

# 1.0 ProMinent® Alpha Metering Pumps

## 1.0.1 alpha® Metering Pumps



ALPHA.psd

### ProMinent® alpha Motor Driven Diaphragm Metering Pumps

- Output range 1.0-30.6 l/h, 10-2 bar
- Stroke length adjustment in 10 % steps from 0-100 %
- Material options: PVDF and Acrylic/PVC
- Patented coarse/fine bleed valve
- Constant stroke rate
- Controlled via mains supply ON/OFF

The alpha is a metering pump designed for simple operations. It is ideal for continuous metering.

It is an oscillating motor diaphragm metering pump for liquid chemicals and consists of drive and delivery unit as main components. The drives are available in 2 gear ratios, delivery units in 4 sizes and in the materials acrylic/PVC. It is therefore possible to specify the required output and the material combination. The alpha pumps are switched on/off via the mains power supply, the metering output can be changed via the stroke length adjustment between 100 % and 0.

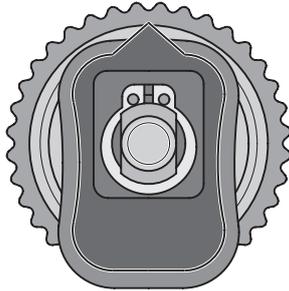
The drive consists of a powerful split pole motor with gearbox, eccentric shaft and connecting rod as driving rod. The housing is made of glass fibre reinforced plastic and is resistant to shock and chemicals. The eccentric for the stroke movement is guided in an eccentric cam. Suction and pressure stroke are positively driven.

The stroke length adjustment is carried out by varying the eccentricity in 10 % steps via a notched slide when the pump is not working. This means that the diaphragm deflection is always made from the neutral centre position.

During operation, the alpha pump with its positively driven suction and metering strokes, as well as the stroke length adjustment by varying the eccentricity produces a smooth, sinusoidal stroke action for suction and metering stroke with diaphragm deflection from the centre position.

The result is a good suction performance, smooth metering stroke and consistently accurate metering with low mechanical load on the metering diaphragm.

The delivery unit consists of liquid end, metering diaphragm and head disc. The liquid end in the material combinations PVDF or plexiglass/PVC is equipped with double ball valves on the suction and pressure side as well as coarse/fine bleeding. The bleed valve facilitates suctioning and bleeding at full operating pressure without having to interrupt and de-pressurise the metering line. For media of higher viscosity, the valves can be spring-loaded.



pk\_1\_002

# 1.0 ProMinent® Alpha Metering Pumps

## Technical Data

### 1.0.2 Technical Data

pump type	Max. Pump Capacity at Maximum Back Pressure			Max. Pump Capacity at Medium Back Pressure			Number of strokes  strokes/ min.	Stroke length  mm	Connector Sizes Outer Ø x Inner Ø  mm	Suction  m WG	Intake Head  m WG	shipping weight  kg
	bar	l/h	ml/stroke	bar	l/h	ml/stroke						
<b>50 Hz version</b>												
1001	10.0	1.0	0.29	5	1.1	0.32	58	2	6 x 4	5.1	2.5	3
1002	10.0	1.8	0.52	5	2.1	0.60	58	2	6 x 4	5.1	2.5	3
1004	10.0	3.5	1.01	5	3.9	1.12	58	3	8 x 5	5.1	2.5	3
1008	10.0	7.7	1.00	4	8.6	1.12	128	3	8 x 5	5.1	3.0	3
0707	7	6.9	1.98	4	7.7	2.21	58	3	8 x 5	4.1	3.0	3
0417	4	17.0	2.51	3	18.3	2.76	128	3	8 x 5	4.1	3.0	3
0230	2	30.6	3.98	2	32.7	4.26	128	3	12 x 9	4.1	3.0	3

### Materials In Contact with Chemicals

	Liquid End	Suction/Discharge Connector	Seals	Valve Balls
NPE	Plexiglass	PVC	EPDM	ceramic
NPB	Plexiglass	PVC	FPM (Viton®)	ceramic
PVT	PVDF	PVDF	PTFE	ceramic

DEVELOPAN® dosing diaphragms with PTFE coating for all versions.

Viton® is a registered trademark of DuPont Dow Elastomers. (FPM = fluororubber)

**Included in delivery: Metering Pump with 2 m mains cable and plug, connector set for hose/tube connection as indicated in tables.**

### Motor Data

Type: Split pole motor with integrated thermal overload protection

Power supply: 220-240 V, 50Hz

Power input: 50 W (at 230 V/50 Hz)

Power consumption: 0.4 A (at 230 V/50 Hz)

# 1.0 Identity Code Ordering for ProMinent® Alpha Metering Pumps



## 1.0.3 Identity Code Ordering System For alpha

ALPc

alpha version C

	Pump type:	
	Capacity at 50 Hz	
1001	1.2 l/h - 10 bar	NPE
1001	1.2 l/h - 10 bar	NPB
1001	1.2 l/h - 10 bar	PVT
1002	1.8 l/h - 10 bar	NPE
1002	1.2 l/h - 10 bar	NPB
1002	1.2 l/h - 10 bar	PVT
1004	3.5 l/h - 10 bar	NPE
1004	3.5 l/h - 10 bar	NPB
1004	3.5 l/h - 10 bar	PVT
1008	7.7 l/h - 10 bar	NPE
1008	7.7 l/h - 10 bar	NPB
1008	7.7 l/h - 10 bar	PVT
0707	6.9 l/h - 7 bar	NPE
0707	6.9 l/h - 7 bar	NPB
0707	6.9 l/h - 7 bar	PVT
0417	17.0 l/h - 4 bar	NPE
0417	17.0 l/h - 4 bar	NPB
0417	17.0 l/h - 4 bar	PVT
0230	30.6 l/h - 2 bar	NPE
0230	30.6 l/h - 2 bar	NPB
0230	30.6 l/h - 2 bar	PVT

	Liquid end material:
NPE	Acrylic/PVC/EPDM
NPB	Acrylic/PVC/FPM
PVT	PVDF/PVDF/PTFE

	Valve springs:
2	No valve springs with bleeding
3	With 2 valve springs approx. 0.1 bar, stainless steel 1.4571 with bleeding

	Hydraulic Connectors:
0	Standard

	Version:
0	With ProMinent® logo

	Electrical connectors:
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
D	115 V, 50/60 Hz, 2 m, USA plug

	Ancillary equipment:
0	No ancillary equipment
1	With foot and dosing valve, 2 m PVC and 5 m PE hose

ALPc      0707   PVT   2   0   0   A   1

# 1.1 ProMinent® Beta b 4 & 5 Metering Pumps

1.1.1

ProMinent® Beta



- Capacity range 0.74 - 32 l/h, 2 - 25 bar
- Continuous stroke length adjustment from 0 - 100 % (recommended 30-100%)
- Supplied in PP, PVC, Acrylic/PVC, PVDF, PTFE, stainless steel
- Patented coarse/fine, manual bleeding on PP, PVC and PVT Acrylic/PVC versions
- Self-deaerating dosing head type in PP and Plexi/PVC
- HV liquid end for highly viscous media
- 10-setting stroke frequency adjustment from 10 - 100 %
- External control via volt-free contacts
- External contact input with pulse control as standard 1:64 to 64:1
- Connector for dual-setting level switch
- 3 LED display for operation, warning and fault indication
- Wide range power supply 100-230 volt 50/60 Hz

The Beta range represents a new generation of ProMinent® solenoid diaphragm Metering Pumps. These micro-processor controlled pumps set new standards of operating safety and versatility: power surge compensation, wide-ranging power-supply adaptability, triple LED operating-status display and flexible control options, including external contact, volt-free ON/OFF control, and external frequency adjustment via volt-free contacts make these pumps ideal for the water treatment industry.

The 10 settings used to adjust dosing-frequency, along with “external”, “stop” and “test” settings are selected using a multi-function knob. Dosing heads are specifically designed in materials which withstand the chemicals used in this field: acids, alkalis, disinfectants, flocculation additives. In “test” mode, the pump operates at maximum frequency. On release, the spring-loaded button returns to “stop”. Variable stroke length adjustment enables precise selection of dosing capacity.

These settings options result in accurate dosing, and precise reproducibility of the required frequency. High frequencies ensure thorough blending of chemicals. A longer stroke length and correct installation ensures reliable dosing of highly viscous liquids. Self-deaerating dosing heads are available for gaseous chemicals. To complete the safety package we offer an optional dual-setting level switch to monitor chemical levels in containers. The hard-wearing drive systems for these solenoid diaphragm pumps meet the usual ProMinent® high standards of quality. The housing is made from glass-fibre reinforced PPE and carries IP 65 protection.

Foot and injection valves and 7m tube pack are included as standard, (PP/PVC only).

This universal pump offers an excellent cost of ownership ratio.

# Beta b ProMinent® Metering Pumps

## Technical Data

Beta® pump type	Max. Pump Capacity at Maximum Back Pressure			Max. Pump Capacity at Medium Back Pressure			Stroke Freq.	Connector Sizes Outer Ø x Inner Ø	Suction Lift**	Delivery Weight	
	bar	l/h	ml/ stroke	bar	l/h	ml/ stroke				PP, NP, PC, TT	SS
	bar	l/h	ml/ stroke	bar	l/h	ml/ stroke	strokes/ min.	mm	mWC	approx. kg	
BT4b 1000	10	0.74	0.069	5.0	0.82	0.076	180	6 x 4	6.0**	2.9	3.6
BT4b 0700 ***	7	0.8	0.074	3.5	0.8	0.074	180	6 x 4	6.0**	2.9	3.6
BT4b 0400 ***	4	0.84	0.078	2.0	0.84	0.078	180	6 x 4	6.0**	2.9	3.6
BT4b 2001	20	0.96	0.089	10.0	1.5	0.13	180	6 x 3	6.0**	3.1	3.9
BT4b 1601	16	1.1	0.10	8.0	1.4	0.13	180	6 x 4	6.0**	3.1	3.9
BT4b 1001 ***	10	1.3	0.12	5.0	1.5	0.14	180	6 x 4	3.0**	3.1	3.9
BT4b 0701 ***	7	1.4	0.13	3.5	1.5	0.14	180	6 x 4	2.0**	3.3	4.4
BT4b 0401 ***	4	1.5	0.14	2.0	2.0	0.18	180	6 x 4	6.0**	2.9	3.6
BT4b 2002	20	1.7	0.16	2.8	0.26	0.13	180	6 x 3	6.0**	2.9	3.6
BT4b 1602	16	2.2	0.20	8.0	2.5	0.24	180	6 x 4	6.0**	2.9	3.6
BT4b 1002 ***	10	2.4	0.22	5.0	2.8	0.26	180	6 x 4	6.0**	3.1	3.9
BT4b 0702 ***	7	2.6	0.24	3.5	3.1	0.29	180	6 x 4	6.0**	3.1	3.9
BT4b 0402 ***	4	2.8	0.26	2.0	3.9	0.36	180	6 x 4	3.0**	3.1	3.9
BT4b 1604	16	3.6	0.33	8.0	4.3	0.40	180	6 x 4	2.0**	3.3	4.4
BT4b 1004 ***	10	3.9	0.36	5.0	4.7	0.44	180	6 x 4	5.0**	2.9	3.6
BT4b 0704 ***	7	4.2	0.39	3.5	5.1	0.47	180	6 x 4	5.0**	2.9	3.6
BT4b 0404 ***	4	4.5	0.42	2.0	5.6	0.52	180	6 x 4	5.0**	2.9	3.6
BT4b 0708	7	7.1	0.66	3.5	8.4	0.78	180	8 x 5	6.0**	3.1	3.9
BT4b 0408 ***	4	8.3	0.77	2.0	10.0	0.93	180	8 x 5	4.0**	3.1	3.9
BT4b 0413	4	12.3	1.14	2.0	14.2	1.31	180	8 x 5	3.0**	2.9	3.6
BT4b 0220	2	19.0	1.76	1.0	20.9	1.94	180	12 x 9	2.0**	2.9	3.6
BT5b 2504	25	2.9	0.27	12.5	3.7	0.34	180	8 x 4	4.0**	3.1	3.9
BT5b 1008	10	6.8	0.63	5.0	8.3	0.76	180	8 x 5	3.0**	3.3	4.4
BT5b 0713	7	11.0	1.02	3.5	13.1	1.21	180	8 x 5	3.0**	4.5	5.3
BT5b 0420	4	17.1	1.58	2.0	19.1	1.77	180	12 x 9	3.0**	4.7	5.8
BT5b 0232	2	32.0	2.96	1.0	36.2	3.35	180	12 x 9	2.0**	5.1	6.6

### Beta b® Metering Pumps with self-bleeding dosing head \*

BT4b 1601	16	0.59	0.55	8.0	0.80	0.072	180	6 x 4	1.8**	2.9	–
BT4b 1001	10	0.72	0.067	5.0	0.60	0.08	180	6 x 4	2.1**	2.9	–
BT4b 0701	7	0.84	0.078	3.5	1.12	0.10	180	6 x 4	2.7**	3.1	–
BT4b 0401	4	0.90	0.083	2.0	1.2	0.11	180	6 x 4	2.0**	3.1	–
BT4b 2002	20	0.78	0.07	10.0	1.8	0.17	180	6 x 3	2.0**	3.1	–
BT4b 1602	16	1.4	0.13	8.0	1.74	0.174	180	6 x 4	2.0**	3.3	–
BT4b 1002	10	1.7	0.16	5.0	2.0	0.072	180	6 x 4	1.8**	2.9	–
BT4b 0702	7	1.8	0.17	3.5	2.2	0.20	180	6 x 4	2.1**	2.9	–
BT4b 0402	4	2.1	0.19	2.0	2.5	0.23	180	6 x 4	2.7**	3.1	–
BT4b 1604	16	2.7	0.25	8.0	3.6	0.33	180	6 x 4	2.0**	3.1	–
BT4b 1004	10	3.3	0.30	5.0	3.9	0.36	180	6 x 4	2.0**	3.1	–
BT4b 0704	7	3.6	0.33	3.5	4.0	0.37	180	6 x 4	2.0**	3.3	–
BT4b 0404	4	3.9	0.36	2.0	4.2	0.39	180	6 x 4	1.8**	2.9	–
BT4b 0708	7	6.6	0.61	3.5	7.5	0.69	180	8 x 5	2.1**	2.9	–
BT4b 0408	4	7.5	0.64	2.0	8.1	0.77	180	8 x 5	2.7**	3.1	–
BT4b 0413	4	10.8	1.0	2.0	12.6	1.17	180	8 x 5	2.0**	3.1	–
BT4b 0220	2	16.2	1.50	1.0	18.0	1.67	180	12 x 9	2.0**	3.3	–
BT5b 1008	10	6.3	0.58	5.0	7.5	0.69	180	8 x 5	3.0**	4.5	–
BT5b 0713	7	10.5	0.97	3.5	12.3	1.14	180	8 x 5	2.5**	4.5	–
BT5b 0420	4	15.6	1.44	2.0	17.4	1.61	180	12 x 9	2.5**	4.7	–

**Beta® pumps with liquid ends for highly viscous media have 10-20 % less metering capacity and are not self-priming. G 3/4-DN connector with d16-DN10 nozzle union.**

\* The values given in the capacity data tables are guaranteed minimum values, using medium hardness water at room temperature. Bypass bleed size 6x4 all sizes.

\*\* Suction lift readings when liquid end and suction tubing are full, or for self-degassing liquid end when the suction tubing contains air.

\*\*\* Reduced pressure 4, 7 and 10 bar pump types are available for specialised applications, e.g. for use in swimming pool systems.

\*\*\*\* 6 mm inner diameter in stainless steel version.

# Beta b ProMinent® Metering Pumps

## 1.1.3 Beta 4 and Beta 5 ProMinent® Metering Pump

### BT4b Beta version b

<b>BT4b 1000, 1601, 1602, 1604</b>	PP	<b>BT5b 1008, 0713, 0420</b>	PP
also <b>2001, 1001, 0701, 0401</b>	PV	also <b>2504</b>	PV
<b>2002, 1002, 0702, 0402</b>	NP		NP
<b>1004, 0704, 0404</b>	TT	<b>Note: 2504, 2002, 2001 only NP &amp; SS</b>	TT
	SS		SS
<b>BT4b 0708, 0413, 0220</b>	PP	<b>BT5b 0232</b>	PP
also <b>0408</b>	PV		PV
	NP		NP
	TT		TT
	SS		SS

<b>Liquid End Materials / Seals</b> *** Note: not all stocked ***
<b>PPE</b> Polypropylene/EPDM
<b>PPB</b> Polypropylene/Viton (FPM-B) <i>not stocked</i> FPM-B = Fluorine Rubber
<b>NPE</b> Plexiglass/EPDM <i>not stocked</i>
<b>NPB</b> Plexiglass/Viton
<b>PVT</b> PVDF/PTFE, for L/E type 2 <i>not 0232</i> & type 4 <i>only 1005/1605, 0708/1008, 0413/0713, 0220/420</i>
<b>TTT</b> PTFE/PTFE
<b>SST</b> Stainless Steel 1.4571/PTFE

<b>Liquid End Version</b>
<b>0</b> Non bleed, no valve springs, <b>ONLY available for TT, SS and type 0232 ONLY</b>
<b>1</b> Non bleed, with valve springs, <b>ONLY available for TT, SS and type 0232 ONLY</b>
<b>2</b> Bleed function, no valve springs for PP, NP, & PVT - <b>NOT type PP 0232</b>
<b>3</b> Bleed function, with valve springs for PP, NP, & PVT - <b>NOT type PP 0232</b>
<b>4</b> Version for highly viscous media, <b>Beta 4 only PVDF type 0708, 0413, 0220 (see note below)</b>
<b>9</b> Version for highly viscous media, <b>Beta 5 only PVDF type 1008, 0713, 0420 (see note below)</b>
<b>9</b> Self bleed, <b>for PP, NP only all sizes EXCEPT type 1000 and 0232</b>

<b>Hydraulic Connections</b>
<b>0</b> Standard according to technical data

<b>Design</b>
<b>0</b> Housing RAL 5003, Hood RAL 2003

<b>Logo</b>
<b>0</b> With ProMinent Logo

<b>Power Supply</b>
<b>U</b> 100 - 230 V, ±10%, 50/60 Hz
<b>M</b> 12-24 V DC (only BT4b) with 2 m open-ended cable <b>ONLY</b>
<b>N</b> 24 V DC with 2 m open-ended cable <b>ONLY</b>

<b>Cable &amp; Plug</b>
<b>C</b> 2m Australian
<b>1</b> 2m Open ended Cable for 12-24V pumps <b>ONLY</b>

<b>Relay</b>
<b>0</b> No Relay
<b>1</b> Fault indicating relay (N/C) (changeover relay) <b>Preferred</b>
<b>3</b> Fault indicating relay (N/O) (changeover relay)
<b>4</b> As for 1 + pacing relay (1 input each)
<b>5</b> As for 3 + pacing relay (1 input each)

<b>Accessories</b>
<b>0</b> No accessories
<b>1</b> Foot valve & Injection Valve - <b>NOT for PTFE or SS</b>

<b>Electronic Locking</b>
<b>0</b> No lock
<b>1</b> With electronic lock

<b>Control Variant</b>
<b>0</b> Standard

<b>Pause</b>
<b>0</b> Standard

<b>Control Variant</b>
<b>0</b> Standard

<b>Prepack Option</b>
<b>P*</b> See options

**Prepacks = P\***  
**P0** - includes 5m of delivery and 2m suction tube  
**P2** - includes 5m of delivery and 2m suction tube a 2m Control Cable if required.  
**P5** - as P2 but with 5m control Cable  
**PX** - as P2 but with 10m control Cable  
**Note:** 1601, 1602, 1605 pumps are supplied with 5.0m PTFE tube, other tube is available on request.

BT4b1601PPE 2 0 0 0 U C 0 1 0 0 0 0 P0

# Beta ProMinent® Metering Pumps CAN Bus ONLY

## Technical Data

Beta® pump type	Max. Pump Capacity at Maximum Back Pressure			Max. Pump Capacity at Medium Back Pressure			Stroke Freq.	Connector Sizes Outer Ø x Inner Ø	Suction Lift**	Delivery Weight PP, NP, PC, TT	SS
	bar	l/h	ml/stroke	bar	l/h	ml/stroke					
BT4a 1000***	10	0.74	0.07	5	0.82	0.08	180	6 x 4	6.0**	2.9	3.6
BT4a 1601***	16	1.1	0.10	8	1.4	0.13	180	6 x 4	6.0**	2.9	3.6
BT4a 1602***	16	2.1	0.19	8	2.5	0.24	180	6 x 4	6.0**	2.9	3.6
BT4a 1005***	10	4.4	0.41	5	5.0	0.46	180	8 x 5****	6.0**	3.1	3.9
BT4a 0708***	7	7.1	0.66	3.5	8.4	0.78	180	8 x 5	6.0**	3.1	3.9
BT4a 0413	4	12.3	1.14	2	14.2	1.31	180	8 x 5	3.0**	3.1	3.9
BT4a 0220	2	19.0	1.76	1	20.9	1.94	180	12 x 9	2.0**	3.3	4.4
BT5a 1605	16	4.1	0.38	8	4.9	0.45	180	8 x 5****	6.0**	4.5	5.3
BT5a 1008	10	6.8	0.63	5	8.3	0.76	180	8 x 5	6.0**	4.5	5.3
BT5a 0713	7	11.0	1.02	3.5	13.1	1.21	180	8 x 5	4.0**	4.5	5.3
BT5a 0420	4	17.1	1.58	2	19.1	1.77	180	12 x 9	3.0**	4.7	5.8
BT5a 0232	2	32.0	2.96	1	36.2	3.35	180	12 x 9	2.0**	5.1	6.6

### Beta a® Metering Pumps with self-bleeding dosing head \*

BT4a 1601	16	0.59	0.06	8	0.78	0.07	180	6 x 4	1.8**	2.9	-
BT4a 1602	16	1.4	0.13	8	1.7	0.16	180	6 x 4	2.1**	2.9	-
BT4a 1005	10	3.6	0.33	5	4.0	0.37	180	8 x 5	2.7**	3.1	-
BT4a 0708	7	6.6	0.61	3.5	7.5	0.69	180	8 x 5	2.0**	3.1	-
BT4a 0413	4	10.8	1.00	2	12.6	1.17	180	8 x 5	2.0**	3.1	-
BT4a 0220	2	16.2	1.50	1	18.0	1.67	180	12 x 9	2.0**	3.3	-
BT5a 1605	16	3.3	0.31	8	3.8	0.35	180	8 x 5	3.0**	4.5	-
BT5a 1008	10	6.3	0.58	5	7.5	0.69	180	8 x 5	3.0**	4.5	-
BT5a 0713	7	10.5	0.97	3.5	12.3	1.14	180	8 x 5	2.5**	4.5	-
BT5a 0420	4	15.6	1.44	2	17.4	1.61	180	12 x 9	2.5**	4.7	-

### Beta® pumps with liquid ends for highly viscous media have 10-20 % less metering capacity and are not self-priming. G 3/4-DN connector with d16-DN10 nozzle union.

\* The values given in the capacity data tables are guaranteed minimum values, using medium hardness water at room temperature. Bypass bleed size 6x4 all sizes.

\*\* Suction lift readings when liquid end and suction tubing are full, or for self-degassing liquid end when the suction tubing contains air.

\*\*\* Reduced pressure 4, 7 and 10 bar pump types are available for specialised applications, e.g. for use in swimming pool systems. Further information on request.

\*\*\*\* 6 mm inner diameter in stainless steel version.

## Materials on each Model in Contact with Chemicals

	dosing head	suction/pressure connector	seals	balls
PPE	Polypropylene	Polypropylene	EPDM	ceramic
PPB	Polypropylene	Polypropylene	FPM (Viton®)	ceramic
PCE	PVC	PVC	EPDM	ceramic
PCB	PVC	PVC	FPM (Viton®)	ceramic
NPE	Acrylic	PVC	EPDM	ceramic
NPB	Acrylic	PVC	FPM (Viton®)	ceramic
PVT	PVDF	PVDF	PTFE	ceramic
TTT	PTFE with carbon	PTFE with carbon	PTFE	ceramic
SST	stainless steel no. 1.4404	stainless steel no. 1.4404	PTFE	ceramic

Self-degassing version available in PP and NP only. Supplied with Hastelloy valve springs, PVDF valve core.

Dosing diaphragm with PTFE-coating.

Viton® is a registered trademark of DuPont Dow Elastomers.

Reproducible dosing accuracy  $\pm 2$  % under correct conditions (see operating instructions).

Ambient temperature -10 °C to +45 °C.

Medium power consumption Type 1000-0220: 17 W Type 1605-0232: 22 W

Type of enclosure: IP 65, insulation class F

**Metering Pumps supplied with mains power cable (2 m) and plug, hose/pipe connector set as tables.**

# Beta ProMinent® Metering Pumps

## CAN Bus ONLY

### 1.1.3 Beta 4 and Beta 5 ProMinent® Metering Pump

<b>BT4a</b>	<b>Beta version a</b>			
	<b>BT4a 1000, 1601, 1602,</b>	PPE	<b>BT5a 1605, 1008, 0713, 0420</b>	PPE
	also 0700, 0400	PVT		PVT
	1001, 0701, 0401	NPB		NPB
	1002, 0702, 0402	TTT		TTT
		SST		SST
	<b>BT4a 1005, 0708, 0413, 0220</b>	PPE	<b>BT5a 0232</b>	PPE
	also 0405, 0705	PVT		PVT
	0408,	NPB		NPB
		TTT		TTT
		SST		SST

<b>PPE</b>	<b>Liquid End Materials / Seals</b> *** Note: not all stocked ***
<b>PPB</b>	Polypropylene/EPDM
<b>NPE</b>	Polypropylene/Viton (FPM-B) <i>not stocked</i> FPM-B = Fluorine Rubber
<b>NPB</b>	Plexiglass/EPDM <i>not stocked</i>
<b>PVT</b>	Plexiglass/Viton
<b>TTT</b>	PVDF/PTFE, for L/E type 2 <i>not 0232</i> & type 4 <i>only 1005/1605, 0708/1008, 0413/0713, 0220/420</i>
<b>SST</b>	PTFE/PTFE
	Stainless Steel 1.4571/PTFE

	<b>Liquid End Version</b>
<b>0</b>	Non bleed, no valve springs, <b>ONLY available for TT, SS and type 0232 ONLY</b>
<b>1</b>	Non bleed, with valve springs, <b>ONLY available for TT, SS and type 0232 ONLY</b>
<b>2</b>	Bleed function, no valve springs for PP & PVT - <b>NOT type 0232</b>
<b>3</b>	Bleed function, with valve springs for PP, NP, & PVT - <b>NOT type PP 0232</b>
<b>4</b>	Version for highly viscous media, <i>only PVDF type 1005, 1605, 0708, 1008, 0413, 0713, 0220, 0420</i>
<b>9</b>	Self bleed, <b>for PP, NP only - NOT available for types 1000 and 0230</b>

<b>0</b>	<b>Hydraulic Connections</b>
	Standard according to technical data

<b>0</b>	<b>Design</b>
	With ProMinent Logo

	<b>Power Supply</b>
<b>A</b>	200 - 230 V, ±10%, 50/60 Hz ***** CAN Bus ONLY *****
<b>U</b>	100 - 230 V, ±10%, 50/60 Hz ***** CAN Bus ONLY *****

	<b>Cable &amp; Plug</b>
<b>C</b>	2m Australian
<b>1</b>	2m Open ended Cable for 12-24V pumps <b>ONLY</b>

	<b>Relay</b>
<b>0</b>	No Relay
<b>1</b>	Fault indicating relay (N/C) (changeover relay) <b>Preferred</b>
<b>3</b>	Fault indicating relay (N/O) (changeover relay)
<b>4</b>	As for 1 + pacing relay (1 input each)
<b>5</b>	As for 3 + pacing relay (1 input each)

	<b>Accessories</b>
<b>0</b>	No accessories
<b>1</b>	Foot valve & Injection Valve - <b>NOT for PTFE or SS</b>

	<b>Electronic Locking</b>
<b>0</b>	No lock
<b>1</b>	With lock: manual operation locked when external cable is plugged in.

	<b>Options on request</b>
<b>0</b>	Standard
<b>D</b>	CANopen for Dulcomarin® II

<b>0 0</b>	no options
------------	------------

<b>P*</b>	<b>Prepack Option</b>
	See

**Prepacks = P\***  
**P0** - includes 5m of delivery and 2m suction tube a CANbus cable, if specified.  
**Note:** 1601, 1602, 1605 pumps are supplied with 5.0m PTFE tube, other tube is available on request.

BT4a1601PPE 2 0 0 A C 0 1 0 0 00 P0

# 1.1.4 ProMinent Beta4 b Metering Pumps - Spare Part Sets

## 1.1.4 Beta4 & 5 ProMinent® Metering Pumps - Spare Part Sets

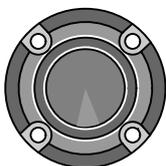
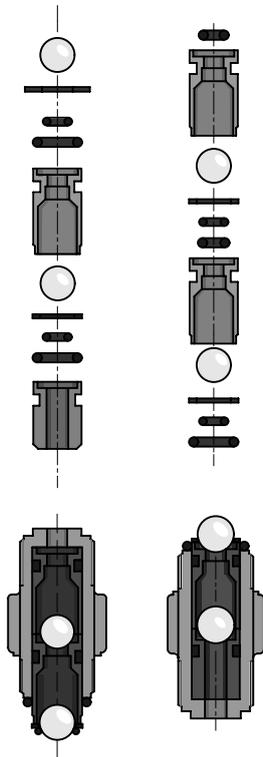
**Replacement part sets for ProMinent® Beta, consisting of:**

- 1 dosing diaphragm
- 1 suction valve
- 1 delivery valve
- 2 valve balls
- 1 set seals
- 1 connector set

*Note: Does not include valves for SS*

**Spare parts kits Beta®**

Type 1000	PPT, NPT, PVT	1023107
	TTT	1001737
	SST	1001729
Type 1601	PPT, NPT, PVT	1023108
	TTT	1001738
	SST	1001730
Type 1602	PPT, NPT, PVT	1023109
	TTT	1001739
	SST	1001731
Type 1604 and Type 2504	PPT, NPT, PVT	1035332
	PVT HV	1035342
	TTT	1035330
	SST	1035331
Type 0708 and Type 1008	PPT, NPT, PVT	1023111
	PVT HV	1019067
	TTT	1001741
	SST	1001733
Type 0413 and Type 0713	PPT, NPT, PVT	1023112
	PVT HV	1019069
	TTT	1001742
	SST	1001734
Type 0220 and Type 0420	PPT, NPT, PVT	1023113
	PVT HV	1019070
	TTT	1001754
	SST	1001735
Type 0232	PPT, NPT, PVT	1023124
	TTT	1001755
	SST	1001736



# 1.1.5 Accessories

## ProMinent Beta4 & 5 & Gamma L Spare Parts Set

### 1.1.5

### Spare Parts Sets

Replacement part sets for ProMinent® Beta,

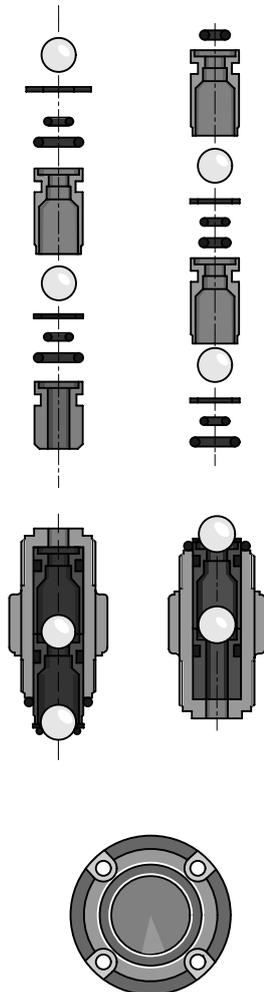
consisting of:

- 1 dosing diaphragm
- 1 suction valve
- 1 delivery valve
- 2 valve balls
- 1 set seals
- 1 connector set

Note: Does not include valves for SS

**Note: Gamma L Spare Parts Sets are the same as the Beta listed here**

Beta replacement part set	Part no.	Price
BT4a 1000	PPE	1001644
	PPB	1001652
	PCE/NPE	1001713
	PCB/NPB	1001721
	PVT	1023107
	TTT	1001737
BT4a 1601	SST	1001729
	PPE	1001645
	PPB	1001653
	PCE/NPE	1001714
	PCB/NPB	1001722
	PVT	1023108
BT4a 1602	TTT	1001738
	SST	1001730
	PPE	1001646
	PPB	1001654
	PCE/NPE	1001715
	PCB/NPB	1001723
BT4a 1005 & BT5a 1605	PVT	1023109
	TTT	1001739
	SST	1001731
	PPE	1001647
	PPB	1001655
	PCE/NPE	1001716
BT4a 0708 & BT5a 1008	PCB/NPB	1001724
	PVT	1023110
	PVT/HV	1019066
	TTT	1001740
	SST	1001732
	PPE	1001648
BT4a 0413 & BT5a 0713	PPB	1001656
	PCE/NPE	1001717
	PCB/NPB	1001725
	PVT	1023111
	PVT/HV	1019067
	TTT	1001741
BT4a 0220 & BT5a 0420	SST	1001733
	PPE	1001649
	PPB	1001657
	PCE/NPE	1001718
	PCB/NPB	1001726
	PVT	1023112
BT4a 0220 & BT5a 0420	PVT/HV	1019069
	TTT	1001742
	SST	1001734
	PPE	1001650
	PPB	1001658
	PCE/NPE	1001719
BT5a 0232	PCB/NPB	1001727
	PVT	1023113
	PVT/HV	1019070
	TTT	1001754
	SST	1001735
	PPE	1001651
BT5a 0232	PPB	1001659
	PCE/NPE	1001720
	PCB/NPB	1001728
	PVT	1023124
	TTT	1001755
	SST	1001736



# 1.1.5 Accessories

## ProMinent Beta4 & 5 & Gamma L Spare Parts Set

### Notes

Replacement part sets for ProMinent® Beta with self-deaerating head, consisting of:	Replacement part set: Beta with self-deaerating head		Part no.	Price
1 dosing diaphragm	BT4a 1601	PPE9	1001756	
1 suction valve		PPB9	1001762	
1 delivery valve		NPE9	1001660	
1 pressure control valve complete		NPB9	1001666	
2 valve balls	BT4a 1602	PPE9	1001757	
1 set seals		PPB9	1001763	
1 connector set		NPE9	1001661	
		NPB9	1001667	
	BT4a 1604	PPE9	1035335	
		PPB9	1035336	
		NPE9	1035333	
		NPB9	1035334	
	BT4a 1005 & BT5a	PPE9	1001758	
		PPB9	1001764	
		NPE9	1001662	
		NPB9	1001668	
	BT4a 0708 and BT5a 1008	PPE9	1001759	
		PPB9	1001765	
		NPE9	1001663	
		NPB9	1001669	
	BT4a 0413 & BT5a 0713	PPE9	1001760	
		PPB9	1001766	
		NPE9	1001664	
		NPB9	1001670	
	BT4a 0220 & BT5a 0420	PPE9	1001761	
		PPB9	1001767	
		NPE9	1001665	
		NPB9	1001671	

Note: Does not include valves for SS

#### Beta/GALA

#### sizes of NP & PP Liquid Ends

These no's engraved on side of Dosing Head

70 x 10 = 1000

70 x 12.5 = 1601

90 x 23 = 1005/1605

90 x 29 = 0708/1008

90 x 37 = 0413/0713

90 x 44 = 0220/0420

110 x 59 = 0232

#### Replacement diaphragms for beta & Gamma L range

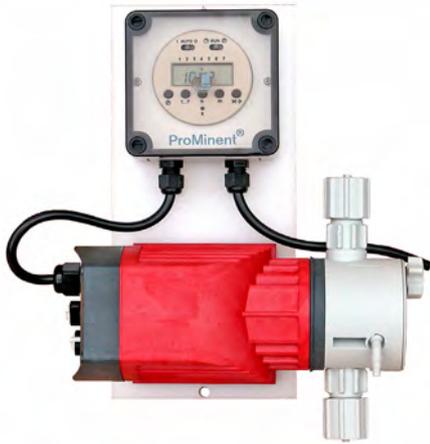
BT4a 1000	all materials	1000244.
BT4a 1601	all materials	1000245.
BT4a 1602	all materials	1000246.
BT4b 1604 & 2504	all materials	1034612.
BT4a 1005 & BT5a 1605	all materials	1000247.
BT4a 0708 & BT5a 1008	all materials	1000248.
BT4a 0413 & BT5a 0713	all materials	1000249.
BT4a 0220 & BT5a 0420	all materials	1000250.
BT5a 0232	all materials	1000251.

#### Replacement O-ring kits for beta & Gamma L range

PPE2 1000, 1601, 1602, 1005, 1605	EPDM	1001775.
0708, 0413, 1008, 0713, 0220, 0420, 0232	EPDM	1001776.
NPB2 & PPB2 1000, 1601, 1602, 1005, 1605	Viton	1001773.
0708, 0413, 1008, 0713, 0220, 0420, 0232	Viton	1001774.
PPE9 1601, 1602, 1005, 1605	EPDM	1001674.
0708, 0413, 1008, 0713, 0220, 0420, 0232	EPDM	1001675.
NPB9 1601, 1602, 1005, 1605	Viton	1001672.
0708, 0413, 1008, 0713, 0220, 0420, 0232	Viton	1001673.

# 1.1.6 Timer Pumps

## 1.1.6 ProMinent® CONCEPT PLUS Timer Pumps



Concept pumps are available with timer in IP65 enclosure and 240 volt power cord as an extra. Select pump from Concept Price List

## 1.1.7 ProMinent® Beta Timer Pumps



Beta pumps are available with timer in IP65 enclosure and 240 volt power cord as an extra. Select pump from Beta Price List

## 1.1.7 ProMinent® Dulco® flex Timer Pumps

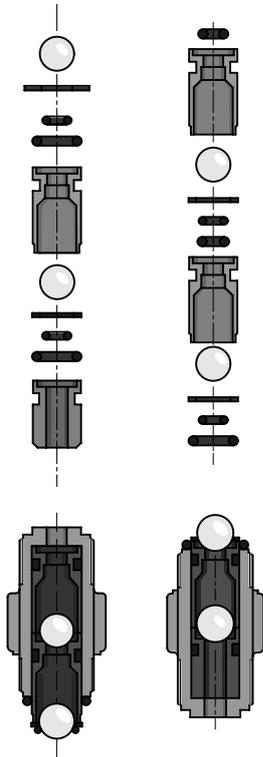


DULCOflex® pumps are available with timer in IP65 enclosure and 240 volt power cord as an extra. Select pump from DULCOflex® Price List

## ProMinent® GALA Timer Pumps

Gala pumps are available with inbuilt timer see GALA Pump Price List

**1.1.8 CONCEPT CONb Spare Parts Sets**



Items included in Spare Parts Kits for material types PP and NP

- 1 metering diaphragm
- 1 suction connection assembly
- 1 pressure connection assembly
- 2 valve balls
- 1 seal set assembly
- 2 fuses

**CONb spare parts sets (identical to gamma/4)**

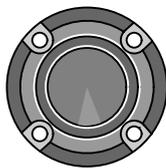
CONb 1601	PP1	910720.
gamma/4 1601	NP6	910719.
CONb 1201	PP1	910724.
gamma/4 1201	NP6	910723.
CONb 0803	PP1	910728.
gamma/4 0803	NP6	910727.
CONb 1002	PP1	910732.
gamma/4 1002	NP6	910731.
CONb 0308	PP1	910736.
gamma/4 0308	NP6	910735.
CONb 0215	PP1	910740.
gamma/4 0215	NP6	910739.

**CONb pump diaphragm**

ProMinent® DEVELOPAN® EPDM pump diaphragm with fabric insert, large contact area with integral vulcanised steel core and PTFE coating areas in contact with the media.

Designation of pump type

CONb 1601, gamma/4 1601,	811453.
CONb 1201, gamma/4 1201,	811454.
CONb 0803, gamma/4 0803,	811455.
CONb 1002, gamma/4 1002, gamma/5 1602	811456.
CONb 0308, gamma/4 0308, gamma/5 1605, 1006	811457.
CONb 0215, gamma/4 0215, gamma/5 0613	811458.



pk\_1\_008

**1.1.9 CONCEPT Plus Spare Parts Sets**

**CONCEPT Plus**

Spare Parts Set

CNPa1000PPE2	1001644.
CNPa1601PPE2	1001645.
CNPa1002PPE2	1001646.
CNPa0308PPE2	1001648.
CNPa0213PPE2	1001649.
CNPa1000NPB2	1001721.
CNPa1601NPB2	1001722.
CNPa1002NPB2	1001723.
CNPa0704NPB2	1025430.
CNPa0308NPB2	1001725.
CNPa0213NPB2	1001726.

**CONCEPT Plus pump diaphragm**

ProMinent® DEVELOPAN® EPDM pump diaphragm with fabric insert, large contact area with integral vulcanised steel core and PTFE coating areas in contact with the media.

CNPa1000	1000244.
CNPa1601	1000245.
CNPa1002	1000246.
CNPa0704	1020672.
CNPa0308	1000248.
CNPa0213	1000249.

# 1.2 ProMinent®

## Gamma L Solenoid Diaphragm Metering Pumps

1.2.1

ProMinent® Gamma L

- Capacity range 0.74 - 32 l/h, 16 - 2 bar
- Continuous stroke length adjustment from 0 - 100 % (recommended 30 to 100%)
- Material options PP, PVC, Acrylic PVC, PTFE, PVDF and Stainless Steel
- Patented coarse/fine, manual bleeding on PP, PVC and PVT Acrylic/PVC versions
- Self-bleeding liquid end version in PP and Plexi/PVC
- PVDF/HV liquid end for highly viscous media
- Digitally accurate stroking rate via keypad and large LCD display
- Select feed rate display in strokes/min. or l/h
- Programmable pressure levels
- Dosing monitor input, adjustable error stroke counter
- External control via volt-free contact with optional pulse multiply / divide function
- Optional external control via standard signal 0/4-20mA
- Interface for PROFIBUS® DP
- Two level float switch connector
- 14 day timer option
- Low voltage 12-24 DC, 24 V AC/DC option
- 3 LED display for operation, warning and fault indication
- Concentration entry option for proportional flow dosing



pk\_1\_005

### Note

- For spare Parts kits see Beta
- For accessories see section 3

# 1.2.2 ProMinent® Gamma L Metering Pumps

## 1.2.2 Technical Data

gamma/ L pump type	Max. Pump Capacity at Maximum Back Pressure			Max. Pump Capacity at Medium Back Pressure			Stroke Freq.	Connector Sizes Outer Ø x Inner Ø	Suction Lift**	Delivery Weight	
	bar	l/h	ml/ stroke	bar	l/h	ml/ stroke				PP, NP, PC, TT	SS
							strokes/ min.	mm	mWG	approx. kg	
GALa 1000	10	0.74	0.07	5	0.82	0.08	180	6 x 4	6.0**	2.9	3.6
GALa 1601	16	1.1	0.10	8	1.4	0.13	180	6 x 4	6.0**	2.9	3.6
GALa 1602	16	2.1	0.19	8	2.5	0.24	180	6 x 4	6.0**	2.9	3.6
GALa 1005	10	4.4	0.41	5	5.0	0.46	180	8 x 5***	6.0**	3.1	3.9
GALa 0708	7	7.1	0.66	3.5	8.4	0.78	180	8 x 5	6.0**	3.1	3.9
GALa 0413	4	12.3	1.14	2	14.2	1.31	180	8 x 5	3.0**	3.1	3.9
GALa 0220	2	19.0	1.76	1	20.9	1.94	180	12 x 9	2.0**	3.3	4.4
GALa 1605	16	4.1	0.38	8	4.9	0.45	180	8 x 5***	6.0**	4.5	5.3
GALa 1008	10	6.8	0.63	5	8.3	0.76	180	8 x 5	6.0**	4.5	5.3
GALa 0713	7	11.0	1.02	3.5	13.1	1.21	180	8 x 5	4.0**	4.5	5.3
GALa 0420	4	17.1	1.58	2	19.1	1.77	180	12 x 9	3.0**	4.7	5.8
GALa 0232	2	32.0	2.96	1	36.2	3.35	180	12 x 9	2.0**	5.1	6.6
gamma/ L Metering Pumps with self-deaerating dosing head*											
GALa 1601	16	0.59	0.06	8	0.78	0.07	180	6 x 4	1.8**	2.9	–
GALa 1602	16	1.4	0.13	8	1.7	0.16	180	6 x 4	2.1**	2.9	–
GALa 1005	10	3.6	0.33	5	4.0	0.37	180	8 x 5	2.7**	3.1	–
GALa 0708	7	6.6	0.61	3.5	7.5	0.69	180	8 x 5	2.0**	3.1	–
GALa 0413	4	10.8	1.00	2	12.6	1.17	180	8 x 5	2.0**	3.1	–
GALa 0220	2	16.2	1.50	1	18.0	1.67	180	12 x 9	2.0**	3.3	–
GALa 1605	16	3.3	0.31	8	3.8	0.35	180	8 x 5	3.0**	4.5	–
GALa 1008	10	6.3	0.58	5	7.5	0.69	180	8 x 5	3.0**	4.5	–
GALa 0713	7	10.5	0.97	3.5	12.3	1.14	180	8 x 5	2.5**	4.5	–
GALa 0420	4	15.6	1.44	2	17.4	1.61	180	12 x 9	2.5**	4.7	–

gamma/ L pumps with liquid ends for highly viscous media have 10-20 % less metering capacity and are not self-priming. G 3/4-DN connector with d16-DN10 nozzle union.

\* The values given in the capacity data tables are guaranteed minimum values, using medium hardness water at room temperature.

\*\* Suction lift readings when liquid end and suction tubing are full, or for self-degassing liquid end when the suction tubing contains air.

\*\*\* 6 mm inner diameter in stainless steel version.

## Materials On Each Model In Contact With Chemicals

	dosing head	suction/pressure connector	seals	balls
PPE	Polypropylene	Polypropylene	EPDM	ceramic
PPB	Polypropylene	Polypropylene	FPM (Viton®)	ceramic
NPE	Acrylic	PVC	EPDM	ceramic
NPB	Acrylic	PVC	FPM (Viton®)	ceramic
PVT	PVDF	PVDF	PTFE	ceramic
TTT	PTFE with carbon	PTFE with carbon	PTFE	ceramic
SST	stainless steel	stainless steel	PTFE	ceramic
	no. 1.4404	no. 1.4404		

Self-degassing version available in PP and NP only. Supplied with Hastelloy valve springs, PVDF valve core.

Dosing diaphragm with PTFE-coating.

Viton® is a registered trademark of DuPont Dow Elastomers.

Reproducible dosing accuracy ±2 % under correct conditions (see operating instructions).

Ambient temperature -10 °C to +45 °C

Medium power consumption Type 1000-0220: 17 W Type 1605-0232: 22 W

Type of enclosure: IP 65, insulation class F

Metering Pumps supplied with mains power cable (2 m) and plug, hose/pipe connector set as tables.

# 1.2.3 ProMinent® Gamma L Metering Pumps

## 1.2.3 ProMinent® Gamma L Metering Pumps

<b>GALA</b> 1000, 1601, 1602 also 1001, 1002	PPE PVT NPB TTT SST	1605, 1008, 0713, 0420	PPE PVT NPB TTT SST
1005, 0708, 0413, 0220	PPE PVT NPB TTT SST	0232	PPE PVT NPB TTT SST

<b>Liquid End Materials/Seals</b> *** Note: not all stocked ***
<b>PPE</b> Polypropylene/EPDM
<b>PPB</b> Polypropylene/Viton (FPM-B) <i>not stocked</i> FPM-B = Fluorine Rubber
<b>NPE</b> Plexiglass/EPDM <i>not stocked</i>
<b>NPB</b> Plexiglass/Viton
<b>PVT</b> PVDF/PTFE
<b>TTT</b> PTFE/PTFE
<b>SST</b> Stainless Steel 1.4571/PTFE

<b>Liquid End Version</b>
<b>0</b> Non bleed, no valve springs, <b>ONLY available for TT, SS and type 0232 ONLY</b>
<b>1</b> Non bleed, with valve springs, <b>ONLY available for TT, SS and type 0232 ONLY</b>
<b>2</b> Bleed function, no valve springs for PP, & PVT - <b>NOT type 0232</b>
<b>3</b> Bleed function, with valve springs for PP, NP, & PVT - <b>NOT type PP 0232</b>
<b>4</b> Version for highly viscous media, <b>only PVDF type 1005, 0708, 0413, 0220</b>
<b>4</b> Version for highly viscous media, <b>only PVDF type 1605, 1008, 0713, 0420</b>
<b>9</b> Self bleed, <b>for PP, NP only - NOT available for types 1000 and 0232</b>

<b>0</b> <b>Hydraulic Connections</b> Standard according to technical data
--

<b>0</b> <b>Version</b> With ProMinent Logo
---

<b>Electrical connectors</b>
<b>U</b> 100 - 230v, ±10%, 50/60 Hz
<b>M</b> 12 - 24 V DC, ±10% for type 1000-0220 with 2 m open-ended cable <b>ONLY</b>
<b>N</b> 24 V DC, ±10% for type 1605-0232 with 2 m open-ended cable <b>ONLY</b>

<b>Cable &amp; Plug</b>
<b>C</b> 2m Australian
<b>1</b> 2m Open ended Cable for 12-24V pumps <b>ONLY</b>

<b>Relay</b>
<b>0</b> No Relay
<b>1</b> Fault indicating relay (N/C) (changeover relay)
<b>3</b> Fault indicating relay (N/O) (changeover relay)
<b>4</b> As for 1 + pacing relay (1 input each)
<b>5</b> As for 3 + pacing relay (1 input each)
<b>C</b> As for 1 + 4-20 mA output
<b>D</b> As for 3 + 4-20 mA output
<b>E</b> 4-20 mA output + Pacing

<b>Accessories</b>
<b>0</b> No accessories
<b>1</b> Foot valve & Injection Valve - <b>NOT for PTFE or SS</b>

<b>Control Variants</b>	
<b>0</b> Manual + external contact 1:1	
<b>1</b> Manual + external contact with pulse control	
<b>2</b> Manual + external contact 1:1 + analogue current	
<b>3</b> Manual + external with pulse control + analogue	
<b>4</b> as for 0 + Timer	
<b>5</b> as for 3 + Timer	
<b>7</b> as for 1 + Concentration Input	
<b>8</b> as for 3 + Concentration Input	
<b>R</b> as 3 + Profibus DP interface <b>M12*</b>	
* no relay possible with this option	

<b>Access Code</b>
<b>0</b> No access code
<b>1</b> With access code

<b>Dosing Monitor</b>
<b>0</b> Pulse signal input

<b>Pause / Level</b>
<b>0</b> Pause N/C, Level N/C

<b>Prepack</b>
<b>P*</b> see options and prices

**Prepacks = P\***  
**P0** - includes 5m of delivery and 2m suction tube a Profibus cable, if specified.  
**P2** - includes 5m of delivery and 2m suction tube a 2m Control Cable if required.  
**P5** - as P2 but with 5m control Cable  
**PX** - as P2 but with 10m control Cable  
**Note:** 1601, 1602, 1605 pumps are supplied with 5.0m PTFE tube, other tube is available on request.

GALA1601PPE 2 0 0 U C 0 1 0 0 0 0 P0

# 1.2.4 Accessories ProMinent® Gamma 4 & 5

## 1.2.4

## Spare Parts Kits

**\*\*\* NOTE \*\*\***  
**for all GALA spare parts kits see pages 1.8 & 1.9**

### Spare parts kits for ProMinent® gamma/ 4, gamma/ 5 metering pumps

Standard kit for PP and NP material versions:

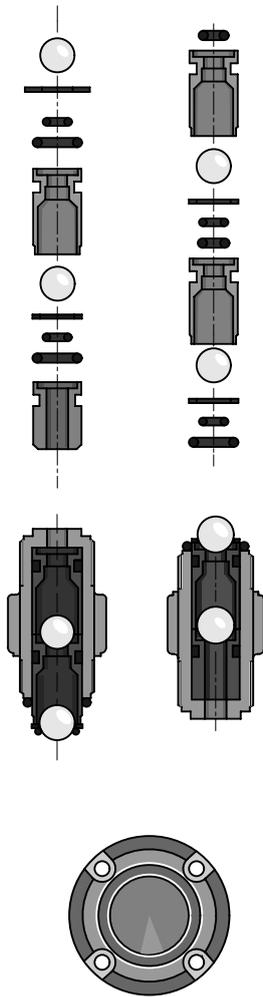
- 1 pump diaphragm
- 1 suction valve complete
- 1 discharge valve complete
- 2 valve balls
- 1 set of seals complete
- 2 fuses
- 1 Connection Set

Standard kit for TT/PTFE material version:

- 1 pump diaphragm
- 1 suction connector complete
- 1 discharge connector complete
- 2 valve balls
- 2 ball seat discs
- 1 set of seals complete
- 2 fuses
- 1 Connection Set

Standard kit for SS stainless steel material version:

- 1 pump diaphragm
- 4 valve balls
- 4 ball seat discs
- 1 set of seals complete
- 1 connector set
- 2 fuses

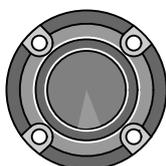
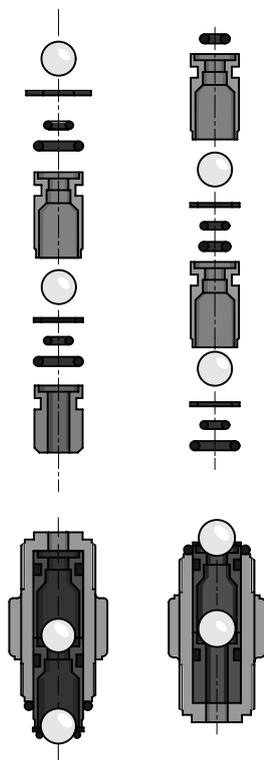


### Spare parts kits gamma/4

Description/version	Part no.	
gamma/ 4 1000	PP1	910716.
	NP3	910715.
	TT1	910776.
	SS/SK1	910777.
gamma/ 4 1601 2001	PP1	910720.
	NP3	910719.
	TT1	910778.
	SS/SK1	910779.
gamma/ 4 1201	PP1	910724.
	NP3	910723.
	TT1	910780.
	SS/SK1	910781.
gamma/ 4 0803 0703	PP1	910728.
	NP3	910727.
	TT1	910782.
	SS1	910783.
gamma/ 4 1003 1002	PP1	910732.
	NP3	910731.
	TT1	910784.
	SS1	910785.
	PP4	910743.
gamma/ 4 0313 0308 0408	PP1	910736.
	NP3	910735.
	TT1	910786.
	SS1	910787.
gamma/ 4 0223 0215 0216	PP1	910740.
	NP3	910739.
	TT1	910788.
	SS1	910789.

# 1.2.5 Accessories ProMinent® Gamma 4 & 5

## 1.2.5 Spare Parts Kits



pk\_1\_008

Description/version		Part no.	Price
Spare parts kits gamma/5			
gamma/5 1602	NP1	910945.	
	SS1	910947.	
gamma/5 1605	NP1	910949.	
	SS1	910951.	
gamma/5 1006	PP1	910955.	
	NP1	910953.	
	TT1	910957.	
	SS1	910959.	
	PP4	910939.	
gamma/ 5 1310	NP1	910961.	
	SS1	910963.	
	PP4	910941.	
gamma/5 0613	PP1	910967.	
	NP1	910965.	
	TT1	910969.	
	SS1	910971.	
gamma/5 0813	PP1	910975.	
	NP1	910973.	
	TT1	910977.	
	SS1	910979.	
	PP4	910943.	
gamma/5 0417	PP1	910983.	
	NP1	910981.	
	TT1	910985.	
	SS1	910987.	
gamma/5 0423-DN 10	PP1	910991.	
	NP1	910989.	
	TT1	910993.	
	SS1	910995.	
gamma/5 0230-DN 10	PP1	910937.	
	NP1	910935.	
	TT1	910931.	
	SS1	910933.	

Spare parts kits from DN 10 upwards with single ball valves.

## Pump Diaphragm

Pump diaphragm, PTFE

ProMinent® Developan® pump diaphragm of fabric-reinforced EPDM, with large-area vulcanised steel core and PTFE Teflon coating on the media-contacted surface.



pk\_1\_008

Designation of pump type

gamma/4 1000	811452.
gamma/4 1601, gamma/5 1602	811453.
gamma/4 1201	811454.
gamma/4 0803	811455.
gamma/4 1002, gamma/4 1003	811456.
gamma/4 0308, gamma/5 1605, gamma/5 1006	811457.
gamma/4 0215, gamma/4 0223, gamma/5 1310, 0613	811458.
gamma/5 0813, gamma/5 0417	811459.
gamma/5 0423, gamma/5 0230	811460.
127.5 x 91.0 260	811461.

\*\*\* NOTE \*\*\*

**for all GALA spare parts kits see pages 1.8 & 1.9**

# ProMinent® Gamma Metering Pumps

Notes

# 1.3 ProMinent® Delta® Controlled Solenoid optodrive® Diaphragm Metering Pumps

1.3.1

ProMinent® Delta®

The solenoid metering pumps of the series Delta® with controlled solenoid drive optoDrive® are microprocessor-controlled solenoid metering pumps with the following features:

- Continuous or pulsating dosing.
- Programmable suction and delivery stroke duration.
- Pump can be adapted to the dosing media.
- Integrated injection control optoGuard detects blocked dosing points, broken dosing lines and air or gas bubbles trapped in the dosing head.
- Capacity range 7.5-75 l/h, 25-2 bar.
- Stroke length continuously adjustable from 0 - 100% (recommended range 30 - 100%).
- Acrylic, PVDF and stainless steel material versions.
- Patented coarse/fine, manual bleeding on Acrylic/PVC versions
- Detection and indication of diaphragm failure.
- Adjustment and display of pump delivery from the keypad with choice of display in l/h or strokes/min.
- Large backlit graphic display.
- External control options via volt-free contacts with pulse multiply/divide function.
- Optional external control via standard 0/4-20 mA signal.
- Interfaces for PROFIBUS® or CANopen (Dulcomarin II).
- 14-day process timer option\* for time and event-dependent dosing duties.
- Connection for 2-stage level switch.
- 3 LED displays for operation and warning and error message in plain text.
- Optional concentration input for volume-proportional dosing.
- Optional automatic degassing function.
- Control module with inputs for pH, ORP an chlorine
- EHEDG-certified stainless steel liquid ends



# 1.3 ProMinent® Delta® Controlled Solenoid optodrive® Diaphragm Metering Pumps

## 1.3.2 ProMinent® Delta® Metering Pumps

### Technical Data

Pump type ProMinent Delta®	Pressure bar	Capacity l/h	Stroke capacity ml/stroke	Stroke frequency strokes/min	Connector size mm	Suction lift* m WG	Shipping weight PVT-NP/SST in kg
DLTA 2508	25	7.5	0.62	200	8x5 & 8x4 (discharge)	5	10 / 11
DLTA 1608	16	7.8	0.65	200	8x5	6	10 / 11
DLTA 1612	16	11.3	0.94	200	8x5	6	10 / 11
DLTA 1020	10	19.1	1.59	200	12x9	5	10 / 11
DLTA 0730	7	29.2	2.43	200	12x9	5	10 / 11
DLTA 0450	4	49.0	4.08	200	DN10SWJ***/16mmHT	3	10 / 11
DLTA 0280	2	75.0	6.25	200	DN10SWJ***/16mmHT	2	10 / 11

NOTE: delta® metering pumps for higher-viscosity media have a 10 - 20 % lower metering capacity and are not self-priming.  
Connection G 3/4 - DN 10 with tube nozzle d16 - DN 10.

