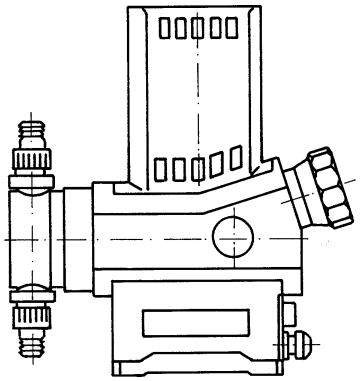
ProMinent® Vario/b Motor-Driven Metering Pumps



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ProMinent Vario/b motor-driven metering pumps

The ProMinent Vario motor-driven, mechanically-actuated, diaphragm-type metering pump is equipped with a special thermal overload protected single-phase AC motor 1/8 HP (0.10 kW), 115 V, 60 Hz or 230 V, 50/60 Hz. A 3-phase motor is also available at 220/460 V, 60 Hz in the basic pump version. It covers a capacity range of 5.3 to 38 gph (20 to 144 L/h) against maximum backpressures of 174 psig (12 bar). The capacity can be infinitely varied in steps of 1% by adjustment of the self-locking stroke length adjusting knob or optional stroke positioning motor (maximum stroke length is 3 mm).

Under defined conditions and correct installation the repeatability of the metering is better than ±2% in the stroke length range of 30% to 100%.

The rugged, corrosion and chemical-resistant plastic housing is rated NEMA 4 (IP 65). Features include three gear ratios, three liquid end sizes, two liquid end materials and a variety of interchangeable slide-in electronic control units offering external pump control by either pulse or analog signals (e.g. 0/4-20 mA).

Note: All motor-driven metering pumps should be installed with a pressure relief valve on the discharge line. See the accessory section for pressure relief valves.

Control versions

Basic type: With power switch (on/off, yellow pilot light) and fuse. For 1 ph. motor, or with standard 3 ph. motor. Not for use with external control cable, float switch or fault/pacing relays. No frequency control is possible. The pump capacity is set manually with the stroke length knob.

Pulse control type: With external pacing by means of pulse signals (voltage-free contacts, open collector), with a voltage-free remote pause (pause function on when contact open); both require an universal control cable (not included with pump). Connection for metering monitor and two-stage float switch. The tri-color LED indicates operating status. An internal/external switch allows either continuous metering or external pulse control. Power switch and fuse (as on basic type) are also provided. Installation of optional relays is available. Six input pulse rates are available to match to nearly any water meter or process controller.

Pulse memory control type: Pulse control-type operation plus memory function. Intermediate memory for control pulses if the input pulse rate is too high. Once the pulse rate drops below maximum, the pump works off all pulses in memory.

Analog control type: With external pacing by means of an analog signal (0/4-20 mA), a voltage-free remote pause (pause function on when contact open); both require an universal control cable (not included with pump). Connection for metering monitor and two-stage float switch. The tri-color LED indicates operating status. An internal/external switch and cable are available. Power switch and fuse (as for basic type) are also provided. Installation of optional relays is available.

CE Approved

CSA® Available (Standard in Canada)

The Vario metering pumps are registered according to DIN-VDE 0700 and protected against radio interference class B according to DIN-VDE 0871.

Unique External Control

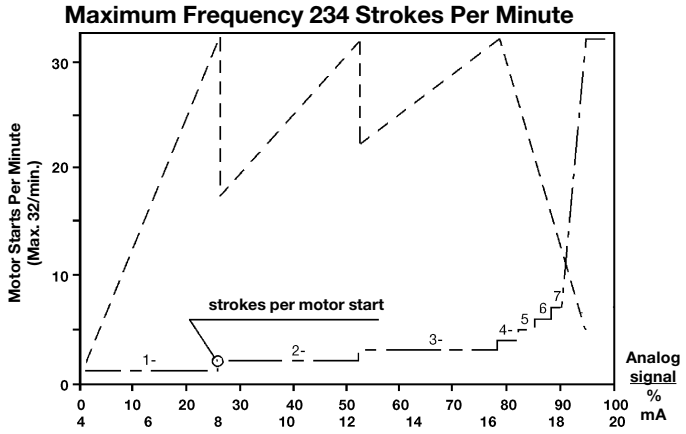
The Vario pumps with analog and pulse control feature a unique method of varying the pump output. The pump varies both the number of strokes per motor start and the number of motor starts per minute in proportion to an external analog signal or the frequency of an external pulse input. The industrial duty motor is designed to provide up to 2000 motor starts and stops per hour (33.3/min) on a continuous basis. The charts at right show the relationship between strokes per start and starts per minute for flow in proportion to an analog signal. For pulse control pumps, the output will be proportional between 0 and the maximum allowable pulse rate (selected by identity code between 2,000 and 12,000 pulses per hour). Input pulses exceeding the selected maximum rate will be ignored, unless the memory option is installed, resulting in excess pulses (up to 65,535) being stored and worked off when the input pulse rate drops below maximum.

