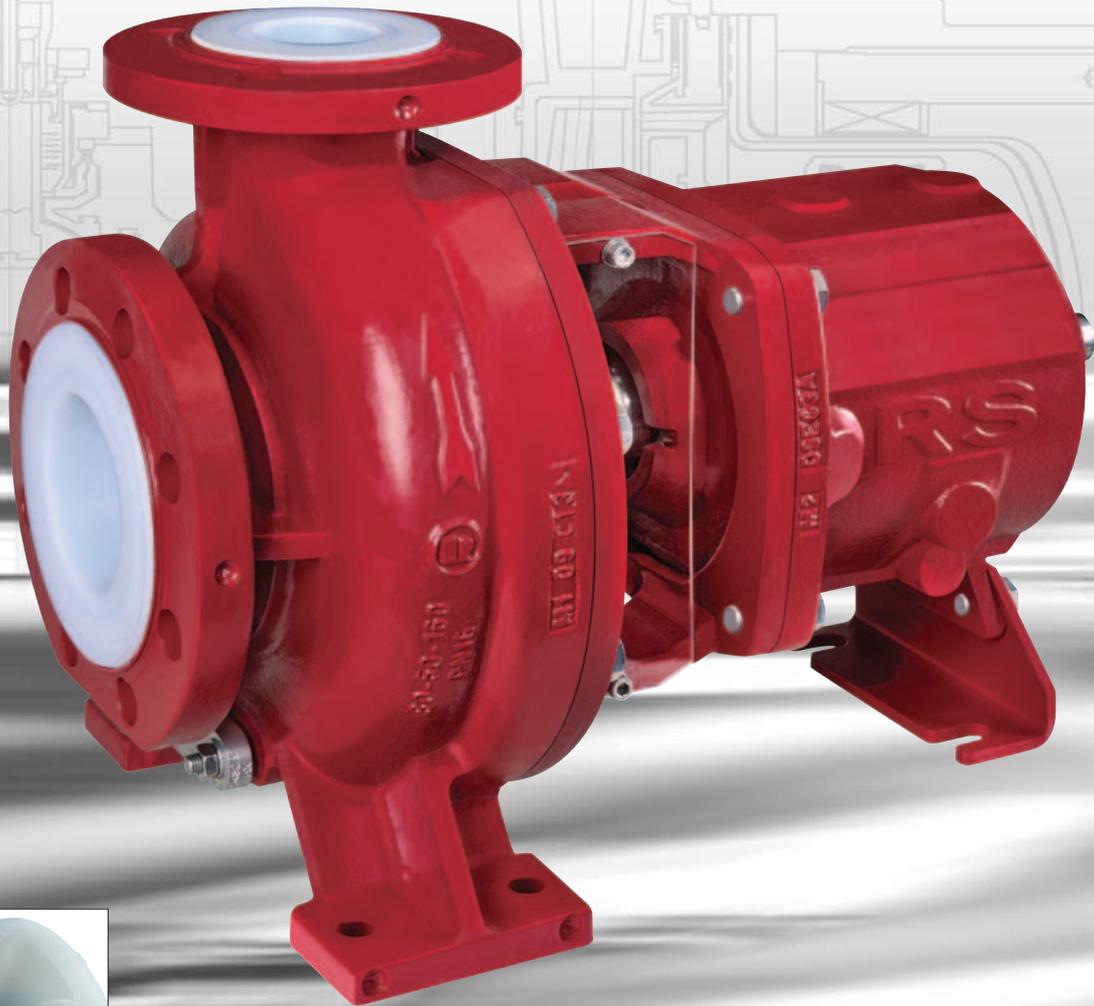


Richter Lined Mechanically Sealed ISO/DIN and ASME/ANSI Pumps

Corrosive, solid-laden and pure fluids



- Temperatures to 150 °C (300 °F)
- Virgin PFA/PTFE without fillers
- All common seal makes
- Very easy maintenance



Richter lined mechanically sealed ISO/DIN and ASME/ANSI process pumps

Fields of Applications

Corrosive fluids in the chemical, pharmaceutical, petrochemical, pulp, metal and food processing and waste disposal/recycling industries.

The Richter RSI and RSA series were developed

- for use with media where stainless steel and conventional plastics do not have sufficient corrosion resistance
- as an alternative to
 - sealed pumps made of expensive long-lead time metals (Alloy C, titanium, nickel etc.)
 - full plastic and fiber-reinforced pumps
 - and to stainless steel and special metal (e.g. cast silicon iron) sealed pumps.

Design

Fluoropolymer-lined mechanically sealed single-stage centrifugal pump.

Dimensions and delivery data to ISO/EN 2858/5199 (RSI) and ASME/ANSI B73.1. (RSA).

Frame-mounted. ATEX 94/9/EG.

Type and material codes

- Frame-mounted ISO/DIN RSI/F
- Frame-mounted ASME/ANSI RSA/F
- Lining perfluoroalkoxy (PFA)

Operating ranges

50 Hz operation

0.1-100 m³/h*

(0.5-440 USgpm)*

up to 70 m (230 ft) head*

60 Hz operation

0.1-120 m³/h*

(0.5-530 USgpm)*

up to 100 m (330 ft) head*

- -30 °C (-22 °F) to 150 °C (+300 °F); max. 20 bar (290 psi)
- Capability of handling solids depending on share, shape, hardness: consult factory

* For larger flows, higher temperatures and more application specific options please see Richter's further pump series:

- mechanically sealed pumps series SCK (ISO/DIN)
- mag-drive pumps series MNK (ISO/DIN) and MNKA (ASME/ANSI)

Features and benefits

Fluoropolymer lined mechanically sealed process pumps are ideal for the handling of highly corrosive fluids without compromises on quality, material and efficiency.

