"Solenoid-Driven Metering Pumps" T.O.C. III

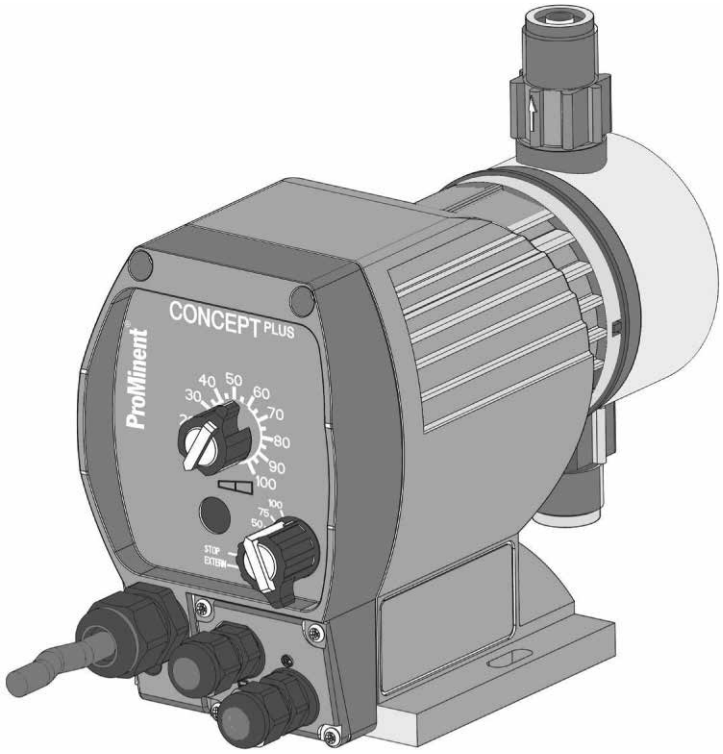
CATALOG SECTION TABS

ProMinent® Concept b
Solenoid Diaphragm Metering Pumps

Overview: Concept b

Ideal for basic chemical feed applications
(see page 138 for spare parts and page 151 for control cables)

- Capacity range of 0.19 to 4.33 GPH (0.7 to 16.4 L/h) at pressures up to 232 psi (16 bar).
- Continuous stroke length adjustment from 0-100 % (recommended 30-100 %)
- Fixed frequency settings @ 0, 25, 50, 75 and 100%.
- Low cost opens up opportunities in the most basic applications
- NP, PP and PVT liquid ends
- Integral bleed valve simplifies priming and prevents “loss of prime”
- Common applications: Cooling towers, chlorination and metal finishing
- NSF 61/50 approved liquid ends



ProMinent® Concept b Solenoid Diaphragm Metering Pumps

Capacity Data

Pump Version	Capacity at Maximum Back Pressure psig	(bar)	U.S. GPH	(L/h)	mL/ stroke	Max. Stroking Rate spm	Pre-Primed Suction Lift ft.	(m)	Tubing Connectors O.D. x I.D. (in.)	Shipping Weight (approx.) lbs.	(kg)
1000	145	(10)	0.19	(0.7)	0.07	180	20	(6)	1/4" x 3/16"	3.97	(1.8)
1601	232	(16)	0.29	(1.1)	0.10	180	20	(6)	1/4" x 3/16"	3.97	(1.8)
1002	145	(10)	0.63	(2.4)	0.18	180	16	(5)	1/4" x 3/16"	3.97	(1.8)
1003	145	(10)	0.79	(3.0)	0.19	240	16	(5)	1/4" x 3/16"	3.97	(1.8)
0704	102	(7)	1.03	(4.0)	0.36	180	13	(4)	1/4" x 3/16"	3.97	(1.8)
0705	102	(7)	1.37	(5.2)	0.38	240	13	(4)	1/4" x 3/16"	3.97	(1.8)
0309	44	(3)	2.38	(9.0)	0.83	180	20	(6)	3/8" x 1/4"	3.97	(1.8)
0215	22	(1.5)	4.33	(16.4)	1.40	180	5	(1.5)	3/8" x 1/4"	3.97	(1.8)

(Note: Above capacities and suction lift refer to pumps tested on water at 115 VAC, 60 Hz, and an ambient temperature of 70*F (20*C). Higher specific gravity fluids will reduce suction lift. Capacities will be slightly reduced from published ratings if pumps are skid mounted)

External pulse contact retrofit available as an option (P/N 1046731)

NSF 50 certification only applies to NPB0 & NPB2 liquid ends

Materials In Contact With Chemicals

	Pump head	Valves	O-rings	Balls
PPE	Polypropylene	Polypropylene	EPDM	ceramic
PPB	Polypropylene	Polypropylene	Viton®	ceramic
NPE	Acrylic	PVC	EPDM	ceramic
NPB	Acrylic	PVC	Viton®	ceramic
PVT	PVDF	PVDF	PTFE	ceramic

Pump diaphram with PTFE-coating.
Note: Viton® is a registered trademark of DuPont Dow Elastomers.

ProMinent® Concept b
Solenoid Diaphragm Metering Pumps

Identcode Ordering System

CNPb — Concept PLUS

Version	Capacity	Version	Capacity
1000	0.19 gph (0.7 l/h), 145 psi (10 bar)	0704	1.03 gph (4.0 l/h), 102 psi (7 bar)
1601	0.29 gph (1.1 l/h), 232 psi (16 bar)	0705	1.37 gph (5.2 l/h), 102 psi (7 bar)
1002	0.63 gph (2.4 l/h), 145 psi (10 bar)	0309	2.38 gph (9.0 l/h), 44 psi (3 bar)
1003	0.79 gph (3.0 l/h), 145 psi (10 bar)	0215	4.33 gph (16.4 l/h), 22 psi (1.5 bar)

Liquid end material:

PP	Polypropylene
NP	Acryllic/PVC
PV	PVDF

O-rings:

B	Viton® seals
E	EPDM seals
T	PTFE seals

Liquid end version:

0	Non-bleed version, no valve spring
1	Non-bleed version, with valve spring
2	With bleed valve, no valve spring (except 0704 models)
3	With bleed valve, with valve spring
7	Auto-degassing

Connection:

M	1/4" x 3/16"
N	3/8" x 1/4"

Logo:

0	With ProMinent logo

Power Supply:

A	1 ph 230 V 50/60 Hz (Euro plug)
D	1 ph 115 V 50/60 Hz (US plug)
4	1 ph 230 V 50/60 Hz (US plug) (consult factory for pricing)

Control Option:

0	Standard (w/o external control)
B	With external and level input retrofit kit, fitted, without level switch

Accessories:

1	With accessories (foot valve, injection valve, tubing)

Control Variant:

0	Standard

Approval:

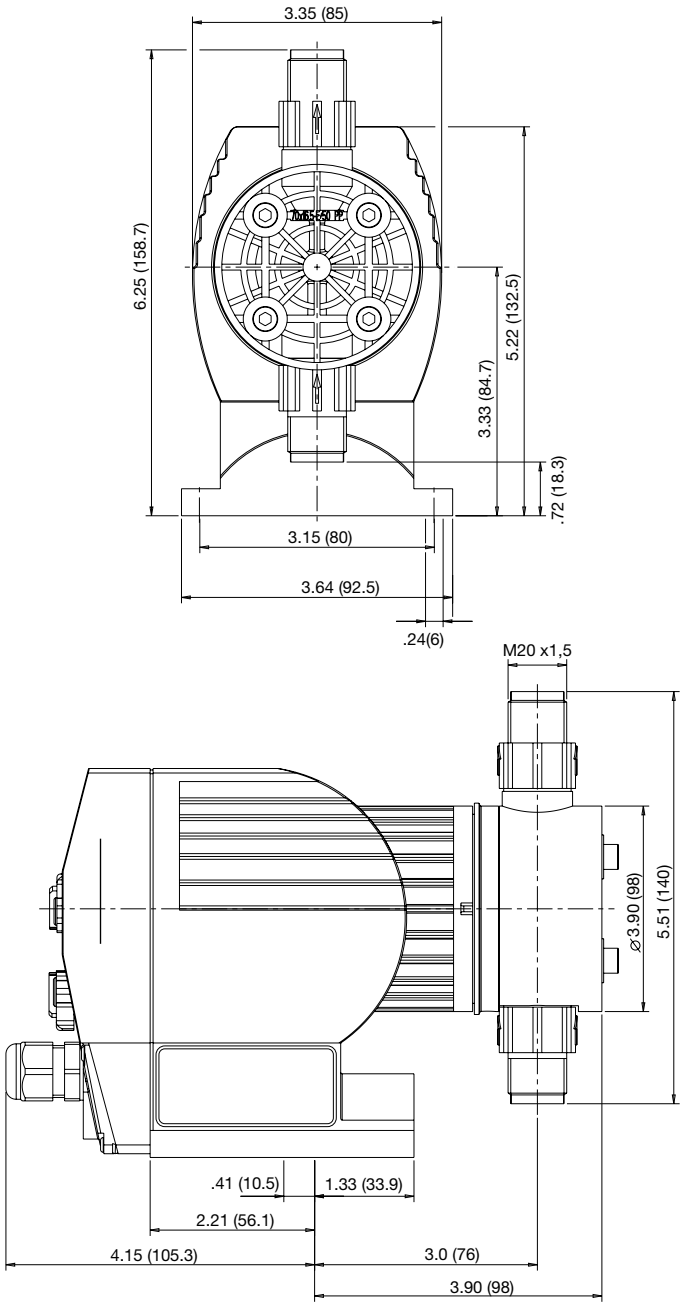
01	CE
07	MET
11	MET + NSF 61

CNPb	1000	PP	B	0	M	0	A	0	1	0	01

ProMinent® Concept b
Solenoid Diaphragm Metering Pumps

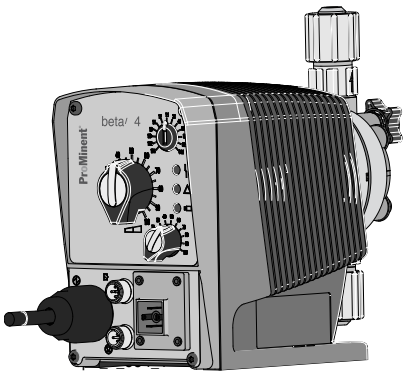
Dimensional Drawings

Dimensions in inches (mm).
Ranges given, actual dimension dependent on liquid end material.



ProMinent® Beta b
Solenoid Diaphragm Metering Pumps

Overview: Beta b



Ideal for basic chemical feed applications
(see page 141 for spare parts and page 151 for control cables)

- Capacity range 8.4 gph (32 l/h) max, 363 psi (25 bar) max
- Standard external control via potential-free contacts with pulse step-up and step-down to adapt to existing signal transducers of 64:1 to 1:64
- (Optional) external control via standard 4-20 mA and potential-free contacts with pulse step-up and step-down of 32:1 to 1:32
- Continuous stroke length adjustment from 0-100% (recommended 30-100%)
- Supplied in PP, Acrylic/PVC, PTFE, PVDF, SS
- Patented coarse/fine deaeration for PP, and Acrylic/PVC
- Auto-degassing liquid end in Acrylic/PVC
- HV liquid end for highly viscous media (suitable for viscosities to 3000 cPs)
- 10-setting stroke frequency adjustment from 10-100%
- External control via voltage-free contacts
- Connector for two-stage level switch
- 12-24 V DC, 24 V AC low voltage version
- LED's for operation status
- NSF/ANSI 61 approved

ProMinent® solenoid-driven metering pumps consist of two main components: the pump drive unit and the liquid end. The Beta b series offers two drive (solenoid) sizes: Beta/4 (BT4b) and Beta/5 (BT5b). Operating principles and options are identical, and both units offer maximum backpressure up to 363 psig (17.5 bar). Capacity range for the Beta/4 is 0.19 to 5 gph (0.74 to 19 l/h); Beta/5 is 0.80 to 8.4 gph (2.9 to 32 l/h).

Feed rate is determined by stroke length and stroking rate: stroke length can be varied from 0 to 100% with an adjustment ratio of 10:1. The stroke length is set manually by the adjustment knob on the front of the pump.

Stroke rate can be adjusted in 10% increments between 10 and 100% via the multifunction switch. This switch is also used to select voltage-free On/Off external pulse contact, pump stop, or test (for priming).

Specifications

Drive Unit

The pump housing is constructed of fiberglass-reinforced PPE plastic to protect against corrosion, dust, and water.

The solenoid drive unit houses a short-stroke solenoid with a maximum stroke length of 0.05" (1.25 mm). It is equipped with a noise suppressing mechanism for quiet operation and the armature is the only moving part.

Operating on pulse action, each pulse generates a magnetic field in the solenoid coil. This magnetic field moves the armature, which in turn moves the diaphragm. The diaphragm pushes into the dosing head and cavity forces chemical out of the discharge valve. When the magnetic field is de-energized, a spring returns the armature and diaphragm to their original position. This return movement draws chemical into the dosing head cavity through the suction valve.

In the event of a diaphragm rupture, the liquid end has a weep hole on the bottom of the backplate to direct chemical out of the pump and away from the solenoid. An optional diaphragm failure detector can be used to stop the pump and indicate a fault.

The stroke-length adjusting mechanism is connected directly to the solenoid. Adjustment results in an accurate self-locking stroke-length setting.

Diaphragm

The diaphragm is constructed of fabric-reinforced EPDM elastomer with a plastic core and PTFE-facing. It is chemically resistant to virtually all process fluids and can be used over a wide temperature range. The Beta b pump is designed with a convex diaphragm. The curved shape provides precise metering and alleviates stress placed on the diaphragm by reducing liquid end dead volume.

ProMinent® Beta b Solenoid Diaphragm Metering Pumps

Specifications (Cont.)

The Liquid End

The Beta b metering pump liquid ends are available in five material versions: Polypropylene (PP), Kynar (PVDF), Acrylic/PVC (NP), PTFE (TT), and 316 Stainless steel (SS).

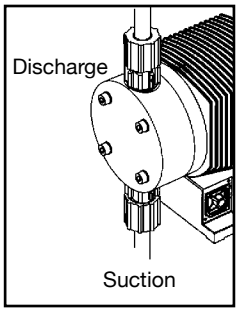
Some liquid ends are interchangeable between the BT4b and BT5b.

Options include a manual bleed valve with needle valve for easy priming, and continuous bleed of fluids that tend to off-gas (available with versions PP, PVT, and NP liquid ends).

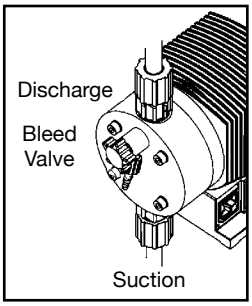
Automatic degassing liquid ends are available for PP and NP versions (except 1000 and 0232). This style liquid end discharges from the center and degasses from the top to prevent air build-up in the chamber.

