

Industry	Service	S	R	Liquids pumped
Food industries	Production of any kind of oils, Vegetable or animal fat, syrup Production of chocolate and Edible creams	✓	✓ ✓ ✓ ✓	Oils and fats Syrups and juices Chocolate Creams, mustards
Stock farming and Cattle breeding	Re-circulation Decanting Disposal Moving	✓	✓ ✓ ✓	Liquid manure Concentrated animal food Molasses Animal fats
Fodder industries Cattle feedings	Production Pouring off silos or tanks		✓ ✓	Molasses, waste syrups Vegetable and animal fats
Sugar refineries (from beets or cane)	Washing beets Production Pouring off Chalk water for clarification of juices	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	Recovering / recycling of washing water Molasses and juices Drainages (green and white) Refluxes from depuration Adding of chalk solutions after diffusers
Detergents and cosmetics	Production of intermediates Packaging Homogenizing Disposal of waste	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	Liquid detergents Silicones Acid fats Sulphonic acids Slurries
Pharmaceutical industries	Production Packaging / disposal	✓ ✓	✓ ✓	Viscous liquids / oils Refluxes from depuration
Ink and printing works	Ink production Transport Feeding printing machines Recycling	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	Resins Solvents / alcohols Compounds Inks Recycled solvents
Glues , adhesive tapes, stickers	Pumping of basic products Pumping into tanks Smearing on tapes or papers	✓ ✓	✓ ✓ ✓	Resins / glues Solvents Finished products
Paper mills	Charged fluids transfer Fluids after vacuum treatment	✓ ✓		Waste water / disposal Recovering of paper pulp
Leather tanning industries	Additives production Veiling machines Depuration, disposal	✓ ✓	✓ ✓	Oils and fats Paints and varnish Refluxes / waste treatments
Paints , enamels	Production Pouring off Disposal Pumping to and from tanks	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	Resins and additives Oils of any origin Water and solvents based paints Solvents of any kind (only clean ones for R) Treatment of waste solvents

Industry	Service	S	R	Liquids pumped
Plastic industries	Production of resins Production of solvents Pouring off silos or tanks Disposal	✓ ✓ ✓ ✓	✓ ✓ ✓	Resins Polyols and isocyanates, TDI Solvents of any kind (only clean ones for R) Treatment of waste solvents
Shipyard, on boats	On board Bilge Engines, machines Ballast Fresh water Disposal Various services on board Loading / unloading	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓	Clean and disposal water Dirty and oily (sea) water Fuels, oils and gasoline Waste and charged liquids of any kind Raw oil
Harbors, wharves and warehouses	Pouring off Pumping Disposal	✓ ✓ ✓	✓ ✓ ✓	Molasses, syrups Acids or basic products Petrochemical products
Building industries	Draining excavations Sinking ground water Impermeabilization Paving machines	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	Asphalt Bitumen Fuels Ground water / waste water
Marble industries	Manufacture Depuration Disposal	✓ ✓ ✓	✓ ✓	Refrigerant for cutting machines Resins, glues Refluxes from depuration
Washing conglomerates	Washing of sand, gravel and stones Recovering of silt and sand	✓ ✓ ✓	✓ ✓ ✓	Washing water Charged fluids Refluxes from depuration
Road pavers	Continuos road paver	✓	✓	Hot asphalt and bitumen
Drilling machines	Earth drilling Feeding piston pumps	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	Water containing sand and gravel Water + cement Water + bentonite Water for piston pumps
Insulations	Winding of electric motor or Pipes	✓ ✓	✓ ✓	Resins, glues Bitumen coatings

Note: somehow, to better fulfil proposed duty, **S** pumps need particular improvements, like cutter devices, etc.

Victor Pumps R internal gear pumps have many advantages

Versatile

Liquids of all viscosity's can be handled, from solvents to thick bitumen or from cooling liquid to heat transfer oil. The pumps are good for all products with the same pair of gears.

Constant flow

The capacity is directly proportional to the rotation speed and virtually independent of the pressure.

Reversible

Full performance is available in either direction of rotation.

Smooth

Non pulsating flow, no foaming or churning, no vibrations in the fittings, valves or coupling.

Self-priming

Up to 8-metres water column suction lift under certain conditions.

Build in modules

Many Single components can be changed. The pump can be easy transformed in another version, if required.

Simple

Only two moving parts, the Idler and the Rotor. Only one shaft seal. Axial tolerance of the Gears can easily be adjusted while operating.

Robust

Heavy-duty and special design pump construction for long lifetime. The low rotor peripheral speed and the large rotor surface against the casing, make this pump perfect for applications with abrasive products. External bearing housing with oversized ball bearings to take axial and radial loads.

Compact

Compact pump construction, easy to install in existing or new plants. The casing, separate from the bearing housing can be positioned as required to change the position of the Inlet and discharge connections.

Temperature resistant

No elastomer parts required in the pump. Therefore particular suitable for pumping liquids with solvents or high temperature.

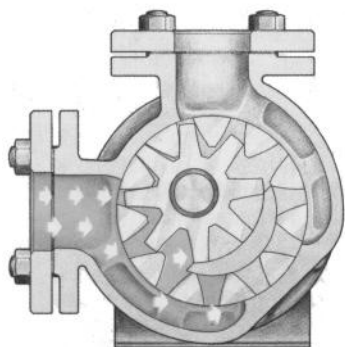
Heating Jacket

Heating chamber integral with the casing and around the shaft seal on most models. Heating Jacket is also available for the casing.

