

## 2.3 ProMinent® Sigma/ 3 Diaphragm Metering Pumps

### 2.3.1 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.

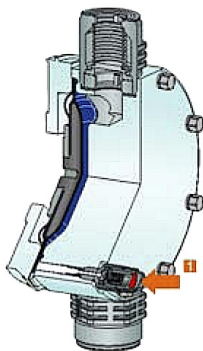
Moreover it enables an optimum metering result thanks to the metering behaviour of the metering pump being matched to the chemicals or application. The task of the control is to measure the movement and speed profile in conjunction with the power demand. This leads to a real reduction in the actually 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

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 S3BaH	at 50 Hz				S3CbH at 60 Hz			Suction Lift	Adm. Priming Pressure Suction Side	Connector Suction/ Discharge Side	Shipping Weight		
	bar	l/h	ml/ stroke	strokes/ min.	bar S3CbH	l/h	strokes/min.						
120145 PVT	10	146	33.7	72	10	182	90	5	2	25	1" / 25mm	22	●
120145 SST	12	146	33.7	72	12	182	90	5	2	25	1" / 25mm	26	●
120190 PVT	10	208	33.7	103	10	243	120	5	2	25	1" / 25mm	22	●
120190 SST	12	208	33.7	103	12	243	120	5	2	25	1" / 25mm	26	●
120270 PVT	10	292	33.8	144	10	365	180	5	2	25	1" / 25mm	22	●
120270 SST	12	292	33.8	144	12	365	180	5	2	25	1" / 25mm	26	●
120330 PVT	10	365	33.8	180	10	-	-	5	2	25	1" / 25mm	22	●
120330 SST	12	365	33.8	180	12	-	-	5	2	25	1" / 25mm	26	●
070410 PVT	7	410	95.1	72	7	500	90	4	1	32	1 1/2" / 32mm	24	●
070410 SST	7	410	95.1	72	7	500	90	4	1	32	1 1/2" / 32mm	29	●
070580 PVT	7	580	95.1	103	7	670	120	4	1	32	1 1/2" / 32mm	24	●
070580 SST	7	580	95.1	103	7	670	120	4	1	32	1 1/2" / 32mm	29	●
040830 PVT	4	830	95.1	144	4	1040	180	3	1	32	1 1/2" / 32mm	24	●
040830 SST	4	830	95.1	144	4	1040	180	3	1	32	1 1/2" / 32mm	29	●
041030 PVT	4	1030	95.1	180	4	-	-	3	1	32	1 1/2" / 32mm	24	●
041030 SST	4	1030	95.1	180	4	-	-	3	1	32	1 1/2" / 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

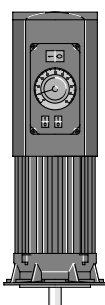
Liquid End	Suction/Discharge connector	Valve	Seals	Balls	Integrated Pressure Bleed Valve
PVT	PVDF (polyvinylidene fluoride)	PVDF (polyvinylidene fluoride)	PTFE	glass	PVDF/Viton® or EPDM
SST	stainless steel no. 1.4581	stainless steel no. 1.4581	PTFE	stainless steel no. 1.4404	stainless steel/Viton®

Note: Large PVDF Liquid Ends have Hastalloy C valve discs and Hastalloy C springs which are coated with CTFE (similar to PTFE).

Viton® is a registered trademark of DuPont Dow Elastomers.

### Motor Data S3Ba

Identity code specifications	Power supply	Δ/Y	Remarks
S	3-phase, IP 55	220 - 240 V/380 - 420 V 220 - 280 V/440 - 480 V	50 Hz 0.37 kW 60 Hz 0.37 kW
T	3-phase, IP 55	220 - 240 V/380 - 420 V 220 - 280 V/440 - 480 V	50 Hz 0.37 kW with PTC, speed control range 1:5 60 Hz
R	3-phase, IP 55	220 - 240 V/380 - 420 V	50 Hz 0.55 kW with PTC, speed adjustment range 1:20 with external fan (1-phase 230 V; 50/60Hz, 134W)
M	1-phase AC, IP 55	230 V ± 5 %	50 Hz/ 60 Hz 0.55 kW
L1	3-phase, II2GEEExIIIT3	220 - 240 V/380 - 420 V	50 Hz 0.37 kW
L2	3-phase, II2GEEExIIICT4	220 - 240 V/380 - 420 V	50 Hz 0.37 kW with PTC, speed control range 1:5
P1	3-phase, II2GEEExIIIT3	250 - 280 V/440 - 480 V	60 Hz 0.37 kW
P2	3-phase, II2GEEExIIICT4	250 - 280 V/440 - 480 V	60 Hz 0.37 kW with PTC, speed control range 1:5
V2	3-phase, II2GEEExIIICT4	400 V ± 10 %	50 Hz/ 60 Hz 0.55 kW Ex-variable speed motor with integrated frequency converter. Mains feed: 3-phase + neutral + earth, adjustment range 1:10