Note: With analog input, at approximately 4.4 mA (or 0.4 mA), the metering pump operates its first metering stroke, and at approximately 19.2 mA, the pump goes into continuous operation. The precise values depend on the gear and the power frequency.

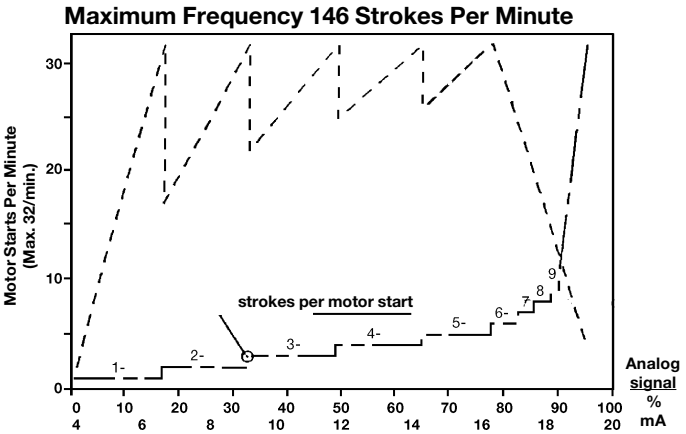
When controlled by analog, pulse or remote pause, the pump has a positive stop with no overrun. The diaphragm is stopped at completion of the suction stroke to prevent starting against a partially compressed spring. Pumps started by means of the power switch or power supply must be started against 50% or less of rated pressure. Starting against a partially compressed spring as well as the system backpressure could exceed the motor's startup torque.

External control may also be provided by an optional stroke positioning motor. This could be used with a manual pump; for example, to provide flow proportional to a water meter signal. It could also be used with an external frequency controlled pump to have compound loop control; for example, from both a water meter and a pH controller.

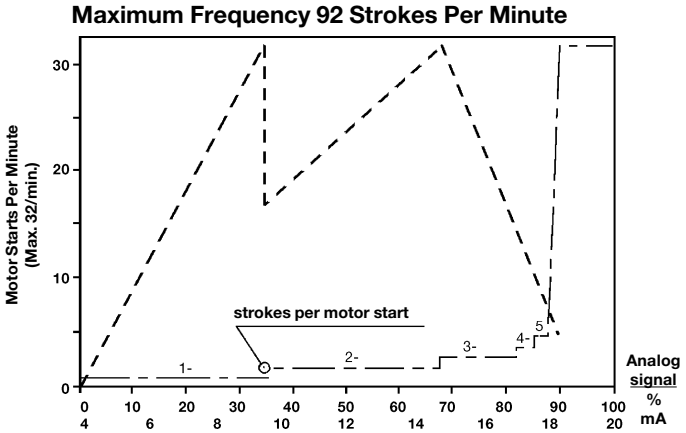
Vario 12042, 07063, 04120



Vario 12026, 09039, 05075



Vario 12017, 10025, 06047



Vario/b microprocessor control - basic to any process.

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FEATURES

Note: The capabilities listed on this page are common to all Vario control version 1, 2 and 3 pumps. The cable for external pacing or remote pause is an optional accessory, as are the float switch, flow monitor and relay outputs.

Stroke frequency control

Continuous operation – "Internal"

The pump capacity can be varied via the manual stroke length knob or via the optional stroke positioning motor (from 0 to 100% stroke length). See the Technical Data for a particular model's maximum stroking rate, (e.g. 92, 146, or 234 strokes per minute) at 60 Hz.

External pacing – "Contact"

The Vario series can be paced externally (e.g. by means of a pulse-type water meter for proportional chemical feed). The pulse signals are fed into the contact input of the pump by an optional universal control cable. The pump output is directly proportional to the incoming pulse rate, up to the pump's maximum stroke rate.

Ensure fluid flow

Chemical tank float switch

An optional two-stage ProMinent float switch can be plugged into the pump to monitor chemical levels in the source tank. An early warning will be issued when the allowable minimum level is reached. The pump continues to operate while the LED changes from green to orange, and an optional collective fault relay changes state to issue an alarm. If the liquid level in the supply tank drops another 3/4" (20 mm), the pump automatically shuts down and the LED changes from orange to red. The optional fault relay remains activated.

Flow monitor

The Vario series metering pumps will monitor their own output, with the optional adjustable flow monitor connected to the discharge line on a variable flow bypass and plugged into the front of the pump. Every fluid discharge is sensed and fed back to the electronic control circuit of the pump. If insufficient fluid is discharged for 8 consecutive strokes, the pump automatically stops and the red LED lights. The optional fault relay changes state to issue an alarm or activate a standby pump.

