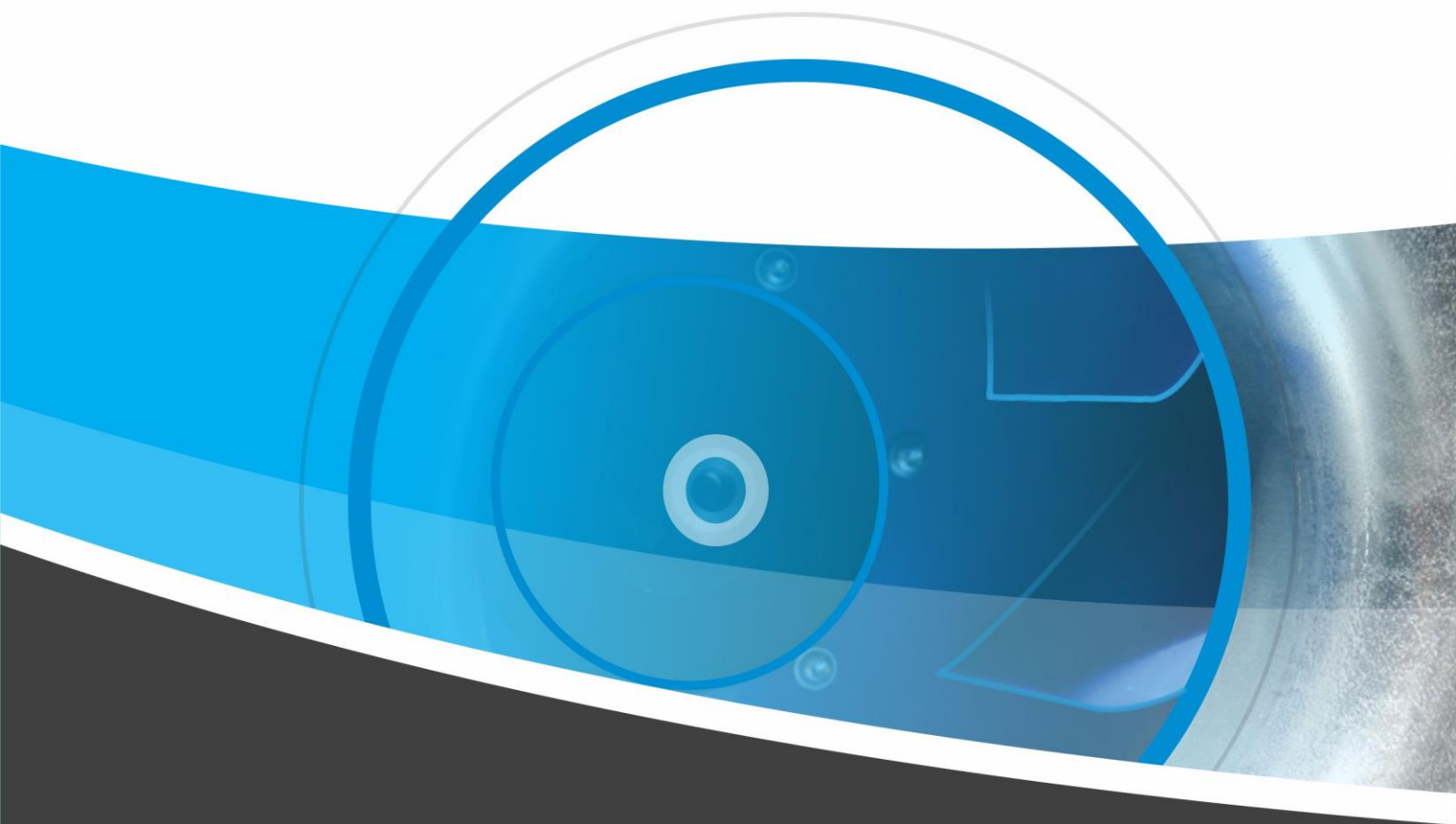


Operation instructions

Mixing nodes for units of TYPE range



 **VentiAir**



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The device has been manufactured in accordance with the EU standards EN1886, EN13053.

This documentation must always be handed over to the user!

In case of non-compliance with the warranty conditions listed below in the documentation, VentiAir s.r.o. reserves the right to refuse warranty.

