ProMinent® beta Metering Pumps

The beta pump series is a solenoid-driven, diaphragm-type metering pump featuring the following:

- **Microprocessor based**
- **Capacity range 0.19 - 8.4 gph (0.74 - 32 L/h)**
- **Continuous stroke length adjustment from 0 to 100%**
- **10-setting stroke frequency adjustment from 10 to 100%**
- **Maximum stroke rate: 180 spm**
- **Repeatability +/- 2% when used according to operating instructions**
- **Liquid end materials: PP, PVC, Acrylic, PTFE, SS**
- **Auto degassing liquid ends**
- **High viscosity liquid ends**
- **External access to options**
- **12-24 VDC low voltage option**

ProMinent® solenoid-driven metering pumps consist of two main components: the pump drive unit and the liquid end. The beta series offers two drive (solenoid) sizes: beta/4 (BT4a) and beta/5 (BT5a). Operating principles and options are identical, and both units offer maximum backpressures up to 253 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 1.1 to 8.4 gph (4.1 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. It 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).

The Drive Unit

Pump housing

Constructed of fiberglass-reinforced PPE plastic, with a NEMA 4x enclosure rating to protect against corrosion, dust and water.

Solenoid drive

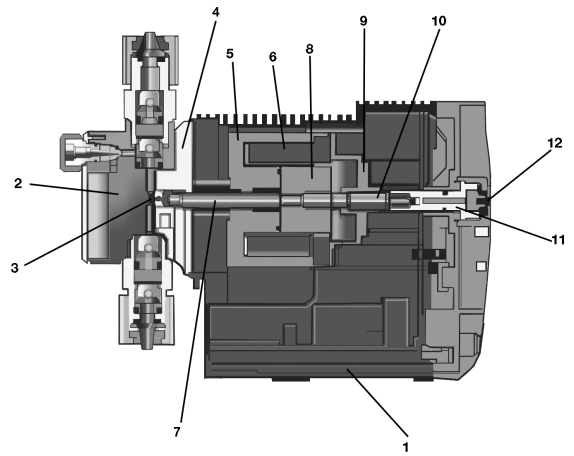
The drive unit houses a short-stroke solenoid with a maximum stroke length of 0.05" (1.25 mm). It is equipped with a noise suppressing mechanism for quiet operation and has only one moving part, the armature.

Operating on pulse action, each pulse generates a magnetic field in the solenoid coil. This magnetic field moves the armature forward. At the end of the armature is the diaphragm. The diaphragm pushes into the dosing head cavity forcing 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 monitor can be used to stop the pump and indicate a problem.

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

CUTAWAY VIEW OF PROMINENT BETA SOLENOID-DRIVEN METERING PUMP



1 HOUSING
2 LIQUID END
3 DIAPHRAGM
4 BACKPLATE
5 SOLENOID
6 SOLENOID COIL
7 SOLENOID AXLE
8 ARMATURE
9 COVER
10 STROKE ADJUSTMENT SCREW
11 STROKE ADJUSTMENT AXLE
12 STROKE ADJUSTMENT KNOB

The Diaphragm

The diaphragm is constructed of fabric-reinforced EPDM elastomer with a plastic core and a PTFE-facing. It is chemically resistant against virtually all process fluids and can be used over a wide temperature range.

The beta pump is designed with the new-style convex diaphragm. The curved shape contributes to more precise metering and alleviates stress placed on the diaphragm by reducing liquid end dead volume.

The Liquid End

The beta metering pump liquid ends are available in five material versions:

- Polypropylene (PP)
- PVC (PC)
- Acrylic/PVC (NP)
- PTFE (TT)
- 316 Stainless steel (SS)

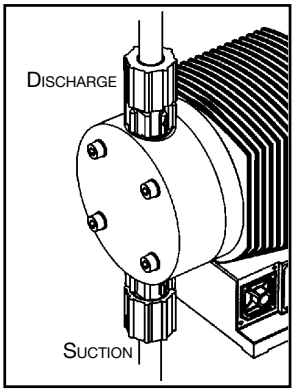
Some liquid ends are interchangeable between the BT4a and BT5a (see table on page 4).

Options include a manual bleed valve for easy priming and continuous bleeding of fluids that tend to off-gas (available with versions 1000-0713 PP, NP and PC liquid ends).

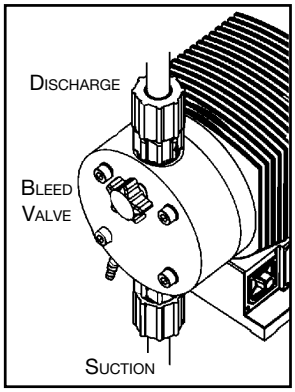
Automatic degassing liquid ends are available for PP and NP versions (except 1000 and 0232). This new-style liquid end discharges from the center and degasses from the top to prevent air build-up in the chamber.

High viscosity PVDF liquid ends are available for pump versions 1005, 0708, 0413, 0220, 1605, 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.

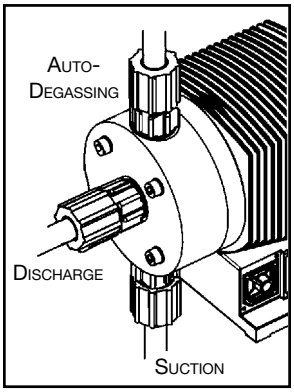
Suction and discharge ports are equipped with double ball check valves for maximum repeatability.



Liquid end without bleed valve



Liquid end with bleed valve



Auto-degassing liquid end

Power Supply

The beta metering pumps accept 100-115, 200-230 or 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. A two-stage level switch is needed to maximize this feature.

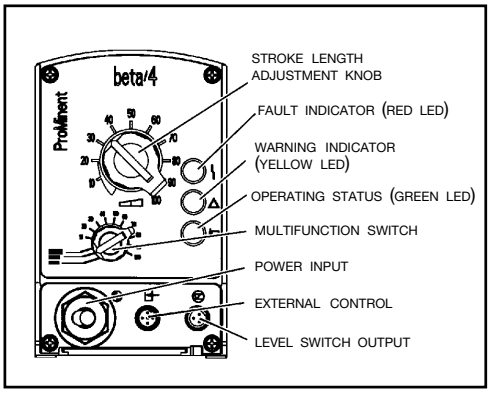
Relay Outputs

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

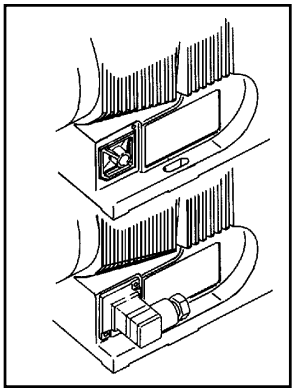
Pacing relay
A contact closure is issued with every pump stroke (contact duration 150 ms). This allows a second ProMinent metering pump to be paced synchronously, or to totalize flow with an external stroke counter.

c UL us Recognized

CE Available



COMPONENTS ARE IDENTICAL ON THE BETA/4 AND BETA/5 PUMPS


AN EXTERNAL PANEL IN THE BASE OF THE PUMP ENABLES OPTIONAL RELAYS TO BE INSTALLED ON-SITE.

