

Radial piston pump, fixed displacement

RE 11260/08.05
Replaces: 07.02

1/8

Type PR4

Sizes 0.40 to 2.00 cm³
Component series 1X
Maximum operating pressure 700 bar



R4_d
PR4-1X/1,00-450WA01M01

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Features

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	– Self-priming, valve-controlled
2	– Very low noise
2	– Long service life due to hydrodynamically lubricated plain bearings
3	– Very compact design, therefore installation-friendly dimensions
4	– Can be combined with fixed and variable displacement vane pumps
5	– 5 sizes
6	
7	
8	
8	

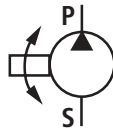
Ordering code

PR	4	1X	W	01	01	*
Type of component Pump, radial = PR						Further details in clear text
Series = 4						Number of pressure ports 01 = 1 pressure port
Component series Component series 10 to 19 (10 to 19: unchanged installation and connection dimensions) = 1X						Seal material M = NBR seals V = FKM seals
Component size Component size pressure stage (maximum)						Pipe connection 01 = Pipe thread to ISO 228/1
0.40 cm ³ = 0.40-700						Shaft version
0.63 cm ³ = 0.63-700						A = Cylindrical shaft end
1.00 cm ³ = 1.00-450						G = Splined shaft end for combination with vane pumps
1.60 cm ³ = 1.60-250						
2.00 cm ³ = 2.00-175						
Direction of rotation Clockwise and counter-clockwise rotation = W						

Note:

All five sizes are pumps with 3 pistons!

Symbol



Function, section

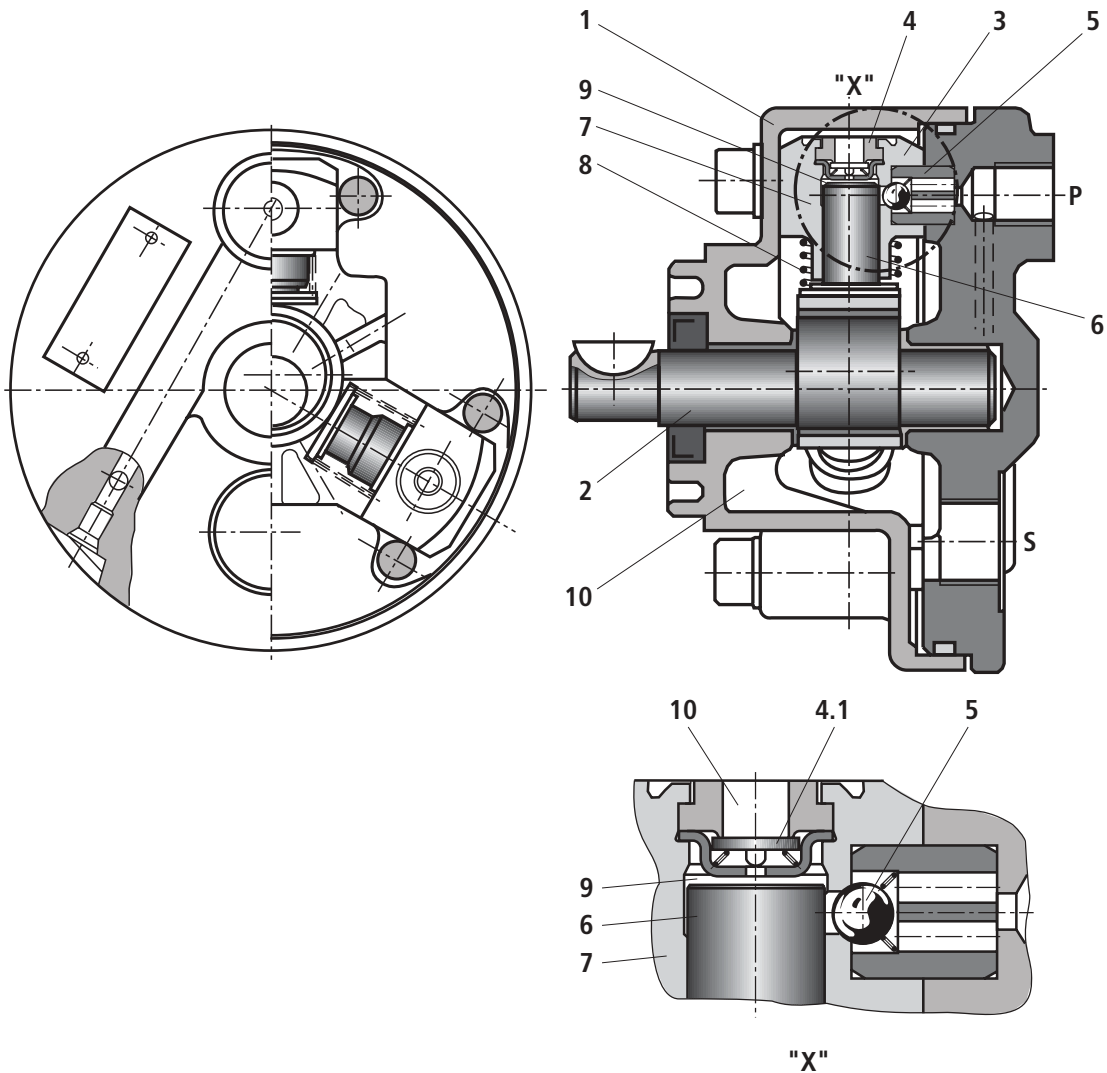
These pumps are valve-controlled, self-priming radial piston pumps with fixed displacement.