High viscosity PVDF liquid ends are available for pump versions 1005, 0708, 0413, 0220, 1008, 0713, and 0420. Their metering capacity is 10-20% less than standard pump versions and recommended viscosity is up to 3000 cPs. The HV liquid ends are not self-priming; flooded suction is recommended.

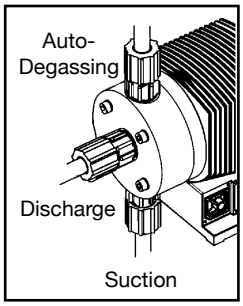
Suction and discharge ports are equipped with double-ball check valves for superior repeatability.



Liquid end without bleed valve



Liquid end with bleed valve



Auto-degassing liquid end

Power Supply

The Beta b metering pumps accept a universal 100-230 volt power supply (+/- 10%), single phase, 50/60 Hz, with a 1.15 service factor. Performance is identical whether operated on 50 Hz or 60 Hz power. The power cord is detachable.

Fault Indicators

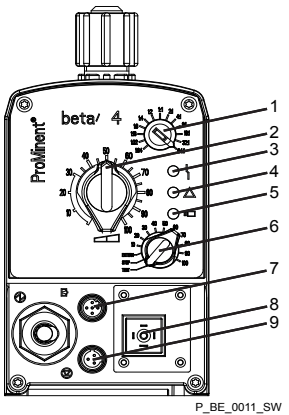
Three LED lights indicate operational status. A green light flashes during normal operation; a yellow light warns of low chemical; and a red light indicates lack of chemical or an operational error.

Relay Outputs

Fault annunciating relay
For low tank level (level switch), processor fault, and fuse/ power supply failure.

Pacing relay
A contact closure is issued with every pump stroke (contact duration 150 ms). This allows a second ProMinent metering pump to be paced synchronously, or to totalize flow with an external stroke counter.

1 Pulse Control Switch
2 Stroke Length Adjustment Knob
3 Fault Indicator (red)
4 Warning Indicator (yellow)
5 Operating Indicator (green)
6 Multifunctional Switch
7 "External Control" Terminal
8 Relay Connection (optional)
9 "Level Switch" Terminal



c UL us Recognized

CE Available

ProMinent® Beta b
Solenoid Diaphragm Metering Pumps

Specifications (Cont.)

Maximum stroke length:	0.05” (1.25 mm)
Materials of construction	
Housing:	Fiberglass reinforced PPE
Diaphragm:	PTFE-faced EPDM with plastic core
Liquid end options:	Polypropylene, PVDF, Acrylic/PVC, PTFE, 316 SS
Enclosure rating:	IP 65
Motor insulation class:	F
Power supply:	100-230 VAC, 1 phase, 50/60 Hz, +/- 10%; 12-24 VDC or 24VDC (+/- 10%)
Check valves:	Double ball
Metering repeatability:	When used according to operating instructions, ±2% under constant conditions and at minimum 30% stroke length
Power cord:	6 ft (2 m)
Relay cable (optional):	6 ft (2 m)
Relay load	
Fault relay only (options 1 & 3):	Contact load: 250 VAC, 2 A, 50/60 Hz Operating life: > 200,000 switch functions
Fault and pacing relay (options 4 & 5):	Contact load: 250 VAC/DC, 2 A, 50/60 Hz Operating life: > 200,000 switch functions Residual impedance in ON-position $R_{DS(on)}$: < 8 Ω Residual current in OFF-position: <1µA Maximum current: < 100 mA Maximum voltage: 24 VDC Switch functions: $15x10^9$ Contact closure: 100 µs (for pacing relay)
Ambient temperature range:	14°F (-10°C) to 113°F (45°C)

Max. fluid operating temperatures:

Material	Constant	Short Term
Acrylic/PVC	113°F (45°C)	140°F (60°C)
Polypropylene	122°F (50°C)	212°F (100°C)
PTFE	122°F (50°C)	248°F (120°C)
316 SS	122°F (50°C)	248°F (120°C)
PVDF	149°F (65°C)	212°F (100°C)

Average power drain at maximum stroking rate (Watts) / current drain at pump stroke (Amps)	
BT4b:	17W / 0.7 A or 15 A (peak current for approx. 1 µs)
BT5b:	22W / 1.0 A or 15 A (peak current for approx. 1 µs)
Service factor:	1.15
Warranty:	2 years on drive, 1 year on liquid end (extended warranties available)
Industry standards:	UL recognized, CE available for U.S.A. and Canada, NSF/ANSI 61
Valve threads:	Metric thread for PP, NP, PVT, and TT versions. 1/2” MNPT connections are available in all materials.
Standard Production Test:	**All pumps are tested for capacity at maximum pressure prior to shipment.**
Max. solids size in fluid:	Pumps with 1/4” valves: 15µ - Pumps with 1/2” valves: 50µ
Controlling contact (pulse):	With voltage free contact, or with semiconductor sink logic control (NPN), not source logic (PNP). With a residual voltage of <700 mV, the contact load is approximately 0.5 mA at +5 VDC. (Note: Semiconductor contacts that require >700 mV across a closed contact should not be used.) Pump ignores contacts exceeding maximum input rate.
Necessary contact duration:	20 µs
Recommended Viscocity:	max. 200 cPs for standard liquid end max. 500 cPs for valve with springs max. 50 cPs for auto-degassing metering pumps max. 3000 cPs for high viscosity

ProMinent® Beta b Solenoid Diaphragm Metering Pumps

Capacity Data

Pump Version	Capacity at Max. Backpressure					Capacity at 1/2 Max. Backpressure					Pre-Primed Suction Lift		Max. Stroking Rate	Tubing Connectors[2] O.D. x I.D.	Shipping Weight (higher weights are for SS)	
	PSIG	(bar)	U.S. GPH	(L/h)	mL/ stroke	PSIG	(bar)	U.S. GPH	(L/h)	mL/ stroke	ft	(m)	spm	in	lbs	(kg)
BT4b: with standard liquid ends																
1000	145	(10)	0.20	(0.74)	0.07	72.5	(5)	0.22	(0.82)	0.08	19.6	(6.0)	180	1/4 x 3/16	6.4-7.9	(2.9-3.6)
2001[3]	290	(20)	0.25	(0.96)	0.10	145	(10)	0.40	(1.5)	0.13	19.6	(6.0)	180	1/4 x 3/16	6.4-7.9	(2.9-3.6)
1601	232	(16)	0.29	(1.1)	0.10	116	(8)	0.37	(1.4)	0.13	19.6	(6.0)	180	1/4 x 3/16	6.4-7.9	(2.9-3.6
2002[3]	290	(20)	0.45	(1.70)	0.20	145	(10)	0.74	(2.8)	0.24	19.6	(6.0)	180	1/4 x 3/16	6.4-7.9	(2.9-3.6)
1602	232	(16)	0.58	(2.2)	0.20	116	(8)	0.66	(2.5)	0.24	19.6	(6.0)	180	1/4 x 3/16	6.4-7.9	(2.9-3.6)
1604	232	(16)	0.95	(3.6)	0.33	116	(8)	1.14	(4.3)	0.40	19.6	(6.0)	180	1/4 x 3/16	6.8-8.6	(3.1-3.9)
0708	101	(7)	1.88	(7.1)	0.66	50.8	(3.5)	2.22	(8.4)	0.78	19.6	(6.0)	180	1/2 x 3/8	6.8-8.6	(3.1-3.9)
0413	58	(4)	3.2	(12.3)	1.14	29	(2)	3.75	(14.2)	1.31	9.8	(3.0)	180	1/2 x 3/8	6.8-8.6	(3.1-3.9)
0220	29	(2)	5.02	(19.0)	1.76	14.5	(1)	5.52	(20.9)	1.94	6.5	(2.0)	180	1/2 x 3/8	7.3-9.7	(3.3-4.4)
BT5b: with standard liquid ends																
2504[3]	363	(25)	0.77	(2.9)	0.27	145	(10)	1.3	(5.0)	0.46	19.6	(6.0)	180	(8 x 4mm)	9.9-11.7	(4.5-5.3)
1008	145	(10)	1.8	(6.8)	0.63	72.5	(5)	2.19	(8.3)	0.76	19.6	(6.0)	180	1/2 x 3/8	9.9-11.7	(4.5-5.3)
0713	101	(7)	2.91	(11.0)	1.02	50.8	(3.5)	3.46	(13.1)	1.21	13.1	(4.0)	180	1/2 x 3/8	9.9-11.7	(4.5-5.3)
0420	58	(4)	4.52	(17.1)	1.58	29	(2)	5.05	(19.1)	1.77	9.8	(3.0)	180	1/2 x 3/8	10.4-12.8	(4.7-5.8)
0232[1]	29	(2)	8.45	(32.0)	2.96	14.5	(1)	9.56	(36.2)	3.35	6.5	(2.0)	180	1/2 x 3/8	11.2-14.6	(5.1-6.6)
BT4b: with auto-degassing liquid ends, 3-port (NPB9/NPE9)																
1601	232	(16)	0.16	(0.6)	0.06	116	(8)	0.21	(0.8)	0.07	5.9	(1.8)	180	1/4 x 3/16	6.4	(2.9)
1602	232	(16)	0.37	(1.4)	0.13	116	(8)	0.46	(1.7)	0.174	6.9	(2.1)	180	1/4 x 3/16	6.4	(2.9)
1604	232	(16)	0.71	(2.7)	0.25	116	(8)	0.95	(3.6)	0.33	8.8	(2.7)	180	1/4 x 3/16	6.8	(3.1)
0708	101	(7)	1.74	(6.6)	0.61	58	(4)	1.98	(7.5)	0.69	6.5	(2.0)	180	1/2 x 3/8	6.8	(3.1)
0413	58	(4)	2.85	(10.8)	1	29	(2)	3.33	(12.6)	1.17	6.5	(2.0)	180	1/2 x 3/8	6.8	(3.1)
0220	29	(2)	4.28	(16.2)	1.5	14.5	(1)	4.76	(18.0)	1.67	6.5	(2.0)	180	1/2 x 3/8	7.3	(3.3)
BT5b: with auto-degassing liquid ends, 3-port (NPB9/NPE9)																
1008	145	(10)	1.66	(6.3)	0.58	72.5	(5)	1.98	(7.5)	0.69	9.8	(3.0)	180	1/2 x 3/8	9.9	(4.5)
0713	101	(7)	2.6	(10.5)	0.911	58	(4)	3.25	(12.3)	1.14	8.2	(2.5)	180	1/2 x 3/8	9.9	(4.5)
0420	58	(4)	4.12	(15.6)	1.44	29	(2)	4.6	(17.4)	1.61	8.2	(2.5)	180	1/2 x 3/8	10.4	(4.7)
BT4b: with self-bleeding liquid ends, 2-port without bypass (PVT7)																
1602	145	(10)	0.37	(1.4)	0.13	16	(8)	0.45	(1.7)	0.16	5.9	(1.8)	180	1/4 x 3/16	6.3	(2.9)
1604	145	(10)	0.71	(2.7)	0.25	16	(8)	0.95	(3.6)	0.33	5.9	(1.8)	180	1/4 x 3/16	6.8	(3.1)
0708	101	(7)	1.8	(6.6)	0.61	50.8	(3.5)	2	(7.5)	0.69	5.9	(1.8)	180	1/2 x 3/8	6.8	(3.1)
0413	58	(4)	2.8	(10.8)	1	29	(2)	3.3	(12.6)	1.17	5.9	(1.8)	180	1/2 x 3/8	6.8	(3.1)
0220	29	(2)	4.4	(16.2)	1.5	14.5	(1)	4.7	(18.0)	1.67	5.9	(1.8)	180	1/2 x 3/8	7.2	(3.3)
BT5b: with self-bleeding liquid ends, 2-port without bypass (PVT7)																
1008	145	(10)	1.7	(6.3)	0.58	72.5	(5)	2	(7.5)	0.69	5.9	(1.8)	180	1/2 x 3/8	9.9	(4.5)
0713	101	(7)	2.8	(10.5)	0.97	58	(3.5)	3.2	(12.3)	1.14	5.9	(1.8)	180	1/2 x 3/8	9.9	(4.5)
0420	58	(4)	4.1	(15.6)	1.44	29	(2)	4.6	(17.4)	1.61	5.9	(1.8)	180	1/2 x 3/8	10.4	(4.7)

Above capacities and suction lift refer to pumps tested on water at 115 VAC, 60 Hz, and an ambient temperature of 70°F (21°C).
Higher specific gravity fluids will reduce suction lift. Higher viscosity fluids will reduce capacity.
Liquid ends for highly viscous media have 10-20% less metering capacity and are not self-priming. Standard connectors are 1/2" MNPT or 5/8" hose barb. Positive suction recommended.

[1] Not available with bleed valve.

[2] SS versions use 1/4" female threads except models 0220, 0420, and 0232 which use 3/8" female threads.

[3] Only available in SS and Acrylic liquid ends

Universal control cable necessary for external Beta control. (see page 151)

Materials In Contact With Chemicals

Liquid end materials in contact with media

Version	Liquid End	Suction/Discharge valves	Seals	Valve balls	Diaphragm*
*PVT	*PVDF	*PVDF	PTFE	Ceramic	PTFE
PPT	Polypropylene	*PVDF	PTFE	Ceramic	PTFE
NPT	Acrylic	*PVDF	PTFE	Ceramic	PTFE
TTT	PTFE with Carbon	PTFE with Carbon	PTFE	Ceramic	PTFE
SST	316 Stainless Steel	316 Stainless Steel	PTFE	Ceramic	PTFE

*Highly compatible material suitable for most fluids.

