

# ProMinent® Fluid Controls Sigma Metering Pumps

- Reliable, economical metering pumps for boilers, cooling towers and other common chemical applications
- Capacities range from 0.6 to 264 gph with maximum pressure of 4640 psi.
- Repeatable accuracy throughout the entire operating range
- Manual or external adjustment
- Removable HMI unit with large illuminated LCD
- Reduced power consumption due to control of speed profile and pump demand
- Integrated multi-layer safety diaphragm (standard) with visual rupture indicators

## Description

The ProMinent Sigma series pumps (Figure 1) are motor-driven microprocessor-controlled, diaphragm metering pumps. The diaphragm (Kynar/PTFE/Viton® synthetic rubber) versions have a capacity of 5.2–264 gph and a maximum pressure of 145 psi. The packed plunger configurations (316 SS/Ceramic) are available with an output range of 0.6 to 20 gph and pressures to 4640 psi.

- S1Ba, S2Ba, S3Ba (basic version) is supplied with a 56 C flange motor. Manual stroke length control only.
- S1Cb, S2Cb, S3Cb (control version) includes motor and accepts pulse and analog signals directly. Includes microprocessor control, user interface and display. An illuminated LED shows pump status (Run, Warning or Fault)
- Chemical resistant NEMA 4X (IP 65) housing
- CSA and CE approved
- Two year warranty on drive unit; one year warranty on liquid end



**Figure 1** — *Sigma metering pumps*

## Control Features

- Continuous stroke length control 0-100%
- Turndown ratio: Minimum 800:1

## Control Features S1Ca, S2Ca, S3Ca only

- Continuous frequency control from 0 to 100%
- Accepts 4-20 mA, dry contact pulses with multiplier/divider and remote on/off signals via optional control cable
- Access controls to prevent unauthorized adjustment
- Calibration – perform draw down to have pump display totalized flow
- Flow monitor versions for feed verification
- Output of feed rate
- Programmable timer (14 day)

