The SICa metering pumps are registered according to DIN-VDE 0700 and are protected against radio interference class B according to DIN-VDE 0871.
High Performance and Hosts of Applications

The ProMinent Sigma is a motor-driven, mechanically actuated diaphragm-type (HM) or packed plunger-type (HK) metering pump. The Sigma series combines a rugged metal inner casing for all components subjected to mechanical stress, with a corrosion resistant plastic outer housing.

The Sigma HM series includes three gear ratios and two liquid end sizes that provide maximum capacities ranging from 15.2 to 111 gph (57 to 420 L/h) at maximum backpressures of 174 to 58 psig (12 to 4 bar). The Sigma HK series includes three gear ratios and four liquid end sizes that provide maximum capacities ranging from 0.6 to 20.1 gph (2.3 to 76 L/h) at maximum backpressures of 4640 to 174 psig (320 to 12 bar). The capacities can be infinitely varied in steps of 0.5% (in the HM) and 0.2% (in the HK) by adjustment of the self-locking stroke length adjusting knob (accomplished when the pump is on or off), or via optional stroke positioning motor. Maximum stroke length is 0.2" (5 mm) in the HM and 0.6" (15 mm) in the HK.

Under defined conditions and with correct installation, the repeatability is better than ±2% (HM) and ±1% (HK) in the stroke length of 30% - 100%.

Sigma SIBa
The Sigma basic version is driven by a close-coupled standard C-faced 1/3 HP electric motor (not included with pump). The pump may be operated manually by adjusting the stroke length knob (displacement per stroke). Automatic control of displacement per stroke via analog (0/4 - 20 mA) or 3P signal is possible with optional motorized stroke positioning systems. Control of stroke frequency at local panel or via analog signal is possible with optional variable speed drives (DC/SCR or AC inverter).

Sigma SICa
The Sigma control version features the same microprocessor control interface as the ProMinent gamma/b metering pump. Functions include digital setting of stroke frequency, batch delivery and external control by pulse or analog signal. The individual pump functions are conveniently set with program buttons and an illuminated LCD provides information on the operating status. An integral TEFC motor is included with SICa pumps.

1. Motor (SICa version)
2. Stroke adjustment knob
3. Gearing
4. Plastic outer housing
5. Liquid end
6. Microprocessor control system (SICa version)
7. Metal inner housing
8. Integrated pressure relief/priming valve
Versions: Basic or Microprocessor Control

**Sigma SIBa Basic Version**
The ProMinent Sigma basic version (SIBa) is a motor-operated metering pump without internal electronics. Any NEMA 56C 1750 rpm motor can be supplied for the SIBa pump, including explosion-proof or inverter duty AC motors. The motor is not included with SIBa pumps and must be ordered separately.

**Variable Speed Drives**
ProMinent offers a variety of AC inverters and DC SCR drives for use with the Sigma pump, providing manual local speed control or automatic external speed control in proportion to a 4-20 mA or other analog signal.

**Stroke length controllers** are available for automatic stroke length adjustment in proportion to an external 4-20 mA or 3P relay signal.

**Sigma SICa Control Version**
The microprocessor electronics offer an operator interface similar to the ProMinent gamma/b metering pump and a motor control system similar to the Vario metering pump.

Contact mode of the pump control features output in proportion to process-dependent external contact (pulse) signals. A pulse multiplier/divider function facilitates adaptation to existing contact generators, such as water meters or process controllers, to the required stroke rate per external contact or to the required contact rate per stroke. This allows batch delivery of a predetermined quantity of fluid with a single contact.

The input connections for flow monitoring and a two-stage tank level switch are integrated as standard in every unit for use with those optional accessories.

An optional fault annunciating relay can be used to notify operators of fault conditions.

In conjunction with an analog flow meter or process controller, the optional analog version offers the ability of controlling the capacity of the pump proportional to a 0/4-20 mA signal. The maximum output set in manual mode becomes the maximum output in analog to exactly match required output to the signal generator.

Pump operation can be effortlessly changed on site from continuous operation to external contact or analog mode and vice versa.

The versatile functions of the pump are complemented by a power switch and a dry contact ON/OFF circuit which can pause the pump via opening a remote contact. For example, in starting the metering pump in conjunction with a main water pump and holding the metering in pause when the water pump stops.

Includes microprocessor control, user interface and display.
Liquid End Features and Options

The standard materials for the liquid end are PVDF or 316 stainless steel, both with PTFE seals.

**Sigma HM Diaphragm**  
The Sigma HM is designed with a concave liquid end and a convex DEVELOPAN diaphragm. This curved seal allows precise metering of media with various viscosities and reduces stress for long diaphragm life.

