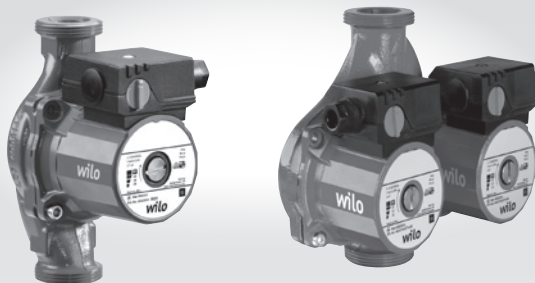


## Wilo-Star RS, RSD



**en** Installation and operating instructions

Fig. 1:

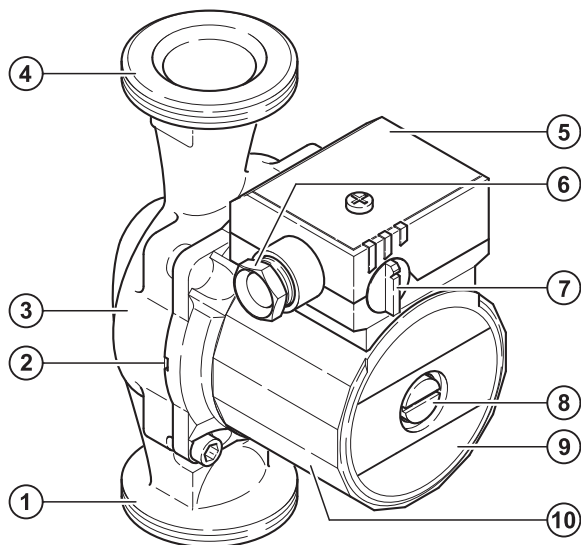


Fig. 2:

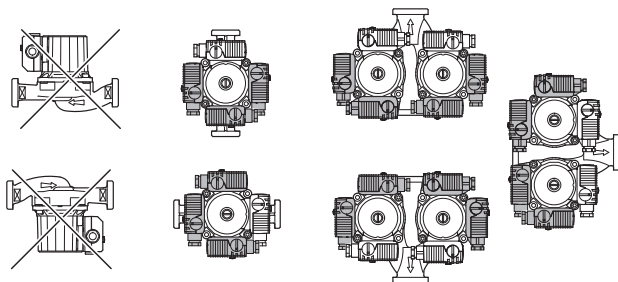


Fig. 3:

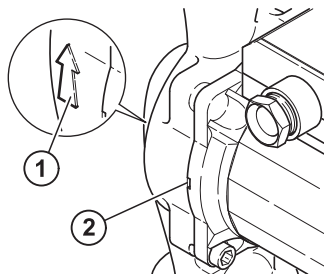


Fig. 4:

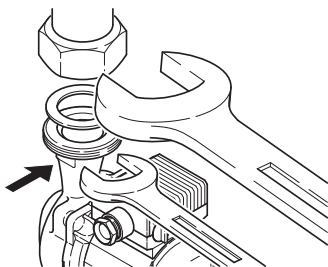


Fig. 5:

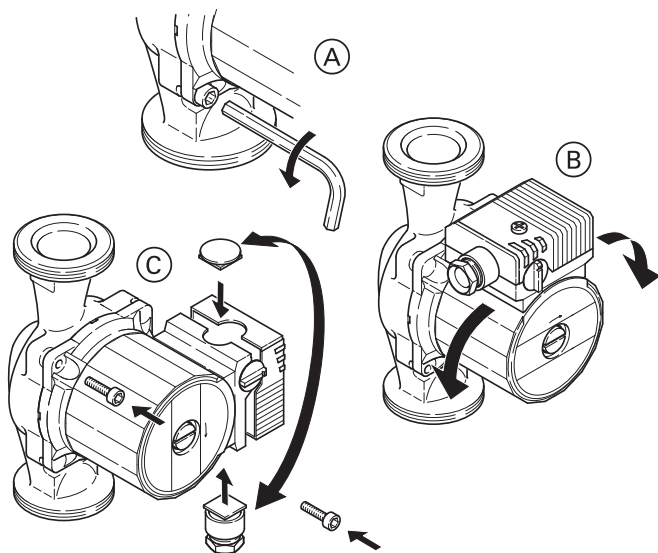


Fig. 6:

