# Pre-engineered Systems

Standard pre-engineered metering packages available with the Sigma series pumps include the single metering pump (M1) and dual metering pump (M2) dosing systems.

ProMinent also offers customized systems built to specification. For more information, contact ProMinent or your local Representative.

- Systems are corrosion-resistant, self contained units with chemical metering pump(s), piping, fittings, and optional accessories.
- Production capabilities include threaded, welded and thermal fusion joining systems for pipe; system assembly; wiring and equipment support and testing (with criteria for electrical, control, mechanical and aesthetic features).
- All systems are factory

assembled and tested prior to shipment.
- Standard options:
  - Pipe size
  - Stand material
  - Calibration column
  - Backpressure valve
  - Pulsation dampener
  - Accumulator
  - Pressure gauge
  - Flow monitor
  - Sediment strainer
  - Pressure relief valve
- Engineering services include process design, P&ID development, CAD drawings, general arrangements, shop electrical drawings, as built, custom operation instructions and maintenance manuals.

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## NEW TECHNOLOGY, DURABLE DESIGN

# SIGMA SERIES


ProMinent®

# Sigma Metering Pumps: Easy as 1, 2, 3

## 1 Operating Principle

Based on the recent technology developed for the gamma/L solenoid metering pumps. Providing unified operation and consistency across a wide range of applications.

## 2 Operating Modes

Basic or Microprocessor controlled

## 3 Performance Ranges

Sigma/1 from 5.2 to 38 gph (20 to 144 l/h)
Sigma/2 from 15.9 to 111 gph (60 to 420 l/h)
Sigma/3 from 46 to 264 gph (174 to 1,000 l/h)


***The control base on the Sigma/1 pump can be rotated on either side at a 90º angle***

# Features and Benefits

*Easy to set, adjust, and access information*

*Sigma with PROFIBUS®-DP interface*

*LED status indicators warn of operating faults*

## Analog Input:

- 4-20 mA input signal can be custom scaled to suit process conditions
- Direct input signal, SCR or inverter not needed
- Can be used for proportional control

## Analog Output:

- 4-20 mA output signal proportional to pump flow rate
- Use with flow monitor to verify flow

## Contact/Pulse Input:

- Programmable multiplier/divider for proportional feed

## Calibration:

- Calibrate to actual flow with LCD indication of pump flow
- Displays capacity in gph or l/h and totalized volume pumped
- Easy field calibration

## Fieldbus Interface:

- PROFIBUS® DP option for remote monitoring, diagnostics and control

## Timer:

- Integral programmable timer (i.e. daily, weekly, biweekly, weekend)
- Change operation to vary dosage on a timed basis (i.e. peak/nonpeak usage times; to bleed gas from suction line; for shock dosing of chemical)
- Run pump from different control signals (i.e. analog then contact)

