Some Applications

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

Some Applications

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

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

General information

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.

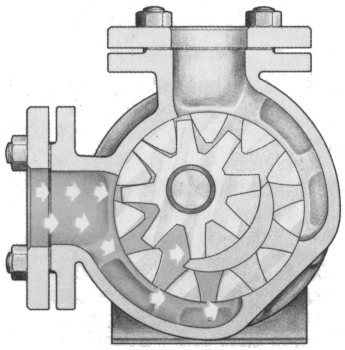
Compact
Compact pump construction, easy to install in existing or new plants. The casing, separate from the bearing housing can be positioned as required to change the position of the Inlet and discharge connections.

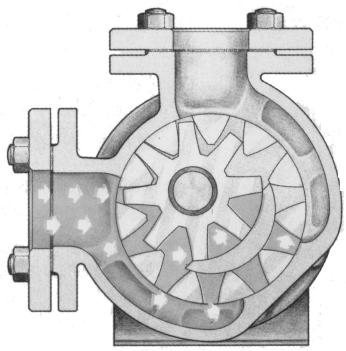
Temperature resistant
No elastomer parts required in the pump. Therefore particular suitable for pumping liquids with solvents or high temperature.

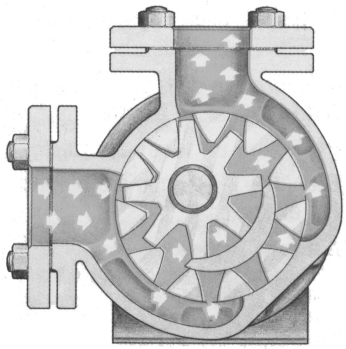
Heating Jacket
Heating chamber integral with the casing and around the shaft seal on most models. Heating Jacket is also available for the casing.

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


3/3

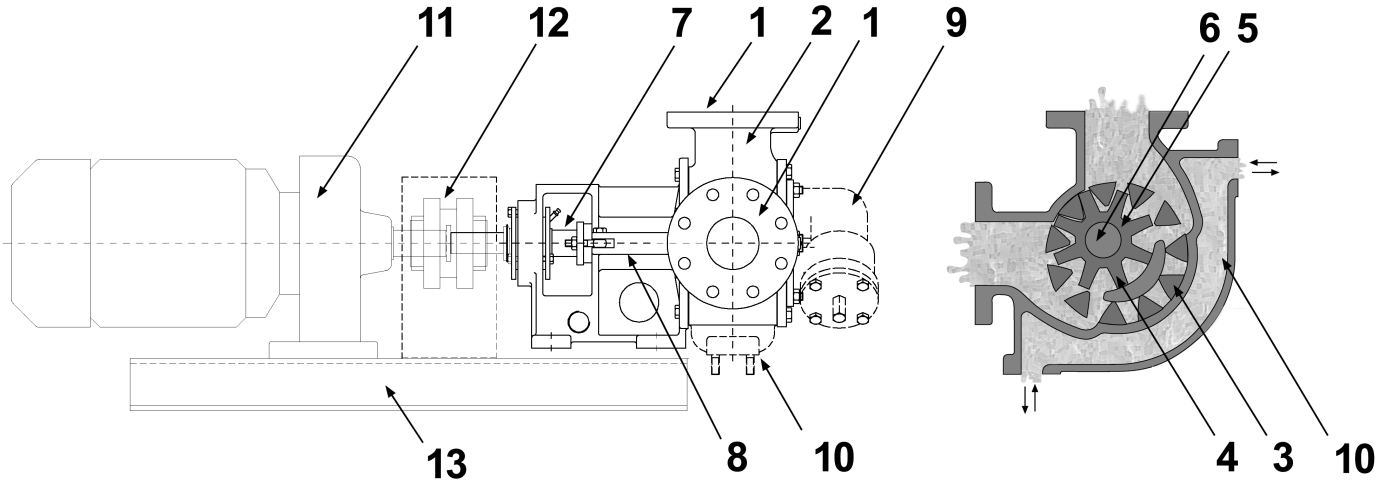
The **R** – internal gear pumps are positive displacement rotary pumps. Two gears generate the flow: the rotor and the idler. The rotor moves the internal idler. As the gears rotate liquid is drawn into the spaces created between the gears.

