Chemical Pumps

Vertical Chemical Pump
Type TNP

In PP / PE-UHMW / PVDF
Vertical setting depths up to 1600 mm
**Applications**

Type TNP vertical chemical pumps are specifically designed to handle acids, alkalis or chemically contaminated fluids with or without solids. Typical applications include the chemical and metal finishing industries, steel and stainless steel pickling lines, evaporation and regeneration units, wet flue gas scrubbing systems downstream of waste incinerators as well as exhaust gas scrubbing and scrubber effluent treatment.

**Construction**

Vertical centrifugal pump with volute casing for wet-end installation; dry-end installation possible (see Fig. 1.3); Radial impeller, single-entry, single-stage.

**Materials**

<table>
<thead>
<tr>
<th>Part designation</th>
<th>Standard material range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PP</td>
</tr>
<tr>
<td>Pump casing</td>
<td>PP</td>
</tr>
<tr>
<td>Casing cover</td>
<td>PP</td>
</tr>
<tr>
<td>Pump shaft</td>
<td>St</td>
</tr>
<tr>
<td>Impeller</td>
<td>PP</td>
</tr>
<tr>
<td>Plain bearing</td>
<td>SSiC</td>
</tr>
<tr>
<td>Secondary seal&lt;sup&gt;2&lt;/sup&gt;</td>
<td>FPM</td>
</tr>
<tr>
<td>Shaft protection sleeve</td>
<td>PP</td>
</tr>
<tr>
<td>Column pipe</td>
<td>PP</td>
</tr>
<tr>
<td>Suspension pipe</td>
<td>PP</td>
</tr>
<tr>
<td>Casing flange</td>
<td>PP</td>
</tr>
<tr>
<td>Sole plate</td>
<td>PP</td>
</tr>
</tbody>
</table>

1) Material combinations possible  
2) Alternatives (depending on fluid pumped): EPDM or Viton-PTFE-coated

- **PP** Polypropylene  
- **PE-UHMW** Ultrahigh-molecular polyethylene  
- **PVDF** Polytetrafluoroethylene  
- **SSiC** Silicon carbide  
- **FPM** Fluoroelastomer  
- **EPDM** Ethylene propylene diene elastomer  
- **PTFE** Polytetrafluoroethylene

**Maximum allowable service pressures and temperatures**

![Graphs showing allowable internal pump pressures and temperatures for different materials](image)

The above maximum allowable service pressures and temperatures relate to the standard pump design. Higher pressure and temperature applications possible in consultation with MUNSCHE GmbH.

**Performance data for 50/60 Hz operation<sup>3)</sup>**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump capacity [Q]</td>
<td>110 m³/h</td>
</tr>
<tr>
<td>Total differential head [H]</td>
<td>45 m</td>
</tr>
<tr>
<td>Motor sizes up to</td>
<td>132</td>
</tr>
<tr>
<td>Vertical setting depths [I]</td>
<td>1600 mm</td>
</tr>
</tbody>
</table>

3) The TNP should only be installed in countries with 50 Hz line frequency; procurement of an alternative motor for 60 Hz line frequency with compatible fitting dimensions may be difficult.

**Shaft seal**

Labyrinth seal

**Plain bearing lubrication**

Standard: internal flushing with fluid pumped; Option: external flushing source.

**Connecting flange**

Standard design with stub end and backing flange to DIN; alternatively to ANSI or JIS.

**Drive**

Three-phase a.c. motor, frame type V1 with canopy to IEC, IP55 type of enclosure; motor voltage according to customer’s specification.

**Painting**

- **Base coat**: 2-component epoxy resin thick-film primer, single coat, dry-film thickness 40 - 50 µm;  
- **Top coat**: 2-component polyurethane finish paint, RAL 2003, pastel orange, 2 coats, dry-film thickness  
40 - 50 µm per coat; total dry-film thickness 130 - 150 µm; special coatings available on request.
Design features

1. Column pipe with 90° elbow and flange; connection by a suitable pipe union allows the column pipe and/or the discharge flange to be rotated to virtually any position (Fig. 1.1).
   Option: column pipe with flange or design to customer's specification (Fig. 1.2).