\* suction lift with primed dosing head and suction line

\*\*\* Male PVC Solvent Weld fittings supplied as standard 15mm (nominal), as well as standard 16mm HT ex Germany.

### Materials in Contact with Chemicals

Version	Dosing head	Suction/discharge connector	Seals	Ball valves
NPB	Acrylic	PVC	FPM(viton®)	Ceramic
NPE	Acrylic	PVC	EPDM	Ceramic
PVT	PVDF	PVDF	PTFE	Ceramic
SST	Stainless steel Mat. No. 1.4404	Stainless steel Mat. No. 1.4404	PTFE	Ceramic

PTFE-coated dosing diaphragm

Dosing repeatability  $\pm 2\%$  when used in accordance with the operating instructions

Permissible ambient temperature  $-10^{\circ}\text{C}$  to  $+45^{\circ}\text{C}$

Average power consumption 78 W

Protection IP65, insulation class F

**Delivery package: metering pump with mains cord (2m) and plug, connection kit for hose/pipe connectors as per table.**

Relay	Description	Explanation of Relays Contacts
1	Alarm relay Normally Closed N/C	1 x changeover 240v - 8A
3	Alarm relay Normally Open N/O	1 x changeover 240v - 8A
4	Alarm relay Normally Closed N/C + pacing relay Normally Closed N/O	2 x make contact 24v 100mA
5	Alarm relay Normally Closed N/O + pacing relay Normally Closed N/O	2 x make contact 24v 100mA
6	Cut-off relay Normally Closed N/C	1 x changeover 240v - 8A
7	Cut-off relay Normally Closed N/O	1 x changeover 240v - 8A
8	Cut-off relay Normally Closed N/C + clock generator relay Normally Closed N/O	2 x make contact 24v 100mA
9	Cut-off relay Normally Closed N/O + pacing relay Normally Closed N/O	2 x make contact 24v 100mA
A	Cut-off relay Normally Closed N/C + warning relay Normally Closed N/C	2 x make contact 24v 100mA
B	Cut-off relay relay Normally Closed N/O + warning relay Normally Closed N/O	2 x make contact 24v 100mA
C	Current output 4-20mA + Alarm relay Normally Closed N/C	1 x make contact 24v 100mA
D	Current output 4-20mA + pacing indicator	1 x make contact 24v 100mA
F	Automatic degassing solenoid 240v	
G	Automatic degassing solenoid 240v + fault relay	2 x make contact 24v 100mA

# 1.3 ProMinent® Delta® Controlled Solenoid optodrive® Diaphragm Metering Pumps

## 1.3.3 ProMinent® Delta® Metering Pumps

### DLTA Delta series

<b>2508</b>	NPB/E 25 bar	7.5 l/h	SS 25 bar	7.5 l/h
<b>1608</b>	PVT 16 bar	7.8 l/h	SS 16 bar	7.8 l/h
<b>1612</b>	PVT 16 bar	11.3 l/h	SS 16 bar	11.3 l/h
<b>1020</b>	PVT 10 bar	19.1 l/h	SS 10 bar	19.1 l/h
<b>0730</b>	PVT 7 bar	29.2 l/h	SS 7 bar	29.2 l/h
<b>0450</b>	PVT 4 bar	49.0 l/h	SS 4 bar	49.0 l/h
<b>0280</b>	PVT 2 bar	75.0 l/h	SS 2 bar	75.0 l/h

<b>NP</b> <b>PV</b> <b>SS</b>	<b>Liquid End Materials</b>
	<b>Plexiglass/PVC</b> *** ONLY available for 2508, 1612, 1020 and 0730 ***
	<b>PVDF/PTFE</b> *** NOT available for 2508 ***
	<b>Stainless Steel</b>

<b>B/E</b> <b>T</b> <b>S</b>	<b>Seals / Diaphragm Material</b>
	<b>B = VITON® &amp; E = EPDM</b> only for NP Heads
	<b>T</b> PTFE / PTFE coated <b>S</b> PTFE / diaphragm additionally with FPM coating for silica-laden media

<b>0</b> <b>1</b> <b>2</b> <b>3</b> <b>4</b>	<b>Liquid End Version</b>
	<b>0</b> No bleed, no valve springs for NPB, NPE, and SST
	<b>1</b> No bleed, plus valve springs for SST
	<b>2</b> With bleed, no valve springs for NPB, NPE, and PVT
	<b>3</b> With bleed, plus valve springs for PVT
<b>4</b> HV version for high-viscosity media *** ONLY available for 1608, 1612, 1020 and 0730 ***	

<b>0</b> <b>F</b>	<b>Hydraulic Connection</b>
	<b>0</b> Standard according to technical data <b>F</b> Discharge side connector & PTFE tube 8x4, (standard for 2508NPB)

<b>0</b> <b>1</b>	<b>Diaphragm Rupture Indicator</b>
	<b>0</b> No diaphragm rupture protection <b>1</b> With diaphragm rupture protection

<b>0</b>	<b>Design</b> With ProMinent Logo
----------	--------------------------------------

<b>U</b>	<b>Electrical Connection</b> 100-240 V, 50-60 Hz
----------	---

<b>C</b>	<b>Cable &amp; Plug</b> Cable Length 2m with Australian 3-pin plug
----------	---

<b>0</b> <b>1</b> <b>3</b> <b>4</b> <b>5</b> <b>A</b> <b>C</b> <b>F</b> <b>G</b>	<b>Relays</b>
	<b>0</b> No relay
	<b>1</b> Fault indicating relay (N/C) (changeover relay)
	<b>3</b> Fault indicating relay (N/O) (changeover relay)
	<b>4</b> As 1 + pacing relay N/C
	<b>5</b> As 3 + pacing relay N/C
	<b>A</b> Shut-down and alarm relay N/C
	<b>C</b> as 1 + 4-20 mA output <b>F</b> Automatic degassing solenoid 240v - *** <b>G</b> Automatic degassing solenoid 24v DC + fault relay ***

<b>0</b> <b>1</b>	<b>Accessories</b>
	<b>0</b> No accessories <b>1</b> Foot valve & dosing valve - <b>NOT for 0450 &amp; 0280 or SS</b>

<b>0</b> <b>3</b> <b>4</b> <b>5</b> <b>C</b> <b>M</b> <b>R</b>	<b>Control Variants</b>
	<b>0</b> Manual + external contact + pulse control
	<b>3</b> Manual + external + pulse control + 0/4-20mA analogue
	<b>4</b> as 0 + 14-day Process Timer
	<b>5</b> as 3 + 14-day Process Timer
	<b>C</b> CANopen for Dulcomarin® II
	<b>M</b> with pH, ORP & chlorine control module <b>R</b> as 3 + PROFIBUS, M 12 - includes cable

<b>0</b> <b>1</b>	<b>Access Code</b>
	<b>0</b> No access code <b>1</b> With access code

<b>EN</b>	<b>Language</b> English
-----------	----------------------------

<b>0</b>	<b>Pause / Level</b> Pause / level break contact
----------	---

<b>P*</b>	<b>Prepack Option</b> See options
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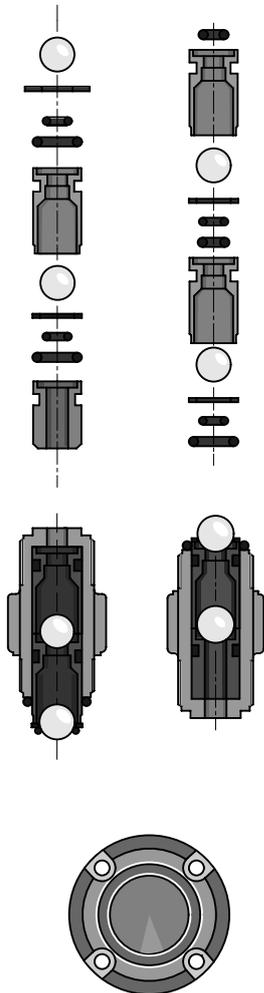
**Prepacks = P\***  
**P0** - includes 5m of delivery and 2m suction tube \*\*  
 a Profibus or CANbus cable, if specified.  
**P2** - as P0 but with 2m control Cable  
**P5** - as P2 but with 5m control Cable  
**PX** - as P2 but with 10m control Cable  
**Note:**  
 \*\* 1608 & 1612 pumps supplied with 5m PTFE Tube  
 \*\* 2508 special tube and connectors - see 'F'  
 \*\* Not for 0450 & 0280 requires 16mm tube

DLTA 1612 PV T 2 0 0 0 U C 0 1 0 0 EN 0 P0 \*\*\* NOT for 2508

# 1.3 ProMinent® Delta® Controlled Solenoid optodrive® Diaphragm Metering Pumps

1.3.3

ProMinent® Delta® Metering Pumps



Replacement spare parts kits for ProMinent® Delta®, consisting of:

- 1 dosing diaphragm
- 1 suction valve
- 1 delivery valve
- 2 valve balls
- 1 set seals
- 1 connector set

Note: Does not include valves for SS

<b>Type 2508</b>	NPB	1033171.
	NPE	1033172.
	SST	1030226.
<b>Type 1608</b>	NPB	1030611.
	NPE	1030620.
	PVT	1030225.
	SST	1030226.
<b>Type 1612</b>	PVT	1027081.
	SST	1027086.
<b>Type 1020</b>	PVT	1027082.
	SST	1027087.
<b>Type 0730</b>	PVT	1027083.
	SST	1027088.
<b>Type 0450</b>	PVT	1027084.
	SST	1027089.
<b>Type 0280</b>	PVT	1027085.
	SST	1027090.

pk\_1\_008

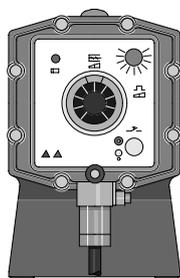
Replacement Diaphragms for Delta® series pumps

Type 2508	all materials	1030353.
Type 1608	all materials	1030353.
Type 1612	all materials	1000248.
Type 1020	all materials	1000249.
Type 0730	all materials	1000250.
Type 0450	all materials	1000251.
Type 0280	all materials	1025075.

# 1.4 ProMinent® EXtronic® - Metering Pumps

1.4.1

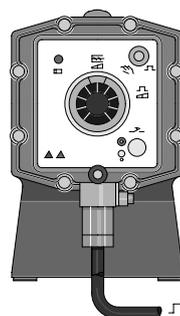
EXBb G version – gas explosion proof  
Property class II, property class 2G  
(Zone 1, group II)  
EXBb M version – firedamp  
Property class I, property class M2 (group I)



pk\_1\_020

### Control type "Internal"

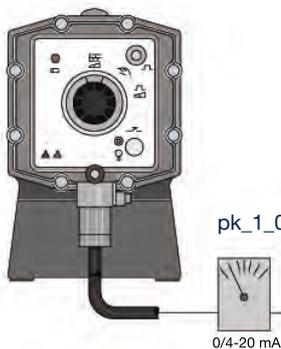
Stroke length adjustment 1:10, stroking rate adjustment 1:25, total adjustment range 1:250.



pk\_1\_019

### Control type: "External Contact"

Stroke length adjustment 1:10, stroking rate control 0-100 % dependant upon external switch contacts. \*)



pk\_1\_018

### Control type: "Analogue"

Stroke length adjustment 1:10, Stoke frequency control 0-100 % proportional to analogue signal 0/4-20 mA. \*)

The ProMinent EXtronic® series approved according to the new EG-EX-directive 94/9/EG (ATEX), for metering fluids in gas explosion endangered operations and firedamp endangered mining operations.

- Operating voltage 500 V. The application field for ProMinent EXtronic® equipment is thereby expanded, e.g. in conjunction with the new EXBb M version for firedamp endangered mining operations.
- The short stroke solenoid action is combined with the liquid ends from the ProMinent® gamma series. The SB material version is recommended for use with flammable media.
- The control inputs "external contact", "analogue" and "zero volts ON/OFF" are intrinsically safe for EXBb - registered in accordance with EN 50020 - available.
- The 2501 SSM/SBM type with diaphragm rupture signalling e.g. for use in gas odorization.

The capacity ranges from 0.19 l/h to 60 l/h at back pressures of max. 25 bar.

The ProMinent EXtronic® conforms to the unified EU standard EN 50014/50018 for "flameproof enclosure". It carries the highest enclosure class for this protection type. This standard is recognised in many other countries outside the EU.

The short stroke solenoid and the pump controller are housed inside the pump housing. Conforms to DIN 40050 standards on contact and moisture resistance, and carries IP 65 protection, even when front cover is open.

Key:

6 resistant to dust entry and complete resistance to contact

5 resistant to spray water from all directions

The liquid end with the proven DEVELOPAN® pump diaphragm with Teflon coating and the proven liquid ends in Acrylic, Polypropylene (PP), PTFE-Teflon®, stainless steel no. 1.4404 and SB for flammable chemicals, according to requirements, bring the highest levels of operating safety to ProMinent EXtronic® Metering Pumps.

Self bleeding liquid ends for gaseous chemicals are available in Acrylic (NS) and PVC (PS).

The micrometer stroke length adjustment knob ensures precise and high reproducibility. There is also a comprehensive range of explosion proof accessories and pump accessories available.

### EXBb G for use in gas endangered areas

#### Protection Grade EEx [i, a] d IIC T6

Key:

EEx - explosion proof equipment conforms to European Standards

[i, a] - control input intrinsically safe in case of occurrence of two unrelated faults

d - fire proofing; flameproof enclosure

IIC - explosion group II for all explosion endangered areas apart from mining, sub group IIC (includes IIA and IIB)

T6 - temperature class, permitted for gas and moisture with ignition temperature > 85 °C

### EXBb M for use in firedamp endangered mining operations

#### Protection grade EEX d I/II C T6

Key:

EEX - explosion proof equipment conforms to European Standards

d - fire proofing, flameproof enclosure

IC - explosion group I for firedamp endangered operations

IIC - explosion group II for all other hazardous locations, sub group IIC (includes IIA and IIB)

T6 - temperature class, permitted for gas and moisture with ignition temperature > 85 °C.

This is the highest temperature class, and includes T1 to T5

\*) The electrical cables for mains connection, contact or analogue control are already connected to the pump. Observe all instructions concerning connecting and activating electrical systems.

# 1.4 ProMinent® EXtronic® - Metering Pumps

## 1.4.2 Technical Data

Pump Type EXtronic®	Max. Pump Capacity at Maximum Back Pressure			Max. Pump Capacity at Medium Back Pressure			Stroking Rate strokes/ min.	Connector Sizes Outer Ø X Inner Ø mm	Suction Lift mWG	Shipping Weight** PP, NP, TT-SS approx. kg
	bar	l/h	ml/ stroke	bar	l/h	ml/ stroke				
<b>EXBb</b>										
1000	10	0.19	0.032	5	0.3	0.042	120	6 x 4	1.5	12 - 16
2501	25	1.0	0.15	20	1.1	0.17	120	6 x 4	6	18
1601	16	1.1	0.15	8	1.3	0.18	120	6 x 4	6	12 - 16
1201	12	1.7	0.23	6	2.0	0.28	120	6 x 4	6	12 - 16
0803	8	3.7	0.51	4	3.9	0.54	120	6 x 4	3	12 - 16
1002	10	2.3	0.31	5	2.7	0.38	120	8 x 5	6	12 - 16
0308	3	8.6	1.20	1.5	10.3	1.43	120	8 x 5	6	12 - 16
2502	25	2.0	0.28	20	2.2	0.31	120	8 x 5	6	13 - 17
1006	10	6.0	0.83	5	7.2	1.00	120	8 x 5	6	13 - 17
0613	6	13.1	1.82	3	14.9	2.07	120	8 x 5	5.5	13 - 17
0417	3.5	17.4	2.42	2	17.9	2.49	120	12 x 9	4.5	13 - 17
2505	25	4.2	0.64	20	4.8	0.73	110	8 x 5	6	16 - 20
1310	13	10.5	1.59	6	11.9	1.80	110	8 x 5	6	16 - 20
0814	8	14.0	2.12	4	15.4	2.33	110	12 x 9	6	16 - 20
0430	3.5	27.0	4.09	2	29.5	4.47	110	DN 10	5	16 - 20
0260	1.5	60.0	9.09	-	-	-	110	DN 15	1.5	16 - 20

### EXtronic® Metering Pumps for dosing highly viscous media

1002	10	2.3	0.31	5	2.7	0.38	120	DN 10	-	12
1006	10	6.0	0.83	5	7.2	1.00	120	DN 15	-	13
1310	10	10.5	1.59	5	11.9	1.80	110	DN 15	-	16
0814	8	14.0	2.12	4	15.4	2.33	110	DN 15	-	16

### EXtronic® Metering Pumps with self bleeding liquid end\*\*\*

1601	16	0.66	0.09	-	-	-	120	6 x 4	1.8	12
1201	12	1.0	0.14	-	-	-	120	6 x 4	2.0	12
0803	8	2.4	0.33	-	-	-	120	6 x 4	2.8	12
1002	10	1.8	0.25	-	-	-	120	6 x 4	2.0	12

\*\* shipping weight for EXBb M version... additional 14 kg

\*\*\* The data given here represent guaranteed minimum values, achieved with medium water at room temperature.

## Materials in Contact With Chemicals

	Liquid End	Suction/Discharge Connector	Seals	Valve Balls (Connector 6 - 12 mm)	Balls (DN 10 and DN 15 Connector)
PP1	Polypropylene	Polypropylene	EPDM	ceramic	Borosilicate glass
PP4*	Polypropylene	Polypropylene	EPDM	-	ceramic
NP1	Acrylic	PVC	FPM A (Viton® A)	ceramic	Borosilicate glass
NP3	Acrylic	PVC	FPM B (Viton® B)	ceramic	-
NS3**	Acrylic	PVC	FPM B (Viton® B)	ceramic	-
PS3**	PVC	PVC	FPM B (Viton® B)	ceramic	-
TT1	PTFE with carbon	PTFE with carbon	PTFE	ceramic	ceramic
SS..	stainless steel no. 1.4404	stainless steel no. 1.4404	PTFE	ceramic	stainless steel no. 1.4404

\* PP4 with Hastelloy C valve springs.

\*\* NS3 and PS3 with Hastelloy C valve springs, PVDF valve core.

Viton® is a registered trademark of DuPont Dow Elastomers.

# 1.4 ProMinent® EXtronic® Metering Pumps Identity Code Ordering System

## 1.4.1 Identity Code Ordering System for ProMinent EXtronic® Metering Pumps

EXBb

<b>ProMinent EXtronic®, Version b</b>	
<b>Protection:</b>	
G	Gas-EX-proof
M	Fire and explosion protection (firedamp) - <i>permitted liquid end material = stainless steel and PTFE</i>
<b>Pump type:</b> (figures 1 + 2 = back pressure [bar], figures 3 + 4 = pump capacity [l/h])	
1000	Capacity: 10 bar; 0.19 l/h
2501	25 bar; 1.0 l/hr (available in SSM and SBM only)
1601	16 bar; 1.1 l/h
1201	12 bar; 1.7 l/h
0803	8 bar; 3.7 l/h
1002	10 bar; 2.3 l/h
0308	3 bar; 8.6 l/h
2502	25 bar; 2.0 l/h (available in SS and SB only)
1006	10 bar; 6.0 l/h
0613	6 bar; 13.1 l/h
0417	4 bar; 17.4 l/h
2505	25 bar; 4.2 l/h (available in SS and SB only)
1310	13 bar; 10.5 l/h (available in NP, PP4, SS and SB only)
0814	8 bar; 14.0 l/h
0430	4 bar; 27.0 l/h
0260	2 bar; 60.0 l/h
<b>Liquid end material:</b>	
PP1	Polypropylene with EPDM O-ring
PP4	HV Polypropylene for high viscosity liquids with EPDM O-ring and Hastelloy C valve springs (Types 1002, 1006, 1301 and 0814 only)
NP1	Acrylic with FPM A (Viton® A) O-ring
NP3	Acrylic with FPM B (Viton® B) O-ring
NS3	Acrylic with FPM B (Viton® B) O-ring, self bleeding (Types 1601, 1201, 0803 and 1002 only)
PS3	PVC with FPM B O-ring, self bleeding (Types 1601, 1201, 0803 and 1002 only)
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 <i>Type 2501 only</i>
SBM	as SB1, with diaphragm rupture indicator <i>Type 2501 only</i>
<b>Valve springs:</b>	
0	No springs
1	With 2 valve springs, 1.4571, 0.1 bar
<b>Electrical connectors:</b>	
A	230 V, 50/60 Hz
B	115 V, 50/60 Hz
E	500 V, 50/60 Hz
<b>Note: Cable length 5 metre open end</b>	
<b>Controller type:</b>	
0	Stroking 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]
* intrinsically safe only with G = EX-protection	
<b>Control variations:</b>	
0	With potentiometer (control type 0 only)
1	With manual auxiliary key for maximum stroking rate (control type 1-6 only) <b>preferred type</b> ; spring return
2	With manual auxiliary key for maximum stroking rate (control type 1-6 only) latching
<b>Approved/Language:</b>	
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

Extronic® pumps with liquid ends for highly viscous media PP4 have 10-20 % less metering capacity and are not self-priming. G 3/4-DN connector with d16-DN10 nozzle union.

Viton® is a registered trademark of DuPont Dow Elastomers  
FPM = Fluorine Rubber

**For any Pricing: refer Sydney office**

*NOTE: May require certificate of conformity for some Australian applications at extra cost.*

EXBb G 1000 PP1 0 A 0 0 0

# ProMinent® EXtronic® - Metering Pumps

## Connectors

PP, NP, PS and TT	6, 8 and 12 mm	hose sleeve with clamping ring fitting
SS1/SSM stainless steel	6, 8 and 12 mm	Swagelok screw fitting system
SS2 stainless steel	6, 8 and 12 mm	internal thread 1/4" NPT
SB1/SBM stainless steel	6, 8 and 12 mm	internal thread ISO 7 Rp 1/4
PP and NP	DN 10 and DN 15	hose sleeve d 16 - DN 10 and d 20 - DN 15
TT	DN 10 and DN 15	fusion joint d 16 - DN 10 and d 20 - DN 15 (PVDF)
SS1 stainless steel	DN 10 and DN 15	insert, internal thread R 3/8 and R 1/2
SB1 stainless steel	DN 10 and DN 15	internal thread ISO 7 Rp 1/4 and 1/2

Reproducible metering accuracy  $\pm 2$  % when correctly installed, refer to operating instructions manual.

$\pm 5$  % for type 1601 with self bleeding liquid end.

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

**Power supply:** 500 V  $\pm 6$  %, 50/60 Hz  
230 V  $\pm 10$  %, 50/60 Hz  
115 V  $\pm 10$  %, 50/60 Hz

**Protection:** IP 65, insulation class F

**Medium power consumption at max. stroking rate (W)/peak power consumption at dosing stroke (A) at 230 V, 50/60 Hz:**

EXBb	Type 1000, 1601, 1201, 0803, 1002, 0308	13 W/0.7 A	at 120 strokes/min
EXBb	Type 2502, 1006, 0613, 0417	26 W/1.7 A	at 120 strokes/min
EXBb	Type 2505, 1310, 1014, 0430, 0260	45 W/2.0 A	at 110 strokes/min

**Included in delivery:**

**Metering Pump with 5 m mains cable, connector set for hose/pipe connections as described in tables.**

### 1.4.3

### Spare Parts Kits

#### PTFE pump diaphragms

ProMinent® DEVELOPAN® pump diaphragms in EPDM with woven inner layer, integrally vulcanised steel core and PTFE Teflon coating on the side in contact with the dosing chemical.



pk\_1\_008A

Description For Pump Type	Part No	Price
31.0 x 6.0 1000	811452.	
35.0 x 11.5 2501	1000246.	
48.0 x 9.5 1601	811453.	
48.0 x 12.5 1201	811454.	
48.0 x 18.5 0803	811455.	
60.0 x 17.0 1002, 2502	811456.	
60.0 x 28.0 0308, 2505, 1006	811457.	
76.0 x 37.0 1310, 0613	811458.	
76.0 x 45.0 0814, 0417	811459.	
127.5 x 63.0 0430, 0230	811460.	
127.5 x 91.0 0260	811461.	

# ProMinent® EXtronic® - Accessories

## 1.4.4

## Accessories - Valves

### Description/version

### Part no. Price

#### Foot valve, 1.4404 stainless steel

With filter and ball check valve, for use with flammable media.

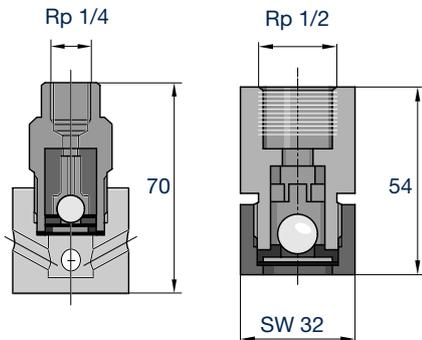
Materials: 1.4404/1.4401/PTFE/ceramic

Connection, 1/4" SB type for EXtronic

809301.

Connection, 1/2" SB type for EXtronic

924561.



pk\_1\_031

pk\_1\_031

#### Dosing valve "SB" 1.4404 Stainless Steel

Spring-loaded ball check valve, installation as desired, suitable for use with flammable media.

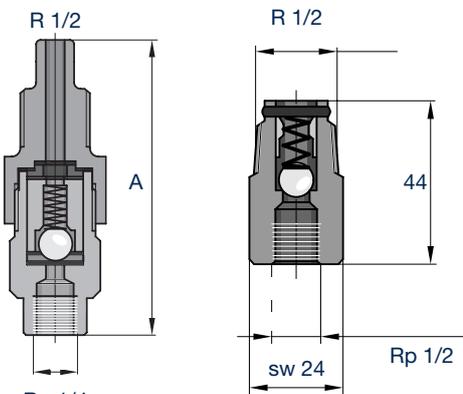
Materials: 1.4404/1.4401/Hastelloy C/PTFE coated/ceramic

Connection, 1/4" - 1/2" k, response pressure approx. 0.5 bar

809302.

Connection, 1/2" - 1/2" k, response pressure approx. 0.5 bar

924560.



pk\_1\_032\_2

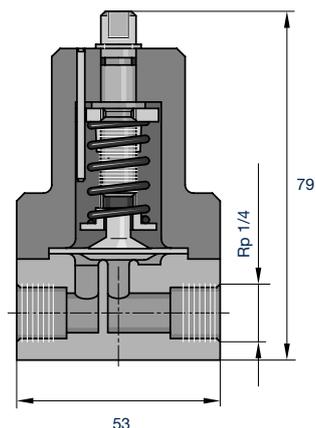
pk\_1\_027

#### Adjustable "SB" back pressure valve 1.4404 stainless steel

Material 1.4404; diaphragm PTFE coated, 1/4" connection at both ends. Adjusting range approximately 1 to 10 bar, enclosed type suitable for use with flammable media.

For generation of a back pressure for precise metering into an open outlet, where the back pressure is fluctuating below 1 bar where there is an inlet pressure on the suction side. Can also be used as a pressure relief valve.

924555.

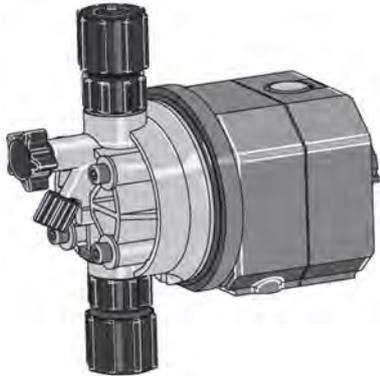


pk\_1\_029

Further accessories such as foot valves, discharge valves and back pressure valves in the standard materials are identical to gamma accessories or for DN 15 connection, refer to section 3

# 1.5 ProMinent® Pneumados Metering Pumps

## 1.5.1 ProMinent® Pneumados Metering Pumps



Pneumados\_001

ProMinent® Pneumados is a pneumatically-operated metering pump. In contrast to solenoid-driven metering pumps, the metering stroke of this pump is effected by a pneumatically actuated diaphragm, the suction stroke by spring force. The delivery capacity can be varied via the stroke frequency and the stroke length setting.

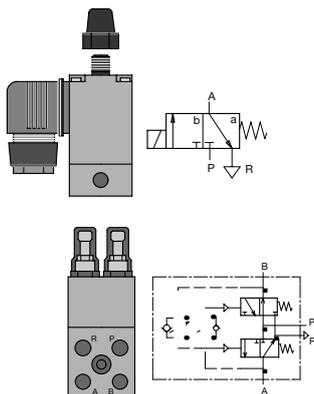
The external electrically-pneumatically or pneumatically activated compressed air valves facilitate a setting of up to 180 metering strokes per minute.

The stroke length and thus the stroke volume can be set between 10 and 100%.

Typical areas of application are:

- Feeding stuff treatment -  
Metering and spraying of feeding stuff with flavouring agents.
- Painting plants -  
Metering of coagulants.
- Greenhouses -  
For metering of fertilisers and minerals compounds.
- Car wash -  
Metering of cleaning agents, shampoo, brighteners, wax, drying agents as well as for the treatment of recycling water via metering of flocculants, pH adjusters, defoaming agents, and emulsion breakers.
- in all plants with central control (e.g. PLC) and compressed air supply.

## Pneumatic Ancillary Equipment



pk\_1\_033

	Part No.	Price
G 1/4 - 6 mm compressed air threaded connector in anodised aluminium with rotating seals; rapid quick release connector LCK 1/40 (fig. 1).	354641.	
G 1/8 A - 6 mm threaded connector for regulator valves with seal; threaded connector CK 1/80	354635.	
G 1/8 blanking plug with seal for regulator valves; G 1/80 plug thread	467921.	
3/2 way pneumatic solenoid valve G 1/8 220 V 50 Hz 21 VA; solenoid valve 311 C 1/80 (fig. 3)	303054.	
Sound absorber in sintered bronze with M 1/8 internal thread for solenoid valve (fig 4)	303812.	
Electric pulse generator for assembly into protective housing on DN 50022 hat rail, adjustable stroking rate 30 - 120 strokes/min. Electrical connection 230 V 50 - 60 Hz 3.5 VA. Switch power max. 3A.	700984.	
Adjustable flash relay (fig. 2)	303836.	<b>STANDARD</b>

All directives and regulations concerning use in hazardous location must be retained by the user.

# 1.5.2 ProMinent® Pneumados Metering Pumps

## 1.5.2 Technical Data

Pump type	Delivery output at maximum Pressure			Connection size OD Ø x id Ø mm	Suction height <sup>3)</sup> mWC	corresp. suction pressure <sup>2)</sup> mbar	Suction height <sup>1)</sup> mWC	corresp. suction pressure <sup>2)</sup> mbar	Admissible pre-pressure on suction side bar
	bar	l/h	ml/stroke						
PNDb									
1000	10	0.76	0.7	6x4	6	600	2.0	200	8
1601	16	1.00	0.09	6x4	6	600	2.8	280	8
1602	16	1.70	0.16	6x4	6	600	3.0	300	5.5
1005	10	3.80	0.35	8x5	5	500	3.0	300	3
0708	7	6.30	0.58	8x5	4	400	2.0	200	2
0413	4	10.50	0.97	8x5	3	300	2.5	250	1.5
0220	2	16.70	1.55	12x9	2	200	2.0	200	1

1) Suction height / suction pressure (dry) determined with clean as well as moistened valves, is tested with empty liquid end.

2) Value corresponds to the obtainable vacuum compared to atmospheric pressure.

3) Suction height / suction pressure tested with filled liquid end and filled suction line, provided sufficiently dimensioned suction line cross-sections are given.

The delivery outputs were determined with an air hose length of 1m, using the Festo solenoid valve MHE3-M1H-3/2G-QS-6K, as well as at max. stroke frequency (180 strokes/min.) and 100% stroke length, with pump at operating state temperature, test medium water.

Compressed air	6 bar ± 10 %, filter size 40µm
Air consumption for 1m line	47 l/min
Stroking frequency	180 strokes per min.

## Connectors

PVT	6, 8 and 12 mm	hose sleeve with clamp ring fitting
SS1 stainless steel	6, 8 and 12 mm	swagelok screw fitting system

## Materials in Contact with Chemicals

Liquid End Connector	Suction/Discharge (Connector 6 - 12 mm)	Seals	Balls
PVDF	PVDF	PTFE	Ceramic
stainless steel no. 1.4571	stainless steel no. 1.4571	PTFE	ceramic

# 1.5.3 ProMinent® Pneumados Metering Pumps

## 1.5.3 Identity Code Ordering System for Pneumados

PND b Pneumados Version b

Pump Type:	Capacity (simplex)	PVT SIMPLEX	SS SIMPLEX	PVT DUPLEX	SS DUPLEX
1000	10 bar 0.76 l/h				
1601	16 bar 1.00 l/h				
1602	16 bar 1.70 l/h				
1005	10 bar 3.80 l/h				
0708	7 bar 6.30 l/h				
0413	4 bar 10.5 l/h				
0220	2 bar 16.7 l/h				

PVT	<b>Liquid end material:</b> PVDF and PTFE seal
SST	Stainless steel (1.4571) and PTFE seal

0	<b>Valve Springs:</b> No vent, no valve springs
1	No vent, with valve springs
2	With vent, no valve springs
3	With vent, with valve springs

0	<b>Hydraulic connections:</b> Standard according to technical data
---	---

0	<b>Version:</b> Pump only
1	Pump assembly complete with bracket and controller
2	Duplex Pump assembly with bracket (uses existing controller)

0	<b>Power connector:</b> G 1/4 connector for compressed air 6 bar
---	---

0	<b>Controller type:</b> Standard 4025 VLG - 1/8" AIR Controller
---	--

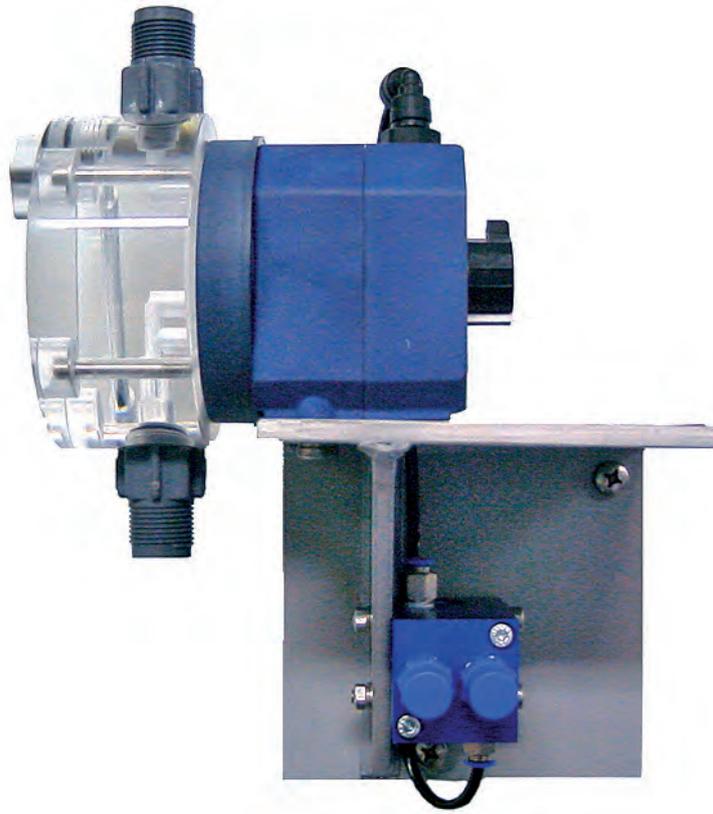
01	<b>Approvals</b> CE
----	------------------------

**Note:**  
All pumps are supplied mounted on a bracket with controller  
Dosing valve, Foot valve and suction and delivery hose and tube are extra.

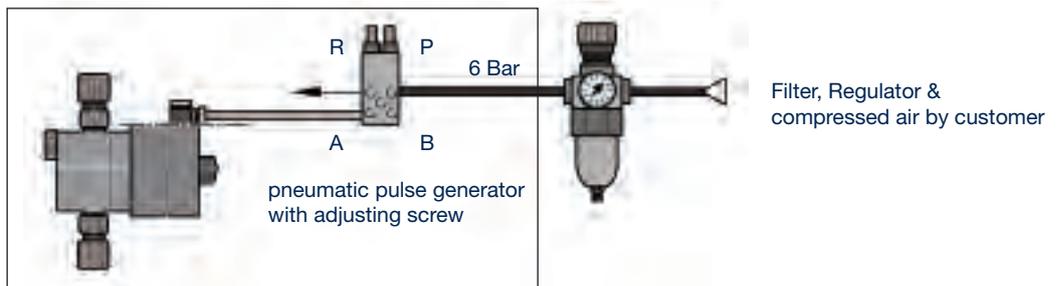
PND b 1601 PVT 0 0 0 0 0 0 01

# 1.5.4 ProMinent® Pneumados Metering Pumps

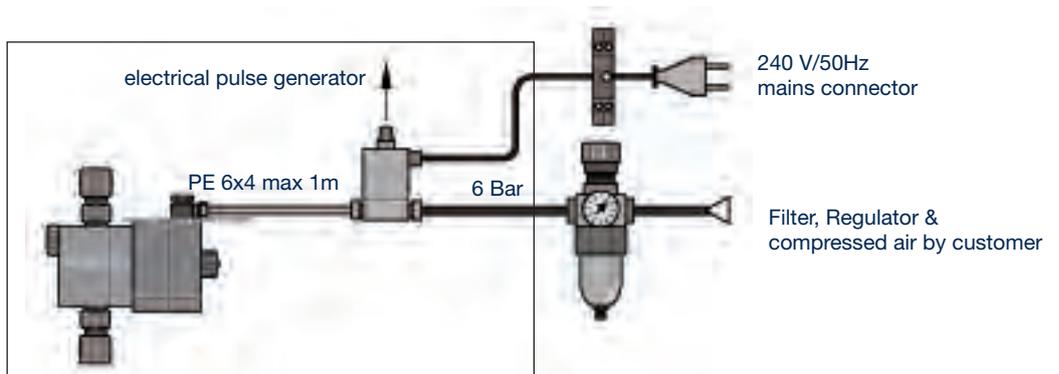
## 1.5.4 Electric and Pneumatic Schematic Diagrams



**STANDARD**  
Pneumatic Controller  
Schematic diagram



**OPTIONAL**  
Electrical/Pneumatic Controller  
Schematic diagram



# 1.6 ProMinent® DULCO®flex Pumps

## 1.6.1

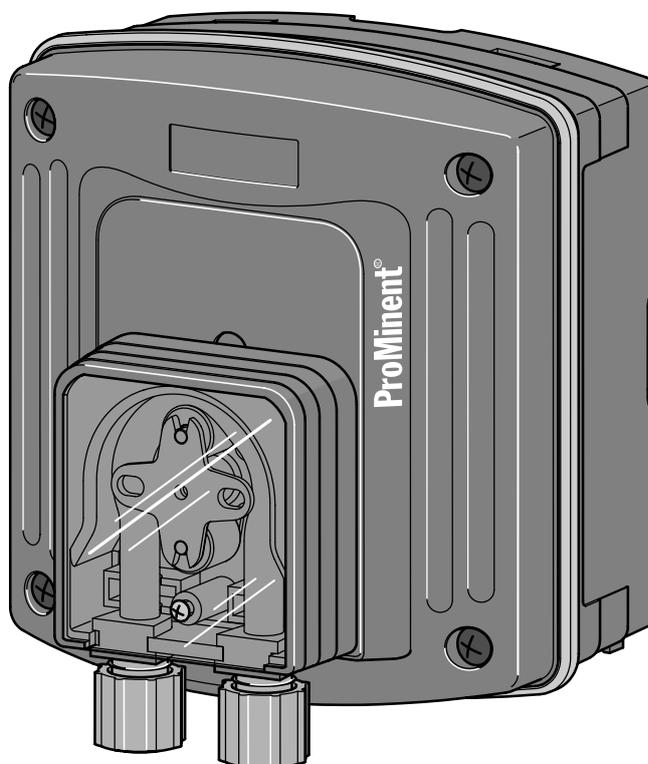
### ProMinent® DULCO®flex Pumps

- Performance range 0.4-2.4 l/h at max. 1.5 bar back pressure
- Hose material: Tygon®, PharMed® or Autoprene®
- Suitable for continuous operation
- Control and/or quantity control via mains ON/OFF
- Practically silent operation
- Self-priming against max. 1.5 bar
- Gentle metering
- Optional in built pulse duration (10:1 manual adjustment)
- Timer Pump refer Page 1.11

The ProMinent® DULCO®flex is a peristaltic pump. The metering chemical is displaced in the direction of flow as a rotor squeezes the hose. No valves are required which ensures that the chemical is treated extremely gently.

Typical applications are processes in which only a limited feed pressure is required such as the metering of conditioning agents in private pools, belt lubricants in bottling machines or the metering of cleaning agents in rinsing machines.

The robust, chemical-resistant PPE housing is protected on all sides from spray (IP 65), which guarantees its universal application capability. OEM versions are available on request.



# 1.6.2 ProMinent® DULCO®flex Pumps

## 1.6.2 Identcode

DF2a

DULCO®flex System, Version a

<b>Type</b>	<b>Capacity:</b>
0204	1.5 bar: 0.4 l/h Tygon® supplied as standard
0208	1.5 bar: 0.8 l/h Tygon® supplied as standard
0216	1.5 bar: 1.6 l/h Tygon® supplied as standard
0224	1.5 bar: 2.4 l/h ParMed® supplied as standard
<b>P</b>	<b>Hose material:</b>
<b>T</b>	ParMed® Tygon®
<b>0</b>	<b>Version:</b>
<b>1</b>	With ProMinent® label No ProMinent® label
<b>0</b>	<b>Hydraulic connection:</b>
<b>9</b>	Connector for hose 6/4 mm priming and discharge side <b>Std</b> Connector for hose 10/4 mm discharge side only
<b>A</b>	<b>Electrical connection:</b>
<b>B</b>	230 V ±10 %, 50/60 Hz <b>Std</b> 115 V ±10 %, 50/60 Hz
<b>0</b>	<b>Lead and plug:</b>
<b>1</b>	No mains lead With 2 m mains lead, open ended <b>Std</b>
<b>0</b>	<b>Drive:</b>
	Mains ON/OFF
<b>W</b>	<b>Assembly type:</b>
	Wall mounted
<b>0</b>	<b>Accessories:</b>
<b>1</b>	No accessories With weight held in place tube nozzle & clamp ring <b>Std</b> 1/4" Dosing Valve, 2 m suction and 5 m discharge tubing
<b>0</b>	<b>Control Type</b>
<b>T</b>	No Control Mounted on Board with 240 volt 7-day Timer

Tygon® and PharMed® are registered trademarks.

DF2a 204 T 0 0 A 0 0 W 0 T

### Technical Data

Pump type DULCO®flex	Feed rate		Frequency rpm	Connector size ext. dia. x int. dia	Suction Lift mWG	Priming Lift mWG
	bar	l/h				
0204	1.5	0.4	5	6x4	4	3
0208	1.5	0.8	10	6x4	4	3
0212	1.5	1.6	20	6x4	4	3
0224	1.5	2.4	30	6x4	4	3

Admissible ambient temperature: 10-45 °C  
 Power consumption approx.: 5 W  
 Switching duration: 100 %  
 Enclosure rating: IP 65

Spare Hose Set PharMed® 1009480.  
 Spare Hose Set Tygon® 1009481.

## 1.6.3 ProMinent® DULCO® flex Pumps

### 1.6.3

### ProMinent® DULCO® flex DF4a Pumps

- Capacity range 0.4 - 12 l/h at max. 4-12 bar
- Hose material Pharmed® and Tygon®
- Powerful stepper motor, controlled speed
- Infinite adjustment of metering rate, manually or externally via contacts or 0/4-20mA analogue signal
- Intake function (high speed)
- Sprung rollers for constant rolling pressure and extended service life of hose
- Metering rate displayed in l/h
- Direction of rotation reversible e.g for backflush
- Enclosure type of protection IP65 in accordance with DIN EN 60529

The DULCO®flex DF4a was specifically developed for metering chemicals in swimming pool applications.

It is available in three versions with the system control menu as well as the inputs and outputs adapted to the respective application:

- 1 "Metering of activated carbon" with reversible direction of rotation for backflushing the hose over the entire output range.
- 2 "Metering of flocculants" with a continuous metering rate as from 5 ml/h. Up to two auxiliary inputs can be configured to realise an increase in the metering rate in line with sudden increased load and a reduction in the metering rate for night-time operation.
- 3 "Standard pump" as a volume-controlled metering pump for general applications. The metered quantity can be set either in l/h in the display or via external control signals. The pump can process contact signals as well as analogue signals, e.g. 0/4 - 20 mA or 0 - 10 V

Thanks to its universal operability and the three output stages, the pump can be used for a wide range of metering tasks. Pharmed® and Tygon® are used as the hose materials.



Dulcoflex DF4a

# 1.6.4 ProMinent® DULCO® flex Pumps

## 1.6.4 Identcode

### DF4a Application

- 0 Standard Pump
- A Activated carbon metering
- F Flocculant metering

### Installation

W

Wall mounting

### Version

- 0 with ProMinent® logo
- 1 without ProMinent® logo

Type	bar	l/h
04004	4.0	0.4
04015	4.0	1.5
03060	2.5	6.0
02120	2.0	12.0

### Hose material

- P PharMed® *Note: PharMed® Not suitable for some liquid polymers*
- T Tygon® *Note: Tygon® Not available for 04004*

### Hydraulic connectors

- 0 Standard
- 9 Special connection 10x4 pressure side

### Power supply

U 100-240 V, 50/60 Hz

### Cable and plug

- 0 Without cable
- C With Australian Plug

### Accessories

- 0 Without accessories
- 1 Injection valve, suction weight, suction & discharge tube

### Main material

- 0 None

### Language

- 00 Language neutral

### Relay

- 1 Fault indicating relay NC
- 3 Fault indicating relay NO

### Control Variants

- 0 Manual + external contact
- 2 Manual + external contact + 0/4-20 mA
- 8 Manual + external contact + 0/4-20 mA / 0-10 V

### Additional Inputs

- 1 Pause + 2 stage level + AUX 1
- 2 Pause + 2 stage level + AUX 1 + AUX 2

### Pause/level

- 0 Pause break contact + level break contact

### Approvals

- 01 CE-Symbol

DF4aF W 0 04015 P 0 U C 1 0 00 3 2 2 0 01 Tygon® and PharMed® registered trademarks.

### SPARE PARTS

Part No	Description	Size	Material
1034997	tube cpl.	0.8 x 4.0	PharMed®
1030722	tube cpl.	1.6 x 4.8	PharMed®
1030775	tube cpl.	1,6 x 4.8	Tygon®
1030723	tube cpl.	3,2 x 6.4	PharMed®
1030776	tube cpl.	3.2 x 6.4	Tygon®
1030774	tube cpl.	4.8 x 8.0	PharMed®
1030777	tube cpl.	4.8 x 8.0	Tygon®
1030778	Rotor cpl. size 1	DF4a04004	black
1031750	Rotor cpl. size 2	DF4a04015	grey
1031153	Rotor cpl. size 3	DF4a03060	blue
1031164	Rotor cpl. size 4	DF4a02120	orange

The colour for the rotors denotes spring tension and relates to the expected life of the Tygon tubes

Black = PharMed® 1.6x4.8	Grey = Tygon® 1.6 x 4.8
Grey = PharMed® 3.2x6.4	Blue = Tygon® 3.2 x 6.4
Grey = PharMed® 4.8x8.0	Orange = Tygon® 4.8 x 8.0

# 2.0 ProMinent® Motor Driven Metering Pumps

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## 2.0 ProMinent® High Viscosity Pumps

### 2.0.1 ProMinent® Sigma/ 1 Diaphragm Metering Pumps

For small capacity High Viscosity pumps see

**Beta, GALA and Delta**

or

refer Sydney

also available in **EXtronic Pumps**

For higher capacity High Viscosity pumps see  
**Hydro2, Hydro3, Sigma/ 1, Sigma/ 2, Sigma/ 3,**

**and Makro TZ or Makro/ 5**

or

**Spectra® progressive cavity pumps**

or

**Orlita pumps**

# 2.1 ProMinent® Sigma/ 1 Diaphragm Metering Pumps

## 2.1.1

## ProMinent® Sigma/ 1 Diaphragm Metering Pumps



pk\_2\_115

### Sigma/ 1 Diaphragm Metering Pumps

The Sigma/1 motor diaphragm metering pumps are produced with a high-strength inner housing for parts subject to load as well as an additional plastic housing to protect against corrosion. The capacity range extends from 17 - 144 l/h at a max. back pressure of 12 to 4 bar. Stroke length 4mm.

Under defined conditions and when installed correctly, the reproducibility of the metering is better than  $\pm 2\%$  at a stroke length of between 30 % and 100 % (instructions in the operating instructions manual must be followed).

In all motor-driven metering pumps without integrated overload protection, for safety reasons, suitable overload protection must be provided during installation.

### Sigma/ 1 control type (S1Cb)

#### Detachable operating unit (HMI)

The optional control via contact or analog signals (e.g. 0/4 - 20 mA) for the Sigma control type results in good adaptability, even to fluctuating metering requirements.

The microprocessor control is an optimum combination of speed control and stop & go operation, i.e. it works in a wide control field with customised fine adjustment. Moreover it enables an optimum metering result thanks to the metering behaviour of the metering pump being matched to the chemicals or application.

The task of the control is to measure the movement and speed profile in conjunction with the power demand. This leads to a real reduction in the actually required power, which means an increase in efficiency.

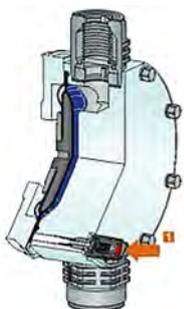
Moreover, the analysis of the power demand makes possible an internal overload switching off of the metering pump, i.e. an integral pressure relief function for pump protection without an additional hydraulic assembly such as relief valves and manometer.

### Sigma/ 1 basic type (S1Ba)

The ProMinent® Sigma Basic type is a motor driven Metering Pump with no internal electronic control system. The ProMinent® S1Ba has a number of different drive options, including single and 3 ph. motor (standard IP55), or the three phase AC motor for use in hazardous Exe and EXde areas.

Different flanges are always available so that customers can use their own motor to drive the pump.

## Diaphragm Rupture Warning System



### Diaphragm rupture warning system.

The liquid end has a patented multilayer safety diaphragm as standard and a visual diaphragm rupture indicator. The diaphragm is coated on both sides with PTFE film. This coating ensures that no leakage to the outside occurs even if the diaphragm ruptures. If the diaphragm ruptures, feed chemical enters between the diaphragm layers and thus triggers a mechanical indication or an alarm via the sensor area.

This concept ensures reliable metering - even under critical operating conditions.

# 2.1 ProMinent® Sigma/ 1 Diaphragm Metering Pumps

## 2.1.2 Technical Data for Sigma Pumps

Pump type <b>S1Ba</b>	at 50 Hz				at 60 Hz				Adm. Priming Pressure Suction Side bar DN	Connector Suction/ Discharge Side <b>Optional BSPM / Hosetail</b>	Shipping Weight kg	
	bar	l/h	ml/ stroke	strokes/ min.	bar <b>S1Cb</b>	l/h	Stroking rate at max. back-pressure strokes/ min.	Suction Lift mWG				
12017 PVT	10	17	3.9	73	10	20	87	7	1	10	1/2" / 16mm	9
12017 SST	12	17	3.9	73	12	20	87	7	1	10	1/2" / 16mm	12
12035 PVT	10	35	4.0	143	10	42	172	7	1	10	1/2" / 16mm	9
12035 SST	12	35	4.0	143	12	42	172	7	1	10	1/2" / 16mm	12
10050 PVT	10	50	4.0	205	10	49	200	7	1	10	1/2" / 16mm	9
10050 SST	10	50	4.0	205	10	49	200	7	1	10	1/2" / 16mm	12
10022 PVT	10	22	5.1	73	10	26	87	6	1	10	1/2" / 16mm	9
10022 SST	10	22	5.1	73	10	26	87	6	1	10	1/2" / 16mm	12
10044 PVT	10	44	5.1	143	10	53	172	6	1	10	1/2" / 16mm	9
10044 SST	10	44	5.1	143	10	53	172	6	1	10	1/2" / 16mm	12
07065 PVT	7	65	5.1	205	7	63	200	6	1	10	1/2" / 16mm	9
07065 SST	7	65	5.1	205	7	63	200	6	1	10	1/2" / 16mm	12
07042 PVT	7	42	9.7	73	7	50	87	3	1	15	3/4" / 20mm	9.5
07042 SST	7	42	9.7	73	7	50	87	3	1	15	3/4" / 20mm	13.5
04084 PVT	4	84	9.7	143	4	101	172	3	1	15	3/4" / 20mm	9.5
04084 SST	4	84	9.7	143	4	101	172	3	1	15	3/4" / 20mm	13.5
04120 PVT	4	120	9.7	205	4	117	200	3	1	15	3/4" / 20mm	9.5
04120 SST	4	120	9.7	205	4	117	200	3	1	15	3/4" / 20mm	13.5

Note: All pumps that are fitted with integral PRV must have the outlet piped to an appropriate place.

### Materials in Contact with Chemicals

Liquid End	Suction/Discharge connector	Valve	Seals	Balls	Integrated Pressure Bleed Valve
PVT	PVDF (Polyvinylidene fluoride)	PVDF (Polyvinylidene fluoride)	PTFE	ceramic	PVDF/Viton® or EPDM
SST	stainless steel no. 1.4571/1.4404	stainless steel no. 1.4581	PTFE	stainless steel no. 1.4404	stainless steel/Viton®

Viton® is a registered trademark of DuPont Dow Elastomers.

### Sigma Basic Type Control Functions (S1Ba)

#### Stroke length actuator/controller

Actuator for automatic stroke length adjustment, actuating period approx. 1 sec for 1% stroke length, 1k Ohm response signal potentiometer, enclosure rating IP 54.

Controller consists of actuator with servomotor and integrated servo control for stroke length adjustment via a standard signal. Standard signal input 0/4-20 mA, corresponds to stroke length 0 - 100 %. Automatic/manual operation selection key for manual stroke adjustment. Mechanical status display of actual stroke length value output 0/4-20 mA for remote display.

#### Variable speed motors with integrated speed controller (identcode characteristic V)

Power supply 1 ph 230 V, 50/60 Hz, 0.18 kW  
External control with 0/4-20 mA

#### Speed Controllers

Speed controllers in metal housing (identcode characteristic Z)

The speed controller assembly consists of a speed controller and a 0.09 kW variable speed



S1Ba with Stroke length controller

# 2.1 ProMinent® Sigma/ 1 Diaphragm Metering Pumps

## 2.1.3 Identity Code Ordering System for Basic Type Sigma (S1Ba)

**S1BaH**

**Sigma Basic Type (S1Ba)**

<b>Pump type:</b> (Figures 1 + 2 = back pressure [bar], figures 3 - 5 = feed rate [l/h]):		
12017*	12 bar; 17 l/h	PVDF
12035*	12 bar; 35 l/h	SS
10050	10 bar; 50 l/h	
10022	10 bar; 22 l/h	PVDF
10044	10 bar; 44 l/h	SS
07065	7 bar; 65 l/h	
07042	7 bar; 42 l/h	PVDF
04084	4 bar; 84 l/h	SS
04120	4 bar; 120 l/h	* for PVDF max. 10 bar

<b>Liquid end material with PTFE Seal:</b>	
PVT	PVDF (max 10 bar)
SST	Stainless steel - select this option if using Hygenic Head option

<b>Diaphragm:</b>	
S	Multi-layer safety diaphragm with optical rupture display
A	Multi-layer safety diaphragm with electrical rupture signal
H	Diaphragm for Hygenic Head

<b>Liquid end version:</b>		PVDF	SS
0	No springs		
1	With 2 valve springs, Hastelloy C 4; 0.1 bar		
4	With bleed valve, Viton® seal, no valve spring		
5	With bleed valve, Viton® seal and valve spring		
H	Hygenic Head with Tri-Clamp connection (maximum 10 bar), contact Sydney		

<b>Hydraulic connector:</b>	
1	Union nut and PVC Solvent Weld
3	Union nut and PVDF Male BSP
4	Union nut and stainless steel insert <i>inc. w/SS pump</i>
7	Union nut and PVDF Hosetail

<b>Version</b>	
0	With ProMinent® logo (standard)
1	Without ProMinent® logo

<b>Power supply:</b>	
S	3 ph, 400 V; 50 Hz; 0.09 kW
M	1 ph. AC, 230 V; 50 Hz; 0.12 kW
N	1 ph, AC 115 V; 60 Hz
L	3 ph, 400 V, 50Hz, (EExe, EExde) see below
P	3 ph, 400 V, 60Hz, (EExe, EExde) see below
R	3ph, variable speed motor 4 pol. 230/400 V 0.09kW
V (0)	var. speed motor with integral speed control 230/1/50
2	No Motor, with C 42 flange (NEMA)
3	No Motor, with flange size 56; B5 (DIN)

<b>Enclosure rating:</b>	
0	IP 55 (standard) 0
1	Exe motor version (ATEX-T3)
2	Exd motor version (ATEX-T4)

<b>Stroke sensor:</b>	
0	No stroke sensor (standard)
2	Pacing relay (reed relay)
3	Stroke Sensor (Namur for EX area)

<b>Stroke length adjustment:</b>	
0	Manual
1	Stroke positioning motor, 230V/50/Hz
4	Stroke control motor, 4-20 mA 230 V/50Hz

<b>P*</b>	<b>Prepack Option</b>	-
	See Options	

**Note:** PRV/Bleed valve available on request.  
The preferred option is relief valve in-line.

**Prepack option P\* for PVDF**  
**P0 - 12017 - 12035 - 10050 - 10022 - 10044 - 07065**  
 15mm PVC solvent weld male and 4 EPDM flat gaskets  
**07042 - 04084 - 04120**  
 20mm PVC solvent weld male and 4 EPDM flat gaskets  
**P1**  
 as P0 but with Viton® Flat Gaskets  
**240 volt motor supplied with power cord.**

S1BaH 12050 PVT S 0 1 0 S 0 0 0 0 P0

# 2.1 ProMinent® Sigma/ 1 Diaphragm Metering Pumps

## 2.1.4 Identity Code Ordering System for Sigma (S1Cb)

S1CbH

**Sigma Control Type (S1Cb)**

**Pump type** (Figures 1 + 2 = back pressure [bar], figures 3 - 5 = feed rate [l/h]):

<b>12017*</b>	12 bar; 20 l/h	PVDF
<b>12035*</b>	12 bar; 42 l/h	SS
<b>10050</b>	10 bar; 49 l/h	
<b>10022</b>	10 bar; 26 l/h	PVDF
<b>10044</b>	10 bar; 53 l/h	SS
<b>07065</b>	7 bar; 63 l/h	
<b>07042</b>	7 bar; 50 l/h	PVDF
<b>04084</b>	4 bar; 101 l/h	SS
<b>04120</b>	4 bar; 117 l/h	

**Notice:**  
S1Cb pump types: 60 Hz performance data applies (as 60 Hz operation) but max. 200 strokes/min.

\*for PVDF max. 10 bar

<b>PVT</b>	<b>Liquid end material with PTFE Seal</b> PVDF (max 10 bar)
<b>SST</b>	Stainless steel

<b>S</b>	<b>Diaphragm</b> Multi-layer safety diaphragm with optical rupture display
<b>A</b>	Multi-layer safety diaphragm with electrical rupture signal "Pump stops"

<b>0</b>	<b>Liquid end version</b> No bleed valve and springs	<b>PVDF</b>	<b>SS</b>
<b>1</b>	No bleed valve, with 2 valve springs, Hastelloy C 4; 0.1 bar		
<b>2</b>	With bleed valve, Viton® seal, no valve spring		
<b>3</b>	With bleed valve, Viton® seal and valve spring		

<b>1</b>	<b>Hydraulic connector</b> Union nut and PVC Solvent Weld
<b>3</b>	Union nut and PVDF Male BSP
<b>4</b>	Union nut and stainless steel insert <i>inc. w/SS pump</i>
<b>7</b>	Union nut and PVDF Hosetail

<b>0</b>	<b>Version</b> With ProMinent® logo (standard)
<b>1</b>	Without ProMinent® logo
<b>M</b>	Modified <span style="float: right;">on request</span>

<b>U</b>	<b>Electrical Power supply</b> 1 ph, 100 - 240 V; 50 Hz
----------	--

<b>C</b>	<b>Power Cable and Plug</b> 2m Australia
----------	---

<b>0</b>	<b>Relays</b> No relay ( Standard)
<b>1</b>	Fault relay (230V - 8A)
<b>3</b>	Fault + pacing relay (24V - 100mA)
<b>8</b>	As 1 + 4-20 mA output

With Profibus option **NO** relay option CAN be selected.