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.

Technical Data - Arangements

Arangements**:



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 mm^2/s).**
Maximum differential pressure with lubricating liquids (viscosity > 100 mm^2/s).
Pression différentielle max. avec liquides lubrifiants (viscosité > 100 mm^2/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 mm^2/s).**
Maximum differential pressure with abrasive liquids (viscosity > 100 mm^2/s).
Pression différentielle max. avec liquides abrasifs (viscosité > 100 mm^2/s).

D **Max. Betriebsdruck.**
Maximum operating pressure.
Pression de service max.

E **Prüfdruck.**
Test pressure.
Pression d'essai.

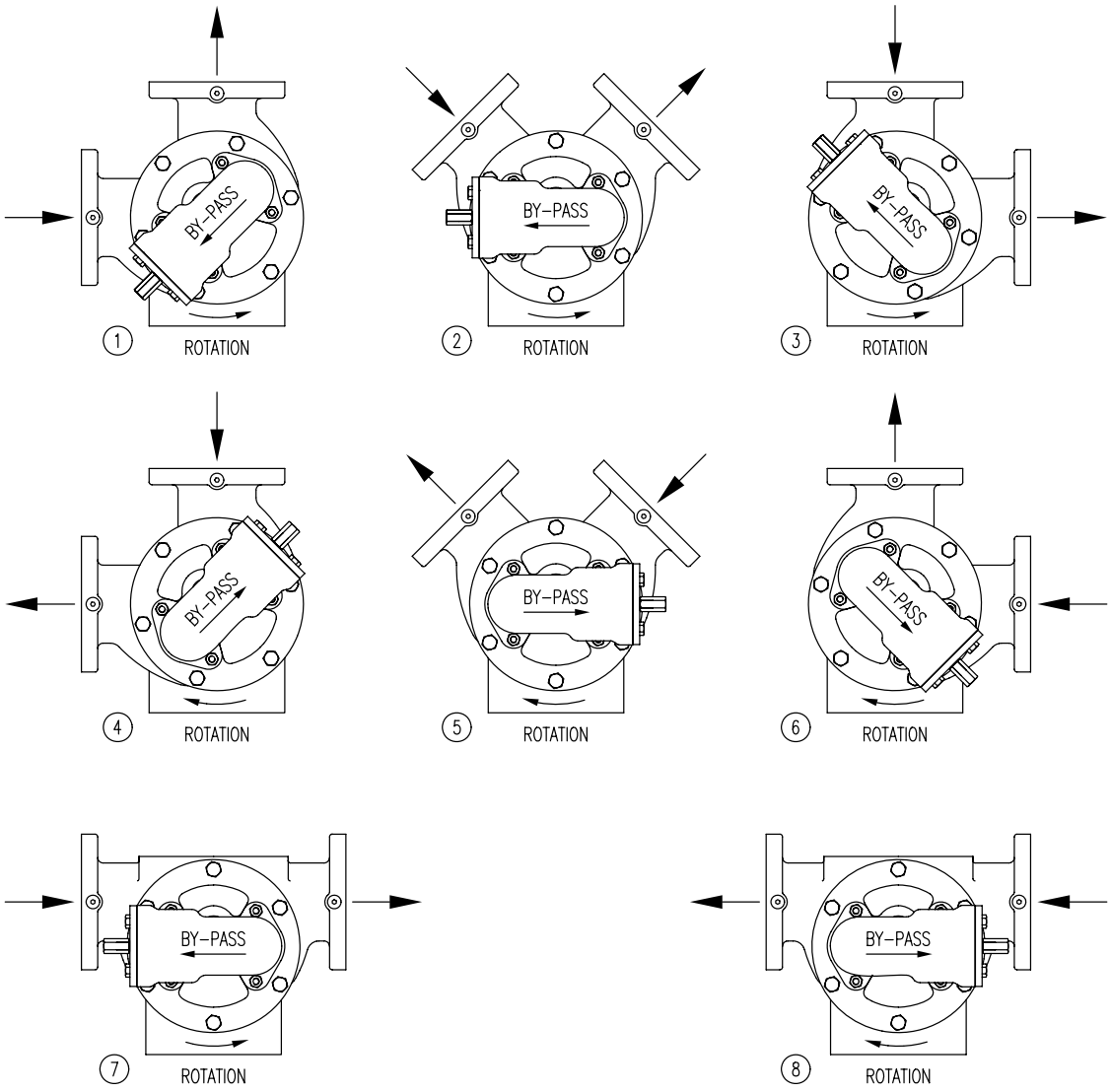
Type Type *Type*	**Nenngeschwindigkeit** Rated speed *Vitesse nominale*	**Empfohlene Geschwindigkeit mit scheuernden Flüssigkeiten** Recommended speed with abrasive liquids *Vitesse conseillée avec liquides abrasifs*
R 35	1450	500
R 40	1450	500
R 50	960	315
R 65	800	250
R 80	630	200
R 105	560	180
R 151	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 ⅓ der Nenngeschwindigkeit reduziert werden.**

