

2.1 ProMinent® Sigma/ 1 Diaphragm Metering Pumps

2.1.1

ProMinent® Sigma/ 1 Diaphragm Metering Pumps



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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.

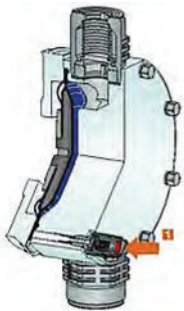
Moreover, the analysis of the power demand makes possible an internal overload switching off of the metering pump, i.e. an integral pressure relief function for pump protection without an additional hydraulic assembly such as relief valves and manometer.

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.

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



Si1Ba with Stroke length controller

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2.1.2 Technical Data for Sigma Pumps

Pump type S1Ba	at 50 Hz				at 60 Hz				Adm. Priming Pressure Suction Side bar DN	Connector Suction/ Discharge Side Optional BSPM / Hosetail	Shipping Weight kg	
	bar	l/h	ml/ stroke	strokes/ min.	bar S1Cb	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®

Motor Data for S1B

Identity code	Power supply	Δ / Y			Remarks
S	3 ph, IP 55	220-240 V/380-420 V	50 Hz	0.09 kW	
		265-280 V/440-480 V	60 Hz	0.09 kW	
T	3 ph, IP 55	220-240 V/380-420 V	50 Hz	0.09 kW	with PTC, speed adjustment range 1:5
		265-280 V/440-480 V	60 Hz	0.09 kW	
R	3 ph, IP 55	220-240 V/380-420 V	50 Hz	0.09 kW	with PTC, speed adjustment range 1:20 w/external fan 1ph 230V; 50/60Hz
V0	1 ph, IP 55	230 V ±10 %	50/60 Hz	0.18 kW	Variable speed motor with integrated frequency converter control range 1:20
M	1 ph AC, IP 55	230 V ±5%	50/60 Hz	0.12 kW	
N	1 ph AC, IP 55	115 V ±5 %	60 Hz	0.12 kW	
L1	3 ph, II2GEEexIIIT3	220-240 V/380-420 V	50 Hz	0.12 kW	
L2	3 ph, II2GEEexIIICT4	220-240 V/380-420 V	50 Hz	0.18 kW	With PTC, speed adjustment range 1:5
P1	3 ph, II2GEEexIIIT3	250-280 V/440-480 V	60 Hz	0.12 kW	
P2	3 ph, II2GEEexIIICT4	250-280 V/440-480 V	60 Hz	0.18 kW	With PTC, speed adjustment range 1:5

Motor data sheets can be requested for more information. Special motors or special motor flanges are available on request.

Motors less than 0.75 kW and motors designed for speed-controllable operation are not subject to the IEC2 standard in compliance with the Ecodesign Directive 2005/32/EC.

Information for use in areas at risk from explosion: Only use pumps with the appropriate labelling in line with the ATEX Directive 94/9/EC in premises at risk from explosion. Ensure that the explosion group, category and degree of protection specified on the label corresponds to or is better than the conditions prevalent in the intended field of application

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

S1BaH	Sigma Basic Type (S1Ba)	Prices	\$								
12017*	Pump type: (Figures 1 + 2 = back pressure [bar], figures 3 - 5 = feed rate [l/h]): 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										
	Liquid end material with PTFE Seal: PVT PVDF (max 10 bar) SST Stainless steel - select this option if using Hygenic Head option										
	Diaphragm: S Multi-layer safety diaphragm with optical rupture display A Multi-layer safety diaphragm with electrical rupture signal H Diaphragm for Hygenic Head										
	Liquid end version: 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										
	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 5 Liquid End Left ... <i>Note: only available ex Germany</i>										
	Power supply: 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, (EEExe, EEExde) see below P 3 ph, 400 V, 60Hz, (EEExe, EEExde) 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)										
	Enclosure rating: 0 IP 55 (standard) 0 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 for EX area)										
	Stroke length adjustment: 0 Manual 1 Stroke positioning motor, 230V/50/Hz 4 Stroke control motor, 4-20 mA 230 V/50Hz										
	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 - 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	P0

2.1 ProMinent® Sigma/ 1 Diaphragm Metering Pumps

2.1.4 Identity Code Ordering System for Sigma (S1Cb)

S1CbH	Sigma Control Type (S1Cb)	Prices	\$
Pump type (Figures 1 + 2 = back pressure [bar], figures 3 - 5 = feed rate [l/h]):			
12017*	12 bar; 20 l/h	PVDF	
12035*	12 bar; 42 l/h	SS	
10050	10 bar; 49 l/h		
10022	10 bar; 26 l/h	PVDF	
10044	10 bar; 53 l/h	SS	
07065	7 bar; 63 l/h		
07042	7 bar; 50 l/h	PVDF	
04084	4 bar; 101 l/h	SS	
04120	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			
Liquid end material with PTFE Seal			
PVT	PVDF (max 10 bar)		
SST	Stainless steel		
Diaphragm			
S	Multi-layer safety diaphragm with optical rupture display		
A	Multi-layer safety diaphragm with electrical rupture signal "Pump stops"		
Liquid end version			
0	No bleed valve and springs	PVDF	SS
1	No bleed valve, 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 valve spring		
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		
5	Liquid end left ... <i>Note: only available ex Germany</i>		
Electrical Power supply			
U	1 ph, 100 - 240V; 50 Hz		
Power Cable and Plug			
C	2m Australia		
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 + 0.5m cable		
1	HMI + 2.0m cable		
2	HMI + 5.0m 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 - 12017 - 12035 - 10050 - 10022 - 10044 - 07065
 15mm PVC solvent weld male and 4 EPDM flat gaskets & CANBUS cable if required.
07042 - 04084 - 04120
 20mm 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.

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).

SST version

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

Spare Parts Kits for versions with new multilayer safety diaphragm

Type 12017, 120035, 10050		Part No.
Liquid end FM 50 - DN 10	PVT	1035964
	PVT - FDA	1046466
	SST	1035966
	SST - FDA	1046468
	SST (with 2 valve sets)	1035965

Type 10022, 10044, 07065		Part No.
Liquid end FM 65 - DN 10	PVT	1035967
	PVT - FDA	1046469
	SST	1035969
	SST - FDA	1046471
	SST (with 2 valve sets)	1035968

Type 07042, 04084, 04120		Part No.
Liquid end FM 120 - DN 15	PVT	1035961
	PVT - FDA	1046453
	SST	1035963
	SST - FDA	1046465
	SST (with 2 valve sets)	1035962

Spare Parts Kits for versions with old standard diaphragm

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

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

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

Multilayer Safety Diaphragms - current

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

Pump Diaphragms (standard diaphragm) old

	Part No.
Sigma/ 1 FM 50 Type: 12017, 120035, 10050	1010279
Sigma/ 1 FM 65 Type: 10022, 10044, 07065	1010282
Sigma/ 1 FM 120 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