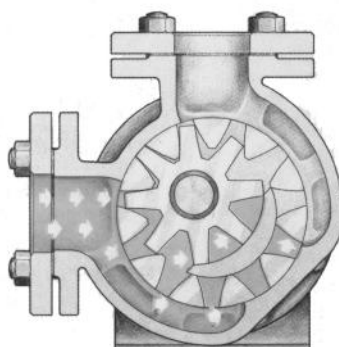
Maintenance-friendly

Rare maintenance required. Inspections and regulations can be carried out without removing the pump, piping or motor.

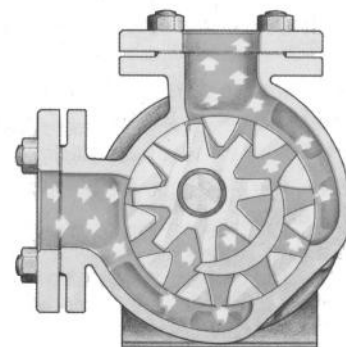
Working principle



1/3



2/3



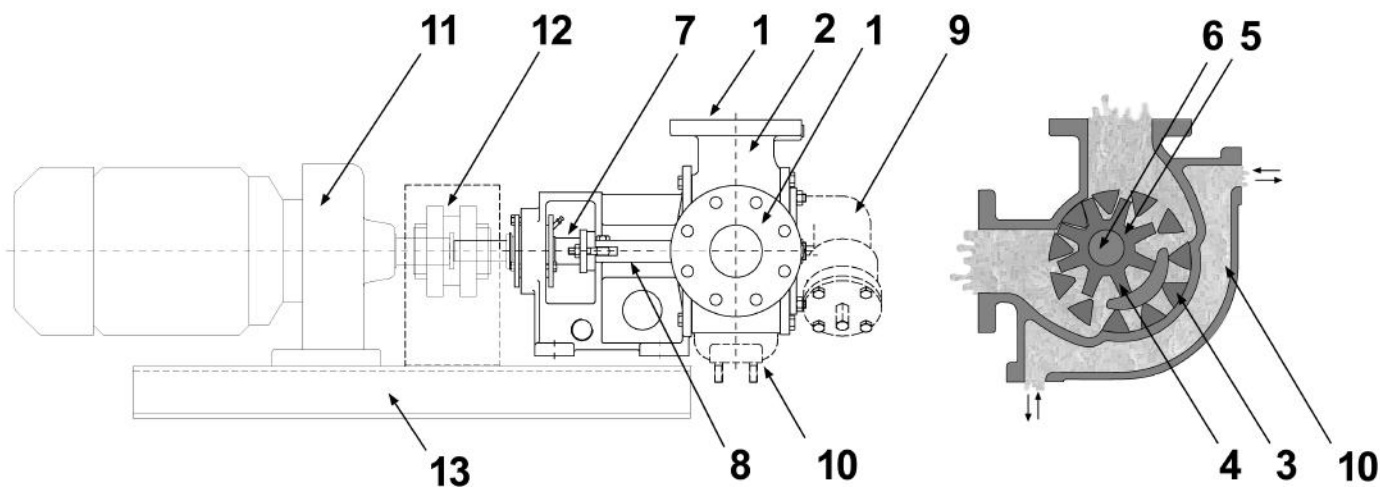
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The **R** – internal gear pumps are positive displacement rotary pumps. Two gears generate the flow: the rotor and the idler. The rotor moves the internal idler. As the gears rotate liquid is drawn into the spaces created between the gears.

The liquid is moved without pressure increase in direction discharge port, were the crescent closes the free space between the two gears. The crescent avoids that the liquid flows back to the suction side.

When the gears mesh, the liquid is slowly forced out of the pump. The results are smooth flow of liquid and high capacity combined with a compact size.

Arrangements ** :



1. Ports: Available in DIN – Flange, ANSI – Flange, BSP tapped ports (R35 – R50) in 90° or 180°, variable position through rotation of the casing.
2. Casing: Available in Cast iron, Ductile iron, Stainless steel
3. Rotor and 4. Idler: Available in Ductile iron, Steel, Stainless steel
5. Bushings: Available in Sintered iron, Graphite, Bronze, Hardened steels, Tungsten carbide, Grey iron
6. Pinion and 7. Shaft: Available in Hardened steels, Stainless steel, Tungsten carbide
8. Shaft seals:
- Packing
 - Packing with flushing
 - Single mechanical seal
 - Single mechanical seal with Quench
 - Metal-bellow mechanical seal with postponed packing gland (Safety-seal)
 - Double mechanical seal: Tandem or Back to Back
 - Cartridge mechanical seals based on customer request
 - Magnetic drive
9. Safety-valve: Direct mounted safety-valve to avoid over-pressures created by the pump with closed pipes. Also available as double-safety-valve for both pump directions and with heating jacket.
10. Pump heating: Available integrated around the casing, on the mechanical seal box, the safety valve, the cover.
11. Drive: Bare shaft pump, free choice on the driving.
12. Coupling: Safety elastic coupling with a brake-away rubber element.
13. Arrangements: On base plate or trailer.