Remote pause

Remote on/off control – "Pause"

The pump operation can be switched on or off via a voltage free dry contact through the optional control cable. The pump operates on a closed contact. If the contact is open, the pump stops and the green LED shuts off.

Problem identification

Auto-fault diagnosis

The electronic control circuit monitors itself continuously. With any fault of the microprocessor, the motor's thermal overload protection or the motor's rotational overload protection stops the pump and issues an alarm (with fault annunciating relay option). The red LED lights.

Relay outputs

Relays can transmit alarm messages to start a back-up pump, indicate pump status, or to pace a second ProMinent metering pump synchronously. Selectable as:

Fault annunciating relay
For low tank level (float switch), loss of flow (flow monitor), and system faults can be ordered with a normally energized or normally de-energized function.

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.

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Technical Data: Vario

60 Hz (3450 RPM motor)

Pump version Vario/b	Capacity at max. backpressure psig (bar)	Capacity at max. backpressure U.S. gph (L/h)	Max. stroking rate strokes/ min.	Displacement mL/ stroke	Max. suction lift ft. (m)	Maximum suction side pressure psig (bar)	Suction/ discharge connector inches NPT	Suction/ discharge connector inches hose barb	Shipping weight lbs. (kg)
12017 PVT	145 (10)	5.3 (20)	92	3.6	22.9 (7.0)	40.6 (2.8)	1/2M	5/8	14.5 (6.6)
12017 SST	174 (12)	5.3 (20)	92	3.6	22.9 (7.0)	40.6 (2.8)	3/8F		18.9 (8.6)
12026 PVT	145 (10)	8.3 (31.4	146	3.6	22.9 (7.0)	40.6 (2.8)	1/2M	5/8	14.5 (6.6)
12026 SST	174 (12)	8.3 (31.4)	146	3.6	22.9 (7.0)	40.6 (2.8)	3/8F		18.9 (8.6)
12042 PVT	145 (10)	13.3 (50.4)	234	3.6	22.9 (7.0)	40.6 (2.8)	1/2M	5/8	14.5 (6.6)
12042 SST	174 (12)	13.3 (50.4)	234	3.6	22.9 (7.0)	40.6 (2.8)	3/8F		18.9 (8.6)
10025 PVT	145 (10)	7.9 (29.8)	92	5.4	13.1 (4.0)	24.6 (1.7)	1/2M	5/8	14.5 (6.6)
10025 SST	145 (10)	7.9 (29.8)	92	5.4	13.1 (4.0)	24.6 (1.7)	3/8F		18.9 (8.6)
09039 PVT	123 (8.5)	12.5 (47.3)	146	5.4	13.1 (4.0)	24.6 (1.7)	1/2M	5/8	14.5 (6.6)
09039 SST	123 (8.5)	12.5 (47.3)	146	5.4	13.1 (4.0)	24.6 (1.7)	3/8F		18.9 (8.6)
07063 PVT	94 (6.5)	20 (75.6)	234	5.4	13.1 (4.0)	24.6 (1.7)	1/2M	5/8	14.5 (6.6)
07063 SST	94 (6.5)	20 (75.6)	234	5.4	13.1 (4.0)	24.6 (1.7)	3/8F		18.9 (8.6)
06047 PVT	80 (5.5)	15 (56.9)	92	10.2	9.8 (3.0)	11.6 (0.8)	3/4M	3/4	16.5 (7.5)
06047 SST	80 (5.5)	15 (56.9)	92	10.2	9.8 (3.0)	11.6 (0.8)	1/2F		29.7 (13.5)
05075 PVT	65 (4.5)	23.8 (90)	146	10.2	9.8 (3.0)	11.6 (0.8)	3/4M	3/4	16.5 (7.5)
05075 SST	65 (4.5)	23.8 (90)	146	10.2	9.8 (3.0)	11.6 (0.8)	1/2F		29.7 (13.5)
04120 PVT	50(3.5)/33(2.3)*	38 (144)	234	10.2	9.8 (3.0)	11.6 (0.8)	3/4M	3/4	16.5 (7.5)
04120 SST	50(3.5)/33(2.3)*	38 (144)	234	10.2	9.8 (3.0)	11.6 (0.8)	1/2F		29.7 (13.5)

*The 33 psig (2.3 bar) value specifies the maximum permissible start-up pressure for 230 V models only. The 50 psig (3.5 bar) backpressure rating is for 115 V models which feature a longer start capacitor.

Media-contacted materials:

	Liquid end	Suction/discharge connections	Seals	Valve balls	Valve Seat
SST	316 stainless steel	316 stainless steel	PTFE	304 SS	PTFE
PVT	PVDF	PVDF	PTFE	Ceramic	PTFE

DEVELOPAN® pump diaphragm is reinforced EPDM with PTFE face on fluid-contact side.
When the pump is switched off by means of the power switch or power supply, the max. possible start-up pressure is 20-50% of the maximum working pressure specified.