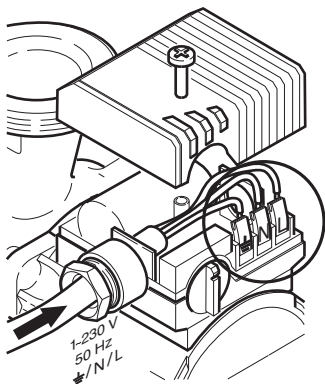


Fig. 6a:

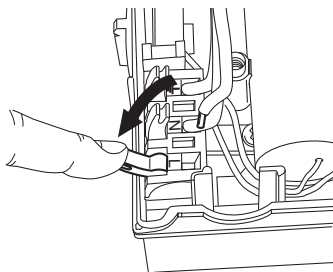


Fig. 6b:

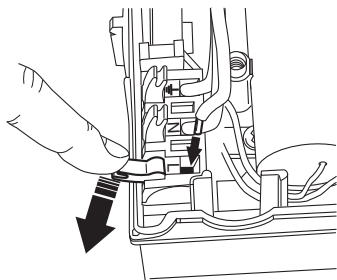


Fig. 6c:

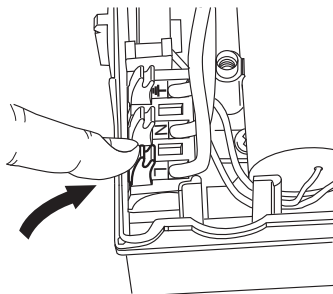


Fig. 7:

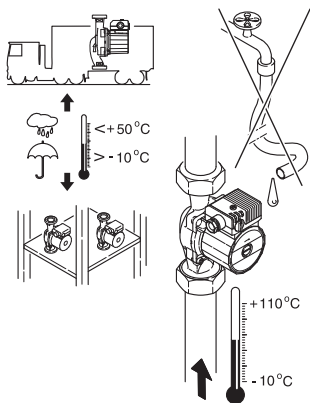


Fig. 8:

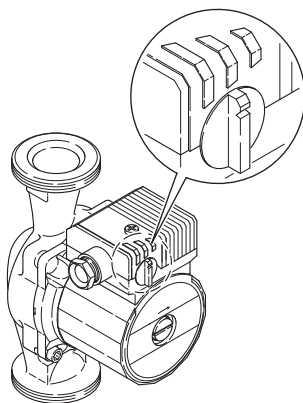
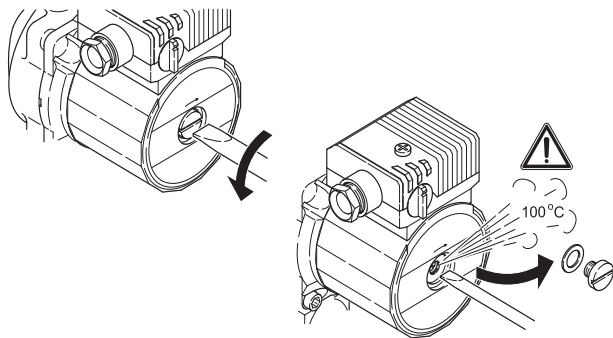


Fig. 9:





## 1 General

### About this document

The language of the original operating instructions is German. All other languages of these instructions are translations of the original operating instructions.

These installation and operating instructions are an integral part of the product. They must be kept readily available at the place where the product is installed. Strict adherence to these instructions is a precondition for the proper use and correct operation of the product.

The installation and operating instructions correspond to the relevant version of the product and the underlying safety regulations and standards valid at the time of going to print.

## 2 Safety

These operating instructions contain basic information which must be adhered to during installation, operation and maintenance. For this reason, these operating instructions must, without fail, be read by the service technician and the responsible specialist/operator before installation and commissioning. It is not only the general safety instructions listed under the main point "safety" that must be adhered to but also the special safety instructions with danger symbols included under the following main points.

## 2.1 Indication of instructions in the operating instructions

**Symbols:**

**General danger symbol**



**Danger due to electrical voltage**



**Note:**



**Signal words:**

**DANGER!**

**Acutely dangerous situation.**

**Non-observance results in death or the most serious of injuries.**

**WARNING!**

**The user can suffer (serious) injuries. "Warning" implies that (serious) injury to persons is probable if this note is disregarded.**

**CAUTION!**

**There is a risk of damaging the product/unit. "Caution" concerns possible damage to the product that could occur if this note is disregarded.**

**Note:** Useful information on handling the product. It draws attention to possible problems.

Information that appears directly on the product, such as

- direction of rotation arrow
- identification for connections
- rating plate
- warning sticker

must be strictly complied with and kept in legible condition.