** Arrangements availability can change depending on the pump size. Please ask your dealer for more details.

Type	bar					mm ² /s (cSt)		°C		pH
	A	B	C*	D	E	min	max	min	max	
Graugußpumpen, Cast iron pumps, Pompes en fonte										
G1.	16	8	4	16	20	100	100.000	-40	+200	6-13
G44.	16	8	4	16	20	100	100.000	-30	+150	6-13
GW44.	-	-	8	16	20	100	100.000	-30	+150	6-8
H1.	16	8	4	16	20	20	100.000	+120	+300	6-8
HR1.	16	8	4	16	20	20	100.000	+120	+300	6-8
S43.	-	8	-	16	20	1	4.000	-30	+150	6-13
Edelstahlpumpen, Stainless steel pumps, Pompes en acier inoxydable										
K1.	12	6	-	16	20	20	4.000	-40	+200	2-14
KB1.	12	8	4	16	20	100	100.000	-40	+200	6-8
K43.	12	6	-	16	20	20	4.000	-30	+150	2-14
KB44.	12	8	4	16	20	100	100.000	-30	+150	6-8

A Max. Druckdifferenz mit schmierenden Flüssigkeiten (Viskosität > 100 mm²/s).Maximum differential pressure with lubricating liquids (viscosity > 100 mm²/s).*Pression différentielle max. avec liquides lubrifiants (viscosité > 100 mm²/s).***B Max. Druckdifferenz mit nichtschmierenden Flüssigkeiten.**

Maximum differential pressure with non lubricating liquids.

*Pression différentielle max. avec liquides non lubrifiants.***C Max. Druckdifferenz mit scheuernden Flüssigkeiten (Viskosität > 100 mm²/s).**Maximum differential pressure with abrasive liquids (viscosity > 100 mm²/s).*Pression différentielle max. avec liquides abrasifs (viscosité > 100 mm²/s).***D Max. Betriebsdruck.**

Maximum operating pressure.

*Pression de service max.***E Prüfdruck.**

Test pressure.

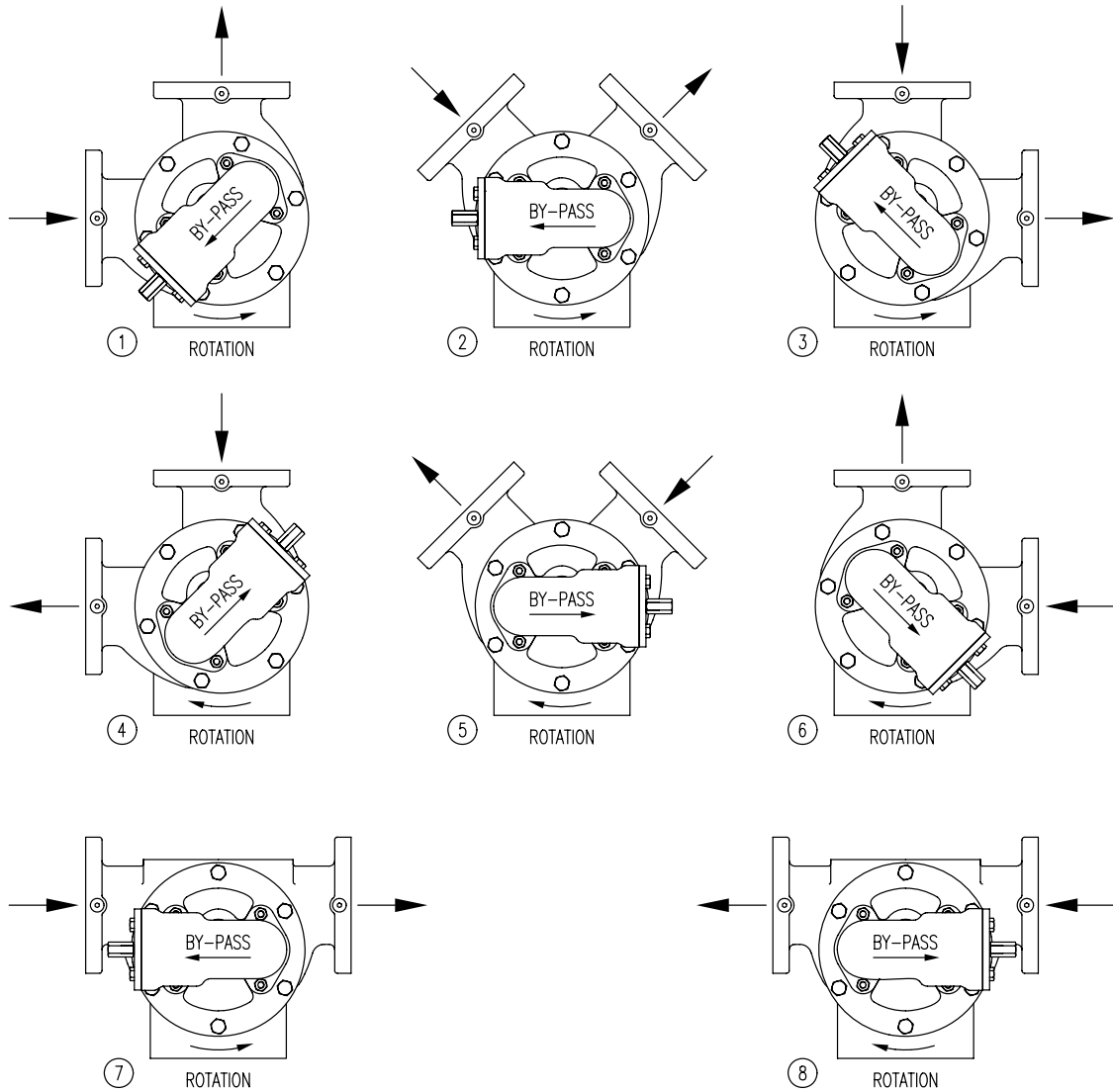
Pression d'essai.

