Centrifugal pumps of plastic for clear or turbid fluids

Technical data
- Delivery rate
  \[ Q_{\text{max}} = 60 \text{ l/min} \]
- Delivery head
  \[ H_{\text{max}} = 32 \text{ m} \]
- Temperature range
  \(-20 ^\circ \text{C} \text{ to } +60 ^\circ \text{C} \)

Product features
- Centrifugal pump, 1- to 4-stage models
- Closed impellers
- Connecting dimensions to DIN EN 12157
- Immersion depths of up to 320 mm
- Operation on 50 Hz and 60 Hz without impeller change
- Three-phase or single-phase motor
Main applications
- Filling installations
- Wetting facilities
- Phototechnical systems
- Freon, Frigen installations
- Beverage cooling systems
- Air conditioning
- Cooling systems
- Cleaning/degreasing installations
- etc.

Fluids delivered
- Aqueous emulsions (with synthetic/mineral oil) also with chemical additives
- Drinking water
- Distilled water
- Deionized water
- Bases and acids
- Photo developer fluids
- etc.

Temperature range: –20 °C to +60 °C.

Maximum grain size: 0.3 mm.

Please select models PRT or PRA (PPU plastic) with open impellers when very dirty liquids are involved.

Product advantages
- Good resistance to chemicals found in a large number of liquids – thanks to high-quality POM and PEI plastics.
- High efficiency – resulting from closed impellers and optimized pump hydraulics.
- Space-saving installation – because of low motor heights.
- Easy to handle – due to low weights.

Design features
- sealless
- free-floating pump shaft, supported only by motor bearings
- closed impellers
- 1- to 4 stage models
- installation and port dimensions to DIN EN 12157
- immersion depths of up to 320 mm

High-tech plastics POM and PEI
The acetal copolymer POM belongs to the polymer group. Thanks to its special chemical structure (base polymer of trioxane with small amounts of comonomers), POM is highly stable in respect to thermal and oxidative degradation.

As a result, this plastic provides the pump’s parts with high fatigue strength and very good resistance to chemicals and aging.

The amorphous thermoplastic polyetherimide PEI displays outstanding thermal and mechanical properties.

We chose this material for the impeller in order to lengthen the pump’s service life, especially when different degrees of water hardness and severe erosion are involved.

Both plastics, POM and PEI, are physiologically harmless and can be recycled. All the plastic pump parts are marked with the prescribed identification symbols.
**Mechanical design**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor housing</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Pump support</td>
<td>POM/GF</td>
</tr>
<tr>
<td>Pump bottom</td>
<td>POM/GF</td>
</tr>
<tr>
<td>Intermediate chamber</td>
<td>POM/GF</td>
</tr>
<tr>
<td>Impeller</td>
<td>PEI/GF</td>
</tr>
<tr>
<td>Shaft</td>
<td>Stainless steel No. 1.4122</td>
</tr>
<tr>
<td>Antifriction bearings</td>
<td>Radial deep-groove ball bearings with 2 side plates (2 Z); with permanent lubrication</td>
</tr>
<tr>
<td>Self-adjusting bush</td>
<td>Teflon/graphite</td>
</tr>
<tr>
<td>Small parts (in contact with the fluid)</td>
<td>Stainless steel</td>
</tr>
</tbody>
</table>

**Electrical design**

The drive motors have a sophisticated fail-safe winding that is baked instead of impregnated. They meet VDE regulations as well as European motor standards (DIN EN 60034-1/11.95) and the requirements underlying the CE mark.

Designs in conformity with non-European regulations, e.g. Canadian Standards Association (CSA), Underwriters Laboratories INC. (UL) or special requirements, e.g. the USA or Japan, are possible. Moreover, we also produce models for special operating conditions (e.g. exposure to humidity or dust).

The regular models have motor windings designed for continuous operation and connection to a mains voltage of 230/400 V ±10 %, 50 Hz in accordance with IEC 38/5.87. On request the motors can be customized to all common mains values.

<table>
<thead>
<tr>
<th>Standard Options</th>
<th>Standard Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Degree of protection</strong> (DIN EN 60034-5/4.89)</td>
<td>IP 54 IP 55</td>
</tr>
<tr>
<td><strong>Insulation class</strong></td>
<td>F.B F</td>
</tr>
<tr>
<td><strong>Ambient temperature</strong> (DIN EN 60034-1/11.95)</td>
<td>max. 40 °C 50 °C and higher</td>
</tr>
<tr>
<td><strong>Relative humidity</strong> (DIN 50315)</td>
<td>max. 92 % 95 % and higher</td>
</tr>
<tr>
<td><strong>Site altitude</strong> (DIN EN 60034-1/11.95)</td>
<td>&lt;1000 m above sea level on request</td>
</tr>
<tr>
<td><strong>Electrical parameters</strong></td>
<td>230/400 V, 50 Hz 220/440 V, 60 Hz on request</td>
</tr>
<tr>
<td><strong>Mains operation</strong></td>
<td>three-phase- single-phase AC</td>
</tr>
<tr>
<td><strong>Number of poles</strong></td>
<td>2 poles 4 poles</td>
</tr>
<tr>
<td><strong>Terminal box</strong> - layout (DIN EN 12157)</td>
<td>layout 1 layout 2, 3 or 4</td>
</tr>
<tr>
<td>- material (DIN EN 50262)</td>
<td>high impact plastic M16x1.5 light metal M20x1.5</td>
</tr>
<tr>
<td>- cable entry (DIN EN 50262)</td>
<td>Industrial plug-in connector</td>
</tr>
<tr>
<td><strong>Protective surface coating</strong></td>
<td>synthetic-resin lacquer color: RAL 9005 (black, matt) Special finish on request</td>
</tr>
<tr>
<td><strong>Special protection</strong></td>
<td>Motor protection (thermistor in the winding (PTC); fan coaf with canopy)</td>
</tr>
</tbody>
</table>

**Installation and operation**

The unit is installed in a vertical position. The maximum permissible level of fluid is 20 mm beneath the mounting flange (cf. following drawing).