Richter PFA lined process pumps have proven to be world-class in demanding chemical processing applications for decades.

Richter's RSI and RSA pump series feature

- ① **Virgin PFA lining without carbon or carbon fiber fillers – Perfect lining quality and even lining thickness**
 - **Highest chemical resistance**, well above ETFE (e. g. Tefzel®) and PVDF
 - Temperatures to 150 °C (300 °F)
 - **Full FDA conformity**
 - Neutral to pure fluids in pharmaceutical, fine chemical and other applications
 - Superb permeation resistance
 - Housing lining thickness **5-6 mm (0.2-0.25“)**
 - Unmatched quality control
 - **Vacuum-proof anchored lining** of housing, impeller and back plate
Richter exclusively applies the **“TM transfer molding process”** (not the so-called roto-molding). Indexing drillings on casting outside guarantee uniform lining thickness according to best practice, very important for high permeation resistance and wear allowance.
- ② **Robust design for dimensional stability even at high temperatures**
 - Full ductile cast iron EN-JS 1049 (ASTM A395) body absorbs pipework forces and eliminates need for expansion joints
 - Impeller and housing back plate with large metal core
 - Sturdy shaft of high-strength stainless steel and minimum overhang for extra low deflection
- ③ **Sophisticated impeller design: Smooth running even under critical load conditions**
 - Semi-open flow optimized impeller design
 - Thrust-balancing circulation holes and back vanes ensure minimum thrust loads
- ④ **Minimum life cycle cost**
 - High efficiency design
 - Low NPSHr value
 - Universal corrosion resistance provides high flexibility
- ⑤ **Ease of maintenance**
 - Intelligently designed “back pull-out” construction for easiest maintenance
 - Wide open lantern design for full visibility and most easy access of mechanical seal area
 - Few components only: a service-orientated pump
- ⑥ **Capability of handling liquids containing solids**
see ⑧ and ⑨, for details consult factory.

Virgin unfilled PFA lining for full corrosion resistance and neutral against high-purity media

- ⑦ **High-quality external corrosion protection**
 - Thick 2-component external epoxy coating
 - SS screws, other grades available

- ⑧ **Throttle ring** reduces axial loads and keep larger solids away from seal chamber, see page 5
- ⑨ **Conical seal chamber design** prevents from clogging particles
- ⑩ **Form fit connection between shaft and protective shaft sleeve** for reliable synchronisation
- ⑪ **Replacable non-wetted PEEK centering shaft sleeves** for temperature compensation