Specifications: beta

ProMinent®

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, PVC, Acrylic/PVC, PTFE, 316 SS
Enclosure rating:	NEMA 4X (IP 65)
Motor insulation class:	F
Power supply:	100-115 VAC, 200-230 VAC or 100-230 VAC, 1 phase, 50/60 Hz, +/- 10%; 12-24 VDC or 24VDC +/- 10%
Check valves:	Double ball
Repeatability of the metering:	When used according to operating instructions, ±2% under constant conditions and at minimum 30% stroke length
Power cord:	6 foot (2 m)
Relay cable (optional):	6 foot (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_{DSOn}): < 8 Ω Residual current in OFF-position: <1μA Maximum current: < 100 mA Maximum voltage: 24 VDC Switch functions: $15x10^9$ Contact closure: 100 ms (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)
PVC	113°F (45°C)	140°F (60°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)	
BT4a:	17W / 0.7 A or 15 A (peak current for approx. 1 ms)
BT5a:	22W / 1.0 A or 15 A (peak current for approx. 1 ms)
Service factor:	1.15
Warranty:	2 years on drive, 1 year on liquid end
Industry standards:	UL recognized, CE available for U.S.A. and Canada
Valve threads:	NP, PP, PC, TT Versions: M20 x 1.5 (provided with tubing adapters)
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, and will not remember.
Necessary contact duration:	20 ms
Recommended Viscocity:	max. 200 cPs for standard liquid end max. 500 cPs for bleed valve max. 50 cPs for auto-degassing metering pumps max. 3000 cPs for high viscosity

ProMinent®

Technical Data: beta

Pump Version	Capacity at Maximum Backpressure					Capacity at 1/2 Maximum Backpressure					Pre-Primed Suction Lift		Max. Stroking Rate	Suction/Discharge Tubing Connectors** 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	inches	lbs.	(kg)
BT4a																
1000	145	(10)	0.19	(0.74)	0.07	73	(5)	0.21	(0.82)	0.08	19.6	(6)	180	1/4 x 3/16	6.4-7.9	(2.9-3.6)
1601	253	(17.5)	0.29	(1.1)	0.10	126	(8.75)	0.37	(1.4)	0.13	19.6	(6)	180	1/4 x 3/16	6.4-7.9	(2.9-3.6)
1602	253	(17.5)	0.55	(2.1)	0.19	126	(8.75)	0.66	(2.5)	0.24	19.6	(6)	180	1/4 x 3/16	6.4-7.9	(2.9-3.6)
1005	145	(10)	1.1	(4.4)	0.41	73	(5)	1.32	(5.0)	0.46	19.6	(6)	180	1/2 x 3/8	6.8-8.6	(3.1-3.9)
0708	101	(7)	1.9	(7.1)	0.66	50.5	(3.5)	2.22	(8.4)	0.78	19.6	(6)	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)	180	1/2 x 3/8	6.8-8.6	(3.1-3.9)
0220	29	(2)	5.0	(19.0)	1.76	14.5	(1)	5.52	(20.9)	1.94	6.5	(2)	180	1/2 x 3/8	7.3-9.7	(3.3-4.4)
BT5a																
1605	253	(17.5)	1.1	(4.1)	0.38	126	(8.75)	1.29	(4.9)	0.45	19.6	(6)	180	1/2 x 3/8	9.9-11.7	(4.5-5.3)
1008	145	(10)	1.8	(6.8)	0.63	73	(5)	2.19	(8.3)	0.76	19.6	(6)	180	1/2 x 3/8	9.9-11.7	(4.5-5.3)
0713	101	(7)	2.9	(11.0)	1.02	50.5	(3.5)	3.46	(13.1)	1.21	13.1	(4)	180	1/2 x 3/8	9.9-11.7	(4.5-5.3)
0420	58	(4)	4.5	(17.1)	1.58	29	(2)	5.04	(19.1)	1.77	9.8	(3)	180	1/2 x 3/8	10.4-12.8	(4.7-5.8)
0232*	29	(2)	8.4	(32.0)	2.96	14.5	(1)	9.56	(36.2)	3.35	6.5	(2)	180	1/2 x 3/8	11.2-14.6	(5.1-6.6)
With auto-degassing liquid ends																
BT4a																
1601	253	(17.5)	0.16	(0.59)	0.06	126	(8.75)	0.21	(0.78)	0.07	5.9	(1.8)	180	1/4 x 3/16	6.4	(2.9)
1602	253	(17.5)	0.37	(1.4)	0.13	126	(8.75)	0.45	(1.7)	0.16	6.9	(2.1)	180	1/4 x 3/16	6.4	(2.9)
1005	145	(10)	0.95	(3.6)	0.33	73	(5)	1.05	(4.0)	0.37	8.8	(2.7)	180	1/2 x 3/8	6.8	(3.1)
0708	101	(7)	1.74	(6.6)	0.61	50.5	(3.5)	1.98	(7.5)	0.69	6.5	(2.0)	180	1/2 x 3/8	6.8	(3.1)
0413	58	(4)	2.8	(10.8)	1.00	29	(2)	3.3	(12.6)	1.17	6.5	(2.0)	180	1/2 x 3/8	6.8	(3.1)
0220	29	(2)	4.3	(16.2)	1.50	14.5	(1)	4.7	(18.0)	1.67	6.5	(2.0)	180	1/2 x 3/8	7.3	(3.3)
BT5a																
1605	253	(17.5)	0.87	(3.3)	0.31	126	(8.75)	1.00	(3.8)	0.35	9.8	(3)	180	1/2 x 3/8	9.9	(4.5)
1008	145	(10)	1.66	(6.3)	0.58	73	(5)	1.98	(7.5)	0.69	9.8	(3)	180	1/2 x 3/8	9.9	(4.5)
0713	101	(7)	2.77	(10.5)	0.97	50.5	(3.5)	3.2	(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)

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% les metering capacity and are not self-priming. Standard connectors are 1/2" MNPT or 5/8" hose barb. Positive suction recommended.

* Not available with bleed valve.
** SS versions use 1/4" female threads except models 0220, 0420, and 0232 which use 3/8" female threads.

Liquid end materials

Version	Liquid End	Suction/Discharge valves	Seals	Valve balls
PPE	Polypropylene	Polypropylene	EPDM	Ceramic
PPB	Polypropylene	Polypropylene	Viton®	Ceramic
PCE	PVC	PVC	EPDM	Ceramic
PCB	PVC	PVC	Viton®	Ceramic
NPE	Acrylic	PVC	EPDM	Ceramic
NPB	Acrylic	PVC	Viton®	Ceramic
PVT	PVDF	PVDF	PTFE	Ceramic
TTT	PTFE with carbon	PTFE with Carbon	PTFE	Ceramic
SST	316 Stainless steel	316 Stainless Steel	PTFE	Ceramic

Auto-degassing type with Hastelloy C valve spring and PVDF valve seat.
Viton® is a registered trademark of DuPont Dow Elastomers.

Interchangeable liquid ends

The following pump versions have interchangeable liquid ends:

BT4a 1005 and BT5a 1605

BT4a 0708 and BT5a 1008

BT4a 0413 and BT5a 0713

BT4a 0220 and BT5a 0420

Identity code: beta metering pumps

ProMinent®

Series:

BT4a beta/ 4 version a
BT5a beta/ 5 version a

BT4a	BT5a
1000	1605*
1601	1008*
1602	0713*
1005*	0420*
0708*	0232
0413*	
0220*	

Pump version:

*Versions available with high viscosity liquid ends

Liquid end materials:

PP	Polypropylene
PC	PVC
NP	Acrylic/PVC
PV	PVDF (for high viscosity only)
TT	PTFE
SS	SS

Seal:

E	EPDM seals (PP, PC, NP)
B	Viton® seals (PP, PC, NP)
T	PTFE seals (PVDF, TT, SS)

Viton® is a registered trademark of DuPont Dow Elastomers

Liquid end version:

0	W/o bleed valve, w/o springs (TT, SS and version 0232 PP/PC)
1	W/o bleed valve, with springs (TT, SS and version 0232 PP/PC)
2	With bleed valve, w/o springs (PP, PC, NP; except version 0232 PP/PC)
3	Wtih bleed valve, with springs (PP, PC, NP; except version 0232 PP/PC)
4	W/o bleed valve, with springs (for high viscosity only)
9	With auto-degassing (PP, NP - except versions 1000, 0232)

Connection:

0	Standard according to technical data
6	1/2" x 3/8" tube fittings

NOTE: Connector option 6 **must** be used on all pumps with standard 1/2" x 3/8" tubing connections, and it may be used on pumps with 1/4" x 3/16" tubing connectors. Use option 0 on all pumps with standard NPT connections and for high viscosity.