Type Type Type	Nenngeschwindigkeit Rated speed Vitesse nominale	Empfohlene Geschwindigkeit mit scheuernden Flüssigkeiten Recommended speed with abrasive liquids Vitesse conseillée avec liquides abrasifs
R 35	1450	500
R 40	1450	500
R 50	960	315
R 65	800	250
R 80	630	200
R 105	560	180
R 151	500	160
R 200	360	120
R 250	280	90

* Um die Standzeit der Pumpe zu erhöhen sollte mit scheuernden Flüssigkeiten die maximale Drehzahl der Pumpe auf 1/3 der Nenngeschwindigkeit reduziert werden.

* To increase the life of the pump with abrasive liquids, reduce the pump speed to 1/3 of the rated speed.

* Pour prolonger la durée de la pompe avec liquides abrasifs, diminuer la vitesse de la pompe d'un tiers de la vitesse nominale.



Important Notice:

The **R** Internal Gear pump can be delivered with different port arrangements. Generally, pumps with 90° ports are delivered with arrangement #1 and pumps with in-line ports are delivered with arrangement #7. If your application needs a different port arrangement, please state your choice following the table based on the pump size:

Pump Size	Port Arrangement
R 35, R 40	1, 3, 4, 6, 7 ¹⁻² , 8 ¹⁻²
R 50	1, 2, 3, 4, 5, 6, 7 ² , 8 ²
R 65, R 80	1, 2, 3, 4, 5, 6, 7 ² , 8 ²
R 105, R 151	1, 2, 3, 4, 5, 6
R 200, R 250	7, 8

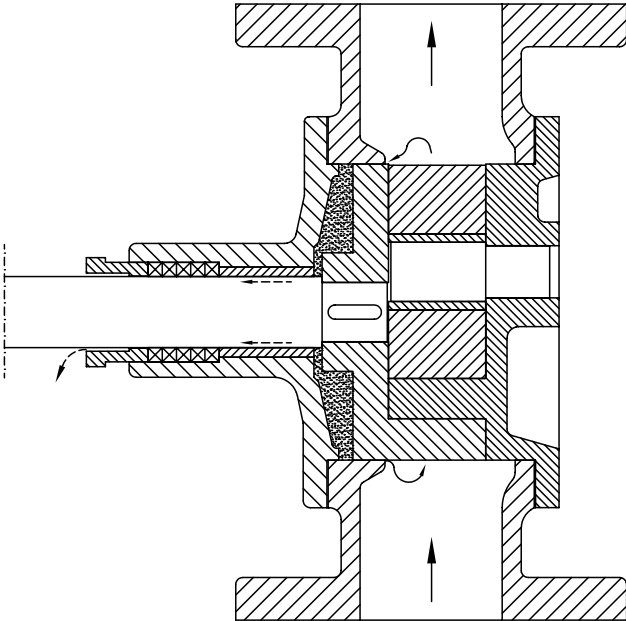
¹ R1½" threaded

² price supplement

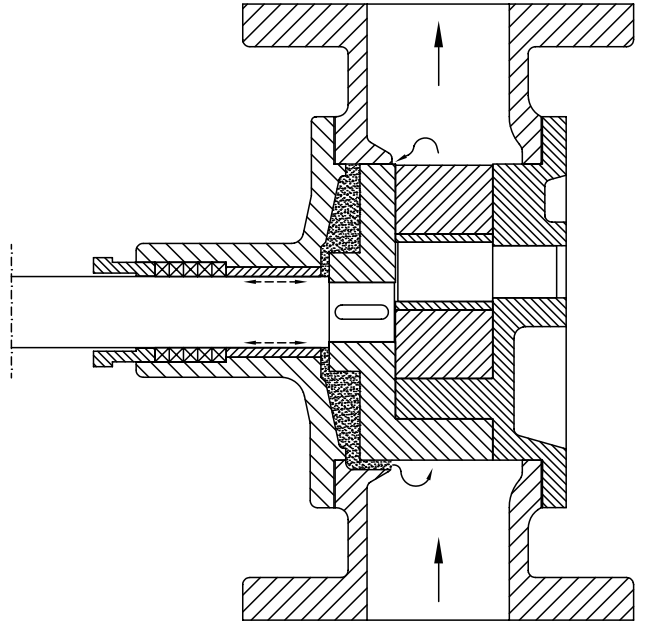
The port arrangement can be changed afterwards on site. Please ask your dealer or distributor for more informations.

Please Note! The port arrangement and rotation direction of the **Magnetic Driven Pumps** should never be changed afterwards.

