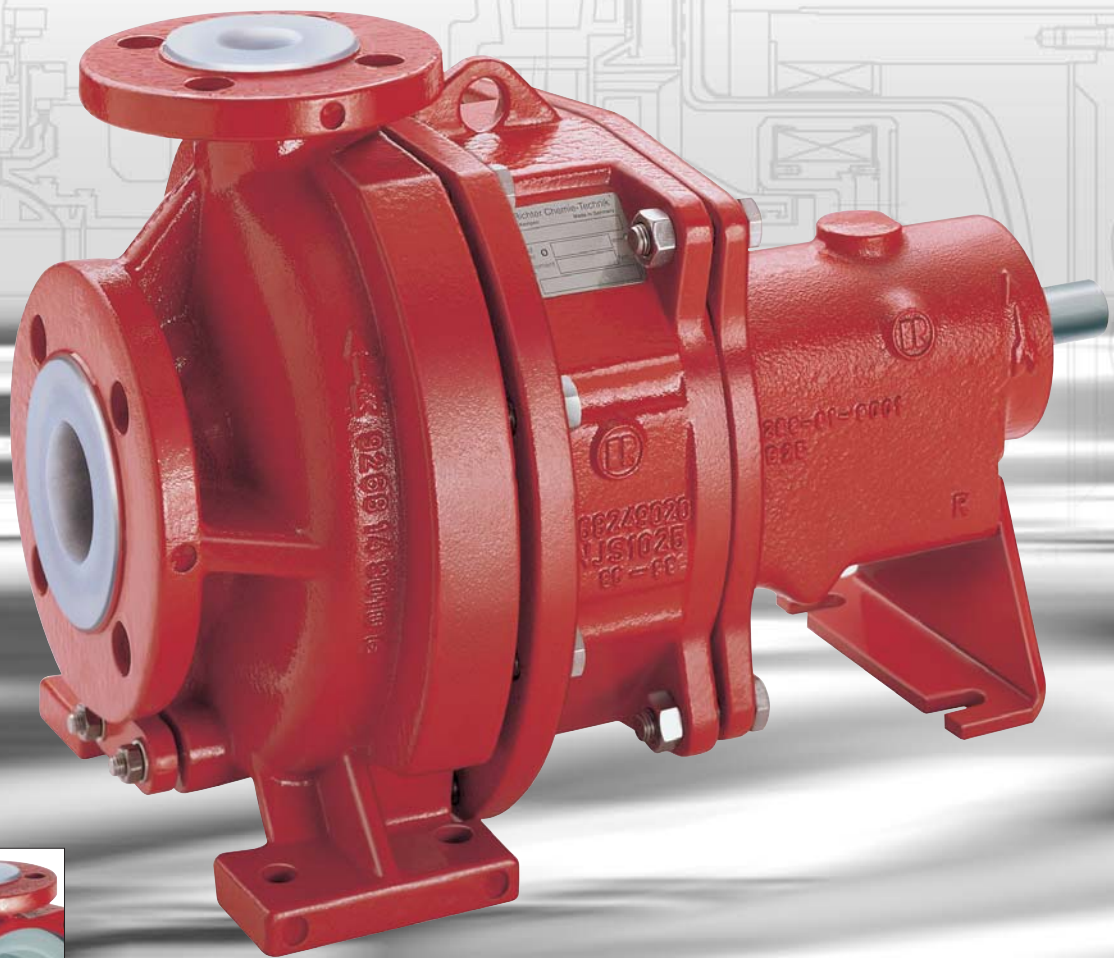


# Richter Sealless Chemical Magnetic Drive Pumps



**SAFEGSLIDE® PLUS**  
dry-run option

Corrosion-resistant  
through PFA

Unfilled virgin lining



**RICHTER**  
Process Pumps & Valves

# Richter sealless chemical magnetic drive pumps

## Fields of application

Conveyance of corrosive, environmentally critical and pure media in the chemical, pharmaceutical, petrochemical, semi-conductor, pulp, metal, food processing and waste disposal/recycling industries.

The Richter MDK/MDK-B series was developed

- for use with media where stainless steel does not have sufficient corrosion resistance
- as an alternative to
  - pumps made of expensive metals (Hastelloy, tantalum etc.)
  - plastic-lined mechanical seal pumps
  - full plastic pumps
  - stainless steel pumps with double mechanical seals and liquid sealing or quench systems
  - and to stainless steel magnetic drive pumps.