Features include:
- PTFE-facing on the liquid contact surface for an extended service life.
- Chemical resistance against virtually all process fluids.
- Operation within a wide range of temperatures.

**Diaphragm Failure Monitor**  
As an option, the pump can be equipped with a diaphragm failure monitor. This option includes a PVDF spacer and backer diaphragm behind the primary diaphragm. If the primary diaphragm fails, a NC diaphragm-isolated pressure switch opens, based on a minimum backpressure of 21 psig (1.5 bar). The backer diaphragm prevents fluid from entering the pump drive or from leaking out of the pump.

The diaphragm failure is signalled on the SICa HM models’ LCD display, the pump is stopped; with Sigma SIba HM models, a contact is opened to allow fault annunciation, or to stop the pump.

**Integrated Pressure Relief/Priming Valve**  
An integrated pressure relief/priming valve is optional. The metering pump and discharge line are effectively protected against overload and subsequent damage without the need for intricate installation.  
Note: Not intended for corrosive or chrystalizing chemistry.

The valve features a fixed spring tension sized for the pump’s rated pressure and is not adjustable except to open for priming.

**Sigma HK Packed-plunger**  
The Sigma HK features a hard-wearing, chemical resistant, precision plunger made from ceramic oxide. The plunger is sealed with pretensioned Viton packing rings made from special PTFE. A flushing ring, with integrated seals, allows any leakage to be flushed, eliminating fugitive emissions.

The standard materials for the liquid end are PVDF or 316 stainless steel, both with PTFE seals.
Applications Examples

Schematic drawing of pH-dependent metering
Example 1: one-side neutralization in industrial wastewater treatment. Dependant upon the pH value, the pH controller sends to the Sigma microprocessor version an analog signal (0/4 - 20 mA) or a frequency signal (potential-free contacts). The Sigma doses chemical (e.g. acid or base) proportionally to the input control signal to maintain a set pH value.

Schematic drawing of flow-dependent metering
Example 2: flow proportional dosing of sodium hypochlorite in drinking water. As water flow increases or decreases, so does the analog signal or pulse rate from the water meter to the Sigma pump, ensuring that the proportion of chemical to water is always constant, regardless of changes in flow.

Applications
- Water treatment
  - Process water
  - Potable water
  - Circulating water
  - Wastewater
- Food and beverage industry
- Chemical industry
- Pulp and Paper industry
- Textile industry
<table>
<thead>
<tr>
<th>Model</th>
<th>Pump Version</th>
<th>Max. Output Stroke</th>
<th>Max. Suction Lift (water)</th>
<th>Pressure</th>
<th>Shipping Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>12050</td>
<td>PVT</td>
<td>145 (10)</td>
<td>15.9 (60)</td>
<td>87</td>
<td>11.4</td>
</tr>
<tr>
<td></td>
<td>SST</td>
<td>174 (12)</td>
<td>15.2 (57)</td>
<td>87</td>
<td>11.4</td>
</tr>
<tr>
<td>12090</td>
<td>PVT</td>
<td>145 (10)</td>
<td>28.6 (108)</td>
<td>156</td>
<td>11.4</td>
</tr>
<tr>
<td></td>
<td>SST</td>
<td>174 (12)</td>
<td>27.4 (103)</td>
<td>156</td>
<td>11.4</td>
</tr>
<tr>
<td>12130</td>
<td>PVT</td>
<td>145 (10)</td>
<td>41 (156)</td>
<td>232</td>
<td>10.9</td>
</tr>
<tr>
<td></td>
<td>SST</td>
<td>174 (12)</td>
<td>39.6 (150)</td>
<td>232</td>
<td>10.9</td>
</tr>
<tr>
<td>07120</td>
<td>PVT</td>
<td>100 (7)</td>
<td>38 (144)</td>
<td>87</td>
<td>27.4</td>
</tr>
<tr>
<td></td>
<td>SST</td>
<td>100 (7)</td>
<td>38 (144)</td>
<td>87</td>
<td>27.4</td>
</tr>
<tr>
<td>07220</td>
<td>PVT</td>
<td>100 (7)</td>
<td>69.7 (264)</td>
<td>156</td>
<td>27.7</td>
</tr>
<tr>
<td></td>
<td>SST</td>
<td>100 (7)</td>
<td>69.7 (264)</td>
<td>156</td>
<td>27.7</td>
</tr>
<tr>
<td>04350</td>
<td>PVT</td>
<td>58 (4)</td>
<td>111 (420)</td>
<td>232</td>
<td>29.4</td>
</tr>
<tr>
<td></td>
<td>SST</td>
<td>58 (4)</td>
<td>111 (420)</td>
<td>232</td>
<td>29.4</td>
</tr>
</tbody>
</table>

Technical Data: Sigma HM Diaphragm Pumps (60 Hz, 1750 RPM operation)

* Dimensions are provided according to technical data. Dimensions B illustrate piping adapter dimensions.