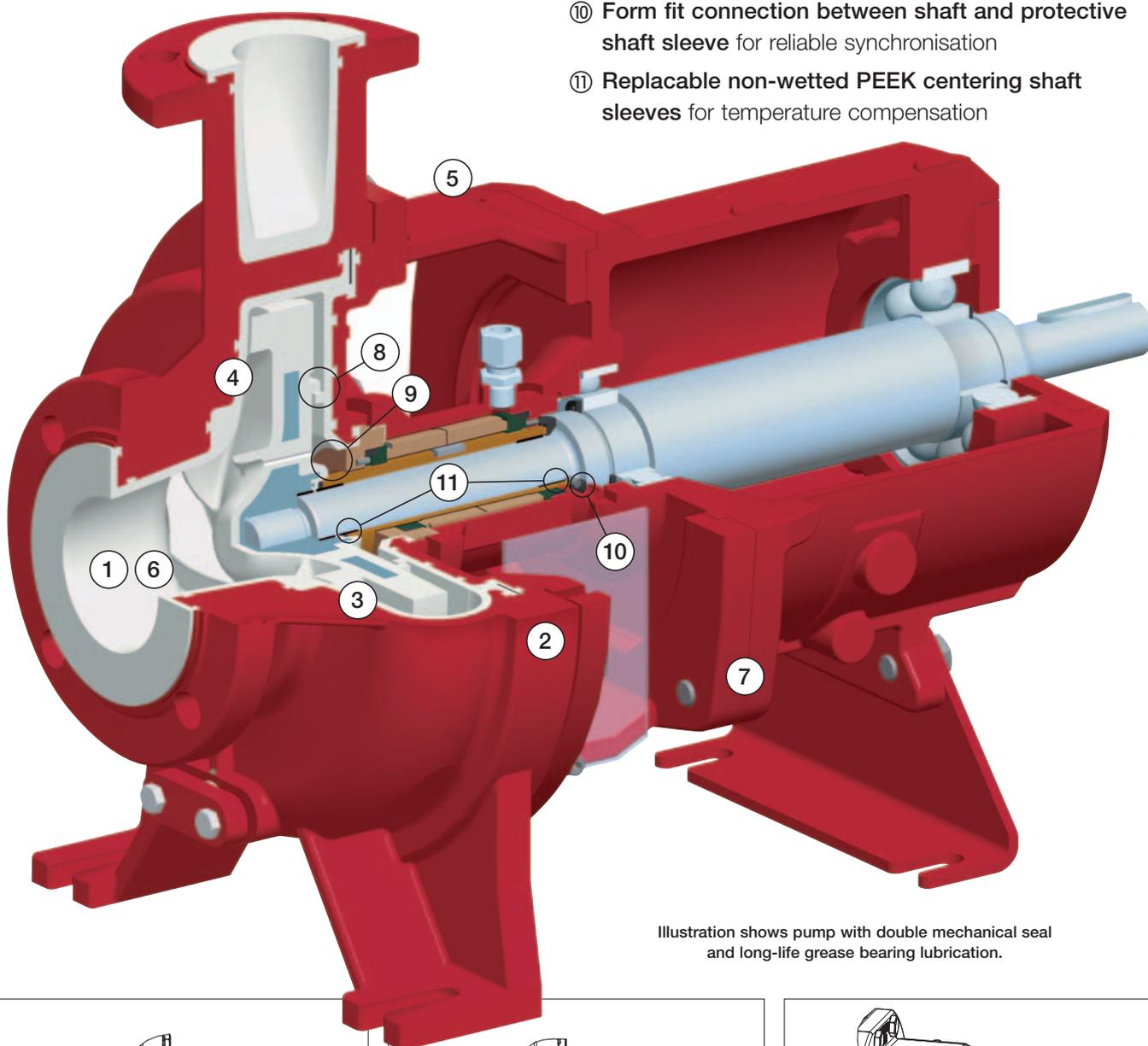
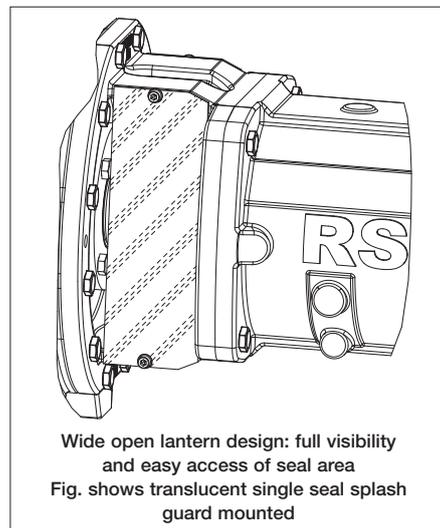
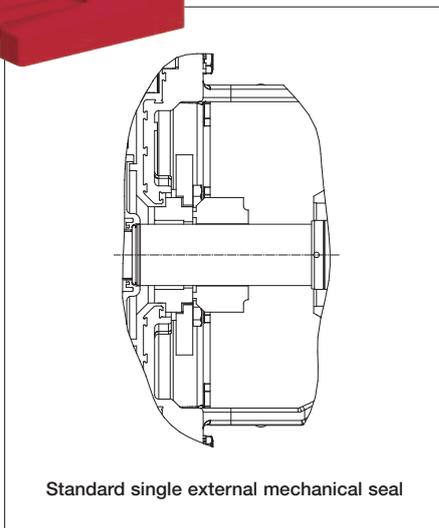
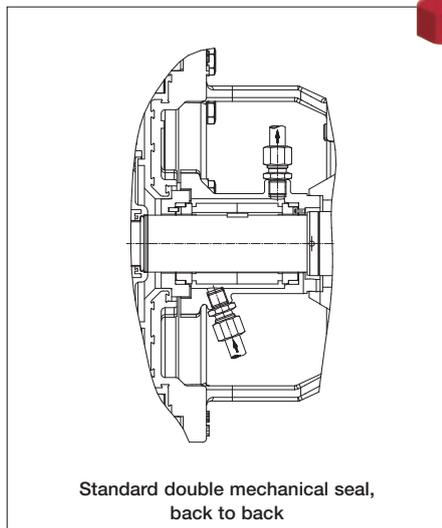


Illustration shows pump with double mechanical seal and long-life grease bearing lubrication.

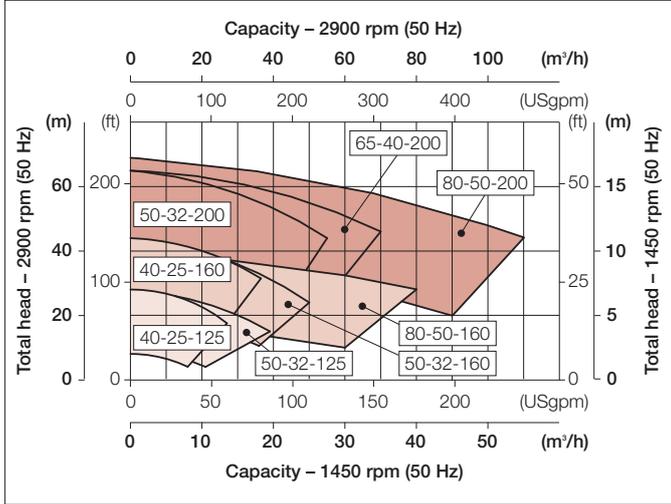


Performance curves

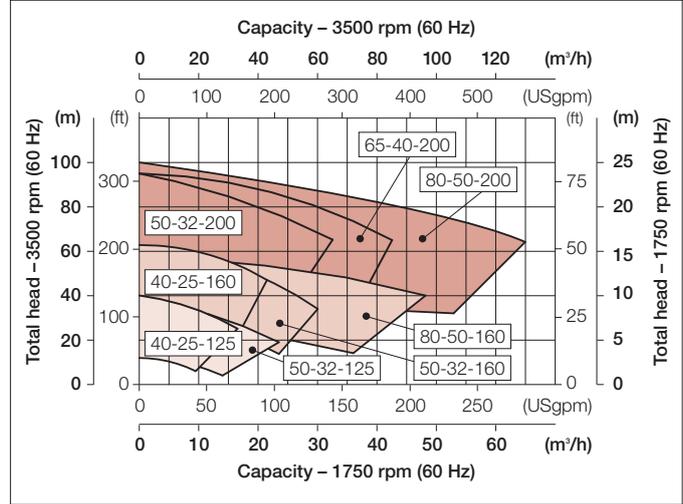
Richter mechanically sealed pumps RSI to ISO/DIN and RSA to ASME/ANSI are available for a performance range of

