DESMI ROTAN, one of the world’s leading manufacturers of internal gear pumps

DESMI A/S, formerly known as A/S De Smit-ske, was founded in 1834. Today DESMI A/S develops, manufactures and markets pumps and pumping systems worldwide.

The ROTAN pumps are marketed by the DESMI ROTAN division and are distributed by subsidiaries, sales agencies and distributors in more than 40 countries.

The internal gear pump principle was developed in 1915 by a Danish American. In 1921, he licensed a Danish Company to manufacture the pumps, which have been continuously marketed worldwide under the ROTAN name. The unique, modular concept of ROTAN pumps is generally recognized as the most advanced internal gear pump design available today.
Method of operation

ROTAN pumps offer the following additional advantages and benefits:

- Pumping capability in either direction (all models) allowing installation flexibility
- Modular, back pull-out (except GP) design makes inspection and maintenance easy
- Construction is simple and rugged with only two rotating parts and a shaft seal, enhancing service life
- External axial adjustment of rotor/shaft for wear and repositioning after maintenance saves time and expense
- Large choice of configurations provide flexibility to handle a wide range of applications
- Substantial inventories are maintained, including stainless steel and mag drive pumps, to meet customer schedules
- Competitively priced, reducing customers’ initial and operation costs
- Computerized selection program available for customers needing immediate sizing and related application information
- Standard, integral relief valve mounted on casing saves space and simplifies piping
GP/CC

Direct coupled pumps in cast iron, for clean and mildly abrasive liquids

GP monoblock pumps are typically used for handling various clean and mildly abrasive liquids. The simple and compact construction makes it a low cost pump, often used in modified versions by OEM customers.

CC models are close-coupled, providing the ultimate compact construction. GP/CC pumps are designed for use with NEMA or IEC-flanged motors.

- Capacity range: Up to 225 gpm
- Speed: Up to 1750 rpm
- Differential pressure: Up to 250 psi
- Suction lift: Up to 15” Hg vacuum while priming
  Up to 24” Hg vacuum while pumping
- Viscosity range: Up to 7,500 cSt
- Temperature: Up to 300°F

Typical Applications:
Pumping of:
- Clean oil
- Glycol
- Vegetable oil
- Solvents
- Lube oil
- Waste oil
- Fish oil
HD pumps are specifically designed for difficult applications and those involving high viscosity liquids.

Typical applications include pumping oils, asphalts, chocolates, paints, lacquers, molasses, soaps, and other industrial viscous process fluids.

HD pumps are known for their rugged and simple construction.

Capacity range: Up to 750 gpm
Speed: Up to 1750 rpm
Differential pressure: Up to 250 psi
Suction lift: Up to 15” Hg vacuum while priming
Up to 24” Hg vacuum while pumping
Viscosity range: Up to 250,000 cSt
Temperature: Up to 500° F

Typical Applications:
Pumping of:

- Oil
- Asphalt
- Chocolate
- Paint
- Lacquer
- Molasses
- Soap
- Other Industrial viscous liquids
- Additives
- Polyol
- Viscose
- Supphate soap
- Maltose
- Grease
- Pitch
- Base oil
- Bitumen
- Polyester
PD pumps are designed for refinery and petrochemical applications, and are of steel external construction.

Typical applications include pumping fuel oils, gasoline, lube oils, greases, and other hydrocarbon-based fluids. PD pumps are available to meet most API 676 standards.

Capacity range: Up to 750 gpm
Speed: Up to 1750 rpm
Differential pressure: Up to 250 psi
Suction lift: Up to 15” Hg vacuum while priming
Up to 24” Hg vacuum while pumping
Viscosity range: Up to 250,000 cSt
Temperature: Up to 500° F

Typical Applications:
Pumping of:

- Fuel
- Oil
- Gasoline
- Lube oil
- Grease
- Other hydrocarbon based fluids
- Additives
- Bitumen
- Polystyrene
- Wax
CD

CD pumps are designed for handling corrosive liquids, primarily in the chemical processing, food, and pharmaceutical industries.

Typical applications include pumping organic acids, fatty acids, alkalis, caustic soda, polymer solutions, soap, shampoo, animal fat, vegetable fat, chocolate, and other special fluids.

