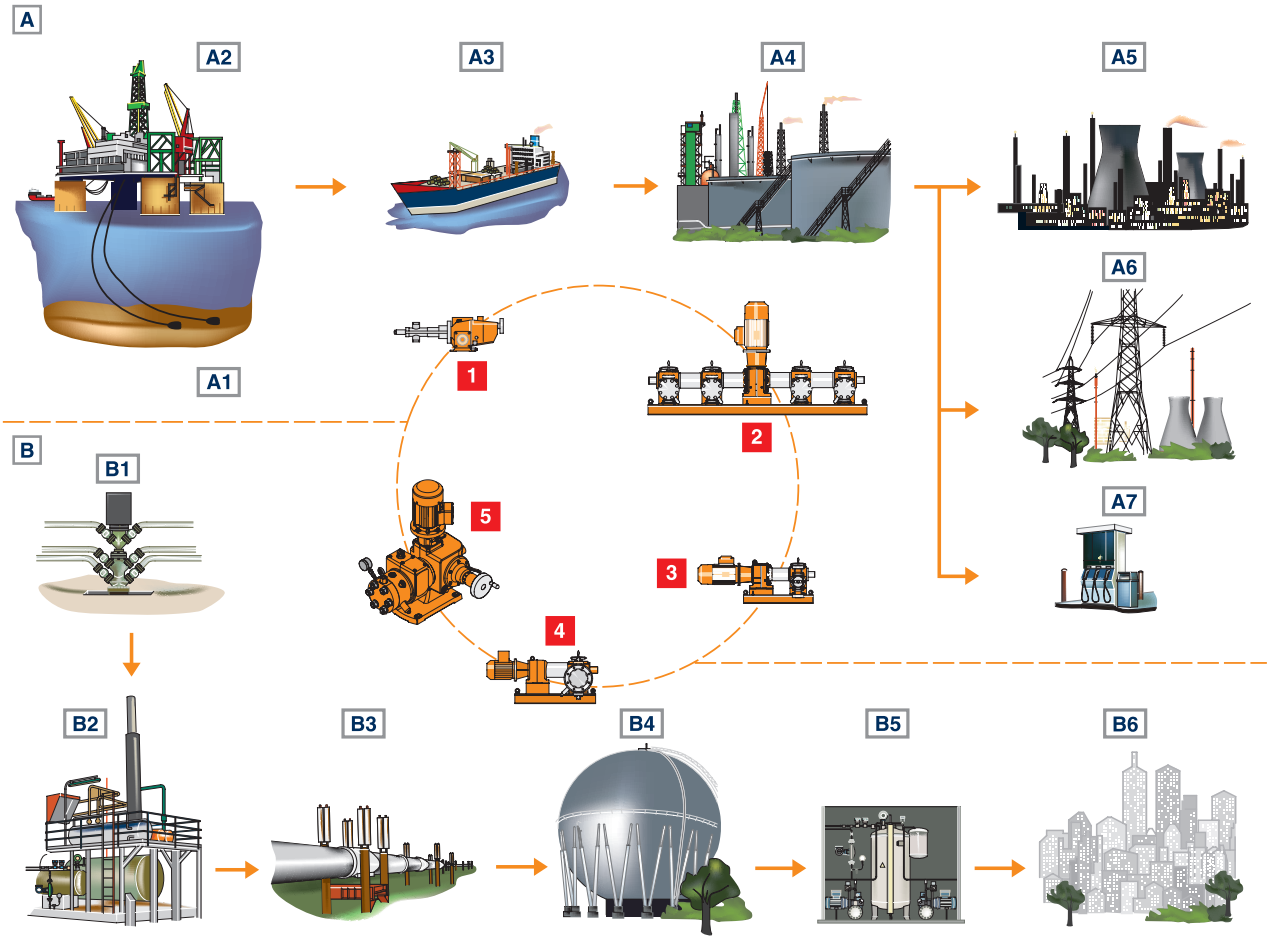
Typ		EF1a	EF2a	EF3a	EF4a	EP1a	EP2a	EF1F	EF2F	EF3F	EF4F
Stroke length	mm	0 – 15	0 – 15	0 – 25	0 – 40	0 – 15	0 – 15	15	15	25	40
Connecting rod force	N	2,600	6,200	9,000	18,000	2,600	6,200	2,600	6,200	9,000	18,000

Typ		EMFa / EMHa	S 18	S 35	S 80	S 180	S 600	S 1400	Rb 15	Rb 150
Stroke length	mm	0 – 60	0 – 15	0 – 20	0 – 20	0 – 40	0 – 40	0 – 60	0 – 15	0 – 32
Connecting rod force	N	-	1,750	3,500	14,000	18,000	40,000	60,000	1,800	15,000

2.1 Overview of Process Metering Pumps

2.1.2 Installation Option

A	Oil industry		
A1	Well	B	Gas industry
A2	Platform	B1	Well
A3	Transportation (tanker, pipeline)	B2	Gas treatment/gas drying
A4	Refinery	B3	Transportation (tanker, pipeline)
A5	Petrochemical	B4	Gas storage tank
A6	Industry/power plants	B5	Local distribution/odorization
A7	Filling stations	B6	Industry/power plants



1 Valveless piston-type dosing pump DR

2 Multiplexed dosing pumps

3 Piston-type dosing pump PS

4 Hydraulic diaphragm-driven dosing pump Mh (metal diaphragm)

5 Hydraulic diaphragm-driven dosing pump Orlita® Evolution (PTFE diaphragm)

2.2 Diaphragm Metering Pumps

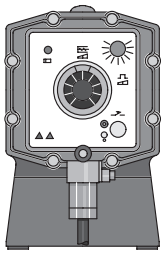
2.2.1 Diaphragm Metering Pump ProMinent EXtronic®

Precise metering with explosion protection

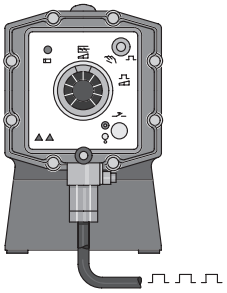
Capacity range of single head pump: 1 – 60 l/h; 25 – 1 bar

The diaphragm metering pump EXtronic® is perfectly suited for the sensitive use of liquid media in facilities with an explosive gas atmosphere as well as for mines at risk of firedamp, as it is approved in compliance with the EU EX Regulation 2014/34/EU (ATEX).

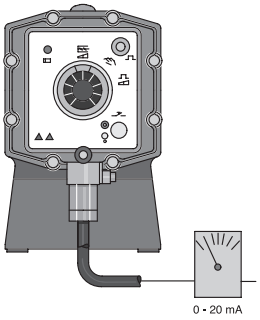
The ATEX-compliant diaphragm metering pump EXtronic® (EXBb) is tested and approved in line with EN 60079/-1 for the ignition type “compression-resistant enclosures” and thus offers the maximum level of protection. The short-stroke solenoid and the complete pump control are integrated in the pump housing so that, together with the explosion-proof power end, there is IP 65 protection against contact and moisture as per EN 60529 even when the front cover is open.



“Internal” control type
stroke length adjustment 1:10, stroke rate adjustment 1:25, total adjustment range 1:250



“External contact” control type
stroke length adjustment 1:10, stroke rate control 0 – 100 %, depending on external switching contacts. *)



“Analogue” control type
stroke length adjustment 1:10, stroke rate control 0 – 100 % proportional to 0/4 – 20 mA analogue signal. *)

*) The electric connecting cable for mains power cable, contact or analogue control are already routed out of the pump. Note the relevant specifications for connection and control.

Your benefits

Optimum adaptation for use in areas at risk from explosion

- ATEX-compliant in line with EExd IIC T6 and EExd I/IIC T6
- Excellent operating and functional reliability by a microprocessor controller, which compensates for fluctuations in mains voltage and automatically switches from 50 to 60 Hz operation
- Broad range of applications due to operating voltages of 230 V, 115 V, special voltage on request
- Ease of integration into processes, thanks to the range of control types (internal, external contact, analogue)
- Also suitable for use with gaseous media, thanks to the self-bleeding head

Technical Details

- Stroke length: 1.25 mm, Rod force: 2,000 N
- Stroke length adjustment range: 0 – 100% in operation and idle
- Stroke length adjustment: manually by scaled rotary dial
- Metering reproducibility is better than ± 2% within the 30– 100% stroke length range under defined conditions and with correct installation. Observe the information in the operating instructions
- DEVELOPAN® metering diaphragm with PTFE coating with diaphragm rupture control
- Wetted materials: Polypropylene, PVC, PTFE with carbon, clear acrylic, stainless steel, special designs available on request
- Degree of protection: IP 65 (even with open front cover)
- Short stroke solenoid drive and complete pump control integrated in the pump housing
- “Internal”, “External contact” and “Analogue” control inputs are available, the latter two also available as intrinsically safe and approved to EN 60079-11
- EXBb G for use in areas at risk from gases and vapours, degree of protection EEx [i,a] d IIC T6

This means:

- EEx - Equipment complies with European standards
- [i,a] - Control input is intrinsically safe when 2 independent errors occur
- d - Type of ignition protection, compression-resistant enclosure
- IIC - Explosion group II for all areas at risk from explosion with the exception of mining, sub-group IIC (includes IIA and IIB)
- T6 - Temperature class permissible for gases and vapours with ignition temperature > 85 °C
- EXBb M for use in mines at risk from firedamp, degree of protection EEx [i,a] d I/IIC T6

This means:

- EEx - Equipment complies with European standards
- [i,a] - Control input is intrinsically safe when 2 independent errors occur
- d - Type of ignition protection, compression-resistant enclosure
- IC - Explosion group I for mines at risk from firedamp
- IIC - Explosion group II for all areas at risk from explosion with the exception of mining, sub-group IIC (includes IIA and IIB)
- T6 - Temperature class permissible for gases and vapours with ignition temperature > 85 °C

2.2 Diaphragm Metering Pumps

Field of application

- Oil, gas and petrochemicals
- Mining
- For use in areas at risk of gases and vapours
- Use in mines at risk from firedamp

2.2 Diaphragm Metering Pumps

Technical Data

Type	Pump capacity at max. back pressure*			Delivery rate at medium back pressure*			Stroke rate	oØ x iØ	Suction lift	Shipping weight PP, NP, TT-SS**
	bar	l/h	ml/stroke	bar	l/h	ml/stroke	Strokes/min	mm	m WC	kg
EXtronic® - metering pumps										
1000	10	0.19	0.03	5	0.27	0.04	120	6 x 4	1.5	12
0260	1	60.00	9.09	-	-	-	110	DN 15	1.5	16
0308	3	8.60	1.20	1	10.30	1.43	120	8 x 5	5.0	12
0417	3	17.40	2.42	2	17.90	2.49	120	12 x 9	4.5	13
0430	3	27.00	4.09	2	29.50	4.47	110	DN 10	5.0	16
0613	6	13.10	1.82	3	14.90	2.07	120	8 x 5	5.5	13
0803	8	3.70	0.51	4	3.90	0.54	120	6 x 4	3.0	12
0814	8	14.00	2.12	4	15.40	2.33	110	12 x 9	5.0	16
1002	10	2.30	0.31	5	2.70	0.38	120	8 x 5	5.0	12
1006	10	6.00	0.83	5	7.20	1.00	120	8 x 5	5.0	13
1201	12	1.70	0.23	6	2.00	0.28	120	6 x 4	5.0	12
1310	13	10.50	1.59	6	11.90	1.80	110	8 x 5	5.0	16
1601	16	1.00	0.15	8	1.30	0.18	120	6 x 4	5.0	12
2501	25	1.14	0.15	20	1.10	0.17	120	6 x 4	5.0	-
2502	25	2.00	0.28	20	2.20	0.31	120	8 x 5	5.0	13
2505	25	4.20	0.64	20	4.80	0.73	110	8 x 5	5.0	16
EXtronic® - metering pumps for media of higher viscosity										
1006	10	6.00	0.83	5	7.20	1.00	120	DN 10	2.0	-
0814	8	14.00	2.12	4	15.40	2.33	110	DN 15	2.0	-
1002	10	2.30	0.31	5	2.70	0.38	120	DN 10	1.8	-
1310	10	10.50	1.59	5	11.90	1.80	110	DN 15	2.8	-
Extronic® - metering pumps with self-bleeding dosing head										
1201	12	1.00	0.14	-	-	-	120	6 x 4	2.0	-
0803	8	2.40	0.33	-	-	-	120	6 x 4	2.8	-
1002	10	1.80	0.25	-	-	-	120	6 x 4	2.0	-
1601	16	0.66	0.09	-	-	-	120	6 x 4	1.8	-

* The given performance data represents guaranteed minimum values, calculated using water as the medium at room temperature.

** Shipping weight for EXBb M... design includes extra 14 kg

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	Seals	Balls (6 – 12 mm connection)	Balls (DN 10 and DN 15 connection)
PP1	Polypropylene	Polypropylene	EPDM	Ceramic	Borosilicate glass
PP4 *	Polypropylene	Polypropylene	EPDM	-	Ceramic
NP1	Clear acrylic	PVC	FKM A	Ceramic	Borosilicate glass
NP3	Clear acrylic	PVC	FKM B	Ceramic	Ceramic
NS3 **	Clear acrylic	PVC	FKM B	Ceramic	Ceramic
PS3 **	PVC	PVC	FKM B	Ceramic	Ceramic
TT1	Carbon-filled PTFE	Carbon-filled PTFE	PTFE	Ceramic	Ceramic
SS ..	Stainless steel 1.4404	Stainless steel 1.4404	PTFE	Ceramic	Stainless steel 1.4404

* PP4 with valve springs made of Hastelloy C

** NS3 and PS3 with valve spring made of Hastelloy C, valve insert made of PVDF

FKM = fluorine rubber

2.2 Diaphragm Metering Pumps

Identity Code Ordering System for EXBb

EXBb	Enclosure rating								
	G	Gas-EX-proof							
	M	Fire and explosion protection, permitted liquid end material: stainless steel and PTFE							
		Type	Output						
		1000	10 bar	0.19 l/h					
		2501	25 bar	1.14 l/h	(only available in SSM and SBM)				
		1601	16 bar	1.00 l/h					
		1201	12 bar	1.70 l/h					
		0803	8 bar	3.70 l/h					
		1002	10 bar	2.30 l/h					
		0308	3 bar	8.60 l/h					
		2502	25 bar	2.00 l/h	(available in SS and SB only)				
		1006	10 bar	6.00 l/h					
		0613	6 bar	13.10 l/h					
		0417	4 bar	17.40 l/h					
		2505	25 bar	4.20 l/h	(available in SS and SB only)				
		1310	13 bar	10.50 l/h	(only available in NP, PP4, SS and SB)				
		0814	8 bar	14.00 l/h					
		0430	4 bar	27.00 l/h					
		0260	2 bar	60.00 l/h					
			Liquid end material						
			PP1	Polypropylene with EPDM O-ring					
			PP4	HV Polypropylene for high viscosity liquids with EPDM O-ring and Hastelloy C valve springs , Only for types 1002, 1006, 1310 and 0814					
			NP1 *	Clear acrylic with FKM A O-ring					
			NP3 *	Clear acrylic with FKM B O-ring					
			NS3 *	Clear acrylic with FKM B O-ring self-bleeding, Only for types 1601, 1201, 0803 and 1002					
			PS3	PVC with FKM B O-ring self-bleeding, Only for types 1601, 1201, 0803 and 1002					
			TT1	PTFE with carbon, PTFE seal					
			SS1	Stainless steel, no. 1.4404, with PTFE seal					
			SS2	Stainless steel with 1/4" NPT internal thread, PTFE seal					
			SB1	Stainless steel with ISO 7 Rp 1/4 internal thread, ISO 7 Rp 1/2 on type 0260, PTFE seal (recommended for flammable materials)					
			SSM	as SS1, with diaphragm rupture indicator , Type 2501 only					
			SBM	as SB1, with diaphragm rupture indicator , Type 2501 only					
				Valve springs					
				0	no valve spring				
				1	With 2 valve springs, 1.4571, 0.1 bar				
					Electrical Connection				
					A	230 V, 50/60 Hz			
					B	115 V, 50/60 Hz			
						Control type			
						0	Manual stroke rate adjustment via potentiometer		
						1	External contact		
						2	Analogue 0-20 mA		
						3	Analogue 4-20 mA		
						4	External contact, intrinsically safe [i,a]		
						5	Analogue 0-20 mA, intrinsically safe [i,a]		
						6	Analogue 4-20 mA, intrinsically safe [i,a]		
						7	Manual with zero volts ON/OFF		
						8	Manual with zero volts ON/OFF, intrinsically safe [i,a]		
							Control Variants		
							0	With potentiometer, Only for control types 0, 7 and 8	
							1	With manual auxiliary key for maximum stroke rate, Only for control types 1 – 6	
							2	With manual auxiliary frequency changer key for maximum stroke rate, Only for control types 1 – 6	
								Approved/Language	
								0	BVS - Europe, German, 100 V - 500 V
								1	BVS - Europe, English, 100 V - 500 V
								2	FM - USA, English, 115 V
								3	CSA - Canada, English, 115 V, 230 V

* FKM = Fluorine Rubber

Design of connectors

with PP, NP, NS, PS and TT	6, 8 and 12 mm	Hose sleeve with clamping ring
with stainless steel SS1/ SSM	6, 8 and 12 mm	Swagelok system threaded connector
with stainless steel SS2	6, 8 and 12 mm	Internal thread 1/4" NPT
with stainless steel SS1/ SBM	6, 8 and 12 mm	Internal thread ISO 7 Rp 1/4

Repeatability of metering ±2 % when performed in line with the information in the operating instructions.

For type 1601 with self-bleeding dosing head ±5 %.

2.2 Diaphragm Metering Pumps

Permissible ambient temperature –20 °C to +45 °C.

Electrical connection:	230 V ±10 %, 50/60 Hz
	115 V ±10 %, 50/60 Hz
	Special voltage on request
Degree of protection:	IP 65, insulation class F

Average power consumption at max. stroke rate (W)/peak current during metering stroke (A) at 230 V, 50/60 Hz

EXBb	Type 1000, 2501, 1601, 1201, 0803, 1002, 0308	13 W/0.8 A	at 120 strokes/min.
EXBb	Type 2502, 1006, 0613, 0417	35 W/1.8 A	at 120 strokes/min.
EXBb	Type 2505, 1310, 1014, 0430, 0260	45 W/2.2 A	at 110 strokes/min.

Scope of delivery: Metering pump with mains cable (5 m) and connector parts for hose/pipe connection as per table.

Spare Parts Kits for Diaphragm Metering Pump ProMinent EXtronic®

Scope of delivery for PP and NP material versions:

1 metering diaphragm
1 suction valve assembly
1 discharge valve assembly
2 valve balls
1 sealing set, complete
1 connector kit

Scope of delivery for TT-PTFE material version:

1 metering diaphragm
1 suction valve assembly
1 discharge valve assembly
2 valve balls
2 ball seat discs
1 sealing set, complete
1 connector kit

Scope of delivery for NS3 and PS3 material versions:

1 metering diaphragm
1 suction valve assembly
1 connector component assembly
1 discharge valve assembly
1 bleed valve assembly
1 connector kit

Scope of delivery for SS stainless steel material version:

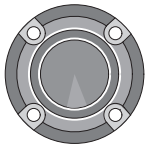
1 metering diaphragm
4 valve balls
4 ball seat discs
1 sealing set, complete
1 connector kit

2.2 Diaphragm Metering Pumps

Pump type	Materials in contact with the medium	Addition	Order no.
EXBb 1000	PP1		740357
EXBb 1000	NP3		740354
EXBb 1000	TT		910776
EXBb 1000	SS/SK		910777
EXBb 2501	SBM		1020281
EXBb 2501	SSM		1020282
EXBb 1601	PP1		740361
EXBb 1601	NP3		740358
EXBb 1601	NS3/PS3		792033
EXBb 1601	TT		910778
EXBb 1601	SS/SK		910779
EXBb 1201	PP1		740380
EXBb 1201	NP3		740362
EXBb 1201	NS3/PS3		792034
EXBb 1201	TT		910780
EXBb 1201	SS/SK		910781
EXBb 0803	PP1		740384
EXBb 0803	NP3		740381
EXBb 0803	NS3/PS3		792035
EXBb 0803	TT		910782
EXBb 0803	SS		910783
EXBb 1002/2502	PP1		740388
EXBb 1002/2502	NP3		740385
EXBb 1002/2502	NS3/PS3		792036
EXBb 1002/2502	TT		910784
EXBb 1002/2502	SS		910785
EXBb 1002/2502	HV/PP 4	Type 1002	910743
EXBb 0308/1006/2505	PP1		740497
EXBb 0308/1006/2505	NP1		740498
EXBb 0308/1006/2505	TT		910957
EXBb 0308/1006/2505	SS		910959
EXBb 0308/1006/2505	HV/PP4	Type 1006	910939
EXBb 0613/1310	PP1		740504
EXBb 0613/1310	NP1		740505
EXBb 0613/1310	TT		910969
EXBb 0613/1310	SS		910971
EXBb 0613/1310	HV/PP4	Type 1310	910941
EXBb 0417/0814	PP1		740501
EXBb 0417/0814	NP1		740502
EXBb 0417/0814	TT		910977
EXBb 0417/0814	SS		910979
EXBb 0417/0814	HV/PP4	Type 0814	910943
EXBb 0430-DN 10	PP1		740507
EXBb 0430-DN 10	NP1		740508
EXBb 0430-DN 10	TT		910993
EXBb 0430-DN 10	SS		910995

Spare parts kit as of DN 10 with single ball valves.





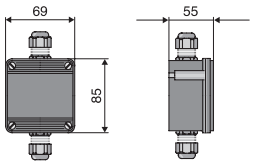
Spare Diaphragms for Diaphragm Metering Pump ProMinent EXtronic®

DEVELOPAN® metering diaphragms from ProMinent made of EPDM with woven inner layer, large-area vulcanised steel core and PTFE Teflon layer on the wetted side.

For pump type	Description	Order no.
1000	31.0 x 6.0	811452
1601	48.0 x 9.5	811453
1201	48.0 x 12.5	811454
0803	48.0 x 18.5	811455
1002, 2502	60.0 x 17.0	811456
0308, 2505, 1006	60.0 x 28.0	811457
0430, 0230	127.5 x 63.0	811460
0260	127.5 x 91.0	811461
1310, 0613	76.0 x 37.0	811458
0814, 0417	76.0 x 45.0	811459
2501	35.0 x 11.5	1000246

Ex-Proof Ancillary Equipment

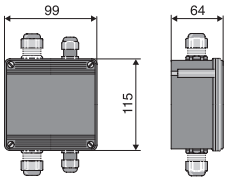
Plastic terminal box: Type I



IP 66, EEx e II T 6, max. 380 V to mains connection of e.g. ProMinent EXtronic® in area at risk from explosion.

	Order no.
1 input, 1 output for power supply cable. 2 terminals + PE and 2 M 20-12 screw glands	1000071

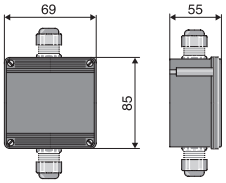
Plastic terminal box: Type II



IP 6, EEx e II T 6, max. 380 V. As type I, but with additional connector for control cable (e.g. for contact water meter or DULCOMETER® controller).

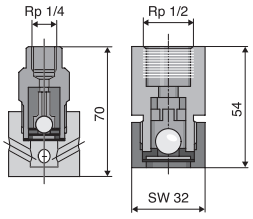
	Order no.
2 inputs (mains and controller cable), 2 outputs 2 terminals + PE, 1 partition, 2 terminals and 2 M 20-12 screw glands and 2 M 16-0.8 screw glands	1000072

Plastic terminal box: EExi Type I



IP 66, EEx ia II T 6 for intrinsically safe control cable

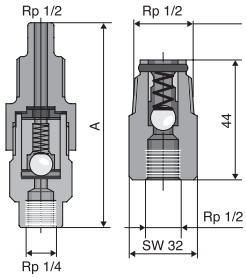
	Order no.
1 input, 1 output for control cable, 2 terminals and 2 M 16-0.8, blue screw glands	1000073



Stainless steel foot valve 1.4404 „SB“

With filter and ball check valve, designed for use with flammable materials. Materials: 1.4404/1.4401/PTFE/ceramic

	Order no.
Connector ISO 7 Rp 1/4 SB version for ProMinent EXtronic®	809301
Connector ISO 7 Rp 1/2 SB version for ProMinent EXtronic®	924561



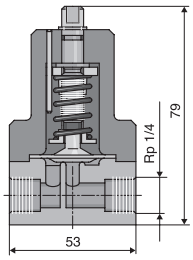
Stainless steel 1.4404 „SB“ dosing valve

Spring-loaded ball check valve designed for use with flammable materials. Materials: 1.4404/1.4401/Hastelloy C/PTFE/ceramic

	Order no.
Connector ISO 7 Rp 1/4 - R 1/2, priming pressure approx. 0.5 bar	809302
Connector ISO 7 Rp 1/2 - R 1/2, priming pressure approx. 0.5 bar	924560

Adjustable “SB” back pressure valve

For the generation of a defined back pressure for precise metering, only for use with a free outlet. Also suitable for use as a relief valve.



	Order no.
Operating range approx. 1-10 bar, closed version, designed for use with flammable materials.	924555

PTFE dosing pipe

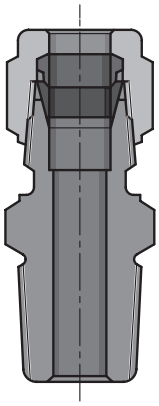
Carbon-filled, surface resistance < 10^7 Ω

Material	Length	Connector size outside Ø x inside Ø	permitted operating pressure*	Order no.
	m	mm	bar	
Carbon-filled PTFE	Sold in metres	6 x 4	12	1024831
Carbon-filled PTFE	Sold in metres	8 x 5	16	1024830
Carbon-filled PTFE	Sold in metres	12 x 9	9	1024832

* Permissible operating pressure at 20 °C as per DIN EN ISO 7751 subject to chemical resistance and correct connection

Further accessories, such as foot valves, injection valves and back pressure valves in the usual material versions, are identical to gamma accessories and/or those for connecting DN 15 Vario accessories.

(Hydraulic/mechanical accessories, see page → 176)



Straight Male Adapter Stainless Steel

Swagelock system, stainless steel SS 316 (1.4401) for fitting tubing to dosing heads and valves with inner threads and for SB versions.

	Order no.
6 mm - ISO 7 R 1/4	359526
8 mm - ISO 7 R 1/4	359527
12 mm - ISO 7 R 1/4	359528
16 mm - ISO 7 R 1/2	359529

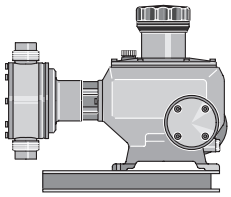
2.2 Diaphragm Metering Pumps

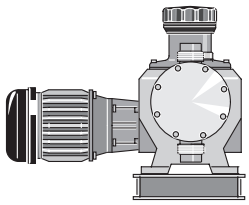
2.2.2 Diaphragm Metering Pump Makro TZ

Greater safety in continuous operation through mechanically deflected multi-layer safety diaphragm.

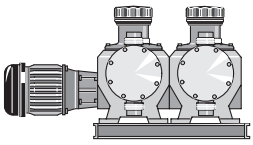
Capacity range of single head pump: 260 – 2,100 l/h, 12 – 4 bar

The modular construction of the diaphragm metering pump Makro TZ with adjustable eccentric drive mechanism and mechanically deflected multi-layer safety diaphragm makes it wonderfully adaptable to the capacity requirements of the respective application.

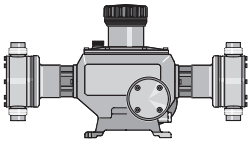




Makro TZ TZMb



Makro TZ externally mounted pump



Makro TZ double head pump

The diaphragm metering pump Makro TZ (TZMb) has an adjustable eccentric drive mechanism and, together with the Makro TZ plunger metering pump, forms a range of drive mechanisms with stroke lengths of 10 and/or 20 mm. A wide range of power end versions is available for use in areas at risk from explosion with ATEX certification.

Your benefits

Excellent process safety and reliability:

- Patented multi-layer safety diaphragm with integral diaphragm rupture warning system
- Metering reproducibility is better than ± 2% within the 30 – 100% stroke length range under defined conditions and with correct installation

Excellent flexibility:

- The modular construction with single and double head versions permits a wide range of applications, with the double head designs being operated in push-pull mode
- It is possible to combine up to 4 metering units, even with different pump capacities, in multiple pump systems
- 5 different gear ratios are available
- Customised designs are available on request

Technical Details

- Stroke length: 0-10 mm, Rod force: 8,000 N
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually by scaled rotary dial in 0.5% increments (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 2% within the 30 – 100% stroke length range under defined conditions and with correct installation. Observe the information in the operating instructions
- Patented multi-layer safety diaphragm with optical diaphragm rupture display (optionally with electrical diaphragm rupture warning system / warning via a contact)
- Wetted materials: Polypropylene, PVC, PTFE+25% carbon, stainless steel 1.4571. Special materials are available on request
- A wide range of power end versions is available: Three-phase or 1-phase AC motor, motors for use in areas at risk from explosion, different flange designs for use of customer-specific motors
- Degree of protection: IP 55
- Salt water-resistant, acrylic resin-coated cast aluminium housing
- For reasons of safety, provide suitable overload protection mechanisms during the installation of all mechanically deflected diaphragm metering pumps

Field of application

- Volume-proportional metering of chemicals/additives in water treatment
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of additives in industrial production engineering

2.2 Diaphragm Metering Pumps

Technical Data

Typ	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Capacity at max. back pressure with 1800 rpm motor at 60 Hz				Suction lift	Connector Suction/ Discharge Side	Shipping weight PP, NP, TT-SS
	l/h	bar	ml/ stroke	Max. stroke rate Strokes/ min	l/h	psi	gph (US)	Max. stroke rate Strokes/ min	m WC	G-DN	kg
120260	260	12	60	72	312	174	82	86	4.0	1 1/2–25	46/54
120340	340	12	60	96	408	174	108	115	4.0	1 1/2–25	46/54
120430	430	12	60	120	516	174	136	144	4.0	1 1/2–25	46/54
120510	510	12	60	144	622	174	164	173	4.0	1 1/2–25	46/54
120650	640	12	60	180	-	174	-	-	4.0	1 1/2–25	46/54
070430	430	7	99	72	516	100	136	86	3.5	2–32	50/64
070570	570	7	99	96	684	100	181	115	3.5	2–32	50/64
070720	720	7	99	120	864	100	228	144	3.5	2–32	50/64
070860	860	7	99	144	1,032	100	273	173	3.5	2–32	50/64
071070	1,070	7	99	180	-	100	-	-	3.5	2–32	50/64
040840	840	4	194	72	1,008	58	266	86	3.0	2 1/4–40	56/80
041100	1,100	4	194	96	1,320	58	349	115	3.0	2 1/4–40	56/80
041400	1,400	4	194	120	1,680	58	444	144	3.0	2 1/4–40	56/80
041670	1,670	4	194	144	2,004	58	529	173	3.0	2 1/4–40	56/80
042100	2,100	4	194	180	-	58	-	-	3.0	2 1/4–40	56/80

Stroke length 10 mm

Plastic material design: max. 10 bar back pressure

The permissible priming pressure on the suction side is approximately 50% of the max. permitted back pressure

Materials in Contact With the Medium

			DN 25 ball valves			DN 32 / DN 40 plate valves		
Identity code of material	Dosing head	Suction/ discharge connection	Seals DN 25	Valve balls	Valve seats	Seals DN 32/DN 40	Valve plates/ valve springs	Valve seats
PCT	PVC	PVDF	PTFE	Borosilicate glass	PTFE	PTFE	Ceramic/Hastelloy C + CTFE *	PTFE
PPT	Polypropylene	PVDF	PTFE	Borosilicate glass	PTFE	PTFE	Ceramic/Hastelloy C + CTFE *	PTFE
SST	Stainless steel 1.4404	Stainless steel 1.4581	PTFE	Stainless steel 1.4401	PTFE	PTFE	Stainless steel 1.4404/Hastel-loy C	PTFE
TTT	Carbon-filled PTFE	PVDF	PTFE	Ceramic	PTFE	PTFE	Ceramic/Hastelloy C + CTFE *	PTFE

* The valve spring is coated with CTFE (resistance similar to PTFE)

Multi-layer safety diaphragm with PTFE coating.

Special designs available on request.

2.2 Diaphragm Metering Pumps

Identity Code Ordering System for Makro TZMb Mechanically Deflected Diaphragm Metering Pump

TZMb	Drive type														
	H	Main drive													
	A	Add-on drive													
	D	Double main drive													
	B	Double add-on power end													
		Type **													
		120260													
		120340													
		120430													
		120510													
		120650													
		070430													
		070570													
		070720													
		070860													
		071070													
		040840													
		041100													
		041400													
		041670													
		042100													
			Liquid end material *												
			PC	PVC											
			PP	Polypropylene											
			SS	Stainless steel											
			TT	PTFE + 25% carbon											
				Material of seals/diaphragm											
				T	PTFE										
					Displacement body										
					1	Multi-layer safety diaphragm with rupture indicator									
						Liquid end version									
						0	no valve spring								
						1	With valve springs								
							Hydraulic connections								
							0	Standard connection							
							1	PVC union nut and insert							
							2	Union nut and insert PP							
							3	PVDF union nut and insert							
							4	SS union nut and insert							
								Version							
								0	with ProMinent logo						
								2	without ProMinent logo						
								A	with ProMinent® logo, with frame, simplex						
								B	with ProMinent® logo, with frame, duplex						
								C	with ProMinent® logo, with frame, triplex						
								M	Modified						
									Electrical power supply						
									S	3 ph. 230/400 V 50/60 Hz (WBS)					
									R	Variable speed motor 4-pole, 230/400 V					
									V0	Variable speed motor with integrated frequency converter					
									Z	Speed control kit					
									L	3 ph. 230/400 V 50 Hz (Exe, Exd)					
									P	3 ph. 230/400 V 60 Hz (Exe, Exd)					
									V2	Variable speed motor with integr. frequency converter (Exd)					
									4	no motor, with motor flange 56 C					
									7	no motor, with motor flange 120/80					
									8	no motor, with motor flange 160/90					
									0	Without motor, externally mounted drive					
										Enclosure rating					
										0	IP 55 (standard)				
										1	Exe motor version ATEX-T3				
										2	Exd motor version ATEX-T4				
										A	ATEX power end				
											Stroke sensor				
											0	No stroke sensor			
											1	With stroke sensor (Namur)			
												Stroke length adjustment			
												0	Stroke length adjustment, manual		
												1	230 V stroke actuator		
												2	115 V stroke actuator		

* Material versions PCT/PPT/TTT max. 10 bar

** Figure 1 + 2=back pressure [bar]; figure 3 - 6=pump capacity [l/h]

2.2 Diaphragm Metering Pumps

3	230 V 0-20 mA stroke controller
4	230 V 4-20 mA stroke controller
5	115 V 0-20 mA stroke controller
6	115 V 4-20 mA stroke controller, Servomotors for area at risk from explosion available upon request
Application	
0	standard

* Material versions PCT/PPT/TTT max. 10 bar

** Figure 1 + 2=back pressure [bar]; figure 3 - 6=pump capacity [l/h]

2.2 Diaphragm Metering Pumps

Motor Data

Identity code specification		Power supply			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V 265 – 280 V/440 – 480 V	50 Hz 60 Hz	0.75 kW	
R	3-phase, IP 55	230 V/400 V	50/60 Hz	1.5 kW	With PTC, speed control range 1:20 with external fan (1-phase 230 V; 50/60 Hz, 20 W)
V0	3-phase, IP 55	230 V ±5%	50/60 Hz	1.5 kW	Variable speed motor with integrated frequency converter
L1	3-phase, II 2G Ex eb IIC T3 Gb	220 - 240 V/380 - 420 V	50 Hz	0.75 kW	
L2	3-phase, II 2G Ex db IIC T4 Gb	220 – 240 V/380 – 420 V	50 Hz	0.75 kW	With PTC, speed control range 1:5
P1	3-phase, II 2G Ex eb IIC T3 Gb	250 – 280 V/440 – 480 V	60 Hz	0.75 kW	
P2	3-phase, II 2G Ex db IIC T4 Gb	250 – 280 V/440 – 480 V	60 Hz	0.75 kW	With PTC, speed control range 1:5
V2	3-phase, II 2G Ex de IIC T4	400 V ±10%	50/60 Hz	1.5 kW	Ex-variable speed motor with integrated frequency converter

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

The motors are designed in compliance with the Ecodesign Directive 2009/125/EC.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

Spare Parts

The spare parts kit generally includes the wear parts for the liquid ends.

1 metering diaphragm (multi-layer safety diaphragm)

1 suction valve assembly

1 discharge valve assembly

2 valve balls (DN 32/DN 40 with plate and spring)

1 complete sealing set (O-rings or flat seals, valve seats, valve seat bushings)

Spare Parts Kits for Diaphragm Metering Pump Makro TZ (TZMb)

Identity Code: 120260, 120340, 120430, 120510, 120650

Liquid end	Materials in contact with the medium	Addition	Order no.
FM 650 - DN 25	PCT, PPT, TTT		1025164
FM 650 - DN 25	SST		1022896
FM 650 - DN 25	SST	without valves cpl.	1022895

Identity Code: 070430, 070570, 070720, 070860, 071070

Liquid end	Materials in contact with the medium	Addition	Order no.
FM 1100 - DN 32	PCT, PPT, TTT		1025167
FM 1100 - DN 32	SST		1022917
FM 1100 - DN 32	SST	without valves cpl.	1022916

Identity Code: 040840, 041100, 041400, 041670, 042100

Liquid end	Materials in contact with the medium	Addition	Order no.
FM 2100 - DN 40	PCT, PPT, TTT		1025169
FM 2100 - DN 40	SST		1022930
FM 2100 - DN 40	SST	without valves cpl.	1022929

Multi-Layer Metering Diaphragm for TZMb

ProMinent multi-layer safety diaphragm with diaphragm rupture warning system and PTFE Teflon coating on the wetted side.

Pump type	Order no.
Identity code: 120260, 120340, 120430, 120510, 120650; Makro TZ FM 650	1022887
Identity code: 070430, 070570, 070720, 070860, 071070; Makro TZ FM 1100	1022900
Identity code: 040840, 041100, 041400, 041670, 042100; Makro TZ FM 2100	1022921

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

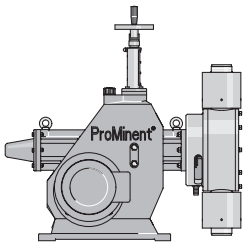
2.2 Diaphragm Metering Pumps

2.2.3 Diaphragm Metering Pump Makro/ 5

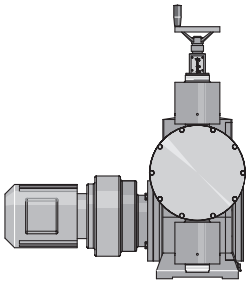
It is not possible to do more with a mechanically deflected diaphragm

Capacity range of single head pump: 1,540 – 4,000 l/h; 4 bar

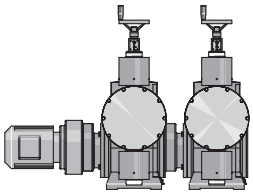
The diaphragm metering pump Makro/ 5 is used to meter reactants and catalysts in the chemical industry. Thanks to its modular construction, it can adapt outstandingly to the actual requirements of each application.

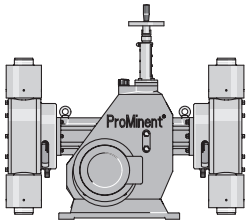


Makro/ 5 M5Ma



Makro/ 5 externally mounted pump





Makro/ 5 double head pump

The diaphragm metering pump Makro/ 5 (M5Ma) with the Makro/ 5 hydraulic diaphragm and plunger metering pumps, form a range of drive mechanisms with stroke lengths of 20 and/or 50 mm. A wide range of power end versions is available for use in areas at risk from explosion with ATEX certification.

Your benefits

Process reliability:

- Metering reproducibility is better than ± 2% within the 30-100% stroke length range under defined conditions and with correct installation.

Excellent flexibility:

- The modular construction with single and double head versions permits a wide range of applications, with the double head designs being operated in push-pull mode
- It is possible to combine up to 4 metering units, even with different pump capacities, in multiple pump systems
- 5 different gear ratios are available
- Customised designs are available on request

Technical Details

- Stroke length: 0-20 mm, Rod force: 10,000 N
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually by means of a manual adjustment wheel and scaled display in 0.5% increments (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 2% within the 30 – 100% stroke length range under defined conditions and with correct installation. Observe the information in the operating instructions
- Wetted materials: Polypropylene, PVC, PTFE+25% carbon, stainless steel 1.4571, special materials are available on request
- A wide range of power end versions is available: Three-phase standard motors, motors for use in areas at risk from explosion and different flange designs for use in customer-specific motors
- Degree of protection: IP 55
- Salt water-resistant, acrylic resin-coated cast iron housing
- For reasons of safety, provide suitable overload protection mechanisms during the installation of all mechanically deflected diaphragm metering pumps

Field of application

- Volume-proportional metering of chemicals/additives in water treatment
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of additives in industrial production engineering

2.2 Diaphragm Metering Pumps

Technical Data

Typ	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Capacity at max. back pressure with 1800 rpm motor at 60 Hz				Suction lift	Connector Suction/ Discharge Side	Shipping weight
	l/h	bar	ml/ stroke	Max. stroke rate Strokes/ min	l/h	psi	gph (US)	Max. stroke rate Strokes/ min	m WC	G-DN	kg
041540	1,540	4	427	60	1,822	58	481	71	3.0	2 3/4–50	320
041900	1,900	4	427	75	2,254	58	595	89	3.0	2 3/4–50	320
042600	2,600	4	427	103	3,104	58	820	123	3.0	2 3/4–50	320
043400	3,400	4	427	133	4,064	58	1,074	159	3.0	2 3/4–50	320
044000	4,000	4	427	156	-	58	-	-	3.0	2 3/4–50	320

Stainless steel version: Shipping weight 340 kg

The permissible admission pressure on the intake side is approx. 50% of the maximum permissible back pressure.

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge valve	Seals DN 50	Valve plates/valve springs	Valve seats
PCT	PVC	PVC	PTFE	Ceramic/Hastelloy C + CTFE *	PTFE
PPT	Polypropylene	Polypropylene	PTFE	Ceramic/Hastelloy C + CTFE *	PTFE
SST	Stainless steel 1.4571/1.4404	Stainless steel 1.4571/1.4404	PTFE	Stainless steel 1.4404/ Hastelloy C	PTFE
TTT	Carbon-filled PTFE	Carbon-filled PTFE	PTFE	Ceramic/Hastelloy C + CTFE *	PTFE

* The valve spring is coated with CTFE (resistance similar to PTFE)

DEVELOPAN® metering diaphragm with PTFE coating.

Special designs available on request.

Motor Data

Identity code specification		Power supply			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V 265 – 280 V/440 – 480 V	50 Hz 60 Hz	3 kW	
R	3-phase, IP 55	230 V/400 V	50 Hz	3 kW	with PTC, speed adjustment range 1:5 with external fan (1-phase 230 V; 50/ 60 Hz; 20 W)
L1	3-phase, II2GE-XellT3X	220 – 240 V/380 – 420 V	50 Hz	3.6 kW	
L2	3-phase, II2GExdeI-ICT4Gb	220 – 240 V/380 – 420 V	50 Hz	4 kW	with PTC, speed control range 1:5
P1	3-phase, II2GExeI-ICT3	250 – 280 V/440 – 480 V	60 Hz	3.6 kW	
P2	3-phase, II2GExdeI-ICT4	250 – 280 V/440 – 480 V	60 Hz	4 kW	with PTC, speed control range 1:5

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

The motors are designed in compliance with the Ecodesign Directive 2009/125/EC.

Information for use in areas at risk from explosion

2.2 Diaphragm Metering Pumps

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

Identity Code Ordering System for Motor-Driven Metering Pump M5Ma with Mechanically Deflected Diaphragm

M5Ma	Drive type													
	H	Main drive												
	D	Double main drive												
	A	Add-on drive												
	B	Double add-on power end												
		Type												
		041540												
		041900												
		042600												
		043400												
		044000												
			Liquid end material											
			PC	PVC										
			PP	Polypropylene										
			SS	Stainless steel										
			TT	PTFE + 25% carbon										
				Sealing material										
				T	PTFE									
					Displacement body									
					T	Composite diaphragm, PTFE coating, with rupture indicator								
						Liquid end version								
						1	With valve springs, Hast. C; 0.1 bar							
							Hydraulic connections							
							0	Standard connection						
							1	PVC union nut and insert						
							2	Union nut and insert PP						
							3	PVDF union nut and insert						
							4	SS union nut and insert						
								Version						
								0	with ProMinent® logo, no frame					
								2	without ProMinent® logo, no frame					
								A	with ProMinent® logo, with frame, simplex					
								B	with ProMinent® logo, with frame, duplex					
								C	with ProMinent® logo, with frame, triplex					
								D	with ProMinent® logo, with frame, quadruplex					
								M	Modified					
									Electrical power supply					
									S	3 ph. 230/400 V 50/60 Hz (WBS)				
									R	Variable speed motor 4-pole 230/400 V (R 1:5)				
									Z	Speed control complete 230/400 V, 50/60 Hz				
									L	3 ph. 230/400 V 50 Hz (Exe, Exd)				
									P	3 ph. 460 V 60 Hz (Exe, Exd)				
									5	No motor, with gearbox IEC 100				
									6	No motor, with gearbox IEC 112				
									0	No motor, no gearbox				
										Enclosure rating				
										0	IP 55 (standard)			
										1	Exe motor version ATEX-T3			
										2	Exd motor version ATEX-T4			
										A	ATEX power end			
											Stroke sensor			
											0	No stroke sensor		
											1	With stroke sensor (Namur)		
												Stroke length adjustment		
												0	Stroke length adjustment, manual	
												3	230 V 0-20 mA stroke controller	
												4	230 V 4-20 mA stroke controller	
												5	115 V 0-20 mA stroke controller	
												6	Control drive 115 V 4-20 mA	
													Application	
													0	standard
													3	Temperature up to -20 °C

Spare Parts

Spare Parts Kits for Diaphragm Metering Pump Makro/ 5 HM

The spare parts kit generally includes the wear parts for the liquid ends.

1 metering diaphragm

1 suction valve assembly

1 discharge valve assembly

2 valve plates and Hast. C spring

1 complete sealing set (cover rings, valve seat, valve seat bushing)

Liquid end	Addition	Order no.
FM 4000 PCT		1008172
FM 4000 PPT		1008171
FM 4000 TTT		1008173
FM 4000 SST	without valves cpl.	1008174

PTFE Metering Diaphragms

DEVELOPAN® metering diaphragms made of EPDM with woven inner layer, large-area vulcanised aluminium core and PTFE Teflon layer on the wetted side.

Product designation	Order no.
Metering diaphragm for Makro/ 5 FM 4000	1009023

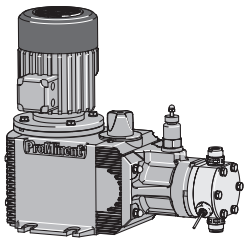
2.3 Hydraulic Diaphragm Metering Pumps

2.3.1 Hydraulic Diaphragm Metering Pump Hydro/ 2

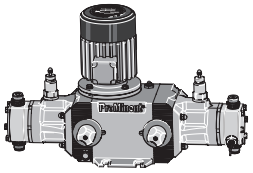
For flexible metering with excellent process reliability in the medium pressure range.

Capacity range of single head pump: 3 – 72 l/h; 100 – 25 bar

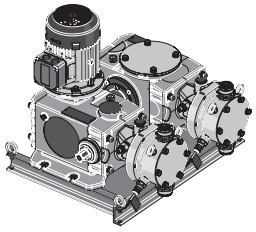
As an extremely robust hydraulic diaphragm metering pump, the Hydro/ 2 meets the most exacting safety requirements. Its modular construction, with either one or two dosing heads, 4 gear ratios, 2 dosing head sizes and 3 dosing head materials, offers a very high degree of flexibility in terms of areas of application.



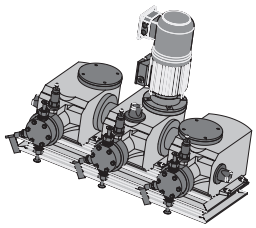
Hydro



Hydro double head pump



Hydro externally mounted pump



Hydro triplex pump

The Hydro/ 2 hydraulic diaphragm metering pump (HP2a), together with the Hydro/ 3 and Hydro/ 4 pumps, represents an integrated product range with stroke lengths of 15 and/or 20 mm. This covers the capacity range from 3 to 1,450 l/h at 100 – 7 bar. A wide range of power end versions is available for use in areas at risk from explosion with ATEX certification. The Hydro product range is designed to comply with API 675 among others.

Your benefits

Excellent process safety and reliability:

- PTFE multi-layer diaphragm with integral diaphragm rupture warning system
- Integral hydraulic relief valve
- Metering reproducibility is better than ± 1% within the 20-100% stroke volume range under defined conditions and with proper installation

Excellent flexibility:

- The modular construction with single and double head versions permits a wide range of applications, with the double head designs being operated in push-pull mode
- It is possible to combine up to 5 metering units, even with different pump capacities, in multiple pump systems
- 5 different gear ratios are available

Technical Details

- Stroke length: 15 mm, Rod force: 2,000 N
- Stroke volume adjustment range: 0 – 100%
- Stroke volume adjustment: manually by scaled rotary dial (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 1% in the 20 to 100% stroke volume range under defined conditions and with correct installation
- PTFE multi-layer diaphragm with electrical diaphragm rupture warning / signalling system via a contact
- Integrated hydraulic relief and bleed valve
- Wetted materials: PVDF, PTFE+25% carbon, stainless steel 1.4571, Hastelloy C.
- A wide range of power end versions is available: Three-phase or 1-phase AC motor, motors for use in areas at risk from explosion, different flange designs for use of customer-specific motors
- Degree of protection: IP 55
- Design in compliance with API 675 see page → 352

Field of application

- Oil and gas industry
- Volume-proportional metering of chemicals/additives in the treatment of boiler feed water
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of auxiliary agents in industrial production engineering, for instance hot wax metering in the production of adhesive strips

2.3 Hydraulic Diaphragm Metering Pumps

Technical Data

Typ	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Capacity at max. back pressure with 1800 rpm motor at 60 Hz				Suction lift	Perm. pre-pressure suction side	Suction / discharge side connector	Shipping weight	Plunger Ø
	l/h	bar	ml/stroke	Max. stroke rate Strokes/min	l/h	psi	gph (US)	Max. stroke rate Strokes/min	m WC	bar	G-DN	kg	mm
100003 *	3	100	0.8	60	3.6	1,450	1.0	72	3.0	5	Rp 1/4	31	16
100006 *	6	100	0.8	125	7.0	1,450	1.8	150	3.0	5	Rp 1/4	31	16
100007 *	7	100	0.8	150	8.0	1,450	2.1	180	3.0	5	Rp 1/4	31	16
100009 *	9	100	0.8	187	11.0	1,450	2.9	224	3.0	5	Rp 1/4	31	16
100010 *	10	100	0.8	212	-	-	-	-	3.0	5	Rp 1/4	31	16
064007	7	64	2.0	60	8.4	928	2.2	72	3.0	5	G 3/4-10	31	18
064015	15	64	2.0	125	18.0	928	4.8	150	3.0	5	G 3/4-10	31	18
064018	18	64	2.0	150	21.0	928	5.5	180	3.0	5	G 3/4-10	31	18
064022	22	64	2.0	187	26.0	928	6.9	224	3.0	5	G 3/4-10	31	18
064025	25	64	2.0	212	-	-	-	-	3.0	5	G 3/4-10	31	18
040014	14	40	3.9	60	16.8	580	4.4	72	3.0	5	G 3/4-10	31	22
040029	29	40	3.9	125	34.8	580	9.2	150	3.0	5	G 3/4-10	31	22
040035	35	40	3.9	150	42.0	580	11.1	180	3.0	5	G 3/4-10	31	22
040044	44	40	3.9	187	52.8	580	13.9	224	3.0	5	G 3/4-10	31	22
040050	50	40	3.9	212	-	580	-	-	3.0	5	G 3/4-10	31	22
025019 **	19	25	5.3	60	23.0	362	6.1	72	3.0	5	G 3/4-10	31	26
025040 **	40	25	5.3	125	48.0	362	12.7	150	3.0	5	G 3/4-10	31	26
025048 **	48	25	5.3	150	58.0	362	15.3	180	3.0	5	G 3/4-10	31	26
025060 **	60	25	5.3	187	72.0	362	19.0	224	3.0	5	G 3/4-10	31	26
025068 **	68	25	5.3	212	-	-	-	-	3.0	5	G 3/4-10	31	26

* SST/HCT version with double ball valve, valve connector on the suction-discharge side with female thread Rp 1/4 and external thread G 3/4 - DN 10

** HV design with G1 - DN 15 connector

PVDF version max. 25 bar, PTFE + 25 % carbon; PTFE max.16 bar

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	Seals/ball seat	Balls
HCT	Hastelloy C	Hastelloy C	PTFE/Hastelloy C	Ceramic
PVT *	PVDF	PVDF	PTFE/PTFE	Ceramic
SST	Stainless steel 1.4571/1.4404	Stainless steel 1.4581	PTFE/stainless steel 1.4404	Ceramic
TTT	PTFE + 25% carbon	PVDF (polyvinylidene fluoride)	PTFE/PTFE	Ceramic

* Not for areas at risk from explosion

2.3 Hydraulic Diaphragm Metering Pumps

Motor Data

Identity code specification		Power supply			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V 250 – 280 V/440 – 480 V	50 Hz 60 Hz	0.37 kW	
T	3-phase, IP 55	220 - 240 V/380 - 420 V 250 – 280 V/440 – 480 V	50 Hz 60 Hz	0.37 kW	With PTC, speed control range 1:5
R	3-phase, IP 55	230 V/400 V	50/60 Hz	0.37 kW	With PTC, speed control range 1:20 with external fan 1-phase 230 V; 50/60 Hz
V0	1-phase, IP 55	230 V ±10%	50/60 Hz	0.37 kW	Variable speed motor with integrated frequency converter
L1	3-phase, II 2G Ex eb IIC T3 Gb	220 – 240 V/380 – 420 V	50 Hz	0.37 kW	
L2	3-phase, II 2G Ex de IIC T4 Gb	220 – 240 V/380 – 420 V	50 Hz	0.37 kW	With PTC, speed control range 1:5
P1	3-phase, II 2G Ex e II T3	254 – 277 V/440 – 480 V	60 Hz	0.37 kW	
P2	3-phase, II 2G Ex de IIC T4	254 – 277 V/440 – 480 V	60 Hz	0.37 kW	With PTC, speed control range 1:5
V2	3-phase, II 2G Ex db IIC T4...T6 Gb	400 V ± 10 %	50/60 Hz	0.55 kW	Ex-variable speed motor with integrated frequency converter

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

The motors are designed in accordance with the Eco Design Directive 2009/125/EC.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.