* To increase the life of the pump with abrasive liquids, reduce the pump speed to ⅓ 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.*

Port Arrangement



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:

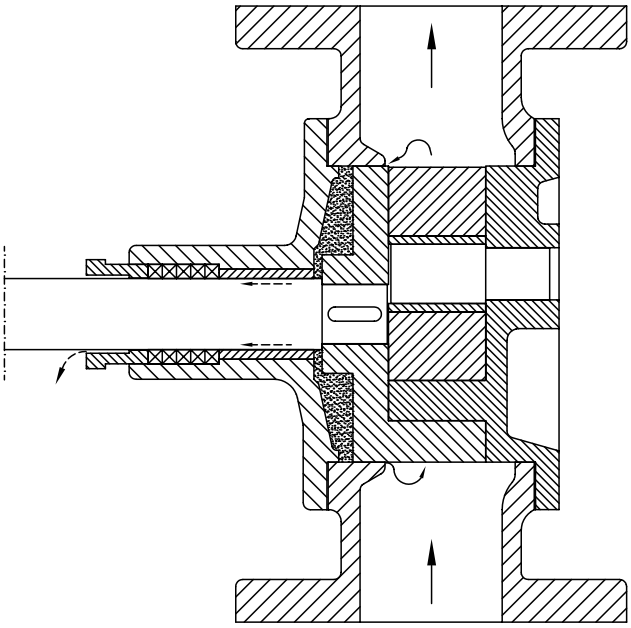
Pump Size	Port Arrangement
R 35, R 40	1, 3, 4, 6, 7[1-2], 8[1-2]
R 50	1, 2, 3, 4, 5, 6, 7[2], 8[2]
R 65, R 80	1, 2, 3, 4, 5, 6, 7[2], 8[2]
R 105, R 151	1, 2, 3, 4, 5, 6
R 200, R 250	7, 8

[1] R1½" threaded
[2] price supplement

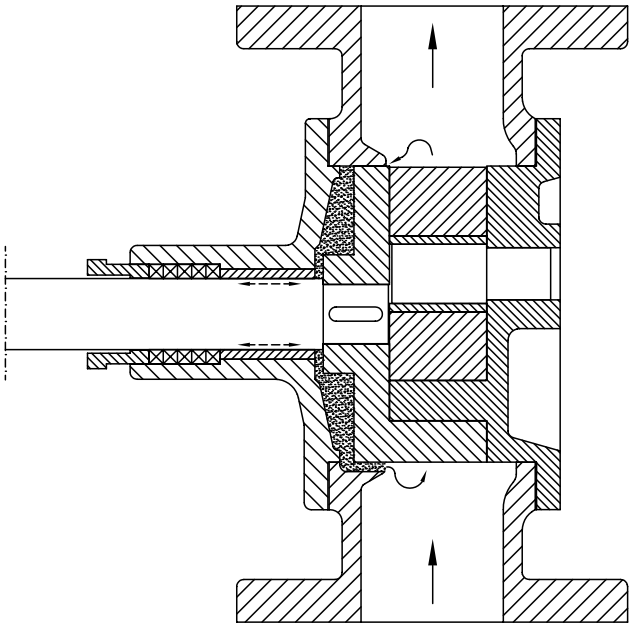
The port arrangement can be changed afterwards on site. Please ask your dealer or distributor for more informations.