## Access Codes:

- Program codes to access settings; prevents unauthorized adjustments

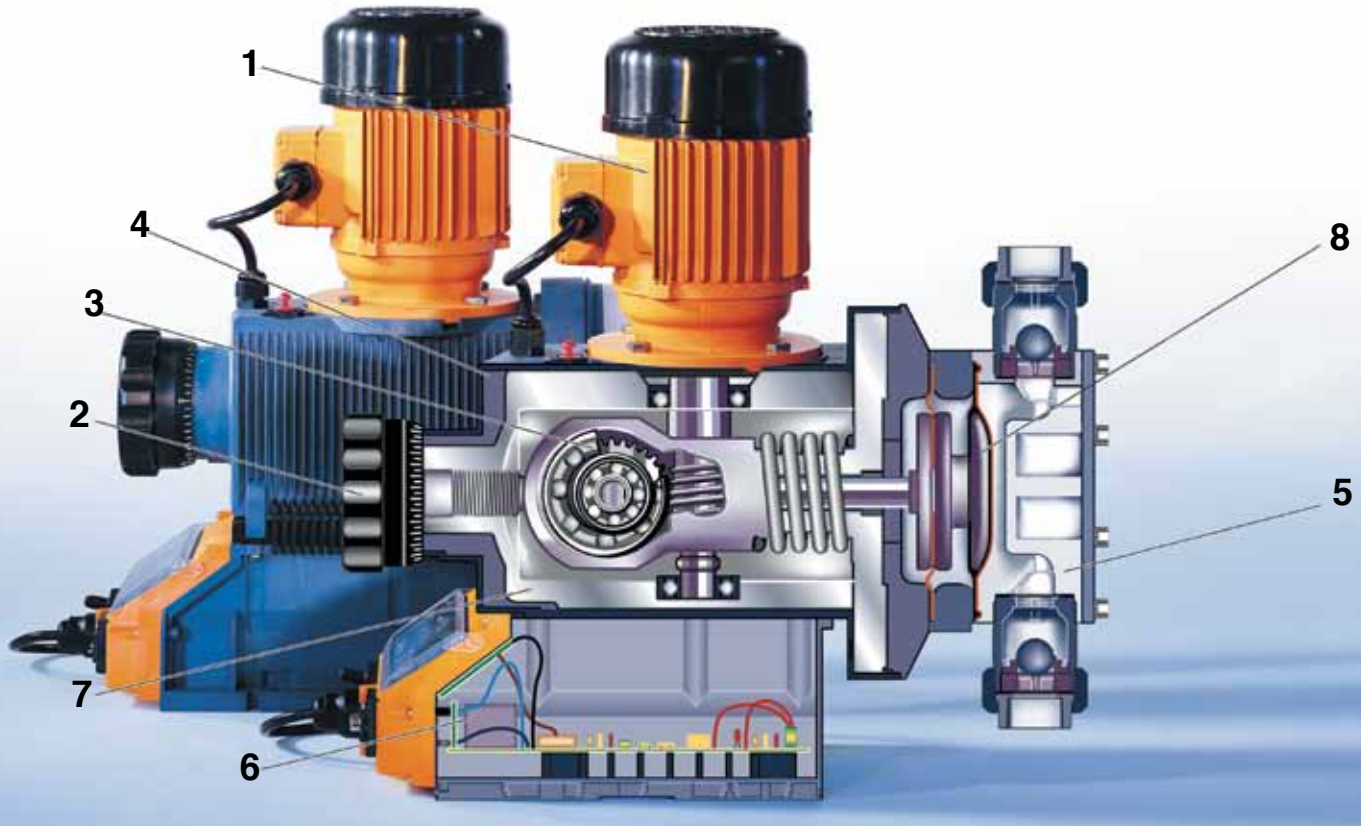
## Typical Applications:

- pH Neutralization
- Chlorination/De-chlorination
- Disinfection
- Cooling tower chemical injection
- Boiler chemical feed
- Polymer feed
- Fertigation services
- Water/wastewater treatment

# Principles of Operation

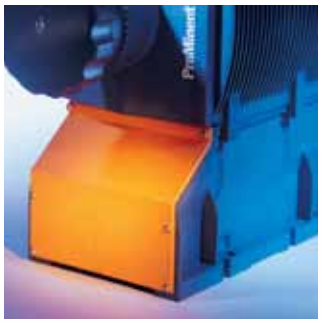
The ProMinent Sigma Series pumps are motor-driven with a mechanically actuated diaphragm-type liquid end. The Sigma pumps are constructed with a corrosion resistant plastic outer housing. The Sigma/2 and 3 also have a rugged metal inner casing for components subjected to mechanical stress. The standard liquid end materials are PVDF or 316 stainless steel; both with PTFE seals.

Sigma pumps are designed with a convex DEVELOPAN® diaphragm which seals to a concave curve in the liquid end. This allows for precise metering of media with various viscosities and reduces stress for long diaphragm life.




1 Motor
2 Stroke length adjuster
3 Gearbox
4 Plastic housing
5 Liquid end
6 Microprocessor controller
7 Metal inner casing (Sigma 2 and 3)
8 Diaphragm failure monitor

# Specifications



*The Sigma series offers an economic basic version for simple applications*

## Basic Version

The choice for simple, metering pump applications. The pumps may be operated manually by adjusting the stroke length knob (displacement per stroke) at a constant stroke frequency using a constant speed motor. Automatic control of displacement per stroke via analog (4-20 mA) or 3P signal is possible with optional motorized stroke positioning systems.

## Control Version

*New control technology*

Sigma microprocessor controlled metering pumps are programmable and display informative data for monitoring, recording and tracking. Functions include digital setting of stroke frequency, batch delivery and external control by contact, pulse or analog signal. Displays include flow rate (gph or l/h) and totalized flow (gallons or litres), cumulative stroke count, and stroke length adjustment. Options include remote monitoring, diagnostics, control (via fieldbus, analog, pulse and/or timer), access codes, fault/pacing relays, mA analog output, and flow monitoring. Control version pumps are supplied with an integral TEFC motor.