## **2.2 Personnel qualifications**

The installation, operating and maintenance personnel must have the appropriate qualifications for this work. Area of responsibility, terms of reference and monitoring of the personnel are to be ensured by the operator. If the personnel are not in possession of the necessary knowledge, they are to be trained and instructed. This can be accomplished if necessary by the manufacturer of the product at the request of the operator.

## **2.3 Danger in the event of non-observance of the safety instructions**

Non-observance of the safety instructions can result in risk of injury to persons and damage to the environment and the product/unit. Non-observance of the safety instructions results in the loss of any claims to damages.

In detail, non-observance can, for example, result in the following risks:

- Danger to persons from electrical, mechanical and bacteriological influences
- Damage to the environment due to leakage of hazardous materials
- Property damage
- Failure of important product/unit functions
- Failure of required maintenance and repair procedures.

## **2.4 Safety consciousness on the job**

The safety instructions included in these installation and operating instructions, the existing national regulations for accident prevention together with any internal working, operating and safety regulations of the operator are to be complied with.

## **2.5 Safety instructions for the operator**

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

- If hot or cold components on the product/the unit lead to hazards, local measures must be taken to guard them against touching.
- Guards protecting against touching moving components (such as the coupling) must not be removed whilst the product is in operation.
- Leakages (e.g. from the shaft seals) of hazardous fluids (which are explosive, toxic or hot) must be led away so that no danger to persons or to the environment arises. National statutory provisions are to be complied with.
- Danger from electrical current must be eliminated. Local directives or general directives [e.g. IEC, VDE etc.] and local energy supply companies must be adhered to.

## **2.6 Safety instructions for installation and maintenance work**

The operator must ensure that all installation and maintenance work is carried out by authorised and qualified personnel, who are sufficiently informed due to their own detailed study of the installation and operating instructions.

Work to the product/unit must only be carried out when at a standstill. It is mandatory that the procedure described in the installation and operating instructions for shutting down the product/unit be complied with.

Immediately on conclusion of the work, all safety and protective devices must be put back in position and/or recommissioned.

## **2.7 Unauthorised modification and manufacture of spare parts**

Unauthorised modification and manufacture of spare parts will impair the safety of the product/personnel and will make void the manufacturer's declarations regarding safety.

Modifications to the product are only permissible after consultation with the manufacturer. Original spare parts and accessories authorised by the manufacturer ensure safety. The use of other parts will absolve us of liability for consequential events.

## **2.8 Improper use**

The operating safety of the supplied product is only guaranteed for conventional use in accordance with Section 4 of the operating instructions. The limit values must on no account fall under or exceed those specified in the catalogue/data sheet.

### 3 Transport and interim storage

Immediately after receiving the product:

- Check the product for damage in transit
- In the event of damage in transit, take the necessary steps with the forwarding agent within the respective time limits.



**CAUTION! Risk of damage to property!**

**Incorrect transport and interim storage can cause damage to the product (Fig. 7).**

- **The pump should be protected from moisture, frost and mechanical damage due to impact during transport and interim storage.**
- **The pump must not be exposed to temperatures outside the range of -10 °C to +50 °C.**

### 4 Intended use

The circulation pumps in the Wilo-Star RS series are designed for hot-water heating systems and similar systems with constantly changing volume flows.

Approved fluids are heating water in accordance with VDI 2035, water/glycol mixture at a mixing ratio of max. 1:1. If glycol is added, the delivery data of the pump must be corrected according to the higher viscosity, depending on the mixing ratio percentage.

Only use brand-name goods with corrosion protection inhibitors and observe the manufacturer's specifications. WILO's approval is necessary for the use of other fluids.

Intended use also includes following these instructions.

Any other use is not regarded as intended use.

