

Supplementary Instructions

Sigma/ 1 metering pumps with
multilayer safety diaphragm



Function Description

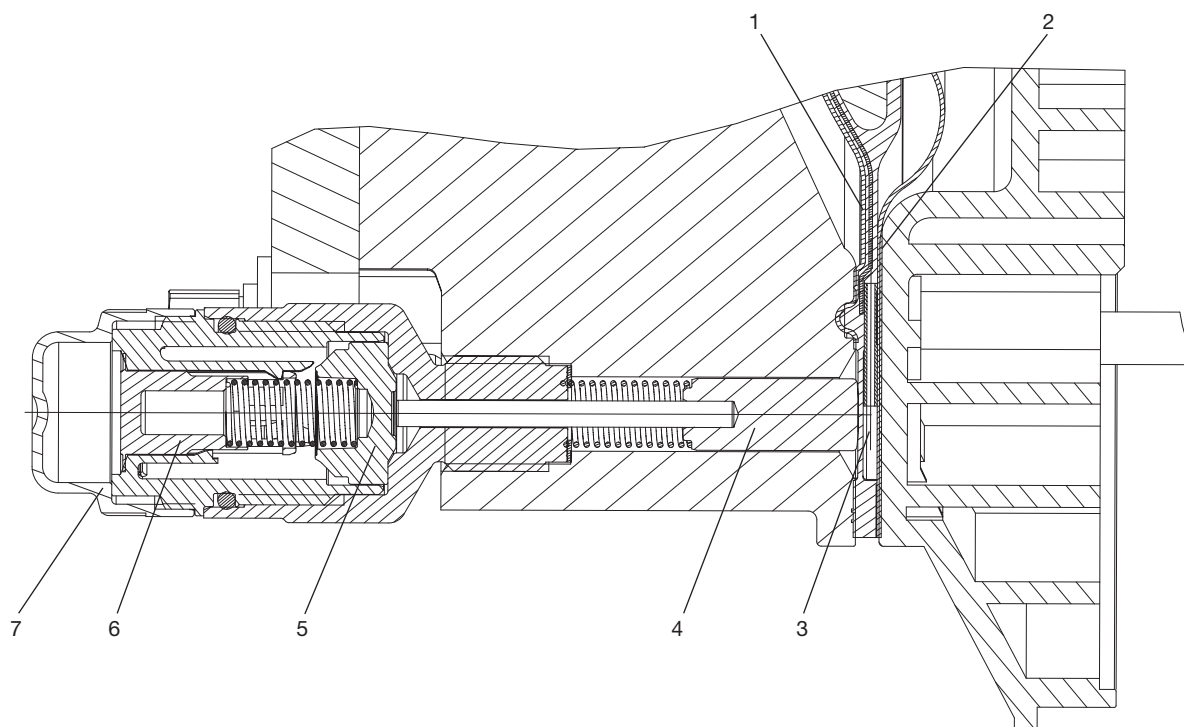


Fig. 1: Section through the diaphragm rupture signalling Sigma (without electrical component parts)

- 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 (S1Ba)

Sigma Basic Type (S1Ba)

S1Ba	Drive type										
	H	Main drive, diaphragm									
		Pump type*									
		bar		l/h		bar		l/h			
		12017	12	17	07065	7	65				
		12035	12	35	07042	7	42				
		10050	10	50	04084	4	84				
		10022	10	22	04120	4	120				
		10044	10	44							
		Material Liquid end									
		PV	PVDF								
		SS	Stainless steel								
		Seal material									
		T	PTFE seal								
		Diaphragm									
		0	PTFE diaphragm								
		1	Double diaphragm with diaphragm rupture signalling (contact)								
		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 C, 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								
		1	Union nut and PVC insert								
		2	Union nut and PP insert								
		3	Union nut and PVDF insert								
		4	Union nut and SS insert								
		7	Union nut and PVDF hose nozzle								
		8	Union nut and SS hose nozzle								
		9	Union nut and stainless steel hose nozzle								
		Version									
		0	With ProMinent® logo (standard)								
		1	Without ProMinent® logo								
		M	Modified								
		Electrical power supply									
		S	3 ph, 230 V/400 V 50/60 Hz, 0.09 kW								
M	1 ph, AC, 230 V/50/60 Hz, 0.09 kW										
N	1 ph, AC 115 V 60 Hz, 0.09 kW										
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, 0.09 kW										
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)										
2	No motor, C 42 flange (NEMA)										
3	No motor, B5 Gr. 56 (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) 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/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/60 Hz										
6	With stroke control motor 4...20 mA 115 V/60 Hz										