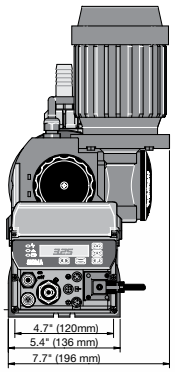
## Specifications

| | Sigma/1 | Sigma/2* | Sigma/3 |
|---|---|---|---|
| Max. Capacity Range: Basic | 5.2 - 38 gph | 15.9 - 111 gph | 46 - 264 gph |
| | 20 - 144 l/h | 60 - 420 l/h | 174 - 1000 l/h |
| Max. Capacity Range: Control | 5.2 - 31.7 gph | 15.9 - 92.5 gph | 46 - 264 gph |
| | 20 - 120 l/h | 60 - 350 l/h | 174 - 1000 l/h |
| Max. Pressure Range | 174 - 58 psi | 174 - 58 psi | 174 - 58 psi |
| Maximum Stroke Length | 0.157” (4mm) | 0.196” (5mm) | 0.236” (6mm) |
| Stroke Length Adjustment Increments | 1.0% | 0.5% | 0.5% |
| Repeatability (between 30-100%) | +/- 2% | +/- 2% | +/- 2% |
| Warranty on drive | 2 years | 2 years | 2 years |
| Warranty on liquid end | 1 year | 1 year | 1 year |
| Industry Standards | CE, CSA | CE, CSA | CE, CSA |

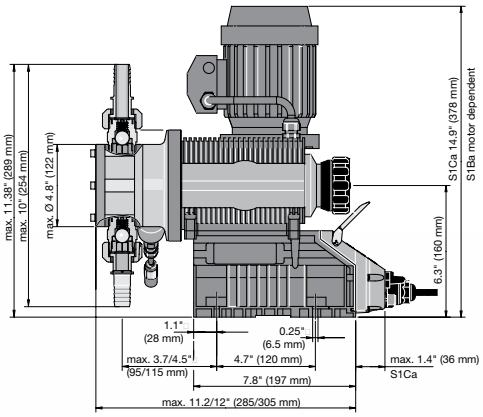
* also available with a packed plunger type liquid end for higher pressure applications

# DIMENSIONS

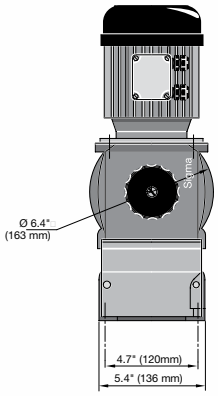
**Dimensions vary based on liquid end size and material (PVDF or SS); maximum dimensions are shown.**



