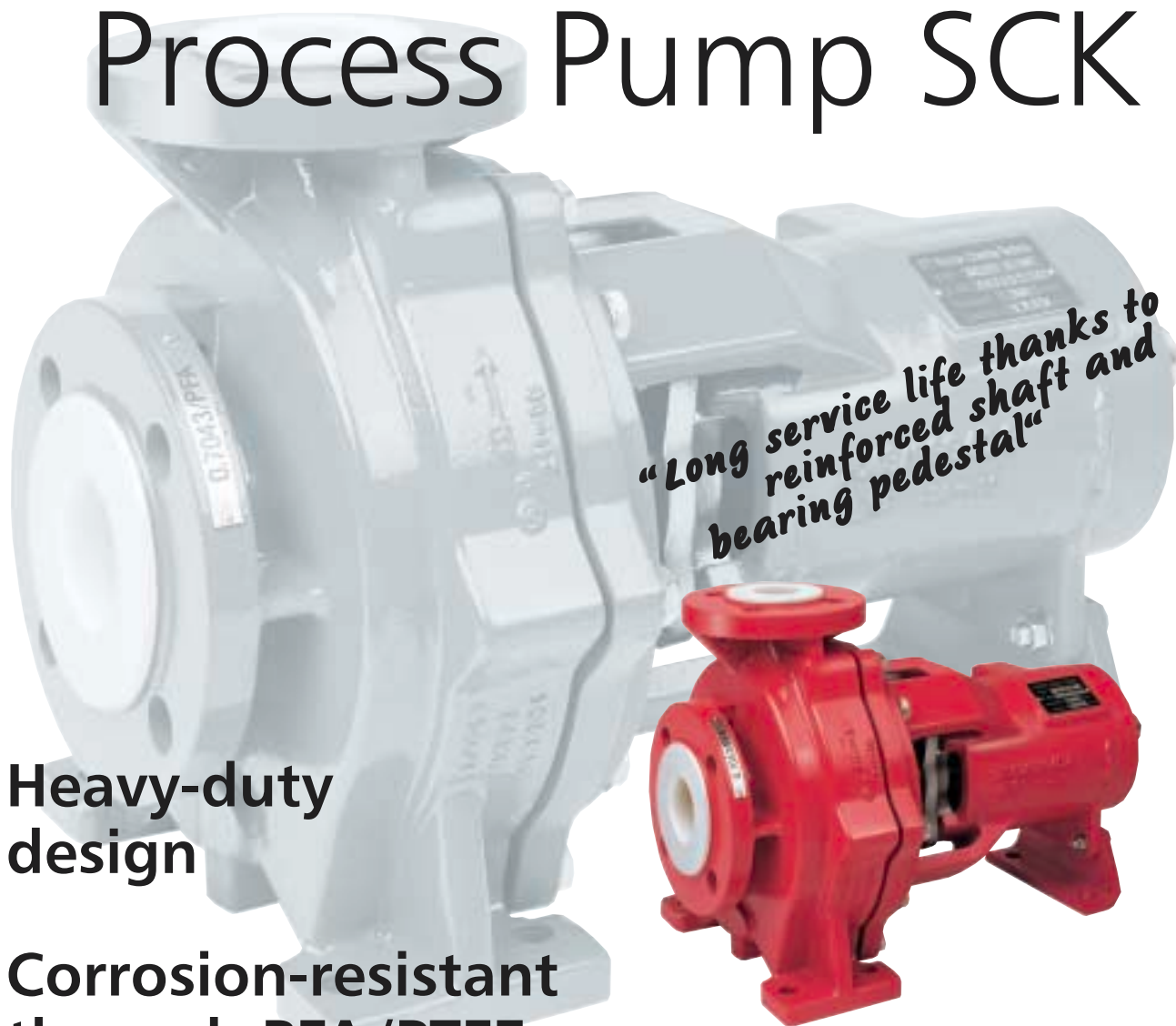


SCK

Richter Chemical Process Pump SCK



**Heavy-duty
design**

**Corrosion-resistant
through PFA/PTFE,
PE-UHMW, PP**

(e.g. Teflon[®], Dyneon[®])

Richter



ITT Industries

Engineered for life

Richter SCK chemical process pump

Fields of application

Corrosive, pure and contaminated media in the chemical and petrochemical industries, pulp and metal processing, waste disposal, recycling etc.

- when stainless steel is not sufficiently resistant
- as an alternative to expensive Hastelloy, Monel and tantalum pumps
- when anti-adhesive surfaces are important.

The SCK is particularly economical and reliable with

- **less environmentally critical or hazardous media,** as pumps with single-acting mechanical seals are lower priced than sealless pumps
- **heavily solids-laden, gas-containing or other problematic media** especially when sealless pumps are unsuitable
- **badly lubricating media:** gas-lubricated seals

Wetted materials:

Lining: PFA, PTFE, PE-UHMW, PP, antistatic lining (PFA, conductive).

Mechanical seal: SSiC/SSiC, Al₂O₃/PTFE glass etc.

Pressure-bearing parts:

Ductile cast iron EN-JS 1049 (formerly 0.7043)/ASTM A 395.

Mechanical seal housing made of stainless steel.

The special benefits:

- The SCK satisfies the requirements of DIN 5199: The **shaft deflection** is reduced to a very low level owing to the reinforced pump shaft and the sturdy bearing pedestal.

Advantages:

- The mechanical seal and the rolling bearings last much longer than in a standard pump.
- Also suitable for critical conditions such as cavitation, low flow rate, large head, high density.
- The SCK can also be modified at a later date for highly solids and gas-laden media as well as for self-priming operation.

Design

Single-stage, plastic-lined, frame-mounted chemical pump of heavy-duty design. Dimensions to EN 22 858/ISO 2858.

Size 25-25-100: Also in close-coupled design for flange motor.

Flanges with through holes drilled to ISO 7005-2/PN 16. On request drilled to ANSI B16.5 Cl. 150, JIS or BS.