2.3 Hydraulic Diaphragm Metering Pumps

Identity Code Ordering System HP2a

HP2a	Drive type													
	H	Main drive												
	D	Main drive, double-head version												
	E	Main drive for add-on drive												
	F	Main drive, double-head version for add-on drive												
	A	Add-on drive												
	B	Double-head version add-on drive												
	T	Triplex comprising 3 power ends and 3 identical heads												
		Type	Output											
		100003	100 bar	3 l/h										
		100006	100 bar	6 l/h										
		100007	100 bar	7 l/h										
		100009	100 bar	9 l/h										
		100010	100 bar	10 l/h										
		064007	64 bar	7 l/h										
		064015	64 bar	15 l/h										
		064018	64 bar	18 l/h										
		064022	64 bar	22 l/h										
		064025	64 bar	25 l/h										
		040014	40 bar	14 l/h										
		040029	40 bar	29 l/h										
		040035	40 bar	35 l/h										
		040044	40 bar	44 l/h										
		040050	40 bar	50 l/h										
		025019	25 bar	19 l/h										
		025040	25 bar	40 l/h										
		025048	25 bar	48 l/h										
		025060	25 bar	60 l/h										
		025068	25 bar	68 l/h										
			Liquid end material											
			SS	Stainless steel										
			PV	PVDF , only for 025019 – 025068, 064007 – 064025, max. 25 bar										
			HC	Hastelloy C										
			TT	PTFE + 25 % carbon, max. 16 bar										
				Sealing material										
				T	PTFE									
					Diaphragm									
					0	Standard multilayer diaphragm with rupture signalling facility								
						Liquid end version								
						1	With valve springs							
						D	Double ball valve , Only for SST and HCT							
						H	HV version , Only for 025019 – 025060, only for SST							
							Hydraulic connections							
							0	Standard threaded connector						
							E	With DIN ISO flange						
							F	With ANSI flange						
								Version						
								0	with ProMinent logo					
								1	without ProMinent logo					
								M	Modified					
									Electrical power supply					
									S	3-phase, 230/400 V, 50/60 Hz, 0.37 kW				
									T	3 ph, 230/400 V, 50/60 Hz, with PTC				
									R	3 ph, Variable speed motor, 230 V/400 V, 0.37 kW				
									V0	Variable speed motor with integrated frequency converter				
									Z	1 ph, variable speed control set, 230 V, 50/60 Hz				
									L	3 ph, 230/400 V, 50 Hz (Exe, Exd), 0.37 kW				
									P	3 ph, 265/400 V, 60 Hz (Exe, Exd), 0.37 kW				
									V2	Variable speed motor with integr. frequency converter (Exd)				
									1	no motor, with motor flange B 14, size 200				
									3	no motor, with motor flange B5, size 160				
									4	no motor, with motor flange NEMA 56 C				
									0	Add-on drive				
										Enclosure rating				
										0	IP 55 (standard)			
										1	Exe motor version ATEX-T3			
										2	Exde motor version ATEX-T4			
										A	ATEX power end			
											Stroke sensor			
											0	No stroke sensor (standard)		
											1	Stroke sensor (for explosion-proof applications)		
												Stroke length adjustment		
												0	Manual (Standard)	

1	With stroke positioning motor, 230 V/50/60 Hz
2	With stroke positioning motor, 115 V/60 Hz
A	With stroke control motor 0-20 mA 230 V/50/60 Hz
B	With stroke control motor 4-20 mA 230 V/50/60 Hz
C	With stroke control motor 0-20 mA 115 V/60 Hz
D	With stroke control motor 4-20 mA 115 V/60 Hz

Hydraulic oil	
0	standard
1	Food grade
2	Low temperature to -25 °C
3	Low temperature Zone 2

Spare Parts

The spare parts kit generally includes the wear parts for the liquid ends.

Scope of delivery for SST/HCT material version

1 metering diaphragm

2 valve balls

1 sealing set, complete

Scope of delivery for PVT material version

1 metering diaphragm

1 suction valve assembly

1 discharge valve assembly

2 valve balls

1 sealing set, complete

Spare parts kits for Hydro/ 2

Identity code 100010, 100009, 100007, 100006, 100003, 064025, 064022, 064018, 064015, 064007

Liquid end	Materials in Contact With the Medium	Addition	Order no.
FMH 60 - DN 10	PVT		1005552
FMH 60 - DN 10	SST		1005553
FMH 60 - DN 10	SST	for double ball valves	1005555
FMH 60 - DN 10	HCT		1009573
FMH 60 - DN 10	SST	with valves cpl.	1005554
FMH 60 - DN 10	SST (HV design)	with valves, complete (DN 15)	1019812

Identity code 025068, 025060, 025048, 025040, 025019

Liquid end	Materials in Contact With the Medium	Addition	Order no.
FMH 60 - DN 10	PVT		1005552
FMH 60 - DN 10	SST		1005553
FMH 60 - DN 10	SST	for double ball valves	1005555
FMH 60 - DN 10	HCT		1009573
FMH 60 - DN 10	SST	with valves cpl.	1005554
FMH 60 - DN 10	SST (HV design)	with valves, complete (DN 15)	1019812

PTFE/1.4404 Metering Diaphragms for Hydro/ 2

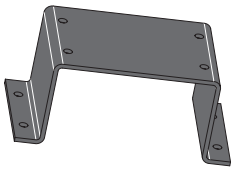
Liquid end	Group title	Order no.
FMH 25	Applies to identity code (SST): 100010, 100009, 100007, 100006, 100003, 064025, 064022, 064018, 064015, 064007	1005545
FMH 60	Applies to identity code (SST): 026068, 025060, 025048, 025040, 025019	1005546

Diaphragms PTFE/Hastelloy C Coated for Hydro/ 2

Liquid end	Group title	Order no.
FMH 25	Applies to identity code (PVT/HCT): 064025, 064022, 064018, 064015, 064007	1006481
FMH 60	Applies to identity code: Type 025068, 025060, 025048, 025040, 025019	1006482

Base for Hydro hydraulic diaphragm metering pumps

Product designation	Order no.
Base for Hydro/ 2, dimensions: 300 x 160 x 128 mm (LxWxH)	1005660



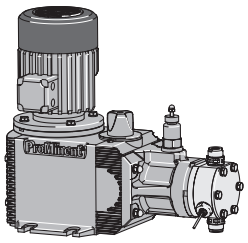
2.3 Hydraulic Diaphragm Metering Pumps

2.3.2 Hydraulic Diaphragm Metering Pump Hydro/ 3

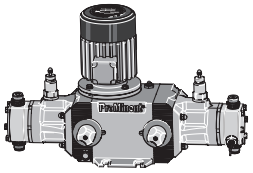
For flexible metering with excellent process reliability in the medium pressure range.

Capacity range of single head pump: 10 – 180 l/h; 100 – 25 bar

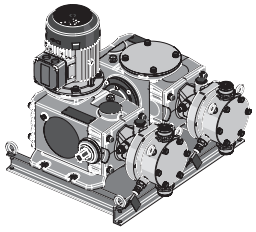
The Hydro/ 3 is an extremely robust hydraulic diaphragm metering pump. It meets the most exacting safety requirements. Its modular construction offers extremely good flexibility in terms of application, for example in the oil and gas industry.



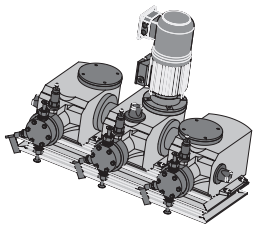
Hydro



Hydro double head pump



Hydro externally mounted pump



Hydro triplex pump

The Hydro/ 3 hydraulic diaphragm metering pump (HP3a), together with the Hydro/ 2 and Hydro/ 4 pumps, represents an integrated product range with stroke lengths of 15 and/or 20 mm. This covers the capacity range from 3 to 1,450 l/h at 100 – 7 bar. A wide range of power end versions is available for use in areas at risk from explosion with ATEX certification. The Hydro product range is designed to comply with API 675 among others.

Your benefits

Excellent process safety and reliability:

- PTFE multi-layer diaphragm with integral diaphragm rupture warning system
- Integral hydraulic relief valve
- Metering reproducibility is better than ± 1% within the 20-100% stroke volume range under defined conditions and with proper installation

Excellent flexibility:

- The modular construction with single and double head versions permits a wide range of applications, with the double head designs being operated in push-pull mode
- It is possible to combine up to 5 metering units, even with different pump capacities, in multiple pump systems
- 5 different gear ratios are available
- Customised designs are available on request

Technical Details

- Stroke length: 15 mm, Rod force: 4,200 N
- Stroke volume adjustment range: 0 – 100%
- Stroke volume adjustment: manually by scaled rotary dial (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 1% in the 20 – 100% stroke volume range under defined conditions and with correct installation
- PTFE multi-layer diaphragm with electrical diaphragm rupture warning / signalling system via a contact
- Integrated hydraulic relief and bleed valve
- Wetted materials: PVDF, PTFE+25% carbon, stainless steel 1.4571, Hastelloy C.
- A wide range of power end versions is available: Three-phase or 1-phase AC motor, motors for use in areas at risk from explosion, different flange designs for use of customer-specific motors
- Degree of protection: IP 55
- Design in compliance with API 675, see page → 357

Field of application

- Oil and gas industry.
- Volume-proportional metering of chemicals/additives in the treatment of boiler feed water
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of auxiliary agents in industrial production engineering, for instance hot wax metering in the production of adhesive strips

2.3 Hydraulic Diaphragm Metering Pumps

Technical Data

Typ	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Capacity at max. back pressure with 1800 rpm motor at 60 Hz				Suction lift	Perm. pre-pressure suction side	Suction / discharge side connector	Shipping weight	Plunger Ø
	l/h	bar	ml/stroke	Max. stroke rate Strokes/min	l/h	psi	gph (US)	Max. stroke rate Strokes/min	m WC	bar	G-DN	kg	mm
100010 *	10	100	2.8	60	12	1,450	3.2	72	3.0	5	Rp 3/8-10	41	22
100021 *	21	100	2.8	125	25	1,450	6.6	150	3.0	5	Rp 3/8-10	41	22
100025 *	25	100	2.8	150	30	1,450	7.9	180	3.0	5	Rp 3/8-10	41	22
100031 *	31	100	2.8	187	37	1,450	9.8	224	3.0	5	Rp 3/8-10	41	22
100035 *	35	100	2.8	212	-	1,450	-	-	3.0	5	Rp 3/8-10	41	22
064019 **	19	64	5.3	60	23	928	6.1	72	3.0	5	G 3/4-10	41	26
064040 **	40	64	5.3	125	48	928	12.7	150	3.0	5	G 3/4-10	41	26
064048 **	48	64	5.3	150	58	928	15.3	180	3.0	5	G 3/4-10	41	26
064060 **	60	64	5.3	187	72	928	19.0	224	3.0	5	G 3/4-10	41	26
064068 **	68	64	5.3	212	-	928	-	-	3.0	5	G 3/4-10	41	26
040029 ***	29	40	8.2	60	35	580	9.2	72	3.0	5	G 1-15	41	32
040062 ***	62	40	8.2	125	74	580	19.7	150	3.0	5	G 1-15	41	32
040074 ***	74	40	8.2	150	89	580	23.5	180	3.0	5	G 1-15	41	32
040092 ***	92	40	8.2	187	110	580	29.2	224	3.0	5	G 1-15	41	32
040105 ***	105	40	8.2	212	-	580	-	-	3.0	5	G 1-15	41	32
025048 ***	48	25	13.4	60	58	362	15.3	72	3.0	5	G 1-15	41	38
025100 ***	100	25	13.4	125	120	362	31.7	150	3.0	5	G 1-15	41	38
025120 ***	120	25	13.4	150	144	362	38.0	180	3.0	5	G 1-15	41	38
025150 ***	150	25	13.4	187	180	362	47.6	224	3.0	5	G 1-15	41	38
025170 ***	170	25	13.4	212	-	362	-	-	3.0	5	G 1-15	41	38

* SST/HCT version with double ball valve, valve connector on the suction/discharge side with female thread Rp 3/8 and external thread G 3/4 - DN 10

** HV design (SST only) with G 1 - DN 15 connector

*** HV design (SST only) with 1 1/4" - DN 20 connector

PVDF version max. 25 bar, PTFE + 25 % carbon; PTFE max.16 bar

2.3 Hydraulic Diaphragm Metering Pumps

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	Seals/ball seat	Balls
HCT	Hastelloy C	Hastelloy C	PTFE/Hastelloy C	Ceramic
PVT *	PVDF	PVDF	PTFE/PTFE	Ceramic
SST	Stainless steel 1.4571/1.4404	Stainless steel 1.4581	PTFE/ZrO_2 (DN 15/DN20 stainless steel 1.4404)	Ceramic
TTT	PTFE + 25% carbon	PVDF (polyvinylidene fluoride)	PTFE/PTFE	Ceramic

* Not for areas at risk from explosion

Motor Data

Identity code specification		Power supply			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V 250 – 280 V/440 – 480 V	50 Hz 60 Hz	0.75 kW	
T	3-phase, IP 55	220 - 240 V/380 - 420 V 250 – 280 V/440 – 480 V	50 Hz 60 Hz	0.75 kW	with PTC, speed control range 1:5
R	3-phase, IP 55	230 V/400 V	50/60 Hz	0.75 kW	with PTC, speed control range 1:20 with external fan 1-phase 230 V; 50/60 Hz
V0	1-phase, IP 55	230 V ±10%	50/60 Hz	0.75 kW	Variable speed motor with integrated frequency converter
L1	3-phase, II 2G Ex eb IIC T3 Gb	220 – 240 V/380 – 420 V	50 Hz	0.75 kW	
L2	3-phase, II 2G Ex de IIC T4	220 – 240 V/380 – 420 V	50 Hz	0.75 kW	with PTC, speed control range 1:5
P1	3-phase, II 2G Ex e II T3	254 – 277 V/440 – 480 V	60 Hz	0.75 kW	
P2	3-phase, II 2G Ex de IIC T4	254 – 277 V/440 – 480 V	60 Hz	0.75 kW	with PTC, speed control range 1:5
V2	3-phase, II 2G Ex db IIC T3...T6 Gb	400 V ± 10 %	50/60 Hz	0.75 kW	Ex-variable speed motor with integrated frequency converter

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

The motors are designed in accordance with the Eco Design Directive 2009/125/EC.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

Identity Code Ordering System HP3a

HP3a	Drive type												
	H	Main drive											
	D	Main drive, double-head version											
	E	Main drive for add-on drive											
	F	Main drive, double-head version for add-on drive											
	A	Add-on drive											
	B	Double-head version add-on drive											
	T	Triplex comprising 3 power ends and 3 identical heads											
		Type	Output										
		100010	100 bar	10 l/h									
		100021	100 bar	21 l/h									
		100025	100 bar	25 l/h									
		100031	100 bar	31 l/h									
		100035	100 bar	35 l/h									
		064019	64 bar	19 l/h									
		064040	64 bar	40 l/h									
		064048	64 bar	48 l/h									
		064060	64 bar	60 l/h									
		064068	64 bar	68 l/h									
		040029	40 bar	29 l/h									
		040062	40 bar	62 l/h									
		040074	40 bar	74 l/h									
		040092	40 bar	92 l/h									
		040105	40 bar	105 l/h									
		025048	25 bar	48 l/h									
		025100	25 bar	100 l/h									
		025120	25 bar	120 l/h									
		025150	25 bar	150 l/h									
		025170	25 bar	170 l/h									
			Liquid end material										
			SS	Stainless steel									
			PV	PVDF , max. 25 bar, only for 025048 – 025170, 064019 – 064068									
			HC	Hastelloy C									
			TT	PTFE + 25 % carbon, max. 16 bar									
				Sealing material									
				T	PTFE								
					Diaphragm								
					0	Standard multilayer diaphragm with rupture signalling facility							
						Liquid end version							
						0	No valve springs (standard)						
						1	With valve springs						
						D	Double ball valve , for 100010 – 100035, 064019 – 064060, only for SST and HCT						
						H	HV version , for 064019 - 064060, 25048 - 25170, only for SST						
							Hydraulic connections						
							0	Standard threaded connector					
							E	With DIN ISO flange					
							F	With ANSI flange					
								Version					
								0	with ProMinent logo				
								1	without ProMinent logo				
								M	Modified				
									Electrical power supply				
									S	3 ph, 230/400 V, 50/60 Hz, 0.75 kW			
									T	3 ph, 230/400 V, 50/60 Hz, with PTC			
									R	3 ph, variable speed motor, 230 V/400 V, 0.75 kW			
									V0	Variable speed motor with integrated frequency converter			
									Z	1 ph, variable speed control set, 230 V, 50/60 Hz			
									L	3 ph, 230/400 V 50 Hz (Exe, Exd), 0.75 kW			
									P	3 ph, 265/440 V 60 Hz (Exe, Exd), 0.75 kW			
									V2	Variable speed motor with integr. frequency converter (Exd)			
									1	no motor, with motor flange B 14, size 200			
									3	no motor, with motor flange B5, size 160			
									4	no motor, with motor flange NEMA 56 C			
									0	Add-on drive			
										Enclosure rating			
										0	IP 55 (standard)		
										1	Exe motor version ATEX-T3		
										2	Exd motor version ATEX-T4		
										A	ATEX power end		
											Stroke sensor		
											0	No stroke sensor (standard)	
											1	Stroke sensor (for explosion-proof applications)	
												Stroke length adjustment	

2.3 Hydraulic Diaphragm Metering Pumps

0	Manual (Standard)
1	With stroke positioning motor, 230 V/50/60 Hz
2	With stroke positioning motor, 115 V/60 Hz
A	With stroke control motor 0-20 mA 230 V/50/60 Hz
B	With stroke control motor 4-20 mA 230 V/50/60 Hz
C	With stroke control motor 0-20 mA 115 V/60 Hz
D	With stroke control motor 4-20 mA 115 V/60 Hz
Hydraulic oil	
0	standard
1	Food grade
2	Low temperature to -25 °C

Spare Parts

The spare parts kit generally includes the wear parts for the liquid ends.

Scope of delivery for SST/HCT material version

1 metering diaphragm

2 valve balls

1 sealing set, complete

Scope of delivery for PVT material version

1 metering diaphragm

1 suction valve assembly

1 discharge valve assembly

2 valve balls

1 sealing set, complete

Spare parts kits for Hydro/ 3

Identity code 100035, 100031, 100025, 100021, 100010, 064068, 064060, 064048, 064040, 064019

Liquid end	Materials in Contact With the Medium	Addition	Order no.
FMH 60 - DN 10	PVT		1005552
FMH 60 - DN 10	SST		1005553
FMH 60 - DN 10	SST	for double ball valves	1005555
FMH 60 - DN 10	HCT		1009573
FMH 60 - DN 10	SST	with valves cpl.	1005554
FMH 60 - DN 10	SST (HV design)	with valves, complete (DN 15)	1019812

Identity code 025170, 025150, 025120, 025100, 025048

Liquid end	Materials in Contact With the Medium	Addition	Order no.
FMH 150 - DN 15	PVT		1005556
FMH 150 - DN 15	SST		1005557
FMH 150 - DN 15	HCT		1009575
FMH 150 - DN 15	SST	with valves cpl.	1005558
FMH 150 - DN 15	SST (HV design)	with valves, complete (DN 20)	1019824

Metering Diaphragm PTFE/1.4404 for Hydro/ 3

Liquid end	Product designation	Order no.
FMH 60	Identity code (SST) 064019, 064040, 064048, 064060, 064068, 100010, 100021, 100025, 100031, 100035	1005546
FMH 150	Identity code (SST) 025048, 025100, 025120, 025150, 025170	1005547

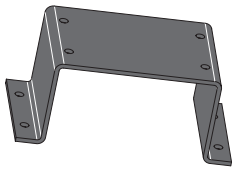
Diaphragms PTFE/Hastelloy C Coated for Hydro/ 3

Liquid end	Product text	Order no.
FMH 60	Identity code (PVT/HCT) 064019, 064040, 064048, 064060, 064068, 100010, 100021, 100025, 100031, 100035	1006482
FMH 150		1006483

2.3 Hydraulic Diaphragm Metering Pumps

Base for Hydro hydraulic diaphragm metering pumps

Product designation	Order no.
Base for Hydro/ 3, dimensions: 324 x 180 x 128 mm (LxWxH)	1005661

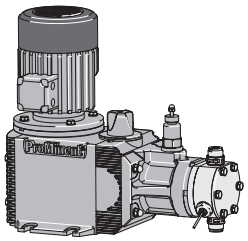


2.3.3 Hydraulic Diaphragm Metering Pump Hydro/ 4

For flexible metering with excellent process reliability in the medium pressure range.

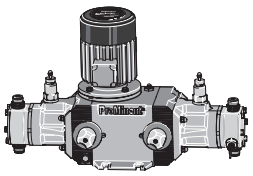
Capacity range of single head pump: 76 – 1,450 l/h; 40 – 7 bar

The Hydro/ 4 is an extremely robust hydraulic diaphragm metering pump, which meets the most exacting safety requirements – it is equipped as standard with a pressure relief valve and PTFE multi-layer diaphragm with diaphragm rupture warning system. Its modular construction offers extremely good flexibility in terms of applications.



Hydro

The Hydro/ 4 hydraulic diaphragm metering pump (HP4a), together with the Hydro/ 2 and Hydro/ 3 pumps, represents an integrated product range with stroke lengths of 15 and/or 20 mm. This covers the capacity range from 3 to 1,450 l/h at 100 – 7 bar. A wide range of power end versions is available for use in areas at risk from explosion with ATEX certification. The Hydro product range is designed to comply with API 675 among others.



Hydro double head pump

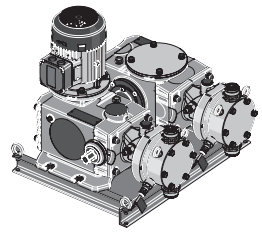
Your benefits

Excellent process safety and reliability:

- PTFE multi-layer diaphragm with integral diaphragm rupture warning system
- Integral hydraulic relief valve
- Metering reproducibility is better than ± 1% in the 20-100% stroke volume range under defined conditions and with proper installation.

Excellent flexibility:

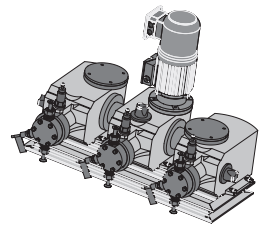
- The modular construction with single and double head versions permits a wide range of applications, with the double head designs being operated in push-pull mode
- It is possible to combine up to 5 metering units, even with different pump capacities, in multiple pump systems
- 5 different gear ratios are available
- Customised designs are available on request



Hydro externally mounted pump

Technical Details

- Stroke length: 20 mm, Rod force: 5,800 N
- Stroke volume adjustment range: 0 – 100%
- Stroke volume adjustment: manually using scaled rotary dial (with electric actuator or control drive as an option).
- Metering reproducibility is better than ± 1% in the 20 – 100% stroke volume range under defined conditions and with correct installation
- PTFE multi-layer diaphragm with electrical diaphragm rupture warning / signalling system via a contact
- Integrated hydraulic relief and bleed valve
- Wetted materials: PVDF, PTFE+25% carbon, stainless steel 1.4571, Hastelloy C.
- A wide range of power end versions is available: Three-phase or 1-phase AC motor, motors for use in areas at risk from explosion, different flange designs for use of customer-specific motors
- Degree of protection: IP 55
- Design in compliance with API 675, see page → 362



Hydro triplex pump

Field of application

- Oil and gas industry.
- Volume-proportional metering of chemicals/additives in the treatment of boiler feed water
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of auxiliary agents in industrial production engineering, for instance hot wax metering in the production of adhesive strips

2.3 Hydraulic Diaphragm Metering Pumps

Technical Data

Typ	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Capacity at max. back pressure with 1800 rpm motor at 60 Hz				Suction lift	Perm. pre-pressure suction side	Suction / discharge side connector	Shipping weight	Plunger Ø
	l/h	bar	ml/stroke	Max. stroke rate Strokes/min	l/h	psi	gph (US)	Max. stroke rate Strokes/min	m WC	bar	G-DN	kg	mm
400071	71	40	17.0	71	85	580	22	86	3	1	G 1 1/2-25	69	40
400105	105	40	17.0	103	126	580	33	124	3	1	G 1 1/2-25	69	40
400140	140	40	17.0	136	168	580	44	164	3	1	G 1 1/2-25	69	40
400190	190	40	17.0	188	188	580	49	225	3	1	G 1 1/2-25	69	40
400220	220	40	17.0	214	-	580	-	-	3	1	G 1 1/2-25	69	40
250130	130	25	31.0	71	155	363	41	86	3	1	G 1 1/2-25	69	52
250190	190	25	31.0	103	230	363	61	124	3	1	G 1 1/2-25	69	52
250250	250	25	31.0	136	300	363	79	164	3	1	G 1 1/2-25	69	52
250350	350	25	31.0	188	420	363	111	225	3	1	G 1 1/2-25	69	52
250400	400	25	31.0	214	-	-	-	-	3	1	G 1 1/2-25	69	52
160210	210	16	48.7	71	250	232	66	86	3	1	G 1 1/2-25	76	63
160300	300	16	48.7	103	360	232	95	124	3	1	G 1 1/2-25	76	63
160400	400	16	48.7	136	480	232	127	164	3	1	G 1 1/2-25	76	63
160550	550	16	48.7	188	660	232	174	225	3	1	G 1 1/2-25	76	63
160625	625	16	48.7	214	-	-	-	-	3	1	G 1 1/2-25	76	63
100330	330	10	78.0	71	400	145	106	86	3	1	G 2-32	87	80
100480	480	10	78.0	103	580	145	153	124	3	1	G 2-32	87	80
100635	635	10	78.0	136	760	145	201	164	3	1	G 2-32	87	80
100880	880	10	78.0	188	1,050	145	277	225	3	1	G 2-32	87	80
101000	1,000	10	78.0	214	-	-	-	-	3	1	G 2-32	87	80
070465	465	7	109.0	71	560	102	148	86	3	1	G 2 1/4-40	96	94
070670	670	7	109.0	103	805	102	213	124	3	1	G 2 1/4-40	96	94
070890	890	7	109.0	136	1,070	102	283	164	3	1	G 2 1/4-40	96	94
071230	1,230	7	109.0	188	1,450	102	383	225	3	1	G 2 1/4-40	96	94
071400	1,400	7	109.0	214	-	-	-	-	3	1	G 2 1/4-40	96	94

PVDF version max. 25 bar, PTFE + 25 % carbon; PTFE max.10 bar

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/ discharge connection	Seals DN 25	Valve balls	Valve seats	Seals DN 32/DN 40	Valve plates/ valve springs	Valve plates/ valve springs
HCT	Hastelloy C	Hastelloy C	PTFE	Hastelloy C	PTFE	PTFE	Hastelloy C/E-CTFE	PTFE
PVT *	PVDF	PVDF	PTFE	Glass	PTFE	PTFE	Ceramic/E-CTFE	PTFE
SST	Stainless steel 1.4404	Stainless steel 1.4404	PTFE	Stainless steel 1.4404	PTFE	PTFE	Stainless steel 1.4404/Hastelloy C	PTFE
TTT	PTFE + 25% carbon	PVDF (polyvinylidene fluoride)	PTFE	Glass	PTFE	PTFE	Ceramic/E-CTFE	PTFE

* Not for areas at risk from explosion

2.3 Hydraulic Diaphragm Metering Pumps

Motor Data

Identity code specification		Power supply			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V 250 – 280 V/440 – 480 V	50 Hz 60 Hz	1.1 kW	
T	3-phase, IP 55	220 - 240 V/380 - 420 V 250 – 280 V/440 – 480 V	50 Hz 60 Hz	1.1 kW	With PTC, speed control range 1:5
R	3-phase, IP 55	230 V/400 V	50/60 Hz	1.5 kW	With PTC, speed control range 1:20 with external fan 1-phase 230 V; 50/60 Hz
V0	3-phase, IP 55	400 V	50/60 Hz	1.5 kW	Variable speed motor with integrated frequency converter
L1	3-phase, II 2G Ex e II T3	220 – 240 V/380 – 420 V	50 Hz	1.1 kW	
L2	3-phase, II 2G Ex de IIC T4 Gb	220 – 240 V/380 – 420 V	50 Hz	1.1 kW	With PTC, speed control range 1:5
P1	3-phase, II 2G Ex e II T3	254 – 277 V/440 – 480 V	60 Hz	1.1 kW	
P2	3-phase, II 2G Ex de IIC T4	254 – 277 V/440 – 480 V	60 Hz	1.1 kW	With PTC, speed control range 1:5
V2	3-phase, II 2G Ex de IIC T4	400 V ± 10 %	50/60 Hz	1.5 kW	Ex-variable speed motor with integrated frequency converter

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

The motors are designed in accordance with the Eco Design Directive 2009/125/EC.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

2.3 Hydraulic Diaphragm Metering Pumps

Identity Code Ordering System HP4a

HP4a	Drive type												
	H	Main drive											
	D	Main drive, double-head version											
	E	Main drive for add-on drive											
	F	Main drive, double-head version for add-on drive											
	A	Add-on drive											
	B	Double-head version add-on drive											
	T	Triplex comprising 3 power ends and 3 identical heads											
		Type	Output										
		400071	40 bar	71 l/h									
		400105	40 bar	105 l/h									
		400140	40 bar	140 l/h									
		400190	40 bar	190 l/h									
		400220	40 bar	220 l/h									
		250130	25 bar	130 l/h									
		250190	25 bar	190 l/h									
		250250	25 bar	250 l/h									
		250350	25 bar	350 l/h									
		250400	25 bar	400 l/h									
		160210	16 bar	210 l/h									
		160300	16 bar	300 l/h									
		160400	16 bar	400 l/h									
		160550	16 bar	550 l/h									
		160625	16 bar	625 l/h									
		100330	10 bar	330 l/h									
		100480	10 bar	480 l/h									
		100635	10 bar	635 l/h									
		100880	10 bar	880 l/h									
		101000	10 bar	1,000 l/h									
		070465	7 bar	465 l/h									
		070670	7 bar	670 l/h									
		070890	7 bar	890 l/h									
		071230	7 bar	1,230 l/h									
		071400	7 bar	1,400 l/h									
			Liquid end material										
			SS	Stainless steel									
			PV	PVDF, max. 25 bar									
			HC	Hastelloy C									
			TT	PTFE + 25 % carbon, max. 10 bar									
				Sealing material									
				T	PTFE								
					Diaphragm								
					0	Standard multilayer diaphragm with rupture signalling facility							
						Liquid end version							
						0	No valve springs (standard)						
						1	With valve springs						
							Hydraulic connections						
							0	Standard threaded connection					
							E	With DIN ISO flange					
							F	With ANSI flange					
								Version					
								0	with ProMinent logo				
								1	without ProMinent logo				
								3	With ProMinent® logo, with electrical overpressure display				
								M	Modified				
									Electrical power supply				
									S	3 ph, 230/400 V, 50/60 Hz, 1.1 kW			
									T	3 ph, 230/400 V, 50/60 Hz, with PTC			
									R	3 ph, variable speed motor, 230/400 V, 1.5 kW			
									V0	Variable speed motor with integrated frequency converter			
									Z	1 ph, variable speed control set, 230 V, 50/60 Hz			
									L	3 ph, 230/400 V 50 Hz (Exe, Exd), 1.1 kW			
									P	3 ph, 265/440 V 60 Hz (Exe, Exd), 1.1 kW			
									V2	Variable speed motor with integr. frequency converter (Exd)			
									1	no motor, with motor flange 250			
									3	no motor, with motor flange B5, size 200			
									4	no motor, with motor flange NEMA 143/145 TC			
									0	Add-on drive			
										Enclosure rating			
										0	IP 55 (standard)		
										1	Exe motor version ATEX-T3		
										2	Exd motor version ATEX-T4		
										A	ATEX power end		

2.3 Hydraulic Diaphragm Metering Pumps

																				Stroke sensor		
																				0	No stroke sensor (standard)	
																				1	Stroke sensor (for explosion-proof applications)	
																				Stroke length adjustment		
																				0	Manual (Standard)	
																				K	Manual (outdoor, SS)	
																				1	With stroke positioning motor, 230 V/50/60 Hz	
																				2	With stroke positioning motor, 115 V/60 Hz	
																				A	With stroke control motor 0-20 mA 230 V/50/60 Hz	
																				B	With stroke control motor 4-20 mA 230 V/50/60 Hz	
																				C	With stroke control motor 0-20 mA 115 V/60 Hz	
																				D	With stroke control motor 4-20 mA 115 V/60 Hz	
																					Hydraulic oil	
																					0	standard
																					1	Food grade
																					2	Low temperature to -25 °C

2.3 Hydraulic Diaphragm Metering Pumps

Spare Parts

The spare parts kit generally includes the wear parts for the liquid ends.

Scope of delivery for SST/HCT material version

1 metering diaphragm

2 valve balls

1 sealing set, complete

Scope of delivery for PVT material version

1 metering diaphragm

1 suction valve assembly

1 discharge valve assembly

2 valve balls

1 sealing set, complete

Spare parts kits for Hydro/ 4

Identity code 250130, 250190, 250250, 250350, 250400

Liquid end	Materials in Contact With the Medium	Addition	Order no.
FMH 400 - DN 25	PVT		1043763
FMH 400 - DN 25	PVT	with valve	1023057
FMH 400 - DN 25	SST		1040812
FMH 400 - DN 25	SST	with valve	1040813
FMH 400 - DN 25	HCT		1040860

Identity code 160210, 160300, 160400, 160550, 160625

Liquid end	Materials in Contact With the Medium	Addition	Order no.
FMH 625 - DN 25	PVT		1043775
FMH 625 - DN 25	PVT	with valve	1040863
FMH 625 - DN 25	SST		1040824
FMH 625 - DN 25	SST	with valve	1040825
FMH 625 - DN 25	HCT		1040861

Identity code 100330, 100480, 100635, 100880, 101000

Liquid end	Materials in Contact With the Medium	Addition	Order no.
FMH 1000 - DN 32	PVT		1043776
FMH 1000 - DN 32	PVT	with valve	1040866
FMH 1000 - DN 32	SST		1040826
FMH 1000 - DN 32	SST	with valve	1040827
FMH 1000 - DN 32	HCT		1040864

Identity code 0704650, 070670, 070890, 071230, 071400

Liquid end	Materials in Contact With the Medium	Addition	Order no.
FMH 1400 - DN 40	PVT		1043777
FMH 1400 - DN 40	PVT	with valve	1040869
FMH 1400 - DN 40	SST		1040828
FMH 1400 - DN 40	SST	with valve	1040829
FMH 1400 - DN 40	HCT		1040867

Diaphragms PTFE/Hastelloy C Coated for Hydro/ 4

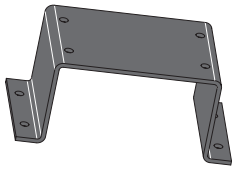
Liquid end	Group title	Order no.
FMH 400	Identity code (HCT) 250130, 250190, 250250, 250350, 250400	1040874
FMH 625	Identity code (HCT) 160210, 160300, 160400, 160550, 160625	1040875
FMH 1000	Identity code (HCT) 100330, 100480, 100635, 100880, 101000	1040876
FMH 1400	Identity code (HCT) 0704650, 070670, 070890, 071230, 071400	1040877

Metering Diaphragm PTFE/1.4404 for Hydro/ 4

Liquid end	Group title	Order no.
FMH 400	Identity code (SST) 250130, 250190, 250250, 250350, 250400	1040808
FMH 625	Identity code (SST) 160210, 160300, 160400, 160550, 160625	1040809
FMH 1000	Identity code (SST) 100330, 100480, 100635, 100880, 101000	1040810
FMH 1400	Identity code (SST) 0704650, 070670, 070890, 071230, 071400	1040811

Base for Hydro hydraulic diaphragm metering pumps

Product designation	Order no.
Base for Hydro/ 4, dimensions: 344 x 250 x 120 mm (LxWxH)	1051421



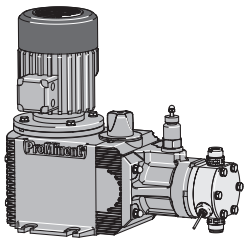
2.3 Hydraulic Diaphragm Metering Pumps

2.3.4 Hydraulic diaphragm metering pump Hydro/ 2 API 675

For flexible metering with excellent process reliability in the medium pressure range.

Capacity range of single head pump: 7 – 91 l/h; 100 – 10 bar

The Hydro/ 2 API 675 is designed to comply with API 675 due to its technical features, including full-motion drive, automatic bleeding etc.



Hvdro

As the new member of the Hydro product range, the hydraulic diaphragm metering pump Hydro/ 2 API 675 (HA2a) meets the requirements of API 675. The pumps stand out on account of their full-motion drive and automatic bleeding. There are a variety of drives, including some for use in areas at risk from explosion.

Your benefits

Excellent process reliability:

- PTFE multi-layer diaphragm with integral diaphragm rupture warning system
- Integrated hydraulic relief valve with ventilation function
- Metering reproducibility is better than ± 1% in the 10-100% stroke volume range under defined conditions and with proper installation.

Excellent flexibility:

- The modular construction with single and double head versions permits a wide range of applications, with the double head designs (boxer principle) being operated in push-pull mode
- It is possible to combine up to 5 metering units, even with different pump capacities, in multiple pump systems
- 5 different gear ratios are available

Technical Details

- Stroke length: 15 mm, Rod force: 2,000 N
- Stroke volume adjustment range: 0 – 100 %
- Stroke volume adjustment: manually by scaled rotary dial (optionally with electric actuator or control drive).
- Metering reproducibility is better than ± 1 % within the 10 – 100% stroke volume range under defined conditions and with correct installation (API 675)
- PTFE multi-layer diaphragm with electrical diaphragm rupture warning system via a contact
- Integrated hydraulic relief and bleed valve
- Full-motion drive
- Wetted materials: PVDF, PTFE+25% carbon, stainless steel 1.4571, Hastelloy C.
- A wide range of power end versions is available: Three-phase AC or 1-phase AC motor, motors for use in areas at risk from explosion, different flange designs for use of customer-specific motors
- Degree of protection: IP 55
- Design in compliance with API 675

Field of application

- Oil and gas industry.
- Volume-proportional metering of chemicals/additives in the treatment of boiler feed water
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of auxiliary agents in industrial production engineering, for instance hot wax metering in the production of adhesive strips

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for HA2a 50 Hz

Plunger Ø	Max. pressure	Max. pump capacity in l/h at strokes/min					Theor. stroke volume	Suction lift	Connection on suction/ pressure side	Shipping weight
		60	125	150	187	214				
mm	bar	l/h	l/h	l/h	l/h	l/h	ml/stroke	m WC	G-DN	kg
16	100	–	–	(8.5) – 8.5	(10) – 11	(12) – 13	3.0	3.0	Rp 1/4 – DKV *	31
16	64	–	(10) – 10	(10) – 13	(12) – 16.5	(14) – 18.5	3.0	3.0	Rp 1/4 – DKV *	31
16	40	–	(10) – 13	(12) – 15.5	(14) – 19.5	(16) – 23.5	3.0	3.0	Rp 1/4 – DKV *	31
16	25	–	(12) – 14.5	(14) – 17.5	(17) – 22.5	(20) – 26.5	3.0	3.0	Rp 1/4 – DKV *	31
16	10	(7) – 7.5	(13) – 16.5	(15) – 19.5	(18) – 24.5	(22) – 29.5	3.0	3.0	Rp 1/4 – DKV *	31
18	64	–	(12) – 15.5	(18.5) – 18.5	(24.5) – 24.5	(26) – 26.5	3.8	3.0	G 3/4 – 10 **	31
18	40	(7) – 8	(13) – 18.5	(22) – 22	(26) – 28.5	(26) – 32.5	3.8	3.0	G 3/4 – 10 **	31
18	25	(8) – 9	(16) – 19.5	(23) – 24.5	(26) – 30.5	(28) – 35.5	3.8	3.0	G 3/4 – 10 **	31
18	10	(8) – 10	(16) – 21.5	(23) – 26.5	(29) – 33.5	(28) – 37.5	3.8	3.0	G 3/4 – 10 **	31
22	40	(7) – 7.5	(20) – 25.5	(27) – 28.5	(37) – 42.5	(44) – 48	5.7	3.0	G 3/4 – 10 **	31
22	25	(7) – 8.5	(20) – 25.5	(25) – 33.5	(35) – 43.5	(40) – 51	5.7	3.0	G 3/4 – 10 **	31
22	10	(8) – 10	(17) – 28.5	(25) – 36.5	(30) – 47	(40) – 54	5.7	3.0	G 3/4 – 10 **	31
26	25	(20) – 22	(35) – 49	(40) – 59	(65) – 72	(50) – 83	7.9	3.0	G 3/4 – 10 **	31
26	10	(20) – 23.5	(30) – 51	(35) – 61	(40) – 76	(45) – 86	7.9	3.0	G 3/4 – 10 **	31

* SST/HCT version with double ball valve, valve connector on the suction-discharge side with female thread Rp 1/4 and external thread G 3/4 - DN 10

** HV design with G1 - DN 15 connector

When pumps are selected in accordance with API 675 (control range 1:10), the permitted rated flow configuration in the stated range is possible.

Example: a piston 16 mm, pressure 25 bar and stroke rate 150 strokes/min results in (14) - 17.5, i.e. the control range of 1:10 is met for a rated flow of between 14 l/h and 17.5 l/h.

PVDF version max. 25 bar, PTFE + 25 % carbon; PTFE up to 16 bar

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for HA2a 60 Hz

Plunger Ø	Max. pressure	Max. pump capacity in l/h at strokes/min				Theor. stroke volume	Suction lift	Connection on suction/pressure side	Shipping weight
		72	149	180	224				
mm	bar	l/h	l/h	l/h	l/h	ml/stroke	m WC	G-DN	kg
16	100	–	–	(10) – 10	(12) – 13	3.0	3.0	Rp 1/4 – DKV *	31
16	64	–	(10) – 11.5	(12) – 15.5	(14.5) – 19.5	3.0	3.0	Rp 1/4 – DKV *	31
16	40	–	(12) – 15.5	(14.5) – 18.5	(16.5) – 23	3.0	3.0	Rp 1/4 – DKV *	31
16	25	–	(14.5) – 17	(16.5) – 21	(20.5) – 27	3.0	3.0	Rp 1/4 – DKV *	31
16	10	(8.5) – 9	(15.5) – 19.5	(18) – 23	(21.5) – 29	3.0	3.0	Rp 1/4 – DKV *	31
18	64	–	(14.5) – 18.5	(22) – 22	(29) – 29	3.8	3.0	G 3/4 – 10 **	31
18	40	(8.5) – 9.5	(15.5) – 22	(26) – 26	(31) – 34	3.8	3.0	G 3/4 – 10 **	31
18	25	(9.5) – 10.5	(19.5) – 23	(27.5) – 29	(31) – 36.5	3.8	3.0	G 3/4 – 10 **	31
18	10	(9.5) – 12	(19.5) – 25.5	(27.5) – 31.5	(34.5) – 40	3.8	3.0	G 3/4 – 10 **	31
22	40	(8.5) – 9	(24) – 30	(32.5) – 34	(44) – 50.5	5.7	3.0	G 3/4 – 10 **	31
22	25	(8.5) – 10	(24) – 30	(30) – 40	(42) – 52	5.7	3.0	G 3/4 – 10 **	31
22	10	(9.5) – 12	(20) – 34	(36) – 56	(44) – 50.5	5.7	3.0	G 3/4 – 10 **	31
26	25	(24) – 26	(42) – 58	(48) – 70.5	(78) – 86	7.9	3.0	G 3/4 – 10 **	31
26	10	(24) – 28	(36) – 60.5	(42) – 73	(48) – 91	7.9	3.0	G 3/4 – 10 **	31

* SST/HCT version with double ball valve, valve connector on the suction-discharge side with female thread Rp 1/4 and external thread G 3/4 - DN 10

** HV design with G1 - DN 15 connector

Materials in Contact With the Medium

can be found in Chapter Hydro/2, see page → 332

Motor Data

can be found in Chapter Hydro/2, see page → 332

Spare Parts

can be found in Chapter Hydro/2, see page → 336

2.3 Hydraulic Diaphragm Metering Pumps

Identity code ordering system for HA2a

HA2a	Drive type										
	V	Simplex (vertical)									
	D	Simplex double head									
	U	Duplex									
	T	Triplex									
	M	Modified									
		Plungers									
		016	Plunger 16 mm								
		018	Plunger 18 mm								
		022	Plunger 22 mm								
		026	Plunger 26 mm								
		M00	Modified								
			stroke rate								
			060	60 strokes/min.; 50 Hz							
			125	125 strokes/min.; 50 Hz							
			150	150 strokes/min.; 50 Hz							
			187	187 strokes/min.; 50 Hz							
			214	214 strokes/min.; 50 Hz							
			M00	Modified							
				Pressure rating							
				A	10 bar						
				D	25 bar						
				E	40 bar						
				H	64 bar						
				J	100 bar						
				M	Modified						
					Material						
					S1	Standard stainless steel; PTFE					
					H1	Hastelloy C; PTFE					
					P1	PVDF; PTFE up to 25 bar					
					T1	PTFE + 25 % carbon; PTFE up to 16 bar					
					M0	Modified					
						Valve design					
						0	(without valve spring)				
						1	With valve springs				
						M	Modified				
							Diaphragm rupture display				
							0	Standard (electrical)			
							2	visual display			
							M	Modified			
								Hydraulic connector			
								0	standard		
								1	Swagelok		
								E	DIN flange		
								F	Flange ANSI		
								M	Modified		
									Electrical Connection		
									S	3-phase, 230/400 V, 50/60 Hz, 0.37 kW	
									T	3-phase, 230/400 V, 50/60 Hz, 0.37 kW, with PTC	
									K	3-phase, 230/400 V, 50 Hz, 0.37 kW, (Exe) T3	
									L	3-phase, 230/400 V, 50 Hz, 0.37 kW, (Exde) T4	
									P	3-phase, 265/460 V, 60 Hz, 0.37 kW, (Exe) T3	
									Q	3-phase, 265/460 V, 60 Hz, 0.37 kW, (Exde) T4	
									R	Variable speed motor, 1-phase, 230/400 V, 0.37 kW	
									V	Variable speed motor with integr. frequency converter, 1-phase, 230 V, 50/60 Hz, 0.37 kW	
									W	Variable speed motor with integr. frequency converter, ATEX, 3-phase, 400 V, 50/60 Hz, 0.55 kW	
									1	no motor, with motor flange 200/80	
									2	no motor, with motor flange 160/71	
									3	without motor, with motor flange 56C	
									4	without motor, with motor flange 200/80 ATEX	
									5	without motor, with motor flange 160/71 ATEX	
									6	without motor, with motor flange 56C	
									M	Modified	
										Stroke length adjustment	
										0	Stroke length adjustment standard
										A	Stroke control motor 0-20 mA, 230 V, 50/60 Hz
										B	Stroke control motor 4-20 mA, 230 V, 50/60 Hz
										C	Stroke control motor 0-20 mA, 115 V, 60 Hz
										D	Stroke control motor 4-20 mA, 115 V, 60 Hz
										M	Modified
											Temperature (ambient / fluid)

2.3 Hydraulic Diaphragm Metering Pumps

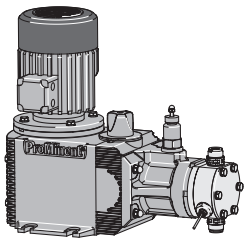
												0	-20 °C … +40 °C / -20 °C … +90 °C (SS; HC) / +50 °C (PTFE) / +65 °C (PVDF)						
												1	-10 °C … +50 °C / -20 °C … +90 °C (SS; HC) / +50 °C (PTFE) / +65 °C (PVDF)						
												2	-25 °C … +40 °C / -25 °C … +90 °C (SS; HC) / +50 °C (PTFE) / +65 °C (PVDF)						
												M	Modified						
													Paint						
													0P	C3 Standard textured paint - RAL 2003					
													1P	C3 Standard gloss paint - RAL 2003					
													2P	C4 Outdoor - RAL 2003					
													3P	C5 - Offshore - RAL 2003					
													M0	Modified					
														Tests					
														S1	Standard performance test				
														S2	Standard performance test + 3.1 certificate				
														A1	API complete test				
														A2	API complete test + NPSH/NPIP				
														M0	Modified				
															Approvals				
															0	CE			
															1	CE + ATEX			
															2	CE + EAC			
															3	CE + EAC + ATEX			
															M	Modified			
																Documentation			
																DE	German		
																EN	English		
																FR	French		
																ES	Spanish		
																RU	Russian		
																M0	Modified		
																	Measuring unit		
																	0	bar, l/h	
																	1	psi, gph	
																	2	kPa, l/h	

2.3.5 Hydraulic diaphragm metering pump Hydro/ 3 API 675

For flexible metering with excellent process reliability in the medium pressure range.

Capacity range of single head pump: 15 – 201 l/h; 100 – 10 bar

The Hydro/ 3 API 675 is designed to comply with API 675 due to its technical features, including full-motion drive, automatic bleeding etc.



Hvdro

The hydraulic diaphragm metering pump Hydro/ 3 API 675 (HA3e) meets the requirements of API 675, among other things due to its full-motion drive and automatic bleeding. Some of the many drive options are also approved for use in areas at risk from explosion.

Your benefits

Excellent process reliability:

- PTFE multi-layer diaphragm with integral diaphragm rupture warning system
- Integrated hydraulic relief valve with ventilation function
- Metering reproducibility is better than ± 1% in the 10-100% stroke volume range under defined conditions and with proper installation.

Excellent flexibility:

- The modular construction with single and double head versions permits a wide range of applications, with the double head designs (boxer principle) being operated in push-pull mode
- It is possible to combine up to 5 metering units, even with different pump capacities, in multiple pump systems
- 5 different gear ratios are available
- Customised designs are available on request

NEW

Technical Details

- Stroke length: 15 mm, Rod force: 4,200 N
- Stroke volume adjustment range: 0 – 100 %
- Stroke volume adjustment: manually by scaled rotary dial (optionally with electric actuator or control drive).
- Metering reproducibility is better than ± 1 % within the 10 – 100% stroke volume range under defined conditions and with correct installation (API 675)
- PTFE multi-layer diaphragm with electrical diaphragm rupture warning system via a contact
- Integrated hydraulic relief and bleed valve
- Full-motion drive
- Wetted materials: PVDF, PTFE+25% carbon, stainless steel 1.4571, Hastelloy C.
- A wide range of power end versions is available: Three-phase AC or 1-phase AC motor, motors for use in areas at risk from explosion, different flange designs for use of customer-specific motors
- Degree of protection: IP 55
- Design in compliance with API 675

Field of application

- Oil and gas industry.
- Volume-proportional metering of chemicals/additives in the treatment of boiler feed water
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of auxiliary agents in industrial production engineering, for instance hot wax metering in the production of adhesive strips

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for HA3a 50 Hz

Plunger Ø*	Max. pressure	Max. pump capacity in l/h at strokes/min					Theor. stroke volume	Suction lift	Connection on suction/ pressure side	Shipping weight*
		60 l/h	125 l/h	150 l/h	187 l/h	214 l/h				
mm	bar						ml/stroke	m WC	G-DN	kg
22	100	–	–	–	–	–	5.7	3.0	Rp 3/8 – 10-DKV **	41
22	64	–	–	–	–	–	5.7	3.0	Rp 3/8 – 10-DKV **	41
22	40	–	–	–	–	–	5.7	3.0	Rp 3/8 – 10-DKV **	41
22	25	–	–	–	–	–	5.7	3.0	Rp 3/8 – 10-DKV **	41
22	10	–	–	–	–	–	5.7	3.0	Rp 3/8 – 10-DKV **	41
26	64	–	(35) – 43.5	(40) – 51.5	(55) – 63	(65) – 73	7.9	3.0	G 3/4 – 10 ***	41
26	40	(18) – 21	(37) – 45.5	(40) – 55	(50) – 71	(70) – 81	7.9	3.0	G 3/4 – 10 ***	41
26	25	(15) – 21	(30) – 49.5	(40) – 59	(55) – 74	(70) – 84	7.9	3.0	G 3/4 – 10 ***	41
26	10	(15) – 22	(30) – 49.5	(35) – 61	(50) – 77	(80) – 87	7.9	3.0	G 3/4 – 10 ***	41
32	40	(25) – 25.5	(50) – 66	(70) – 80	(65) – 101.5	(70) – 116.5	12.0	3.0	G 1 – 15 ****	41
32	25	(25) – 26.5	(50) – 69	(65) – 83	(65) – 105.5	(70) – 122.5	12.0	3.0	G 1 – 15 ****	41
32	10	(22) – 31.5	(50) – 74	(70) – 90	(60) – 112.5	(65) – 129	12.0	3.0	G 1 – 15 ****	41
38	25	(25) – 50.5	(70) – 110.5	(80) – 126	(150) – 166	(180) – 187	17.0	3.0	G 1 – 15 ****	41
38	10	(30) – 51.5	(80) – 111.5	(90) – 135	(150) – 168	(180) – 191	17.0	3.0	G 1 – 15 ****	41

* The pump type with a 22 mm piston diameter does not currently comply with API 675

** SST/HCT version with double ball valve, valve connector on the suction-discharge side with female thread Rp 1/4 and external thread G 3/4 - DN 10

*** HV design with G1 - DN 15 connector

**** HV design (SST only) with 1 1/4" - DN 20 connector

When pumps are selected in accordance with API 675 (control range 1:10), the permitted rated flow configuration in the stated range is possible.