Version 01/2021



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2 USE OF MIXING NODES

SRI mixing units are designed and manufactured to regulate the heating power of hot water exchangers, especially in air conditioning. They are manufactured in two basic types – as 3-way and 4-way ones. A diagram of both versions is shown in Figures 1 and 2.

Diagram of RSU in 3-way version

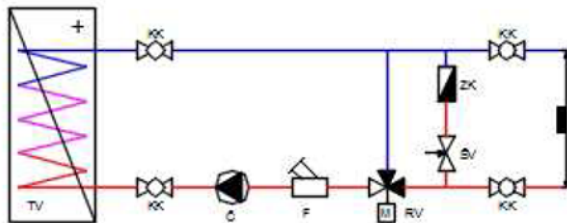


Fig. 1

TV – Hot water heat exchanger
 Č – Circulation pump
 F – Filter
 RV – Regulation valve
 KK – Ball valve
 ŠV – Throttle valve
 ZK – Backflow valve

Diagram of RSU in 4-way version

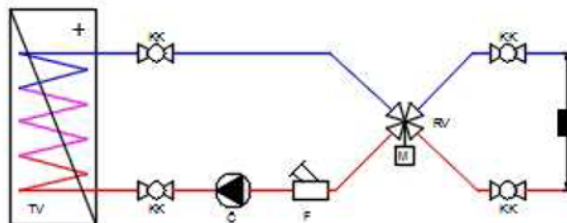


Fig. 2

TV – Hot water heat exchanger
 Č – Circulation pump
 F – Filter
 RV – Regulation valve
 KK – Ball valve
 ŠV – Throttle valve
 ZK – Backflow valve

RSU mixing nodes are manufactured in the entire power range using Grundfos Alpha 25-40 to 25-60, Magna 1 25-80 and 25-120 pumps. The mixing valves are then supplied depending on the transmitted power from $Kv = 0.63$ to $Kv = 25$.

Use for cooling water systems is also possible, but the entire RSU must be provided with vapor-tight insulation against condensation on the surface of the parts. If the medium is a mixture of water and glycol, this fact must be taken into account in the design of the RSU due to the lower viscosity of the medium and poorer heat transfer (cold).

3 DESCRIPTION

RSUs are composed of individual parts - ball valves, EESBE mixing valve, BELIMO servo drive, filter and GRUNDFOS circulation pump. On request, the set can also be supplied with stainless steel flexible hoses.

The version with a three-way valve can be supplemented with a by-pass, which serves partly to balance the hydraulic pressure on the supply and at the same time ensures a constant temperature before the valve and prevents the supply branch from cooling down.

Three-point or 0-10V DC voltage regulation is possible. Servo drives with three-point control are equipped with a limit switch signaling, when extreme positions is reached. Servo drives controlled by 0-10V DC voltage enable feedback with 2-10V DC voltage (optionally 0-10V DC) - see Fig. 4-8.

4 CONNECTION PARAMETERS

4.1 HEAT TRANSFER MEDIUM

RSUs are designed for heat transfer medium - water with following limit parameters:

- Max. water temperature +110°C
- Min. water temperature +5°C
- Max. water pressure 1MPa
- Min. water pressure 30kPa

Water must not contain abrasive substances or chemically aggressive additives. The RSU can be operated with a mixture of water and glycol, but this option must be taken into account during the design of the RSU. The glycol mixture has a lower viscosity and poorer heat transfer.

The differential pressure at the inlet to the RSU should ideally be zero, otherwise the opposite flow may occur at a certain stroke of the control unit and the heating power control will not be correct. If there is a differential pressure, you can help by installing a pressure regulator, a relief valve or a balancing valve before the RSU. In this case, there is no fault in the RSU.

4.2 ELECTRIC CONNECTION

4.2.1 CIRCULATION PUMP

The power supply of the circulation pump is single-phase with a voltage of 230VAC, 50 Hz. The power of the used pumps is from 75W - 500W, max. current is 2A. They are connected with a 3-core cable with a cross-section of 1.5 mm² determined for the specified voltage. Detailed parameters of the pumps used are listed on the Grundfos website. The wiring diagram of the circulation pump is shown in Fig. 3.