ProMinent® Beta b
Solenoid Diaphragm Metering Pumps

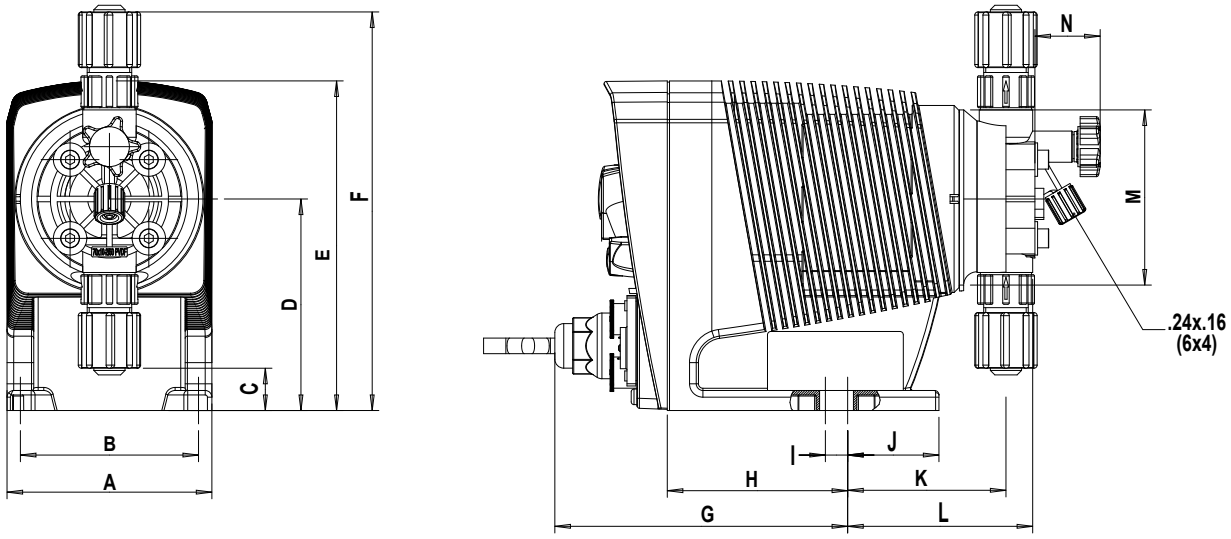
Identcode Ordering System

BT4b	Beta 4b																Beta 5b	
	Version	Capacity															Version	Capacity
	1000	0.20 gph (0.74 l/h), 145 psi (10 bar)															2504	0.77 gph (2.9 l/h), 363 psi (25 bar)
	2001	0.25 gph (0.96 l/h), 290 psi, (20 bar)															1008	1.8 gph (6.8 l/h), 145 psi (10 bar)
	1601	0.29 gph (1.10 l/h), 232 psi (16 bar)															0713	2.91 gph (11.0 l/h), 102 psi (7 bar)
	2002	0.45 gph (1.70 l/h), 290 psi (20 bar)															0420	4.52 gph (17.1 l/h), 58 psi (4 bar)
	1602	0.58 gph (2.2 l/h), 232 psi (16 bar)															0232	8.45 gph (32.0 l/h), 29 psi (2 bar)
		Liquid end material:																
		PP	Polypropylene/PVDF, for self-degassing version Polypropylene/Polypropylene															
		NP	Acrylic glass/PVDF, for self-degassing version Acrylic glass/PVC															
		PV	PVDF/PVDF															
		TT	PTFE/PTFE															
		SS	Stainless steel															
			O-rings:															
			E	EPDM/PTFE coated, only for PP and NP self-degassing														
			B	FPM-B/PTFE coated, only on PP and NP self-degassing														
			T	PTFE/PTFE coated														
			P	Diaphragm and seal EPDM														
				Liquid end version:														
				0	Non-bleed version, no valve spring, for TT, SS and type 0232 only													
				1	Non-bleed version, with valve spring, for TT, SS and type 0232 only													
				2	With deaerator, no valve spring, PP, PV, NP only, not type 0232													
				3	With deaerator, with valve spring, PP, PV, NP only, not type 0232													
				4	Version for highly viscous media, only PVT, types 1005, 1605, 0708, 1008, 0413, 0713, 0220, 0420													
				7	Self-bleeding without bypass, only with PV, not for versions 2504 and 0245													
				9	Auto-degassing for PP, NP only, not for types 1000 and 0232													
					Hydraulic connections:													
					0	Standard according to technical data												
					B	special-connection 3/8" x 1/4"												
						Labeling:												
						0	Standard Housing											
							Logo:											
							0	With ProMinent® logo										
								Power supply:										
								U	Universal 100-240 V									
								M	12-24 VDC									
									Cable and plug:									
									1	6 ft Open end								
									A	6 ft European								
									D	6 ft USA 115 V								
									U	6 ft USA 230 V								
										Relay:								
										0	No relay							
										1	Fault annunciating relay, drops out							
										4	Option 1 + pacing relay							
										5	Option 3 + pacing relay							
											Accessories:							
											0	No accessories						
											1	With foot and injection valve, 5 ft PVC suction tubing, 10 ft PE discharge tubing						
												Control type:						
												0	No lock					
												1	With lock: manual operation locked when external cable plugged in					
													Control variants:					
													0	External contact 1:1				
													A	External analog 0-20mA/4-20mA				
														Remote stop:				
														0	External controllable frequency			
															Auxilliar frequency:			
															0	External controllable frequency =180max		
																Approval:		
																01	CE	
BT4b	**1000**	**PP**	**E**	**0**	**0**	**0**	**0**	**U**	**D**	**0**	**0**	**0**	**0**	**0**	**0**	**01**		

ProMinent® Beta b
Solenoid Diaphragm Metering Pumps

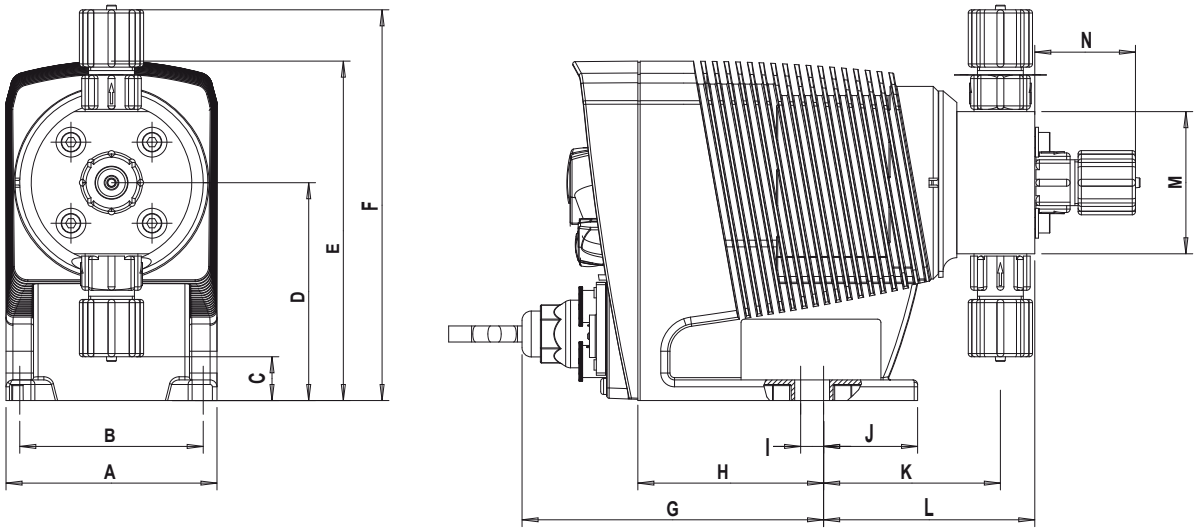
Dimensional Drawings

Dimensions in inches (mm).
Ranges given, actual dimension dependent on liquid end material.



Pump	A	B	C	D	E	F	G	H	I	J	K	L	M	N
BT4	3.6 (92)	3.1 (80)	.13-.75 (3.2-19)	3.7 (95)	5.8 (148)	7.0-7.8 (179-199)	5.2 (131.5)	3.2 (81)	.39 (10)	1.4 (36)	2.8-3.0 (71-76)	3.2-3.7 (83-93)	2.8-4.3 (Ø 90-Ø 110)	1.1 29.3
BT5	4.0 (102)	3.1 (80)	.13-.75 (3.2-19)	4.0 (101)	6.0 (153)	7.0-7.8 (179-199)	5.3 (135.5)	3.3 (85)	.59 (15)	1.6 (41)	2.8-3.0 (71-76)	3.2-3.7 (83-93)	2.8-4.3 (Ø 90-Ø 110)	1.1 29.3

With Auto-Degassing Liquid Ends



Pump	A	B	C	D	E	F	G	H	I	J	K	L	M	N
BT4	3.6 (92)	3.1 (80)	.30-.75 (7.5-19)	3.7 (95)	5.8 (148)	6.7-7.42 (170.5-188.5)	5.2 (131.5)	3.2 (81)	.39 (10)	1.4 (36)	2.9-3.0 (74-77)	3.5-4.2 (89-105.5)	2.8-3.5 (Ø 90-Ø 70)	1.73 43.9
BT5	4.0 (102)	3.1 (80)	.30-.75 (7.5-19)	4.0 (101)	6.0 (153)	6.7-7.42 (170.5-188.5)	5.3 (135.5)	3.3 (85)	.59 (15)	1.6 (41)	2.9-3.0 (74-77)	3.5-4.2 (89-105.5)	2.8-3.5 (Ø 90-Ø 70)	1.73 43.9

ProMinent® gamma/ X Solenoid Diaphragm Metering Pumps

Overview: gamma/ X

The **gamma/ X** solenoid diaphragm metering pump incorporates a wealth of eXcellent ingenuity! With integrated pressure measurement, it ensures the smooth running of your metering process. The **gamma/ X** is ideal for all chemical metering applications. (see **page 143** for spare parts)

- Capacity range from 0.24 GPH to 11.9 GPH, maximum discharge pressure up to 363 psi
- Simple adjustment of the capacity directly in GPH
- Configurable discharge stroke, continuous or pulsed dosing
- Configurable suction stroke duration
- Stroke rate adjustable from 1 – 12,000 strokes per hour
- Electronic stroke length adjustment, continuous from 0 - 100% (recommended range 30 - 100%)
- Suitable for continuous micro-metering from 1 ml/hr thanks to the innovative solenoid control
- Integrated pressure measurement allows for detection of blocked discharge line, broken discharge lines and air or gas bubbles trapped in the dosing head
- Acrylic/PVC, PVT (PVDF) and Stainless Steel liquid end material versions
- Auto degassing liquid ends in Acrylic/ PVC and PVT
- High viscosity liquid ends (PVT4) for viscosities of up to 3000 cP
- Large backlit graphic display and status LED's
- External control via voltage-free contacts with pulse multiplier/divider function
- External control via standard 4-20 mA signal, and scalable adjustment of mA signal to stroke rate
- Standard internal programmable timer for real-time dependent dosing routines i.e biocides, cooling towers etc.
- Standard pump capable of accepting 2-stage tank level sensor input, flow monitor input, diaphragm rupture sensor input and control cable input.
- NSF/ANSI 61 Approved Liquid ends
- Bluetooth, PROFIBUS, CANbus interface as an optional feature (see page 151 for PROFIBUS)

PROFIBUS PROCESS FIELD BUS

Bluetooth™

ProMinent® gamma/ X Solenoid Diaphragm Metering Pumps

Capacity Data

Capacity data: gamma/ X

Pump Version	Capacity at Maximum Backpressure					Max. Stroking Rate	Tubing Connectors O.D. x I.D	Pre-Primed Suction Lift **		SS Liquid end connections FNPT	Shipping Weight lbs	
	psig	(bar)	GPH*	(l/h)	ml/stroke	Strokes/min	in	ft	(m)	in	NP/PV	SS
gamma/ X: with standard liquid ends												
1602	232	(16)	0.61	(2.3)	0.19	200	1/4 x 3/16	19.6	(6)	1/4	7.9	9
1604	232	(16)	0.95	(3.6)	0.30	200	1/4 x 3/16	16.4	(5)	1/4	7.9	9
0708	102	(7)	2.0	(7.6)	0.63	200	1/2 x 3/8	13.1	(4)	1/4	8.1	11
0414	58	(4)	3.56	(13.5)	1.13	200	1/2 x 3/8	9.8	(3)	1/4	8.1	11
0220	29	(2)	5.2	(19.7)	1.64	200	1/2 x 3/8	6.5	(2)	3/8	8.1	11
2504	363	(25)	1.0	(3.8)	0.32	200	(8 x 4mm)	13.1	(4)	1/4	10.8	12.1
1009	145	(10)	2.38	(9.0)	0.75	200	1/2 x 3/8	9.8	(3)	1/4	11.2	14.3
0715	102	(7)	3.83	(14.5)	1.21	200	1/2 x 3/8	9.8	(3)	1/4	11.2	14.3
0424	58	(4)	6.34	(24)	2.00	200	1/2 x 3/8	9.8	(3)	3/8	11.2	14.3
0245	29	(2)	11.9	(45)	3.70	200	1/2 x 3/8	6.5	(2)	3/8	11.5	15.4
gamma/ X: with auto-degassing liquid ends NPB9/ NPE9												
1602	232	(16)	0.34	(1.30)	0.11	200	1/4 x 3/16	6.9	(2.1)	~	7.9	~
1604	232	(16)	0.63	(2.40)	0.21	200	1/2 x 3/8	8.8	(2.7)	~	7.9	~
0708	101	(7)	1.8	(6.80)	0.57	200	1/2 x 3/8	6.5	(2)	~	8.1	~
0414	58	(4)	3.17	(12)	1.00	200	1/2 x 3/8	6.5	(2)	~	8.1	~
0220	29	(2)	4.75	(18)	1.5	200	1/2 x 3/8	6.5	(2)	~	8.1	~
1009	145	(10)	2.11	(8)	0.67	200	1/2 x 3/8	9.8	(3)	~	11.2	~
0715	101	(7)	3.56	(13.5)	1.00	200	1/2 x 3/8	8.2	(2.5)	~	11.2	~
0424	58	(4)	5.28	(20)	1.67	200	1/2 x 3/8	8.2	(2.5)	~	11.2	~
gamma/ X: with self-bleeding liquid ends, 2-port without bypass (PVT7)												
1604	232	(10)	0.42	(1.6)	0.13	200	1/4 x 3/16	6	(1.8)	~	7.9	~
0708	101	(7)	1.50	(5.7)	0.48	200	1/2 x 3/8	6	(1.8)	~	8.1	~
0414	58	(4)	3.17	(12.0)	1.00	200	1/2 x 3/8	6	(1.8)	~	8.1	~
0220	29	(2)	4.60	(17.4)	1.45	200	1/2 x 3/8	6	(1.8)	~	8.1	~
1009	145	(10)	1.58	(6.0)	0.50	200	1/2 x 3/8	6	(1.8)	~	11.2	~
0715	101	(7)	3.40	(12.9)	1.08	200	1/2 x 3/8	6	(1.8)	~	11.2	~
0424	58	(4)	5.07	(19.2)	1.60	200	1/2 x 3/8	6	(1.8)	~	11.2	~

gamma/X metering pumps with high viscosity liquid ends (PVT4) have a 10 – 20 % lower capacity rating and are not self-priming.

Positive suction is recommended and pumps supplied with ½" MNPT connections.

Permissible ambient temperature: 14 °F to 113 °F | Average power consumption: 78 W | Degree of protection: IP 66

** Capacity data represents minimum values, tested using water at 68 ºF (room temperature)*

*** Suction lift with pre-primed suction line and liquid end*

Materials In Contact With Chemicals

Liquid end materials in contact with media

	Pump head	Suction/discharge valve	Ball seat	Seals	Balls
NPE	Clear Acrylic	PVC	EPDM	EPDM	Ceramic
NPB	Clear Acrylic	PVC	FKM	FKM	Ceramic
PPT	Polypropylene	PVDF	PTFE	PTFE	Ceramic
PVT	PVDF	PVDF	PVDF	PTFE	Ceramic
SST	Stainless Steel	Stainless Steel	Ceramic	PTFE	Ceramic

Auto-degassing liquid ends in NP with a valve spring made of Hastelloy C and a PVDF valve insert. PVT7 version with PVDF/PTFE wetted parts. Diaphragm with a PTFE face.