- **Capacity range:** Up to 750 gpm
- **Speed:** Up to 1750 rpm
- **Differential pressure:** Up to 250 psi
- **Suction lift:** Up to 15” Hg vacuum while priming
- **Viscosity range:** Up to 250,000 cSt
- **Temperature:** Up to 500° F

**Typical Applications:**

**Pumping of:**
- Organic acid
- Fatty acid
- Alkali
- Caustic soda
- Polymer solutions
- Soap
- Shampoo
- Animal fat
- Chocolate
- Other special fluids
- Resin
- Paint
- Rosin

![Image of CD pumps and laboratory equipment]
MD pumps are designed for applications demanding zero emissions. Previously, these applications were typically isocyanate, solvents and other hazardous organic liquids.

The use of MD pumps is rapidly expanding to include many non-hazardous liquids.

This is due to the increasing need to eliminate leakage and subsequent pollution. Another advantage of installing MD pumps is the extremely low maintenance requirement.

They will often provide a cost-effective solution for installations where a conventional pump would need frequent replacement of the shaft seal(s).

**Most important MD model features and benefits:**

- Maximum protection against leakage, sealless design provides assurance against environmental contamination
- Advanced, patented cooling system based on an integral pump eliminates the need for external cooling
- Dynamic axial balancing system minimizes axial loads, reduces energy consumption, and increases equipment MTBM
- Inherent secondary containment system, provided by completely enclosed magnetic coupling housing, controls leakage if primary containment fails
- Superior, positive thrust control feature maintains correct running clearances and eliminates failures common to other designs
- Wide choice of bearing materials available, including cast iron, bronze, carbon and tungsten carbide
- Standard magnet material is neodymium-iron-boron. Optional samarium cobalt permanent magnets allow operating temperatures up to 500°F
- Reversible pumping capability, available by changing the rotation of the motor, allows installation flexibility
- Optional external heating jackets for both front cover and magnetic coupling housing available when required to assure proper pump operation
- Genuine back-pullout design
- Pump comes standard as close-coupled, optional with bare shaft
- Both internal and external canister protection

Typical Applications:
Where no leakage liquid or gaseous, is allowed:

Pumping of:
- Isocyanate
- Solvents
- Hazardous organic liquids
- Printing Ink
- Resin
- Pitch
- Alkyd resin
- Soyabean oil
- Linseed oil
- Monomers
- Polyol
- Corn Syrup

**ROTAN MD SERIES PUMP**
The most advanced, magnetically driven, positive displacement pump available.
By indicating the options in the order below, the complete pump can be identified

1) Pump series

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP</td>
<td>General Purpose, mono block pump in cast iron</td>
</tr>
<tr>
<td>CC</td>
<td>General Purpose, close-coupled pump in cast iron</td>
</tr>
<tr>
<td>HD</td>
<td>Heavy Duty pump in cast iron</td>
</tr>
<tr>
<td>PD</td>
<td>Petrochemical Duty pump in carbon steel</td>
</tr>
<tr>
<td>MD</td>
<td>Mag Drive pump, magnetically coupled, in cast iron, carbon steel or stainless steel</td>
</tr>
<tr>
<td>CD</td>
<td>Chemical Duty</td>
</tr>
</tbody>
</table>

2) Pump sizes

<table>
<thead>
<tr>
<th>Code</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>DN 25-1”</td>
</tr>
<tr>
<td>33</td>
<td>DN 32-1½”</td>
</tr>
<tr>
<td>41</td>
<td>DN 40-1½”</td>
</tr>
<tr>
<td>51</td>
<td>DN 50-2”</td>
</tr>
<tr>
<td>66</td>
<td>DN 65-2½”</td>
</tr>
<tr>
<td>81</td>
<td>DN 80-3”</td>
</tr>
<tr>
<td>101</td>
<td>DN 100-4”</td>
</tr>
<tr>
<td>126</td>
<td>DN 125-5”</td>
</tr>
<tr>
<td>151</td>
<td>DN 150-6”</td>
</tr>
<tr>
<td>152</td>
<td>DN 150-6”</td>
</tr>
<tr>
<td>201</td>
<td>DN 200-8”</td>
</tr>
</tbody>
</table>

Available with flanges* or NPT tapped dependent on the size and material. GP pumps are available through size 101; PD are not available in size 152.

* Flange connections according to: ANSI B 16.1/B 16.5, ISO 2084, DIN 2501, BS 4504 1969

3) Configurations

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Suction/discharge connections in-line</td>
</tr>
<tr>
<td>B</td>
<td>Suction/discharge connections at 90° angle (optional)</td>
</tr>
</tbody>
</table>

7) Material codes for wetted parts

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Casing/Covers</th>
<th>Rotor/Idler</th>
<th>Shaft</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GP/HD</td>
<td>Cast iron</td>
<td>Cast Iron</td>
<td>Carbon Steel</td>
</tr>
<tr>
<td>3</td>
<td>CD</td>
<td>316 SS</td>
<td>329 SS</td>
<td>329 SS</td>
</tr>
<tr>
<td>4</td>
<td>PD</td>
<td>Cast steel</td>
<td>Cast iron</td>
<td>Carbon steel</td>
</tr>
</tbody>
</table>

For MD pumps, all material codes may be used.