Type codes, materials

Frame-mounted design	SCK/...
Close-coupled design (only 25-25-100)	SCK-B/...
Perfluoroalkoxy (PFA), polytetrafluoroethylene (PTFE) e.g. Teflon®, Dyneon®	.../F
Polyethylene, ultra-high molecular (PE-UHMW)	.../E
Polypropylene (PP)	.../P
Antistatic linings	.../...-L

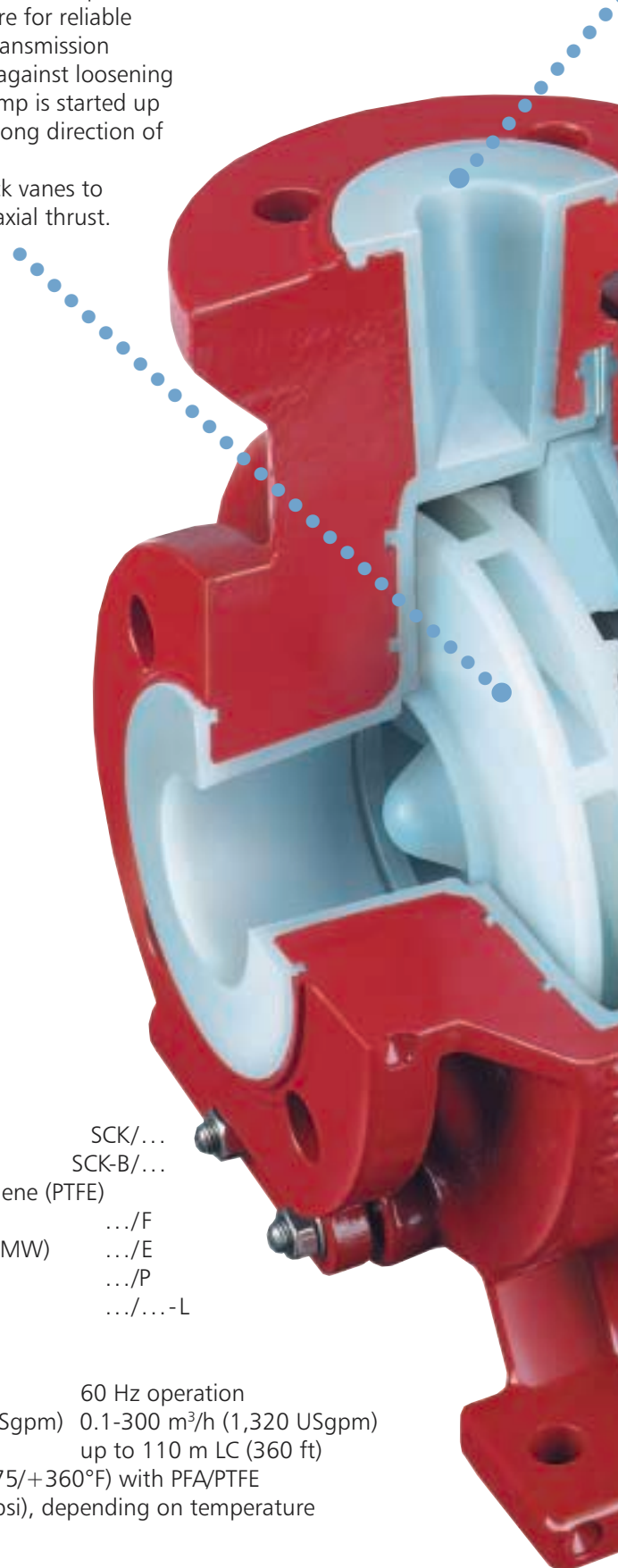
Operating range

	50 Hz operation	60 Hz operation
Flow rates	0.1-300 m ³ /h (1,320 USgpm)	0.1-300 m ³ /h (1,320 USgpm)
Delivery heads	up to 90 m LC (300 ft)	up to 110 m LC (360 ft)

- Operating temperature: -60/+180°C (-75/+360°F) with PFA/PTFE
- Operating pressure: up to 16 bar (235 psi), depending on temperature
- Solids: depending on pump design. Vortex version SCK-X up to 50%

Semi-open or closed impeller

- Semi-open with curved vanes as standard feature
- Closed impeller with optimised hydraulics when a particularly low pump NPSH is required
- Metal core for reliable torque transmission
- Secured against loosening if the pump is started up in the wrong direction of rotation
- With back vanes to balance axial thrust.



Thick-walled PFA/PTFE, PE-UHMW and PP linings

of the ductile cast iron housing

- Armouring bears system pressure and pipe forces. No need for expansion joints
- Virgin lining, full chemical suitability and optimum quality assurance. Resists even high standstill vacuum, depending on temperature. See also page 5.

Very sturdy one-piece ductile cast iron bearing pedestal

Standard feature: rolling bearings type 2RS with high load rating:

- Permanent grease lubrication, grease chambers outside on both sides to protect against corrosion
- Optional oil-bath lubrication
- Stainless steel labyrinth disc protects rolling bearings if the mechanical seal leaks.

Shaft sleeve

made of Al_2O_3 , optionally e.g. SiC, Hastelloy, tantalum etc. The stainless steel cup spring assembly ensures a leak-tight sealing between impeller and shaft sleeve.

Deflection-resistant pump shaft

Enlarged shaft diameter, also in the area of the mechanical seal, ensures very smooth running and low shaft deflection – even in Q/H boundary areas – with a considerably longer pump life compared to pumps with standard shaft diameter.

Internal and external mechanical seals

(illustrated: Richter RG-4 stationary double seal, internal, specially for solids-laden and crystallising media).

The Richter chemical mechanical seals RG-1, RG-2 and RG-4 have been tried and tested in practice for many years.

Alternatively, all standard-complaint makes (DIN 24 960), e.g. Crane, Burgmann, Chesterton etc., and arrangements:

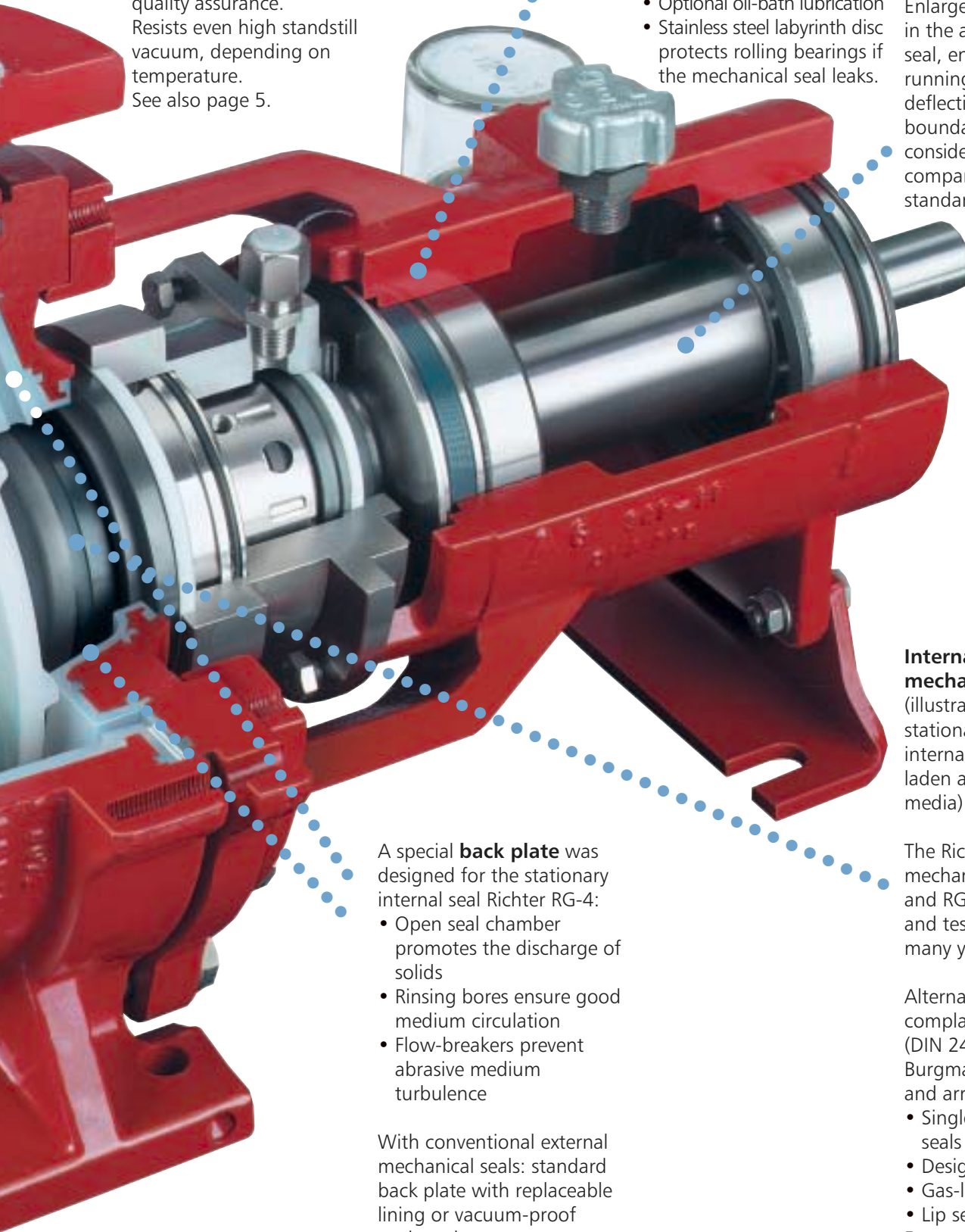
- Single/double mechanical seals
- Designs for solids
- Gas-lubricated seals
- Lip seals

For examples, see page 6.

A special **back plate** was designed for the stationary internal seal Richter RG-4:

- Open seal chamber promotes the discharge of solids
- Rinsing bores ensure good medium circulation
- Flow-breakers prevent abrasive medium turbulence

With conventional external mechanical seals: standard back plate with replaceable lining or vacuum-proof anchored.



Performance curves

Richter chemical process pumps SCK are available for the performance range up to 300 m³/h (1,320 USgpm) and up to 90 m (300 ft) LC at 2,900 rpm.

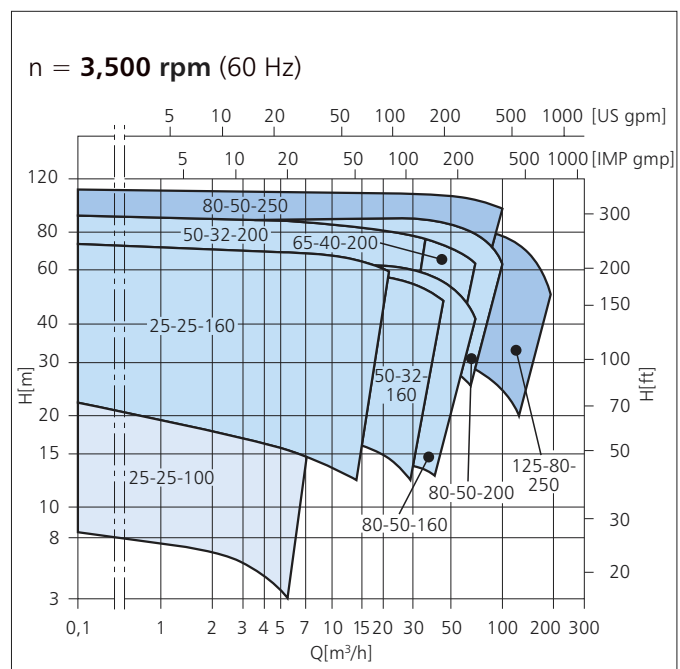
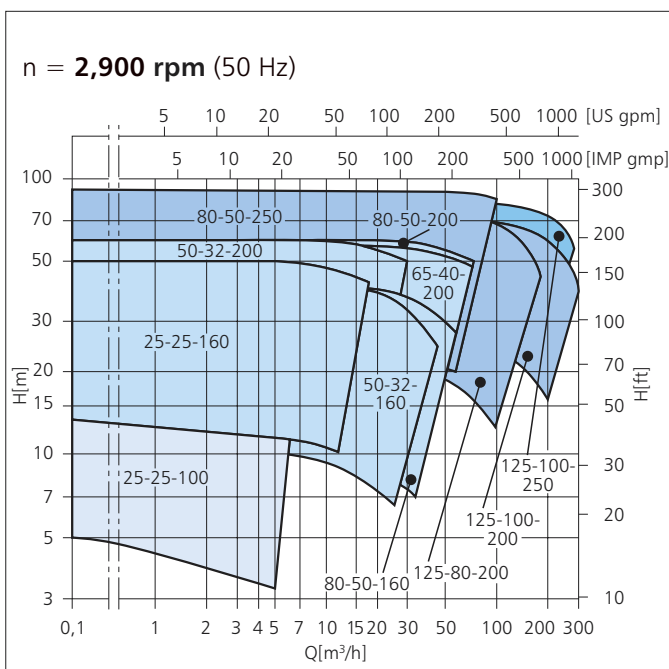
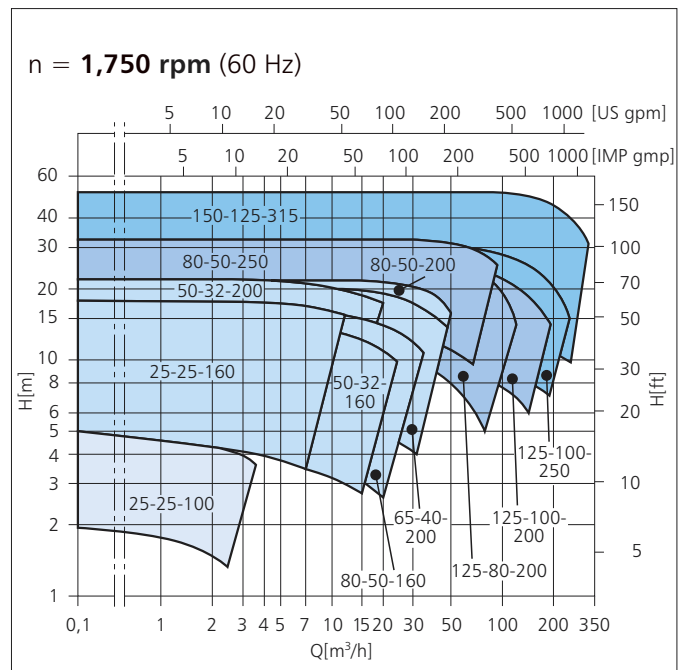
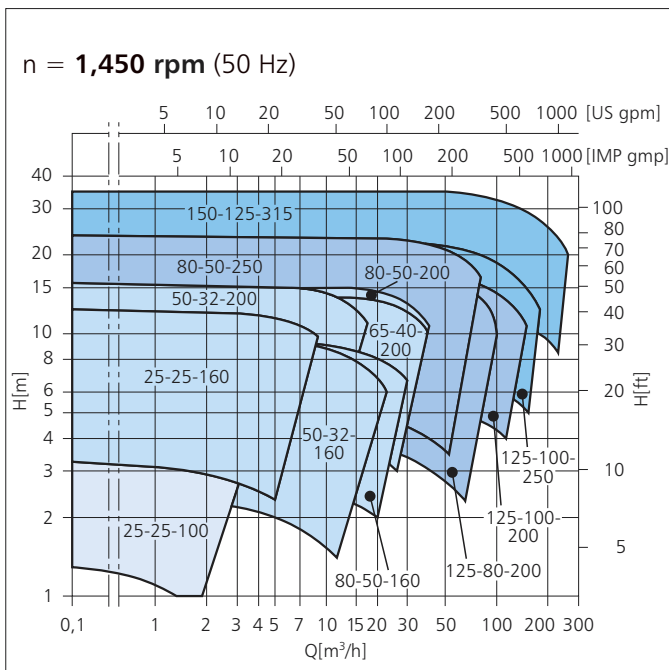
The SCK attains heads of up to 110 m (360 ft) LC at 3,500 rpm.