Example: a piston 26 mm, pressure 25 bar and stroke rate 150 strokes/min results in (40) - 59, i.e. the control range of 1:10 is met for a rated flow of between 40 l/h and 59 l/h.

Version PVDF max. 25 bar

* Version SST with double ball valve, valve connector on the suction/discharge side with female thread Rp 3/8, male thread G 3/4-DN 10

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for HA3a 60 Hz

Plunger Ø	Max. pressure	Max. pump capacity in l/h at strokes/min				Theor. stroke volume	Suction lift	Connection on suction/pressure side	Shipping weight
		72	149	180	224				
mm	bar	l/h	l/h	l/h	l/h	ml/stroke	m WC	G-DN	kg
22	100	–	–	–	–	5.7	3.0	Rp 3/8 – 10-DKV *	41
22	64	–	–	–	–	5.7	3.0	Rp 3/8 – 10-DKV *	41
22	40	–	–	–	–	5.7	3.0	Rp 3/8 – 10-DKV *	41
22	25	–	–	–	–	5.7	3.0	Rp 3/8 – 10-DKV *	41
22	10	–	–	–	–	5.7	3.0	Rp 3/8 – 10-DKV *	41
26	64	(21.5) – 22.5	(42) – 51.5	(48) – 61.5	(66) – 75	7.9	3.0	G 3/4 – 10 **	41
26	40	(21.5) – 25	(44) – 54	(48) – 66	(60) – 85	7.9	3.0	G 3/4 – 10 **	41
26	25	(18) – 25	(36) – 59	(48) – 70.5	(66) – 88.5	7.9	3.0	G 3/4 – 10 **	41
26	10	(18) – 26	(36) – 59	(42) – 73	(60) – 92	7.9	3.0	G 3/4 – 10 **	41
32	40	(30) – 30.5	(60) – 78.5	(84) – 96	(78) – 121	12.0	3.0	G 3/4 – 10 **	41
32	25	(30) – 31.5	(60) – 82	(78) – 99.5	(78) – 126	12.0	3.0	G 3/4 – 10 **	41
32	10	(26.5) – 37.5	(60) – 88	(84) – 108	(72) – 134.5	12.0	3.0	G 3/4 – 10 **	41
38	25	(30) – 60.5	(84) – 131	(96) – 151	(180) – 198	17.0	3.0	G 3/4 – 10 **	41
38	10	(36) – 61.5	(96) – 132	(108) – 162	(180) – 201	17.0	3.0	G 3/4 – 10 **	41

* SST/HCT version with double ball valve, valve connector on the suction-discharge side with female thread Rp 1/4 and external thread G 3/4 - DN 10

** HV design with G1 - DN 15 connector

Materials in Contact With the Medium

can be found in Chapter Hydro/3, see page → 339

Motor Data

can be found in Chapter Hydro/3, see page → 339

Spare Parts

can be found in Chapter Hydro/3, see page → 343

2.3 Hydraulic Diaphragm Metering Pumps

Identity code ordering system for HA3a

HA3a	Drive type										
	V	Simplex (vertical)									
	D	Simplex double head									
	U	Duplex									
	T	Triplex									
	M	Modified									
		Plungers									
		022	Plunger 22 mm								
		026	Plunger 26 mm								
		032	Plunger 32 mm								
		038	Plunger 38 mm								
		M00	Modified								
			stroke rate								
			060	60 strokes/min.; 50 Hz							
			125	125 strokes/min.; 50 Hz							
			150	150 strokes/min.; 50 Hz							
			187	187 strokes/min.; 50 Hz							
			214	214 strokes/min.; 50 Hz							
			M00	Modified							
				Pressure rating							
				A	10 bar						
				D	25 bar						
				E	40 bar						
				F	64 bar						
				J	100 bar						
				M	Modified						
					Material						
					S1	Standard stainless steel; PTFE					
					H1	Hastelloy C; PTFE					
					P1	PVDF; PTFE up to 25 bar					
					T1	PTFE + 25 % carbon; PTFE up to 16 bar					
					M0	Modified					
						Valve design					
						0	Standard (without valve spring)				
						1	With valve springs				
						M	Modified				
							Diaphragm rupture display				
							0	Standard (electrical)			
							2	Visual display			
							M	Modified			
								Hydraulic connector			
								0	standard		
								1	Swagelok		
								E	DIN flange		
								F	Flange ANSI		
								M	Modified		
									Electrical Connection		
									S	3-phase, 230/400 V, 50/60 Hz, 0.75 kW	
									T	3-phase, 230/400 V, 50/60 Hz, 0.75 kW, with PTC	
									K	3-phase, 230/400 V, 50 Hz, 0.75 kW, (Exe) T3	
									L	3-phase, 230/400 V, 50 Hz, 0.75 kW, (Exde) T4	
									P	3-phase, 265/460 V, 60 Hz, 0.75 kW, (Exe) T3	
									Q	3-phase, 265/460 V, 60 Hz, 0.75 kW, (Exde) T4	
									R	Variable speed motor, 1-phase, 230/400 V	
									V	Variable speed motor with integr. Frequency converter, 1-phase, 230 V, 50/60 Hz, 0.75kW	
									W	Variable speed motor with integr. Frequency converter, ATEX, 3-phase, 400 V, 50/60 Hz, 0.75 kW	
									1	no motor, with motor flange 200/80	
									2	no motor, with motor flange 160/71	
									3	without motor, with motor flange 56C	
									4	without motor, with motor flange 200/80 ATEX	
									5	without motor, with motor flange 160/71 ATEX	
									6	without motor, with motor flange 56C	
									M	Modified	
										Stroke length adjustment	
										0	Stroke length adjustment standard
										A	Stroke control motor , 0-20 mA, 230 V, 50/60 Hz
										B	Stroke control motor , 4-20 mA, 230 V, 50/60 Hz
										C	Stroke control motor , 0-20 mA, 115 V, 60 Hz
										D	Stroke control motor , 4-20 mA, 115 V, 60 Hz
										M	Modified
											Temperature (ambient / fluid)

												0	-20 °C … +40 °C / -20 °C … +90 °C (SS; HC) / +50 °C (PTFE) / +65 °C (PVDF)					
												1	-10 °C … +50 °C / -20 °C … +90 °C (SS; HC) / +50 °C (PTFE) / +65 °C (PVDF)					
												2	-25 °C … +40 °C / -25 °C … +90 °C (SS; HC) / +50 °C (PTFE) / +65 °C (PVDF)					
												M	Modified					
													Paint					
													0P	C3 Standard textured paint - RAL 2003				
													1P	C3 Standard gloss paint - RAL 2003				
													2P	C4 Outdoor - RAL 2003				
													3P	C5 Offshore - RAL 2003				
													M0	Modified				
														Tests				
														S1	Standard performance test			
														S2	Standard performance test + 3.1 certificate			
														A1	API complete test			
														A2	API complete test + NPSH/NPIP			
														M	Modified			
															Approvals			
															0	CE		
															1	CE + ATEX		
															2	CE + EAC		
															3	CE + EAC + ATEX		
															M	Modified		
																Documentation		
																DE	German	
																EN	English	
																FR	French	
																ES	Spanish	
																RU	Russian	
																M0	Modified	
																	Measuring unit	
																	0	bar, l/h
																	1	psi, gph
																	2	kPa, l/h

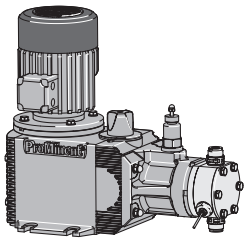
2.3 Hydraulic Diaphragm Metering Pumps

2.3.6 Hydraulic diaphragm metering pump Hydro/ 4 API 675

For flexible metering with excellent process reliability in the medium pressure range.

Capacity range of single head pump: 252 – 1,506 l/h; 40 – 7 bar

The Hydro/ 4 API 675 is an extremely robust hydraulic diaphragm metering pump, which meets the most exacting safety requirements and is designed in accordance with API 675. This is ensured by the PTFE multi-layer diaphragm with diaphragm monitoring, the full-motion drive and automatic bleeding, for example. Its modular construction makes it extremely versatile.



Hydro

The Hydro/ 4 API 675 hydraulic diaphragm metering pump (HA4a), together with the Hydro/ 2 and Hydro/ 3 pumps, represents an integrated product range with stroke lengths of 15 and/or 20 mm. The Hydro API 675 family, equipped with full-motion drive and automatic bleeding, therefore covers the capacity range of 4 to 1,506 l/h at 100 – 7 bar. They also meet the requirements of API 675.

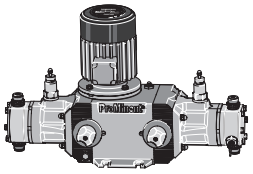
Your benefits

Excellent process reliability:

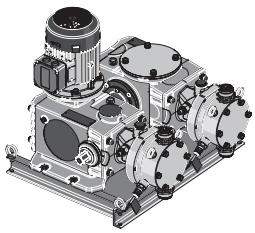
- PTFE multi-layer diaphragm with integrated diaphragm monitoring with condition signals sent via contact
- Integrated hydraulic relief valve with ventilation function
- Metering reproducibility is better than ± 1% in the 10-100% stroke volume range under defined conditions and with correct installation.

Excellent flexibility:

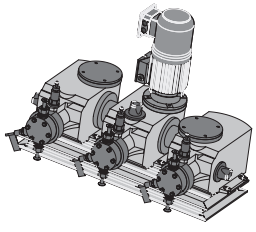
- The modular construction with single and double head versions permits a wide range of applications, with the double head designs (boxer principle) being operated in push-pull mode
- It is possible to combine up to 5 metering units, even with different pump capacities, in multiple pump systems
- 5 different gear ratios are available
- Customised designs are available on request



Hydro double head pump



Hydro externally mounted pump



Hydro triplex pump

Technical Details

- Stroke length: 20 mm, Rod force: 5,800 N
- Stroke volume adjustment range: 0 – 100 %
- Stroke volume adjustment: manually using scaled rotary dial (with electric actuator or control drive as an option).
- Metering reproducibility is better than ± 1% in the 10 – 100% stroke volume range under defined conditions and with correct installation
- PTFE multi-layer diaphragm with electrical diaphragm monitoring with condition signals sent via contact
- Integrated hydraulic relief and bleed valve
- Full-motion drive
- Wetted materials: PVDF, PTFE+25% carbon, stainless steel 1.4571, Hastelloy C.
- A wide range of power end versions is available: Three-phase or standard three-phase motors or motors for use in areas at risk from explosion, different flange designs for use of customer-specific motors
- Degree of protection: IP 55
- Design in compliance with API 675

Field of application

- Oil and gas industry.
- Volume-proportional metering of chemicals/additives in the treatment of boiler feed water
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of auxiliary agents in industrial production engineering, for instance hot wax metering in the production of adhesive strips

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for HA4a 50 Hz

Plunger Ø	Max. pressure	Max. pump capacity in l/h at strokes/min					Theor. stroke volume	Suction lift	Connection on suction/ pressure side	Shipping weight
		71	103	136	188	214				
mm	bar	l/h	l/h	l/h	l/h	l/h	ml/stroke	m WC	G-DN	kg
40	7	–	(100) – 127	(150) – 167	(200) – 230	(220) – 261	25.1	3	G 1 A – DN 15	69
40	10	–	(100) – 125	(150) – 166	(200) – 228	(220) – 256	25.1	3	G 1 A – DN 15	69
40	16	–	–	–	(200) – 225	(220) – 254	25.1	3	G 1 A – DN 15	69
40	25	–	–	(150) – 160	(200) – 219	(220) – 250	25.1	3	G 1 A – DN 15	69
40	40	–	–	(150) – 154	(200) – 211	(220) – 242	25.1	3	G 1 A – DN 15	69
52	7	–	(180) – 209	(200) – 277	–	–	42.4	3	G 1 1/2 A – DN 25	69
52	10	–	(180) – 207	(200) – 276	(370) – 379	–	42.4	3	G 1 1/2 A – DN 25	69
52	16	–	(190) – 205	(200) – 274	(370) – 376	–	42.4	3	G 1 1/2 A – DN 25	69
52	25	–	(200) – 204	(200) – 271	(370) – 372	–	42.4	3	G 1 1/2 A – DN 25	69
63	7	(210) – 216	(280) – 312	(370) – 408	–	–	62.3	3	G 1 1/2 A – DN 25	76
63	10	(210) – 215	(280) – 311	(380) – 407	–	–	62.3	3	G 1 1/2 A – DN 25	76
63	16	(200) – 212	(280) – 306	(390) – 401	–	–	62.3	3	G 1 1/2 A – DN 25	76
80	7	(270) – 352	(420) – 513	(590) – 683	(890) – 947	(1.050) – 1.080	100.4	3	G 2 A – DN 32	87
80	10	(280) – 350	(420) – 509	(580) – 657	(890) – 914	(1.050) – 1.056	100.4	3	G 2 A – DN 32	87
94	7	(350) – 493	(500) – 710	(820) – 936	(1.000) – 1.258	(1.400) – 1.440	138.7	3	G 2 1/2 A – DN 40	96

When pumps are selected in accordance with API 675 (control range 1:10), the permitted rate flow configuration is possible in the stated range.

Example: a piston 52 mm, pressure 10 bar and stroke rate 136 strokes/min results in (200) - 276, i.e. the control range of 1:10 is met for a rate flow of between 200 l/h and 276 l/h.

PVDF version max. 25 bar, PTFE + 25 % carbon; PTFE up to 10 bar

Pump types with "–" do not meet the test requirements of API 675 with regard to the 1:10 control range

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for HA4a 60 Hz

Plunger Ø	Max. pressure	Max. pump capacity in l/h at strokes/min				Theor. stroke volume	Suction lift	Connection on suction/pressure side	Shipping weight
		86	124	164	225				
mm	bar	l/h	l/h	l/h	l/h	ml/stroke	m WC	G-DN	kg
40	7	–	(120) – 152	(180) – 201	(240) – 275	25.1	3	G 1 A – DN 15	69
40	10	–	(120) – 150	(180) – 200	(240) – 272	25.1	3	G 1 A – DN 15	69
40	16	–	–	–	(240) – 269	25.1	3	G 1 A – DN 15	69
40	25	–	–	(180) – 185	(240) – 262	25.1	3	G 1 A – DN 15	69
40	40	–	–	(180) – 200	(240) – 252	25.1	3	G 1 A – DN 15	69
52	7	–	(220) – 251	(240) – 334	–	42.4	3	G 1 1/2 A – DN 25	69
52	10	–	(220) – 249	(240) – 333	(450) – 455	42.4	3	G 1 1/2 A – DN 25	69
52	16	–	(230) – 246	(240) – 330	(450) – 450	42.4	3	G 1 1/2 A – DN 25	69
52	25	–	(240) – 245	(240) – 327	(440) – 445	42.4	3	G 1 1/2 A – DN 25	69
63	7	(260) – 262	(340) – 375	(445) – 491	–	62.3	3	G 1 1/2 A – DN 25	76
63	10	(255) – 260	(340) – 374	(460) – 490	–	62.3	3	G 1 1/2 A – DN 25	76
63	16	(245) – 256	(340) – 368	(470) – 483	–	62.3	3	G 1 1/2 A – DN 25	76
80	7	(330) – 426	(505) – 618	(711) – 823	(1.065) – 1.133	100.4	3	G 2 A – DN 32	87
80	10	(340) – 424	(505) – 613	(700) – 792	(1.065) – 1.094	100.4	3	G 2 A – DN 32	87
94	7	(430) – 597	(600) – 854	(990) – 1.128	(1.200) – 1.506	138.7	3	G 2 1/2 A – DN 40	96

Materials in Contact With the Medium

can be found in Chapter Hydro/4, see page → 346

Motor Data

can be found in Chapter Hydro/4, see page → 346

Identity code ordering system for HA4a

HA4a	Drive type
V	Simplex (vertical)
D	Simplex double head
U	Duplex
T	Triplex
M	Modified

Plungers	
040	Plunger d 40
052	Plunger d 52
063	Plunger d 63
080	Plunger d 80
094	Plunger d 94
M00	Modified

stroke rate	
071	71 strokes/min; 50 Hz
103	103 strokes/min; 50 Hz
136	136 strokes/min; 50 Hz
188	188 strokes/min; 50 Hz
214	214 strokes/min; 50 Hz
086	86 strokes/min; 60 Hz
124	124 strokes/min; 60 Hz
164	164 strokes/min; 60 Hz
225	225 strokes/min; 60 Hz
M00	Modified

Pressure rating	
Z	7 bar
A	10 bar
B	16 bar
D	25 bar
E	40 bar
M	Modified

Material	
S1	Standard stainless steel; PTFE
H1	Hastelloy-C; PTFE
P1	PVDF; PTFE
T1	PTFE + carbon; PTFE
V1	PVC; PTFE
Y1	PP; PTFE
M0	Modified

Valve design	
0	Without valve spring
1	with valve spring
M	Modified

Diaphragm monitoring	
0	standard
1	none
2	Visual display
A	Standard with electrical overload indication
B	Without with electric overload indication
C	Visual indication with electric overload indication
M	Modified

Hydraulic connector	
0	standard
E	DIN flange
F	Flange ANSI
M	Modified

Electrical Connection	
S	3-phase, 230/400 V, 50/60 Hz, 1,1 kW
T	3-phase, 230/400 V, 50/60 Hz, 1,1 kW mit PTC
K	3-phase, 230/400 V, 50 Hz, 1,1 kW (Exe) T3
L	3-phase, 230/400 V, 50 Hz, 1,1 kW (Exde) T4
P	3-phase, 265/460 V; 60 Hz, 1,35 kW (Exe) T3
Q	3-phase, 265/460 V; 60 Hz, 1,1 kW (Exde) T4
R	Variable speed motor, 3 ph. 1,5 kW, 230/400 V
V	Variable speed motor with integrated frequency converter
W	Variable speed motor with integrated frequency converter ATEX
1	without motor, with motor flange 200/90
2	without motor, with motor flange 250/100
3	without motor, with motor flange NEMA
4	without motor, with motor flange 200/90 ATEX
5	without motor, with motor flange 250/100 ATEX
6	without motor, with motor flange NEMA ATEX
M	Modified

2.3 Hydraulic Diaphragm Metering Pumps

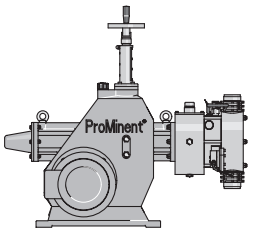
Stroke length adjustment							
0	Stroke length adjustment standard						
A	Stroke control motor 0-20 mA; 230 V; 50/60 Hz						
B	Stroke control motor 4-20 mA; 230 V; 50/60 Hz						
C	Stroke control motor 0-20 mA; 115 V; 60 Hz						
D	Stroke control motor 4-20 mA; 115 V; 60 Hz						
M	Modified						
	Temperature (ambient / fluid)						
	0	-20 °C…+40 °C / -20 °C…+90 °C (SS; HC) +50 °C (PTFE) +65 °C (PVDF)					
	1	-10 °C…+50 °C / -20 °C…+90 °C (SS; HC) +50 °C(PTFE) +65 °C (PVDF)					
	2	-25 °C…+40 °C / -25 °C…+90 °C (SS; HC) +50 °C (PTFE) +65 °C (PVDF)					
	M	Modified					
		Paint					
		0P	C3 Standard textured paint - RAL2003				
		1P	C3 Standard gloss paint - RAL2003				
		2P	C4 Outdoor - RAL2003				
		3P	C5 Offshore - RAL2003				
		M0	Modified				
			Tests				
			S1	Standard performance test			
			S2	Standard performance test + 3.1 certificate			
			A1	API complete test			
			A2	API complete test + NPSH/NPIP			
			M0	Modified			
				Approvals			
				0	CE		
				1	CE + ATEX		
				2	CE + EAC		
				3	CE + EAC+ ATEX		
				M	Modified		
					Documentation		
					DE	German	
					EN	English	
					FR	French	
					ES	Spanish	
					RU	Russian	
					M0	Modified	
						Measuring unit	
						0	bar, l/h
						1	psi, gph
						2	kPa, l/h

2.3.7 Hydraulic Diaphragm Metering Pump Makro/ 5

Excellent feed rates in the low pressure range

Capacity range of single pump: 450 – 6,108 l/h, 25 – 6 bar

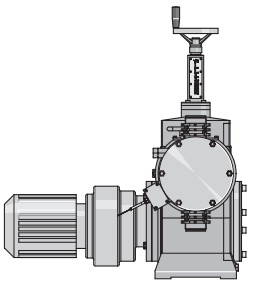
The robust hydraulic diaphragm metering pump Makro/ 5 guarantees outstanding process reliability. Its modular construction offers extremely good flexibility and a large range of power end versions are available.



Makro/ 5 M5Ha

The Makro/ 5 hydraulic diaphragm metering pump (M5Ha) together with the Makro/ 5 diaphragm and plunger metering pumps form an integrated product range with stroke lengths of 20 and/or 50 mm. This covers the capacity range from 38 to 6,108 l/h at 320 – 4 bar. A wide range of power end versions is available for use in areas at risk from explosion with ATEX certification. The Makro/ 5 product range is designed to comply with API 675 among others.

Your benefits

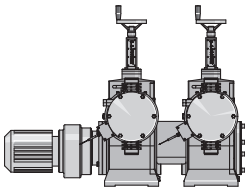

Makro/ 5 M5Ha

Excellent process safety and reliability:

- PTFE multi-layer diaphragm with integral diaphragm rupture warning system
- Integral hydraulic relief valve
- Metering reproducibility is better than ± 1% within the 10-100% stroke length range under defined conditions and with correct installation.

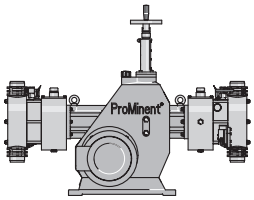
Excellent flexibility:

- The modular construction with single and double head versions permits a wide range of applications, with the double head designs being operated in push-pull mode
- It is possible to combine up to 4 metering units, even with different pump capacities, in multiple pump systems
- 5 different gear ratios are available
- Customised designs are available on request


Makro/ 5 externally mounted pump

Technical Details

- Stroke length: 0 – 50 mm, Rod force: 10,000 N
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually by means of a manual adjustment wheel and scaled display (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 1 % within the 10 – 100% stroke length range under defined conditions and with correct installation
- PTFE multi-layer diaphragm with electrical diaphragm rupture warning system via a contact
- Integrated hydraulic relief and bleed valve
- Wetted materials: PVDF, PTFE+25% carbon, stainless steel 1.4571, special materials are available on request
- A wide range of power end versions is available: Three-phase standard motors, motors for use in areas at risk from explosion and different flange designs for use in customer-specific motors
- Degree of protection: IP 55
- Design in compliance with API 675 among others



Makro/ 5 double head pump

Field of application

- Oil and gas industry.
- Volume-proportional metering of chemicals/additives in the treatment of boiler feed water
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of auxiliary agents in industrial production engineering, for instance hot wax metering in the production of adhesive strips

Control of Makro/5 Hydraulic Diaphragm Metering Pumps

Makro/ 5 stroke length controller

Stroke length adjustment via a standard signal. Actuating period approx. 100 sec for 100% stroke length, equipped with 2 limit switches for min./max. position, degree of protection: IP 54. Electrical connection 230 V (±10%), 50/60 Hz, 40 W mechanical stroke length display fitted on the Makro/ 5 power end.

Special voltage/higher degrees of protection/explosion protection on request.

Design with:

Standard current input 0/4 – 20 mA, corresponds to stroke length 0 – 100 %; internal switch-over for manual/ automatic operation, key switch for stroke adjustment in manual mode. Actual value output 0/4 – 20 mA for remote display.

Speed controllers with frequency converter (identity code specification Z)

The speed controller assembly comprises a frequency converter and a variable speed motor (see also identity code specification R). The frequency converter is accommodated in an IP 55 rated protective housing with integral control unit and main switch, suitable for max. motor power 0.37/0.75/1.1 kW.

Externally controllable with 0/4 – 20 mA or 0 – 10 V corresponding to 0 – 50 (60) Hz output frequency.

Frequency converter for controlling speed, see page → 259

Stroke sensor with Namur signal

Mounting on the crank drive mechanism of the Makro/ 5 gearbox. For precise measurement of each metering stroke, comprising electronic cams and inductive proximity switches, switching signal according to Namur. In combination with electronic pre-selection meters suitable for batch metering or proportional metering in conjunction with proportional control.

Retrospective fitting only possible in the factory.

Approved for Ex safety operation with degree of protection EEx ia II C T6.

2.3 Hydraulic Diaphragm Metering Pumps

Technical Data

Typ	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Capacity at max. back pressure with 1800 rpm motor at 60 Hz				Suction lift	Suction / discharge side connector	Shipping weight	Plunger Ø
	l/h	bar	ml/stroke	Max. stroke rate Strokes/min	l/h	psi	gph (US)	Max. stroke rate Strokes/min	m WC	G-DN	kg	mm
250450	450	25	125.0	60	537	362	142	72	3.0	G 2-32	320	60
250562	562	25	125.0	75	671	362	177	89	3.0	G 2-32	320	60
250772	772	25	125.0	103	922	362	244	123	3.0	G 2-32	320	60
250997	997	25	125.0	133	1,191	362	315	159	3.0	G 2-32	320	60
251170	1,170	25	125.0	156	-	-	-	-	-	G 2-32	320	60
160616	616	16	171.2	60	736	232	194	72	3.0	G 2 1/4-40	320	70
160770	770	16	171.2	75	920	232	243	89	3.0	G 2 1/4-40	320	70
161058	1,058	16	171.2	103	1,264	232	334	123	3.0	G 2 1/4-40	320	70
161366	1,366	16	171.2	133	1,633	232	431	159	3.0	G 2 1/4-40	320	70
161602	1,602	16	171.2	156	-	-	-	-	3.0	G 2 1/4-40	320	70
120716	716	12	199.0	60	855	174	226	72	3.0	G 2 1/4-40	320	75
120895	895	12	199.0	75	1,069	174	282	89	3.0	G 2 1/4-40	320	75
121229	1,229	12	199.0	103	1,469	174	388	123	3.0	G 2 1/4-40	320	75
121588	1,588	12	199.0	133	1,898	174	501	159	3.0	G 2 1/4-40	320	75
121862	1,862	12	199.0	156	-	-	-	-	3.0	G 2 1/4-40	320	75
120919	919	12	255.3	60	1,098	174	290	72	3.0	G 2 1/4-40	320	85
121148	1,148	12	255.3	75	1,372	174	362	89	3.0	G 2 1/4-40	320	85
121577	1,577	12	255.3	103	1,885	174	498	123	3.0	G 2 1/4-40	320	85
122037	2,037	12	255.3	133	2,435	174	643	159	3.0	G 2 1/4-40	320	85
122389	2,389	12	255.3	156	2,856	-	754	-	3.0	G 2 1/4-40	320	85
101345	1,345	10	374.0	60	1,607	145	425	72	3.0	G 2 3/4-50	330	100
101680	1,680	10	374.0	75	2,008	145	530	89	3.0	G 2 3/4-50	330	100
102310	2,310	10	374.0	103	2,761	145	729	123	3.0	G 2 3/4-50	330	100
102980	2,980	10	374.0	133	3,562	145	941	159	3.0	G 2 3/4-50	330	100
103500	3,500	10	374.0	156	-	-	-	-	3.0	G 2 3/4-50	330	100
062305 *	2,305	6	641.0	60	2,755	87	728	72	3.0	Flange–65	330	130
062880 *	2,880	6	641.0	75	3,443	87	910	89	3.0	Flange–65	330	130
063960 *	3,960	6	641.0	103	4,734	87	1,251	123	3.0	Flange–65	330	130
065110 *	5,110	6	641.0	133	6,108	87	1,614	159	3.0	Flange–65	330	130
066000 *	6,000	6	641.0	156	-	-	-	-	3.0	Flange–65	330	130

* SST design with G 2 1/2”

PPT/PCT/TTT material version max. 10 bar

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge connection	DN 32 - DN 65 seals	Valve plates/valve springs	Valve seats
SST	Stainless steel 1.4571/1.4404	Stainless steel 1.4571/1.4404	PTFE	Hastelloy C	PTFE
PCT	PVC	PVC	PTFE	Hastelloy C	PTFE
PPT	Polypropylene	Polypropylene	PTFE	Hastelloy C	PTFE
TTT	Carbon-filled PTFE	Carbon-filled PTFE	PTFE	Hastelloy C	PTFE

Patented multi-layer diaphragm, vacuum-packed

Special designs available on request

Viton® is a registered trademark of DuPont Dow Elastomers

2.3 Hydraulic Diaphragm Metering Pumps

Identity Code Ordering System for M5Ha

M5Ha	Drive type									
	H	Main drive								
	A	Add-on drive								
	D	Double main drive								
	B	Double add-on power end								
		Type *								
		250450								
		250562								
		250772								
		250997								
		251170								
		160616								
		160770								
		161058								
		161366								
		161602								
		120716								
		120895								
		121229								
		121588								
		121862								
		120919								
		121148								
		121577								
		122037								
		122389								
		101345								
		101680								
		102310								
		102980								
		103500								
		062305								
		062880								
		063960								
		065110								
		066000								
			Liquid end material							
			PC	PVC						
			PP	Polypropylene						
			SS	Stainless steel						
			TT	PTFE + 25% carbon						
				Material of seals/diaphragm						
				T	PTFE					
					Displacement body					
					T	Composite diaphragm, PTFE coating, with rupture indicator				
						Liquid end version				
						1	With valve springs			
							Hydraulic connections			
							0	Standard connection		
							1	PVC union nut and insert		
							2	Union nut and insert PP		
							3	PVDF union nut and insert		
							4	SS union nut and insert		
								Version		
								0	with ProMinent® logo, no frame	
								2	without ProMinent® logo, no frame	
								A	with ProMinent® logo, with frame, simplex	
								B	with ProMinent® logo, with frame, duplex	
								C	with ProMinent® logo, with frame, triplex	
								D	with ProMinent® logo, with frame, quadruplex	
								M	Modified	
									Electrical power supply	
									S	3 ph. 230/400 V 50/60 Hz (WBS)
									R	Variable speed motor 4-pole, 230/400 V
									V0	Motor with integr. frequency converter
									L	3 ph. 230/400 V 50 Hz (Exe, Exd)
									P	3 ph. 230/400 V 60 Hz (Exe, Exd)
									V2	Motor with integr. frequency converter (Exd)
									5	No motor, with gearbox IEC 100
									6	No motor, with gearbox IEC 112
									0	No motor, no gearbox
										Enclosure rating

* PC/PP/TT material versions max. 10 bar

0	IP 55 (standard)
1	Exe motor version ATEX-T3
2	Exd motor version ATEX-T4
A	ATEX power end
	Stroke sensor
0	No stroke sensor
1	With stroke sensor (Namur)
	Stroke length adjustment
0	Stroke length adjustment, manual
3	230 V 0-20 mA stroke controller
4	230 V 4-20 mA stroke controller
5	115 V 0-20 mA stroke controller
6	115 V 4-20 mA stroke controller
	Application
0	standard
3	Low temperature -20 °C

* PC/PP/TT material versions max. 10 bar

2.3 Hydraulic Diaphragm Metering Pumps

Motor Data

Identity code specification		Power supply			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V 250 – 280 V/440 – 480 V	50 Hz 60 Hz	3 kW	
R	3-phase, IP 55	230 V/400 V	50/60 Hz	3 kW	With PTC, speed control range 1:5
V0	3-phase, IP 55	400 V ±10%	50/60 Hz	3 kW	Variable speed motor with integrated frequency converter
L1	3-phase, II 2G Ex e II T3 X	220 – 240 V/380 – 420 V	50 Hz	3.6 kW	
L2	3-phase, II 2G Ex de IIC T4 Gb	220 – 240 V/380 – 420 V	50 Hz	4 kW	With PTC, speed control range 1:5
P1	3-phase, II 2G Ex e IIC T3	250 - 280 V/440 - 480 V	60 Hz	3.6 kW	
P2	3-phase, II 2G Ex de IIC T4	250 - 280 V/440 - 480 V	60 Hz	4 kW	With PTC, speed control range 1:5
V2	3-phase, 2GDe Ex db IIB T4 Gb, IP67	400 V ± 10 %	50/60 Hz	4 kW	Ex-variable speed motor with integrated frequency converter

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

The motors are designed in compliance with the Ecodesign Directive 2009/125/EC.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

Spare Parts

The spare parts kit generally includes the wear parts for the liquid ends.

1 metering diaphragm

1 suction valve assembly

1 discharge valve assembly

2 valve plates and Hast. C spring

1 complete sealing set (O-rings, cover rings, valve seat, valve seat bushing)

Spare Parts Kits for Makro/ 5 HMH

Identity code: 250450, 250562, 250772, 250997, 251170

Liquid end	Materials in contact with the medium	Valve	Order no.
FMH 60–50	SST	with 2 valves cpl.	1008170
FMH 60–50	SST	without valves cpl.	1008169

Identity code: 160616, 160770, 161058, 161366, 161602, 120716, 120895, 121229, 121588, 121862, 120919, 121148, 121577, 122037, 122389

Liquid end	Materials in contact with the medium	Valve	Order no.
FMH 70/75/85–50	PPT	-	911904
FMH 70/75/85–50	PCT	-	911902
FMH 70/75/85–50	TTT	-	911906
FMH 70/75/85–50	SST	-	911910
FMH 70/75/85–50	SST	without valves cpl.	911909

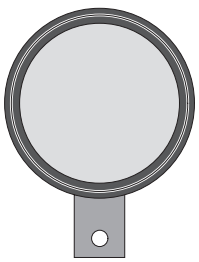
Identity code: 101345, 101680, 102310, 102980, 103500

Liquid end	Materials in contact with the medium	Valve	Order no.
FMH 100–50	PPT	-	1008246
FMH 100–50	PCT	-	1008247
FMH 100–50	TTT	-	1008248
FMH 100–50	SST	with valves cpl.	1008250
FMH 100–50	SST	without valves cpl.	1008249

Identity code: 062305, 062880, 063960, 065110, 066000

Liquid end	Materials in contact with the medium	Valve	Order no.
FMH 130–50	PP	-	1008251
FMH 130–50	P	-	1008252
FMH 130–50	T	-	1008253
FMH 130–50	S	with valves cpl.	1008265
FMH 130–50	S	without valves cpl.	1008264

Metering Diaphragms for Makro/ 5 HMH



Liquid end	Order no.
FMH 60/70/75/85–50	1007298
FMH 100/130–50	1007852

2.3 Hydraulic Diaphragm Metering Pumps

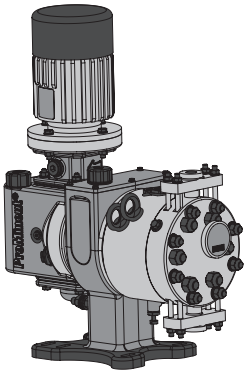
2.3.8 Hydraulic Diaphragm Metering Pump Orlita® Evolution

Maximum process reliability and flexibility.

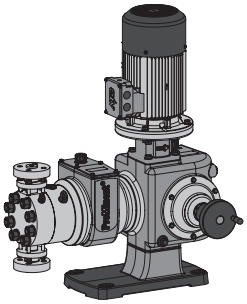
Capacity range of single head pump: 3 – 7,400 l/h, 400 – 8 bar

The Orlita® Evolution meets the most exacting safety requirements as an extremely robust hydraulic diaphragm metering pump. It is characterised by its PTFE multi-layer diaphragm with integral diaphragm rupture warning / signalling and unique diaphragm position control.

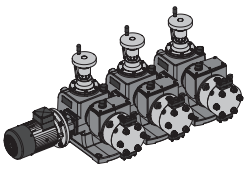
The Orlita® Evolution hydraulic diaphragm metering pump range of EF1a, EF2a, EF3a and EF4a form an integrated product range with stroke lengths of 15 to 40 mm. This covers the capacity range of 3 to 7,400 l/h at 400 – 10 bar. A wide range of drive versions is available, including some with ATEX certification for use in Zone 1 or Zone 2 areas at risk from explosion. The Orlita® Evolution product range is designed to comply with API 675.



Orlita® Evolution EF1a



Orlita® Evolution EF4a



Orlita® Evolution triplex pump

Your benefits

Maximum process reliability:

- PTFE multi-layer diaphragm with integral diaphragm rupture warning system
- Integral hydraulic relief valve
- The new diaphragm position control protects against operating faults (e. g. no damage in the event of a blockage on the suction or discharge side)
- Metering reproducibility is better than ± 1% within the 10 – 100% stroke length range under defined conditions and with correct installation
- Continuous bleeding of the hydraulic oil chamber ensures reliable operation

Excellent flexibility:

- The modular compact construction with single and multiple pump versions allows for a wide range of applications, also for multiple pump systems, whereas up to 5 metering units, even with different pump capacities, can be combined.
- 7 different gear ratios are available
- Power end configuration ideal for installation in any position (vertical or horizontal)
- Customised designs are available on request

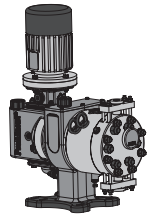
Technical Details

- Stroke length: 0 - 16 mm (Evo 1, Evo 2), 0 - 25 mm (Evo 3), 0 - 40 mm (Evo 4) Rod force: 2,300 N (Evo 1), 5,400 N (Evo 2), 8,000 N (Evo 3), 15,700 N (Evo 4)
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually by means of a manual adjustment wheel and scaled display (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 1 % within the 10 – 100% stroke length range under defined conditions and with correct installation
- PTFE multi-layer diaphragm with electrical diaphragm rupture warning / signalling system via a contact
- Integrated hydraulic relief and bleed valve
- Wetted materials: Stainless steel 1.4404, special designs available on request Plastics PVC, PVDF, special designs available on request
- A wide range of power end versions is available: Three-phase AC standard motors also for use in areas at risk from explosion, different flange designs for use of customer-specific motors
- Degree of protection: IP 55
- Design in compliance with API 675 among others

Field of application

- Oil and gas industry
- Metering of reactants and catalysts in the chemical industry
- Volume-proportional metering of chemicals/additives in the treatment of boiler feed water
- Level-dependent metering of auxiliary agents in industrial production engineering, for instance hot wax metering in the production of adhesive strips

2.3 Hydraulic Diaphragm Metering Pumps



Orlita® Evolution EF1a

Orlita® Evolution 1-4 with stainless steel liquid end

The standard version of Orlita® Evolution hydraulic diaphragm metering pumps has a stainless steel dosing head.

Technical data for EF1a single head pump 50 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
8	0.80	3.5	4.7	5.6	7.0	8.0	8.7	9.7	400	0.43	0.75	DN 3
10	1.26	5.5	7.3	8.7	10.9	12.4	13.6	15.2	337	0.61	0.79	DN 3
12	1.81	7.9	10.5	12.6	15.7	17.9	19.7	21.8	234	0.77	0.86	DN 6
14	2.46	10.8	14.3	17.1	21.4	24.4	26.7	29.7	172	0.62	0.80	DN 6
17	3.63	15.9	21.1	25.3	31.6	36.0	39.4	43.8	117	0.77	0.88	DN 6
21	5.54	24.3	32.3	38.6	48.2	54.9	60.2	66.8	76	0.85	0.90	DN 10
25	7.85	34.4	45.7	54.7	68.3	77.8	85.3	94.7	54	0.90	0.93	DN 10
29	10.57	46.3	61.5	73.6	91.9	104.6	114.8	127.5	40	0.95	0.96	DN 10
32	12.87	56.4	74.9	89.6	112.0	127.4	139.7	155.2	33	0.89	0.93	DN 16
38	18.15	79.5	105.6	126.3	157.9	179.6	197.1	218.8	23	0.93	0.95	DN 16
44	24.33	106.6	141.6	169.3	211.7	240.9	264.2	293.4	17	0.94	0.96	DN 16
50	31.42	137.6	182.8	218.7	273.3	311.0	341.2	378.9	13	0.95	0.96	DN 16
58	42.27	185.2	246.0	294.2	367.8	418.5	459.1	509.8	10	0.95	0.97	DN 16

Technical data for EF1a single head pump 60 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
8	0.80	4.2	5.6	6.8	8.4	9.6	400	0.43	0.69	DN 3
10	1.26	6.6	8.8	10.6	13.2	15.0	337	0.61	0.79	DN 3
12	1.81	9.6	12.7	15.2	19.0	21.6	234	0.77	0.86	DN 6
14	2.46	13.0	17.3	20.7	25.9	29.4	172	0.62	0.80	DN 6
17	3.63	19.2	25.5	30.5	38.1	43.4	117	0.77	0.88	DN 6
21	5.54	29.3	38.9	46.6	58.2	66.2	76	0.85	0.90	DN 10
25	7.85	41.5	55.1	66.0	82.5	93.8	54	0.90	0.93	DN 10
29	10.57	55.8	74.2	88.8	111.0	126.2	40	0.95	0.96	DN 10
32	12.87	67.9	90.3	108.1	135.1	153.6	33	0.89	0.93	DN 16
38	18.15	95.8	127.4	152.4	190.5	216.7	23	0.93	0.95	DN 16
44	24.33	128.5	170.8	204.4	255.4	290.5	15	0.94	0.96	DN 16
50	31.42	165.9	220.5	263.9	329.9	375.1	13	0.95	0.96	DN 16
58	42.27	223.2	296.8	355.1	443.9	504.7	10	0.95	0.97	DN 16

Note: Abridged presentation of our complete product range. Other piston diameters (8-60 mm) on request

2.3 Hydraulic Diaphragm Metering Pumps

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
Stainless steel 1.4404	Stainless steel 1.4462	PTFE multi-layer diaphragm

Ball valve DN 3 - DN 10

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing	Clamp ring
DN 3	Stainless steel 1.4404	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 6	Stainless steel 1.4404	Stainless steel 1.4404	SiN ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 10	Stainless steel 1.4404	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4

Further material versions and details available on request.

Plate valve DN 16

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	Stainless steel 1.4404	Stainless steel 1.4404	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404

Further material versions and details available on request.

Technical data for EF2a single head pump 50 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
12	1.81	7.9	10.5	12.6	15.7	17.9	20.3	21.8	400	0.69	0.82	DN 6
14	2.46	10.8	14.3	17.1	21.4	24.4	27.6	29.7	400	0.35	0.67	DN 6
17	3.63	15.9	21.1	25.3	31.6	36.0	40.7	43.8	274	0.60	0.79	DN 6
21	5.54	24.3	32.3	38.6	48.2	54.9	62.2	66.8	179	0.75	0.85	DN 10
25	7.85	34.4	45.7	54.7	68.3	77.8	88.1	94.7	127	0.83	0.89	DN 10
29	10.57	46.3	61.5	73.6	91.9	104.6	118.6	127.5	94	0.90	0.93	DN 10
32	12.87	56.4	74.9	89.6	112.0	127.4	144.4	155.2	77	0.76	0.87	DN 16
38	18.15	79.5	105.6	126.3	157.9	179.6	203.6	218.8	55	0.87	0.92	DN 16
44	24.33	106.6	141.6	169.3	211.7	240.9	273.0	293.4	41	0.90	0.94	DN 16
50	31.42	137.6	182.8	218.7	273.3	311.0	352.5	378.9	32	0.91	0.95	DN 16
58	42.27	185.2	246.0	294.2	367.8	418.5	474.3	509.8	24	0.93	0.96	DN 16
70	61.58	269.7	358.4	428.6	535.7	609.6	690.9	742.6	16	0.94	0.96	DN 20

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for EF2a single head pump 60 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
		88 [2]	117 [3]	140 [4]	175 [5]	199 [6]				
mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	bar			
12	1.81	9.6	12.7	15.2	19.0	21.6	400	0.69	0.82	DN 6
14	2.46	13.0	17.3	20.7	25.9	29.4	400	0.35	0.67	DN 6
17	3.63	19.2	25.5	30.5	38.1	43.4	274	0.60	0.79	DN 6
21	5.54	29.3	38.9	46.6	58.2	66.2	179	0.75	0.85	DN 10
25	7.85	41.5	55.1	66.0	82.5	93.8	127	0.83	0.89	DN 10
29	10.57	55.8	74.2	88.8	111.0	126.2	94	0.90	0.93	DN 10
32	12.87	67.9	90.3	108.1	135.1	153.6	77	0.76	0.87	DN 16
38	18.15	95.8	127.4	152.4	190.5	216.7	55	0.87	0.92	DN 16
44	24.33	128.5	170.8	204.4	255.4	290.5	41	0.90	0.94	DN 16
50	31.42	165.9	220.5	263.9	329.9	375.1	32	0.91	0.95	DN 16
58	42.27	223.2	296.8	355.1	443.9	504.7	24	0.93	0.96	DN 16
70	61.58	325.1	432.3	517.2	646.5	735.2	16	0.94	0.96	DN 20

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
Stainless steel 1.4404	Stainless steel 1.4462	PTFE multi-layer diaphragm

Ball valve DN 3 - DN 10

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing	Clamp ring
DN 3	Stainless steel 1.4404	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 6	Stainless steel 1.4404	Stainless steel 1.4404	SiN ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 10	Stainless steel 1.4404	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4

Plate valve DN 16 - DN 20

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	Stainless steel 1.4404	SiN ceramic	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 20	Stainless steel 1.4404	SiN ceramic	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404

Further material versions and details available on request.

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for EF3a single head pump 50 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
17	5.67	24	39	49	56	61	68		397	0.72	0.80	DN 6
22	9.50	41	55	66	82	94	103	114	237	0.87	0.93	DN 6
25	12.27	53	71	85	106	121	133	148	183	0.83	0.85	DN 10
30	17.67	77	102	123	153	174	191	213	127	0.92	0.95	DN 10
34	22.70	99	132	158	197	224	246	273	99	0.90	0.94	DN 16
38	28.35	124	165	197	246	280	307	341	79	0.93	0.95	DN 16
44	38.01	166	221	264	330	376	412	458	59	0.95	0.97	DN 20
50	49.09	215	285	341	427	486	533	592	46	0.97	0.98	DN 20
58	66.05	289	384	459	574	653	717	796	34	0.98	0.99	DN 20
63	77.93	341	453	542	678	771	846	939	29	0.97	0.98	DN 25
70	96.21	421	559	669	837	952	1,044	1,160	23	0.97	0.98	DN 25
75	110.45	483	642	768	960	1,093	1,199	1,332	20	0.98	0.98	DN 25
100	196.35	860	1,142	1,366	1,708	1,943	2,132	2,368	11	0.99	0.98	DN 40

Technical data for EF3a single head pump 60 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
17	5.67	30	39	47	59	67	397	0.72	0.77	DN 6
22	9.50	50	66	79	99	113	237	0.83	0.85	DN 6
25	12.27	64	86	103	128	146	183	0.83	0.85	DN 10
30	17.67	93	124	148	185	211	127	0.87	0.89	DN 10
34	22.70	119	159	190	238	271	99	0.88	0.89	DN 16
38	28.35	149	199	238	297	338	79	0.89	0.90	DN 16
44	38.01	266	319	399	453		59	9.00	0.91	DN 20
50	49.09	259	344	412	515	586	46	0.91	0.91	DN 20
58	66.05	348	463	554	693	788	34	0.92	0.92	DN 20
63	77.93	411	547	654	818	930	29	0.92	0.93	DN 25
70	96.21	508	675	808	1,010	1,148	23	0.93	0.94	DN 25
75	110.45	583	775	927	1,159	1,318	20	0.94	0.95	DN 25
100	196.35	1,036	1,378	1,649	2,061	2,344	11	0.96	0.96	DN 40

Note:

Abridged presentation of our complete product range. Other piston diameters (14–100 mm) on request.

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
Stainless steel 1.4404	Stainless steel 1.4462	PTFE multi-layer diaphragm

Ball valve DN 6 - DN 10

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing	Clamp ring
DN 6	Stainless steel 1.4404	Stainless steel 1.4404	SiN ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 10	Stainless steel 1.4404	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4

DN 16 - DN 40 Plate valve

2.3 Hydraulic Diaphragm Metering Pumps

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing	Clamp ring
DN 16	Stainless steel 1.4404	Stainless steel 1.4404	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 20	Stainless steel 1.4404	Stainless steel 1.4404	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 25	Stainless steel 1.4404	Stainless steel 1.4404	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4

Further material versions and details available on request.

Technical data for EF4a single head pump 50 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
22	15.21	66	88	105	132	150	165	183	400	0.64	0.67	DN 16
25	19.63	86	114	136	170	194	213	236	368	0.67	0.74	DN 16
30	28.27	123	164	196	246	279	307	341	255	0.70	0.76	DN 16
34	36.32	159	211	252	316	359	394	438	199	0.81	0.84	DN 16
38	45.36	198	264	315	394	449	492	547	159	0.82	0.84	DN 20
44	60.82	266	354	423	529	602	660	733	119	0.87	0.88	DN 20
50	78.54	344	457	546	683	777	852	947	92	0.90	0.92	DN 25
60	113.10	495	658	787	983	1,119	1,228	1,364	64	0.91	0.93	DN 32
70	153.94	674	895	1,071	1,339	1,524	1,671	1,856	47	0.91	0.93	DN 40
75	176.71	774	1,028	1,229	1,537	1,749	1,919	2,131	41	0.91	0.93	DN 40
86	232.35	1,017	1,352	1,617	2,021	2,300	2,523	2,802	31	0.93	0.94	DN 50
90	254.47	1,114	1,481	1,771	2,213	2,519	2,763	3,068	28	0.93	0.94	DN 50
100	314.16	1,376	1,828	2,186	2,733	3,110	3,411	3,788	23	0.94	0.94	DN 50
110	380.13	1,665	2,212	2,645	3,307	3,763	4,128	4,584	19	0.95	0.95	DN 50
115	415.48	1,819	2,418	2,891	3,614	4,113	4,512	5,010	17	0.93	0.95	DN 65
130	530.93	2,325	3,090	3,695	4,619	5,256	5,765	6,403	14	0.94	0.95	DN 65
140	615.75	2,697	3,583	4,285	5,357	6,095	6,687	7,426	12	0.95	0.96	DN 65

Technical data for EF4a single head pump 60 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
22	15.21	80	106	127	159	181	400	0.67	0.81	DN 16
25	19.63	103	137	164	206	234	368	0.74	0.85	DN 16
30	28.27	149	198	237	269	337	255	0.76	0.85	DN 16
34	36.32	191	254	305	381	433	199	0.84	0.87	DN 16
38	45.36	239	318	381	476	541	159	0.84	0.90	DN 20
44	60.82	321	427	510	638	726	119	0.88	0.87	DN 20
50	78.54	414	551	659	824	937	92	0.92	0.90	DN 25
60	113.10	597	793	950	1,187	1,350	64	0.93	0.91	DN 32
70	153.94	812	1,080	1,293	1,616	1,838	47	0.93	0.91	DN 40
75	176.71	933	1,240	1,484	1,855	2,110	41	0.93	0.91	DN 40
86	232.35	1,226	1,631	1,951	2,439	2,774	31	0.94	0.93	DN 50
90	254.47	1,343	1,786	2,137	2,671	3,038	28	0.94	0.93	DN 50
100	314.16	1,658	2,205	2,638	3,298	3,751	23	0.94	0.94	DN 50
110	380.13	2,007	2,668	3,193	3,991	4,538	19	0.95	0.95	DN 50
115	415.48	2,193	2,916	3,490	4,362	4,960	17	0.95	0.93	DN 65
130	530.93	2,803	3,727	4,459	5,574	6,339	14	0.95	0.94	DN 65
140	615.75	3,251	4,322	5,172	6,465	7,352	12	0.96	0.96	DN 65

Note:

Abridged presentation of our complete product range. Other piston diameters (22–140 mm) on request.

2.3 Hydraulic Diaphragm Metering Pumps

Materials in Contact With the Medium

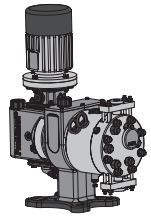
Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
Stainless steel 1.4404	Stainless steel 1.4462	PTFE multi-layer diaphragm

Plate valve

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 20	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 25	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 32	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 40	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 50	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 65	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404

2.3 Hydraulic Diaphragm Metering Pumps



Orlita® Evolution EF1a

Orlita® Evolution 1-4 with PVC/PVDF liquid end

The hydraulic diaphragm pump Orlita® Evolution is also available in a “plastic dosing head” version. The chemical resistance of the wetted materials PVC and PVDF to many media enables the even more flexible use of this process-reliable pump in an even greater number of applications.

Technical data for EF1a single head pump 50 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
8	0.80	3.5	4.7	5.6	7.0	8.0	8.7	9.7	16	0.67	0.77	DN 3
10	1.26	5.5	7.3	8.7	10.9	12.4	13.6	15.2	16	0.73	0.82	DN 3
12	1.81	7.9	10.5	12.6	15.7	17.9	19.7	21.8	16	0.71	0.77	DN 6
21	5.54	24.3	32.3	38.6	48.2	54.9	60.2	66.8	16	0.78	0.85	DN 10
25	7.85	34.4	45.7	54.7	68.3	77.8	85.3	94.7	16	0.81	0.87	DN 10
29	10.57	46.3	61.5	73.6	91.9	104.6	114.8	127.5	16	0.84	0.89	DN 10
44	24.33	106.6	141.6	169.3	211.7	240.9	264.2	293.4	15	0.94	0.96	DN 16
50	31.42	137.6	182.8	218.7	273.3	311.0	341.2	378.9	12	0.95	0.96	DN 16
58	42.27	185.2	246.0	294.2	367.8	418.5	459.1	509.8	9	0.95	0.96	DN 16

Technical data for EF1a single head pump 60 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
8	0.80	4.2	5.6	6.8	8.4	9.6	16	0.67	0.77	DN 3
10	1.26	6.6	8.8	10.6	13.2	15.0	16	0.73	0.82	DN 3
12	1.81	9.6	12.7	15.2	19.0	21.6	16	0.71	0.77	DN 6
21	5.54	29.3	38.9	46.6	58.2	66.2	16	0.78	0.85	DN 10
25	7.85	41.5	55.1	66.0	82.5	93.8	16	0.81	0.87	DN 10
29	10.57	55.8	74.2	88.8	111.0	126.2	16	0.84	0.89	DN 10
44	24.33	128.5	170.8	204.4	255.4	290.5	15	0.94	0.96	DN 16
50	31.42	165.9	220.5	263.9	329.9	375.1	12	0.95	0.96	DN 16
58	42.27	223.2	296.8	355.1	443.9	504.7	9	0.95	0.96	DN 16

Note:

Abridged presentation of our complete product range. Other piston diameters (8 - 60 mm) on request. Other pressures (e.g. 21 bar) on request.