They basically consist of housing (1), eccentric shaft (2) and pump elements (3), with suction valve (4), pressure valve (5) and piston (6).

Suction and displacement process

Pistons (6) are arranged radially to eccentric shaft (2). Piston (6) is guided in cylinder (7) and pressed by spring (8) onto eccentric (2). During the downward stroke of piston (6), the work-

ing chamber (9) in cylinder (7) increases in size. The resulting negative pressure lifts suction valve plate (4.1) from the sealing edge. This opens the connection between suction chamber (10) to working chamber (9). The working chamber fills with fluid. During the upward movement of piston (6), the suction valve closes and pressure valve (5) opens. Fluid can now flow via pressure port (P) to the system.



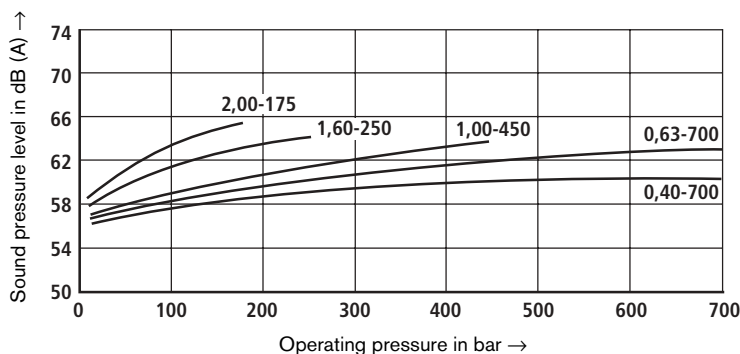
Technical data (for applications outside these parameters, please consult us!)

Speed range	min ⁻¹	Size 0.40	1000 to 3400 min ⁻¹
		Size 0.63	1000 to 3000 min ⁻¹
		Size 1.00	1000 to 2000 min ⁻¹
		Size 1.60	1000 to 2000 min ⁻¹
		Size 2.00	1000 to 2000 min ⁻¹
Operating pressure	Inlet	bar	0.8 to 1.5 absolute
	Outlet	bar	Size 0.40 700 bar Size 0.63 700 bar Size 1.00 450 bar Size 1.60 250 bar Size 2.00 175 bar
Max. permissible torque (drive shaft)	Nm	10	
Installation orientation	Size 0.40-700 Horizontal installation: The suction port should be located vertically above the pressure port. This arrangement improves bleeding of the pump. Vertical installation: No restrictions. All other sizes can be installed at any position.		
Shaft loading	Radial and axial forces cannot be absorbed!		
Type of mounting	Face mounting		
Pipe connections	Screw-in fittings		
Direction of rotation (viewed to shaft end)	Counter-clockwise or clockwise, has no influence on the direction of flow		
Hydraulic fluid	HLP mineral oil to DIN 51524 part 2 Please note the regulations laid down in RE 07075!		
Hydraulic fluid temperature range	°C	-10 to +70	
Viscosity range	mm ² /s	10 to 200	
Max. permissible degree of contamination of the hydraulic fluid - cleanliness classes to ISO 4406 (c)	Class 20/18/15 ¹⁾		
Weight	kg	2.6	

¹⁾ The cleanliness classes specified for components must be adhered to in hydraulic systems. Effective filtration prevents malfunction and, at the same time, prolongs the service life of components.

For the selection of filters, see data sheet RE 51144.