- up to 100 m³/h (440 USgpm) and up to 70 m (230 ft) head at 2900 rpm
- up to 120 m³/h (530 USgpm) and up to 100 m (330 ft) head at 3500 rpm

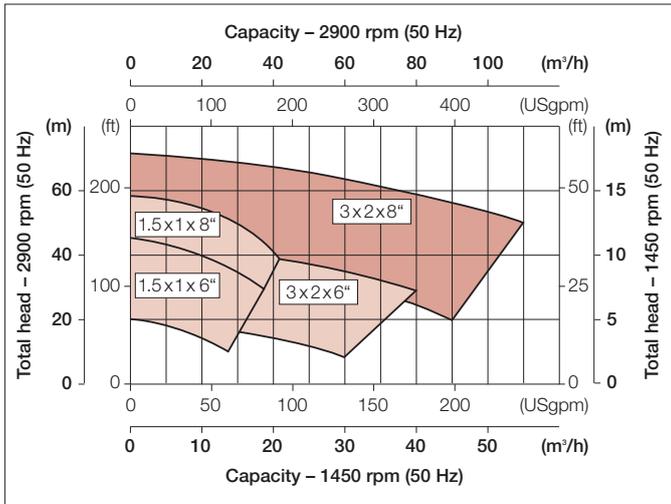
RSI Performance curves 1450/2900 rpm



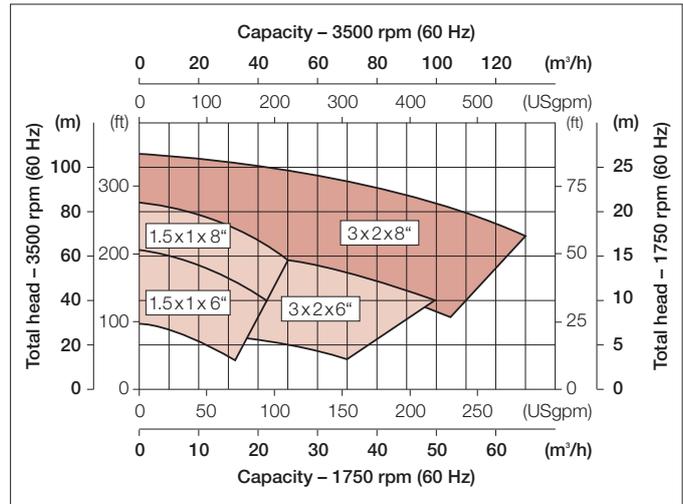
RSI Performance curves 1750/3500 rpm



RSA Performance curves 1450/2900 rpm



RSA Performance curves 1750/3500 rpm



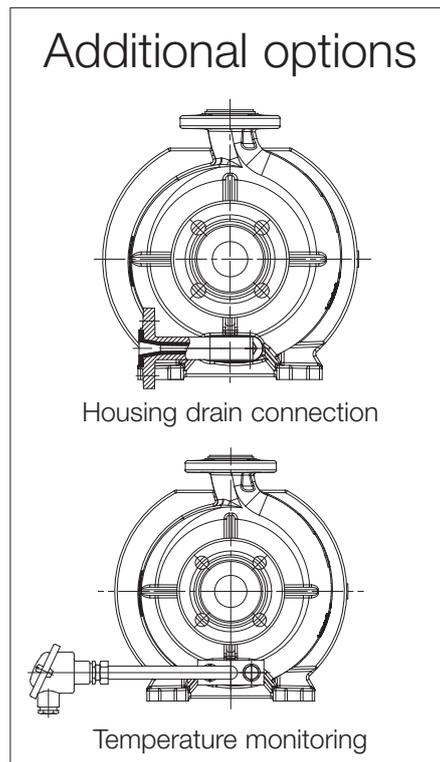
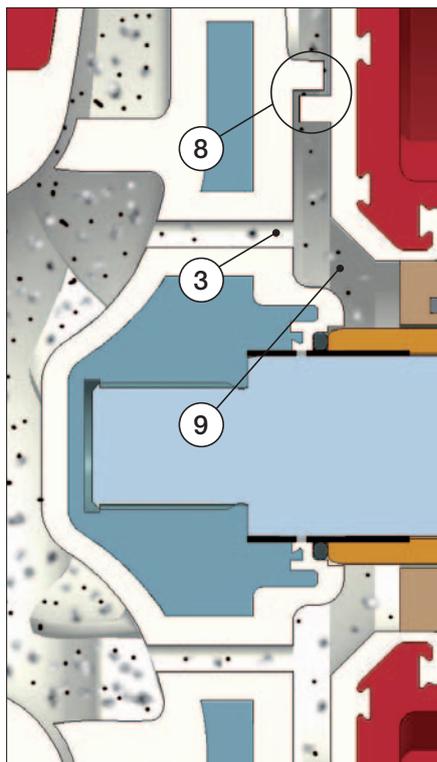
Flow rates and delivery heads outside this performance range can be covered by the