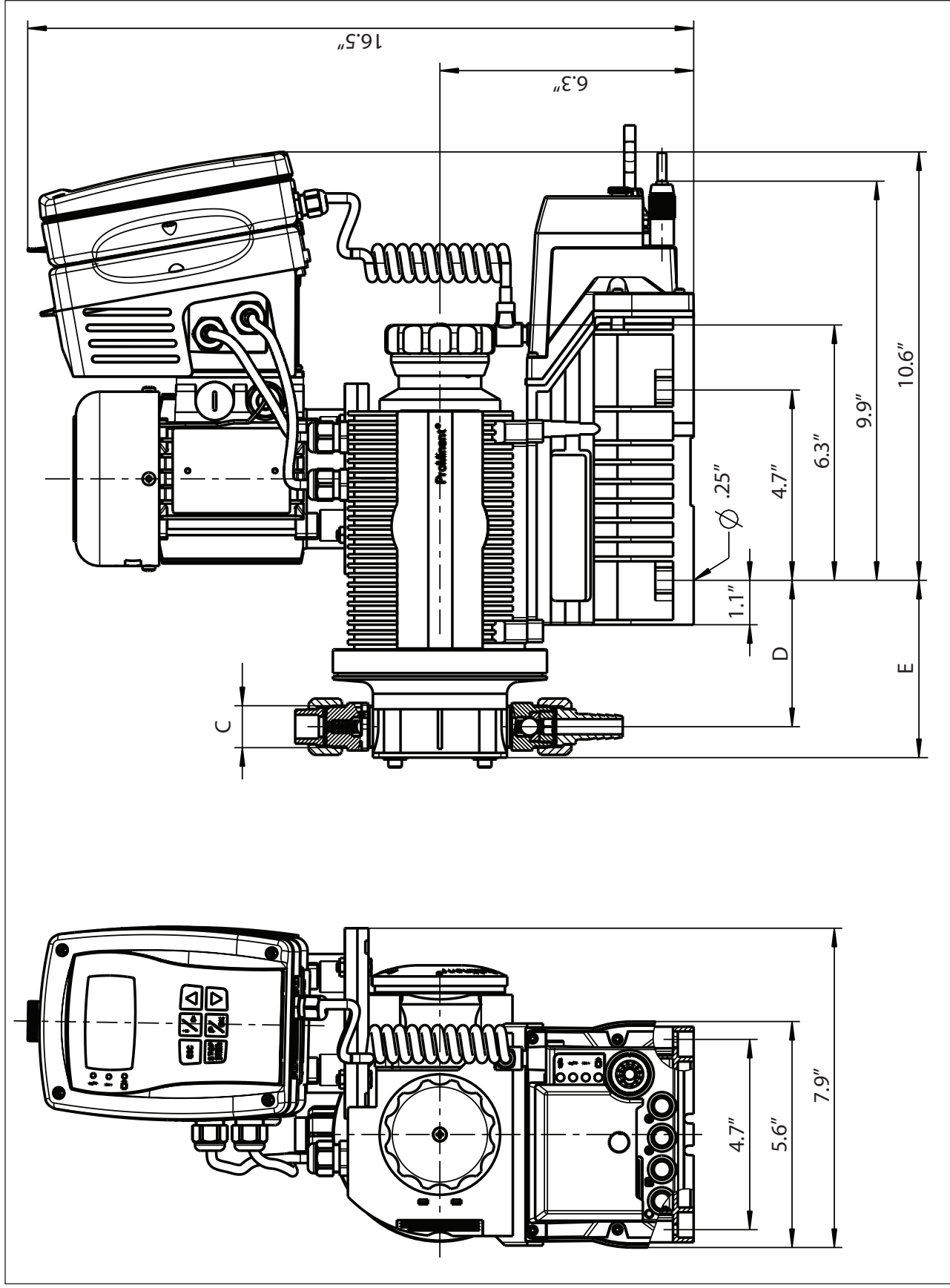


Figure 2 – S1Cb Dimensions

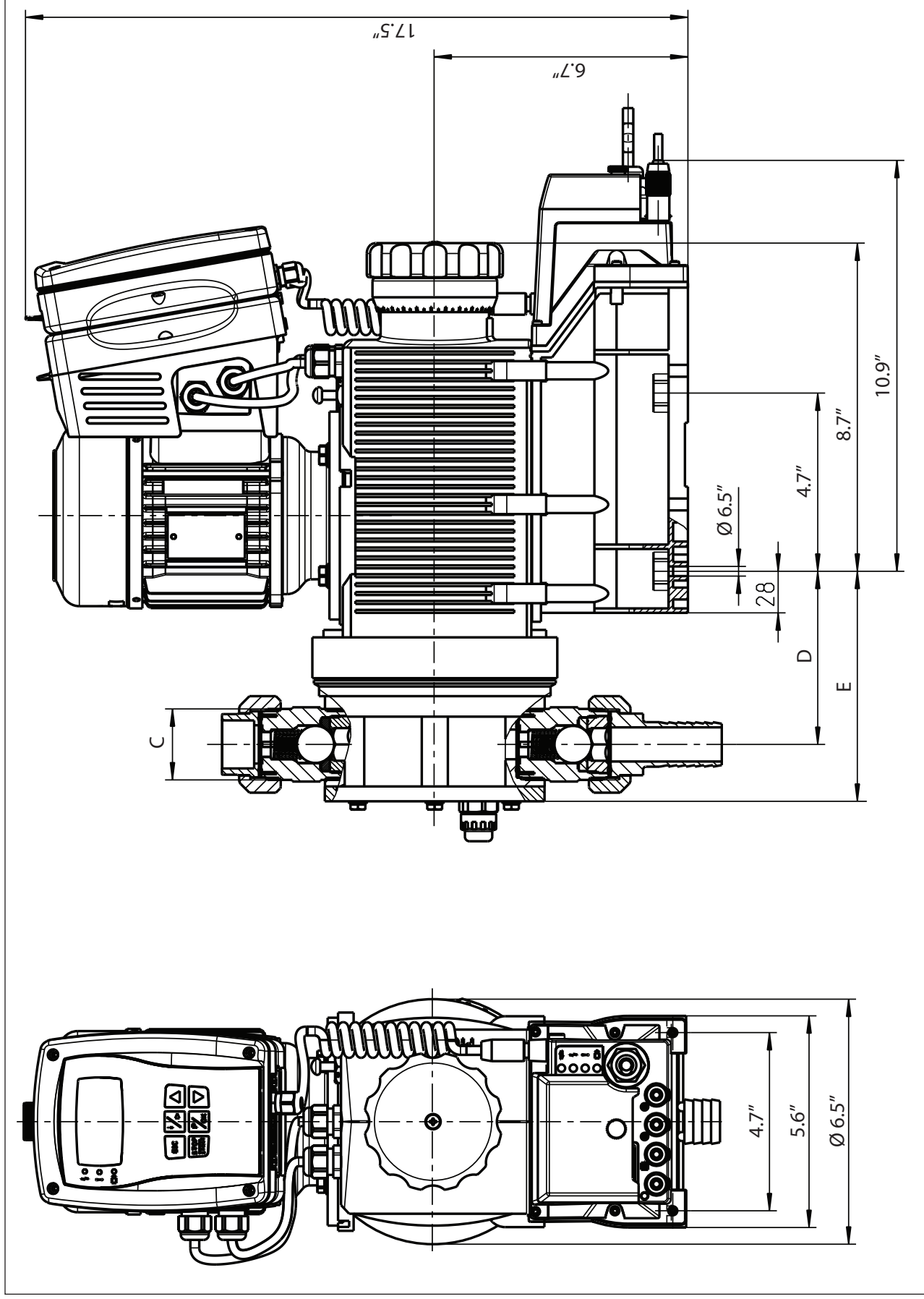


Figure 3 – S2Cb Dimensions

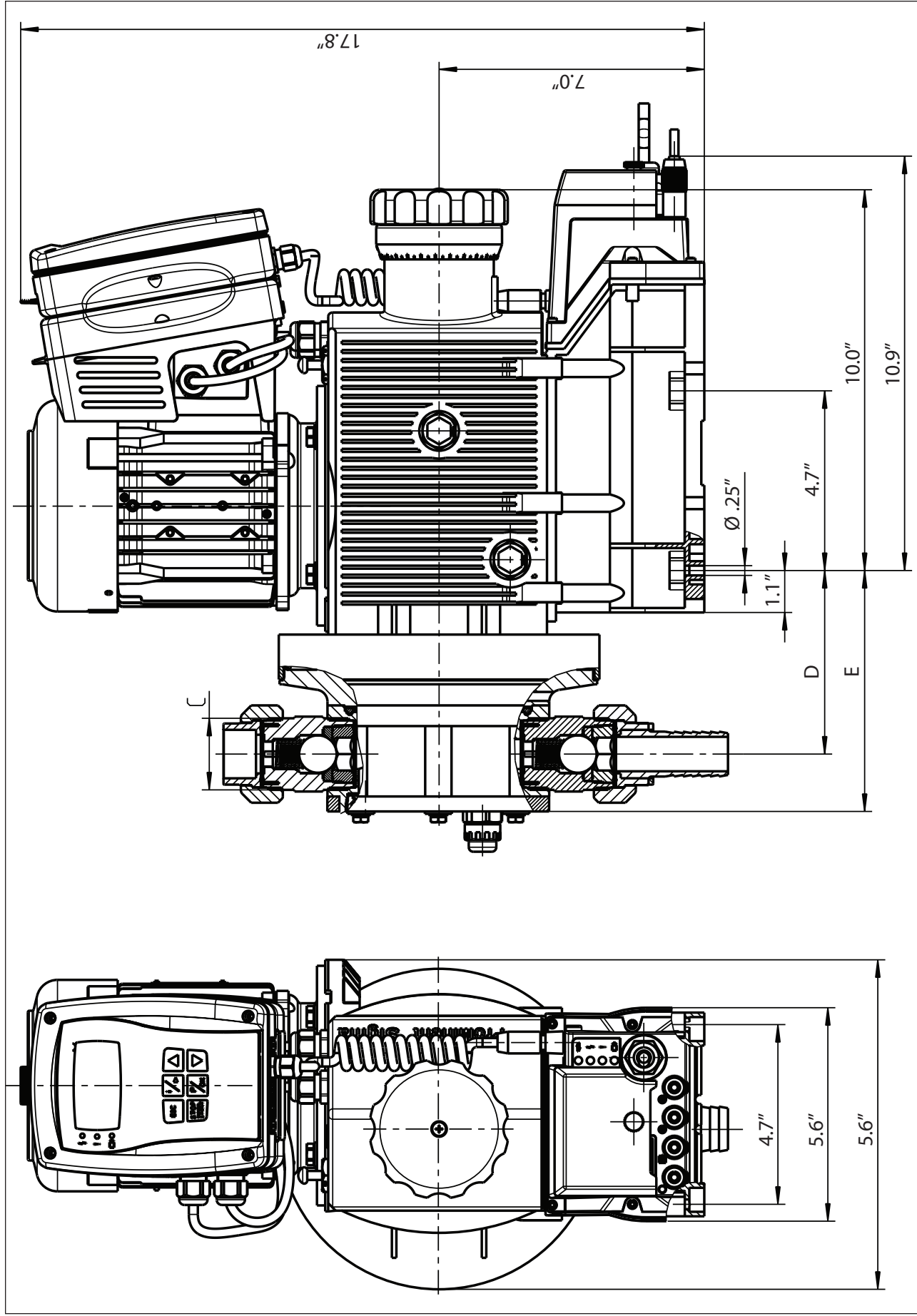


Figure 4 – S3Cb Dimensions

## Specifications

*Capacities and pressure ratings:* Refer to Tables 1–3

*Reproducibility:*  $\pm 1\%$

*Housing:* Fiberglass reinforced PPE NEMA 4X (IP55)

*Diaphragm:* PTFE faced

*Viscosity:* Maximum 10,000 cp with springs

*Power Supply:* 110-115 VAC or 200-230 VAC;

22 W / 2 A maximum

S1Ba, S2Ba, S3Ba version includes 1/3 hp 56C flange  
1750 rpm motor

SiCb version 1/3 hp (3.1 A @ 115 VAC)

*Relay load:* 250 VAC, 2A, 50/60 Hz

*Temperature Range:* 14-113°F (-10 to +45°C)

*Dimensions:* See Figure 2

## Pump Selection Guidelines

1. Choose Sigma model that meets your required capacity.
2. Make sure that the pump selected exceeds your system pressure.