Pump wiring diagram

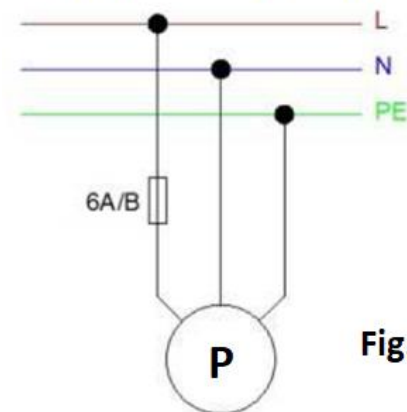
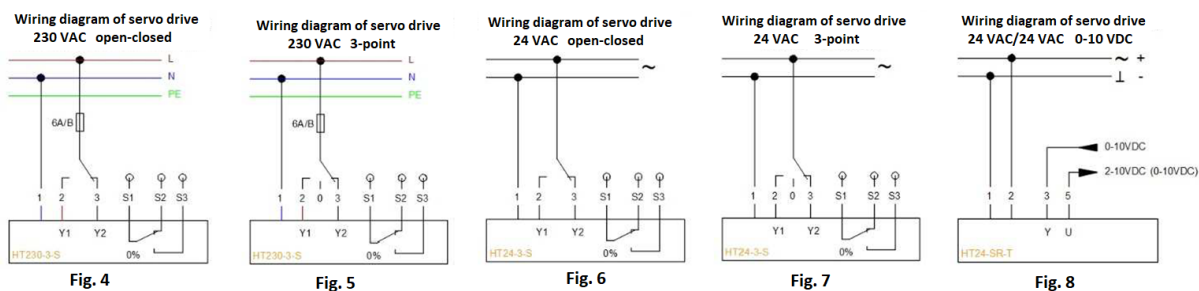


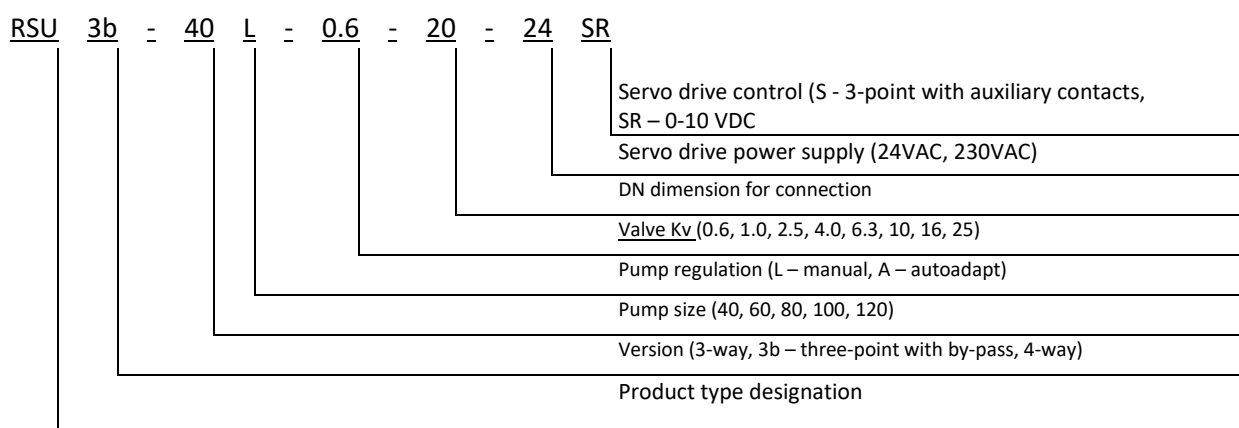
Fig. 3

4.2.2 SERVO DRIVE

In terms of their power supply, the servo drives are of two types - 203VAC and 24VAC / 24VDC, while the 24VAC / 24VDC version is either 3-point or with a control voltage of 0-10VDC. The wiring diagram of the servo drives is shown in Fig. 4-8,



5 DESIGNATION SYNTAX OF RSU



6 DESIGN OF RSU SIZE AND TYPE

6.1 RSU TYPE

- First you need to determine is the type of RSU to be installed – i.e. 3-way or 4-way version. In the case of a 3-way version, it is then also necessary to determine the version with or without by-pass.
- Determining the type of regulation - whether it will be 3-point or with control voltage 0-10 VDC. It is also important to know the supply voltage for the servo drive. Mains voltage 230VAC, 50Hz allows only 3-point control.
- For the RSU size design itself, it is important to know:
 - Thermodynamic conditions - temperature gradient on the heat exchanger, flow rate and medium composition, or heat output of the heat exchanger.
 - Hydrodynamic conditions - differential pressure at the connection, medium flow rate, pressure loss of the heat exchanger.

