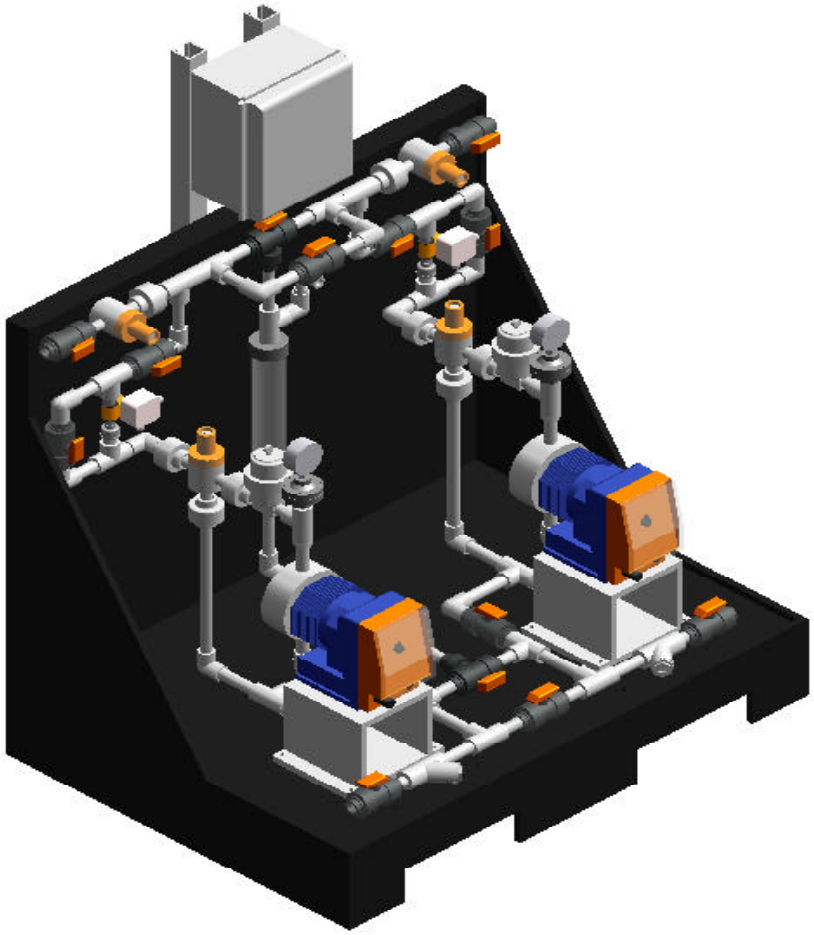
Operating Instructions ProMinent® Low Flow Dual Metering Pump (S-2) Dosing Package

ProMinent®



Read the operating instructions before installation and use. The warranty does not cover damages due to faulty operation. ***Keep for reference and replacement information.***

BA S2 02 08/02NA Order no. 7750079

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SAFETY INSTRUCTIONS

General safety considerations

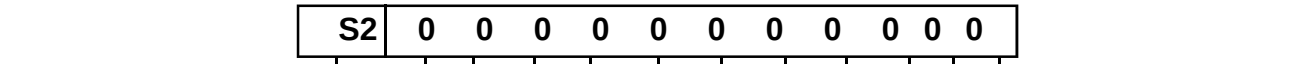
- Wear protective clothing and glasses when working with or near chemicals.
- Refer to the MSDS for all chemicals being used.
- Inspect tubing regularly for cracking or deterioration and replace as necessary.
- Make sure the voltage on the equipment matches the voltage at installation.
- Do NOT use with flammable liquids.
- Use only ProMinent® parts, use of other parts may result in damage to equipment or injury.
- Flush all components that are in contact with chemicals prior to servicing.
- Secure all chemicals and equipment making them inaccessible to children and pets.
- Pumps must be accessible at all times to facilitate operation and maintenance of the pumps.
- Dispose of all chemicals and waste according to all local, state and federal regulations.

Safety operating procedures

- **Caution** the liquid end may contain water from factory testing. If chemical will react with water remove water from liquid end by turning pump 180° and discharge the liquid end. Flush an appropriate solvent through the intake valve prior to use.
- Consult a licensed plumber and electrician prior to installation; conform to local codes.
- Disconnect all power from equipment prior to repairing or moving the equipment.
- Depressurize the system prior to working on the pump.
- Do not exceed maximum operating pressure.
- Use an overflow valve to avoid excessive backpressure when conditions warrant it.
- Set the stroke length when the pump is running; when the load is relieved from the setting pin.
- Use a pulsation dampener when discharge lines are over 100 ft. in length.