* Figure 1 and 2=back pressure [bar]; figure 3, 4, 5=flow rate [l/h]

** Standard with tube nozzle in the bypass. Threaded connection on request.

NEW: EHEDG-certified (European Hygienic Eng. Design Group) stainless steel metering heads are available on request.

Identcode Ordering System Control Type (S1Ca)

Sigma Control Type (S1Ca)

The 60 Hz performance data apply to the S1Ca pump types, however, at max. 200 strokes/min.

S1Ca	Drive type											
H	Main drive, diaphragm											
	Pump type*											
	bar		l/h		bar		l/h		bar		l/h	
	12017	12	20	10022	10	26	07042	7	50			
	12035	12	42	10044	10	53	04084	4	101			
	10050	10	50	07065	7	65	04120	4	120			
	Material Liquid end											
	PV		PVDF									
	SS		Stainless steel									
	Seal material											
	T		PTFE seal									
	Diaphragm											
	0		PTFE-Membran									
	1		Double diaphragm with rupture signalling; pump stops									
	2		Double diaphragm with rupture signalling; pump emits alarm									
	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 spring									
	1		With 2 valve springs, Hastelloy C, 0.1 bar									
	4**		With pressure relief valve, FPM seal, no valve spring									
	5**		with overflow valve, FPM gasket with valve spring									
	6**		with overflow valve, EPDM gasket, without valve spring									
	7**		with overflow valve, EPDM gasket, with valve spring									
	Hydraulic connection											
	0		Standard				4		Union nut and stainless steel insert			
	1		Union nut and PVC insert				7		Union nut and PVDF hose nozzle			
	2		Union nut and PP insert				8		Union nut and stainless steel hose nozzle			
	3		Union nut and PVDF insert				9		Union nut and stainless steel welded sleeve			
	Version											
	0		With ProMinent® logo (standard)									
	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 close 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										
R***		as 1 + PROFIBUS®DP interface, M12										
C***		as 1 + CANopen										
Access code												
0		No access code										
1		With access code										
2		As 0 + message in the event of a manual stop										
3		As 1 + message in the event of a manual stop										
Metering monitor												
0		Input with pulse evaluation										
Stroke length adjustment												
0		Manual										
C		Manual + calibration										

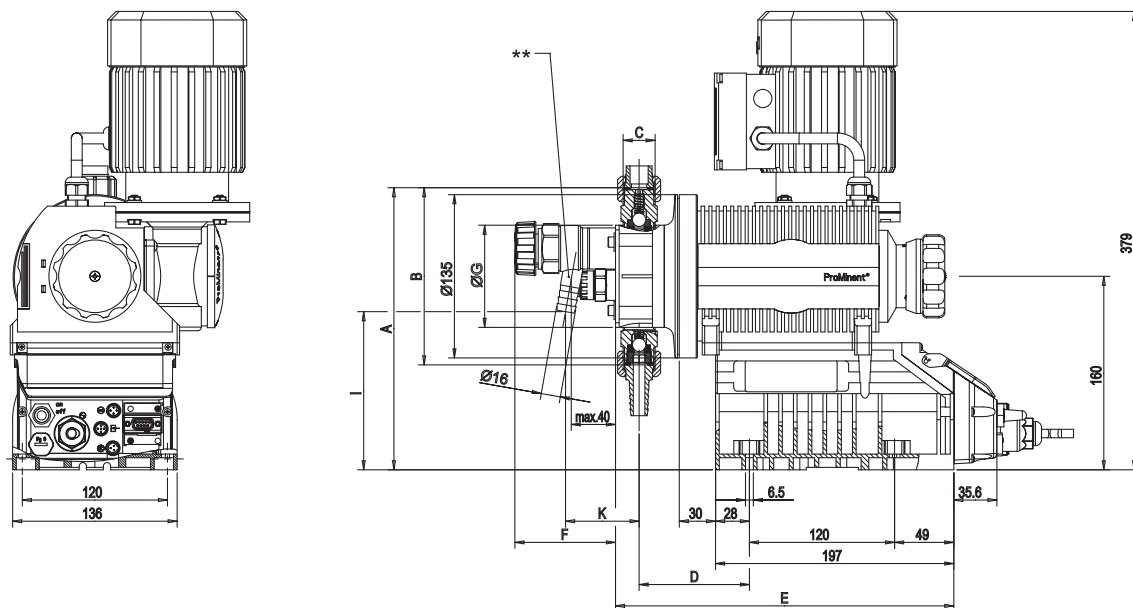
* Figure 1 and 2=back pressure [bar]; figure 3, 4, 5=flow rate [l/h]