12 sizes from 25-25-100 to 150-125-315 are available for a pump selection to suit your application.

This range offers suitable pump sizes both for applications in small production and test plants as well as for conveying large volume flows.

Delivery heads which exceed the SCK performance range can be covered by the Richter series MPB and MNKA, depending on the flow rate.

The curves relate to a viscosity of 1 mm²/s.





The pump housing

with ductile cast iron armouring absorbs all hydraulic forces and pipe forces to DIN / ISO 5199 / Europump 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 etc.

Available on request:

- Housing drain, can also be used as a cleaning and monitoring connection.
- Heating jacket, e.g. for crystallising or polymerising media. Can also be retrofitted.

Impeller with curved vanes

The large metal core ensures the dimensional stability of the impeller, even at elevated temperatures and high flow rates.

Optionally closed impellers, e.g. in the event of NPSH problems.

Axial forces reduced by back vanes, increasing the service life of the rotating components.

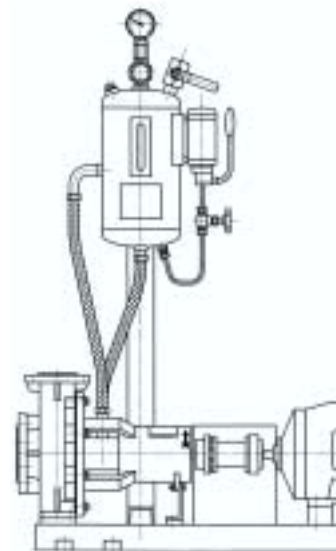
The lining is seamless; the metal core is protected by thick-walled plastic.

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.

Important options

With the options package of the SCK the standard versions can also be tailored to specific and particularly difficult operating conditions.

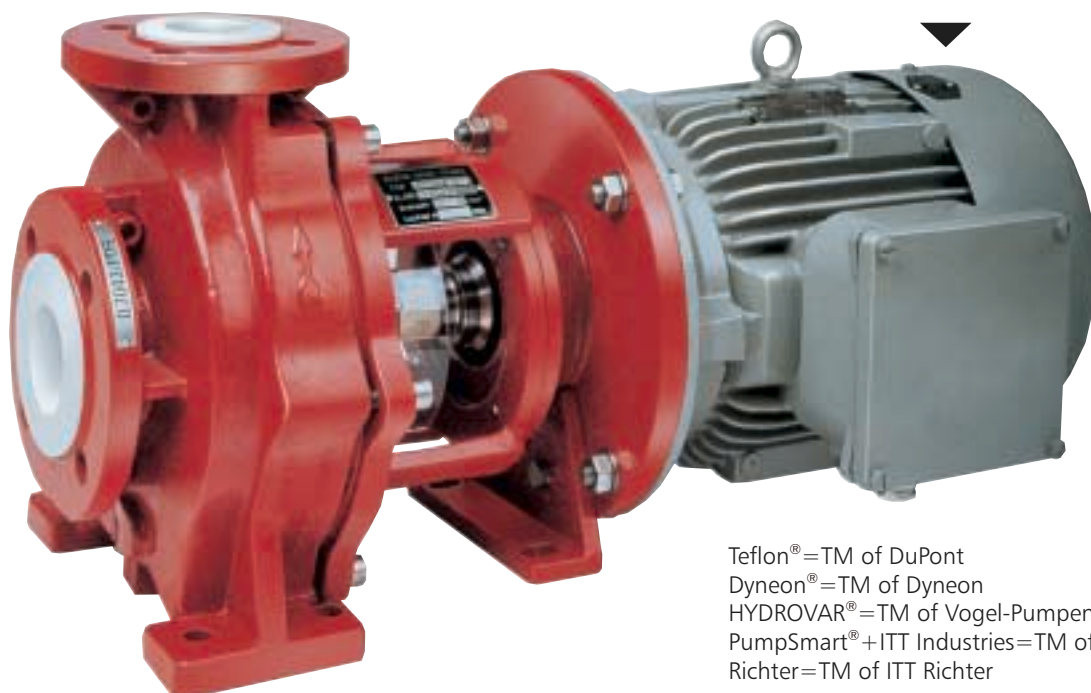
- Heating jacket for mechanical seal and pump housing
- Thermosiphon and liquid sealing systems
- Temperature, rolling bearing and motor load monitors
- HYDROVAR® and PumpSmart® pump control systems
- Self-priming (SCK-S) and vortex versions (SCK-X)
- Metallic mechanical seal pump IC



Thermosiphon and liquid sealing systems

Close-coupled pump SCK-B

The size 25-25-100 is also available as a close-coupled version with flange motor. For space reasons this close-coupled pump can only be provided with an external single mechanical seal but the frame-mounted design 25-25-100 can be fitted both with external single and double mechanical seals.