The exact specifications and included accessories for you system can be determined by using the chart below.

S2 PACKAGE CONFIGURATION



Series: Dual Pump Package (for beta, vario 1/2", and gamma Chemical Metering Pumps)

Stand Assembly Type

1	SS Stand (32"x28"x20")
2	PP or PE, UV Protected, black (37"x40"x28.25")
3	PP Wall Board
S	Special Order

Ball Valve & Piping Assembly Type

	Valve	Seat/Seal	Piping	Connection
0	None	None	None	None
1	PVC	EPDM	PVC	Socket weld
2	PVC	EPDM	PVC	Threaded
3	PVC	Viton®	PVC	Socket weld
4	PVC	Viton®	PVC	Threaded
5	SS	PTFE	SS	Threaded
6	PVDF	Viton®	PVDF	Fusion weld
7	PP	EPDM	PP	Fusion weld
8	PP	Viton®	PP	Fusion weld
9	CPVC	Viton®	CPVC	Socket weld
S	Special Order			

Calibration Column

0	None
1	100 mL PVC
2	500 mL PVC
3	100 mL PP
4	500 mL PP
5	100 mL PVDF/Glass
6	500 mL PVDF/Glass
7	100 mL SS/Glass
8	500 mL SS/Glass
S	Special Order

Self Filling Calibration Option

	Valve	Seat/Seal	Piping
0	None	None	None
1	PVC	EPDM	PVC
2	PVC	Viton®	PVC
3	SS	PTFE	SS
4	PVDF	Viton®	PVDF
5	PP	EPDM	PP
6	PP	Viton®	PP
7	CPVC	Viton®	CPVC
S	Special Order		

†† Pressure Relief Valve

0	None
1	PVC
2	SS
3	PVDF
4	PP
5	CPVC
S	Special Order

Y-Type Sediment Strainer

0	None
1	PVC
2	SS
3	PP
4	CPVC
S	Special Order

†† Pulsation Dampener

		mL	cu.in.
0	None		
1	PVC/Viton®	164	10
2	SS/PTFE	131	8
3	PVDF/PTFE	131	8
4	PP/EPDM	164	10
5	PVC/HYPALON®	164	10
S	Special Order		

†† Backpressure Valve

0	None
1	PVC
2	SS
3	PVDF
4	PP
5	CPVC
S	Special Order

†† Pressure Gauge**

0	None
1	2" SS w/PVDF isolator
2	2" SS w/PVC isolator
3	2" SS w/SS isolator
4	2" SS w/PP isolator
5	2" SS gauge only (w/o isolator)
6	2" SS w/CPVC isolator
S	Special Order

†† Multi-Function Valve

0	None
1	Size I, PVDF, 145 psig (10 bar)
2	Size I, PVDF, 232 psig (16 bar)
3	Size II, PVDF, 87 psig (6 bar)
4	Size II, PVDF, 145 psig (10 bar)
5	Size III, PVDF, 145 psig (10 bar)
S	Special Order

†† Flow Monitor

0	None
1	Type I, PVC
2	Type II, PVC
3	Type III, PVC
4	Type III, PVC w/bypass Assy.
5	Type I, PP
6	Type II, PP
7	Type III, PP
8	Type III, PP w/bypass Assy.
9	SS flow sensor w/ flow monitor
S	Special Order

Principle of operation

The Dual Metering Pump Dosing Package (S-2) is a corrosion-resistant, completely self-contained chemical metering pump package. It contains an integrated calibration column making it ideal for chemical trials as well as permanent or emergency chemical injection. All the necessary piping, appurtenances and fittings are assembled and tested by ProMinent®. The chemical metering pumps, all fittings, piping and accessories are mounted to a stainless steel (SS) or plastic stand. The S-2 stand is portable and has a convenient carrying handle. The chemical metering pump is a microprocessor controlled, positive displacement, diaphragm type pump with capacities of 8 gph (30 L/h). ProMinent® gamma or beta metering pumps are used for this package.