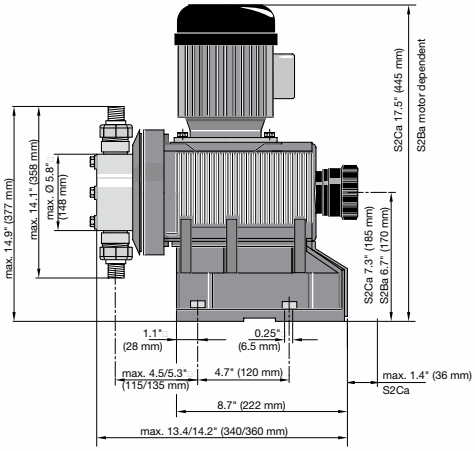

**Sigma/ 1**

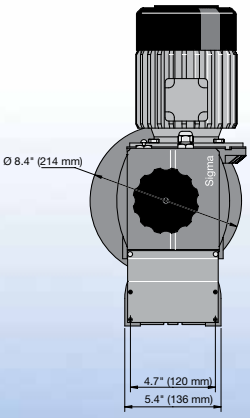



Shown with optional diaphragm failure monitor

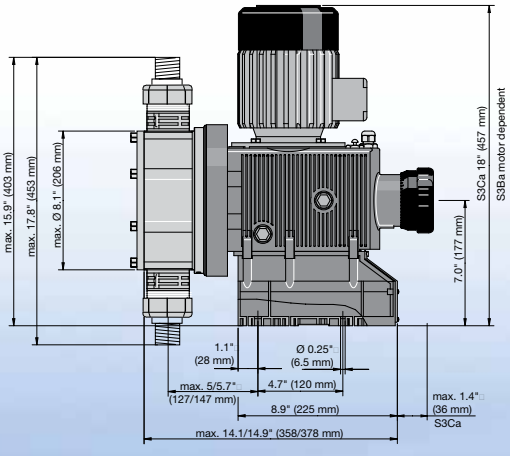



**Sigma/ 2**




**Sigma/ 3**




**Detailed dimension sheets on request**

# Technical Data

| Pump type Sigma | Sigma Basic: Feed rate at max. back pressure psi | Capacity U.S. gph | Capacity l/h | Approx ml/stroke | Max. stroke rate strokes/min | Sigma Control: Feed rate at max. back pressure psi | Capacity U.S. gph | Capacity l/h | Approx ml/stroke | Max. stroke rate strokes/min | Suction lift ft | Suction lift *mWc | Max. suction pressure psi | Suction/ discharge connector NPT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sigma/ 1** | | | | | | | | | | | | | | |
| 12017 PVT | 145 | 5.2 | 20 | 4.0 | 88 | 145 | 5.2 | 20 | 4.0 | 90 | 23 | 7 | 14.5 | 1/2" MNPT |
| 12017 SST | 174 | 5.2 | 20 | 4.0 | 88 | 174 | 5.2 | 20 | 4.0 | 90 | 23 | 7 | 14.5 | 3/8" FNPT |
| 12035 PVT | 145 | 11.1 | 42 | 4.0 | 172 | 145 | 11.1 | 42 | 4.0 | 170 | 23 | 7 | 14.5 | 1/2" MNPT |
| 12035 SST | 174 | 11.1 | 42 | 4.0 | 172 | 174 | 11.1 | 42 | 4.0 | 170 | 23 | 7 | 14.5 | 3/8" FNPT |
| 10050 PVT | 145 | 15.8 | 60 | 4.0 | 240 | 145 | 13.2 | 50 | 4.0 | 200 | 23 | 7 | 14.5 | 1/2" MNPT |
| 10050 SST | 145 | 15.8 | 60 | 4.0 | 240 | 145 | 13.2 | 50 | 4.0 | 200 | 23 | 7 | 14.5 | 3/8" FNPT |
| 10022 PVT | 145 | 6.8 | 26 | 5.1 | 88 | 145 | 6.8 | 26 | 5.1 | 90 | 19.6 | 6 | 14.5 | 1/2" MNPT |
| 10022 SST | 145 | 6.8 | 26 | 5.1 | 88 | 145 | 6.8 | 26 | 5.1 | 90 | 19.6 | 6 | 14.5 | 3/8" FNPT |
| 10044 PVT | 145 | 14 | 53 | 5.1 | 172 | 145 | 14 | 53 | 5.1 | 170 | 19.6 | 6 | 14.5 | 1/2" MNPT |
| 10044 SST | 145 | 14 | 53 | 5.1 | 172 | 145 | 14 | 53 | 5.1 | 170 | 19.6 | 6 | 14.5 | 3/8" FNPT |
| 07065 PVT | 102 | 20.6 | 78 | 5.1 | 240 | 102 | 17.2 | 65 | 5.1 | 200 | 19.6 | 6 | 14.5 | 1/2" MNPT |
| 07065 SST | 102 | 20.6 | 78 | 5.1 | 240 | 102 | 17.2 | 65 | 5.1 | 200 | 19.6 | 6 | 14.5 | 3/8" MNPT |
| 07042 PVT | 102 | 13.2 | 50 | 9.7 | 88 | 102 | 13.2 | 50 | 9.7 | 90 | 9.8 | 3 | 14.5 | 3/4" MNPT |
| 07042 SST | 102 | 13.2 | 50 | 9.7 | 88 | 102 | 13.2 | 50 | 9.7 | 90 | 9.8 | 3 | 14.5 | 1/2" FNPT |
| 04084 PVT | 58 | 26.7 | 101 | 9.7 | 172 | 58 | 26.7 | 101 | 9.7 | 170 | 9.8 | 3 | 14.5 | 3/4" MNPT |
| 04084 SST | 58 | 26.7 | 101 | 9.7 | 172 | 58 | 26.7 | 101 | 9.7 | 170 | 9.8 | 3 | 14.5 | 1/2" FNPT |
| 04120 PVT | 58 | 38 | 144 | 9.7 | 240 | 58 | 31.7 | 120 | 9.7 | 200 | 9.8 | 3 | 14.5 | 3/4" MNPT |
| 04120 SST | 58 | 38 | 144 | 9.7 | 240 | 58 | 31.7 | 120 | 9.7 | 200 | 9.8 | 3 | 14.5 | 1/2" FNPT |
| **Sigma/ 2** | | | | | | | | | | | | | | |
