

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.

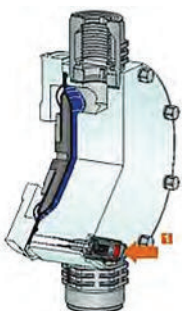
Moreover, the analysis of the power demand makes possible an internal overload switching off of the metering pump, i.e. an integral pressure relief function for pump protection without an additional hydraulic assembly such as relief valves and manometer.

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 S2BaH	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 Suction Side bar 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

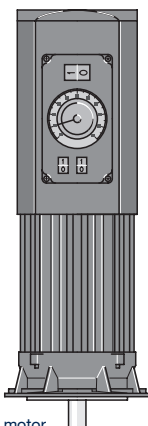
Liquid End	Suction/Discharge connector	Valve	Seals	Balls	Integrated Pressure Bleed Valve
PVT	PVDF (Polyvinylidene fluoride)	PVDF (Polyvinylidene fluoride)	PTFE	ceramic	PVDF/Viton® or EPDM
SST	stainless steel no. 1.4571/1.4404	stainless steel no. 1.4581	PTFE	stainless steel no. 1.4404	stainless steel/Viton®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

Viton® is a registered trademark of DuPont Dow Elastomers.

Motor Data

3 ph IP55	230V/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	230V/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)										Prices \$		
	HM	Main drive, diaphragm											
		Pump type: (Figures 1 + 2 = back pressure [bar], figures 3 - 5 = feed rate [l/h]): 16050* 16 bar; 50 l/h 16090* 16 bar; 90 l/h 16130* 16 bar; 130 l/h 07120 7 bar; 120 l/h 07220 7 bar; 220 l/h 04350 4 bar; 350 l/h										PVDF SS	
		*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 1 With 2 valve springs, Hastelloy C 4: 0.1 bar 4 With relief valve, Viton® seal, no valve spring 5 With relief valve, Viton® seal and 2 valve springs H Hygienic head with tri-clamp connection (maximum 10 bar), contact Sydney						PVDF	SS		
				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) F Physiologically harmless (FDA) M Modified									
					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, (EExe, EExde) see below P 3 ph, 400 V, 60Hz, (EExe, EExde) 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)

S2Cb	Sigma Control Type (S2Cb)	Prices \$
	H Main power end, diaphragm	
	Pump type: (Figures 1 + 2 = back pressure [bar], figures 3 - 5 = feed rate [l/h]):	
	16050* 16 bar; 56 l/h Notice: PVDF	
	16090* 16 bar; 99 l/h S2Cb pump types: 60 Hz performance data applies SS	
	16130* 16 bar; 125 l/h (as 60 Hz operation) but max. 200 strokes/min.	
	07120 7 bar; 148 l/h PVDF	
	07220 7 bar; 271 l/h SS	
	04350 4 bar; 352 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; pump stops	
	Liquid end version: PVDF SS	
	0 No valve springs	
	1 With 2 valve springs, Hastelloy C 4: 0.1 bar	
	4 With relief valve, Viton® seal, no valve springs	
	5 With relief valve, Viton® seal and 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 & stainless steel insert inc. w/SS pump	
	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	
	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 - exPDT only	
	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	

Relays Type	Cable
1 - 1029311	c/w cable
3 - 1029310	1002011
8 - 1031273	1002011

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

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 - 16050 - 16090 - 16130
 20mm PVC solvent weld male and 4 EPDM flat gaskets & CANbus cable if required.
07120 - 07220 - 04350
 25mm PVC solvent weld male and 4 EPDM flat gaskets & CANBUS 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		Part No
Liquid end FM 130 - DN 15	PVT	1035951
	PVT - FDA	1046472
	SST	1035957
	SST - FDA	1046473
	SST (with 2 valve sets)	1035954

Type 07120, 07220, 04350		
Liquid end FM 350 - DN 25	PVT	1035953
	PVT - FDA	1046475
	SST	1035590
	SST - FDA	1046472
	SST (with 2 valve sets)	1035959

Spare Parts Kits for versions with old standard/double diaphragm

Type 16050, 16090, 16130		Part No
Liquid end FM 130 - DN 15	PVT	740324
	SST	740326
	SST (with 2 valve sets)	740328

Type 07120, 07220, 04350		
Liquid end FM 350 - DN 25	PVT	740325
	SST	740327
	SST (with 2 valve sets)	740329

Diaphragms (old type)

FM 130 (Type 12050, 12090, 12130)	792495
FM 350 (Type 07120, 07220, 04350)	792496

Multilayer Safety Diaphragms

FM 130 (Type 16050, 16090, 16130)	1029771
FM 350 (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