** Standard with tube nozzle in the bypass Threaded connection on request.

*** No relay can be selected with PROFIBUS® and CANopen options

NEW: EHEDG-certified (European Hygienic Eng. Design Group) stainless steel metering heads are available on request.

Dimensions Sigma/ 1 S1Ca

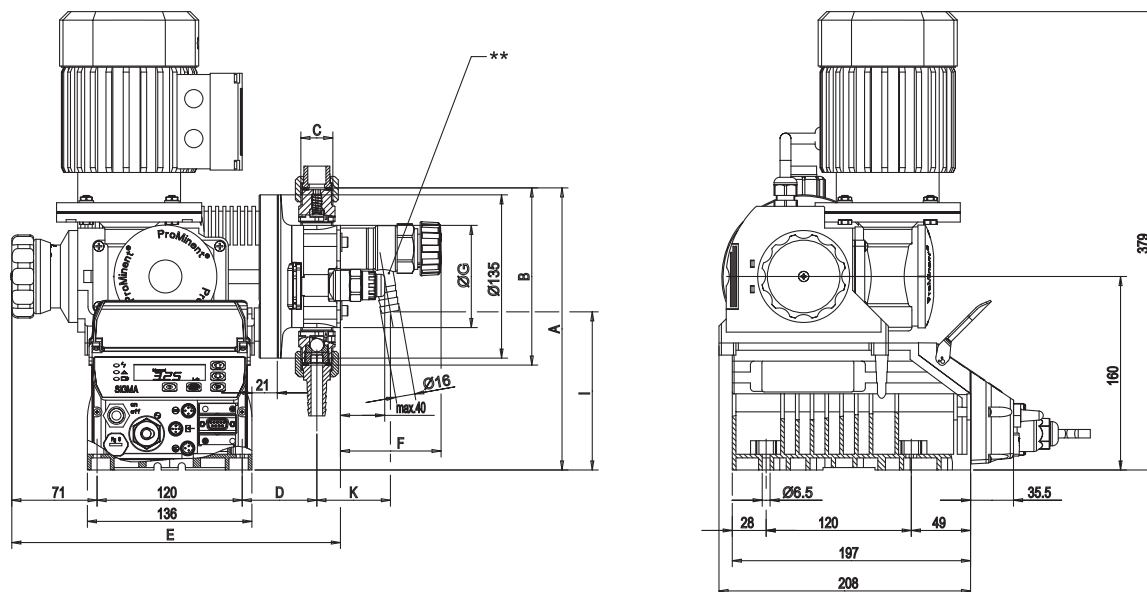


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Dimensions Sigma/ 1 (in mm)

