

Supplementary Instructions

Sigma/ 2 metering pumps with multilayer safety diaphragm



Function Description

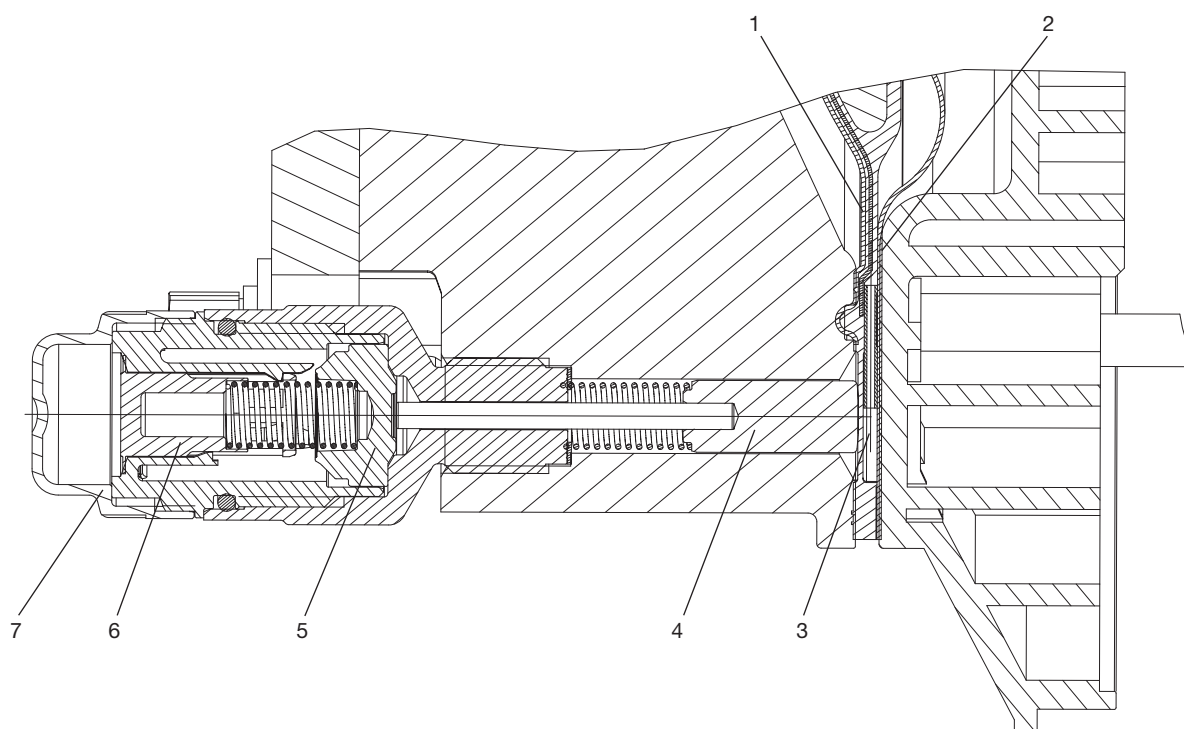


Fig. 1: Section through the diaphragm rupture signalling Sigma (without electrical component parts)

- 1 Working layer (\triangleq working diaphragm)
- 2 Safety layer (\triangleq safety diaphragm)
- 3 Lug
- 4 Plunger
- 5 Diaphragm rupture sensor
- 6 Cylinder, red
- 7 Cover, transparent

The multilayer safety diaphragm has the same function as the conventional double diaphragm systems with working and safety diaphragm; however, it has the advantage that both diaphragms are grouped to form a unit.

If the working layer (1) ruptures, the metering medium penetrates between the working layer and the safety layer (2) and spreads. The safety layer ensures that no metering medium leaks to the outside.

As soon as the metering medium reaches the lug (3) at the edge of the multilayer safety diaphragm, the lug expands. The lug presses on a plunger (4) in the diaphragm rupture sensor (5) and the sensor triggers.

In **mechanical** diaphragm rupture sensors, the sunk red cylinder (6) under the transparent cover (7) jumps to the front such that it is clearly visible.