**Note:** PRV/Bleed valve available on request. The preferred option is relief valve in-line.

<b>0</b>	<b>Control Variant</b> Manual + External Control + Pulse Control
<b>1</b>	Manual + External Control + Pulse Control + analog + metering profiles
<b>5</b>	As 1 + Process Timer
<b>6</b>	As 1 + PROFIBUS® DP M12
<b>7</b>	As 1 + CANopen **

<b>0</b>	<b>Overload switch-off</b> Without overload switch-off
<b>1</b>	With overload switch-off - 4 bar
<b>2</b>	With overload switch-off - 7 bar
<b>3</b>	With overload switch-off - 10 bar

<b>S</b>	<b>Operating Unit (HMI)</b> HMI + 0.5m cable
<b>1</b>	HMI + 2.0m cable
<b>2</b>	HMI + 5.0m cable
<b>X</b>	Without HMI

<b>0</b>	<b>Dosing Monitor:</b> Without access code
<b>1</b>	With access code

<b>EN</b>	<b>Language:</b> English
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<b>P*</b>	<b>Prepack Option</b> See options
-----------	--------------------------------------

**Prepack option P\* for PVDF**  
**P0 - 12017 - 12035 - 10050 - 10022 - 10044 - 07065**  
 15mm PVC solvent weld male and 4 EPDM flat gaskets & PROFIBUS cable if required.  
**07042 - 04084 - 04120**  
 20mm PVC solvent weld male and 4 EPDM flat gaskets & PROFIBUS cable if required.  
**P1** as P0 but with Viton® Flat Gaskets  
**P2** As P0 but with a 2.0m control cable  
**P5** As P2 but with a 5.0m control cable  
**PX** As P2 but with a 10.0m control cable  
**PA** As P1 but with a 2.0m control cable  
**PB** As P1 but with a 5.0m control cable  
**PC** As P1 but with a 10.0m control cable  
**Note: for SS pumps as per P2, P5 & P7 but only require control cables ... prices also as above.**

S1CbH 10050 PVT S 0 1 0 U C 0 1 0 1 0 EN P2

# 2.1 ProMinent® Sigma/ 1 Spares for Diaphragm Metering Pumps

## 2.1.5 Spare Parts Kits

The spare parts kits contain all components for maintenance of liquid ends.

### PVT version

- 1 pump diaphragm
- 1 suction valve
- 1 discharge valve
- 2 valve balls
- 1 seal set (PTFE Gaskets, ball seats, ball seat housings).

### Spare Parts Kits for versions with new multilayer safety diaphragm

Type 12017, 120035, 10050		Part No.
<b>Liquid end FM 50 - DN 10</b>	PVT	1035964.
	SST	1035966.
	SST (with 2 valve sets)	1035965.

Type 10022, 10044, 07065		Part No.
<b>Liquid end FM 65 - DN 10</b>	PVT	1035967.
	SST	1035969.
	SST (with 2 valve sets)	1035968.

### SST version

- 1 pump diaphragm
- 2 valve balls
- 1 seal set (PTFE Gaskets, ball seat discs).

Type 07042, 04084, 04120		Part No.
<b>Liquid end FM 120 - DN 15</b>	PVT	1035961.
	SST	1035963.
	SST (with 2 valve sets)	1035962.

### Spare Parts Kits for versions with old standard diaphragm

Type 12017, 120035, 10050		Part No.
<b>Liquid end FM 50 - DN 10</b>	PVT	1010541.
	SST	1010554.
	SST (with 2 valve sets)	1010555.

Type 10022, 10044, 07065		Part No.
<b>Liquid end FM 65 - DN 10</b>	PVT	1010542.
	SST	1010556.
	SST (with 2 valve sets)	1010557.

Type 07042, 04084, 04120		Part No.
<b>Liquid end FM 120 - DN 15</b>	PVT	1010543.
	SST	1010558.
	SST (with 2 valve sets)	1010559.

### Multilayer Safety Diaphragms - current

<b>Sigma/ 1 FM 50</b> Type: 12017, 120035, 10050	1030114.
<b>Sigma/ 1 FM 65</b> Type: 10022, 10044, 07065	1030115.
<b>Sigma/ 1 FM 120</b> Type: 07042, 04084, 04120	1035828.

### Pump Diaphragms (standard diaphragm) old

	Part No.
<b>Sigma/ 1 FM 50</b> Type: 12017, 120035, 10050	1010279.
<b>Sigma/ 1 FM 65</b> Type: 10022, 10044, 07065	1010282.
<b>Sigma/ 1 FM 120</b> Type: 07042, 04084, 04120	1010285.

### Suction - Discharge Valves PVT

	Part No.
Sigma/ 1 12017, 120035, 10050 DN10	1002267.
Sigma/ 1 10022, 10044, 07065 DN10	1002267.
Sigma/ 1 07042, 04084, 04120 DN15	792517.

### PTFE Moulding Gasket

	Part No.
Sigma/ 1 12017, 120035, 10050 DN10	1019364.
Sigma/ 1 10022, 10044, 07065 DN10	1019364.
Sigma/ 1 07042, 04084, 04120 DN15	1019365.

## 2.2 ProMinent® Sigma/ 2 Diaphragm Metering Pumps

2.1.1

ProMinent® Sigma/ 2 Diaphragm Metering Pumps



### Sigma/ 2 Diaphragm Metering Pumps

The Sigma/2 motor diaphragm metering pumps are produced with a high-strength inner housing for parts subject to load as well as an additional plastic housing to protect against corrosion. The capacity range extends from 50 - 420 l/h at a max. back pressure of 16 to 4 bar. Stroke length 5mm.

Under defined conditions and when installed correctly, the reproducibility of the metering is better than  $\pm 2\%$  at a stroke length of between 30 % and 100 % (instructions in the operating instructions manual must be followed).

In all motor-driven metering pumps without integrated overload protection, for safety reasons, suitable overload protection must be provided during installation.

### Sigma/ 2 control type (S2Cb)

#### Detachable operating unit (HMI)

The optional control via contact or analog signals (e.g. 0/4 - 20 mA) for the Sigma control type results in good adaptability, even to fluctuating metering requirements.

The microprocessor control is an optimum combination of speed control and stop & go operation, i.e. it works in a wide control field with customised fine adjustment. Moreover it enables an optimum metering result thanks to the metering behaviour of the metering pump being matched to the chemicals or application.

The task of the control is to measure the movement and speed profile in conjunction with the power demand. This leads to a real reduction in the actually required power, which means an increase in efficiency.

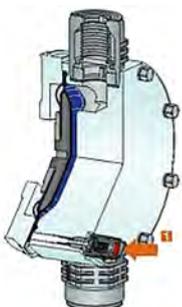
Moreover, the analysis of the power demand makes possible an internal overload switching off of the metering pump, i.e. an integral pressure relief function for pump protection without an additional hydraulic assembly such as relief valves and manometer.

### Sigma/ 2 basic type (S2Ba)

The ProMinent® Sigma Basic type is a motor driven Metering Pump with no internal electronic control system. The ProMinent® S2Ba has a number of different drive options, including single and 3 ph. motor (standard IP55), or the three phase AC motor with ATEX certification for use in hazardous Exe and EXde areas.

Different flanges are always available so that customers can use their own motor to drive the pump.

## Diaphragm Rupture Warning System



### Diaphragm rupture warning system.

The liquid end has a patented multilayer safety diaphragm as standard and a visual diaphragm rupture indicator. The diaphragm is coated on both sides with PTFE film. This coating ensures that no leakage to the outside occurs even if the diaphragm ruptures. If the diaphragm ruptures, feed chemical enters between the diaphragm layers and thus triggers a mechanical indication or an alarm via the sensor area.

This concept ensures reliable metering - even under critical operating conditions.

# 2.2 ProMinent® Sigma/ 2 Diaphragm Metering Pumps

## 2.2.2 Technical Data for Sigma Pumps

Pump type <b>S2BaH</b>	at 50 Hz				at 60 Hz								
	bar	l/h	ml/ stroke	strokes/ min.	bar	l/h	Stroking rate at max. back- pressure strokes/ min.	Suction Lift mWG	Adm. Priming Pressure bar	Suction Side DN	Connector Suction/ Discharge Side	Shipping Weight kg	
16050 PVT	10	50	11.4	73	10	61	90	7	3	15	1" / 20mm	15	
16050 SST	16	48	11.4	73	16	56	90	7	3	15	1" / 20mm	20	
16090 PVT	10	88	11.4	132	10	109	160	7	3	15	1" / 20mm	15	
16090 SST	16	82	11.4	132	16	99	160	7	3	15	1" / 20mm	20	
16130 PVT	10	135	10.9	198	10	136	200	7	3	15	1" / 20mm	15	
16130 SST	16	124	10.9	198	16	125	200	7	3	15	1" / 20mm	20	
07120 PVT	7	120	27.4	73	7	148	90	5	1	25	1-1/2" / 25mm	16	
07120 SST	7	120	27.4	73	7	148	90	5	1	25	1-1/2" / 25mm	24	
07220 PVT	7	220	27.7	132	7	271	160	5	1	25	1-1/2" / 25mm	16	
07220 SST	7	220	27.7	132	7	271	160	5	1	25	1-1/2" / 25mm	24	
04350 PVT	4	350	29.4	198	4	352	200	5	1	25	1-1/2" / 25mm	16	
04350 SST	4	350	29.4	198	4	352	200	5	1	25	1-1/2" / 25mm	24	

NOTE: The valves in the liquid end of the Sigma types 07120, 07220 and 04350 are dimensioned DN25 (R1-1/2"). Since a piping size of DN20 is generally sufficient for these types (see Technical Date, connection intake/delivery side), the connection parts (eg inserts) which can be ordered in the identity code are reduced to DN 20, ie. piping and accessories can sized to DN 20.

Note: All pumps that are fitted with integral PRV must have the outlet piped to an appropriate place.

### Materials in contact with Dosing Medium

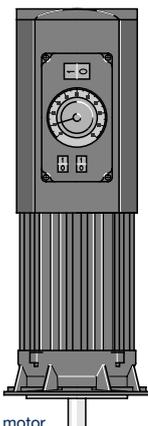
Liquid End	Suction/Discharge connector	Valve	Seals	Balls	Integrated Pressure Bleed Valve
<b>PVT</b>	PVDF (Polyvinylidene fluoride)	PVDF (Polyvinylidene fluoride)	PTFE	ceramic	PVDF/Viton® or EPDM
<b>SST</b>	stainless steel no. 1.4571/1.4404	stainless steel no. 1.4581	PTFE	stainless steel no. 1.4404	stainless steel/Viton®

Viton® is a registered trademark of DuPont Dow Elastomers.

### Motor Data

3 ph IP55	230 V/400 V	50/60 HZ	0.25 kW	0.7/1.1 A
3 ph EXe or EXde	230 V/400 V	50 HZ	0.18 kW	0.7/1.1 A
3 ph EXe or EXde	230 V/400 V	60 HZ	0.18 kW	0.6/1.0 A
1 ph AC	230 V	50/60 HZ	0.18 kW	1.7/1.5 A
1 ph AC	115 V	60 HZ	0.18 kW	3.3 A

The ProMinent Sigma basic version is also available with a standard motor flange (DIN ISO/NEMA standards). The electrical connection data specified here apply to the standard motor supplied.



Variable speed motor

### Sigma Basic Type Control Functions (S2Ba)

#### Stroke length actuator/controller

Actuator for automatic stroke length adjustment, actuating period approx. 1 sec for 1% stroke length, 1k Ohm response signal potentiometer, enclosure rating IP 54.

Controller consists of actuator with servomotor and integrated servo control for stroke length adjustment via a standard signal. Standard signal input 0/4-20 mA, corresponds to stroke length 0 - 100 %. Automatic/manual operation selection key for manual stroke adjustment. Mechanical status display of actual stroke length value output 0/4-20 mA for remote display.

#### Variable speed motors with integrated speed controller (identcode characteristic V)

Power supply 1 ph 230 V, 50/60 Hz, 0.18 kW

External control with 0/4-20 mA

#### Speed Controllers

Speed controllers in metal housing (identcode characteristic Z)

The speed controller assembly consists of a speed controller and a 0.09 kW variable speed

# 2.2 ProMinent® Sigma/ 2 Diaphragm Metering Pump

## 2.2.3 Identity Code Ordering System for Basic Type Sigma (S2Ba)

S2Ba

**Sigma Basic Type (S2Ba)**

HM

Main drive, diaphragm

16050*	16 bar; 50 l/h	PVDF
16090*	16 bar; 90 l/h	SS
16130*	16 bar; 130 l/h	
07120	7 bar; 120 l/h	PVDF
07220	7 bar; 220 l/h	SS
04350	4 bar; 350 l/h	

\*for PVDF max. 10 bar

**Liquid end material with PTFE Seal:**

PVT	PVDF (max 10 bar)
SST	Stainless steel

**Diaphragm:**

S	Multilayer safety diaphragm with visual rupture indicator
A	Multilayer safety diaphragm with rupture signalling (contact)
H	Diaphragm for Hygienic head

**Liquid end version:**

0	No springs	PVDF	SS
1	With 2 valve springs, Hastelloy C 4: 0.1 bar		
4	With bleed valve, Viton® seal, no valve spring		
5	With bleed valve, Viton® seal and 2 valve springs		
H	Hygienic head with tri-clamp connection (maximum 10 bar), contact Sydney		

**Hydraulic connector:**

1	Union nut and PVC Solvent Weld
3	Union nut and PVDF male BSP
4	Union nut and stainless steel insert <i>inc. w/SS pump</i>
7	Union nut and PVDF Hosetail

**Version:**

0	With ProMinent® logo (standard)
1	Without ProMinent® logo

**Power supply:**

S	3 ph, 400 V, 50/60 Hz, 0.25 kW
M	1 ph. AC, 230 V/50 Hz, 0.18 kW
N	1 ph, AC 115 V 60 Hz, 0.18 kW
L	3 ph, 400 V, 50Hz, (EEExe, EEExde) see below
P	3 ph, 400 V, 60Hz, (EEExe, EEExde) see below
R	3ph, variable speed motor 4 pol. 230/400 V
V(0)	var. speed motor with integral speed control 230/1/50
1	No Motor with B14 flange (Gr.71(DIN))
2	No Motor, C 56 flange (NEMA)
3	No Motor, B5 Gr. 63 (DN)

**Enclosure rating:**

0	IP 55 (standard)
1	Exe motor version (ATEX-T3)
2	Exd motor version (ATEX-T4)

**Stroke sensor:**

0	No stroke sensor (standard)
2	Pacing relay (reed relay)
3	Stroke Sensor (Namur) hazardous locations

**Stroke length adjustment:**

0	Manual
1	With stroke positioning motor, 230V/50/60Hz
2	With stroke positioning motor, 115V/50/60Hz
4	With stroke control motor, 4...20 mA 230 V/50/60Hz
6	With stroke control motor, 4...20 mA 115 V/50/60Hz

**Prepack Option**

P\* See options

**Note:** PRV/Bleed valve available on request. The preferred option is relief valve in-line.

**Prepack option P\* for PVDF**

**P0 - 16050 - 16090 - 16130**  
20mm PVC solvent weld male and 4 EPDM flat gaskets

**07120 - 07220 - 04350**  
25mm PVC solvent weld male and 4 EPDM flat gaskets

**P1** as P0 but with Viton® Flat Gaskets

**240 volt motor supplied with power cord.**

S2Ba HM 12050 PVT S 0 1 0 S 0 0 0 P1

# 2.2 ProMinent® Sigma/ 2 Diaphragm Metering Pump



## 2.2.4 Identity Code Ordering System for Sigma (S2Cb)

<b>S2Cb</b>	<b>Sigma Control Type (S2Cb)</b>	
	H	Main power end, diaphragm
	<b>Pump type:</b> (Figures 1 + 2 = back pressure [bar], figures 3 - 5 = feed rate [l/h]):	
	16050*	16 bar; 56 l/h
	16090*	16 bar; 99 l/h
	16130*	16 bar; 125 l/h
	07120	7 bar; 148 l/h
	07220	7 bar; 271 l/h
	04350	4 bar; 352 l/h * for PVDF max. 10 bar
	<b>Notice:</b> S2Cb pump types: 60 Hz performance data applies (as 60 Hz operation) but max. 200 strokes/min.	
		PVDF SS
		PVDF SS
	<b>Liquid end material with PTFE Seal:</b>	
	PVT	PVDF (max 10 bar)
	SST	Stainless steel
	<b>Diaphragm:</b>	
	S	Multilayer safety diaphragm with visual rupture indicator
	A	Multilayer safety diaphragm with rupture signalling; pump stops
	<b>Liquid end version:</b>	
	0	No valve springs
	1	With 2 valve springs, Hastelloy C 4: 0.1 bar
	2	With bleed valve, Viton® seal, no valve springs
	3	With bleed valve, Viton® seal and valve springs
	H	Hygienic head with tri-clamp connection (maximum 10 bar), contact Sydney
	<b>Hydraulic connector:</b>	
	1	Union nut and PVC Solvent Weld
	3	Union nut and PVDF male BSP
	4	Union nut & stainless steel insert <i>inc. w/SS pump</i>
	7	Union nut and PVDF Hosetail
	<b>Version:</b>	
	0	With ProMinent® logo (standard)
	1	Without ProMinent® logo
	<b>Electrical Power supply:</b>	
	U	1 ph 100 - 230 V ±10% 50 Hz
	<b>Cable and plug:</b>	
	C	2 m Australian
	<b>Relays:</b>	
	0	No relay ( Standard)
	1	Fault relay (230V - 8A)
	3	Fault + pacing relay (24V - 100mA)
	8	As 1 + 4-20 mA output
	<b>Control Variant:</b>	
	0	Manual + External Control + Pulse Control
	1	Manual + External Control + Pulse Control + analog + metering profiles
	5	As 1 + Process Timer
	6	As 1 + PROFIBUS® DP M12
	7	As 1 + CANopen **
	<b>Overload switch-off</b>	
	0	Without overload switch-off
	1	With overload switch-off - 4 bar
	2	With overload switch-off - 7 bar
	3	With overload switch-off - 10 bar
	<b>Operating Unit (HMI):</b>	
	S	HMI + 0.5 m cable
	1	HMI + 2.0 m cable
	2	HMI + 5.0 m cable
	X	Without HMI
	<b>Dosing Monitor:</b>	
	0	Without access code
	1	With access code
	<b>Language:</b>	
	EN	English
	<b>Prepack Option</b>	
	P*	See options

With Profibus option **NO** relay option CAN be selected.

**Note:** PRV/Bleed valve available on request. The preferred option is relief valve in-line.

**Prepack option P\* for PVDF**  
**P0 - 16050 - 16090 - 16130**  
 20mm PVC solvent weld male and 4 EPDM flat gaskets & PROFIBUS cable if required.  
**07120 - 07220 - 04350**  
 25mm PVC solvent weld male and 4 EPDM flat gaskets & PROFIBUS cable if required.  
**P1** as P0 but with Viton® Flat Gaskets  
**P2** As P0 but with a 2.0m control cable  
**P5** As P2 but with a 5.0m control cable  
**PX** As P2 but with a 10.0m control cable  
**PA** As P1 but with a 2.0m control cable  
**PB** As P1 but with a 5.0m control cable  
**PC** As P1 but with a 10.0m control cable

**Note: for SS pumps as per P2, P5 & P7 but only require control cables ... prices also as above.**

**S2Cb H 12050 PVT S 0 1 0 U C 0 1 0 1 0 EN P2**

# 2.2 ProMinent® Sigma/ 2 Spares for Diaphragm Metering Pumps

## 2.2.5 ProMinent® Sigma Pumps Spare Parts

The spare parts kit contains all components required for maintenance of liquid ends.

### PVT version

- 1 pump diaphragm
- 1 suction valve
- 1 discharge valve
- 2 valve balls
- 1 seal set (4 x composite Gaskets, 2 x ball seats, 2 x ball seat housings)

### SST version

- 1 pump diaphragm
- 2 valve balls
- 1 seal set (4 x composite Gaskets, 2 x ball seats, 2 x ball seat housings)

### Spare Parts Kits for versions with new multilayer safety diaphragm

Type 16050, 16090, 16130		<b>Part No</b>
<b>Liquid end FM 130 - DN 15</b>	PVT	1035951.
	SST	1035957.
	SST (with 2 valve sets)	1035954.
Type 07120, 07220, 04350		
<b>Liquid end FM 350 - DN 25</b>	PVT	1035953.
	SST	1035590.
	SST (with 2 valve sets)	1035959.

### Spare Parts Kits for versions with old standard/double diaphragm

Type 16050, 16090, 16130		<b>Part No</b>
<b>Liquid end FM 130 - DN 15</b>	PVT	740324.
	SST	740326.
	SST (with 2 valve sets)	740328.
Type 07120, 07220, 04350		
<b>Liquid end FM 350 - DN 25</b>	PVT	740325.
	SST	740327.
	SST (with 2 valve sets)	740329.

### Diaphragms (old type)

<b>FM 130</b> (Type 12050, 12090, 12130)	792495.
<b>FM 350</b> (Type 07120, 07220, 04350)	792496.

### Multilayer Safety Diaphragms

<b>FM 130</b> (Type 16050, 16090, 16130)	1029771.
<b>FM 350</b> (Type 07120, 07220, 04350)	1033422.

### Suction - Discharge Valves PVT Part No.

Type 16050, 16090, 16130	DN15	792517.
Type 07120, 07220, 04350	DN25	740615.

### PTFE Moulding Gasket

Type 16050, 16090, 16130	DN15	1019365.
Type 07120, 07220, 04350	DN25	1019367.

## 2.3 ProMinent® Sigma/ 3 Diaphragm Metering Pumps

### 2.1.1

### ProMinent® Sigma/ 3 Diaphragm Metering Pumps



#### Sigma/ 3 Diaphragm Metering Pumps

The Sigma/1 motor diaphragm metering pumps are produced with a high-strength inner housing for parts subject to load as well as an additional plastic housing to protect against corrosion. The capacity range extends from 145 - 1003 l/h at a max. back pressure of 12 to 4 bar. Stroke length 6mm.

Under defined conditions and when installed correctly, the reproducibility of the metering is better than  $\pm 2\%$  at a stroke length of between 30 % and 100 % (instructions in the operating instructions manual must be followed).

In all motor-driven metering pumps without integrated overload protection, for safety reasons, suitable overload protection must be provided during installation.

#### Sigma/ 3 control type (S3Cb) Detachable operating unit (HMI)

The optional control via contact or analog signals (e.g. 0/4 - 20 mA) for the Sigma control type results in good adaptability, even to fluctuating metering requirements.

The microprocessor control is an optimum combination of speed control and stop & go operation, i.e. it works in a wide control field with customised fine adjustment. Moreover it enables an optimum metering result thanks to the metering behaviour of the metering pump being matched to the chemicals or application.

The task of the control is to measure the movement and speed profile in conjunction with the power demand. This leads to a real reduction in the actually required power, which means an increase in efficiency.

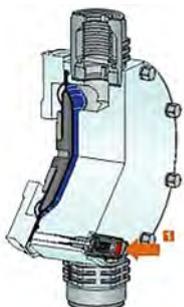
Moreover, the analysis of the power demand makes possible an internal overload switching off of the metering pump, i.e. an integral pressure relief function for pump protection without an additional hydraulic assembly such as relief valves and manometer.

#### Sigma/ 3 basic type (S3Ba)

The ProMinent® Sigma Basic type is a motor driven Metering Pump with no internal electronic control system. The ProMinent® S3Ba has a number of different drive options, including single and 3 ph. motor (standard IP55), or the three phase AC motor for use in hazardous Exe and EXde areas.

Different flanges are always available so that customers can use their own motor to drive the pump.

### Diaphragm Rupture Warning System



#### Diaphragm rupture warning system.

The liquid end has a patented multilayer safety diaphragm as standard and a visual diaphragm rupture indicator. The diaphragm is coated on both sides with PTFE film. This coating ensures that no leakage to the outside occurs even if the diaphragm ruptures. If the diaphragm ruptures, feed chemical enters between the diaphragm layers and thus triggers a mechanical indication or an alarm via the sensor area.

This concept ensures reliable metering - even under critical operating conditions.

# 2.3 ProMinent® Sigma/ 3 Diaphragm Metering Pumps

## 2.3.2 Technical Data for Sigma/ 3

Pump type <b>S3BaH</b>	at 50 Hz				at 60 Hz							
	bar	l/h	ml/ stroke	strokes/ min.	bar <b>S3CbH</b>	l/h	Stroking rate at max. back- pressure strokes/ min.	Suction Lift mWG	Adm. Priming Pressure Suction Side bar	DN	Connector Suction/ Discharge Side	Shipping Weight kg
120145 PVT	10	146	31.5	72	10	182	90	5	2	25	1-1/2" / 25mm	22
120145 SST	12	146	31.5	72	12	182	90	5	2	25	1-1/2" / 25mm	26
120190 PVT	10	208	31.5	103	10	243	120	5	2	25	1-1/2" / 25mm	22
120190 SST	12	208	31.5	103	12	243	120	5	2	25	1-1/2" / 25mm	26
120270 PVT	10	292	31.5	144	10	365	180	5	2	25	1-1/2" / 25mm	22
120270 SST	12	292	31.5	144	12	365	180	5	2	25	1-1/2" / 25mm	26
120330 PVT	10	365	31.5	180	10	-	-	5	2	25	1-1/2" / 25mm	22
120330 SST	12	365	31.5	180	12	-	-	5	2	25	1-1/2" / 25mm	26
070410 PVT	7	410	95.1	72	7	500	90	4	1	32	2" / 32mm	24
070410 SST	7	410	95.1	72	7	500	90	4	1	32	2" / 32mm	29
070580 PVT	7	580	95.1	103	7	670	120	4	1	32	2" / 32mm	24
070580 SST	7	580	95.1	103	7	670	120	4	1	32	2" / 32mm	29
040830 PVT	4	830	95.1	144	4	1040	180	3	1	32	2" / 32mm	24
040830 SST	4	830	95.1	144	4	1040	180	3	1	32	2" / 32mm	29
041030 PVT	4	1030	95.1	180	4	-	-	3	1	32	2" / 32mm	24
041030 SST	4	1030	95.1	180	4	-	-	3	1	32	2" / 32mm	29

Note: All pumps that are fitted with integral PRV must have the outlet piped to an appropriate place.

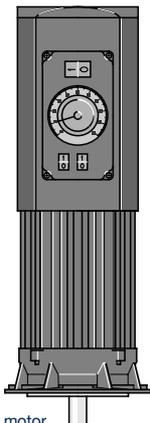
### Liquid End Materials in Contact with Dosing Chemical

Liquid End	Suction/Discharge connector	Valve	Seals	Balls	Integrated Pressure Bleed Valve
PVT	PVDF (polyvinylidene fluoride)	PVDF (polyvinylidene fluoride)	PTFE glass		PVDF/Viton® or EPDM
<b>Note: Large PVDF Liquid Ends have Hastalloy C valve discs and Hastalloy C springs which are coated with CTFE (similar to PTFE)</b>					
SST	stainless steel no. 1.4571	stainless steel no. 1.4571	PTFE	stainless steel no. 1.4401	stainless steel/Viton®

Viton® is a registered trademark of DuPont Dow Elastomers.

### Motor Data

3 ph IP 55	230 V/400 V	50/60 Hz	0.37 kW	S
3 ph IP 55	230 V/400 V	50/60 Hz	0.55 kW	S for S3Cb
1 ph AC	230 V	50/60 Hz	0.55 kW	M
1 ph AC	115 V	60 Hz	0.55 kW	N
3 ph EXe or EXde	230 V/400 V	50 Hz	0.37 kW	L
3 ph EXe or EXde	230 V/400 V	60 Hz	0.37 kW	P
3 ph IP 55	230 V/400 V	50/60 Hz	0.55 kW	R
1 ph IP 55	230 V	50/60 Hz	0.55 kW	V



Variable speed motor

### Sigma Basic Type Control Functions (S3Ba)

#### Stroke length actuator/controller

Actuator for automatic stroke length adjustment, actuating period approx. 1 sec for 1% stroke length, 1k Ohm response signal potentiometer, enclosure rating IP 54.

Controller consists of actuator with servomotor and integrated servo control for stroke length adjustment via a standard signal. Standard signal input 0/4-20 mA, corresponds to stroke length 0 - 100 %. Automatic/manual operation selection key for manual stroke adjustment. Mechanical status display of actual stroke length value output 0/4-20 mA for remote display.

#### Variable speed motors with integrated speed controller (identcode characteristic V)

Power supply 1 ph 230 V, 50/60 Hz, 0.18 kW

External control with 0/4-20 mA

#### Speed Controllers

Speed controllers in metal housing (identcode characteristic Z)

The speed controller assembly consists of a speed controller and a 0.09 kW variable speed

# 2.2 ProMinent® Sigma/ 3 Diaphragm Metering Pumps



## 2.3.3 Identity Code Ordering System Basic Type For Sigma/ 3 (S3Ba)

### S3Ba Sigma Basic Type (S3Ba) at 50Hz

HMain Drive, diaphragm

<b>Pump type:</b> (Figures 1 + 2 = back pressure [bar], figures 3 - 5 = feed rate [l/h]):		
120145*	12 bar; 145 l/h	<b>*for PVDF max. 10 bar</b>
120190*	12 bar; 190 l/h	
120270*	12 bar; 270 l/h	
120330*	12 bar; 330 l/h	
070410	7 bar; 410 l/h	<b>DN32 Hastalloy C valve discs and springs</b>
070580	7 bar; 580 l/h	<b>DN32 Hastalloy C valve discs and springs</b>
040830	4 bar; 830 l/h	<b>DN32 Hastalloy C valve discs and springs</b>
041030	4 bar; 1030 l/h	

PVDF  
SS

PVDF  
SS

<b>Liquid end material with PTFE Seal:</b>	
PVT	PVDF (max 10 bar)
SST	Stainless steel

<b>Diaphragm:</b>	
S	Multilayer safety diaphragm with visual rupture indicator
A	Multilayer safety diaphragm with visual rupture signaling; pump stops
H	Diaphragm for Hygienic Head

<b>Liquid end version:</b>		PVDF	SS
0	No valve springs (standard)		
1	With 2 valve springs, Hastelloy C 4: 0.1 bar <b>Std for DN32</b>		
4	With bleed valve, Viton® seal, no valve springs		
5	With bleed valve, Viton® seal and valve springs <b>Std for DN32</b>		
H	Hygienic head with tri-clamp connection (maximum 10 bar), contact Sydney		

<b>Hydraulic connector:</b>	
1	Union nut and PVC Solvent Weld
3	Union nut and PVDF male BSP <b>DN25 \$ 165 DN32</b>
4	Union nut and stainless steel insert <i>inc. w/SS pump</i>
7	Union nut and PVDF Hosetail

<b>Version:</b>	
0	With ProMinent® logo (standard)
1	Without ProMinent® logo

<b>Power supply:</b>	
S	3 ph, 230 V/400 V, 0.37 kW (standard)
M	1 ph, 230 V 0.55 kW
N	1 ph, 115 V
L	3 ph, 230 V/400 V, 0.37 kW, 50Hz, (EExe, EExde)
P	3 ph, 230 V/400 V, 0.37 kW, 60Hz, (EExe, EExde)
R	3ph, variable speed motor 4 pol. 230/400 V
V (0)	var. speed motor with integral speed control 230/1/50
V (2)	var. speed motor with integral speed control Exd

<b>Enclosure rating:</b>	
0	IP 55
1	Exe motor version (ATEX-T3)
2	Exd motor version (ATEX-T4)

<b>Stroke sensor:</b>	
0	No stroke sensor (standard)
2	Pacing relay (read relay)
3	Stroke sensor (Namur) for explosion-proof appli.

<b>Stroke length adjustment:</b>	
0	Manual
1	With stroke positioning motor, 230V/50/60Hz
2	With stroke positioning motor, 115V/50/60Hz
4	With stroke control motor, 4...20 mA 230 V/50/60Hz
6	With stroke control motor, 4...20 mA 115 V/50/60Hz

<b>Prepack Option</b>	
P*	See options

**Note:** PRV/Bleed valve available on request.  
The preferred option is relief valve in-line.

**Prepack option P\* for PVDF**  
**P0 - 120145 - 120190 - 120270 - 120330**  
 25mm PVC solvent weld male and 4 EPDM flat gaskets  
**070410 - 070580 - 040830 - 041030**  
 32mm PVC solvent weld socket and 4 EPDM flat gaskets  
**P1** as P0 but with Viton® Flat Gaskets  
**240 volt motor supplied with power cord.**

S3Ba H 120145PVT A 0 1 0 S 0 0 0 P1

# ProMinent® 2.3 ProMinent® Sigma/ 3 Diaphragm Metering Pumps

## 2.3.4 Identity Code Ordering System for Sigma (S3Cb)

S3Cb

**Sigma Control Type (S3Cb)**

H Main power end, diaphragm

**Pump type:** (Figures 1 + 2 = back pressure [bar], figures 3 - 5 = feed rate [l/h]):

120145	12 bar; 160 l/h	<b>Notice:</b>	PVDF
120190	12 bar; 220 l/h	S3Cb pump types: 60 Hz performance data applies (as 60 Hz operation) but max. 173 strokes/min.	SS
120270	12 bar; 330 l/h	Note: <b>DN32 Hastalloy C valve discs and springs</b>	PVDF
070410	7 bar; 500 l/h	Note: <b>DN32 Hastalloy C valve discs and springs</b>	SS
070580	7 bar; 670 l/h	Note: <b>DN32 Hastalloy C valve discs and springs</b>	for PVDF max. 10 bar
040830	4 bar; 1040 l/h	Note: <b>DN32 Hastalloy C valve discs and springs</b>	

**Liquid end material with PTFE Seal:**

PVT	PVDF (max 10 bar)
SST	Stainless steel

**Diaphragm:**

S	Multilayer safety diaphragm with visual rupture indicator
A	Multilayer safety diaphragm with rupture signalling; pump stops

**Liquid end version:**

0	No valve springs	PVDF	SS
1	With 2 valve springs, Hastelloy C 4: 0.1 bar <i>Std for DN32</i>		
2	With bleed valve, Viton® seal, no valve springs		
3	With bleed valve, Viton® seal and valve springs		

**Hydraulic connector:**

1	Union nut and PVC Solvent Weld		
3	Union nut and PVDF male BSP	DN25	DN32
4	Union nut & stainless steel insert <i>inc. w/SS pump</i>		
7	Union nut and PVDF Hosetail		

**Version:**

0	With ProMinent® logo (standard)
1	Without ProMinent® logo

**Electrical Power supply:**

U	1 ph 100 - 230 V ±10% 50 Hz
---	-----------------------------

**Cable and plug:**

C	2 m Australian
---	----------------

**Relays:**

0	No relay ( Standard)
1	Fault relay (230V - 8A)
3	Fault + pacing relay (24V - 100mA)
8	As 1 + 4-20 mA output

**Control Variant:**

0	Manual + External Control + Pulse Control
1	Manual + External Control + Pulse Control + analog + metering profiles
5	As 1 + Process Timer
6	As 1 + PROFIBUS® DP M12
7	As 1 + CANopen **

**Overload switch-off**

0	Without overload switch-off
1	With overload switch-off - 4 bar
2	With overload switch-off - 7 bar
3	With overload switch-off - 10 bar

**Operating Unit (HMI):**

S	HMI + 0.5 m cable
1	HMI + 2.0 m cable
2	HMI + 5.0 m cable
X	Without HMI

**Dosing Monitor:**

0	Without access code
1	With access code

**Language:**

EN	English
----	---------

**Prepack Option**

P*	See options
----	-------------

With Profibus option **NO** relay option CAN be selected.

**Note:** PRV/Bleed valve available on request. The preferred option is relief valve in-line.

**Prepack option P\* for PVDF**

**P0 - 120145 - 120190 - 120270**

25mm PVC solvent weld male and 4 Viton flat gaskets & PROFIBUS cable if required.

**070410 - 070580 - 040830**

32mm PVC solvent weld socket and 4 Viton flat gaskets & PROFIBUS cable if required.

**P1** as P0 but with Viton® Flat Gaskets

**P2** As P0 but with a 2.0m control cable

**P5** As P2 but with a 5.0m control cable

**PX** As P2 but with a 10.0m control cable

**PA** As P1 but with a 2.0m control cable

**PB** As P1 but with a 5.0m control cable

**PC** As P1 but with a 10.0m control cable

**Note:** for SS pumps as per P2, P5 & P7 but only require control cables ... prices also as above.

S3Cb H 120270 PVT S 0 1 0 U C 0 0 0 1 0 EN P2

## 2.3 ProMinent® Sigma/ 3 Spares for Diaphragm Metering Pumps

### 2.3.5 Spare Parts Kits

The spare parts kits generally contain the consumable components for the liquid ends.

#### PVT version

- 1 pump diaphragm
- 1 suction valve
- 1 discharge valve
- 2 valve balls or valve discs with spring for DN32
- 1 seal set (PTFE Gaskets, ball seats, ball seat housings)

#### SST version

- 1 pump diaphragm
- 2 valve balls or valve discs with spring for DN32
- 1 seal set (PTFE Gaskets, ball seat discs)

#### Spare parts kits Sigma/ 3 with new multilayer safety diaphragm

Type	120145, 120190, 120270, 120330	Part No.
<b>Liquid end FM 330 - DN 25</b>	PVT	1034678.
	SST	1034679.
	SST (with 2 valve set)	1034680.
Type	070410, 070580, 040830, 041030	
<b>Liquid end FM 1000 - DN 32</b>	PVT	1034681.
	SST	1034682.
	SST (with 2 valve set)	1034683.

#### Spare Parts Kits for versions with old standard/double diaphragm

Type	120145, 120190, 120270, 120330	Part No.
<b>Liquid end FM 330 - DN 25</b>	PVT	1005308.
	SST	1005310.
	SST (with 2 valve set)	1005312.
Type	070410, 070580, 040830, 041030	
<b>Liquid end FM 1000 - DN 32</b>	PVT	1020032.
	SST	1005311.
	SST (with 2 valve set)	1005313.

#### Pump Diaphragms (old version)

FM 330	Type 120145, 120190, 120270, 120330	1004604.
FM 1000	Type 070410, 070580, 040830, 041030	1002835.

#### Multilayer Safety Diaphragm

FM 330	Type 120145, 120190, 120270, 120330	1029604.
FM 1000	Type 070410, 070580, 040830, 041030	1029603.

#### Suction - Discharge Valves PVT

Sigma/3	120145, 120190, 120270, 120330 DN25	740615.
Sigma/ 3	070410, 070580, 040830, 041030 DN32	1020031.

#### PTFE Moulding Gasket

Sigma/ 3	120145, 120190, 120270, 120330 DN10 (Bleed Valve)	1019364.
Sigma/ 3	120145, 120190, 120270, 120330 DN25	1019367.
Sigma/ 3	Type 070410, 070580, 040830, 041030 DN15 (Bleed Valve)	1019365.
Sigma/3	Type 070410, 070580, 040830, 041030 DN32	1019353.

# 2.4 ProMinent® Sigma/ 2 Piston Metering Pumps

## 2.4.1 Technical Data - ProMinent Sigma Piston Metering Pumps

Pump type SBKaHK	at 50 Hz				at 60 Hz				Shipping Weight kg		
	bar	l/h	ml/ stroke	Max. Stroke Freq. strokes/ min.	bar	l/h	Stroking rate at max. back- pressure strokes/ min.	Suction Lift mWG			
32002 SST	320	1.9	0.46	71	320	2.3	84	5	approx. 50% of max permissible pressure	1/4"	24
23004 SST	230	4.0	0.52	125	230	4.8	154	5		1/4"	24
10006 SST	100	6.4	0.55	195	100	6.5	200	5		1/4"	24
14006 SST	140	6.1	1.42	71	140	7.1	84	4		1/4"	24
10011 SST	100	11.0	1.43	125	100	13.1	154	4		1/4"	24
05016 SST	50	16.7	1.43	195	50	17.1	200	4		1/4"	24
07012 SST	70	12.4	2.90	71	70	14.8	85	5		1/4"	24
04522 SST	45	22.5	2.91	125	45	26.7	153	4		1/4"	24
02534 SST	25	34.1	2.92	195	25	35.0	200	4		1/4"	24
04022 SST	40	22.4	5.26	71	40	26.5	84	4		3/8"	25
02541 SST	25	41.5	5.37	125	25	49.2	154	4		3/8"	25
01264 SST	12	64.0	5.45	196	12	65.2	200	4		3/8"	25

## Materials in Contact with Chemicals

Material	Liquid End	Suction / Discharge connection	Seals	Valve Balls	Ball Seat
SST	Stainless steel 1.4571 / 1.4404	Stainless steel 1.4571 / 1.4404	PTFE/PTFE with graphite	Ceramic	Stainless steel 1.4571 / 1.4404

## Motor Data

3 ph IP55	400 V	50 Hz	0.18 kW	0.7/1.1 A	S
1 ph AC	230 V	50 Hz	0.18 kW	1.7/1.5 A	M
3 ph EXe or EXde	400 V	50 Hz	0.18 kW	0.7/1.1 A	L
3 ph EXe or EXde	400 V	60 HZ	0.18 kW	0.6/1.0 A	P
1 ph AC	115 V	60 HZ	0.18 kW	3.3 A	

The ProMinent Sigma basic version is also available with a standard motor flange (DIN ISO/NEMA standards). The electrical connection data specified here apply to the standard motor supplied.

## 2.4.2 Sigma HK Spare Parts Kits

### Spare parts kits Sigma HK

Consisting of: 1 ceramic dosing plunger, 4 valve balls, 4 ball seat discs, 2 ball PTFE/graphite ball seals, 2 plunger guides, 14 flat seals, 2 O-rings.

	Part No.
Applies to identity code: 32002, 23004, 10006 FK 0.8 for Sigma HK	1001572.
Applies to identity code: 14006, 10011, 05016 FK 12.5 for Sigma HK	910470.
Applies to identity code: 07012, 04522, 02534 FK 25 for Sigma HK	910471.
Applies to identity code: 04022, 02541, 01264 FK 50 for Sigma HK	910472.

# 2.4 ProMinent® Sigma/ 2 Piston Metering Pumps

## 2.4.3 Identity Code - ProMinent Sigma Piston Metering Pumps - Basic version (S2Ba)

SBKa	Sigma Basic Type (SBKaHK)	Price
	HK Main displacement component, piston	
	<b>Pump type:</b> (figures 1 - 3 = back pressure [bar], figures 4 + 5 = feed rate [l/h]) 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, 64,2 l/h	
	<b>Liquid end materials:</b> SS Stainless steel	
	<b>Seal Material:</b> T PTFE seal	
	<b>Displacement component:</b> 4 Piston (oxide ceramic)	
	<b>Liquid end version:</b> 0 No spring 1 With 2 valve springs, Hastelloy C4, 0.1 bar	
	<b>Hydraulic connection:</b> 0 Standard according to technical data	
	<b>Version:</b> 0 With ProMinent® (standard) 1 Without ProMinent® logo	
	<b>Electrical power supply:</b> S 3 ph. 230 V/400 V 50/60 Hz, 0.18 kW 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, 50Hz, (EExe, EExde) } See Enclosure Rating P 3 ph. 230 V/400 V, 60Hz, (EExe, EExde) } See Enclosure Rating R 3ph, variable speed motor 4 pol. 230/400 V V (0) var. speed motor with integral speed control 230/1/50	
	<b>Enclosure rating:</b> 0 IP 55 (standard) 1 Exe motor version (ATEX-T3) 2 Exde motor version (ATEX-T4)	
	<b>Stroke sensor:</b> 0 No stroke sensor (standard) 2 Pacing relay (reed relay) 3 Stroke sensor (Namur) for hazardous locations	
	<b>Stroke length adjustment:</b> 0 Manual (standard) 1 With stroke positioning motor, 230V/50/60 Hz 2 With stroke positioning motor, 115V/50/60 Hz 4 With stroke control motor, 4...20 mA 230 V/50/60Hz 6 With stroke control motor, 4...20 mA 115 V/50/60Hz	

SBKa HK 23004 SS T 4 0 0 0 S 0 0 0

# 2.4 ProMinent® Sigma/ 2 Piston Metering Pumps

## 2.4.4 Identity Code - ProMinent Sigma Pumps - Piston Metering Pumps (S2Ca)

**SCKa**

**Sigma Control Type (SCKaHK)**

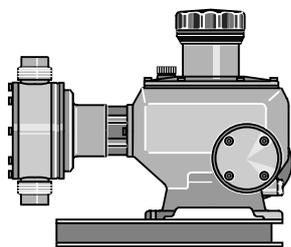
HK	Main drive, piston
	Pump type: (figures 1 - 3 = back pressure [bar], figures 4 + 5 = feed rate [l/h])
32002	320 bar, 2.3 l/h
23004	230 bar, 4.8 l/h
10006	100 bar, 6.4 l/h
14006	140 bar, 7.1 l/h
10011	100 bar, 13.1 l/h
05016	50 bar, 16.7 l/h
07012	70 bar, 14.8 l/h
04522	45 bar, 26.7 l/h
02534	25 bar, 34.1 l/h
04022	40 bar, 26.5 l/h
02541	25 bar, 49.2 l/h
01264	12 bar, 64,2 l/h
SS	<b>Liquid end materials:</b> Stainless steel
T	<b>Seal material:</b> PTFE seal
4	<b>Displacement component:</b> Pistons (oxide ceramic)
0	<b>Liquid end version:</b> No spring (standard)
1	With 2 valve springs, Hastelloy C 4, 0.1 bar
0	<b>Hydraulic connection:</b> Standard threaded connector (according to technical data)
0	<b>Version:</b> With ProMinent® logo
1	Without ProMinent® logo
U	<b>Electrical power supply:</b> 1 ph 200-230 V ±10 %, 50/60 Hz
C	<b>Cable and plug:</b> 2 m Australian
0	<b>Relays:</b> No relay
1	With fault indicating relay (N/C)
3	With fault indicating relay (N/O)
4	As 1 with pacing relay
5	As 3 with pacing relay
0	<b>Control variant:</b> Manual + external with pulse control
1	Manual + external + pulse control + analogue
4	As 1 + Process Timer
5	As 3 + Process Timer
0	<b>Access code:</b> No access code
1	With access code
0	<b>Metering monitor:</b> Input with pulse evaluation
1	input with permanent contact evaluation
0	<b>Stroke length adjustment:</b> Manual
P*	<b>Prepack Option</b> See options

**Note: Prepack option P\***  
**P2** - includes a 2.0m control cable  
**P5** - includes a 5.0m control cable  
**PX** - includes a 10.0m control cable

SCKa HK 23004 SS T 4 0 0 0 U C 1 0 0 0 0 P2

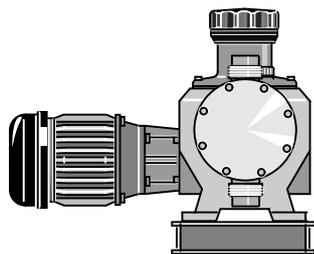
# 2.5 ProMinent® Makro TZ Diaphragm Metering Pumps

## 2.5.1 Makro TZ Diaphragm Metering Pumps



The ProMinent® Makro TZ diaphragm metering pump is a 0.75 kW dual-wound three phase motor driven metering pump, 230/400 V, 50/60 Hz, enclosure rating IP 55, insulation class F.

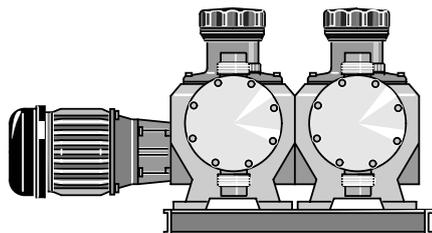
The stroke length can be adjusted by means of the shift ring mechanism from 0-10 mm (TZMb), with 0.5 % accuracy. The 5-speed gearbox is encased in a cast, seawater resistant, acrylic resin lacquered housing. Liquid ends are available in different material combinations to suit differing applications. The suction lift varies according to the density and viscosity of the medium, the dimension of the pipework and the pump stroke rate. Reproducibility of metering is better than  $\pm 2$  % in the stroke length range from 30 % -100 % subject to defined conditions and correct installation. (You must follow the instructions in the operating instruction manual). All motor driven metering pumps must be fitted with appropriate cut-out systems for safety reasons.



pk\_2\_012

### ProMinent® Makro TZ TZMbA Add-On Pumps

The ProMinent® Makro TZ main diaphragm metering pump can be converted to a duplex or triplex pump with the ProMinent® Makro TZ add-on diaphragm pump (several add-on pumps can be operated at reduced back pressure). Multiplex pumps can also be retrofitted by the operator; all the necessary components and fittings are included with the TZMbA. Different stroke rates can be achieved with the add-on pump independently of the main pump as each TZMbA has its own reducing gear. The main power end can be fitted for this purpose with a more powerful drive motor. A base frame is required when using add-on power ends.

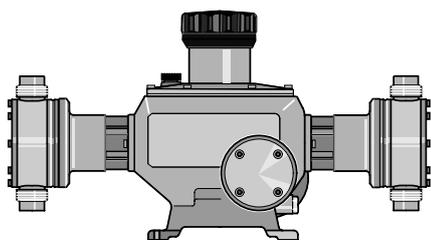


pk\_2\_013

### ProMinent® Makro TZ Double Head Version TZMbD/TZMbB

The double head version of the ProMinent® Makro TZ is similar to the simplex pump. It is, however, fitted with a second liquid end.

The liquid ends work in push-pull mode by means of a coupling element in the gearbox.



pk\_2\_014

### Actuation of Makro TZ Metering Pumps

#### Makro TZ stroke length-actuator/stroke controller

##### Makro TZ stroke actuator

Stroke adjustment motor for automatic stroke length adjustment, adjustment time approx. 1 sec. for 1 % stroke length, fitted with 2 limit switches for min. /max. setting, 1 k Ohm feedback potentiometer; enclosure rating: IP 54. Power supply 230 V ( $\pm 10$  %), 50/60 Hz, 40 W. Mech. stroke length indicator fitted to Makro TZ power end.

Alternative current / higher enclosure rating / Ex-protection to order.

##### Makro TZ stroke controller

**Stroke controller** comprising actuator with stroke adjustment motor and integrated micro-processor controller for stroke length adjustment via a standard signal. Technical data see actuator.

##### Version:

Standard 0/4-20 mA current input, corresponds to 0-100 % stroke length. Change over switch for manual/automatic mode. Key switch for stroke adjustment in manual operating mode. 0/4-20 mA actual value output for remote display.

# 2.5 ProMinent® Makro TZ Diaphragm Metering Pumps

## 2.5.2 Makro TZ Diaphragm Metering Pumps

### TZMb Motor-Driven Metering Pump TZMb Makro TZ 10 (mechanically driven add-on diaphragm pump)

<b>Drive type</b>	
H	Main drive
A	Add-on drive
D	Double main drive
B	Double add-on drive
<b>Pump type:</b> (digits 1 +2 = back pressure [bar], digits 3-6 = feed rate [l/h])	
120260	070430 040840
120340	070570 041100
120430	070720 041400
120510	070860 041670
120650	071070 042100 material version PCT/PPT/TTT max. 10 bar
<b>Liquid end material:</b>	
PC	PVC
PP	Polypropylene
SS	Stainless steel
TT	PTFE + 25% carbon
<b>Seal material:</b>	
T	PTFE
<b>Positive displacement element:</b>	
1	Multi-layer safety diaphragm with rupture indicator
<b>Liquid end version:</b>	
0	No valve springs
1	With valve springs
<b>Hydraulic connection:</b>	
0	Standard connection
1	PVC union nut and insert
2	PP union nut and insert
3	PVDF union nut and insert
4	SS union nut and insert
<b>Version:</b>	
0	with ProMinent® logo
2	No ProMinent® logo
A	0 with ProMinent® logo, with frame, simplex
B	0 with ProMinent® logo, with frame, duplex
C	0 with ProMinent® logo, with frame, triplex
M	Modified
<b>Electrical power supply:</b>	
S	3 ph. 230/400 V 50/60 Hz (dual wound)
P	3 ph. 230/400 V 60 Hz (Exe, Exde)
L	3 ph. 230/400 V 50 Hz (Exe, Exde)
R	Variable speed motor 4 pole 230/400 V
V (0)	Variable speed motor with integr. frequency converter
V (2)	variable speed motor with integr. frequency converter (Exde)
Z	Speed control kit
4	No motor, with 56 C flange
7	No motor, with 120/80 flange
8	No motor, with 160/90 flange
0	No motor, externally mounted drive
<b>Enclosure rating:</b>	
0	IP 55 (Standard) ISO class F
1	Exe version (ATEX-T3)
2	Exde version (ATEX-T4)
A	ATEX power end
<b>Stroke sensor:</b>	
0	No stroke sensor
1	With stroke sensor (Namura)
<b>Stroke length adjustment:</b>	
0	0 Stroke length adjustment, man.
1	230 V stroke actuator
2	115 V stroke actuator
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 (servo motors for Ex zones on request)
<b>Applications:</b>	
0	Standard

TZMb H 120260 PC T 1 0 0 0 S 0 0 0 0

# 2.5 ProMinent® Makro TZ Diaphragm Metering Pumps

## 2.5.3 Makro TZ Diaphragm Metering Pumps

### Spare Parts Kits Makro TZ (TZMb)

The spare parts kit generally consists of liquid end consumables

- 1 pump diaphragm
- 1 suction valve assembly.
- 1 discharge valve assembly
- 2 valve balls (Multi-layer safety diaphragm DN 32/DN 40 with shim and springs)
- 1 set of seals (O-rings, ball seat discs, ball seat housings)

Delivery unit	Materials in contact with medium	Part no.
FM 650 - DN 25	PCT, PPT, TTT	1025164
	SST	1022896
	SST (without valve cpl.)	1022895

Delivery unit	Materials in contact with medium	Part no.
FM 1100 - DN 32	PCT, PPT, TTT	1025167
	SST	1022917
	SST (without valve cpl.)	1022916

Delivery unit	Materials in contact with medium	Part no.
FM 2100 - DN 40	PCT, PPT, TTT	1025169
	SST	1022930
	SST (without valve cpl.)	1022929

### Multi-layer safety diaphragm for TZMb

ProMinent® multi-layer safety diaphragm with diaphragm rupture indication and PTFE Teflon coating on the wetted side.

Pump type	Part No.
Identcode: 120260, 120340, 120430, 120510, 120650; Makro TZ FM 650	1022887
Identcode: 070430, 070570, 070720, 070860, 071070; Makro TZ FM 1100	1022900
Identcode: 040840, 041100, 041400, 041670, 042100; Makro TZ FM 2100	1022921

### Makro TZ spare parts kits for TZMa

Delivery unit	Materials in contact with medium	Part no.
Identcode: 120190, 120254, 120317, 120381 Liquid end FM 530 - DN 25	PP	910452
	P	910455
	T	910458
	S (without valve cpl.)	910475
	S	910461
Identcode: 060397, 060529, 060661, 060793 Liquid end FM 530 - DN 25	PP	910453
	P	910456
	T	910459
	S (without valve cpl.)	910476
	S	910462
Identcode: 030750, 031000, 031250, 031500, 031875, 031050, 031395, 031740, 032100, 032500 Liquid end FM 1500/2100	PP	1001573
	P	1001574
	T	1001575
	S (without valve cpl.)	1001577
	S	1001576

# 2.5 Accessories ProMinent® Meta/Makro TZ Spare Parts Kits

## 2.5.4

## Spare Parts Kits

### Description/version

### Part No

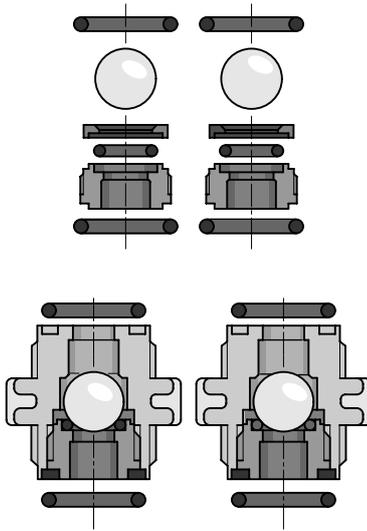
### Price

The spare parts kit generally consists of the liquid end parts which are subject to wear.

#### Standard kit for PP/P material version:

- 1 pump diaphragm
- 1 suction connector compl.
- 1 discharge connector compl.
- 2 valve balls
- 1 set of seals compl. (O rings, ball seat discs, ball seat liners)

#### Spare parts kit Meta HM, Makro TZ-HM



pk\_2\_002

Liquid end FM 130 - DN 20	PPE	910451.
	PCA	910454.
	TTT	910457.
	SST	910474.
	SST additionally complete with 2 valves	910460.
Liquid end FM 260 - DN 20	PPE	910452.
	PCA	910455.
	TTT	910458.
	SST	910475.
	SST additionally complete with 2 valves PPT/PCT (MTMa 6mm)	910461. 1001570.
Liquid end FM 530 - DN 25	PPE	910453.
	PCA	910456.
	TTT	910459.
	SST	910476.
	SST additionally complete with 2 valves PPT/PCT (MTMa 6mm)	910462. 1001568.
Liquid end FM 1500 - DN 40	PPE	910463.
	TTT	910465.
	SST	910477.
	SST additionally complete with 2 valve	910466.

#### Spare parts kit, Meta HK

comprising: 1 ceramic plunger, 4 valve balls, 4 ball seat discs, 2 plunger packings of PTFE/graphite, 2 plunger guide ribbons, 14 gaskets, 2 O-rings

for Meta FK 12.5	910470.
for Meta FK 25	910471.
for Meta FK 50	910472.

#### Pump diaphragm, PTFE

ProMinent® DEVELOPAN® pump diaphragm of fabric-reinforced EPDM, with large-area vulcanised steel core and PTFE Teflon coating on the media-contacted surface.