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
PVC	Hastelloy C	PTFE
PVDF	Hastelloy C	PTFE

Ball valve DN 6 – DN 10

2.3 Hydraulic Diaphragm Metering Pumps

Identity code of material	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing	Clamp ring
DN 6 (double ball)	PVDF	PTFE moulded composite	Al_2O_3 ceramic	PTFE	PVDF	PVDF
DN 10 (single ball)	PVDF	PTFE moulded composite	Al_2O_3 ceramic	PTFE	PVDF	PVDF

Plate valve DN 16

Identity code of material	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	PVDF	PTFE	ZrO_2 ceramic	PTFE	PVDF

Further material versions and details available on request.

Technical data for EF2a single head pump 50 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
12	1.81	7	10	12	15	17	19	21	16	0.71	0.77	DN 6
21	5.54	24	32	38	48	54	60	66	16	0.78	0.85	DN 10
25	7.85	34	45	54	68	77	85	94	16	0.81	0.87	DN 10
29	10.57	46	61	73	91	104	114	127	16	0.84	0.89	DN 10
44	24.33	106	141	169	211	240	264	293	16	0.94	0.96	DN 16
50	31.42	137	182	218	273	311	341	378	16	0.95	0.96	DN 16
58	42.27	185	246	294	367	418	459	509	16	0.95	0.96	DN 16

Technical data for EF2a single head pump 60 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
12	1.81	9	12	15	19	21	16	0.71	0.77	DN 6
21	5.54	29	38	46	58	66	16	0.78	0.85	DN 10
25	7.85	41	55	66	82	93	16	0.81	0.87	DN 10
29	10.57	55	74	88	111	126	16	0.84	0.89	DN 10
44	24.33	128	170	204	255	290	16	0.94	0.96	DN 16
50	31.42	165	220	263	329	375	16	0.95	0.96	DN 16
58	42.27	223	296	355	433	504	16	0.95	0.96	DN 16

Note:

Abridged presentation of our complete product range. Other piston diameters on request. Other pressure stages (e.g. 21 bar) on request.

2.3 Hydraulic Diaphragm Metering Pumps

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
PVC	Hastelloy C	PTFE
PVDF	Hastelloy C	PTFE

Ball valve DN 6 – DN 10

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing	Clamp ring
DN 6	PVDF	PTFE moulded composite	Al_2O_3 ceramic	PTFE	PVDF	PVDF
DN 10	PVDF	PTFE moulded composite	Al_2O_3 ceramic	PTFE	PVDF	PVDF

Plate valve DN 16

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	PVDF	PTFE	ZrO_2 ceramic	PTFE	PVDF

Further material versions and details available on request.

Technical data for EF3a single head pump 50 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
63	77.93	341	453	542	678	771	846	939	16	0.92	0.93	DN 32
70	96.21	421	559	669	837	952	1,044	1,160	16	0.93	0.96	DN 50
75	110.45	483	642	768	960	1,096	1,199	1,332	16	0.94	0.94	DN 32
100	196.35	860	1,142	1,366	1,708	1,943	2,132	2,368	11	0.96	0.96	DN 50

Technical data for EF3a single head pump 60 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
63	77.93	411	547	654	818	930	16	0.92	0.93	DN 32
70	96.21	508	675	802	1,010	1,148	16	0.93	0.94	DN 32
75	110.45	583	775	927	1,159	1,318	16	0.94	0.95	DN 32
100	196.35	1,036	1,378	1,649	2,061	2,344	11	0.99	0.99	DN 50

Note:

Abridged presentation of our complete product range. Other piston diameters on request. Other pressure stages (e.g. 16 bar) on request.

2.3 Hydraulic Diaphragm Metering Pumps

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
PVC	Hastelloy C	PTFE
PVDF	Hastelloy C	PTFE

Plate valve

Identity code of material	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
≥ DN 16	PVDF	PTFE	ZrO_2 ceramic	PTFE	PVDF

Further material versions and details available on request.

Technical data for EF4a single head pump 50 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
70	153.90	674	895	1,071	1,339	1,524	1,671	1,856	10	0.84	0.85	DN 50
75	176.70	774	1,028	1,229	1,537	1,749	1,919	2,131	10	0.85	0.86	DN 50
115	415.50	1,819	2,418	2,891	3,614	4,113	4,512	5,010	10	0.90	0.91	DN 50
130	530.90	2,325	3,090	3,695	4,619	5,253	5,765	6,403	10	0.93	0.93	DN 65
140	530.90	2,697	3,583	4,285	5,357	6,095	6,687	7,426	10	0.93	0.94	DN 65

Technical data for EF4a single head pump 60 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
70	153.90	812	1,080	1,293	1,616	1,838	10	0.84	0.85	DN 50
75	176.70	933	1,240	1,484	1,855	2,110	10	0.86	0.86	DN 50
115	415.50	2,193	2,916	3,490	4,362	4,960	10	0.90	0.91	DN 50
130	530.90	2,803	3,727	4,459	5,574	6,339	10	0.92	0.93	DN 65
140	530.90	3,251	4,322	5,172	6,465	7,352	10	0.93	0.94	DN 65

Note:

Abridged presentation of our complete product range. Other piston diameters on request. Other pressure stages (16 and/or 21 bar) on request.

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
PVC	Hastelloy C	PTFE
PVDF	Hastelloy C	PTFE

Plate valve

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 50	PVDF	PTFE	ZrO_2 ceramic	PTFE	PVDF
DN 65	PVDF	PTFE	ZrO_2 ceramic	PTFE	PVDF

Further material versions and details available on request.

2.3 Hydraulic Diaphragm Metering Pumps

2.3.9 Hydraulic Diaphragm Metering Pump Evolution mikro

For the smallest quantities at the highest pressures

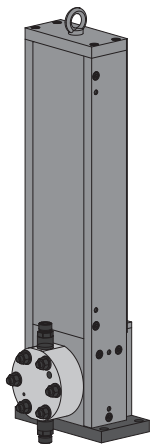
Capacity range 0.02 – 18.0 l/h, 400 – 16 bar

The Evolution mikro is an innovative micro-metering pump for high pressures. The hydraulic diaphragm metering pump is the first of its kind with an electronically regulated linear direct power end. The power end has few mechanical functional elements and thus operates with virtually minimal maintenance.

With a capacity range of 0.02 – 18 l/h at pressures of up to 400 bar, the hydraulic diaphragm metering pumps Evolution mikro EMFa and EMHa are extremely suitable for ultra-precise micro-metering in gas metering and filling processes of all kinds. They are also used for additive metering in oil, gas and chemical applications, etc.

Typical applications include the metering of additives in gas metering and filling processes.

The Evolution mikro is the first of its kind with an electronically regulated direct power end. It can be ideally adapted to the respective application, thanks to an adjustment range of 1:200 and the combination of individually independent metering profiles with 3-parameter control.



Pump

Your benefits

Maximum process reliability:

- Precise micro-metering at high pressures
- Hermetically sealed by PTFE multi-layer safety diaphragm or metal diaphragm
- Long service life thanks to its sturdy construction with low-wear, contact-less power end
- High positional accuracy guarantees reproducibility of better than ±1%

Excellent flexibility:

- Seriously extended adjustment range of up to 1:200
- Universally controllable with electronically integrated overload protection
- Individually process-dependent metering profiles combined with 3-parameter control are possible
- Space-saving, easy-to-fit solution

Technical Details

- Stroke length: 0 – 60 mm
- Stroke rate: 0 – 200 strokes/min.
- Precise metering of 0.02 l/h up to a max. of 18 l/h at up to 400 bar
- Stroke length adjustment range 0 – 100%
- Metering reproducibility is better than ± 1% under defined conditions and with proper installation
- PTFE multi-layer safety diaphragm with integrated diaphragm rupture warning system or metal diaphragm
- Large real volumetric flow adjustment range: 1:200
- Wetted materials: Stainless steel 1.4404, special materials such as Hastelloy C, PVDF etc. available on request
- Universal control options, such as analogue, contact, field bus etc.
- Individual process-dependent metering profiles are possible
- Space-saving, easy-to-fit solution
- Degree of protection IP 55
- Designs compliant with API 675 and ATEX

Field of application

- Additive metering in the chemical and petrochemical industry
- General filling processes in industry
- Metering of additives in the food industry
- Universal lab applications
- Gas metering applications

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for EMFa - Evo mikro with PTFE multi-layer safety diaphragm

Plunger Ø	Max. pressure	Stroke rate	Feed rate at max. pressure	Theor. stroke volume	Suction lift	Connection on suction/ pressure side	Shipping weight
mm	bar	Strokes/min	l/h	ml/stroke	m WC	G-DN	kg
3	400	140	0.6	0.42	1	DN 3	25
3	320	200	1.5	0.42	1	DN 3	25
3	250	200	2.0	0.42	1	DN 3	25
3	160	200	2.8	0.42	1	DN 3	25
3	100	200	3.3	0.42	1	DN 3	25
3	64	200	3.7	0.42	1	DN 3	25
3	25	200	4.1	0.42	1	DN 3	25
6	100	140	10.2	1.69	1	DN 6	25
6	80	140	10.8	1.69	1	DN 6	25
6	64	200	16.7	1.69	1	DN 6	25
6	40	200	17.0	1.69	1	DN 6	25
6	25	200	18.0	1.69	1	DN 6	25

Data applies at ambient temperature of up to 45°C and with motor energy supply of 72 V DC.

Pumps can be operated with reduced output at ambient temperatures of 50°C, 55°C, 60°C and also at 24 V DC (e.g. using solar energy). Further details on request.

Technical data for EMHa - Evo mikro with metal single diaphragm

Plunger Ø	Max. pressure	Max. stroke rate	Feed rate at max. pressure	Theor. stroke volume	Suction lift	Connection on suction/ pressure side	Shipping weight
mm	bar	Strokes/min	l/h	ml/stroke	m WC	G-DN	kg
3	400	140	1.5	0.42	1	DN 3	25
3	320	200	2.7	0.42	1	DN 3	25
3	250	200	3.2	0.42	1	DN 3	25
3	160	200	3.8	0.42	1	DN 3	25
3	100	200	4.0	0.42	1	DN 3	25
3	64	200	4.3	0.42	1	DN 3	25
3	25	200	4.5	0.42	1	DN 3	25

Data applies at ambient temperature of up to 45°C and with motor energy supply of 72 V DC.

Pumps can be operated with reduced output at ambient temperatures of 50°C, 55°C, 60°C and also at 24 V DC (e.g. using solar energy). Further details on request.

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
Stainless steel 1.4404	Stainless steel 1.4462	PTFE multi-layer diaphragm

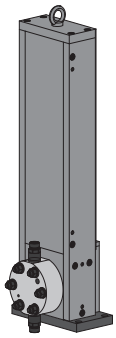
Identity code of material	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing	Clamp ring
DN 3 (double ball)	Stainless steel 1.4404	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 6 (double ball)	Stainless steel 1.4404	Stainless steel 1.4404	SiN ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4

Scope of delivery

- Pump
- Cable
- Drive Control

2.3 Hydraulic Diaphragm Metering Pumps

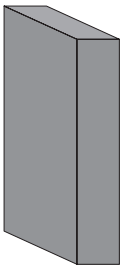
Pump



2 m cable



Drive Control



Options:

- Cable up to 30 m
- Transformer

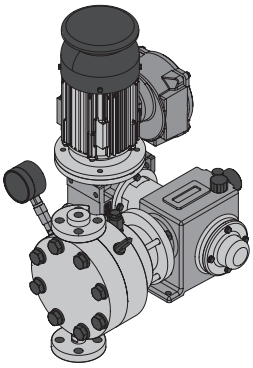
2.3 Hydraulic Diaphragm Metering Pumps

2.3.10 Hydraulic diaphragm metering pump Orlita® MF

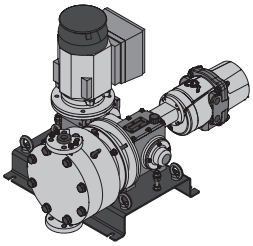
Reliable capacity even at high pressure

Capacity range of single head pump: 0 – 13,000 l/h; 700 – 6 bar

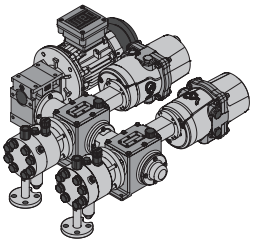
The hydraulic diaphragm metering pump Orlita® MF offers reliable capacities even under high pressure and has a modular construction, therefore has versatile uses. Thanks to its modular design, this pump is tailored to meet your requirements even at very high pump capacities.



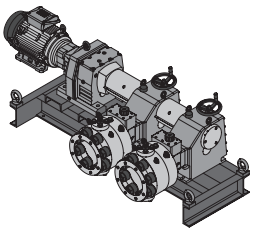
Orlita® MHS 18-20



Orlita® MHS 35/45



Orlita® MHS 35-8-8



Orlita® MHS 600-28-28

ORLITA® MF hydraulic diaphragm metering pumps (MFS 18 to MFS 1400) with a stroke length of 15 to 60 mm provide a capacity ranging from 0 to 13,000 l/h at 700 – 6 bar. A wide range of drive versions is available, including some for use in Zone 1 or Zone 2 areas at risk from explosion with ATEX certification. The Orlita® MF product range is designed to comply with API 675. Its modular construction permits the free combination of drives, power ends and dosing heads, producing a pump for a range of different feed rates and media operating at different working pressures.

Your benefits

Excellent process safety and reliability:

- PTFE double diaphragm with integrated diaphragm rupture warning system ensures precise and low-wear operation despite high pressures
- The product chamber is hermetically separated from the hydraulic part
- Integrated hydraulic relief valve and automatic bleed valve for the hydraulic chamber
- Wear-free, valveless enforced anti-cavitation of the hydraulic leakage guarantees optimum dosing precision
- Cone valves for use as suction and/or discharge valves with minimal wear, good self-cleaning and low pressure loss (NPSHR)

Excellent flexibility:

- The modular construction allows a wide range of uses. In multiple pump systems it is possible to combine up to 6 metering units, even with different pump capacities. In single pumps the drive arrangement may be either vertical or horizontal.
- 10 different gear ratios are available
- Temperature range -40 to +150 °C
- Customised designs are available on request

Technical Details

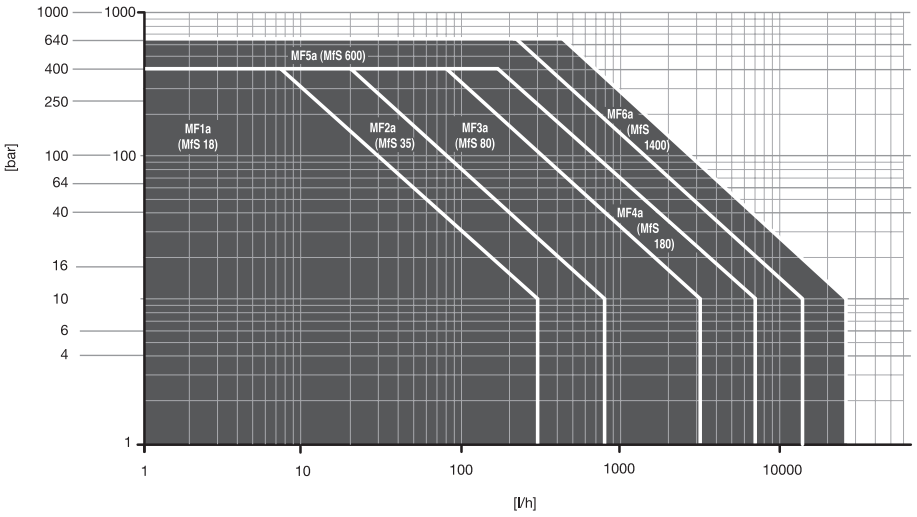
- MfS 18 (MF1a) – Stroke length: 0-15 mm, Rod force: 1,750 N
- MfS 35 (MF2a) – Stroke length: 0-20 mm, Rod force: 3,500 N
- MfS 80 (MF3a) – Stroke length: 0-20 mm, Rod force: 14,000 N
- MfS 180 (MF4a) – Stroke length: 0-40 mm, Rod force: 18,000 N
- MfS 600 (MF5b) – Stroke length: 0-40 mm, Rod force: 40,000 N
- MfS 1400 (MF6a) – Stroke length: 0-60 mm, Rod force: 60,000 N
- Stroke length adjustment range: 0 – 100% in operation and idle
- Stroke length adjustment: manually by means of a manual adjustment wheel and scaled display (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 1% within the 10 – 100% stroke length range under defined conditions and with correct installation (API 675)
- PTFE multi-layer diaphragm with electrical diaphragm rupture warning system via a contact
- Integrated hydraulic relief and bleed valve
- Wetted materials: Stainless steel, special designs are available on request
- A wide range of power end versions is available: 3-phase AC motors, motors for use in areas at risk from explosion and different flange designs for use in customer-specific motors
- Degree of protection: IP 55
- Temperature range - 40 °C to + 150 °C
- Suction lift up to 8 m
- Design in compliance with API 675 among others

2.3 Hydraulic Diaphragm Metering Pumps

Field of application

- Oil/ gas production (onshore/offshore)
- Refineries
- Chemical/Petrochemical industry
- Pharmaceuticals & cosmetics
- Food production
- Packaging industry (bottling pumps)

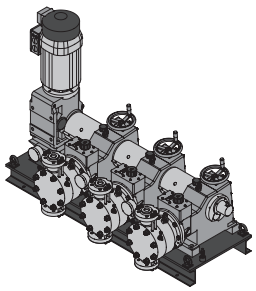




Pressure [bar] depending on the metering volume [l/h] at 50 Hz

Triplex metering pumps

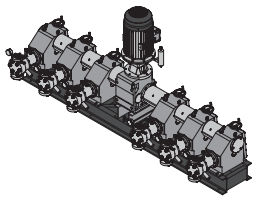
With Triplex metering pumps, the discharge stroke of the individual dosing heads is displaced through 120°. The result is a low-pulsation metering flow even without the use of complex pulsation dampers. This design of process diaphragm metering pumps is favoured in the chemical and petrochemical industries.



Orlita® MF3S 180/90-90-90 triplex pump

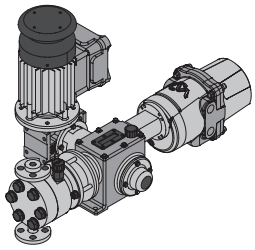
Multiplexed metering pumps

Thanks to the modular design of the Orlita® MF series, a variable combination of power ends, motors and dosing heads is possible.

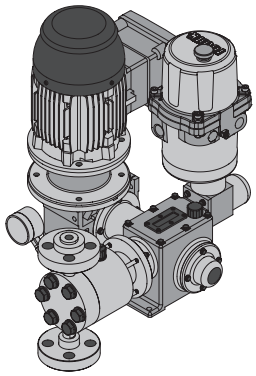


Orlita® MF3S 1400/50 multiple pump

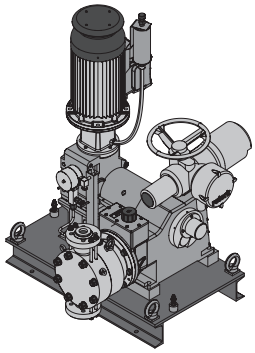
2.3 Hydraulic Diaphragm Metering Pumps



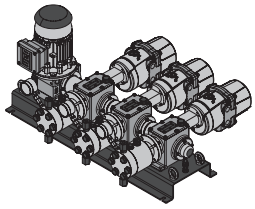
Orlita® MFS 18 with 1-phase control drive 115/230 V

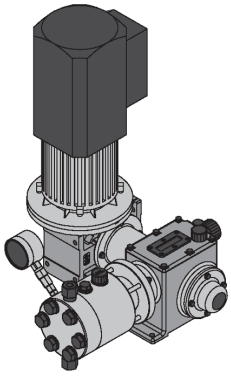


Orlita® MFS 35 with 1-phase control drive 115/230 V vertical



Orlita® MFS 180 with 3-phase control drive





Orlita® MFS 18/7 with Varicon

Actuation of ORLITA® MF, MH, PS, DR

Control drive consisting of an actuator with servomotor and integral servo controller for stroke length adjustment via a standard signal. Standard current input 0/4 – 20 mA, corresponds to stroke length 0 – 100%, switch-over for manual/automatic operation; key switch for stroke adjustment in manual mode, mechanical position display of actual stroke length value output 0/4 – 20 mA for remote display. Control drives can also be designed with bus systems, like HART, PROFIBUS, Fieldbus Foundation ...

Variable speed motors with integrated frequency converter (identity code specification V)

Power supply 1 ph 230 V, 50/60 Hz (up to 3 kW). Externally controllable with 0/4 - 20 mA.

The following functions are integrated in the terminal box cover:

- Start/stop switch
- Switch for manual/external operation
- Potentiometer for speed control in manual mode

Speed controllers with frequency converter (identity code specification Z)

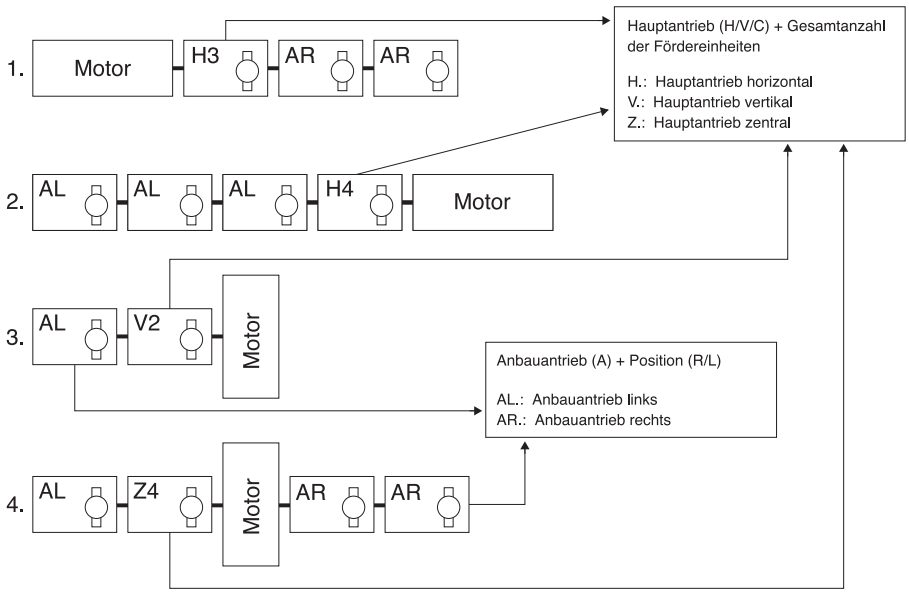
The frequency converter is accommodated in an IP 55 rated protective housing with integral control unit and main switch, suitable for max. 0.37/0.75 kW motor capacity.

Externally controllable with 0/4 - 20 mA or 0 - 10 V corresponding to 0 - 50 (60) Hz output frequency.

Integrated control unit with versatile functions, such as switching between external/internal control; frequency input using arrow keys with internal control, multilingual fault message display etc. and motor temperature monitoring (thermistor protection).

The speed controller assembly consists of a frequency converter and a variable speed motor.

Type of drive



When ordering the multiple pump, the main and/or all add-on power ends need a separate identity code.

For example, a Triplex pump (1.) :

MF_aH3.....MF_aAR.....MF_aAR.....

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/discharge valve housing	Valve seals	Valve	Valve seats	Range
S1 (DIN)	Stainless steel 1.4404	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4462	≥ DN 6
S1 (DIN)	Stainless steel 1.4404	none	Stainless steel 1.4571	Ceramic	Stainless steel 1.4404	DN 3
S1 (ANSI)	AISI 316L	AISI 316L	AISI 316Ti	Duplex steel	Duplex steel	DN 3
S1 (ANSI)	AISI 316L	N/A	AISI 316Ti	Ceramic	AISI 316L	DN 3
S2 (DIN)	Stainless steel 1.4462	Stainless steel 1.4462	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4462	≥ DN 6
S2 (ANSI)	Duplex steel	Duplex steel	AISI 316Ti	Duplex steel	Duplex steel	DN 3
S3 (DIN)	Stainless steel 1.4539	Stainless steel 1.4539	Stainless steel 2.4610	Stainless steel 1.4539	Stainless steel 1.4539	≥ DN 6
S3 (ANSI)	AISI 904L	AISI 904L	Hastelloy C	AISI 904L	AISI 904L	≥ DN 6

Motor Data

A	50 Hz	3 ph. 230/400 V 3 ph. 400/690 V	3 ph. 500 V 3 ph. 415 V	3 ph. 380/660 V
B (controllable 1:5)	50 Hz	3 ph. 230/400 V 3 ph. 400/690 V	3 ph. 500 V 3 ph. 415 V	3 ph. 380/660 V
H	60 Hz	3 ph. 220/380 V	3 ph. 400 V	
K (controllable 1:5)	60 Hz	3 ph. 220/380 V	3 ph. 400 V	

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for MFS 18 single head pump 50 Hz

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/ stroke	45 [3] l/h	58 [4] l/h	73 [5] l/h	91 [6] l/h	112 [7] l/h	145 [8] l/h	207 [9] l/h	bar			
7	0.58	1.5	2.0	2.5	3.1	3.8	5.0	7.1	400	0.50	0.70	DK DN 3
8	0.75	2.0	2.6	3.2	4.1	5.0	6.5	9.3	348	0.55	0.72	DK DN 3
10	1.18	3.2	4.1	5.1	6.4	7.8	10.2	14.6	222	0.67	0.79	Ke DN 6
11	1.43	3.8	4.9	6.2	7.7	9.5	12.4	17.7	184	0.67	0.79	Ke DN 6
12	1.70	4.6	5.9	7.3	9.2	11.3	14.7	21.0	154	0.84	0.88	Ke DN 6
14	2.31	6.2	8.0	10.0	12.5	15.4	20.0	28.7	113	0.85	0.88	Ke DN 6
16	3.02	8.2	10.5	13.1	16.4	20.1	26.2	37.4	87	0.86	0.88	Ke DN 6
18	3.82	10.3	13.2	16.6	20.7	25.5	33.2	47.4	68	0.87	0.88	Ke DN 6
20	4.71	12.8	16.4	20.5	25.6	31.5	41.0	58.5	55	0.88	0.89	Ke DN 6
22	5.70	15.5	19.8	24.8	31.0	38.1	49.6	70.8	46	0.88	0.89	Ke DN 10/6
25	7.36	20.0	25.6	32.0	40.0	49.2	64.0	91.5	35	0.89	0.89	Ke DN 10
27	8.59	23.3	29.8	37.3	46.7	57.4	74.7	106.7	30	0.89	0.89	Ke DN 10
29	9.91	26.9	34.4	43.1	53.8	66.3	86.2	123.1	26	0.89	0.89	Ke DN 10
30	10.60	28.8	36.9	46.1	57.6	70.9	92.2	131.7	24	0.89	0.89	Ke DN 10
36	15.27	41.5	53.1	66.4	83.0	102.1	132.8	189.7	17	0.89	0.89	Ke DN 16
40	18.85	51.2	65.6	82.0	102.4	126.1	163.9	234.2	13	0.89	0.89	Ke DN 16
44	22.81	62.0	79.3	99.2	124.0	152.6	198.4	283.4	11	0.89	0.90	Ke DN 16
50	29.45	80.0	102.4	128.1	160.1	197.1	256.2	366.0	8	0.89	0.90	Ke DN 16

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for MFS 18 single head pump 60 Hz

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/ stroke	44 [2] l/h	55 [3] l/h	70 [4] l/h	88 [5] l/h	110 [6] l/h	135 [7] l/h	176 [8] l/h	bar			
7	0.58	1.5	1.9	2.4	3.0	3.8	4.6	6.1	400	0.50	0.70	DK DN 3
8	0.75	1.9	2.4	3.1	3.9	4.9	6.1	7.9	348	0.55	0.72	DK DN 3
10	1.18	3.1	3.8	4.9	6.2	7.7	9.5	12.4	222	0.67	0.79	Ke DN 6
11	1.43	3.7	4.7	6.0	7.5	9.4	11.5	15.0	184	0.67	0.79	Ke DN 6
12	1.70	4.4	5.6	7.1	8.9	11.2	13.7	17.9	154	0.84	0.88	Ke DN 6
14	2.31	6.1	7.6	9.7	12.1	15.2	18.7	24.3	113	0.85	0.88	Ke DN 6
16	3.02	7.9	9.9	12.7	15.9	19.9	24.5	31.8	87	0.86	0.88	Ke DN 6
18	3.82	10.0	12.6	16.1	20.1	25.1	31.0	40.3	68	0.87	0.88	Ke DN 6
20	4.71	12.4	15.5	19.9	24.8	31.1	38.2	49.7	55	0.88	0.89	Ke DN 6
22	5.70	15.0	18.8	24.0	30.1	37.6	46.3	60.2	46	0.88	0.89	Ke DN 10/6
25	7.36	19.4	24.3	31.1	38.8	48.6	59.8	77.7	35	0.89	0.89	Ke DN 10
27	8.59	22.6	28.3	36.2	45.3	56.6	69.7	90.6	30	0.89	0.89	Ke DN 10
29	9.91	26.1	32.7	41.8	52.3	65.3	80.4	104.6	26	0.89	0.89	Ke DN 10
30	10.60	27.9	34.9	44.7	55.9	69.9	86.1	111.9	24	0.89	0.89	Ke DN 10
36	15.27	40.3	50.3	64.4	80.6	100.7	124.0	161.2	17	0.89	0.89	Ke DN 16
40	18.85	49.7	62.2	79.6	99.5	124.4	153.1	199.0	13	0.89	0.89	Ke DN 16
44	22.81	60.2	75.2	96.3	120.1	150.5	185.2	240.8	11	0.89	0.90	Ke DN 16
50	29.45	77.7	97.1	124.4	155.5	194.3	239.2	311.0	8	0.89	0.90	Ke DN 16

DK Double ball valve

Ke Conical valve

Note:

- Abridged presentation of our complete product range. Other types on request
- Allow for a minimum 10% power reserve when designing in accordance with API
- All hydraulic performance data is based on water at 20 °C

2.3 Hydraulic Diaphragm Metering Pumps

Hydraulic diaphragm metering pump Orlita® MFS18 (MF1a)

MF1a	Drive type															
	V1 **	Main power end, single, vertical														
	Z1 **	Main power end, single, central														
	AL	Drive module left-hand														
	AR	Drive module right-hand														
	M *	Modified														
		Plunger diameter														
		007	7 mm													
		008	8 mm													
		010	10 mm													
		011	11 mm													
		012	12 mm													
		014	14 mm													
		016	16 mm													
		018	18 mm													
		020	20 mm													
		022	22 mm													
		025	25 mm													
		027	27 mm													
		029	29 mm													
		030	30 mm													
		036	36 mm													
		040	40 mm													
		044	44 mm													
		050	50 mm													
			Stroke rate 50 (60) Hz													
			2	-/44 strokes/min												
			3	45 (55) strokes/min												
			4	58 (70) Strokes/min												
			5	73 (88) Strokes/min												
			6	91 (110) Strokes/min												
			7	112 (135) Strokes/min												
			8	145 (176) Strokes/min												
			9	207 (-) Strokes/min												
				Liquid end material (including valve materials)												
				S1	Stainless steel (see table, sheet 2)											
					Temperature of pumped medium											
					0	-10 °C to 80 °C										
					1	-25 °C to 60 °C										
					2	-40 °C to 60 °C										
					3	10 °C to 115 °C										
					4	10 °C to 150 °C										
						Displacer format										
						0	PTFE multi-layer diaphragm									
						1	PTFE multi-layer diaphragm with pressure gauge									
							Liquid end version									
							0	standard								
							1	Standard with spring								
							2	Standard double valve								
							3	Standard double valve with spring								
								Hydraulic connection suction side								
								G	Thread DIN/ISO							
								N	Thread NPT/ANSI							
								A	Flange ANSI							
								D	Flange DIN/ISO							
									Hydraulic connection discharge side							
									G	Thread DIN/ISO						
									N	Thread NPT/ANSI						
									A	Flange ANSI						
									D	Flange DIN/ISO						
										version						
										0	no features					
										1	Liquid end heating					
										2	Liquid end polished					
										3	Special paint finish					
											Power connector					
											A	Standard voltage 50 Hz				
											B	Standard voltage 50 Hz adjustable				
											H	Standard voltage 60 Hz				
											K	Standard voltage 60 Hz adjustable				
											0	Externally mounted pump				

* Modified design (M) is possible for each feature of the identity code.

** Further pump compositions, see power end shape on page → <cbpagelink offset="1" page="$KT-PK-DT-PR-$KP-HYDMPUMPS-$PG-PK1-59" />

												1	without motor with IEC flange					
												2	without motor with NEMA flange					
													Electrical protection system / explosion protection					
													0	IP 55				
													1	IP 56				
													A	IP 55 EExn				
													B	IP 55 EExe				
													C	IP 55 EExde				
													D	IP 56 EExn				
													E	IP 56 EExe				
													F	IP 56 EExde				
														Electrical options				
														0	no options			
														1	Stroke sensor			
															Stroke length adjustment			
															0	manual		
															1	0/4-20 mA without Ex		
															2	0/4-20 mA Ex Zone 2		
															3	0/4-20 mA Ex Zone 1		
															4	0/4-20 mA without EX offshore		
															5	0/4-20 mA Ex Zone 2 offshore		
															6	0/4-20 mA Ex Zone 1 offshore		
																Ambient conditions		
																0	-20 °C to 40 °C	
																1	-40 °C to 40 °C	
																2	0 °C to 55 °C	
																	Approvals	
																	0	CE
																	1	API 675
																	2	VDMA
																	3	ATEX
																	4	ATEX / API 675
																	5	VDMA / ATEX

* Modified design (M) is possible for each feature of the identity code.

** Further pump compositions, see power end shape on page → <cbpagelink offset="1" page="$KT-PK-DT-PR-$KP-HYDMPUMPS-$PG-PK1-59" />

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for MFS 35 single head pump 50 Hz

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/ stroke	45 [3] l/h	58 [4] l/h	73 [5] l/h	91 [6] l/h	112 [7] l/h	145 [8] l/h	207 [9] l/h	bar			
7	0.77	2.0	2.6	3.3	4.1	5.1	6.7	9.5	400	0.50	0.70	DK DN 3
8	1.01	2.7	3.5	4.3	5.4	6.7	8.7	12.4	400	0.50	0.70	DK DN 3
10	1.57	4.2	5.4	6.8	8.5	10.5	13.6	19.5	400	0.50	0.70	Ke DN 6
11	1.90	5.1	6.6	8.2	10.3	12.7	16.5	23.6	368	0.79	0.85	Ke DN 6
12	2.26	6.1	7.8	9.8	12.3	15.1	19.6	28.1	309	0.79	0.85	Ke DN 6
14	3.08	8.3	10.7	13.3	16.7	20.6	26.7	38.2	227	0.81	0.85	Ke DN 6
16	4.02	10.9	13.9	17.4	21.8	26.9	34.9	49.9	174	0.83	0.86	Ke DN 6
18	5.09	13.8	17.7	22.1	27.6	34.0	44.2	63.2	137	0.84	0.87	Ke DN 6
20	6.28	17.0	21.8	27.3	34.1	42.0	54.6	78.0	111	0.86	0.88	Ke DN 6
22	7.60	20.6	26.4	33.0	41.3	50.8	66.1	94.4	92	0.86	0.88	Ke DN 10/6
25	9.82	26.6	34.1	42.7	53.3	65.7	85.4	122.0	71	0.87	0.88	Ke DN 10
27	11.45	31.1	39.8	49.8	62.2	76.6	99.6	142.3	61	0.87	0.88	Ke DN 10
30	14.14	38.4	49.2	61.5	76.8	94.6	122.9	175.7	49	0.88	0.89	Ke DN 10
36	20.36	55.3	70.8	88.5	110.6	136.2	177.1	253.0	34	0.88	0.89	Ke DN 16
40	25.13	68.3	87.4	109.3	136.6	168.2	218.6	312.3	27	0.89	0.89	Ke DN 16
44	30.41	82.6	105.8	132.2	165.3	203.5	264.5	377.9	23	0.89	0.89	Ke DN 16
50	39.27	106.7	136.6	170.8	213.5	262.8	341.6	488.0	17	0.89	0.89	Ke DN 16
60	56.55	153.7	196.7	245.9	307.4	378.4	491.9	702.8	12	0.89	0.90	Ke DN 16/25
65	66.37	180.4	230.9	288.6	360.8	444.1	577.3	824.8	10	0.89	0.90	Ke DN 16/25
80	100.53	273.3	349.8	437.3	546.6	672.7	874.6	1,249.4	6	0.89	0.90	Ke DN 25



2.3 Hydraulic Diaphragm Metering Pumps

Technical data for MFS 35 single head pump 60 Hz

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	44 [2] l/h	55 [3] l/h	70 [4] l/h	88 [5] l/h	110 [6] l/h	135 [7] l/h	176 [8] l/h	bar			
7	0.77	2.0	2.5	3.2	4.0	5.0	6.2	8.1	400	0.50	0.70	DK DN 3
8	1.01	2.6	3.3	4.2	5.3	6.6	8.1	10.6	400	0.50	0.70	DK DN 3
10	1.57	4.1	5.1	6.6	8.2	10.3	12.7	16.5	400	0.50	0.70	Ke DN 6
11	1.90	5.0	6.2	8.0	10.0	12.5	15.4	20.0	368	0.79	0.85	Ke DN 6
12	2.26	5.9	7.4	9.5	11.9	14.9	18.3	23.8	309	0.79	0.85	Ke DN 6
14	3.08	8.1	10.1	13.0	16.2	20.3	25.0	32.5	227	0.81	0.85	Ke DN 6
16	4.02	10.6	13.2	16.9	21.2	26.5	32.6	42.4	174	0.83	0.86	Ke DN 6
18	5.09	13.4	16.7	21.5	26.8	33.5	41.3	53.7	137	0.84	0.87	Ke DN 6
20	6.28	16.5	20.7	26.5	33.1	41.4	51.0	66.3	111	0.86	0.88	Ke DN 6
22	7.60	20.0	25.0	32.1	40.1	50.1	61.7	80.2	92	0.86	0.88	Ke DN 10/6
25	9.82	25.9	32.4	41.4	51.8	64.8	79.7	103.6	71	0.87	0.88	Ke DN 10
27	11.45	30.2	37.7	48.3	60.4	75.5	93.0	120.9	61	0.87	0.88	Ke DN 10
30	14.14	37.3	46.6	59.7	74.6	93.3	114.8	149.2	49	0.88	0.89	Ke DN 10
36	20.36	53.7	67.1	85.9	107.4	134.3	165.3	214.9	34	0.88	0.89	Ke DN 16
40	25.13	66.3	82.9	106.1	132.7	165.8	204.1	265.4	27	0.89	0.89	Ke DN 16
44	30.41	80.2	100.3	128.4	160.5	200.7	247.0	321.1	23	0.89	0.89	Ke DN 16
50	39.27	103.6	129.5	165.8	207.3	259.1	318.9	414.6	17	0.89	0.89	Ke DN 16
60	56.55	149.2	186.6	238.8	298.5	373.2	459.3	597.1	12	0.89	0.90	Ke DN 16/25
65	66.37	175.2	219.0	280.3	350.4	438.0	539.1	700.8	10	0.89	0.90	Ke DN 16/25
80	100.53	265.4	331.7	424.6	530.8	663.5	816.6	1,061.6	6	0.89	0.90	Ke DN 25

DK Double ball valve

Ke Conical valve

Note:

- Abridged presentation of our complete product range. Other types on request
- Allow for a minimum 10% power reserve when designing in accordance with API
- All hydraulic performance data is based on water at 20 °C

Hydraulic diaphragm metering pump Orlita® MFS35 (MF2a)

Code	Description
MF2a	**Drive type**
V1 **	Main power end, single, vertical
Z1 **	Main power end, single, central
AL	Drive module left-hand
AR	Drive module right-hand
M *	Modified
	Plunger diameter
007	7 mm
008	8 mm
010	10 mm
011	11 mm
012	12 mm
014	14 mm
016	16 mm
018	18 mm
020	20 mm
022	22 mm
025	25 mm
027	27 mm
030	30 mm
036	36 mm
040	40 mm
044	44 mm
050	50 mm
060	60 mm
065	65 mm
080	80 mm
	Stroke rate 50 (60) Hz
2	-/44 strokes/min
3	45 (55) strokes/min
4	58 (70) Strokes/min
5	73 (88) Strokes/min
6	91 (110) Strokes/min
7	112 (135) Strokes/min
8	145 (176) Strokes/min
9	207 (-) Strokes/min
	Liquid end material (including valve materials)
S1	Stainless steel (see table, sheet 2)
	Temperature of pumped medium
0	-10 °C to 80 °C
1	-25 °C to 60 °C
2	-40 °C to 60 °C
3	10 °C to 115 °C
4	10 °C to 150 °C
	Displacer format
0	PTFE multi-layer diaphragm
1	PTFE multi-layer diaphragm with pressure gauge
	Liquid end version
0	standard
1	Standard with spring
2	Standard double valve
3	Standard double valve with spring
	Hydraulic connection suction side
G	Thread DIN/ISO
N	Thread NPT/ANSI
A	Flange ANSI
D	Flange DIN/ISO
	Hydraulic connection discharge side
G	Thread DIN/ISO
N	Thread NPT/ANSI
A	Flange ANSI
D	Flange DIN/ISO
	version
0	no features
1	Liquid end heating
2	Liquid end polished
3	Special paint finish
	Power connector
A	Standard voltage 50 Hz
B	Standard voltage 50 Hz adjustable
H	Standard voltage 60 Hz

* Modified design (M) is possible for each feature of the identity code.

** Further pump compositions, see power end shape on page → <cbpagelink offset="1" page="$KT-PK-DT-PR-$KP-HYDMPUMPS-$PG-PK1-59" />

												K	Standard voltage 60 Hz adjustable						
												0	Externally mounted pump						
												1	without motor with IEC flange						
												2	without motor with NEMA flange						
													Electrical protection system / explosion protection						
													0	IP 55					
													1	IP 56					
													A	IP 55 EExn					
													B	IP 55 EExe					
													C	IP 55 EExde					
													D	IP 56 EExn					
													E	IP 56 EExe					
													F	IP 56 EExde					
													K	IP 65 EExde					
														Electrical options					
														0	no options				
														1	Stroke sensor				
															Stroke length adjustment				
															0	manual			
															1	0/4-20 mA without Ex			
															2	0/4-20 mA Ex Zone 2			
															3	0/4-20 mA Ex Zone 1			
															4	0/4-20 mA without EX offshore			
															5	0/4-20 mA Ex Zone 2 offshore			
															6	0/4-20 mA Ex Zone 1 offshore			
																Ambient conditions			
																0	-20 °C to 40 °C		
																1	-40 °C to 40 °C		
																2	0 °C to 55 °C		
																	Approvals		
																	0	CE	
																	1	API 675	
																	2	VDMA	
																	3	ATEX	
																	4	ATEX / API 675	
																	5	VDMA / ATEX	

* Modified design (M) is possible for each feature of the identity code.

** Further pump compositions, see power end shape on page → <cbpagelink offset="1" page="$KT-PK-DT-PR-$KP-HYDMPUMPS-$PG-PK1-59" />

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for MFS 80 single head pump 50 Hz

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/ stroke	104 [4] l/h	122 [5] l/h	134 [6] l/h	155 [7] l/h	160 [8] l/h	182 [9] l/h	193 [F] l/h	bar			
16	4.02	25	29	32	37	38	43	46	400	0.75	0.83	Ke DN 6
20	6.28	39	46	50	58	60	68	72	400	0.75	0.83	Ke DN 6
22	7.60	47	55	61	70	73	82	87	360	0.79	0.80	Ke DN 10/6
25	9.82	61	71	79	91	94	107	113	285	0.79	0.85	Ke DN 10
27	11.45	71	83	92	106	109	125	132	244	0.81	0.85	Ke DN 10
29	13.21	82	96	106	122	126	144	152	211	0.82	0.85	Ke DN 10
30	14.14	88	103	113	131	135	154	163	198	0.83	0.86	Ke DN 10
36	20.36	126	149	164	189	195	222	235	137	0.85	0.87	Ke DN 16
40	25.13	156	184	202	233	241	274	290	111	0.86	0.88	Ke DN 16
44	30.41	189	222	245	282	292	331	351	98	0.86	0.88	Ke DN 16
46	33.24	207	243	268	309	319	362	384	84	0.86	0.88	Ke DN 16
50	39.27	244	287	316	365	377	428	453	71	0.87	0.88	Ke DN 16
60	56.55	352	414	455	526	543	617	653	50	0.88	0.89	Ke DN 16/25
65	66.37	413	486	535	617	637	724	766	40	0.88	0.89	Ke DN 16/25
80	100.53	626	736	810	935	965	1,097	1,161	25	0.89	0.89	Ke DN 25
100	157.08	979	1,150	1,266	1,461	1,508	1,714	1,814	17	0.89	0.89	Ke DN 32

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for MFS 80 single head pump 60 Hz

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/ stroke	119 [3] l/h	126 [4] l/h	163 [7] l/h	188 [7] l/h	194 [8] l/h	221 [9] l/h	148 [6] l/h	bar			
16	4.02	28	30	39	45	46	53	35	400	0.75	0.83	Ke DN 6
20	6.28	44	47	61	70	73	83	55	400	0.75	0.83	Ke DN 6
22	7.60	54	57	74	85	88	100	67	360	0.79	0.80	Ke DN 10/6
25	9.82	70	74	96	110	114	130	87	285	0.79	0.85	Ke DN 10
27	11.45	81	86	112	129	133	151	101	244	0.81	0.85	Ke DN 10
29	13.21	94	100	129	149	153	175	117	211	0.82	0.85	Ke DN 10
30	14.14	101	107	138	159	164	187	125	198	0.83	0.86	Ke DN 10
36	20.36	145	154	199	229	237	269	180	137	0.85	0.87	Ke DN 16
40	25.13	179	190	245	283	292	333	223	111	0.86	0.88	Ke DN 16
44	30.41	217	230	297	343	354	402	270	98	0.86	0.88	Ke DN 16
46	33.24	237	251	325	375	387	440	295	84	0.86	0.88	Ke DN 16
50	39.27	280	297	384	443	457	520	349	71	0.87	0.88	Ke DN 16
60	56.55	404	428	553	638	659	749	502	50	0.88	0.89	Ke DN 16/25
65	66.37	474	502	649	749	773	879	589	40	0.88	0.89	Ke DN 16/25
80	100.53	718	761	983	1,134	1,171	1,332	893	25	0.89	0.89	Ke DN 25
100	157.08	1,123	1,189	1,537	1,774	1,830	2,081	1,396	17	0.89	0.89	Ke DN 32

Ke Conical valve

Note:

- Abridged presentation of our complete product range. Other types on request
- Allow for a minimum 10% power reserve when designing in accordance with API
- All hydraulic performance data is based on water at 20 °C

2.3 Hydraulic Diaphragm Metering Pumps

Hydraulic diaphragm metering pump Orlita® MFS80 (MF3a)

MF3a	Drive type												
	H1 *	Main power end, single, horizontal											
	V1 *	Main power end, single, vertical											
	Z1 *	Main power end, single, central											
	AL	Drive module left-hand											
	AR	Drive module right-hand											
	M **	Modified											
		Plunger diameter											
		016	16 mm										
		020	20 mm										
		022	22 mm										
		025	25 mm										
		027	27 mm										
		029	29 mm										
		030	30 mm										
		036	36 mm										
		040	40 mm										
		044	44 mm										
		046	46 mm										
		050	50 mm										
		060	60 mm										
		065	65 mm										
		080	80 mm										
		100	100 mm										
			Stroke rate 50 (60) Hz										
			3	- (119) Strokes/min									
			4	104 (126) strokes/min									
			5	122 (148) Strokes/min									
			6	134 (163) Strokes/min									
			7	155 (188) Strokes/min									
			8	160 (194) Strokes/min									
			9	182 (221) strokes/min									
			F	193 (-) Strokes/min									
				Liquid end material (including valve materials)									
				S1	Stainless steel (see table, sheet 2)								
					Temperature of pumped medium								
					0	-10 °C to 80 °C							
					1	-25 °C to 60 °C							
					2	-40 °C to 60 °C							
					3	10 °C to 115 °C							
					4	10 °C to 150 °C							
						Displacer format							
						0	PTFE multi-layer diaphragm						
						1	PTFE multi-layer diaphragm with pressure gauge						
							Liquid end version						
							0	standard					
							1	Standard with spring					
							2	Standard double valve					
							3	Standard double valve with spring					
								Hydraulic connection suction side					
								G	Thread DIN/ISO				
								N	Thread NPT/ANSI				
								A	Flange ANSI				
								D	Flange DIN/ISO				
									Hydraulic connection discharge side				
									G	Thread DIN/ISO			
									N	Thread NPT/ANSI			
									A	Flange ANSI			
									D	Flange DIN/ISO			
										version			
										0	no features		
										1	Liquid end heating		
										2	Liquid end polished		
										3	Special paint finish		
											Power connector		
											A	Standard voltage 50 Hz	
											B	Standard voltage 50 Hz adjustable	
											H	Standard voltage 60 Hz	
											K	Standard voltage 60 Hz adjustable	
											0	Externally mounted pump	
											1	without motor with IEC flange	

* Further pump compositions, see power end shape on page → <cbpagelink offset="1" page="$KT-PK-DT-PR-$KP-HYDMPUMPS-$PG-PK1-59" />

** Modified design (M) is possible for each feature of the identity code.

												2	without motor with NEMA flange					
													Electrical protection system / explosion protection					
													0	IP 55				
													1	IP 56				
													A	IP 55 EExn				
													B	IP 55 EExe				
													C	IP 55 EExde				
													D	IP 56 EExn				
													E	IP 56 EExe				
													F	IP 56 EExde				
													K	IP 65 EExde				
														Electrical options				
														0	no options			
														1	Stroke sensor			
															Stroke length adjustment			
															0	manual		
															1	0/4-20 mA without Ex		
															2	0/4-20 mA Ex Zone 2		
															3	0/4-20 mA Ex Zone 1		
															4	0/4-20 mA without EX offshore		
															5	0/4-20 mA Ex Zone 2 offshore		
															6	0/4-20 mA Ex Zone 1 offshore		
																Ambient conditions		
																0	-20 °C to 40 °C	
																1	-40 °C to 40 °C	
																2	0 °C to 55 °C	
																	Approvals	
																	0	CE
																	1	API 675
																	2	VDMA
																	3	ATEX
																	4	ATEX / API 675
																	5	VDMA / ATEX

* Further pump compositions, see power end shape on page → <cbpagelink offset="1" page="$KT-PK-DT-PR-$KP-HYDMPUMPS-$PG-PK1-59" />

** Modified design (M) is possible for each feature of the identity code.

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for MFS 180 single head pump 50 Hz

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/ stroke	92 [4] l/h	107 [5] l/h	117 [6] l/h	134 [7] l/h	152 [8] l/h	171 [9] l/h	200 [F] l/h	bar			
25	19.63	107	126	138	157	178	201	235	366	0.77	0.83	Ke DN 16
30	28.27	155	181	199	226	257	290	339	254	0.81	0.85	Ke DN 16
36	40.72	223	262	286	326	370	417	489	176	0.83	0.86	Ke DN 16
40	50.27	276	323	353	403	457	515	604	143	0.85	0.87	Ke DN 25
44	60.82	334	391	428	488	553	623	730	118	0.85	0.87	Ke DN 25
50	78.54	431	505	552	630	714	805	943	91	0.86	0.88	Ke DN 25
55	95.03	521	611	668	762	864	974	1,141	75	0.87	0.88	Ke DN 32
60	113.10	621	727	796	907	1,029	1,160	1,359	63	0.87	0.89	Ke DN 32
65	132.73	729	854	934	1,065	1,207	1,361	1,594	54	0.88	0.89	Ke DN 32
70	153.94	845	990	1,083	1,235	1,400	1,579	1,849	46	0.88	0.89	Ke DN 40
75	176.71	970	1,137	1,243	1,418	1,608	1,812	2,123	40	0.88	0.89	Ke DN 40
80	201.06	1,104	1,293	1,415	1,613	1,829	2,062	2,416	35	0.88	0.89	Ke DN 40
85	226.98	1,246	1,460	1,597	1,821	2,065	2,328	2,727	31	0.88	0.89	Ke DN 40
90	254.47	1,397	1,637	1,791	2,042	2,315	2,610	3,057	28	0.89	0.89	Ke DN 40
95	283.53	1,557	1,824	1,995	2,275	2,590	2,908	3,407	25	0.89	0.89	Pt DN 50
100	314.16	1,725	2,021	2,211	2,521	2,858	3,223	3,775	22	0.89	0.89	Pt DN 50
115	415.48	2,281	2,673	2,924	3,334	3,781	4,262	4,992	17	0.89	0.89	Pt DN 65
125	490.87	2,696	3,158	3,455	3,939	4,467	5,036		14	0.89	0.90	Pt DN 65
135	572.56	3,144	3,684	4,030	4,595	5,210	5,874	6,880	12	0.89	0.90	Pt DN 65
142	633.47	3,479	4,076	4,458	5,084	5,764	6,499	7,612	11	0.89	0.90	Pt DN 65