## Design

Sealless, plastic-lined magnetic drive chemical centrifugal pump. Dimensions and delivery data to DIN EN 22858/ISO 2858/ DIN ISO 5199.

Flanges drilled acc. to ISO 7005-2/PN 16 (old: DIN 2533, PN 16); on request to ANSI B16.5 Cl. 150.

Frame-mounted design, alternatively close-coupled design with flange motor. No dynamic seal. Eddy-current-free. Compliant with ATEX and the German Clean Air Act.

## High-purity media

e.g. in the pharmaceutical, fine chemical and semi-conductor industries: modified MDK version from defined production process available.

## Type and material codes

- Frame-mounted MDK/...
- Close-coupled MDK-B MDK-B/...
- Perfluoroalkoxy (PFA) .../F

## Operating range

### 50 Hz operation

0.1-80 m<sup>3</sup>/h\*

(0.4-350 US gpm)\*

up to 60 m (200 ft) LC\*

### 60 Hz operation

0.1-95 m<sup>3</sup>/h\*

(0.4-420 US gpm)\*

up to 85 m (280 ft) LC\*

- Operating temperatures: -60/+120 °C (-75/+250 °F)\*
- Operating pressure up to 16 bar (235 psi), depending on temperature
- Solid contents on request

\* Higher flow rates, delivery heads, pressures and temperatures with MNK/MNKA series

## ① Thick-walled PFA lined housing

- Transparent unfilled virgin lining, see ⑤
- Full-surface ductile cast iron armoring EN-JS 1049 („0.7043”) withstands system pressure and pipework forces and eliminates the need for expansion joints
- Housing drain connection prepared as standard feature
- Housing heating on request.

## ⑩ Closed impeller

with flow-optimised vane channels for **high efficiency** and **low NPSH** values.

**Stable metal core** ensures reliable torque transmission within the impeller assembly.

## ⑨ Robust plain bearings

The impeller assembly with radial plain bearings made of SSiC or hard carbon rotates on the SSiC shaft. Axial thrust rings made of SSiC or carbon-reinforced PTFE absorb the axial thrust.

The plain bearing system can be made completely of SSiC components. Brief dry-running is possible with the optional time-tested **Richter SAFEGLIDE® PLUS dry-run-optimised** plain bearing system.

## ⑧ Solid stationary SSiC shaft

safely positioned in the shaft spider and in the can.

② 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.