** Dimension B illustrates piping adapter dimensions.

† Dimensions D & E refer to pumps with integral pressure relief/priming valve.

†† Applies only to pumps with integral pressure relief/priming valve.
### Technical Data: Sigma HK Plunger Pumps [60 Hz (1750 RPM) operation]

<table>
<thead>
<tr>
<th>Pump Version</th>
<th>Capacity at Maximum Pressure</th>
<th>Max. Stroke Rate</th>
<th>Output per Stroke</th>
<th>Max. Suction Lift (water)</th>
<th>Max. Suction Pressure</th>
<th>Suction/Discharge Connector</th>
<th>Shipping Weight w/Motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sigma (kg.)</td>
<td>psig (bar)</td>
<td>U.S. (L/h)</td>
<td>mL/ft. (m)</td>
<td>psig (bar)</td>
<td>in. lbs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32002 SST</td>
<td>4640 (320)</td>
<td>0.6 (2.3)</td>
<td>84</td>
<td>0.46</td>
<td>16 (5)</td>
<td>2175 (150)</td>
<td>1/4 53 (24)</td>
</tr>
<tr>
<td>23004 SST</td>
<td>3335 (230)</td>
<td>1.2 (4.8)</td>
<td>154</td>
<td>0.52</td>
<td>16 (5)</td>
<td>2175 (150)</td>
<td>1/4 53 (24)</td>
</tr>
<tr>
<td>10006 SST</td>
<td>1450 (100)</td>
<td>2.0 (7.6)</td>
<td>233</td>
<td>0.55</td>
<td>16 (5)</td>
<td>2175 (150)</td>
<td>1/4 53 (24)</td>
</tr>
<tr>
<td>14006 SST</td>
<td>2030 (140)</td>
<td>1.8 (7.1)</td>
<td>84</td>
<td>1.42</td>
<td>13 (4)</td>
<td>870 (60)</td>
<td>1/4 53 (24)</td>
</tr>
<tr>
<td>10011 SST</td>
<td>1450 (100)</td>
<td>3.4 (13.1)</td>
<td>154</td>
<td>1.43</td>
<td>13 (4)</td>
<td>870 (60)</td>
<td>1/4 53 (24)</td>
</tr>
<tr>
<td>05016 SST</td>
<td>725 (50)</td>
<td>5.2 (20)</td>
<td>233</td>
<td>1.43</td>
<td>13 (4)</td>
<td>870 (60)</td>
<td>1/4 53 (24)</td>
</tr>
<tr>
<td>07012 SST</td>
<td>1015 (70)</td>
<td>3.9 (14.8)</td>
<td>84</td>
<td>2.90</td>
<td>13 (4)</td>
<td>435 (30)</td>
<td>1/4 53 (24)</td>
</tr>
<tr>
<td>04522 SST</td>
<td>652 (45)</td>
<td>7.0 (27.6)</td>
<td>154</td>
<td>2.91</td>
<td>13 (4)</td>
<td>435 (30)</td>
<td>1/4 53 (24)</td>
</tr>
<tr>
<td>02534 SST</td>
<td>362 (25)</td>
<td>10.7 (40.8)</td>
<td>233</td>
<td>2.92</td>
<td>13 (4)</td>
<td>435 (30)</td>
<td>1/4 53 (24)</td>
</tr>
<tr>
<td>04022 SST</td>
<td>580 (40)</td>
<td>7.0 (26.5)</td>
<td>84</td>
<td>5.26</td>
<td>13 (4)</td>
<td>218 (15)</td>
<td>3/8 55 (25)</td>
</tr>
<tr>
<td>02541 SST</td>
<td>362 (25)</td>
<td>13.0 (49.2)</td>
<td>154</td>
<td>5.37</td>
<td>13 (4)</td>
<td>218 (15)</td>
<td>3/8 55 (25)</td>
</tr>
<tr>
<td>01264 SST</td>
<td>174 (12)</td>
<td>20.1 (76)</td>
<td>233</td>
<td>5.45</td>
<td>13 (4)</td>
<td>218 (15)</td>
<td>3/8 55 (25)</td>
</tr>
</tbody>
</table>
Pre-engineered Packaged 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.
- Engineering services include process design, P&ID development, CAD drawings, general arrangements, shop electrical drawings, as built, custom operation instructions and maintenance manuals.
- 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:
  - Pipeline size
  - Stand material
  - Calibration column
  - Backpressure valve
  - Pulsation dampener
  - Pressure gauge
  - Flow monitor
  - Sediment strainer

Visit our websites
USA@www.prominent.cc  Canada@www.prominent.ca  Worldwide@www.prominent.de