VENTIAIR

Operation instructions

Mixing nodes for units od TYPE range

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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.

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1 CONTENTS

2 APPLICATION OF THE MIXING NODE RSU

The Mixing nodes RSU are designed and manufactured to regulate heat output of heat exchangers in air handling units. They are manufactured in a single type: 3-way. The hydraulic diagram is shown in Fig. 1.

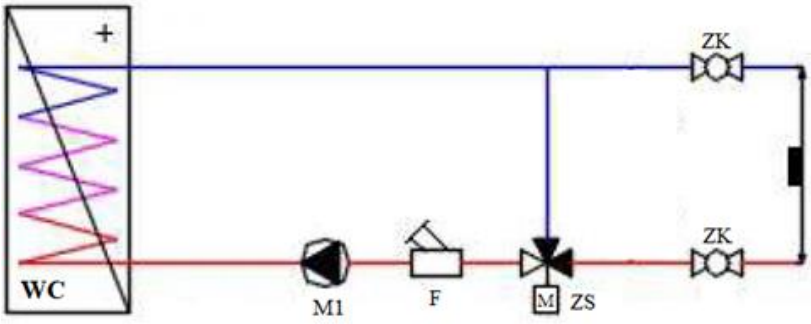

Fig. 1. Hydraulic diagram for connecting the Mixing node RSU.
WC – heat exchanger, ZK – ball valve, M1 – circulator pump,
F – inclined mesh filter, ZS – 3D valve with an actuator

The Mixing nodes RSU are manufactured for a given output range using an appropriate pump. Mixing valves are fed at Kv = 1.6 to Kv = 16, depending on the output to be transferred.

The Mixing nodes RSU can also be used in cooling water systems, provided that they are equipped with a steam-tight anti-condensation insulation. If the medium is a mixture of water and glycol, this must be taken into account when choosing the Mixing node RSU due to lower viscosity of the medium and poorer heat (cold) transfer.

3 DESCRIPTION

The Mixing node RSU consists of the following parts: ball valves, three-way mixing valve, valve actuator, inclined mesh filter, circulator pump and flexible stainless steel hoses.
The Mixing node RSU is controlled by a 0-10 VDC signal. Actuators controlled by 0-10 VDC signals enable feedback via 0-10 VDC (optionally 2-10 VDC) signals (Fig. 3).

4 TECHNICAL PARAMETERS

4.1 HEATING MEDIUM

The Mixing nodes RSU are designed to work with a heating medium – water/glycol – with the following parameters:

- Maximum water temperature: +110 °C
- Minimum water temperature: +5 °C
- Maximum water pressure: 1 MPa
- Minimum water pressure: 30 kPa

Water may not contain abrasive substances or chemically aggressive additives. The Mixing nodes RSU can work with a water/glycol mixture, but this must be taken into account when choosing the Mixing node RSU. A glycol mixture has lower viscosity and poorer heat transfer. Differential pressure at the Mixing node RSU inlet should be zero, otherwise a stroke of the control unit can lead to backflow and incorrect heat output regulation. Non-zero differential pressure can be eliminated by using a pressure regulator, a relief valve or a balancing valve before the Mixing node RSU.

4.2 ELECTRIC CONNECTION

4.2.1 CIRCULATION PUMP

The circulator pump is powered by a single-phase 230 VAC/50 Hz supply. Used pumps have a power of 25 W – 50 W; maximum current is 0.44 A. Connection should be made using a 1.5 mm2 3-core cable designed for the specified voltage. The circuit diagram for the circulator pump is shown in Fig. 2.

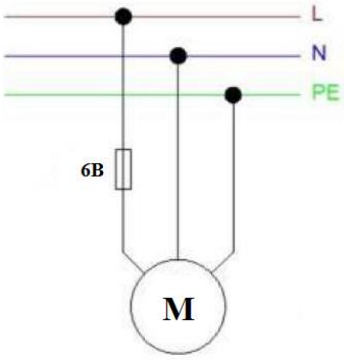

Fig. 2. Connection diagram for the circulator pump

4.2.2 3D VALVE ACTUATOR

The supply voltage of the 3-way valve actuator in the Mixing node RSU is 24 VAC/24 VDC; the actuator is controlled by a 0-10 VDC signal. The connection diagram for the actuator is shown in Fig. 3.