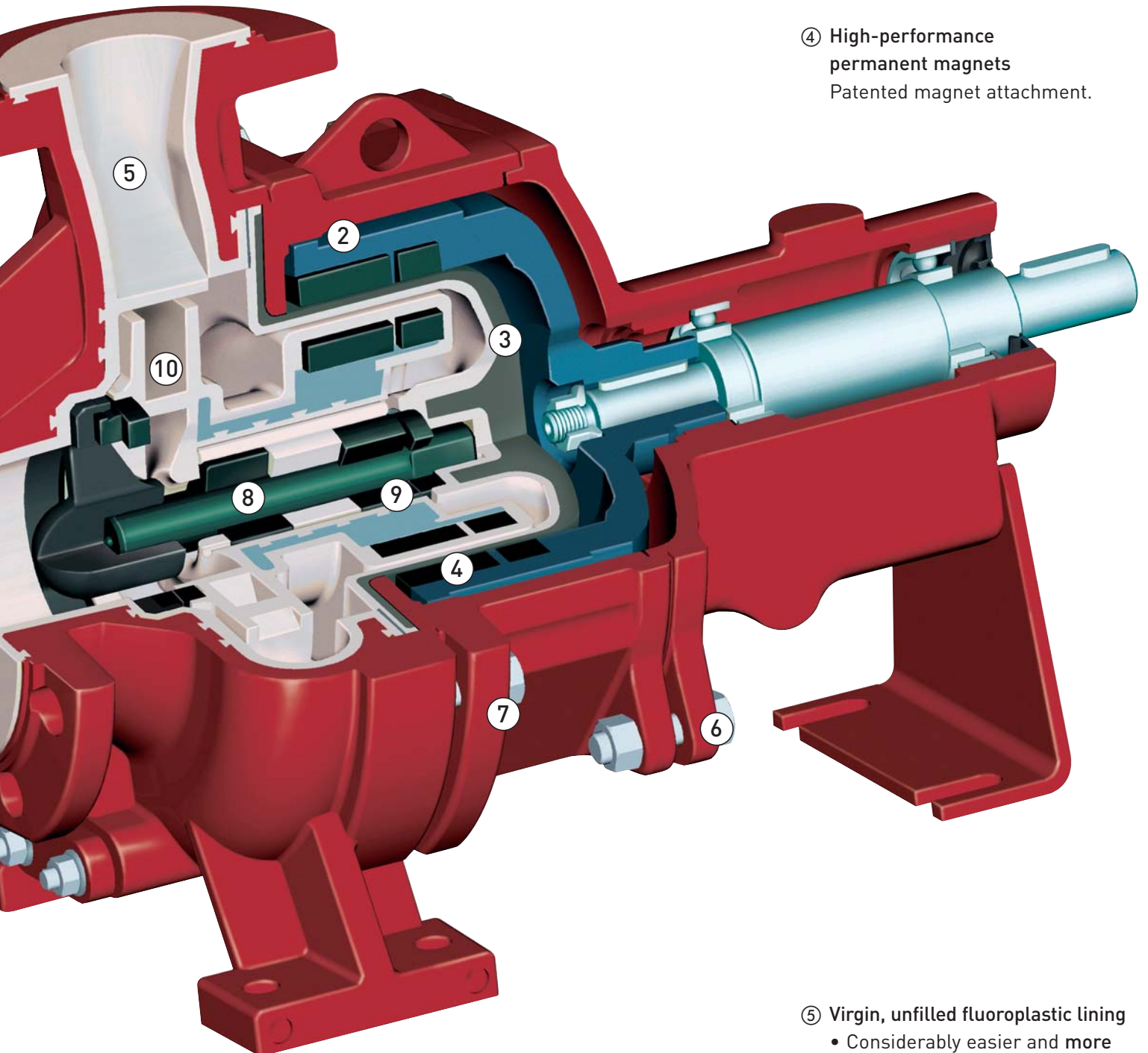
③ Non-metallic double can system

- wetted: thick-walled PTFE
- pressure-bearing: glass-fibre-reinforced plastic (GFRP); breakproof; high safety reserves.

Free of eddy currents

- No heating of the medium and so conveyance of media near the boiling point also possible
- No waste of energy.

④ High-performance permanent magnets  
Patented magnet attachment.