UNPACKING

CHECK ALL EQUIPMENT FOR DAMAGE AND FOR COMPLETENESS AGAINST THE ORDER. REPORT INCORRECT ORDERS OR DAMAGE TO THE SELLER IMMEDIATELY.

The carton should contain:

ProMinent® Dual Metering Pump (S-2) Dosing Package
Specified pumps and accessories
Warranty Validation Card
Instruction Manual(s)
Accessories as ordered

GETTING STARTED

- Mount S-2 stand on a level surface.
- Install suction and discharge lines, with isolating valves between the S-2 stand and the tank and between the S-2 stand and the injection point.
- Make electrical connections.
- Perform pump startup procedure.

INSTALLATION

Mounting

Secure the S-2 stand to a stable fixture by fastening with screws or nuts and bolts through the predrilled holes in the stand.

Piping

Chemical Supply Line

Attach the chemical line to the inlet valve on the stand:

- Remove the threaded union nut from the inlet valve
- Insert the ½" tubing through the union nut, put the tube nozzle into the tubing.

- Place the O-ring against the tube nozzle end.
- Screw the union nut onto the inlet valve.
- Hand tighten, check for leaks and retighten if necessary.

Discharge Line

Attach the discharge line to the outlet of the liquid end of the metering pump:

- Remove the threaded union nut from the outlet valve
- Insert the ½" tubing through the union nut, put the tube nozzle into the tubing.
- Place the O-ring against the tube nozzle end.
- Screw the union nut onto the outlet valve.
- Hand tighten, check for leaks and retighten if necessary.

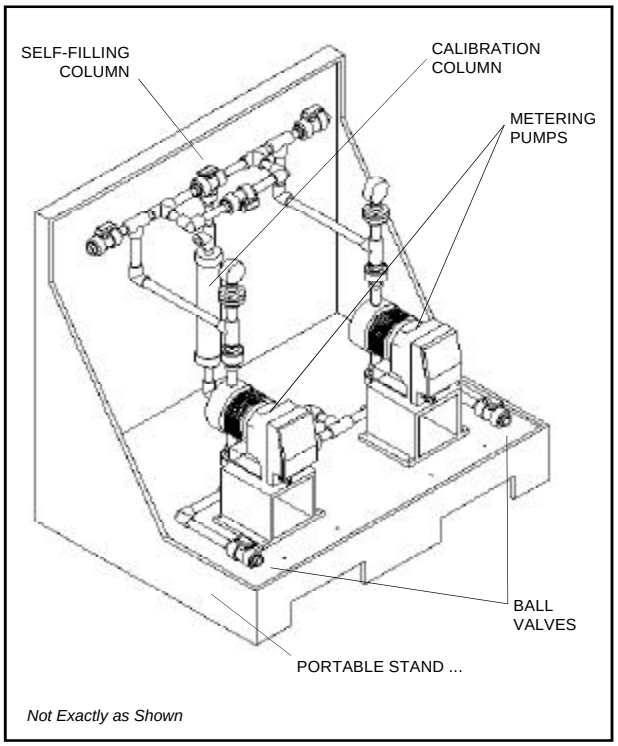
NOTE: This may be plumbed with piping if desired

Wiring

Plug or hardwire the pump into the proper electric receptacle. We recommend that you use surge protection for the pump.

DESCRIPTION OF CONTROLS AND OPERATION

Specific components of equipment



General overview

The S-2 stand is available with a variety of options to suit your application. The piping and ball valves can be of PVC, PP, PVDF, CPVC or stainless steel, with the seal being of EPDM, Vitron or PTFE, offering an option that is resistant to most chemicals. The calibration column is available from a 100 mL capacity to a 500 mL capacity to allow for various metering volumes. Optional pressure relief valves, backpressure valves and pulsation dampeners are available as necessary for your application. A pressure gauge and a flow monitor are options that can help you maintain and control your system.

Calibration Column

This is used to calibrate the metering pump.

- Open the inlet valve.
- Ensure chemical and discharge lines are connected correctly.
- Turn on the pump.
- Run the pump until the air is out of the line and it is operating normally.
- Set the backpressure and pressure relief valves to the operating pressure.
- Set the stroke length and the pump speed to desired settings.
- Fill the calibration column with the chemical that is being metered.
- Open the valve to the calibration column.
- Close the inlet valve.
- Refill the calibration column (omit in self-filling calibration columns).
- Time how long it takes to meter the volume of the calibration column (if the time is over 1 minute you can use the volume metered in 1 minute for calibration).
- Calculate the volume per time or volume per stroke as desired.
- Adjust the pump rate or the stroke length to the desired volume.
- Recalibrate to check settings.

