Richter Sealless Chemical Magnetic Drive Pumps

MNK, MNK-B

Up to 600 m³/h
Reinforced plain bearing engagement
Linings PFA/PTFE, PFA-L, PE, PFA-P
Richter sealless chemical magnetic drive pumps

Fields of application
Conveyance of corrosive, hazardous and pure media in the chemical, pharmaceutical and petrochemical industries, semi-conductor production, water treatment, pulp, metal processing and waste disposal/recycling industries.

The Richter MNK series is rated
• for medium to most difficult operating conditions
• for media where stainless steel, iron silicon alloy and others do not have sufficient corrosion resistance
• as an alternative to pumps made of expensive exotic metals (Hastelloy®, Monel, tantalum etc.)
• for solids-laden, crystallising, toxic, hot or otherwise critical media

Design

Heavy-duty horizontal design. Sealless. Eddy-current-free. FDA-conformity.

Alternatively as
• close-coupled design MNK-B
• ANSI series MNKA/MNKA-B
• self-priming MNK-S
• vortex pump MNK-X

High-purity media
e.g. in the pharmaceutical, semi-conductor and fine chemical industries: special MNK version available

Type codes, materials
- Frame-mounted design MNK/…
- Close-coupled design MNK-B/…

Linings:
- Perfluoroalkoxy (PFA) …/F
- Polytetrafluoroethylene (PTFE) …/F
- PFA-P, highly permeation-resistant …/F-P
- PFA-L, PTFE-L, antistatic …/F-L
- Polyethylene, ultra-high molecular (PE-UHMW) …/E

Operating range
<table>
<thead>
<tr>
<th>50 Hz operation</th>
<th>60 Hz operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1-600 m³/h</td>
<td>0.1-600 m³/h</td>
</tr>
<tr>
<td>(0.4-2650 USgpm)</td>
<td>(0.4-2650 USgpm)</td>
</tr>
<tr>
<td>up to 95 m (310 ft) LC</td>
<td>up to 95 m (310 ft) LC</td>
</tr>
</tbody>
</table>

• Operating temperatures: -60/+180 °C (-75/+360 °F)*
• Operating pressures up to 16 bar (235 psi)"
• Solids up to 50 % and gas contents up to 5 %, depending on pump design

* Higher operating temperatures to more than 200 °C (400 °F) and pressures to 25 bar (360 psi) available on request.

① Closed impeller with flow-optimised vane channels for high efficiency and low NPSH values. The large metal core increases the mechanical strength considerably. Secured screw connection to the shaft.

⑤ Thick-walled housing lining
- Anchored in the armouring
- Vacuum-resistant to 0 bar at standstill vacuum
- Full-surface armouring absorbs system pressure and pipe forces and eliminates the need for expansion joints
- Housing drain and heating jacket optional.

⑧ Robust plain bearings made of pure SSiC
With optional SAFEGLIDE® PLUS dry-running for a brief period will not cause any damage.

Reinforced plain bearing engagement to increase reliability in case of particularly high loads and in critical operating ranges.

⑦ Plain bearing pedestal and inner magnet assembly with stable metal core, with full and seamless thermoplastic lining. The plain bearing pedestal absorbs all hydraulic forces.
Solids-laden media can be conveyed with solids contents of up to 50% and grain sizes of up to 20 mm. Special pump accessories are required for these applications.

High-quality external corrosion protection
Epoxy coating of the pump. Screws and drive shaft made from stainless steel.

The radial rubbing safety surface protects – in the event of a rolling bearing failure – the can from damage by a possibly tumbling drive magnet assembly.

Bearing pedestal interior can be monitored with optional leak sensor; suitable for conductive media.

Virgin, unfilled lining plastics
The linings need no stabilising fillers. Therefore:
• considerably easier and more reliable quality control
• no reduction in the permeation resistance
• pure pharmaceutical and fine chemical media: no contamination.

Non-metallic double can system
• wetted: PTFE, PFA, PFA-P, PFA-L
• pressure-bearing: carbon-fibre reinforced plastic (CFRP)
• pressure-resistant, breakproof, high safety reserves

Free from eddy currents
• No heating of the medium
• High secondary corrosion resistance
• Optional can monitoring

High-performance permanent magnets
Patented magnet attachment.

Solids-laden media can be conveyed with solids contents of up to 50% and grain sizes of up to 20 mm. Special pump accessories are required for these applications.