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

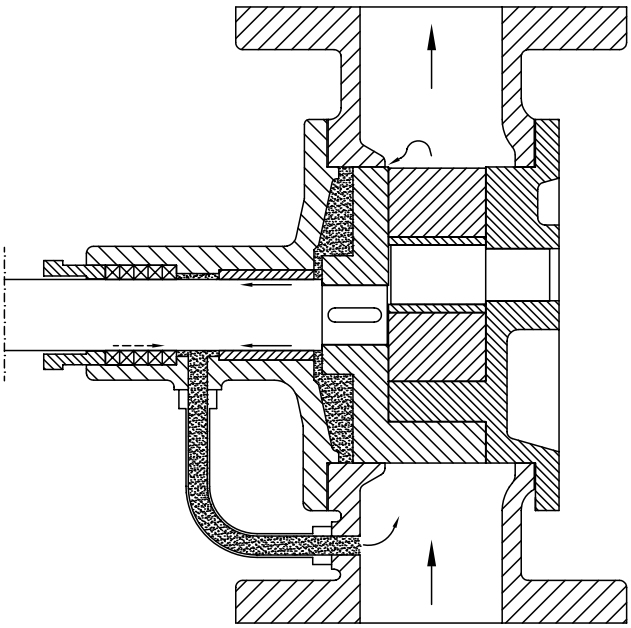
.1.



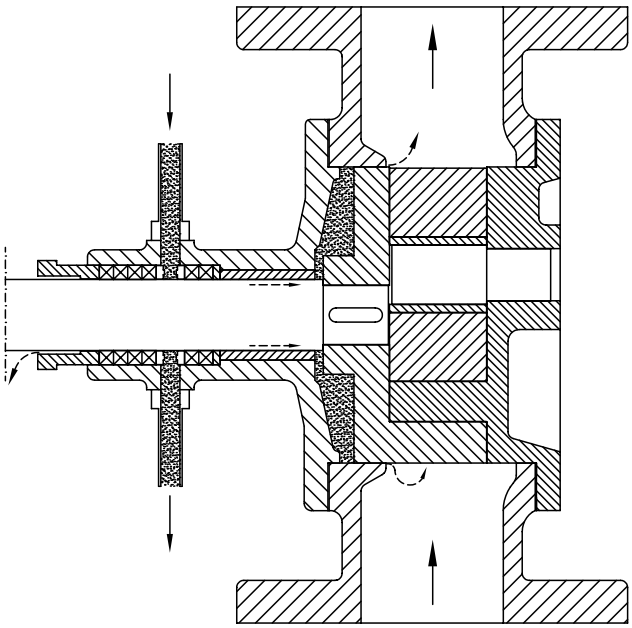
.N.



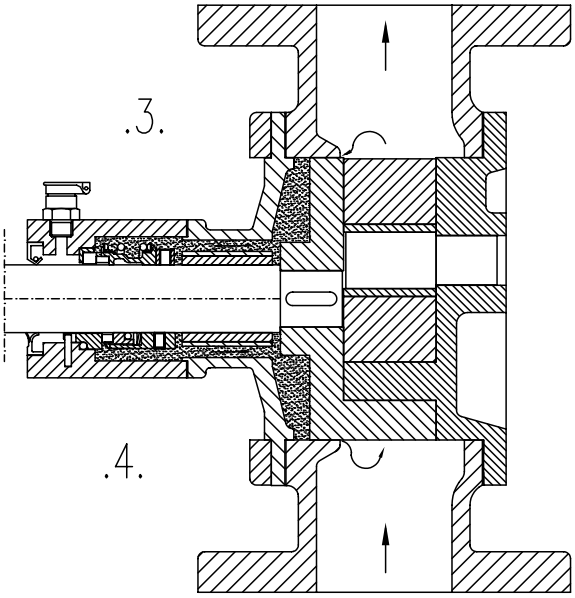
.22.