- Richter mechanically sealed pump series SCK up to 300 m³/h (1320 USgpm)
- Richter magnetic drive pump series MNK/MNKA up to 600 m³/h (2650 USgpm)

Improved capability of handling solids

As for standard all RSI and RSA pumps feature

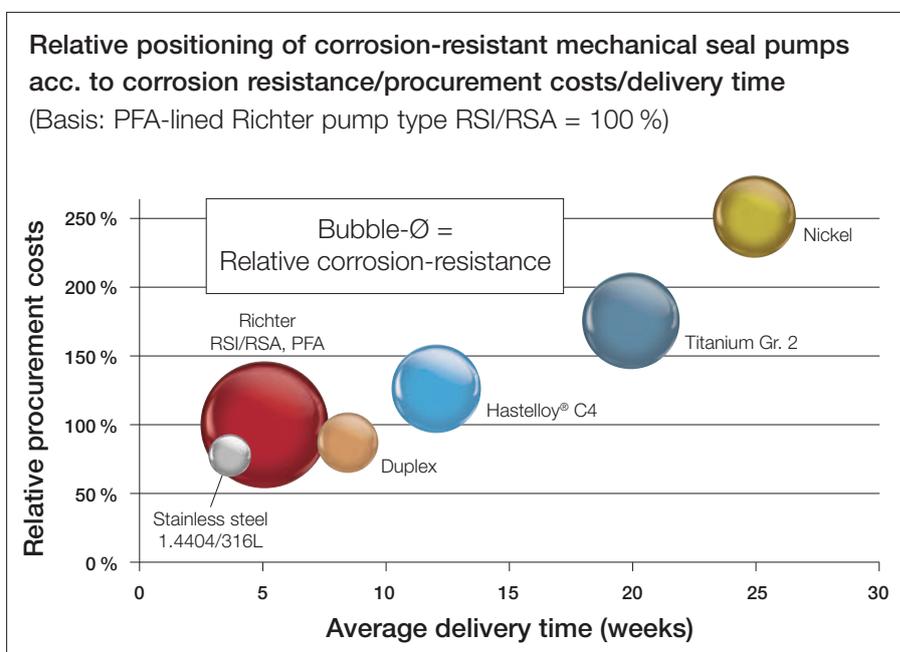
- ⑧ **labyrinth-like throttle rings:**
They restrict larger solids from entering the seal chamber behind the impeller and reduce axial loads
- ⑨ **a wide open conical seal chamber:** Particles cannot clog but are evacuated through the impeller's balancing holes ③ thanks to differential pressure



Advantages of the Richter mechanically sealed pump: Highest corrosion-resistance, low costs, short delivery time

- **Compared with mechanical seal pumps made of corrosion-resistant metals (Duplex, Hastelloy®, titanium, nickel)**
 - Considerably lower procurement costs: only 40-60 % compared to nickel and titanium
 - Considerably shorter normal procurement lead times (only 5 weeks instead of 12-25 weeks)
 - Maximum and universal corrosion resistance: Significantly better than Duplex, Hastelloy® and even titanium and nickel

Richter pumps RSI/RSA are not only much more corrosion-resistant (bubble size) but, at the same time, available much more quickly (X-axis) and better priced (Y-axis). With this combination of advantages the RSI/RSA is ideally suited as a standard pump for corrosive applications and dispenses with the need to work with different makes and material designs.



- **Compared with full-plastic and partially armoured pumps**
 - Considerably larger pressure/temperature range up to 150 °C (300 °F) and 16 bar (235 psi) instead of only up to 120 °C (200 °F) and 10 bar (145 psi)
 - Extremely robust thanks to metal armouring: smooth running even at elevated loads
 - Bears all piping forces, no need for expansion joints