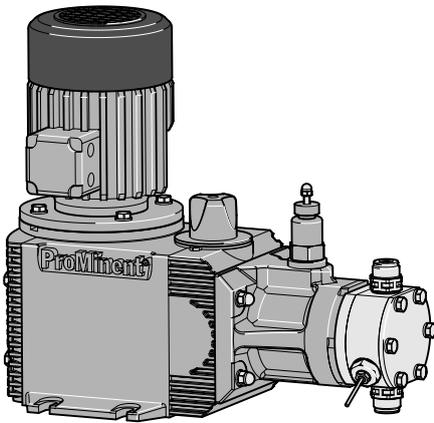
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Meta, Makro TZ FM 130	811470.
Meta, Makro TZ FM 260	811471.
Meta, Makro TZ FM 530	811472.
Makro TZ FM 1500	811473.

# 2.6 ProMinent® Hydro Hydraulic Diaphragm Metering Pumps

2.6

Hydro hydraulic Diaphragm Metering Pumps



### Hydro main pump H

The hydraulic diaphragm metering pump is a standard sized metering pump with a 0.37/0.75 kW dual wound three phase motor, 230/400 V, 50/60 Hz, enclosure rating IP 55, insulation class F. The stroke length is 15 mm and is adjustable within 1 % accuracy. The cast aluminium housing is combined at any one time with 4 gear reductions. Comes in 2 liquid end sizes and 2 liquid end materials. All pump types are standard sized and fitted with a preset bypass (**relief**) valve integrated into the hydraulics, as well as a multi-layer diaphragm with diaphragm rupture signalling. Metering reproducibility under defined conditions and when installed correctly, is better than  $\pm 1$  % in a stroke length range of between 20 and 100 % (instructions in the operating instructions manual must be followed precisely).

### Hydro double-head version

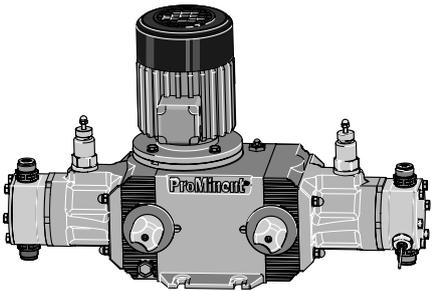
The double-head version is fitted with a second liquid end which operates on a push-pull action (Boxer principle). Each liquid end is provided with a separate stroke length-adjusting knob so that each liquid end can operate at an independent feed rate.

### Hydro add-on pumps

For the Hydro add-on pumps the same basic instructions apply as for the simplex pumps. A main power end can be combined with an add-on power end in both simplex and duplex forms.

### Hydro Triplex

The Hydro Triplex pump comprises a main drive (arranged centrally) and 2 add-on drives. Typical applications for Triplex pumps include metering applications in medium to upper pressure levels with pulsation reduction. The pulsation damping features are produced by the offset pressure stroke (offset 120° crank angle).



### Stroke length actuator/controller

Actuator for automatic stroke length adjustment, actuating period approx. 1 sec for 1% stroke length, 1k Ohm response signal potentiometer, enclosure rating IP 54.

Controller consists of actuator with servomotor and integrated servo control for stroke length adjustment via a standard signal. Standard signal input 0/4-20 mA, corresponds to stroke length 0 - 100 %. Automatic/manual operation selection key for manual stroke adjustment. Mechanical status display of actual stroke length value output 0/4-20 mA for remote display.

### Variable speed motors with integrated speed controller (identcode characteristic V)

Power supply 1 ph 230 V, 50/60 Hz, 0.18 kW

External control with 0/4-20 mA

# 2.6 ProMinent® Hydro/ 2 - Single Head Hydraulic Diaphragm Metering Pumps

## 2.6.1 Hydro/ 2 Technical Data

Type HP2aH	With motor 1500 rpm at 50 Hz			With motor 1800 rpm at 60 Hz			Suction height mWC	Perm. admiss. pressure suction side bar	Connec- tion on suction/ pressure side G-DN	Shipping weight kg	
	backpressure bar	Delivery rate at max. l/h ml/stroke	Max. stroke rate strokes/ min	backpressure psi	Delivery rate at max. l/h / gph	Max. stroke rate strokes/ min					
100003*	100	3	0.8	60	1,450	3.6/1.0	72	3.0	5	Rp 1/4	31
100006*	100	6	0.8	125	1,450	7.0/1.8	150	3.0	5	Rp 1/4	31
100007*	100	7	0.8	150	1,450	8.0/2.1	180	3.0	5	Rp 1/4	31
100009*	100	9	0.8	187	1,450	11.0/2.9	224	3.0	5	Rp 1/4	31
100010*	100	10	0.8	212	-	-	-	3.0	5	Rp 1/4	31
064007	64	7	2.0	60	928	8.4/2.2	72	3.0	5	G 3/4-10	31
064015	64	15	2.0	125	928	18.0/4.8	150	3.0	5	G 3/4-10	31
064018	64	18	2.0	150	928	21.0/5.5	180	3.0	5	G 3/4-10	31
064022	64	22	2.0	187	928	26.0/6.9	224	3.0	5	G 3/4-10	31
064025	64	25	2.0	212	-	-	-	3.0	5	G 3/4-10	31
025019	25	19	5.3	60	362	23.0/6.	172	3.0	5	G 3/4-10**	31
025040	25	40	5.3	125	362	48.0/12.7	150	3.0	5	G 3/4-10**	31
025048	25	48	5.3	150	362	58.0/15.3	180	3.0	5	G 3/4-10**	31
025060	25	60	5.3	187	362	72.0/19.0	224	3.0	5	G 3/4-10**	31
025068	25	68	5.3	212	-	-	-	3.0	5	G 3/4-10**	31

Material version PVDF max. 25 bar.

\* Material version SST/HCT with double ball valve, valve connection on suction/pressure side

\*\* HV version for G1-DN 15 designed as standard with internal thread Rp 1/4 and external, thread G 3/4-DN 10

### Material in contact with media

Material	Liquid End	Suction/Discharge connector	Seals/ball seat	Valve Balls
SST	stainless steel no. 1.4571/1.4404	stainless steel no. 1.4581	PTFE/ZrO2	stainless steel
PVT	PVDF (Polyvinylidenfluoride)	PVDF (Polyvinylidenfluoride)	PTFE/PTFE	ceramic
HCT	Hast. C	Hast. C	PTFE/Hast. C	ceramic

## 2.6 Hydro/ 3 Technical Data

Type HP3aH	With motor 1500 rpm at 50 Hz			With motor 1800 rpm at 60 Hz			Suction height mWC	Perm. admiss. pressure at max. bar	Connec- tion on suction/ pressure side G-DN	Shipping weight kg	
	backpressure bar	Delivery rate at max. stroke	Max. Delivery rate stroke	psi	side l/h / gph	side strokes/ min					
100010*	100	10	2.8	60	1,450	12.0/3.2	72	3.0	5	Rp 1/4	41
100021*	100	21	2.8	125	1,450	25.0/6.6	150	3.0	5	Rp 1/4	41
100025*	100	25	2.8	150	1,450	30.0/7.9	180	3.0	5	Rp 1/4	41
100041*	100	41	2.8	187	1,450	37.0/9.8	224	3.0	5	Rp 1/4	41
100035*	100	35	2.8	212	-	-	-	3.0	5	Rp 1/4	41
064019	64	19	5.3	60	928	23.0/6.1	72	3.0	5	G 3/4-10**	41
064040	64	40	5.3	125	928	48.0/12.7	150	3.0	5	G 3/4-10**	41
064048	64	48	5.3	150	928	58.0/15.3	180	3.0	5	G 3/4-10**	41
064060	64	60	5.3	187	928	72.0/19.0	224	3.0	5	G 3/4-10**	41
064068	64	68	5.3	212	-	-	-	3.0	5	G 3/4-10**	41
025048	25	48	13.4	60	362	58.0/15.3	172	3.0	5	G 1-15***	41
025100	25	100	13.4	125	362	120.0/31.7	150	3.0	5	G 1-15***	41
025120	25	120	13.4	150	362	144.0/38.0	180	3.0	5	G 1-15***	41
025150	25	150	13.4	187	362	180.0/47.6	224	3.0	5	G 1-15***	41
025170	25	170	13.4	212	-	-	-	3.0	5	G 1-15***	41

Material version PVDF max. 25 bar.

\* Material version SST/HCT with double ball valve, valve connection on suction/pressure side

\*\* HV version for G1-DN 15 designed as standard with internal thread Rp 1/4 and external, thread G 3/4-DN 10

\*\*\* HV version for G1 1/4"-DN 20 connection

### Material in contact with media

Material	Liquid End	Suction/Discharge connector	Seals/ball seat	Valve Balls
SST	stainless steel no. 1.4571/1.4404	stainless steel no. 1.4581	PTFE/ZrO2	stainless steel
PVT	PVDF (Polyvinylidenfluoride)	PVDF (Polyvinylidenfluoride)	PTFE/PTFE	ceramic
HCT	Hast. C	Hast. C	PTFE/Hast. C	ceramic

# 2.6 ProMinent® Hydro/ 2 - Single Head Hydraulic Diaphragm Metering Pumps

## 2.6.2 Identity Code Ordering System For Hydro/ 2 - Single Head

**HP2a**

**Hydro/ 2**

<b>H</b>	<b>Main power end</b>		
	<b>Pump type:</b>	<b>Pump type:</b>	<b>Pump type:</b>
	100003 100 bar, 3 litre	064007 64 bar, 7 litre	025019 25 bar, 19 litre
	100006 100 bar, 6 litre	064015 64 bar, 15 litre	025040 25 bar, 40 litre
	100007 100 bar, 7 litre	064018 64 bar, 18 litre	025048 25 bar, 48 litre
	100009 100 bar, 9 litre	064022 64 bar, 22 litre	025060 25 bar, 60 litre
	100010 100 bar, 10 litre	064025 64 bar, 25 litre	025068 25 bar, 68 litre
	<b>PVT Liquid End Maximum 25 Bar</b>		
	<b>Liquid end material:</b>		
	PV PVDF		
	SS Stainless steel		
	HC Hastalloy C		
	<b>Seal material:</b>		
	T PTFE seal		
	<b>Positive displacement element:</b>		
	0 Standard multi-layer diaphragm with rupture protection signal		
	<b>Liquid end version:</b>		
	0 No valve springs		
	1 With valve springs		
	D Double ball valve		
	H HV-Version (only for PVDF version 025019-025060)		
	<b>Hydraulic connector:</b>		
	0 Standard threaded connector <i>SEE NOTE IN BOX BELOW</i>		
	E With DIN ISO flange		
	F With ANSI flange		
	<b>Version:</b>		
	0 With ProMinent® logo		
	1 Without ProMinent® logo		
	<b>Power supply:</b>		
	S 3 ph. 230 V/400 V 50/60 Hz, 0.37kW		
	L 3 ph. 230 V/400 V 50 Hz (EExe, EExde) } See Enclosure Rating		
	P 3 ph. 230 V/400 V 60 Hz (EExe, EExde) } See Enclosure Rating		
	R 3ph, variable speed motor 4 pol. 230/400 V		
	V (0) var. speed motor with integral speed control 230/1/50		
	V (2) var. speed motor with integral speed control Exd		
	<b>Enclosure rating:</b>		
	0 IP 55		
	1 Exe motor version (ATEX-T3)		
	2 Exde motor version (ATEX-T4)		
	<b>Stroke sensor:</b>		
	0 No stroke sensor (standard)		
	1 Stroke sensor for explosion-proof applications		
	<b>Stroke length adjustment:</b>		
	0 Manual (standard)		
	1 With stroke positioning motor, 230V/50/60Hz		
	2 With stroke positioning motor, 115V/60Hz		
	B With stroke control motor, 4...20 mA 230 V/50/60Hz		
	D With stroke control motor, 4...20 mA 115 V/50/60Hz		
	<b>Hydraulic oil:</b>		
	0 Standard		
	1 Food products grade		
	2 Temp. < 10 °C		
	<b>Prepack Option</b>		
	<b>P*</b> See options		

**Prepack option P\* for PVDF**  
**P0** - 064007 - 064015 - 064018 - 064022 - 064025  
 025019 - 025040 - 025048 - 025060 - 025068  
 1/2" Male BSPT PVDF adaptor

**for SS**  
 064007 - 064015 - 064018 - 064022 - 064025  
 025019 - 025040 - 025048 - 025060 - 025068  
 3/8" Female BSP insert and union nut

**HP2a H 025060 SS T 0 0 0 0 S 0 0 0 0 P1**

# 2.6 ProMinent® Hydro/ 2 - Double Head Hydraulic Diaphragm Metering Pumps

## 2.6.3 Identity Code Ordering System For Hydro/ 2 - Double Head

HP2a

Hydro/ 2

<b>D</b>	<b>Main power end, duplexed</b>		
	<b>Pump type:</b>	<b>Pump type:</b>	<b>Pump type:</b>
	100003 100 bar, 3 litre	064007 64 bar, 7 litre	025019 25 bar, 19 litre x 2
	100006 100 bar, 6 litre	064015 64 bar, 15 litre	025040 25 bar, 40 litre x 2
	100007 100 bar, 7 litre	064018 64 bar, 18 litre	025048 25 bar, 48 litre x 2
	100009 100 bar, 9 litre	064022 64 bar, 22 litre	025060 25 bar, 60 litre x 2
	100010 100 bar, 10 litre	064025 64 bar, 25 litre	025068 25 bar, 68 litre x 2
	<b>PVT Liquid End Maximum 25 Bar</b>		
	<b>Liquid end material:</b>		
PV	PVDF		
SS	Stainless steel		
HC	Hastalloy C		
	<b>Seal material:</b>		
T	PTFE seal		
	<b>Positive displacement element:</b>		
0	Standard multi-layer diaphragm with rupture protection signal		
	<b>Liquid end version:</b>		
0	No valve springs		
1	With valve springs		
D	Double ball valve		
H	HV-Version (only for PVDF version 025019-025060)		
	<b>Hydraulic connector:</b>		
0	Standard threaded connector SEE NOTE IN BOX BELOW		
E	With DIN ISO flange		
F	With ANSI flange		
	<b>Version:</b>		
0	With ProMinent® logo		
1	Without ProMinent® logo		
	<b>Power supply:</b>		
S	3 ph. 230 V/400 V 50/60 Hz, 0.37kW		
L	3 ph. 230 V/400 V 50 Hz (EExe, EExde) } See Enclosure Rating		
P	3 ph. 230 V/400 V 60 Hz (EExe, EExde) } See Enclosure Rating		
R	3ph, variable speed motor 4 pol. 230/400 V		
V (0)	var. speed motor with integral speed control 230/1/50		
V (2)	var. speed motor with integral speed control Exd		
	<b>Enclosure rating:</b>		
0	IP 55		
1	Exe motor version (ATEX-T3)		
2	Exde motor version (ATEX-T4)		
	<b>Stroke sensor:</b>		
0	No stroke sensor (standard)		
1	Stroke sensor for explosion-proof applications		
	<b>Stroke length adjustment:</b>		
0	Manual (standard)		
1	With stroke positioning motor, 230V/50/60Hz		
2	With stroke positioning motor, 115V/60Hz		
B	With stroke control motor, 4...20 mA 230 V/50/60Hz		
D	With stroke control motor, 4...20 mA 115 V/50/60Hz		
	<b>Hydraulic oil:</b>		
0	Standard		
1	Food products grade		
2	Temp. < 10 °C		
	<b>Prepack Option</b>		
P*	See options		

**Prepack option P\* for PVDF**

P0 - 064007 - 064015 - 064018 - 064022 - 064025  
 025019 - 025040 - 025048 - 025060 - 025068  
 1/2" Male BSPT PVDF adaptor

**for SS**

064007 - 064015 - 064018 - 064022 - 064025  
 025019 - 025040 - 025048 - 025060 - 025068  
 3/8" Female BSP insert and union nut

HP2a D 025060 SS T 0 0 0 0 S 0 0 0 0 P1

# 2.6 ProMinent® Hydro/ 3 - Single Head Hydraulic Diaphragm Metering Pumps

## 2.6.4 Identity Code Ordering System For Hydro/ 3 - Single Head

HP3a

Hydro/ 3

**H** Main power end

Pump type:		Pump type:		Pump type:	
100010	100 bar, 10 litre	064019	64 bar, 19 litre	025048	25 bar, 48 litre
100021	100 bar, 21 litre	064040	64 bar, 40 litre	025100	25 bar, 100 litre
100025	100 bar, 25 litre	064048	64 bar, 48 litre	025120	25 bar, 120 litre
100031	100 bar, 31 litre	064060	64 bar, 60 litre	025150	25 bar, 150 litre
100035	100 bar, 35 litre	064068	64 bar, 68 litre	025170	25 bar, 170 litre

**PVT Liquid End Maximum 25 Bar**

Liquid end material:	
PV	PVDF
SS	Stainless steel
HC	Hastalloy C

Seal material:	
T	PTFE seal

Positive displacement element:	
0	Standard multi-layer diaphragm with rupture protection signal

Liquid end version:	
0	No valve springs
1	With valve springs
D	Double ball valve
H	HV-Version (only for PVDF version)

Hydraulic connector:	
0	Standard threaded connector SEE NOTE IN BOX BELOW
E	With DIN ISO flange
F	With ANSI flange

Version:	
0	With ProMinent® logo
1	Without ProMinent® logo

Power supply:	
S	3 ph. 230 V/400 V 50/60 Hz, 0.75kW
L	3 ph. 230 V/400 V 50 Hz (EExe, EExde) } See Enclosure Rating
P	3 ph. 230 V/400 V 60 Hz (EExe, EExde) } See Enclosure Rating
R	3ph, variable speed motor 4 pol. 230/400 V
V (0)	var. speed motor with integral speed control 230/1/50
V (2)	var. speed motor with integral speed control Exd

Enclosure rating:	
0	IP 55
1	Exe motor version (ATEX-T3)
2	Exde motor version (ATEX-T4)

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, 230V/50/60Hz
2	With stroke positioning motor, 115V/60Hz
B	With stroke control motor, 4...20 mA 230 V/50/60Hz
D	With stroke control motor, 4...20 mA 115 V/50/60Hz

Hydraulic oil:	
0	Standard
1	Food products grade
2	Temp. < 10 °C

Prepack Option	
P*	See options

**Prepack option P\* for PVDF**  
**P0** - 064019 - 064040 - 064048 - 064060 - 064068  
 1/2" Male BSPT PVDF adaptor  
 025048 - 025100 - 025120 - 025150 - 025170  
 3/4" Male BSPT PVDF adaptor

**for SS**  
 064019 - 064040 - 064048 - 064060 - 064068  
 3/8" Female BSP insert and union nut  
 025048 - 025100 - 025120 - 025150 - 025170  
 1/2" Female BSP insert and union nut

HP3a H 100035 SS T 0 0 0 0 S 0 0 0 0 P1

# 2.6 ProMinent® Hydro/ 3 - Double Head Hydraulic Diaphragm Metering Pumps

## 2.6.5 Identity Code Ordering System For Hydro/ 3 - Double Head

HP3a

Hydro/ 3

<b>D</b>	<b>Main power end, duplexed</b>					
	<b>Pump type:</b>		<b>Pump type:</b>		<b>Pump type:</b>	
	100010	100 bar, 10 litre	064019	64 bar, 19 litre	025048	25 bar, 48 litre x 2
	100021	100 bar, 21 litre	064040	64 bar, 40 litre	025100	25 bar, 100 litre x 2
	100025	100 bar, 25 litre	064048	64 bar, 48 litre	025120	25 bar, 120 litre x 2
	100031	100 bar, 31 litre	064060	64 bar, 60 litre	025150	25 bar, 150 litre x 2
	100035	100 bar, 35 litre	064068	64 bar, 68 litre	025170	25 bar, 170 litre x 2
	<b>PVT Liquid End Maximum 25 Bar</b>					

	<b>Liquid end material:</b>
PV	PVDF
SS	Stainless steel
HC	Hastalloy C

	<b>Seal material:</b>
T	PTFE seal

0	<b>Positive displacement element:</b> Standard multi-layer diaphragm with rupture protection signal
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	<b>Liquid end version:</b>
0	No valve springs
1	With valve springs
D	Double ball valve
H	HV-Version (only for PVDF version)

	<b>Hydraulic connector:</b>
0	Standard threaded connector <i>SEE NOTE IN BOX BELOW</i>
E	With DIN ISO flange
F	With ANSI flange

	<b>Version:</b>
0	With ProMinent® logo
1	Without ProMinent® logo

	<b>Power supply:</b>
S	3 ph. 230 V/400 V 50/60 Hz, 0.75kW
L	3 ph. 230 V/400 V 50 Hz (EExe, EExde) } See Enclosure Rating
P	3 ph. 230 V/400 V 60 Hz (EExe, EExde) } See Enclosure Rating
R	3ph, variable speed motor 4 pol. 230/400 V
V (0)	var. speed motor with integral speed control 230/1/50
V (2)	var. speed motor with integral speed control Exd

	<b>Enclosure rating:</b>
0	IP 55
1	Exe motor version (ATEX-T3)
2	Exde motor version (ATEX-T4)

	<b>Stroke sensor:</b>
0	No stroke sensor (standard)
1	Stroke sensor for explosion-proof application

	<b>Stroke length adjustment:</b>
0	Manual (standard)
1	With stroke positioning motor, 230V/50/60Hz
2	With stroke positioning motor, 115V/60Hz
B	With stroke control motor, 4...20 mA 230 V/50/60Hz
D	With stroke control motor, 4...20 mA 115 V/50/60Hz

	<b>Hydraulic oil:</b>
0	Standard
1	Food products grade
2	Temp. < 10 °C

<b>P*</b>	<b>Prepack Option</b> See options
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**Prepack option P\* for PVDF**

**P0** - 064019 - 064040 - 064048 - 064060 - 064068  
1/2" Male BSPT PVDF adaptor  
025048 - 025100 - 025120 - 025150 - 025170  
3/4" Male BSPT PVDF adaptor

**for SS**

064019 - 064040 - 064048 - 064060 - 064068  
3/8" Female BSP insert and union nut  
025048 - 025100 - 025120 - 025150 - 025170  
1/2" Female BSP insert and union nut

HP3a    D    025120    SS    T    0    0    0    0    S    0    0    0    0    P1

# 2.6 ProMinent® Hydro/ 4 - Single Head Hydraulic Diaphragm Metering Pumps

## 2.6.6

## Hydro/ 4 Technical Data



Type HP4aH	With motor 1500 rpm at 50 Hz			With motor 1800 rpm at 60 Hz			Suction height  mWC	Perm. admiss. pressure suction side bar	Connec- tion on suction/ pressure side G-DN	Shipping weight  kg
	bar	Delivery rate at max. backpressure l/h	Max. stroke rate strokes/ min	psi	Delivery rate at max. backpressure l/h	Max. stroke rate strokes/ min				
250130	25	130	71	363	155	86	3	1	1-1/2" 25	69
250190	25	190	103	363	230	124	3	1	1-1/2" 25	69
250250	25	250	136	363	300	164	3	1	1-1/2" 25	69
250350	25	350	188	363	420	225	3	1	1-1/2" 25	69
250400	25	400	214	-	-	-	3	1	1-1/2" 25	69
160210	16	210	71	232	250	86	3	1	1-1/2" 25	76
160300	16	300	103	232	360	124	3	1	1-1/2" 25	76
160400	16	400	136	232	480	164	3	1	1-1/2" 25	76
160550	16	550	188	232	660	225	3	1	1-1/2" 25	76
160625	16	625	214	-	-	-	3	1	1-1/2" 25	76
100330	10	330	71	145	400	86	3	1	2" 32	87
100480	10	480	103	145	580	124	3	1	2" 32	87
100635	10	635	136	145	760	164	3	1	2" 32	87
100880	10	880	188	145	1050	225	3	1	2" 32	87
101000	10	1000	214	-	-	-	3	1	2" 32	87
070465	7	465	71	102	560	86	3	1	2-1/4" 40	96
070670	7	670	103	102	805	124	3	1	2-1/4" 40	96
070890	7	890	136	102	1070	164	3	1	2-1/4" 40	96
071230	7	1230	188	102	1450	225	3	1	2-1/4" 40	96
071400	7	1400	214	-	-	-	3	1	2-1/4" 40	96

### Material in contact with media

Material	Liquid End	Suction/Discharge connector	Seals/ball seat	Valve Balls
SST	stainless steel 1.4404	stainless steel no. 1.4401	PTFE/PTFE	stainless steel 1.4404
PVT	PVDF (Polyvinylidenfluoride)	PVDF (Polyvinylidenfluoride)	PTFE/PTFE	glass
HCT	Hast. C	Hast. C	PTFE/PTFE	Hast. C

DN32 and DN40 plate valves		Suction/Discharge connector	Seals/seats	Valve plates	Springs
Material	Liquid End	stainless steel no. 1.4401	PTFE/PTFE	stainless steel 1.4404	Hast. C
SST	stainless steel 1.4404	PVDF (Polyvinylidenfluoride)	PTFE/PTFE	ceramic	C-CTFE
PVT	PVDF (Polyvinylidenfluoride)	Hast. C	PTFE/PTFE	Hast. C	C-CTFE
HCT	Hast. C				

# 2.6 ProMinent® Hydro/ 4 - Single Head Hydraulic Diaphragm Metering Pumps

## 2.6.7 Identity Code Ordering System For Hydro/ 4 - Single Head

HP4a

Hydro/ 4

<b>H Main power end</b>	
<b>Pump type:</b>	<b>Pump type:</b>
250130 25 bar, 130 l/h <b>PVT</b>	160210 16 bar, 210 l/h <b>PVT</b>
250190 25 bar, 190 l/h <b>SS</b>	160300 16 bar, 300 l/h <b>SS</b>
250250 25 bar, 250 l/h	160400 16 bar, 400 l/h
250350 25 bar, 350 l/h	160550 16 bar, 550 l/h
250400 25 bar, 400 l/h	160625 16 bar, 625 l/h
100330 10 bar, 330 l/h <b>PVT</b>	070465 7 bar, 465 l/h <b>PVT</b>
100480 10 bar, 480 l/h <b>SS</b>	070670 7 bar, 670 l/h <b>SS</b>
100635 10 bar, 625 l/h	070890 7 bar, 890 l/h
100880 10 bar, 880 l/h	071230 7 bar, 1230 l/h
101000 10 bar, 1000 l/h	071400 7 bar, 1400 l/h
<b>Liquid end material:</b>	
PV PVDF	
SS Stainless steel	
HC Hastalloy C <i>Price on Application</i>	
<b>Seal material:</b>	
T PTFE seal	
<b>Positive displacement element:</b>	
0 Standard multi-layer diaphragm with rupture protection signal	
<b>Liquid end version:</b>	
0 No valve springs	
1 With valve springs DN32 and DN40	
<b>Hydraulic connector:</b>	
0 Standard threaded connector	
E With DIN ISO flange	
F With ANSI flange	
<b>Version:</b>	
0 With ProMinent® logo, with overpressure signal	
1 Without ProMinent® logo, with overpressure signal	
M Modified	
<b>Power supply:</b>	
S 3 ph. 230 V/400 V 50/60 Hz, 1.1kw	
L 3 ph. 230 V/400 V 50 Hz (Exe, Exd) } See Enclosure Rating	
P 3 ph. 230 V/400 V 60 Hz (Exe, Exd) } See Enclosure Rating	
R 3ph, variable speed motor 4 pol. 230/400 V 1.5 kw	
V (0) var. speed motor with integral speed control 230/1/50	
V (2) var. speed motor with integral speed control Exd	
<b>Enclosure rating:</b>	
0 IP 55	
1 Exe motor version (ATEX-T3)	
2 Exde motor version (ATEX-T4)	
<b>Stroke sensor:</b>	
0 No stroke sensor (standard)	
1 Stroke sensor for explosion-proof applications	
<b>Stroke length adjustment:</b>	
0 Manual (standard)	
1 With stroke positioning motor, 230V/50/60Hz	
2 With stroke positioning motor, 115V/60Hz	
B With stroke control motor, 4...20 mA 230 V/50/60Hz	
D With stroke control motor, 4...20 mA 115 V/50/60Hz	
<b>Hydraulic oil:</b>	
0 Standard	
1 Food products grade	
2 Low Temp. to -25 °C	
<b>Hydraulic oil:</b>	
<b>P*</b> See options	

**Prepack option P\* for PVDF**  
**P0** - 250130 - 250190 - 250250 - 250350 - 250400  
 160210 - 160300 - 160400 - 160550 - 160625  
 1" Male BSPT PVDF adaptor  
 100330 - 100480 - 100635 - 100880 - 101000  
 1-1/2" Male BSPT SS Insert and Union Nut

**for SS**  
 250130 - 250190 - 250250 - 250350 - 250400  
 160210 - 160300 - 160400 - 160550 - 160625  
 1" Male BSPT PVDF adaptor  
 100330 - 100480 - 100635 - 100880 - 101000  
 1-1/2" Male BSPT SS Insert and Union Nut

HP4a H 025130 SS T 0 0 0 0 S 0 0 0 0 P1

# 2.6 ProMinent® Hydro/ 4 - Double Head Hydraulic Diaphragm Metering Pumps

## 2.6.8 Identity Code Ordering System For Hydro/ 4 - Double Head

**HP4a Hydro/ 4**

**D Main power end Double Head V\version**

Pump type:			Pump type:		
250130	25 bar, 130 l/h	PVT	160210	16 bar, 210 l/h	PVT
250190	25 bar, 190 l/h	SS	160300	16 bar, 300 l/h	SS
250250	25 bar, 250 l/h		160400	16 bar, 400 l/h	
250350	25 bar, 350 l/h		160550	16 bar, 550 l/h	
250400	25 bar, 400 l/h		160625	16 bar, 625 l/h	
100330	10 bar, 330 l/h	PVT	070465	7 bar, 465 l/h	PVT
100480	10 bar, 480 l/h	SS	070670	7 bar, 670 l/h	SS
100635	10 bar, 625 l/h		070890	7 bar, 890 l/h	
100880	10 bar, 880 l/h		071230	7 bar, 1230 l/h	
101000	10 bar, 1000 l/h		071400	7 bar, 1400 l/h	

**Liquid end material:**

PV	PVDF
SS	Stainless steel
HC	Hastalloy C <i>Price on Application</i>

**Seal material:**

T	PTFE seal
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**Positive displacement element:**

0	Standard multi-layer diaphragm with rupture protection signal
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**Liquid end version:**

0	No valve springs
1	With valve springs DN32 and DN40

**Hydraulic connector:**

0	Standard threaded connector
E	With DIN ISO flange
F	With ANSI flange

**Version:**

0	With ProMinent® logo, with overpressure signal
1	Without ProMinent® logo, with overpressure signal
M	Modified

**Power supply:**

S	3 ph. 230 V/400 V 50/60 Hz, 1.1kw
L	3 ph. 230 V/400 V 50 Hz (Exe, Exd) } See Enclosure Rating
P	3 ph. 230 V/400 V 60 Hz (Exe, Exd) } See Enclosure Rating
R	3ph, variable speed motor 4 pol. 230/400 V 1.5 kw
V (0)	var. speed motor with integral speed control 230/1/50
V (2)	var. speed motor with integral speed control Exd

**Enclosure rating:**

0	IP 55
1	Exe motor version (ATEX-T3)
2	Exde motor version (ATEX-T4)

**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, 230V/50/60Hz
2	With stroke positioning motor, 115V/60Hz
B	With stroke control motor, 4...20 mA 230 V/50/60Hz
D	With stroke control motor, 4...20 mA 115 V/50/60Hz

**Hydraulic oil:**

0	Standard
1	Food products grade
2	Low Temp. to -25 °C

**Hydraulic oil:**  
P\* See options

**Prepack option P\* for PVDF**  
**P0** - 250130 - 250190 - 250250 - 250350 - 250400  
 160210 - 160300 - 160400 - 160550 - 160625  
 1" Male BSPT PVDF adaptor  
 100330 - 100480 - 100635 - 100880 - 101000  
 1-1/2" Male BSPT SS Insert and Union Nut  
**for SS**  
 250130 - 250190 - 250250 - 250350 - 250400  
 160210 - 160300 - 160400 - 160550 - 160625  
 1" Male BSPT PVDF adaptor  
 100330 - 100480 - 100635 - 100880 - 101000  
 1-1/2" Male BSPT SS Insert and Union Nut

HP4a H 025130 SS T 0 0 0 0 S 0 0 0 0 P1

# 2.6 ProMinent® Hydro/ Spare Parts Kits Hydraulic Diaphragm Metering Pumps

## 2.6.9

### Spare Parts Kits

The spare parts kits generally contain the consumable components for the liquid ends.

#### Supplied as standard for SST material version

- 1 dosing diaphragm
- 2 valve balls
- 1 seal set

#### Supplied as standard for PVT material version

- 1 dosing diaphragm
- 1 suction connector set
- 1 discharge connector set
- 2 valve balls
- 1 seal set

### Spare parts kits Hydro/ 2

Applies to identity code:

Type 100010, 100009, 100007, 100006, 100003,  
064025, 064022, 064018, 064015, 064007,

FMH 25 - DN 10	PVT	1005548.
	SST	1005549.
	SST (with 2 valve set)	1005550.

Applies to identity code:

Type 025068, 025060, 025048, 025040, 025019

FMH 60 - DN 10	PVT	1005552.
	SST	1005553.
	SST (with 2 valve set)	1005554.

### Spare parts kits Hydro/ 3

Applies to identity code:

Type 100035, 100031, 100025, 100021, 100010, 064068,  
064060, 064048, 064040, 064019

FMH 60 - DN 10	PVT	1005552.
	SST	1005553.
	SST (with 2 valve set)	1005554.

Applies to identity code:

Type 025170, 025150, 025120, 025100, 025048

FMH 150 - DN 15	PVT	1005556.
	SST	1005557.
	SST (with 2 valve set)	1005558.

### Pump Diaphragms PTFE/SS - 1.4404

FMH 25 applies to identity code:

Type 100010, 100009, 100007, 100006, 100003,  
064025, 064022, 064018, 064015, 064007,

FMH 25	1005545.
--------	----------

FMH 60 applies to identity code:

Type 025068, 025060, 025048, 025040, 025019,  
100035, 100031, 100025, 100021, 100010, 064068,  
064060, 064048, 064040, 064019

FMH 60	1005546.
--------	----------

FMH 150 applies to identity code:

025150, 025120, 025100, 025048

FMH 150	1005547.
---------	----------

### Pump Diaphragms PTFE/Hastalloy C covered with PTFE

FMH 25 applies to identity code:

064025, 064022, 064018, 064015, 064007

FMH 25	1006481.
--------	----------

FMH 60 applies to identity code:

025068, 025060, 025048, 025040, 025019,  
064068, 064060, 064048, 064040, 064019

FMH 60	1006482.
--------	----------

FMH 150 applies to identity code:

025170, 025150, 025120, 025100, 025048

FMH 150	1006483.
---------	----------

## 2.6 ProMinent® Hydro/ Spare Parts Kits Hydraulic Diaphragm Metering Pumps

2.6.10

### Spare Parts Kits

#### Spare parts kits Hydro/ 4

Applies to identity code:		Part No.
Type 250130, 250190, 250250, 250350, 250400		
<b>FMH 400 - DN 25</b>	PVT	<b>1023057.</b>
	SST	<b>1040812.</b>
	SST (with 2 valve set)	<b>1040813.</b>

Applies to identity code:		Part No.
Type 160210, 160300, 160400, 160550, 160625		
<b>FMH 625 - DN 32</b>	PVT	<b>1040863.</b>
	SST	<b>1040824.</b>
	SST (with 2 valve set)	<b>1040825.</b>

Applies to identity code:		Part No.
Type 100330, 100480, 100635, 100880, 101000		
<b>FMH 1000 - DN 32</b>	PVT	<b>1040866.</b>
	SST	<b>1040826.</b>
	SST (with 2 valve set)	<b>1040827.</b>

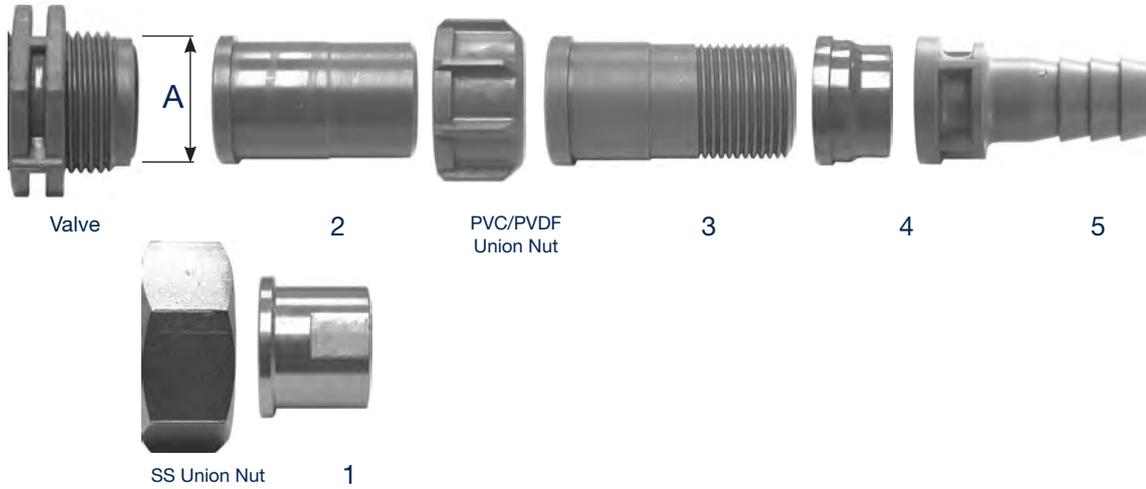
Applies to identity code:		Part No.
Type 070465, 070670, 070890, 071230, 071400		
<b>FMH 1400 - DN 40</b>	PVT	<b>1040869.</b>
	SST	<b>1040828.</b>
	SST (with 2 valve set)	<b>1040829.</b>

Hydro /4 Diaphragm PTFE/1.4404	Part No.
Type 250130, 250190, 250250, 250350, 250400	1040808
Type 160210, 160300, 160400, 160550, 160625	1040809
Type 100330, 100480, 100635, 100880, 101000	1040810
Type 070465, 070670, 070890, 071230, 071400	1040811

Hydro /4 Diaphragm PTFE/Hast.C coated	Part No.
Type 250130, 250190, 250250, 250350, 250400	1040874
Type 160210, 160300, 160400, 160550, 160625	1040875
Type 100330, 100480, 100635, 100880, 101000	1040876
Type 070465, 070670, 070890, 071230, 071400	1040877

# 2.6 ProMinent® Adaptor Sizes for Motor Pumps

## Adaptor Sizes



### Standard Sizes & Fittings for Motor Driven Pumps

			1	2	3	4	5
Size	'A' Actual dia.	'A'	SSF Socket	SWM PVC	BSPM PVC/PVDF	SWF PVC	Hosetail PVC/PVDF
DN10	21.3 mm	3/4"	3/8" BSP	15 NB	1/2"		16 mm
DN15	32.8 mm	1"	1/2" BSP	20 NB	3/4"		20 mm
DN20	41.6 mm	1-1/4"	3/4" BSP	25 NB	1"		25 mm
DN25	47.5 mm	1-1/2"	1" BSP	25 NB	1"		25 mm
DN32	58.8 mm	2"	1-1/4" BSP		1-1/2"	32 NB	32 mm
DN40	65.1 mm	2-1/4"	1-1/2" BSP				

		<b>Suction Discharge</b>	<b>PRV</b>
Sigma/ 1	12017 12035 10050	DN10	16 mm
	10022 10044 07065	DN10	16 mm
	07042 04084 04120	DN15	16 mm
Sigma/ 2	12050 12090 12130	DN15	16 mm
	07120 07220 04350	DN 25	16 mm
Sigma/ 3	120145 120190 120270 120330	DN25	DN10
	070410 070580 040830 041030	DN32	DN20
Hydro/ 2	ALL	DN10	
Hydro/ 3	ALL 100 bar & 64 bar pumps	DN10	
	ALL 25 bar pumps	DN15	

#### Soft Flat Gaskets

DN10 Viton	V483983
DN15 Viton	V483984
DN20 Viton	V483985
DN25 Viton	V483986
DN32 Viton	V1000308

#### Soft Flat Gaskets

DN10 EPDM	E483983
DN15 EPDM	E483984
DN20 EPDM	E483985
DN25 EPDM	E483986
DN32 EPDM	E1000308

# 2.7 Accessories ProMinent® VAMb and VAMc Spare Parts Kits

**2.7.1**

**Spare Parts Kits**

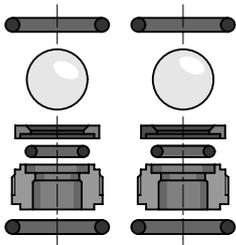
**Description/version**

**Part No**

The spare parts kit generally consists of the liquid end parts which are subject to wear.

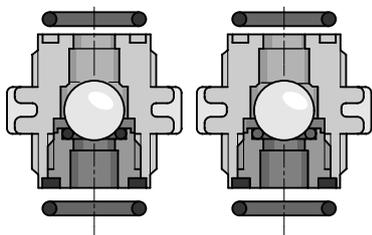
**Standard kit for PVT material version:**

- 1 pump diaphragm
- 1 suction connector compl.
- 1 discharge connector compl.
- 2 valve balls
- 1 set of seals complete (gaskets, ball seat discs)



**Standard kit for SS stainless steel version:**

- 1 pump diaphragm
- 2 valve balls
- 1 set of seals complete (gaskets, ball seat discs)



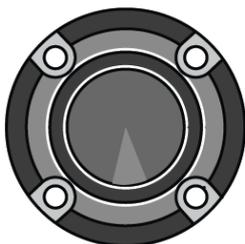
pk\_2\_002

**Spare parts kit Vario**

VAMb, 12017, 12026, 12042			
VAMc, 10008, 10016, 0726, 0742			
Liquid end FM42 - DN 10	PVT		1003641.
VAMb, 10025, 09039, 07063			
VAMc, 07012, 07024, 04039, 04063			
Liquid end FM 63 - DN 10	PVT		1003642.
VAMb, 06047, 05075, 04120			
Liquid end FM 120 - DN 15	PVT		1003643.

**Dosing diaphragms**

VAMb, 12017, 12026, 12042	811458.
VAMc, 10008, 10016, 0726, 0742	811458.
VAMb, 10025, 09039, 07063	811459.
VAMc, 07012, 07024, 04039, 04063	811459.
VAMb, 06047, 05075, 04120	811460.

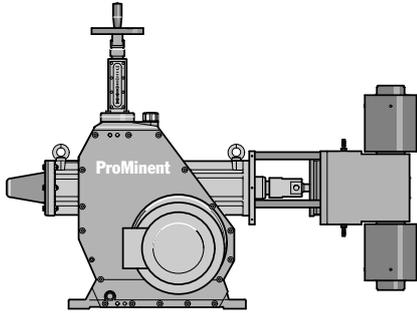


pk\_1\_008\_A

# 2.8 ProMinent® Makro/ 5 Piston Metering Pumps

## 2.8.1

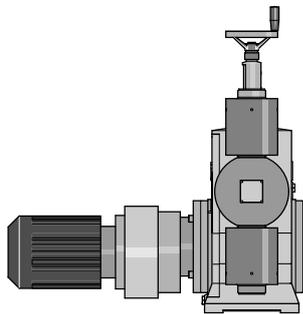
### ProMinent® Makro/ 5 Piston Metering Pumps



pk\_2\_075

#### ProMinent® Makro/ 5 HK piston Metering Pump

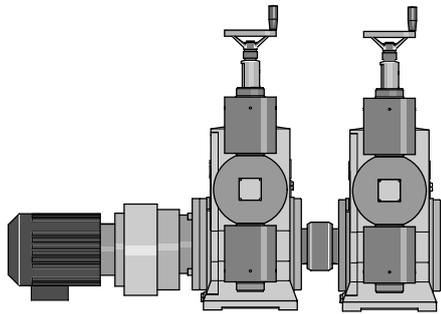
The ProMinent® Makro/ 5 piston Metering Pump is driven by a dual wound three phase, 3 kW motor, 230/400 V, 50/60 Hz, enclosure rating IP 55, insulation class F. The stroke length is adjustable between 0...50 mm. The gearbox is housed in a sea water-resistant acrylic resin lacquered cast housing. The piston liquid end is made of stainless steel 1.4571 and pistons are made of oxide ceramic or stainless steel with a ceramic wear-resistant coating. Dosing reproducibility under defined conditions and when installed correctly, is better than  $\pm 0.5\%$  in a stroke length range of between 10 and 100 % (instructions in the operating instructions manual must be followed). The suction lift varies with the density and viscosity of the dosing chemical, the connection tubing and the pump stroking rate. For all motor-driven Metering Pumps, for safety reasons, suitable overload protection must be provided during installation. A tensioning key is supplied as standard for re-tensioning packing rings.



pk\_2\_076

#### ProMinent® Makro/ 5 AK add-on pumps

The ProMinent® Makro/ 5 AK add-on piston Metering Pump can be used with the ProMinent® Makro/ 5 HK piston main power end to expand to a duplex or triplex system. (At reduced backpressures up to four add-on power ends can be combined with a single main power end.). The customer can retrofit the add-on power ends on site. If required, the main power end can be fitted with a 3 kW or a 5.5 kW motor. When using add-on power ends a mounting frame should be provided.



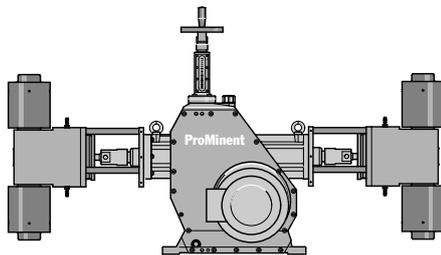
pk\_2\_077

#### ProMinent® Makro/ 5 double head version

##### HDK (main pump)/AKD (add-on pump)

For the ProMinent® Makro/ 5 HKD and AKD the same basic instructions as for the simplex pumps apply. It is also fitted, however, with a second liquid end.

The liquid ends operate in push-pull mode.



pk\_2\_078

#### Capacity with 1500 rpm motor and 50Hz

##### M5KaH

| Bar l/hr |
|----------|----------|----------|----------|----------|
| 320 0038 | 140 0120 | 050 0335 | 025 0658 | 012 1343 |
| 320 0048 | 140 0151 | 050 0419 | 025 0822 | 012 1678 |
| 320 0066 | 140 0207 | 050 0576 | 025 1129 | 012 2305 |
| 320 0085 | 140 0267 | 045 0744 | 023 1458 | 012 2977 |
| 320 0100 | 100 0314 | 035 0872 | 018 1710 | 010 3491 |
| 240 0070 | 080 0214 | 035 0483 | 016 0970 | 006 2269 |
| 240 0088 | 080 0268 | 035 0604 | 016 1212 | 006 2837 |
| 240 0121 | 080 0368 | 035 0829 | 016 1665 | 006 3896 |
| 216 0157 | 070 0476 | 030 1071 | 016 2150 | 006 5031 |
| 170 0184 | 056 0558 | 025 1257 | 016 2522 | 006 6000 |

Note: all \$ P.O.A.

contact Sydney Office

## 2.9 ProMinent®/ORLITA® Metering Pumps

### 2.9.1

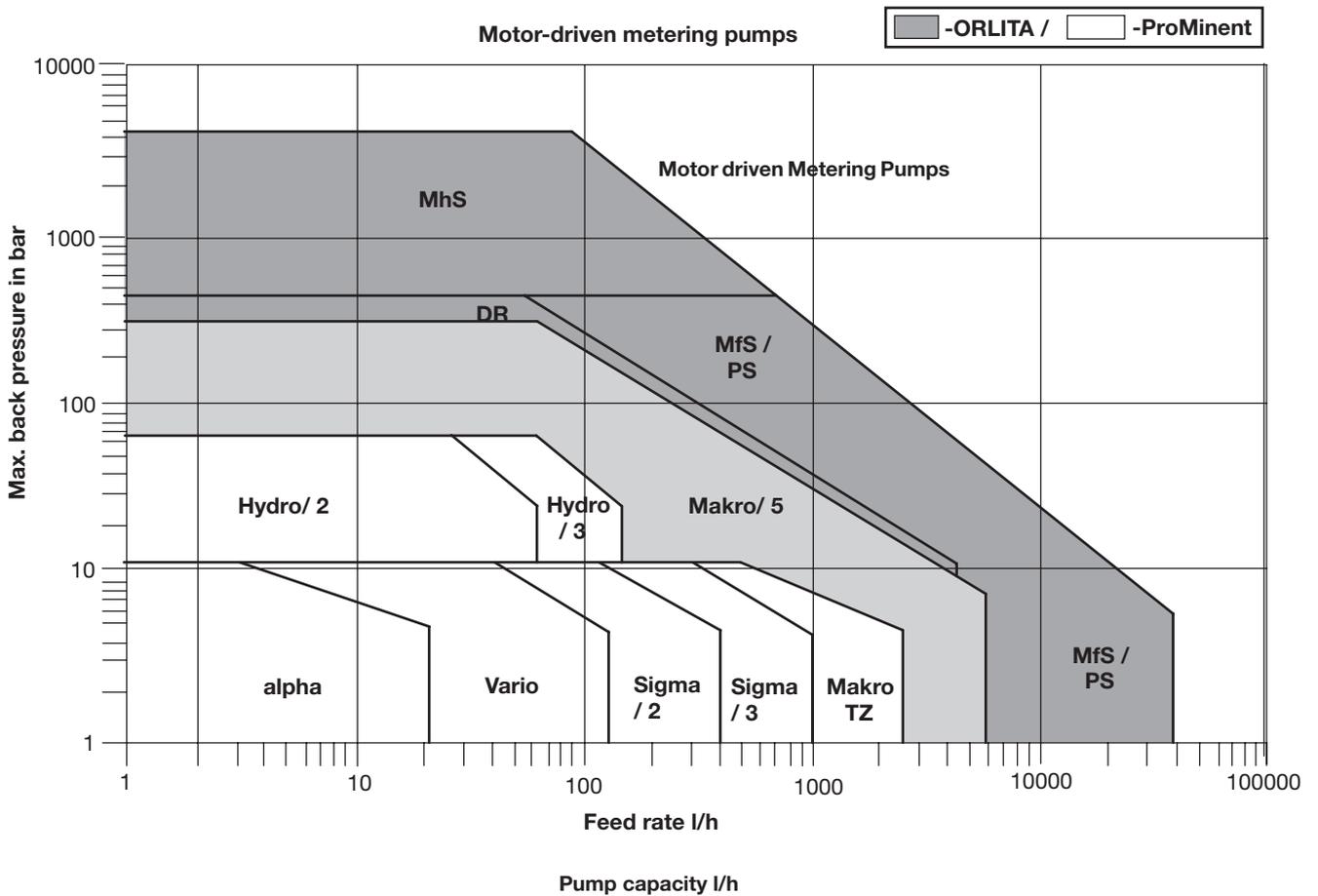
### ProMinent®/ORLITA® Metering Pumps

In November last year the ProMinent® Group, Heidelberg took over ORLITA GmbH + Co, KG, Gießen . The new ProMinent® subsidiary company is now operating under the name "ORLITA Dosiertechnik GmbH". This new acquisition expands ProMinent®'s product range into the high-end, high capacity Metering Pump sector.

ORLITA® Metering Pumps are motor-driven, oscillating positive displacement pumps with adjustable stroke volumes. There are four series available:

- Mf diaphragm Metering Pumps with hydraulically driven PTFE double diaphragms
- Mh diaphragm Metering Pumps with hydraulically driven metal diaphragms
- PS piston Metering Pumps with stuffing box packing rings
- DR valve-free piston Metering Pumps

ORLITA® Metering Pumps have established a wide application range in process technology, due in part to their cost effectiveness.

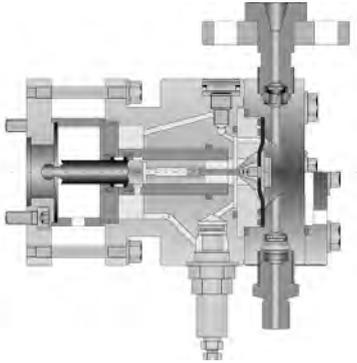


contact Sydney Office

## 2.9 ProMinent®/ORLITA® Metering Pumps

### 2.9.2

#### Mf Diaphragm Liquid End



Hydraulically operating diaphragm liquid end. A double PTFE diaphragm forms a hermetic seal between the liquid and hydraulic ends.

During the discharge stroke the diaphragm is balanced by the hydraulic liquid only. During the suction stroke the diaphragm operation is aided by the mechanical coupling. This combined principle offers an extraordinary suction lift capability of the Mf pump.

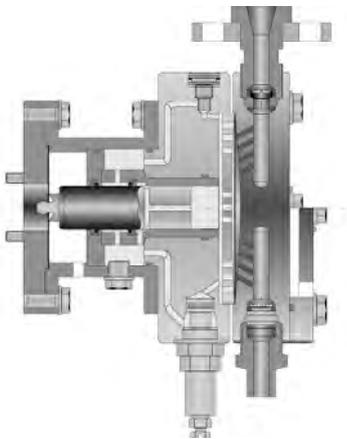
Integrated in the hydraulic chamber are the pressure relief valve and an automatic venting valve. The valveless forced reflow of the internal oil leakage operates wearfree and guarantees optimum dosing accuracy.

The pump check valves are of cone type. This guarantees low wear, short pressure loss (NPSH<sub>r</sub>) and self-cleaning.

All wetted parts (except for the PTFE-diaphragm) are fabricated from stainless steel.

### 2.9.3

#### Diaphragm Head Mh



Hydraulic actuated diaphragm head. A metal diaphragm hermetically separates the wetted area from the hydraulic chamber.

Both during discharge and suction stroke the diaphragm is balanced by the hydraulic liquid which has been displaced by the piston.

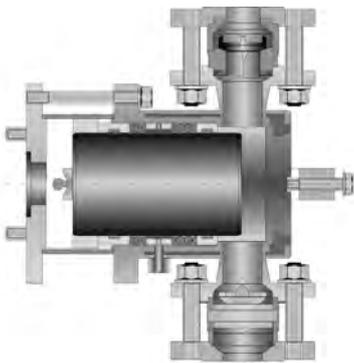
Integrated in the hydraulic chamber are the pressure relief valve and an automatic venting valve. The valveless forced reflow of the internal oil leakage operates wearfree and guarantees optimum dosing accuracy.

The pump check valves are of cone, ball or prismatic type depending on size and design pressure.

All wetted parts are fabricated from stainless steel.

### 2.9.4

#### Ps Piston Liquid End



Plunger head with stuff box packing. The plunger oscillates in the cylinder and displaces the liquid. The packing adjustment is achieved by the front-sided adjusting screw, which is also possible during operation.

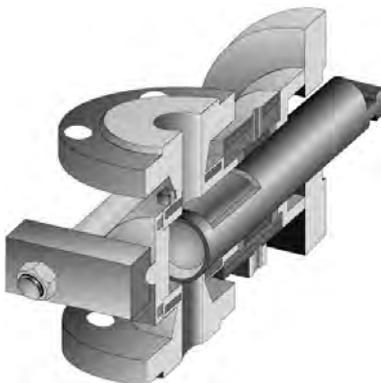
The lantern on the rear head end serves to drain the leakage or can be used as an area to flush, lubricate or seal the pump with suitable media.

The pump check valves are of cone type. This guarantees low wear, short pressure loss (NPSHR) and self-cleaning.

All wetted parts are fabricated from stainless steel and sealed by PTFE.

### 2.9.5

#### DR Valve-Free Piston Liquid End



The valve-free piston liquid end functions by means of the oscillating and rotating piston action. The suction and discharge sides are opened and closed by the piston itself. This means that the pump requires no valves and can operate across a large stroking rate range.

This principle enables the exact dosing of highly viscous liquids which also might contain – even large – solids.

The pump head is fabricated from stainless steel. Piston and liner are treated by a special wear-resistant coating.

Depending on the application the pump head also is available from other high performance materials.

The clearance between piston and liner which mainly seals the pump is adapted to the viscosity of the liquid.

The lantern on the rear head end serves to drain the leakage or can be used as an area to flush, lubricate or seal the pump with suitable media.

The lantern is sealed by elastomer lip rings. The flow direction is selectable by the assembly position of the piston. By turning the head around its horizontal axis an effect of re-suction is adjustable.

# 2.10 Spectra Progressive Cavity Metering Pumps

## 2.10.1 Spectra Progressive Cavity Metering Pumps

**Construction:** Wetted parts in all 1.4571 stainless steel or RCH1000 casing with 1.4571 stainless steel rotating parts. Hastelloy or special materials available for rotating parts. Stators available in NBR, CSM, EPDM or Viton.

**Applications:** polymer, lime, fluoride, PAC, milk etc. Non-pulsating flow, handles abrasives, corrosives, solids in suspension and viscous fluids.

**Note:** For all applications refer to Sydney office for selection and pricing.

Approximate Flows l/hr 0-8 bar						
Model / RPM	100	200	300	375	500	770
S06	5	10	15	18	25	37
S08	9	18	27	35	45	70
S10	20	40	60	75	100	150
Fixed Speed	Yes					
Manual 5:1	Yes					

Drive Power		
Pump	Type	kW
S06	Fixed Speed	0.37
	Manual Variator	
	Integrated Variable Drive	
S08	Fixed Speed	0.37
	Manual Variator	
	Integrated Variable Drive	
S10	Fixed Speed	0.37
	Manual Variator	
	Integrated Variable Drive	



Note: For variable frequency drives refer to 'Green Pages' Price Book.

# 2.10 Spectra Progressive Cavity Metering Pumps

## 2.10.2 Spectra Progressive Cavity Metering Pumps

**Construction:**

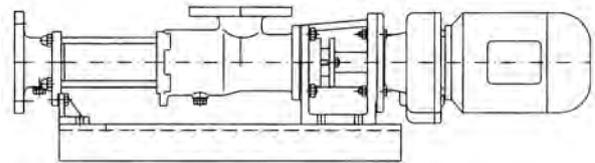
- Casing - cast iron, 1.4308SS, 1.4571SS, special materials
- Rotors - hardened tool steel, 1.4057SS, 1.4571SS, 1.4112SS hardened, special materials
- Stators - NBR, CSM, EPDM, FPM, CR, special materials

**Flows:** to 480,000 litres per hour

**Pressure:** to 24 bar

**Application areas:**

- Waste water and sewage treatment
- Mining Industry
- Beverage and brewing industry
- Pharmaceutical industry
- Food industry
- Paper industry
- Chemical industry
- Water treatment
- Live stock waste products
- Paint and varnish manufacture
- Polymer and lime milk dosing



Type	Size	Up to 4 Stages	Max. Pressure	Capacity (l/h)	Cardan Joint
Standard					
S15	15	4	24	2,500	Yes
S20	20	4	24	4,500	Yes
S30	30	4	24	10,000	Yes
S40	40	4	24	18,000	Yes
S50	50	4	24	28,000	Yes
S60	60	4	24	40,000	Yes
S70	70	1	6	50,000	Yes
S80	80	4	24	70,000	Yes
S90	90	2	12	70,000	Yes
S100	100	4	24	70,000	Yes
S120	120	4	24	165,000	Yes
S150	150	1	6	320,000	Yes
S200	200	1	6	480,000	Yes

*Open throat hopper and bridge breaker pumps for high solids fluids  
high viscosity, solids, abrasives, corrosives, self-priming, metered flow, reversible*  
**all words that indicate a Spectra pump is needed for the job to be a success.**

Selection and Pricing

Please refer to Sydney office for assistance. Pumps are sized for customer duty and drive requirements.