Cross-Reference: Obsolete Vario model numbers to current Vario pump versions

HM 38-042 = 12017	HM 38-063 = 10025	HM 38-120 = 06047
HM 24-042 = 12026	HM 24-063 = 09039	HM 24-120 = 05075
HM 15-042 = 12042	HM 15-063 = 07063	HM 15-120 = 04120

Identity code: Vario

Series:

VAM b Vario Version b

12017	07063	**Pump version:**
12026	06047	
12042	05075	
10025	04120	
09039		

Liquid end materials:

PVT	PVDF with PTFE packing seals
SST	Stainless steel with PTFE packing seals

Valve springs:

0	without springs
1	with 2 springs (1.5 psig) Hastelloy C4

Hydraulic Connector:

C	Clamping nut & insert with NPT connections (PVDF)
D	Clamping nut & insert with NPT connections (SST)

Labeling:

0	Standard with logo

Electrical connection: (with 6 ft. (2 m) power cord)

A	1 ph	230 V	50/60 Hz	Euro plug
D	1 ph	115 V	60 Hz	N. American plug
U	1 ph	230 V	50/60 Hz	N. American plug
S	3 ph	230/400 V	50/60 Hz	Comes with junction box on motor (basic only)

Control type:

0	Basic type with 3 ph or 1 ph motor (1 ph w/ power switch + fuse)
1	External contact (pulse) input + power switch + fuse + two-stage float switch connector + pause function as N/C contact + flow monitor input + tri color function display
2	Same as control type 1 + memory function
3	Analog input + power switch + fuse + two-stage float switch connector + pause function as N/C contact + flow monitor input + tri color function display

Note: When selecting control type "0", control version must be "0" also.

Control version:

	For control type "0" only
0	Standard
	For control type "1" and "2" only, maximum contact closures
1	6000 pulses/h
2	2000 pulses/h
3	4000 pulses/h
4	8000 pulses/h
5	10000 pulses/h
6	12000 pulses/h
	For control type "3" only
A	0 - 20 mA
B	4 - 20 mA
	Stoke length adjustment
H	With 3 P stroke positioning motor, 230 V, 50/60 Hz
I	With 3 P stroke positioning motor, 115 V, 50/60 Hz
K	With stroke positioning motor, 4-20 mA, 230 V, 50/60 Hz
M	With stroke positioning motor, 4-20 mA, 115 V, 50/60 Hz

Switching mode relay:

0	Without relay (standard)
1	Fault annunciating relay, drops out (N/C contact)
2	Pacing relay, pulls in (N/O contact)
3	Fault annunciating relay, pulls in (N/O contact)

VAMb	**05075**	**PVT**	**1**	**C**	**0**	**D**	**1**	**1**	**1**	

Specifications: Vario

Maximum stroke length:	0.12" (3.0 mm)
Materials of construction	
Housing:	Glass-filled Luranyl™ (PPE)
Diaphragm:	PTFE faced EPDM with steel core and Nylon reinforcement
Liquid end options:	PVDF and 316 SS
Enclosure rating:	NEMA 4 (IP 65)
Motor HP:	1/8 HP (0.10 kW)
Motor voltage:	230 ±10% VAC (50/60 Hz), 1 phase 115 -6% +15% VAC (60 Hz), 1 phase 220 /460 V, 60 Hz, 3 phase
Current drain:	1 ph: 1.6 A (115 V), 0.8 A (230 V) startup current about 2.5 times nominal current. 3 ph: 0.5 A (230 V), 0.32 A (400 V)
Full load RPM:	3450 RPM (60 Hz), 2830 RPM (50 Hz) (*Note:* different performance with 50 and 60 Hz power)
Allowable motor start/stops:	2000/hour
Motor insulation class:	F
Motor enclosure:	Fan-cooled open motor
Thermal overload protection:	Yes (176°F, 80°C)
Check valves:	Single ball
Repeatability:	When used according to the operating instructions ±2%.
Power cord:	6 foot (2 m) 2 wire + ground
Relay cable (optional):	6 foot (2 m) 3 wire (SPDT) 250 VAC, 2 A
Ambient temperature range:	14°F (-10°C) to 104°F (40°C)
Lubrication:	Sealed grease lubricated bearings and gearing
Max. fluid operating temperatures:	Material / Constant / Short Term PVDF: 149°F (65°C) / 212°F (100°C) 316 SS: 122°F (50°C) / 248°F (120°C)
Maximum solids size in fluid:	0.2 mm
Remote pause and/or contact input voltage level with open contact:	Approximately +5 VDC supply voltage
Impedance:	10 kOhm
Controlling contact:	With voltage-free contact, or semiconductor sink logic control (not source logic) 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).
Max. pulse frequency:	25 pulses/sec
Max. pulse memory:	65,535 pulses
Necessary contact duration:	20 ms
Analog - current input burden:	Approximately 70 Ohm
Max. allowable input current:	50 mA
Warranty:	Two years on drive; one year on liquid end.
Factory testing:	**Each pump is tested for rated flow and pressure**
Industry standards:	CSA approval available at additional cost in U.S., standard in Canada. CE approved.