Permissible ambient temperature: 14 °F - 113 °F / Average power consumption: 25/30 W / Degree of protection: IP 66/NEMA 4X

FKM = fluorine rubber

ProMinent® gamma/ X Solenoid Diaphragm Metering Pumps

Specifications

Maximum stroke length: For 70mm solenoid approx. .05”
For 85mm solenoid approx. .06”

Materials of construction

Housing: Fibreglass reinforced PPE (Polyphenylene Ether)
Diaphragm: PTFE faced EPDM with plastic core
Liquid end options: Acrylic/PVC, PVDF, Stainless Steel
Enclosure rating: IP 65
Power supply: 100 – 230 VAC 1 Phase 50 / 60 Hz ± 10%
Power consumption: 1602 / 1604 / 0708 / 0414 / 0220 25 W
2504 / 1009 / 0715 / 0424 / 0245 30 W
Check valves: Double ball suction / discharge (PVT4 with spring loaded single ball)
Power cord: 6ft
Relay cable (optional): 6ft
Relay Options
Identcode Option 1: Relay contact rated 230 VAC 2 A Max
Identcode Option 4: Both relay contacts rated 24 V, 100 mA Max
Identcode Option C: Isolated 4 – 20 mA output can drive up to 300 Ω maximum impedance
Relay contact rated 24 V 100 mA

Ambient temperature range

In operation: 14 °F to 113 °F
Storage & Transport: -4 °F to 140 °F
Max. fluid operating temp:

Material	Constant	Short Term*
Acrylic/PVC	113 °F	140 °F
PVDF	113 °F	248 °F
SS	113 °F	248 °F

*15 minutes at 29 psi maximum

Climate: 95% Relative humidity – non-condensing
Sound pressure level: LpA < 70 dB according to EN ISO 20361
Warranty: 2 years on pump drive, 1 year on liquid end
Valve threads: NP / PVT M20 x 1.5 (provided with adapters for tubing)
Standard production test: All pumps are tested for capacity at maximum pressure prior to shipment
Max solids size in fluid: Versions 1602 / 1604 / 2504 = 15µ
Versions 0708 / 0414 / 0220 / 1009 / 0715 / 0424 / 0245 = 50 µ

Contact input

Minimum pulse duration: 20 ms
Maxiumum pulse input: 25 pulses / second
Analog Input Impedance: 120 Ohms
Recommended Viscocity: Max. 200 cPs for standard liquid end
Max. 500 cPs for valve with springs
Max. 50 cPs for auto-degassing liquid ends
Max. 3000 cPs for high-viscosity liquid ends

ProMinent® gamma/ X Solenoid Diaphragm Metering Pumps

Identcode Ordering System

GMXa — Gamma/ X

Version	Capacity	Version	Capacity	Version	Capacity
1602	0.61 gph (2.3 l/h), 232 psi (16 bar)	0220	5.2 gph (19.7 l/h), 29 psi (2 bar)	0424	6.34 gph (24 l/h), 58 psi (4 bar)
1604	0.95 gph (3.6 l/h), 232 psi (16 bar)	2504	1.0 gph (3.8 l/h), 363 psi (25 bar)	0245	11.9 gph (45 l/h), 29 psi (2 bar)
0708	2.0 gph (7.6 l/h), 102 psi (7 bar)	1009	2.38 gph (9.0 l/h), 145 psi (10 bar)		
0414	3.56 gph (13.5 l/h), 58 psi (4 bar)	0715	3.83 gph (14.5 l/h), 102 psi (7 bar)		

Liquid end material:

NP	Clear acrylic /PVDF, for auto-degassing version Clear acrylic / PVC
PP	Polypropylene
PV	PVDF/PVDF
SS	Stainless Steel
TT	PTFE Carbon-loaded

O-rings:

B	FKM-B/PFTE coated
E	EPDM/PTFE coated
T	PTFE/PFTE coated

Liquid end version:

0	Non-bleed version, no valve spring only with NP, TT and SS and type 0245
1	Non-bleed version, with valve spring only with NP, TT and SS and type 0245
2	Bleed function, no valve springs only with PV, NP not for type 0245
3	Bleed function, with valve springs only with PV, NP not for type 0245
4	Version for highly viscous media only with PV, types 1604, 0708, 0414, 2504, 1009, 0715, 0424
7	Self-bleeding without bypass, only with PV, not for versions 2504, 0245, and 1602
9	Auto-degassing with bypass (SEK), only with NP, not for types 2504 and 0245

Hydraulic connections:

6	Standard (SS/TT)
M	1/4" x 3/16"
N	3/8" x 1/4"
O	1/2" x 1/4" for 2504 only
Q	1/2" x 3/8"

Diaphragm rupture indicator:

0	Without diaphragm rupture indicator
1	With diaphragm rupture indicator, optical sensor

Version:

0	Standard

Logo:

0	Standard, with logo

Electrical Connection:

U	100-230 V, ±10 %, 50/60 Hz

Cable and plug with 6ft (2m) power cord, single phase:

A	European plug
D	N. American plug, 115 V

Relay, pre-set to:

0	Without relay
1	1 x changeover contact 230 V – 2 A, fault indicating relay N/C
4	2 x N/O 24 V – 100 mA, such as 1 + pacing relay
C	1 x N/O 24 V – 100 mA, such as 1 + 4 – 20 mA output
F	Auto degassing module (not available for version 2504)
G	Auto degassing module + fault relay (not available for version 2504), comes with panel

Accessories:

0	Not included (for PVDF, TT, SS)
1	With foot and injection valve, 5 ft PVC suction tubing, 10 ft PE discharge tubing

Control Variants:

0	Manual + external 1:1 with pulse control
3	Manual + external with pulse control + analogue 0/4 - 20 mA
5	Options 3 + 4 week process timer
C	Options 3 + CANopen
R	Options 3 + PROFIBUS® DP interface, M12 Note: no relay with PROFIBUS® version "R"

Metering Monitor:

0	Pulse signal input

Bluetooth connection:

0	Not included
B	Included

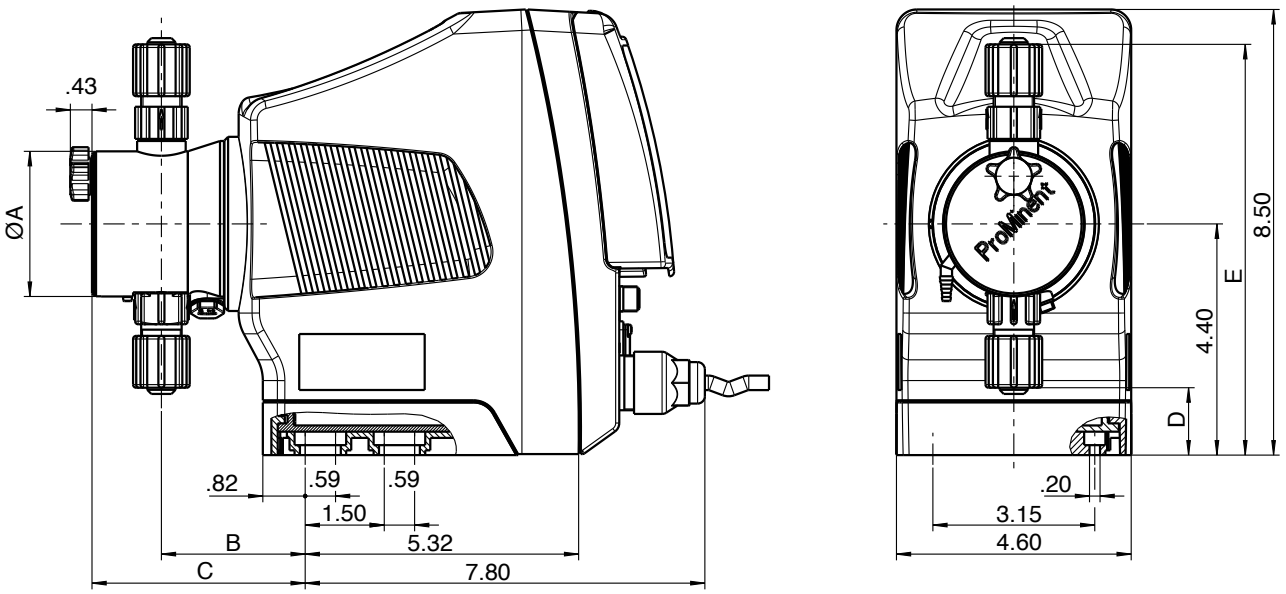
Language:

EN	Standard

GMXa	**1601**	**PP**	**E**	**1**	**M**	**0**	**0**	**0**	**U**	**D**	**1**	**0**	**0**	**0**	**0**	**EN**	

ProMinent® gamma/ X Solenoid Diaphragm Metering Pumps

Dimensional Drawings



Material design **PPT**

Type	Ø A	B	C	D	E
0245	4.30	3.00	–	.55	8.22
0424, 0220	3.50	3.00	4.33	.95	7.95
0715, 0414	3.50	2.91	4.21	.95	7.95
1009, 0708	3.50	2.91	4.25	.95	7.95
1604	2.75	2.80	4.17	1.25	7.80
1602	2.75	2.80	4.17	1.25	7.80

Material design **NPT**

Type	Ø A	B	C	D	E
0245	4.30	3.00	4.13	.55	8.27
0424, 0220	3.50	3.00	4.09	.90	7.87
0715, 0414	3.50	3.00	4.09	.90	7.87
1009, 0708	3.50	2.91	4.01	.90	7.87
1604	2.75	3.03	4.13	1.30	7.52
1602	2.75	3.03	4.13	1.30	7.52

Material design **PVT**

Type	Ø A	B	C	D	E
0245	4.30	3.00	–	.55	8.22
0424, 0220	3.50	3.11	3.50	.98	8.00
0715, 0414	3.50	2.87	3.50	.98	8.00
1009, 0708	3.50	2.95	3.62	.98	8.00
1604	2.75	2.80	3.31	1.42	7.72
1602	2.75	2.80	3.31	1.42	7.72

ProMinent® gamma/ XL Solenoid Diaphragm Metering Pumps

Overview: gamma/ X

The new ***gamma/ XL*** is a solenoid metering pump with predictive intelligence. Thanks to its controlled solenoid drive with sensor-free pressure measurement, it detects hydraulic faults even in the case of minimal deviations – immediately and optimally matching its output to the pressure conditions and properties of the medium while protecting the pump and piping systems from overload situations. The ***gamma/ XL*** covers a capacity range of **.006 GPD** at **363 PSIG** to **21.1 GPH** at **29 PSIG** (depending on pump version).
(see **page 147** for spare parts)

- Electronic stroke length adjustment via click wheel
- Volume adjustment in GPH or LPH
- Manual, Analog, Contact and Batch modes optional
- Integrated system pressure measurement
- BUS interfaces such as Profibus, CANbus, PROFINET and Modbus
- High visibility of LED-indicator lights
- Large illuminated display
- Analog output for stroke length and stroke rate transmission
- Auto compensates programmed feed rates during back pressure fluctuations
- As low as 1 mL/hr continuous feed rate with regulated solenoid drive
- Turn down ratio up to 40,000:1
- Integrated pressure measurement and display
- Available diaphragm rupture indicator
- Integrated 7-day timer
- Detects Overpressure/ No Pressure (broken discharge line) and gas in the liquid end
- Automatically sets optimal speed and stroke based on GPH settings (when set to automatic)
- New configurable input/output
- gamma/ XL and delta footprints are identical

ProMinent® gamma/ XL
Solenoid Diaphragm Metering Pumps

Capacity Data

Capacity data: gamma/ XL

Pump Version	Capacity at Maximum Backpressure					Max. Stroking Rate	Tubing Connectors O.D. x I.D	Pre-Primed SuctionLift **		Shipping Weight lbs	
	PSIG	(bar)	GPH*	(L/H)	ml/stroke	Strokes/min	in	ft	(m)	NPE/NPB/PVT	SS
gamma/ XL: with standard liquid ends											
2508	363	(25)	2.0	(8.0)	0.67	200	3/8" x 1/4" (1/2" MNPT dis. Only)	16.4	(5)	22.0	24.25
1608	232	(16)	2.0	(8.0)	0.67	200	3/8" x 1/4"	16.4	(5)	22.0	24.25
1612	232	(16)	3.17	(12)	1.00	200	3/8" x 1/4"	19.6	(6)	22.0	24.25
1020	145	(10)	5.3	(20)	1.70	200	1/2 x 3/8	16.4	(5)	22.0	24.25
0730	102	(7)	7.9	(30)	2.50	200	1/2 x 3/8	16.4	(5)	22.0	24.25
0450	58	(4)	13.2	(50)	4.20	200	5/8" ID hose barb standard***	9.8	(3)	22.0	24.25
0280	29	(2)	21.1	(80)	6.70	200	5/8" ID hose barb standard***	6.5	(2)	22.0	24.25
gamma/ X: with self-bleeding liquid ends, 2-port without bypass (PVT7)											
1608	145	(10)	1.85	(7)	0.60	200	1/2" x 3/8"	5.9	(1.8)	22.0	~
1612	145	(10)	2.64	(10)	0.80	200	1/2" x 3/8"	5.9	(1.8)	22.0	~
1020	145	(10)	3.96	(15)	1.25	200	1/2" x 3/8"	5.9	(1.8)	22.0	~
0730	102	(7)	7.26	(27.5)	2.30	200	1/2" x 3/8"	5.9	(1.8)	22.0	~

Positive suction is recommended on pumps with 1/2" MNPT connections.

gamma/ XL metering pumps with high viscosity liquid ends (PVT 4) have a 10 – 20 % lower capacity rating and are not self-priming.