# 3.0 ProMinent Accessories

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# 3.1 Accessories for ProMinent® Beta, Gamma, Concept and Pneumados - Foot Valves

## 3.1 Accessories - Foot Valves

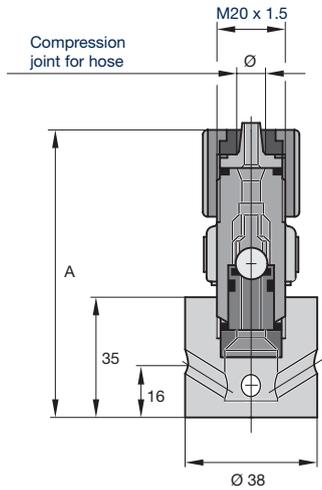


Fig.1  
pk\_1\_038

### Description/version

### Part no.

For connection to the end of the suction line as suction aid and to protect the pump from contamination, with strainer and ball check. For connection diameters 6, 8, 12 and 12/6 mm with ceramic weight. The same materials are used as for the liquid ends.

### Valve body of PP, seals of EPDM

Foot valve, PP

			Ø	A		
Connection	6 mm	for hose	6 x 4	84	(Fig.1)	924558.
Connection	8 mm	for hose	8 x 5	84	(Fig.1)	809468.
Connection	12 mm	for hose	12 x 9	87	(Fig.1)	809470.

### Foot valve, PP 2

Valve body of PP, seals of Viton.

			Ø	A		
Connection	6 mm	for hose	6 x 4	84	(Fig.1)	924559.
Connection	8 mm	for hose	8 x 5	84	(Fig.1)	924683.
Connection	12 mm	for hose	12 x 9	87	(Fig.1)	924684.

### Foot valve, PVC

With strainer, ball check, valve body of PVC, seals of Viton.

			Ø	A		
Connection	6 mm	for hose	6 x 4	84	(Fig.1)	924557.
Connection	8 mm	for hose	8 x 5	84	(Fig.1)	924562.
Connection	12 mm	for hose	12 x 9	87	(Fig.1)	924564.

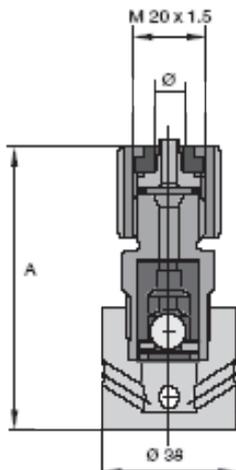


Fig.2  
pk\_1\_038

### Foot valve, PVT

With non-return valve, PVDF housing, PTFE seals, with ceramic weight.

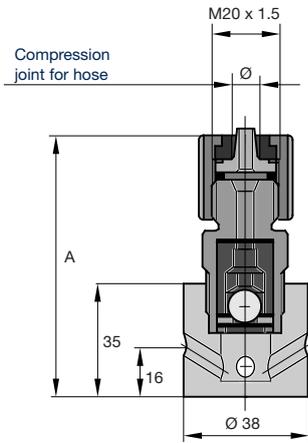
			Ø	A		
Connection	6 mm	for hose	6 x 4	79	(Fig.2)	1024705.
Connection	8 mm	for hose	8 x 5	79	(Fig.2)	1024706.
Connection	12 mm	for hose	12 x 9	82	(Fig.2)	1024707.

# 3.1 Accessories for ProMinent® Beta, Gamma, Concept and Pneumados - Foot Valves

## 3.1 Accessories - Foot Valves

Description/version

Part no.

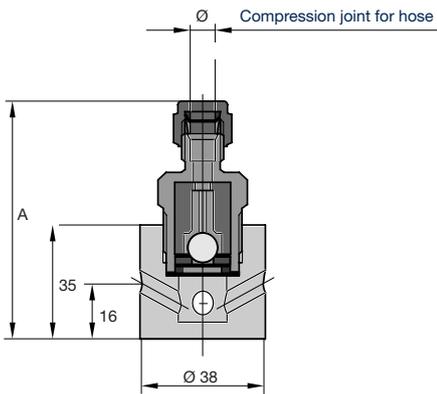


### Foot valve, PTFE

Valve body, ball check and seals of PTFE, for connection diameters 6, 8 and 12 mm with ceramic weight.

		Ø	A	
Connection	6 mm for hose	6 x 4	79 (Fig.2397/4)	809455.
Connection	8 mm for hose	8 x 5	79 (Fig.2397/4)	809471.
Connection	12 mm for hose	12 x 9	82 (Fig.2397/4)	809473.

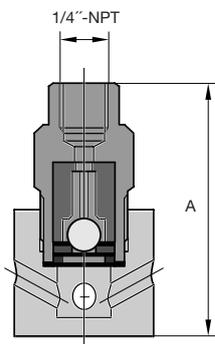
pk\_1\_040



### Foot valve, stainless steel 1.4571

With strainer and ball check, valve body of stainless steel 1.4571, seals of PTFE, For 6x4, 8x5 and 12x 9 mm hose connection a support sleeve is required (see page 3.23).

		Ø	A	
Connection	for 6 mm O.D. pipe			924568.
Connection	for 8 mm O.D. pipe			809474.
Connection	for 12 mm O.D. pipe			809475.



### Foot valve, stainless steel 1.4571

With strainer and ball check, valve body of stainless steel 1.4571, seals of PTFE, as above but with

Connection	1/4" BSP/F *			803730.
Connection	3/8" BSP/F			803731.

\*See also 924567.

pk\_1\_031

# 3.1 Accessories ProMinent® Meta/Makro TZ Foot Valves

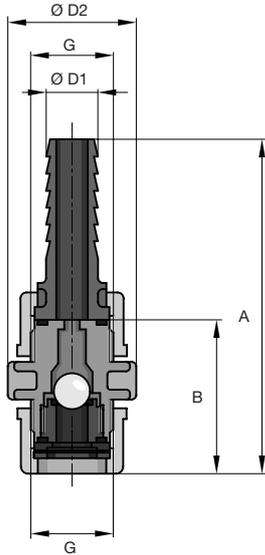
## 3.1 Accessories Meta/Makro TZ - Foot Valves

**Description/version**

**Part no.**

For connection to the end of the suction line to prevent return flow and to protect the pump from contamination, with strainer and ball check valve. The same materials are used as for the liquid ends. The union nut and union end/hose connector are part of the standard delivery package.

Caution: Foot valves are not suitable as absolutely leakproof isolating elements.



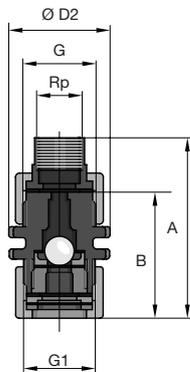
pk\_2\_026

**Foot valve, PVC**

Valve body of PVC, seals of Viton, with strainer and ball check-valve

G	Solvent weld male	B	Ø D2	
DN 10	15mm	51	40	P809464
DN 15	20mm	56	47	P924515
DN 20	25mm	67	55	P803723
DN 25	25mm	73	60	P803724
DN 32 PVT	32mm Female	85	74	P1006434
DN 40	32mm	100	90	P1004204

NOTE : BSPM and Hose tail connections also available.



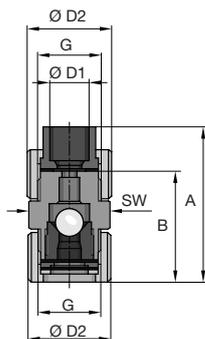
pk\_2\_027

**Foot valve, PVDF**

Valve body of PVDF, seals of PTFE, with strainer and ball check-valve

G	BSPTM	B	SW	ØD2	Part No
DN 10	1/2"	69	30	35	P1029471
DN 15	3/4"	75	36	47	P1029472
DN 20	1"	69	46	57	P1029473
DN 25	1"	75	50	64	P1029474
DN 32	1-1/2"	103	75	89	P1006434-PVT

NOTE: DN32 valve has Hastalloy-C Disc and Spring



pk\_2\_025

**Foot valve, stainless steel**

Valve body of stainless steel, seals of PTFE, with strainer and ball check valve (1.4571/1.4581)

G1	BSPF	G2	A	B	Ø D2	
DN 10	3/8"	BSP/F	-	48	37	809467.
DN 15	1/2"	BSP/F	-	51	48	924518.
DN 20	3/4"	BSP/F	-	64	55	P803727
DN 25	1"	BSP/F	-	72	63	P803728
DN 32	1-1/4"	BSP/F	-	82	75	P1006435
DN 40	1-1/2"	BSP/F	-	98	90	P1004206

# 3.2 Accessories ProMinent® Concept, Beta Gamma, Delta and Pneumados Injection Valves

## 3.2 Accessories - concept, beta, gamma and pneumados Injection Valves

### Description/version

### Part no.

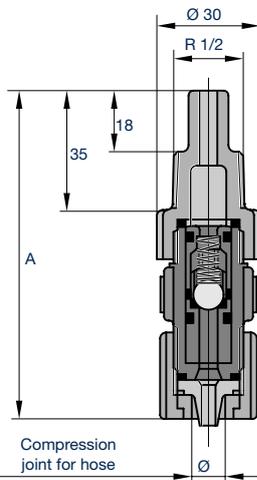
For the connection of the discharge line to the point of injection. The injection valves are equipped with ball check, for PP, PVC and stainless steel versions spring-loaded with Hastelloy C spring, 0.5 bar response pressure (for connection 1/4" stainless steel spring 1.4571, response pressure approx. 1 bar), can be installed in any position.

For PTFE version without spring for vertical installation from below. Valve spring can be retrofitted. The same materials are used as for the liquid ends.

Caution: Injection valves and injection lances are not suitable as absolutely leak proof isolating elements.

### Injection valve, PP

Valve body of PP, seals of EPDM, with spring-loaded ball check, response pressure approx. 0.5 bar.

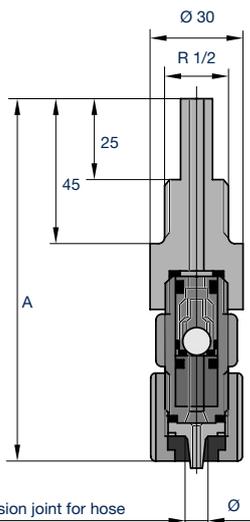


pk\_1\_045

		Ø	A	
Connection	6 mm - 1/2" for PE/PTFE tubing	6 x 4	96	924681.
Connection	8 mm - 1/2" for PE/PTFE tubing	8 x 5	96	809476.
Connection	12 mm - 1/2" for PE/PTFE tubing	12 x 9	99	809478.

### Injection valve, PP 2

Valve body of PP, seals of Viton.



pk\_1\_046

		Ø	A	
Connection	6 mm - 1/2" for PE/PTFE tubing	6 x 4	96	924682.
Connection	8 mm - 1/2" for PE/PTFE tubing	8 x 5	96	924687.
Connection	12 mm - 1/2" for PE/PTFE tubing	12 x 9	99	924685.

### Injection valve PP/PTFE

To prevent deposits, body of PP, mounting insert of PTFE, seals of EPDM, with ball check and Hast. C spring, response pressure approx. 0.5 bar.

		Ø	A	
Connection	6 mm - 1/2" for PE/PTFE tubing	6 x 4	103	924588.
Connection	8 mm - 1/2" for PE/PTFE tubing	8 x 5	103	924589.
Connection	12 mm - 1/2" for PE/PTFE tubing	12 x 9	106	924590.

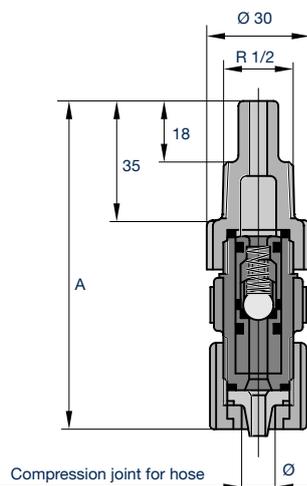
### Injection valve, PVC

		Ø	A	
Connection	6 mm - 1/2" for PE/PTFE tubing	6 x 4 mm	96	924680.
Connection	8 mm - 1/2" for PE/PTFE tubing	8 x 5 mm	96	924592.
Connection	12 mm - 1/2" for PE/PTFE tubing	12 x 9 mm	99	924594.

### Injection valve, PVC / PTFE (Antiscale version)

Body of PVC, PTFE with 1/2" BSPT Male tailpiece

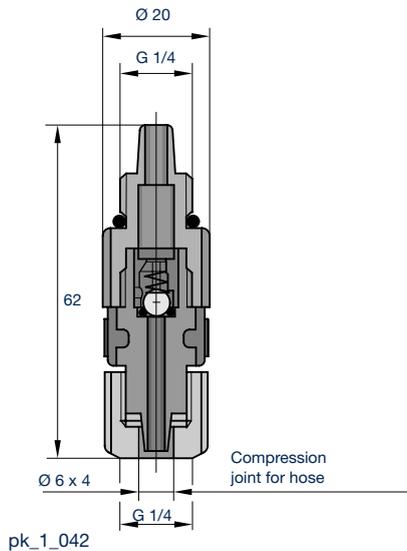
Connection	6 mm - 1/2" for PE/PTFE tubing	6 x 4 mm	924588.
Connection	8 mm - 1/2" for PE/PTFE tubing	8 x 5 mm	809451.
Connection	12 mm - 1/2" for PE/PTFE tubing	12 x 9 mm	809452.



pk\_1\_045

# 3.2 Accessories ProMinent® Concept, Beta, Gamma and Pneumados Injection Valves

## 3.2 Accessories - concept, beta, gamma and pneumados Injection Valves



Description/version

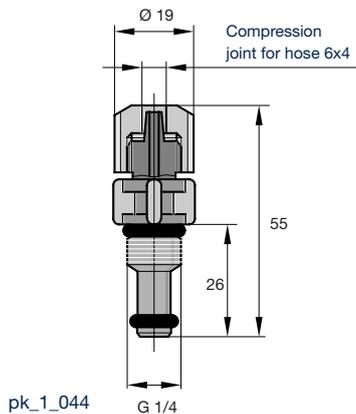
Part no.

### Injection valve PVC, connection 1/4"

With ceramic ball check, spring of 1.4571 s/s, response pressure approx. 1 bar.

Connection 6 mm - 1/4" for PE/PTFE tubing 6 x 4mm

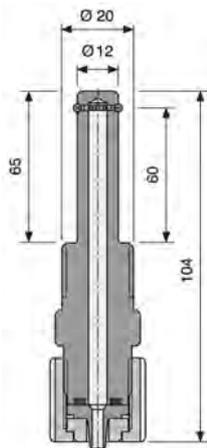
914559.



### Injection valve PVC, O-ring loaded

Valve body of PVC, seals of Viton, response pressure approx. 0.5 bar.

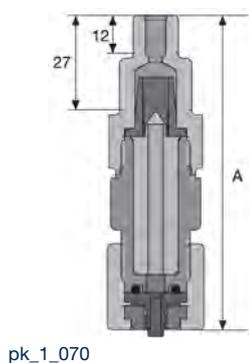
Connection 6 mm - 1/4" (long) for PE/PTFE tubing 6 x 4 (Fig 1016/4) 915091.



### PTFE Injection valves O-ring, loaded

PTFE housing, FPM (Viton) seals.

Connection	oØ x iØ mm	A mm	Part No:
6/4 – for PE/PTFE line	6 x 4	104	809484.
8/5 – for PE/PTFE line	8 x 5	104	809485.
10/4 – for PE/PTFE line	10 x 4	104	1002925.
12/6 – for PVC hose	12 x 6	104	809487.
12/9 – for PE/PTFE line	12 x 9	104	809486.



### Lip Seal Injection valve PCB

Body PVC, seals FPM, inlet pressure approx. 0.05 bar. For dosing sodium hypochlorite in conjunction with peristaltic pumps DF2a

Connection	oØ x iØ mm	A mm	Part No:
6/4 – R 1/2 - 1/4 for PE/PTFE	6 x 4	90	1019953.

# 3.2 Accessories ProMinent® Gamma, Beta & Concept Injection Valves

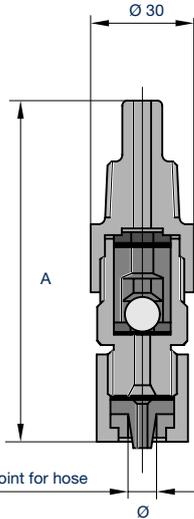
## 3.2 Accessories - gamma Injection Valves

**Description/version**

**Part no.**

**Injection valve PVT**

PVDF housing, PTFE seals, with non-return valve, spring-loaded with Hastalloy C spring, priming pressure approx. 0.5 bar with extended threaded connection.



Compression joint for hose

pk\_1\_048

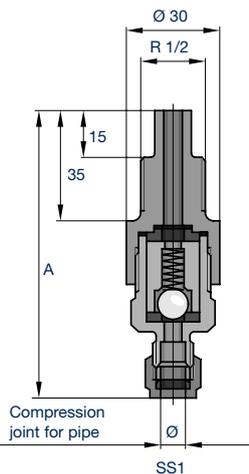
		Ø	A	
Connection	6/3 mm * 1/2" for PTFE pipe	6 x 3	120	1024713.
Connection	6 mm - 1/2" for PE/PTFE pipe	6 x 4	120	1024708.
Connection	8 mm - 1/2" for PE/PTFE pipe	8 x 5	120	1024710.
Connection	12 mm - 1/2" for PE/PTFE tubing	12 x 9	120	1024711.
Connection	10/4 mm * 1/2" for PVC hose	10 x 4	120	1024709.
Connection	12/6 mm * 1/2" for PVC hose	12 x 6	120	1024712.

\* **Not Stocked**

**Injection valve PTFE**

For vertical installation from below, without spring, with ball check. Valve spring can be retrofitted. Body and seals of PTFE.

		Ø	A	
Connection	6 mm - 1/2" for PE/PTFE tubing	6 x 4	98	(fig.1) 809488.
Connection	8 mm - 1/2" for PE/PTFE tubing	8 x 5	98	(fig.1) 809479.
Connection	12 mm - 1/2" for PE/PTFE tubing	12 x 9	101	(fig.1) 809481.



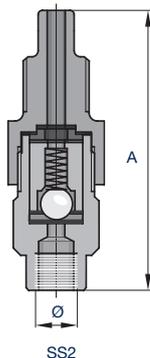
pk\_1\_032\_1

**Injection valve stainless steel**

Body of 1.4571, seals of PTFE with spring-loaded ball check. Hastel. C spring with 0.5 bar response pressure; for connection 1/4" stainless steel spring 1.4571 and response pressure approx. 1 bar.

For connection of PE/PTFE tubing a ferrule is required.

SS1		Ø	A	
Connection	6 mm - 1/2" for pipe	6 x 5 mm	93	809489.
Connection	8 mm - 1/2" for pipe	8 x 7 mm	93	809482.
Connection	12 mm - 1/2" for pipe	12 x 10 mm	93	809483.



pk\_1\_032\_2

SS2		Ø	A	
Connection	1/4" NPT - 1/2" for pipe	12 x 10 mm	93	924597.

# ProMinent® 3.2 Accessories ProMinent® Sigma, Meta/Makro TZ Injection Valves

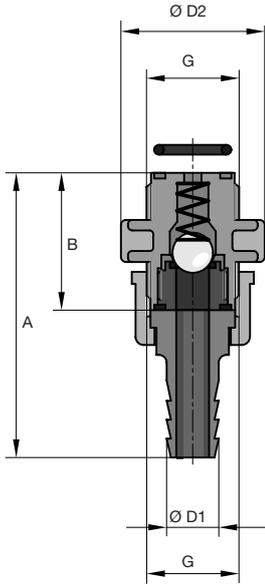
## 3.2 Accessories - Meta/Makro TZ Injection Valves

### Description/version

### Part no.

For the connection of the pump metering line to the point of injection. The injection valves are equipped with ball check and a Hastelloy C spring (0.5 bar response pressure) and can be installed in any position. They are used for creating pressure and preventing return flow. The same materials are used as for the liquid ends. Union nuts and union ends are part of the standard delivery package.

Caution: Injection valves are not suitable as absolutely leakproof isolating elements.



pk\_2\_029

### Injection valve, PVC

Valve body of PVC, seals of Viton, with ball check, spring-loaded, response pressure approx. 0.5 bar

	G	BSPM x solvent weld	B	Ø D2	Part No.	Price
DN 10	3/4"	1/2" x 15mm	51	40	P809460	
DN 15	1"	3/4" x 20mm	56	47	P924520	
DN 20	1 1/4"	1" x 25mm	67	55	P803712	
DN 25	1 1/2"	1" x 25mm	73	60	P803713	
DN 32 PVT 2"		1-1/2" x 32mm female	73	60	P1002783	
DN40	2 1/4"	2" x 32mm			P804760	

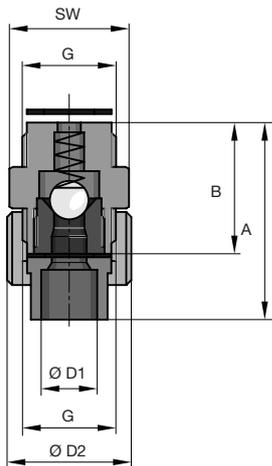
NOTE : BSP fittings available for inlet and outlet.

### Injection valve, PVDF

Valve body of PVDF, seals of PTFE, with ball check, spring-loaded, response pressure approx. 0.5 bar. **ALL are supplied Male/Male BSP**

	G	BSPM x BSPM	B	Ø D2	
DN 10		1/2" BSPTM			PA07002486
DN 15		3/4" BSPTM			PA07002487
DN 20		1"	55	46	PA07002488
DN 25		1"	60	50	PA07002489
DN 32		1-1/2"	85	75	PA07002490

NOTE: DN32 valve has Hastalloy-C Disc and Spring

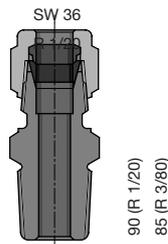


pk\_2\_030

### Injection valve, stainless steel

Valve body of stainless steel, seals of PTFE, ball check, spring-loaded (1.4571/1.4581), response pressure approx. 0.5 bar

	G1	BSPF x BSPF	B	Ø D	
DN 10		3/8" BSPF inlet & outlet			P809463
DN 15		1/2" BSPF inlet & outlet			P924523
DN 20		3/4" x 3/4" BSPF	56	56	P803716
DN 25		1" x 1" BSPF	60	59	P803717
DN 32		1-1/4" x 1-1/4" BSPF	60	59	P1002801
DN 40		1-1/2" x 1-1/2" BSPM	85	90	P804763



pk\_2\_028

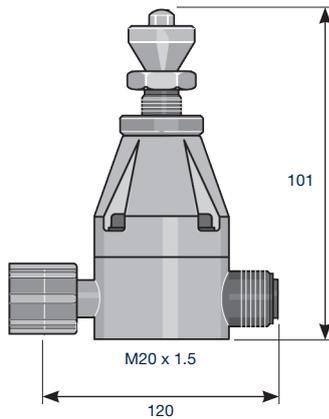
### Injection valve DN 10 for Meta/Makro TZ-HK

Valve body and valve spring of 1.4571 s/s, ball of 1.4401 s/s, seals of PTFE, response pressure approx. 0.1 bar

Connection 1/4" x 1/2" BSP	803732.
Connection 3/8" x 1/2" BSP	803733.

# 3.3 Accessories ProMinent® Beta, Gamma and Pneumados Back Pressure Valves S Series

## 3.3 Accessories - concept, beta, gamma and pneumados Back Pressure Valves S Series



pk\_1\_129

**Description/version**

**Part no.**

**Type DHV-S-DL back pressure valve/relief valve , adjustable 1-10 bar, 6-12 mm**

Adjustable back pressure valve for installation in the discharge line to generate a constant back pressure for precise delivery when injecting into an open outlet with an inlet pressure on the suction side, a fluctuating back pressure or into a vacuum.

Application is the same as for the safety pressure relief valve.

When used as a back pressure valve in long lines to avoid resonance vibration, it should be mounted on the end of the injection line or the set pressure should be greater than the line pressure loss.

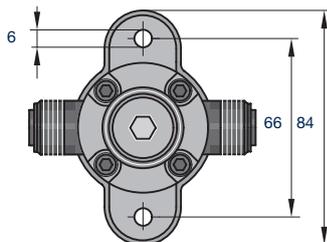
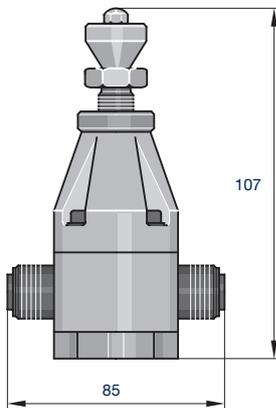
Use in conjunction with a pulsation dampener only where there is an open outlet and short injection line.

Caution: Back pressure valves are not designed for use as a completely-sealing, isolating elements!

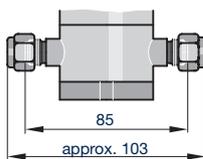
Application:

Beta, Gamma, Concept, Pneumados, Delta, EXtronic, electronic metering pumps.

PP, PC, TT version



SS version



pk\_1\_054

DHV-S-DL	1-10 bar	PP	6 x 4mm	P6-302323
DHV-S-DL	1-10 bar	PP	8 x 5mm	P8-302323
DHV-S-DL	1-10 bar	PP	12 x 9mm	P12-302323
DHV-S-DL	1-10 bar	PVC	6 x 4mm	P6-302324
DHV-S-DL	1-10 bar	PVC	8 x 5mm	P8-302324
DHV-S-DL	1-10 bar	PVC	12 x 9mm	P12-302324
DHV-S-DL	1-10 bar	TT	6 x 4mm	P6-302325
DHV-S-DL	1-10 bar	TT	8 x 5mm	P8-302325
DHV-S-DL	1-10 bar	TT	12 x 9mm	P12-302325
DHV-S-DL	1-10 bar	SS	6mm O.D.	302326.
DHV-S-DL	1-10 bar	SS	8mm O.D.	302327.
DHV-S-DL	1-10 bar	SS	12mm O.D.	302328.

Pipe Nipple, 316 S.S., 40mm long

For connecting to the liquid end use back pressure valve DHV-S-DL of stainless steel in conjunction with an appropriate pipe nipple.

6mm O.D.	818537.
8mm O.D.	818538.
12mm O.D.	818539.

TUBING - 316 Stainless Steel

6mm O.D.	015738.
8mm O.D.	015740.
12mm O.D.	015743.



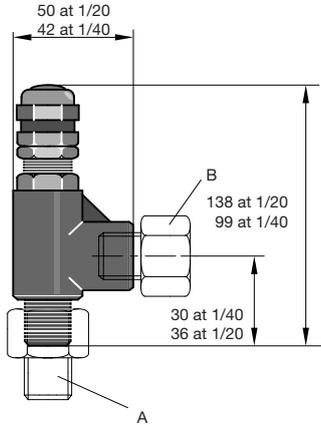
pk\_1\_017

**NOTE: See also multi-function valve**

**NOTE: PP valves are non-stock items. Availability ex Germany.**

# 3.4 Accessories, Adjustable Relief Valves

## 3.4 Accessories - Adjustable Relief Valves



pk\_2\_032

**Description/version**

**Part no.**

**Adjustable relief valve, 1/4" NPT**

For use as safety relief valve and as back pressure valve.

Housing: Stainless steel 316/Viton

Connection: 1/4" NPT female and male thread

202505.

Relief valve without spring, can be ordered separately.

Spring: Colour:

3.4 -	24 bar	blue	202519.
24 -	52 bar	yellow	202520.
52 -	103 bar	violet	202525.
103 -	155 bar	orange	202524.
155 -	207 bar	brown	202523.
207 -	276 bar	white	202522.
276 -	345 bar	red	202521.

**Adaptor nipple**

1/4" NPT female thread - 1/4" male thread (A)

359378.

1/4" NPT male thread - 1/4" female thread (B)

359379.

**Note: For Piston/Plunger Pumps**

**Take care with capacity.**

## 3.5 Accessories - Solenoid Dosing Pumps Back Pressure / Relief Valves

### 3.5 Accessories - Back Pressure Valves or Relief Valves

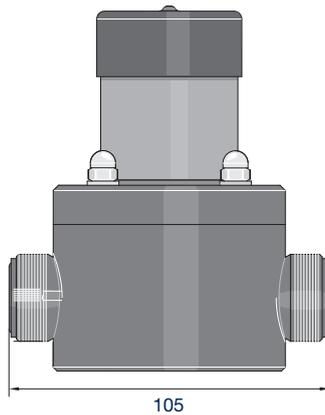
#### Back Pressure Valves or Relief Valves BPV-DM-E

Adjustable back pressure valve for installation in the discharge line to create a constant back pressure. Also suitable for generating accurate dosing in the case of an open discharge port or where there is priming pressure on the vacuum side.

Used as a Relief valve installed in a bypass to protect pumps, pipework and fittings from excess pressure as a result of operational errors or blockages. In the event of a malfunction, the pump conveys in a loop or back into the storage tank.

**Warning:** Back pressure valves are not fluid-tight stop taps! Installation instructions in the operating manual must be observed!

**Applications:** Dosing pumps alpha, Beta®, gamma, EXtronic®, Pneumados and Delta



pk\_1\_101

					Part No.
DHV-DM-E	1 - 10 bar	6 x 4	PPE	PP/EPDM	P1009884-6
DHV-DM-E	1 - 10 bar	8 x 5	PPE	PP/EPDM	P1009884-8
DHV-DM-E	1 - 10 bar	12 x 9	PPE	PP/EPDM	P1009884-12
DHV-DM-E	1 - 10 bar	6 x 4	PPB	PP/FPMB	P1009886-6
DHV-DM-E	1 - 10 bar	8 x 5	PPB	PP/FPMB	P1009886-8
DHV-DM-E	1 - 10 bar	12 x 9	PPB	PP/FPMB	P1009886-12
DHV-DM-E	1 - 10 bar	6 x 4	PCE	PVC/EPDM	P1009885-6
DHV-DM-E	1 - 10 bar	8 x 5	PCE	PVC/EPDM	P1009885-8
DHV-DM-E	1 - 10 bar	12 x 9	PCE	PVC/EPDM	P1009885-12
DHV-DM-E	1 - 10 bar	6 x 4	PCB	PVC/FPMB	P1026450-6
DHV-DM-E	1 - 10 bar	8 x 5	PCB	PVC/FPMB	P1026450-8
DHV-DM-E	1 - 10 bar	12 x 9	PCB	PVC/FPMB	P1026450-12

**Note:**

Valves should normally be set to the desired back pressure on site after installation. However if you require them to be pre-set prior to dispatch then there would be a charge

# 3.6 Accessories - Motor Driven Dosing Pumps Back Pressure / Relief Valves

## 3.6 Accessories - Back Pressure Valves or Relief Valves

Back pressure valves of the DHV-U series can be used universally and are back-pressure free piston diaphragm valves with an internal flow. They can be used to generate a constant back pressure, used as relief valves and be assembled anywhere in the pipework system.

Back pressure valves act to generate a constant back pressure for precise chemical feed, and/or to protect against overdosing with a free outlet, fluctuating back pressure or to dose into a vacuum. They can also be used in conjunction with pulsation dampers for low pulsation metering.

Relief valves are installed in the bypass to protect pumps, pipework and fittings from excess pressure as a result of operational errors or blockages. In the event of a malfunction, the pump conveys in a loop or back into the storage tank.

**Important:** Back pressure valves cannot be used as absolutely leak-tight shut-off devices. All relevant safety precautions must be taken when using with hazardous chemicals.

**Important:** Appropriate safety measures should be implemented when used as relief valves in conjunction with agglutinative media (e. g. milk of lime), (for instance flushing after activation).

### Back Pressure Valve / Relief Valve Type DHV-U

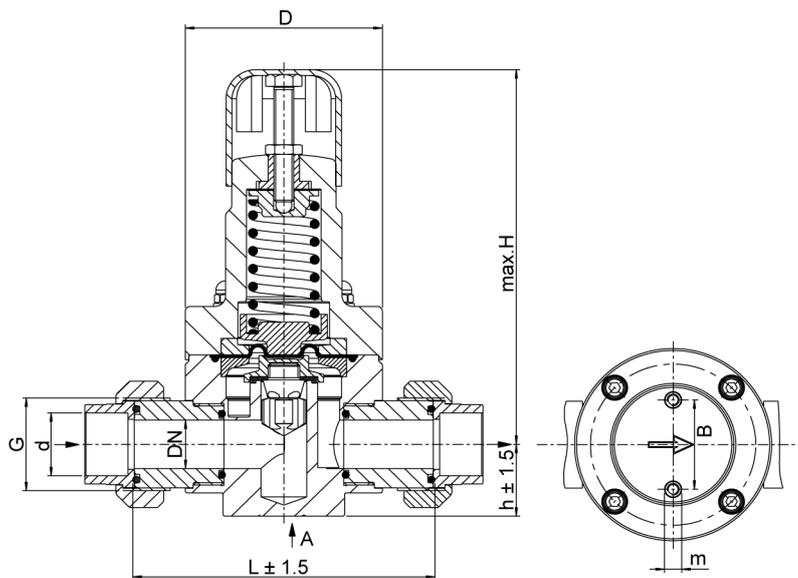
Adjustable pressure 0.5 – 10 bar

**Areas of application of PPE / PPB / PCE / PCB**

20 °C - maximum operating pressure 10 bar

**Area of application of PVDF**

30 °C - maximum operating pressure 10 bar



**DHV-U**

DN	G	L	H	h	D	m	B	d
10	3/4"	118	144	24	79	M6	40	16
15	1"	118	144	24	79	M6	40	20
20	1-1/4"	150	196	37	99	M6	46	25
25	1-1/2"	150	196	37	99	M6	46	32
32	2"	205	260	59	147	M8		
40	2-1/4"	205	260	59	147	M8		

**Materials**

Version	Housing/ Connectors	Plungers	Plunger Seal	Seal Connectors
PPE	PP	PVDF	EPDM	EPDM
PCB	PVC	PVDF	FKM	FKM
PVT	PVDF	PVDF	PVDF	PTFE

# 3.6 Accessories - Motor Driven Dosing Pumps Back Pressure / Relief Valves

## 3.6 Accessories - Back Pressure Valves or Relief Valves

### Back Pressure Valve and Relief valve

**Suit ProMinent® Sigma/ 1 Dosing Pump**

DN10 valve = 1/2" BSP M/M, S/W or  
DN15 valve = 3/4" BSP M/M

**Suit ProMinent® Sigma/ 2 & small Sigma/ 3 Dosing Pump**

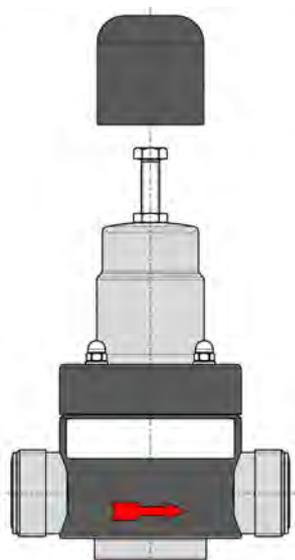
DN15 valve = 3/4" BSP M/M, S/W or  
DN20 valve = 1" BSP M/M

**Suit ProMinent® Sigma/ 3 Dosing Pump**

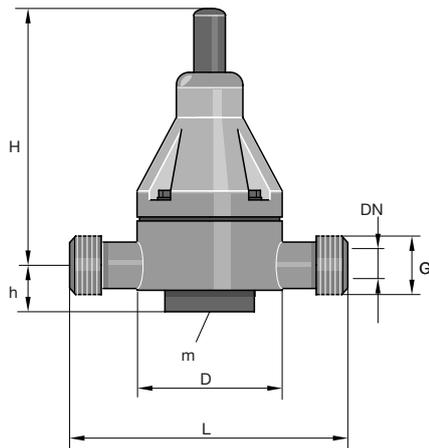
DN15 valve = 3/4" BSP M/M, S/W or  
DN20 valve = 1" BSP M/M  
DN25 valve = 1" BSP M/M  
DN32 valve = 1-1/2" BSP M/M

**Suit ProMinent® Sigma/ 3 & Makro Dosing Pump**

DN25 valve = 1" BSP M/M, S/W or  
DN32 valve = 1-1/2" BSP M/M  
DN40 valve = 1-1/2" BSP M/M



**DHV-U**



**DHV-712R**

All PVC valves are supplied complete with Male/Male Solvent Weld fittings.

						Part No.
DHV- U	0.5 - 10 bar	G 3/4"	DN 10	•	PPE	P1037285
DHV- U	0.5 - 10 bar	G 1"	DN 15	•	PPE	P1036816
DHV- U	0.5 - 10 bar	G 1-1/4"	DN 20	•	PPE	P1037284
DHV- U	0.5 - 10 bar	G 1-1/2"	DN 25	•	PPE	P1036633
DHV- 712R	0.5 - 10 bar	G 2"	DN 32	•	PPE	P1000035
DHV- 712R	0.5 - 10 bar	G 2-1/4"	DN 40	•	PPE	P1000036
DHV- U	0.5 - 10 bar	G 3/4"	DN 10	•	PCE	P1038144
DHV- U	0.5 - 10 bar	G 1"	DN 15	•	PCE	P1038146
DHV- U	0.5 - 10 bar	G 1-1/4"	DN 20	•	PCE	P1038148
DHV- U	0.5 - 10 bar	G 1-1/2"	DN 25	•	PCE	P1038150
DHV- U	0.5 - 10 bar	G 3/4"	DN 10		PCB	P1037765
DHV- U	0.5 - 10 bar	G 1"	DN 15		PCB	P1037764
DHV- U	0.5 - 10 bar	G 1-1/4"	DN 20		PCB	P1037775
DHV- U	0.5 - 10 bar	G 1-1/2"	DN 25		PCB	P1037774
DHV- 712R	0.5 - 10 bar	G 2"	DN 32		PCB	P1000051
DHV- 712R	0.5 - 10 bar	G 2-1/4"	DN 40		PCB	P1000052
DHV- U	0.5 - 10 bar	G 3/4"	DN 10	•	PVB	P1037767
DHV- U	0.5 - 10 bar	G 1"	DN 15	•	PVB	P1037766
DHV- U	0.5 - 10 bar	G 1-1/4"	DN 20	•	PVB	P1037777
DHV- U	0.5 - 10 bar	G 1-1/2"	DN 25	•	PVB	P1037776
DHV- 712R	0.5 - 10 bar	G 2"	DN 32	•	PVT	P1000057
DHV- 712R	0.5 - 10 bar	G 2-1/4"	DN 40	•	PVT	P1000058
DHV- 712R	0.5 - 10 bar	G 3/4"	DN 10	•	TTT	P1000059
DHV- 712R	0.5 - 10 bar	G 1"	DN 15	•	TTT	P1000060
DHV- 712R	0.5 - 10 bar	G 1-1/4"	DN 20	•	TTT	P1000061
DHV- 712R	0.5 - 10 bar	G 1-1/2"	DN 25	•	TTT	P1000062
DHV- 712R	0.5 - 10 bar	G 2"	DN 32	•	TTT	P1000063
DHV- 712R	0.5 - 10 bar	G 2-1/4"	DN 40	•	TTT	P1000064
DHV- U	0.5 - 10 bar	G 3/4"	DN 10	•	SST	P1043194
DHV- U	0.5 - 10 bar	G 1"	DN 15	•	SST	P1043193
DHV- U	0.5 - 10 bar	G 1-1/4"	DN 20	•	SST	P1043192
DHV- U	0.5 - 10 bar	G 1-1/2"	DN 25	•	SST	P1043191
DHV- 712R	0.5 - 10 bar	G 2"	DN 32	•	SST	P1000069
DHV- 712R	0.5 - 10 bar	G 2-1/4"	DN 40	•	SST	P1000070

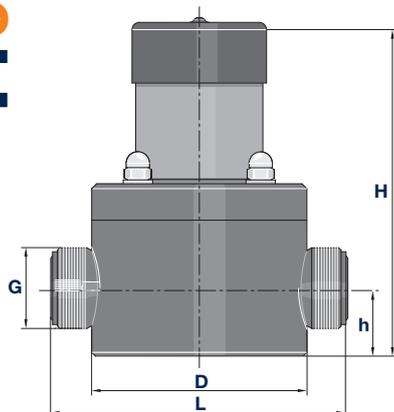
- This item not stocked - order on PDT

**Note:**

Valves should normally be set to the desired back pressure on site after installation. However if you require them to be pre-set prior to dispatch then there would be a charge

# 3.6 Accessories - Motor Driven Dosing Pumps Back Pressure / Relief Valves

## 3.6 Accessories - Back Pressure Valves or Relief Valves



pk\_1\_101\_2

	G	L	H	D	h
		approx.	approx.		
M20x1.5	M20	105	120	65	31
DN10	G 3/4	120	120	65	31
DN15	G 1	120	136	88	28
DN25	G 1 1/2	150	145	98	32.5

### Back Pressure Valves or Relief Valves BPV-DM

Adjustable back pressure valve for installation in the discharge line to create a constant back pressure. Also suitable for generating accurate dosing in the case of an open discharge port or where there is priming pressure on the vacuum side.

Used as a Relief valve installed in a bypass to protect pumps, pipework and fittings from excess pressure as a result of operational errors or blockages. In the event of a malfunction, the pump conveys in a loop or back into the storage tank.

**Warning:** Back pressure valves are not fluid-tight stop taps! Installation instructions in the operating manual must be observed!

**Applications:** Vario, Sigma/ 1, Sigma/ 2 and Sigma/ 3 metering pumps.

					Part No.
BPV-DM	1 - 10 bar	G 3/4	DN 10	PPE	P1009890
		G 1	DN 15	PPE	P1009896
		G 1 1/2	DN 25	PPE	P1009908
BPV-DM	1 - 10 bar	G 3/4	DN 10	PPB	P1009892
		G 1	DN 15	PPB	P1009898
		G 1 1/2	DN 25	PPB	P1009910
BPV-DM	1 - 10 bar	G 3/4	DN 10	PCE	P1009891
		G 1	DN 15	PCE	P1009897
		G 1 1/2	DN 25	PCE	P1009909
BPV-DM	1 - 10 bar	G 3/4	DN 10	PCB	P1026451
		G 1	DN 15	PCB	P1026452
		G 1 1/2	DN 25	PCB	P1026453

Material combinations	Housing	Seal
PPE	PP	EPDM
PPB	PP	FPM B
PCE	PVC	EPDM
PCB	PVC	FPM B

#### Connection Sizes

DN10 valve	=	1/2"	BSP M/M or 15 S/WM	Note: PP only in BSP M/M
DN15 valve	=	3/4"	BSP M/M or 20 S/WM	
DN20 valve	=	1"	BSP M/M or 25 S/WM	
DN25 valve	=	1"	BSP M/M or 25 S/WM	

#### Note:

Valves should normally be set to the desired back pressure on site after installation. However if you require them to be pre-set prior to dispatch then there would be a charge

# 3.7 Accessories, Multifunction valve Type MFV-DK

## 3.7 Accessories - Multifunction valve Type MFV-DK

**Description/version**

**Part no.**

**Price**

**Multifunction valve Type MFV-DK**

ProMinent® multifunction valve mounted directly on the liquid end of the pump with the functions

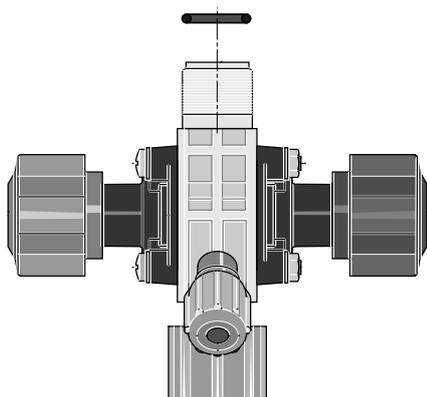
- Backpressure valve, opening pressure approx. 1.5 bar
- Relief valve, opening pressure approx. 10 or 16 bar
- Priming aid when backpressure applied, no need to release delivery line
- Pressure relief in delivery line, e.g. before servicing work

The ProMinent® multifunction valve is operated by means of smooth-action rotary knobs which automatically return to their initial position when released. This feature ensures safe and reliable operation even under difficult access conditions. The ProMinent® multifunction valve is made of the material PVDF and can be used in feed systems for virtually all chemicals.

Caution: Backpressure valves are not absolutely leakproof isolating elements!

**Materials in contact with media**

Valve body - PVDF; Diaphragm - PTFE coated;  
Seals - Viton or EPDM; DN10 adaptor - PVC



pk\_1\_053

Type	Overflow opening pressure	Bypass Size	Connection	Part No
Size I	16 bar	6x4	6 - 12 mm	P792011
Size I	10 bar	6x4	6 - 12 mm	P791715
Size I	6 bar	6x4	6 - 12 mm	P1005745
Size II	10 bar	12x9	6 - 12 mm	P792203
Size II	6 bar	12x9	6 - 12 mm	P740427
Size III	10 bar	12x9	DN10	P792215

**Also available**

Size I	8-10 bar	6x4	6 - 12 mm	P791715C
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Note: this unit is made by prominent China BUT has German diaphragms

**Applications**

- Size I Beta®, gamma L type 1000,1601, 1602, 1605, 1005, 1008,0708, 0413, 0220  
Delta 1608, 1612
- Size II Beta®, gamma L, Delta 1605, 1008, 0713, 0420, 0232  
all types under size 1  
Delta 1020, 0730
- Size III Delta 0450, 0280 **Note: Can't act as a PRV with these 2 pumps**

NOTE: Valve Pre-Pack is supplied with 2m PVC clear tube, for return to tank.



**MFV with bypass plugged with Teflon Socket**

Use this as an alternative injection valve for aggressive media as it has no spring in contact with the chemical.

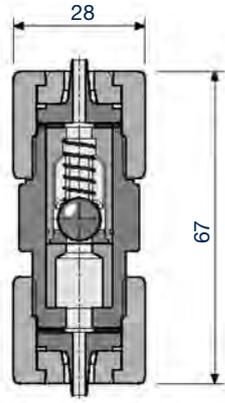
Size I	1.5 bar	6x4	6 x 4 mm	P1027652-6
Size I	1.5 bar	6x4	8 x 5 mm	P1027652-8

# 3.8 Accessories Concept, Gamma, Pneumados Anti-Return Valves & Injection valve assembly

## 3.8 Accessories - Anti-Return Valves & Injection valve assembly

**Description/version**

**Part no.**



### PVDF non-return valve, for inline mounting

With dual-end connector set, for installation inline (tube), valve body of PVDF seals of PTFE, with ball check, spring-loaded with Hastelloy C spring, response pressure approx. 0.5 bar.

By using different connector sets, different tube sizes from 6 - 12 mm can be connected with each other.

### Applications when using appropriate tubing

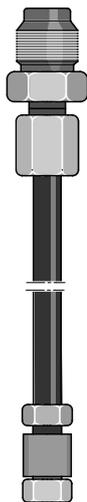
25° C - max. operating pressure 16 bar

45° C - max. operating pressure 12 bar

			OD x ID	A	
Connection	6 mm	for PE/PTFE tubing	6 x 4	67	1030463.
Connection	8 mm	for PE/PTFE tubing	8 x 5	67	1030975.
Connection	12 mm	for PE/PTFE tubing	12 x 9	67	1030976.

P\_AC\_0181\_SW

## Dosing Connector For Hot Water Up To 200 °C



### Injection valve assembly for hot water up to 200°C

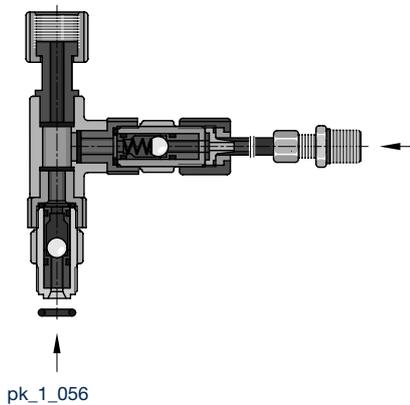
Comprising injection valve of stainless steel 1.4571, 1 m stainless steel 1.4571 discharge line and adaptor unions with ferrule to connect PE/PTFE tubing with stainless steel pipe.

Hot water connection	6 mm - 1/4"	913166.
Hot water connection	6 mm - 1/2"	913167.
Hot water connection	8 mm - 1/2"	913177.
Hot water connection	12 mm - 1/2"	913188.

pk\_1\_049

# 3.9 Accessories ProMinent® Flushing Device & Rigid Suction Assemblies

## 3.9 Accessories Flushing Devices



pk\_1\_056

**Description/version**

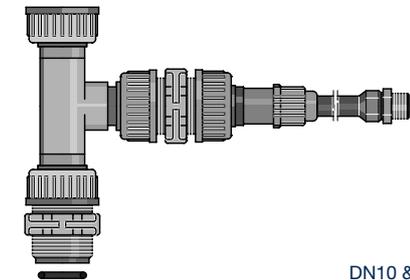
**Part no.**

For flushing and cleaning the liquid end, discharge line and injection valve and for protection against deposits.

**Flushing device, PVC**

for 6, 8, and 12 mm connector

809925.



pk\_1\_057

DN10 &  
DN15

for DN 10 connector

809926.

for DN 15 connector

803960.

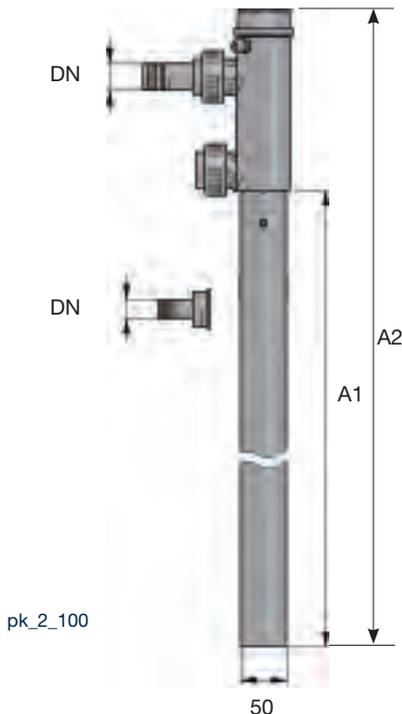
for DN 20 connector

809361.

for DN 25 connector

809362.

## Rigid Suction Assemblies



pk\_2\_100

Suction lances for motor-driven metering pumps. Universal PVC suction lances with float switch in protective tube Ø 50 incorporating foot/check valve (not detachable), hydraulic connector with PVC hose nozzles. DN 10/15: fitted with ball check valve (borosilicate glass ball, FPM seals), DN 20/25; DN 32 fitted with FPM flutter valve.

**FPM Seals**

Size	Float switch	Contact	A1	A2	Part No.
DN10/15	2-stage	3 pin round plug	1000	1100	P1037748
	3 m lead				
DN20/25	2-stage	3 pin round plug	1000	1100	P1037750
	3 m lead				
DN32	2-stage	3 pin round plug	1000	1100	P1037752
	3 m lead				

**EPDM Seals \*\*\* Not Stocked**

Size	Float switch	Contact	A1	A2	Part No.
DN10/15	2-stage	3 pin round plug	1000	1100	P1037749
	3 m lead				
DN20/25	2-stage	3 pin round plug	1000	1100	P1037751
	3 m lead				
DN32	2-stage	3 pin round plug	1000	1100	P1037753
	3 m lead				

## 3.10 Accessories, Float Switches for Solenoid-Driven Pumps

### 3.10 Accessories - Concept Float Switches



#### Description/version

#### Part no.

#### Single-stage float switch

for minimum level indication with simultaneous shutdown of the metering pump, with or without a flat connector.

#### Technical data:

Max. switching voltage 60 V, switching current 0.3 A

Making/breaking capacity 5 W/5 VA

Temperature range -25 °C to 75 °C, enclosure rating IP 67

#### Materials:

Body PVC, 21 dia. foamed PP float, PE cable

PVC 2m Cable, with Flat Plug

142056.

PVC 5m Cable, with Flat Plug

142058.

PVC 2m Cable, No Plug

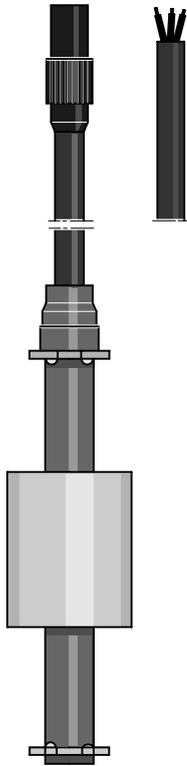
142062.

PVC 5m Cable, No Plug

142064.

# 3.10 Accessories, Float Switches for Solenoid-Driven Pumps

## 3.10 Accessories - Solenoid-Driven Pumps Float Switches, & Ceramic Weight



**Description/version**

**Part no.**

**Two-stage float switch**

For monitoring the level in a batching tank, two-stage with early alarm. Stops the metering pump if the level drops a further 30 mm.  
Fitted with 3-pole round plug for direct connection to Beta® and GALA®.

**Technical data:**

Max. switching voltage 100 V, switching current 0.5 A, switch power 5 W/5 VA.  
Temperature range -10°C to 65°C, enclosure rating IP 67.  
**Switching mode: 2 x N/C for low liquid levels.**

**Materials:**

**Body of PVDF, 25 dia. float of PVDF, PE cable**

PVDF with 3-pole round plug	Cable Length	2 m	1034697.
PVDF with 3-pole round plug	Cable Length	5 m	1034698.
PVDF with 3 cores	Cable Length	2 m	1034699.
PVDF with 3 cores	Cable Length	5 m	1034700.

pk\_1\_081



**DO NOT FORGET Z CLIP**

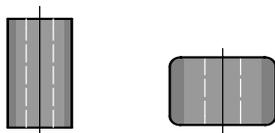
**Z-Clip, PP,** For two-stage float switch & 6 x 4, 8 x 5 & 12 x 9 foot valves 800692.

**Z-Clip, PVC,** For two-stage float switch & 6 x 4, 8 x 5 & 12 x 9 foot valves 800573.

**Ceramic weight for vertical location of float switch**

**Size 1** Dia 25 x 50, 40g with 10 dia. opening to suit round plug and jack plug. 1019244.

**Size 2** Dia 39 x 32, 65g with elongated 13 x 27 opening for round plug and flat connector type. 404004.



1

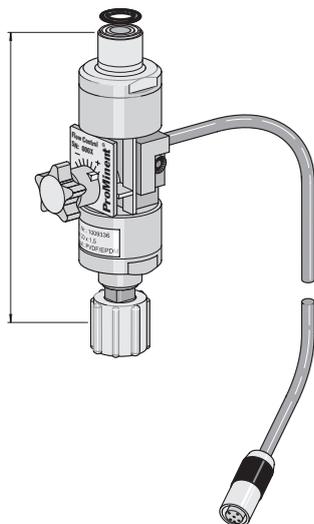
2

For the two-stage float switch with a round plug the weight is slid into place from below after removal of the float.

pk\_1\_082

# 3.11 Accessories ProMinent® Gamma and Sigma Metering Monitors

## 3.11 Accessories - Gamma and Sigma Metering Monitors



pk\_1\_086\_2

### Description/version

### Part no.

#### Adjustable flow control monitor

Suitable for gamma/L series in material versions PP, PC, NP and TT. Supplied with connection cable for assembly directly to liquid end.

Monitors individual strokes according to the float and orifice principle. The partial quantity of chemical flowing past the float is adapted to the preset stroke volume via the adjusting screw so that an alarm is actuated if the flow falls below 20 %. The user can select the number of incomplete strokes permitted (between 1 and 127) in accordance with the actual process requirements.

#### Materials

Flow meter: PVDF  
Float: PTFE-coated  
Seals: Viton® B/EPDM

Flow Control	Material	for pump type	Part no.
Size I	PVDF/EPDM	1000, 1601, 1602	1009229.
Size II	PVDF/EPDM	1005, 1605, 0708, 1008, 0413, 0713, 0220, 0420, 0232	1009336.
Size I	PVDF/Viton® B	1000, 1601, 1602	1009335.
Size II	PVDF/Viton® B	1005, 1605, 0708, 1008, 0413, 0713, 0220, 0420, 0232	1009338.

Suitable for Sigma/ 1 / 2 / 3 series in PVT & SS material versions. Supplied with connection cable for assembly directly to liquid end.

Monitors individual strokes according to the float and orifice principle. The partial quantity of chemical flowing past the float is adapted to the preset stroke volume via the adjusting screw so that an alarm is actuated if the flow falls below 20 %. The admissible number of incomplete strokes can be set at the Sigma Control (S1Ca/S2Ca/S3Ca) to between 1 and 127 to allow optimum adjustment to the process requirements.

Size III - DN10	PVDF/EPDM	Sigma/1 12017, 10022, 12035 10044, 10050, 07065	1021168.
Size III - DN10	PVDF/Viton® B	Sigma/1 12017, 10022, 12035 10044, 10050, 07065	1021169.
Size III - DN15	PVDF/EPDM	Sigma/1 07042, 07084, 04120 Sigma/2 12050, 12090, 12130	1021170.
Size III - DN15	PVDF/Viton® B	Sigma/1 07042, 07084, 04120 Sigma/2 12050, 12090, 12130	1021171.
Size IV	PVDF/EPDM	Sigma/2 07120, 07220, 04350 Sigma/3 120145, 12190, 12270	1021164.
Size IV	PVDF/Viton® B	Sigma/2 07120, 07220, 04350 Sigma/3 120145, 12190, 12270	1021165.
Size V	PVDF/EPDM	Sigma/3 07410, 07580, 04830	1021166.
Size V	PVDF/Viton® B	Sigma/3 07410, 07580, 04830	1021167.

**NOTE: When using the above with Delta Pumps these can be mounted on the suction side of pump if using slow discharge. Additional adaptors may be required.**

#### NOTE: FOR DE-GASSING LIQUID ENDS USE KITS AS BELOW.

For GALA degassing heads use wall mounting kit

For PVC PA55002429 \$ 170

For P.P. PA55002430 \$ 170

Note: Mounting kit suitable for multi-function valve as well as metering monitor  
ADD RELAY to PUMP for an EXTERNAL ALARM

**Note: See also GREEN PAGE price List for LOCAL Flow Switches**

# 3.12 Accessories ProMInent® Beta, Gamma, Vario & Sigma

## 3.12 Accessories - Flow Control Monitor, Control Cables, Profibus Cables

Description/version	Part no.
 <p>pk_1_085</p>	<p><b>Universal control cable</b></p> <p>For Beta 4, Beta 5 , Gamma L, DELTA, mikro g/ 5 and Sigma with 5-pole plastic round connector and 5-wire cable with open end. For pacing a metering pump through contacts - external pacing, standard signals - analogue pacing and for voltage-free remote on/off control.</p> <p>Universal control cable, 5-pole round connector, 5-wire, 2 m 1001300.</p> <p>Universal control cable, 5-pole round connector, 5-wire, 5 m 1001301.</p> <p>Universal control cable, 5-pole round connector, 5-wire, 10 m 1001302.</p>
 <p>Ⓐ</p>	<p><b>Profibus adaptor, enclosure rating IP65</b></p> <p>eurofast 5-pin M12 male to M12 Female, length approx <u>500 mm</u>.</p> <p><b>PROFIBUS® Y-adaptor 2 x M12 x 1 male/female to M12 male</b> 1040956.</p>
 <p>Ⓑ</p>	<p><b>PROFIBUS® Y-adaptor</b> 1036621.</p>
 <p>Ⓒ</p>	<p><b>PROFIBUS® termination resistance, plug-in</b> 1036622.</p>
	<p><b>PROFIBUS® Terminating Assembly</b>, comprising; a Y-adaptor and termination resistance. (B + C) 1040955.</p>

# 3.14 Accessories, Mechanical/Hydraulic Pumps

## 3.14 Accessories - Connectors & Fittings

**Description/version**

**Part no.**

**Connector set**

Connector set for connecting hoses of different sizes to suction and discharge connectors on the liquid end of Beta, gamma, Delta, EXtronic, CONCEPT, Pneumados, D4a and accessories. The set consists of 2 of each, hose sleeve, grip ring, union nut and seal.