Teflon®=TM of DuPont
 Dyneon®=TM of Dyneon
 HYDROVAR®=TM of Vogel-Pumpen
 PumpSmart®+ITT Industries=TM of ITT Industries
 Richter=TM of ITT Richter

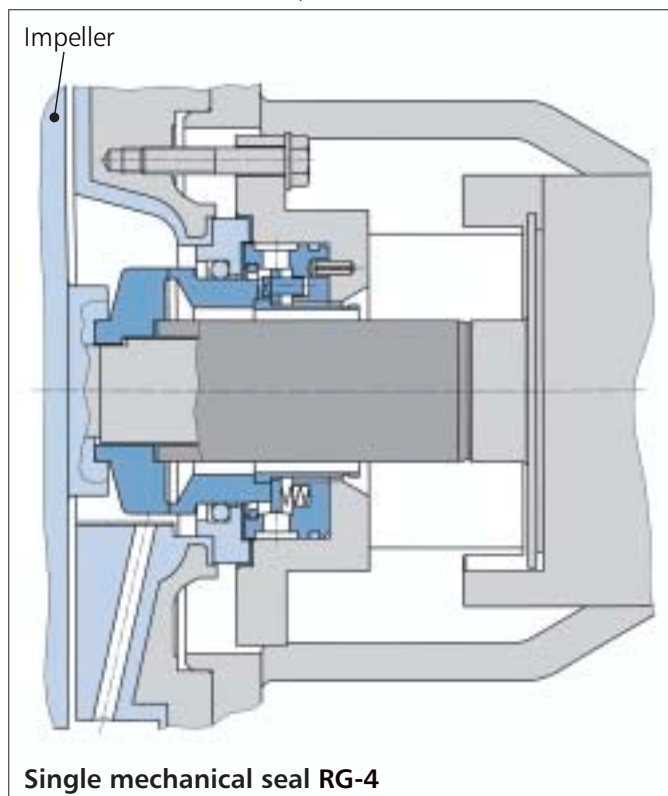
Frequently used mechanical seal versions

The mechanical seal technology suitable for the SCK covers the entire range of reasonably priced, single-acting seals down to complex self-lubricated or externally lubricated and remotely monitored double-acting sealing systems.

As a result, a mechanical seal pump can also be used in difficult operating conditions and for hazardous media. The most common versions are illustrated on this and the next page. Other versions and makes, thermosiphon and liquid sealing systems etc. on request.

Single mechanical seal RG-4

For media which do not crystallise and are not environmentally hazardous. Low to medium solids contents.



Mechanical seals Richter RG-4

The stationary internal RG-4 is metal-free on the wetted side and available as

- single mechanical seal
- double mechanical seal with quench
- double mechanical seal with liquid seal

The RG-4 was developed together with the special back plate for the Richter pump series SCK.

Main field of application: Solids-laden and crystallising media.

Major features:

- Flow-optimised sealing chamber and circulation bores in the back plate prevent clogging by solids
- The centrifugal force keeps particles away from the seal surface
- Flow-breakers moulded into the back plate prevent abrasive turbulence
- Back plate PFA/PTFE-lined (optionally PE-UHMW), rotary, stationary and centering rings SSiC, O-rings FFKM (optionally FKM).

Detailed information: See special publication "Mechanical seals for solids-containing and crystallising media".

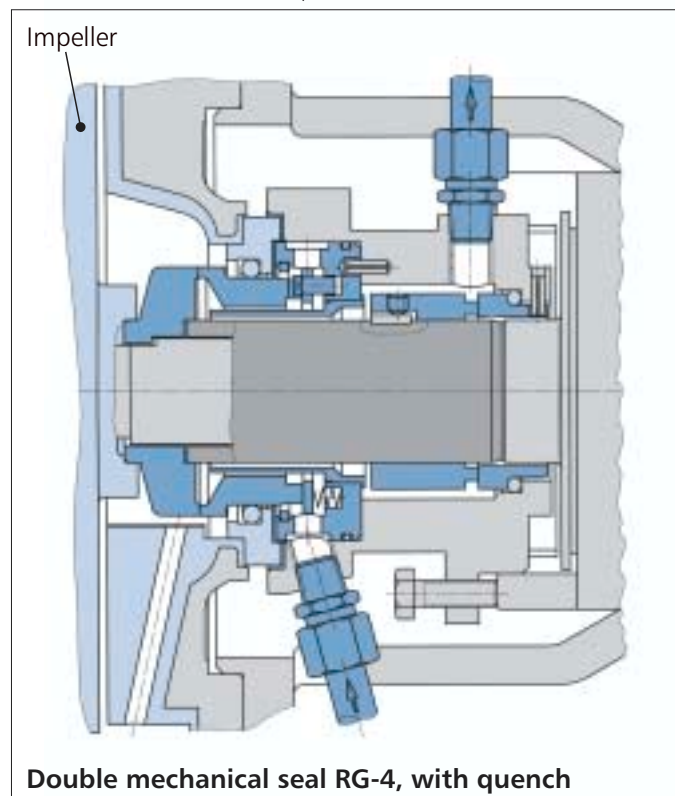
Double mechanical seal RG-4, with quench/liquid seal