Data required to size metering pumps and accessories

Complete this data sheet and fax it to ProMinent Pittsburgh at (412) 787-0704 or ProMinent Canada at (519) 836-5226 for a review of the system hydraulics and recommendations on pump and accessory selection.

Desired capacity min./max.	GPH (l/h)_____
Available power supply	_____V, _____ Hz, _____ phase
Working temperature min./max.	°F (°C)_____
Description of process fluid	_____
Concentration %	_____
Solids content %	_____
Absolute viscosity, cP	_____
Vapor pressure at working temperature	psig (bar) _____
Remarks (e.g. abrasive, developing gases and fumes, flammable, corrosive)	_____ _____

Suction conditions:

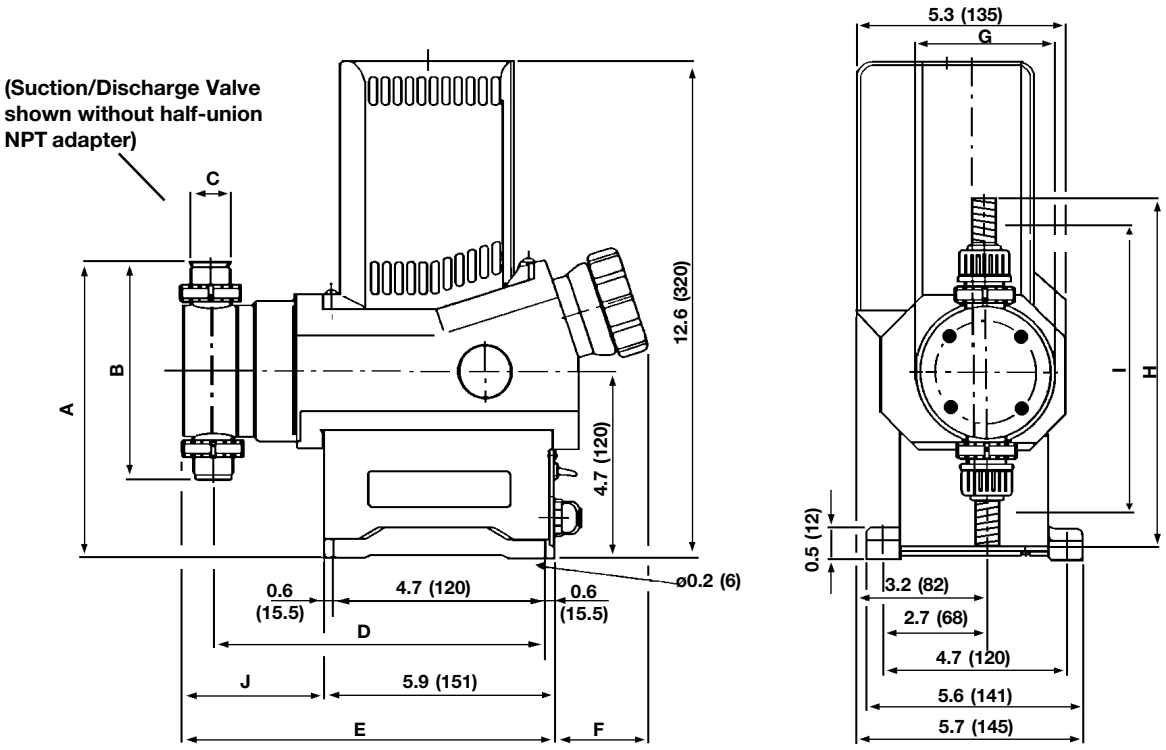
Suction lift min./max., or	ft. (m) _____
Positive suction head min./max., or	ft. (m)_____
Pressure in chemical tank	psig (bar)_____
Length of suction line	ft. (m) _____
Size (I.D.) of suction line	in. (mm)_____
Number of valves and fittings in suction line	_____

Discharge conditions:

Back-pressure min./max.	psig (bar) _____
Discharge head min./max.	ft. (m) _____
Negative discharge head min./max.	ft. (m) _____
Length of discharge line	ft. (m) _____
Size (I.D.) of discharge line	in. (mm)_____
Number of valves and fittings in discharge line	_____

System sketch

Dimensions: Vario



Dimensions in inches (mm)