Permissible ambient temperature: 14 °F to 113 °F | Average power consumption: 78 W | Degree of protection: IP 66

Repeatability ± 2% when utilized and installed per operating instructions

** Capacity data represents minimum values, tested using water at 68 ºF (room temperature)*

*** Suction lift with pre-primed suction line and liquid end*

**** (1/2" MNPT optional)*

Materials In Contact With Chemicals

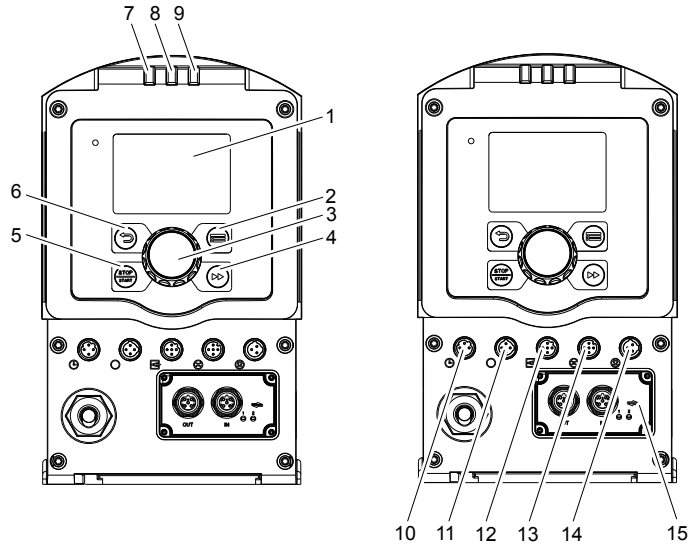
Liquid end materials in contact with media

Version	Liquid End	Suction/discharge valve	Ball seat	Seals	Balls
NPT	Acrylic	PVC	PVDF	PTFE	Ceramic
PVT	PVDF	PVDF	PVDF	PTFE	Ceramic
NPE	Acrylic	PVC	PVDF	EPDM	Ceramic
NPB	Acrylic	PVC	PVDF	FKM	Ceramic
SST	316 SST	316 SST	Ceramic	PTFE	Ceramic
SST (DN10)	316SST	316 SST	PTFE with carbon	PTFE	Ceramic

Note: PVT7 versions have PVDF / PTFE wetted parts. Diaphragm with a PTFE face

FKM = fluorine rubber

Control Elements



1 LCD screen
2 *[Menu]* key
3 Clickwheel
4 *[Priming]* key
5 *[STOP/START]* key
6 *[Back]* key
7 Fault indicator (red)
8 Warning indicator (yellow)
9 Operating indicator (green)
10 "Config I/O" terminal
11 "Diaphragm rupture indicator" terminal
12 "External control" terminal
13 "Metering monitor" terminal
14 "Level switch" terminal
15 Slot for relays and optional modules

ProMinent® gamma/ XL Solenoid Diaphragm Metering Pumps

Specifications

Maximum stroke length: 110 mm solenoid approx. 2mm

Materials of construction:

Housing	Fiberglass reinforced PPE (Polyphenylene Ether)
Diaphragm	PTFE faced EPDM with plastic core
Liquid end options	Acrylic/PVC, PVDF, Stainless Steel
Enclosure rating	IP 66
Power supply	100 – 230 VAC 1 Phase 50 / 60 Hz ± 10%
Power consumption	2508/ 1608/ 1612/ 1020/ 0730/ 0450/ 0280 78 W
Check valves	Double ball suction / discharge (PVT4 with spring loaded single ball)
Power cord	6ft
Relay cable (optional)	6ft
Relay Options:	
Identcode Option 1	Fault indicating relay, N/C 230 V - 6 A Max.
Identcode Option 4	Fault indicating relay, N/C 24 V - 1 A Max. Pacing relay, normally open 24 V - 100 mA Max.
Identcode Option C	4 – 20 mA current output Fault indicating relay 24 V - 100 mA Max.

Ambient temperature range:

In operation	14 °F to 113 °F
Storage & Transport	14 °F to 122 °F

Max. fluid operating temp

Material	Constant	Short Term*
Acrylic/PVC	104 °F	140 °F
PVDF	122 °F	248 °F
SS	122 °F	248 °F

15 minutes at 29 psi maximum

Climate:	95% Relative humidity – non-condensing
Sound pressure level:	LpA < 70 dB according to EN ISO 20361
Warranty:	2 years on pump drive, 1 year on liquid end
Valve threads:	NP / PVT M20 x 1.5 (provided with adapters for tubing)
Standard production test:	All pumps are tested for capacity at maximum pressure prior to shipment

Contact input:

Minimum pulse duration	10 ms
Maximum pulse input	50 pulses / second
Analog Input Impedance	120 Ohms
Recommended Viscosity	Max. 0-50 cPs for standard liquid end Max. 50-200 cPs for valve with springs Max. 20-500 cPs for auto-degassing liquid ends Max. 500-1000 cPs for high-viscosity liquid ends

ProMinent® gamma/ XL
Solenoid Diaphragm Metering Pumps

Identcode Ordering System

GXLa **Product Range**

Regional Version

US North America

Version	Capacity	Version	Capacity
2508	2.0 gph (8 l/h), 363 psi (25 bar)	0730	7.9 gph (30 l/h), 102 psi (7 bar)
1608	2.0 gph (8 l/h), 232 psi (16 bar)	0450	13.2 gph (50 l/h), 58 psi (4 bar)
1612	3.17 gph (12 l/h), 232 psi (16 bar)	0280	21.1 gph (80 l/h), 29 psi (2 bar)
1020	5.3 gph (20 l/h), 145 psi (10 bar)		

Liquid end material:

- PV PVDF/PVDF, not for pump type 2508
- NP Clear acrylic /PVC, only for pump types 2508, 1608, 1612, 1020 and 0730
- SS Stainless Steel

O-rings:

- B Standard Diaphragm/ Viton-B seal
- E Standard Diaphragm/ EPDM seal
- F FDA-Compliant
- T Standard Diaphragm/ PTFE seal

Liquid end version:

- 0 Without bleed valve, without valve spring, only with material TT and SS
- 1 Without bleed valve, with valve spring, only with material TT and SS
- 2 With bleed valve, without valve spring, only with material NP and PV
- 3 With bleed valve, with valve spring, only with material NP and PV
- 4 HV design for higher-viscosity media, only for types 1608, 1612, 1020 and 0730
- 7 Self-bleeding without bypass, only for types 1608, 1612, 1020 and 0730, only for material NP and PV

Hydraulic connections:

- 6 Standard connection for SST and PVT4 ONLY
- 7 without connection
- M Connection 1/4" x 3/16" USA
- N Connection 3/8" x 1/4" USA
- Q Connection 1/2" x 3/8" USA

Diaphragm rupture indicator:

- 0 Without diaphragm rupture indicator
- 1 With diaphragm rupture indicator, optical sensor

Version:

- 0 Standard

Logo:

- 0 Standard, with logo

Electrical Connection:

- U 100-240 V, ±10 %, 50/60 Hz

Cable and plug:

- A European plug, 6 ft
- D N. American plug, 115 V, 6 ft
- V N. American plug, 115 V, 16 ft
- W N. American plug, 115 V, 32 ft

Relay, pre-set to:

- 0 Without relay
- 1 1 x changeover contact 230 V – 2 A, fault indicating relay N/C
- 4 2 x N/O 24 V – 100 mA, such as 1 + pacing relay
- C 1 x N/O 24 V – 100 mA, such as 1 + 4 – 20 mA output

Accessories:

- 0 Without accessories
- 1 With foot and injection valve

Control Variants:

- 0 Manual + external 1:1 with pulse control
- 3 Manual + external with pulse control + analogue 0/4 - 20 mA
- C CANopen
- D CANopen Dulcomarin
- E PROFINET®
- M Modbus RTU
- P PROFINET® without certificate
- R PROFIBUS® M12 plug

Communication:

- 0 Without

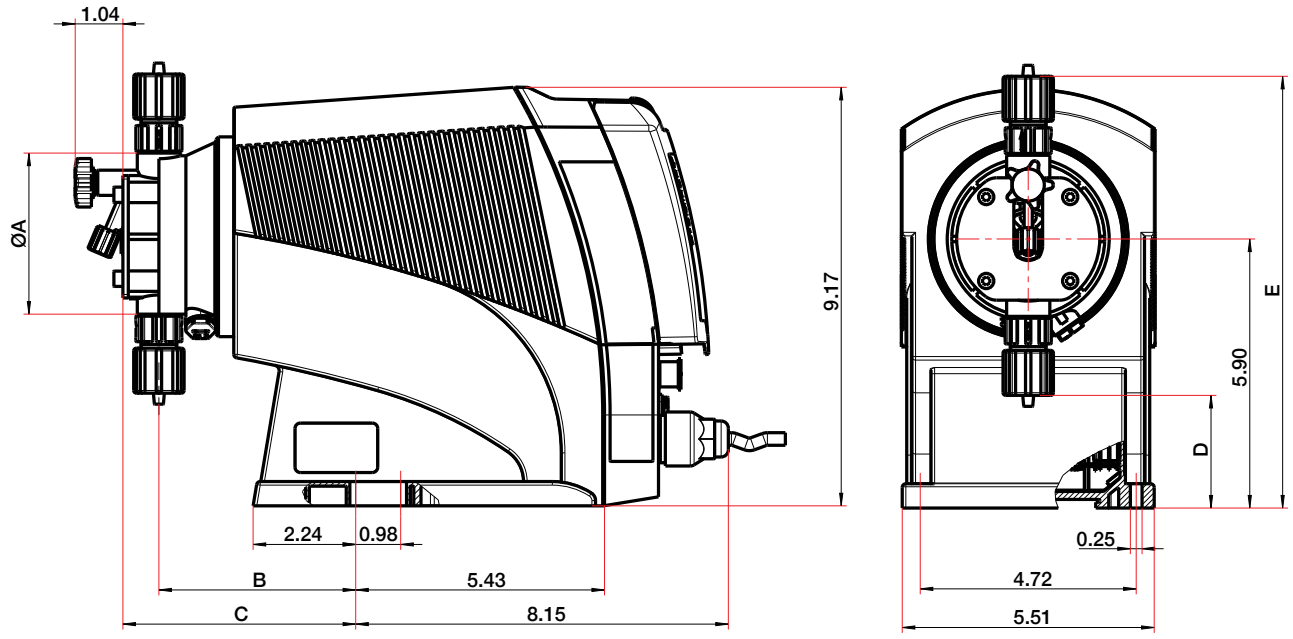
Language:

- EN Standard

GXLa	US	1608	PV	T	2	6	0	0	0	U	A	0	0	0	0	EN	

ProMinent® gamma/ XL
Solenoid Diaphragm Metering Pumps

Dimensional Drawings



	1608	1612	1020	0703
⌀A	3.54	3.54	3.54	3.54
B	4.25	4.33	4.33	4.40
C (with bleed valve)	~	5.12	5.12	5.20
C (SER)	5.03	5.12	5.12	5.20
D	2.50	2.50	2.50	2.50
E	9.45	9.45	9.45	9.45

Note: The above drawing represents the **PV** liquid end version (see O&M for all other) All measurements are in inches

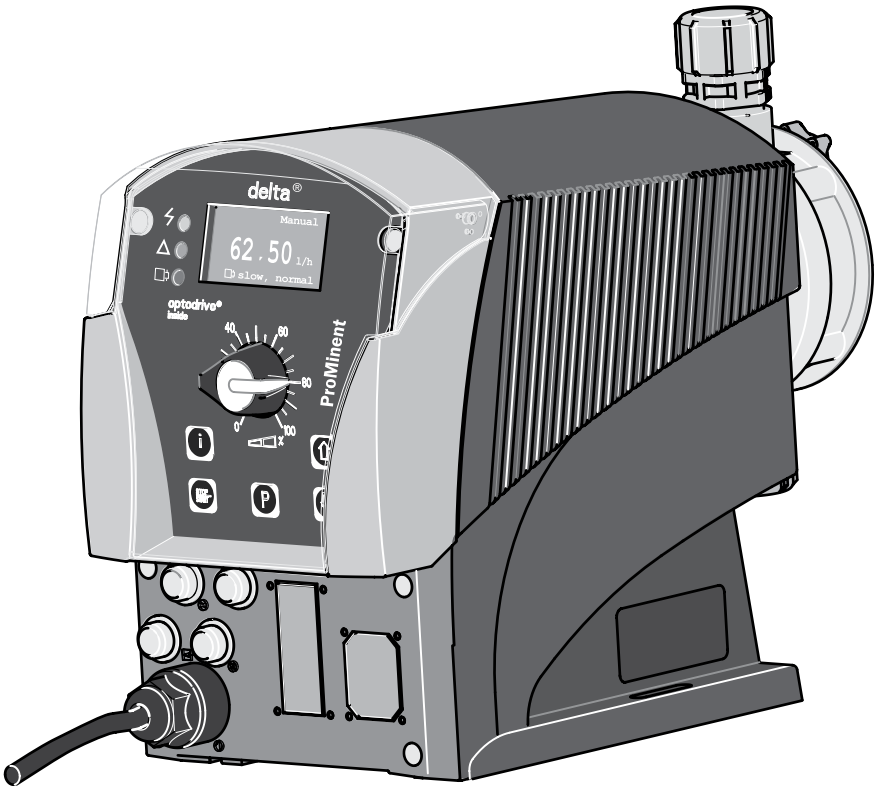
ProMinent® delta
Solenoid Diaphragm Metering Pumps

Overview: delta (No Longer Available, for Reference ONLY)

Ideal for applications requiring metering pump accuracy with minimal pulsation

(see page 147 for spare parts and page 151 for control cables)

- Continuous or pulsating dosing
- Configurable suction and delivery stroke duration
- Pump can be adapted to the dosing media
- Integrated optoGuard monitoring detects blocked dosing points, broken dosing lines and air or gas bubbles trapped in the dosing head
- Capacities: 2.0 gph (7.5 lph) to 19.8 gph (75.0 l/h)
- Stroke length continuously adjustable from 0 - 100% (recommended range 30 - 100%)
- Acrylic, PVDF and stainless steel material versions
- Patented bleed
- Optional detection and indication of diaphragm failure
- Adjustment and display of pump delivery from the keypad with choice of display in l/h or strokes/min
- Optional external auto-degassing solenoid kit available for outgassing media
- Large backlit graphic display
- External control options via voltage-free contacts with optional increase/reduce speed pulse
- Optional external control via standard 0/4-20 mA signal
- Interfaces for PROFIBUS® DP *(see page 151)* or CAN bus system
- 14-day process timer option for time and event-dependent dosing duties
- Connections for 2 stage-level switch and flow monitor
- 3 LED displays for operation and warning and error message in plain text
- Optional concentration input for volume-proportional dosing
- NSF/ANSI 61 approved



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ProMinent® delta
Solenoid Diaphragm Metering Pumps

Capacity Data

Capacity data: delta

Pump Version	Capacity at Maximum Backpressure				Max. strokes/ min.	Pre-primed suct. lift		Suction/Discharge connectors	Shipping weights (higher weights are for SST)	
	GPH	**(L/h)**	**psig**	**(bar)**	**spm**	**ft**	**(m)**	**in**	**lbs**	**(kg)**
2508	2	(7.5)	363	(25)	200	19.6	(5)	3/8" x 1/2" (1/2" MNPT dis. only)	22-24	(10-11)
1608	2.1	(7.8)	232	(16)	200	16.4	(5)	3/8" x 1/4"	22-24	(10-11)
1612	3	(11.3)	232	(16)	200	19.6	(6)	3/8" x 1/4"	22-24	(10-11)
1020	4.8	(18.0)	145	(10)	200	16.4	(5)	1/2" x 3/8"	22-24	(10-11)
0730	7.7	(29.2)	102	(7)	200	16.4	(5)	1/2" x 3/8"	22-24	(10-11)
0450	12.9	(49.0)	58	(4)	200	9.8	(3)	5/8" ID hose barb standard[1]	22-24	(10-11)
0280	19.8	(75.0)	29	(2)	200	6.7	(2)	5/8" ID hose barb standard[1]	22-24	(10-11)
delta: with self-bleeding liquid end without bypass										
1608	1	(3.8)	232	(16)	200	5.9	(1.8)	1/2" x 3/8"	22.0	(10.0)
1612	1.7	(6.5)	232	(16)	200	5.9	(1.8)	1/2" x 3/8"	22.0	(10.0)
1020	3.7	(14.0)	145	(10)	200	5.9	(1.8)	1/2" x 3/8"	22.0	(10.0)
0730	7.4	(28.0)	101	(7)	200	5.9	(1.8)	1/2" x 3/8"	22.0	(10.0)

Above capacities and suction lift refer to pumps tested on water at 115 VAC, 60 Hz, and an ambient temperature of 70°F (21°C).
Higher specific gravity fluids will reduce suction lift. Higher viscosity fluids will reduce capacity.