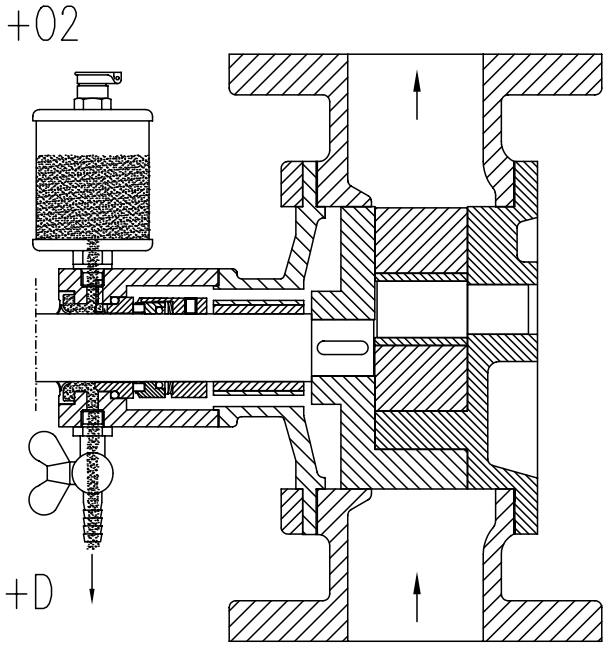


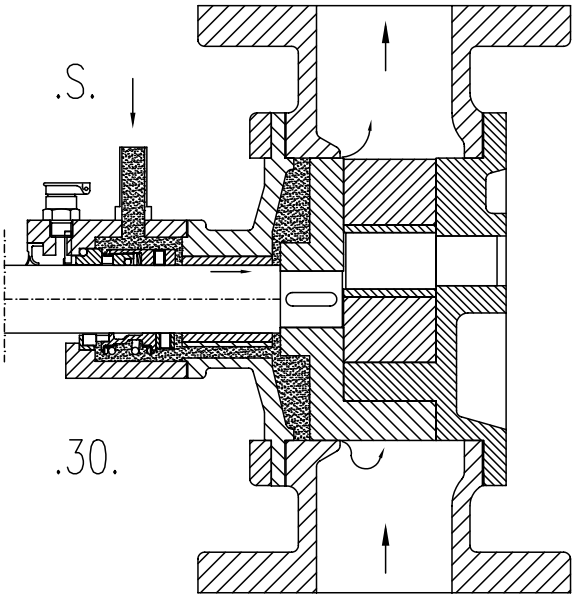
.2.

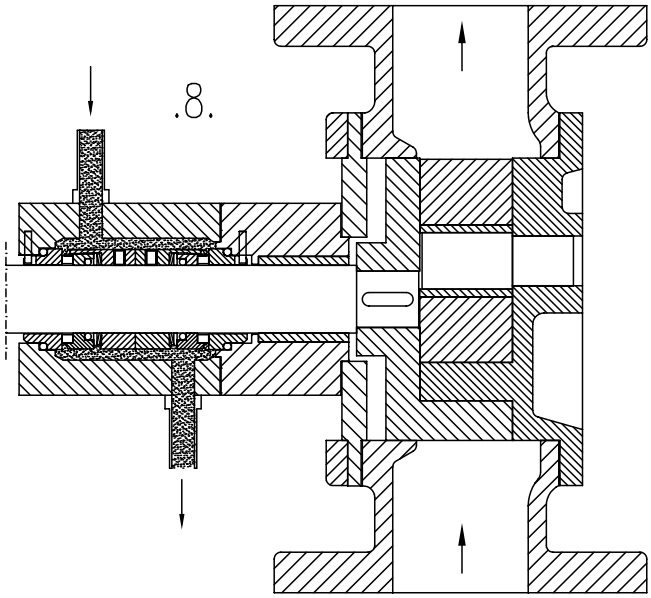


GERMANY • Tel. +49 89 9048660 • Fax +49 89 9043447 • germany@victorpumps.com
ITALY • Tel. +39 0498961266 • Fax +39 0498961255 • italy@victorpumps.com