## 5 Product information

### 5.1 Type key

#### Example: Wilo-Star-RS 25/4

Star-RS	RS = heating circulation pump, glandless pump RSD = double heating circulation pump, glandless pump
25	Screwed connection 15, (Rp ½), 25 (Rp1), 30 (Rp1 ½)
/4	4 = maximum delivery head in m at Q = 0 m³/h

### 5.2 Technical data

Connection voltage	1 ~ 230 V ± 10 %
Mains frequency	50 Hz
Protection class IP	See rating plate
Max. motor speed	See rating plate
Water temperatures at max. ambient temperature of +40 °C	-10 °C to +110 °C
Max. ambient temperature	+40 °C
Max. operating pressure	10 bar (1000 kPa)
Minimum inlet pressure <sup>1)</sup> at +50 °C/+95 °C/+110 °C	0.05 bar / 0.3 bar / 1.0 bar (5 kPa / 30 kPa / 100 kPa)
Port-to-port length	130 mm / 180 mm
Variable speed control <sup>2)</sup>	3 stages

<sup>1)</sup> The values apply up to 300 m above sea level; Addition for higher altitudes: 0.01 bar/100 m increase in height. To prevent cavitation noises, be sure to maintain the minimum inlet pressure at the suction port of the pump.

<sup>2)</sup> For Star-RSD double pumps, a switchgear is required in addition for time-dependent main/standby or parallel/peak-load operation.

### 5.3 Scope of delivery

- Complete circulation pump
- 2 flat gaskets
- Installation and operating instructions

## **5.4 Accessories**

Accessories must be ordered separately:

- Thermal insulation shell
  - Screwed connections
- See catalogue for detailed list.

# **6 Description and function**

## **6.1 Description of the product**

The pump (Fig. 1) consists of a hydraulic system, a glandless pump motor with terminal box. All the rotating parts in the glandless pump are in contact with the fluid, this is also true for the motor rotor. A shaft sealing, which is subject to wear, is not necessary. The fluid lubricates the slide bearings and cools the bearing and the rotor. Motor protection is not necessary. Even the maximum overload current cannot damage the motor. The motor is blocking-current proof.

### **Terms (Fig. 1):**

1. Suction port
2. Condensate drain
3. Pump housing
4. Pressure port
5. Terminal box
6. Cable feed-in
7. Speed switch
8. Venting
9. Rating plate
10. Motor housing

## 6.2 Function of the product

### Variable speed control (Fig. 8)

The pump's speed is switched in three stages using a rotary knob. The speed in the smallest stage is approx. 40 to 50 % of the maximum speed with a reduction of the current consumption to 50 %.

### Special pump features

For a double pump, the two motor impeller units are fitted identically and are mounted in a common pump housing with integrated switchover valve.

Each pump can run individually, but both pumps can also run at the same time in parallel operation. The operating modes are main/standby or parallel/peak-load operation. The individual units can be configured for different capacities. With the double pump, a system can be adapted to individual operating situations. It is necessary to connect a corresponding switchgear for switching-over in order to control the different operating modes.

## 7 Installation and electrical connection



### **DANGER! Risk of fatal injury!**

**Improper installation and electrical connection can result in fatal injury.**

- **Installation and electrical connection may only be carried out by qualified personnel and in accordance with the applicable regulations.**
- **Adhere to regulations for accident prevention**

## 7.1 Installation

- Only install the pump after all welding and soldering work has been completed and, if necessary, the pipe system has been flushed through.
- Install the pump in a readily accessible place for easy inspection and dismantling.
- When installing in the feed of open systems, the safety supply must branch off upstream of the pump (DIN EN 12828).
- Install check valves upstream and downstream of the pump to facilitate a possible pump replacement.
  - Perform installation so that any leaking water cannot drip onto the control module.
  - To do this, align the upper gate valve laterally.
- In thermal insulation work, make sure that the pump motor and the module are not insulated. The condensate–drain openings must remain uncovered (Fig. 3, item 2).
- Install with the power switched off and the pump motor in a horizontal position. See Fig. 2 for installation positions of the pump.
- Direction arrows on the pump housing and the thermal insulation shell (accessories) indicate the direction of flow (Fig. 3, item 1).
- Use a open–end wrench to prevent the pump from twisting (Fig. 4).
- The motor housing can be twisted after undoing the motor attachment screws if it is necessary to position the terminal box (Fig. 5).



Note: Generally, turn the motor head before the system is filled. When turning the motor head in an installation which is already filled, do not pull the motor head out of the pump housing. Turn the motor head with a small amount of pressure on the motor unit so that no water can come out of the pump.