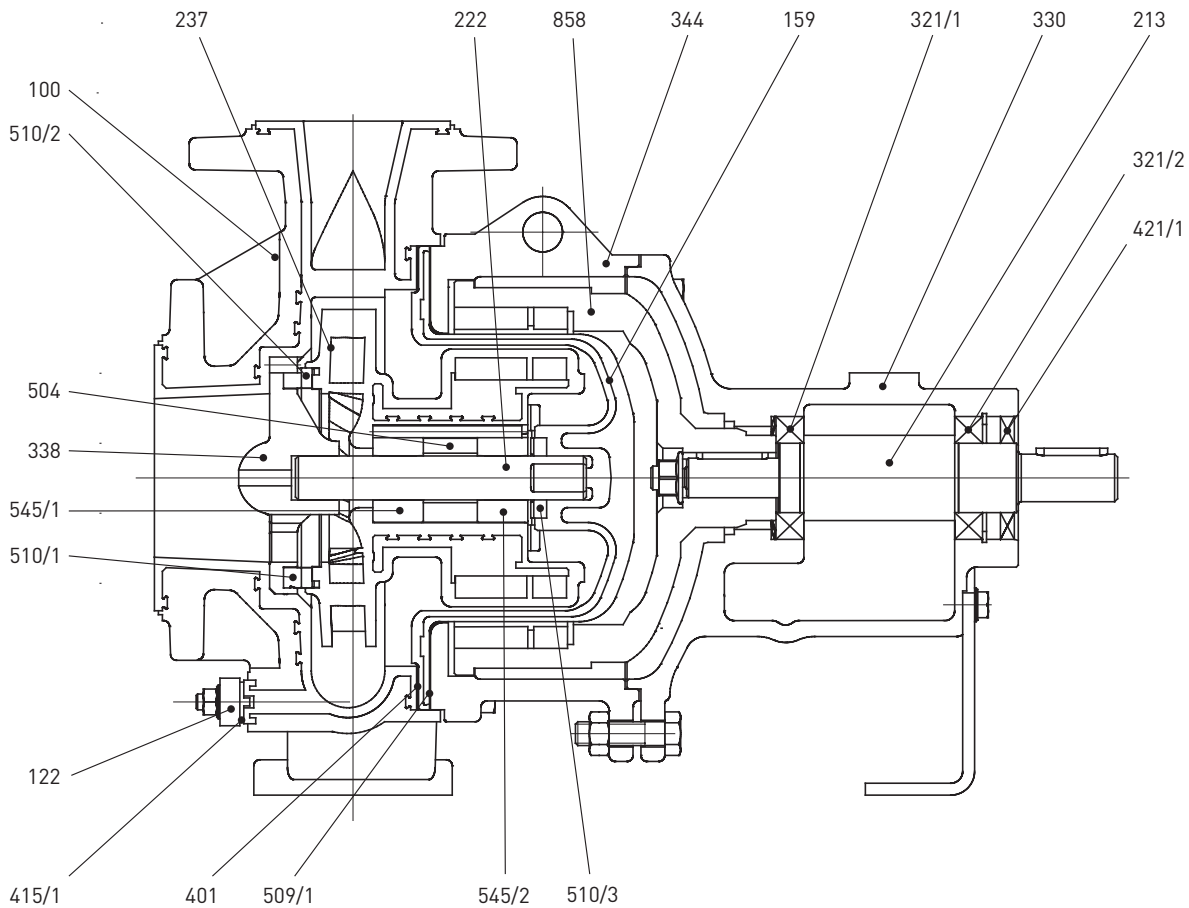


⑦ High-quality external corrosion protection  
Epoxy coating of the pump; stainless steel screws.

⑥ Double back pull-out design  
Rapid and easy pump maintenance due to few components.

⑤ Virgin, unfilled fluoroplastic lining

- Considerably easier and more reliable quality control of the lining
- Full permeation resistance
- Neutral to pure media in the pharmaceutical and fine chemical sectors.



## Components and materials

Item	Designation	Material
100	Housing	Ductile cast iron EN-JS 1049 (0.7043)/PFA
122	Blind cover	Steel
159	Can	wetted: PTFE, pressure-bearing: GFRP glass-fibre composite material
213	Drive shaft	Steel
222	Shaft	SSiC, optionally with SAFEGLIDE® PLUS dry-run optimisation
237	Impeller assembly	Steel, PFA-lined
321/x	Radial ball bearing	Long-life grease lubrication, optionally: oil-lubrication
330	Bearing pedestal	Grey cast iron EN-JL 1040 (GG 25)
338	Shaft spider	PTFE-carbon, optionally: modified PTFE. Thrust ring 510/1 PTFE-carbon (integrated) or SSiC (inserted)
344	Lantern	Ductile cast iron EN-JS 1049 (0.7043)
401	Housing gasket	PTFE
415/1	Centering gasket	PTFE
421/1	Rotary shaft seal	Nitrile butadiene rubber (NBR)
504	Distance ring	PTFE
509/1	Intermediate ring	PTFE
510/1	Thrust ring	PTFE-carbon (integrated in shaft spider), optionally SSiC or SSiC with SAFEGLIDE® PLUS dry-run optimisation
510/2	Thrust ring	SSiC, optionally with SAFEGLIDE® PLUS dry-run optimisation
510/3	Thrust ring	PTFE-carbon
545/x	Bearing bush	Hard carbon, optionally SSiC or SSiC with SAFEGLIDE® PLUS dry-run optimisation
858	Drive magnet assembly	Grey cast iron EN-JL 1040 (GG 25)

## Pump housing and bearing spider

The ductile cast iron armoured absorbs all the hydraulic and pipe-work forces to ISO/DIN 5199/Euro-pump 1979.

In contrast to partially or non-armoured plastic pumps, no expansion joints are required.

The carbon-reinforced PTFE bearing spider (pure PTFE optional) is mounted positively locked in the suction area of the housing and can be replaced. The sliding surface of the spider is optionally available in SSiC – instead of PTFE/carbon.

Available on request:

Housing drain, also serves as a flushing and monitoring connection.



Pump housing

## Impeller/magnet assembly

Closed, hydraulically optimised impellers make an important contribution to low NPSHR values and good pump performance.

The large metal core of the assembly ensures dimensional stability and reliable torque transmission even at elevated temperatures.

The high-performance permanent magnets are securely fixed (patented) under the PFA lining.



Impeller/  
magnet assembly

Operational reliability, operating range and efficiency benefit from this: Even low flow rates or media with temperatures near the boiling point are therefore better controlled.