Labeling:

0	Standard, with logo

Electrical connection (± 10%):

M	12-24 VDC (versions 1000-0220)
N	24 VDC (versions 1605-0232)
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, 230 V
1	Open ended (for low voltage options M and N)

Relay:

0	Without relay
1	Fault annunciating relay, drops out
3	Fault annunciating relay, pulls in
4	Option 1 + pacing relay
5	Option 3 + pacing relay

Accessories:

0	Not included (for PVDF, TT, SS)
1	Standard (for PP, PC, NP)

Operating mode configuration:

0	Standard operating mode
1	With lock for one operating mode: external or manual

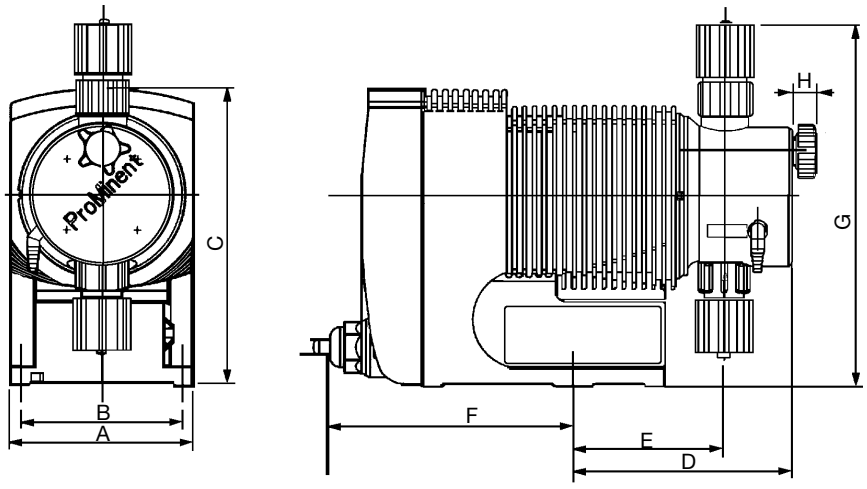
Options:

000	Standard

BT4a 1602 NP B 2 0 0 U D 0 1 0 000

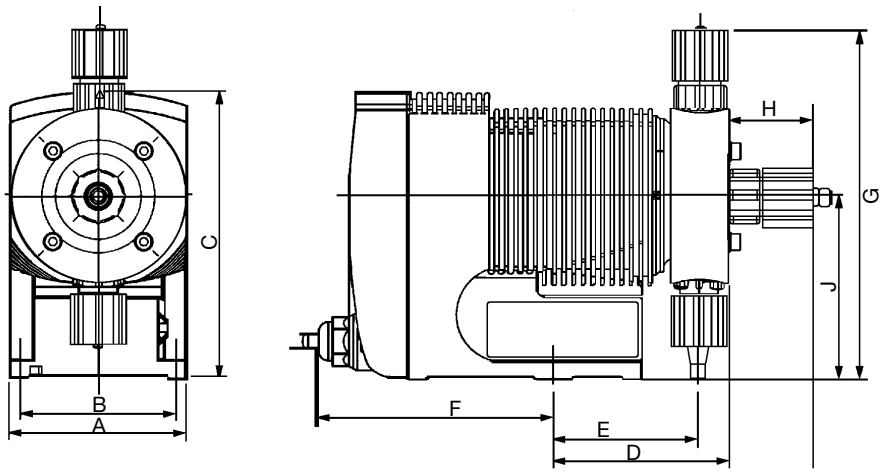
Dimensions: beta

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



Pump	A	B	C	D	E	F	G	H
BT4	3.6 (92)	3.1 (80)	5.8 (148)	3.5-4.2 (88-108)	2.8-3.3 (71-83)	5.2 (132)	6.1-7.4 (156-187)	0.5-0.6 (12-14)
BT5	4.0 (102)	3.1 (80)	6.3 (160)	3.5-4.3 (88-110)	2.8-3.3 (71-83)	5.7 (144)	6.7-8.5 (171-217)	0.5-0.6 (12-14)

With Auto-Degassing Liquid Ends



	A	B	C	D	E	F	G	H	J
BT4	3.6 (92)	3.1 (80)	5.8 (148)	3.5-3.6 (89-92)	2.9-3.0 (74-76)	5.2 (132)	6.7-7.1 (171-181)	1.7 (44)	3.7 (95)
BT5	4.0 (102)	3.1 (80)	6.3 (160)	3.5-3.6 (89-91)	2.9-3.0 (74-76)	5.7 (144)	7.3-7.4 (186-187)	1.7 (44)	4.0 (101)

ProMinent® beta Accessories

Description	Part No.

Accessory kits

Pump includes tubing, foot valve and injection valve as standard.

Accessory kits for beta pumps with tube fittings, including 5 ft. (1.5 m) of suction tubing, 10 ft. (3 m) of discharge tubing, foot valve and injection valve.

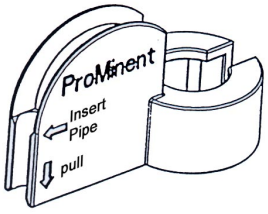
Tubing Size (in.) (select to fit pump)	Material Code	Suction Tubing	Discharge Tubing	
1/4 x 3/16	PCB/NPB	PE	PE	7809401
1/4 x 3/16	PPE	PE	PE	7809403
1/4 x 3/16	PPB	PE	PE	7809405
1/4 x 3/16	PCE/NPE	PE	PE	7809422
1/2 x 3/8	PCB/NPB	PVC	PE	7809402
1/2 x 3/8	PPE	PVC	PE	7809404
1/2 x 3/8	PPB	PVC	PE	7809406
1/2 x 3/8	PCE/NPE	PVC	PE	7809423

PVC 1/2" x 3/8" suction tubing is pliable, allowing foot valve to sink. PE discharge tubing is rigid.
Pressure ratings are:

PVC: 7 psig PE: 100 psig.

Tubing, foot valves and injection valves for TT and SS pumps are not available as kits and must be ordered as separate items.

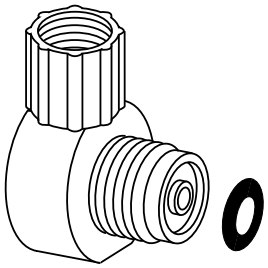
Auto-degassing accessories



Bypass line fold protector (for soft tubing only)

Fits on top of the beta and gamma/L auto-degassing liquid ends, used to prevent a fold in the bypass line which is fed back to the tank. This is required when using soft tubing, however rigid tubing is standard.

for tubing size (mm)	
1/4" x 3/16" (6 mm)	1001844



Right-angled PVC threaded connector

Connector for the beta and gamma/L auto-degassing liquid ends required when mounting multifunction valves; optionally used to direct discharge flow upwards. Angle union 90°.

Type PCB (PVC/Viton®)	1003318
Type PCE (PVC/EPDM)	1003472

ProMinent® beta Control cables

Description	Part No.

Control cables for beta

Universal control cable

For metering pump control via voltage-free contact for remote pause control.

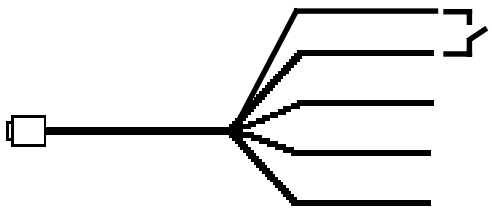
For beta with 5-pole round plastic connector and 5-wire cable with loose end.

Universal control cable, 5-pole round connector, 5-wire, 6 ft. (2 m)	1001300
Universal control cable, 5-pole round connector, 5-wire, 15 ft. (5 m)	1001301
Universal control cable, 5-pole round connector, 5-wire, 30 ft. (10 m)	1001302

ON/OFF Control

BROWN and BLACK wires must be connected together via an ON/OFF contact or shorted together. When the contact is closed between the BLACK & BROWN wires, the pump will run. When the contact is open, the pump will stop.

Note: If ON/OFF control is the only control feature being used, GREY, WHITE and BLUE wires are not used.