In **electrical** diaphragm rupture sensors, a switch switches. A connected signalling unit signals the diaphragm rupture. In the control version, the diaphragm rupture sensor is connected to the “socket for diaphragm rupture monitor”. In case of a diaphragm rupture, the red LED indicator “Fault” is illuminated at the pump, the identifier “Error” and DIAPH flash on the LCD screen. Depending on the selected Identcode version in “Displacement body”, the pump continues to meter (“Pump emits alarm”) or stops (“Pump stops”).

Identcode Ordering System Basic Type (S2Ba)

Sigma Basic Type (S2Ba)

S2Ba	Drive type	
	HM	Main drive, diaphragm
	Pump type*	
	bar	l/h (50 Hz)
	16050	16 50
	16090	16 90
	16130	16 130
	07120	7 120
	07220	7 220
	04350	4 350
	Material Liquid end	
	PV	PVDF (max. 10 bar)
	SS	Stainless steel
	Seal material	
	T	PTFE seal
	Diaphragm	
	0	Standard diaphragm, PTFE version
	1	Double diaphragm with diaphragm rupture indicator (retro fit possible)
	S	Multilayer safety diaphragm with visual rupture indicator
	A	Multilayer safety diaphragm with rupture signalling (contact)
	Liquid end version	
	0	No spring
	1	With 2 valve springs, Hastelloy C4, 0,1 bar
	4	With pressure relief valve, FPM seal, no valve spring
	5	with overflow valve, FPM gasket with valve springs
	6	with overflow valve, EPDM gasket, without valve spring
	7	with overflow valve, EPDM gasket, with valve spring
	Hydraulic connection	
	0	Standard threaded connector (according to technical data)
	1	Union nut and PVC insert
	2	Union nut and PP insert
	3	Union nut and PVDF insert
	4	Union nut and stainless steel insert
	7	Union nut and PVDF hose nozzle
	8	Union nut and stainless steel hose nozzle
	Version	
	0	With ProMinent® logo (standard)
	1	Without ProMinent® logo (standard)
	M	Modified
	Electrical power supply	
	S	3 ph, 230 V/400 V 50/60 Hz
	M	1 ph, AC, 230 V/50/60 Hz
	N	1 ph, AC, 115 V/50/60 Hz
	L	3 ph, 230 V/400 V, 50 Hz, (Exe, Exd)
	P	3 ph, 265 V/440 V, 60 Hz, (Exe, Exd)
	R	3 ph, variable speed motor, 230/400 V
	V (0)	Variable speed motor with integrated frequency converter 1 pH, 230 V, 50/60 Hz
	Z	Speed control compl 1 ph 230 V, 50/60 Hz (variable speed motor + FC)
	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
	A	ATEX power end
	Stroke sensor	
	0	No stroke sensor (standard)
	2	Pacing relay (reed relay)
	3	Stroke sensor (Namur) for hazardous locations
	Stroke length adjustment	
	0	Manual (standard)
	1	With stroke positioning motor, 230 V/50/60 Hz
	2	With stroke positioning motor, 115 V/50/60 Hz
	3	With stroke control motor, 0...20 mA 230 V/50/60 Hz
	4	With stroke control motor, 4...20 mA 230 V/50/60 Hz
	5	With stroke control motor, 0...20 mA 115 V/50/60 Hz
	6	With stroke control motor, 4...20 mA 115 V/50/60 Hz

* Item 1 and 2=backpressure [bar]; item 3, 4, 5=output [l/h]

Identcode Ordering System Control Type (S2Ca)

Sigma Control Type (S2Ca)