[1] (1/2" MNPT optional)

Materials In Contact With Chemicals

Liquid end materials in contact with media

Version	Liquid End	valves	Seals	Valve balls	Diaphragm*
*PVT	*PVDF	*PVDF	PTFE	Ceramic	PTFE
SST	316 SS	316 SS	PTFE	Ceramic	PTFE
NPE	Acrylic	PVC	EPDM	Ceramic	PTFE
NPB	Acrylic	PVC	Viton®	Ceramic	PTFE

*Highly compatible material suitable for most fluids.
Viton® is a registered trademark of DuPont Dow Elastomers.

ProMinent® delta
Solenoid Diaphragm Metering Pumps

Identcode Ordering System

DLTA **delta**

Version	Capacity	Version	Capacity
2508	2.1 gph (7.5 l/h), 362 psi (25 bar)	0730	7.7 gph (29.20 l/h), 101.5 psi (7 bar)
1608	2.1 gph (7.8 l/h), 232 psi (16 bar)	0450	13 gph (49 l/h), 58 psi (4 bar)
1612	3.0 gph (11.30 l/h), 232 psi (16 bar)	0280	19.8 gph (75 l/h), 29 psi (2 bar)
1020	5.05 gph (19.1 l/h), 145 psi (25 bar)		

Liquid end materials:

PV	PVDF (for models 1608, 1612, 1020, and 0730)
SS	SS
NP	Acrylic glass/PVC (for pump type 2508, 1608, 1612, 1020 & 0730)

O-rings:

T	PTFE seals
E	EPDM o-ring (NP only)
B	Viton® o-rings (NP only)

Liquid end version:

0	W/o bleed valve, w/o spings (for SS liquid ends)
1	W/o bleed valve, with springs (for SS liquid ends)
2	With bleed valve, w/o springs
3	With bleed valve, with springs
4	W/o bleed valve, with springs (for high viscosity only)
X	W/o liquid end

Connection:

0	1/2" x 3/8" tubing (for models 1020 & 0730); 5/8" hose barb (for models 0450 & 0280); 3/8" x 1/4" tubing (for models 1608 & 1612)
6	1/2" MNPT Connections (for models 0450, 0280 & 2508)

Diaphragm failure indicator:

0	Without diaphragm failure indicator
1	With diaphragm failure indicator

Logo:

0	Standard, with ProMinent® logo

Electrical connection (± 10%)

U	115-230 V, 50/60 Hz

Cable and plug with 6 ft (2 m) power cord, single phase:

A	European plug
D	N. American plug, 115 V
U	N. American plug, 230V

Relay:

0	Without relay (Required with PROFIBUS)
1	Fault annunciating relay, drops out
3	Fault annunciating relay, pulls in
4	Option 1 + pacing relay
5	Option 3 + pacing relay
A	Alarm indication + pump shut off
C	Option 1 + 4-20 mA analog output + fault output (24V 100 mA max.)
G	Auto-degassing valve + fault relay (not available for version 2508)

Accessories:

0	Not included
1	Foot Valve, Inj Valve, 15' Tubing (3/8" x 1/4") PVC (for model 1608)
1	Foot Valve, Inj Valve, 15' Tubing (3/8" x 1/4") PVDF (for model 1612)
1	Foot Valve, Inj Valve, 15' Tubing (1/2" x 3/8") PVC (for model 1020)
1	Foot Valve, Inj Valve, 15' Tubing (1/2" x 3/8") PVDF (for model 0730)
1	Foot Valve, Inj Valve, 5' Suction Tubing (1/2" x 3/8") PVC (1/2" MNPT on Discharge) (for model 2508)
1	FV, IV, 15' House (5/8" ID) PVDF (for models 0450 & 0280)

Control Variants:

0	Manual + External contact (multiplier/divider)
3	Manual + External with pulse control & analog control
4	Option 0 + 14 day timer
5	Option 3 + 14 day timer
M	with pH,ORP and chlorine control module
R	Option 3 + Profibus M12 (Relay must be 0)

Access Code:

0	No Access Code
1	Access Code

Language:

EN	English

Pause/Float:

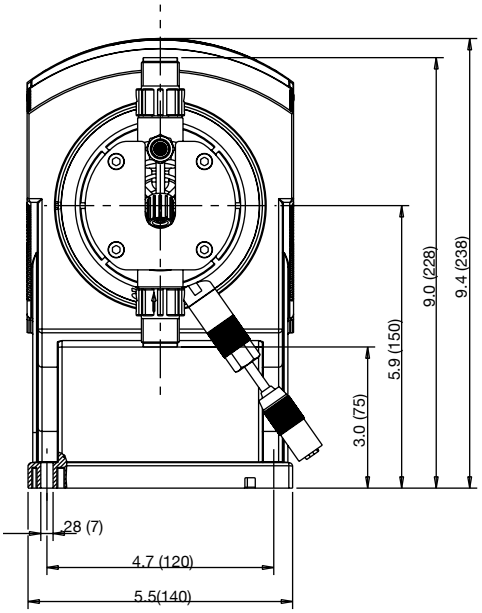
0	Standard

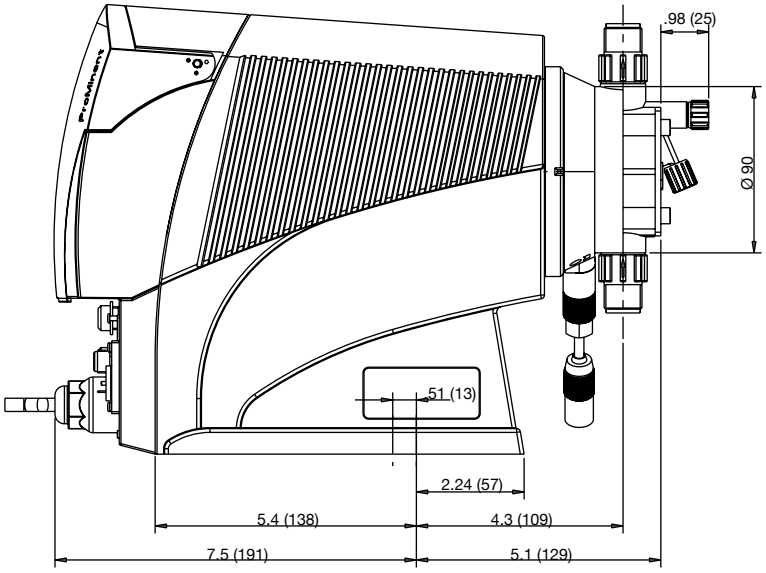
DLTA	2508	PV	0	0	0	0	0	U	A	0	0	0	0	EN	0

Dimensional Drawings

Dimensions in inches (mm).
Ranges given, actual dimension dependent on liquid end material.

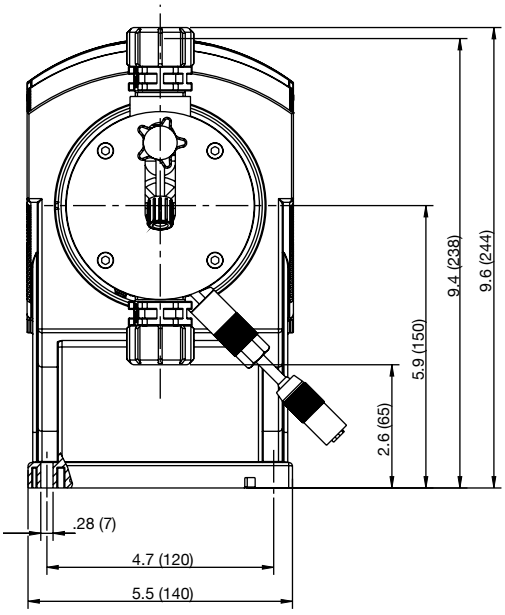
Dimensions of delta® type 1612 - 0730 PVT

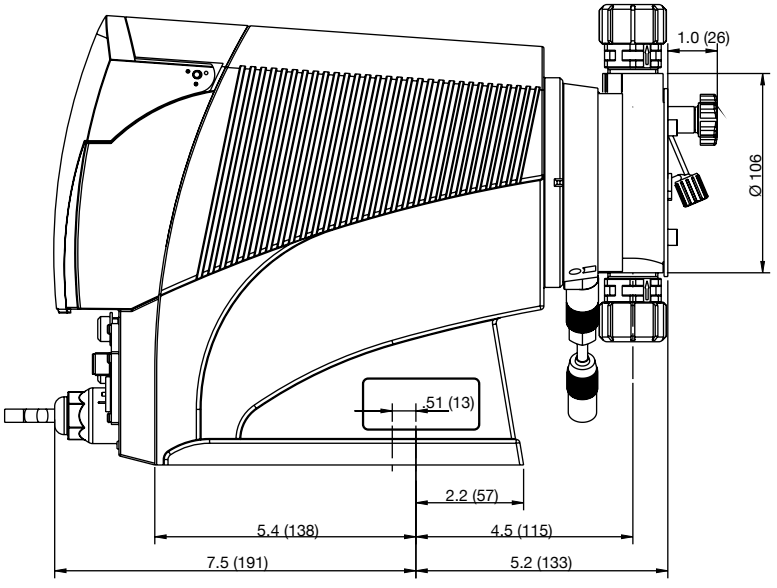




dimensions in inches (mm)

Dimensions of delta® type 0450 - 0280 PVT



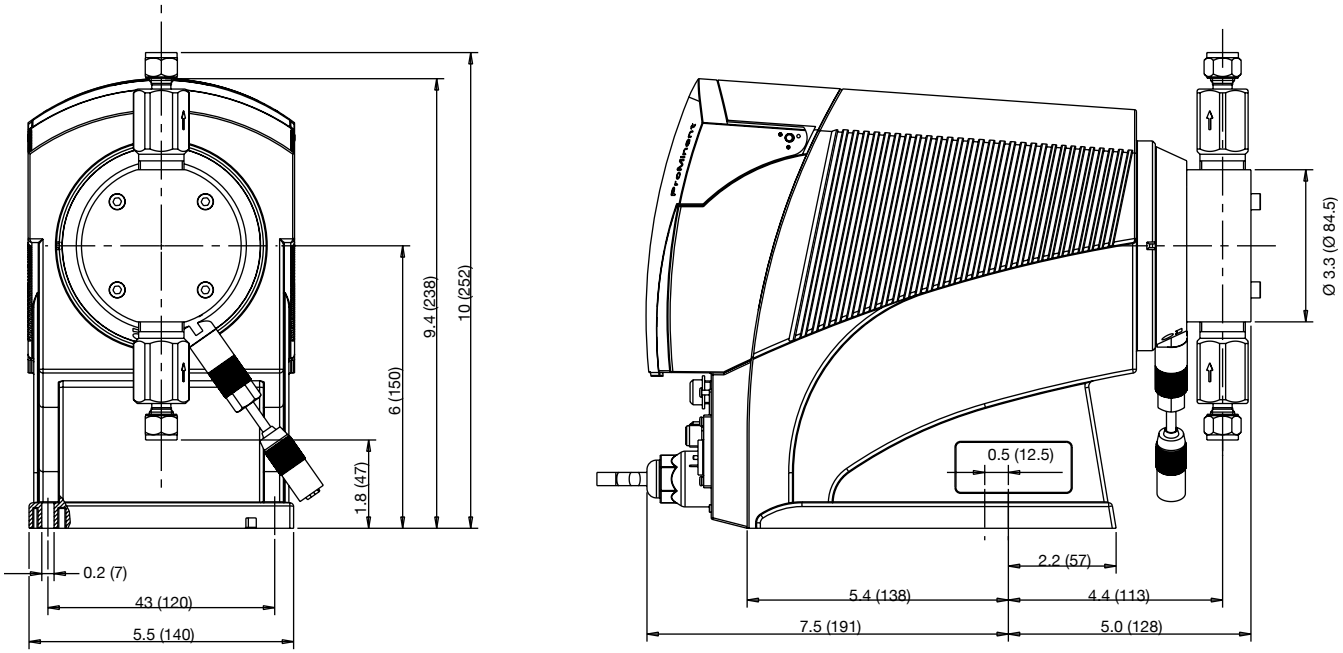


dimensions in inches (mm)

ProMinent® delta
Solenoid Diaphragm Metering Pumps

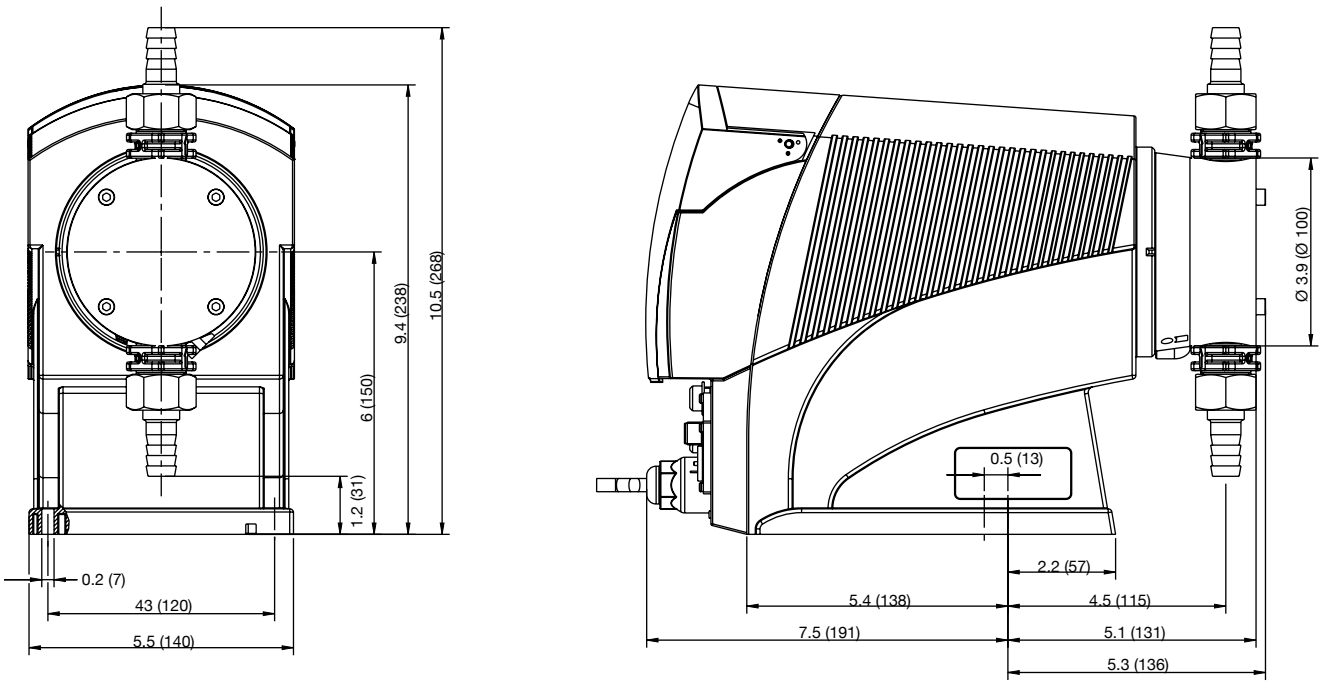
Dimensional Drawings

Dimensions of delta® type 1612 - 0730 SST



dimensions in inches (mm)

