

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)



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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 1/2" 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 °F (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:	<table border="0"> <thead> <tr> <th>Material</th> <th>Constant</th> <th>Short Term*</th> </tr> </thead> <tbody> <tr> <td>Acrylic/PVC</td> <td>113 °F</td> <td>140 °F</td> </tr> <tr> <td>PVDF</td> <td>113 °F</td> <td>248 °F</td> </tr> <tr> <td>SS</td> <td>113 °F</td> <td>248 °F</td> </tr> </tbody> </table> <p>*15 minutes at 29 psi maximum</p>	Material	Constant	Short Term*	Acrylic/PVC	113 °F	140 °F	PVDF	113 °F	248 °F	SS	113 °F	248 °F
Material	Constant	Short Term*											
Acrylic/PVC	113 °F	140 °F											
PVDF	113 °F	248 °F											
SS	113 °F	248 °F											
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												
Maximum pulse input:	25 pulses / second												
Analog Input Impedance:	120 Ohms												
Recommended Viscosity:	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												

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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/PTFE 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	0	U	D	1	0	0	0	0	EN

product overview

solenoid-driven metering pumps

motor-driven metering pumps

pump spare parts & accessories

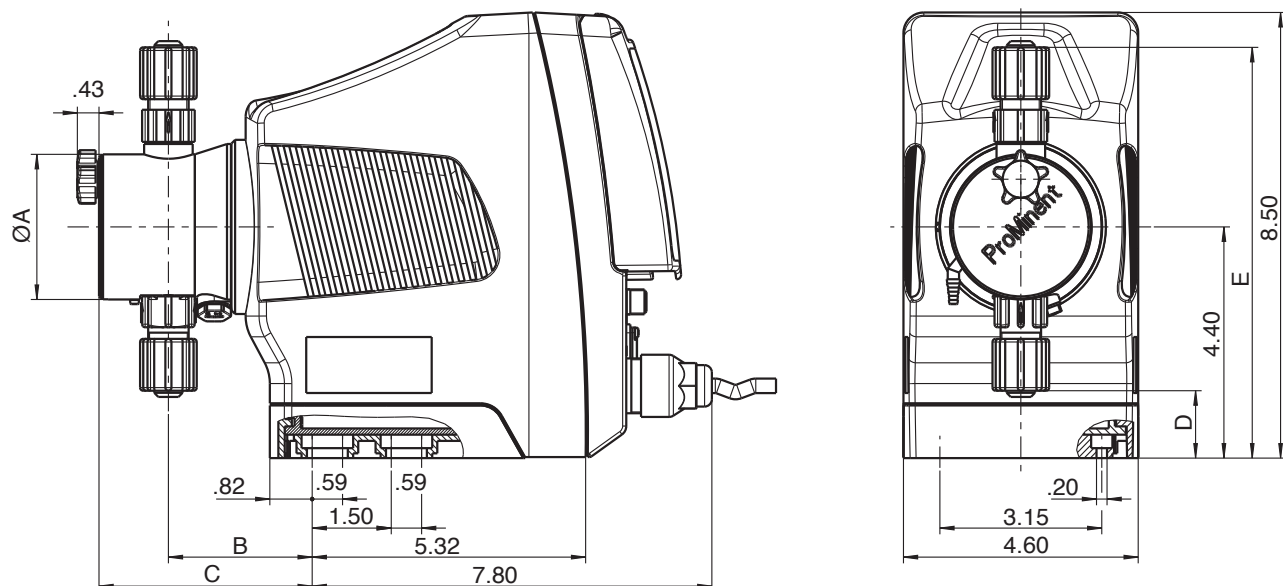
DULCOMETER instrumentation

DULCOTEST sensors

polymer blending & dry feed solutions

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