High-quality external corrosion protection
Epoxy coating of the pump. Screws and drive shaft made from stainless steel.
### Components and materials

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Housing</td>
<td>Ductile cast iron EN-JS 1049 [0.7043]/PFA¹</td>
</tr>
<tr>
<td>122</td>
<td>Blind cover</td>
<td>Steel</td>
</tr>
<tr>
<td>158</td>
<td>Can insert</td>
<td>PTFE</td>
</tr>
<tr>
<td>159</td>
<td>Can</td>
<td>Carbon-fibre-reinforced plastic [CFRP]</td>
</tr>
<tr>
<td>211</td>
<td>Pump shaft</td>
<td>Stainless steel/PFA¹</td>
</tr>
<tr>
<td>213</td>
<td>Drive shaft</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>230</td>
<td>Impeller</td>
<td>PFA¹ with stainless steel/steel core</td>
</tr>
<tr>
<td>321</td>
<td>Radial ball bearing</td>
<td>Long-life grease, optionally: oil-lubricated</td>
</tr>
<tr>
<td>330</td>
<td>Bearing pedestal</td>
<td>Ductile cast iron EN-JS 1049 [0.7043]</td>
</tr>
<tr>
<td>339</td>
<td>Plain bearing pedestal</td>
<td>Ductile cast iron EN-JS 1049 [0.7043]/PFA¹</td>
</tr>
<tr>
<td>361</td>
<td>Rear bearing cover</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>401</td>
<td>Housing gasket</td>
<td>PTFE</td>
</tr>
<tr>
<td>412</td>
<td>O-ring</td>
<td>FFKM® [Kalrez® or equivalent]</td>
</tr>
<tr>
<td>415/1</td>
<td>Centering gasket</td>
<td>PTFE</td>
</tr>
<tr>
<td>504</td>
<td>Distance ring</td>
<td>PTFE</td>
</tr>
<tr>
<td>509/1</td>
<td>Intermediate ring</td>
<td>PTFE</td>
</tr>
<tr>
<td>518</td>
<td>Support ring</td>
<td>Steel</td>
</tr>
<tr>
<td>525</td>
<td>Distance sleeve</td>
<td>Steel</td>
</tr>
<tr>
<td>529/545</td>
<td>Bearing sleeve/bearing bush set</td>
<td>SSIC/SSIC, optionally with SAFEGlide® PLUS</td>
</tr>
<tr>
<td>551</td>
<td>Distance washer</td>
<td>PTFE</td>
</tr>
<tr>
<td>858</td>
<td>Drive magnet assembly</td>
<td>Steel, magnets</td>
</tr>
<tr>
<td>859</td>
<td>Inner magnet assembly</td>
<td>Steel/PFA®, magnets</td>
</tr>
</tbody>
</table>

¹ PE-UHMW, highly permeation-resistant and antistatic linings on request

Viton®, Kalrez®: TM of DuPont

SAFEGlide®: TM Richter Chemie-Technik GmbH
The pump housing with ductile cast iron armouring absorbs all the hydraulic and pipe-work forces to DIN/ISO5199/Euro-pump 1979. In contrast to partially or non-armoured plastic pumps, no expansion joints are required. Flanges with service-minded through holes to DIN, ANSI, BS, JIS. Available on request:
- Housing drain, also serves as a flushing and monitoring connection.
- Heating jacket, e.g. for crystal-lising or polymerising media. Can also be retrofitted.

Impeller with curved vanes
The large metal core ensures dimensional stability, even at elevated temperatures and high flow rates. Axial forces are reduced by back vanes. The metal core is protected by a thick-walled seamless plastic lining. The impeller is secured against loosening if the pump is started up in the wrong direction of rotation or in the case of back-flowing media.

Eddy-current-free double can
The metal-free can system does not induce any eddy currents and thus avoids unnecessary heat generation. Efficiency and operational reliability benefit from this. Even low flow rates or media near their boiling point can therefore be conveyed without the introduction of heat. Optional can and bearing pedestal monitoring increases safety with particularly hazardous media.

Plain bearings of pure SSIC with optional Richter SAFEGLIDE® PLUS dry-run-optimisation.
They make a decisive contribution to operational reliability and the long service life of the pump. Richter has gained experience in thousands of applications. Pure SSIC as a base material produces maximum dimensional stability; the optional Richter SAFEGLIDE® PLUS system offers protection against damage from dry-running. This optimised feature of the second generation has even withstood dry-run trials lasting 30 to 60 min. (at 2900 rpm).

SSIC and SAFEGLIDE® PLUS are extremely resistant to corrosion and abrasion.

Close-coupled pump MNK-B
9 MNK sizes are alternatively available as a cost and space-saving, close-coupled version MNK-B. In terms of performance, the sizes 25-25-100 to 80-50-200 cover most of the applications which arise in chemical processing.
Performance curves

The MNK/MNKA family offers by far the largest application range in the world of all available fluor-plastic-lined magnetic drive pumps: Flow rates of up to 600 m³/h (2650 USgpm), delivery heads of up to 140 m (500 ft) LC.

Depending on the pump accessories, the suitability for medium temperatures of -60 to 200 °C (-75 to 400 °F), the extraordinary capability for conveying solids-laden media and the problem-solving options package contribute to its leading market position.

Performance curves 2900/3500 rpm*

Performance curves 1450/1750 rpm*

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