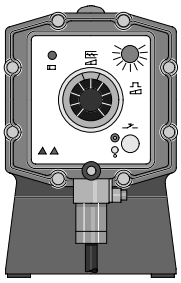
Dimensions of delta® type 0450 - 0280 SST



dimensions in inches (mm)

ProMinent® EXtronic Solenoid Diaphragm Metering Pumps

Overview: EXtronic



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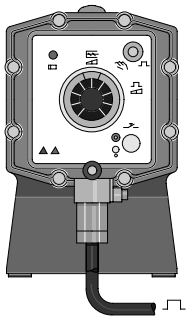
Control type "Internal"

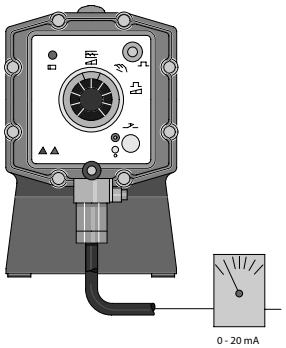
Stroke length adjustment 1:10, stroking rate adjustment 1:25, total adjustment range 1:250.



pk_1_019

Control type: "External Contact"

Stroke length adjustment 1:10, stroking rate control 0-100 % dependant upon external switch contacts. *)



pk_1_018

Control type: "Analogue"

Stroke length adjustment 1:10, Stoke frequency control 0-100 % proportional to analogue signal 0/4-20 mA. *)

*) The electrical cables for mains connection, contact or analogue control are already connected to the pump. Observe all instructions concerning connecting and activating electrical systems.

Ideal for explosion-proof applications

(*see page 146 for spare parts)* The ProMinent EXtronic series represents a proven technology for metering liquid media in hazardous areas classified in accordance with Zone 1 and in fire-damp-endangered mining applications.

- The new microprocessor control compensates for fluctuations in the power supply. Automatic switchover from 50 Hz to 60 Hz operation with no change in capacity.
- Operating voltage of 500V increases the scope of application for ProMinent EXtronic (e.g. in conjection with the new EXBb M version for fire-damp-endangered areas in mining applications).
- The short-stroke solenoid drive is combined with liquid ends from the ProMinent gamma series. The material version SB material is recommended for use with flammable media.
- The control inputs "External Contact", "Analog", and "Zero Volts ON/OFF"are intrinsically safe for the EXBb-registered in accordance with EN 50020.
- The 2501 SSM/SBM type is available with diaphragm failure detection
- The capacity range extends from 0.06 gph (0.19 L/h) to 15.8 gph (60 L/h) at backpressures of up to maximum 363 psig (25 bar).

Factory Mutual Hazard Classification

Factory Mutual Research Corporation has certified that EXtronic series pumps are in compliance with explosion-proof classifications Class 1, Division 1, Groups B, C and D indoor hazardous locations; and with intrinsically safe output connections for Class 1, Division 1, Groups A, B, C, and D hazardous locations. Installation must be in accordance with manufacturer's instructions and the National Electrical Code.

CSA Approval

CSA approved for Class 1, Division 1, Groups B, C and D locations.

ProMinent EXtronic metering pumps are tested and classified in compliance with harmonized European Standards EN 50014/50018 for "flame-proof enclosure." They have the highest degree of protection in this type of enclosure class. This approval is recognized by many other countries outside the EC member states.

The short-stroke solenoid and electronic control are integrated in the pump housing. The enclsoure rating in accordance with DIN 40050, even with the front cover open.

The liquid end is equipped with a registered multi-layer (Teflon coated) pump diaphragm. The liquid end is made of Acrylic, Polypropylene (PP), PTFE-Teflon, 316 stainless steel and SB for flammable chemicals to ensure maximum operating safety.

Self-bleeding liquid ends made of Acrylic (NS) and PVC (PS) are available for off-gassing fluids.

The micrometering adjusting knob for the stroke length enables precision setting of the capacity and ensures a high degree of repeatability. A comprehensive range of explosion-proof ancillary equipment and pump accessories is available.

EXBb G for use in gas and fire damp hazardous areas
Degree of protection EEx [i,a] d IIC T6

EEX - Explosion-proof equipment built in accordance with European standards

[i,a] - Intrinsically safe control input in the case of two independent faults occurring

d - Flameproof enclosure protection

IIC - Explosion Group II for all hazardous areas apart from mines (includes IIA and IIB)

T6 - Temperature class approval for gases and vapours with ignition temperature > 85°C

EXBb M for use in hazardous mining operations
Degree of protection EEX d I/IIC T6

EEX - Explosion-proof equipment built in accordance with European standards

d- Flameproof enclosure protection

IC - Explosion Group I for firedamp-endangered mines

IIC - Explosion Group II for all other hazardous areas apart from mines (includes IIA and IIB)

T6 - Temperature class approval for gases and vapors with ignition temperature > 85°C. This is the highest temperature class; it includes T1 to T5.

ProMinent® EXtronic
Solenoid Diaphragm Metering Pumps

Specifications

Maximum stroke length:	0.026” (0.65 mm) for pump models 1000 0.049” (1.25 mm) for all other models
Materials of construction	
Housing:	Epoxy coated die cast aluminum
Diaphragm:	PTFE faced EPDM with steel core
Liquid end options:	Polypropylene, Acrylic/PVC, PTFE, 316 SS, high-viscosity Polypropylene
Enclosure rating:	(IP 65); insulation class F
Power supply:	500V ±6%, 50/60 Hz 230V ±10%, 50/60 Hz 115V ±10%, 50/60 Hz
	Mean power input at max. stroke frequency (W)/peak current consumption for metering stroke (A) at 230V, 50/60 Hz EXBb Type 1000, 1601, 1201, 0803, 1002, 0308: 23/25 W/0.9 A at 120 strokes/min. EXBb Type 2502, 1006, 0613, 0417: 54/61 W/2.1 A at 120 strokes/min. EXBb Type 2505, 1310, 1014, 0430, 0260: 77/83 W/3.1 A at 110 strokes/min.
Thermal protection:	Yes
Check valves:	all models double ball except single ball on PP4 (HV) models
Repeatability:	When used according to operating instructions, ±2%; For type 1601 with self-degassing liquid end, ±5%.
Power cord:	6 ft. (2 m) 2 wire plus ground (no plug)
External control cable:	6 ft. (2 m) 2 wire
Ambient temperature range:	14°F (-10°C) to 113°F (45°C)

Max. fluid operating temperatures:

Material	Constant	Short Term
Acrylic/PVC	113°F (45°C)	140°F (60°C)
Polypropylene	122°F (50°C)	212°F (100°C)
PTFE	122°F (50°C)	248°F (120°C)
316 SS	122°F (50°C)	248°F (120°C)

Max. allowable input current:	50 mA
Warranty:	Two years on drive; one year on liquid end.
Industry standards:	Factory mutual (explosion-proof, intrinsically safe), CSA approved and CE approved. EN 50014/50018; VDE 0170/0171-5.78,
Standard Production Test:	**100% tested for rated pressure and volume**
Max. solids size in fluid:	Pumps with 1/4” valves: 15µ; pumps with 1/2” valve: 50µ
Controlling contact (pulse):	With voltage free contact, or with semiconductor sink logic control (NPN), not source logic (PNP); with a residual voltage of <700 mV, the contact load is approximately 20 mA at +10 VDC. (*Note*: Semiconductor contacts that require >700 mV across a closed contact should not be used).
Necessary contact duration:	100 ms

ProMinent® EXtronic Solenoid Diaphragm Metering Pumps

Capacity Data

Capacity data: Extronic

Pump Version	Capacity at Max. Backpressure					Capacity at 1/2 Max. Backpressure					Pre-Primed Suction Lift		Max. Stroking Rate	Tubing Connectors O.D. x I.D.	Shipping Weight (higher weights are for SS)	
EXBb	psig	(bar)	GPH	(L/h)	mL/ stroke	psig	(bar)	GPH	(L/h)	mL/ stroke	ft	(m)	spm	in	lbs	(kg)
1000	145	(10)	0.05	(0.19)	0.03	73	(5)	0.07	(0.27)	0.04	4.9	(1.5)	120	1/4 x 3/16	26.5-35.3	(12-16)
1601	232	(16)	0.26	(1.0)	0.14	116	(8)	0.34	(1.3)	0.18	16.4	(5)	120	1/4 x 3/16	26.5-35.3	(12-16)
2501	363	(25)	0.30	(1.14)	0.15	290	(20)	0.29	(1.1)	0.17	16.4	(5)	120	1/4 x 3/16	39.7	(18)
1201	174	(12)	0.45	(1.7)	0.23	87	(6)	0.53	(2.0)	0.28	16.4	(5)	120	1/4 x 3/16	26.5-35.3	(12-16)
2502	363	(25)	0.53	(2.0)	0.28	290	(20)	0.58	(2.2)	0.31	16.4	(5)	120	1/4 FNPT	28.7-37.5	(13-17)
1002*	145	(10)	0.61	(2.3)	0.31	73	(5)	0.71	(2.7)	0.38	16.4	(5)	120	1/2 x 3/8	26.5-35.3	(12-16)
0803	116	(8)	0.98	(3.7)	0.51	58	(4)	1.03	(3.9)	0.54	9.8	(3)	120	1/4 x 3/16	26.5-35.3	(12-16)
2505	363	(25)	1.11	(4.2)	0.64	290	(20)	1.27	(4.8)	0.73	6.5	(2)	110	1/4 FNPT	35.3-44.1	(16-20)
1006*	145	(10)	1.59	(6.0)	0.83	73	(5)	1.9	(7.2)	1	16.4	(5)	120	1/2 x 3/8	28.7-37.5	(13-17)
0308	44	(3)	2.27	(8.6)	1.2	22	(1)	2.72	(10.3)	1.43	16.4	(5)	120	1/2 x 3/8	26.5-35.3	(12-16)
1310*	188	(13)	2.77	(10.5)	1.59	87	(6)	3.14	(11.9)	1.8	16.4	(5)	110	1/2 x 3/8	35.3-44.1	(16-20)
0613	87	(6)	3.46	(13.1)	1.82	44	(3)	3.94	(14.9)	2.07	18.0	(5.5)	120	1/2 x 3/8	28.7-37.5	(13-17)
0814*	116	(8)	3.70	(14.0)	2.12	58	(4)	4.07	(15.4)	2.33	16.4	(5)	110	1/2 x 3/8	35.3-44.1	(16-20)
0417	51	(3.5)	4.6	(17.4)	2.42	29	(2)	4.73	(17.9)	2.49	14.7	(4.5)	120	1/2 x 3/8	28.7-37.5	(13-17)
0430	51	(3.5)	7.13	(27.0)	4.09	29	(2)	7.79	(29.5)	4.47	16.4	(5)	110	DN 10	35.3-44.1	(16-20)
0260	22	(1.5)	15.85	(60.0)	9.09	-	(-)	-	(-)	-	4.9	(1.5)	110	DN 15	35.3-44.1	(16-20)
EXtronic with Auto-degassing Liquid Ends																
1601	232	(16)	0.17	(0.66)	0.09	-	(-)	-	(-)	-	5.9	(1.8)	120	1/4 x 3/16	27	(12)
1201	174	(12)	0.26	(1.0)	0.14	-	(-)	-	(-)	-	6.6	(2.0)	120	1/4 x 3/16	27	(12)
0803	116	(8)	0.63	(2.4)	0.33	-	(-)	-	(-)	-	9.2	(2.8)	120	1/4 x 3/16	27	(12)
1002	145	(10)	0.48	(1.8)	0.25	-	(-)	-	(-)	-	6.6	(2.0)	120	1/4 x 3/16	27	(12)

Above capacities and suction lift refer to pumps tested on water at 115 VAC, 60 Hz, and an ambient temperature of 70°F (20°C).
Higher specific gravity fluids will reduce suction lift. Higher viscosity fluids will reduce capacity.
Liquid ends for highly viscous media have 10-20% less metering capacity and are not self-priming. Standard connectors are 1/2" MNPT or 5/8" hose barb. Positive suction is recommended.
*High Viscosity models are available in the 1002, 1006, 1310 and 0814 models. Liquid end designation is PP4 (Polypropylene/EPDM) Suitable for viscosities to 3500 cps

ProMinent® EXtronic
Solenoid Diaphragm Metering Pumps

Materials in Contact With Chemicals

Version	Liquid End	Suction/Discharge	Seals	Valve balls	Diaphragm
PP1	Polypropylene	Polypropylene	EPDM	Ceramic	PTFE
PP4[1]	Polypropylene	Polypropylene	EPDM	Ceramic	PTFE
NP1	Acrylic	PVC	Viton®	Ceramic	PTFE
NP3	Acrylic	PVC	Viton®	Ceramic	PTFE
NS3[2]	Acrylic	PVC	Viton®	Ceramic	PTFE
PS3[2]	PVC	PVC	Viton®	Ceramic	PTFE
TT1	PTFE with carbon	PTFE with carbon	PTFE	Ceramic	PTFE
TTT	PTFE with carbon	PTFE with Carbon	PTFE	Ceramic	PTFE
SS	316 Stainless steel	316 Stainless Steel	PTFE	Ceramic[3]	PTFE

[1] PP4 with Hastelloy C valve springs.
[2] NS3 and PS3 with Hastelloy C valve springs, PVDF valve core. NOTE: Viton® is a registered trademark of DuPont Dow Elastomers.
[3] DN 10 and DN 15 valve balls are 316 stainless steel

Factory Mutual System approved

Approved
(standard in Canada)

Approved

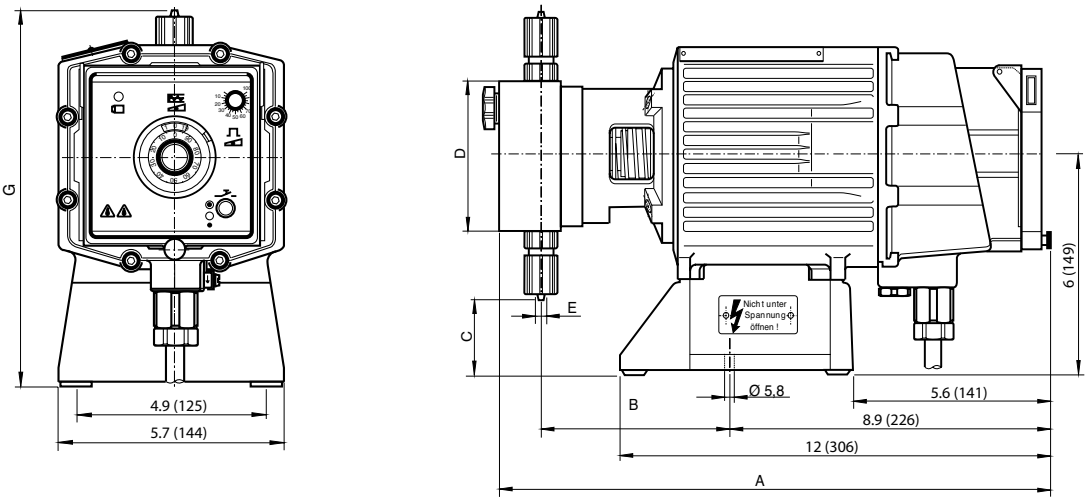
The EXtronic metering pumps are registered according to DIN-VDE 0170/0171-5.78.