| 12050 PVT | 145 | 15.9 | 60 | 11.4 | 87 | 145 | 15.9 | 60 | 11.4 | 90 | 23 | 7 | 43.5 | 1/2" MNPT |
| 12050 SST | 174 | 15.2 | 57 | 11.4 | 87 | 174 | 15.9 | 60 | 11.4 | 90 | 23 | 7 | 43.5 | 1/2" FNPT |
| 12090 PVT | 145 | 28.5 | 108 | 11.4 | 156 | 145 | 28.5 | 108 | 11.4 | 160 | 23 | 7 | 43.5 | 3/4" MNPT |
| 12090 SST | 174 | 27 | 103 | 11.4 | 156 | 174 | 28.5 | 108 | 11.4 | 160 | 23 | 7 | 43.5 | 1/2" FNPT |
| 12130 PVT | 145 | 41 | 156 | 10.9 | 232 | 145 | 34.3 | 130 | 10.9 | 200 | 23 | 7 | 43.5 | 3/4" MNPT |
| 12130 SST | 174 | 39.6 | 150 | 10.9 | 232 | 174 | 34.3 | 130 | 10.9 | 200 | 23 | 7 | 43.5 | 1/2" FNPT |
| 07120 PVT | 100 | 38 | 144 | 27.4 | 87 | 100 | 38 | 144 | 27.4 | 90 | 16 | 5 | 14.5 | 3/4" MNPT |
| 07120 SST | 100 | 38 | 144 | 27.4 | 87 | 100 | 38 | 144 | 27.4 | 90 | 16 | 5 | 14.5 | 3/4" MNPT |
| 07220 PVT | 100 | 69.7 | 264 | 27.7 | 156 | 100 | 69.7 | 264 | 27.7 | 160 | 16 | 5 | 14.5 | 3/4" MNPT |
| 07220 SST | 100 | 69.7 | 264 | 27.7 | 156 | 100 | 69.7 | 264 | 27.7 | 160 | 16 | 5 | 14.5 | 3/4" MNPT |
| 04350 PVT | 58 | 111 | 420 | 29.4 | 232 | 58 | 92.5 | 350 | 29.4 | 200 | 16 | 5 | 14.5 | 1" MNPT |
| 04350 SST | 58 | 111 | 420 | 29.4 | 232 | 58 | 92.5 | 350 | 29.4 | 200 | 16 | 5 | 14.5 | 1" MNPT |
| **Sigma/ 3** | | | | | | | | | | | | | | |
| 120145 PVT | 145 | 46 | 174 | 31.5 | 86 | 145 | 46 | 174 | 31.5 | 90 | 16 | 5 | 29 | 1" MNPT |
| 120145 SST | 174 | 46 | 174 | 31.5 | 86 | 174 | 46 | 174 | 31.5 | 90 | 16 | 5 | 29 | 1" MNPT |
| 120190 PVT | 145 | 60.2 | 228 | 31.5 | 124 | 145 | 60.2 | 228 | 31.5 | 120 | 16 | 5 | 29 | 1" MNPT |
| 120190 SST | 174 | 60.2 | 228 | 31.5 | 124 | 174 | 60.2 | 228 | 31.5 | 120 | 16 | 5 | 29 | 1" MNPT |
| 120270 PVT | 145 | 85.6 | 324 | 31.5 | 173 | 145 | 85.6 | 324 | 31.5 | 180 | 16 | 5 | 29 | 1" MNPT |
| 120270 SST | 174 | 85.6 | 324 | 31.5 | 173 | 174 | 85.6 | 324 | 31.5 | 180 | 16 | 5 | 29 | 1" MNPT |
| 070410 PVT | 100 | 130 | 492 | 95.1 | 86 | 100 | 130 | 492 | 95.1 | 90 | 13 | 4 | 14.5 | 1-1/2" MNPT |
| 070410 SST | 100 | 130 | 492 | 95.1 | 86 | 100 | 130 | 492 | 95.1 | 90 | 13 | 4 | 14.5 | 1-1/2" MNPT |
| 070580 PVT | 100 | 184 | 696 | 95.1 | 124 | 100 | 184 | 696 | 95.1 | 120 | 13 | 4 | 14.5 | 1-1/2" MNPT |
| 070580 SST | 100 | 184 | 696 | 95.1 | 124 | 100 | 184 | 696 | 95.1 | 120 | 13 | 4 | 14.5 | 1-1/2" MNPT |
| 040830 PVT | 58 | 264 | 1000 | 95.1 | 173 | 58 | 264 | 1000 | 95.1 | 180 | 10 | 3 | 14.5 | 1-1/2" MNPT |
| 040830 SST | 58 | 264 | 1000 | 95.1 | 173 | 58 | 264 | 1000 | 95.1 | 180 | 10 | 3 | 14.5 | 1-1/2" MNPT |

***Detailed product information can be found on the ProMinent website:*** **wwwprominent.us**

*** mWc = metres of water column**

**Technical data subject to change**