**CAUTION! Risk of damage to property!**

The gasket may be damaged when the motor housing is turned. Replace defective gaskets immediately:  
 $\varnothing 86 \times \varnothing 76 \times 2.0$  mm EP.

## 7.2 Electrical connection

**DANGER! Risk of fatal injury!**

A fatal shock may occur if the electrical connection is not made correctly.

- **Only allow the electrical connection to be made by an electrician approved by the local power supply company and in accordance with the local regulations in force.**
- **Disconnect the power supply before any work.**
- The current type and voltage must correspond to the details on the rating plate.
- The electrical connection must be made in accordance with VDE 0700/part 1 via a fixed connected load. The latter is provided with a plug device or an all-pole switch with a contact opening width of at least 3 mm.
- To ensure drip protection and strain relief at the PG screwed connection, a connected load with an adequate outer diameter is necessary (e.g. H05VV-F3G1.5).
- When pumps are used in systems with water temperatures above 90°C, a suitably heat-resistant connected load must be installed.
- The connected load is to be installed in such a way that it can under no circumstances come into contact with the piping and/or the pump and motor housing.
- Make the mains connection according to Fig. 6.
- The connection cable can be taken through the cable feed-in right or left. Exchange dummy plugs and cable feed-in as necessary. When the terminal box is positioned laterally, always arrange the cable feed-in from below (Fig. 5).



**CAUTION! Risk of short circuit!**

**Once electrical connection is complete and in order to protect the terminal box from moisture, the terminal box cover must be sealed according to regulations.**

- Earth the pump/system according to regulations.
- When connecting automatic switchgears (for double pumps), observe the relevant installation and operating instructions.



Note: Double pumps: Provide a separate power cable and a separate fuse on the mains side for both motors of the double pump.

## **8 Commissioning**



**WARNING! Risk of injury and damage to property!**

**Incorrect commissioning can lead to injuries to persons and damage to property.**

- **Commissioning by qualified personnel only!**
- **Depending on the operating status of the pump or system (fluid temperature), the entire pump can become very hot. Touching the pump can cause burns!**

### **8.1 Filling and bleeding**

Fill and bleed the system correctly.

It is necessary to vent the pump if, for example, the radiators remain cold although the heating and pump are running. The pump does not pump any water if there is air in the pump room. The pump rotor compartment is vented automatically after a short operating period. Dry running for short periods will not harm the pump.

Please proceed as follows if it is necessary to vent the rotor room:

- Switch off the pump.



**WARNING! Danger of personal injury!**

**Depending on the operating status of the pump or system (fluid temperature), the entire pump can become very hot. Touching the pump can cause burns!**

- Close the check valve on the pressure side piping.



**WARNING! Danger of personal injury!**

**Depending on the temperature of the fluid and system pressure, when the venting screw is opened, hot liquid or gaseous fluid may escape or shoot out at high pressure. Escaping fluid can cause scalding!**

- Undo the venting screw carefully with a suitable screwdriver and unscrew it completely (Fig. 9).
- Carefully push back the pump shaft with a screwdriver several times.
- Protect electrical parts from any escaping water.
- Switch on the pump.



Note: The pump may jam if the venting screw is undone, depending on the operating pressure level.

- Screw the venting screw back in again after 15 to 30 seconds.
- Open the check valve again.

## 8.2 Variable speed control

If rooms cannot be heated sufficiently, the speed of the pump may be too low. It is then necessary to switch over to a higher speed. If, on the other hand, the pump is set to a speed which is too high, flow noises are created in the lines and in particular at throttled thermostatic valves. They can be resolved by switching to a lower speed. A rotary knob on the terminal box is used to switch over to a different speed stage. The small marking indicates the lowest, and the large marking indicates the highest speed (Fig. 8).



Note: If on a double pump both the individual pumps are in operation at the same time, the pre-selected speeds must be identical for both pumps.

## 9 Maintenance



**DANGER! Risk of fatal injury!**

**A fatal shock may occur when working on electrical equipment.**

- **The pump should be electrically isolated and secured against unauthorised switch-on during any maintenance or repair work.**
- **Any damage to the connection cable should always be rectified by a qualified electrician only.**

After successful maintenance and repair work, install and connect the pump according to the “Installation and electrical connection” chapter. Switch on the pump according to the “Commissioning” chapter.

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