Double  
can system

## Robust radial and axial plain bearings

The radial plain bearings are mounted positively locked in the impeller magnet assembly and rotate on the SSiC shaft. Thrust rings in the impeller and the bearing spider absorb the hydraulic axial thrust. The rear thrust ring acts as wear protection in the can.

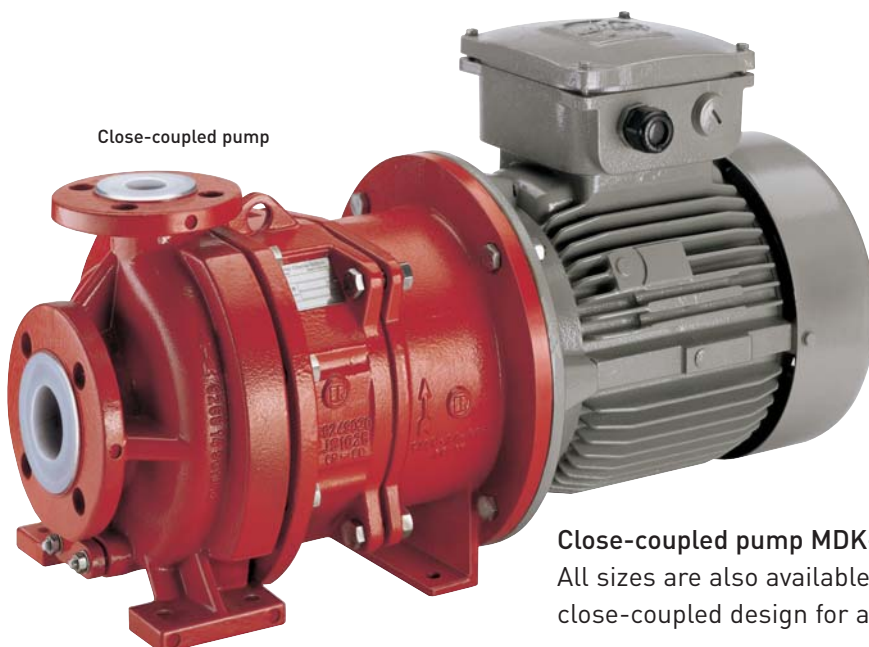


Plain bearing system

## Eddy-current-free double can system

The can system made of GFRP with thick-walled PTFE lining reliably isolates the pumped medium from the atmosphere. As the can system is non-metallic, eddy currents and therefore unnecessary heat generation and energy losses are avoided.

Close-coupled pump



## Close-coupled pump MDK-B

All sizes are also available in a particularly compact close-coupled design for a flange motor – series MDK-B.

## Performance curves

Richter magnetic drive pumps MDK and MDK-B are available for a performance range of up to

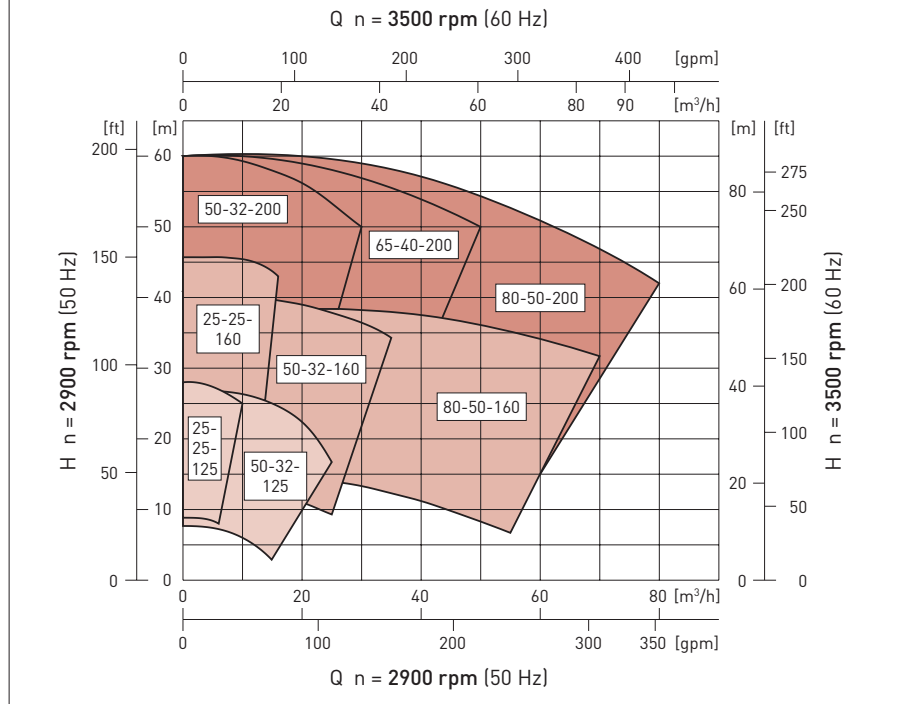
- 80 m<sup>3</sup>/h (350 US gpm) and up to 60 m (200 ft) LC at 2900 rpm
- 95 m<sup>3</sup>/h (420 US gpm) to 85 m (280 ft) LC at 3500 rpm.