6.2 RSU ASSIGNMENT TABLE FOR ORIENTATION

The table assumes a temperature gradient of 80/60 ° C and a pressure drop of RSU + heat exchanger of 6-12kPa



RSU 3B-40-0,6-20	5 kW
RSU 3B-40-1,0-20	7 kW
RSU 3B-40-1,6-20	10 kW
RSU 3B-40-2,5-20	20 kW
RSU 3B-40-4,0-20	30 kW
RSU 3B-40-6,3-20	45 kW
RSU 3B-60-6,3-25	50 kW
RSU 3B-80-6,3-25	55 kW
RSU 3B-80-10-25	80 kW
RSU 3B-80-16-32	130 kW
RSU 3B-100-16-32	140 kW
RSU 3B-100-25-32	180 kW
RSU 3B-120-25-32	210 kW

7 ASSEMBLY INSTRUCTIONS

The RSU is installed closest to the appliance on separate hinges. It must not be subject to any external force effects and is designed exclusively for the internal environment. The RSU must be installed so that:

- The axis of the pump spindle is always in a horizontal position
- The servo drive is not below the control valve
- The filter is always turned with the plug down and is accessible for service
- The assembly is not aerated and also allows the heat exchanger to be de-aerated
- It is not exposed to external influences - mechanical damage, water or other liquids, dusty environment, vibrations, excessive temperatures or temperatures below freezing point, etc.
- Access to the pump terminal box is provided
- The correct connection to the supply and return pipes and the heat exchanger is kept.

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To prevent the transmission of force effects, it is recommended to connect the RSU via flexible stainless steel hoses. After installing the RSU, the entire system, including the heat exchanger, must be thoroughly de-aerated, the tightness of all connections, the operation of the pump and the servo drive must be checked. In case of installation in a new system, it is recommended to clean the filter after one month of operation.

When putting into operation, it is necessary to check the correct mutual position of the control valve inside with respect to the servo drive and the correct direction of rotation - see the enclosed catalogue sheet.

Electrical installation of RSU is allowed to be performed only by a person meeting the legislative requirements for work on electrical equipment according to ČSN 34 3205 and Decree No. 50-51 / 1978 Coll. The installation technician is obliged to comply with safety standards, especially ČSN 12 2002, ČSN 33 2190, ČSN 33 2310 and ČSN 33 2000-4-41. After installation, before putting into operation, it is necessary to perform an initial electrical inspection according to ČSN 33 2000-6.



8 REGULAR MAINTENANCE

The RSU does not require any specific maintenance. At least once a year it is necessary to clean the filter, check the tightness of all connections, the operation of the pump and the servo drive. It is also recommended to turn the shut-off ball valves or tighten the electric connection terminals as part of maintenance.

When handling the actuator or pump, everything must be disconnected from the power supply in advance.

9 PACKAGING

The products are provided with a label with the RSU type designation and packed in bubble wrap. They are then inserted into a 5-layer corrugated cardboard box. The box has the same label for a good track. Each package includes this manual, including leaflets of the pump and actuator. Also included is a plastic bag with manual control of the control valve, a connector to the pump and a set of seals.

10 MATERIALS USED

10.1 PRODUCT

Brass, copper, aluminium, cast iron, stainless steel, plastic, cables, teflon, rubber.

10.2 PACKAGING MATERIALS

Corrugated cardboard, PVC foil

11 STORAGE

Storage of RSU is possible in original packaging in a dry environment at temperatures of 5-40 ° C. It must not be exposed to vibrations and mechanical damage, e.g. by falling from a height. Protect the product from rodents.

12 DISPOSAL AFTER LIFETIME

The RSU, which has already been taken out of service, because it does not work, can be disposed of by handing it over to an environmental waste disposal facility.