Version/Material	A	B	Suction/Discharge Valve Thread C	Half Union Pipe Adapter	D	E	F	G	H	I	J
12017, 12026, 12042 PVDF	7.5 (190)	5.5 (140)	DN 10	1/2" MNPT	8.2 (208)	9.6 (243)	2.5 (65)	3.3 (85)	8.9 (225)	–	3.6 (92)
SS	7.5 (190)	5.5 (140)	DN 10	3/8" FNPT	8.2 (208)	9.5 (241)	2.5 (65)	3.3 (85)	–	7.0 (175)	3.5 (90)
10025, 09039, 07063 PVDF	7.5 (190)	5.5 (140)	DN 10	1/2" MNPT	8.2 (208)	9.6 (243)	2.5 (65)	3.3 (85)	8.9 (225)	–	3.6 (92)
SS	7.5 (190)	5.5 (140)	DN 10	3/8" FNPT	8.2 (208)	9.5 (241)	2.5 (65)	3.3 (85)	–	7.0 (175)	3.5 (90)
06047, 05075, 04120 PVDF	8.6 (218)	7.7 (195)	DN 15	3/4" MNPT	8.3 (210)	10.1 (257)	2.5 (65)	5.3 (135)	12.8 (325)	–	4.2 (106)
SS	8.6 (218)	7.7 (195)	DN 15	1/2" FNPT	8.3 (210)	9.8 (249)	2.5 (65)	5.3 (135)	–	9.5 (235)	3.9 (98)

ProMinent® Vario Accessory kits

Description	Part No.

Accessory kits

Pumps **DO NOT** include foot valves or injection valves as standard.
Foot valves and injection valves can be ordered together as accessory kits in the following materials. These kits **DO NOT** include tubing. (See High Flow Accessories section for ordering information).

Material	Material Code	Connection	
PVC/Viton®	NP1	1/2" MNPT	7809414
PP/EPDM	PP1	1/2" MNPT	7809415
PP/Viton®	PP2	1/2" MNPT	7809420
PVC/Viton®	NP1	3/4" MNPT	7809416
PP/EPDM	PP1	3/4" MNPT	7809417
PP/Viton®	PP2	3/4" MNPT	7809421

Foot valves and injection valves are also available in PVDF and SS.

Foot Valves

Material	Connection	
PVDF/PTFE	1/2" MNPT	7803720
PVDF/PTFE	3/4" MNPT	7803721
SS/PTFE	3/8" FNPT	809467
SS/PTFE	1/2" FNPT	924518

Injection Valves

Material	Connection	
PVDF/PTFE	1/2" MNPT	7803724
PVDF/PTFE	3/4" MNPT	7803725
SS/PTFE	3/8" FNPT	809463
SS/PTFE	1/2" FNPT	924523

ProMinent® Vario Control cables

Description	Part No.

External control cables

Universal control cable

For metering pump control via contact closure (pulse), standard process signal (analog), and voltage-free contact for remote pause control.

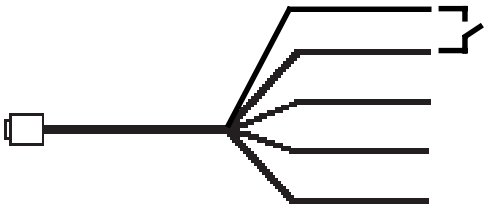
For Vario pumps with 5-pole round plastic connector and 5-wire cable with loose end.

Universal control cable, 5-pole round connector, 5-wire, 6 ft. (2 m)	1001300
Universal control cable, 5-pole round connector, 5-wire, 16.4 ft. (5 m)	1001301
Universal control cable, 5-pole round connector, 5-wire, 32.8 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, WHITE, BLUE & GREY wires are not used and should be cut.



BROWN: Remote On/Off (+)

BLACK: Common

GREY: Not used

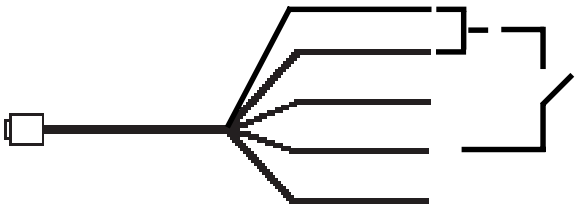
WHITE: Pulse (+)

BLUE: Analog (+)

Pulse Control

Pulse control will allow the pump to run in proportion off of 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

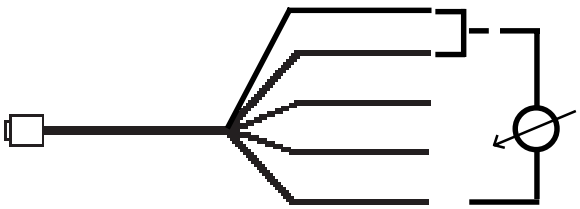
WHITE: Pulse (+)

BLUE: Analog (+)

Analog Control

Analog control runs in proportion to an analog signal such as 4 - 20 mA.