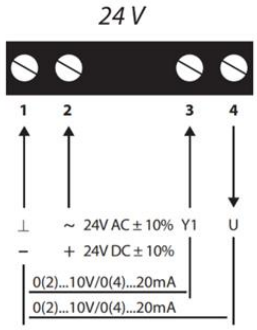

Fig. 3. Connection diagram for the 3D valve actuator

5 MODELS OF MIXING NODE RSU

Product No.	Valve Kvs	Connector DN	Heating medium
28-0RSU-0016-0015-C-V1	1.6	15	Water
28-0RSU-G016-0015-C-V1	1.6	15	Glycol
28-0RSU-0025-0015-C-V1	2.5	15	Water
28-0RSU-G025-0015-C-V1	2.5	15	Glycol
28-0RSU-0040-0020-C-V1	4	20	Water
28-0RSU-G040-0020-C-V1	4	20	Glycol
28-0RSU-0063-0020-C-V1	6.3	20	Water
28-0RSU-G063-0020-C-V1	6.3	20	Glycol
28-0RSU-G100-0025-C-V1	10	25	Glycol
28-0RSU-G160-0025-C-V1	16	25	Glycol

6 TYPE OF MIXING NODE RSU

The Mixing node RSU is a three-way design – a three-way valve with an actuator with a 24 VAC supply voltage and a 0-10 VDC control signal. With respect to the size of the Mixing node RSU itself, it is important to know:

- Thermodynamic conditions - temperature gradient on the exchanger and the flow medium, i.e. heat output of the exchanger.
- Hydrodynamic conditions - differential pressure at the connector, flow rate of the medium, pressure drop in the exchanger.

7 INSTALLATION INSTRUCTIONS

The Mixing node RSU should be installed on separate brackets as close to the unit as possible. The Mixing node RSU must not be exposed to external forces and is intended for indoor environments only. The Mixing node RSU should be installed in such a way that:

- The pump axis is always in a horizontal position,
- The actuator is not located below the control valve,
- The filter is accessible for maintenance,
- The assembly allows the heat exchanger to be vented,
- It is not exposed to external factors – mechanical damage, water or other liquids, dusty environment, vibration, excessive or sub-zero temperatures, etc.
- The electrical connection of the pump is accessible,
- Care is taken to correctly connect the supply and return pipes and the heat exchanger.

To prevent the transmission of force effects, it is recommended to connect the Mixing node RSU using flexible stainless steel hoses. After the Mixing node RSU is installed, the entire system, including the heat exchanger, should be thoroughly vented, tightness of all connections should be checked and correct operation of the pump and the actuator should be confirmed. When installed in a new system, it is recommended to clean the filter after one month of operation.

During start-up, the correct positioning of the control valve plug relative to the actuator and the correct direction of rotation should be verified (see the enclosed data sheet).

Electrical installation of the Mixing node RSU can only be carried out by a person who meets the statutory requirements concerning works related to electrical equipment. The installer is obliged to observe safety standards, in particular EN 809:1998+A1:2009+AC:2010. A preliminary electrical check should be performed after installation, but before start-up.

8 SYSTEM MAINTENANCE

The Mixing node RSU requires no special maintenance. At least once a year, the inclined mesh filter should be cleaned, tightness of all connections should be checked and correct operation of the pump and the actuator should be confirmed. Recommended maintenance also includes loosening the ball shut-off valves and tightening the electrical connection terminals. All devices must be disconnected from the power supply before servicing of the actuator or the pump can be commenced.

9 PACKAGING

Products are labelled with the Mixing node RSU type designation. Each kit includes this manual. Each kit also includes electrical connector for the pump and a set of gaskets.

10 MATERIALS USED

The Mixing node RSU is made of the following materials: brass, copper, cast iron, stainless steel, plastic, PTFE.

11 STORAGE

The Mixing node RSU can be stored in a dry environment at a temperature of 5–40 °C. The module must not be exposed to vibration and mechanical damage, e.g. due to being dropped from a height. The product should be protected against rodents.

12 RECYCLING

A Mixing node RSU which has been decommissioned due to failure can be disposed of by being handed over to an environmentally friendly disposal facility.