Parts and materials

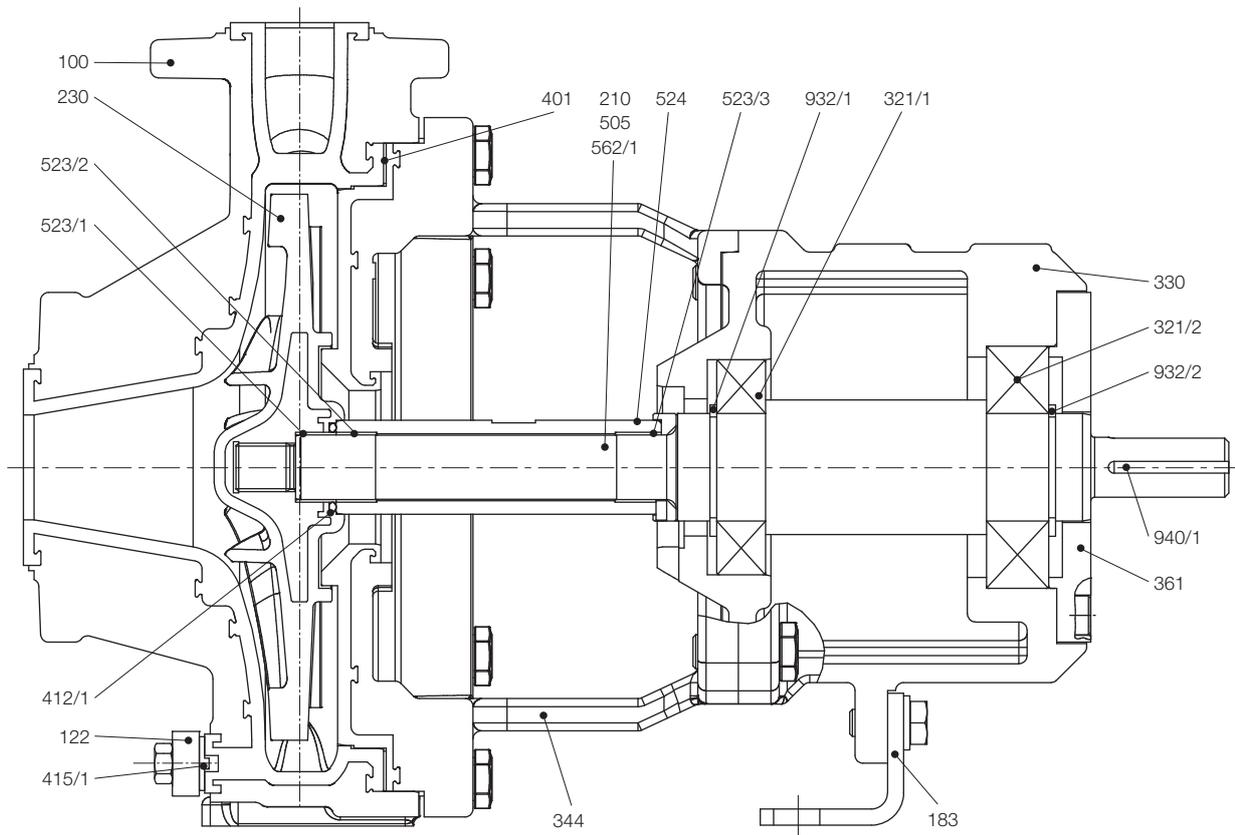


Fig.: Long life grease lubrication
Mechanical seal: not shown here

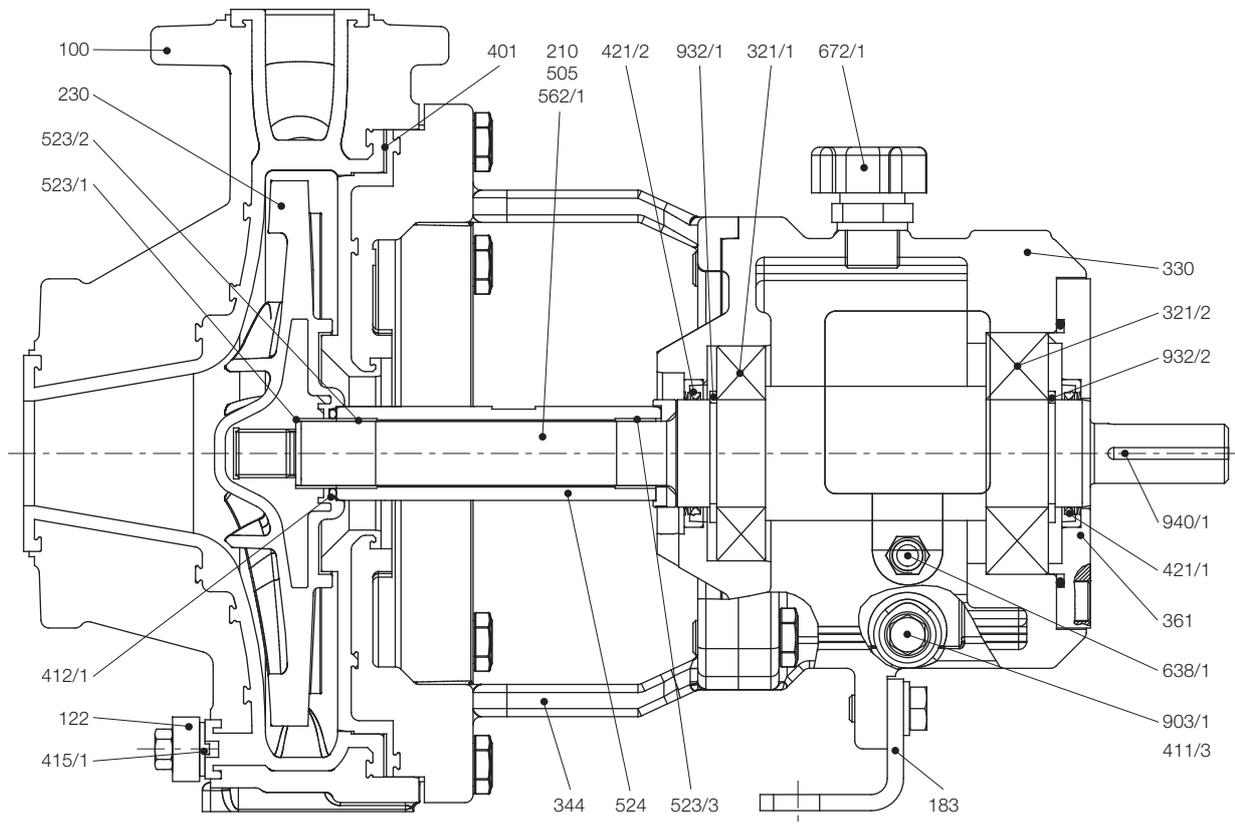
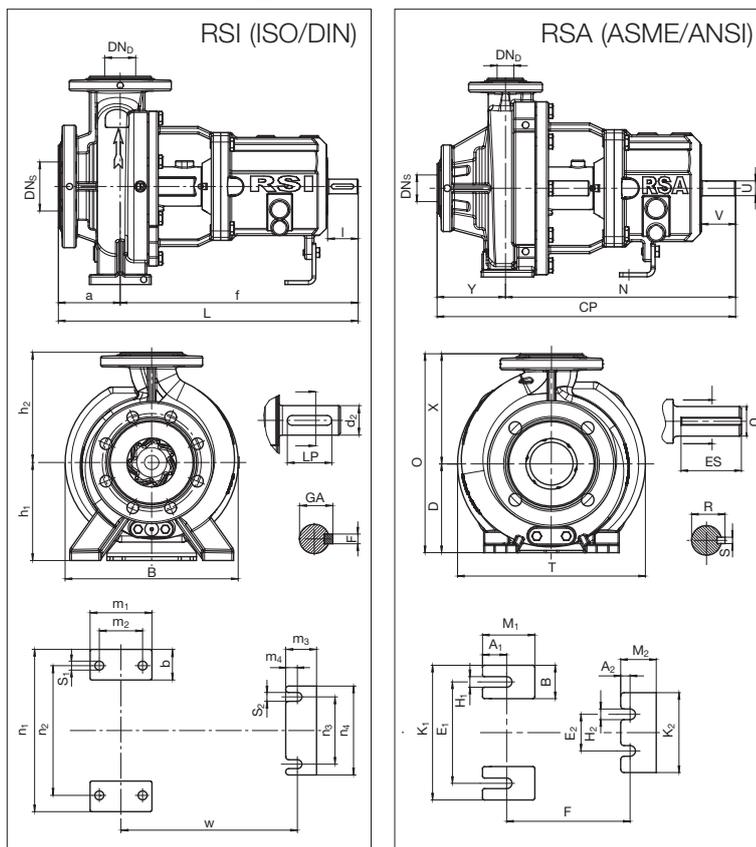