Note: BROWN and BLACK wires must be connected together via an ON/OFF contact or shorted together. The BLACK wire is negative and the BLUE wire is positive. GREY wire is not used and should be cut.



BROWN: Remote On/Off (+)

BLACK: Common

GREY: Not used

WHITE: Pulse (+)

BLUE: Analog (+)

ProMinent® Vario
Metering monitor

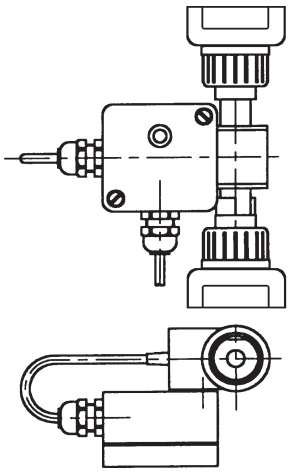
Description	Part No.

Metering monitor

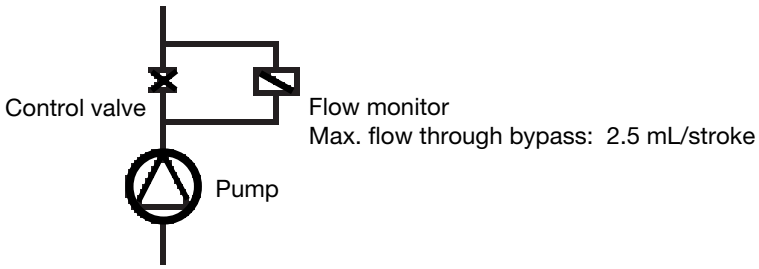
Adjustable metering monitor “Flow Control”

For Vario, with signal transmitter and connecting cable with 4-pole round connector for direct connection with the metering pump.

For monitoring the actual flow output per pump stroke using a plastic encapsulated metal poppet detected by the proximity sensor. The stroke sensor with the signal transmitter can be adjusted so that when the stroke volume is reduced by at least 20%; or if there is no flow for eight incomplete strokes, the metering pump is shut down and an alarm signal is issued. Assemble on a bypass in the discharge line as shown below. Provided with 1/2" FNPT connections.



monitor/Vario



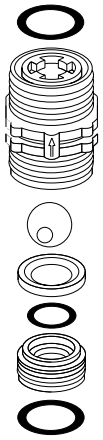
Bypass Assemblies with Metering Monitor

PVC, Viton®, 1/2" FNPT x 1/2" FNPT	7358655
PVC, Viton®, 3/4" FNPT x 3/4" FNPT	7358656
PP, EPDM, (PVDF bypass), 1/2" FNPT x 1/2" FNPT	7740709
PP, EPDM, (PVDF bypass), 3/4" FNPT x 3/4" FNPT	7740710

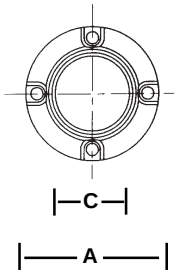
ProMinent® Vario Spare Parts

Description **Part No.**

Spare parts and Liquid ends



Discharge/Suction Valve



Liquid End	Dim A (mm)	Dim C (mm)
FM 042	76	42
FM 063	76	51
FM 120	126	70

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

PP, NP Liquid Ends
- 1 Diaphragm
- 1 Suction Valve
- 1 Discharge Valve
- 2 Valve Balls
- 1 Set of Seals (O-rings & ball-seat discs)

PVT/TT Liquid Ends
- 1 Diaphragm
- 1 Suction Valve
- 1 Discharge Valve
- 2 Valve Balls
- 1 Set of Seals (sleeve rings & ball-seat discs)

SS Liquid Ends
- 1 Diaphragm
- 2 Valve Balls
- 1 Set of Seals (sleeve rings, flat seals & ball-seat discs)

	Material Code	Complete Liquid End	Spare Parts Kit	Spare Valves Only (adapter sets not included) Suction and Discharge	Diaphragm
with Liquid end FM 042 - Pump versions 12017, 12026, 12042					
	PP1	910625	910753	809457	811458
	NP1	910624	910754	809456	811458
	TT1	910626	910752	809458	811458
	PVT	1002989	1003641	1002267	811458
(10 bar sv)	PVT	1002972	1003641	1002267	811458
	SST	1002995	910751	809459	811458
	SS2		*910750		
with Liquid end FM 063 - Pumps versions 10025, 09039, 07063					
	PP1	910621	910758	809457	811459
	NP1	910620	910759	809456	811459
	TT1	910622	910757	809458	811459
	PVT	1002990	1003642	1002267	811459
(10 bar sv)	PVT	1002973	1003642	1002267	811459
(8.5 bar sv)	PVT	1002984	1003642	1002267	811459
(6.5 bar sv)	PVT	1002985	1003642	1002267	811459
	SST	1002996	910756	809459	811459
	SS2		*910755		
with Liquid end FM 120 - Pumps versions 06047, 05075, 04120					
	PP1	910629	910763	809402	811460
	NP1	910628	910764	809401	811460
	TT1	910630	910762	809403	811460
	PVT	1002991	1003643	792517	811460
(5.5 bar sv)	PVT	1002986	1003643	792517	811460
(4.5 bar sv)	PVT	1002987	1003643	792517	811460
(3.5 bar sv)	PVT	1002988	1003643	792517	811460
	SST	1002997	910761	809404	811460
	SS2		*910760		