3. Select the wetted end materials that are compatible with the chemical(s) being used.
4. Verify that the selected pumps have the control capabilities required for your application.
5. How do I choose between the Basic and Control pump product lines?

*Key selection factors for S1Ba:* low cost, simple operation and control

*Key selection factors for S1Cb:* more control flexibility, feed verification, calibration and access control.

## Support

If you have any questions about the ProMinent Sigma metering pumps, please contact your Nalco representative. In North America, you can contact the Equipment Solutions Technical Support Group at 1-800-323-8483.

## Accessories

Individual liquid end repair kits are shown with the pumps in the selection tables.

### Nalco

Part Number	Description
121-PJ1080.88	Foot valve (316 SS)
121-PJ1081.88	Injection valve (316 SS)
121-PJ1034.88	Remote control cable (6 ft), required for external pulse, remote on/off or 4-20 mA of control versions
121-PJ1056.88	1/3 hp AC motor 115/230 VAC
121-PJ1049.88	1/2" PVC back pressure valve
121-PJ1050.88	1/2" PVC pressure relief valve
121-PJ1051.88	3/4" PVC back pressure valve
121-PJ1052.88	3/4" PVC pressure relief valve
121-PJ0001.88	Flow monitor for S1 12017 PVDF/Viton
121-PJ0002.88	Flow monitor for S2 12050, 12090 PVDF/Viton
121-PJ0003.88	Flow monitor for S2 07120 07220 PVDF/Viton
121-PJ0004.88	Flow monitor for S3 070410 PVDF/Viton
121-PJ1095.88	Deaeration valve for DN10 Sigma pump CPVC
121-PJ1096.88	Deaeration valve for DN15 Sigma pump CPVC
121-PJ1097.88	Deaeration valve for DN25 Sigma pump CPVC

## To Order

Contact your local Nalco representative or our Nalco Customer Service at 1-800-288-0879. Order the ProMinent Sigma series pumps and accessories by using the Nalco part number listed in the selection tables grouped by application (Tables 1–3).