Fig.: Oil bath lubrication
Mechanical seal: not shown here

Parts and materials

Item No.	Index of parts	Material
100	Housing	Ductile iron EN-JS 1049/ASTM A395, PFA lined
122	Blind cover	Steel
183	Support bracket	Steel
210	Shaft (includes: 505, 562/1)	Stainless steel
230	Impeller	PFA with metal core
321/x	Radial ball bearing	Long-life grease, optional oil bath
330	Bearing pedestal	Ductile iron EN-JS 1049/ASTM A395
344	Lantern/backplate	Ductile iron EN-JS 1049/ASTM A395
361	Rear bearing cover	Steel
401	Housing gasket	PTFE
411/3	Seal ring	
412/1	O-ring	Aramid®, FFKM (Kalrez® or equivalent)
415/1	Centering gasket	PTFE
421/x	Rotary shaft seal	FPM (Only with oil bath lubrication)
523/x	Centering shaft sleeves (non-wetted)	PEEK
524	Protective shaft sleeve	Al ₂ O ₃ (aluminium oxide, 99.7%), other materials on request
638/1	Constant level oiler	Only with oil bath lubrication
672/1	Venting/filling plug	Only with oil bath lubrication
903/1	Screw plug	SS (only with oil bath lubrication)
932/x	Circlip	PTFE
940/1	Key	Steel
w/o no.	Nuts, bolts	Stainless steel, other grades optional

Dimensions and weights



RSI pump dimensions mm (inch)

Group	Pump size	DN _S	DN _D	a	B	d ₂	f	h ₁	h ₂	L	I	GA	F	LP	Weight approx.	
															kg	lbs
1.1	40-25-125	40 (1.57)	25 (0.98)	80 (3.15)	240 (9.45)	24 (0.94)	385 (15.16)	112 (4.41)	140 (5.51)	465 (18.31)	50 (1.97)	27 (1.06)	8 (0.31)	36 (1.42)	36	79
	50-32-125	50 (1.97)	32 (1.26)												38	84
1.2	40-25-160	40 (1.57)	25 (0.98)	80 (3.15)	280 (11.02)	24 (0.94)	385 (15.16)	132 (5.2)	160 (6.3)	465 (18.31)	50 (1.97)	27 (1.06)	8 (0.31)	36 (1.42)	44	97
	50-32-160	50 (1.97)	32 (1.26)												46	101
	80-50-160	80 (3.15)	50 (1.97)	100 (3.94)				160 (6.3)	180 (7.09)	51	112					
1.3	50-32-200	50 (1.97)	32 (1.26)	80 (3.15)	330 (13)	24 (0.94)	385 (15.16)	160 (6.3)	180 (7.09)	465 (18.31)	50 (1.97)	27 (1.06)	8 (0.31)	36 (1.42)	65	143
	65-40-200	65 (2.56)	40 (1.57)												69	152
	80-50-200	80 (3.15)	50 (1.97)	100 (3.94)				200 (7.87)	485 (19.1)	71	157					

RSI pump feet dimensions mm (inch)