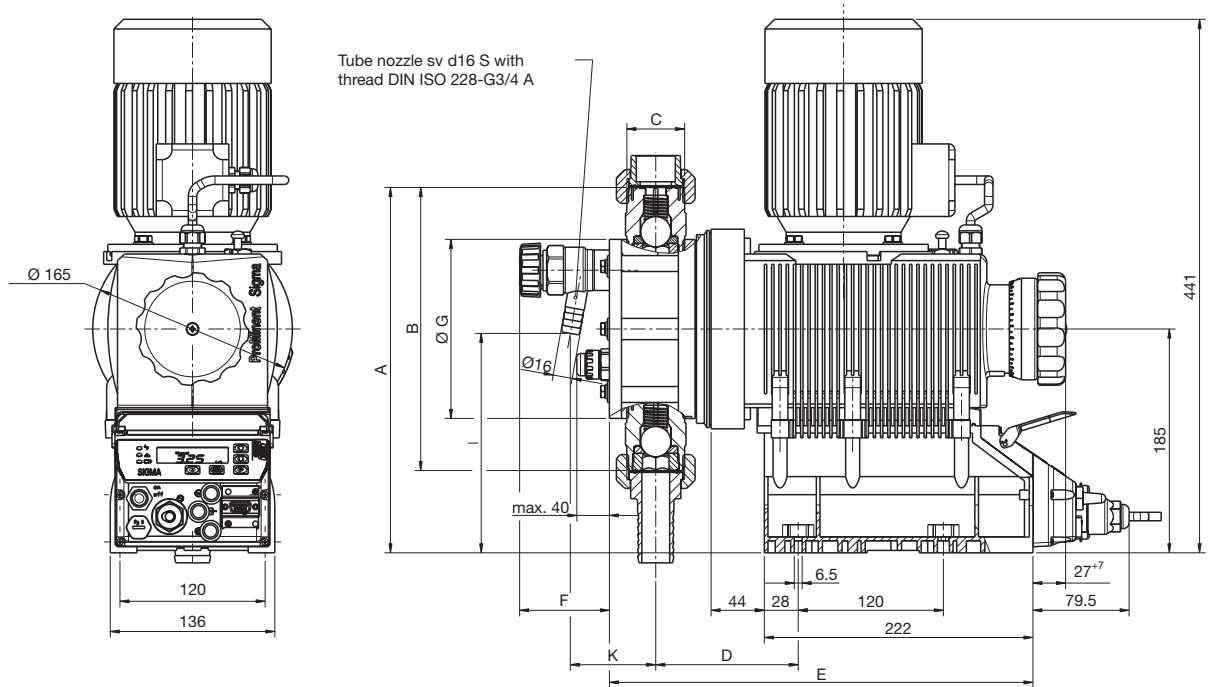
The 60 Hz performance data apply to the S2Ca pump types, however, at max. 200 strokes/min.

S2Ca	Drive type	
HM	Main drive, diaphragm	
	Pump type*	
	bar	l/h
16050	16	60
16090	16	108
16130	16	130
	bar	l/h
07120	7	144
07220	7	264
04350	4	350
	Material Liquid end	
PV	PVDF (max. 10 bar)	
SS	Stainless steel	
	Seal material	
T	PTFE seal	
	Diaphragm	
0	Standard diaphragm	
1	Double diaphragm with rupture indicator incorporating "Pump stopping" function	
2	Double diaphragm with rupture indicator incorporating "Pump alarm" function	
S	Multilayer safety diaphragm with visual rupture indicator	
A	Multilayer safety diaphragm with rupture signalling; pump stops	
B	Multilayer safety diaphragm with rupture signalling; pump emits alarm	
	Liquid end version	
0	No springs	
1	With 2 valve springs, Hastelloy C4, 0.1 bar	
4	With relief valve, FPM seal, no valve spring	
5	with overflow valve, FPM gasket with valve springs	
6	with overflow valve, EPDM gasket, without valve spring	
7	with overflow valve, EPDM gasket, with valve spring	
	Hydraulic connection	
0	Standard threaded connector (according to technical data)	
1	Union nut and PVC insert	
2	Union nut and PP insert	
3	Union nut and PVDF insert	
4	Union nut and stainless steel insert	
7	Union nut and PVDF hose nozzle	
8	Union nut and stainless steel hose nozzle	
	Version	
0	With ProMinent® logo	
1	Without ProMinent® logo	
	Electrical power supply	
U	1 ph 100-230 V ±10 %, 50/60 Hz	
	Cable and plug	
A	2 m European	C 2 m Australian
B	2 m Swiss	D 2 m USA
	Relay	
0	No relay	
1	With fault indicating relay (normally energised) 1x changeover 230V – 2A	
3	With fault indicating relay (normally de-energised) 1x changeover 230V – 2A	
4	As 1 with pacing relay 2x normally open 24 V – 100 mA	
5	As 3 with pacing relay 2x normally open 24 V – 100 mA	
A	shut-off and warning relays normally closed 2x normally open 24 V – 100 mA	
C	4-20 mA output = stroke length x frequency 1 x fault-indicating relay make contact 24 V - 100 mA	
F	Power relay normally closed 1 x changeover 230 V – 8 A	
	Control variant	
0	Manual + external with pulse control	
1	Manual external + pulse control + analogue	
4	As 0 + process-timer	
5	As 1 + process-timer	
P**	As 1 + PROFIBUS® DP-interface, D sub 9	
R**	as 1 + PROFIBUS® DP interface, M12	
	Access code	
0	No access code	
1	With access code	
	Metering monitor	
0	Input with pulse evaluation	
	Stroke length adjustment	
0	Manual	
C	Manual + calibration	