5) Lubrication

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>Idler bearing and main bearing lubricated by pump medium</td>
</tr>
<tr>
<td>M</td>
<td>Externally lubricated idler bearing and main bearing</td>
</tr>
</tbody>
</table>

6) Material codes for idler bearing

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cast iron</td>
<td>Hardened steel</td>
<td>329 SS</td>
</tr>
<tr>
<td>2</td>
<td>Bronze</td>
<td>Hardened steel</td>
<td>329 SS</td>
</tr>
<tr>
<td>3</td>
<td>Carbon</td>
<td>Hardened steel</td>
<td>329 SS</td>
</tr>
<tr>
<td>4</td>
<td>Al.oxide</td>
<td>Cr. oxide coated</td>
<td>Coated</td>
</tr>
<tr>
<td>5</td>
<td>Carbon</td>
<td>Al.oxide,</td>
<td>Al.oxide,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>polished</td>
<td>polished</td>
</tr>
<tr>
<td>8</td>
<td>Tungsten</td>
<td>Tungsten</td>
<td>Tungsten</td>
</tr>
<tr>
<td></td>
<td>carbide</td>
<td>carbide</td>
<td>carbide</td>
</tr>
</tbody>
</table>

7) Material codes for main bearing

<table>
<thead>
<tr>
<th>Code</th>
<th>Bearing bush</th>
<th>Shaft: GP-HD-PD</th>
<th>Shaft: CD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cast iron</td>
<td>Carbon steel</td>
<td>329 SS</td>
</tr>
<tr>
<td>2</td>
<td>Bronze</td>
<td>Carbon steel</td>
<td>329 SS</td>
</tr>
<tr>
<td>3</td>
<td>Carbon</td>
<td>Carbon steel</td>
<td>329 SS</td>
</tr>
<tr>
<td>4</td>
<td>Al.oxide</td>
<td>Cr. oxide coated</td>
<td>Cr. oxide coated 329 SS</td>
</tr>
<tr>
<td>8</td>
<td>Tungsten</td>
<td>Coated steel</td>
<td>Tungsten</td>
</tr>
<tr>
<td></td>
<td>carbide</td>
<td>carbide</td>
<td>329 SS</td>
</tr>
<tr>
<td>B</td>
<td>Ball bearing</td>
<td>Steel</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

8) Shaft seals

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Teflon-impregnated, non-asbestos packing</td>
</tr>
<tr>
<td>2</td>
<td>Single mechanical shaft seal</td>
</tr>
<tr>
<td>22</td>
<td>Double mechanical seal, O-ring type</td>
</tr>
</tbody>
</table>

Only for MD pumps

9) Special configurations

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/xx</td>
<td>Magnet length: xx cm</td>
</tr>
<tr>
<td>N</td>
<td>Magnet material: Neodymium-iron-boron</td>
</tr>
<tr>
<td>C</td>
<td>Magnet material: Samarium Cobalt</td>
</tr>
<tr>
<td>S</td>
<td>All special configurations are marked with: S</td>
</tr>
</tbody>
</table>
Selection of pump size

To size a pump with the adjacent chart, the following is needed:

- The capacity
- The viscosity

From the viscosity at the top of the chart, follow the color-coded lines downwards. Next, find the capacity at the right or left side of the chart and follow a horizontal line until it intersects with the viscosity line. The point of intersection of the two lines determines the pump size, defined by the diagonal lines. If there is not a precise intersection of the three lines, select the nearest size, giving either a slightly higher or slightly lower capacity.

The required speed is found on the bottom scale, vertically below the point of intersection. The maximum speed of each pump is indicated by the dot at the end of each pump’s line.

This speed must be reduced by up to 50% when pumping abrasive liquids and/or emulsions. When the differential pressure is known, the shaft power can be calculated by the formula:

\[ \text{BHP} = 0.0015 \times \text{flow (gpm)} \times \text{differential pressure (psi)} \]

The required shaft power is increased by up to 35% when handling higher viscosities (above 5,000 cSt), and conversely reduced by up to 35% when handling thin liquids (below 500 cSt).