Sound pressure level (average value): (measured at $n = 1450 \text{ min}^{-1}$, $v = 41 \text{ mm}^2/\text{s}$ and $\vartheta = 50 \text{ °C}$)



Measured in an anechoic chamber to DIN 45 635, part 26

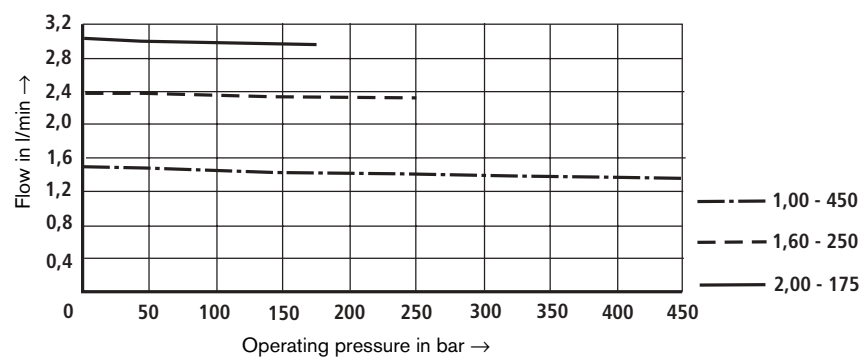
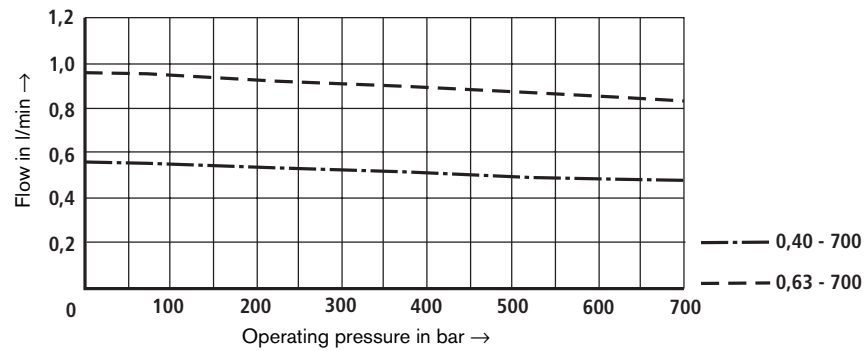
Distance:
Microphone – pump = 1 m

At a system pressure below 4 bar and a viscosity > 150 mm²/s, audible valve noise may occur.

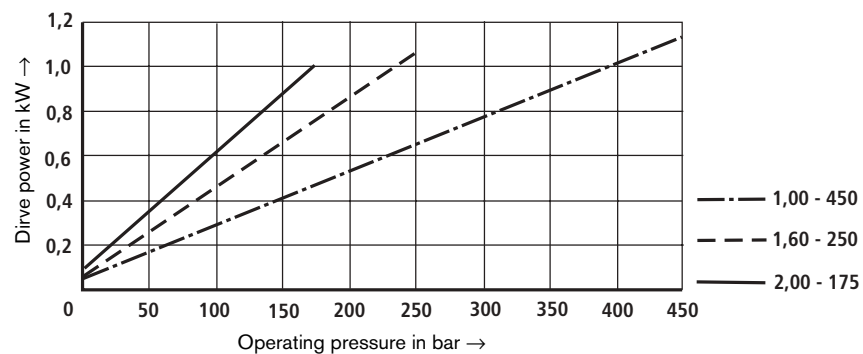
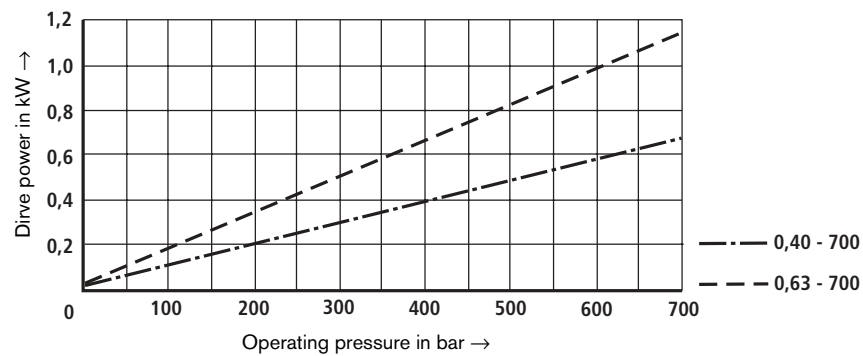
Sound pressure level at system pressure < 4 bar: ≤ 58 dB(A)

Characteristic curves (measured at $n = 1450 \text{ min}^{-1}$, $v = 41 \text{ mm}^2/\text{s}$ and $\vartheta = 50 \text{ }^\circ\text{C}$)

Flow



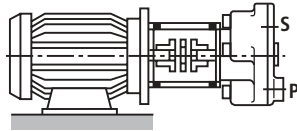
Drive power



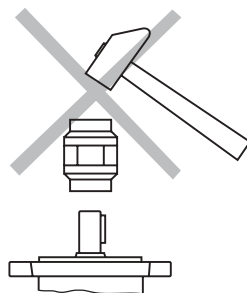
Installation notes

Drive

El. motor + pump mounting bracket + coupling + pump

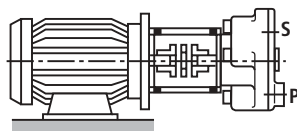


- No radial and axial forces permitted on the pump drive shaft!
- Motor and pump must be exactly aligned!
- Always use a coupling that is suitable for compensating for shaft offsets!
- When installing the coupling, avoid axial forces, that is, **do not hammer or press the coupling onto the shaft!** Use the female thread of the drive shaft!