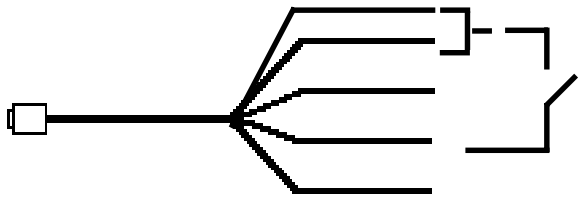


BROWN: Remote On/Off (+)
BLACK: Common
GREY: Auxiliary Frequency
WHITE: External (+)
BLUE: Not Used

Pulse Control

Pulse control will allow the pump to run in proportion to a pulsing potentially free contact closure.

Note: BROWN and BLACK wires have to be connected together via an ON/OFF contact or shorted together. GREY wire is not used and should be cut.

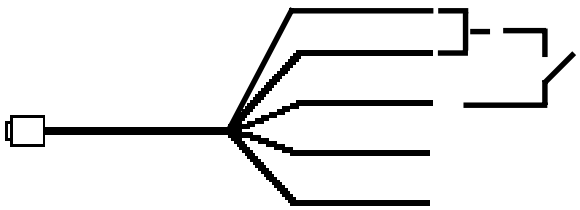


BROWN: Remote On/Off (+)
BLACK: Common
GREY: Not used
WHITE: Pulse (+)
BLUE: Analog (+)

Auxiliary Frequency

Auxiliary frequency will default the pump to 100% stroking frequency regardless of which operating mode the pump is in. The pump defaults to this stroking frequency as long as a contact is closed between the black and grey wires of the universal control cable.

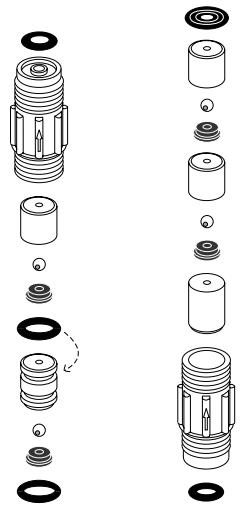
Note: BROWN and BLACK wires must be connected together via an ON/OFF contact or shorted together.

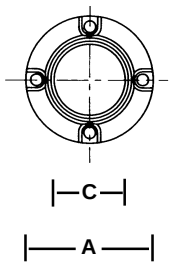


BROWN: Remote On/Off (+)
BLACK: Common
GREY: Auxiliary Frequency
WHITE: Pulse (+)
BLUE: Analog (+)

ProMinent® beta BT4a Materials

Spare parts kits and Diaphragms





Pump Version	Dim A (mm)	Dim C (mm)
BT4a		
1000	30	5.0
1601	30	7.5
1602	35	11.5
1005	46	16.5
0708	46	21.5
0413	55	26.0
0220	77	33.5
BT5a		
1605	46	16.5
1008	46	21.5
0713	55	26.0
0420	77	33.5
0232	91	46.0

Complete liquid ends include pump head, valves, mounting screws, diaphragm and back plate. Spare parts kits include:

PP, PC & NP Liquid Ends
- 1 Diaphragm
- 1 Suction Valve
- 1 Discharge Valve
- 1 Adapter Set
- 2 Valve Balls
- 1 Set Seals

TT Liquid Ends
- 1 Diaphragm
- 1 Suction Valve
- 1 Discharge Valve
- 1 Adapter Set
- 2 Valve Balls
- 1 Set Seals
- 2 Ball Seat Discs

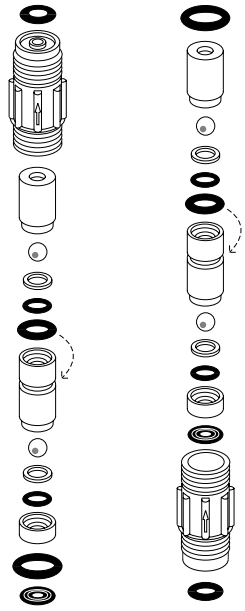
SS Liquid Ends
- 1 Diaphragm
- 4 Valve Balls
- 1 Set Seals
- 4 Ball Seat Discs

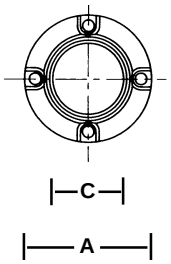
Liquid End Version	Material Code	Complete Liquid End	Spare Parts Kit	Spare Valves Only (adapter sets not included) Suction	Discharge	Diaphragm
BT4A						
1000	PPE	1002057	1001644	792644	740350	1000244
	PPB	1002065	1001652	792646	740351	1000244
	PCE	1002365	1001713	792119	740349	1000244
	NPE	1002193	1001713	792119	740349	1000244
	PCB	1002358	1001721	792026	740348	1000244
	NPB	1002201	1001721	792026	740348	1000244
	TTT	1002345	1001737	809407	809406	1000244
	SST	1002557	1002549	809424	809423	1000244
1601	PPE	1002058	1001645	792644	740350	1000245
	PPB	1002066	1001653	792646	740351	1000245
	PCE	1002366	1001714	792119	740349	1000245
	NPE	1002194	1001714	792119	740349	1000245
	PCB	1002359	1001722	792026	740348	1000245
	NPB	1002202	1001722	792026	740348	1000245
	TTT	1002346	1001738	809407	809406	1000245
	SST	1002558	1002550	809424	809423	1000245
1602	PPE	1002059	1001646	792644	740350	1000246
	PPB	1002067	1001654	792646	740351	1000246
	PCE	1002367	1001715	792119	740349	1000246
	NPE	1002195	1001715	792119	740349	1000246
	PCB	1002360	1001723	792026	740348	1000246
	NPB	1002203	1001723	792026	740348	1000246
	TTT	1002347	1001739	809407	809406	1000246
	SST	1002559	1002551	809424	809423	1000246
1005	PPE	1002060	1001647	792644	740350	1000247
	PPB	1002068	1001655	792646	740351	1000247
	PCE	1002368	1001716	792119	740349	1000247
	NPE	1002196	1001716	792119	740349	1000247
	PCB	1002361	1001724	792026	740348	1000247
	NPB	1002204	1001724	792026	740348	1000247
	PVT	1018072	1019066	1002267	1002267	1000247
	TTT	1002348	1001740	809407	809406	1000247
	SST	1002560	1002552	809424	809423	1000247
0708	PPE	1002061	1001648	1001437	1001441	1000248
	PPB	1002069	1001656	1001436	1001440	1000248
	PCE	1002369	1001717	1001435	1001439	1000248
	NPE	1002197	1001717	1001435	1001439	1000248
	PCB	1002362	1001725	1001434	1001438	1000248
	NPB	1002205	1001725	1001434	1001438	1000248
	PVT	1018073	1019067	1002267	1002267	1000248
	TTT	1002349	1001741	809445	809444	1000248
	SST	1002561	1002553	809497	809496	1000248
0413	PPE	1002062	1001649	1001437	1001441	1000249
	PPB	1002070	1001657	1001436	1001440	1000249
	PCE	1002370	1001718	1001435	1001439	1000249

(additional materials for 0413 on following page)

ProMinent® beta BT4a Materials (cont.)