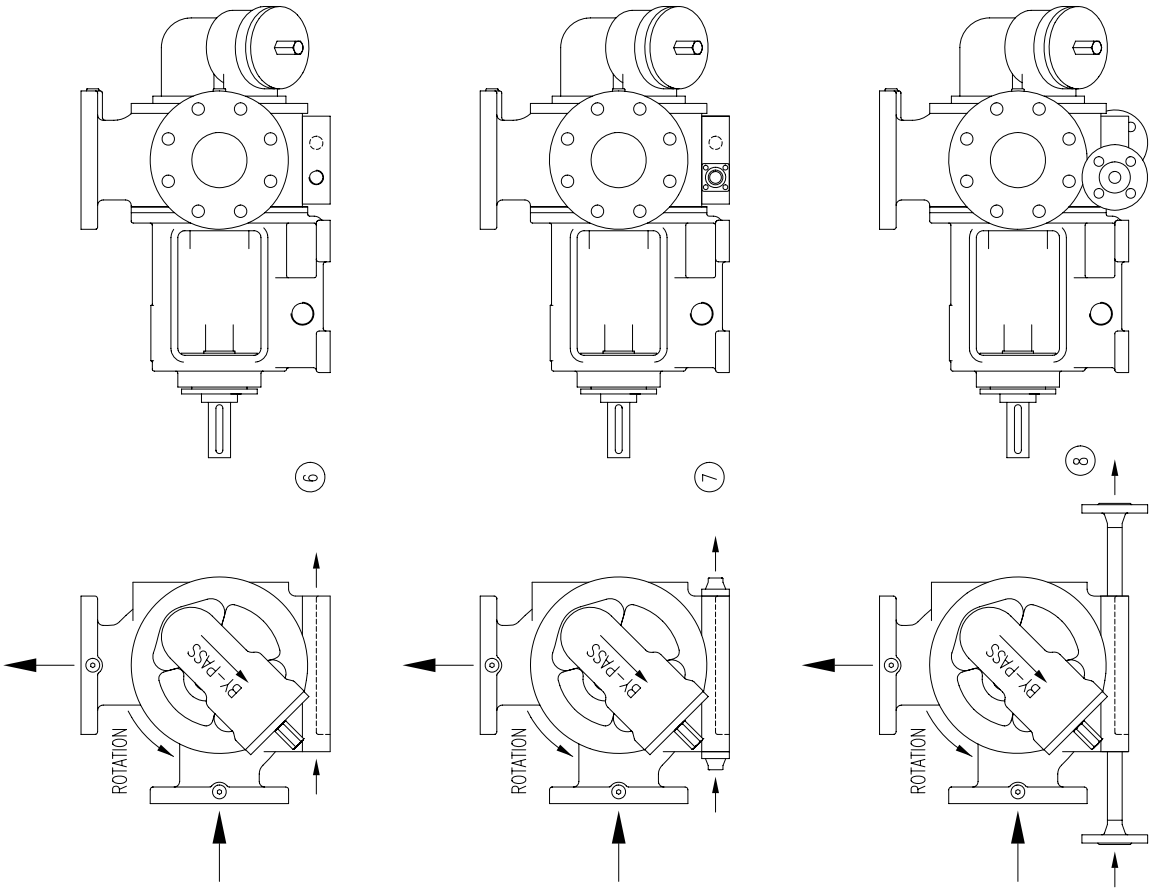

.3.
.4.