* Item 1 and 2=backpressure [bar]; item 3, 4, 5=output [l/h]

** For the option PROFIBUS® no relay can be selected

Dimensions Sigma/ 2 S2Ca

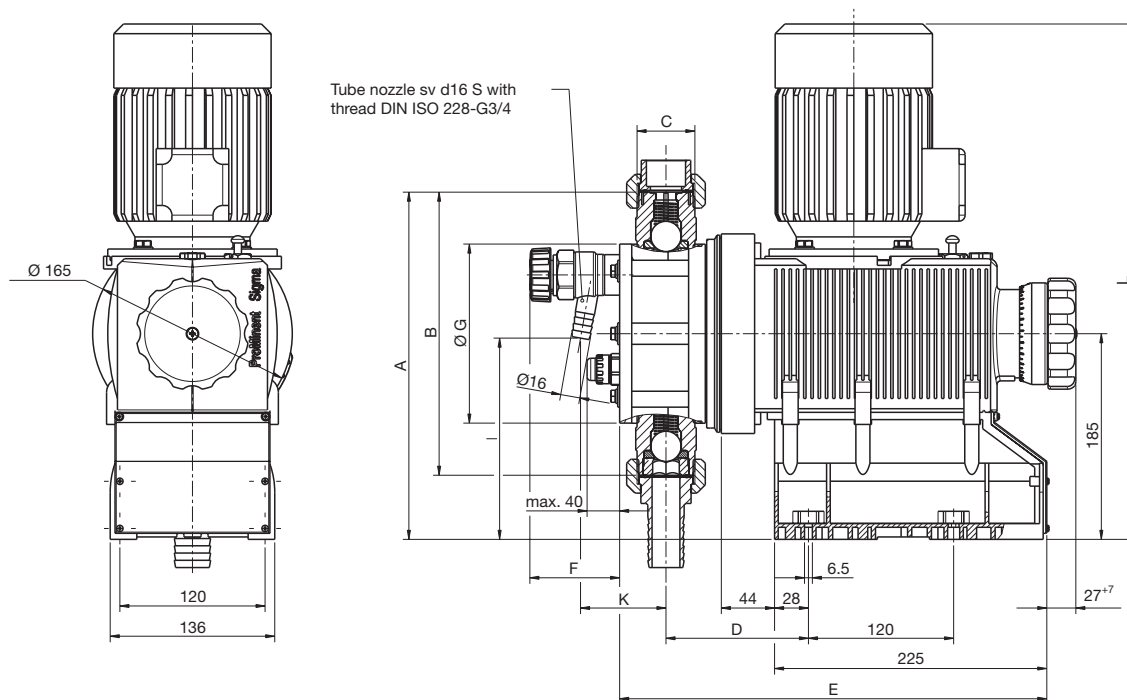


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Dimensions Sigma/ 2 (in mm)

Type	Connection	A	B	C	D	E	F	$\varnothing G$	I	K
Sigma 04350, 07120, 07220 PVT	DN 25	302	234	G1 1/2"A	118	350	75	156	181	71
Sigma 04350, 07120, 07220 SST	DN 25	302	233	G1 1/2"A	118	342	88	159	155	60
Sigma 12050, 12090, 12130, 16050, 16090, 16130 PVT	DN 15	266	162	G1"A	111	338	72	122	163	63
Sigma 12050, 12090, 12130, 16050, 16090, 16130 SST	DN 15	266	162	G1"A	110	327	88	122	137	53