Spare parts kits and Diaphragms





Pump Version	Dim A (mm)	Dim C (mm)
BT4a		
1000	30	5.0
1601	30	7.5
1602	35	11.5
1005	46	16.5
0708	46	21.5
0413	55	26.0
0220	77	33.5
BT5a		
1605	46	16.5
1008	46	21.5
0713	55	26.0
0420	77	33.5
0232	91	46.0

Liquid End Version	Material Code	Complete Liquid End	Spare Parts Kit	Spare Valves Only (adapter sets not included) Suction	Discharge	Diaphragm
BT4A						
0413 (cont.)	NPE	1002198	1001718	1001435	1001439	1000249
	PCB	1002363	1001726	1001434	1001438	1000249
	NPB	1002206	1001726	1001434	1001438	1000249
	PVT	1018084	1019069	1002267	1002267	1000249
	TTT	1002350	1001742	809445	809444	1000249
	SST	1002562	1002554	809497	809496	1000249
0220	PPE	1002063	1001650	1001437	1001441	1000250
	PPB	1002071	1001658	1001436	1001440	1000250
	PCE	1002371	1001719	1001435	1001439	1000250
	NPE	1002199	1001719	1001435	1001439	1000250
	PCB	1002364	1001727	1001434	1001438	1000250
	NPB	1002207	1001727	1001434	1001438	1000250
	PVT	1018085	1019070	1002267	1002267	1000250
	TTT	1002351	1001754	809445	809444	1000250
	SST	1002563	1002555	1002547	1002548	1000250
BT5A						
1605	PPE	1002060	1001647	792644	740350	1000247
	PPB	1002068	1001655	792646	740351	1000247
	PCE	1002368	1001716	792119	740349	1000247
	NPE	1002196	1001716	792119	740349	1000247
	PCB	1002361	1001724	792026	740348	1000247
	NPB	1002204	1001724	792026	740348	1000247
	PVT	1018072	1019066	1002267	1002267	1000247
	TTT	1002348	1001740	809407	809406	1000247
	SST	1002560	1002552	809424	809423	1000247
1008	PPE	1002061	1001648	1001437	1001441	1000248
	PPB	1002069	1001656	1001436	1001440	1000248
	PCE	1002369	1001717	1001435	1001439	1000248
	NPE	1002197	1001717	1001435	1001439	1000248
	PCB	1002362	1001725	1001434	1001438	1000248
	NPB	1002205	1001725	1001434	1001438	1000248
	PVT	1018073	1019067	1002267	1002267	1000248
	TTT	1002349	1001741	809445	809444	1000248
	SST	1002561	1002553	809497	809496	1000248
0713	PPE	1002062	1001649	1001437	1001441	1000249
	PPB	1002070	1001657	1001436	1001440	1000249
	PCE	1002370	1001718	1001435	1001439	1000249
	NPE	1002198	1001718	1001435	1001439	1000249
	PCB	1002363	1001726	1001434	1001438	1000249
	NPB	1002206	1001726	1001434	1001438	1000249
	PVT	1018084	1019069	1002267	1002267	1000249
	TTT	1002350	1001742	809445	809444	1000249
	SST	1002562	1002554	809497	809496	1000249
0420	PPE	1002063	1001650	1001437	1001441	1000250
	PPB	1002071	1001658	1001436	1001440	1000250
	PCE	1002371	1001719	1001435	1001439	1000250
	NPE	1002199	1001719	1001435	1001439	1000250
	PCB	1002364	1001727	1001434	1001438	1000250
	NPB	1002207	1001727	1001434	1001438	1000250
	PVT	1018085	1019070	1002267	1002267	1000250
	TTT	1002351	1001754	809445	809444	1000250
	SST	1002563	1002555	1002547	1002548	1000250
0232	PPE	1002064	1001651	1001437	1001441	1000251
	PPB	1002072	1001659	1001436	1001440	1000251
	PCE	1002609	1001720	1001435	1001439	1000251
	NPE	1002200	1001720	1001435	1001439	1000251
	PCB	1002608	1001728	1001434	1001438	1000251
	NPB	1002208	1001728	1001434	1001438	1000251
	TTT	1002352	1001755	809445	809444	1000251
	SST	1002564	1002556	1002547	1002548	1000251

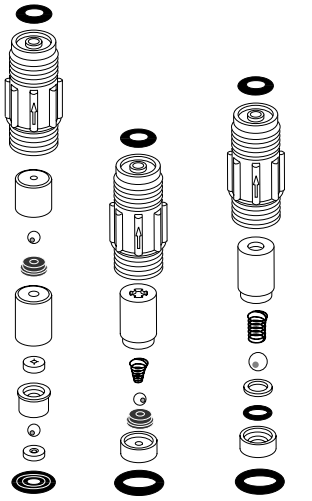
ProMinent® beta auto-degassing Materials

Spare parts kit and Diaphragm

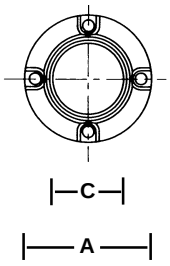
Complete liquid ends include pump head, valves, mounting screws, diaphragm and back plate. Spare parts kits include:

PP & NP
Liquid Ends

1 Diaphragm
1 Suction Valve
1 Discharge Valve
1 Adapter Set
2 Valve Balls
1 Set Seals
1 Vent Valve, Complete



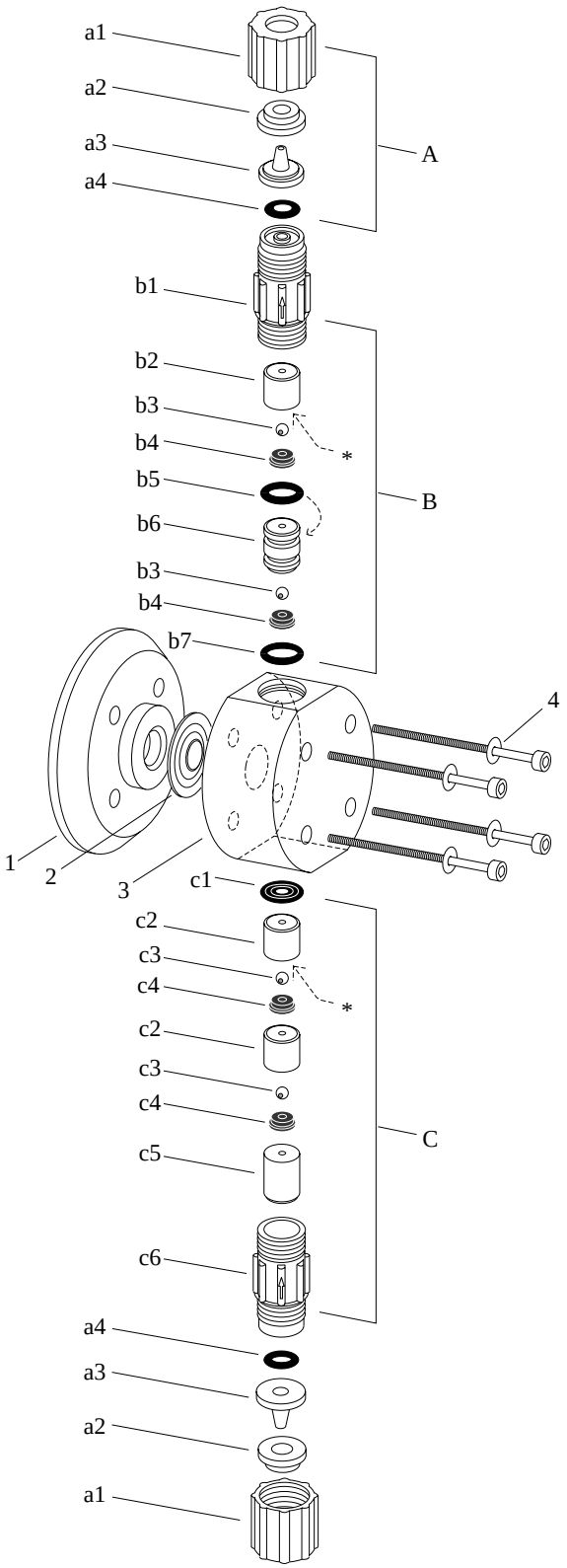
(sdb) Vent Valve | Discharge Valve 1/4" | Discharge Valve 1/2"



Pump Version	Dim A (mm)	Dim C (mm)
BT4a		
1000	30	5.0
1601	30	7.5
1602	35	11.5
1005	46	16.5
0708	46	21.5
0413	55	26.0
0220	77	33.5
BT5a		
1605	46	16.5
1008	46	21.5
0713	55	26.0
0420	77	33.5
0232	91	46.0