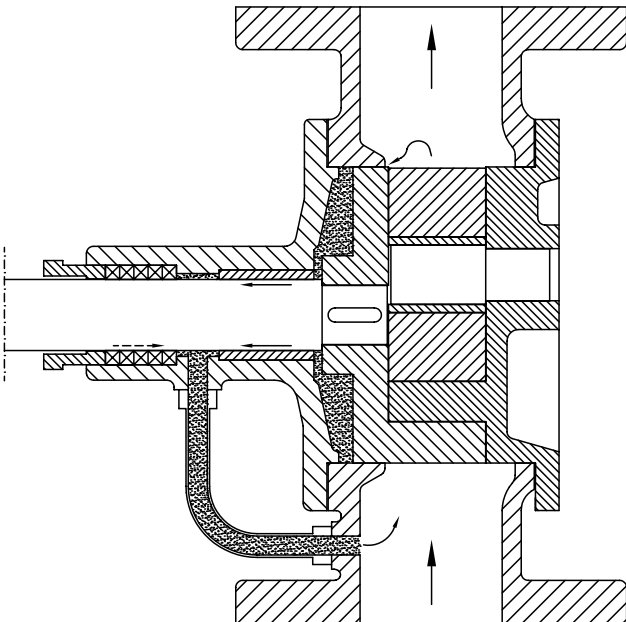
.1.



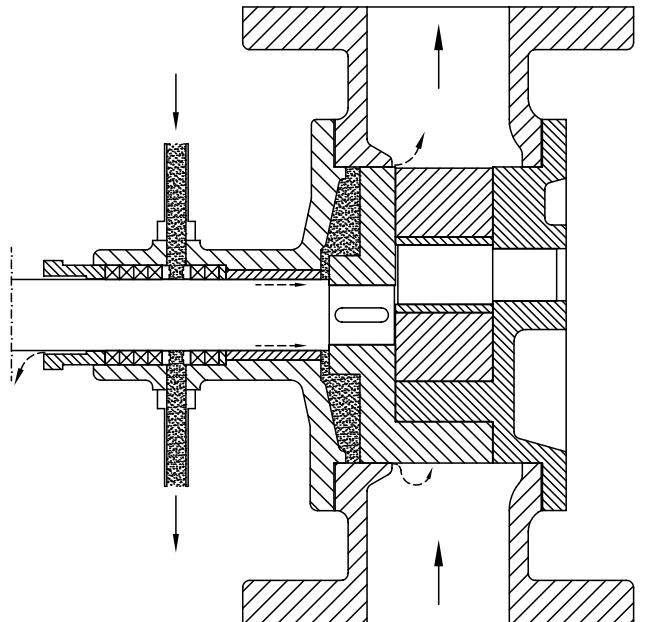
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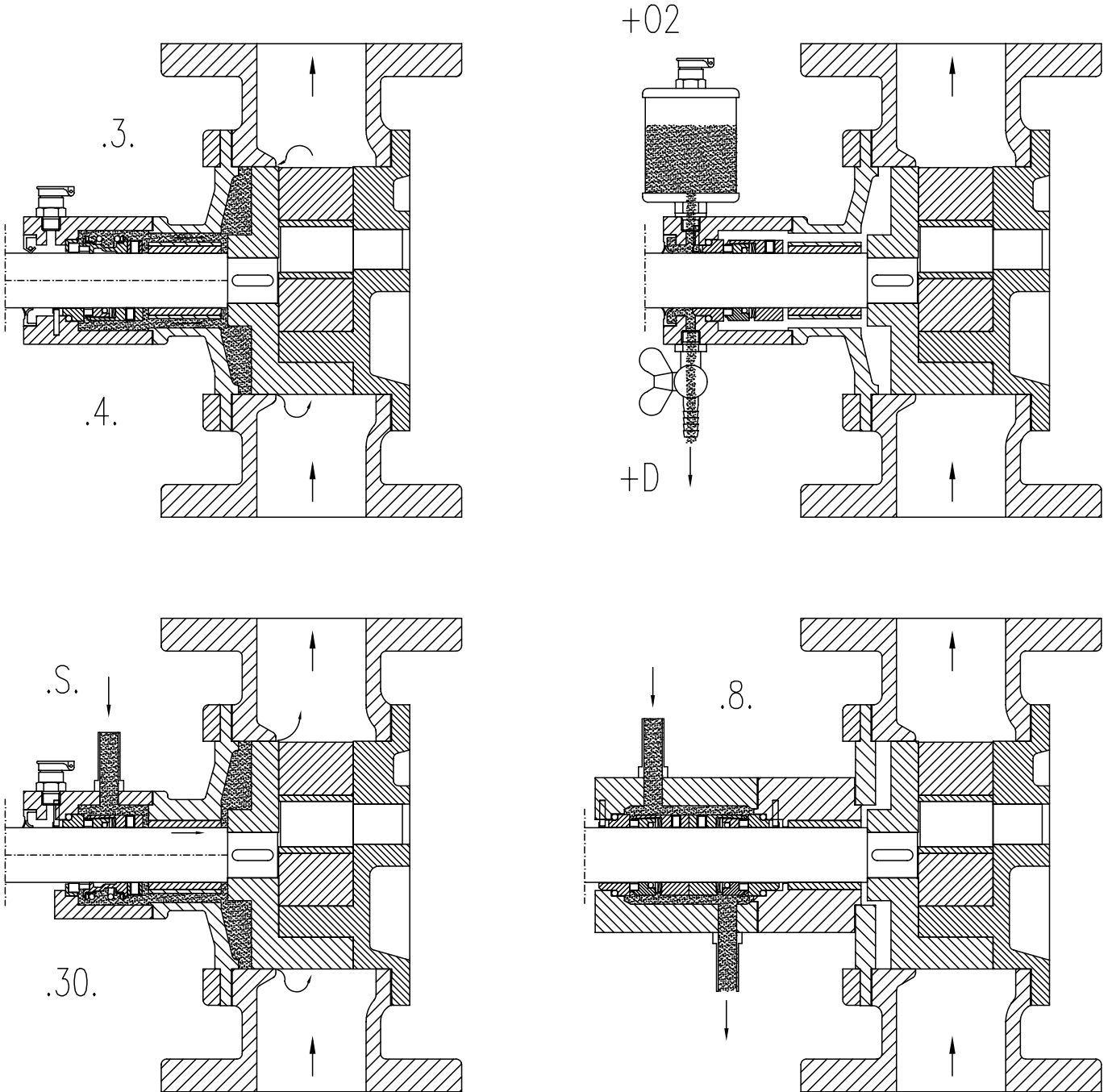