Technical data for MFS 180 single head pump 60 Hz

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/ stroke	98 [3] l/h	111 [4] l/h	130 [5] l/h	142 [6] l/h	162 [7] l/h	184 [8] l/h	208 [9] l/h	bar			
25	19.63	116	130	153	167	216	244	244	352	0.77	0.83	Ke DN 16
30	28.27	167	188	220	241	275	312	352	254	0.81	0.85	Ke DN 16
36	40.72	240	271	318	347	396	449	507	176	0.83	0.86	Ke DN 16
40	50.27	297	335	392	429	489	555	625	143	0.85	0.87	Ke DN 25
44	60.82	359	405	475	519	592	671	757	118	0.85	0.87	Ke DN 25
50	78.54	464	523	613	671	765	867	978	91	0.86	0.88	Ke DN 25
55	95.03	561	633	742	811	925	1,049	1,183	75	0.87	0.88	Ke DN 32
60	113.10	668	753	883	966	1,101	1,249	1,408	63	0.87	0.89	Ke DN 32
65	132.73	784	884	1,036	1,134	1,293	1,466	1,652	54	0.88	0.89	Ke DN 32
70	153.94	909	1,026	1,202	1,315	1,499	1,700	1,916	46	0.88	0.89	Ke DN 40
75	176.71	1,044	1,178	1,380	1,509	1,721	1,951	2,200	40	0.88	0.89	Ke DN 40
80	201.06	1,188	1,340	1,570	1,717	1,958	2,220	2,503	35	0.88	0.89	Ke DN 40
85	226.98	1,341	1,513	1,772	1,939	2,211	2,507	2,826	31	0.88	0.89	Ke DN 40
90	254.47	1,503	1,696	1,987	2,174	2,478	2,810	3,168	28	0.89	0.89	Ke DN 40
95	283.53	1,675	1,890	2,214	2,422	2,762	3,131	3,530	25	0.89	0.89	Pt DN 50
100	314.16	1,856	2,094	2,453	2,684	3,060	3,470	3,912	22	0.89	0.89	Pt DN 50
115	415.48	2,455	2,769	3,245	3,549	4,047	4,589	5,173	17	0.89	0.89	Pt DN 65
125	490.87	2,900	3,272	3,834	4,193	4,781	5,422		14	0.89	0.90	Pt DN 65
135	572.56	3,383	3,817	4,472	4,891	5,577	6,324		11	0.89	0.90	Pt DN 65
142	633.47	3,743	4,223	4,947	5,412	6,171	6,997		11	0.89	0.90	Pt DN 65

Ke Conical valve

Pt Plate valve

Note:

- Abridged presentation of our complete product range. Other types on request
- Allow for a minimum 10% power reserve when designing in accordance with API
- All hydraulic performance data is based on water at 20 °C

2.3 Hydraulic Diaphragm Metering Pumps

Hydraulic diaphragm metering pump Orlita® MFS180 (MF4a)

MF4a	**Drive type**
H1 *	Main power end, single, horizontal
V1 *	Main power end, single, vertical
Z1 *	Main power end, single, central
AL	Drive module left-hand
AR	Drive module right-hand
M **	Modified
	Plunger diameter
025	25 mm
030	30 mm
036	36 mm
040	40 mm
044	44 mm
050	50 mm
055	55 mm
060	60 mm
065	65 mm
070	70 mm
075	75 mm
080	80 mm
085	85 mm
090	90 mm
095	95 mm
100	100 mm
115	115 mm
125	125 mm
135	135 mm
142	142 mm
	Stroke rate 50 (60) Hz
3	- (98) Strokes/min
4	92 (111) strokes/min
5	107 (130) Strokes/min
6	117 (142) Strokes/min
7	134 (162) Strokes/min
8	152 (184) Strokes/min
9	171 (208) strokes/min
F	200 (-) Strokes/min
	Liquid end material (including valve materials)
S1	Stainless steel (see table, sheet 2)
	Temperature of pumped medium
0	-10 °C to 80 °C
1	-25 °C to 60 °C
2	-40 °C to 60 °C
3	10 °C to 115 °C
4	10 °C to 150 °C
	Displacer format
0	PTFE multi-layer diaphragm
1	PTFE multi-layer diaphragm with pressure gauge
	Liquid end version
0	standard
1	Standard with spring
2	Standard double valve
3	Standard double valve with spring
	Hydraulic connection suction side
G	Thread DIN/ISO
N	Thread NPT/ANSI
A	Flange ANSI
D	Flange DIN/ISO
	Hydraulic connection discharge side
G	Thread DIN/ISO
N	Thread NPT/ANSI
A	Flange ANSI
D	Flange DIN/ISO
	version
0	no features
1	Liquid end heating
2	Liquid end polished
3	Special paint finish
	Power connector
A	Standard voltage 50 Hz
B	Standard voltage 50 Hz adjustable

* Further pump compositions, see power end shape on page → <cbpagelink offset="1" page="$KT-PK-DT-PR-$KP-HYDMPUMPS-$PG-PK1-59" />

** Modified design (M) is possible for each feature of the identity code.

2.3 Hydraulic Diaphragm Metering Pumps

												H	Standard voltage 60 Hz					
												K	Standard voltage 60 Hz adjustable					
												0	Externally mounted pump					
												1	without motor with IEC flange					
												2	without motor with NEMA flange					
													Electrical protection system / explosion protection					
													0	IP 55				
													1	IP 56				
													A	IP 55 EExn				
													B	IP 55 EExe				
													C	IP 55 EExde				
													D	IP 56 EExn				
													E	IP 56 EExe				
													F	IP 56 EExde				
													K	IP 65 EExde				
														Electrical options				
														0	no options			
														1	Stroke sensor			
															Stroke length adjustment			
															0	manual		
															1	0/4-20 mA without Ex		
															2	0/4-20 mA Ex Zone 2		
															3	0/4-20 mA Ex Zone 1		
															4	0/4-20 mA without EX offshore		
															5	0/4-20 mA Ex Zone 2 offshore		
															6	0/4-20 mA Ex Zone 1 offshore		
																Ambient conditions		
																0	-20 °C to 40 °C	
																1	-40 °C to 40 °C	
																2	0 °C to 55 °C	
																	Approvals	
																	0	CE
																	1	API 675
																	2	VDMA
																	3	ATEX
																	4	ATEX / API 675
																	5	VDMA / ATEX

* Further pump compositions, see power end shape on page → <cbpagelink offset="1" page="$KT-PK-DT-PR-$KP-HYDMPUMPS-$PG-PK1-59" />

** Modified design (M) is possible for each feature of the identity code.

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for MFS 600 single head pump 50 Hz

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/ stroke	90 [4] l/h	99 [5] l/h	117 [6] l/h	134 [7] l/h	156 [8] l/h	173 [9] l/h	204 [F] l/h	bar			
36	40.72	219	242	285	327	381	422	497	392	0.76	0.83	Ke DN 16
38	45.36	244	269	318	364	424	470	554	352	0.77	0.83	Ke DN 16
40	50.27	270	299	352	404	470	521	614	318	0.78	0.84	Ke DN 16
44	60.82	327	361	427	488	569	630	743	263	0.80	0.85	Ke DN 25
46	66.48	357	395	466	534	622	689	812	240	0.81	0.85	Ke DN 25
50	78.54	422	467	551	631	735	814	959	221	0.83	0.86	Ke DN 25
55	95.03	511	565	667	764	889	985	1,161	168	0.84	0.87	Ke DN 25
60	113.10	608	673	794	909	1,059	1,172	1,381	141	0.85	0.87	Ke DN 25
65	132.73	714	789	932	1,067	1,243	1,376	1,621	120	0.85	0.87	Ke DN 32
70	153.94	828	916	1,080	1,237	1,441	1,596	1,880	100	0.90	0.88	Ke DN 32
75	176.71	950	1,051	1,240	1,420	1,654	1,832	2,159	90	0.86	0.88	Ke DN 32
80	201.06	1,081	1,196	1,411	1,616	1,882	2,084	2,456	79	0.87	0.88	Ke DN 40
85	226.98	1,221	1,350	1,593	1,825	2,125	2,353	2,773	70	0.87	0.88	Ke DN 40
90	254.47	1,369	1,514	1,786	2,046	2,383	2,638	3,109	62	0.87	0.88	Ke DN 40
95	283.53	1,525	1,687	1,990	2,279	2,655	2,940	3,464	56	0.87	0.88	Ke DN 50
100	314.16	1,690	1,869	2,205	2,526	2,942	3,257	3,838	50	0.88	0.89	Ke DN 50
115	415.48	2,235	2,472	2,917	3,340	3,890	4,308	5,076	38	0.88	0.89	Ke DN 65
125	490.87	2,641	2,921	3,446	3,946	4,596	5,090	5,998	32	0.89	0.89	Ke DN 65
135	572.56	3,080	3,407	4,020	4,603	5,361	5,937	6,996	26	0.89	0.89	Ke DN 65
142	633.47	3,408	3,769	4,448	5,093	5,932	6,568	7,740	20	0.89	0.89	Ke DN 65

Technical data for MFS 600 single head pump 60 Hz

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/ stroke	96 [3] l/h	109 [4] l/h	120 [5] l/h	142 [6] l/h	163 [7] l/h	189 [8] l/h	210 [9] l/h	bar			
36	40.72	235	265	294	347	397	462	512	392	0.76	0.83	Ke DN 16
38	45.36	262	296	327	386	442	515	570	352	0.77	0.83	Ke DN 16
40	50.27	291	328	363	428	490	571	632	318	0.78	0.84	Ke DN 16
44	60.82	352	397	439	518	593	691	765	263	0.80	0.85	Ke DN 25
46	66.48	384	434	480	566	648	755	836	240	0.81	0.85	Ke DN 25
50	78.54	454	512	567	669	765	892	988	200	0.83	0.86	Ke DN 25
55	95.03	550	620	686	809	926	1,080	1,196	168	0.84	0.87	Ke DN 25
60	113.10	654	738	816	963	1,102	1,285	1,423	141	0.85	0.87	Ke DN 25
65	132.73	768	866	958	1,131	1,294	1,508	1,670	120	0.85	0.87	Ke DN 40
70	153.94	891	1,005	1,111	1,312	1,501	1,749	1,937	100	0.90	0.88	Ke DN 32
75	176.71	1,023	1,154	1,276	1,506	1,723	2,008	2,224	90	0.86	0.88	Ke DN 32
80	201.06	1,164	1,313	1,452	1,713	1,960	2,285	2,530	79	0.87	0.88	Ke DN 40
85	226.98	1,314	1,482	1,639	1,934	2,213	2,580	2,856	70	0.87	0.88	Ke DN 40
90	254.47	1,473	1,661	1,838	2,168	2,481	2,892	3,202	62	0.87	0.88	Ke DN 40
95	283.53	1,641	1,851	2,047	2,416	2,767	3,222	3,568	56	0.87	0.88	Ke DN 50
100	314.16	1,818	2,051	2,269	2,677	3,063	3,571	3,954	50	0.88	0.89	Ke DN 50
115	415.48	2,405	2,713	3,000	3,541	4,051	4,722	5,229	38	0.88	0.89	Ke DN 65
125	490.87	2,841	3,205	3,545	4,183	4,786	5,579		32	0.89	0.89	Ke DN 65
135	572.56	3,314	3,739	4,135	4,879	5,587	6,508	7,206	26	0.89	0.89	Ke DN 65
142	633.47	3,667	4,136	4,575	5,399	6,182	7,200	7,973	20	0.89	0.89	Ke DN 65

Ke Conical valve

Note:

- Abridged presentation of our complete product range. Other types on request
- Allow for a minimum 10% power reserve when designing in accordance with API
- All hydraulic performance data is based on water at 20 °C

2.3 Hydraulic Diaphragm Metering Pumps

Hydraulic diaphragm metering pump Orlita® MFS600 (MF5a)

MF5a	Drive type												
	H1 *	Main power end, single, horizontal											
	V1 *	Main power end, single, vertical											
	Z1 *	Main power end, single, central											
	AL	Drive module left-hand											
	AR	Drive module right-hand											
	M **	Modified											
		Plunger diameter											
		036	36 mm										
		038	38 mm										
		040	40 mm										
		044	44 mm										
		046	46 mm										
		050	50 mm										
		055	55 mm										
		060	60 mm										
		065	65 mm										
		070	70 mm										
		075	75 mm										
		080	80 mm										
		085	85 mm										
		090	90 mm										
		095	95 mm										
		100	100 mm										
		115	115 mm										
		125	125 mm										
		135	135 mm										
		142	142 mm										
			Stroke rate 50 (60) Hz										
			3	- (96) Strokes/min									
			4	90 (109) strokes/min									
			5	99 (120) Strokes/min									
			6	117 (142) Strokes/min									
			7	134 (163) Strokes/min									
			8	156 (189) Strokes/min									
			9	173 (210) strokes/min									
			F	204 (-) Strokes/min									
				Liquid end material (including valve materials)									
				S1	Stainless steel (see table, sheet 2)								
					Temperature of pumped medium								
					0	-10 °C to 80 °C							
					1	-25 °C to 60 °C							
					2	-40 °C to 60 °C							
					3	10 °C to 115 °C							
					4	10 °C to 150 °C							
						Displacer format							
						0	PTFE multi-layer diaphragm						
						1	PTFE multi-layer diaphragm with pressure gauge						
							Liquid end version						
							0	standard					
							1	Standard with spring					
							2	Standard double valve					
							3	Standard double valve with spring					
								Hydraulic connection suction side					
								G	Thread DIN/ISO				
								N	Thread NPT/ANSI				
								A	Flange ANSI				
								D	Flange DIN/ISO				
									Hydraulic connection discharge side				
									G	Thread DIN/ISO			
									N	Thread NPT/ANSI			
									A	Flange ANSI			
									D	Flange DIN/ISO			
										version			
										0	no features		
										1	Liquid end heating		
										2	Liquid end polished		
										3	Special paint finish		
											Power connector		
											A	Standard voltage 50 Hz	
											B	Standard voltage 50 Hz adjustable	

* Further pump compositions, see power end shape on page → <cbpagelink offset="1" page="$KT-PK-DT-PR-$KP-HYDMPUMPS-$PG-PK1-59" />

** Modified design (M) is possible for each feature of the identity code.

												H	Standard voltage 60 Hz					
												K	Standard voltage 60 Hz adjustable					
												0	Externally mounted pump					
												1	without motor with IEC flange					
												2	without motor with NEMA flange					
													Electrical protection system / explosion protection					
													0	IP 55				
													1	IP 56				
													A	IP 55 EExn				
													B	IP 55 EExe				
													C	IP 55 EExde				
													D	IP 56 EExn				
													E	IP 56 EExe				
													F	IP 56 EExde				
													K	IP 65 EExde				
														Electrical options				
														0	no options			
														1	Stroke sensor			
															Stroke length adjustment			
															0	manual		
															1	0/4-20 mA without Ex		
															2	0/4-20 mA Ex Zone 2		
															3	0/4-20 mA Ex Zone 1		
															4	0/4-20 mA without EX offshore		
															5	0/4-20 mA Ex Zone 2 offshore		
															6	0/4-20 mA Ex Zone 1 offshore		
																Ambient conditions		
																0	-20 °C to 40 °C	
																1	-40 °C to 40 °C	
																2	0 °C to 55 °C	
																	Approvals	
																	0	CE
																	1	API 675
																	2	VDMA
																	3	ATEX
																	4	ATEX / API 675
																	5	VDMA / ATEX

* Further pump compositions, see power end shape on page → <cbpagelink offset="1" page="$KT-PK-DT-PR-$KP-HYDMPUMPS-$PG-PK1-59" />

** Modified design (M) is possible for each feature of the identity code.

2.3 Hydraulic Diaphragm Metering Pumps

Technical data for MFS 1400 single head pump 50 Hz

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 50 % pressure	Efficiency at 100 % pressure	Standard type of valve
mm	ml/ stroke	80 [4] l/h	93 [5] l/h	106 [6] l/h	125 [7] l/h	143 [8] l/h	169 [9] l/h	191 [F] l/h	bar			
30	42.41	202	235	270	318	364	431	486	630	0.78	0.67	Ke DN 16
40	75.40	360	419	480	565	647	766	864	435	0.83	0.75	Ke DN 25
42	83.13	397	462	529	623	713	844	952	435	0.83	0.76	Ke DN 25
44	91.23	435	507	581	684	783	927	1,045	394	0.83	0.76	Ke DN 25
46	99.71	476	554	635	748	856	1,013	1,142	361	0.83	0.77	Ke DN 25
50	117.81	562	654	750	884	1,011	1,197	1,350	305	0.84	0.79	Ke DN 25
53	132.37	632	735	843	993	1,136	1,345	1,517	271	0.84	0.79	Ke DN 32
55	142.55	681	792	907	1,070	1,224	1,448	1,633	250	0.85	0.81	Ke DN 25
57	153.11	731	851	975	1,149	1,314	1,556	1,754	235	0.85	0.81	Ke DN 32
60	169.65	810	943	1,080	1,273	1,456	1,724	1,944	212	0.86	0.82	Ke DN 25
65	199.10	951	1,106	1,268	1,494	1,709	2,023	2,282	180	0.87	0.83	Ke DN 32
70	230.91	1,103	1,283	1,470	1,733	1,983	2,346	2,646	155	0.87	0.84	Ke DN 40
75	265.07	1,266	1,473	1,688	1,989	2,276	2,694	3,038	135	0.87	0.85	Ke DN 40
80	301.59	1,440	1,676	1,920	2,263	2,590	3,065	3,456	119	0.87	0.85	Ke DN 40
90	381.70	1,823	2,121	2,431	2,865	3,278	3,879	4,375	94	0.90	0.90	Ke DN 50
100	471.24	2,251	2,619	3,001	3,537	4,047	4,789	5,401	76	0.88	0.87	Ke DN 65
120	678.58	3,242	3,772	4,321	5,093	5,827	6,896	7,778	53	0.89	0.88	Ke DN 65
140	923.63	4,412	5,134	5,882	6,933	7,932	9,387	10.587	38	0.89	0.88	Ke DN 80
160	1,206.37	5,763	6,706	7,683	9,055	10.360	12,261	13,827	29	0.89	0.89	Ke DN 80

Technical data for MFS 1400 single head pump 60 Hz

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 50 % pressure	Efficiency at 100 % pressure	Standard type of valve
mm	ml/ stroke	88 [3] l/h	97 [4] l/h	112 [5] l/h	129 [6] l/h	152 [7] l/h	174 [8] l/h	206 [9] l/h	bar			
30	42.41	223	245	286	327	386	442	523	630	0.78	0.67	Ke DN 16
40	75.40	396	437	508	582	686	785	930	435	0.83	0.75	Ke DN 25
42	83.13	437	482	560	642	757	866	1,025	435	0.83	0.76	Ke DN 25
44	91.23	480	529	615	705	831	951	1,125	394	0.83	0.76	Ke DN 25
46	99.71	524	578	672	770	908	1,039	1,230	361	0.83	0.77	Ke DN 25
50	117.81	619	683	794	910	1,073	1,228	1,453	305	0.84	0.79	Ke DN 25
53	132.37	696	767	893	1,023	1,206	1,379	1,632	271	0.84	0.79	Ke DN 32
55	142.55	750	826	961	1,102	1,298	1,486	1,758	250	0.85	0.81	Ke DN 25
57	153.11	805	887	1,033	1,183	1,394	1,596	1,888	235	0.85	0.81	Ke DN 32
60	169.65	892	983	1,144	1,311	1,545	1,768	2,092	212	0.86	0.82	Ke DN 25
65	199.10	1,047	1,154	1,343	1,539	1,814	2,075	2,456	180	0.87	0.83	Ke DN 32
70	230.91	1,214	1,339	1,558	1,785	2,103	2,407	2,848	155	0.87	0.84	Ke DN 40
75	265.07	1,394	1,537	1,788	2,049	2,415	2,763	3,270	135	0.87	0.85	Ke DN 40
80	301.59	1,586	1,748	2,035	2,331	2,747	3,143	3,720	119	0.87	0.85	Ke DN 40
90	381.70	2,008	2,213	2,575	2,950	3,477	3,979	4,200	94	0.90	0.90	Ke DN 50
100	471.24	2,479	2,732	3,179	3,642	4,293	4,912	4,708	76	0.88	0.87	Ke DN 65
120	678.58	3,570	3,935	4,578	5,245	6,182	7,073	8,371	53	0.89	0.88	Ke DN 65
140	923.21	4,859	5,356	6,232	7,140	8,415	9,628		38	0.89	0.88	Ke DN 80
160	1,206.37	6,347	6,995	8,140	9,325	10.991	12,575		29	0.89	0.89	Ke DN 80

Ke Conical valve

Note:

- Abridged presentation of our complete product range. Other types on request
- Allow for a minimum 10% power reserve when designing in accordance with API
- All hydraulic performance data is based on water at 20 °C

2.3 Hydraulic Diaphragm Metering Pumps

Hydraulic diaphragm metering pump Orlita® MFS1400 (MF6a)

MF6a	Drive type
H1 *	Main power end, single, horizontal
V1 *	Main power end, single, vertical
Z1 *	Main power end, single, central
AL	Drive module left-hand
AR	Drive module right-hand
M **	Modified
	Plunger diameter
030	30 mm
040	40 mm
042	42 mm
044	44 mm
046	46 mm
050	50 mm
053	53 mm
055	55 mm
057	57 mm
060	60 mm
065	65 mm
070	70 mm
075	75 mm
080	80 mm
090	90 mm
100	100 mm
120	120 mm
140	140 mm
160	160 mm
	Stroke rate 50 (60) Hz
3	- (88) Strokes/min
4	80 (97) strokes/min
5	93 (112) Strokes/min
6	106 (129) Strokes/min
7	125 (152) Strokes/min
8	143 (174) Strokes/min
9	169 (206) strokes/min
F	191 (-)
	Liquid end material (including valve materials)
S1	Stainless steel (see table, sheet 2)
	Temperature of pumped medium
0	-10 °C to 80 °C
1	-25 °C to 60 °C
2	-40 °C to 60 °C
3	10 °C to 115 °C
4	10 °C to 150 °C
	Displacer format
0	PTFE multi-layer diaphragm
1	PTFE multi-layer diaphragm with pressure gauge
	Liquid end version
0	standard
1	Standard with spring
2	Standard double valve
3	Standard double valve with spring
	Hydraulic connection suction side
G	Thread DIN/ISO
N	Thread NPT/ANSI
A	Flange ANSI
D	Flange DIN/ISO
	Hydraulic connection discharge side
G	Thread DIN/ISO
N	Thread NPT/ANSI
A	Flange ANSI
D	Flange DIN/ISO
	version
0	no features
1	Liquid end heating
2	Liquid end polished
3	Special paint finish
	Power connector
A	Standard voltage 50 Hz
B	Standard voltage 50 Hz adjustable
H	Standard voltage 60 Hz

* Further pump compositions, see power end shape on page → <cbpagelink offset="1" page="$KT-PK-DT-PR-$KP-HYDMPUMPS-$PG-PK1-59" />

** Modified design (M) is possible for each feature of the identity code.

												K	Standard voltage 60 Hz adjustable						
												0	Externally mounted pump						
												1	without motor with IEC flange						
												2	without motor with NEMA flange						
													Electrical protection system / explosion protection						
													0	IP 55					
													1	IP 56					
													A	IP 55 EExn					
													B	IP 55 EExe					
													C	IP 55 EExde					
													D	IP 56 EExn					
													E	IP 56 EExe					
													F	IP 56 EExde					
													K	IP 65 EExde					
														Electrical options					
														0	no options				
														1	Stroke sensor				
															Stroke length adjustment				
															0	manual			
															1	0/4-20 mA without Ex			
															2	0/4-20 mA Ex Zone 2			
															3	0/4-20 mA Ex Zone 1			
															4	0/4-20 mA without EX offshore			
															5	0/4-20 mA Ex Zone 2 offshore			
															6	0/4-20 mA Ex Zone 1 offshore			
																Ambient conditions			
																0	-20 °C to 40 °C		
																1	-40 °C to 40 °C		
																2	0 °C to 55 °C		
																	Approvals		
																	0	CE	
																	1	API 675	
																	2	VDMA	
																	3	ATEX	
																	4	ATEX / API 675	
																	5	VDMA / ATEX	

* Further pump compositions, see power end shape on page → <cbpagelink offset="1" page="$KT-PK-DT-PR-$KP-HYDMPUMPS-$PG-PK1-59" />

** Modified design (M) is possible for each feature of the identity code.

2.3 Hydraulic Diaphragm Metering Pumps

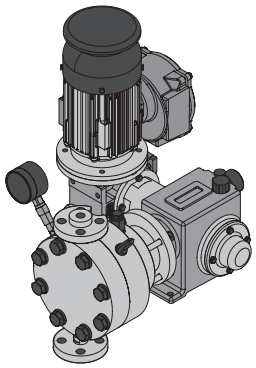
2.3.11 Hydraulic diaphragm metering pumps with metal diaphragm Orlita® MH

Reliable capacity even at very high pressure

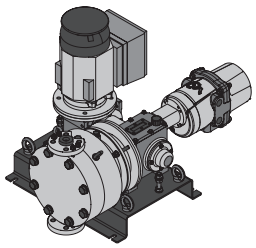
Capacity range of single pump: up to 800 l/h, up to 700 bar

The diaphragm metering pump Orlita® MH has a robust metal diaphragm, which permits precise pump capacities even at very high pressure. The ORLITA® MH has a modular construction and therefore has a versatile range of uses. A range of power end versions are therefore available and drives, power ends and dosing heads can be freely combined.

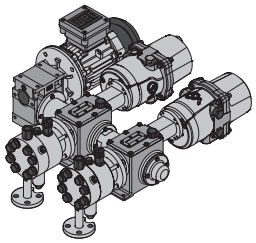
ORLITA® MH hydraulic diaphragm metering pumps (MHS 18 to MHS 1400) with a stroke length of 15 to 60 mm provide a capacity range of up to 800 l/h at pressures of up to 7 bar. A wide range of power end versions is available for use in areas at risk from explosion with ATEX certification. The Orlita® MH product range is designed to comply with API 675. Its modular construction permits the free combination of drives, power ends and dosing heads, producing a pump for a range of different feed rates and media operating at different working pressures.



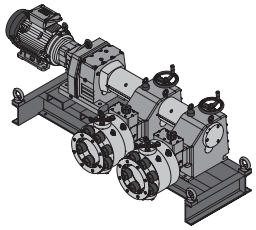
Orlita® MHS 18-20



Orlita® MHS 35/45



Orlita® MHS 35-8-8



Orlita® MHS 600-28-28

Your benefits

Excellent process safety and reliability:

- Metal double diaphragm with integrated diaphragm rupture warning system ensures precise and low-wear operation even at very high pressure
- The product chamber is hermetically separated from the hydraulic part
- Integrated hydraulic relief valve and automatic bleed valve for the hydraulic chamber
- Wear-free, valveless enforced anti-cavitation of the hydraulic leakage guarantees optimum dosing precision
- Cone valves for use as suction and/or discharge valves with minimal wear, good self-cleaning and low pressure loss (NPSHR)

Excellent flexibility:

- It is possible to combine up to 6 metering units, even with different pump capacities, in multiple pump systems
- The modular construction ensures a wide range of uses
- 6 different gear ratios are available
- Power end configuration ideal for installation in any position (vertical or horizontal)
- Temperature range -60 °C to +200 °C
- Customised designs are available on request

Technical Details

- MHS 18 – Stroke length: 0-15 mm, Rod force: 1,750 N
- MHS 35 – Stroke length: 0-20 mm, Rod force: 3,500 N
- MHS 80 – Stroke length: 0-20 mm, Rod force: 14,000 N
- MHS 180 – Stroke length: 0-40 mm, Rod force: 18,000 N
- MHS 600 – Stroke length: 0-40 mm, Rod force: 40,000 N
- MHS 1400 – Stroke length: 0-60 mm, Rod force: 60,000 N
- Stroke length adjustment range: 0 – 100% in operation and idle.
- Stroke length adjustment: manually by means of a manual adjustment wheel and scaled display (optionally with electric actuator or control drive).
- Metering reproducibility is better than ± 1% within the 10 – 100 % stroke length range under defined conditions and with proper installation (API 675).
- Metal diaphragm with diaphragm rupture monitoring system
- Integrated hydraulic relief and bleed valve
- Wetted materials: Stainless steel, special designs are available on request
- A wide range of power end versions is available: 3-phase AC motors, motors for use in areas at risk from explosion and different flange designs for use in customer-specific motors
- Degree of protection: IP 55
- Temperature range - 60 °C to + 200 °C
- Design in compliance with API 675 among others

2.3 Hydraulic Diaphragm Metering Pumps

Field of application

- Oil/ gas production (onshore/offshore)
- Chemical/Petrochemical industry
- Pharmaceuticals & cosmetics
- Food production
- Packaging industry (bottling pumps)

2.3 Hydraulic Diaphragm Metering Pumps

Technical Data

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)						Max. pressure
			58	73	91	112	145	207	
	mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	l/h	bar
MHS 18/	3	0.11	0.37	0.46	0.58	0.71	0.92	1.32	100
MHS 18/	5	0.29	1	1.2	1.6	1.9	2.5	3.6	400
MHS 18/	6	0.42	1.4	1.8	2.3	2.8	3.6	5.2	400
MHS 18/	7	0.58	2	2.5	3.1	3.8	5	7.1	400
MHS 18/	8	0.75	2.6	3.2	4.1	5	6.5	9.3	348
MHS 18/	10	1.18	4.1	5.1	6.4	7.8	10.2	14.6	222
MHS 18/	12	1.70	5.9	7.3	9.2	11.3	14.7	21	154
MHS 18/	16	3.02	10.5	13.1	16.4	20.1	26.2	37.4	87
MHS 18/	20	4.71	16.4	20.5	25.5	31.5	41	58.5	55

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)						Max. pressure
			58	73	91	112	145	207	
	mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	l/h	bar
MHS 35/	7	0.77	2.6	3.3	4.1	5.1	6.7	9.5	900
MHS 35/	8	1.01	3.5	4.3	5.4	6.7	8.7	12.4	630
MHS 35/	10	1.57	5.4	6.8	8.5	10.5	13.6	19.5	445
MHS 35/	12	2.26	7.8	9.8	12.3	15.1	19.6	28.1	309
MHS 35/	14	3.08	10.7	13.3	16.7	20.6	26.7	38.2	227
MHS 35/	16	4.02	13.9	17.4	21.8	26.9	34.9	49.9	174
MHS 35/	18	5.09	17.7	22.1	27.6	34.0	44.2	63.2	137
MHS 35/	20	6.28	21.8	27.3	34.1	42.0	54.6	78.0	111
MHS 35/	22	7.60	26.4	33.0	41.3	50.8	66.1	94.4	92
MHS 35/	25	9.80	34.1	42.7	53.3	65.7	85.4	122.0	71
MHS 35/	36	20.36	70.8	88.5	110.6	136.2	177.1	253.0	34
MHS 35/	40	25.13	87.4	109.3	136.6	168.2	218.6	312.3	27
MHS 35/	45	31.81	110.6	138.3	172.9	212.8	276.7	395.3	22

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)						Max. pressure
			98	104	122	134	160	182	
	mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	l/h	bar
MHS 80/	16	4.02	23.6	25.0	29.4	32.4	38.6	43.9	696
MHS 80/	18	5.09	29.9	31.7	37.2	41.0	48.8	55.5	550
MHS 80/	20	6.28	37.0	39.1	46.0	50.6	60.3	68.5	445
MHS 80/	22	7.60	44.7	47.4	55.6	61.3	73.0	82.9	368
MHS 80/	25	9.82	57.8	61.2	71.9	79.1	94.2	107.1	285

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)						Max. pressure
			99	117	134	156	173	204	
	mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	l/h	bar
MHS 600/25.5	25.5	20.43	121	143	164	191	211	249	783
MHS 600/28	28	24.63	146	172	198	230	255	300	649
MHS 600/30	29.2	26.79	159	188	215	250	277	327	570
MHS 600/32	32	32.17	191	225	258	301	333	393	497

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)						Max. pressure
			93	106	125	143	169	191	
	mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	l/h	bar
MHS 1400/	30	42.41	235	270	318	364	431	486	848
MHS 1400/	32	48.25	268	307	362	414	490	553	746
MHS 1400/	36	61.07	339	388	458	524	620	700	589
MHS 1400/	40	75.40	419	480	565	647	766	864	477

Important note:

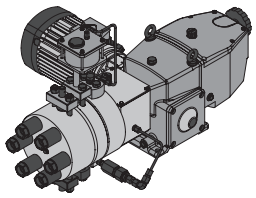
Abridged presentation of our complete product range. Other types on request

2.3.12 Hydraulic Metal Diaphragm Metering Pump High-pressure Orlita® MHHP

Reliable capacity even at maximum pressure

Capacity range of single pump: 3 – 11 l/h, 3,000 bar

The metal diaphragm metering pumps Orlita® MHHP are special pumps, which provide precise pump capacities even at maximum pressures of up to 3,000 bar.



Orlita® MHR 150/7

The hydraulic metal diaphragm metering pumps ORLITA® MHRH 150 / MHSH 600 have a metal diaphragm, which is designed to meter precisely at maximum pressures of up to 3,000 bar. Only in this way can excellent process reliability be ensured.

Your benefits

Excellent process reliability:

- metal double diaphragm with integrated diaphragm rupture warning / signalling system ensures precise and low-wear operation even at very high pressure
- The product chamber is hermetically separated from the hydraulic part
- Integrated hydraulic relief valve and automatic bleed valve for the hydraulic chamber
- Wear-free, valveless enforced anti-cavitation of the hydraulic leakage guarantees optimum dosing precision
- Metering reproducibility is better than ± 0.5 % within the 10 – 100% stroke length range under defined conditions and with correct installation
- Cone valves for use as suction and/or discharge valves with minimal wear, good self-cleaning and low pressure loss (NPSHR)

Technical Details

- MHSH: Stroke length: 0 – 40 mm, rod force: 40,000 N
- MHRH: Stroke length: 0 – 32 mm, Rod force: 15,000 N
- Stroke length adjustment range: 0 – 100% in operation and idle
- Stroke length adjustment: manually by means of a manual adjustment wheel and scaled display (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 0.5% within the 10 – 100% stroke length range under defined conditions and with correct installation
- Metal diaphragm
- Integrated hydraulic relief and bleed valve
- Wetted materials: Stainless steel, special designs are available on request
- A wide range of power end/drive versions is available: Three-phase standard motors, motors for use in areas at risk from explosion, different flange designs for the use of customer-specific motors
- Degree of protection: IP 55
- Temperature range -10 °C to +60 °C

Field of application

- Chemical/petrochemical industry
- Maximum pressure applications of up to 3,000 bar

Technical Data

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)				Max. pressure
			58	87	116	145	
	mm	ml/stroke	l/h	l/h	l/h	l/h	bar
MHRH 150/	6	0.90	3.1	4.7	6.3	7.8	3,000
MHRH 150/	7	1.23	4.2	6.4	8.5	10.7	3,000

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)						Max. pressure
			90	99	117	134	156	173	
	mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	l/h	bar
MHSH 600/	10.5	3.46	18.6	20.6	24.3	27.8	32.4	35.9	3,000

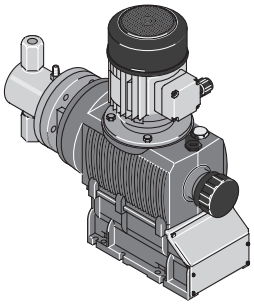
2.4 Plunger Metering Pumps

2.4.1 Plunger Metering Pump Sigma/ 2 (Basic Type)

Sigma plunger pump – durable and high-performance

Capacity range 2 – 76 l/h, 320 – 12 bar

The plunger metering pump Sigma/ 2 (Basic Type) is an extremely robust plunger metering pump with high-performance plunger and the option to adjust the pump capacity in 0.2% increments. It offers a wide range of power end versions, such as three-phase or 1-phase AC motors, even for Exe and Exde areas with ATEX certification.



Sigma Basic Type SBKa

The plunger metering pump Sigma/ 2 (Basic Type) (SBKa) is a metering pump, the pump capacity of which can be precisely adjusted in 0.2% increments, either manually or optionally with an electric actuator or control drive. A wide range of power end versions is available for use in areas at risk from explosion with ATEX certification.

Your benefits

Excellent process safety and reliability:

- Metering reproducibility is better than ± 1% within the 10 – 100% stroke length range under defined conditions and with correct installation

Flexible adaptation to the process:

- Wide range of power end versions, also for use in Exe and Exde areas and different flange designs for the use of customised motors
- Customised designs are available on request

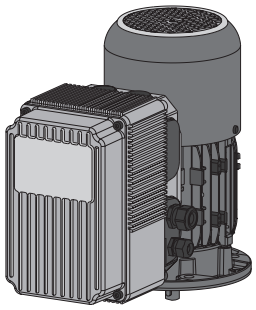
Technical Details

- Stroke length: 15 mm
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually by self-locking rotary dial in 0.2% increments (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 1 % within the 10-100% stroke volume adjustment range under certain defined conditions and with correct installation
- Wetted materials: Stainless steel 1.4571/1.4404, special materials are available on request
- High-performance oxide ceramic plunger
- A wide range of power end versions is available: Three-phase standard motor, 1-phase AC motor, motors for use in areas at risk from explosion and different flange designs for use in customer-specific motors
- Degree of protection IP 55
- Highly rigid fibreglass-reinforced plastic housing with excellent chemical resistance
- Provide suitable overload protection in all plunger metering pumps during installation for safety reasons

Field of application

- Volume-proportional metering of chemicals in the treatment of boiler feed water
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of auxiliary agents in industrial production engineering, for instance hot wax metering in the production of adhesive strips

Sigma Basic Type Control Functions



Variable speed motor with integrated frequency converter

Stroke length actuator/control drive

Actuator for automatic stroke length adjustment, actuating period approx. 1 second for 1 % stroke length, return potentiometer 1 K degree of protection IP 54.

Control drive consisting of an actuator and an integral servo controller for stroke length adjustment via a standard signal. Standard current input 0/4-20 mA corresponds to stroke length 0 - 100%. Switch-over for manual/automatic operation, key switch for stroke adjustment in manual mode, mechanical position display of actual stroke length value output 0/4-20 mA for remote display.

Variable speed motors with integrated frequency converter (identity code specification V)

Power supply 1-phase 230 V, 50/60 Hz, 0.37 kW

Externally controllable with 0/4-20 mA (see Fig. pk_2_103).

(Speed controllers, see page → 259)

Speed controllers in metal housing (identity code specification Z)

The speed controller assembly consists of a frequency converter and a variable speed motor of 0.37 kW.

(Speed controllers, see page → 259)

2.4 Plunger Metering Pumps

Technical Data

Type	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Capacity at max. back pressure with 1800 rpm motor at 60 Hz				Suction lift	Perm. pre-pressure suction side	Connector Suction/ Discharge Side	Shipping weight	Plunger Ø
	l/h	bar	ml/ stroke	Max. stroke rate Strokes/ min	l/h	psi	gph (US)	Max. stroke rate Strokes/ min	m WC	bar	G-DN	kg	mm
32002	1.9	320	0.46	71	2.3	4,641	0.61	84	5.0	160	1/4	24	8
23004	4.0	230	0.52	129	4.8	3,336	1.27	154	5.0	115	1/4	24	8
10006	6.4	100	0.55	195	7.6	1,450	2.01	233	5.0	50	1/4	24	8
14006	6.1	140	1.42	71	7.1	2,031	1.88	84	4.0	70	1/4	24	12
10011	11.0	100	1.43	129	13.1	1,450	3.46	153	4.0	50	1/4	24	12
05016	16.7	50	1.43	195	20.0	725	5.28	233	4.0	25	1/4	24	12
07012	12.4	70	2.90	71	14.8	1,015	3.91	85	4.0	35	1/4	24	17
04522	22.5	45	2.91	129	26.7	653	7.05	153	4.0	22.5	1/4	24	17
02534	34.1	25	2.92	195	40.8	363	10.78	233	4.0	12.5	1/4	24	17
04022	22.4	40	5.26	71	26.5	580	7.00	84	4.0	20	3/8	25	23
02541	41.5	25	5.37	129	49.2	363	13.00	153	4.0	12.5	3/8	25	23
01264	64.0	12	5.45	195	76.0	174	20.08	233	4.0	6	3/8	25	23

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/pressure connector on dosing head DN 25	Seals/ball seat	Balls	Ball seat
SST	Stainless steel 1.4404	Stainless steel 1.4404	PTFE or PTFE +25 % carbon	Ceramic	Stainless steel 1.4404

Motor Data

Identity code specification		Power supply			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V 250 – 280 V/440 – 480 V	50 Hz 60 Hz	0.25 kW	
R	3-phase, IP 55	230 V/400 V	50/60 Hz	0.37 kW	With PTC, speed control range 1:20 with external fan 1-phase 230 V; 50/60 Hz
V0	1-phase, IP 55	230 V ± 5 %	50/60 Hz	0.37 kW	Variable speed motor with integrated frequency converter
M	1-phase AC, IP 55	230 V ± 5 %	50/60 Hz	0.18 kW	
N	1-phase AC, IP 55	115 V ± 5 %	60 Hz	0.18 kW	
L1	3-phase, II 2G Ex e II T3	220 – 240 V/380 – 420 V	50 Hz	0.18 kW	
L2	3-phase, II 2G Ex de IIC T4	220 – 240 V/380 – 420 V	50 Hz	0.18 kW	With PTC, speed control range 1:5
P1	3-phase, II 2G Ex e II T3	250 – 280 V/440 – 480 V	60 Hz	0.18 kW	
P2	3-phase, II 2G Ex de IIC T4	250 – 280 V/440 – 480 V	60 Hz	0.21 kW	With PTC, speed control range 1:5

Motor data sheets can be requested for more information.

Special motors or special motor flanges are available on request.

The motors are designed in compliance with the Ecodesign Directive 2009/125/EC.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

Identity Code Ordering System for SBKa

SBKa	Drive type													
	HK	Main drive, plunger												
		Type		Output										
		32002		320 bar	1.9 l/h									
		23004		230 bar	4.0 l/h									
		10006		100 bar	6.4 l/h									
		14006		140 bar	6.1 l/h									
		10011		100 bar	11.0 l/h									
		05016		50 bar	16.7 l/h									
		07012		70 bar	12.4 l/h									
		04522		45 bar	22.5 l/h									
		02534		25 bar	34.1 l/h									
		04022		40 bar	22.4 l/h									
		02541		25 bar	41.5 l/h									
		01264		12 bar	64.0 l/h									
			Liquid end material											
			SS	Stainless steel										
				Sealing material										
				T	PTFE									
					Diaphragm									
					4	Plunger (oxide ceramic)								
						Liquid end version								
						0	No valve springs (standard)							
						1	With 2 valve springs, Hastelloy C, 0.1 bar							
							Hydraulic connections							
							0	Standard threaded connector (according to technical data)						
								Version						
								0	with ProMinent logo					
								1	without ProMinent logo					
								M	Modified					
									Electrical power supply					
									S	3 ph, 230 V/400 V 50/60 Hz, 0.18 kW				
									R	3 ph, Variable speed motor, 230 V/400 V, 0.37 kW				
									V0	Variable speed motor with integrated frequency converter 1 pH, 230 V, 50/60 Hz				
									Z	1 ph, variable speed set 230 V, 50/60 Hz				
									M	1 ph, AC, 230 V/ 50/60 Hz, 0.18 kW				
									N	1 ph, AC 115 V 60 Hz, 0.18 kW				
									L	3 ph, 230 V/400 V, 50 Hz, (EExe, EExd), 0.18 kW				
									P	3 ph, 230 V/400 V, 60 Hz, (EExe, EExd), 0.18 kW				
									1	No motor, with B 14 flange (size 71 (DIN)				
									2	No motor, C 56 flange (NEMA)				
									3	No motor, B 5 size 63 (DIN)				
										Enclosure rating				
										0	IP 55 (standard)			
										1	Exe motor version ATEX-T3			
										2	Exd motor version ATEX-T4			
										A	ATEX power end			
											Stroke sensor			
											0	No stroke sensor (standard)		
											2	Pacing relay (reed relay)		
											3	Stroke sensor (Namur) for hazardous locations		
												Stroke length adjustment		
												0	Manual (Standard)	
												1	With stroke positioning motor, 230 V/50/60 Hz	
												2	With stroke positioning motor, 115 V/50/60 Hz	
												3	With stroke control motor 0...20 mA 230 V/50/60 Hz	
												4	With stroke control motor 4...20 mA 230 V/50/60 Hz	
												5	With stroke control motor 0...20 mA 115 V/50/60 Hz	
												6	With stroke control motor 4...20 mA 115 V/50/60 Hz	

2.4 Plunger Metering Pumps

Spare Parts Kits

consists of: 1 ceramic metering piston, 4 valve balls, 4 ball seat discs, 2 piston packings made from PTFE / graphite, 2 piston guide bands, 14 flat seals, 2 O-rings

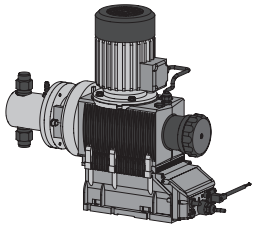
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Liquid end FK 12.5	Applies to identity code: 14006, 10011, 05016	910470
Liquid end FK 25	Applies to identity code: 07012, 04522, 02534	910471
Liquid end FK 50	Applies to identity code: 04022, 02541, 01264	910472

2.4.2 Plunger Metering Pump Sigma/ 2 (Control Type)

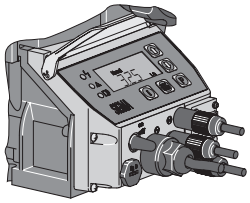
Sigma plunger pump – durable, high-performance and intelligent.

Capacity range 2 – 76 l/h, 320 – 12 bar

The plunger metering pump Sigma/2 (Control Type) is an extremely robust metering pump with integral control for analogue and/or contact operation. It offers the option of adjusting the pump capacity in 0.2% increments. It offers a wide range of power end versions, and different flange designs.



Sigma Control Type SCKa



Sigma Controller

The plunger metering pump Sigma/ 2 (Control Type) (SCKa) is a metering pump, the pump capacity of which can be precisely adjusted in 0.2% increments, either manually or optionally with an electric actuator or control drive. The integrated controller allows the pump to adapt quickly and reliably to changing metering tasks.

Your benefits

Process reliability:

- Metering reproducibility is better than ± 1% within the 10 – 100% stroke length range under defined conditions and with correct installation

Flexible adaptation to the process:

- The integrated controller allows the pump to adapt quickly and reliably to changing metering tasks
- Customised designs are available on request

Technical Details

- Stroke length: 15 mm
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually by self-locking rotary dial in 0.2% increments (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 1% within the 10-100% stroke length adjustment range under certain defined conditions and with proper installation
- Wetted materials: Stainless steel 1,4571/1.4404, special materials are available on request
- High-performance oxide ceramic plunger
- Integrated control for analogue and/or contact operation
- Power supply: 1-phase, 100 – 230 V ±10%, 240 V ± 6%, 50/60 Hz (220 W)
- Degree of protection IP 55
- Highly rigid fibreglass-reinforced plastic housing with excellent chemical resistance
- Provide suitable overload protection in all plunger metering pumps during installation for safety reasons

Field of application

- Volume-proportional metering of chemicals in the treatment of boiler feed water
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of auxiliary agents in industrial production engineering, for instance hot wax metering in the production of adhesive strips

2.4 Plunger Metering Pumps

Technical Data

Type	Pump capacity at max. back pressure		Capacity at max. back pressure with 1800 rpm motor at 60 Hz				Suction lift	Perm. pre-pressure suction side	Connector Suction/ Discharge Side	Shipping weight	Plunger Ø
	bar	ml/stroke	l/h	psi	gph (US)	Strokes/ min	m WC	bar	G-DN	kg	mm
32002	320	0.46	2.3	4,641	0.61	84	5.0	160	1/4	24	8
23004	230	0.52	4.8	3,336	1.27	154	5.0	115	1/4	24	8
10006	100	0.55	7.6	1,450	2.01	233	5.0	50	1/4	24	8
14006	140	1.42	7.1	2,031	1.88	84	4.0	70	1/4	24	12
10011	100	1.43	13.1	1,450	3.46	153	4.0	50	1/4	24	12
05016	50	1.43	20.0	725	5.28	233	4.0	25	1/4	24	12
07012	70	2.90	14.8	1,015	3.91	85	4.0	35	1/4	24	17
04522	45	2.91	26.7	653	7.05	153	4.0	22.5	1/4	24	17
02534	25	2.92	40.8	363	10.78	233	4.0	12.5	1/4	24	17
04022	40	5.26	26.5	580	7.00	84	4.0	20	3/8	25	23
02541	25	5.37	49.2	363	13.00	153	4.0	12.5	3/8	25	23
01264	12	5.45	65.4	174	17.28	200	4.0	6	3/8	25	23

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/pressure connector on dosing head DN 25	Seals/ball seat	Balls	Ball seat
SST	Stainless steel 1.4404	Stainless steel 1.4404	PTFE or PTFE +25 % carbon	Ceramic	Stainless steel 1.4404

Motor Data

Identity code specification		Power supply			Remarks
U	1-phase, IP 55	100 – 230 V ±10 %, 240 V ±6 %,	50/60 Hz	220 W	

The motors are designed in compliance with the Ecodesign Directive 2009/125/EC.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

2.4 Plunger Metering Pumps

Identity Code Ordering System for SCKa

Code	Description	
SCKa	**Drive type**	
HK	Main drive, plunger	
Type	**Output**	
32002	320 bar	2.3 l/h
23004	230 bar	4.8 l/h
10006	100 bar	6.4 l/h
14006	140 bar	7.1 l/h
10011	100 bar	13.1 l/h
05016	50 bar	16.7 l/h
07012	70 bar	14.8 l/h
04522	45 bar	26.7 l/h
02534	25 bar	34.1 l/h
04022	40 bar	26.5 l/h
02541	25 bar	49.2 l/h
01264	12 bar	64.0 l/h
	Liquid end material	
SS	Stainless steel	
	Sealing material	
T	PTFE	
	Diaphragm	
4	Plunger (oxide ceramic)	
	Liquid end version	
0	No valve springs (standard)	
1	With 2 valve springs, Hastelloy C, 0.1 bar	
	Hydraulic connections	
0	Standard threaded connector (according to technical data)	
	Version	
0	with ProMinent logo	
1	without ProMinent logo	
	Electrical power supply	
U	1 ph 100-230 V ±10%, 50/60 Hz	
	Cable and plug	
A	2 m European	
B	2 m Swiss	
C	2 m Australian	
D	2 m USA	
	Relay	
0	no relay	
1	With fault indicating relay 1x changeover 230 V – 2A	
3	With fault indicating relay 1x changeover 230 V – 2A	
4	As 1 + pacing relay 2x normally open 24 V - 100 mA	
5	As 3 with pacing relay 2x normally open 24 V – 100 mA	
A	Shut-off and warning relays normally closed 2x normally open 24 V - 100 mA	
F	Power relay normally closed 1x changeover 230 V - 8 A	
	Control Variants	
0	Manual + external with pulse control	
1	Manual + external + pulse control + analogue	
	Access code	
0	no acces code	
1	with acces code	
	Metering monitor	
0	Pulse signal input	
1	Input with cont. evaluation	
	Stroke length adjustment	
0	manual	

Spare Parts Kits

Consisting of: 1 ceramic metering plunger, 4 valve balls, 4 ball seat discs, 2 PTFE/graphite ball seals, 2 plunger guides, 14 flat seals, 2 O-rings.

2.4 Plunger Metering Pumps

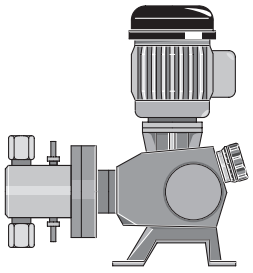
	Version	Order no.
Liquid end FK 08	Applies to identity code: 32002, 23004, 10006	1001572
Liquid end FK 12.5	Applies to identity code: 14006, 10011, 05016	910470
Liquid end FK 25	Applies to identity code: 07012, 04522, 02534	910471
Liquid end FK 50	Applies to identity code: 04022, 02541, 01264	910472

2.4.3 Plunger Metering Pump Meta

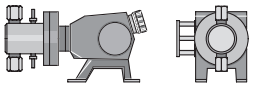
Meta plunger metering pump – durable and high-performance

Capacity range 6 – 59 l/h, 216 – 52 bar

The extremely high-performance Meta is a plunger metering pump with the option of adjusting the pump capacity in 0.2% increments. It offers a wide range of power end versions, such as three-phase or 1-phase AC motors, even for Exe and Exde areas with ATEX certification.



Meta plunger metering pump MTKa



Meta plunger metering pump MTKa

The Meta (MTKa) is a plunger metering pump, the pump capacity of which can be precisely adjusted in 0.2% increments, either manually or optionally with an electric actuator or control drive. A wide range of power end versions is available for use in areas at risk from explosion with ATEX certification.

Your benefits

Excellent process safety and reliability:

- Metering reproducibility is better than ± 0.5 % within the 10 – 100% stroke length range under defined conditions and with correct installation

Flexible adaptation to the process:

- Wide range of power end versions, also for use in Exe and Exde areas and different flange designs for the use of customised motors
- Customised designs are available on request

Technical Details

- Stroke length: 15 mm,
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually by self-locking rotary dial in 0.2% increments (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 1% within the 10-100% stroke length adjustment range under certain defined conditions and with proper installation
- Wetted materials: Stainless steel 1.4571/1.4404
- High-performance oxide ceramic plunger
- A wide range of power end versions is available: Three-phase standard motor, 1-phase AC motor, motors for use in areas at risk from explosion and different flange designs for use in customer-specific motors
- Degree of protection IP 55
- Cast aluminium housing
- Provide suitable overload protection in all plunger metering pumps during installation for safety reasons.

Field of application

- Volume-proportional metering of chemicals in the treatment of boiler feed water
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of auxiliary agents in industrial production engineering, for instance hot wax metering in the production of adhesive strips

Control of Meta Plunger Metering Pumps

(Speed controllers, see page → 259)

Speed controllers in metal housing (identity code specification Z)

The frequency converter is accommodated in an IP 54 rated protective housing with integral control unit and main switch, suitable for max. 0.37 kW motor capacity.