Liquid End Version	Material Code	Complete Liquid End	Spare Parts Kit	Spare Valves Only (adapter sets not included) Suction	Discharge	Vent	Diaphragm
BT4A							
1601	PPE	1002393	1001756	792644	1001067	1001063	1000245
	PPB	1002392	1001762	792646	1001066	1001062	1000245
	NPE	1002248	1001660	792119	1001065	1001061	1000245
	NPB	1002242	1001666	792026	1001064	1001060	1000245
1602	PPE	1002395	1001757	792644	1001067	1001063	1000246
	PPB	1002394	1001763	792646	1001066	1001062	1000246
	NPE	1002249	1001661	792119	1001065	1001061	1000246
	NPB	1002243	1001667	792026	1001064	1001060	1000246
1005	PPE	1002399	1001758	792644	1001067	1001063	1000247
	PPB	1002398	1001764	792646	1001066	1001062	1000247
	NPE	1002250	1001662	792119	1001065	1001061	1000247
	NPB	1002244	1001668	792026	1001064	1001060	1000247
0708	PPE	1002397	1001759	1001437	1001071	1001063	1000248
	PPB	1002396	1001765	1001436	1001070	1001062	1000248
	NPE	1002251	1001663	1001435	1001069	1001061	1000248
	NPB	1002245	1001669	1001434	1001068	1001060	1000248
0413	PPE	1002401	1001760	1001437	1001071	1001063	1000249
	PPB	1002400	1001766	1001436	1001070	1001062	1000249
	NPE	1002252	1001664	1001435	1001069	1001061	1000249
	NPB	1002246	1001670	1001434	1001068	1001060	1000249
0220	PPE	1002403	1001761	1001437	1001071	1001063	1000250
	PPB	1002402	1001767	1001436	1001070	1001062	1000250
	NPE	1002253	1001665	1001435	1001069	1001061	1000250
	NPB	1002247	1001671	1001434	1001068	1001060	1000250
BT5A							
1605	PPE	1002399	1001758	792644	1001067	1001063	1000247
	PPB	1002398	1001764	792646	1001066	1001062	1000247
	NPE	1002250	1001662	792119	1001065	1001061	1000247
	NPB	1002244	1001668	792026	1001064	1001060	1000247
1008	PPE	1002397	1001759	1001437	1001071	1001063.5	1000248
	PPB	1002396	1001765	1001436	1001070	1001062.7	1000248
	NPE	1002251	1001663	1001435	1001069	1001061.9	1000248
	NPB	1002245	1001669	1001434	1001068	1001060.1	1000248
0713	PPE	1002401	1001760	1001437	1001071	1001063.5	1000249
	PPB	1002400	1001766	1001436	1001070	1001062.7	1000249
	NPE	1002252	1001664	1001435	1001069	1001061.9	1000249
	NPB	1002246	1001670	1001434	1001068	1001060.1	1000249
0420	PPE	1002403	1001761	1001437	1001071	1001063.5	1000250
	PPB	1002402	1001767	1001436	1001070	1001062.7	1000250
	NPE	1002253	1001665	1001435	1001069	1001061.9	1000250
	NPB	1002247	1001671	1001434	1001068	1001060.1	1000250

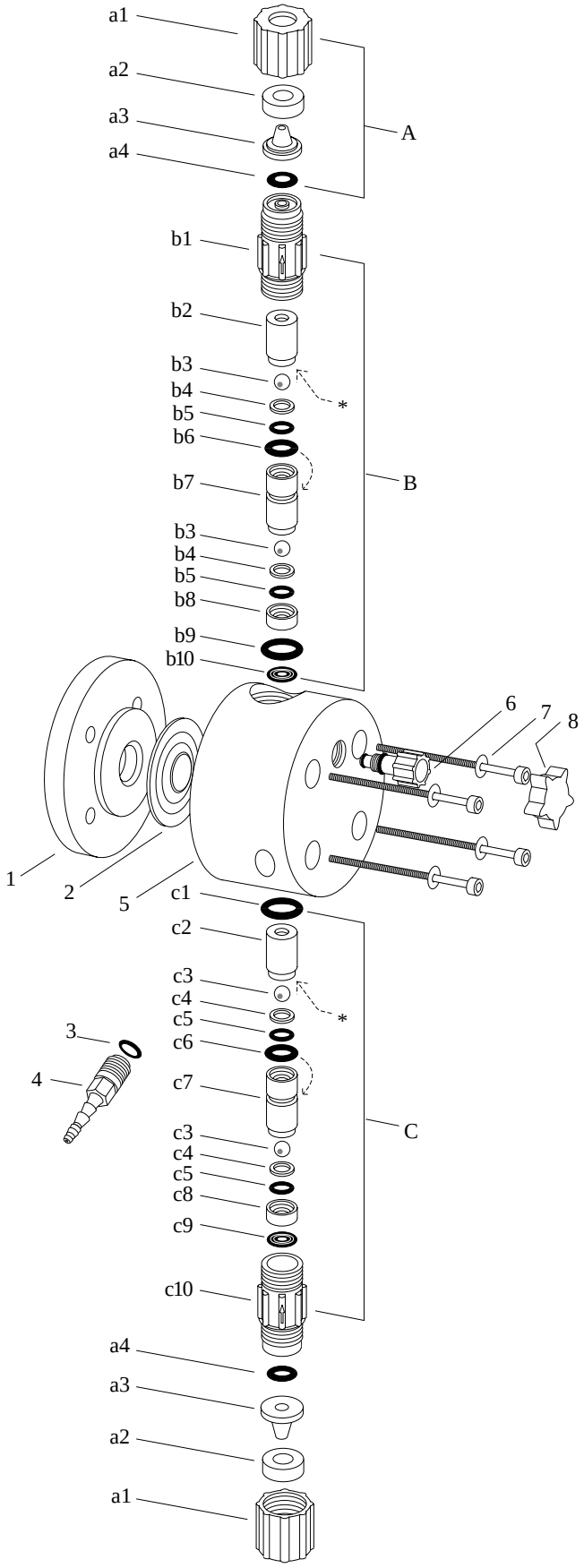
EXPLODED VIEW



Description		Qty.	Part No.
1602-2 NPE0 liquid end complete		**1**	**1002075**
1	backplate B1602 70 x 16.5-2	1	1000262
2	diaphragm 35.0 x 11.5	1	1000246
3	dosing head 70 x 16.5-2 NP0	1	1000286
4	screw M5 x 55 & washer	4	1000268
A	connector set 1/4" PCE	1	817060
B	discharge valve beta 1/4" PCE	1	740349
C	suction valve beta 1/4" PCE	1	792119
*	indicates location of spring if needed		
A	**connector set 1/4" PCE**	**1**	**817060**
a1	union nut M20 x 1.5 PVC	2	800518
a2	clamp ring 1/4" ferule	2	800712
a3	tube nozzle 3/16" PVC	2	800520
a4	O-ring 9 x 2.5 EPDM/P	2	1001263
B	**dis. valve beta 1/4" PCE**	**1**	**740349**
b1	dis. valve body beta 1/4" PVC	1	791880
b2	valve insert 4.7-1 PVC	1	791090
b3	valve ball 4.7mm Ceramic	2	404201
b4	ball seat 3 x 9.5 EPDM/P	2	1001233
b5	O-ring 9 x 2.5 EPDM/P	1	1001263
b6	valve insert (dis.) 4.7-1 PVC	1	791879
b7	O-ring 14 x 2 EPDM/P	1	1001264
C	**suction valve beta 1/4" PCE**	**1**	**792119**
c1	sealing gasket 18 x 2.5 EPDM/P	1	1001232
c2	valve insert 4.7-1 PVC	2	791090
c3	valve ball 4.7mm Ceramic	2	404201
c4	ball seat 3 x 9.5 EPDM/P	2	1001233
c5	distance sleeve (suction) PVC	1	791089
c6	suction valve body beta 1/4" PVC	1	800569
Spare Parts Set 1602-2 PCE		**1**	**1001715**
A	connector set 1/4" PCE	1	817060
B	discharge valve beta 1/4" PCE	1	740349
C	suction valve beta 1/4" PCE	1	792119
2	diaphragm 35.0 x 11.5	1	1000246
b5	O-ring 9 x 2.5 EPDM/P	3	1001263
b7	O-ring 14 x 2 EPDM/P	1	1001264
c1	sealing gasket 18 x 2.5 EPDM/P	1	1001232
c3	valve ball 4.7mm Ceramic	2	404201
c4	ball seat 3 x 9.5 EPDM/P	4	1001233