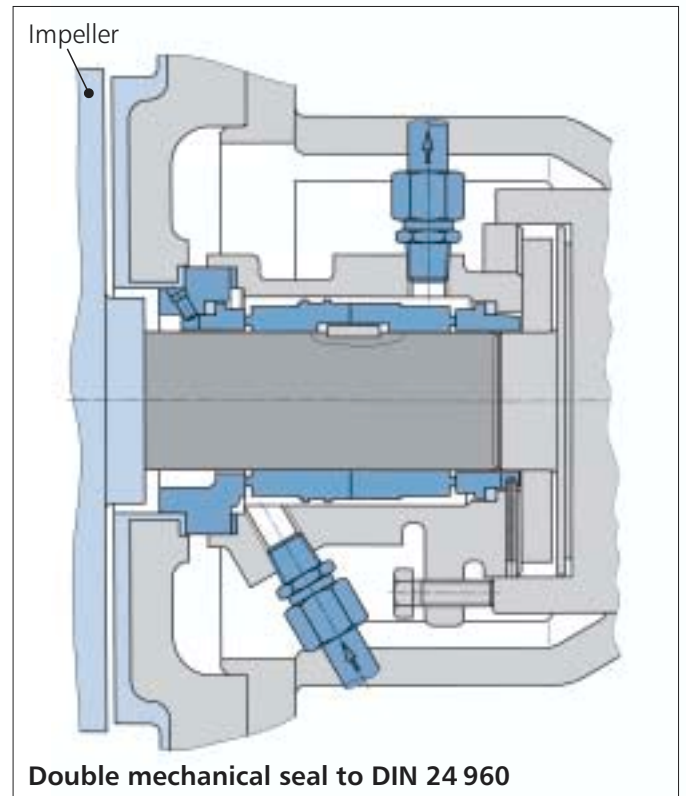
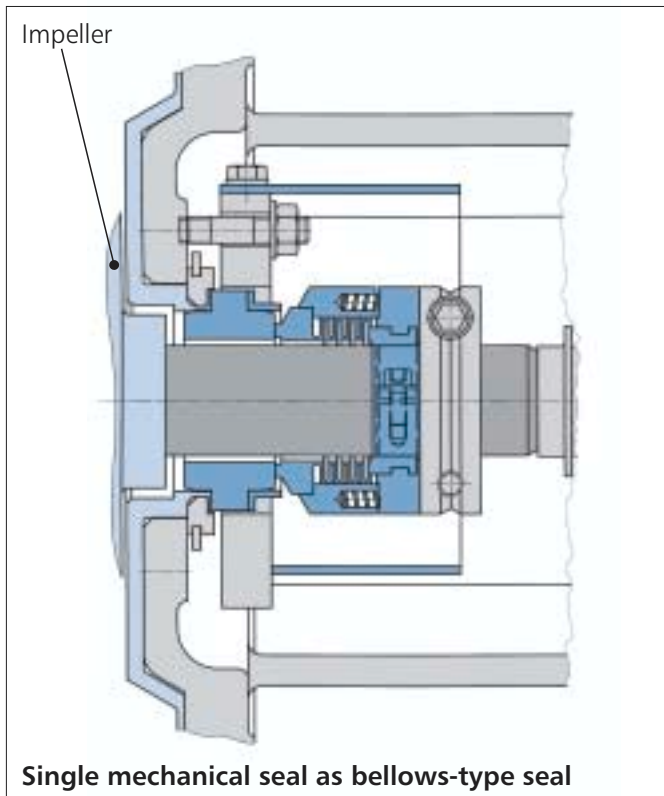
With quench:

For media which tend to crystallise on contact with the air or cause sedimentation and are not environmentally hazardous. Also if there is a risk of freezing, dry running and with highly odorous media.

Liquid-sealed:

In addition, also for media with higher solids contents, crystallising or environmentally hazardous media. On request with thermosiphon system.



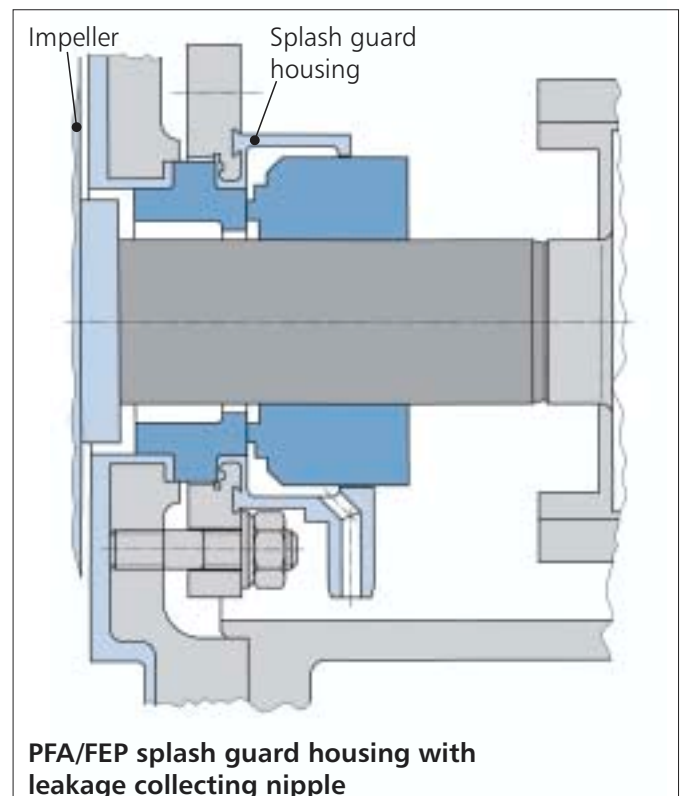
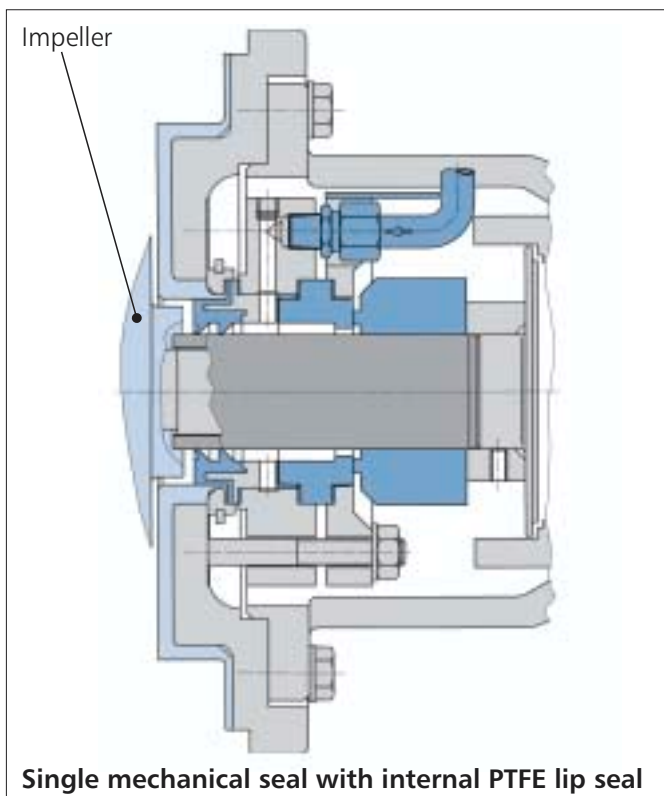


Single mechanical seal as bellows-type seal
 e.g. Richter RG-1, Crane 10 T etc. in various material combinations. With acrylic glass splash guard. Optionally with PFA/FEP splash guard housing and integrated leakage collecting connection.