Flow rates and delivery heads outside the MDK's performance range can be covered by the Richter magnetic drive pump series MNK/MNKA and MPB up to 550 m<sup>3</sup>/h (2400 US gpm) and up to 140 m (460 ft) LC.

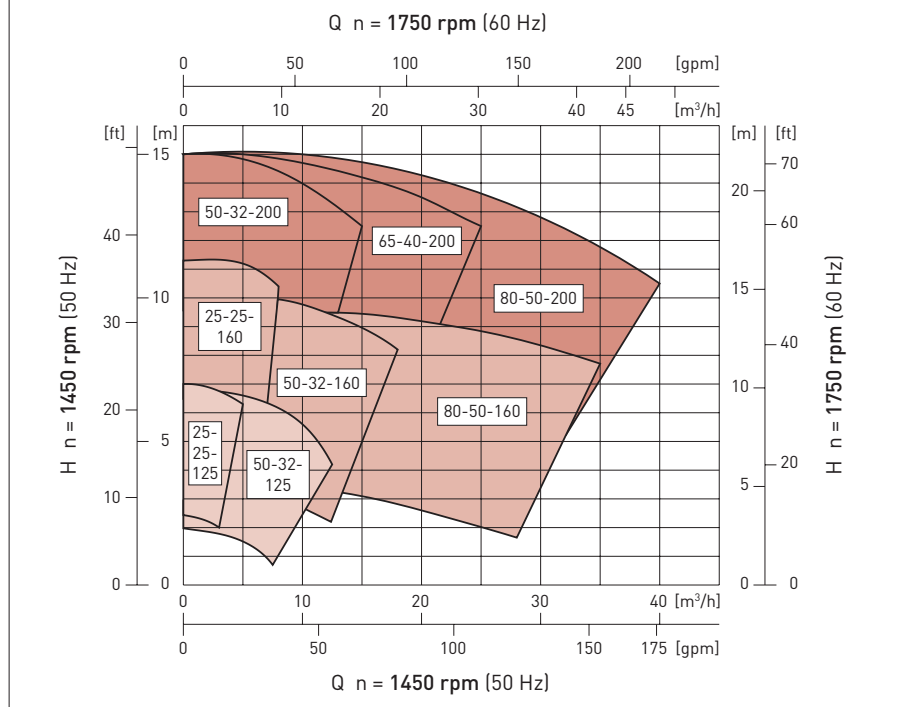
In view of its design, the good hydraulics, the can system free of eddy currents and the overall good value for money, the MDK/MDK-B series is one of the most economic pumps of its kind.

8 well graduated pump sizes from 25-25-125 up to 80-50-200 allow for a tailor-made pump selection. The pump curves relate to a viscosity of 1 mm<sup>2</sup>/s.

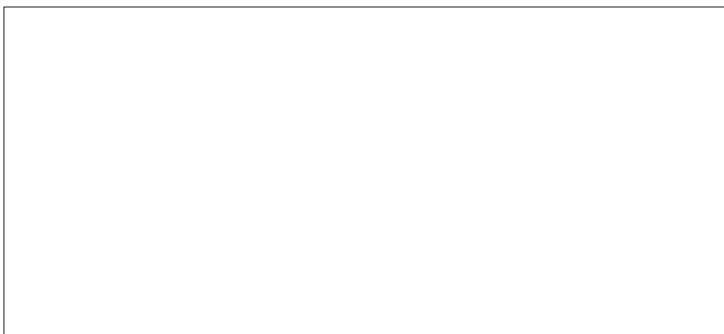
Performance curves 2900/3500 rpm



Performance curves 1450/1750 rpm



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