HDP 400-2 High Pressure Pump series

Design criteria

Hammelmann high pressure pumps are built to operate at the continuous maximum duty stated in the performance parameters. Just compare the crankshaft speed, average plunger speed, plunger diameter and power rating.

High pressure pump
Weight: approx. 1700 kg

Features
- Power ratings up to 400 kW
- Vertical 3 cylinder design
- Wide variety of complementary ancillaries

Quality and reliability
- Crank section calculation by ‘Finite element method’ ensures long working life under continuous load
- Stainless steel pump head free of alternating stress
- Integral speed reduction gear
- Pressurised oil lubrication system with oil cooler/filter
- Bellows form hermetic seal between the suction chamber and crank section
- Solid ceramic or tungsten carbide plungers
- Choice of application specific seal assemblies
- Choice of bronze (standard) or stainless steel suction chamber
### Technical data, series HDP 400-2

#### Performance parameters (Standard design)

<table>
<thead>
<tr>
<th>HDP</th>
<th>Q</th>
<th>Required power rating [kW]</th>
<th>Operating pressure [bar]</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[l/min]</td>
<td>200</td>
<td>250</td>
<td>300</td>
</tr>
<tr>
<td>404</td>
<td>45*</td>
<td>2400**</td>
<td>3000**</td>
<td>3000**</td>
</tr>
<tr>
<td></td>
<td>55*</td>
<td>2000**</td>
<td>2500**</td>
<td>2500**</td>
</tr>
<tr>
<td></td>
<td>65*</td>
<td>1650</td>
<td>2100</td>
<td>2500</td>
</tr>
<tr>
<td></td>
<td>61 / 58*</td>
<td>1600</td>
<td>2250</td>
<td>2600</td>
</tr>
<tr>
<td></td>
<td>73 / 70*</td>
<td>1550</td>
<td>1800</td>
<td>2300*</td>
</tr>
<tr>
<td></td>
<td>88 / 84*</td>
<td>1300</td>
<td>1550</td>
<td>1850</td>
</tr>
<tr>
<td></td>
<td>73 / 71*</td>
<td>1500</td>
<td>1550</td>
<td>1800</td>
</tr>
<tr>
<td></td>
<td>89 / 85*</td>
<td>1200</td>
<td>1500</td>
<td>1800</td>
</tr>
<tr>
<td></td>
<td>107/103</td>
<td>1000</td>
<td>1300</td>
<td>1500</td>
</tr>
</tbody>
</table>

*Ultra high pressure

#### Sealing system

- **HDP 404**
  - Dynamic D 28: Tungsten carbide plunger & bushing
  - Dynamic D 35: Tungsten carbide plunger / bronze bushing
  - Packing: Ceramic plunger / packing

- **HDP 403**
  - Dynamic: Ceramic plunger / bronze bushing
  - Packing: Ceramic plunger / packing

- **HDP 402**
  - Dynamic D 50-75: Ceramic plunger / bronze bushing
  - Packing: Ceramic plunger / packing

- **HDP 401**
  - Packing: Ceramic plunger / packing

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Note: Actual flow rates for water as pumped medium (volumetric efficiency has already been taken into account).

- Rod force: 210 kN
- Stroke: 80 mm
- Mean piston speed at n₂: 340 r.p.m. = 0.9 m/sec, 410 r.p.m. = 1.1 m/sec, 490 r.p.m. = 1.3 m/sec

Typical high pressure pump units:

- Diesel unit in container

Hammelmann plunger pumps convert 93 to 98% of the shaft power to hydraulic energy.

\[
D = \text{Piston/Plunger dia. [mm]} \\
\text{n₁ = Motor/Engine r.p.m.} \\
\text{n₂ = Crankshaft}
\]

**Conversion table**

<table>
<thead>
<tr>
<th>Rating</th>
<th>1 kW = 1.34 HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Op. Pressure</td>
<td>1 bar = 14.5 psi</td>
</tr>
<tr>
<td>Flow rate</td>
<td>1 l = 0.264 US gallon</td>
</tr>
</tbody>
</table>

**Energy efficient**