Externally controllable with 0/4-20 mA or 0-10 V corresponding to 0-50 (60) Hz output frequency.

Integrated control unit with versatile functions, such as switching between external/internal control; frequency specified using arrow keys with internal control, multilingual fault message display etc. and motor temperature monitoring (thermistor protection).

2.4 Plunger Metering Pumps

The speed controller assembly comprises a frequency converter and a variable speed motor (see also identity code specification R).

2.4 Plunger Metering Pumps

Technical Data

Type	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Capacity at max. back pressure with 1800 rpm motor at 60 Hz				Suction lift	Perm. pre-pressure suction side	Connector Suction/ Discharge Side	Motor rating	Shipping weight	Plunger Ø
	l/h	bar	ml/ stroke	Max. stroke rate Strokes/ min	l/h	psi	gph (US)	Max. stroke rate Strokes/ min	m WC	bar	G-DN	W	kg	mm
21606	6.1	216	1.42	72	7.3	3,130	1.9	86	4.0	108	1/4	180	18	12
24006	6.1	240	1.42	72	7.3	3,477	1.9	86	4.0	120	1/4	370	20	12
16208	8.1	162	1.42	96	9.8	2,347	2.6	115	4.0	81	1/4	180	18	12
22508	8.1	225	1.42	96	9.8	3,260	2.6	115	4.0	112.5	1/4	370	20	12
12910	10.2	129	1.42	120	12.2	1,878	3.2	144	4.0	64.5	1/4	180	18	12
21610	10.2	216	1.42	120	12.2	3,130	3.2	144	4.0	108	1/4	370	20	12
10812	12.2	108	1.42	144	14.7	1,565	3.9	173	4.0	54	1/4	180	18	12
21012	12.2	210	1.42	144	14.7	3,043	3.9	173	4.0	105	1/4	370	20	12
10213	13.0	102	3.01	72	15.6	1,479	4.1	86	4.0	51	1/4	180	18	17
11313	13.0	113	3.01	72	15.6	1,644	4.1	86	4.0	56.5	1/4	370	20	17
07617	17.3	76	3.01	96	20.8	1,109	5.5	115	4.0	38	1/4	180	18	17
10617	17.3	106	3.01	96	20.8	1,541	5.5	115	4.0	53	1/4	370	20	17
06122	21.7	61	3.01	120	26.0	888	6.9	144	4.0	30.5	1/4	180	18	17
10222	21.7	102	3.01	120	26.0	1,479	6.9	144	4.0	51	1/4	370	20	17
05425	24.6	54	5.71	72	29.5	782	7.8	86	4.0	27	3/8	180	18	23
06025	24.6	60	5.71	72	29.5	869	7.8	86	4.0	30	3/8	370	20	23
05126	26.0	51	3.01	144	31.2	740	8.2	173	4.0	25.5	1/4	180	18	17
09926	26.0	99	3.01	144	31.2	1,438	8.2	173	4.0	49.5	1/4	370	20	17
04033	32.8	40	5.71	96	39.4	587	10.4	115	4.0	20	3/8	180	18	23
05633	32.8	56	5.71	96	39.4	815	10.4	115	4.0	28	3/8	370	20	23
03241	41.1	32	5.71	120	49.3	469	13.0	144	4.0	16	3/8	180	18	23
05441	41.1	54	5.71	120	49.3	782	13.0	144	4.0	27	3/8	370	20	23
02749	49.3	27	5.71	144	59.2	391	15.6	173	4.0	13.5	3/8	180	18	23
05249	49.3	52	5.71	144	59.2	761	15.6	173	4.0	26	3/8	370	20	23

Materials in Contact With the Medium

Identity code of material	Dosing head	Suction/pressure connector on dosing head DN 25	Seals/ball seat	Balls	Ball seat	Plungers
SST	Stainless steel 1.4404	Stainless steel 1.4404	PTFE or PTFE +25 % carbon	Ceramic	Stainless steel 1.4404	Ceramic

2.4 Plunger Metering Pumps

Motor Data

Identity code specification		Power supply			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V 250 – 280 V/440 – 480 V	50 Hz 60 Hz	0.25 kW	
R	3-phase, IP 55	230 V/400 V	50/60 Hz	0.37 kW	With PTC, speed control range 1:20 with external fan 1-phase 230 V; 50/60 Hz
M	1-phase AC, IP 55	230 V ± 5 %	50/60 Hz	0.18 kW	
N	1-phase AC, IP 55	115 V ± 5 %	60 Hz	0.18 kW	
L1	3-phase, II 2G Ex e II T3	220 – 240 V/380 – 420 V	50 Hz	0.18 kW	
L2	3-phase, II 2G Ex de IIC T4	220 – 240 V/380 – 420 V	50 Hz	0.18 kW	With PTC, speed control range 1:5
P1	3-phase, II 2G Ex e II T3	250 – 280 V/440 – 480 V	60 Hz	0.18 kW	
P2	3-phase, II 2G Ex de IIC T4	250 – 280 V/440 – 480 V	60 Hz	0.21 kW	With PTC, speed control range 1:5

The motor power is dependent on the pump type (see technical data).

Motor data sheets can be requested for more information.

Special motors or special motor flanges are available on request.

The motors are designed in accordance with the Eco Design Directive 2009/125/EC.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

Identity Code Ordering System for MTKa

MTKa	Drive type												
	H	Main drive											
	A	Add-on drive											
		Type	Output										
		21606	216 bar	6.1 l/h									
		24006	240 bar	6.1 l/h									
		16208	162 bar	8.1 l/h									
		22508	225 bar	8.1 l/h									
		12910	129 bar	10.2 l/h									
		21610	216 bar	10.2 l/h									
		10812	108 bar	12.2 l/h									
		21012	210 bar	12.2 l/h									
		10213	102 bar	13.0 l/h									
		11313	113 bar	13.0 l/h									
		07617	76 bar	17.3 l/h									
		10617	106 bar	17.3 l/h									
		06122	61 bar	21.7 l/h									
		10222	102 bar	21.7 l/h									
		05126	51 bar	26.0 l/h									
		09926	99 bar	26.0 l/h									
		05425	54 bar	24.6 l/h									
		06025	60 bar	24.6 l/h									
		04033	40 bar	32.8 l/h									
		05633	56 bar	32.8 l/h									
		03241	32 bar	41.1 l/h									
		05441	54 bar	41.1 l/h									
		02749	27 bar	49.3 l/h									
		05249	52 bar	49.3 l/h									
			Liquid end material										
			SS	Stainless steel									
				Sealing material									
				T	PTFE								
					Diaphragm								
					S	Standard plunger, oxide ceramic							
						Liquid end version							
						0	No valve springs (standard)						
						1	With 2 valve springs, Hastelloy C, 0.1 bar						
							Hydraulic connections						
							0	Standard threaded connector (according to technical data)					
								Version					
								0	With ProMinent® logo (standard)				
								1	without ProMinent logo				
								M	Modified				
									Electrical power supply				
									S	3 ph, 230 V/400 V, 50/60 Hz (WBS)			
									R	3 ph, variable speed motor, 230 V/400 V			
									Z	1 ph, variable speed set 230 V, 50/60 Hz			
									M	1 ph, AC, 230 V, 50/60 Hz			
									N	1 ph, AC, 115 V, 60 Hz			
									L	3 ph, 230 V/400 V, 0.37 kW, 50 Hz, (Exe, Exd)			
									P	3 ph, 230 V/400 V, 60 Hz, (Exe, Exd)			
									1	No motor, with flange 90/63			
									2	No motor, with flange 140/71			
									3	No motor, with flange 160/71			
									4	No motor, with flange 56 C			
									0	Add-on pump (no motor)			
										Enclosure rating			
										0	IP 55 (standard)		
										1	Exe motor version ATEX-T3		
										2	Exd motor version ATEX-T4		
										A	ATEX power end		
											Stroke sensor		
											0	No stroke sensor (standard)	
											1	With stroke sensor, Namur signal (Ex)	
												Stroke length adjustment	
												0	Manual (Standard)
												2	With stroke positioning, 115 V/50/60 Hz
												A	With stroke control motor 0-20 mA 230 V/50/60 Hz
												B	With stroke control motor 4-20 mA 230 V/50/60 Hz
												C	With stroke control motor 0...20 mA 115 V/50/60 Hz
												D	With stroke control motor 4...20 mA 115 V/50/60 Hz

Spare Parts

Spare Parts Kits for Plunger Metering Pump Meta (MTKa)

consists of:

1 ceramic metering piston

4 valve balls

4 ball seat discs

2 piston packings made from PTFE / graphite

2 piston guide bands

14 flat seals

2 O-rings

	Order no.
FK 12.5 liquid end valid for identity code: 21606, 24006, 16208, 22508, 12910, 21610, 10812, 21012	910470
FK 25 liquid end valid for identity code: 10213, 11313, 07617, 10617, 06122, 10222, 05126, 09926	910471
FK 50 liquid end valid for identity code: 05425, 06025, 04033, 05633, 03241, 05441, 02749, 05249	910472

Mounting Frame for Meta MTMa and MTKa

A mounting frame can be provided when combining primary and externally mounted pumps.

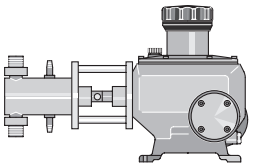
Product designation	Order no.
Base frame for main and one add-on pump	803897
Base frame for main and two add-on pumps	803898
Base frame for main and three add-on pumps	803899

2.4.4 Plunger Metering Pump Makro TZ

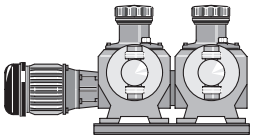
Powerful, built to last with a plunger

Capacity range of single head pump: 8 – 1,141 l/h, 320 – 11 bar

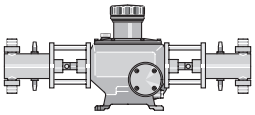
The plunger metering pump Makro TZ impresses with its excellent process reliability, outstanding flexibility and its modular construction enables it to be outstandingly adapted to the performance requirements of the respective application.



Makro TZ plunger metering pump



Makro TZ TZKa externally mounted pump



Makro TZ TZKa double head pump

The plunger metering pump Makro TZ (TZKa) has an adjustable eccentric drive mechanism and, together with the Makro TZ diaphragm metering pump, forms a range of drive mechanisms with stroke lengths of 10 and/or 20 mm. A wide range of drive versions is available, including some for use in Exe and Exde areas with ATEX certification.

Your benefits

Process reliability:

- Metering reproducibility is better than ± 0.5 % within the 10 – 100% stroke length range under defined conditions and with correct installation

Excellent flexibility:

- The modular construction with single and double head versions permits a wide range of applications, with the double head designs being operated in push-pull mode
- It is possible to combine up to 4 metering units, even with different pump capacities, in multiple pump systems
- 4 different gear ratios are available
- Customised designs are available on request

Technical Details

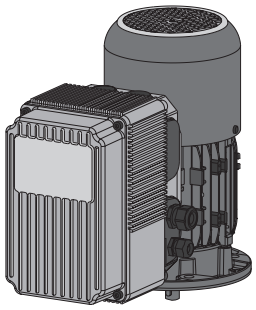
- Stroke length: 0-20 mm, Rod force: 8,000 N
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually by means of shift ring in 0.5% increments (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 0.5% within the 10 – 100% stroke length range under defined conditions and with proper installation. Observe the information in the operating instructions.
- High-performance ceramic-coated stainless steel plunger Wetted materials: Stainless steel 1.4571. Special materials are available on request
- A wide range of power end versions is available: Three-phase standard motors, motors for use in areas at risk from explosion and different flange designs for use in customer-specific motors
- Degree of protection: IP 55
- Salt water-resistant, acrylic resin-coated cast aluminium housing
- Provide suitable overload protection in all plunger metering pumps during installation for safety reasons

Field of application

- Volume-proportional metering of chemicals/additives in water treatment
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of additives in industrial production engineering

2.4 Plunger Metering Pumps

Makro TZ Pump Control



Variable speed motor with integrated frequency converter

Makro TZ stroke length actuator/control drive

Makro TZ actuator

Servomotor for automatic stroke length adjustment, actuating period approx. 1 sec for 1 % stroke length, including 1 k return potentiometer for stroke position response signal; degree of protection: IP 54. Electrical connection 230 V (±10 %), 50/60 Hz, 40 W mechanical stroke length display present on the Makro TZ power end.

Special voltage/higher degrees of protection/explosion protection on request.

Makro TZ control drive

Control drive consisting of an actuator with servomotor and integral microprocessor controller for stroke length adjustment via a standard signal. Technical data see actuator.

Design:

Standard current input 0/4-20 mA corresponds to stroke length 0 – 100 %. Switch-over for manual/automatic operation, key switch for stroke adjustment in manual mode. Actual value output 0/4 – 20 mA for remote display.

Variable speed motors with integrated frequency converter (identity code specification V)

The following functions are integrated in the terminal box cover:

- Start/Stop switch
- Manual/external operation switch-over (0/4 – 20 mA)
- Potentiometer for speed control in manual mode
- On request externally controllable via PROFIBUS® DP

Variable speed motors with integrated frequency converter, IP 55 degree of protection, see page→ 259

Speed controllers with frequency converter (identity code specification Z)

The speed controller (complete) comprises a frequency converter and a variable speed motor (see also identity code specification R). The frequency converter is accommodated in an IP 55 rated protective housing with integral control unit and main switch.

Externally controllable with 0/4 - 20 mA or 0 - 10 V corresponding to 0 - 50 (60) Hz output frequency.

Frequency converter for controlling speed, see page → 259

2.4 Plunger Metering Pumps

Technical Data

Typ	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Capacity at max. back pressure with 1800 rpm motor at 60 Hz				Suction lift	Connector Suction/ Discharge Side	Ship- ping weight	Plunger Ø
	l/h	bar	ml/ stroke	Max. stroke rate Strokes/ min	l/h	psi	gph (US)	Max. stroke rate Strokes/ min	m WC	G-DN	kg	mm
320009 *	8.7	320	2.0	72	10	4,627	2.6	86	4.0	Rp 1/4–8	50	12
320012 *	11.6	320	2.0	96	14	4,627	3.7	115	4.0	Rp 1/4–8	50	12
320014 *	14.5	320	2.0	120	17	4,627	4.5	144	4.0	Rp 1/4–8	50	12
320017 *	17.4	320	2.0	144	21	4,627	5.5	173	4.0	Rp 1/4–8	50	12
320018 *	17.7	320	4.1	72	21	4,627	5.5	86	4.0	Rp 1/4–8	50	17
320024 *	23.6	320	4.1	96	28	4,627	7.4	115	4.0	Rp 1/4–8	54	17
320030 *	29.5	320	4.1	120	35	4,627	9.2	144	4.0	Rp 1/4–8	54	17
313035 *	35.4	313	4.1	144	42	4,526	11.1	173	4.0	Rp 1/4–8	54	17
192033 *	32.9	192	7.6	72	39	2,776	10.3	86	4.0	Rp 3/8–10	55	23
192044 *	43.9	192	7.6	96	59	2,776	15.6	115	4.0	Rp 3/8–10	55	23
192055 *	54.8	192	7.6	120	66	2,776	17.4	144	4.0	Rp 3/8–10	55	23
168066 *	65.8	168	7.6	144	79	2,437	20.9	173	4.0	Rp 3/8–10	55	23
113057 *	57.5	113	13.3	72	69	1,634	18.2	86	4.0	Rp 3/8–10	56	30
113077 *	76.6	113	13.3	96	92	1,634	24.3	115	4.0	Rp 3/8–10	56	30
113096 *	95.8	113	13.3	120	115	1,634	30.4	144	4.0	Rp 3/8–10	56	30
096115 *	114.9	96	13.3	144	138	1,392	36.5	173	4.0	Rp 3/8–10	56	30
063104	104.3	63	24.2	72	125	911	33.0	86	4.0	G 1 1/4–20	58	40
063139	139.0	63	24.2	96	167	911	44.1	115	4.0	G 1 1/4–20	58	40
063174	173.8	63	24.2	120	209	914	55.2	144	4.0	G 1 1/4–20	58	40
052208	208.5	52	24.2	144	250	754	66.0	173	4.0	G 1 1/4–20	58	40
040163	162.9	40	37.7	72	195	578	51.5	86	4.0	G 1 1/4–20	58	50
040217	217.2	40	37.7	96	261	578	68.9	115	4.0	G 1 1/4–20	58	50
040271	271.5	40	37.7	120	326	580	86.1	144	4.0	G 1 1/4–20	58	50
033326	325.8	33	37.7	144	391	479	103.3	173	4.0	G 1 1/4–20	58	50
028237	237.0	28	54.9	72	284	405	75.0	86	4.0	G 1 1/2–25	62	60
028316	315.9	28	54.9	96	379	405	100.1	115	4.0	G 1 1/2–25	62	60
027395	394.9	27	54.9	120	474	392	125.2	144	4.0	G 1 1/2–25	62	60
022474	473.9	22	54.9	144	569	319	150.3	173	4.0	G 1 1/2–25	62	60
020322	322.5	20	74.7	72	387	289	102.2	86	4.0	G 1 1/2–25	62	70
020430	430.0	20	74.7	96	516	289	136.3	115	4.0	G 1 1/2–25	62	70
020538	537.6	20	74.7	120	645	290	170.4	144	4.0	G 1 1/2–25	62	70
016645	645.1	16	74.7	144	774	232	204.5	173	4.0	G 1 1/2–25	62	70
014475	475.1	14	110.0	72	571	202	150.8	86	4.0	G 2 1/4–40	68	85
014634	634.1	14	110.0	96	761	202	201.0	115	4.0	G 2 1/4–40	68	85
013793	792.6	13	110.0	120	951	189	251.2	144	4.0	G 2 1/4–40	68	85
011951	951.1	11	110.0	144	1,141	160	301.4	173	4.0	G 2 1/4–40	68	85

* The suction and discharge side Rp 1/4 and Rp 3/8 connectors have an internal thread connection and are configured as double ball valves.

Other gear reduction ratios are available upon request.

The permissible priming pressure on the suction side is approximately 50% of the max. permitted back pressure.

Materials in Contact With the Medium

Identity code of material	Hydraulic Ø mm	Dosing head connection	Suction/dis- charge connec- tion	Ball seat	Valve balls	Plungers
SST	…12 S to 50 S	Stainless steel 1.4571/1.4404	Stainless steel 1.4571/1.4404	Stainless steel/ PTFE	Oxide ceramic	Stainless steel/ ceramic
SST	…60 S to 70 S	Stainless steel 1.4571/1.4404	Stainless steel 1.4581	PTFE	Stainless steel 1.4404	Stainless steel/ ceramic
SST	…85 S	Stainless steel 1.4571/1.4404	Stainless steel 1.4581	PTFE	Stainless steel 1.4404 (plate)/ Hastelloy C (spring)	Stainless steel/ ceramic

2.4 Plunger Metering Pumps

Motor Data

Identity code specification		Power supply			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V 250 – 280 V/440 – 480 V	50 Hz 60 Hz	1.5 kW	
R	3-phase, IP 55	230 V/400 V	50/60 Hz	2.2 kW	With PTC, speed control range 1:20 with external fan 1-phase 230 V; 50/60 Hz
V0	3-phase, IP 55	400 V ±10%	50/60 Hz	3.0 kW	Variable speed motor with integrated frequency converter
L1	3-phase,II 2G Ex eb IIC T3 Gb	220 – 240 V/380 – 420 V	50 Hz	1.5 kW	
L2	3-phase,II 2G Ex db IIC T4 Gb	220 – 240 V/380 – 420 V	50 Hz	1.5 kW	With PTC, speed control range 1:5
P1	3-phase,II 2G Ex e IIC T3	250 – 280 V/440 – 480 V	60 Hz	2.0 kW	
P2	3-phase,II 2G Ex de IIC T4	250 – 280 V/440 – 480 V	60 Hz	1.5 kW	With PTC, speed control range 1:5
V2	3-phase,II 2G Ex de IIC T4	400 V ±10%	50/60 Hz	2.2 kW	Ex-variable speed motor with integrated frequency converter

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

The motors are designed in compliance with the Ecodesign Directive 2009/125/EC.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

Identity Code Ordering System TZKa

TZKa	Drive type		Liquid end material		Sealing material		Displacement body		Liquid end version		Hydraulic connections		Version		Electrical power supply	
	H	Main drive														
	A	Add-on drive														
	D	Double main drive														
	B	Double add-on power end														
		Type *														
		320009														
		320012														
		320014														
		320017														
		320018														
		320024														
		320030														
		313035														
		192033														
		192044														
		192055														
		168066														
		113057														
		113077														
		113096														
		096115														
		063104														
		063139														
		063174														
		052208														
		040163														
		040217														
		040271														
		033326														
		028237														
		028316														
		027395														
		022474														
		020322														
		020430														
		020538														
		016645														
		014475														
		014634														
		013793														
		011951														
			SS	Stainless steel												
					T	PTFE										
							S	Stainless steel plunger, chromium dioxide-coated								
									0	no valve spring						
									1	With valve springs						
											0	Standard connection				
											4	SS union nut and insert				
													0	with ProMinent® logo, no frame		
													2	without ProMinent® logo, no frame		
													A	with ProMinent® logo, with frame, simplex		
													B	with ProMinent® logo, with frame, duplex		
													C	with ProMinent® logo, with frame, triplex		
													M	Modified		
															S	3 ph. 230/400 V 50/60 Hz (WBS)
															R	Variable speed motor 4-pole, 230/400 V
															V0	Variable speed motor with integr. frequency converter
															Z	1 ph, variable speed control set 1 ph, 230 V, 50/60 Hz
															P	3 ph. 230/400 V 60 Hz (Exe, Exd)
															L	3 ph. 230/400 V 50 Hz (Exe, Exd)
															V2	With integrated frequency converter (Exd)
															4	No motor, with 56 C flange
															7	No motor, with 120/80 flange

* Figure 1 - 3=back pressure [bar]; figure 4 - 6=flow rate [l/h]

2.4 Plunger Metering Pumps

8	No motor, with 160/90 flange				
0	Without motor, externally mounted drive				
	Enclosure rating				
	0	IP 55 (standard)			
	1	Exe motor version ATEX-T3			
	2	Exd motor version ATEX-T4			
	A	ATEX power end			
		Stroke sensor			
		0	No stroke sensor		
		1	With stroke sensor (Namur)		
			Stroke length adjustment		
			0	Stroke length adjustment, manual	
			1	230 V stroke adjustment motor	
			2	115 V stroke adjustment motor	
			3	230 V 0-20 mA stroke controller	
			4	230 V 4-20 mA stroke controller	
			5	115 V 0-20 mA stroke controller	
			6	115 V 4-20 mA stroke controller	
				Application	
				0	standard

* Figure 1 - 3=back pressure [bar]; figure 4 - 6=flow rate [l/h]

Spare Parts Kits for Plunger Metering Pump Makro TZ

consists of:

valve balls
valve plate with spring
ball seat discs
piston packings made from PTFE/graphite
piston guide bands
flat seals/ O-rings

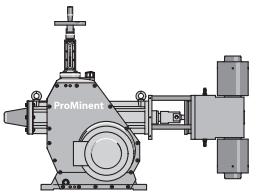
	Order no.
Spare parts kit for Makro TZ FK 12/20 S DN 8	1019106
Spare parts kit for Makro TZ FK 17/20 S DN 8	1019107
Spare parts kit for Makro TZ FK 23/20 S DN 10	1019108
Spare parts kit for Makro TZ FK 30/20 S DN 10	1019109
Spare parts kit for Makro TZ FK 40/20 S DN 20	1019110
Spare parts kit for Makro TZ FK 50/20 S DN 20	1019111
Spare parts kit for Makro TZ FK 60/20 S DN 25	1019112
Spare parts kit for Makro TZ FK 70/20 S DN 25	1019113
Spare parts kit for Makro TZ FK 85/20 S DN 40	1019124

2.4.5 Plunger Metering Pump Makro/ 5

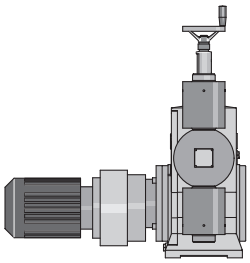
Powerful, built to last with a plunger

Capacity range of single head pump: 38 – 6,014 l/h, 320 – 6 bar

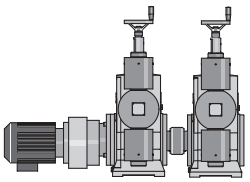
The plunger metering pump Makro/ 5 can virtually be used throughout the low-pressure range and its modular construction enables it to be outstandingly adapted to the performance requirements of the respective application.



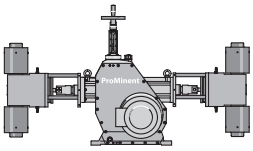
Makro/ 5 M5Ka



Makro/ 5 M5Ka



Makro/ 5 M5Ka externally mounted pump



Makro/ 5 double head pump

The plunger metering pump Makro/ 5 (M5ka) together with the Makro/ 5 hydraulic diaphragm and diaphragm metering pumps, form a range of drive mechanisms with stroke lengths of 20 and/or 50 mm. A wide range of power end versions is available for use in areas at risk from explosion with ATEX certification.

Your benefits

Process reliability:

- Metering reproducibility is better than ± 0.5 % within the 10 – 100% stroke length range under defined conditions and with correct installation

Excellent flexibility:

- The modular construction with single and double head versions permits a wide range of applications, with the double head designs being operated in push-pull mode
- It is possible to combine up to 4 metering units, even with different pump capacities, in multiple pump systems
- 5 different gear ratios are available
- Customised designs are available on request

Technical Details

- Stroke length: 0-50 mm, Rod force: 10,000 N
- Stroke length adjustment range: 0 – 100%
- Stroke length adjustment: manually by means of a manual adjustment wheel and scaled display in 0.5% increments (optionally with electric control drive)
- Metering reproducibility is better than ± 0.5 % within the 10 – 100% stroke length range under defined conditions and with correct installation. Observe the information in the operating instructions
- High-performance ceramic-coated stainless steel plunger
- Wetted materials: Stainless steel 1.4571, special materials are available on request
- A wide range of power end versions is available: Three-phase standard motors, motors for use in areas at risk from explosion and different flange designs for use in customer-specific motors
- Degree of protection: IP 55
- Salt water-resistant, acrylic resin-coated cast aluminium housing
- Provide suitable overload protection in all plunger metering pumps during installation for safety reasons

Field of application

- Volume-proportional metering of chemicals/additives in water treatment
- Metering of reactants and catalysts in the chemical industry
- Level-dependent metering of additives in industrial production engineering

Makro/ 5 Pump Control

Makro/ 5 stroke length controller

Control drive consisting of an actuator with servomotor and integral microprocessor controller for stroke length adjustment via a standard signal. Actuating period approx. 100 sec for 100% stroke length, equipped with 2 limit switches for min./max. position, degree of protection: IP 54. Electrical connection 230 V (±10%), 50/60 Hz, 40 W mechanical stroke length display fitted on the Makro/ 5 power end.

Special voltage/higher degrees of protection/explosion protection on request.

Design with:

Standard current input 0/4-20 mA (corresponds to stroke length 0-100%); internal switch-over for manual/ automatic operation, key switch for stroke adjustment in manual mode. Actual value output 0/4-20 mA for remote display.

Frequency converter for controlling speed in metal housing with IP 54 degree of protection

The frequency converter is accommodated in an IP 54 rated protective housing with integral control unit and main switch, suitable for motor capacity listed below.

Externally controllable with 0/4-20 mA or 0-10 V corresponding to 0-50 (60) Hz output frequency.

Integrated control unit with versatile functions, such as switching between external/internal control; frequency specified using arrow keys with internal control, multilingual fault message display etc.

With evaluation equipment for monitoring temperature of motor (thermistor protection).

Stroke sensor with Namur signal

Mounting on the crank drive mechanism of the Makro/ 5 gearbox. For precise measurement of each metering stroke, comprising electronic cams and inductive proximity switches, switching signal according to Namur. In combination with electronic pre-selection meters suitable for batch metering or proportional metering in conjunction with proportional control.

Retrospective fitting only possible in the factory.

Approved for Ex safety operation with degree of protection EEx ia II C T6.

2.4 Plunger Metering Pumps

Technical Data

Typ	Capacity at max. back pressure with 1500 rpm motor at 50 Hz				Capacity at max. back pressure with 1800 rpm motor at 60 Hz				Suction lift	Connector Suction/ Discharge Side	Ship- ping weight	Plunger Ø
	l/h	bar	ml/ stroke	Max. stroke rate Strokes/ min	l/h	psi	gph (US)	Max. stroke rate Strokes/ min	m WC	G-DN	kg	mm
3200038	38	320	11	60	44	4,640	12	71	3.0	Rp 1/4–8	300	17
3200048	48	320	11	75	56	4,640	15	89	3.0	Rp 1/4–8	300	17
3200066	66	320	11	103	78	4,640	21	123	3.0	Rp 1/4–8	300	17
3200085	85	320	11	133	101	4,640	27	159	3.0	Rp 3/8–10	300	17
3200100	100	320	11	156	-	-	-	-	3.0	Rp 3/8–10	300	17
2400070	70	240	21	60	82	3,480	22	71	3.0	Rp 3/8–10	300	23
2400088	88	240	21	75	104	3,480	27	89	3.0	Rp 3/8–10	300	23
2400121	121	240	21	103	144	3,480	38	123	3.0	Rp 3/8–10	300	23
2160157	157	216	21	133	187	3,132	49	159	3.0	Rp 3/8–10	300	23
1700184	184	170	21	156	-	-	-	-	3.0	G 1–15	300	23
1400120	120	140	35	60	142	2,030	38	71	3.0	G 1–15	302	30
1400151	151	140	35	75	179	2,030	47	89	3.0	G 1–15	302	30
1400207	207	140	35	103	247	2,030	65	123	3.0	G 1–15	302	30
1270267	267	127	35	133	319	1,842	84	159	3.0	G 1 1/4–20	302	30
1000314	314	100	35	156	-	-	-	-	3.0	G 1 1/4–20	302	30
0800214	214	80	63	60	253	1,160	67	71	3.0	G 1 1/4–20	303	40
0800268	268	80	63	75	318	1,160	84	89	3.0	G 1 1/4–20	303	40
0800368	368	80	63	103	439	1,160	116	123	3.0	G 1 1/4–20	303	40
0700476	476	70	63	133	569	1,015	150	159	3.0	G 1 1/2–25	303	40
0560558	558	56	63	156	-	-	-	-	3.0	G 1 1/2–25	303	40
0500335	335	50	98	60	396	725	105	71	3.0	G 1 1/2–25	303	50
0500419	419	50	98	75	497	725	131	89	3.0	G 1 1/2–25	303	50
0500576	576	50	98	103	687	725	181	123	3.0	G 1 1/2–25	303	50
0450744	744	45	98	133	889	653	235	159	3.0	G 2–32	303	50
0350872	872	35	98	156	-	-	-	-	3.0	G 2–32	303	50
0350483	483	35	141	60	571	508	151	71	3.0	G 1 1/2–25	311	60
0350604	604	35	141	75	716	508	189	89	3.0	G 1 1/2–25	311	60
0350829	829	35	141	103	989	508	261	123	3.0	G 2–32	311	60
0301071	1,071	30	141	133	1,280	435	338	159	3.0	G 2–32	311	60
0251257	1,257	25	141	156	-	-	-	-	3.0	G 2–32	311	60
0250658	658	25	192	60	778	363	206	71	3.0	G 2–32	311	70
0250822	822	25	192	75	975	363	258	89	3.0	G 2–32	311	70
0251129	1,129	25	192	103	1,348	363	356	123	3.0	G 2–32	311	70
0231458	1,458	23	192	133	1,743	334	460	159	3.0	G 2 1/4–40	311	70
0181710	1,710	18	192	156	-	-	-	-	3.0	G 2 1/4–40	311	70
0160970	970	16	284	60	1,147	232	303	71	3.0	G 2 1/4–40	317	85
0161212	1,212	16	284	75	1,438	232	380	89	3.0	G 2 1/4–40	317	85
0161665	1,665	16	284	103	1,988	232	525	123	3.0	G 2 1/4–40	317	85
0162150	2,150	16	284	133	2,570	232	679	159	3.0	G 2 3/4–50	317	85
0162522	2,522	16	284	156	-	-	-	-	3.0	G 2 3/4–50	317	85
0121343	1,343	12	393	60	1,589	174	420	71	3.0	G 2 3/4–50	331	100
0121678	1,678	12	393	75	1,991	174	526	89	3.0	G 2 3/4–50	331	100
0122305	2,305	12	393	103	2,752	174	727	123	3.0	G 2 3/4–50	331	100
0122977	2,977	12	393	133	3,558	174	940	159	3.0	G 2 3/4–50	331	100
0103491	3,491	10	393	156	-	-	-	-	3.0	G 2 3/4–50	331	100
0062269	2,269	6	664	60	2,684	87	709	71	3.0	G 2 1/2–65	350	130
0062837	2,837	6	664	75	3,366	87	889	89	3.0	G 2 1/2–65	350	130
0063896	3,896	6	664	103	4,652	87	1,229	123	3.0	G 2 1/2–65	350	130
0065031	5,031	6	664	133	6,014	87	1,589	159	3.0	G 2 1/2–65	350	130
0066000	6,000	6	664	156	-	-	-	-	3.0	G 2 1/2–65	350	130

2.4 Plunger Metering Pumps

Identity Code Ordering System for M5Ka

M5Ka	Drive type		Liquid end material		Sealing material *		Displacement body		Liquid end version		Hydraulic connections		Version	
	H	Main drive												
	A	Add-on drive												
	D	Double main drive												
	B	Double add-on power end												
		Type *												
		3200038												
		3200048												
		3200066												
		3200085												
		3200100												
		2400070												
		2400088												
		2400121												
		2160157												
		1700184												
		1400120												
		1400151												
		1400207												
		1270267												
		1000314												
		0800214												
		0800268												
		0800368												
		0700476												
		0560558												
		0500335												
		0500419												
		0500576												
		0450744												
		0350872												
		0350483												
		0350604												
		0350829												
		0301071												
		0251257												
		0250658												
		0250822												
		0251129												
		0231458												
		0181710												
		0160970												
		0161212												
		0161665												
		0162150												
		0162522												
		0121343												
		0121678												
		0122305												
		0122977												
		0103491												
		0062269												
		0062837												
		0063896												
		0065031												
		0066000												
			SS	Stainless steel										
					T	PTFE								
							S	Stainless steel plunger, chromium dioxide-coated						
									0	no valve spring				
									1	With valve springs				
											0	Standard connection		
											4	SS union nut and insert		
													0	with ProMinent® logo, no frame
													2	without ProMinent® logo, no frame
													A	with ProMinent® logo, with frame, simplex

* Figure 1 - 3=back pressure [bar]; figure 4 - 7=flow rate [l/h]

									B	with ProMinent® logo, with frame, duplex						
									C	with ProMinent® logo, with frame, triplex						
									D	with ProMinent® logo, with frame, quadruplex						
									M	Modified						
										Electrical power supply						
										S	3 ph. 230/400 V 50/60 Hz (WBS)					
										R	Variable speed motor 4-pole, 230/400 V					
										V0	Motor with integrated frequency converter					
										P	3 ph. 230/400 V 60 Hz (Exe, Exd)					
										L	3 ph. 230/400 V 50 Hz (Exe, Exd)					
										V2	Motor with integrated frequency converter (Exd)					
										5	No motor, with gearbox IEC 100					
										6	No motor, with gearbox IEC 112					
										0	No motor, no gearbox					
											Enclosure rating					
											0	IP 55 (standard)				
											1	Exe motor version ATEX-T3				
											2	Exd motor version ATEX-T4				
											A	ATEX power end				
												Stroke sensor				
												0	No stroke sensor			
												1	With stroke sensor (Namur)			
													Stroke length adjustment			
													0	Stroke length adjustment, manual		
													3	230 V 0-20 mA stroke controller		
													4	230 V 4-20 mA stroke controller		
													5	115 V 0-20 mA stroke controller		
													6	115 V 4-20 mA stroke controller		
													G	Control drive 230 V 0-20 mA Exde		
													H	Control drive 230 V 4-20 mA Exde		
														Application		
														0	standard	
														3	Temperature up to -20 °C	

* Figure 1 - 3=back pressure [bar]; figure 4 - 7=flow rate [l/h]

2.4 Plunger Metering Pumps

Materials in Contact With the Medium

Typ	Identity code of material	Dosing head	Suction/discharge connection	Valve seat/seals	Valve balls	Plungers
M5Ka	DN 8 - DN 10	Stainless steel 1.4571/1.4404	Stainless steel 1.4571/1.4404	Stainless steel/ PTFE	Oxide ceramic	Stainless steel/ ceramic
M5Ka	DN 15 - DN 25	Stainless steel 1.4571/1.4404	Stainless steel 1.4581	PTFE	Stainless steel 1.4401	Stainless steel/ ceramic
M5Ka	DN 32 - DN 65	Stainless steel 1.4571/1.4404	Stainless steel 1.4581/1.4404	PTFE	Stainless steel 1.4404 (plate/ spring)	Stainless steel/ ceramic

The permissible priming pressure on the suction side is approximately 50% of the max. permitted back pressure.

Motor Data

Identity code specification		Power supply			Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V 250 – 280 V/440 – 480 V	50 Hz 60 Hz	3 kW	
R	3-phase, IP 55	230 V/400 V	50/60 Hz	3 kW	With PTC, speed control range 1:5
V0	3-phase, IP 55	400 V ±10%	50/60 Hz	3 kW	Variable speed motor with integrated frequency converter
L1	3-phase, II 2G Ex e II T3 X	220 – 240 V/380 – 420 V	50 Hz	3.6 kW	
L2	3-phase, II 2G Ex de IIC T4 Gb	220 – 240 V/380 – 420 V	50 Hz	4 kW	With PTC, speed control range 1:5
P1	3-phase, II 2G Ex e IIC T3	250 – 280 V/440 – 480 V	60 Hz	3.6 kW	
P2	3-phase, II 2G Ex de IIC T4	250 – 280 V/440 – 480 V	60 Hz	4 kW	With PTC, speed control range 1:5
V2	3-phase, II 2GDc Ex de IIB T4 Gb, IP67	400 V ±10%	50/60 Hz	4 kW	Ex-variable speed motor with integrated frequency converter

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

Information for use in areas at risk from explosion

Only use pumps with the appropriate labelling in line with the ATEX Directive 2014/34/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label correspond to or are superior to the conditions prevalent in the intended application.

Spare Parts Kits

Spare parts kit for Makro/ 5, consisting of:

- Valve balls
- Valve plate with spring
- Ball seat discs
- Plunger packings made from PTFE/graphite
- Piston guide bands
- Flat seals / O-rings

	Order no.
Spare parts kit for Makro/ 5 FK 17/50 S DN 8	1005899
Spare parts kit for Makro/ 5 FK 17/50 S DN 10	1005536
Spare parts kit for Makro/ 5 FK 23/50 S DN 10	1005004
Spare parts kit for Makro/ 5 FK 23/50 S DN 15	1005900
Spare parts kit for Makro/ 5 FK 30/50 S DN 15	1005901
Spare parts kit for Makro/ 5 FK 30/50 S DN 20	1005537
Spare parts kit for Makro/ 5 FK 40/50 S DN 20	1005902
Spare parts kit for Makro/ 5 FK 40/50 S DN 25	1005538
Spare parts kit for Makro/ 5 FK 50/50 S DN 25	1005539
Spare parts kit for Makro/ 5 FK 60/50 S DN 25	1005903
Spare parts kit for Makro/ 5 FK 60/50 S DN 32	1005540
Spare parts kit for Makro/ 5 FK 70/50 S DN 32	1005541
Spare parts kit for Makro/ 5 FK 70/50 S DN 40	1005904
Spare parts kit for Makro/ 5 FK 85/50 S DN 40	1005542
Spare parts kit for Makro/ 5 FK 85/50 S DN 50	1005905
Spare parts kit for Makro/ 5 FK 100/50 S DN 50	1005543
Spare parts kit for Makro/ 5 FK 130/50 S DN 65	1005544

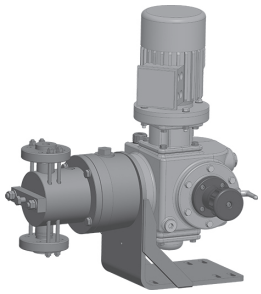
2.4 Plunger Metering Pumps

2.4.6 Plunger metering pump Orlita® Evolution

Simple and flexible.

Capacity range of single head pump: 15 – 545 l/h, 520 – 9 bar

The high-performance plunger metering pump Orlita® Evolution enables precise pump capacities even at maximum pressure and temperatures of up to +200 °C. The Orlita® Evolution pump has a modular construction and thus versatile uses.



Plunger metering pump Orlita® Evolution

The Orlita® Evolution plunger metering pumps EP1a and EP2a form an integrated product range with stroke lengths of 15 mm. This covers a capacity range from 5 to 511 l/h at 293 – 8 bar. A wide range of drive versions is available, including some for use in Zone 1 or Zone 2 areas at risk from explosion with ATEX certification. The Orlita® Evolution product range is designed to comply with API 675.

Your benefits

Flexible adaptation to the process:

- Precise capacity even at maximum pressure
- Metering reproducibility is better than ± 0.5 % within the 10 - 100 % stroke length range under defined conditions and with correct installation.
- Excellent hydraulic efficiency

Excellent flexibility:

- The modular and compact construction with single and multiple pump versions permits a wide range of applications. In multiple pump systems up to 5 metering units can be combined, including units with different pump capacities
- 7 gear ratios are available
- Power end configuration ideal for installation in any position (vertical or horizontal)
- Customised designs are available on request

Technical Details

- Stroke length: 0-16 mm, Rod force: 2,600 N (EP1a), 6,200 N (EP2a)
- Stroke length adjustment: 0 – 100 %
- Stroke length adjustment range: 0 – 100% in operation and idle
- The plunger packing can be tightened by the tensioning screw on the front even during operation
- Metering reproducibility is better than ± 0.5 % within the 10 – 100 % stroke length range under defined conditions and with correct installation
- Wetted materials: Stainless steel, special designs are available on request
- A wide range of power end versions is available: 3-phase AC motors, motors for use in areas at risk from explosion and different flange designs for use in customer-specific motors
- Degree of protection: IP 55
- Temperature range - 40 °C to + 200 °C
- Design in compliance with API 675 among others

Field of application

- Oil/ gas production (onshore/offshore)
- Refineries
- Chemical / petrochemical industry
- Pharmaceuticals & cosmetics
- Packaging industry (bottling pumps)
- Maximum temperature applications of up to + 200 °C

2.4 Plunger Metering Pumps

Technical data for EP1a single pump 50 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
10	1.26	5.5	7.3	8.7	10.9	12.4	13.6	15.2	331	0.85	0.95	DN 6
19	4.54	19.9	26.4	31.6	39.5	44.9	49.3	54.7	92	0.89	0.95	DN 10
26	8.49	37.2	49.4	59.1	73.9	84.1	92.3	102.4	49	0.92	0.95	DN 10
35	15.39	67.4	89.6	107.1	133.9	152.4	167.2	185.6	27	0.94	0.96	DN 16

Technical data for EP1a single pump 60 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
10	1.26	6.6	8.8	10.6	13.2	15.0	331	0.85	0.95	DN 6
19	4.54	24.0	31.8	38.1	47.6	54.2	92	0.89	0.95	DN 10
26	8.49	44.9	59.6	71.4	59.2	101.4	49	0.92	0.95	DN 10
35	15.39	81.3	108.1	129.3	161.6	183.8	27	0.94	0.96	DN 16

Note:

Abridged presentation of our complete product range. Other piston diameters (8–60 mm) on request.

Materials in Contact With the Medium

Ball valve DN 6 - DN 10

Identity code of material	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing	Clamp ring
DN 6 (double ball)	Stainless steel 1.4404	Stainless steel 1.4404	SiN ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 10 (single ball)	Stainless steel 1.4404	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4

Plate valve DN 16 - DN 20

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404

Further material versions and details available on request.

2.4 Plunger Metering Pumps

Technical data for EP2a single pump 50 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
10	1.26	5.5	7.3	8.7	10.9	12.4	13.6	15.2	520	0.82	0.95	DN 6
19	4.54	19.9	26.4	31.6	39.5	44.9	49.3	54.7	219	0.86	0.95	DN 10
26	8.49	37.2	49.4	59.1	73.9	84.1	92.3	102.4	117	0.90	0.96	DN 10
35	15.39	67.4	89.6	107.1	133.9	152.4	167.2	185.6	65	0.92	0.96	DN 16

Technical data for EP2a single pump 60 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
10	1.26	6.6	8.8	10.6	13.2	15.0	520	0.82	0.95	DN 6
19	4.54	24.0	31.8	38.1	47.6	54.2	219	0.86	0.95	DN 10
26	8.49	44.9	59.6	71.4	89.2	101.4	117	0.90	0.95	DN 10
35	15.39	81.3	108.1	129.3	161.6	183.8	65	0.92	0.96	DN 16

Note:

Abridged presentation of our complete product range. Other types on request. Piston diameter 11 - 80 mm.

Materials in Contact With the Medium

Ball valve DN 6 - DN 10

Identity code of material	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing	Clamp ring
DN 6 (double ball)	Stainless steel 1.4404	Stainless steel 1.4404	SiN ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 10 (single ball)	Stainless steel 1.4404	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4

Plate valve DN 16

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404

Further material versions and details available on request.

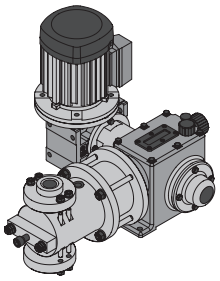
2.4.7 Plunger metering pump Orlita® PS

Orlita® PS - simple, robust and reliable.

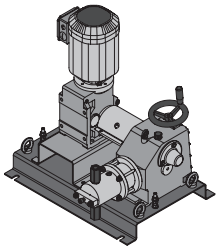
Capacity range of single head pump: 0 – 37,000 l/h; 400 – 4 bar

The high-performance plunger metering pump ORLITA® PS enables precise pump capacities even at maximum pressure and temperatures of up to +400 °C. The ORLITA® PS pump has a modular construction and thus versatile uses.

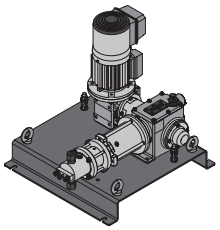
ORLITA® PS plunger metering pumps (PS 18 to PS 1400) with a stroke length of 15 to 60 mm provide a capacity ranging from 0 to 37,000 l/h at 400 – 4 bar. A wide range of drive versions is available, including some for use in Exe and Exde areas with ATEX certification. The Orlita® PS product range is designed to comply with API 675. Its modular construction permits the free combination of drives, power ends and dosing heads, producing a pump for a range of different feed rates and media operating at different working pressures.



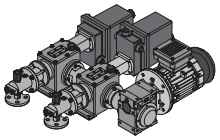
Orlita® PS 18-36



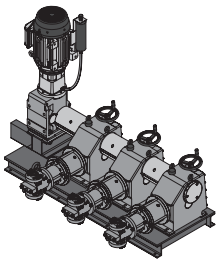
Orlita® PS 80-30



Orlita® PS 18-12 high-temperature



Orlita® PS 35-7-7



Orlita® PS 600-40-40-40

Your benefits

Flexible adaptation to the process:

- Precise capacity even at maximum pressure
- Metering reproducibility is better than ± 0.5 % within the 10-100% stroke length range under defined conditions and with correct installation.
- Cone valves for use as suction and/or discharge valves with minimal wear, good self-cleaning and low pressure loss (NPSHR)
- Excellent hydraulic efficiency

Excellent flexibility:

- The modular construction ensures a wide range of uses
- It is possible to combine up to 6 metering units, even with different pump capacities, in multiple pump systems
- 6 different gear ratios are available
- Power end configuration ideal for installation in any position (vertical or horizontal)
- Customised designs are available on request

Technical Details

- PS 18 – Stroke length: 0-15 mm, Rod force: 1,750 N
- PS 35 – Stroke length: 0-20 mm, Rod force: 3,500 N
- PS 80 – Stroke length: 0-20 mm, Rod force: 14,000 N
- PS 180 – Stroke length: 0-40 mm, Rod force: 18,000 N
- PS 600 – Stroke length: 0-40 mm, Rod force: 40,000 N
- PS 1400 – Stroke length: 0-60 mm, Rod force: 60,000 N
- Stroke length adjustment range: 0 – 100% in operation and idle
- The plunger packing can be tightened by the tensioning screw on the front even during operation
- Metering reproducibility is better than ± 0.5 % within the 10 – 100% stroke length range under defined conditions and with correct installation
- Wetted materials: Stainless steel, special designs are available on request
- A wide range of power end versions is available: Three-phase standard motors, motors for use in Exe and Exde areas and different flange designs for use in customer-specific motors
- Degree of protection: IP 55
- Temperature range - 40 °C to + 400 °C
- Design in compliance with API 675 among others

Field of application

- Oil/ gas production (onshore/offshore)
- Refineries
- Chemical/Petrochemical industry
- Pharmaceuticals & cosmetics
- Packaging industry (bottling pumps)
- Maximum temperature applications of up to +400 °C

2.4 Plunger Metering Pumps

Technical Data

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)						Max. pressure
			58	73	91	112	145	207	
	mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	l/h	bar
PS 18/	5	0.29	1.0	1.2	1.6	1.9	2.5	3.6	250
PS 18/	6	0.42	1.4	1.8	2.3	2.8	3.6	5.2	250
PS 18/	7	0.58	2.0	2.5	3.1	3.8	5.0	7.1	250
PS 18/	8	0.75	2.6	3.2	4.1	5.0	6.5	9.3	250
PS 18/	10	1.18	4.1	5.1	6.4	7.8	10.2	14.6	200
PS 18/	12	1.70	5.9	7.3	9.2	11.3	14.7	21.0	139
PS 18/	16	3.02	10.5	13.1	16.4	20.1	26.2	37.4	78
PS 18/	20	4.71	16.4	20.5	25.6	31.5	41.0	58.5	50
PS 18/	25	7.36	25.6	32.0	40.0	49.2	64.0	91.5	32
PS 18/	30	10.60	36.9	46.1	57.6	70.9	92.2	131.7	16
PS 18/	36	15.27	53.1	66.4	83.0	102.1	132.8	189.7	15
PS 18/	40	18.85	65.6	82.0	102.4	126.1	163.9	234.2	10
PS 18/	50	29.45	102.4	128.1	160.1	197.1	256.2	366.0	8

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)						Max. pressure
			58	73	91	112	145	207	
	mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	l/h	bar
PS 35/	7	0.77	2.6	3.3	4.1	5.1	6.7	9.5	630
PS 35/	8	1.01	3.5	4.3	5.4	6.7	8.7	12.4	400
PS 35/	10	1.57	5.4	6.8	8.5	10.5	13.6	19.5	400
PS 35/	12	2.26	7.8	9.8	12.3	15.1	19.6	28.1	250
PS 35/	16	4.02	13.9	17.4	21.8	26.9	34.9	49.9	156
PS 35/	20	6.28	21.8	27.3	34.1	42.0	54.6	78.0	100
PS 35/	25	9.82	34.1	42.7	53.3	65.7	85.4	122.0	64
PS 35/	30	14.14	49.2	61.5	76.8	94.6	122.9	175.7	44
PS 35/	36	20.36	70.8	88.5	110.6	136.2	177.1	253.0	30
PS 35/	40	25.13	87.4	109.3	136.6	168.2	218.6	312.3	25
PS 35/	50	39.27	136.6	170.8	213.5	262.8	341.6	488.0	16
PS 35/	65	66.37	230.9	288.6	360.8	444.1	577.3	824.8	9
PS 35/	80	100.53	349.8	437.3	546.6	672.7	874.6	1,249.4	6
PS 35/	100	157.08	546.6	683.3	854.1	1,051.2	1,366.5	1,952.2	4

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)						Max. pressure
			78	98	122	134	155	182	193	
	mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	l/h	l/h	bar
PS 80/	20	6.28	29	37	46	50	58	68	72	400
PS 80/	25	9.82	45	57	71	79	91	107	113	250
PS 80/	30	14.14	66	83	103	113	131	154	163	178
PS 80/	36	20.36	95	119	149	164	189	222	235	123
PS 80/	40	25.13	117	148	184	202	233	274	290	100
PS 80/	50	39.27	183	231	287	316	365	428	453	64
PS 80/	60	56.55	264	333	414	455	526	617	653	44
PS 80/	65	66.37	310	390	486	535	617	724	766	37
PS 80/	80	100.53	470	592	736	810	935	1,097	1,161	25
PS 80/	100	157.08	734	925	1,150	1,266	1,461	1,714	1,814	16
PS 80/	125	245.44	1,148	1,445	1,797	1,978	2,283	2,679	2,835	10
PS 80/	140	307.88	1,440	1,813	2,254	2,482	2,864	3,360	3,557	8
PS 80/	160	402.12	1,880	2,368	2,944	3,242	3,741	4,389	4,646	6

Important note:

All performance data is stated at 50 Hz motor frequency

Abridged presentation of our complete product range. Other types on request

2.4 Plunger Metering Pumps

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)						Max. pressure
			107	117	134	152	171	200	
	mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	l/h	bar
PS 180/	30	28.27	181	199	226	257	290	339	229
PS 180/	36	40.72	262	286	326	370	417	489	159
PS 180/	40	50.27	323	353	403	457	515	604	125
PS 180/	50	78.54	505	552	630	714	805	943	80
PS 180/	54	91.61	589	644	735	833	939	1,100	70
PS 180/	65	132.73	854	934	1,065	1,207	1,361	1,594	48
PS 180/	70	153.94	990	1,083	1,235	1,400	1,579	1,849	40
PS 180/	80	201.06	1,293	1,415	1,613	1,829	2,062	2,416	32
PS 180/	94	277.59	1,786	1,953	2,227	2,526	2,847	3,335	23
PS 180/	125	490.87	3,158	3,455	3,939	4,467	5,036	5,898	13
PS 180/	140	615.75	3,962	4,334	4,941	5,603	6,317	7,399	10
PS 180/	160	804.25	5,175	5,660	6,454	7,318	8,251	9,664	8
PS 180/	200	1,256.64	8,086	8,845	10.085	11,435	12,892	15,100	5

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)						Max. pressure
			99	117	134	156	173	204	
	mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	l/h	bar
PS 600/	30	28.27	168	198	227	264	293	345	400
PS 600/	36	40.27	242	285	327	381	422	497	353
PS 600/	40	50.27	299	352	403	470	521	614	286
PS 600/	50	78.54	467	551	630	735	814	959	183
PS 600/	54	91.61	545	643	735	857	949	1,119	157
PS 600/	65	132.73	789	932	1,067	1,243	1,376	1,621	100
PS 600/	70	153.94	916	1,080	1,236	1,441	1,596	1,880	93
PS 600/	80	201.06	1,196	1,411	1,616	1,882	2,084	2,456	71
PS 600/	94	277.59	1,651	1,949	2,229	2,599	2,878	3,391	51
PS 600/	125	490.87	2,921	3,446	3,946	4,596	5,090	5,998	29
PS 600/	140	615.75	3,664	4,323	4,951	5,766	6,385	7,523	23
PS 600/	160	804.25	4,785	5,647	6,466	7,531	8,339	9,827	16
PS 600/	200	1,256.64	7,477	8,823	10.104	11,768	13,030	15,354	11

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)						Max. pressure
			93	106	125	143	169	191	
	mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	l/h	bar
PS 1400/	40	75.40	419	480	565	647	766	864	400
PS 1400/	50	117.81	654	750	884	1,011	1,197	1,350	275
PS 1400/	60	169.65	943	1,080	1,273	1,456	1,724	1,944	190
PS 1400/	70	230.91	1,283	1,470	1,733	1,983	2,346	2,646	140
PS 1400/	80	301.59	1,676	1,920	2,263	2,590	3,065	3,456	107
PS 1400/	94	416.39	2,314	2,651	3,125	3,576	4,231	4,772	77
PS 1400/	125	736.31	4,093	4,689	5,527	6,323	7,483	8,439	44
PS 1400/	140	923.63	5,134	5,882	6,933	7,932	9,387	10.587	35
PS 1400/	160	1,206.37	6,706	7,683	9,055	10.360	12,261	13,827	25
PS 1400/	200	1,884.96	10.478	12,005	14,149	16,188	19,157	21,606	17
PS 1400/	280	3,694.51	20.538	23,530	27,732	31,729	37,549	42,348	8

Important note:

All performance data is stated at 50 Hz motor frequency

Abridged presentation of our complete product range. Other types on request

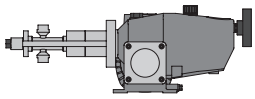
2.4 Plunger Metering Pumps

2.4.8 Plunger metering pump Orlita® DR

For the precise metering of high-viscosity and extremely high-viscosity media even containing solid fractions

Capacity range of single head pump: 0 – 4,000 l/h; 400 – 4 bar

The plunger metering pump Orlita® DR does not need valves and can therefore be operated within a broad stroke rate range. It is therefore suitable for use with high-viscosity and extremely high-viscosity media of up to 10^6 mPas within a wide temperature range of -40 °C to 400 °C.