One connector set is required for the metering pump.

**Connector set (Pair)**

PP/EPDM for hose	6 x 4 mm	817150.
PP/EPDM for hose	8 x 5 mm	817153.
PP/EPDM for hose	12 x 9 mm	817151.
PP/EPDM for hose	12 x 6 mm	817152.
PVC/Viton for hose	6 x 4 mm	817050.
PVC/Viton for hose	8 x 5 mm	817053.
PVC/Viton for hose	12 x 9 mm	817051.
PVC/Viton for hose	12 x 6 mm	817052.
PVDF (PVT) for hose	6 x 4 mm	1023246.
PVDF (PVT) for hose	8 x 5 mm	1023247.
PVDF (PVT) for hose	12 x 9 mm	1023248.
PTFE for hose	6 x 4 mm	817201.
PTFE for hose	8 x 5 mm	817204.
PTFE for hose	12 x 9 mm	817202.

**Connector set (Single)**

PVC/Viton for hose	6 x 4 mm	817065.
PVC/Viton for hose	8 x 5 mm	817066.
PVC/Viton for hose	12 x 9 mm	817067.
PVDF (PVT) for hose	6 x 4 mm	1024619.
PVDF (PVT) for hose	8 x 5 mm	1024620.
PVDF (PVT) for hose	12 x 9 mm	1024618.
PVC/Viton for hose	10 x 4 mm	1002589.
PVC/Viton for hose	12 x 6 mm	817068.

Adaptor for connecting from connectors on system + GF + to liquid end and accessories.

PP for connector DN 8 with external thread 5/8" M 20 x 1.5 (Fig.) 817164.

PP for connector DN 10 with external thread 3/4" M 20 x 1,5 817165.

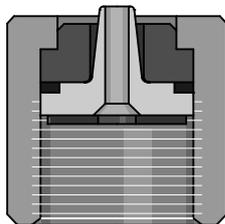
PVC for connector DN 8 with external thread 5/8" M 20 x 1.5 (Fig.) 817069.

PVC for connector DN 10 with external thread 3/4" M 20 x 1.5 817099.

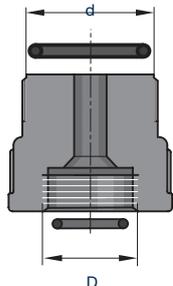
**Fittings**

pressure hose tail	PVC d 16 - DN 10	800554
pressure hose tail	PVDF d 16 - DN 10	1002288

PVC Adaptor 15mm Rigid PVC to 20 x 1.5 Female Union Nut PA27022382



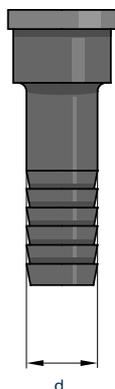
pk\_1\_089



pk\_1\_114



pk\_1\_116



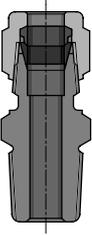
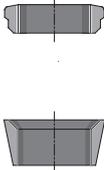
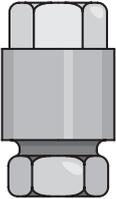
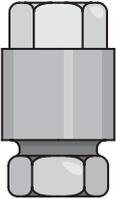
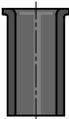
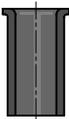
pk\_2\_046



15mm Solvent Weld to 20x1.5 Female Union

## 3.14 Accessories, Mechanical/Hydraulic Pumps

### 3.14 Accessories - Connectors & Fittings

	Description/version	Part no.	
pk_1_028		<b>Straight male adapter, stainless steel</b> Swagelok system, SS 316(1.4401) stainless steel for connecting pipes to internally-threaded suction heads and valves and for SB type.	
		6 mm - 1/4" ISO	359526.
		8 mm - 1/4" ISO	359527.
		12 mm - 1/4" ISO	359528.
		12 mm - 3/8" ISO	359520.
		16 mm - 3/8" ISO	359521.
		16 mm - 1/2" ISO	359529.
pk_1_117		<b>Grip ring set, stainless steel</b> For use with stainless steel connectors of metering pumps and accessories using the Swagelok system. The rings must always be changed in pairs. A ring set consists of a front and rear grip ring.	
		Ring set 6 dia. for tubing 6 mm o.d.	104232.
		Ring set 8 dia. for tubing 8 mm o.d.	104236.
		Ring set 12 dia. for tubing 12 mm o.d.	104244.
pk_1_118		<b>Straight connector, stainless steel</b> Serto system for connecting a PE or PTFE injection line to stainless steel tubing, made of stainless steel with a grip ring but no support sleeve (components in contact with the medium stainless steel 1.4571).	
		6 mm o.d. to 6 mm o.d. stainless steel tubing	359317.
		8 mm o.d. to 8 mm o.d. stainless steel tubing	359318.
		12 mm o.d. to 12 mm o.d. stainless steel tubing	359320.
pk_1_118		<b>Grip ring, stainless steel</b> Serto system for use with stainless steel connectors.	
		6 dia. for tubing 6 mm o.d.	359357.
		8 dia. for tubing 8 mm o.d.	359355.
		12 dia. for tubing 12 mm o.d.	359356.
pk_1_090		<b>Reducing grip ring, stainless steel</b> Serto system. By changing the grip ring for a reducing grip ring, and the support sleeve in the case of plastic tubing, a smaller pipe can be connected.	
		8/6 dia. for tubing 6 mm o.d. x 4 mm	359376.
pk_1_090		<b>Support sleeve, stainless steel</b> For connecting PE or PTFE tubing to stainless steel connectors using Swagelok and Serto systems.	
		for hose 6 dia. x 4 mm standard tubing	359365.
		for hose 8 dia. x 5 mm standard tubing	359366.
		for hose 12 dia. x 9 mm standard tubing	359368.

# 3.14 Accessories, Solenoid Driven Pumps

## 3.14 Accessories - Flexible & Rigid Tubing

### Description/version

### Part no.

#### Suction and discharge line

For pumps and accessories. It is recommended that only original tubing be used so as to ensure that the mechanical strength of the clamp unions and also the resistance to pressure and chemicals are maintained.

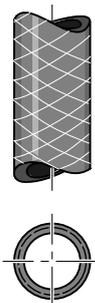
#### Suction and discharge line

				Max. working pressure bar	per Metre
PTFE	6	mm o.d. x 4	mm i.d.	20*	037426.
PTFE	8	mm o.d. x 4	mm i.d.	25*	1033166.
PTFE	8	mm o.d. x 5	mm i.d.	20*	037427.
PTFE	12	mm o.d. x 9	mm i.d.	17*	037428.
PTFE	19	mm o.d. x 16	mm i.d. for DN 10	10*	037430.
Stainless steel 1.4571	6	o.d. x 5 mm i.d.		175	015738.
Stainless steel 1.4571	8	o.d. x 7 mm i.d.		131	015740.
Stainless steel 1.4571	12	o.d. x 10 mm i.d.		185	015743.

\* Maximum working pressure at 20°C provided there is media compatibility and the connection is properly made.

**FOR PE AND PVC TUBE SEE 'GREEN PAGE' Price List.**

#### HIGH PRESSURE TUBE



for small capacity pumps 10-16 bar working Pressure

				Max. working pressure bar	per Metre
10 X 4 Tube Fabric Reinforced	PVC	16*	5m	1004533.	
10 X 4 Tube Fabric Reinforced	PVC	16*	50m	1004536.	
12 X 6 Tube Fabric Reinforced	PVC	16*	5m	1004538.	
12 X 6 Tube Fabric Reinforced	PVC	16*	50m	1004541.	

\* Maximum working pressure at 20°C provided there is media compatibility and the connection is properly made.

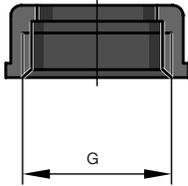
# 3.15 Accessories ProMinent Motor-Driven Pumps General Accessories

## 3.15 Accessories - Union Nuts & Inserts

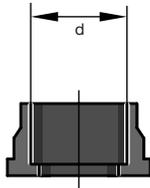
Description/version Part no.

**Connecting parts/fittings**

Union nut	PP	5/8"	-	DN 8	800665.
Union nut	PP	3/4"	-	DN 10	358613.
Union nut	PP	1"	-	DN 15	358614.
Union nut	PP	1 1/4"	-	DN 20	358615.
Union nut	PP	1 1/2"	-	DN 25	358616.
Union nut	PP	2"	-	DN 32	358617.
Union nut	PP	2 1/4"	-	DN 40	358618.
Union nut	PP	2 3/4"	-	DN 50	358619.
Union nut	PVC	3/4"	-	DN 10	356562.
Union nut	PVC	1"	-	DN 15	356563.
Union nut	PVC	1 1/4"	-	DN 20	356564.
Union nut	PVC	1 1/2"	-	DN 25	356565.
Union nut	PVC	2"	-	DN 32	356566.
Union nut	PVC	2 1/4"	-	DN 40	356567.
Union nut	PVC	2 3/4"	-	DN 50	356568.
Union nut	PVDF	3/4"	-	DN 10	358813.
Union nut	PVDF	1"	-	DN 15	358814.
Union nut	PVDF	1 1/4"	-	DN 20	358815.
Union nut	PVDF	1 1/2"	-	DN 25	358816.
Union nut	PVDF	2"	-	DN 32	1003639.
Union nut	PVDF	2 1/4"	-	DN 40	358818.
Union nut	PVDF	2 3/4"	-	DN 50	358819.
Union nut	SS	3/4"	-	DN 10	805270.
Union nut	SS	1"	-	DN 15	805271.
Union nut	SS	1 1/4"	-	DN 20	805272.
Union nut	SS	1 1/2"	-	DN 25	805273.
Union nut	SS	2"	-	DN 32	805274.
Union nut	SS	2 1/4"	-	DN 40	805275.
Union nut	SS	2 3/4"	-	DN 50	805276.
Union end (female thread)	SS	3/8" - DN 10			805285.
Union end (female thread)	SS	1/2" - DN 15			805286.
Union end (female thread)	SS	3/4" - DN 20			805287.
Union end (female thread)	SS	1" - DN 25			805288.
Union end (female thread)	SS	1 1/4" - DN 32			805289.
Union end (female thread)	SS	1 1/2" - DN 40			805290.
Union end (female thread)	SS	2" - DN 50			805291.



pk\_2\_069

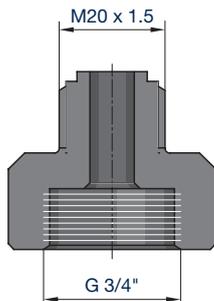


pk\_2\_069

**NOTE: PVC Solvent Weld fittings are standard with Sigma and optional with Vario.**

**Adaptor**

PVC DN10 - 3/4" F to 20x1.5 M 800816.



pk\_1\_112

# 3.16 Accessories Mechanical / Hydraulic Accessories

## 3.16 Accessories - Mechanical / Hydraulic Accessories



pk\_1\_102

### Custom Valve Balls

		Part No.
PTFE diameter 4.7	for valve diameter 6 mm	404255
PTFE diameter 9.5	for valve diameters 8 & 12 mm	404258
PTFE diameter 16.0	for DIN 15 valve	404259
PTFE diameter 11.0	for DIN 10 valve	404260
PTFE diameter 20	for DN 20 valve	404256
PTFE diameter 25	for DN 25 valve	404257
PTFE diameter 38.1	for DN 40 valve	404261
Ceramic diameter 4.7	for valve diameter 6 mm	404201
Ceramic diameter 9.2	for valve diameters 8 & 12 mm	404281
Ceramic diameter 11.1	for DIN 10 valve	404277
Ceramic diameter 16.0	for DIN 15 valve	404275
Ceramic diameter 20	for DN 20 valve	404273
Ceramic diameter 25	for DN 25 valve	404274
Ceramic diameter 38.1	for DN 40 valve	404278

### Valve Springs for Liquid Ends

1.4571 valve spring	0.05 bar for valve 4.7	469406
1.4571 valve spring	0.05 bar for valve 9.2	469403
1.4571 valve spring	0.05 bar for R 1/4" for Meta Makro TZ HK	469461
1.4571 valve spring	0.05 bar for R 3/8" for Makro TZ HK	469461
Hastelloy C valve spring	0.1 bar DN 10	469114
Hastelloy C valve spring	0.1 bar DN 15	469107
Hastelloy C valve spring	0.1 bar DN 20	469451
Hastelloy C valve spring	0.1 bar DN 25	469452

### Valve Springs for Discharge Valves

1.4571 valve spring	1.0 bar for R 1/4" - 6 diameter connector	469401
Hastelloy C valve spring	0.5 bar for R 1/2" - 6, 8 & 12 mm diameter connector	469404
Hastelloy C valve spring	1.0 bar for R 1/2" - 6, 8 & 12 mm diameter connector	469413
Hastelloy C valve spring	0.5 bar DN 10	469115
Hastelloy C valve spring	1.0 bar DN 10	469119
Valve spring	0.5 bar DN 15	469108
Valve spring	1.0 bar DN 15	469116
Hastelloy C valve spring	0.5 bar DN 20	469409
Hastelloy C valve spring	1.0 bar DN 20	469135
Hastelloy C valve spring	0.5 bar DN 25	469414
Hastelloy C valve spring	1.0 bar DN 25	469136
Hastelloy C valve spring	0.5 bar DN 40	469104
Hastelloy C valve spring	1.0 bar DN 40	469137



pk\_1\_102

### Hastelloy C valve spring with FEP coating

Hastelloy C/PVDF valve spring	0.5 bar for R 1/2" - 6, 8 & 12 mm diam. connector	818590
Hastelloy C/PVDF valve spring	1.0 bar for R 1/2" - 6, 8 & 12 mm diam. connector	818536
Hastelloy C/PVDF valve spring	0.5 bar DN 10	818515
Hastelloy C/PVDF valve spring	0.5 bar DN 15	818516
Hastelloy C/PVDF valve spring	0.5 bar DN 20	818517
Hastelloy C/PVDF valve spring	0.5 bar DN 25	818518
Hastelloy C/PVDF valve spring	0.5 bar DN 40	818519

# 3.17 Accessories Contact Water Meters - Cold

## 3.17 Accessories - Contact Water Meter for use in Potable Water Systems

**Description/version**

**Part no.**

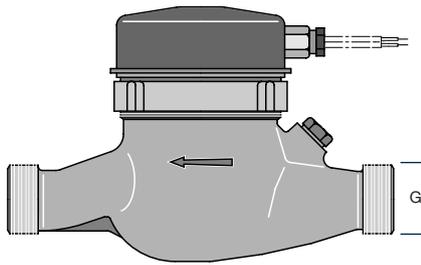
**Pulse-type water meter, DIN type**

**PN 10 bar**, readable, type series **MNR-KGm**, working temperature **40°C**

Max. contact loading 100 mA, 24 V, NG nominal size

$Q_{max}$  = maximum loading  $Q_d$  = continuous duty loading

$Q_n$  = nominal loading (1/2  $Q_d$  in accordance with Calibration Regulations)



pk\_1\_096

$\frac{Q_{max}}{Q_d/Q_n}$ NG - m <sup>3</sup> /h	Union connector size inch DN/mm	Installed length without union mm		Litres per pulse	
5/5/2.5	3/4" - DN 20	190		0.05	P304467
5/5/2.5	3/4" - DN 20	190		0.1	P304432
5/5/2.5	3/4" - DN 20	190		0.25	P304455
5/5/2.5	3/4" - DN 20	190		0.3	P304428
5/5/2.5	3/4" - DN 20	190		0.5	P304431
5/5/2.5	3/4" - DN 20	190	*	1	P304434
5/5/2.5	3/4" - DN 20	190	*	1.5	P304433
5/5/2.5	3/4" - DN 20	190		2.5	P304458
5/5/2.5	3/4" - DN 20	190		10	P304453
5/5/2.5	3/4" - DN 20	190		100	P304444
12/12/6	1" - DN 25	260		0.25	P304427
12/12/6	1" - DN 25	260		0.5	P304451
12/12/6	1" - DN 25	260	*	1	P304445
12/12/6	1" - DN 25	260	*	1.5	P304435
12/12/6	1" - DN 25	260	*	2	P304446
12/12/6	1" - DN 25	260	*	10	P304447
12/12/6	1" - DN 25	260		100	P304448
20/20/10	1 1/2" - DN 40	300	*	2	P304436
20/20/10	1 1/2" - DN 40	300		3	P304429
20/20/10	1 1/2" - DN 40	300		4	P304426
20/20/10	1 1/2" - DN 40	300		10	P304452
20/20/10	1 1/2" - DN 40	300		100	P304449
30/30/15	2" - DN 50	270		3	P304430
30/30/15	2" - DN 50	270	*	4	P304438
30/30/15	DN 50 Flange	270		6	304437.
30/30/15	2" - DN 50	270		10	P304456
30/30/15	DN 50 Flange	270		100	304450.

NOTE: All water meters complete with Union assemblies.

\* stocked item - other pulses changed on request - Flanged ex PDT

## 3.18 Accessories - Water Meters - Hot

**Description/version**

**Part no.**

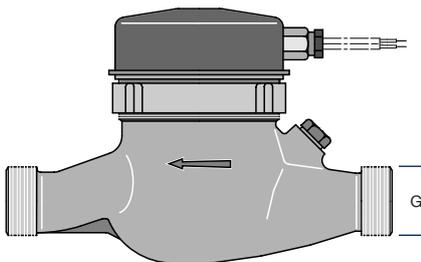
**Pulse-type contact water meter for hot water up to 120°C**

PN 10 bar, readable, type series, **MTH-KGm**, contact loading max. 100 mA, 24 V, NG nominal size.

$Q_{max}$  = maximum loading

$Q_d$  = continuous loading

$Q_n$  = nominal loading



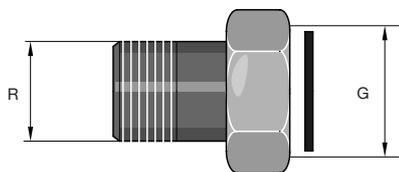
pk\_1\_096

$\frac{Q_{max}}{Q_d/Q_n}$ NG - m <sup>3</sup> /h	Union connector size inch DN/mm	Installed length without union mm		Litres per pulse	
5/2.5/2.5	3/4" 1"	190		0.25	P304478
5/2.5/2.5	3/4" 1"	190		0.5	P304479
5/2.5/2.5	3/4" 1"	190		1	P304480
12/6/6	1" 1 1/4"	260		1.5	P304482
12/6/6	1" 1 1/4"	260		2	P304483
20/10/10	1 1/2" 2"	300		2	P304484
30/15/15	DN 50 2 1/2"	270		6*	P304487

NOTE: All water meters complete with Union assemblies.

# 3.20 Suction Pressure Regulator

## 3.19 Accessories - Water Meters



pk\_1\_098

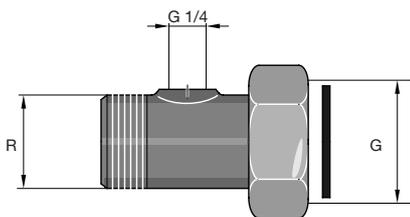
**Description/version**

**Part no.**

**Union assembly with seal**

Brass, for water meter with threaded connections

3/4"	1"	359029.
1"	1 1/4"	801322.
1 1/2"	2"	359037.
2"	2 1/2"	359039.



pk\_1\_099

**Union assembly with seal**

Brass, for water meter with threaded connections with 1/4" connection for injection valve.

R 3/4"	1" - 1/4"	*** non-stock item ***	359030.
R 1"	1 1/4" - 1/4"	*** non-stock item ***	359032.
R 1 1/2"	2" - 1/4"	*** non-stock item ***	359038.
R 2"	2 1/2" - 1/4"	*** non-stock item ***	801321.

## 3.20 Suction Pressure Regulator

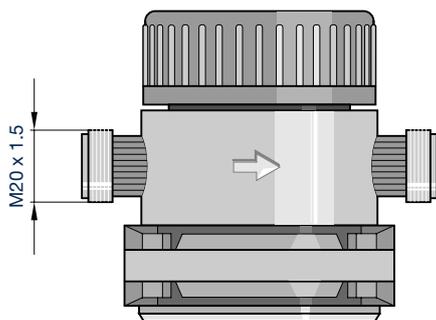
### Suction Pressure Regulator

The suction pressure regulator is a spring-loaded diaphragm valve which opens as a result of the pump suction pressure. This ensures that chemicals cannot flow when the pump is not running, nor can a vacuum be created as a result of tube rupture.

A ball check valve must be fitted to prevent undesirable suction action at the pump outlet (e.g. siphon effect).

An adjustable spring is used to set the maximum required negative pressure for each operating situation up to 400 mbar. For pumps with positive inlet pressure a minimal vacuum of approx. 50 mbar is sufficient. The pump must produce this vacuum in any case, even for an atmospheric pressure inlet.

**CAPACITY:** 50 l/h max.



pk\_2\_079

	Mat.	Connector	Part No.
SDR 50	PVC	M 20 x 1.5 (solenoid pumps)	P6-1005505
SDR 50	PVC	M 20 x 1.5 (solenoid pumps)	P8-1005505
SDR 50	PVC	M 20 x 1.5 (solenoid pumps)	P12-1005505
SDR 50	PVC	DN10 (3/4" up to 50l/hr)	P1005506

## 3.21 Accessories - DulcoFlow® flow meter

### 3.21 DulcoFlow flow meter



The DulcoFlow® flow meter measures all liquid media without any media contact. The rate of flow of non-continuous volume flows and the amount of liquid which has passed through in pulsing flow regimes are measured.

The measuring instrument operates based on the ultrasonic measurement method. Media contacting parts are manufactured using chemically resistant PVDF/PTFE. This ensures that aggressive media can also be measured without problem. The instrument is installed directly in the pipe of the medium being measured.

Interfering influences, such as air bubbles, are identified by the DulcoFlow® and forwarded to the analysis unit as an error message. The instrument, which is structured for wall mounting, is designed for a measurement range of 0.1 to 30 litres per hour.

#### Features

- Direct display of the instantaneous flow and cumulative flow in litres.
- Compact universal housing.
- Two-line display.
- Frequency output for metering pump control.
- Analogue output 0/4...20 mA, can be configured as a recorder output or a control output.

#### Main Applications

Monitoring and recording the dosing of chemicals in:

- Water treatment, Paper industry.
- Waste water treatment.
- Chemical industry, Power plants, etc.

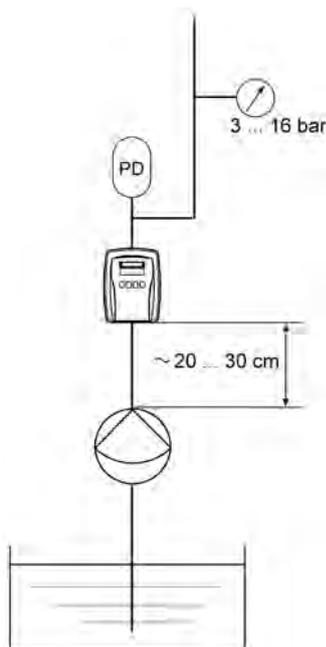
#### Measuring principle

The DulcoFlow® flow meter measures the volume flow of pulsing flows. The ultrasonic, time of flight measurement method is used. For the time of flight measurement, a sound signal is alternately transmitted in and against the direction of flow. The time difference is then a measure of the mean flow velocity.

Use of the ultrasound measurement method automatically compensates any temperature induced changes in the medium. Operation without moving parts guarantees a long service life and wear-free operation.

#### Advantages

- Direct display of the instantaneous flow and cumulative flow in litres.
- Can be switched over to display the pulsing frequency of the liquid or pump.
- Safety and reliability through display of the device operating status using LEDs.
- Safety and reliability through display of the measurement status using LEDs



#### Hydraulic installation parameters

The DulcoFlow® can also be used at constant pressures under 3 bar. However, in such cases, we recommend consulting with ProMinent head office, Sydney.

#### Technical Data

Measuring range:	0.1..... 50 l/h
Accuracy:	< 2 % after calibration
Analogue output:	4...20 mA
Frequency output:	< 10 kHz (optional on special order)
Protection class:	IP 65
Power supply:	100...230 V AC/ 50/60 Hz
Dimensions:	183.6 x 121 x 122.7 mm (H x W x D)
Media to be measured	
Connector:	Tube connection with 6x4, 8x5 or 12x9 mm
Medium pressure:	(min.) 3 ...16 bar
Medium temperature :	-10 ... 45 °C
Dyn. viscosity (rj):	0.5 ... 2000 mPa

Current output	DFMa05T1C100	6x4
Contact output	DFMa05T1C200	6x4
Current output	DFMa05T2C100	8x5
Contact output	DFMa05T2C200	8x5
Current output	DFMa08T3C100	12x9
Contact output	DFMa08T3C200	12x9

DFMa05 Beta/Gamma L ... 1000 - 0413/0713, Delta 1608-1612

DFMa08 Beta/Gamma L ... 0420, Delta 1020 - 0450

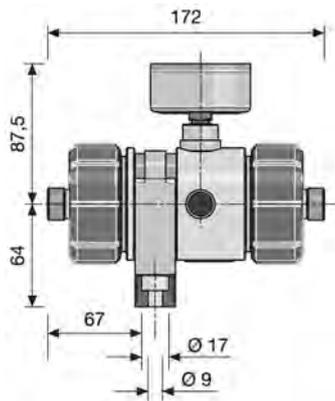
# 3.21 Accessories - Pulsation Dampeners

## 3.21 Accessories - Pulsation Dampeners

The pulsation dampener is used to produce minimal pulsation metering and to reduce flow resistance in long discharge lines.

The cushion of gas located between the hose and the housing is compressed by a thrust stroke from the metering pump, allowing a quantity of feed chemical to pass along the discharge line. On the next suction stroke, the excess pressure created by the cushion of gas forces the chemicals through the pipe. The gas is now released from pressure, and returns to its original volume.

Important notice: The pulsation dampener must be used in conjunction with a relief valve.



P\_AC\_0180\_SW

### PVC In Line Dampener

Operating conditions 5 - 20 °C - max. operating pressure 10 bar  
 40 °C - max. operating pressure 6 bar  
 60 °C - max. operating pressure 2 bar

	Volume l	Dampener diaphragm	Seal material	Connection	Part no.
PCE	0.05	CSM*	EPDM	M 20 x 1.5	P1026774-6
PCE	0.05	CSM*	EPDM	M 20 x 1.5	P1026774-8
PCE	0.05	CSM*	EPDM	M 20 x 1.5	P1026774-12
PCB	0.05	FPM	FPM	M 20 x 1.6	P1026777-6
PCB	0.05	CSM*	FPM	M 20 x 1.5	P1026777-8
PCB	0.05	CSM*	FPM	M 20 x 1.5	P1026777-12
PCE	0.05	CSM*	EPDM	G 3/4 - DN 10	P1026775
PCB	0.05	FPM	FPM	G 3/4 - DN 10	P1026778

Note: M20x1.5 supplied with connection set ..... G3/4 - DN10 supplied with SW fittings.

Connection in-line dampener	Stroke volume (ml/stroke)	ProMinent® pump type
M20 x 1.5	0.05 ... 3.00	Beta® BT4a / BT5a gamma/ L GALa delta® DLTa 1612 - 0730
G3/4 - DN10	3.00 ... 4.00	delta® DLTa 0450 Vario C VAMc 10008 - 07042 Sigma S1Ba / S1Ca 12017 - 10050

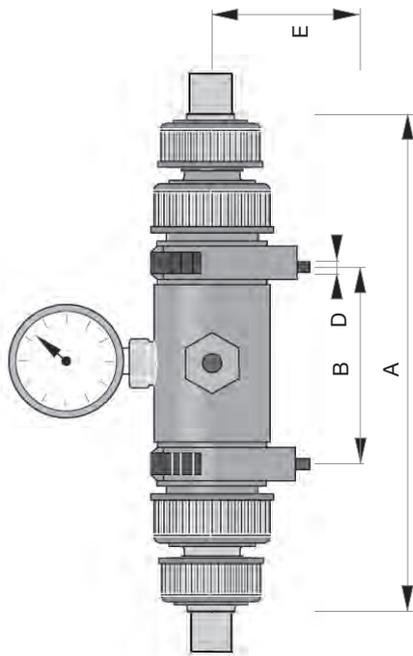
# 3.21 Accessories - Pulsation Dampeners

## 3.21 Accessories - Pulsation Dampeners

The pulsation dampener is used to produce minimal pulsation metering and to reduce flow resistance in long discharge lines.

The cushion of gas located between the hose and the housing is compressed by a thrust stroke from the metering pump, allowing a quantity of feed chemical to pass along the discharge line. On the next suction stroke, the excess pressure created by the cushion of gas forces the chemicals through the pipe. The gas is now released from pressure, and returns to its original volume.

Important notice: The pulsation dampener must be used in conjunction with a relief valve.



Note: A for total space required for installation in-line.

### Description/version

### Part no.

#### PVC In Line Dampener

Removable hose, EPDM/Viton seals.

Type	Volume ml	Hose/Seal Material	Connector	Part No.
PDS	2500	Hypalon/E	Solvent Weld 40 Male	P1001342
PDS	2500	Viton/V	Solvent Weld 40 Male	P1001343

#### PP In Line Dampener

Removable hose, EPDM seals.

Type	Volume ml	Hose material	Order No.
PDS	2500	Hypalon *** non-stock item ***	P1001344
PDS	2500	Viton *** non-stock item ***	P1001345

**Note:**  
Refer to maximum permissible pressure rating in tables

**Note:**  
When using Sodium Hypochlorite select PVC & Viton.

### Measurements

Type	Measurements				
	A	B	C	D	E
PDS 2500	541	525	G 2	d 11	99.5

To select the correct inline dampener you need to consider the stroke volume of the dosing pump. The higher the volume of the dampener is, the better is the dampening effect.

Type Operation	Stroke Volume* up to ... ml/stroke	Max Admissible Pressure (bar)
PDS 2500	400	8

The pre-pressure is = 0.6 x operating pressure.

\*referring to the rest fluctuations +/- 10% of the nominal pressure for singlehead pumps.

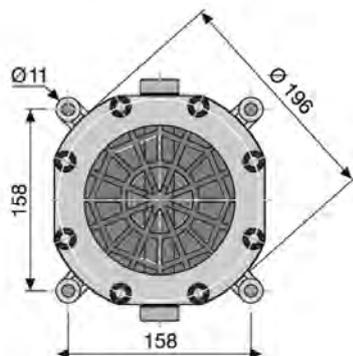
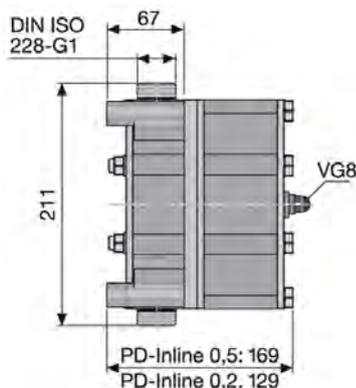
Note: as a rule of thumb you can use the following formula:

volume of the pulsation dampener (in litres) = [26 x max. stroke volume (in ml) ] / 1000

## 3.21 Accessories - Pulsation Dampeners

### 3.21 Accessories - Pulsation Dampeners

#### In-line damper PVDF



**Function:**Hydropneumatic accumulator with deflection facility

The PVDF pulsation damper with PTFE diaphragm offers outstanding resistance to chemicals and is therefore used in connection with a large number of different liquids. The pulsation damper has two liquid connections and can therefore be installed directly in the piping system (in-line). The deflection facility in the liquid valve directs the volumetric flow straight at the diaphragm thus ensuring direct contact of the volumetric flow with the diaphragm. Fluctuations in volumetric flow are optimally balanced out by the enclosed gas volume.

**Important:** The pulsation dampers must be protected by an overflow valve.

Type	Rated volume in l	Max. pressure in bar	Connection	Part No
PD In-line	0.2	10	G1 - DN15	P1026252
PD In-line	0.5	10	G1 - DN15	P1026736

The preload is approx. 0.6x operating pressure. Medium temperature max. 65°C  
The accumulator is filled with nitrogen or with compressed air using a commercially available filler fitting (e.g. car tyre inflation fitting) via the VG8 gas filler connection.

**Caution:** Nitrogen should be used as the filler gas in connection with combustible liquids. On no account fill with oxygen!

**Design:** DGRL97/23/EC, other acceptance procedures/countries available on request

**Fluid group:** 1 and 2

**Certificates:** Manufacturer's test certificate M DIN55350-18

**Manufacturer:** HYDAC Technology

#### Connection/adapter kits

Consisting of PTFE-formed composite seal, insert/adapter and union nut.

Connection PD In-line	Connection Piping	Materials	Part No.
G1 - DN15	DN10	PVDF	P1029426
G1 - DN15	DN15	PVDF	P1029445
G1 - DN15	DN20	PVDF	P1029429
G1 - DN15	DN25	PVDF	P1029432

# 4.0 Chemical Tanks, Bunds, Manual Stirrers and Transfer Pumps

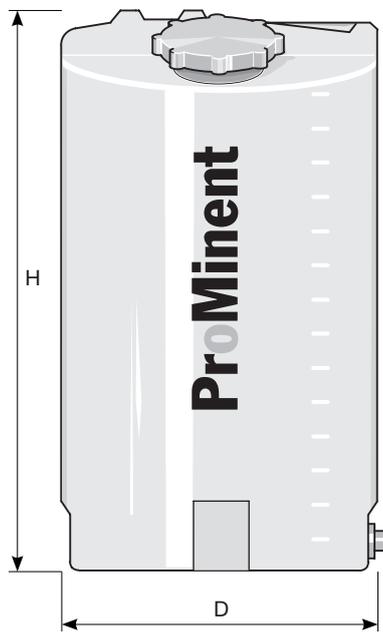
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# 4.1 ProMinent® Chemical Tanks and Bunds

## 4.1 ProMinent Chemical Tanks



pk\_3\_001\_1

Made of transparent UV-stabilised polyethylene, with scale for litre and US gallons, lockable screw cap, moulded-in threaded sleeves (except 35l) to bolt down a ProMinent® electronic metering pump, mounting flange with moulded-in stud bolts for manual or electric stirrer. All tanks of especially rugged design with ProMinent® logo.

**All tanks are fitted with 3/4" BSPF plugged outlet.**

useful volume (litre)	∅ mm D	Height mm H	Minimum Wall mm	Thread sleeves for metering pump	Empty weight kg	
35	350	485		w/o threaded sleeves	3.5	791993.
60	410	590	4	GALa, Beta, Alpha	5	791994.
100	500	760	4	GALa, Beta, Alpha	7	1001490.
140	500	860	4	GALa, Beta, Alpha	9.5	791995.
250	650	1100	5	Delta GALa, Beta, Alpha, Vario	17.5	1023175.
500	820	1190	7	2 x Delta, GALa, Beta, Alpha, Vario & Sigma	24.5	791997.
1000	1070	1260	8	Alpha, Vario & Sigma	48	1010909.

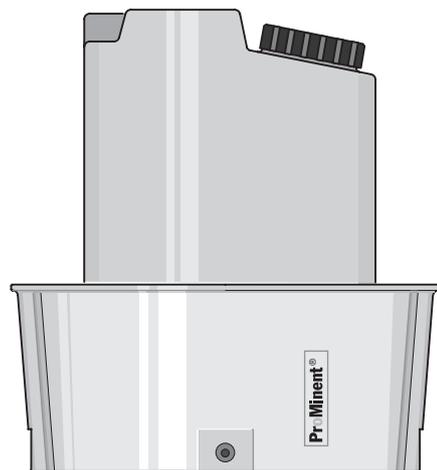
*Note: These tanks are fully enclosed, and as such **cannot** be stacked. For freight purposes the cubic capacity rather than weight will be charged for shipment.*

**NOTE: FOR LARGER TANKS SEE GREEN PAGES PRICE LIST**

### Screw Pack for Pumps

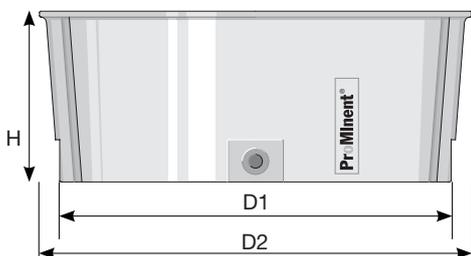
Includes 2 x SS screws and washers for mounting pumps on above ProMinent tanks.

<b>Beta / Gala</b>	PA39002781
<b>Sigma 1</b>	PA39002782
<b>Sigma 2</b>	PA39002783
<b>Sigma 3</b>	PA39002784



pk\_3\_002

pk\_3\_019



## 4.2 Stackable Bunds For Dosing Tanks PE

Made of UV stabilised polyethylene, stackable, with ProMinent® logo. Incorporating 2 lateral flats for mounting bund.

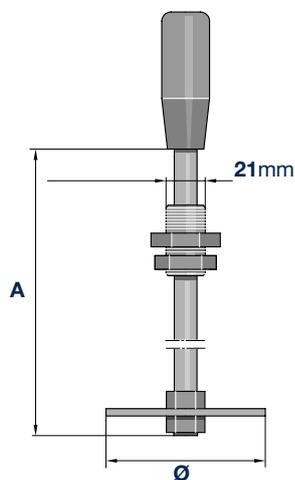
*Note: There is NO Australian Standard for bunds of 250 litres and undercapacity. ProMinent have made their bunds to to comply with their tanks above PLUS 10% reserve.*

### PE colourless/transparent stackable bunds

Usable capacity in litres	Material	D2 ∅ mm	D1 ∅ mm	H mm	Part No.
60	PE	680	607	270	1010880.
100	PE	802	727	320	1010881.
140	PE	811	727	370	1010882.
250	PE	917	807	520	1010883.

# 4.3 Accessories for Dosing Tanks

## 4.3 Accessories for Dosing Tanks



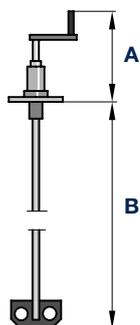
pk\_3\_009

### PP Hand mixer

completely assembled

	<b>A</b>	<b>Ø</b>	<b>Part No.</b>
for tanks 35 l and 60 l **	460 mm	90 mm	741118
for tanks 100 l and 140 l **	660 mm	90 mm	741119
for tanks 250 l and 500 l	980 mm	90 mm	741120

\*\* = non stocked item



pk\_3\_007

### PP Hand stirrer

with crank, completely assembled

	<b>A</b>	<b>B</b>	<b>Part No.</b>
for tanks 60 l **	220 mm	450 mm	914701
for tanks 100 l **	220 mm	635 mm	914738
for tanks 140 l **	220 mm	760 mm	914702
for tanks 250 l **	220 mm	900 mm	914703
for tanks 500 l **	220 mm	900 mm	914703
for tanks 1000 l **	220 mm	1065 mm	914705

\*\* = non stocked item

**Note:** for Electric Stirrers see GREEN PAGE price list

## 4.4 Spare Parts for Tanks

Push cap for 35 l tank	740708.
Screw cap with seals for 60-100-140-250 l tank	740715.
Screw cap with seals for 500-1000 l tank	740718.

# ProMinent® von TAINE® Pumps

## 4.4 von TAINE® Magnetically Coupled Centrifugal Pumps



### Metering pumps for liquid media

von TAINE® pumps are magnetically coupled centrifugal pumps. Thanks to the magnetic coupling, the pumps transport the liquid media leak-free from container to container or from a container into a discharge line.

The von TAINE® centrifugal pumps deliver media up to 22,500 l/hr and up to a delivery height of 23.5 metres. Because the capacity heavily depends on the backpressure, the delivery characteristic must be absolutely observed.

When selecting the pumps, the material compatibility is to be checked and density, viscosity, solid fraction, and temperature of the delivered medium are to be considered. The pump is not self-priming and requires a flooded suction.

The following material types are available:

- Pump head: PP or PVDF
- Seals: FPM or EPDM

The bearings of the pumps are made of "oxide ceramics" and may not run dry. The pump is to be protected against running dry. The hydraulic connections are equipped with pipe threads according to DIN ISO 228-1 (internal and external thread cylindrical).

### ProMinent® vonTAINE

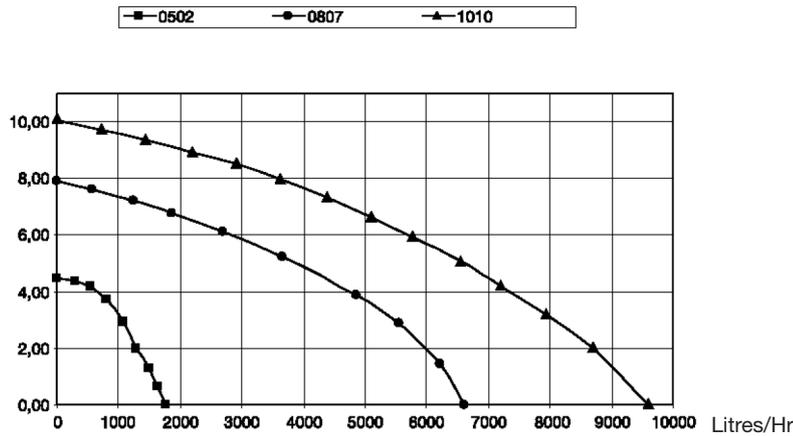
Description	l/h	m	Model	kw	Suction-Discharge	Part No
Centrifugal pump von TAINE	1,800	4.5	0502PP/FPM	0.06	1-1/4" - 1"	P1023089
Centrifugal pump von TAINE	6,600	7.9	0807 PP/FMP	0.25	1-1/4" - 1-1/4"	P1023090
Centrifugal pump von TAINE	9,600	10.0	1010 PP/FPM	0.37	2" - 1-1/2"	P1023091
Centrifugal pump von TAINE	13,200	13.2	1313 PP/FPM	0.65	2" - 1-1/2"	P1023092
Centrifugal pump von TAINE	19,500	18.1	1820 PP/FPM	1.10	2-1/4" - 2"	P1023093
Centrifugal pump von TAINE	22,500	23.5	2323 PP/FPM	1.50	2-1/4" - 2"	P1023094
Centrifugal pump von TAINE	1,800	4.5	0502 PVDF/FPM	0.06	1-1/4" - 1"	P1023095
Centrifugal pump von TAINE	6,600	7.9	0807 PVDF/FPM	0.25	1-1/4" - 1-1/4"	P1023096
Centrifugal pump von TAINE	9,600	10.0	1010 PVDF/FPM	0.37	2" - 1-1/2"	P1023097
Centrifugal pump von TAINE	13,200	13.2	1313 PVDF/FPM	0.65	2" - 1-1/2"	P1023098
Centrifugal pump von TAINE	19,500	18.2	1820 PVDF/FPM	1.10	2-1/4" - 2"	P1023099
Centrifugal pump von TAINE	22,500	23.5	2323 PVDF/FPM	1.50	2-1/4" - 2"	P1023100
Centrifugal pump von TAINE	1,800	4.5	0502PP/EPDM	0.06	1-1/4" - 1"	P1028551
Centrifugal pump von TAINE	6,600	7.9	0807 PP/EPDM	0.25	1-1/4" - 1-1/4"	P1028552
Centrifugal pump von TAINE	9,600	10.0	1010 PP/EPDM	0.37	2" - 1-1/2"	P1028553
Centrifugal pump von TAINE	13,200	13.2	1313 PP/EPDM	0.65	2" - 1-1/2"	P1028564
Centrifugal pump von TAINE	19,500	18.1	1820 PP/EPDM	1.10	2-1/4" - 2"	P1028565
Centrifugal pump von TAINE	22,500	23.5	2323 PP/EPDM	1.50	2-1/4" - 2"	P1028566
Centrifugal pump von TAINE	1,800	4.5	0502 PVDF/EPDM	0.06	1-1/4" - 1"	P1028567
Centrifugal pump von TAINE	6,600	7.9	0807 PVDF/EPDM	0.25	1-1/4" - 1-1/4"	P1028568
Centrifugal pump von TAINE	9,600	10.0	1010 PVDF/EPDM	0.37	2" - 1-1/2"	P1028569
Centrifugal pump von TAINE	13,200	13.2	1313 PVDF/EPDM	0.65	2" - 1-1/2"	P1028570
Centrifugal pump von TAINE	19,500	18.2	1820 PVDF/EPDM	1.10	2-1/4" - 2"	P1028571
Centrifugal pump von TAINE	22,500	23.5	2323 PVDF/EPDM	1.50	2-1/4" - 2"	P1028572

Note: *l/h* is Feedrate at Minimum Pressure

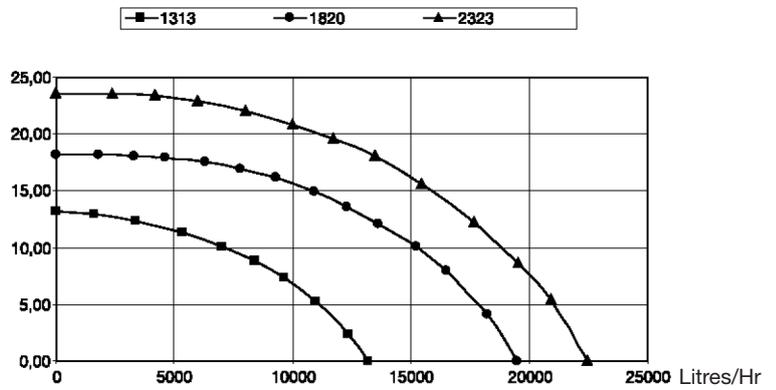
*m* is Feed Lift Maximum

# ProMinent® von TAINE® Pumps

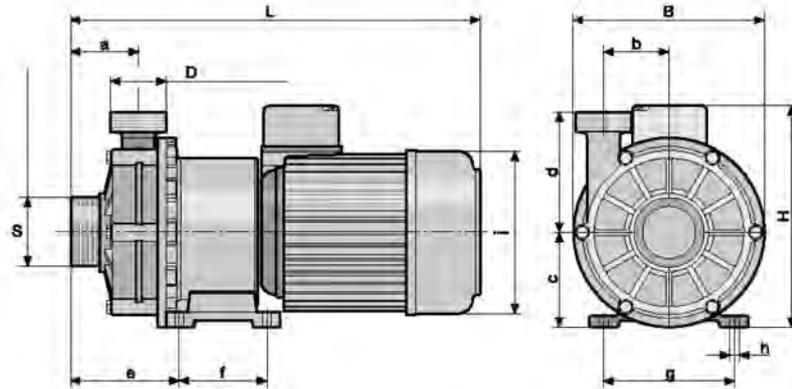
## 4.5 von TAINE® Magnetically Coupled Centrifugal Pumps



Delivered quantity (l/h) as a function of delivery head (mWC)



### Dimensions



		von Taine® 0502 PVDF	von Taine® 0807 PVDF	von Taine® 1010 PVDF	von Taine® 1313 PVDF	von Taine® 1820 PVDF	von Taine® 2323 PVDF
<b>Discharge connector (D)</b>		G 1"	G 1 1/4"	G 1 1/2"	G 1 1/2"	G 2"	G 2"
<b>Suction connector (S)</b>		G 1 1/4"	G 1 1/4"	G 2"	G 2"	G 2 1/4"	G 2 1/4"
<b>L</b>	mm	240	283	320	350	430	430
<b>B</b>	mm	120	138	163	163	205	205
<b>H</b>	mm	145	185	191	191	227	227
<b>a</b>	mm	37.0	45.0	58.5	58.5	70.0	70.0
<b>b</b>	mm	29.5	29.5	56.0	56.0	70.0	70.0
<b>c</b>	mm	60.0	70.0	82.0	82.0	104.5	104.5
<b>d</b>	mm	65.5	86.0	104.0	104.0	134.5	134.5
<b>e</b>	mm	129	50	106	106	115	115
<b>f</b>	mm	78	71	74	74	100	100
<b>g</b>	mm	91	91	114	114	130	130
<b>h</b>	mm	6.5	8.5	8.5	8.5	10.0	10.0
<b>i</b>	mm	92	135	135	135	155	155
<b>Enclosure rating</b>		IP 55					
<b>Min. flow</b>	l/h	30	60	60	60	90	120

# ProMinent® Duodos Air Operated Diaphragm Pump

## 4.6 Duodos Air Operated Diaphragm Pumps



Duodos pumps are air operated double diaphragm pumps. Thanks to the operation with air, the pump has no electrical components. Duodos pumps are dry-running safe and self-priming. By adjusting the pressure in the air supply, the delivery rate of the pump can be controlled. The air control is designed for oil-free operation. The maintenance-free air control valve facilitates a trouble-free operation and guarantees a re-start. No pressure-control valves are required, the pump simply stops in case of high backpressure and re-starts automatically if the pressure is released. Duodos pumps are the optimum solution for metering liquid chemicals. Duodos pumps transport media up to approximately 6,700 l/h or up to a delivery height of 70m. Because the capacity heavily depends on the backpressure, the delivery characteristic must be absolutely observed. But the differential pressure between the hydraulic and the pneumatic end should not exceed the value of 2 bar. Higher values reduce the life of the pump. When selecting the pump, the material compatibility should be checked. In addition, density, viscosity, solid fraction, and temperature of the delivered medium are to be considered.

The following materials are available:

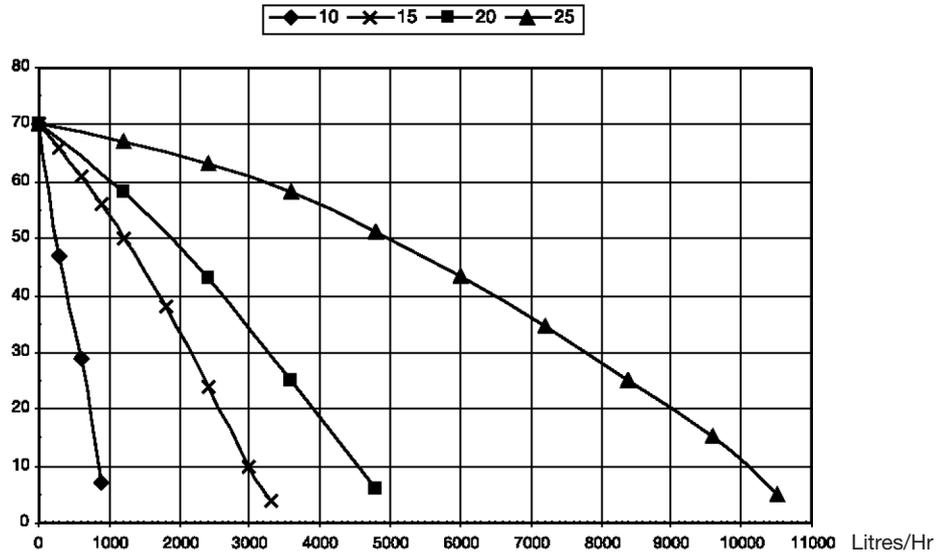
- PP pump chambers with Santoprene® diaphragms and valves
- PVDF pump chambers with PTFE diaphragms and valves

Model	l/h	Part No
Duodos 10 PP	0...650	1010793
Duodos 15 PP	0...2,000	1010794
Duodos 20 PP	0...3,000	1010795
Duodos 25 PP	0...6,700	1010796
Duodos 10 PVDF	0...650	1010797
Duodos 15 PVDF	0...2,000	1010798
Duodos 20 PVDF	0...3,000	1010799
Duodos 25 PVDF	0...6,700	1010800

*Note: l/hr shown is at a differential pressure of 2 bar  
(0.5 bar backpressure, 2.5 bar air pressure)*

# ProMinent® Duodos Air Operated Diaphragm Pump

## 4.7 Duodos Air Operated Diaphragm Pumps



Feed lift (mWS) over feed rate (l/h) at 7 bar air supply

Technical drawings of the Duodos pump showing dimensions A through O and P. Dimension A is the width of the pump head, B is the height, C is the width of the discharge port, D is the total height including the base, E is the height of the base, F is the width of the base, G is the height of the base flange, H is the width of the base flange, I is the height of the base flange, J is the height of the base flange, K is the width of the base flange, L is the height of the base flange, M is the width of the base flange, N is the height of the base flange, O is the width of the base flange, and P is the height of the base flange.

Dimensions		Duodos 10	Duodos 15	Duodos 20	Duodos 25
A	mm	79	103	103	143
B	mm	140	179	179	260
C	mm	32	44	60	92
D	mm	198	287	339	527
E	mm	167	243	279	435
F	mm	87	140	163	249
G	mm	19	35	46	64
H	mm	32	44	60	92
I	mm	78	143	143	130
J	mm	178	258	300	433
K	mm	89	129	150	216
L	mm	33	92	114	123
M	mm	66	76	76	102
Discharge connector		1/2" NPT	1"	1 1/2"	1" ANSI flange
Suction connector		1/2" NPT	1"	1 1/2"	1" ANSI flange
Air consumption	m <sup>3</sup> /h	0.5...11	3.5...27	7.0...34	8.5...77
Differential pressure	bar	2	2	2	2
Air connection		1/4" NPT	1/4" NPT	1/4" NPT	1/2" NPT
Weight (PP)	kg	2	8	9	24
Weight (PVDF)	kg	2.5	9.0	9.5	29.0



# 5.0 DULCOMETER® Measurement & Control Technology

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# 5.1 DULCOMETER® Compact Controller

## 5.1.1

### DULCOMETER® Compact Controller

DULCOMETER® Compact transmitters with control functions for pH, ORP, Chlorine and conductive conductivity measured variables provide basic functions for applications in water treatment. They have a fixed configuration with the following features.



#### Measured variables pH and ORP (can be changed on the controller)

- Operation independent of the operating language (use of abbreviations, such as CAL, PARAM, CONFIG, ERROR)
- Illuminated display
- 3 LED display operating state (relay 1 / 2 active, Error)
- Sensor monitoring for pH
- P and PID control characteristics
- Selectable control direction (raise or lower measured value)
- Pulse frequency relay for control of metering pump
- Power relay can be configured as an alarm, limit value or pulse width modulated control output for metering pumps, (connection function or switch on operating voltage)
- Analogue output 0/4...20 mA can be configured as a writer output or control output
- Digital input to switch off the control or to process a sample water limit contact by remote control
- Temperature sensor input (Pt 1000) for temperature compensation of the pH value

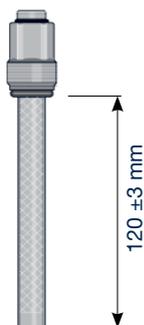
#### Applications

- Waste water treatment
- Treatment of drinking water
- Swimming pool water treatment

#### Technical Data

<b>Measurement range</b>	pH: 0.00 ... 14 ORP: -1000 ... +1000 mV ... Chlorine: 0.05 - 10 ppm
<b>Resolution</b>	pH: 0.01 pH ... ORP: 1 mV ... Chlorine: 0.01 ppm Conductivity: 1 µS/cm depends on measuring range)
<b>Correction variable</b>	Temperature for pH via Pt 1000
<b>Correction range</b>	0 ... 120 °C
<b>Control characteristic</b>	P/PID
<b>Control</b>	1-way controller with selectable control direction (raise/lower)
<b>Signal current output</b>	1 x 0/4-20 mA galvanically isolated max. load 400 Ω Range and assignment (measured or actuating variable) can be set
<b>Control outputs</b>	1 pulse frequency output for control of the metering pump 1 relay (alarm or limit value relay or pulse length control) 1 x analogue output 0/4 ... 20 mA
<b>Electrical connection</b>	90 - 253 V ~
<b>Ambient temperature</b>	-10 ... +60 °C
<b>Enclosure rating</b>	IP 67
<b>Dimensions</b>	135 x 125 x 75 mm (H x W x D)
<b>Weight</b>	0,5 kg

for pH/ORP	1035638.
for Chlorine	1038546.
for Conductive Conductivity	1044468.
Panel Mounting Kit	1037273.



Sensor for Chlorine, **ONLY** for use with **Compact Controller**

#### CLB 2-µA

<b>Measured variable</b>	free chlorine (hypochlorous acid HOCl)
<b>Measuring range</b>	0.05 - 5.0 mg/l: linear, can be used for shock chlorination up to 10.0 mg/l
<b>Reference method</b>	DPD1
<b>pH range</b>	5.0 ... 9.0
<b>Temperature</b>	5 ... 45 °C
<b>Max. pressure</b>	3.0 bar
<b>Intake flow</b>	30...60 l/h (in DGMA), constant flow needed as flow-dependent signal
<b>Power supply</b>	16...24 V DC (2-wire)
<b>Output signal</b>	Non-amplified primary current signal, not temperature-compensated, uncalibrated, not electrically isolated
<b>Temperature compensation</b>	Pt 1000, integrated, calculation in the compact controller
<b>Typical applications</b>	Swimming pool, drinking water, can also be used with membrane-free chlorine production electrolysis processes, even with varying media temperatures

#### Measurement and control equipment

<b>In-line probe fitting</b>	Compact controller
<b>Measuring principle</b>	DGM, DLG III amperometric, 3 electrodes, no diaphragm

<b>Measuring range</b>	CLB 2-µA-5 ppm	1038902
------------------------	----------------	---------

# 5.2 DULCOMETER® Measurement and Control Technology D1C Series

5.2.1

DULCOMETER® D1C Series Controller



Microprocessor-based controller for panel mounting

The most important data:

- Standard format: 96 x 96 mm
- Installed depth: 140 mm
- Enclosure rating: Installed in control panel IP 54

The measured variables are:

- pH/value
- Redox potential
- Temperature
- Chlorine concentration
- mA signal
- Conductivity
- Chlorine dioxide
- Ozone
- Oxygen

Various expansion stages permit process adaptation to various measurement, control and metering requirements.

- Large, clear display of measured value
- Easy operation and clear prompting of settings by texts in the display
- Menu-assisted calibration of measuring probes
- Activation of ProMinent® metering pumps, solenoid valves or actuators
- Monitoring of limit values
- Connection of measuring probes also via converter with disturbance free mA signal
- Connection facility for recording measured value by mA signal

Microprocessor-based controller for Wall mounting

The most important data:

- Standard format: 189 x 200 x 76 mm (W x H x D)
- Enclosure rating: IP65

Other data same as for controller for panel mounting

**PLEASE NOTE: Panel Mount type is not stocked.**

Description/Version	Part no.
<b>Accessories</b>	
Kit to convert Wall mounting D1C & D2C into Panel mount	792908.

### SERVO POSITION CONTROLLER

Servo Position Controller ProMinent® D1CAW0S10000R010E

This is a wall or panel mounting unit designed for controlling the stroke lengths of metering pumps or other devices via the servo motor positioner. The unit features ratio control, digital display of stroke position, 0-100%, increasing & decreasing indication. The unit accepts 4-20 mA input and requires 0-1000 ohm feed back from the servo motor unit.