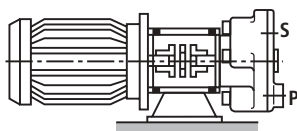


Installation positions

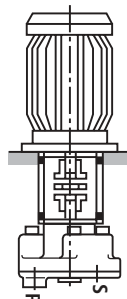
B3



B5



V1



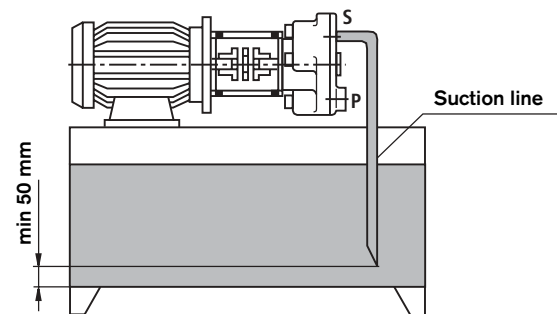
Fluid tank

- Adjust the useful capacity of the tank to the operating conditions
- The permissible fluid temperature must not be exceeded; if required, provide cooler

Lines and connections

- Remove protective plug from pump
- We recommend the use of seamless precision steel pipes according to DIN 2391 and pipe connections that can be loosened
- Select the clear width of pipes according to the connections (suction velocity 1 to 1.5 m/s)
- For inlet pressure, see page 4
- Thoroughly clean pipes and fittings before their installation

Recommendation for piping



- The returning oil must **under no circumstances** be re-apsed directly, i.e. select the largest possible distance between suction and return line
- The return oil outlet must always be immersed in the oil
- Ensure suction-tight installation of the pipes

Filters

- If possible, use return line or pressure filters.
(Use suction filters only in conjunction with an underpressure switch/clogging indicator)

Hydraulic fluid

- Please observe our regulations according to data sheet RE 07075
- We recommend the use of branded hydraulic oils
- Different oil grades must not be mixed, since this can result in decomposition and deterioration of the lubricating properties
- The fluid must be changed at certain intervals depending on the operating conditions. This involves cleaning of the fluid tank from residues.

Engineering notes

Comprehensive notes and suggestions can be found in The Hydraulic Trainer, Volume 3 RE 00281, "notes on the planning and design of hydraulic systems".

When using radial piston pumps, the following notes should be observed in particular.

Technical data

All technical data given depend on manufacturing tolerances and are valid in conjunction with certain boundary conditions. Please note that certain deviations are therefore possible, and that technical data may vary when boundary conditions (e.g. viscosity) change.

Characteristic curves

Characteristic curves for flow and required power. When dimensioning the drive motor, observe the permissible maximum data.

Noise

The sound pressure level values given on page 4 were measured in line with DIN 45635 part 26. This means that only the noise emitted by the pump is shown. Influences by the surroundings (such as place of installation, piping, etc.) were eliminated. The values always refer to only one pump

Caution!

Due to the power unit design and influences at the final place of installation of the pump, the noise pressure level is usually 5 to 10 dB(A) higher than the value of the pump itself.

Commissioning notes

Bleeding

- All radial piston pumps of type PR4 are self-priming.
- Fill the housing with filtered oil via port S.
- For initial commissioning, set the pump to pressureless circulation. To this end, disconnect the pressure hose and route it to the tank.
- Before initial commissioning, the pump must be bled in order to protect it from damage.
- Switch over to pressureless circulation or route the pressure line or pressure hose back to the tank.
- Briefly switch the pump on (inching mode).
- Should the pump not displace bubble-free oil after approx. 20 seconds, re-check the system. After having reached operating values, check the pipe connections for leakage. Check the operating temperature.
- Take note of the generation of noise.

Commissioning

- Check that the system is properly and correctly installed.
- Start the pump under no-load conditions and let it displace fluid for some seconds at zero pressure to ensure sufficient lubrication.
- **In no case may the pump be operated without fluid!**

Important notes

- Adjustments, maintenance and repair of the pump may only be carried out by authorised, trained and instructed personnel!
- Use only genuine Rexroth spare parts!
- The pump may only be operated at the permissible data.
- The pump may only be operated when in perfect condition!
- When carrying out any work on the pump (e.g. installation or removal), the system must be switched off and depressurised!
- Unauthorised conversions or changes that affect safety and function are not permitted!
- Attach protective guards (e.g. coupling protection)!
- Any existing protective guards must not be removed!
- The generally valid safety regulations and regulations for the prevention of accidents must be strictly observed!

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