Dry running is not permitted.

The pump may, however, run dry (no fluid) for a brief period of time to check the direction of rotation prior to startup.

Operation against closed valve is possible.

Direction of rotation: to the left (counterclockwise) as viewed from above looking down on the ventilation side of the motor.

**Options**

- Model with extension tube
  - if immersion depth deviates from standard.

- Model with agitator blades
  - to mix the liquid and distribute the temperature.
  (Please note: higher power required)

**Order example**

Model

Single-phase AC current

Size

Immersion depth

Please indicate electrical parameters, e.g. 230/400 V, 50 Hz.

When ordering spare parts, always indicate the 10-place serial number (see motor rating plate).
Characteristics for 50 Hz

The data apply to fluids with a viscosity of 1 mm²/s at a density of 1 kg/dm³

<table>
<thead>
<tr>
<th>Model</th>
<th>Three phase operation</th>
<th>Electrical data</th>
<th>Single-phase operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[kW]</td>
<td>[V]</td>
<td>[Hz]</td>
</tr>
<tr>
<td>PRG6 1-stage</td>
<td>0.06</td>
<td>230/400</td>
<td>50</td>
</tr>
<tr>
<td>PRG12 2-stage</td>
<td>0.12</td>
<td>230/400</td>
<td>50</td>
</tr>
<tr>
<td>PRG18 3-stage</td>
<td>0.18</td>
<td>230/400</td>
<td>50</td>
</tr>
<tr>
<td>PRG23 4-stage</td>
<td>0.37</td>
<td>230/400</td>
<td>50</td>
</tr>
</tbody>
</table>

*) to DIN EN 60034-9/5.96
### Characteristics for 60 Hz

The data apply to fluids with a viscosity of 1 mm²/s at a density of 1 kg/dm³

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#### Extended performance range in single-phase operation.

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#### Electrical data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PRG6</td>
<td>0.09</td>
<td>255/440</td>
<td>60</td>
<td>0.42/0.24</td>
<td>3257</td>
<td>45</td>
</tr>
<tr>
<td>PRGE6</td>
<td>0.09</td>
<td>230</td>
<td>60</td>
<td>0.68</td>
<td>3247</td>
<td>2</td>
</tr>
<tr>
<td>PRG12</td>
<td>0.16</td>
<td>255/440</td>
<td>60</td>
<td>0.74/0.43</td>
<td>3158</td>
<td>46</td>
</tr>
<tr>
<td>PRGE12</td>
<td>0.22</td>
<td>230</td>
<td>60</td>
<td>1.35</td>
<td>3430</td>
<td>6</td>
</tr>
<tr>
<td>PRG18</td>
<td>0.25</td>
<td>255/440</td>
<td>60</td>
<td>0.99/0.57</td>
<td>3350</td>
<td>50</td>
</tr>
<tr>
<td>PRGE18</td>
<td>0.35</td>
<td>230</td>
<td>60</td>
<td>2</td>
<td>3220</td>
<td>6</td>
</tr>
<tr>
<td>PRG23</td>
<td>0.37</td>
<td>255/440</td>
<td>60</td>
<td>1.49/0.86</td>
<td>3329</td>
<td>51</td>
</tr>
<tr>
<td>PRGE23</td>
<td>0.35</td>
<td>230</td>
<td>60</td>
<td>2</td>
<td>3220</td>
<td>6</td>
</tr>
</tbody>
</table>

*) to DIN EN 60034-9/5.96
*) Dimension "b" is increased by +20 mm in the case of CSA and USA designs or if thermistor-type motor protection is provided.

Standard ventilated motors come without a canopy. If necessary – observe the respective safety regulations and laws applying to machinery guards –, the motors can be supplied with a canopy at extra charge.

Dimension "c" is then increased by about 14 mm.

Please note:
All equipment may only be installed and/or assembled by qualified personnel. Observe existing safety regulations.
To avoid errors please consult our operating instructions.
Immersion Pumps PRG, sealless

1 Stator housing with winding
2 Fan cowl
3 Fan impeller
4 Ball bearing, DIN 625
5 Rotor
6 Shaft
7 Retaining ring
8 Washer
9 Bolt
10 Bolt
11 Bolt (not required with PRG 6 and 12)
12 Muff
13 Ball bearing, DIN 625
14 Ball bearing, DIN 625
15 Terminal box
16 Packing
17 Bolt
18 Bolt
19 Bolt
20 Bolt
21 Muff
22 Splash ring
23 Shaft sleeve
24 Nut
25 Shim
26 Flange sleeve
27 Nut
28 Key
29 Impeller chamber
30 Intermediate chamber
31 1st stage impeller
32 1st stage impeller
33 Pump bottom
34 Impeller
35 End shield
36 Splash ring
37 Washer
38 Bolt
39 Spring washer
40 Bolt

With the PRG 6 and PRG 12 only