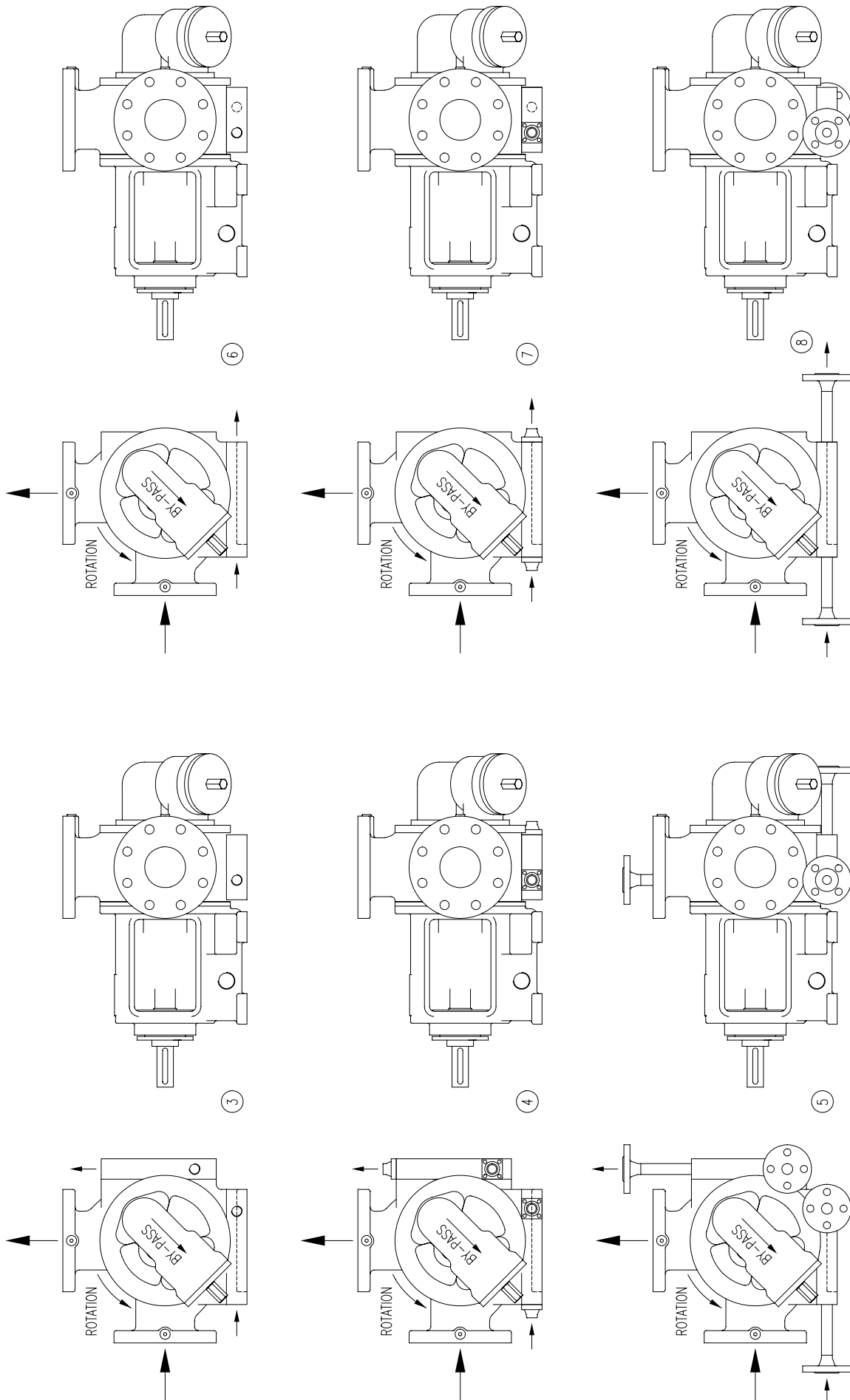
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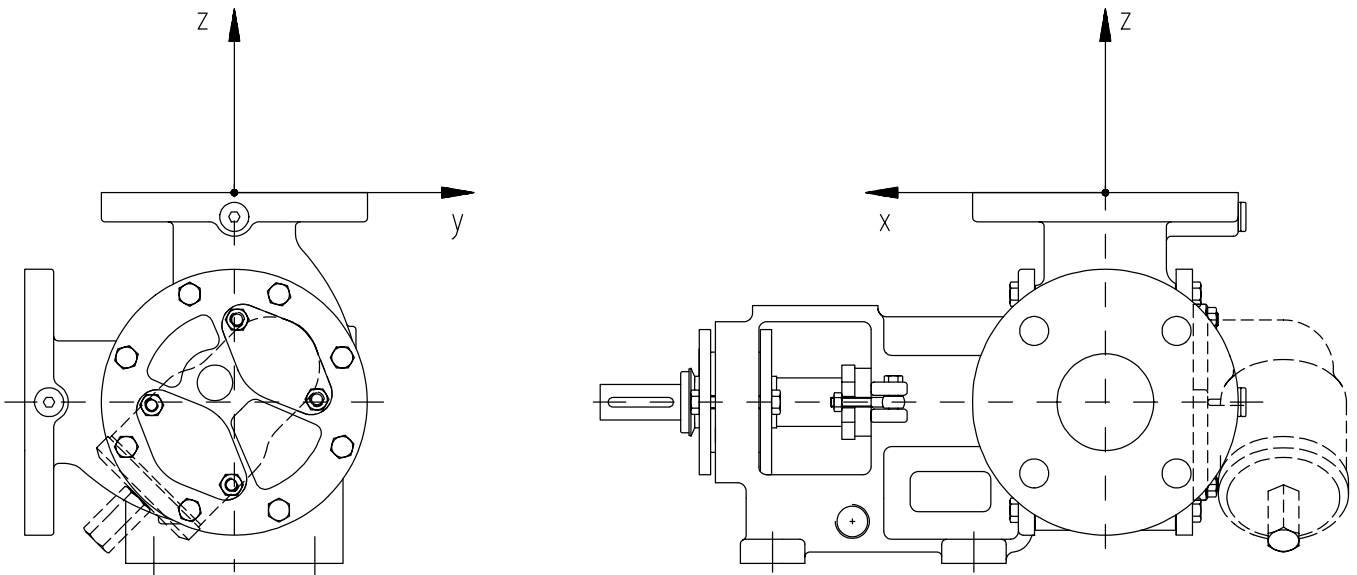
The maximum loads which can be carried by cast iron and stainless steel flanges are shown below.