## Pressure Relief Options - Flooded Suction

Pressure Relief may discharge back to tank, but where tank is distant from pump, relief back to suction line is common.

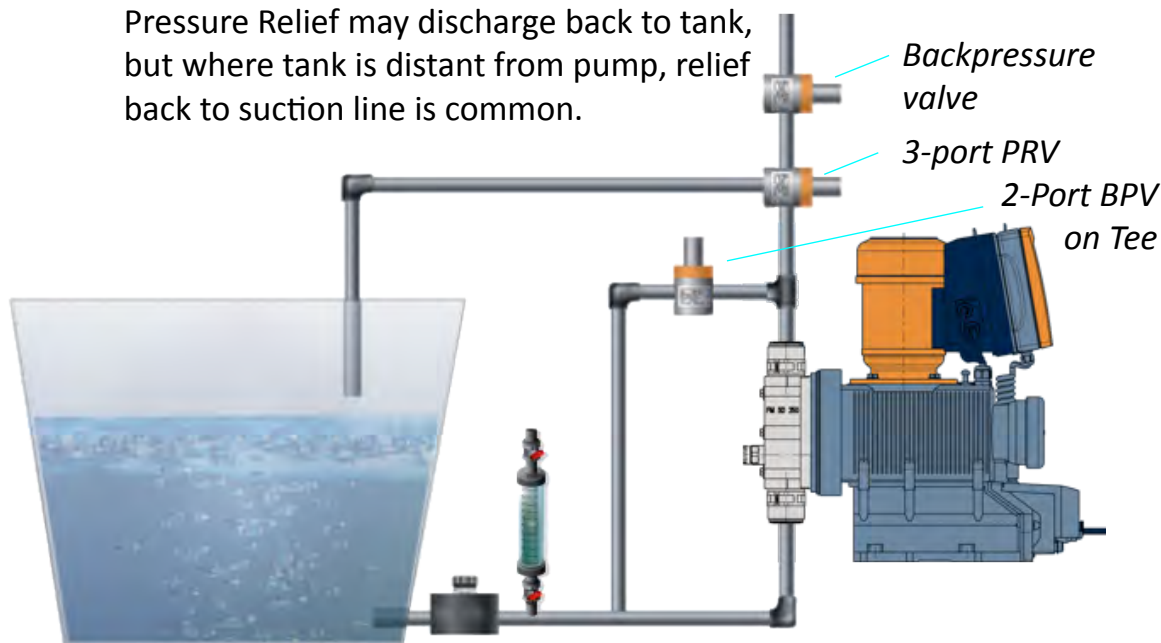


Figure 5 — Typical installation

### Replacement Parts

Downtime is often costly and can be detrimental to your operation. Having a repair Kit on-site will ensure quick liquid end repair. Select and order the necessary repair kit for your pump on Tables 1-3.

### Installation Guidelines

To minimize friction losses:

- Suction lines should be as short and straight as possible
- Stay with recommended tubing/pipe sizes or use larger diameters (Figure 5)

Flooded suction is always recommended to ensure the most trouble-free installation. If a flooded suction is not practical, be sure to install a foot valve to hold pump prime.

When pumping products that tend to evolve gas, keep the stroke length above 50%.

Installing the following components increases the performance and reliability of your chemical feed system:

- Suction strainer to remove valve-clogging particulate
- Calibration cylinder to set dosage rate with the chemical product and exact process conditions
- Flow monitor to ensure that chemical is flowing to the process
- Back pressure valve to ensure consistent chemical feed accuracy and prevent siphoning
- Pressure relief valve to protect the piping system and personnel
- Injection check valve to disperse the chemical into the process

**Table 1** – Stainless steel pumps (316 SS/PTFE/ceramic) for high pressure feed of boiler chemicals

Nalco Part Number	Model	Capacity (gpd)	Pressure (psi)	Stroke Rate (spm)	Connections	Repair Kit Part Number
121-PJ1060.88	S2Ca	14	4640	84	1/4 in FNPT	121-K1001572.88

**Note:** Stainless pumps do not include foot valves and injection valves. Please order separately.

121-PJ1080.88	Foot Valve (316SS)	121-PJ1083.88	Spring 754-1493 psi
121-PJ1081.88	Injection Valve (316 SS)	121-PJ1084.88	Spring 3001-4002 psi
121-PJ1082.88	Pressure relief valve		

**Table 2** – Basic Sigma Kynar pumps for bleach, ACTI-BROM® and STA•BR•EX®. Recommended for products that may evolve gas under storage or usage conditions. Flow monitor only available on control versions (see Table 3).