**D1CAW0S10000R010E**

# 5.2 Identity Code Ordering System for DULCOMETER® D1Ca Controller

## 5.2.3 Identity Code-Ordering System for DULCOMETER® D1C Controller

<b>D1C a</b>		<b>DULCOMETER® D1C series a controller</b>	
		Type of mounting	
W	Wall mounting (To panel mount add brackets see P.5/2)		
		<b>Operating voltage:</b>	
0	230 V	50/60 Hz	
1	115 V	50/60 Hz	Not a stock item
4	24 V	AC/DC	
		<b>Measured variables:</b>	
A	Peracetic Acid		
B	Bromine 0-10 ppm		
C	Chlorine 0-0.5/2/5/10/20/50/100 ppm		
D	Chlorine dioxide 0-0.5/2/10/20 ppm		
L	Conductivity		
H	Hydrogen Peroxide		
P	pH 0-14		
R	Redox -1000...+1000 mV		
S	Standard signal 0/4-20 mA		
T	Temperature 0-100° C, 32-212° F		
X	Dissolved Oxygen		
Z	Ozone 0-2 ppm		
		<b>Connection of measured variable:</b>	
1	Standard signal 0/4-20 mA terminal (signal converters are necessary for controllers with standard signal 0/4-20 mA measured variable connection)		
2	SN 6 plug connector for P or R		
3	Terminal for L		
4	Terminal Pt 100 for T		
5	Terminal mV for P or R		
6	Inductive (electrode less) conductivity		
7	0/4-20 mA standard signal terminal for H and A with PAA1 sensor		
		<b>Correction variable:</b>	
0	None		
1	pH for chlorine (Note: Transducer required Part No: 809126.)		
2	Temperature for P or L, via terminal		
3	Temperature for P or L, via standard signal 0/4-20 mA		
4	Manual temperature entry for P or L		
		<b>Feed forward control:</b>	
0	None		
1	Flow as standard signal 0/4-20 mA		
2	Flow as frequency 0-500 Hz		
3	Flow as frequency 0-10 Hz		
		<b>Control input:</b>	
0	None		
1	Pause		
		<b>Signal output:</b>	
0	None		
1	Standard signal 0/4-20 mA measured value		
2	Standard signal 0/4-20 mA control variable		
3	Standard signal 0/4-20 mA correction variable		
4	2 programmable standard signal 0/4 - 20 mA		
		<b>Relay control:</b>	
G	Alarm and 2 limit relays <i>standard</i>		
M	Alarm and 2 solenoid valve relays (pause length control)		
R	Alarm relay and servomotor with feedback signal (3P)		
		<b>Pump control:</b>	
0	None		
2	Two pumps		
		<b>Control characteristic:</b>	
0	None		
1	Proportional control		
2	PID control		
		<b>Protocol output:</b>	
0	None		
		<b>Language:</b>	
E	English		

**Please Note:**  
Any controllers that include the shaded codes use D1Ca for ALL other controllers use D1Cb

The identity code shown here describes a controller from the D1CA series for wall mounting and operating voltage 230 V.  
The measured variable is the pH-value; it is transmitted via a mA signal. temperature measurement facility for correcting the pH-value is connected.

**D1Ca W 0 P 1 2 1 1 1 G 2 2 0 E**

# 5.2 Identity Code Ordering System for DULCOMETER® D1Cb Controller

## 5.2.2 DULCOMETER® D1Cb Series Controller

<b>D1Cb</b>	<b>DULCOMETER® D1C series b controller</b>	
W	<b>Installation</b> Wall mounting	
00	<b>Version</b> with ProMinent logo	
6	<b>Power Supply</b> 90 - 253 V 48/63 Hz	
01	<b>Approvals</b> CE Mark	
0	<b>Hardware Expansion 1</b> None	
0	<b>Hardware Expansion 2</b> None	
1	RC protection of the 2 power relays by using a inductive load (motor driven pump) together with power Relay 'M' or 'G'	
0	<b>External Connection</b> None	
V	<b>Software Preset</b> Software preset	
	<b>Measured variables</b> A PES (peracetic acid) B Bromine 0-10 ppm C Chlorine 0-0.5/2/5/10/20/50/100 ppm D Chlorine dioxide 0-0.5/2/10/20 ppm L Conductivity H Hydrogen Peroxide H2O2 P pH 0-14 R Redox -1000...+1000 mV S Standard signal 0/4-20 mA T Temperature 0-100° C, 32-212° F X Dissolved Oxygen O <sub>2</sub> Z Ozone 0-2 ppm O <sub>3</sub>	
1	<b>Connection of measured variable</b> Standard signal 0/4-20 mA terminal (signal converters are necessary for controllers with standard signal 0/4-20 mA measured variable connection)	
5	Terminal mV for P or R	
0	<b>Correction variable</b> None	
2	Temperature via Pt 100 (via terminal ) for pH	
4	Manual temperature compensation for pH	
0	<b>Control input</b> None	
1	Pause	
0	<b>Standard signal output</b> None	
1	Standard signal 0/4-20 mA configurable output	
G	<b>Power relay</b> Alarm, 2 limit relays or 2 timer	
M	Alarm, 2 solenoid valve relays or 2 timer	
0	<b>Pump control</b> None	
2	Two pumps via pulse frequency	
0	<b>Control characteristic:</b> None	
1	P control	
2	PID control	
EN	<b>Language</b> English	

D1Cb W 00 6 01 0 0 0 V C 1 0 1 1 G 0 0 EN

Example shown:

D1Cb for Chlorine with pause and 4-20 mA output.

## 5.3 DULCOMETER® D2C Controller

### 5.3.1 DULCOMETER® D2C Controller



- Different configurations means optimised adaptation to process requirements
- Large, clear graphic display for the measured values
- Full text user guidance/limit value monitoring with controller output deactivation as standard
- Disturbance-free two-wire sensor connector
- 2 signal outputs 0/4 ... 20mA, electrically isolated
- Different designs for wall and control panel mounting
- 2 digital inputs for pause and error sample water
- Differential pH measurement (sensor monitoring)
- Differential chlorine measurement
- Control output to minimise combined chlorine

#### Applications:

- Waste water treatment
- Cooling water treatment
- Drinking water treatment
- Neutralisation
- Swimming pool water treatment
- All applications which have to be equipped with a redundant pH measurement for safety reasons.

#### Technical Data

<b>Measurement range</b>	pH 0.00 ... 14.00 ORP 0 ... +1000 mV Chlorine 0 ... 0,5/2/10/20/50/100 ppm Chlorine dioxide 0.00 ... 0.500/2.00/10.0/20.0 ppm
<b>Resolution</b>	0.01 pH/1 mV/0.001 ppm/0.01 ppm
<b>Accuracy</b>	0.5 % from measurement range
<b>Measurement input</b>	SN6 (input resistance > 1012 Ω) measured variable 1: mV terminal (input resistance > 5 x 1011 Ω) or Standard 4 ... 20 mA signal terminal measured variable 2: Standard 4 ... 20 mA signal terminal
<b>Correction variable</b>	Temperature via Pt 100 (pH only)
<b>Correction range temp.</b>	0 ... 100 °C
<b>Control characteristic</b>	P/PID control
<b>Control</b>	unidirectional (pH/ORP and pH/chlorine)
<b>Signal current output</b>	2 x electrically isolated 0/4-20 mA max. load 600 Ω (400 Ω 2nd output) Adjustable range and direction (measured, correction and control variable)
<b>Control outputs</b>	2 reed contacts (pulse frequency, pump actuation) 2 relays (pump impulse, 3P or limit value) 2 x 0/4 ... 20 mA
<b>Control input</b>	Voltage free (electrically isolated) – pause – error, water sample (or superchlorination or basic load chlorine)
<b>Alarm relay</b>	250 V ~ 3 A, 700 VA changeover contact
<b>Electrical connection</b>	24 V ~ /115 V ~ /230 V ~
<b>Ambient temperature</b>	Control panel version: 0 ... 45 °C Wall mounted: -5 ... 40 °C
<b>Enclosure rating</b>	Control panel version: IP 54 Wall mounted: IP 65
<b>Dimensions</b>	Control panel version: 96 x 96 x 140 mm

#### Note:

The pH/pH and chlorine/chlorine versions include only one 2-sided controller for measuring channel 1. Measured variable 2 can only be used for monitoring purposes or to calculate the difference.

# 5.3 Identity Code Ordering System for DULCOMETER® D2C Controller

## 5.3.2 Identity Code-Ordering System for DULCOMETER® D2C Controller

D2C A	DULCOMETER® D2C series controller	
	<b>Installation:</b>	
W	Wall mounting (To panel mount add brackets \$201)	
	<b>Power Supply:</b>	
0	230 V	50/60 Hz
1	115 V	50/60 Hz Not A Stock Item
4	24 V	AC/DC (This item only stock for pH/chlorine)
	<b>Measured variables (Measured variable1 / Measured variable 2):</b>	
PC	pH/Chlorine 0-14 pH; 0.5/2/5/10/20 ppm	
PR	pH/Redox 0-14 pH; 0-1000 mV (Note: Redox Transducer required P/N: 809127.)	
PP	pH/pH 0-14 pH (Note: pH Transducer required P/N: 809126.)	
CC	Chlorine/Chlorine	
PD	pH/Chlorine Dioxide	
	<b>Measured variable 1 connector: (measured variable 2 always via 4-20 mA)</b>	
1	4-20 mA standard signal terminal (signal transducer required)	
2	SN 6 plug connector	
5	mV terminal	
	<b>Correction variable (temperature compensation for pH):</b>	
0	None	
2	Temperature for P, via terminal (Pt100) for pH only	
4	Manual temperature input for P for pH only	
	<b>Disturbance signal:</b>	
0	None	
	<b>Signal output:</b>	
0	None	
4	2 programmable 0/4-20 mA standard signal outputs	
	<b>Relay control:</b>	
G	Alarm and 2 limit value relays	
M	Alarm and 2 solenoid valve relays (pulse length control)	
	<b>Control characteristic:</b>	
1	Proportional control	
2	PID control	
	<b>Protocol output:</b>	
0	None	
	<b>Language:</b>	
E	English (D, F, N)	

The identity code shown describes a P controller with pump control, wall mounted version, D2C series, power supply 230V.  
 The measured variables are the chlorine concentration and the pH value, transmitted via 4 - 20 mA signals.  
 The controller contains 2 limit value relays.

**Do not overlook need for signal transducer for PR & PP Versions**

D2C A W 0 PC 1 0 0 4 G 1 0 E

## 5.4 DULCOMETER® diaLog DACa Multi-parameter Controller

### 5.4.1 diaLog DACa Multi-parameter Controller



The DULCOMETER® diaLog DACa multi-parameter controller is the new controller platform from ProMinent. It replaces the D1Ca/D2Ca controllers. The diaLog DACa can also be installed in a control cabinet using the optional mounting kit. The diaLog DACa has been specifically developed for the continuous control of liquid analysis parameters in water treatment processes, environmental technology and industry.

The DULCOMETER® diaLog DACa multi-parameter controller is available in a version with one or two measuring channels and can work with conventional analogue sensors and actuators. It is also equipped to communicate with digital sensors and actuators via the CANopen sensor/actuator bus.

The diaLog DACa controller intelligently completes the control circuit between ProMinent® DULCOTEST® sensors and ProMinent® metering pumps offering special functions, as required in water treatment.

#### Typical applications

- Potable water treatment
- Waste water treatment
- Industrial and process water treatment
- Swimming pool water treatment

#### Standard equipment

- 1 measuring channel with 14 freely selectable measured variables (via the mV or mA input). The measured variables conductive and inductive conductivity are currently only available with the D1Ca.
- PID controller with frequency-based metering pump control for 2 metering pumps.
- 2 analogue outputs for measured value, correction variable or control variable (dependent on the optional equipment).
- 2 digital inputs for sample water fault detection, pause and parameter switching.
- 2 relays with limit value functions, timer and non-continuous control, 3-point step control (dependent on the optional equipment).
- Measured variables and language selection during commissioning.
- Temperature compensation for the pH and fluoride measured variables.
- 22 operating languages.
- Saving and transfer of device parameterisation using the SD card.
- Subsequent upgrade of the software functions by means of an activation key or firmware update.

#### Optional accessories

- Second, complete measuring and control channel with second PID controller.
- Data and event logger with SD card.
- Disturbance variable processing (flow) via mA or frequency.
- Compensation of the pH influence on chlorine measurement.
- 3 additional inputs, e.g. for level monitoring.

# 5.4 DULCOMETER® diaLog DACa Multi-parameter Controller

## 5.4.2 diaLog DACa Multi-parameter Controller - Technical Data

### Technical Data

<b>Measuring range</b>	<b>mV connection type:</b> pH: 0.00 ... 14.00 ORP voltage: -1,500 ... +1,500 mV <b>Connection type mA (amperometric measured variables, measuring ranges corresponding to the sensors):</b> Chlorine Chlorine dioxide Chlorite Bromine Ozone Hydrogen peroxide (PER sensor) Hydrogen peroxide (PEROX sensor with Peracetic acid) Dissolved oxygen <b>Connection type mA (potentiometer measured variables, measuring ranges corresponding to the transmitter):</b> pH ORP voltage Fluoride <b>Conductivity (measuring ranges corresponding to the transmitters):</b> via Transmitter 0/4 ... 20 mA (DMT) Temperature: via Pt 100/Pt 1000, measuring range 0 ... 150 °C
<b>Resolution</b>	pH: 0.01 ORP voltage: 1 mV Temperature: 0.1 °C Amperometric analysis (chlorine etc.): 0.001/0.01 ppm, 0.01 vol. %, 0.1 vol. %
<b>Accuracy</b>	0.3 % based on the full-scale reading
<b>Measurement input</b>	pH/ORP (input resistance > 0.5 x 10 <sup>12</sup> Ω)
<b>Correction variable</b>	Temperature via Pt 100/Pt 1000
<b>Correction range</b>	0 ... 100 °C
<b>pH compensation range for chlorine</b>	6.5 ... 8.5
<b>Disturbance signals</b>	Flow via mA or frequency
<b>Control characteristic</b>	P/PID control
<b>Control</b>	2 x bidirectional control
<b>Signal current output</b>	2 x 0/4 ... 20 mA electrically isolated, max. load 450 Ω, range and allocation (measured, correction, control variable) can be set
<b>Control outputs</b>	2 x 2 pulse frequency outputs for metering pump control 2 relays (limit value, 3-point step or pulse length control) 2 x 0/4 ... 20 mA
<b>Alarm relay</b>	250 V ~3 A, 700 VA contact type changeover contact
<b>Electrical connection</b>	90-253 V, 50/60 Hz, 25 VA
<b>Ambient temperature</b>	0 ... 55 °C (for indoor installation or with protective housing)
<b>Enclosure rating</b>	Wall mounted: IP 67 Control cabinet mounting: IP 54
<b>Tests and approvals</b>	CE, MET (corresponding to UL according to IEC 61010)
<b>Housing material</b>	PC with flame retardant additive
<b>Dimensions</b>	250 x 220 x 122 mm (WxHxD)
<b>Weight</b>	1.3 kg

### A complete measuring station comprises the following:

- DACa measuring transducer /controller (see identcode)
- DGMa..., DLG III ..., sensor holder
- pH sensor
- ORP sensor
- Chlorine, chlorine dioxide, chlorite, bromine, dissolved oxygen sensor
- Transducers for pH and/or ORP
- Sensor cable

# 5.4 Identcode Ordering System for DULCOMETER® diaLog DACa Controller

## 5.4.3 diaLog DACa Identcode Ordering System

<b>DACa</b>	<b>Version</b>	
	<b>00</b>	Wall mounted with ProMinent® logo
	<b>S0</b>	With fitting kit for panel mounting
	<b>Operating voltage</b>	
	<b>6</b>	90 ... 253 V, 48/63 Hz
	<b>Channel 1 (the measured variable is selected during initial commissioning)</b>	
	<b>1</b>	Measurement + control, 2 pumps, 2 control inputs, 2 mA outputs
	<b>Channel 2 (the measured variable is selected during initial commissioning or software presetting.)</b>	
	<b>0</b>	No 2nd channel ( <i>Not stocked - use D1Cb</i> )
	<b>1</b>	Hardware only for channel 2, no software functions activated ( <i>Not stocked use option 2</i> )
	<b>2</b>	Disturbance variable (mA) or external setpoint specification via mA or pH compensation for chlorine (all acting on channel 1)
	<b>3</b>	2nd measurement + control, additionally 2 pumps, additionally 3 control inputs ( <i>Not stocked use option 4</i> )
	<b>4</b>	2nd measurement + control, additionally 2 pumps, additionally 3 control inputs, disturbance variable (mA or frequency), pH compensation for chlorine
	<b>Software presets</b>	
	<b>0</b>	no default settings (standard)
	<b>1</b>	Batch neutralisation 2 x pH measurement with 1-2 sided controller and final checking
	<b>2</b>	Batch neutralisation 2 x pH measurement with 1-2 sided controller, disturbance variable and final checking
	<b>3</b>	pH-/ORP measurement/control (pH 2 way, ORP 1 way)
	<b>4</b>	pH-/Cl <sub>2</sub> measurement/control (pH 2 way, chlorine 1 way)
	<b>5</b>	pH-/ClO <sub>2</sub> measurement/control (pH 2 way, chlorine dioxide 1 way)
	<b>6</b>	pH-/Cl <sub>2</sub> measurement/control with disturbance variable (pH 2 way, chlorine 1 way)
	<b>7</b>	ClO <sub>2</sub> -/ORP measurement/control (chlorine dioxide 1 way, ORP for monitoring)
	<b>Channel connections</b>	
	<b>0</b>	Channel 1 / 2 via terminals (mA and mV)
	<b>Connection of digital sensors / actuators</b>	
	<b>0</b>	none
	<b>Communication</b>	
	<b>0</b>	none
	<b>Data logger</b>	
	<b>0</b>	No data logger
	<b>1</b>	Data logger with SD card
	<b>Hardware upgrade</b>	
	<b>0</b>	none
	<b>1</b>	Protective RC circuit for power relay
	<b>Approvals</b>	
	<b>01</b>	none (CE standard)
	<b>Certificates</b>	
	<b>0</b>	none
	<b>Documentation language</b>	
	<b>EN</b>	English

# 5.5 DULCOMETER® Measuring and Control Technology

## 5.5.1 Measured Variable, Fluoride In Drinking Water

### Measurement principle and application

The DULCOMETER® fluoride meter is a potentiometric meter which uses an ion selective electrode (ISE) and a reference electrode to deliver a measurement signal in mV. The expertise of the newly developed fluoride ISE lies in the physical-chemical characteristics of the LaF<sub>3</sub> crystals and the ion electrolytes which permit long-term stable and continuous measurement without additional use of special conditioning chemicals. Photometric measurement-based calibration is necessary only when commissioning and at occasional intervals.

The typical and only use of our fluoride meter is for continuous monitoring at waterworks in which fluoride is metered for the prevention of tooth decay.

#### Installation conditions for the fluoride electrode

We recommend that our fluoride meter is used only in waterworks.

Measurement range: 0/.05... 10 mg/l fluoride

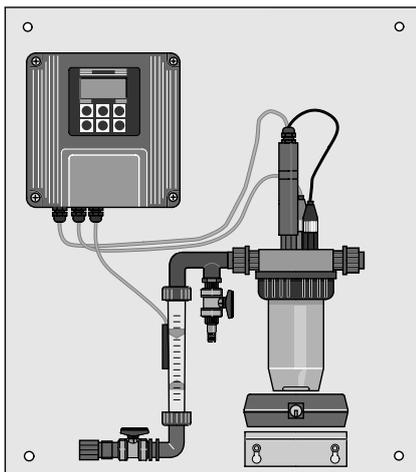
pH range: 5.5... 8.5

Temperature range: 1...35 °C

Max operating pressure: 7 bar/100 psi

We recommend that you install measurement electrodes at atmospheric pressure to facilitate maintenance of all installed electrodes.

*Notice: the maximum admissible operating pressure for the following mounted measurement equipment is 1-bar. This is dictated by the inline probe housing used.*



pk\_6\_009

#### Fully-mounted fluoride meter

For quick and easy installation our fluoride meter is supplied ready-mounted on a PE panel. The following components are included:

- FLEP 010 SE fluoride sensor, PG 13.5 threaded insert and SN 6 plug end.
- PHEN 112 SE 3D reference electrode, PG 13.5 threaded insert and SN 6 plug end.
- Pt 100 SE temperature sensor, PG 13.5 threaded insert and SN 6 plug end.
- 4-20 mA FVP1 measurement transducer for direct screw-fitting to fluoride sensor and with connection lead and SN-6 plug for reference electrode.
- DLG IV inline probe housing to hold 4 electrodes, PG 13.5 threaded insert, electrodes are fitted in spaces 1-3 and one space is left free for user's choice.
- D1C fluoride measurement and control device, wall-mounted with display of fluoride concentration and temperature, with automatic temperature compensation, 0/4 ... 20 mA output for measured variable, with pause control input, alarm and two threshold value relay outputs, default language: English, identcode; D1CAW0F12011G000E (230 V).
- Magnetic stirrer with magnetic stirring rod for stirring sample water during calibration.
- PVC pipework with ball stop/adjustment valve, rotameter with threshold contact, sampling tap, sample water connector for hose 8x5 mm, inserts for DN 10 rigid pipe.

All parts are ready mounted on a white 50 x 60 cm PE panel and fully wired.



PA56003043

#### Part No.

Fluoride meter mounted on panel (230 V)	P1010602
<i>Note: c/w airbreak, flowing junction reference electrode, 25m 8x5 sample line, and 2 x 1/2" BSP to 8x5 adaptors.</i>	
TISAB Add-on Module assembly c/w 60 lt tank	PA56003043

#### Replacement Parts

• FLE 010 SE fluoride sensor (old)	1010311.
• FLEP 010 SE fluoride sensor	1028279.
• PHEN 112 SE 3D reference electrode	150078.
• REFP-SE reference electrode	1018458.
• Pt 100 SE temperature sensor	305063.
• Transmitter FPV1 4-20mA	1028280.
• Polishing paste	559810.
• KCl solution 3 molar 250ml.	791440.
• KCl solution 3 molar 1000ml.	791441.
• Clear Plastic Filter Housing 10'	2801100XV07BCNB
• Filter Cartridge	04PP00X-09NPA
• Mounting Bracket for Filter Housing	28SPF00003
• Releasing Spanner for Filter Housing	28SPF00001

# ProMinent® 5.6 ProMinent DULCOMARIN® II Multi-Channel Measuring & Control System

## 5.6.1 DULCOMARIN® II



- The multi-channel measuring and control system DULCOMARIN®II is characterised by the following features:
- 5.7", 1/4 VGA colour display for easy operation
- Integrated data logger with screen recorder: directly view the measuring data at the controller
- SD card and card reader for PC included: simply transfer measuring data to the PC as standard
- Control of up to 16 drinking water systems or filtration circuits in swimming pools
- CAN bus system: simple wiring and subsequent upgradability
- Visualisation\*: easy with embedded Web server\* and standard Web browser
- LAN interface\*: easy connection to PC or PC network or Internet
- Intelligent sensors: with CANopen bus, save the sensor data and are always within the optimal measuring range thanks to auto ranging
- Intelligent metering pumps: with CANopen bus, inform about the operating parameters such as e.g.: chemicals levels and output in the metering range of 0.74 l/h to 1,030 l/h
- Standby metering pump for disinfectant (automatic switching in case of low level and pump failure)

### Area of application drinking water (and general applications)

- Using a power input module (I module), the following measuring parameters can be measured via 0/4...20 mA and displayed. These values are also available on the data logger/screen recorder, the Web and OPC server:
- Flow rate (as disturbance for pH and chlorine control)
- UV intensity
- Conductivity
- Chlorine dioxide
- Chlorite
- Ammonia
- Fluoride (via D1Ca)
- Pt100 resistance thermometer via transducer
- Display and controlling of free chlorine and total available chlorine
- OPC server\*: easy connection to superordinated visualisation systems

\*optional

### Area of application swimming pool

- Combined chlorine: is safely minimised via controller output and corresponding systems
- OPC server\*: easy connection to superordinated visualisation systems
- Controlling of pool temperature via standard temperature controller
- High chlorination or off-peak reduction by contact via second parameter set
- The decentral modular DULCOMARIN®II system is designed for use in public swimming pools in accordance with DIN 19643. Depending on requirements, the system can be supplied as compact system DULCOMARIN®II compact or as decentral modular system DULCOMARIN®II DULCO®-Net.

# 5.6 ProMinent DULCOMARIN® II DULCO® - net Swimming Pool Controllers

## 5.6.2 DULCOMARIN® II DULCO® - net

The DULCOMARIN® II - DULCO®-Net swimming pool control system uses the CANopen

BUS as the medium for transmission of the data between the measurement and actuator units and the sensors and the central unit.

In its maximum expanded form the system can control up to 16 filtration cycles, i.e. 16 measurement units and 16 dosing units and corresponding sensors can be operated from a single central unit.

For this purpose a central unit is combined with the number of measurement and dosing units required for the application.

A M12 T-distributor is required for connection to any CANopen device (sensors module, actuator module, metering pumps and chlorine sensors). This connects the device to the main bus train via a stub cable.

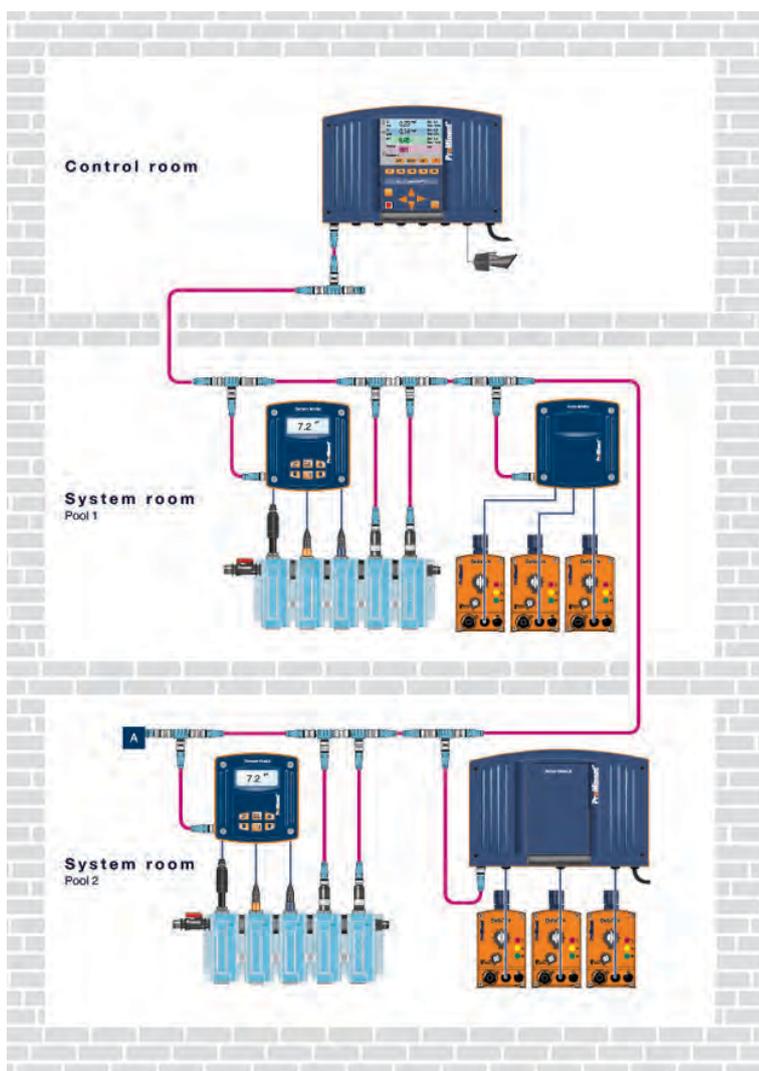
The sum of the lengths of all stub cables in a CANopen - system cannot exceed 15 m.

DULCOMARIN® II DULCO®-Net and compact can both be easily expanded later.

What components make up a DULCOMARIN® II DULCO®-Net system?

A DULCOMARIN® II DULCO®-Net system comprises:

- a central unit and an individual combination of the following components:
- measurement unit
- dosing unit without mains power module
- dosing unit with mains power module (optional)



### Central unit

The central unit can be installed anywhere, e.g. in a control room or in the office. It serves as an in/output module (for viewing and configuring individual modules) and has the following functions: screen recorder, interfaces, Embedded Web Server and the power supply. The central unit may optionally incorporate a sensor and an actuator module. The central unit is connected with the other units via the main Bus train. CAN connection cables are used for this purpose. The main Bus train of the first unit must be connected with a M 12 load resistor coupling and the final unit by a M 12 load resistor plug. You can find these components in section 5 Accessories.

The central unit in the above example comprises the following components:

### Accessories

Description:	Part no.
Chlorine sensor CLE 3-CAN-10 ppm	1023425.
Chlorine sensor CLE 3.1-CAN-10 ppm	1023426.
Chlorine sensor CTE 1-CAN-10 ppm	1023427.
Chlorine sensor CGE 2-CAN-10 ppm	1024420.
Chlorine sensor BRE 3-CAN-10 ppm	1029660.
Cable connection-CAN M12 5pol. 0,5m	1022137.
Cable connection-CAN M12 5pol. 1m	1022139.
Cable connection-CAN M12 5pol. 2m	1022140.
Cable connection-CAN M12 5pol. 5m	1022141.
T-splitter M12 5pol. CAN	1022155.
Terminator M12-female 120R(4-5)	1022154.
Terminator M12-male 120R(4-5)	1022592.
CAN-BUS-Cable	1022160.
Joining Kit CAN-BUS-Cable	1026589.

See Green Pages PriceList  
for above components and  
complete POOL Systems

# 5.6 Identity Code for ProMinent DULCOMARIN® II DULCO®-net Swimming Pool Controllers

## 5.6.3 Identity Code Ordering System for DULCOMARIN® II DULCO® - net

**Central unit:**

<b>DXCa</b>	<b>DULCOMARIN® II Swimming Pool Controller, DXC Series</b>										
	<b>Mounting type:</b>										
	W	Wall mounted (IP 65)									
	S	Control cabinet (IP 54)									
		<b>Design:</b>									
		0	With controls								
			<b>Communication interfaces:</b>								
			0	None							
			5	LAN incl. plug M12							
			6	OPC Server							
				<b>Optional:</b>							
				1	Measurement data archiving incl. 128 MB MMC						
					<b>Module 1:</b>						
					0	Not in use					
					M	Sensor module - pH, Redox, temperature					
					A	Actuator module - pump and analogue output					
						<b>Module 2:</b>					
						0	Not in use				
						M	Sensor module - pH, Redox, temperature				
						A	Actuator module - pump and analogue output				
							<b>Module 3:</b>				
						P	Mains power supply, alarm relay, solenoid valve relay				
						N	Mains power module without relay				
							<b>Applications:</b>				
							S	Swimming pool			
								<b>Preset language:</b>			
								DE	German		
								EN	English		
								ES	Spanish		
								FR	French		
								IT	Italian		
									<b>Approvals:</b>		
									01	CE-mark	

See Section 6  
 GREEN PAGE PRICELIST  
 for complete pool packages  
 and accessories  
 or consult Sydney office

**DXCa W 0 0 1 0 0 P S EN 01**

## 5.7 DULCOMETER® Transducers DMT

### 5.7.1 Measured Variables: pH, Redox, Temperature, Conductivity

DULCOMETER® DMT type transmitters are compact 2-wire transmitters for measured variables pH, redox, chlorine, conductive conductivity, temperature.

Easily combined with programmable memory controllers.

#### Summary of advantages:

- Reliable measurement due, e.g., to symmetrical input for pH/redox signals
- High level of operating safety, e.g. probe monitoring (pH), electrical isolation
- Simple flexible installation
- Full text user guidance
- Automatic buffer recognition (pH)
- Autoranging (conductivity)
- Compact design
- Switch between pH, redox and temperature

#### Applications:

**process control in  
food and beverage industry  
chemical and  
pharmaceutical industries  
water treatment  
waste water treatment  
power stations**

### Technical Data



pk\_5\_001

Measurement range:	pH -1.00...15.00 -1200...+1200 mV redox voltage 0.01...50.0 mg/l chlorine -20...+150 °C 1 µS/cm...200 mS/cm (autoranging)
Cell constant:	0.006... 12.0/cm for conductivity
Resolution:	pH 0.01 1 mV 0.1 % from measurement range for chlorine 0.1 °C Conductivity 1/1000 of display value (min. 0.001 µS/cm)
Reproducibility:	0.5 % from measurement range
Measurement input:	mV terminal (pH, redox); input resistance >5 x 10 <sup>11</sup> Ω Chlorine terminal (DMT chlorine probes) Pt 100/1000 terminal Conductivity terminal (2 or 4 wire connector)
Correction variable:	Temperature via Pt 100/1000 (pH, chlorine, conductivity)
Current output:	4...20 mA, fault current 23 mA
Supply voltage:	16...35 V DC (nominal 24v)
Communication interface:	Profibus DP (wall-mounted version only)
Ambient temperature:	-5...+55 °C
Climatic conditions:	up to 95 % relative humidity (non-condensing)
Enclosure rating:	IP 65 (wall/pipe mounted) IP 54 (control panel installation)
Display:	graphical display
Housing:	PPE
Dimensions:	125 x 135 x 75 mm (WxHxD)
Weight:	approx. 450 g

**Sensors** see section 6.

**In-line probe housings, signal cables**, see section 6/16

# 5.7 DULCOMETER® Transducers DMT

## 5.7.2 Identity Code Ordering System For DMT

DMT

DULCOMETER® Transducers

A	Version
S	<b>Installation:</b> Control panel mounted <sup>1</sup>
W	Wall mounted (also column mounted)
0	<b>Version:</b> With ProMinent® logo
9	<b>Electrical connection:</b> Loop powered 4-20 mA (2 wire, auxillary power 16 ... 40 v DC) standard
5	
0	<b>Communication interface:</b> None
4	
P	<b>Measured variable 1:</b> pH Redox Temperature Chlorine Conductivity
R	
T	
C	
L	
0	<b>Measured variable 2 (Correction variable)</b> None (for measured variable T)
1	
0	<b>Enclosure rating:</b> Standard
E	<b>Language:</b> English

The final 4 digits in the identity code give the software presettings, e.g. cell constant at conductivity.  
0 = standard settings  
Presetting options available on request.

**Note:**

- 1) The panel mounted version does not include the rear housing.
- 2) Choose the 24 V DC electrical connection with the Profibus DP
- 3) Wall-mounted version only

**Note:**

Power Supply if required  
24Volt DC up to 1 amp MP3494

DMT A W 0 9 0 P 1 0 E 0 0 0 0

## 5.8 DULCOMETER® Transmitters

### 5.8.1 Measured Variable Inductive Conductivity Transmitter 2401 Cond I



pk\_5\_091\_2

Conductivity	
measurement range:	0...2000 mS/cm
Measurement error:	< 1 % of M. <sup>2)</sup>
Measurement range:	Conductivity 00.00...99.99 mS/cm
	000.0...999.9 mS/cm
	0000...9999 mS/cm
	Concentration 0.0...100.0 %/weight
	Salinity 0.0...45.0 ‰ (0...35 °C)
Conductivity input for connection of inductive sensor LF (conductivity) 654 X	
Measurement input:	Terminal
Temperature input:	Pt 100 / Pt 1000 / NTC 30 k $\Omega$ / NTC 100 k $\Omega$
Temperature	
measurement range:	NTC -20.0...+130.0 °C Pt 100/Pt 1000 -20.0...+150.0 °C
Temperature	
measurement error:	$\pm 0.5$ K <sup>1)</sup>
Current output:	(0)4...20 mA, 22 mA in the case of alarm
Auxiliary power:	20...253 V AC/DC, approx. 2 VA
Ambient temperature:	-20...+55 °C
Enclosure rating:	IP 65
Relay outputs:	2 threshold value relays (no adjustable hysteresis)
	1 alarm relay
	1 wash contact
Load capacity:	
AC: < 250 V, < 3A, < 750 VA	
DC: < 30 V, < 3A, < 90 W	
Display:	7-segment LC display
Dimensions:	144 x 105 x 144 mm (WxHxD)
Weight:	Approx. 1 kg

<sup>1)</sup> Pt 100: 1K, NTC > 100 °C: 1K

<sup>2)</sup>  $\pm 1$  digit

**Part No.**  
1008706.

Electrodeless sensor, see page 5.20



# 5.9 DULCOMETER® Measurement and Control Technology Measuring and Test Instruments

5.9.1

Technical Data



pk\_5\_073\_A

3-molar KCl solution, 50 ml	505533.
3-molar KCl solution, 250 ml	791440.
3-molar KCl solution, 1000 ml	791441.
Buffer solution 465 mV, 50 ml	506240.
Buffer solution 220 mV, 50 ml	506244.
Buffer solution pH 4.0 - red, 50 ml	506251.
Buffer solution pH 7.0 - green, 50 ml	506253.
Buffer solution pH 10.0 - blue, 50 ml	506255.

# 5.10 DULCOMETER® Measurement and Control Technology Measuring and Test Instruments

## 5.10.1 Portamess® Portable Meters, Measured Variable pH, Hazardous and Safe-Area Applications

- Smooth membrane keypad
- Large easy-to-read LC display
- Integrated sensor quivers for protection of electrode
- Robust housing (enclosure rate IP 66)
- Robust, watertight gold plated connector sockets

### Applications:

**industrial, environmental protection, food production and in water and wastewater investigation**

### Technical Data Portamess® 911 pH



pk\_5\_099

Measurement range: pH: -2.00...+16.00  
mV: -1300...+1300  
°C: -20.0...+120

Measurement error: pH: < 0.01  
mV: < 0.1 % of measured value ±0.3 mV  
°C: < 0.3 K

Measured variable  
buffer memory: 100 storage spaces: pH/mV, °C, time and date

Sensor adjustment: 8 buffer record options

Temperature  
compensation: manual

Explosion protection: IP 66

Operating life: 2000 hours with 3 AA batteries

Dimensions: 133 x 160 x 30 mm (WxHxD)

Weight: Approx. 560 g with batteries

Supplied as standard: measuring device, carrying case, operating instructions manual in German, English and French.

### Part No.

Portamess® 911 pH (not Ex)

1008710.

**Notice:** the PHEKT 013 F pH electrode and the buffer solutions are **NOT INCLUDED** as standard.

### Part No.

PHEKT 013 F

1036537.

Buffer solution pH 4.0 - red, 50 ml

506251.

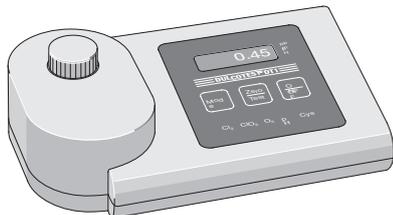
Buffer pH 7, 50 ml

506253.

See page 5.21 for pH probe

# 5.11 DULCOMETER® Measurement and Control Technology - Photometer DT1

## 5.11.1 Photometer DT 1



pk\_5\_021

### DT1 Photometers

- Portable compact Photometer
- Simple to operate with support text
- Simple reliable measurement of chlorine, chlorine dioxide, bromine, ozone, pH and cyanuric acid
- Self-diagnostic

### Applications:

**swimming pool, drinking water, process water**

## Technical Data

Measurement range of DT1:	0.05...6.0 mg/l Chlorine free (DPD1) + total (DPD1+3) 0.1...13.0 mg/l Bromine (DPD1) 0.05...11 mg/l Chlorine Dioxide (DPD1) 0.03...4.0 mg/l Ozone (DPD4) 6.5...8.4 pH (phenol red) 1...80 mg/l Cyanuric Acid
Measurement range of DT3:	1...50 / 40...500 mg/l Hydrogen Peroxide
Measurement range of DT4:	0.03...2.5 mg/l Chlorite 0.05...11 mg/l Chlorine Dioxide 0.05...6.0 mg/l Chlorine
Measuring tolerance:	Dependant upon measured value and measuring method
Battery:	4 x batteries AA/LR6
Ambient temperature:	5...40 °C
Relative humidity:	30...90 % (non-condensing)
Housing material:	ABS
Keypad:	Polycarbonate
Dimensions:	190 x 110 x 55 mm (LxWxH)
Weight:	approx. 0.4 kg

	<b>Part No.</b>
<b>Photometer DT1B</b> kit with carrying case <i>Included as standard with DT1 are accessories, cells and 15ml bottles of reagents DPD1, DPD1 Buffer, DPD3, Phenol Red tablets (50) and Cyanuric Acid tablets (50).</i>	1039315.
<b>Photometer DT3B</b> kit with carrying case <i>Included as standard with DT3 are accessories, cells and reagents for hydrogen peroxide.</i>	1023143.
<b>Photometer DT4B</b> kit with carrying case <i>Included as standard with DT1 are accessories, cells and reagents for chlorine and chlorine dioxide detection.</i>	1022695.
<b>Consumable items:</b>	
• DPD 1 buffer, 15 ml (Note: approx 360 drops per 15ml)	1002857.
• DPD 1 reagent, 15 ml	1002858.
• DPD 3 solution, 15 ml	1002859.
• Phenol red tablets R 175 (100 in each)	305532.
• Cyanuric acid tablets R 263 (100 in each)	305531.
• 3 off spare cells: round cells with covers for DPD phenol red and cyanuric acid detection (DT1 and DT2B)	1007566.
• 3 off spare cells for fluoride detection (DT2A and B)	1010396.
• DPD reagents set, 15 ml each: 3 x DPD 1 buffer, 1 x DPD 1 reagent, 2 x DPD 3 solution (Total = 6 BOTTLES)	1007567.

# 5.12 DULCOMETER® Measurement and Control Technology Ancillary Equipment

## 5.12.1 4...20 mA Transmitters (2-Wire Technology)

### Advantages:

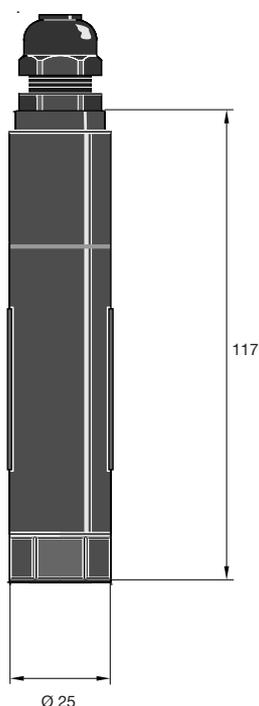
- Safer signal transfer, even across large distances
- Interference free 4-20 mA signal
- Simple installation directly onto sensor

**Typical applications:** Measurement signal transfer over large distances, or to transfer signals subject to disturbance (e.g. pH, redox) in conjunction with D1C, D2C and DULCOMARIN® measurement and control systems, or for direct connection to PC/PLC.

### pH transmitter 4...20 mA, type pHV1

Measurement range:	pH 0...14
Accuracy:	better than pH 0.1 (typical $\pm$ pH 0.07)
Socket:	SN6
Input resistance:	$> 5 \times 10^{11} \Omega$
Signal output:	4...20 mA <sup>3</sup> -500...+500 mV <sup>3</sup> pH 15.45...-1.45 not calibrated, not electrically isolated
Power supply:	18...24 V DC
Ambient temperature:	-5...50 °C, non-condensing
Enclosure rating:	IP 65
Dimensions:	141 mm length, 25 mm $\varnothing$

**Part No.**  
809126.



pk\_5\_064

### Redox transmitter 4...20 mA, type RH V1

Technical data as for pH transmitter, but:

Measurement range:	0...1000 mV
Accuracy:	better than $\pm$ 0.5 mV (typical $\pm$ 3 mV)
Input resistance:	$> 5 \times 10^{11} \Omega$
Signal output:	4...20 mA <sup>3</sup> 0...+1000 mV not electrically isolated
Power supply:	18...24 V DC

**Part No.**  
809127.

### Temperature transmitter 4...20 mA, type Pt 100 V1

Technical data as for pH transmitter, but:

Measurement range:	0...100 °C
Accuracy:	better than $\pm$ 0.5 °C (typical $\pm$ 0.3 °C)
Input resistance:	$\sim 0 \Omega$
Signal output:	4...20 mA <sup>3</sup> 0...+100 °C not electrically isolated
Power supply:	18...24 V DC

**Part No.**  
809128.

# 5.13 DULCOMETER® Measurement and Control Technology Ancillary Equipment

## Electrodeless Conductivity Sensor

### INDUCTIVE CONDUCTIVITY

#### Electrodeless sensor LF 654X

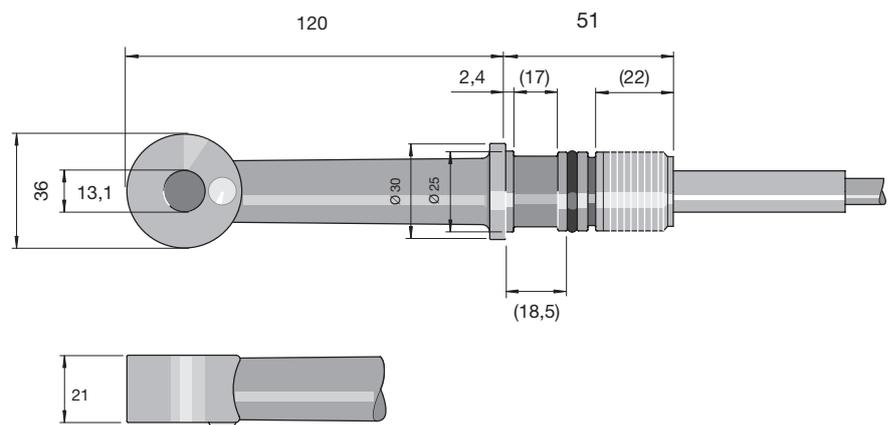


pk\_5\_097

Cell factor:	Nominal value 2.15 cm <sup>-1</sup>
Measurement range:	0.001 mS/cm ... 2000 mS/cm
Material:	Cell: PEEK, Seal EPR
Temperature probe:	NTC 100 k $\Omega$
Temperature:	-5...+120 °C
Pressure:	0...17.5 bar
Cable length:	6 m
Explosion protection:	EEx ia IIC T4...T6
Mounting:	3/40 NPT thread

LF 654X can be used for explosive and non-explosive applications.

**Part No.**  
1024416.



pk\_5\_022

**Note: See also Section 6 Sensors**

## Technical Data



### Impedance converter

The high impedance of pH and redox measurements can cause electrical interference, especially when using long signal lead. The impedance converter lowers the probe signal impedance to approx. 1 k $\Omega$  thereby making the signal resistant to interference. The device can be screwed directly onto pH and redox sensors with no other installation required.

Power supply from integrated batteries. Operating life approx. 5 years, enclosure rating IP 65.

**Type 2 AMZ 20**

**Part No.**  
305350.

pk\_5\_067

# 5.14 DULCOMETER® Measurement and Control Technology Ancillary Equipment

## Conductivity Sensor



### Conductivity sensor

#### 4-electrode sensor LF 204

Number of electrodes:	4
Electrode shaft material:	Black Epoxy
Electrode material:	Graphite
Shaft length:	120 mm
Shaft diameter:	15.3 mm
Cable length:	1.5 m
Temperature probe:	NTC (30 k $\Omega$ ) -5...+100 °C
Immersion depth:	min. 36 mm Max. total length inc. cable
Pressure resistance:	2 bar
Temperature range:	0...90 °C
Cell constant:	0.475 cm <sup>-1</sup> $\pm$ 1.5 %
Measurement range:	1 $\mu$ S/cm...500 mS/cm

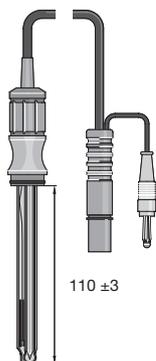
#### Part No.

Conductivity sensor LF 204

1008723.

pk\_5\_093

Note: See also Green Pages PriceList



### ILFa-PHEKT 013 F for Portamess® manual measuring devices

Plastic shaft electrode with inbuilt Pt 1000 for temperature display and compensation, 1 m fixed cable, device side DIN and banana plug

pH range:	0...13
Temperature:	0...80 °C
Max. pressure:	atmospheric pressure
Min. conductivity:	>150 $\mu$ S/cm
Diaphragm:	fibreglass
Length:	110 mm $\pm$ 3 mm
Device plug:	DIN plug/banana plug

#### Part No.

PHEKT 013 F ex HD works

1036537.

pk\_6\_008

## 5.15 Turbidity DULCO® turb C

### 5.15.1 Turbidity Meter DULCO® turb C



#### Turbidity Meter DULCO® turb C

Measuring Principle:	Nephelometric measurement, (scattering 90 degree) • according US-Standard USEPA 180.1: versions TUC2 & TUC4
Measuring Range:	0 - 1000 NTU (FNU, FTU)
Accuracy:	• range: 0- 40 NTU: ± 2% of measured value or ± 0.02 NTU • range 40- 1000 NTU: ± 5% of measured value
Resolution:	0.0001 NTU, selectable
Light source:	• white, according to USEPA 180.1, tungsten lamp
Response time:	5 to 500 seconds, adjustable (0 - 1000 NTU)
Input pressure:	700 mbar- 13.8 bar (built in regulator set at 1.035 bar)
Input flow:	6 litre/h to 60 litre/h
Signal output:	4-20 mA, galvanic isolated RS-485 (Modbus)
Features:	Available as USEPA method 180.1 (ISO702 by special order) design and performance. Range of 0 -1000 NTU Target application drinking water treatment. Optics are not in contact with the sample which reduces the chance of false low readings. Removable sample cuvettes allow for easy cleaning & calibrating Convenient reusable Primary calibration standards. One-piece modular design eliminates the need to mount more than one module per turbidimeter. Fast response time and inexpensive calibration due to low (30 ml) sample volume.

Compatible to controllers:

D1Cb/ Disinfection Controller via 4-20 mA

TUC2 WL without ultrasonic cleaning P1037695

TUC4 WL with ultrasonic cleaning P1037697

**Note:** both the above supplied with 25m 8x5 sample line, and 2 off 1/2" BSPT to 8x5 adaptors

Calibration kit (electronics only)	1037699.
Desiccant	1037701.
Flow control	1037880.
Pressure control	1037885.
Cuvette for TUC2	1037877.
Cuvette for TUC4	1037878.
Tubing kit	1037879.
Degassing assembly	1037700.
Replacement lamp	1037703.

#### Turbidity Standards for Calibration

complete with validation certificate

0.02 Ntu 1 Litre	53030.
10 Ntu 1 Litre	53000.
1000 Ntu 1 Litre	53070.



# 6.0 DULCOTEST® Sensor Technology

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# 6.0 DULCOTEST® Sensor Technology pH Measurement Probes & Resistance Thermometers

All probes are combination probes that have been proven in both industrial and laboratory applications.

Before being dispatched all probes are tested twice to ensure they are functioning correctly; the first time immediately after being manufactured, the second time about a fortnight afterwards in order to eliminate glass-specific manufacturing risks.

All pH combination probes have their voltage zero at pH  $7 \pm 0.5$ .

In the reference electrode system of the ProMinent® pH and Redox combination probes an Ag/AgCl conductance is generally used which is not only less harmful to the environment than the calomel type (mercurous chloride) but

can also be used in a wider temperature application range.

The shaft diameter of all probes is 12 mm. All dimensions specified are approximate since pH and Redox probes are handmade.

Please note:

The service life and storage life of all pH and Redox electrodes is limited which is why they should only be kept in storage for as short as possible.

The electrodes must be stored solely with the plugged on wetting caps in 3-molar potassium chloride solution. They may not be stored dry on any account!

The ageing of electrodes depends greatly on the application conditions.

The service life is between one and three years for problem-free applications as well as at room temperature and average pH values. In extreme operating temperatures only two to three months. Every electrode ages even when it is not in operation!

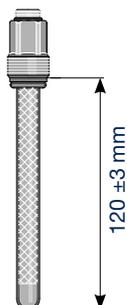
Various influences can shorten the service life of electrodes, e.g. chemical reactions with the reference electrode or in the diaphragm, extreme pH values, high temperatures, abrasive media or media containing hydrofluoric acid.

From the date of delivery a 6 month warranty for material and workmanship is granted for all pH and Redox electrodes.

- ◆ Pt 100 with Push-and-Twist Connector for Type SN 6 Coax Connector
- ◆ pH Combination Probes with Push-and-Twist Connector for Type SN 6 Coax Connector
- ◆ Redox Combination Probes with Push-and-Twist Connector for Type SN 6 Coax Connector

For all other pH & Redox Probes and associated equipment see the appropriate section in the 'Green Page' Price List

## Temperature Sensor



### Type PT 100 SE

Resistance temperature sensor PT 100, integrated in glass stem, installed length 120 mm; with plug-type head for SN6 coaxial connector and internal thread PG 13.5

Temperature range: 0... 80°C.

Operating pressure: max. 10 bar.

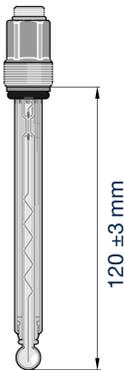
Typical applications: Temperature measurement and pH-temperature compensation.

**305063.**

Note: Local alternative also available

# 6.1 DULCOTEST® pH Probes

## 6.1 pH Probes with Push-and-Twist Type SN6 Coax Connectors

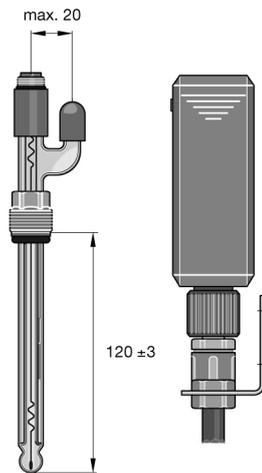


### PHER 112 SE

pH range: 1...12  
 Temperature: 0...80 °C  
 Max. pressure: 6 bar  
 Min. conductivity: >50 µS/cm  
 Electrolyte with solid KCl supply (salt rings in the reference electrolyte)  
 Diaphragm: PTFE ring diaphragm  
 Installation Length: 120 ±3 mm  
 Typical applications: Municipal and industrial wastewater, process water, water in the chemical and paper manufacturing industries. General, for water with suspended solid content.

**1001586.**

pk\_6\_018



### PHEN 112 SE 3D

pH range: 1...12  
 Temperature: 0...80 °C  
 Max. pressure: Atmospheric pressure  
 Min. conductivity: >50 µS/cm  
 KCl electrolyte, refillable  
 Diaphragm: 3 Ceramic diaphragms  
 Installation Length: 120 ±3 mm  
 Typical applications: Waste water

**Note: Supplied without storage container and tubing**

**150078.**

#### Accessories

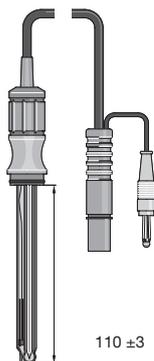
PE storage container and tubing **305058.**

KCl solution 3 molar 250ml. **791440.**

KCl solution 3 molar 1000ml. **791441.**

**Note: See Green Pages Price List for POOL Probes and industrial probes.**

## pH-Combination Probes With Fixed Cable



### PHEKT 013 F for Portamess® manual measuring devices

Plastic shaft electrode with inbuilt Pt 1000 for temperature display and compensation, 1 m fixed cable, device side DIN and banana plug.

pH range: 0...13  
 Temperature: 0...80 °C  
 Max. pressure: atmospheric pressure  
 Min. conductivity: >150 µS/cm  
 Diaphragm: fibreglass  
 Length: 110 mm ± 3 mm  
 Device plug: DIN plug/banana plug

**Part No.**

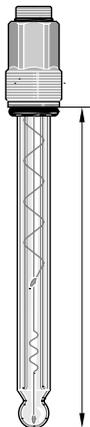
PHEKT 013 F ex HD works

**1036537.**

pk\_6\_008

# 6.2 DULCOTEST® pH & Redox Probes

## pH & Redox Probes with Push-and-Twist Connector for SN6



pk\_6\_016

**ProMinent Code**

**PFC Part No**

**pH Sensors with SN6 Connector**

**PHE-112-SE**

**SP100-4330-DH**

**PHEP-112-SE**

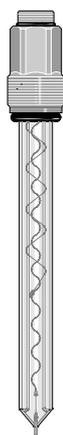
**SP200-2330-DH**

**PHEX-112-SE**

**SP200-2330-DH**

**PHED-112-SE**

**SP200-2330-DH**



pk\_6\_031

**ORP Sensors with SN6 Connector**

**RHEP-Pt-SE**

**SP100-4PB0-DH**

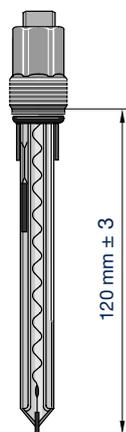
**RHEX-Pt-SE**

**SP200-2PB0-DH**

**RHEK-Pt-SE**

**SP200-2PB0-DH**

**Note: See Green Pages Price List for POOL Probes and alternative Industrial probes.**



pk\_6\_035

**RHEP-Au-SE**

Gold pin electrode

Temperature: 0...80 °C

Max. pressure: 6 bar

Min. conductivity: >150 µS/cm

Diaphragm: ceramic

Installation length: 120 mm ± 3 mm

Mounting hole minimum 14.5 dia. mm

Typical applications: Cyanide detoxification, ozone monitoring, saltwater pools or for use with saltwater generator. Do not use with media containing chlorine.

**RHEP-Au-SE** ex HD works

**Part No.**

1003875.

## 6.3 DULCOTEST® Amperometric Sensors

### 6.3 Amperometric Sensors for Chlorine, Bromine, Chlorine Dioxide, Chlorite, Ozone, Dissolved Oxygen and Peracetic Acid

For optimum functioning of chlorine, bromine, chlorine dioxide and ozone measuring cells please note the following guidelines:

- Use DULCOMETER® measurement and control systems.
- Install only in ProMinent® DGM or DLGA in-line probe housings.
- Defined flow between 30 and 60 l/h.
- Chlorine measurement must only take place when pH is stable (CLE 3).
- Regular calibration with a Photometer (e.g. Type DT 1).

#### Important:

Amperometric probes are **NOT electrically isolated**.

When installing in external appliances (e.g. PLC), you should electrically isolate the supply voltage and the analogue input signal.

- Summary of features:
- High zero point stability
- Compact design
- Integrated temperature correction
- Simple to install
- Simple to maintain
- Short warm up period time
- Measurement signal virtually unaffected by flow

Chlorine dissolved in water is present in different forms:

**Free (active) chlorine:**  $\text{Cl}_2$ , HOCl (hypochlorous acid),  $\text{OCl}^-$  (hypochlorite) recommended sensors: CLE (analysis: DPD 1).

**Combined chlorine:** mono, di, trichloramine (analysis: DPD 4 - DPD 1).

**Organic combined chlorine:** Of isocyanuric acid / isocyanurate bound chlorine (total available chlorine) and the resulting free (effective) chlorine; recommended sensor: CGE (analysis: DPD 1).

**Total chlorine:** Sum of free and combined chlorine; recommended sensor: CTE (analysis: DPD 4).

**Applications:** Chlorine measurement in drinking, swimming pool, process, industrial water and water of similar quality e.g. seawater/brine with up to 15 % chloride content.

We recommend the CGE, CTE chlorine sensors for measuring chlorine if pH value is high (8...9.5).

#### Guidelines for device usage:

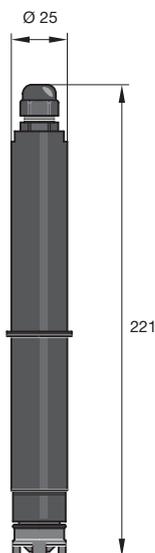
The measuring cells type CLE cannot be used in the presence of iso-cyanuric acid/chlorine stabilisers!

The sensors with the suffix -mA are used with the measurement and control devices D1C, D2C and DULCOMARIN®. The sensors with the suffix -4P are used with the earlier WS controllers and for metering pumps with integrated chlorine controllers. DMT-type sensors are used for the DMT transducer. CAN-type sensors are used with the DULCOMARIN® II swimming pool controller.