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.

## 2.3 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

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

120145	12 bar; 182 l/h	PVDF
120190	12 bar; 243 l/h	SS
120270	12 bar; 365 l/h	
070410	7 bar; 500 l/h	PVDF
070580	7 bar; 670 l/h	SS
040830	4 bar; 1040 l/h	

**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:**

		PVDF	SS
0	No valve springs	0	
1	With 2 valve springs, Hastelloy C 4: 0.1 bar <i>No Charge DN32</i>	●	
4	With relief valve, Viton® seal, no valve springs	●	
5	With relief valve, Viton® seal and valve springs <i>STD for DN32</i>	●	

**Hydraulic connector:**

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

**Version:**

0	With ProMinent® logo (standard)
F	Physiologically harmless (FDA)
M	Modified

**Electrical Power supply:**

U	1 ph 100 - 230V ±10% 50 Hz	0
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**Cable and plug:**

C	2 m Australian	0
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**Relays:**

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

**Control Variant:**

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

**Overload switch-off**

0	Without overload switch-off
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**Operating Unit (HMI):**

0	Operating unit with Click Wheel <b>0.5 m cable</b>
4	Operating unit with Click Wheel <b>2 m cable</b>
5	Operating unit with Click Wheel <b>5 m cable</b>
6	Operating unit with Click Wheel <b>10 m cable</b>
X	with out operating unit (HMI)

**Dosing Monitor:**

0	Without access code
1	With access code

**Language:**

EN	English
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**Prepack Option**

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

**Note:** DN32 Valves only use soft gaskets, due to smooth insert faces. PVT exceptions.

**Note:** If PROFIBUS® is specified refer to page 3.19 to determine which PROFIBUS® cables, adaptors and terminators are required. Also if PROFIBUS® option is selected NO relays can be fitted.

**Prepack option P\* for PVDF**

**P0 - 120145 - 120190 - 120270**

4 EPDM flat gaskets & CANBUS cable if required. Refer page 2.36 for fitting sizes

**070410 - 070580 - 040830**

4 EPDM flat gaskets & CANBUS cable if required. Refer page 2.36 for fitting sizes

- 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 Diaphragm Metering Pumps

### 2.3.5 Spare Parts Kits Sigma/ 3

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

#### PVT version

- 1 x pump diaphragm
- 1 x suction valve
- 1 x discharge valve

#### SST version

- 1 x pump diaphragm
- 2 x valve balls or valve discs with spring for DN32
- 1 x 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
	PVT - FDA	1046478
	SST	1034679
	SST - FDA	1046479
	SST (with 2 valve set)	1034680
Type 070410, 070580, 040830, 041030		Part No.
<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		Part No.
<b>Liquid end FM 1000 - DN 32</b>	PVT	1020032
	SST	1005311
	SST (with 2 valve set)	1005313

<b>Pump Diaphragms (old version)</b>	Part No.
FM 330 Type 120145, 120190, 120270, 120330	1004604
FM 1000 Type 070410, 070580, 040830, 041030	1002835
<b>Multilayer Safety Diaphragm</b>	Part No.
FM 330 Type 120145, 120190, 120270, 120330	1029604
FM 1000 Type 070410, 070580, 040830, 041030	1029603
<b>Suction - Discharge Valves PVT</b>	Part No.
Sigma/3 120145, 120190, 120270, 120330 DN25	740615
Sigma/ 3 070410, 070580, 040830, 041030 DN32	1020031
<b>PTFE Moulding Gasket</b>	Part No.
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
	Part No.
Visual Diaphragm Failure Indicator	1033323
Retrofit rupture signalling switch & cable	1034312