With reference (see figure) to the plane of the flange and with origin at the center of the flange, the following are defined:

x → axis parallel to the pump shaft lying on the flange plane.

y → axis lying on the flange plane perpendicular to the **x** axis.

z → axis orthogonal to the flange plane.



F_x, F_y, F_z → Forces along the axes expressed in N (Newton).

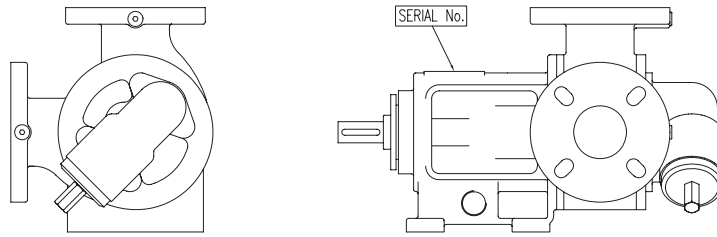
M_x, M_y, M_z → Moment of flexure around the axes expressed in Nm (Newton meters).

The maximum loads permitted on the flanges are:

Pump type	DN Ports mm	F _x , F _y , F _z N	M _x , M _y , M _z Nm
R 35,40	40	520	260
R 50	50	650	330
R 65	50	650	330
R 80	80	1040	520
R 105	100	1300	660
R 151	150	1630	820

Pumps with tapped ports are not included.

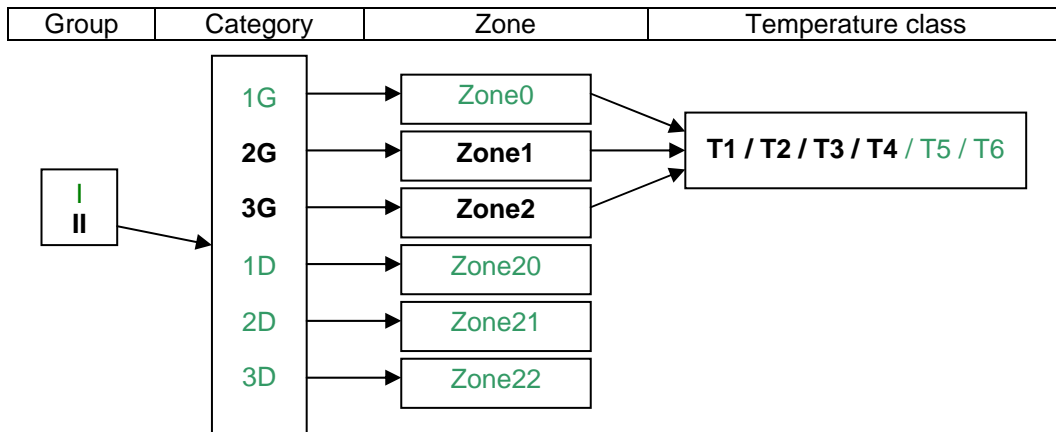
INFO FOR ATEX



To avoid risk of explosions in an Ex-Zone, when you mount a **R** internal gear pump you have to check the following information:

1. EX - ZONE

1.1. The **R** internal gear pumps can be used in the zones and categories signed in bold:



2. ATEX REQUIREMENTS

- 2.1. The pump and the bearings has to be inspected monthly.
- 2.2. Pumps with mechanical seal: The mechanical seal can leak. If the pumped liquid is inflammable in the outside of the pump you have to declare a zone 1 (Category 2).
- 2.3. Pumps with packing: It is not allowed to use the pump with flammable fluids (conform to ATEX) because the packing has a permanent leakage. It is not recommended to use the pump with packing in Category 2 and it is not allowed to use the packing without leakage.
- 2.4. The pump has to be earthed.
- 2.5. There is a danger of electrostatic charging if the paint on the unit has a coating thickness of more than 0.2 mm.
- 2.6. With solids in the liquid the pump can block. It is therefore necessary to mount for the electric motor an automatic switch (PTC if used with inverter).
- 2.7. Use the pump only in the authorized performances levels indicated in performance curve, technical datasheet and instructions! The liquid should never be pumped on the limit of vaporisation, crystallisation, polymerisation or solidification. If the pump has to be used in a different duty not indicated in the ATEX schedule or in the technical datasheet of the pump, please check the use and ask for authorisation of use from the manufacturer.
- 2.8. The pump-materials have to be compatible with the liquid. This responsibility can not be taken by the manufacturer.