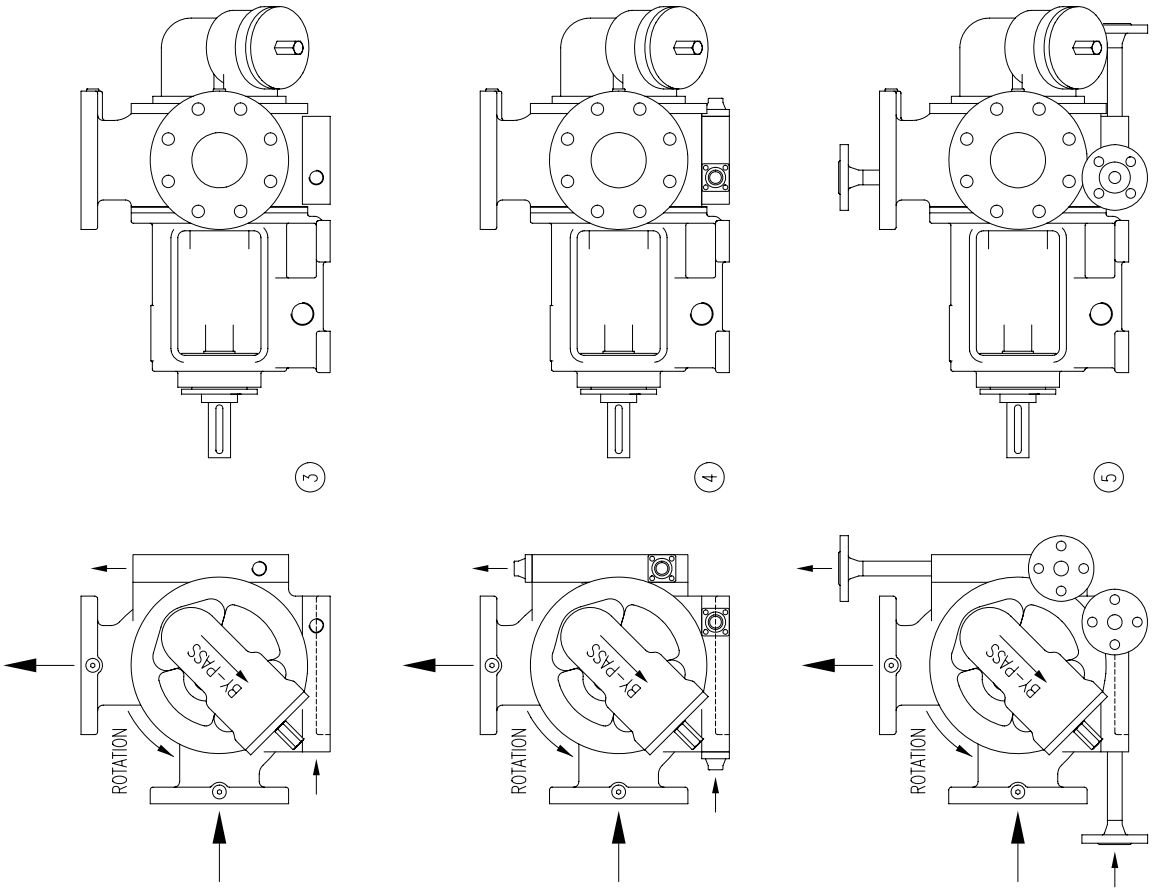

+02
+D


.S.
.30.


.8.

Heizplatten - Heating plates



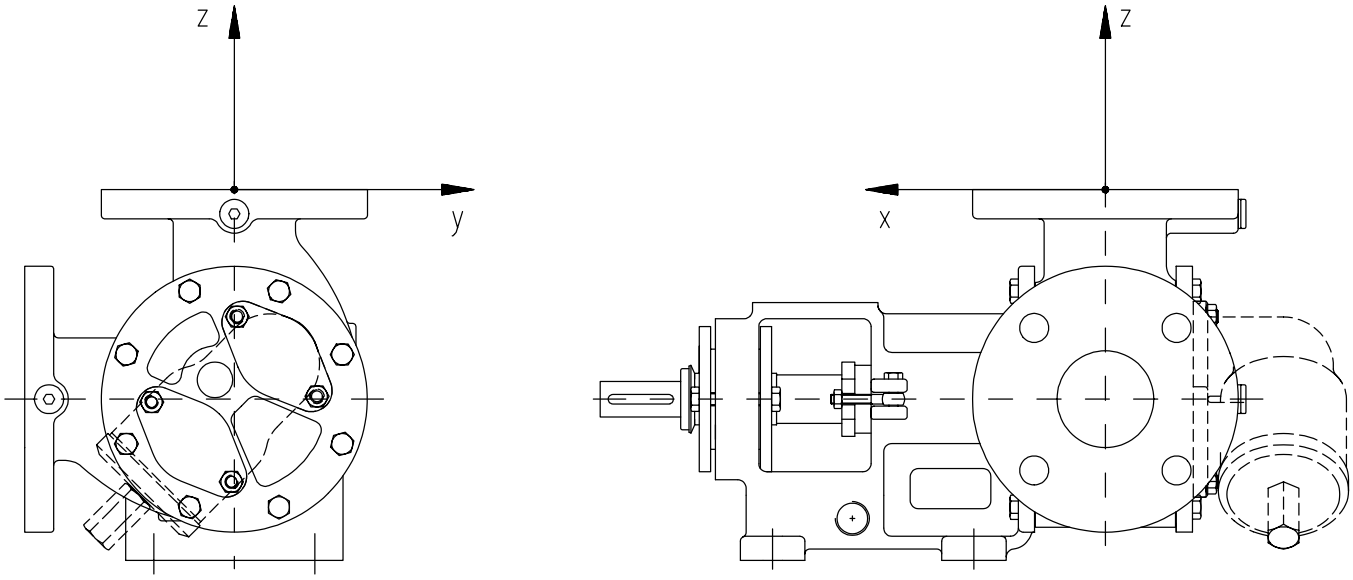


R 812272

GERMANY • Tel. +49 89 9048660 • Fax +49 89 9043447 • germany@victorpumps.com
ITALY • Tel. +39 0498961266 • Fax +39 0498961255 • italy@victorpumps.com

Maximum Nozzle Loads

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.