Single mechanical seal, liquid-sealed, with internal PTFE lip seal
 Specially intended for solids-laden and crystallising media. Lips and sealing pressure prevent the ingress of solids and sedimentation.

Double mechanical seal to DIN 24 960
 e.g. Crane 59U/59U, Burgmann M7FS2/M7S2 etc. in various material combinations. Optionally with pumping screw. Mechanical seal housing made of stainless steel.

PFA/FEP splash guard housing for internal and external single mechanical seals
 Reliable collection of a mechanical seal leak which can be specifically drained from the integrated nipple. For mechanical seals with an outside Ø of up to 95 mm.



Conveyance of solids and gas-laden media

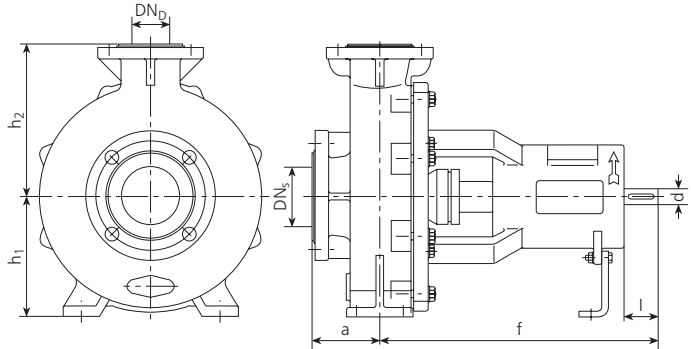
With low solids contents it is frequently sufficient to merely install an internal or external liquid-sealed double mechanical seal with SSiC sliding surfaces.

The vortex version SCK-X with an internal double mechanical seal RG-4

permits solids contents of up to 30% by vol., in specific cases even up to 50%. Grain sizes of up to 10-20 mm, depending on the pump size.

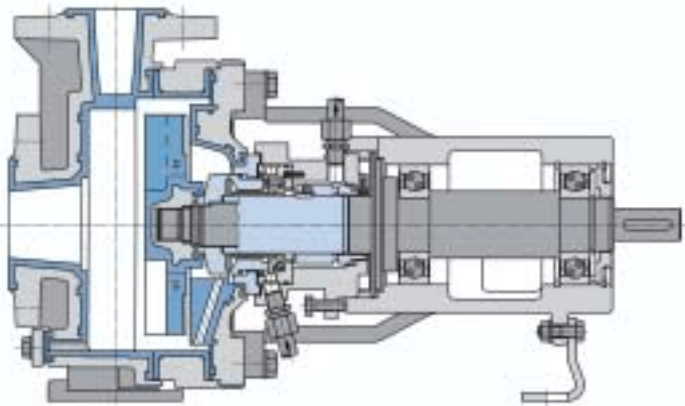
The SCK-X is also ideally suited for media with long-fibre constituents and for gas contents of up to 5%.

Pump dimensions for frame-mounted and close-coupled designs



Frame-mounted design

Pump size	Flanges		Pump				Shaft end		Weight approx. kg (without drive)
	DN _S mm	DN _D mm	a	f	h ₁	h ₂	d	l	
25-25-100	25	25	80	385	132	160	24	50	16
25-25-160	25	25	80	385	132	160	24	50	46
50-32-160	50	32	80	385	132	160	24	50	46
50-32-200	50	32	80	385	160	180	24	50	52
65-40-200	65	40	100	385	160	180	24	50	54
80-50-160	80	50	100	385	160	180	24	50	49
80-50-200	80	50	100	385	160	200	24	50	57
80-50-250	80	50	125	500	180	225	32	80	94
125-80-200	125	80	125	500	180	250	32	80	106
125-100-200	125	100	125	500	200	280	32	80	110
125-100-250	125	100	140	530	225	280	42	110	120
150-125-315	150	125	140	530	280	355	42	110	160



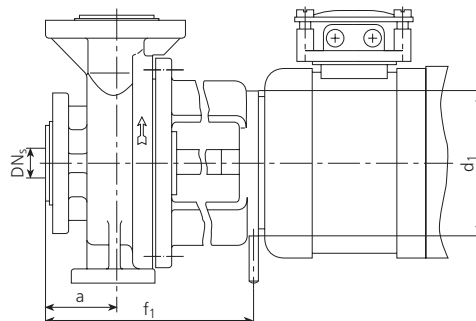
Vortex pump SCK-X

The semi-open special vortex impeller is located outside the main flow:

- More space in the pump housing for larger particles
- Milder conveyance of the medium
- Longer impeller service life thanks to minimised abrasion.

More detailed information:

- Publication "Vortex Pump"
- Publication "Mechanical seals for solids-containing and crystallising media".



