High-Pressure Displacement Pumps

Precision metering and displacement of high-pressure fluids

**APPLICATIONS**
- Dispensing gases or liquids at high pressure

**BENEFITS**
- Precise volume measurements

**FEATURES**
- Precision recirculating ball screw drive
- Cylinder-piston syringe-type design
- Mirror-polished piston finish to extend seal life
- Materials for wetted parts
  - Piston—Colmonoy®-coated 316 stainless steel
  - Cylinder—316 stainless steel
  - Recommended displacement fluids—water, mineral oil
- Sealing material
  - Glass-filled Teflon®
- Outlet ports
  - ¼-in National Pipe Thread or ¼-in

High-pressure displacement (HPD) pumps are precision laboratory instruments that generate high fluid pressures and accurately meter, inject, and proportionately displace fluids. Used extensively in petroleum research and fluid property measurement laboratories worldwide, HPD pumps apply to all situations in which precision is of utmost importance when dispensing gases and liquids.

Using a piston-cylinder arrangement, HPD pumps are tested to perform accurately and reliably for standard working pressure ranges of 10,000 to 20,000 psi [69 to 138 MPa]. Displacement capacities range between 0.6 and 122 in³ [10 and 2,000 cm³] with a volume resolution as low as 0.005 cm³. HPD pumps are available in hand-operated, motorized, and computer-controlled models. Each has a variety of options, making the inclusion of an HPD pump possible for almost every application.

Model numbers identify specific features of an HPD pump: volume, number of barrels, pressure rating, operating method, construction material, motor type, and controller type. Model number designators are as follows: product-volume-barrels-pressure-operating method-construction material-motor type-controller type. For example, model number PMP-0500-1-10-MB-316-M4-C0 indicates that the pump is a 500-cm³, single-barrel, 10,000-psi, motorized ball screw drive, 316 SS stepper motor with internal indexer, pump control, and data acquisition software. If a laptop computer is supplied with the pump, the letters “PC” appear immediately after the controller type.

**Additional Options**

<table>
<thead>
<tr>
<th>Volume, in³ [cm³]</th>
<th>0.6, 3.1, 6.1, 15.2, 30.5, 61.0, 122.0 [10, 50, 100, 250, 500, 1,000, and 2,000]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder type</td>
<td>Single-barrel, double-barrel, double-barrel opposed</td>
</tr>
<tr>
<td>Pressure, psi [MPa]</td>
<td>4,000 [28]</td>
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<tr>
<td></td>
<td>10,000 [69]</td>
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<tr>
<td></td>
<td>16,000 [110]</td>
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<tr>
<td></td>
<td>20,000 [138]</td>
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<tr>
<td></td>
<td>25,000 [172]</td>
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<tr>
<td>Wetted materials</td>
<td>316 stainless steel, Hastelloy® C-276®, XM19 stainless steel, Nitronic® 50, 400 series stainless steel</td>
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</tbody>
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