Dimensions Sigma/ 2 S2Ba



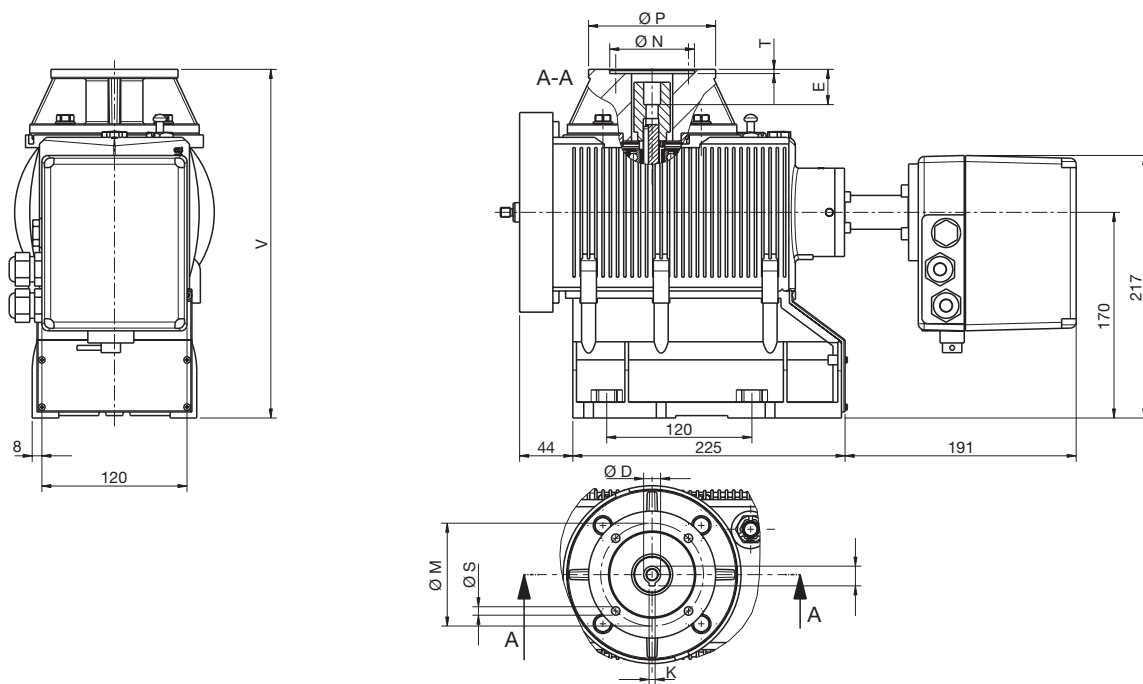
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Dimensions Sigma/ 2 (in mm)

Type	Connection	A	B	C	D	E	F	ØG	I	K	L*
Sigma 04350, 07120, 07220 PVT	DN 25	287	234	G1 1/2"A	118	353	75	156	166	71	
Sigma 04350, 07120, 07220 SST	DN 25	287	233	G1 1/2"A	118	345	88	159	140	60	
Sigma 12050, 12090, 12130, 16050, 16090, 16130 PVT	DN 15	251	162	G1"A	111	341	72	122	148	63	
Sigma 12050, 12090, 12130, 16050, 16090, 16130 SST	DN 15	251	162	G1"A	110	330	88	122	122	53	

* Dimensions for L: Standard motor: 426 mm "S"
 Motor variable speed: 523 mm "R"
 EExe-motor: 472 mm "L1" "P1"
 EExde-motor: 448 mm "L2" "P2"
 Motor with frequency inverter: 644 mm "V0"
 1 phase motor: 427 mm "N" "M"

Dimensions Sigma/ 2 S2Ba



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Dimensions Sigma/ 2 (in mm)

Motor flange	Ø P	Ø M	Ø N	Ø S	Ø D	E	T	K	L	V
B 14/105	105	85	70	7	19	29	3,5	5	16,3	288
56 C/138	5.43"	5.88"	4.5"	0.43"	0.62"	1.14"	0.16"	0.2"	0.72"	12.2"
B 14/160	160	130	110	9	14	29	6	5	16,3	290
B 14/200	200	165	130	11	19	52,5	6	6	21,8	323
B 5/140*	140	115	95	9,5	11	26	3,5	4	12,8	230

* assembly without adapt flange direct on pump housing

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