2. Motor shaft directly coupled to pump shaft.

3. Maximum setting depth 1600 mm.

4. Vertical setting depth variable in steps of 100 mm (standard); intermediate setting depths possible.

5. Steel shaft with solid plastic protection sleeve.

6. Volute casing, casing cover and suspension pipe fabricated from solid plastics: ample wear allowance, maximum operating reliability in chemically aggressive and abrasive service environments.

7. Solid impeller hub ensures plastics stability even at high temperatures.

8. Optimum hydraulic design using the latest numerical methods ensures: good suction behaviour due to low NPSH requirements, minimum mechanical vibration of components, long service lives of anti-friction and plain bearings, minimized running noise.


10. Impeller is keyed to the shaft and is therefore bi-directional and unaffected by inadvertent reverse rotation.
11 Standardized motor, frame type V1 with canopy.

12 Low external height above, compact construction below the sole plate; the TNP can still be installed where conventional pump configurations have space problems.

13 Circular sole plate; special sole plate geometries and sole plates with additional supporting flange (tank cover) available on request.

14 Non-contacting Type 10 labyrinth seal integrated into the sole plate prevents product escaping to the atmosphere. It is typically used in service environments involving no environmental hazards and when the pump tank is vented.

15.1 Product-lubricated plain bearing fabricated from EKasic® C. This advanced silicon carbide not only offers extreme wear resistance but is also resistant to virtually all acids and alkalis.

15.2 External flushing source for plain bearing (option): required when the fluid pumped is loaded with solids or tends to crystallize.

16 The metallic screw connections (threaded rods and cap nuts) reliably absorb the maximum internal casing pressures arising. Corrosion protection is achieved by a plastic coating and plastic cap nuts with O-rings to preclude contact with the fluid pumped.

▲ Accessories/Options

17 Suction strainer,
18 Suction pipe up to a length of 1600 mm,
19 Suction strainer and suction pipe,
20 Motor overload switch (not shown).
Performance characteristic charts
**Dimensions - Standard design**

- **Pump size**
  - 50-32-125: 32 50 4 350 220 140 0 285 318 12.5 35
  - 50-32-160: 32 50 4 480 295 180 0 365 440 12.5 45
  - 50-32-200: 32 50 6 540 370 225 20 445 508 12.5 50
  - 65-40-160: 40 65 4 480 295 180 0 370 440 12.5 45
  - 65-40-200: 40 65 6 540 370 225 20 452 508 12.5 50
  - 65-40-250: 40 65 8 590 425 245 45 485 558 12.5 60
  - 80-50-200: 50 80 6 540 370 225 20 455 508 12.5 50
  - 80-50-250: 50 80 8 590 425 245 45 495 558 12.5 50
  - 100-65-200: 65 100 8 590 425 245 45 500 558 12.5 60
  - 125-80-200: 80 125 8 590 425 245 45 515 558 12.5 60

- **Vertical setting depth range [A] as a function of the motor speed**

<table>
<thead>
<tr>
<th>Motor speed [1/min]</th>
<th>TNP</th>
</tr>
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<tbody>
<tr>
<td>750</td>
<td>400-1600</td>
</tr>
<tr>
<td>860</td>
<td>400-1620</td>
</tr>
<tr>
<td>950</td>
<td>400-1620</td>
</tr>
<tr>
<td>1150</td>
<td>400-1620</td>
</tr>
<tr>
<td>1450</td>
<td>400-1620</td>
</tr>
<tr>
<td>1750</td>
<td>400-1620</td>
</tr>
<tr>
<td>2000</td>
<td>400-1200</td>
</tr>
<tr>
<td>3500</td>
<td>400-1000</td>
</tr>
</tbody>
</table>

- Dimensions in [mm]
- For motor dimensions, please refer to motor catalogue
- Weights depend on vertical setting depth and motor size; please contact manufacturer for exact data

**Sole plate**

The standard pump comes with a circular sole plate (1); rectangular sole plate (2) and supporting flange (3) can be supplied on request.

- **Circular sole plate; standard**
- **Rectangular sole plate; special design on request**
- **Circular sole plate with supporting flange; special design on request**