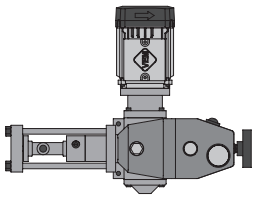
Orlita® DR

Orlita® DR plunger metering pumps (DR 15 to DR 150) are special pumps for high-viscosity and extremely high-viscosity media, which can also contain solids. The pump can be operated within a broad stroke rate range due to its operation without valves.

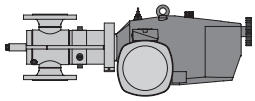
Your benefits

Optimum adaptation to processes with high-viscosity and extremely high-viscosity media, even containing solid fractions:

- Low-wear and precise operation even at high pressures thanks to the rotary piston with abrasion-resistant / wear-resistant surface coating
- Valve-free operation guarantees a broad stroke rate range
- Wide range of uses: Operating pressure of up to 400 bar, temperature range of - 40 °C to + 400 °C
- Pumping direction can be selected depending on the fitting position of the piston
- A reverse suction effect can be set in a continuously variable manner by rotating the pump head around its longitudinal axis
- Power end configuration ideal for installation in any position (vertical or horizontal)
- Excellent hydraulic efficiency
- 4 different gear ratios are available
- Customised designs are available on request



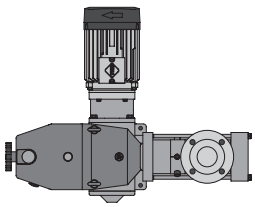
Orlita® DR 15/12



Orlita® 150/90

Technical Details

- DR 15 - stroke length: 0-15 mm, Rod force: 1,800 N
- DR 150 - stroke length: 0-32 mm, Rod force: 15,000 N
- Stroke length adjustment range: 0 – 100% in operation and idle
- Stroke length adjustment: manually by means of a manual adjustment wheel and scaled display (optionally with electric actuator or control drive)
- Metering reproducibility is better than ± 0.5% within the stroke length adjustment range of 10 to 100% under defined conditions and with proper installation
- Wetted materials: Stainless steel, special designs are available on request
- A wide range of power end versions is available: Three-phase AC standard motors, motors for use in areas at risk from explosion and different flange designs for use in customer-specific motors
- Degree of protection: IP 55
- Temperature range - 40 °C to + 400 °C
- The play between the piston and cylinder responsible for the sealing effect is selected depending on the viscosity
- Turret on the rear head end, either designed as a circular collecting vessel for leaks or exposed to a sealing medium
- The turret is sealed by elastomer lip sealing rings



Orlita® DR 150/90

Field of application

- Metering of high-viscosity and extremely high-viscosity media containing solid fractions.

2.4 Plunger Metering Pumps

Technical Data

Pump type	Plunger Ø	Theor. stroke volume	Max. capacity (theo.) in l/h at strokes/min (50 Hz)			Max. pressure
			58	77	116	
	mm	ml/stroke	l/h	l/h	l/h	bar
DR 15/	7	0.58	2.0	2.6	4.0	400
DR 15/	12	1.70	5.9	7.8	11.8	159
DR 15/	18	3.82	13.2	17.7	26.5	70
DR 15/	25	7.36	25.6	34.1	51.2	36
DR 15/	36	15.27	53.1	70.8	106.2	17
DR 15/	50	29.45	102.4	136.6	204.9	9
DR 15/	70	57.73	200.8	267.8	401.7	4

Pump type	Plunger Ø	Theor. stroke volume	Pump capacity (theo.) in l/h at strokes/min (60 Hz)				Max. pressure
			58	77	116	145	
	mm	ml/stroke	l/h	l/h	l/h	l/h	bar
DR 150/	12	3.62	12.5	16.7	25.1	31.4	400
DR 150/	18	8.14	28.3	37.7	56.6	70.8	400
DR 150/	25	15.71	54.6	72.8	109.3	136.6	250
DR 150/	36	32.57	113.3	151.1	226.7	283.3	147
DR 150/	50	62.83	218.6	291.5	437.3	546.6	76
DR 150/	70	123.15	428.5	571.4	857.1	1,071.4	38
DR 150/	90	203.58	708.4	944.5	1,416.8	1,771.1	23

Note:

All performance data is stated at 50 Hz motor frequency

Abridged presentation of our complete product range. Other types on request

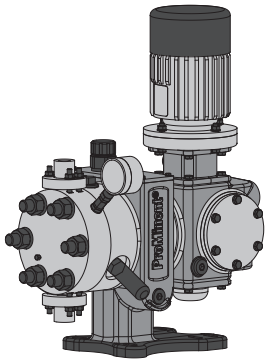
2.5 Process Hydraulic Diaphragm Pumps

2.5.1 Process hydraulic diaphragm metering pump Orlita® Evolution API 674

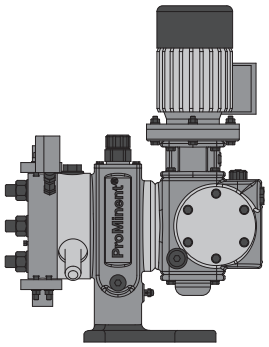
Maximum process reliability in accordance with API 674.

Capacity range per pump head: 3 – 7,400 l/h, 400 – 8 bar

The hydraulic diaphragm metering pump Orlita® Evolution API 674 is characterised by a PTFE multilayer diaphragm with integral diaphragm rupture warning and by its unique diaphragm position control. For critical and heavy Industrial applications and when meeting exacting safety requirements.



Orlita® Evolution hydraulic diaphragm metering pumps EF1F, EF2F, EF3F and EF4F form an integrated product range with stroke lengths of 15 to 40 mm. This covers the capacity range from 3 to 7,400 l/h at 400 – 10 bar. A wide range of drive versions is available, including some for use in Zone 1 or Zone 2 areas at risk from explosion with ATEX certification. The Orlita® Evolution product range is designed to comply with API 674.



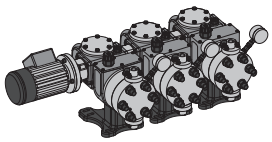
Your benefits

Maximum process reliability:

- PTFE multi-layer diaphragm with integral diaphragm rupture warning system
- Integral hydraulic relief valve
- The new diaphragm position control protects against impermissible operating statuses (e.g. no damage in the event of a blockage on the suction or discharge side)
- Metering reproducibility is better than ± 1% under defined conditions and with proper installation
- Continuous bleeding of the oil chamber ensures reliable operation

Excellent flexibility:

- The modular and compact construction with single and multiple pump versions permits a wide range of applications. In multiple pump systems up to 5 metering units can be combined, including units with different pump capacities
- 7 gear ratios are available
- Power end configuration ideal for installation in any position (vertical or horizontal)
- Customised designs are available on request



Technical Details

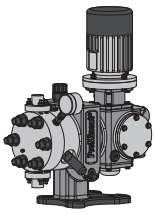
- Stroke length: 16 mm (Evo 1, Evo 2), 25 mm (Evo 3), 40 mm (Evo 4) Rod force: 2,600 N (Evo 1), 6,200 N (Evo 2), 9,000 N (Evo 3), 18,000 N (Evo 4)
- Metering reproducibility is better than ± 1% under defined conditions and with proper installation
- PTFE multi-layer diaphragm with electrical diaphragm rupture warning / signalling system via a contact
- Integrated hydraulic relief and bleed valve
- Wetted materials: Stainless steel 1.4404, special designs available on request Plastics PVC, PVDF, special designs available on request
- A wide range of power end versions is available: Three-phase AC standard motors also for use in areas at risk from explosion, different flange designs for use of customer-specific motors
- Degree of protection: IP 55
- Design in compliance with API 674 among others

Field of application

- Oil and gas industry
- Metering of reactants and catalysts in the chemical industry
- Volume-proportional metering of chemicals/additives in the treatment of boiler feed water
- Level-dependent metering of auxiliary agents in industrial production engineering, for instance hot wax metering in the production of adhesive strips

2.5 Process Hydraulic Diaphragm Pumps

Orlita® Evolution API 674 with stainless steel liquid end



The standard version of Orlita® Evolution hydraulic diaphragm metering pumps has a stainless steel dosing head.

Technical data for EF1F single head pump 50 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
8	0.80	3.5	4.7	5.6	7.0	8.0	8.7	9.7	400	0.43	0.75	DN 3
10	1.26	5.5	7.3	8.7	10.9	12.4	13.6	15.2	337	0.61	0.79	DN 3
12	1.81	7.9	10.5	12.6	15.7	17.9	19.7	21.8	234	0.77	0.86	DN 6
14	2.46	10.8	14.3	17.1	21.4	24.4	26.7	29.7	172	0.62	0.80	DN 6
17	3.63	15.9	21.1	25.3	31.6	36.0	39.4	43.8	117	0.77	0.88	DN 6
21	5.54	24.3	32.3	38.6	48.2	54.9	60.2	66.8	76	0.85	0.90	DN 10
25	7.85	34.4	45.7	54.7	68.3	77.8	85.3	94.7	54	0.90	0.93	DN 10
29	10.57	46.3	61.5	73.6	91.9	104.6	114.8	127.5	40	0.95	0.96	DN 10
32	12.87	56.4	74.9	89.6	112.0	127.4	139.7	155.2	33	0.89	0.93	DN 16
38	18.15	79.5	105.6	126.3	157.9	179.6	197.1	218.8	23	0.93	0.95	DN 16
44	24.33	106.6	141.6	169.3	211.7	240.9	264.2	293.4	17	0.94	0.96	DN 16
50	31.42	137.6	182.8	218.7	273.3	311.0	341.2	378.9	13	0.95	0.96	DN 16
58	42.27	185.2	246.0	294.2	367.8	418.5	459.1	509.8	10	0.95	0.97	DN 16

Technical data for EF1F single head pump 60 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
8	0.80	4.2	5.6	6.8	8.4	9.6	400	0.43	0.69	DN 3
10	1.26	6.6	8.8	10.6	13.2	15.0	337	0.61	0.79	DN 3
12	1.81	9.6	12.7	15.2	19.0	21.6	234	0.77	0.86	DN 6
14	2.46	13.0	17.3	20.7	25.9	29.4	172	0.62	0.80	DN 6
17	3.63	19.2	25.5	30.5	38.1	43.4	117	0.77	0.88	DN 6
21	5.54	29.3	38.9	46.6	58.2	66.2	73	0.85	0.90	DN 10
25	7.85	41.5	55.1	82.5	93.8	66.0	54	0.90	0.93	DN 10
29	10.57	55.8	126.2	74.2	88.8	111.0	40	0.95	0.96	DN 10
32	12.87	67.9	90.3	108.1	135.1	153.6	33	0.89	0.93	DN 16
38	18.15	95.8	127.4	152.4	190.5	216.7	23	0.93	0.95	DN 16
44	24.33	128.5	170.8	204.4	255.4	290.5	17	0.94	0.96	DN 16
50	31.42	165.9	220.5	263.9	329.9	375.1	13	0.95	0.96	DN 16
58	42.27	223.2	296.8	355.1	443.9	504.7	10	0.95	0.97	DN 16

Note:

Abridged presentation of our complete product range. Other piston diameters (8-60 mm) on request

2.5 Process Hydraulic Diaphragm Pumps

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
Stainless steel 1.4404	Stainless steel 1.4462	PTFE multi-layer diaphragm

DN 3 – DN 10 ball valve

Identity code of material	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing	Clamp ring
DN 3 (double ball)	Stainless steel 1.4404	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 6 (double ball)	Stainless steel 1.4404	Stainless steel 1.4404	SiN ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 10 (single ball)	Stainless steel 1.4404	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4

Plate valve DN 16

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	Stainless steel 1.4404	Stainless steel 1.4404	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404

Further material versions and details available on request.

Technical data for EF2F single head pump 50 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
12	1.81	7.9	10.5	12.6	15.7	17.9	20.3	21.8	400	0.69	0.82	DN 6
14	2.46	10.8	14.3	17.1	21.4	24.4	27.6	29.7	400	0.35	0.67	DN 6
17	3.63	15.9	21.1	25.3	31.6	36.0	40.7	43.8	274	0.60	0.79	DN 6
21	5.54	24.3	32.3	38.6	48.2	54.9	62.2	66.8	179	0.75	0.85	DN 10
25	7.85	34.4	45.7	54.7	68.3	77.8	88.1	94.7	127	0.83	0.89	DN 10
29	10.57	46.3	61.5	73.6	91.9	104.6	118.6	127.5	94	0.90	0.93	DN 10
32	12.87	56.4	74.9	89.6	112.0	127.4	144.4	155.2	77	0.76	0.87	DN 16
38	18.15	79.5	105.6	126.3	157.9	179.6	203.6	218.8	55	0.87	0.92	DN 16
44	24.33	106.6	141.6	169.3	211.7	240.9	273.0	293.4	41	0.90	0.94	DN 16
50	31.42	137.6	182.8	218.7	273.3	311.0	352.5	378.9	32	0.91	0.95	DN 16
58	42.27	185.2	246.0	294.2	367.8	418.5	474.3	509.8	24	0.93	0.96	DN 16
70	61.58	269.7	358.4	428.6	535.7	609.6	690.9	742.6	16	0.94	0.96	DN 20

2.5 Process Hydraulic Diaphragm Pumps

Technical data for EF2F single head pump 60 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
		88 [2]	117 [3]	140 [4]	175 [5]	199 [6]				
mm	ml/stroke	l/h	l/h	l/h	l/h	l/h	bar			
12	1.81	9.0	12.0	15.0	19.0	21.0	400	0.69	0.82	DN 6
14	2.46	13.0	17.0	20.0	25.0	29.0	400	0.35	0.67	DN 6
17	3.63	19.0	25.0	30.0	38.0	43.0	274	0.60	0.79	DN 6
21	5.54	29.0	38.0	46.0	58.0	66.0	179	0.75	0.85	DN 10
25	7.85	41.0	55.0	66.0	82.0	93.0	127	0.83	0.89	DN 10
29	10.57	55.0	74.0	88.0	111.0	126.0	94	0.90	0.93	DN 10
32	12.87	67.0	90.0	108.0	135.0	153.0	77	0.76	0.87	DN 16
38	18.15	95.0	127.0	152.0	190.0	216.0	55	0.87	0.92	DN 16
44	24.33	128.0	170.0	204.0	255.0	290.0	41	0.90	0.94	DN 16
50	31.42	165.0	220.0	263.0	329.0	375.0	32	0.91	0.95	DN 16
58	42.27	223.0	296.0	355.0	443.0	504.0	24	0.93	0.96	DN 16
70	61.58	325.0	432.0	517.0	646.0	735.0	16	0.94	0.96	DN 20

Note:

Abridged presentation of our complete product range. Other piston diameters (11–80 mm) on request.

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
Stainless steel 1.4404	Stainless steel 1.4462	PTFE multi-layer diaphragm

DN 3 – DN 10 ball valve

Identity code of material	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing	Clamp ring
DN 6 (double ball)	Stainless steel 1.4404	Stainless steel 1.4404	SiN ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 10 (single ball)	Stainless steel 1.4404	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4

Plate valve DN 16 - DN 20

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	Stainless steel 1.4404	Stainless steel 1.4404	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 20	Stainless steel 1.4404	Stainless steel 1.4404	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404

Further material versions and details available on request.

2.5 Process Hydraulic Diaphragm Pumps

Technical data for EF3F single head pump 50 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
17	5.67	24	33	39	49	56	61	68	397	0.72	0.77	DN 6
22	9.50	41	55	66	82	94	103	114	237	0.83	0.85	DN 6
25	12.27	53	71	85	106	121	133	148	183	0.83	0.85	DN 10
30	17.67	77	102	123	153	174	191	213	127	0.87	0.89	DN 10
34	22.70	99	132	158	197	224	246	273	99	0.88	0.89	DN 16
38	28.35	124	165	197	246	280	307	341	79	0.89	0.90	DN 16
44	37.01	166	221	264	330	376	412	453	59	0.90	0.91	DN 20
50	49.09	215	285	341	427	416	533	592	46	0.91	0.91	DN 20
58	66.05	289	384	459	574	653	717	796	34	0.92	0.92	DN 20
63	77.93	341	453	542	678	771	846	939	29	0.92	0.93	DN 25
70	96.21	421	559	669	837	952	1,044	1,160	23	0.93	0.94	DN 25
75	100.45	483	642	768	960	1,093	1,199	1,332	20	0.94	0.95	DN 25
100	196.35	860	1,142	1,366	1,708	1,943	2,132	2,368	11	0.96	0.96	DN 40

Technical data for EF3F single head pump 60 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
17	5.67	30	39	47	59	67	397	0.72	0.77	DN 6
22	9.50	50	66	79	99	113	237	0.83	0.85	DN 6
25	12.27	64	86	103	128	146	183	0.83	0.85	DN 10
30	17.67	93	124	148	186	211	127	0.87	0.89	DN 10
34	22.70	119	159	190	238	271	99	0.88	0.89	DN 16
38	28.35	149	199	238	297	338	79	0.89	0.90	DN 16
44	38.01	200	266	319	399	458	59	0.90	0.91	DN 20
50	49.09	259	344	412	515	586	46	0.91	0.91	DN 20
58	66.05	348	463	554	693	788	34	0.92	0.92	DN 20
63	77.93	411	547	654	818	930	29	0.92	0.93	DN 25
70	96.21	508	675	808	1,010	1,148	23	0.93	0.94	DN 25
75	110.45	583	775	927	1,159	1,318	20	0.94	0.95	DN 25
100	196.35	1,036	1,378	1,649	2,061	2,344	11	0.96	0.96	DN 40

Note:

Abridged presentation of our complete product range. Other piston diameters (14–100 mm) on request.

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
Stainless steel 1.4404	Stainless steel 1.4462	PTFE multi-layer diaphragm

DN 6 – DN 10 ball valve

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing	Clamp ring
DN 6	Stainless steel 1.4404	Stainless steel 1.4404	SiN ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4
DN 10	Stainless steel 1.4404	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404	Hastelloy C-4

DN 16 - DN 40 Plate valve

2.5 Process Hydraulic Diaphragm Pumps

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 20	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 25	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 40	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404

Further material versions and details available on request.

Technical data for EF4F single head pump 50 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
22	15.21	66	88	105	132	150	165	183	400	0.64	0.67	DN 16
25	19.63	86	114	136	170	194	213	236	368	0.67	0.74	DN 16
30	28.27	123	164	196	246	279	307	341	255	0.70	0.76	DN 16
34	36.32	159	211	252	316	359	394	438	199	0.81	0.84	DN 16
38	45.36	198	264	315	394	449	492	547	159	0.82	0.84	DN 20
44	60.82	266	354	423	529	602	660	733	119	0.87	0.88	DN 20
50	78.54	344	457	546	683	777	852	947	92	0.90	0.92	DN 25
60	113.10	495	658	787	983	1,119	1,228	1,364	64	0.91	0.93	DN 32
70	153.94	674	895	1,071	1,339	1,524	1,671	1,856	47	0.91	0.93	DN 40
75	176.71	774	1,028	1,229	1,537	1,749	1,919	2,131	41	0.91	0.93	DN 40
86	232.35	1,017	1,352	1,617	2,021	2,300	2,523	2,802	31	0.93	0.94	DN 50
90	254.47	1,114	1,481	1,771	2,213	2,519	2,763	3,068	28	0.93	0.94	DN 50
100	314.16	1,376	1,828	2,186	2,733	3,110	3,411	3,788	23	0.94	0.94	DN 50
110	380.13	1,665	2,212	2,645	3,307	3,763	4,128	4,584	19	0.95	0.95	DN 50
115	415.48	1,819	2,418	2,891	3,614	4,113	4,512	5,010	17	0.93	0.95	DN 65
130	530.93	2,325	3,090	3,695	4,619	5,256	5,765	6,403	14	0.94	0.95	DN 65
140	615.75	2,697	3,583	4,285	5,357	6,095	6,687	7,426	12	0.95	0.96	DN 65

Technical data for EF4F single head pump 60 Hz SST

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
22	15.21	80	106	127	159	181	400	0.64	0.67	DN 16
25	19.63	103	137	164	206	234	368	0.67	0.74	DN 16
30	28.27	149	198	237	269	337	255	0.70	0.76	DN 16
34	36.32	191	254	305	381	433	199	0.81	0.84	DN 16
38	45.36	239	318	381	476	541	159	0.82	0.84	DN 20
44	60.82	321	427	510	638	726	119	0.87	0.88	DN 20
50	78.54	414	551	659	824	937	92	0.90	0.92	DN 25
60	113.10	597	793	950	1,187	1,350	64	0.91	0.93	DN 32
70	153.94	812	1,080	1,293	1,616	1,838	47	0.91	0.93	DN 40
75	176.71	933	1,240	1,484	1,855	2,110	41	0.91	0.93	DN 40
86	232.35	1,226	1,631	1,951	2,439	2,774	31	0.93	0.94	DN 50
90	254.47	1,343	1,786	2,137	2,671	3,038	28	0.93	0.94	DN 50
100	314.16	1,658	2,205	2,368	3,298	3,751	23	0.94	0.94	DN 50
110	380.13	2,007	2,668	3,193	3,991	4,538	19	0.95	0.95	DN 50
115	415.48	2,193	2,916	3,490	4,362	4,960	17	0.93	0.95	DN 65
130	530.93	2,803	3,727	4,459	5,574	6,339	14	0.94	0.95	DN 65
140	615.75	3,251	4,322	5,172	6,465	7,352	12	0.95	0.96	DN 65

2.5 Process Hydraulic Diaphragm Pumps

Note:

Abridged presentation of our complete product range. Other piston diameters (22–140 mm) on request.

Materials in Contact With the Medium

Dosing head assembly

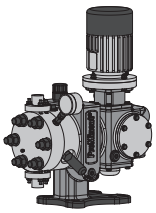
Dosing head	Diaphragm retaining screw	Diaphragm
Stainless steel 1.4404	Stainless steel 1.4462	PTFE multi-layer diaphragm

Plate valve

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 20	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 25	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 32	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 40	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 50	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404
DN 65	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4462	Stainless steel 1.4404	Stainless steel 1.4404

Further material versions and details available on request.

2.5 Process Hydraulic Diaphragm Pumps



Orlita® Evolution API 674 with PVC/PVDF liquid end

The process hydraulic diaphragm metering pump Orlita® Evolution API 674 is also available in a “plastic dosing head” version. The chemical resistance of the wetted materials PVC and PVDF to many media enables the even more flexible use of this process-reliable pump in an even greater number of applications.

Technical data for EF1F single head pump 50 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
8	0.80	3.5	4.7	5.6	7.0	8.0	8.7	9.7	16	0.67	0.77	DN 3
10	1.26	5.5	7.3	8.7	10.9	12.4	13.6	15.2	16	0.73	0.82	DN 3
12	1.81	7.9	10.5	12.6	15.7	17.9	19.7	21.8	16	0.71	0.77	DN 6
21	5.54	21.3	32.3	38.6	48.2	54.9	60.2	66.8	16	0.78	0.82	DN 10
25	7.85	34.4	45.7	54.7	68.3	77.8	85.3	94.7	16	0.81	0.87	DN 10
29	10.57	46.3	61.5	73.6	91.9	104.6	114.8	127.5	16	0.84	0.89	DN 10
44	24.33	106.6	141.6	169.3	211.7	240.9	264.2	293.4	15	0.94	0.96	DN 16
50	31.42	137.6	182.8	218.7	273.3	311.0	341.2	378.9	12	0.95	0.96	DN 16
60	42.27	185.2	246.0	294.2	367.8	418.5	459.1	509.8	9	0.95	0.96	DN 16

Technical data for EF1F single head pump 60 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
8	0.80	4.2	5.6	6.8	8.4	9.6	16	0.67	0.77	DN 3
10	1.26	6.6	8.8	10.6	13.2	15.0	16	0.73	0.82	DN 3
12	1.81	9.6	12.7	15.2	19.0	21.6	16	0.71	0.87	DN 6
21	5.54	29.3	38.9	46.6	58.2	66.2	16	0.78	0.85	DN 10
25	7.85	41.5	55.1	66.0	82.5	93.8	16	0.81	0.87	DN 10
29	10.57	55.8	74.2	88.8	111.0	126.2	16	0.84	0.89	DN 10
44	24.33	128.5	170.8	204.4	255.4	290.5	15	0.94	0.96	DN 16
50	31.42	165.9	220.5	263.9	329.9	375.1	12	0.95	0.96	DN 16
60	42.27	223.2	296.8	355.1	443.9	504.7	9	0.95	0.96	DN 16

Note:

Abridged presentation of our complete product range. Other piston diameters (8 - 60 mm) on request. Other pressures (e.g. 21 bar) on request.

2.5 Process Hydraulic Diaphragm Pumps

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
PVC	Hastelloy C	PTFE
PVDF	Hastelloy C	PTFE

DN 3 – DN 10 ball valve

Identity code of material	Standard type of valve	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing
DN 3 (double ball)	DN 3	PVDF	Stainless steel 1.4404	Al_2O_3 ceramic	Stainless steel 1.4404	Stainless steel 1.4404
DN 6 (single ball)	DN 6	PVDF	PTFE moulded composite	Al_2O_3 ceramic	PTFE	PVDF
DN 10 (single ball)	DN 10	PVDF	PTFE moulded composite	Al_2O_3 ceramic	PTFE	PVDF

Plate valve DN 16

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	PVDF	PTFE	ZrO_2 ceramic	PTFE	PVDF

Technical data for EF2F single head pump 50 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
12	1.81	7.9	10.5	12.6	15.7	17.9	19.7	21.8	16	0.71	0.77	DN 6
21	5.54	24.3	32.3	38.6	48.2	54.9	60.2	66.8	16	0.78	0.85	DN 10
25	7.85	34.4	45.7	54.7	68.3	77.8	85.8	94.7	16	0.81	0.87	DN 10
29	10.57	46.3	61.5	73.6	91.9	104.6	114.8	127.5	16	0.84	0.89	DN 10
44	24.33	106.6	141.6	169.3	211.7	240.9	264.2	296.4	16	0.94	0.96	DN 16
50	31.42	137.6	182.8	218.7	273.3	311.0	341.2	378.9	16	0.95	0.96	DN 16
58	42.27	185.2	246.0	294.2	367.8	418.5	459.1	509.8	16	0.95	0.96	DN 16

Technical data for EF2F single head pump 60 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
12	1.81	9.6	12.7	15.2	19.0	21.6	16	0.71	0.77	DN 6
21	5.54	29.3	38.9	46.6	58.2	66.2	16	0.78	0.85	DN 10
25	7.85	41.5	55.1	66.0	82.5	93.8	16	0.84	0.85	DN 10
29	10.57	55.8	74.2	88.8	111.0	126.2	16	0.84	0.87	DN 10
44	24.33	128.5	170.8	204.4	255.4	290.5	16	0.94	0.96	DN 16
50	31.42	165.9	220.5	263.9	329.9	375.1	16	0.95	0.96	DN 16
58	42.27	223.2	296.8	355.1	433.9	504.7	16	0.95	0.96	DN 16

Note:

Abridged presentation of our complete product range. Other piston diameters on request. Other pressure stages (e.g. 21 bar) on request.

2.5 Process Hydraulic Diaphragm Pumps

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
PVC	Hastelloy C	PTFE
PVDF	Hastelloy C	PTFE

DN 3 – DN 10 ball valve

Identity code of material	Suction/discharge connection	Valve/head seal	Valve balls	Valve seats	Valve housing	Clamp ring
DN 6 (double ball)	PVDF	PTFE moulded composite	Al_2O_3 ceramic	PTFE	PVDF	PVDF
DN 10 (single ball)	PVDF	PTFE moulded composite	Al_2O_3 ceramic	PTFE	PVDF	PVDF

Plate valve DN 16

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 16	PVDF	PTFE	ZrO_2 ceramic	PTFE	PVDF

Further material versions and details available on request.

Technical data for EF3F single head pump 50 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
63	77.93	341	453	542	678	771	846	939	16	0.92	0.93	DN 32
70	96.21	421	559	669	837	952	1,044	1,160	16	0.93	0.94	DN 32
75	110.45	483	642	768	960	1,093	1,199	1,332	16	0.94	0.95	DN 32
100	196.35	860	1,142	1,366	1,708	1,943	2,132	1,063	11	0.95	0.96	DN 50

Technical data for EF3F single head pump 60 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
63	77.93	411	547	654	818	930	10	0.92	0.93	DN 32
70	96.21	508	674	802	1,010	1,148	10	0.93	0.94	DN 32
75	110.45	583	775	927	1,159	1,318	10	0.94	0.95	DN 32
100	196.35	1,036	1,378	1,649	2,061	2,344	10	0.95	0.96	DN 50

Note:

Abridged presentation of our complete product range. Other piston diameters on request. Other pressure stages (e.g. 16 bar) on request.

2.5 Process Hydraulic Diaphragm Pumps

Materials in Contact With the Medium

Dosing head assembly

Dosing head	Diaphragm retaining screw	Diaphragm
PVC	Hastelloy C	PTFE
PVDF	Hastelloy C	PTFE

DN 32 - DN 50 Plate valve

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 32	PVDF	PTFE	ZrO_2 ceramic	PTFE	PVDF
DN 50	PVDF	PTFE	ZrO_2 ceramic	PTFE	PVDF

Further material versions and details available on request.

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min							Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	73 [2] l/h	97 [3] l/h	116 [4] l/h	145 [5] l/h	165 [6] l/h	181 [7] l/h	201 [8] l/h	bar			
70	153.90	674	895	1,071	1,339	1,524	1,671	1,856	10	0.84	0.85	DN 50
75	176.70	774	1,028	1,229	1,537	1,749	1,919	2,131	10	0.85	0.86	DN 50
115	415.50	1,819	2,418	2,891	3,614	4,113	4,512	5,010	10	0.90	0.91	DN 50
130	530.90	2,325	3,090	3,695	4,619	5,253	5,765	6,403	10	0.92	0.93	DN 65
140	615.80	2,697	3,583	4,285	5,357	6,095	6,687	7,426	10	0.93	0.94	DN 65

Technical data for EF4F single head pump 50 Hz PVC/PVDF

Plunger Ø	Theor. stroke volume	Theoretical pump capacity in l/h at strokes/min					Max. pressure	Efficiency at 100 % pressure	Efficiency at 50 % pressure	Standard type of valve
mm	ml/stroke	88 [2] l/h	117 [3] l/h	140 [4] l/h	175 [5] l/h	199 [6] l/h	bar			
70	153.90	812	1,080	1,293	1,616	1,838	10	0.84	0.85	DN 50
75	176.70	933	1,240	1,855	2,110	1,484	10	0.85	0.86	DN 50
115	415.50	2,193	2,916	3,490	4,362	4,960	10	0.90	0.91	DN 50
130	615.80	2,803	3,727	4,459	5,574	6,339	10	0.92	0.93	DN 65
140	530.90	3,251	4,322	5,172	6,465	7,352	10	0.93	0.94	DN 65

Technical data for EF4F single head pump 60 Hz PVC/PVDF

Note:

Abridged presentation of our complete product range. Other piston diameters on request. Other pressure stages (16 and/or 21 bar) on request.

Materials in Contact With the Medium

Dosing head	Diaphragm retaining screw	Diaphragm
PVC	Hastelloy C	PTFE
PVDF	Hastelloy C	PTFE

Dosing head assembly

Standard type of valve	Suction/discharge connection	Valve/head seal	Valve plate	Valve seats	Valve housing
DN 50	PVDF	PTFE	ZrO_2 ceramic	PTFE	PVDF
DN 65	PVDF	PTFE	ZrO_2 ceramic	PTFE	PVDF

Plate valve

Further material versions and details available on request.

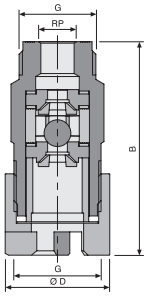
2.6 Accessories for Process Metering Pumps

2.6.1 Hydraulic/Mechanical Accessories

Hydraulic/mechanical accessories for metering pumps such as injection valves and foot valves, can be found in Chapter 1.4.2, sorted by nominal width DN 8 ... DN 40:

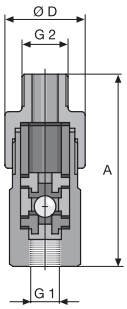
Please observe the permitted pressure stages or material combinations in your selection. Further accessories are available on request.

Foot Valve SST for High-Pressure Metering Pumps



Product designation	Dimension G	B dimension	Dimension Rp	Diameter Ø D	Order no.
		mm		mm	
DN 10	3/4	70	1/4	41	803730
DN 10	3/4	70	3/8	41	803731

Injection Valve SST for High-Pressure Metering Pumps



To fit metering pumps of the product ranges Sigma, Meta and Makro TZ-HK.

Housing and valve spring made of stainless steel no. 1.4571, ball made of stainless steel no. 1.4401, PTFE seals, priming pressure approx. 0.1 bar.

Application

90 °C - max. operating pressure, see table

Product designation	Max. pressure bar	G1	G2	Diameter Ø D mm	Dimension A mm	Order no.
DN 8	320	Rp 1/4	Rp 1/2	42	85	803732
DN 10	190	Rp 3/8	Rp 1/2	42	90	803733

Return/Pressure Relief Valve, Spring-loaded

Spring-loaded valves, inline version, designed as pump valves, i.e. to cope with a very high number of load cycles. Also suitable for use without pulsation damper.

Features:

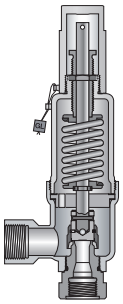
- Female thread on both sides or with sealing surface
- For bracing between 2 flanges
- PN 200 or PN 400
- Settings factory-set
- Standard design in stainless steel, hastelloy also available on request, as is Inconel

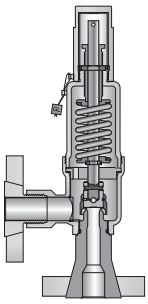
Also available heatable on request.

Dimension DN	Adjustable pressure bar	Construction	Order no.
6	2.0	Ball	1020074
6	4.0	Ball	1019224
6	8.0 – 9.0	Ball	1019097
10	2.0	Cone, fixed	1019649
10	3.0 – 6.0	Cone, adjustable	1023053
10	8.0 – 14.0	Cone, adjustable	1024065
16	2.0	Cone, fixed	1017937
16	3.0	Cone, fixed	1035266
16	4.5 – 5.4	Cone, fixed	1017936
25	1.0 – 2.0	Cone, fixed	1021843

2.6 Accessories for Process Metering Pumps

Safety Valve





Regulations:

Safety valves are designed to comply with the following regulations:

- Pressurised Vessel and Steam Boiler Directive
- TRD 421, 721
- TRB 403
- AD 2000 Bulletins A2 and A4
- DIN EN ISO 4126
- Pressure Equipment Directive 97/23/EC
- ASME Code, Sections II and VIII
- API 526, 520, 527
- Others

The relevant product-specific certificates are available to prove compliance with these regulations and thus also the safety of the products.

Safety valves carry a parts label (specification label) stipulating the following data:

- Order date (serial no.)
- Technical data
- Set pressure
- VdTÜV Parts test number
- CE mark with number of nominated centre
- Further data, e.g. UV stamp with ASME-approved safety valves

Inspection / Labelling:

Following adjustment and inspection, every safety valve is sealed by the manufacturer.

Connections: NPT threaded connectors, threaded sockets, flange connections comply with DIN / ANSI. Other connections
are available on request.

Inlet body material	
Material description	X 14 CrNiMo 17 – 12 – 2
Material no.	1.4404
ASME	316L

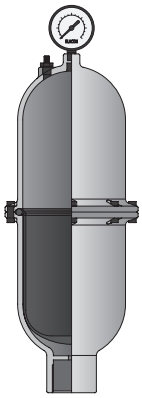
Dimensions, pressure ranges, weights	**Standard 10 mm**
Pressure stage at inlet	320 PN
Pressure stage at outlet	160 PN
Min. response pressure	0.1 bar
Max. response pressure (4373/4374)	68 bar
Narrowest flow cross-section	78.5 mm^2
Narrowest flow diameter	10 mm
Leg length (outlet/inlet)	30 mm/33 mm
Pin length (G 1/2/G 3/4)	15 mm/16 mm
Flange design	100 mm
Height (H2/H4)	137/162 mm
Weight	1.2 kg

2.6 Accessories for Process Metering Pumps

Pulsation damper

Pulsation dampers with separating membrane / bubble / bellows for providing separation between the gas cushion and metered chemical are used for low-pulsation metering as well as for reducing flow resistance in long metering lines and with viscous media. The response pressure of the gas cushion should be approx. 60-80% of the operating pressure.

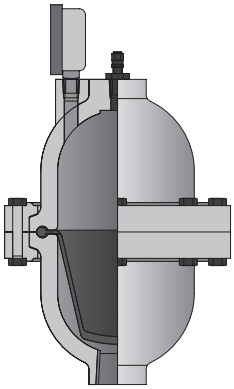
Important: A pressure relief valve should always be fitted with an adjustable back pressure valve when using a pulsation damper.



Bladder dampers, metal

Volume	0.066 – 379 l
Pressure	20.7 bar
Material of bladder/diaphragm	EPDM or FKM
Housing material	316 L stainless steel, Hastelloy C, PTFE

Further material versions and details available on request.

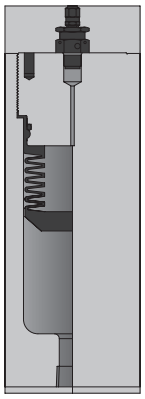


Bladder damper, plastic

Volume	0.066 – 19 l
Pressure	17.2 bar
Material of bladder/diaphragm	EPDM or FKM
Housing material	PVDF

Further material versions and details available on request.

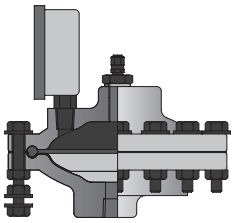
2.6 Accessories for Process Metering Pumps



Bladder damper, high pressure

Volume	0.13 – 0.39 l
Pressure	793 bar
Material of bladder/diaphragm	EPDM or FKM
Housing material	316 L stainless steel, Hastelloy C, Alloy 20

Further material versions and details available on request.



Diaphragm damper with PTFE diaphragm

Volume	0.20 l
Pressure	137 bar
Material of bladder/diaphragm	PTFE
Housing material	316 L stainless steel, Hastelloy C, Alloy 20

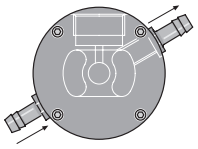
Further material versions and details available on request.

2.6 Accessories for Process Metering Pumps

2.6.2 Electrical Accessories

Accessories for metering pumps, such as frequency converters etc., can be found in Chapter 1.4.4. depending on the motor capacity DN 8 ... DN 40.

Cooling/Heating Equipment, Plunger Metering Pumps



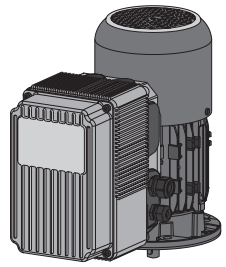
The cooling/heating device is integrated in the dosing head. Connecting sockets Ø 10 mm. Modification at a later date is not possible.

For pump	Order no.
Sigma HK - 08 S	1040459
Meta/Sigma HK - 12.5 S	803551
Meta/Sigma HK - 25 S	803552
Meta/Sigma HK - 50 S	803553
Makro TZ FK 30	1036645
Makro TZ FK 50	1036655
Makro TZ FK 85	1024665

Cooling/heating device for Makro TZ HK available on request.

2.6 Accessories for Process Metering Pumps

2.6.3 Variable speed motors with integrated frequency converter with IP 55 degree of protection



Variable speed motor with integrated frequency converter

Externally controllable by 5 digital inputs, 1 analogue output 0 - 20 mA, 1 analogue input 0 - 10 V.

Max. motor output kW	Voltage supply	Control range	Flange Ø mm	For pump	Order no.
0.37	1-phase, 230 V, 50/60 Hz	1:20	160	Hydro/ 2	1106898
0.75	1-phase, 230 V, 50/60 Hz	1:20	160	Hydro/ 3	1106900
1.50	3-phase, 400 V, 50/60 Hz	1:20	200	Hydro/ 4, Makro TZ (TZMb)	1106899
3.00	3-phase, 400 V, 50/60 Hz	1:20	200	Makro 5, Makro TZ (TZKa)	1106901

Motor data sheets can be requested for more information. Versions 265/460V - 60Hz, special motors or special motor flanges are available on request.

Motors less than 0.75 kW and motors designed for speed-controllable operation are not subject to the IE3 standard in compliance with the Ecodesign Directive 2009/125/EC.

Data Required for Specification of Metering Pump and Accessories

Pump Specification Data

Min./max. required feed rate	l/h _____
Available power supply	_____ V, _____ Hz
Min./max. operating temperature	°C _____
Properties of process chemical	_____
Name, concentration %	_____
Solids content %	_____
Dynamic viscosity mPa (= cP)	_____
Vapour pressure at operating temperature	bar _____
Remarks, e.g. abrasive,	_____
gaseous, flammable,	_____
corrosive towards	_____

Suction conditions:

Min./max. suction lift	m _____
Min./max. positive suction head	m _____
Pressure in chemical tank	bar _____
Suction line length	m _____
Suction line diameter	mm _____

Discharge conditions:

Min./max. back pressure	bar _____
Min./max. discharge head	m _____
Min./max. negative discharge head	m _____
Discharge line length	m _____
Discharge line diameter	mm _____
Number of valves and fittings in suction and discharge line	_____

Data required for proportional dosing:

Water flow Q min./max.	m^3/h _____
Required final concentration	g/m^3, ppm _____

Example:

A required dose in mg/l = g/m^3 = ppm

(Water flow Q max. 50 m^3/h)

Pulse spacing (flow volume per pulse) of water meter 5 l.

Process fluid = sodium hypochlorite solution Na OCl with 12 % chlorine (by weight) = 120 g/kg = 150 g/l = 150 mg/ml

Selected dosing pump GMXa 1604NPT2 NPB2 with 0.3 ml/per stroke volume, at max. 10800 strokes/h.

Variables: pump type, pulse spacing and concentration. The stroke rate (max. throughput l/h: pulse spacing l/pulse = 50,000 l/h : 5 l/pulse = 10000 pulses/h) must not exceed the max. stroke frequency (10800 strokes/h) of the dosing pump.

$$\text{Feed quantity} = \frac{\text{water throughput Q max. (l/h) x stroke volume (l)}}{\text{pulse spacing (l)}} = \frac{50{,}000\ \text{l} \times 0.0003\ \text{l}}{\text{h} \times 5\ \text{l}} = 3\ \text{l/h}$$

$$\text{Final dose} = \frac{\text{concentration (mg/l) x stroke volume (l)}}{\text{pulse spacing (l)}} = \frac{150\ \text{mg} \times 0.3\ \text{l}}{\text{ml} \times 5\ \text{l}} = 9\ \text{mg/l}$$

$= 9\ g/m^3$

$= 9$ ppm chlorine Cl_2

ProMinent® Chemical Resistance List

Resistance of Materials Used in Liquid Ends to the Chemicals Most Frequently Used

This data applies to standard conditions (20 °C, 1,013 mbar).

s	saturated solution in water
+	resistant
+/o	practically resistant
o	conditionally resistant
-	not resistant
n	resistance not known
=>	see under
*	The resistance of the adhesive (e.g. Tangit) should be taken into account for bonded connections. (We would not recommend materials rated as 'o' and '-' !)
**	Does not apply to fibre glass-reinforced material

Concentrations are stated as weight percentages with reference to aqueous solutions. If the level of resistance is provided with a percentage figure, it only applies up to this concentration.

NOTE:

The **CSM (Hypalon®)** and **IIR (butyl rubber)** elastomers used as the diaphragm materials in bladder dampers have similar characteristics to **EPDM**.

PTFE is resistant to all the chemicals in this list.

However, **PTFE filled with carbon** is attacked by aggressive oxidants such as bromine (anhydrous) or concentrated acids (nitric acid, sulfuric acid, chromic acid).

The resistance of PVC-U connections bonded with Tangit deviates from the list below for the following chemicals:

Medium	Concentration range
Chromo-sulfuric acid	≥ 70 % H_2SO_4 + 5 % $K_2Cr_2O_7$/$Na_2Cr_2O_7$
Chromic acid	≥ 10 % CrO_3
Hydrochloric acid	≥ 25 % HCl
Hydrogen peroxide	≥ 5 % H_2O_2
Hydrofluoric acid	≥ 0 % HF

Abbreviations used in the column designations:

Acrylic:	Resistance of poly(methyl methacrylate) (clear acrylic)
PVC:	Resistance of polyvinyl chloride, hard (PVC-U)
PP:	Resistance of polypropylene
PVDF:	Resistance of polyvinylidene fluoride (PVDF)
1.4404:	Resistance of stainless steel 1.4404, 1.4571 and 1.4435
FKM:	Resistance of fluorine rubber (e. g. Viton® A and B)
EPDM:	Resistance of ethylene propylene diene monomer
PharMed®:	Resistance of PharMed®
PE:	Resistance of polyethylene
2.4819:	Resistance of Hastelloy C-276
WGK:	Water hazard class

Viton® is a registered trademark of DuPont Dow Elastomers

Water Hazard Classes (WGK):

1	Low hazard to waters
2	Hazard to waters
3	Severe hazard to waters
(X)	Not classified. Classified through conclusion by analogy. To be used with reservations.

Safety data sheets

ProMinent® Chemical Resistance List

Safety data sheets for our products can be found on our website and are available in versions for numerous different countries.

www.prominent.com/MSDS

The data has been taken from relevant manufacturers' literature and supplemented by our own tests and experience. As the resistance of materials also depends on other factors (operating conditions, state of surface etc.), this list should merely be regarded as an initial guide and does not claim to offer any guarantees. Take into consideration the fact that conventional feed chemicals are largely compounds, the corrosiveness of which cannot simply be calculated by adding together the corrosiveness of each individual component. In cases such as these the material compatibility data produced by the chemical manufacturer must be read as a matter of priority when selecting a material. Safety data sheets do not provide this information and cannot therefore replace application-specific documentation.