Nalco Part Number	Model	Flow Monitor	Capacity (gpd)	Pressure (psi)	Stroke Rate (spm)	Connections	Repair Kit Part Number
121-PJ1074.88	S1Ba	No	125	145	87	1/2 in MNPT	121-K1035964.88
121-PJ1076.88	S1Ba	No	265	145	156	1/2 in MNPT	121-K1035964.88
121-PJ1061.88	S2Ba	No	380	145	87	1/2 in MNPT	121-K1035951.88
121-PJ1062.88	S2Ba	No	684	145	156	3/4 in MNPT	121-K1035951.88
121-PJ1063.88	S2Ba	No	912	100	87	3/4 in MNPT	121-K1035953.88
121-PJ1064.88	S2Ba	No	1670	100	156	3/4 in MNPT	121-K1035953.88
121-PJ1078.88	S3Ba	No	3120	105	87	1-1/2 in MNPT	121-K1034681.88

**Table 3** – Control Sigma Kynar pumps for bleach, ACTI-BROM and STA•BR•EX. Recommended for products that may evolve gas under storage or usage conditions. Flow monitor versions for flow verification.

Nalco Part Number	Model	Flow Monitor	Capacity (gpd)	Pressure (psi)	Stroke Rate (spm)	Connections	Repair Kit Part Number
121-PJ1075.88	S1Cb	No	125	145	87	1/2 in MNP	121-K1035964.88
121-PJ1075F.88	S1Cb	Yes	125	145	87	1/2 in MNP	121-K1035964.88
121-PJ1077.88	S1Cb	No	265	145	156	1/2 in MNP	121-K1035964.88
121-PJ1077F.88	S1Cb	Yes	265	145	156	1/2 in MNP	121-K1035964.88
121-PJ1065.88	S2Cb	No	380	145	87	1/2 in MNP	121-K1035951.88
121-PJ1065F.88	S2Cb	Yes	380	145	87	1/2 in MNP	121-K1035951.88
121-PJ1066.88	S2Cb	No	685	145	156	3/4 in MNP	121-K1035951.88
121-PJ1066F.88	S2Cb	Yes	685	145	156	3/4 in MNP	121-K1035951.88
121-PJ1067.88	S2Cb	No	912	100	87	3/4 in MNP	121-K1035953.88
121-PJ1067F.88	S2Cb	Yes	912	100	87	3/4 in MNP	121-K1035953.88
121-PJ1068.88	S2Cb	No	1670	100	156	3/4 in MNP	121-K1035953.88
121-PJ1068F.88	S2Cb	Yes	1670	100	156	3/4 in MNP	121-K1035953.88
121-PJ1079.88	S3Cb	No	3120	105	87	1-1/2 in MNP	121-K1034681.88
121-PJ1079F.88	S3Cb	Yes	3120	105	87	1-1/2 in MNP	121-K1034681.88

## **NALCO**

**North America: *Headquarters*** – 1601 West Diehl Road • Naperville, Illinois 60563 • USA

***Energy Services Division*** – 7705 Highway 90-A • Sugar Land, Texas 77487 • USA

**Europe:** Richtstrasse 7 • 8304 Wallisellen • Switzerland

**Asia Pacific:** 2 International Business Park • #02-20 The Strategy Tower 2 • Singapore 609930

**Latin America:** Av. das Nações Unidas 17.891 • 6° Andar 04795-100 • São Paulo • SP • Brazil

[www.nalco.com](http://www.nalco.com)

PORTA-FEED, NALCO and the logo are trademarks of Nalco Company

Ecolab is a trademark of Ecolab USA Inc.

PulsaFeeder and PULSAtron are Registered Trademarks of PulsaFeeder Inc.

©2004, 2013 Ecolab USA Inc. All Rights Reserved 6-13