ProMinent® EXtronic Solenoid Diaphragm Metering Pumps

Identcode Ordering System

EXBb	Enclosure Type:								
	G	Explosion protection							
	M	Fire and explosion protection: permissible liquid end material - PTFE & Stainless Steel							
	Version:	Capacity:			Version:	Capacity:			
	1000	0.05 gph, 145 psi			0613	3.46 gph, 87 psi			
	1601	0.26 gph, 232 psi			0417	4.6 gph, 50.8 psi			
	1201	0.45 gph, 174 psi			2501***	0.26 gph, 363 psi			
	0803	0.98 gph, 116 psi			2505*	1.11 gph, 363 psi			
	1002	0.61 gph, 145 psi			1310**	2.77 gph, 189 psi			
	0308	2.27 gph, 43.5 psi			0814	3.7 gph, 116 psi			
	2502*	0.53 gph, 363 psi			0430❖	7.13 gph, 50.8			
	1006	1.59 gph, 145 psi			0260❖	15.8 gph, 21.8 psi			
		Liquid end materials:							
		PP1	Polypropylene with EPDM O-rings						
		PP4	Polypropylene for high viscosity fluid with enlarged ports, with EPDM O-rings & Hastelloy C valve springs (Only for type 1002, 1006, 1310 & 0814)						
		NP1	Arcylic with PVC check valves & Viton® O-rings						
		NP3	Arcylic with PVC check valves & Viton® O-rings						
		NS3	Auto-degassing Arcylic with Viton® O-rings (Only for type 1601, 1201, 0803 & 1002)						
		PS3	Auto-degassing PVC with Viton® O-rings (Only for type 1601, 1201, 0803 & 1002)						
		TT1	Carbon-reinforced PTFE with PTFE O-rings						
		SS1	316 SS with PTFE O-rings (Only for types 0430 & 0260)						
		SS2	316 SS with PTFE O-rings, 1/4" FNPT thread						
		SB1	316 SS with PTFE O-rings, R 1/4" internal thread, R 1/2" for type 0260 (Recommended for combustible media)						
		SSM	as SS1, with diaphragm failure indicator, type 2501 only						
		SBM	as SB1, with diaphragm failure indicator, type 2501 only						
			Valve springs:						
			0	Without springs					
			1	With 2 springs, 316 SS, 1.4 psig (0.1 bar)					
				Electrical connection:					
				A	230 V 50/60 Hz 1 phase				
				B	115 V 50/60 Hz 1 phase				
				D	100 V 50/60 Hz 1 phase				
				E	500 V 50/60 Hz 1 phase				
					Control type:				
					0	Stroke rate adjustment via potentiometer			
					1	External contact			
					2	Analog 0-20 mA			
					3	Analog 4-20 mA			
					4*	External contact, intrinsically safe [i,a]	*Intrinsically safe only with E=Ex protection		
					5*	Analog 0-20 mA, intrinsically safe [i,a]			
					6*	Analog 4-20 mA, intrinsically safe [i,a]			
					7	Manual with zero volts ON/OFF			
					8	Manual with zero volts ON/OFF, intrinsically safe [i,a]			
						Control variant:			
						0	With potentiometer (Only for control type 0)		
						1	With momentary contact push-button switch for maximum stroke rate (Not for control type 0)		
						2	With spring-return change-over switch for maximum frequency rate (not for control type 0)		
							Approval/Language:		
							0	BVS - Europe, German, 100 V - 500 V	
							1	BVS - Europe, English, 100 V - 500 V	
							2	FM - USA, English, 115 V 230 V	
							3	CSA - Canada, English, 115 V, 230 V	
EXBb	**G**	**1000**	**PP1**	**0**	**A**	**0**	**0**	**0**	

Dimensional Drawings

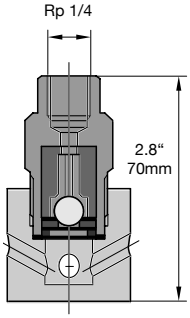


Dimensions in inches (mm)

Pump		A		B		C		D	E	F	G	
1000, 1601, 1201, 0803	NP1	15.4	(391)	5.4	(136)	2.7	(69)	ø70	6 x 4	ø38	9.0	(229)
1002, 0308, 2502/05, 1006	NP1	15.4	(391)	5.4	(136)	2.4	(61)	ø85	8 x 5	ø50	9.3	(237)
1310, 0613	NP1	15.4	(391)	5.4	(136)	2.0	(52)	ø100	8 x 5	ø66	9.6	(244)
0814, 0417	NP1	15.4	(391)	5.4	(136)	2.0	(52)	ø100	12 x 9	ø66	9.6	(244)
0430	NP1	15.0	(381)	5.4	(137)	1.8	(46)	ø135	DN 10	ø117	12.0	(304)
0260	NP1	15.7	(398)	5.6	(142)	.63	(16)	ø135	DN 15	ø117	12.4	(314)
1000, 1601, 1201, 0803	PP1	15.5	(393)	5.4	(136)	2.6	(67)	ø70	6 x 4	ø38	9.3	(236)
1002, 0308, 1006	PP1	15.5	(393)	5.4	(136)	2.6	(67)	ø70	8 x 5	ø50	9.3	(236)
0613	PP1	15.5	(393)	5.4	(136)	2.2	(57)	ø90	8 x 5	ø66	9.7	(246)
0814, 0417	PP1	15.5	(393)	5.4	(136)	2.2	(57)	ø90	8 x 5	ø66	9.7	(246)
0430	PP1	15.0	(381)	5.4	(137)	1.8	(46)	ø135	DN 10	ø117	12.0	(304)
0260	PP1	15.7	(398)	5.6	(142)	.63	(16)	ø135	DN 15	ø117	12.4	(314)
1002	PP4	15.3	(389)	5.4	(138)	1.8	(46)	ø85	DN 10	ø50	8.7	(222)
1006	PP4	15.3	(398)	5.7	(145)	3.0	(76)	ø85	DN 15	ø50	8.7	(222)
1310	PP4	15.3	(398)	5.7	(145)	3.0	(76)	ø85	DN 15	ø50	8.7	(222)
1014	PP4	15.3	(398)	5.7	(145)	2.7	(69)	ø100	DN 15	ø66	9.1	(229)
1000, 1601, 1202	TT1	14.9	(378)	5.3	(134)	2.9	(75)	ø60	6 x 4	ø38	8.8	(223)
0803	TT1	14.9	(378)	5.3	(134)	2.8	(70)	ø70	6 x 4	ø38	9.0	(228)
1002, 0308, 1006	TT1	15.3	(388)	5.3	(138)	1.3	(32)	ø95	8 x 5	ø66	10.5	(266)
0613	TT1	15.3	(388)	5.4	(138)	1.3	(32)	ø95	8 x 5	ø66	10.5	(266)
0814, 0417	TT1	15.3	(388)	5.4	(138)	1.3	(32)	ø95	12 x 9	ø66	10.5	(266)
0430	TT1	15.3	(388)	5.4	(137)	1.4	(35)	ø135	DN 10	ø117	10.4	(263)
0260	TT1	15.7	(398)	5.6	(142)	1.2	(31)	ø135	DN 15	ø117	10.6	(268)
1000, 1601, 1202	SS1	14.8	(376)	5.3	(134)	3.3	(84)	ø60	6 x 5	ø38	8.4	(214)
0803	SS1	14.8	(376)	5.3	(134)	3.1	(79)	ø70	6 x 5	ø38	8.6	(219)
1002, 0308, 2502/05, 1006	SS1	15.2	(386)	5.4	(138)	1.9	(48)	ø80	8 x 7	ø50	9.8	(250)
1310, 0613	SS1	15.2	(386)	5.4	(138)	1.5	(39)	ø95	8 x 7	ø66	10.2	(259)
0814, 0417	SS1	15.2	(386)	5.4	(138)	1.5	(39)	ø95	12 x 10	ø66	10.2	(259)
0430	SS1	15.2	(386)	5.4	(137)	1.4	(35)	ø135	DN 10	ø117	10.4	(263)
0260	SS1	15.4	(390)	5.6	(142)	1.1	(28)	ø135	DN 15	ø117	10.7	(271)
1000	SB1	14.7	(373)	5.3	(134)	3.4	(87)	ø70	R1/4”	ø38	8.3	(211)
1601, 1202, 0803	SB1	14.7	(373)	5.3	(134)	3.1	(79)	ø85	R1/4”	ø38	8.6	(219)
1002, 0308, 2502/05, 1006	SB1	15.0	(381)	5.4	(138)	2.2	(56)	ø80	R1/4”	ø50	9.5	(242)
1310, 0613	SB1	15.0	(381)	5.4	(138)	1.9	(48)	ø95	R1/4”	ø66	9.8	(250)
0814, 0417	SB1	15.0	(381)	5.4	(138)	1.9	(48)	ø95	R1/4”	ø66	9.8	(250)
0430	SB1	15.0	(381)	5.4	(138)	.87	(22)	ø145	R1/4”	ø117	10.8	(275)
0260	SB1	15.1	(383)	5.5	(139)	1.1	(27)	ø145	R1/2”	ø117	11.0	(279)
1601, 1202, 0803	NS3	15.1	(383)	5.4	(136)	2.6	(67)	s. Abb.	6 x 4	ø38	9.6	(243)
1002	NS3	15.1	(383)	5.4	(136)	2.6	(67)	s.Abb.	6 x 4	ø50	9.6	(243)
1601, 1202, 0803	NS3	15.1	(383)	5.4	(136)	2.6	(67)	s. Abb.	6 x 4	ø38	9.6	(243)
1002	NS3	15.1	(383)	5.4	(136)	2.6	(67)	s.Abb.	6 x 4	ø50	9.6	(243)

ProMinent® EXtronic Solenoid Diaphragm Metering Pumps

Special Valves for EXtronic®



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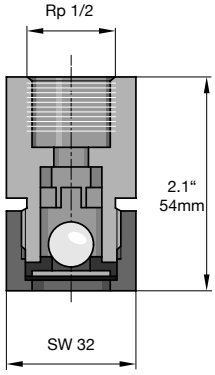


pk_1_030

Stainless steel 1.4404 “SB” foot valve

With filter and ball check valve, designed for use with flammable materials.

Materials: 1.4404/1.4401/PTFE/ceramic

	Order No.
Connector ISO 7 Rp 1/4 SB version for ProMinent EXtronic®	809301
Connector ISO 7 Rp 1/2 SB version for ProMinent EXtronic®	924561

Stainless steel 1.4404 “SB” injection valve

Spring loaded ball check valve designed for use with flammable materials.

Materials: 1.4404/1.4401/Hastelloy C/PTFE/ceramic

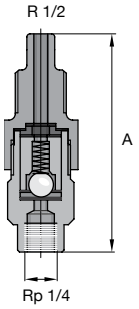
	Order No.
Connector ISO 7 Rp 1/4 - R 1/2, pre-pressure approx. 7.3 psi	809302
Connector ISO 7 Rp 1/2 - R 1/2, pre-pressure approx. 7.3 psi	924560

Adjustable “SB” back pressure valve

Materials: 1.4404; PTFE coated diaphragm. Connector both sides ISO 7 Rp 1/4

	Order No.
Operating range approx. 14.5 - 145 psi (1-10 bar), closed version designed for use with flammable materials.	924555

To generate a constant back pressure for accurate metering with a free outlet. Can also be used as an overflow valve.



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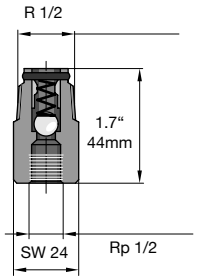


pk_1_027

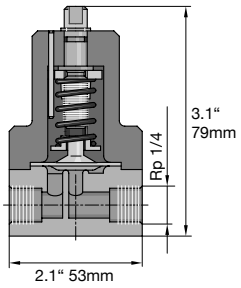
PTFE dosing pipe

Carbon-filled, surface resistance <10^7 Ω

Material	Length m	Ext. diam. x int. diam.	Permissible operating press. psi (bar)*	Order No.
PTFE	Sold by the foot	6.0 x 4.0	174 (12)	1024831
PTFE	Sold by the foot	8.0 x 5.0	232 (16)	1024830
PTFE	Sold by the foot	12.0 x 9.0	130.5 (9)	1024832

* permissible operating pressure at 68°F (20 °C) in accordance with EN ISO 7751, $^1/_4$ of the bursting pressure, assuming chemical resistance and correct connection.

Additional ancillary equipment, i.e. foot valves, injection valves and back pressure valves in the usual material combinations, identical to gamma ancillary equipment and/or for connector DN 15 Vario ancillary equipment, see section 2.14.

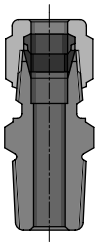


pk_1_029

Stainless steel straight threaded connectors

Swagelok system in stainless steel SS 316 (1.4401) for connection of pipework to liquid ends and valves with internal thread and for SB version.

Normal thread o-rings compounds required.	Order No.
6 mm - ISO 7 R 1/4	359526
8 mm - ISO 7 R 1/4	359527



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