#BT4ANPE0-11/98

EXPLODED VIEW

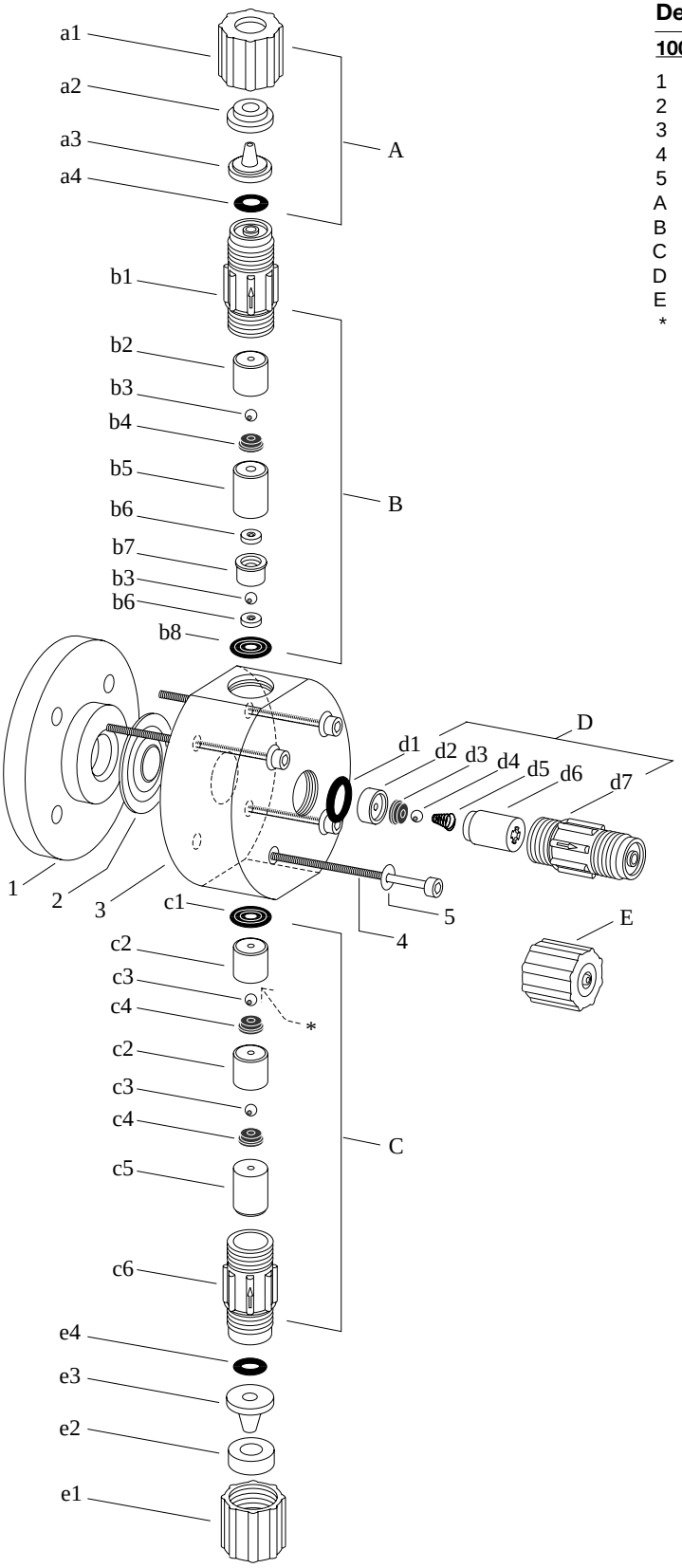


Description		Qty.	Part No.
1008-2 PCE2 liquid end complete		**1**	**1002369**
1	backplate B1008 90 x 29-2	1	1000264
2	diaphragm 46.0 x 21.5	1	1000248
3	O-ring 7.65 x 1.78 EPDM/P	1	1001262
4	upper part nozzle PVC	1	1001984
5	dosing head 90 x 29-2 PC2	1	1001696
6	bleed valve complete EPDM	1	809490
7	screw M5 x 55 & washer	4	1000268
8	bleed valve knob PP	1	800832
A	connector set 1/2" PCE	1	740160
B	discharge valve beta 1/2" PCE	1	1001439
C	suction valve beta 1/2" PCE	1	1001435
*	indicates location of spring if needed		
A	**connector set 1/2" PCE**	**1**	**740160**
a1	union nut M20 x 1.5 PVC	2	800518
a2	clamp ring 1/2" ferule	2	800715
a3	tube nozzle 3/8" PVC	2	800523
a4	O-ring 9 x 2.5 EPDM/P	2	1001263
B	**dis. valve beta 1/2" PCE**	**1**	**1001439**
b1	dis. valve body beta 1/2" PVC	1	1000500
b2	valve insert 9.2-2 (top) PVC	1	1000490
b3	valve ball 9.2mm Ceramic	2	404281
b4	ball seat disc PVC	2	140554
b5	O-ring 7.65 x 1.78 EPDM/P	2	1001262
b6	O-ring 9 x 2.5 EPDM/P	1	1001263
b7	valve insert 9.2-2 (lower) PVC	1	1000492
b8	valve lid 9.2-2 PVC	1	1000494
b9	O-ring 14 x 2 EPDM/P	1	1001264
b10	sealing gasket 14 x 1.5 EPDM/P	1	1001231
C	**suction valve beta 1/2" PCE**	**1**	**1001435**
c1	O-ring 14 x 2 EPDM/P	1	1001264
c2	valve insert 9.2-2 (top) PVC	1	1000490
c3	valve ball 9.2mm Ceramic	2	404281
c4	ball seat disc PVC	2	140554
c5	O-ring 7.65 x 1.78 EPDM/P	2	1001262
c6	O-ring 9 x 2.5 EPDM/P	1	1001263
c7	valve insert 9.2-2 (lower) PVC	1	1000492
c8	valve lid 9.2-2 PVC	1	1000494
c9	sealing gasket 14 x 1.5 EPDM/P	1	1001231
c10	suction valve body beta 1/2" PVC	1	1000498
Spare Parts Set 1008-2 PCE		**1**	**1001717**
A	connector set 1/2" PCE	1	740160
B	discharge valve beta 1/2" PCE	1	1001439
C	suction valve beta 1/2" PCE	1	1001435
2	diaphragm 46.0 x 21.5	1	1000248
6	O-ring (bleed valve) EPDM/P	3	1001265
b3	valve ball 9.2mm Ceramic	2	404281
b5	O-ring 7.65 x 1.78 EPDM/P	6	1001262
b6	O-ring 9 x 2.5 EPDM/P	4	1001263
b9	O-ring 14 x 2 EPDM/P	2	1001264
b10	sealing gasket 14 x 1.5 EPDM/P	2	1001231

