2.1 ProMinent® Sigma/ 1 Motor Driven Metering Pumps

2.1.1 ProMinent® Sigma/ 1 Diaphragm Metering Pumps

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 ±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.

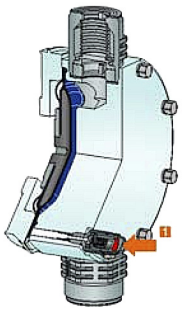
The task of the control is to measure the movement and speed profile in conjunction with the power demand. This leads to a real reduction in the actually required power, which means an increase in efficiency.

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

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.

Si1Ba with Stroke length controller

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.

DN10
DN15

2.1 ProMinent® Sigma/ 1 Motor Driven Metering Pumps

2.1.2 Technical Data for Sigma/ 1 Pumps

	at 50 Hz Pump Capacity at Max. Back Pressure		Max Stroke Freq	**S1Cb at 60 Hz** Pump Capacity at Max. Back Pressure		Stroking rate at Max. Back Pressure	Suction Lift	Adm. Priming Pressure Suction Side		Connector Suction/ Discharge Side	Shipping Weight	
Pump type S1Ba	**bar**	**l/h**	**ml/ stroke.**	**strokes/ min.**	**bar S1Cb**	**l/h**	**strokes/ min.**	**mWG**	**bar**	**DN**	**Optional BSPM / Hosetail**	**kg**	
12017 PVT	10	17	3.9	73	10	21	87	7	1	10	1/2" / 16mm	9	●
12017 SST	12	17	3.9	73	12	21	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	27	87	6	1	10	1/2" / 16mm	9	●
10022 SST	10	22	5.1	73	10	27	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	52	87	3	1	15	3/4" / 20mm	9.5	●
07042 SST	7	42	9.7	73	7	52	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 (Polyvinylidenefluoride)	PVDF (Polyvinylidenefluoride)	PTFE	Ceramic	PVDF/Viton® or EPDM
SST	stainless steel no. 1.4404/1.4581	Stainless steel no. 1.4404	PTFE	Stainless steel no. 1.4404	Stainless steel/Viton®

Motor Data for S1Ba

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 60 Hz	0.09 kW 0.09 kW	
T	3-phase, IP 55	220 - 240 V/380 - 420 V 220 - 280 V/440 - 480 V	50 Hz 60 Hz	0.09 kW 0.09 kW	with PTC, speed control range 1:5
R	3-phase, IP 55	220 - 240 V/380 - 420 V	50 Hz	0.09 kW	with PTC, speed adjustment range 1:20 with external fan (1-phase 230 V; 50/60Hz, 20W
M	1-phase AC, IP 55	230 V ± 5 %	50 Hz/ 60 Hz	0.12 kW	
L1	3-phase, II2GEExeIIT3	220 - 240 V/380 - 420 V	50 Hz	0.12 kW	
L2	3-phase, II2GEExdIICT4	220 - 240 V/380 - 420 V	50 Hz	0.18 kW	with PTC, speed control range 1:5
P1	3-phase, II2GEExeIIT3	250 - 280 V/440 - 480 V	60 Hz	0.12 kW	
P2	3-phase, II2GEExdIICT4	250 - 280 V/440 - 480 V	60 Hz	0.18 kW	with PTC, speed control range 1:5

- Motor data sheets can be requested for more information. 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.

DN10
DN15

2.1 ProMinent® Sigma/ 1 Motor Driven Metering Pumps

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

S1BaH — **Sigma Basic Type (S1Ba)**

Pump Type (Figure 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	

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 signa
H	Diaphragm for Hygenic Head

Liquid end version: 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

Hydraulic connector:

1	Union nut and PVC Solvent Weld
2	Union nut and PVC Male BSP
3	Union nut and PVDF Male BSP
4	Union nut and stainless steel insert *inc. w/SS pump*
5	Union nut and PVC Hosetail
7	Union nut and PVDF Hosetail

Version

0	With ProMinent® logo (standard)
F	Physiologically harmless (FDA)
M	Modified
5	Liquid End Left ... *Note: only available ex Germany*

Power supply:

S	3 ph, 400 V; 50 Hz; 0.09 kW
T	3 ph, 230 V/400 V 50/60 Hz, with PTC
M	1 ph. AC, 230 V; 50 Hz; 0.12 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 0.09kW
2	No Motor, with C 42 flange (NEMA)
3	No Motor, with flange size 56; B5 (DIN)

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 for EX area)

Stroke length adjustment:

0	Manual 0
1	Stroke positioning motor, 85-265V AC 50/60Hz
4	Stroke control motor, 4-20 mA 85-265V AC 50/60Hz

Prepack Option

P*	Manual 0

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
4 EPDM flat gaskets
Refer page 2.36 for fitting sizes
07042 - 04084 - 04120
4 EPDM flat gaskets
Refer page 2.36 for fitting sizes

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 Motor Driven Metering Pumps

2.1.5 Spare Parts Kits Sigma/ 1

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

PVT version

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

SST version

1 x pump diaphragm
1 x 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		Part No.
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**

	Part No.
Visual Diaphragm Failure Indicator	**1033323**
Retrofit rupture signalling switch & cable	**1034312**