Feed unit	Connection	A	B	C	D	E	F	G	I	K
Sigma 12017, 12035, 10050 PVT	DN 10	233	147	G3/4 A	91	277	-	96	-	-
Sigma 12017, 12035, 10050 PVT-ÜV-A/sv-a	DN 10	233	147	G3/4 A	91	280	84	96	131	61
Sigma 12017, 12035, 10050 SST	DN 10	231	142	G3/4 A	91	275	-	105	-	-
Sigma 12017, 12035, 10050 SST-ÜV-A/sv-a	DN 10	231	142	G3/4 A	91	275	88	105	100	45
Sigma 10022, 10044, 07065 PVT	DN 10	233	147	G3/4 A	91	277	-	96	-	-
Sigma 10022, 10044, 07065 PVT-ÜV-A/sv-a	DN 10	233	147	G3/4 A	91	280	84	96	131	61
Sigma 10022, 10044, 07065 SST	DN 10	231	142	G3/4 A	91	275	-	105	-	-
Sigma 10022, 10044, 07065 SST-ÜV-A/sv-a	DN 10	231	142	G3/4 A	91	275	88	105	100	45
Sigma 07042, 04084, 04120 PVT	DN 15	242	165	G1 A	96	286	-	122	-	-
Sigma 07042, 04084, 04120 PVT-ÜV-A/sv-a	DN 15	242	165	G1 A	96	296	74	122	138	63
Sigma 07042, 04084, 04120 SST	DN 15	242	165	G1 A	91	285	-	122	-	-
Sigma 07042, 04084, 04120 SST-ÜV-A/sv-a	DN 15	242	165	G1 A	91	285	88	122	112	51

Dimensions Sigma/ 1 S1Ca with liquid end right*



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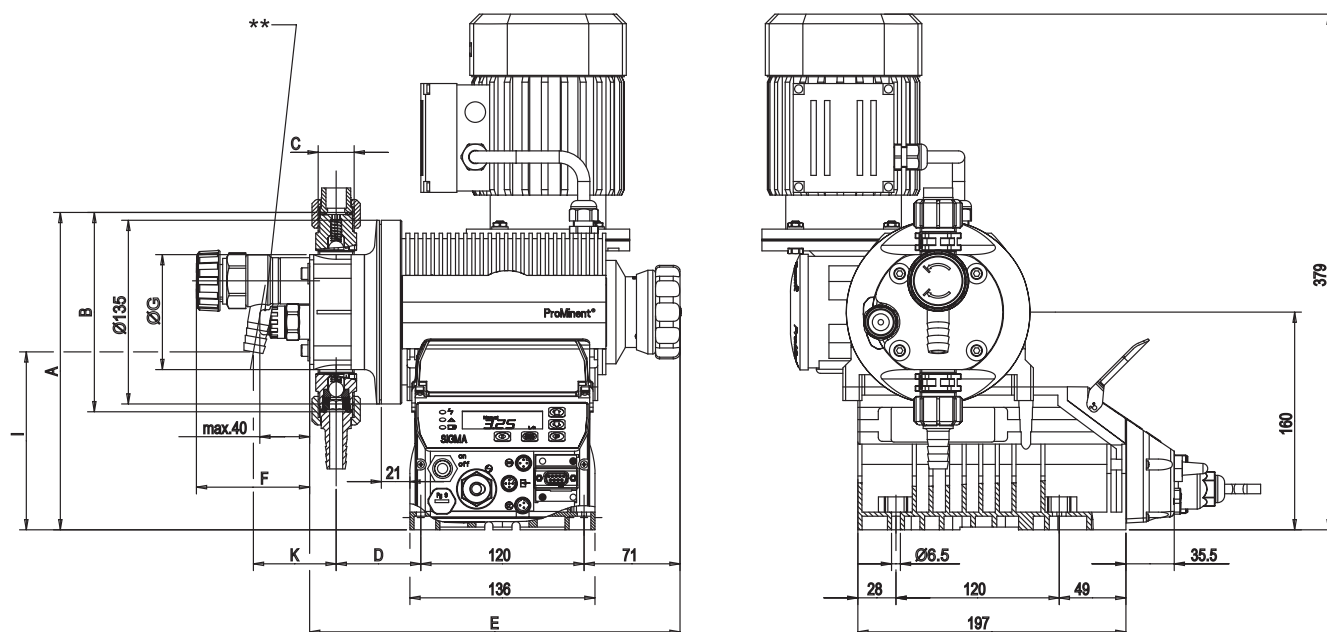
* Special version available on request