INFO FOR ATEX

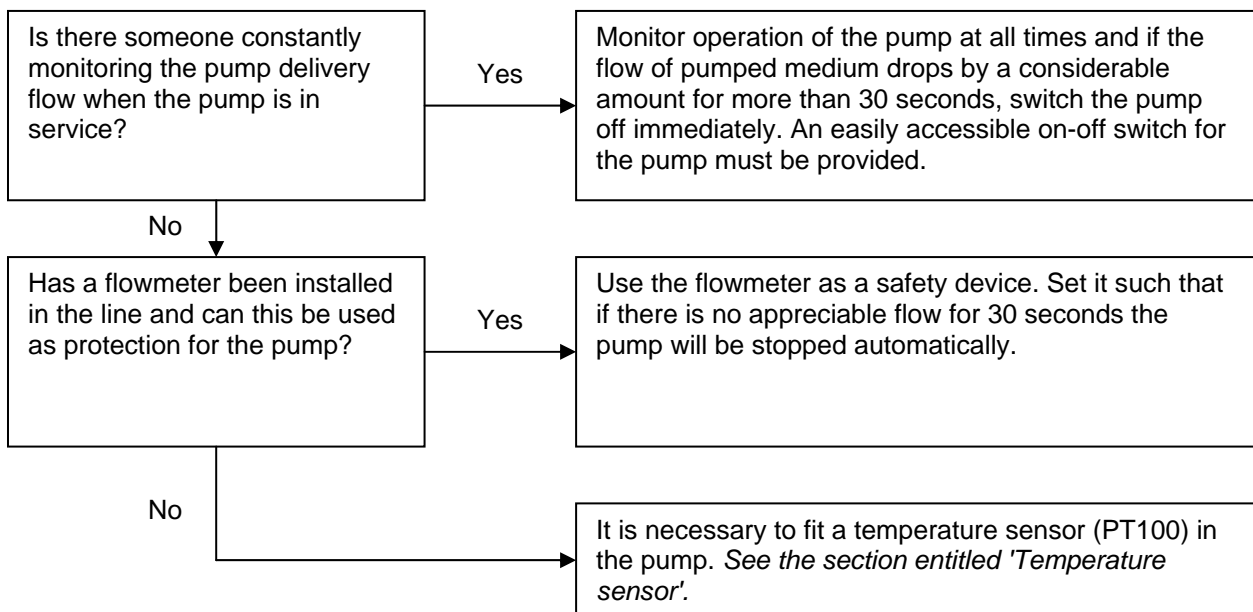
- 2.9. The operating temperature of the pump must not exceed the values given below. If a pumped medium is capable of reaching this temperature, it is not permitted to put the pump into service. A temperature sensor can be used for checking. On request other values can be permitted by the manufacture. This will be indicated specifically in the technical data sheet.

Temperature class acc. to DIN EN 13463-1	Maximum operating temperature* for pump with		
	Packing °C	Mechanical seal °C	Magnet-coupling °C
T1	200(300)	150	200
T2	200(240)	150	200
T3	140	150	160
T4	75	95	105

* Above 140°C the pump has to be painted with high temperature paint.

() H. version of the pump

- 2.10. The R internal gear pump is a volumetric pump. It is not allowed to regulate the flow by closing the suction or discharge side. Flow regulation can be achieved only through speed changing or an external by pass line.
- 2.11. It is not permitted to start the pump with closed suction and/or discharge line. The user should take efforts to avoid this situation. To secure the pump against a closed discharged line you can use the internal safety relief valve (+Y). Never use the internal safety relief valve as a standard by-pass line. As an alternative you can use an external by pass line. This by pass line has to be large enough, always able to work and preferably returning to the suction tank.
- 2.12. Measures such as are listed below should be taken against dry running:



- 2.13. With **R** magnetic driven internal gear pumps the port position and the flow direction can not be changed afterwards.
- 2.14. It is necessary to check the magnetic coupling with an temperature sensor (Type PT100).
- 2.15. If the starting torque of the pump is near or exceeds the torque limit of the magnetic coupling it is necessary to use a soft-start device or a frequency converter.

INFO FOR ATEX

3. TEMPERATURE SENSOR

- 3.1. The sensor monitors temperature changes in the pumped medium. This means that a closed pressure line or abnormal wear in the pump can be monitored by means of a temperature increase. When the limit temperature is exceeded, the sensor trips to shut off power to the pump drive and the pump stops.
- 3.2. This shut off device and associated wiring are not included in the scope of supply of the pump. The pump owner is required to have this installed himself by a suitably qualified technician.
- 3.3. Victor Pumps delivers the temperature sensor with integrated transmitter. The transmitter is regulated as follows:

Temperature range	OUT-Signal	Current
0-150 °C	4 - 20 mA, linear	8 - 30 VDC