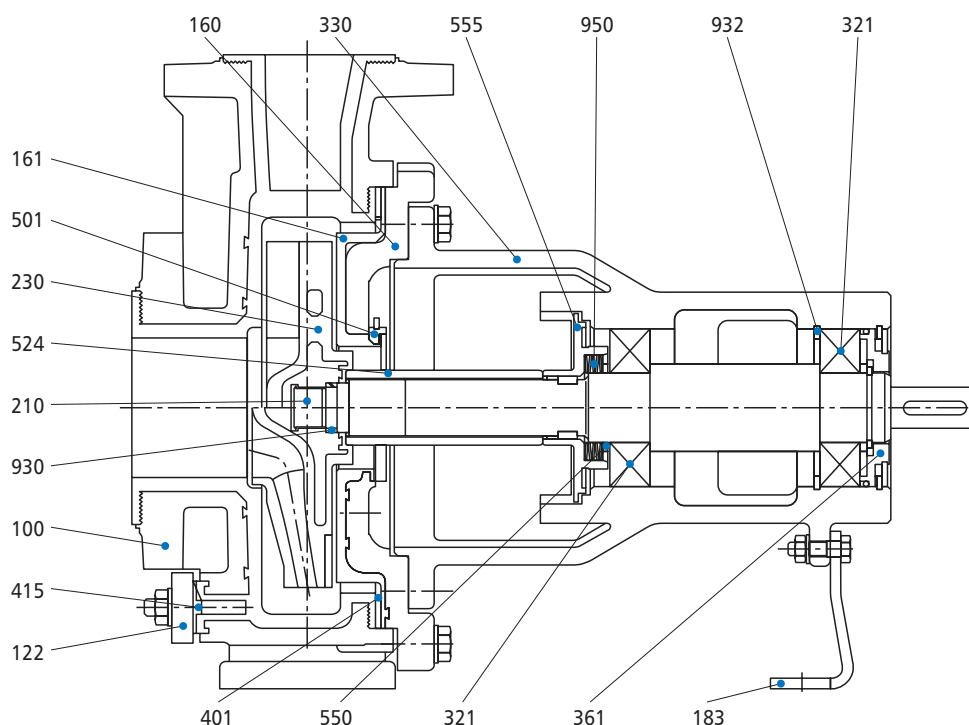
Close-coupled design

Close-coupled pump dimensions depending on motor									
Pump size	Flanges		Pump				Motor size	d ₁	Weight approx. kg (without drive)
	DN _S mm	DN _D mm	a	f ₁	h ₁	h ₂			
25-25-100	25	25	80	275,5	132	160	80	200	15

All dimensions in mm

Parts and material list

- 100 Housing
- 122 Blind cover
- 160 Cover
- 161 Back plate
- 183 Support bracket
- 210 Shaft
- 230 Impeller
- 321 Radial ball bearing
- 330 Bearing pedestal
- 361 Rear bearing cover
- 401 Housing gasket
- 415 Centering gasket
- 501 Ring, 2-piece
- 524 Shaft sleeve
- 550 Washer
- 555 Labyrinth disc
- 930 Locking unit
- 932 Circlip
- 950 Cup spring



Not illustrated:
 mechanical seal
 mechanical seal housing + accessories

Series SCK

Here: for external mechanical seal; semi-open and closed impeller.

The bearing pedestal of the size 25-25-100 in the frame-mounted and close-coupled designs differs from the above illustration.

Part No.	Designation	Material
100	Housing armouring	Ductile cast iron EN-JS 1049 (0.7043)/ASTM A395
	Housing lining	PFA/PTFE, PP, PE-UHMW, antistatic lining
122	Blind cover	Ductile cast iron EN-JS 1049 (0.7043)/ASTM A395
160	Cover	Ductile cast iron EN-JS 1049 (0.7043)/ASTM A395
161	Back plate	Ductile cast iron EN-JS 1049 (0.7043)/ASTM A395
	Back plate lining	PFA/PTFE, PP, PE-UHMW, antistatic lining
183	Support bracket	Steel 1.0037
210	Shaft	Stainless steel 1.4057
230	Impeller	PFA/PTFE, PE-UHMW, PP, antistatic lining, impeller core ductile cast iron
321	Radial ball bearing	
330	Bearing pedestal	Ductile cast iron EN-JS 1049 (0.7043)/ASTM A395
361	Rear bearing cover	Steel 1.0601
401	Housing gasket	PTFE
415	Centering gasket	PTFE
501	Ring, 2-piece	Stainless steel 1.4571
524	Shaft sleeve	Al ₂ O ₃ , SSiC, Hastelloy etc.
550	Washer	Stainless steel
555	Labyrinth disc	Stainless steel
930	Locking unit	Spring steel
950	Cup spring	Stainless steel
W/o no.	Bolts, nuts	Stainless steel

Other Richter pumps

Richter magnetic drive and mechanical seal pumps are – just like Richter chemical shut-off and control valves – at home in a host of different chemical and related processes.

This pump range also includes more specialised designs. The plant operator can thus choose from Richter pumps even for difficult applications.

New: Magnetic drive pump ICM made of stainless steel, Hastelloy, titanium, ductile cast iron.

The unique cartridge plain bearing element and an innovative overall concept ensure high operational reliability, low life-cycle costs and extremely easy and fast maintenance. Frame-mounted and close-coupled designs.

Further information: ICM publication.

Plastic-lined pumps

Mechanical seal pumps
up to 300 m³/h (1,320 USgpm) and 90 m (300 ft) LC at 2,900 rpm. Also for solids-laden media.

Close-coupled pumps
as a space-saving alternative to frame-mounted designs. 0.1 to 80 m³/h (0.4-350 gpm) and up to 115 m (380 ft) LC at 2,900 rpm.

Self-priming pumps
for emptying containers and basins from the top. Suction height up to 6 m WC, suction back pressure up to 18 m WC. Up to 33 m³/h (145 gpm) and 40 m (130 ft) LC at 2,900 rpm.

Magnetic drive pumps

- to EN 22 858/ISO 2858 up to 300 m³/h (1,320 USgpm) and 90 m (300 ft) LC at 2,900 rpm and up to 375 m³/h (1,650 USgpm) at 3,500 rpm
- to ASME B73.1 for ANSI plants, up to 90 m³/h (395 USgpm) and 140 m (460 ft) LC at 3,500 rpm.

Vortex pumps

time-tested with, e.g. high solids contents, lumpy particles and with gas contents of up to 5%. Up to 200 m³/h (880 USgpm) and 85 m (280 ft) LC at 2,900 rpm.

Peripheral pumps

for lower flow rates at high delivery heads. 0.05 - 4 m³/h (0.2-17 USgpm) and up to 115 m (380 ft) LC at 2,900 rpm.

Metallic pumps

Magnetic drive pumps

made of stainless steel, Hastelloy, ductile cast iron etc. up to 300 m³/h (1,320 USgpm) and 150 m (490 ft) LC at 2,900 rpm.

Mechanical seal pumps

made of stainless steel, ductile cast iron, Hastelloy etc. up to 600 m³/h (2,650 USgpm) and 150 m (490 ft) LC at 1,450/2,900 rpm.



From the same family: The **mechanical seal pump IC**, with patented cyclone back plate as a standard feature.

This back plate promotes in particular the dissipation of heat and the removal of solid particles out of the mechanical seal area.

Further information: IC publication.

Subject to change without notice.

Printed in Germany.

©ITT Richter Chemie-Technik GmbH.



Presented by:

Richter



ITT Industries
Engineered for life

ITT Richter Chemie-Technik GmbH
Otto-Schott-Straße 2
D-47906 Kempen
Tel. +49 (0) 21 52 / 146 - 0
Fax +49 (0) 21 52 / 146 - 190
www.itt-richter.de