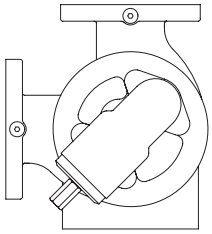
Fx, Fy, Fz → Forces along the axes expressed in N (Newton).
Mx, My, Mz → Moment of flexure around the axes expressed in Nm (Newton meters).

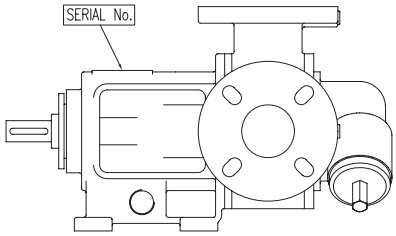
The maximum loads permitted on the flanges are:

Pump type	DN Ports mm	Fx, Fy, Fz N	Mx, My, Mz 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:

Group	Category	Zone	Temperature class
I **II**	1G **2G** **3G** 1D 2D 3D	Zone0 **Zone1** **Zone2** Zone20 Zone21 Zone22	**T1 / T2 / T3 / T4** / T5 / T6

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 leackage.

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

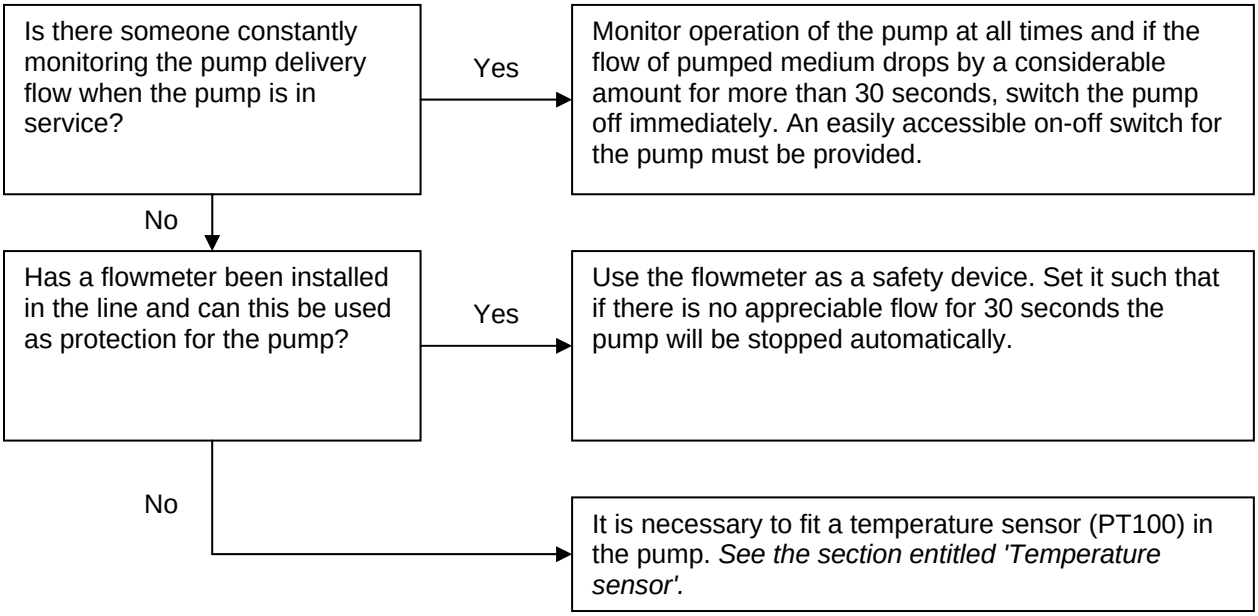
* Above 140°C the pump has to be painted with high temperature paint.

( ) 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