*SS complete with 2 valves

Spare fuses

110 V	5 x 20 mm	2.5 AT	712033
220 V	5 x 20 mm	1.25 AT	712032

((THIS IS A MASTER, EDIT FOR SPECIFIC APPLICATION))
PROMINENT FLUID CONTROLS, INC. - VARIO b (for flow rates from 2 to 38 gph)
SECTION _____- CHEMICAL METERING PUMPS

ProMinent®

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 simplex, motor-driven, reciprocating, mechanically-actuated diaphragm type. The pump shall include integral motor, grease-lubricated gear reducer and cam-and-spring drive mounted in a corrosion-resistant, glass-reinforced Luranyl (PPO) plastic housing.
B. The chemical metering pump 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.
C. The pump shall be fully tested to meet rated flow and pressure by the manufacturer.
D. The power supply shall be ____ VAC, ____ Hz, single phase.
E. 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 virgin PVDF. The suction and discharge valves shall be PVDF with PTFE faced Viton® gasket seals and ceramic valve balls.
- The liquid end shall be constructed of 316 stainless steel. The suction and discharge valves shall be constructed of 316 stainless steel with PTFE seals and stainless steel valve balls.

1.4 CONTROL

A. Stroke length control ((SELECT ONE))

- shall be adjustable manually by means of a stroke length knob, in increments of 1%, from 0% to 100% of stroke length.
- shall be adjustable by means of a stroke positioning motor from 0% to 100% of stroke length. The stroke positioning motor shall feature visual stroke length indication and manual/ external selector switch for local control via toggle switch or external control in proportion to a 4-20 mA signal.

B. Stroke frequency control ((SELECT ONE))

- shall be fixed at the pump's maximum stroke rate. Pump shall be switched on and off via a toggle switch. Motor shall be 1/8 hp with fused overload protection. Electronics enclosure shall be rated NEMA 4X.

- shall be switchable between local operation at the pump's maximum stroke rate or external control via 4-20 mA signal. The microprocessor control unit housed in the pump shall control the motor such that the stroke rate, as measured by a stroke sensor, is proportional to the strength of the analog signal. Motor shall be 1/8 hp with fused and thermal overload protection, and rotational motor overload protection. Pump shall feature power switch and shall be capable of remote ON-OFF operation using the PAUSE function via a voltage-free contact relay through an optional control cable. Electronics enclosure shall be rated NEMA 4X.
- shall be switchable between local operation at the pump's maximum stroke rate or external control via pulse train signal. The microprocessor control unit housed in the pump shall control the motor such that the stroke rate, as measured by a stroke sensor, is proportional to the incoming pulse rate. Motor shall be 1/8 hp with fused and thermal overload protection, and rotational motor overload protection. Pump shall feature power switch and shall be capable of remote ON-OFF operation using the PAUSE function via a voltage-free contact relay through an optional control cable. The maximum pulse input rate to the pump shall be ((SELECT ONE: 6000, 2000, 4000, 8000, 10000 or 12000) pulses per hour. Electronics enclosure shall be rated NEMA 4X.

1.5 FLOW ASSURANCE ((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 LED.
B. Flow Monitor - A Flow Monitor shall be installed on the discharge line to automatically stop pumping and annunciate a fault condition on the pump LED upon loss of discharge flow.
C. Relay Output - An SPDT relay shall be installed on the pump for: ((SELECT ONE))

- 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.

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. The pump shall be mounted on a ((CHOOSE ONE: Fiberglass Reinforced Plastic / Stainless 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 4-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. An adjustable discharge flow monitoring device mounted on a valved bypass shall be provided. The flow monitor shall be capable of signaling a fault condition to the metering pump.
G. A diaphragm failure detector shall be provided to ((open/close)) a contact in the event of

diaphragm failure.

H. An adjustable-pressure, diaphragm-type back pressure/antisiphon valve shall be provided with each metering pump.
I. An in-line, adjustable-pressure, diaphragm-type pressure relief valve shall be provided with each metering pump.
J. 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. ((AVAILABLE ONLY ON MODELS 12017, 12026, 12042, 10025, 09039, 07063))
K. An air-charged, bladder-type pulsation dampener shall be provided with each metering pump.
L. A clear PVC calibration column with FNPT fittings top and bottom shall be provided with each pump.

END OF SECTION