Corrosive agent	Formula	Concentration in %	Acryl	PVC	PP	PVDF	1.4404	FKM	EPDM	PharMed®	PE	HastelloyC	WGK
Acetaldehyde	CH_3CHO	100	-	-	o	-	+	-	+/o	-	+	+	2
Acetamide	CH_3CONH_2	s	+	+	+	+	+	o	+	+/o	+	+	1
Acetic anhydride	$(CH_3CO)_2O$	100	-	-	o	-	+	-	+/o	+	o	+	1
Ethyl acetoacetate	$C_6H_{10}O_3$	100	n	-	+	+	+	-	+/o	+/o	+	+	1
Acetone	CH_3COCH_3	100	-	-	+	-	+	-	+	-	+	+	1
Acetophenone	$C_6H_5COCH_3$	100	-	n	+	-	+	-	+	n	+	+	-
Acetylacetone	$CH_3COCH_2COCH_3$	100	-	-	+	-	+	-	+	n	+	+	1
Acetyl chloride	CH_3COCl	100	-	+	n	-	o	+	-	o	n	+	1
1,2-Dichloroethene	$C_2H_2Cl_2$	100	-	-	o	+	+	o	-	o	-	+	2
Acetylene tetrachloride	$C_2H_2Cl_4$	100	-	-	o	+	+	o	-	o	o	+	3
Acrylonitrile	CH_2=CH-CN	100	-	-	+	+	+	-	-	-	+	+	3
Adipic acid	$HOOC(CH_2)_4COOH$	s	+	+	+	+	+	+	+	+/o	+	+	1
Battery acid	H_2SO_4	98%	30%	50%	85%	+	20%	+	80%	30%	80%	+	1
Allyl alcohol	CH_2CHCH_2OH	96	-	o	+	+	+	-	+	o	+	+/o	2
Aluminium acetate	$Al(CH_3COO)_3$	s	+	+	+	+	+	+	+	+	+	+/o	1
Aluminium bromide	$AlBr_3$	s	+	+	+	+	n	+	+	+	+	+	2
Aluminium chloride	$AlCl_3$	s	+	+	+	+	-	+	+	+	+	+	1
Aluminium fluoride	AlF_3	10	+	+	+	+	-	+	+	+	+	+/o	1
Aluminium hydroxide	$Al(OH)_3$	s	+	+	+	o	+	+	+	+	+	+	1
Aluminium nitrate	$Al(NO_3)_3$	s	+	+	+	+	+	+	+	+	+	+	1
Aluminium phosphate	$AlPO_4$	s	+	+	+	+	+	+	+	+	+	+	1
Aluminium sulfate	$Al_2(SO_4)_3$	s	+	+	+	+	+	+	+	+	+	+	1
Formic acid	$HCOOH$	s	-	+/o	+	+	+	-	-	+/o	+	+	1
Ammonia	"NH_4OH"	30	+	+	+	+ (25 °C)	+	-	+	+	+	+	2
Ammonium acetate	CH_3COONH_4	s	+	+/o	+	+	+	+	+	+	+	+	1
Ammonium aluminium sulfate	$NH_4Al(SO_4)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Ammonium carbonate	$(NH_4)_2CO_3$	40	+	+	+	+	+	+	+	+	+	+	1
Ammonium chloride	NH_4Cl	s	+	+	+	+	-	+	+	+	+	+/o	1
Ammonium fluoride	NH_4F	s	+	o	+	+	o	+	+	+	+	+	1
Ammonium bicarbonate	NH_4HCO_3	s	+	+	+	+	+	+	+	+	+	+	1
Ammonium hydroxide	"NH_4OH"	30	+	+	+	+ (25 °C)	+	-	+	+	+	+	2
Ammonium nitrate	NH_4NO_3	s	+	+	+	+	+	+	+	+	+	+	1
Ammonium oxalate	$(COONH_4)_2 * H_2O$	s	+	+	+	+	+	+	+	+	+	+	1
Ammonium perchlorate	NH_4ClO_4	10	+	+	+	+	+	+	+	+	+	+	1
Ammonium peroxodisulfate	$(NH_4)_2S_2O_8$	s	+	+	+	+	5%	+	+	+	+	5%	2
Ammonium phosphate	$(NH_4)_3PO_4$	s	+	+	+	+	10%	+	+	+	+	10%	1
Ammonium sulfate	$(NH_4)_2SO_4$	s	+	+	+	+	10%	+	+	+	+	10%	1
Ammonium sulfide	$(NH_4)_2S$	s	+	+	+	+	n	+	+	n	+	n	2
Ammonium nitrate	NH_4NO_3	s	+	+	+	+	+	+	+	+	+	+	1
Amyl alcohol	$C_5H_{11}OH$	100	+	+	+	+	+	-	+	-	+	+	1
Aniline	$C_6H_5NH_2$	100	-	-	+	+	+	-	+/o	o	+	+	2
Anilinium chloride	$C_6H_5NH_2 * HCl$	s	n	+	+	+	-	+/o	+/o	o	+	+	2
Cyclohexanone	$C_6H_{10}O$	100	-	-	+	-	+	-	+/o	-	+	+	1
Antimony trichloride	$SbCl_3$	s	+	+	+	+	-	+	+	+	+	n	2
Malic acid	$C_4H_6O_5$	s	+	+	+	+	+	+	+	+	+	+	1
Arsenic acid	H_3AsO_4	s	+	+	+	+	+	+	+	o	+	+	3
Askarels	$C_6H_{10}O$	100	-	-	+	-	+	-	+/o	-	+	+	1
Ether	$C_2H_5OC_2H_5$	100	-	-	o	+	+	-	-	o	o	+	1
Barium carbonate	$BaCO_3$	s	+	+	+	+	+	+	+	+	+	+	1
Barium chloride	$BaCl_2$	s	+	+	+	+	-	+	+	+	+	+	1
Barium hydroxide	$Ba(OH)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Barium nitrate	$Ba(NO_3)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Barium sulfate	$BaSO_4$	s	+	+	+	+	+	+	+	+	+	+	1
Barium sulfide	BaS	s	+	+	+	+	+	+	+	+	+	+	1
Barium hydroxide	$Ba(OH)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Benzaldehyde	C_6H_5CHO	100	-	-	+	-	+	+	+	-	o	+	1
Benzine	-	100	-	-	+	+	+	+	-	-	+	+	2
Benzoic acid	C_6H_5COOH	s	+	+	+	+	+	+	+	+/o	+	+	1
Benzyl benzoate	$C_6H_5COOC_7H_7$	100	-	-	+	o	+	+	-	-	+	+	2

ProMinent® Chemical Resistance List

Corrosive agent	Formula	Concentration in %	Acryl	PVC	PP	PVDF	1.4404	FKM	EPDM	PharMed®	PE	HastelloyC	WGK
Methyl benzoate	$C_6H_5COOCH_3$	100	-	-	+	o	+	+	-	-	+	+	2
Benzene	C_6H_6	100	-	-	o	+	+	o	-	-	o	+	3
Benzenesulfonic acid	$C_6H_5SO_3H$	10	n	n	+	+	+	+	-	-	n	+	2
Benzoyl chloride	C_6H_5COCl	100	-	n	o	n	o	+	+	n	o	+	2
Benzyl alcohol	$C_6H_5CH_2OH$	100	-	-	+	+	+	+	-	+	+	+	1
Benzyl chloride	$C_6H_5CH_2Cl$	90%	-	n	o	+	+	+	-	-	o	+	2
Succinic acid	$C_4H_6O_4$	s	+	+	+	+	+	+	+	+	+	+	1
Epsomite	$MgSO_4$	s	+	+	+	+	+	+	+	+	+	+/o	1
Hydrogen cyanide	HCN	s	+	+	+	+	+	+	+	+	+	+	3
Lead(II) acetate / lead(IV) acetate	$Pb(CH_3COO)_2$	s	+	+	+	+	+	+	+	+	+	+	2
Sodium hypochlorite	NaOCl + NaCl	12%	+	+	o	+	-	+	+	+	o	> 10%	2
Lead(II) nitrate	$Pb(NO_3)_2$	50	+	+	+	+	+	+	+	+	+	+	2
Lead(II) sulfate	$PbSO_4$	s	+	+	+	+	+	+	+	+	+	+	2
Tetraethyl lead	$Pb(C_2H_5)_4$	100	+	+	+	+	+	+	-	n	+	+	3
Sugar of lead	$Pb(CH_3COO)_2$	s	+	+	+	+	+	+	+	+	+	+	2
Potassium ferrocyanide / potassium ferricyanide	$K_4Fe(CN)_6$	s	+	+	+	+	+	+	+	+	+	+	1
Borax	$Na_2B_4O_7 * {}_{10H2}O$	s	+	+	+	+	+	+	+	+	+	+	1
Boric acid	H_3BO_3	s	+	+	+	+	+	+	+	+	+	+	1
Bromine (dry)	Br_2	100	-	-	-	+	-	-	-	-	-	+	2
Bromobenzene	C_6H_5Br	100	n	n	o	+	+	o	-	-	o	+	2
Bromochloromethane	CH_2BrCl	100	-	-	-	+	+	n	+/o	-	o	+	2
Bromochlorotrifluoroethane	$HCClBrCF_3$	100	-	-	o	+	+	+	-	+	o	+	3
Potassium bromide	KBr	s	+	+	+	+	10%	+	+	+	+	0.1	1
Bromine water	$Br_2 + H_2O$	s	-	+	-	+	-	-	-	n	-	n	2
Hydrogen bromide	HBr	50	+	+	+	+	-	-	+	-	+	o	1
Butanediol	HOC_4H_8OH	10	n	+	+	+	+	o	+	+	+	+	1
Butanol	C_4H_9OH	100	-	+	+	+	+	o	+/o	-	+	+	1
Butanone	$CH_3COC_2H_5$	100	-	-	+	-	+	-	+	-	+	+	1
Butanetriol	$C_4H_{10}O_3$	s	+	+	+	+	+	o	+	+	+	+	1
Butyric acid	C_3H_7COOH	100	5%	20%	+	+	+	+	+	+/o	+	+	1
Butyl acetate	$CH_3COOC_4H_9$	100	-	-	o	+	+	-	+/o	+/o	-	+	1
Butyl acrylate	$C_7H_{13}O_2$	100	-	-	+	+	+	-	-	+/o	+	+	1
Butyl alcohol	C_4H_9OH	100	-	+	+	+	+	o	+/o	-	+	+	1
Butylamine	$C_4H_9NH_2$	100	n	n	n	-	+	-	-	n	+	+	1
Butyl benzoate	$C_6H_5COOC_4H_9$	100	-	-	o	n	+	+	+	-	o	+	2
Butyl mercaptan	C_4H_9SH	100	n	n	n	+	n	+	-	n	n	n	3
Butyl oleate	$C_{22}H_{42}O_2$	100	n	n	n	+	+	+	+/o	n	n	+	1
Butyl stearate	$C_{22}H_{44}O_2$	100	o	n	n	+	+	+	-	n	n	+	1
Butyraldehyde	C_3H_7CHO	100	-	n	+	n	+	-	+/o	-	+	+	1
Calcium acetate	$(CH_3COO)_2Ca$	s	+	+	+	+	+	+	+	+	+	+	1
Calcium bisulfite	$Ca(HSO_3)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Calcium carbonate	$CaCO_3$	s	+	+	+	+	+	+	+	+	+	+	1
Calcium chloride	$CaCl_2$	s	+	+	+	+	-	+	+	+	+	+	1
Calcium cyanide	$Ca(CN)_2$	s	+	+	+	+	n	+	+	+	+	n	3
Calcium bisulfite	$Ca(HSO_3)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Calcium hydroxide	$Ca(OH)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Calcium hypochlorite	$Ca(OCl)_2$	s	+	+	o	+	-	o	+	+	+	+	2
Calcium nitrate	$Ca(NO_3)_2$	s	+	50%	50%	+	+	+	+	+	+	+	1
Calcium phosphate	$Ca_3(PO_4)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Calcium sulfate	$CaSO_4$	s	+	+	+	+	+	+	+	+	+	+	1
Calcium sulfide	CaS	s	+	+	+	+	n	+	+	+	+	+	2
Calcium sulfite	$CaSO_3$	s	+	+	+	+	+	+	+	+	+	+	1
Calcium thiosulfate	CaS_2O_3	s	+	+	+	+	-	+	+	+	+	+	1
Caprylic aldehyde	$C_5H_{11}CHO$	100	n	n	+	+	+	-	+/o	-	+	+	1
Chloracetone	$ClCH_2COCH_3$	100	-	-	n	n	+	-	+	-	n	+	3
Chloral hydrate	$CCl_3CH(OH)_2$	s	-	-	o	-	+	o	o	n	+	+	2
Chlorobenzene	C_6H_5Cl	100	-	-	+	+	+	+	-	-	o	+	2
Sodium hypochlorite	NaOCl + NaCl	12%	+	+	o	+	-	+	+	+	o	> 10%	2
Chloroprene	C_4H_5Cl	100	-	-	n	n	+	+	-	-	n	+	1
Chlorine dioxide solution	$ClO_2 + H_2O$	0.5%	o	+	o	+[1)]	-	o	-	-	o	+	-
Ethyl chloroacetate	$ClCH_2COOC_2H_5$	100	-	o	+	+	+	+	-	-	+	+	2
Methyl chloroacetate	$ClCH_2COOCH_3$	100	-	o	+	+	+	o	-	-	+	+	2
2-Chloroethanol	$ClCH_2CH_2OH$	100	-	-	+	o	+	-	o	+	+	+	3
Chloroethylbenzene	$C_6H_4ClC_2H_5$	100	-	-	o	n	+	o	-	-	o	+	2
Chlorinated lime	$Ca(OCl)_2$	s	+	+	o	+	-	o	+	+	+	+	2
Chloroformic acid ethyl ester	$ClCO_2C_2H_5$	100	n	n	n	n	n	+	-	n	n	n	2
Chloroform	$CHCl_3$	100	-	-	o	+	+	+	-	o	-	+	2
Chloroprene	C_4H_5Cl	100	-	-	n	n	+	+	-	-	n	+	1
Chlorophenol	C_6H_4OHCl	100	-	n	+	+	+	n	-	-	+	+	2
Chloric acid	$HClO_3$	20	+	+	-	+	-	o	o	+	10%	+	2
Disulfur dichloride	S_2Cl_2	100	n	n	n	+	n	+	-	-	n	n	-
Chlorosulfuric acid	$SO_2(OH)Cl$	100	-	o	-	+	-	-	-	-	-	o	1
Chlorotoluene	C_7H_8Cl	100	-	-	n	+	+	+	-	-	n	+	2

ProMinent® Chemical Resistance List

Corrosive agent	Formula	Concentration in %	Acryl	PVC	PP	PVDF	1.4404	FKM	EPDM	PharMed®	PE	HastelloyC	WGK
Chlorine water	$Cl_2 + H_2O$	s	+	+	o	+	-	+	+	-	o	+	-
Hydrochloric acid	HCl	38%	32%	+	+	+	-	+	o	o	+	o	1
Chromium(III) potassium sulfate dodecahydrate	$KCr(SO_4)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Chromic acid	H_2CrO_4	50	-	+	o	+	10%	+	-	o	+	10%	3
Chromo-sulfuric acid	$K_2CrO_4 + H_2SO_4$	s	-	+	-	+	n	n	n	-	-	n	3
Chromium(III) sulfate	$Cr_2(SO_4)_3$	s	+	+	+	+	+	+	+	+	+	+	1
Colamine	$HOC_2H_4NH_2$	100	o	n	+	-	+	-	+/o	o	+	+	1
Crotonaldehyde	$CH_3C_2H_2CHO$	100	n	-	+	+	+	-	+	-	+	+	3
Cumene	$C_6H_5CH(CH_3)_2$	100	-	-	o	+	+	+	-	-	o	+	1
Potassium cyanide	KCN	s	+	+	+	+	5%	+	+	+	+	5%	3
Prussic acid	HCN	s	+	+	+	+	+	+	+	+	+	+	3
Cyclohexane	C_6H_{12}	100	+	-	+	+	+	+	-	-	+	o	1
Cyclohexanol	$C_6H_{11}OH$	100	o	+/o	+	+	+	+	-	-	+	+	1
Cyclohexanone	$C_6H_{10}O$	100	-	-	+	-	+	-	+/o	-	+	+	1
Cyclohexyl alcohol	$C_6H_{11}OH$	100	o	+/o	+	+	+	+	-	-	+	+	1
Cyclohexylamine	$C_6H_{11}NH_2$	100	n	n	n	n	+	-	n	n	n	+	2
Decahydronaphthalene	$C_{10}H_{18}$	100	-	+/o	o	+	n	o	-	-	o	+	2
Decalin	$C_{10}H_{18}$	100	-	+/o	o	+	n	o	-	-	o	+	2
Dextrin	-	s	+	+	+	+	+	+	+	+	+	+	1
Dextrose	$C_6H_{12}O_6$	s	+	+	+	+	+	+	+	+	+	+	1
Diacetone alcohol	$C_6H_{12}O_2$	100	-	-	+	o	+	-	+	-	+	+	1
Dibromoethane	$C_2H_4Br_2$	100	-	-	n	+	+	+	-	-	-	+	3
Dibutylamine	$(C_4H_9)_2NH$	100	n	n	+	+	+	-	-	n	+	+	1
Dibutyl ether	$C_4H_9OC_4H_9$	100	-	-	+	+	+	-	o	-	+	+	2
Dibutyl phthalate	$C_{16}H_{22}O_4$	100	-	-	+	+	+	+	+/o	+	o	+	2
Dichlorobenzene	$C_6H_4Cl_2$	100	-	-	o	+	+	+	-	-	o	+	2
Dichlorobutane	$C_4H_8Cl_2$	100	-	-	o	+	+	+	-	-	o	+	3
Dichlorobutene	$C_4H_6Cl_2$	100	-	-	o	+	+	o	-	-	o	+	3
Dichlorobutene	$C_4H_6Cl_2$	100	-	-	o	+	+	o	-	-	o	+	3
Dichloroacetic acid	$Cl_2CHCOOH$	100	-	+	+	+	+	-	+	o	+	+	1
Dichloroacetic acid methyl ester	$Cl_2CHCOOCH_3$	100	-	-	+	n	+	-	n	-	+	+	2
Dichloroethane	$C_2H_4Cl_2$	100	-	-	o	+	+	+	-	o	-	+	3
Dichloroethene	$C_2H_2Cl_2$	100	-	-	o	+	+	o	-	o	-	+	2
Dichloroisopropyl ether	$(C_3H_6Cl)_2O$	100	-	-	o	n	+	o	o	-	o	+	2
Dichloromethane	CH_2Cl_2	100	-	-	o	o	o	+	-	o	-	+	2
Dicyclohexylamine	$(C_6H_{12})_2NH$	100	-	-	o	n	+	-	-	-	o	+	2
Diethylene glycol	$C_4H_{10}O_3$	s	+	+	+	+	+	+	+	+	+	+	1
Diethylene glycol monoethyl ether	$C_8H_{18}O_3$	100	n	n	+	+	+	n	+/o	o	+	+	1
Diethyl ether	$C_2H_5OC_2H_5$	100	-	-	o	+	+	-	-	o	o	+	1
Diethylene glycol	$C_4H_{10}O_3$	s	+	+	+	+	+	+	+	+	+	+	1
Diglycolic acid	$C_4H_6O_5$	30	+	+	+	+	+	+	n	+/o	+	+	3
Dihexyl phthalate	$C_{20}H_{26}O_4$	100	-	-	+	+	+	-	n	+	+	+	1
Diisobutyl ketone	$C_9H_{18}O$	100	-	-	+	+	+	-	+	-	+	+	1
Diisononyl phthalate	$C_{26}H_{42}O_4$	100	-	-	+	+	+	n	n	+	+	+	1
Diisopropyl ketone	$C_7H_{14}O$	100	-	-	+	+	+	-	+	-	+	+	1
Dimethyl carbonate	$(CH_3O)_2CO$	100	n	n	+	+	+	+	-	n	+	+	1
Dimethylformamide	$HCON(CH_3)_2$	100	-	-	+	-	+	-	+	+/o	+	+	1
Dimethylhydrazine	$H_2NN(CH_3)_2$	100	n	n	+	n	+	-	+	n	+	+	3
Dimethyl ketone	CH_3COCH_3	100	-	-	+	-	+	-	+	-	+	+	1
Dimethyl phthalate	$C_{10}H_{10}O_4$	100	-	-	+	+	+	-	+/o	+	+	+	1
Disodium hydrogen phosphate	Na_2HPO_4	s	+	+	+	+	+	+	+	+	+	+	1
Dioctyl phthalate	$C_4H_4(COOC_8H_{17})_2$	100	-	-	+	+	+	-	+/o	+	+	+	1
Dioxane	$C_4H_8O_2$	100	-	-	o	-	+	-	+/o	-	+	+	1
Disulfur dichloride	S_2Cl_2	100	n	n	n	+	n	+	-	-	n	n	-
Disulfuric acid	$H_2SO_4 + SO_3$	s	n	-	-	-	+	+	-	+	-	+	2
DMF	$HCON(CH_3)_2$	100	-	-	+	-	+	-	+	+/o	+	+	1
DOP	$C_4H_4(COOC_8H_{17})_2$	100	-	-	+	+	+	-	+/o	+	+	+	1
Iron(II) chloride	$FeCl_2$	s	+	+	+	+	-	+	+	+	+	+/o	1
Iron(III) chloride	$FeCl_3$	s	+	+	+	+	-	+	+	+	+	+/o	1
Iron(III) nitrate	$Fe(NO_3)_3$	s	+	+	+	+	+	+	+	+	+	+	1
Iron(III) phosphate	$FePO_4$	s	+	+	+	+	+	+	+	+	+	+	1
Iron(III) sulfate	$Fe_2(SO_4)_3$	s	+	+	+	+	o	+	+	+	+	+	1
Iron(II) sulfate	$FeSO_4$	s	+	+	+	+	+	+	+	+	+	+	1
Ferrous sulfate	$FeSO_4$	s	+	+	+	+	+	+	+	+	+	+	1
Glacial acetic acid	CH_3COOH	100	-	50%	+	+	+	-	o	60%	70%	+	1
Epichlorohydrin	C_3H_5OCl	100	-	n	+	-	+	+	o	+	+	+	3
Acetic ester	$CH_3COOC_2H_5$	100	-	-	35%	+	+	-	+/o	+/o	+	+	1
Acetic acid	CH_3COOH	100	-	50%	+	+	+	-	o	60%	70%	+	1
Acetic acid anhydride	$(CH_3CO)_2O$	100	-	-	o	-	+	-	+/o	+	o	+	1
Butyl acetate	$CH_3COOC_4H_9$	100	-	-	o	+	+	-	+/o	+/o	-	+	1
Acetyl chloride	CH_3COCl	100	-	+	n	-	o	+	-	o	n	+	1
Ethyl acetate	$CH_3COOC_2H_5$	100	-	-	35%	+	+	-	+/o	+/o	+	+	1

ProMinent® Chemical Resistance List

Corrosive agent	Formula	Concentration in %	Acryl	PVC	PP	PVDF	1.4404	FKM	EPDM	PharMed®	PE	HastelloyC	WGK
Propyl acetate	$CH_3COOC_3H_7$	100	-	-	+	+	+	-	+/o	-	+	+	1
Ethanol	C_2H_5OH	100	-	+	+	+	+	-	+	+	+	+	1
Ethanolamine	$HOC_2H_4NH_2$	100	o	n	+	-	+	-	+/o	o	+	+	1
Ethyl acrylate	$C_2H_3COOC_2H_5$	100	-	-	+	o	+	-	+/o	-	+	+	2
Ethylacrylic acid	C_4H_7COOH	100	n	n	+	+	+	n	+/o	n	+	+	1
Ethyl alcohol	C_2H_5OH	100	-	+	+	+	+	-	+	+	+	+	1
Ethyl benzoate	$C_6H_5COOC_2H_5$	100	n	-	+	o	+	+	-	-	+	+	1
Ethylbenzene	C_6H_5-C_2H_5	100	-	-	o	+	+	o	-	-	o	+	1
Ethyl bromide	C_2H_5Br	100	-	n	+	+	n	+	-	o	+	+	2
Ethylcyclopentane	$C_5H_4C_2H_5$	100	+	+	+	+	+	+	-	-	+	+	1
Ethylene dichloride	$C_2H_4Cl_2$	100	-	-	o	+	+	+	-	o	-	+	3
Ethylenediamine	$(CH_2NH_2)_2$	100	o	o	+	-	o	-	+	n	+	o	2
Ethylene dibromide	$C_2H_4Br_2$	100	-	-	n	+	+	+	-	-	-	+	3
Ethylene dichloride	$C_2H_4Cl_2$	100	-	-	o	+	+	+	-	o	-	+	3
Ethylene glycol	$C_2H_4(OH)_2$	100	+	+	+	+	+	+	+	+	+	+	1
Ethylene glycol ethyl ether	$HOC_2H_4OC_2H_5$	100	n	n	+	+	+	n	+/o	o	+	+	1
2-Ethylhexanol	$C_8H_{16}O$	100	n	+/o	+	+	+	+	+	-	+	+	2
Fatty acids	R-COOH	100	+	+	+	+	+	+	o	o	+	+	1
Sodium thiosulfate	$Na_2S_2O_3$	s	+	+	+	+	25%	+	+	+	+	25%	1
Fluorobenzene	C_6H_5F	100	-	-	+	+	+	o	-	-	o	+	2
Fluoroboric acid	HBF_4	35%	+	+	+	+	o	+	+	-	+	+	1
Hexafluorosilicic acid	H_2SiF_6	100	+	30%	30%	+	o	+	+	o	40%	+/o	2
Hydrofluoric acid	HF	80%	-	40%*	40%**	+	-	+	o	-	40%	+/o	1
Hydrofluoric acid	HF	80%	-	40%*	40%**	+	-	+	o	-	40%	+/o	1
Formaldehyde	CH_2O	40	+	+	+	+	+	-	+/o	-	+	+	2
Formalin	CH_2O	40	+	+	+	+	+	-	+/o	-	+	+	2
Formamide	$HCONH_2$	100	+	-	+	+	+	+	+	n	+	+	1
Furan	C_4H_4O	100	-	-	+	-	+	-	n	-	+	+	3
Furanaldehyde	$C_5H_5O_2$	100	n	n	n	o	+	-	+/o	-	n	n	2
Furfural	$C_5H_5O_2$	100	n	n	n	o	+	-	+/o	-	n	n	2
Furfuryl alcohol	$OC_4H_3CH_2OH$	100	-	-	+	o	+	n	+/o	-	+	+	1
Gallic acid	$C_6H_2(OH)_3COOH$	5%	+	+	+	+	+	+	+/o	+	+	+	1
Calcium hydroxide	$Ca(OH)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Tannin	$C_{76}H_{52}O_{46}$	50	+	+	+	+	+	+	+	+	+	+	1
Plaster	$CaSO_4$	s	+	+	+	+	+	+	+	+	+	+	1
Glauber's salt	Na_2SO_4	s	+	+	+	+	+	+	+	+	+	+	1
Glucose	$C_6H_{12}O_6$	s	+	+	+	+	+	+	+	+	+	+	1
Glycerol	$C_3H_5(OH)_3$	100	+	+	+	+	+	+	+	+	+	+	1
Glycerol chlorohydrin	C_3H_5OCl	100	-	n	+	-	+	+	o	+	+	+	3
Triacetin	$C_3H_5(CH_3COO)_3$	100	n	n	+	+	+	-	+	n	+	+	1
Glycine	NH_2CH_2COOH	10	+	+	+	+	+	+	+	+	+	+	1
Glycine	NH_2CH_2COOH	10	+	+	+	+	+	+	+	+	+	+	1
Glycol	$C_2H_4(OH)_2$	100	+	+	+	+	+	+	+	+	+	+	1
Glycolic acid	$CH_2OHCOOH$	70%	+	37%	+	+	+	+	+	+/o	+	+	1
Green vitriol	$FeSO_4$	s	+	+	+	+	+	+	+	+	+	+	1
Urea	$CO(NH_2)_2$	s	+	+/o	+	+	+	+	+	20%	+	+	1
Heptane	C_7H_{16}	100	+	+	+	+	+	+	-	-	+	+	1
Hexachloroplatinic acid	H_2PtCl_6	s	n	+	+	+	-	n	+	n	+	-	-
Hexafluorosilicic acid	H_2SiF_6	100	+	30%	30%	+	o	+	+	o	40%	+/o	2
Hexane	C_6H_{14}	100	+	+	+	+	+	+	-	-	+	+	1
Hexanal	$C_5H_{11}CHO$	100	n	n	+	+	+	-	+/o	-	+	+	1
Hexanol	$C_6H_{13}OH$	100	-	-	+	+	+	n	+	o	+	+	1
Hexanetriol	$C_6H_9(OH)_3$	100	n	n	+	+	+	+	+	n	+	+	1
Hexene	C_6H_{12}	100	n	+	+	+	+	+	-	-	+	+	1
1-Hexanol	$C_6H_{13}OH$	100	-	-	+	+	+	n	+	o	+	+	1
Ammonium carbonate	$(NH_4)_2CO_3$	40	+	+	+	+	+	+	+	+	+	+	1
Silver nitrate	$AgNO_3$	s	+	+	+	+	+	+	+	+	+	+/o	3
Hydrazin hydrate	$N_2H_4 * H_2O$	s	+	+	+	+	+	n	+	o	+	+	3
Hydroquinone	$C_6H_4(OH)_2$	s	o	+	+	+	+	+	-	+/o	+	+	2
Hydroxylammonium sulfate	$(NH_2OH)_2 * H_2SO_4$	10	+	+	+	+	+	+	+	+	+	+	2
Hypochlorous acid	HOCl	s	+	+	o	+	-	+	+/o	+	o	+	1
Iodine	I_2	s	o	-	+	+	-	+	+/o	+	o	+/o	-
Iodkalium	KI	s	+	+	+	+	+	+	+	+	+	+	1
Hydroiodic acid	HI	s	+	+	+	+	-	-	n	-	+	n	1
Isobutyl alcohol	$C_2H_5CH(OH)CH_3$	100	-	+	+	+	+	+	+	o	+	+	1
Isopropanol	$(CH_3)_2CHOH$	100	-	+/o	+	+	+	+	+	o	+	+	1
Isopropyl acetate	$CH_3COOCH(CH_3)_2$	100	-	-	+	+	+	-	+/o	+/o	+	+	1
Isopropyl alcohol	$(CH_3)_2CHOH$	100	-	+/o	+	+	+	+	+	o	+	+	1
Isopropylbenzene	$C_6H_5CH(CH_3)_2$	100	-	-	o	+	+	+	-	-	o	+	1
Isopropyl chloride	$CH_3CHClCH_3$	80%	-	-	o	+	+	+	-	o	o	+/o	2
Isopropylether	$C_6H_{14}O$	100	-	-	o	+	+	-	-	o	o	+	1
Potassium alum	$KAl(SO_4)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Caustic potash	KOH	50	+	+	+	+ (25 °C)	+	-	+	10%	+	+	1
Saltpetre	KNO_3	s	+	+	+	+	+	+	+	+	+	+	1
Potassium acetate	CH_3COOK	s	+	+	+	+	+	+	+	+	+	+	1

ProMinent® Chemical Resistance List

Corrosive agent	Formula	Concentration in %	Acryl	PVC	PP	PVDF	1.4404	FKM	EPDM	PharMed®	PE	HastelloyC	WGK
Potassium aluminium sulfate	$KAl(SO_4)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Potassium bicarbonate	$KHCO_3$	40	+	+	+	+	+	+	+	+	+	+/o	1
Potassium dichromate	$K_2Cr_2O_7$	s	+	+	+	+	25%	+	+	+	+	10%	3
Potassium bisulfate	$KHSO_4$	5%	+	+	+	+	+	+	+	+	+	+	1
Potassium bitartrate	$KC_4H_5O_6$	s	+	+	+	+	+	+	+	+	+	+	1
Potassium metaborate	KBO_2	s	+	+	+	+	+	+	+	+	+	+	1
Potassium bromate	$KBrO_3$	s	+	+	+	+	+	+	+	+	+	+	2
Potassium bromide	KBr	s	+	+	+	+	10%	+	+	+	+	0.1	1
Potassium carbonate	K_2CO_3	s	+	+	+	+	+	+	+	55%	+	+	1
Potassium chlorate	$KClO_3$	s	+	+	+	+	+	+	+	+	+	+	2
Potassium chloride	KCl	s	+	+	+	+	-	+	+	+	+	+/o	1
Potassium chromate	K_2CrO_4	10	+	+	+	+	+	+	+	+	+	+	3
Chromium(III) potassium sulfate dodecahydrate	$KCr(SO_4)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Potassium cyanate	KOCN	s	+	+	+	+	+	+	+	+	+	+	2
Potassium cyanide	KCN	s	+	+	+	+	5%	+	+	+	+	5%	3
Potassium dichromate	$K_2Cr_2O_7$	s	+	+	+	+	25%	+	+	+	+	10%	3
Potassium fluoride	KF	s	+	+	+	+	+	+	+	+	+	+	1
Potassium ferrocyanide	$K_4Fe(CN)_6$	s	+	+	+	+	+	+	+	+	+	+	1
Potassium hexacyanoferrate(III)	$K_3Fe(CN)_6$	s	+	+	+	+	+	+	+	+	+	+	1
Potassium hydrogen fluoride	KHF_2	s	n	+	+	+	+	+	+	+	+	+	1
Potassium hydroxide	KOH	50	+	+	+	+ (25 °C)	+	-	+	10%	+	+	1
Potassium iodide	KI	s	+	+	+	+	+	+	+	+	+	+	1
Potassium nitrate	KNO_3	s	+	+	+	+	+	+	+	+	+	+	1
Potassium perchlorate	$KClO_4$	s	+	+	+	+	n	+	+	+	+	+	1
Potassium permanganate	$KMnO_4$	s	+	+	+	+	+	+	+	6%	+	+	2
Potassium persulfate	$K_2S_2O_8$	s	+	+	+	+	+	+	+	+	+	+	1
Potassium persulfate	$K_2S_2O_8$	s	+	+	+	+	+	+	+	+	+	+	1
Tripotassium phosphate	KH_2PO_4	s	+	+	+	+	+	+	+	+	+	+	1
Potassium sulfate	K_2SO_4	s	+	+	+	+	+	+	+	+	+	+	1
Potassium sulfite	K_2SO_3	s	+	+	+	+	+	+	+	+	+	+	1
Limescale	$CaCO_3$	s	+	+	+	+	+	+	+	+	+	+	1
Lime milk	$Ca(OH)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Calcium nitrate	$Ca(NO_3)_2$	s	+	50%	50%	+	+	+	+	+	+	+	1
Carbolic acid	C_6H_5OH	100	-	-	+	+	+	+	-	+	+	+	2
Silicic acid	$SiO_2 * x H_2O$	s	+	+	+	+	+	+	+	+	+	+	1
Cobalt chloride	$CoCl_2$	s	+	+	+	+	-	+	+	+	+	+	2
Sodium chloride (table salt)	NaCl	s	+	+	+	+	-	+	+	+	+	+	1
Carbonic acid	"H_2CO_3"	s	+	+	+	+	+	+	+	+	+	+	1
Carbon disulfide	CS_2	100	-	-	o	+	+	+	-	-	o	+	2
Carbon tetrachloride	CCl_4	100	-	-	-	+	+	+	-	-	o	+	3
Aqua regia	$3 HCl + HNO_3$	100	-	+	-	+[2)]	-	-	o	-	-	-	2
Cresol	$C_6H_4CH_3OH$	100	o	o	+	+	+	+	-	-	+	+	2
Copper(II) acetate	$Cu(CH_3COO)_2$	s	+	+	+	+	+	+	+	+	+	+	3
Copper arsenite	$Cu_3(AsO_3)_2$	s	+	+	+	+	+	+	+	+	+	+	3
Copper(II) carbonate	$CuCO_3$	s	+	+	+	+	+	+	+	+	+	+	2
Copper(II) chloride	$CuCl_2$	s	+	+	+	+	1%	+	+	+	+	+	2
Copper(II) cyanide	$Cu(CN)_2$	s	+	+	+	+	+	+	+	+	+	+	3
Copper(II) fluoride	CuF_2	s	+	+	+	+	+	+	+	+	+	+	2
Copper(II) nitrate	$Cu(NO_3)_2$	s	+	+	+	+	+	+	+	+	+	+/o	2
Copper(II) sulfate	$CuSO_4$	s	+	+	+	+	+	+	+	+	+	+	2
Vitriol of copper	$CuSO_4$	s	+	+	+	+	+	+	+	+	+	+	2
Levoxin	$N_2H_4 * H_2O$	s	+	+	+	+	+	n	+	o	+	+	3
Lithium bromide	LiBr	s	+	+	+	+	+	+	+	+	+	+	1
Lithium chloride	LiCl	s	+	+	+	+	-	+	+	+	+	n	1
Magnesium carbonate	$MgCO_3$	s	+	+	+	+	+	+	+	+	+	+/o	1
Magnesium chloride	$MgCl_2$	s	+	+	+	+	o	+	+	+	+	+	1
Magnesium hydroxide	$Mg(OH)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Magnesium nitrate	$Mg(NO_3)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Magnesium sulfate	$MgSO_4$	s	+	+	+	+	+	+	+	+	+	+/o	1
Maleic acid	$C_4H_4O_4$	s	+	+	+	+	+	+	+	o	+	+	1
Manganese(II) chloride	$MnCl_2$	s	+	+	+	+	-	+	+	+	+	+	1
Manganese(II) sulfate	$MnSO_4$	s	+	+	+	+	+	+	+	+	+	+	1
MEK	$CH_3COC_2H_5$	100	-	-	+	-	+	-	+	-	+	+	1
Mesityl oxide	$C_6H_{10}O$	100	-	-	n	n	+	-	+/o	-	n	+	1
Methacrylic acid	C_3H_5COOH	100	n	n	+	+	+	o	+/o	+/o	+	+	1
Methanol	CH_3OH	100	-	-	+	+	+	o	+	+/o	+	+	1
Methoxybutanol	$CH_3O(CH_2)_4OH$	100	-	-	+	+	+	+	o	o	+	+	1
Methyl acetate	CH_3COOCH_3	60%	-	-	+	+	+	-	+/o	+/o	+	+	2
Methyl acetoacetate	$C_5H_8O_3$	100	-	-	+	+	+	-	+/o	o	+	+	2
Methyl acrylate	$C_2H_3COOCH_3$	100	-	-	+	+	+	-	+/o	o	+	+	2
Methyl alcohol	CH_3OH	100	-	-	+	+	+	o	+	+/o	+	+	1
Methylamine	CH_3NH_2	32%	+	o	+	o	+	-	+	+	+	+	2

ProMinent® Chemical Resistance List

Corrosive agent	Formula	Concentration in %	Acryl	PVC	PP	PVDF	1.4404	FKM	EPDM	PharMed®	PE	HastelloyC	WGK
4-Methylcatechol	$C_6H_3(OH)_2CH_3$	s	+	+	+	+	+	+	-	+/o	+	+	1
Methyl cellulose	-	s	+	+	+	+	+	+	+	+	+	+	1
Methyl chloroform	CCl_3CH_3	100	-	-	o	+	+	+	-	o	o	+	3
Methylcyclopentane	$C_5H_9CH_3$	100	+	+	+	+	+	+	-	-	+	+	1
Methylene chloride	CH_2Cl_2	100	-	-	o	o	o	+	-	o	-	+	2
Methyl ethyl ketone	$CH_3COC_2H_5$	100	-	-	+	-	+	-	+	-	+	+	1
Methylglycol	$C_3H_8O_2$	100	+	+	+	+	+	-	+/o	+	+	+	1
Methyl isobutyl ketone	$CH_3COC_4H_9$	100	-	-	+	-	+	-	o	-	+	+	1
Methyl isopropyl ketone	$CH_3COC_3H_7$	100	-	-	+	-	+	-	+/o	-	+	+	1
Methyl methacrylate	$C_3H_5COOCH_3$	100	-	-	+	+	+	-	-	-	+	+	1
Methyl oleate	$C_{17}H_{33}COOCH_3$	100	n	n	+	+	+	+	+/o	n	+	+	1
Methyl salicylate	$HOC_6H_4COOCH_3$	100	-	-	+	+	+	n	+/o	-	+	+	1
MIBK	$CH_3COC_4H_9$	100	-	-	+	-	+	-	o	-	+	+	1
Lactic acid	$C_3H_6O_3$	100	-	+	+	+	+/o	+	10%	+/o	+	+	1
Morpholine	C_4H_9ON	100	-	-	+	-	+	n	n	-	+	+	2
Motor oils	-	100	n	+/o	+	+	+	+	-	-	+	+	2
Sodium acetate	$NaCH_3COO$	s	+	+	+	+	+	+	+	+	+	+	1
Sodium benzoate	C_6H_5COONa	s	+	+	+	+	+	+	+	+	+	+	1
Sodium bicarbonate	$NaHCO_3$	s	+	+	+	+	+	+	+	+	+	+	1
Sodium dichromate	$Na_2Cr_2O_7$	s	+	+	+	+	+	+	+	+	+	+	3
Sodium bisulfate	$NaHSO_4$	s	+	+	+	+	+	+	+	+	+	+	1
Sodium bisulfite	$NaHSO_3$	s	+	+	+	+	+	+	+	+	+	+	1
Borax	$NaBO_2$	s	+	+	+	+	+	+	+	+	+	+	1
Sodium bromate	$NaBrO_3$	s	+	+	+	+	+	+	+	+	+	+	3
Sodium bromide	NaBr	s	+	+	+	+	+	+	+	+	+	+	1
Sodium carbonate	Na_2CO_3	s	+	+	+	+	+/o	+	+	+	+	+	1
Sodium chlorate	$NaClO_3$	s	+	+	+	+	+	+	+	+	+	+	2
Sodium chloride	NaCl	s	+	+	+	+	-	+	+	+	+	+	1
Sodium chlorite	$NaClO_2$	24%	+	+	+	+	10%	+	+	+	+	10%	2
Sodium chromate	Na_2CrO_4	s	+	+	+	+	+	+	+	+	+	+	3
Sodium cyanide	NaCN	s	+	+	+	+	+	+	+	+	+	+	3
Sodium metabisulfite	$Na_2S_2O_5$	s	+	+	+	+	+	n	n	+	+	+	1
Sodium dithionite	$Na_2S_2O_4$	s	+	10%*	10%	+	+	n	n	+	10%	+/o	1
Sodium fluoride	NaF	s	+	+	+	+	10%	+	+	+	+	+	1
Sodium hydrogen sulfate	$NaHSO_4$	s	+	+	+	+	+	+	+	+	+	+	1
Sodium hydroxide	NaOH	50	+	+	+	+ (60%/25 °C)	+	-	+	30%	+	+	1
Sodium hypochlorite	NaOCl + NaCl	12%	+	+	o	+	-	+	+	+	o	> 10%	2
Sodium iodide	NaI	s	+	+	+	+	+	+	+	+	+	+	1
Sodium metaphosphate	$(NaPO_3)_n$	s	+	+	+	+	+	+	+	+	+	+	1
Sodium nitrate	$NaNO_3$	s	+	+	+	+	+	+	+	+	+	+	1
Sodium nitrite	$NaNO_2$	s	+	+	+	+	+	+	+	+	+	+	2
Sodium oxalate	$Na_2C_2O_4$	s	+	+	+	+	+	+	+	+	+	+	1
Sodium perborate	$NaBO_2*H_2O_2$	s	+	+/o	+	+	+	+	+	+	+	+/o	1
Sodium perchlorate	$NaClO_4$	s	+	+	+	+	10%	+	+	+	+	10%	1
Sodium peroxide	Na_2O_2	s	+	+	+	+	+	+	+	n	-	+	1
Sodium peroxodisulfate	$Na_2S_2O_8$	s	n	+	+	+	+	+	+	+	+	+	1
Sodium salicylate	$C_6H_4(OH)COONa$	s	+	+/o	+	+	+	+	+	+	+	+	1
Sodium silicate	Na_2SiO_3	s	+	+	+	+	+	+	+	+	+	+	1
Sodium sulfate	Na_2SO_4	s	+	+	+	+	+	+	+	+	+	+	1
Sodium sulfide	Na_2S	s	+	+	+	+	+	+	+	+	+	+	2
Sodium sulfite	Na_2SO_3	s	+	+	+	+	50%	+	+	+	+	50%	1
Sodium tetraborate	$Na_2B_4O_7 * {}_{10H2}O$	s	+	+	+	+	+	+	+	+	+	+	1
Sodium thiosulfate	$Na_2S_2O_3$	s	+	+	+	+	25%	+	+	+	+	25%	1
Sodium tripolyphosphate	$Na_5P_3O_{10}$	s	+	+	+	+	+	+/o	+	+	+	+	1
Natron	$NaHCO_3$	s	+	+	+	+	+	+	+	+	+	+	1
Sodium hydroxide solution	NaOH	50	+	+	+	+ (60%/25 °C)	+	-	+	30%	+	+	1
Chile saltpeter	$NaNO_3$	s	+	+	+	+	+	+	+	+	+	+	1
Nickel(II) acetate	$(CH_3COO)_2Ni$	s	+	+	+	+	+	-	+	+	+	+	2
Nickel(II) chloride	$NiCl_2$	s	+	+	+	+	-	+	+	+	+	+	2
Nickel(II) nitrate	$Ni(NO_3)_2$	s	+	+	+	+	+	+	+	+	+	+/o	2
Nickel(II) sulfate	$NiSO_4$	s	+	+	+	+	+	+	+	+	+	+/o	2
Nitromethane	CH_3NO_2	100	-	-	+	o	+	-	+/o	-	+	+	2
Nitropropane	$(CH_3)_2CHNO_2$	100	-	-	+	n	+	-	+/o	-	+	+	2
Nitrotoluene	$C_6H_4NO_2CH_3$	100	-	-	+	+	+	o	-	-	+	+	2
Octane	C_8H_{18}	100	o	+	+	+	+	+	-	-	+	+	1
Octanol	$C_8H_{17}OH$	100	-	-	+	+	+	+	+	-	+	+	1
1-Octanol	$C_8H_{17}OH$	100	-	-	+	+	+	+	+	-	+	+	1
Octylcresol	$C_{15}H_{24}O$	100	-	-	+	+	+	o	n	-	+	+	1
Oil	-	100	n	+/o	+	+	+	+	-	-	+	+	2
Oleum	$H_2SO_4 + SO_3$	s	n	-	-	-	+	+	-	+	-	+	2
Orthophosphoric acid	H_3PO_4	85%	50%	+	+	+	+	+	+	+	+	+	1
Oxalic acid	$(COOH)_2$	s	+	+	+	+	10%	+	+	+/o	+	+/o	1
Pentane	C_5H_{12}	100	+	+	+	+	+	+	-	-	+	+	1
1-Pentanol	$C_5H_{11}OH$	100	+	+	+	+	+	-	+	-	+	+	1

ProMinent® Chemical Resistance List

Corrosive agent	Formula	Concentration in %	Acryl	PVC	PP	PVDF	1.4404	FKM	EPDM	PharMed®	PE	HastelloyC	WGK
PER	C_2Cl_4	100	-	-	o	+	+	o	-	o	o	+	3
Tetrachloroethylene	C_2Cl_4	100	-	-	o	+	+	o	-	o	o	+	3
Perchloric acid	$HClO_4$	70%	n	10%*	10%	+	-	+	+/o	+	+	n	1
Perhydrol	H_2O_2	90%	40%	40%*	30%	+	+	30%	30%	+	+	+	1
Petroleum ether	C_nH_{2n+2}	100	+	+/o	+	+	+	+	-	-	+	+	1
Phenol	C_6H_5OH	100	-	-	+	+	+	+	-	+	+	+	2
Phenylethyl ether	$C_6H_5OC_2H_5$	100	-	-	+	n	+	-	-	-	+	+	2
Phenylhydrazine	$C_6H_5NHNH_2$	100	-	-	o	+	+	o	-	-	o	+	2
Phosphoric acid	H_3PO_4	85%	50%	+	+	+	+	+	+	+	+	+	1
Phosphorus trichloride	PCl_3	100	-	-	+	+	+	o	+	+/o	+	+	1
Phosphoryl chloride	$POCl_3$	100	-	-	+	+	n	+	+	n	+	+	1
Phthalic acid	$C_6H_4(COOH)_2$	s	+	+	+	+	+	+	+	+	+	+	1
Picric acid	$C_6H_2(NO_3)_3OH$	s	+	+	+	+	+	+	+	-	+	+	2
Piperidine	$C_5H_{11}N$	100	-	-	n	n	+	-	-	-	n	+	2
Potassium carbonate	K_2CO_3	s	+	+	+	+	+	+	+	55%	+	+	1
Propionitrile	CH_3CH_2CN	100	n	n	+	+	+	+	-	-	+	+	2
Propionic acid	C_2H_5COOH	100	o	+	+	+	+	+	+	+/o	+	+	1
Propyl acetate	$CH_3COOC_3H_7$	100	-	-	+	+	+	-	+/o	-	+	+	1
Propylene glycol	$CH_3CHOHCH_2OH$	100	+	+	+	+	+	+	+	+	+	+	1
Pyridine	C_5H_5N	100	-	-	o	-	+	-	-	o	+	+	2
Pyrrole	C_4H_4NH	100	n	n	+	n	+	-	-	-	+	+	2
Mercury	Hg	100	+	+	+	+	+	+	+	+	+	+	3
Mercury(II) chloride	$HgCl_2$	s	+	+	+	+	-	+	+	+	+	+	3
Mercury(II) cyanide	$Hg(CN)_2$	s	+	+	+	+	+	+	+	+	+	+	3
Mercury(II) nitrate	$Hg(NO_3)_2$	s	+	+	+	+	+	+	+	+	+	+	3
Salicylic acid	HOC_6H_4COOH	s	+	+	+	+	+	+	+	+	+	+/o	1
Salmiac	NH_4Cl	s	+	+	+	+	-	+	+	+	+	+/o	1
Ammonia solution	"NH_4OH"	30	+	+	+	+ (25 °C)	+	-	+	+	+	+	2
Nitric acid	HNO_3	99%	10%	10%*	50%	65%[2)]	50%	65%	10%	35%	50%	65%	1
Hydrochloric acid	HCl	38%	32%	+	+	+	-	+	o	o	+	o	1
Salt water	-	s	+	+/o	+	+	+/o	+	+	+	+	+	1
Sulfur chloride	S_2Cl_2	100	n	n	n	+	n	+	-	-	n	n	-
Disulfur dichloride	S_2Cl_2	100	n	n	n	+	n	+	-	-	n	n	-
Carbon disulfide	CS_2	100	-	-	o	+	+	+	-	-	o	+	2
Sulfuric acid	H_2SO_4	98%	30%	50%	85%	+	20%	+	80%	30%	80%	+	1
Sulfuric acid, fuming	$H_2SO_4 + SO_3$	s	n	-	-	-	+	+	-	+	-	+	2
Sulfurous acid	H_2SO_3	s	+	+	+	+	10%	+	+	+	+	+	1
Silver bromide	AgBr	s	+	+	+	+	+/o	+	+	+	+	+	1
Silver chloride	AgCl	s	+	+	+	+	-	+	+	+	+	+/o	1
Silver nitrate	$AgNO_3$	s	+	+	+	+	+	+	+	+	+	+/o	3
Starch	$(C_6H_{10}O_5)_n$	s	+	+	+	+	+	+	n	+	+	+	1
Styrene	$C_6H_5CHCH_2$	100	-	-	o	+	+	o	-	-	o	+	2
Sulfuryl chloride	SO_2Cl_2	100	-	-	-	o	n	+	o	-	-	n	1
Tetrachloroethane	$C_2H_2Cl_4$	100	-	-	o	+	+	o	-	o	o	+	3
Tetrachloroethylene	C_2Cl_4	100	-	-	o	+	+	o	-	o	o	+	3
Tetrachloromethane	CCl_4	100	-	-	-	+	+	+	-	-	o	+	3
Tetraethyllead	$Pb(C_2H_5)_4$	100	+	+	+	+	+	+	-	n	+	+	3
Tetrahydrofuran	C_4H_8O	100	-	-	o	-	+	-	-	-	o	+	1
Tetralin	$C_{10}H_{12}$	100	-	-	-	+	+	+	-	-	o	+	3
Thionyl chloride	$SOCl_2$	100	-	-	-	+	n	+	+	+	-	n	1
Thiophene	C_4H_4S	100	n	-	o	n	+	-	-	-	o	+	3
Titanium tetrachloride	$TiCl_4$	100	n	n	n	+	n	o	-	n	n	n	1
Toluene	$C_6H_5CH_3$	100	-	-	o	+	+	o	-	-	o	+	2
Toluene diisocyanate	$C_7H_3(NCO)_2$	100	n	n	+	+	+	-	+/o	n	+	+	2
Tributyl phosphate	$(C_4H_9)_3PO_4$	100	n	-	+	+	+	-	+	+	+	+	1
Trichloroacetic acid	CCl_3COOH	50	-	+	+	+	-	-	o	+/o	+	+	1
Trichloroethane	CCl_3CH_3	100	-	-	o	+	+	+	-	o	o	+	3
Trichloroethylene	C_2HCl_3	100	-	-	o	+	+/o	o	-	o	o	+	3
Triethanolamine	$N(C_2H_4OH)_3$	100	+	o	+	n	+	-	+/o	o	+	+	1
Tricresyl phosphate	$(C_7H_7)_3PO_4$	90%	-	-	+	n	+	o	+	+	+	+	2
Trisodium phosphate	Na_3PO_4	s	+	+	+	+	+	+	+	+	+	+	1
Tris(2-ethylhexyl) phosphate	$(C_8H_{17})_3PO_4$	100	n	-	+	+	+	o	+	+	+	+	2
Hypochlorous acid	HOCl	s	+	+	o	+	-	+	+/o	+	o	+	1
Vinyl acetate	CH_2=$CHOOCCH_3$	100	-	-	+	+	+	n	n	+/o	+	+	2
Hydrogen peroxide	H_2O_2	90%	40%	40%*	30%	+	+	30%	30%	+	+	+	1
Tartaric acid	$C_4H_6O_6$	s	50%	+	+	+	+	+	+/o	+	+	+	1
Xylene	$C_6H_4(CH_3)_2$	100	-	-	-	+	+	o	-	-	o	+	2
Zinc acetate	$(CH_3COO)_2Zn$	s	+	+	+	+	+	-	+	+	+	+	1
Zinc chloride	$ZnCl_2$	s	+	+	+	+	-	+	+	+	+	n	1
Zinc sulfate	$ZnSO_4$	s	+	+	+	+	+	+	+	+	+	+/o	1
Tin(II) chloride	$SnCl_2$	s	+	o	+	+	-	+	+	+	+	+/o	1
Tin(II) sulfate	$SnSO_4$	s	n	+	+	+	+	+	+	+	+	+/o	1
Tin(IV) chloride	$SnCl_4$	s	n	+	+	+	-	+	+	+	+	+	1
Citric acid	$C_6H_8O_7$	s	+	+	+	+	+	+	+	+	+	+	1
Sugar solution	-	s	+	+	+	+	+	+	+	+	+	+	1

ProMinent® Chemical Resistance List

[1)] Chlorine dioxide is capable of penetrating PVDF without destroying it. This can lead to damage to PVDF-coated parts.

[2)] Nitric acid is a highly diffusive acid and tends to permeate depending on temperature and concentration. For potential limitations on its use in piston diaphragm valves, please contact ProMinent.

The statements made in this list do not necessarily apply to components, such as valves, even if they are made from the same materials.

ProMinent® Chemical Resistance List

Overview of the Resistance of Soft PVC Hoses (Guttasyn®) to the Most Common Chemicals

This data applies to standard conditions (20 °C, 1,013 mbar).

+	resistant
o	conditionally resistant
-	not resistant

The data has been taken from relevant manufacturers' literature and supplemented by our own tests and experience. As the resistance of a material also depends on other factors, especially pressure and operating conditions etc., this list should merely be regarded as an initial guide and does not claim to offer any guarantees. Take into consideration the fact that conventional feed chemicals are largely compounds, the corrosiveness of which cannot simply be calculated by adding together the corrosiveness of each individual component. In cases such as these the material compatibility data produced by the chemical manufacturer must be read as a matter of priority when selecting a material. Safety data sheets do not provide this information and cannot therefore replace application-specific documentation.

Corrosive agent	Concentration in %	Evaluation
Acetone	all	-
Acetylene tetrabromide	100	-
Alums of all kinds, aqueous	all	+
Aluminium salts, aqueous	all	+
Ammonium, aqueous	15	-
Ammonium, aqueous	saturated	-
Ammonium salts, aqueous	all	+
Aniline	100	-
Benzene	100	-
Bisulfite, aqueous	40	+
Borax solution	all	+
Boric acid, aqueous	10	+
Bromine, vaporous and liquid	-	-
Hydrogen bromide	10	+
Butanol	100	+
Butyric acid, aqueous	20	+
Butyric acid, aqueous	conc.	-
Butyl acetate	100	-
Calcium chloride, aqueous	all	+
Chlorinated hydrocarbons	all	-
Chrome-alum, aqueous	all	+
Chromic acid, aqueous	50	-
Dextrin, aqueous	saturated	+
Diesel oils, compressed oils	100	o
Diethyl ether	100	-
Fertilizing manure salt, aqueous	all	+
Ferric chloride, aqueous	all	+
Glacial acetic acid	100	-
Acetic ester	100	-
Acetic acid, aqueous	10	+
Acetic acid	50	o
Acetic acid (wine vinegar)	-	o
Acetic acid anhydride	100	-
Ethanol	96	-
Ethyl acetate	100	-
Ethylene glycol	30	+
Formaldehyde, aqueous	30	o
Difluorodichloromethane	100	-
Glycerol	100	-
Glucose, aqueous	saturated	+
Halogens	all	-
Urea, aqueous	all	+
Caustic potash	15	+
Potassium bichromate, aqueous	saturated	+
Potassium persulfate, aqueous	saturated	+
Creosote	-	-
Sodium chloride, aqueous	all	+
Carbonic acid	all	+
Copper sulfate, aqueous	all	+
Magnesium salts, aqueous	all	+

ProMinent® Chemical Resistance List

Corrosive agent	Concentration in %	Evaluation
Methyl alcohol	100	+
Methylene chloride	100	-
Sodium hypochlorite	15	+
Sodium salts	-	-
Sodium hydroxide solution	aqueous	+
Oils	-	-
Perchloric acid	all	o
Phenol, aqueous	all	o
Phosphoric acid, aqueous	100	-
Nitric acid, aqueous	25	+
Hydrochloric acid	15	+
Sulfur dioxide, gaseous	all	+
Carbon disulfide	100	-
Sulfuric acid	30	+
Hydrogen sulfide, gaseous	100	-
Silver nitrate	10	+
Tetrachloromethane	100	-
Ink	-	+
Toluene	100	-
Trichloroethylene	100	-
Hydrogen peroxide	up to 10	+
Xylene	100	-
Zinc salts	all	+

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