Group	Pump size	b	m ₁	m ₂	m ₃	m ₄	n ₁	n ₂	n ₃	n ₄	S ₁	S ₂	w
1.1	40-25-125	50 (1.97)	94 (3.7)	50 (1.97)	50 (1.97)	19 (0.75)	190 (7.5)	140 (5.51)	110 (4.33)	145 (5.71)	14 (0.55)	14.5 (0.57)	285 (11.2)
	14.5 (0.57)												
1.2	40-25-160	50 (1.97)	100 (3.94)	70 (2.76)	50 (1.97)	19 (0.75)	240 (9.45)	190 (7.5)	110 (4.33)	145 (5.71)	14.5 (0.57)	14.5 (0.57)	285 (11.2)
	265 (10.43)												
	50-32-160						240 (9.45)	190 (7.5)	110 (4.33)	145 (5.71)	14.5 (0.57)	14.5 (0.57)	285 (11.2)
1.3	50-32-200	50 (1.97)	100 (3.94)	70 (2.76)	50 (1.97)	19 (0.75)	240 (9.45)	190 (7.5)	110 (4.33)	145 (5.71)	14.5 (0.57)	14.5 (0.57)	285 (11.2)
	265 (10.43)												
	65-40-200						240 (9.45)	190 (7.5)	110 (4.33)	145 (5.71)	14.5 (0.57)	14.5 (0.57)	285 (11.2)
80-50-200	265 (10.43)	212 (8.35)	110 (4.33)	145 (5.71)	14.5 (0.57)	14.5 (0.57)	285 (11.2)						

RSA pump dimensions mm (inch)

Group	Pump size	DN _S	DN _D	Y	T	U	N	D	X	CP	V	R	S	ES	Weight approx.		
															kg	lbs	
1	1.5 x 1 x 6"	38.1 (1.5)	25.4 (1)	102 (4.02)	280 (11.02)	22.3 (0.87)	343 (13.5)	133 (5.25)	165 (6.5)	445 (17.52)	51 (2)	24.3 (0.96)	4.8 (0.19)	44.5 (1.75)	42	92	
	3 x 2 x 6"	76.2 (3)	50.8 (2)												290 (11.4)	47	103
	1.5 x 1 x 8"	38.1 (1.5)	25.4 (1)												45	99	
2	3 x 2 x 8"	76.2 (3)	50.8 (2)	102 (4.02)	330 (13)	28.6 (1.13)	495 (19.5)	210 (8.25)	242 (9.5)	597 (23.5)	82 (3.23)	31.4 (1.24)	6.35 (0.25)	57.2 (2.25)	82	181	

RSA pump feet dimensions mm (inch)

Group	Pump size	B	M ₁	A ₁	M ₂	A ₂	K ₁	E ₁	E ₂	K ₂	H ₁	H ₂	F
1	1.5 x 1 x 6"	50 (1.97)	78 (3.07)	36 (1.42)	43 (1.69)	14 (0.55)	202.4 (7.97)	152.4 (6)	0	100 (3.94)	16 (0.63)	16 (0.63)	184 (7.25)
	83 (3.27)		41 (1.61)										
	78 (3.07)		36 (1.42)										
2	3 x 2 x 8"	50 (1.97)	83 (3.27)	41 (1.61)	54 (2.13)	25 (0.98)	298 (11.7)	248 (9.76)	184 (7.25)	220 (8.66)	16 (0.63)	16 (0.63)	318 (12.5)

Other Richter process 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 very difficult applications.

Magnetic drive pumps

- to EN 22858/ISO 2858 up to 600 m³/h (2650 USgpm)
- to ASME B73.3 up to 180 m³/h (800 USgpm)

Mechanically sealed pumps

- to EN 22858/ISO 2858 up to 300 m³/h (1320 USgpm)

Self-priming pumps

for emptying containers and basins from the top.

Suction height up to 6 m (20 ft) head, flows up to 33 m³/h (145 USgpm)

Vortex pumps

for higher solid contents, lumpy particles and gas contents, up to 200 m³/h (880 USgpm)

Peripheral pumps

for low flow rates at heads to 100 m (330 ft), 0.1-5 m³/h (0.4-22 USgpm)

Richter PFA/PTFE lined valves ideally complement lined pumps

Make your corrosion resistant pumps work perfect thanks to Richter lined valves, available to ISO/DIN and ASME/ANSI standards. Operating pressures to 19 bar (275 psi) and temperatures from -60 °C (-75 °F) to 200 °C (400 °F).

Shut-off and control ball valves
DN 15-200, 1/2"-8"



Strainers
DN 25-100, 1"-4"



Check valves
DN 15-150, 1/2"-6"



Sight glasses
DN 25-150, 1"-6"



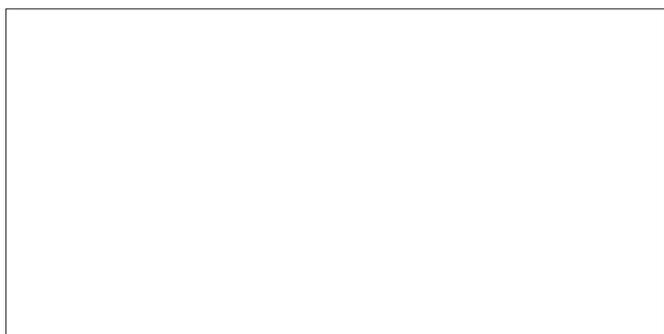
Shut-off and control butterfly valves
DN 50-1000, 2"-40"



Diaphragm shut-off and control valves
DN 15-150, 1/2"-6"



Presented by:



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