**Note** CLE sensors: The CLE type sensors cannot be used in liquids containing isocyanuric acid/chlorine stabilisers.

## 6.3 DULCOTEST® Sensors for Chlorine

### 6.3.1 DULCOTEST® Sensors for free chlorine - CLE 3-mA and CLE 3.1-mA



pk\_5\_046

#### Measurement of free chlorine

##### CLE 3-mA

Measured variable:	<b>Free chlorine (hypochlorous acid HOCl)</b>
Analysis:	DPD 1
Measurement range:	0.01...0.50 mg/l (CLE 3-mA-0.5 ppm) 0.02...2.00 mg/l (CLE 3-mA-2 ppm) 0.1...10.0 mg/l (CLE 3-mA-10 ppm) 0.2...20 mg/l (CLE 3-mA-20 ppm) 0.5...50 mg/l (CLE 3-mA-50ppm)
pH range:	5.5...8.0 (up to pH 8.5 for pH correction in the D1C)
Temperature range:	5...45 °C (temperature compensated)
Max. pressure:	1 bar
Flow:	30...60 l/h (in DGM or DLGA)
Power supply:	16...24 VDC (two-wire technology)
Output signal:	4...20 mA <sup>3</sup> measurement range (un-calibrated) <b>Warning: no electrical isolation!</b>
Typical applications:	CLE 3-mA-0.5 ppm, potable water CLE 3-mA-2.0/10 ppm, swimming pool, potable, industrial, process water (surfactant free)
Measurement and control devices:	D1C, D2C, DULCOMARIN® (2/10 ppm only)
In-line probe housing:	DGM, DLGA

CLE 3-mA-0.5 ppm set, with 100 ml electrolyte \*\*\* not stocked\*\*\* 792927.

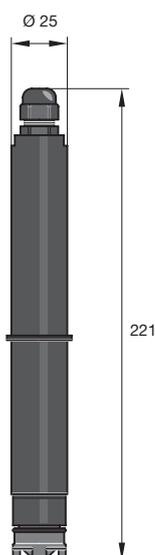
CLE 3-mA-2 ppm set, with 100 ml electrolyte \*\*\* not stocked\*\*\* 792920.

CLE 3-mA-10 ppm set, with 100 ml electrolyte 792919.

CLE 3-mA-20 ppm set, with 100 ml electrolyte 1002964.

CLE 3-mA-50 ppm set, with 100 ml electrolyte 1020531.

CLE 3-mA-100 ppm set, with 100 ml electrolyte 1022786.



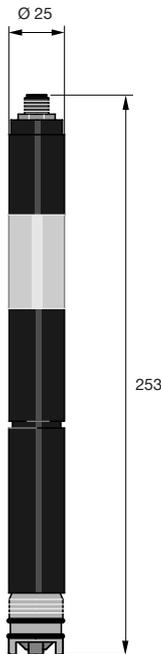
pk\_5\_046

##### CLE 3.1-mA

Measured variable:	<b>Free chlorine (hypochlorous acid HOCl) where there is a high rate of combined chlorine and/or in the case of pH values up to 8.5 (with D1C pH correction).</b>
Analysis:	DPD 1
Measurement range:	0.02...2.00 mg/l (CLE 3.1-mA-2 ppm) 0.01...5.0 mg/l (CLE 3.1-mA-5 ppm) 0.1...10.0 mg/l (CLE 3.1-mA-10 ppm)
pH range:	5.5...8.0 (up to pH 8.5 for pH correction in the D1C)
Temperature range:	5...45 °C (temperature compensated)
Max. pressure:	1 bar
Flow:	30...60 l/h (in DGM or DLGA)
Power supply:	16...24 VDC (two-wire technology)
Output signal:	4...20 mA <sup>3</sup> measurement range (un-calibrated) <b>Warning: no electrical isolation!</b>
Typical applications:	CLE 3-mA-2.0/10 ppm, swimming pool, potable, industrial, process water (surfactant free)
Measurement and control devices:	D1C, D2C, DULCOMARIN®
In-line probe housing:	DGM, DLGA
CLE 3.1-mA-0.5 ppm set, with 100 ml electrolyte	1020530.
CLE 3.1-mA-2 ppm set, with 100 ml electrolyte	1018369.
CLE 3.1-mA-5 ppm set, with 100 ml electrolyte	1019398.
CLE 3.1-mA-10 ppm set, with 100 ml electrolyte	1018368. <b>\$ 2,510</b>

## 6.3 DULCOTEST® Sensors for Chlorine

### 6.3.2 DULCOTEST® Sensors for free chlorine - CLE 3-mA and CLE 3.1-mA



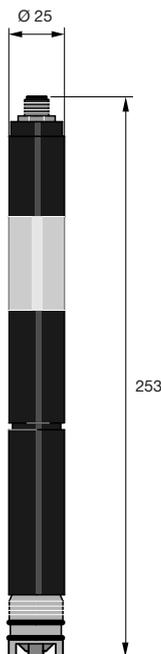
#### CLE 3-CAN

Measured variable:	Free chlorine (hypochlorous acid HOCl)
Analysis:	DPD 1
pH range:	5.5...8.0
Temperature range:	5...45 °C (temperature compensated)
Max. pressure:	1 bar
Flow:	30...60 l/h (in DGM or DLGA)
Power supply:	Via CAN interface(11-30V)
Output signal:	un-calibrated, temperature compensated, electrically isolated
Typical applications:	swimming pool, potable water (surfactant free)
Measurement and control devices:	DULCOMARIN®
In-line probe housing:	DGM, DLGA

CLE 3-CAN-10 ppm 0.01 ... 10.0 mg/l 1023425.

complete with 100 ml electrolyte

pk\_6\_096



#### CLE 3.1-CAN

Measured variable:	Free chlorine (hypochlorous acid HOCl) with large proportions of bound chlorine; to detect bound chlorine using DULCOMARIN® II and Sensor for Total Chlorine type CTE 1-CAN
Reference Method:	DPD 1
pH range:	5.5...8.0 (up to pH 8.5 for pH correction in the D1C)
Temperature range:	5...45 °C (temperature compensated)
Max. pressure:	1 bar
Flow:	30...60 l/h (in DGM or DLGA)
Power supply:	Via CAN interface (11-30V)
Output signal:	un-calibrated, temperature compensated, electrically isolated
Typical applications:	swimming pool, potable water with a high percentage of bound chlorine (surfactant free)
Measurement and control devices:	DULCOMARIN® II
In-line probe housing:	DGM, DLGA

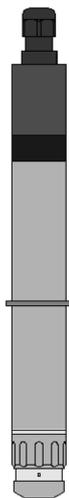
CLE 3.1-CAN-10 ppm 0.01 ... 10.0 mg/l 1023426.

complete with 100 ml electrolyte

pk\_6\_096

## 6.3 DULCOTEST® Sensors for Chlorine

### 6.3.3 DULCOTEST® Sensors for Free Chlorine



#### CLO 1-mA

Measured variable	free chlorine (hypochlorous acid HOCl)
Reference method	DPD1
pH range	5,0 ... 9,0
Temperature range	5 ... 45 °C
Max. pressure	8,0 bar
Intake flow	30...60 l/h (in DGM or DLG III), constant flow as flow-dependent signal
Power supply	16...24 V DC (2-wire)
Output signal	4...20 mA = Measuring range, temperature-compensated, uncalibrated, not electrically isolated
Typical applications	swimming pool, uncontaminated drinking water and industrial service water, and can also be used together with diaphragm-free electrolysis processes
Measurement and control equipment	D1C, D2C, DULCOMARIN®
In-line probe housing	DGM, DLG III to 60 °C, special fitting for 60 °C-70 °C (on request)
Measuring principle	amperometric, 3 electrodes, no diaphragm

CLO 1-mA-2 ppm	0,02...2,0 mg/l	1033871
CLO 1-mA-10 ppm	0,10...10,0 mg/l	1033870

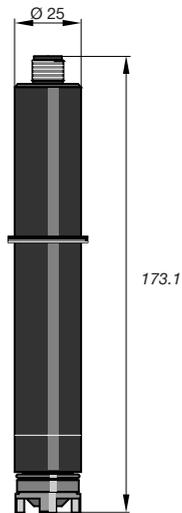
#### CLO 2-mA

Measured variable	free chlorine (hypochlorous acid HOCl)
Reference method	DPD1
pH range	5,0 ... 9,0
Temperature range	5 ... 70 °C
Max. pressure	8,0 bar
Intake flow	30...60 l/h (in DGM oder DLG III), constant flow as flow-dependent signal
Power supply	16...24 V DC (two-wire system)
Output signal	4...20 mA = Measuring range, temperature-compensated, uncalibrated, not electrically isolated
Typical applications	Hot water up to 70°C, combating legionella uncontaminated drinking water and industrial service water, and can also be used together with diaphragm-free electrolysis processes
Measurement and control equipment	D1C, D2C, DULCOMARIN®
In-line probe housing	DGM, DLG III to 60°C, special fitting for 60°C-70°C (on request)
Measuring principle	amperometric, 3 electrodes, no diaphragm

CLO 2-mA-2 ppm	0,02...2,0 mg/l	1033878
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## 6.3 DULCOTEST® Sensors for DMT

### 6.3.4 DULCOTEST® Sensors for free Chlorine - CLE3-DMT and CTE1-DMT



pk\_5\_045

#### CLE 3-DMT

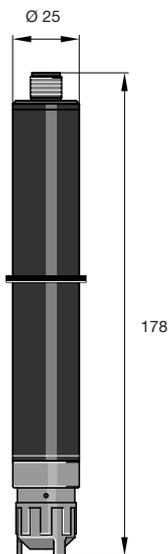
Measuring cell for use with the DMT "chlorine" measurement transducer.

Measured variable:	Free chlorine (hypochlorous acid HOCl)
Reference method:	DPD1
Measurement range:	0.01...5.0 mg/l 0.05...50 mg/l
Supply:	From the DMT measurement transducer (3.3 VDC)
Output signal:	Un-calibrated, not temperature compensated
Temperature	5...45 °C
Max. pressure:	1 bar
Flow:	30...60 l/h (in DGM or DLGA)
measurement:	Via integrated Pt 1000: compensation carried out in DMT
Measuring cell output:	5-pin plug
Other data as for CLE-3 mA.	

CLE 3-DMT-5 ppm set with 100 ml electrolyte	1005511.
CLE 3-DMT-50 ppm set with 100 ml electrolyte	1005512.

See section 3.21

Universal control cable, 5-pole round connector, 5-wire, 2 m	1001300.
Universal control cable, 5-pole round connector, 5-wire, 5 m	1001301.
Universal control cable, 5-pole round connector, 5-wire, 10 m	1001302.



pk\_5\_022

#### CTE 1-DMT

Measuring cell for use with the DMT "chlorine" measurement transducer.

Measured variable:	Total Chlorine
Reference method:	DPD4
Measurement range:	0.01...10 mg/l
Supply:	From the DMT measurement transducer (3.3 VDC)
Output signal:	Un-calibrated, not temperature compensated
Temperature	5...45 °C
Max. pressure:	1 bar
Flow:	30...60 l/h (in DGM or DLGA)
measurement:	Via integrated Pt 1000: compensation carried out in DMT
Measuring cell output:	5-pin plug
Other data as for CLE-3 mA.	

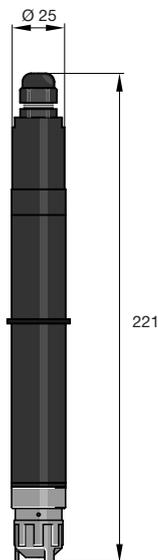
CTE 1-DMT-10 ppm set with 50 ml electrolyte	1007540.
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See section 3.21

Universal control cable, 5-pole round connector, 5-wire, 2 m	1001300.
Universal control cable, 5-pole round connector, 5-wire, 5 m	1001301.
Universal control cable, 5-pole round connector, 5-wire, 10 m	1001302.

# 6.3 DULCOTEST® Sensors for Total Chlorine

## 6.3.5 DULCOTEST® Sensors for Total Chlorine



pk\_5\_047\_1

### Measured variable of total chlorine

#### CTE 1-mA

Measured variable: **total chlorine**  
 Analysis: DPD 4  
 Measurement range: 0.01...0.50 mg/l (CTE 1-mA-0.5 ppm)  
 0.02... 2.00 mg/l (CTE 1-mA-2 ppm)  
 0.05... 5.00 mg/l (CTE 1-mA-5 ppm)  
 0.1...10.0 mg/l (CTE 1-mA-10 ppm)

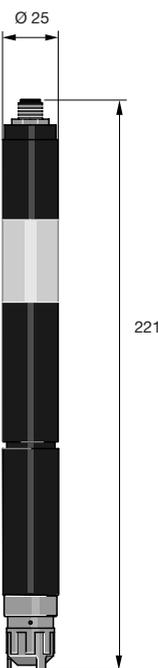
pH range: 5.5...9.5  
 Temperature range: 5...45 °C  
 Max. pressure: 3 bar  
 Flow: 30...60 l/h (in DGM or DLGA)  
 Power supply: 16...24 V DC (two-wire technology)  
 Output signal: 4...20 mA<sup>3</sup> measurement range (un-calibrated)  
**Warning: no electrical isolation!**

Typical applications: CTE 1-mA-0.5 ppm, potable water  
 CTE 1-mA-2/5/10 ppm, potable, industrial, process water,  
 In swimming pool in combination with CLE3.1 for determining  
 combined chlorine.

Measurement and control devices: D1C, DULCOMARIN® (2/10 ppm only)  
 In-line probe housing: DGM, DLGA

#### Part No.

CTE 1-mA-0.5 ppm set, with 50 ml electrolyte	740686.
CTE 1-mA-2 ppm set, with 50 ml electrolyte	740685.
CTE 1-mA-5 ppm set, with 50 ml electrolyte	1003203.
CTE 1-mA-10 ppm set, with 50 ml electrolyte	740684.



pk\_6\_084

#### CTE 1-CAN

Measured variable: **total chlorine**  
 Analysis: DPD 4  
 pH range: 5.5...9.5  
 Temperature range: 5...45 °C  
 Max. pressure: 3 bar  
 Flow: 30...60 l/h (in DGM or DLGA)  
 Power supply: Via CAN interface (11-30V)  
 Output signal: un-calibrated, temperature compensated, electrically isolated  
 Typical applications: In swimming pool in combination with CLE3.1 for determining  
 combined chlorine.

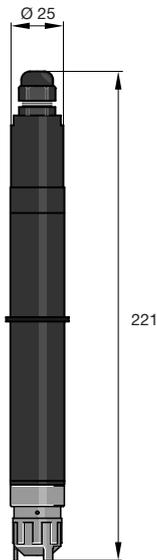
Measurement and control devices: DULCOMARIN® II  
 In-line probe housing: DGM, DLGA

#### Part No.

CTE 1-mA-10 ppm	0.01 ... 10.0 mg/l	1023427.
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## 6.3 DULCOTEST® Sensors for Total Chlorine

### 6.3.6 DULCOTEST® Sensors for total Chlorine



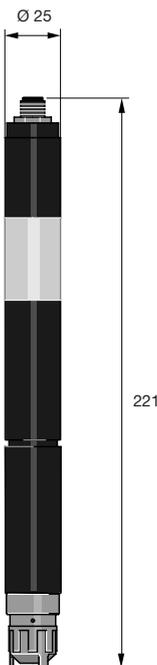
pk\_5\_047\_1

#### Measured variable of organic combined chlorine and free chlorine (total available chlorine)

##### CGE 2-mA

Measured variable:	<b>Organic combined chlorine and free chlorine (e.g. trichloroisocyanuric acid)</b>
Analysis:	DPD 1
Measurement range:	0.02...2.00 mg/l (CGE 2-mA-2 ppm) 0.1...10.0 mg/l (CGE 2-mA-10 ppm)
pH range:	5.5...9.5
Temperature range:	5...45 °C (temperature compensated)
Max. pressure:	3 bar
Flow:	30...60 l/h (in DGM or DLGA)
Power supply:	16...24 V DC (two-wire technology)
Output signal:	4...20 mA <sup>3</sup> measurement range (un-calibrated) <b>Warning: no electrical isolation!</b>
Typical applications:	Swimming pool, potable, industrial, process water, cooling water and water with a high pH value
Measurement and control devices:	D1C, D2C, DULCOMARIN®
In-line probe housing:	DGM, DLGA

	<b>Part No.</b>
CGE 2-mA-2 ppm set, with 50 ml electrolyte	792843.
CGE 2-mA-10 ppm set, with 50 ml electrolyte	792842.



pk\_6\_084

##### CGE 2-CAN

Measured variable:	Organic combined chlorine and free chlorine (e.g. trichloroisocyanuric acid)
Analysis:	DPD 1
pH range:	5.5...9.5
Temperature range:	5...45 °C (temperature compensated)
Max. pressure:	3 bar
Flow:	30...60 l/h (in DGM or DLGA)
Power supply:	Via CAN interface (11-30V)
Output signal:	un-calibrated, temperature compensated, electrically isolated
Typical applications:	Swimming pool water
Measurement and control devices:	DULCOMARIN® II
In-line probe housing:	DGM, DLGA

		<b>Part No.</b>
CGE 2-CAN-10 ppm	0.01 ... 10.0 mg/l	1024420.
with 50 ml electrolyte		

## 6.4 DULCOTEST® Bromine Sensors

### 6.4.1 DULCOTEST® Sensors for Bromine

The following bromating agents are used as disinfectants:

#### organic bromating agent

- DBDMH (1.3-dibrom-5.5-dimethyl-hydantoin) e. g. sold as Albrom 100®
- BCDMH (1-bromine-3-chlorine-5.5-dimethyl-hydantoin) e.g. sold as Brom-Sticks®

These bromating agents are solid and are metered as saturated solutions via brominators.

#### Inorganic free bromine

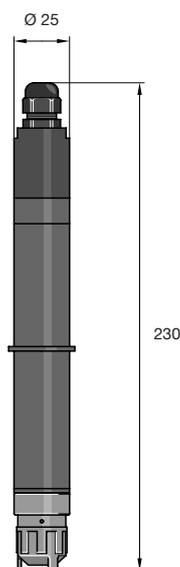
Free bromine is produced via the so-called Acti-Brom process® (Nalco) chlorine bleach + acid +sodium bromide.

For measuring DBDMH or free bromine as a bromating agent in the measurement range: 0.2 -10 ppm bromine the BRE 2-mA-10 ppm sensor is recommended along with DPD1-method calibration.

Alternatively, to measure BCDMH in the same measurement range, the BRE 1-mA-10 ppm sensor is recommended along with DPD4-method calibration.

Typical applications are in swimming pools, Jacuzzis and cooling systems. Particularly in cooling systems the quality of the sample water must be tested and, where applicable, compatibility with other chemicals employed (e.g. corrosion inhibitors). Dissolved copper(>0.1 mg/l) will interfere with the measurement.

Photometric DPD measurement is the recommended method for calibrating the bromine sensor (e.g. with DT 1), calculated and displayed as bromine. If bromine is determined as "chlorine" with DPD, note when selecting the measurement range that you need to lower the result by a factor of 2.25.



#### Bromine measured variable

Measured variable:	Total available bromine (free and organic bound bromine)
Bromine chemicals:	DBDMH (1.3-dibromine 5.5-dimethyl hydantoin) BCDMH (1-bromine-3-chlorine-5.5-dimethyl hydantoin), free bromine
Reference method:	DBDMH, free bromine:DPD1 BCDMH:DPD4
Measurement range:	DBDMH free bromine:0.2...10.0 mg/l with type BRE 2-mA-10 ppm BCDMH:0.2...10.0 mg/l with type BRE 1-mA-10 ppm
pH dependence:	if pH 7 changes to pH 8 the sensor sensitivity is reduced accordingly a)in the case of DBDMH and free bromine by approx. 10 % b)in the case of BCDMH by approx. 25 %
Temperature range:	5...45 °C
Max. pressure:	3 bar
Sample flow:	30...60 l/h (in DGM or DLGA)
Voltage:	16...24 V DC (two-wire technology)
Output signal:	4...20 mA measurement range (not calibrated)

#### Warning: not electrically isolated!

Typical applications: Swimming pools / whirlpools and cooling water; can also be used in seawater

#### Measurement and

control device:	D1C-bromine
In-line probe housing:	DGM, DLGA

#### Part no.

BRE 1-mA-2 ppm with 50 ml electrolyte	1006894.
BRE 1-mA-10 ppm with 50 ml electrolyte	1006895.
BRE 1-mA -0.5 ppm with 50 ml electrolyte	1033390.

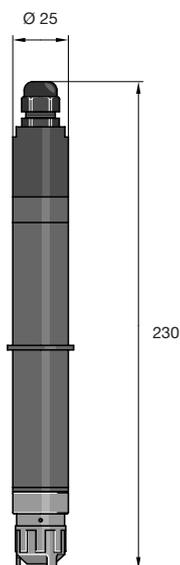
*Measurement range relates to BCDMH*

BRE 2-mA-2 ppm with 50 ml electrolyte	1033391.
BRE 2-mA-10 ppm with 50 ml electrolyte	1020529.

*Measurement range relates to DBDMH, free bromine.*

# 6.4 DULCOTEST® Bromine Sensors

## 6.4.2 DULCOTEST® Sensors for Bromine



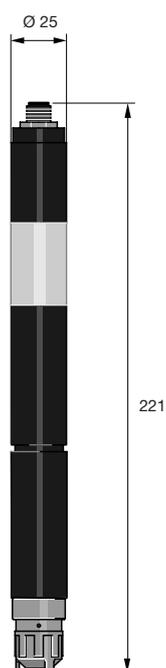
pk\_5\_089

### CBR 1-mA

Measured variable:	Free chlorine (hypochlorous acid HOCl), free bromine, bound bromine
Reference method:	DPD1
pH range:	5.0 ..... 9.5
Temperature	5 ... 45 °C
Max. pressure:	1 bar
Flow:	30 ... 60 l/h (in DGM or DLGA)
Power supply:	16 ... 24 V DC (2-wire)
Supply:	From the DMT measurement transducer (3.3 VDC)
Output signal:	4 ... 20 mA = Measuring range, temperature-compensated, uncalibrated, not electrically isolated
Typical applications:	Cooling water, Process water, Waste water, Water with higher pH values (stable pH)
Measurement and control equipment:	D1C, ProMcon
In-line probe fitting	DGM, DLGA
Measuring principle	amperometric, 2 electrodes, diaphragm-covered

CBR 1-mA-0.5 ppm	0.01 ... 0.5 mg/l	1038016.
CBR 1-mA-2 ppm	0.02 ... 2.0 mg/l	1038015.
CBR 1-mA-10 ppm	0.10 ... 10.0 mg/l	1038014.

*Note: the above measuring range is based on chlorine. The upper and lower limits of the measuring range are increased by a factor of 2.25 when measuring bromine e.g. CBR 1 -mA- 2 ppm 0.0045 ... 4.5 ppm*



pk\_6\_084

### BRE 3-CAN

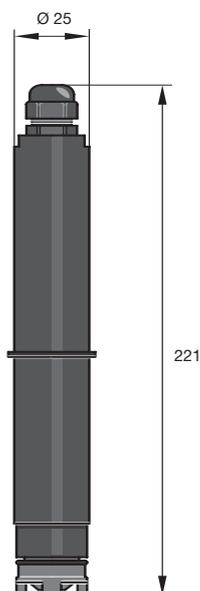
Measured variable:	Total available bromine
Bromine chemicals:	DBDMH (1.3-dibromine 5.5-dimethyl hydantoin) BCDMH (1-bromine-3-chlorine-5.5-dimethyl hydantoin), free bromine
Reference method:	DBDMH, free bromine: DPD1 BCDMH: DPD4
Measurement range:	DBDMH free bromine: 0.2...10.0 mg/l with type BRE 2-mA-10 ppm BCDMH: 0.2...10.0 mg/l with type BRE 1-mA-10 ppm
pH dependence:	if changes from pH 7 to pH 8 the sensor sensitivity is reduced a) in the case of DBDMH and free bromine by approx. 10 % b) in the case of BCDMH by approx. 25 %
Temperature range:	5...45 °C
Max. pressure:	3 bar
Sample flow:	30...60 l/h (in DGM or DLGA)
Voltage:	Via CAN interface (11-30V)
Output signal:	uncalibrated, temperature compensated, electrically isolated
Typical applications:	Swimming pools / whirlpools and cooling water; can also be used in seawater
Measurement and control device:	Dulcomarin® II
In-line probe housing:	DGM, DLGA

BRE 3-CAN-10ppm	0.02 ... 10.0 mg/l	1029660.
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Part no.

# 6.5 DULCOTEST® Chlorine Dioxide Sensors

## 6.5.1 DULCOTEST® Sensors for Chlorine Dioxide



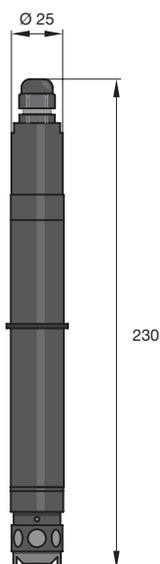
### CDE 2-mA

Measured variable	Chlorine dioxide (ClO <sub>2</sub> )
Reference method	DPD1
pH range	4.0 ... 11
Cross sensibility	Ozone, compared with chlorine <2%
Temperature range	1 ... 45 °C
Max. pressure	1,0 bar
Intake flow	30...60 l/h (in DGMA or DLG III)
Supply voltage	16...24 V DC
Output signal	4...20 mA temperature compensated, uncalibrated, not electrically isolated
Typical applications	uncontaminated potable water (surfactant-free)
Measurement and control equipment	D1C, D2C, DAC
In-line probe housing	DGMa / DLG III
Measuring Principle	amperometric, 2 electrodes, diaphragm-covered

CDE 2-mA-0.5 ppm	0,01...0,5 mg/l	792930.
CDE 2-mA-2 ppm	0,02...2,0 mg/l	792929.
CDE 2-mA-10 ppm	0,10...10,0 mg/l	792928.

pk\_5\_046

with 100 ml of electrolyte



### CDP 1-mA-2 ppm (ClO<sub>2</sub>-process probe)

Applications:	Bottle washing machines and water containing surfactants
Measured variable:	Chlorine dioxide (ClO <sub>2</sub> )
Analysis:	DPD 1
Measurement range:	0.02...2.00 mg/l
pH range:	5.5...10.5
Temperature range:	10...45 °C (short term periods 55 °C) with external temperature correction via Pt 100 (no internal temperature correction!)
Temperature variation speed:	Up to 10 K/min
Max. pressure:	3 bar (no pressure surges)
Flow:	30...60 l/h (in DGM or DGMA)
Supply voltage:	16...24 V DC (two-wire technology)
Output signal:	4...20 mA <sup>3</sup> measurement range (un-calibrated)

**Warning: no electrical isolation!**

Type application: Process water containing surfactants (bottle washing machines)

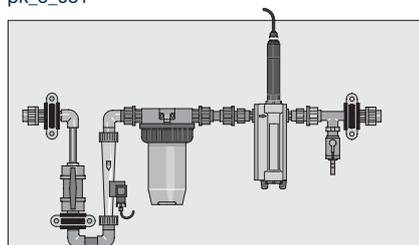
Measuring and control device: D1C with automatic temperature compensation only

In line probe housing: the following is recommended (see fig.)

Probe housing quote on request.

pk\_5\_050

pk\_5\_081



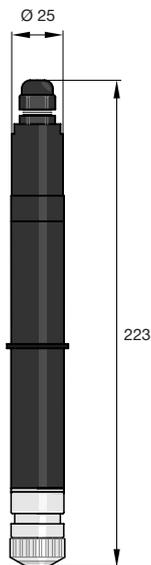
CDP 1-mA-2 ppm set with 100 ml electrolyte

**Part No.**

1002149

# 6.5 DULCOTEST® Chlorine Dioxide Sensors

## 6.5.2 DULCOTEST® Sensors for Chlorine Dioxide

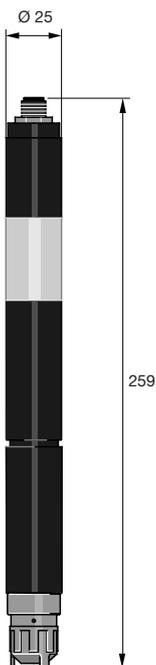


### CDR 1-mA

Measured variable	Chlorine dioxide (ClO <sub>2</sub> )
Reference method	DPD1
pH range	1.0 ... 10
Temperature range	1 ... 55 °C (short-term periods 60 °C)
Max. pressure	310 bar (30 °C in DGMA)
Intake flow	30...60 l/h (in DGMA or DLG III)
Supply voltage	16...24 V DC
Output signal	4...20 mA temperature compensated, uncalibrated, not electrically isolated
Typical applications	contaminated industrial, process water, containing surfactants, Cooling water, irrigation water, slightly contaminated waste water, warm water
Measurement and control equipment	D1C
In-line probe housing	DGMa / DLG III
Measuring Principle	amperometric, 2 electrodes, diaphragm-covered

CDR 1-mA-0.5 ppm	0,01...0,5 mg/l	1033762
CDR 1-mA-2 ppm	0,02...2,0 mg/l	1033393
CDR 1-mA-10 ppm	0,10...10,0 mg/l	1033404

pk\_6\_083



### CDR 1-CAN

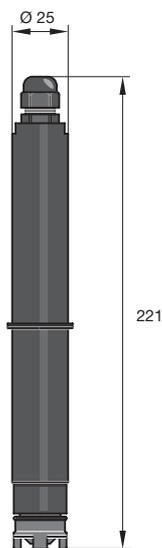
Measured variable	Chlorine dioxide (ClO <sub>2</sub> )
Reference method	DPD1
pH range	1.0 ... 10
Temperature range	5 ... 45 °C
Max. pressure	1.0 bar (30 °C in DGMA)
Response time sensor	t <sub>90</sub> ~ 3 min.
Intake flow	30...60 l/h (in DGMA or DLG III)
Supply voltage	Via CAN interface (11-30V)
Temperature measurement	via integral digital semiconductor device
Output signal	uncalibrated, temperature-compensated, electrically isolated
Typical applications	contaminated industrial, process water, containing surfactants, cooling water, irrigation water, slightly contaminated waste water, warm water
Measurement and control equipment	Dulcomarin® Disinfection Controller
In-line probe housing	DGMa / DLG III
Measuring Principle	amperometric, 2 electrodes, diaphragm-covered

CDR 1-can-10 ppm	0,10...10,0 mg/l	1041145
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pk\_6\_084

## 6.6 DULCOTEST® Ozone Sensor

### 6.6.1 DULCOTEST® Sensors for Ozone



pk\_5\_046

#### OZE 3-mA

Measured variable:	Ozone (O <sub>3</sub> )
Analysis:	DPD 4
Measurement range:	0.02...2.00 mg/l
pH range:	Ozone stability range
Temperature range:	5...40 °C (temperature compensated), no significant Temperature fluctuations
Max. pressure:	1 bar
Flow:	30...60 l/h (in DGM or DLGA)
Power supply:	16...24 VDC (two-wire technology)
Output signal:	4...20 mA <sup>3</sup> measurement range (un-calibrated)
	<b>Warning: no electrical isolation!</b>
Typical applications:	Swimming pools, potable, industrial, process water, surfactant free
Measurement and control devices:	D1C
In-line probe housing:	DGM , DLGA

#### Part No.

OZE 3-mA-2 ppm set, with 100 ml electrolyte

792957.

OZE 3-mA-5 ppm set, with 100 ml electrolyte

\*\*\* 792957-5PPM \*\*\*

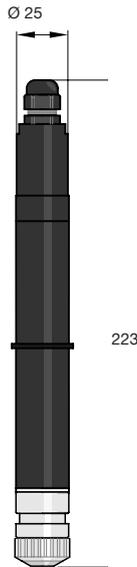
\*\*\* **special** \*\*\* not carried in stock, 6 week delivery

Note: An assembly set (order no. 791818.8 for DGM or 815079.9 for DLG III) is required for initial installation of ozone measuring cells.

# 6.7 DULCOTEST® PAA Sensor

## 6.7.1 DULCOTEST® Sensor for Peracetic Acid

The DULCOTEST® PAA 1 sensor models are membrane-covered amperometric 2-electrode sensors for the selective measurement of peracetic acid. Peracetic acid is used as a disinfectant particularly in the food and beverage industries as well as in the cosmetic, pharmaceutical and medical industries. The continuous measurement and control of the peracetic acid is essential to comply with demanding disinfection requirements and for quality control. Unlike with the sensors in the earlier Perox PES system the PAA 1-mA can be used with the D1Ca controller. Commissioning and maintenance is greatly simplified. The sensors can even be used in the presence of surfactants (tensides).



pk\_6\_083

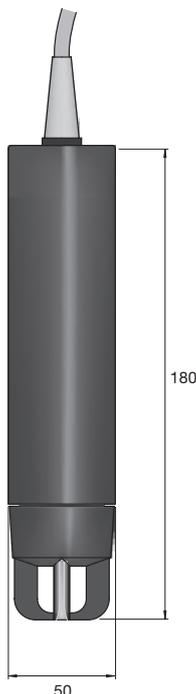
### PAA 1-mA

Measured variable:	peracetic acid
Reference method:	titration
Measurement range	10...200 mg/l (PAA 1-mA-200 ppm) 100...2000 mg/l (PAA 1-mA- 2000 ppm)
pH range:	1...9 (peracetic acid stability range)
Temp. range:	1...45 °C (temperature compensated)
Admissible	
Temperature fluctuation:	0.3 °C/min
Response time T90	3 min. Max.
Pressure.:	3 bar (30 °C, in DGM)
Intake flow:	30- 60 l/h (with DGM or DLGA in-line probe housing)
Power supply	16...24 V DC (two wire)
Output signal:	4...20 mA measurement range (uncalibrated) Important not electrically isolated
Typical application:	scouring in Cleaning in Place (CIP) and rinsing systems, also designed for use in the presence of cationic and anionic tensides. Selective measurement of peracetic acid as well as hydrogen peroxide is possible.
Measurement and control equipment:	D1C
In-line probe housing:	DGM, DLGA

PAA 1-mA-200ppm	1022506.
PAA 1-mA-2000ppm	1022507.

## 6.8 DULCOTEST® Dissolved Oxygen Sensors

### 6.8.1 Dissolved Oxygen Sensors



pk\_6\_050\_1

The measured variable “dissolved oxygen” gives the quantity of the gaseous physical dissolved oxygen in its aqueous phase in mg/l (ppm).

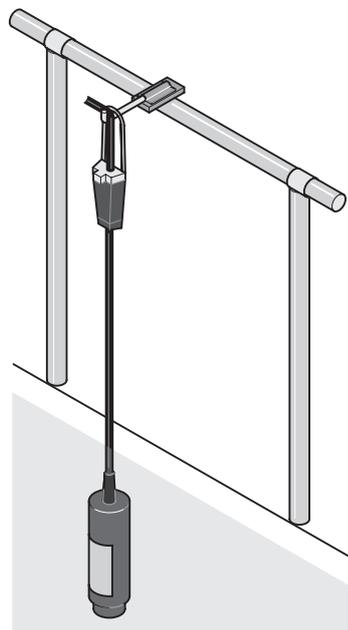
The “dissolved oxygen” is thereby an important parameter for controlling the quality of surface water and water which needs to be oxygenated for use in aqua culture and aqua zoos. The dissolved oxygen is also used to control processes in sewage plants and waterworks.

The following sensors are assigned to the different applications and can be supplied separately as 4-20 mA-transmitters to central controllers or together with the D1C as a stand alone solution (measured variable: “dissolved oxygen”: X. s. chapter 5).

#### DO 1-mA

Measured variable:	dissolved oxygen
Calibration:	of oxygen in air
Measurement range:	2-20 mg/l
Reproducibility of measurement:	± 0.5 % of measurement limit value
Temp. range:	0 -50 °C
Max. pressure:	1 bar
Velocity of sample water:	minimum: 0.05 m/s
Enclosure rating:	IP 68
Power supply:	12...30 V DC
Electrical connection:	fixed lead, 10 m
Output signal:	4-20 mA. Measurement range calibrated, temperature corrected and electrically isolated

Process integration:	<ol style="list-style-type: none"> <li>immersion, suspended on cable with or without mountain bracket for cable.</li> <li>Immersion of immersion pipe           <ol style="list-style-type: none"> <li>Immersion pipe with 50 mm outside diameter and 1-1/4 inch internal thread (provided by the customer). Connection via immersion pipe adapter</li> <li>PVC immersion pipe with 50 mm outside diameter (provided by the customer). Connection via standard PVC adhesive union (provided by the customer).</li> </ol> </li> <li>In-flow operation to order</li> </ol>
----------------------	--



#### Typical applications

Fish and shrimp farming.  
Conditioning of water in large aquaria in zoological systems.  
Control of oxygen input in waterworks  
Appraisal of the biological status of surface waters

#### Part No.

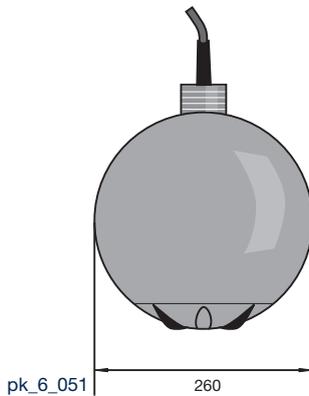
DO 1-mA-20 ppm 1020532

pk\_6\_011

# 6.8 DULCOTEST® Dissolved Oxygen Sensors

## 6.8.2 Dissolved Oxygen Sensors

### DO 2-mA



Measured variable: dissolved oxygen  
 Calibration: of oxygen in air  
 Measurement range: 0.1-10 mg/l  
 Reproducibility of measurement: ± 0.5 % of measurement limit value  
 Temp. Range: 0 -50 °C  
 Max. pressure: 1 bar  
 Velocity of sample water: minimum: 0.05 m/s  
 Enclosure rating: IP 68  
 Supply voltage: 12...30 V DC  
 Electrical connection: fixed lead, 10 m  
 Output signal: 4-20 mA. Measurement range calibrated, temperature corrected and electrically isolated  
 Process integration: as float with venturi grooves to increase the flow of samplewater for the self-cleaning of the sensor part. Supplied with adapter for connection to PVC-pipes with outside diameter 50mm, and railing bracket, also for PVC pipes with outside diameter 50 mm.

**Note:** The customer must provide the straight PVC tube and a 45 ° standard elbow for gluing to PVC pipes (outside diameter 50 mm).

Typical application: Control of the oxygen input in activated sludge pools (sewage plant) for the purpose of energy conservation.

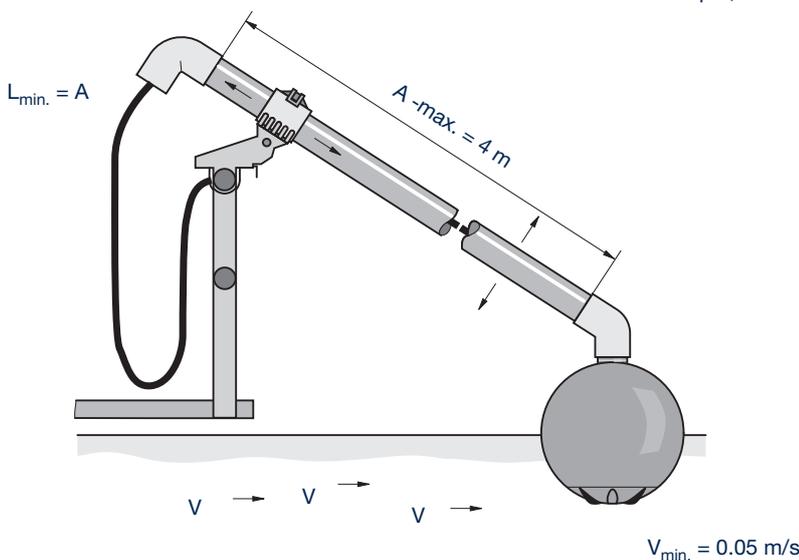
**Part No.**

DO 2-mA-10 ppm 1020533

pk\_6\_012

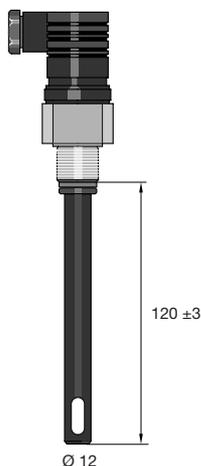
### Spare parts for dissolved oxygen sensors

	Measuring range	
Sensor insert for DO 1-mA-20 ppm	0-20 mg/l	
Membrane thickness 125 µm,	2.00...20.0 mg/l	1020534
Sensor insert for DO 2-mA-10 ppm	0-10 mg/l	
Membrane thickness 50 µm,	0.10...10.0 mg/l	1020535



# 6.9 DULCOTEST® Conductivity Sensors

## 6.9.1 DULCOTEST® Conductivity Sensors



pk\_6\_086

### Description/version

### Part no. Price

The two-electrode measuring cell type LF 1 DE with mounting thread PG 13.5 is used for the conductive measurement of electrolytic conductivity in watery liquids.

The electrical connection is by DIN 4 pin angle plug.

Important: For initial operation put the conductivity cell for 5 - 10 minutes in distilled or deionized water.

For a correct measuring function of the conductivity cell, it must be made sure that no air bubbles are in the gap between the electrodes.

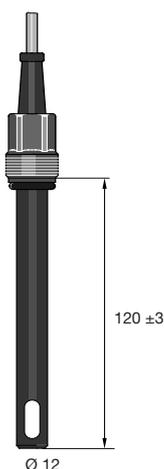
Maintenance: Deposits can be removed by rinsing the electrodes with a soft water jet, by dipping them for 2 - 3 minutes into diluted (1 %) acids or by cleaning them with a soft brush (e.g. tooth brush/bottle brush). Storage: dry

### Technical Data

Cell constant:	k = 1.0 cm <sup>-1</sup> , (+ 5 %)
Measuring range:	0.01 20 mS/cm
Fluid temperature:	0 80°C at atmospheric pressure
Maximum pressure:	16 bar at 25°C
Mounting thread:	PG 13.5
Dimensions:	shaft length 120 mm; Ø12 mm
Storage temperature:	-5 50°C
Sensors:	Special-graphite
Cell shaft:	PPE glasfibre-reinforced epoxy resin
Electrical connection:	DIN 4 pin angle plug.
Degree of protection	IP65

LF1 DE 1001375.

**Suitability:** Compact, DMTa, DICa



pk\_6\_086

The two-electrode measuring cell type LFTK 1 FE with mounting thread PG 13.5 is used for the conductive measurement of electrolytic conductivity in watery liquids.

The electrical connection is by Fixed Cable 5m.

Important: For initial operation put the conductivity cell for 5 - 10 minutes in distilled or deionized water.

For a correct measuring function of the conductivity cell, it must be made sure that no air bubbles are in the gap between the electrodes.

Maintenance: Deposits can be removed by rinsing the electrodes with a soft water jet, by dipping them for 2 - 3 minutes into diluted (1 %) acids or by cleaning them with a soft brush (e.g. tooth brush/bottle brush). Storage: dry

### Technical Data

Cell constant:	k = 1.0 cm <sup>-1</sup> , (+ 5 %)
Measuring range:	approx. 0.01 20 mS/cm
Fluid temperature:	0 ..... 80°C at atmospheric pressure
Maximum pressure:	16 bar at 25°C
Mounting thread:	PG 13.5
Dimensions:	shaft length 120 mm; Ø12 mm
Storage temperature:	-5 50°C
Sensors:	Special graphite
Temperature sensor	PT1000 integrated in the sensor shaft
Cell shaft:	PPE glasfibre-reinforced epoxy resin
Electrical connection:	Fixed Cable 5m, 4 wire measuring line
Degree of protection	IP65

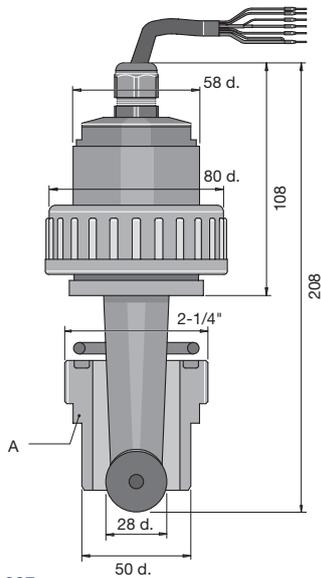
LFTK 1 FE 1046132.

**Suitability:** Compact, DMTa

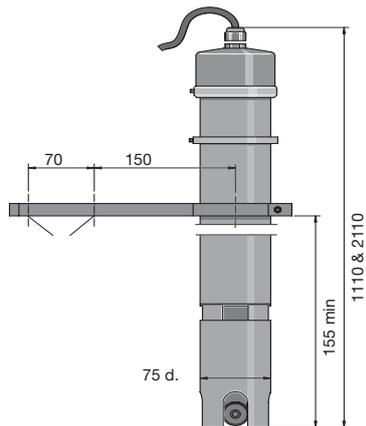
# 6.9 DULCOTEST® Conductivity Sensors

## 6.8.2

### Inductive Conductivity Sensors



pk\_6\_087



pk\_6\_088

#### INDUCTIVE CONDUCTIVE SENSORS

Electrode-free inductive conductivity sensors are used to measure the electrolytic conductivity over a wide measurement range in heavily soiled and/or aggressive media and offer a particularly low maintenance operating method. The sensors are particularly suitable for the measurement of high conductivity levels since there is no electrode polarisation.

#### ICT 1 and ICT 1-IMA-1m/ICT 1-IMA-2m

Economical inductive conductivity sensors for all soiled water types and for high conductivity levels up to a temperature of 70 °C. The ICT 1 sensor is designed for in-flow measurement and is installed in DN40 pipes (option PVC or PP). The ICT 1-IMA-1 m and ICT 1-IMA-2 m immersion sensors comprise the ICT 1-IM sensor and the ready-fitted IMA-ICT1 immersion pipe, length 1 m or 2 m.

Measurement range:	0.2-1000 mS/cm
Cell constant:	8.5 cm-1
Temperature compensation:	Pt 100
Medium temperature:	0 °C ... 70 °C
Max. pressure:	8 bar/40 °C, 1 bar/70 °C
Material: Sensor:	PP, Seals: Viton®
Assembly:	ICT 1:

*with union nuts, 2-1/4 imperial internal thread, DN40, PVC incl. DN40 Adhesive joints with 2-1/4 imperial external thread for installation in DN40 standard PVC pipes included in scope of supply.*

ICT 1-IMA-1m sensor:	supplied with immersion pipe, 1 m
ICT 1-IMA-2m sensor:	supplied with immersion pipe, 2 m

The assembly accessories for the IPHa 3-PP in-line probe housing (see 6.5.3) can be used for both immersion sensors.

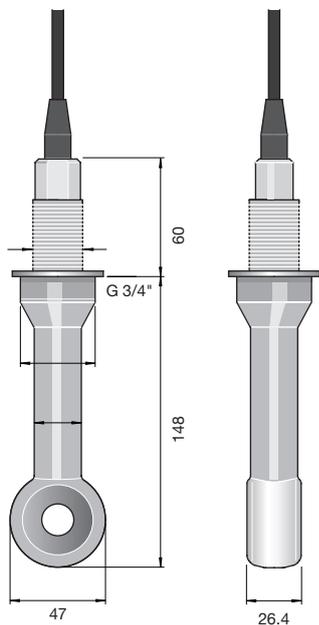
Power supply:	all versions, 7 m fixed cable
Enclosure rating:	IP65
Measurement and control equipment:	D1C for inductive conductivity

Typical application: All types of soiled water, desalination control in cooling towers control of electroplating baths, Cleaning in Place (CIP), product monitoring

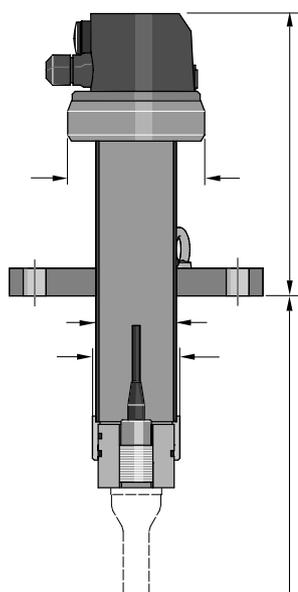
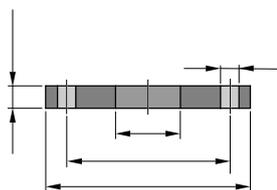
ICT 1 for installation in pipes	1023244.
ICT 1-IMA-1 m ready fitted in in-line probe housing 1 m	1023349.
ICT 1-IMA-2 m ready fitted in in-line probe housing 2 m	1023351.
ICT 1-IM spare sensor for ICT 1-IMA-1 m and ICT-IMA-2 m	1023245.

# 6.9 DULCOTEST® Conductivity Sensors

## 6.9.2 Inductive Conductivity Sensors



pk\_6\_082



pk\_6\_094

**Description/version**

**Part no.**

**Price**

**ICT 2**

High performance sensors for aggressive media, maximum conductivity and high temperatures up to 125 °C. Available for installation in tanks, pipes or the IMA-ICT 2 in-line probe housing.

Measurement range:	0-2000 mS/cm
Cell constant:	2 cm-1
Reproducibility of measurement:	±(5 µS/cm + 0.5 % of the measured value)
Temperature compensation:	Pt 100, class A, completely extrusion-coated
Medium temperature:	0 °C...125 °C
	<i>Note: for use together with D1C, temperature compensation is limited to 100 °C</i>
Max. pressure:	16 bar
Material: sensor:	PFA, completely extrusion-coated
Assembly:	
installation in pipes, tanks (on the side):	G 3/4 stainless steel thread(1.4571) with PTFE O-ring and locknut (scope of supply)
or flange mounted:	With accessories: Stainless steel flange ANSI 2 imperial 300lbs, SS 316L (can be adapted to DIN counter-flange DN 50 PN 16)

Installation in immersion pipe for tank from above:

With accessories: IMA-ICT 2 in-line probe housing via stainless steel flange DN 80 PN (see section 6.5.3)

Length when fitted: 1 m, diameter when fitted 70 mm  
 Power supply: 5 m fixed cable

Measurement and control equipment: D1C  
 Enclosure rating: IP67

Typical applications: Production processes in the chemical industry, Phase separation of product mixtures, Determining concentrations of aggressive chemicals

ICT 2 **1023352.**

**Immersion assembly Type IMA-ICT 2**

To hold an inductive conductivity sensor, type ICT 2.

Material fittings:	Stainless steel 1.4404
Material seal:	Viton®
Max. temperature:	125 °C
Max. pressure:	10 bar
Length:	1 m
Pipe diameter:	70

Flange mounting for installation in tank from above, stainless steel flange DN 80 PN 16

IMA-ICT 2 **1023353.**

Flange:	DN 80/PN 16
Ø D	200
Ø K	160
Ø d <sub>2</sub>	8 x 18
b	20
Ø a	63.5
Screws	M 16

**Note: See 'Green Pages' for local probe & controllers**

## 6.10 DULCOTEST® Accessories

### 6.10.1 DULCOTEST® Electrolyte & Membrane Caps

#### Electrolyte for Sensors

Electrolyte for all CLE type chlorine sensors	100	506270
Electrolyte for CDM 1 and CDE 3 type chlorine dioxide sensors	100	506271
Electrolyte for CDE 2 and CDR 1 type chlorine dioxide sensors	100	506272
Electrolyte for OZE type ozone sensors	100	506273
Electrolyte for CGE/CTE/BRE type sensors	50	792892
Electrolyte for CDP type chlorine dioxide sensors	100	1002712
Electrolyte for PAA 1 type peracetic acid sensors	100	1023896
Electrolyte for CLT 1 type chlorite sensors	50	1022015
Electrolyte for PER 1 type hydrogen peroxide sensors	50	1025774
Electrolyte for CLO 1 type chlorine sensor	100	1035191
Electrolyte for CLO 2 type chlorine sensor	100	1035480
Electrolyte for CBR 1 type chlorine/bromine sensor	100	1038017

#### Membrane Caps for Sensors

	Membrane cap for types CLE II T, CDM 1 and OZE 1	–	790486
<i>Cap has a red dot</i> ●	Membrane cap for types: CLE 2.2, CLE 3, CDE 1.2, CDE 2, OZE 2 & OZE 3	–	790488
	Sensor cap for CLO 1	–	1035197
	Sensor cap for CLO 2	–	1035198
<i>Cap is orange</i> ●	Membrane cap for CGE/CTE 1 (2/5/10 ppm) and BRE 1 (10 ppm), BRE 2	–	792862
<i>Cap is blue</i> ●	Membrane cap for CTE 1 (0.5 ppm), CBR 1	–	741274
	Membrane cap for CDP 1, BRE 1 (0.5 / 2 ppm), CLT	–	1002710
	Membrane cap for CDE 3	–	1026578
	Membrane cap for PAA 1, CDR 1	–	1023895
	Membrane cap for PER 1	–	1025776
	Membrane cap for H2.10 P	–	792978

#### Accessory Sets for Sensors

Accessory set for CGE 2/CTE 1 (2/5/10 ppm) and BRE 1 (10 ppm), BRE 2 (2 membrane caps + electrolyte)	50	740048
Accessory set for CTE 1 (0.5 ppm) (2 membrane caps + electrolyte)	50	741277
Accessory set for CLE (2 membrane caps + electrolyte)	100	1024611
Accessory set for CDP 1 (2 membrane caps + electrolyte), BRE 1 (0.5 / 2 ppm), CLT	100	1002744
Accessory set for PAA 1 (2 membrane caps + electrolyte)	100	1024022
Accessory set for PER 1 (2 membrane caps + electrolyte)	50	1025881
Accessory set for CDE 3 (2 membrane caps + electrolyte)	100	1026361
Accessory set for CLO 1 (electrolyte, grinding disc, plug)	100	1035482
Accessory set for CLO 2 (electrolyte, grinding disc, plug)	100	1035483
Accessory set for CBR 1 (2 membrane caps + electrolyte)	100	1038984
Accessory set CLE (4 membrane caps 790488 + 100 ml electrolyte)		PA24002764

## Technical Data DGM

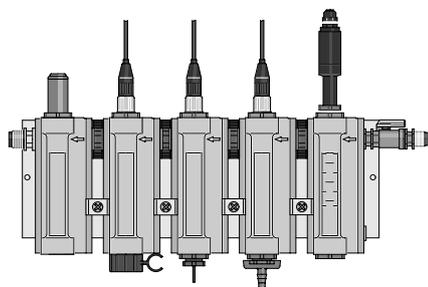
### DGM modular in-line probe housing

For conductivity, Pt 100, pH or redox probes with 13.5 PG internal thread or chlorine, bromine, chlorine dioxide, ozone measuring cells with R 10 internal thread.

- Simple to assemble (already mounted on panel up to max. 5 units)
- Expansion options
- Water flow monitor module
- Simple to calibrate measured variables due to low sample water volume

Input-side ball valve for stopping and adjusting flow

Every fully mounted DGM set is fitted with a simple sampling tap



pk\_5\_080\_1

Material:	Transparent PVC (all modules) Viton® (seals) PP (calibration cup) PVC white (mounting panel)
Max. temperature:	60 °C
Max. pressure:	6 bar (30 °C) 1 bar (60 °C) 2 bar ( <b>note: with flow monitor ... typical</b> )
Flow volume:	Up to 80 l/h (40 l/h recommended)
Flow sensor:	Reed contact max. switch power 3 W max. switch voltage 175 V max. switch current 0.25 A max. operating current 1.2 A max. contact resistance 150 mΩ
Switch hysteresis:	approx. 20 %
Enclosure rating:	IP 65
Applications:	Potable, swimming pool water or water of similar quality with no suspended solids
Assembly:	Max. 5 modules pre-assembled onto baseboard: more than 5 modules, pre-assembled onto baseboard as custom version, priced accordingly.

# 6.11 DULCOTEST® Accessories Modular In-Line Probe Housing DGM



## Identity Code Ordering System For In-Line Probe Housing Modules

DGM

Flow Housing Module

A Series Version

<b>Flow monitor module:</b>	
0	No flow monitor
1	With l/h scale
2	With gph scale (US) ***** Not Stocked *****
3	With flow monitor, l/h scale
4	With flow monitor, gph scale (US) ***** Not Stocked *****

<b>Number of PG 13.5 modules:</b>	
0	No PG 13.5 modules
1	One PG 13.5 module
2	Two PG 13.5 modules
3	Three PG 13.5 modules
4	Four PG 13.5 modules

<b>Number of 25 mm modules:</b>	
0	No 25 mm modules
1	One 25 mm module*
2	Two 25 mm modules*

<b>Main material:</b>	
T	Transparent PVC

<b>Seal material:</b>	
0	Viton® A

<b>Connections:</b>	
0	8 x 5 hose
1	PVC DN 10 threaded connector
9	Connector nipple/expansion module

<b>Versions:</b>	
0	With ProMinent® logo
1	Without ProMinent® logo

**Accessories included:**

Wall mounting;  
for Pg 13.5 module; calibration cup; Pg 13.5 probe assembly set.

The identity code opposite describes a fully assembled combination of flow monitor with sensor, two Pg 13.5 modules (e.g. for pH and redox probes) and a 25 mm module (e.g. for chlorine probe CLE 3). Fitted with 8 x 5 hose connector.

<b>Recommended accessories:</b>	<b>Part No.</b>
for potential equaliser plug	791663.
flow sensor	791635.
additional calibration cup	791229.

*Maric Flow Control Valve Assembly, 33 l/h*

DGM

A

3

2

1

T

0

0

0

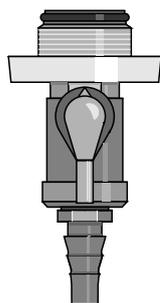
PA27002656 (connects to module) see GREEN PAGE Pricelist  
Note: if using Maric flow control it is STRONGLY recommended that a filter be used, refer section 4 GREEN PAGE PriceList

Flow Control Unit c/w float & sensor switch	1042687.	DGMA300T000
Flow Control plus pH Cell Unit		DGMA310T000
Flow Control plus pH Cell Unit & rH Unit		DGMA320T000
Flow Control plus Chlorine Cell includes Fitting Kit		DGMA301T000
Flow Control plus pH plus Chlorine Cell includes Fitting Kit		DGMA311T000
Flow Control plus pH plus rH Cell plus Chlorine Cell includes Fitting Kit		DGMA321T000

**Note: ALL complete DGMA assemblies are supplied with a simple sampling tap.**

# 6.12 DULCOTEST® Accessories

## 6.12.1 Accessories

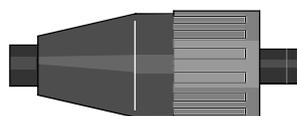


pk\_5\_085

### Accessory: Sampling tap for DGMa

for PG 13.5 and 25 mm modules designed as a convenient ball valve.

PG 13.5 sampling tap	<b>Part No.</b> 1004737.
25 mm sampling tap	1004739.



pk\_5\_071

### CABLES & CONNECTORS

SN6 coax connector for 5 mm dia. coax cable	<b>304974.</b>
SN6 coax connector for 3 mm dia coax cable	<b>304975.</b>



pk\_5\_070

### CABLE & GLANDS

Coax Cable, per meter	
Military Grade, 50 ohm, type AM-900, Low Noise	A04001118
Grey HC2049 Cable, (2 core pulse)	A04001289
Grey cable entry gland 1/4" BSPM	703830.
Black cable entry gland 3/8" BSPM	703885.

### ProMinent® DULCOTEST COMPLETE SIGNAL CABLES

2 x SN6 Coax 0.8 m - SS	305077.
2 x SN6 Coax 2.0 m - SS	304955.
2 x SN6 Coax 5.0 m - SS	304956.
2 x SN6 Coax 10.0 m - SS	304957.



pk\_5\_071

### Below cables for typical use with pH / ORP probes

in submersible holders such as DGMa & PA2032260 (Green Pages)

SN6 - open end Coax 2.0m - S	305030.
SN6 - open end Coax 5.0m - S	305039.
SN6 - open end Coax 10.0m - S	305040.
SN6 - open end Coax 20.0m - S <i>non-stock item</i>	304952.

**The signal lead is required for connection of DMT type measuring cells to the DMT transducer.**



pk\_1\_085

Universal cable, 5-pole round plug, 5-wire, 2 m	1001300.
Universal cable, 5-pole round plug, 5-wire, 5 m	1001301.
Universal cable, 5-pole round plug, 5-wire, 10 m	1001302.