** Hose nozzle ÜV d16 S with thread DIN ISO 228-G3/4 A

Dimensions Sigma/ 1 (in mm)

Feed unit	Connection	A	B	C	D	E	F	G	I	K
Sigma 12017, 12035, 10050 PVT	DN 10	233	147	G3/4 A	62	269	-	96	-	-
Sigma 12017, 12035, 10050 PVT-ÜV-A/sv-a	DN 10	233	147	G3/4 A	62	272	84	96	131	61
Sigma 12017, 12035, 10050 SST	DN 10	231	142	G3/4 A	61	267	-	105	-	-
Sigma 12017, 12035, 10050 SST-ÜV-A/sv-a	DN 10	231	142	G3/4 A	61	267	88	105	100	45
Sigma 10022, 10044, 07065 PVT	DN 10	233	147	G3/4 A	62	269	-	96	-	-
Sigma 10022, 10044, 07065 PVT-ÜV-A/sv-a	DN 10	233	147	G3/4 A	62	272	84	96	131	61
Sigma 10022, 10044, 07065 SST	DN 10	231	142	G3/4 A	61	267	-	105	-	-
Sigma 10022, 10044, 07065 SST-ÜV-A/sv-a	DN 10	231	142	G3/4 A	61	267	88	105	100	45
Sigma 07042, 04084, 04120 PVT	DN 15	242	165	G1 A	67	278	-	122	-	-
Sigma 07042, 04084, 04120 PVT-ÜV-A/sv-a	DN 15	242	165	G1 A	67	288	74	122	138	63
Sigma 07042, 04084, 04120 SST	DN 15	242	165	G1 A	66	277	-	122	-	-
Sigma 07042, 04084, 04120 SST-ÜV-A/sv-a	DN 15	242	165	G1 A	66	277	88	122	112	51

Dimensions Sigma/ 1 S1Ba



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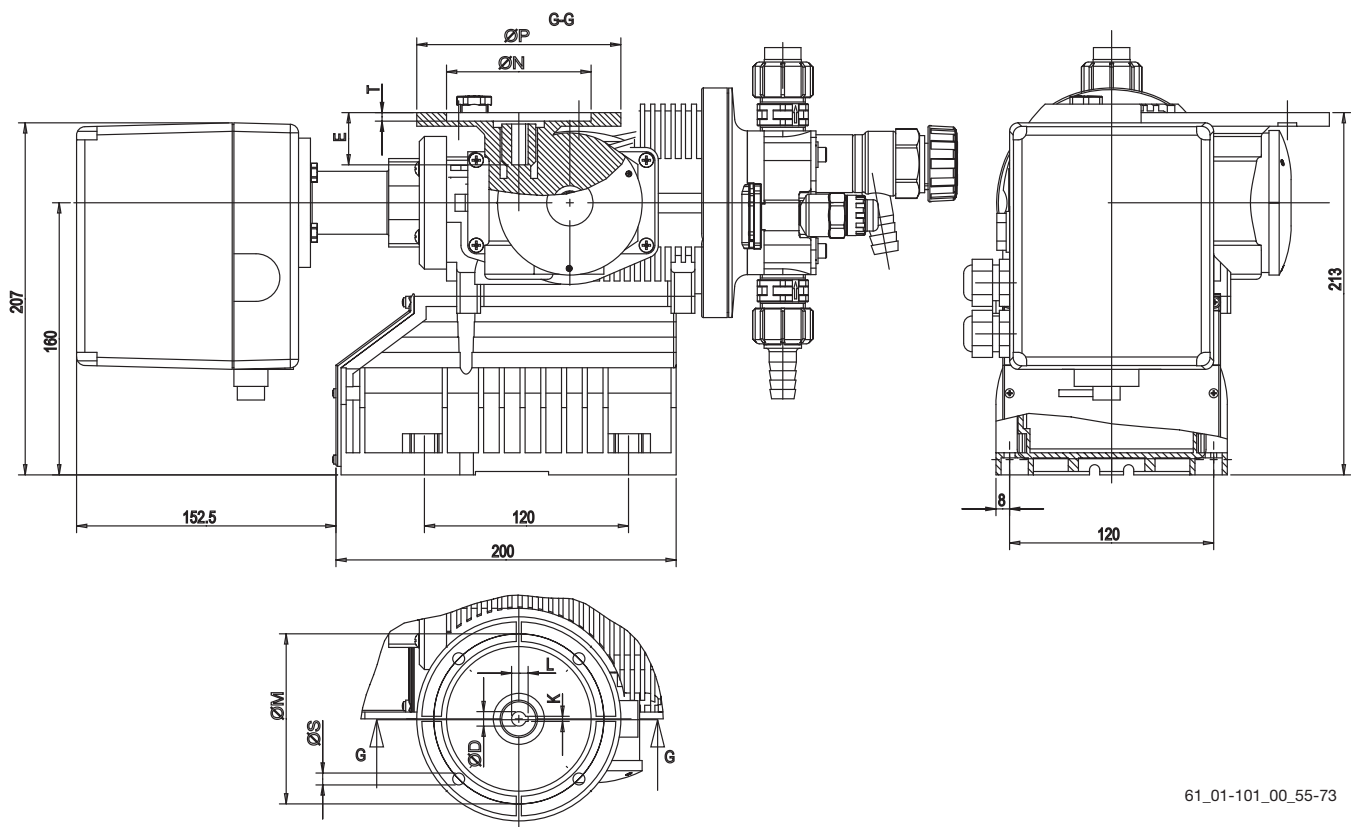
* Special version available on request