Pressure Relief Valve

Valve must be set in field depending on injection point pressure. Do not set higher than maximum pump pressure rating or damage may occur to pump and/or piping.

Pressure relief valves mount in the discharge line and have a separate relief port which discharges back to the chemical tank or to the pump suction line to create a bypass.
Pressure relief valves are adjusted with a special adjusting wrench; turn clockwise to increase the pressure and counter clockwise to decrease pressure. RELIEVE PRESSURE BEFORE REMOVING THE PUMP OR THE VALVE FROM SERVICE!

Backpressure Valve

Valve must be set in field depending on injection point pressure. Do not set higher than maximum pump pressure rating or damage may occur to pump and/or piping.

When priming the pumps it is helpful to completely open the valve to allow chemical to flow freely through piping. After the pumps are primed the backpressure valve must be set to at least 15psi above pump suction pressure.

The backpressure valve improves repeatability by providing a constant discharge pressure, provides antisiphon protection when discharging into pressurized lines, open tanks or vacuums. When used in conjunction with the pulsation dampener they minimize pulsation.
Backpressure valves are adjusted with a special adjusting wrench; turn clockwise to increase the pressure and counter clockwise to decrease pressure. RELIEVE PRESSURE BEFORE REMOVING THE PUMP OR THE VALVE FROM SERVICE!

Pulsation Dampener

Note: Use a pressure relief valve with pulsation dampeners. Pulsation dampeners operate on the principle that gas is compressible and fluid is not. The pulsation dampener consists of an air chamber containing compressed air and a fluid chamber. A bladder separates the air and fluid.

Pressurizing the pulsation dampener

- Attach an air source to the Schrader (bicycle) valve.
- Add air until the pressure gauge reads 90% of the system pressure.
- Remove air source.

Pump

See the operating manual for the appropriate pump.

HELPFUL HINTS

Conversions
1L = 0.264 gallon
1000 mL = 1 L
1 bar = 14.5 psig

Calibration example:

A pump draws 75 mL from a calibration cylinder in 1 minute. The strokes per minute rate are 120 spm at 100% stroke length.

To determine mL per stroke:
75 mL divided by 120 spm equals 0.625 mL/stroke.

If you want 0.5 mL per stroke you need to reduce the stroke

length. 0.5 mL/stroke divided by 0.625 mL/stroke equals 0.8 times 100% equals 80.0%. Therefore, 80.0 % of stroke length will give approximately 0.5 mL per stoke or 60 mL/minute. Recalibrate and adjust if necessary.

To develop a complete calibration curve calibrate at several different stroke lengths or stroke frequencies.

MAINTENANCE

Routine maintenance

See the operating manual for the appropriate pump for maintenance of the pump.

S-2 STAND
Keep S-2 stand clean and free of excessive chemical leakage and fumes. Clean with a general household cleaner as necessary. Routinely inspect all tubing and fittings for wear or leaks, replace as necessary

SPARE PARTS

See the pump operating manual for spare parts.

REPAIR SERVICE

Repairs must be done by ProMinent® Fluid Controls. Call your distributor or ProMinent® at [(412) 787-2484] for a return goods authorization. DO NOT return any goods without authorization. **All returned items must be free of hazardous chemicals and clean when returned.**

TROUBLESHOOTING

See the operating manual for the pump for troubleshooting of the pump.

SPECIFICATIONS

Piping Materials:	316 SS, PVC, PVDF, CPVC or PP	
Connections:	Suction Inlet - 1/2" FNPT	Discharge Outlet - Refer to Pump Specifications in PFC Catalog
Dimensions:	PP: 37" H x 40" W x 2/1/4" D SS: 32" H x 28" W x 20" D	94 cm H x 102 cm W x 72 cm D 81 cm H x 71 cm W x 51 cm D
Shipping Weights:	Without pumps - 60 lbs. 27.2 kg	With pumps - 90 lbs. 40.8 kg

GLOSSARY OF TERMS

S-2 Stand – A completely self-contained package with a chemical metering pumps, and all necessary piping, appurtenances and fittings assembled and mounted on a stainless steel or a plastic stand predrilled for mounting.