#BT5APCE2-1/99

beta/4a 1005-2 NPB9 Liquid End Complete

EXPLODED VIEW



Description		Qty.	Part No.
1005-2 NPB9 liquid end complete		**1**	**1002244**
1	backplate B1005 90 x 23-2	1	1000263
2	diaphragm 46.0 x 16.5	1	1000247
3	dosing head 90 x 23-2 NP9	1	1001089
4	screw M5 x 50	4	468075
5	washer	4	462228
A	connect. set 1/4" sing. PCB	1	817065
B	vent valve sdb beta 1/4" PCB	1	1001060
C	suction valve beta 1/4" PCB	1	792026
D	discharge valve beta sdb 1/4" PCB	1	1001064
E	connect. set 1/2" sing. PCB	2	817067
*	indicates location of spring if needed		
A	**connector set 1/4" sing. PCB**	**1**	**817065**
a1	union nut M20 x 1.5 PVC	1	800518
a2	clamp ring 1/4" ferule	1	800712
a3	tube nozzle 3/16" PVC	1	800520
a4	O-ring 9 x 2.5 FPM-B	1	791421
B	**vent valve sdb beta 1/4" PCB**	**1**	**1001060**
b1	vent body sdb beta 1/4" PVC	1	1001038
b2	valve insert 4.7-1 PVC	1	791090
b3	valve ball 4.7mm Ceramic	2	404201
b4	ball seat 3 x 9.5 FPM-B	1	792759
b5	distance sleeve sdb PVC	1	1001042
b6	ball seat disc 8.95 x 2.1 Ceramic	2	1001589
b7	valve insert sdb PVDF	1	791839
b8	sealing gasket 18 x 2.5 FPM-B	1	791051
C	**suction valve beta 1/4" PCB**	**1**	**792026**
c1	sealing gasket 18 x 2.5 FPM-B	1	791051
c2	valve insert 4.7-1 PVC	2	791090
c3	valve ball 4.7mm Ceramic	2	404201
c4	ball seat 3 x 9.5 FPM-B	2	792759
c5	distance sleeve (suction) PVC	1	791089
c6	suct. valve body beta 1/4" PVC	1	800569
D	**dis. valve beta sdb 1/4" PCB**	**1**	**1001064**
d1	O-ring 14 x 2 FPM-B	1	791628
d2	valve lid sdb 4.7-1 PVC	1	1001047
d3	ball seat 3 x 9.5 FPM-B	1	792759
d4	valve ball 4.7mm Ceramic	1	404201
d5	spring cone Hast.	1	791052
d6	valve insert sdb (dis.) 4.7-1 PVC	1	1001040
d7	dis. body sdb beta 1/4" PVC	1	1001036
E	**connect. set 1/2" sing. PCB**	****2**	**817067**
e1	union nut M20 x 1.5 PVC	1	800518
e2	clamp ring 1/2" ferule	1	800715
e3	tube nozzle 3/8" PVC	1	800523
e4	O-ring 9 x 2.5 FPM-B	1	791421
**	sdb sp. parts kits ship with single connector sets. Quantities reflect # of components in *each* set.		
Spare Parts Set 1005-2 sdb PCB		**1**	**1001668**
A	connect. set 1/4" sing. PCB	1	817065
B	vent valve sdb beta 1/4" PCB	1	1001060
C	suction valve beta 1/4" PCB	1	792026
D	dis. valve beta sdb 1/4" PCB	1	1001064
E	connect. set 1/2" sing. PCB	2	817067
2	diaphragm 46.0 x 16.5	1	1000247
b4	ball seat 3 x 9.5 FPM-B	4	792759
b8	sealing gasket 18 x 2.5 FPM-B	2	791051
d1	O-ring 14 x 2 FPM-B	1	791628
d4	valve ball 4.7mm Ceramic	4	404201

#BT4ANPB9-12/98

((THIS IS A MASTER, EDIT FOR SPECIFIC APPLICATION))
PROMINENT FLUID CONTROLS, INC. – beta 4 and beta 5 (for flow rates up to 8.4 gph)

ProMinent®

SECTION _____- CHEMICAL METERING PUMPS

1.1 APPLICATION

A. Quantity: _____
B. Chemical Service: _____
C: Tag. Nos.: _____
D: Capacity (US gallons per hour)_____
E. Backpressure (psig): _____

1.2 DESCRIPTION

A. The chemical metering pump(s) shall be a microprocessor-controlled, simplex, solenoid-driven, reciprocating, mechanically-actuated diaphragm type. The housing shall be rated NEMA 4X.
B. The manufacturer shall provide a two year warranty on the pump drive and one year warranty on the pump liquid end, including diaphragm and O-rings. The pump shall be fully tested to meet rated flow and pressure by the manufacturer.
C. The power supply shall be ____ VAC, ____ Hz, single phase. The microprocessor is to automatically compensate for supply voltage variations within 15% of the rated voltage such that frequency of the pump remains constant.
D. The liquid end shall be physically separated from the drive unit by back plate with weep hole creating an air gap. An elastomer shaft wiper seal shall prevent contamination of the solenoid if the primary diaphragm fails. The diaphragm shall be nylon-reinforced EPDM with PTFE-faced fluid contact surface.

1.3 LIQUID END ((SELECT ONE))

- The liquid end shall be glass-filled polypropylene, with built coarse valve and needle valve for air bleed, manually adjusted for continuous degassing of process fluid and self-priming against pressure. The suction and discharge valve shall be of the double ball check design.
- The liquid end shall be Plexiglas® (acrylic) with built coarse valve and needle valve for air bleed, manually adjusted for continuous degassing of process fluid and self-priming against pressure. The suction and discharge valve shall be PVC, with double ball check design
- The liquid end shall be of the self-degassing type, with integral automatic air relief valve for self priming under maximum rated discharge line pressure. The liquid end shall be con structed of (PVC). The suction valve shall be of the double ball check design and discharge valve shall be double ball design, perpendicular to the suction valve.
- The Liquid end shall be constructed of virgin PVDF, suitable for pumping high viscosity fluids up to 3000 cPs. The suction and sischarge valve shall be PVDF with PTFE faced Viton® gasket seals and spring-loaded ceramic valve balls.
- The liquid end shall be constructed of carbon-filled PTFE. The suction and discharge valve shall be of the double ball check design.
- The liquid end shall be constructed of 316 stainless steel. The suction and discharge valve shall be of the double ball check design.

1.4 CONTROL

A. Stroke length control shall be manually adjusted between 100% and 0% with a stroke adjusting knob on the pump control face.

B. Stroke frequency control shall be manually adjusted in 10% increments by a multifunction switch. The metering pump shall be capable of receiving a pulse input via optional external control cable such that 1 pulse gives 1 pump stroke. The metering pump shall be capable of remote ON-OFF operation using the PAUSE function via a voltage-free contact relay through an optional control cable.

1.5 STATUS / LOW LEVEL INDICATION ((OPTIONAL))

A. Low Level Control - A 2-stage Float Switch shall be supplied to stop the pump prior to losing prime and annunciate low level on the pump via a LCD light.
B. Relay Output - An SPDT relay shall be installed on the pump for: ((SELECT ONE OR BOTH OF THE FOLLOWING))

- Fault Indication - ((OPTIONAL)) the metering pump shall have an integral relay to allow remote annunciation of a fault condition (i.e. low supply solution early warning/lack of supply solution shut down, flow monitor, system faults, and fuse/power supply failure).
- Pacing Relay - ((OPTIONAL)) the metering pump shall have an integral relay to issue a contact closure with every pump stroke to pace a second PROMINENT metering pump.
- If both of the above options are chosen, two SPST relay contacts shall be provided through a -conductor cable.

1.6 ACCEPTABLE MANUFACTURER:

A. ProMinent Fluid Controls, model _____
B. Or pre-approved equal.

1.7 ACCESSORIES ((ALL ARE OPTIONAL AND MAY BE INCLUDED AS SEPARATE ITEMS OR AS COMPONENTS OF A PUMP STAND))

A. Steel)) support stand suitable for wall, floor or top-of-tank mounting, and including the following accessories pre-piped and factory tested:
B. A foot valve and strainer shall be provided with each pump.
C. An injection check valve shall be provided with each pump.
D. A universal control cable with 4 pole round plastic connector and 5-wire cable with loose ends shall be provided with each pump.
E. A two-stage float switch compatible with the chemical metering pump shall be provided for monitoring tank level.
F. A diaphragm failure detector shall be provided to ((open/close)) a contact in the event of diaphragm failure.
G. An adjustable-pressure, diaphragm-type back pressure/antisiphon valve shall be provided with each metering pump.
H. An in-line, adjustable-pressure, diaphragm-type pressure relief valve shall be provided with each metering pump.
I. A pump-mounted, multi-function, fixed-spring pressure diaphragm-type valve for backpressure/antisiphon protection, pressure relief, priming and discharge line drain shall be provided with each metering pump.
J. An air-charged, bladder-type pulsation dampener shall be provided with each metering pump.
K. A clear PVC calibration column with FNPT fittings top and bottom shall be provided with each pump.
L. Fifteen feet of tubing compatible with the fluid pumped shall be provided with each pump.

END OF SECTION