** Hose nozzle ÜV d16 S with thread DIN ISO 228-G3/4 A

Dimensions Sigma/ 1 (in mm)

Feed unit	Connection	A	B	C	D	E	F	G	I	K
Sigma 12017, 12035, 10050 PVT	DN 10	233	147	G3/4 A	62	269	-	96	-	-
Sigma 12017, 12035, 10050 PVT-ÜV-A/sv-a	DN 10	233	147	G3/4 A	62	272	84	96	131	61
Sigma 12017, 12035, 10050 SST	DN 10	231	142	G3/4 A	61	267	-	105	-	-
Sigma 12017, 12035, 10050 SST-ÜV-A/sv-a	DN 10	231	142	G3/4 A	61	267	88	105	100	45
Sigma 10022, 10044, 07065 PVT	DN 10	233	147	G3/4 A	62	269	-	96	-	-
Sigma 10022, 10044, 07065 PVT-ÜV-A/sv-a	DN 10	233	147	G3/4 A	62	272	84	96	131	61
Sigma 10022, 10044, 07065 SST	DN 10	231	142	G3/4 A	61	267	-	105	-	-
Sigma 10022, 10044, 07065 SST-ÜV-A/sv-a	DN 10	231	142	G3/4 A	61	267	88	105	100	45
Sigma 07042, 04084, 04120 PVT	DN 15	242	165	G1 A	67	278	-	122	-	-
Sigma 07042, 04084, 04120 PVT-ÜV-A/sv-a	DN 15	242	165	G1 A	67	288	74	122	138	63
Sigma 07042, 04084, 04120 SST	DN 15	242	165	G1 A	66	277	-	122	-	-
Sigma 07042, 04084, 04120 SST-ÜV-A/sv-a	DN 15	242	165	G1 A	66	277	88	122	112	51

Dimensions Sigma/ 1 S1Ba with servomotor



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Dimensions Sigma/ 1 (in mm)

Motor flange	Ø P	Ø M	Ø N	Ø S	E	Ø D	T	K	L
42 C	4.725"	3.75"	3"	0.276"	0.5"	0.157"	1.287"	0.125"	0.56"
B5/120	120	100	80	7	9E7	5	30	3H9	10.4