INSTALLATION AND OPERATING MANUAL

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3-way rotary mixing valves
ARV Vario ProClick

NOTE!

The product may only be used if you have fully read and understood these operating instructions. The manual is also available on the AFRISO websites in the Internet.

WARNING!

The ARV Vario ProClick mixing valve may only be installed, commissioned, and dismantled by trained personnel.

Changes and modifications carried out by unauthorised persons may cause danger and are prohibited for safety reasons.

Risk of burns from hot medium! All installation and maintenance work must be carried out after the system has cooled down.

APPLICATION

ARV Vario ProClick 3-way mixing valves are designed for heating and cooling installations. They are usually installed on the system feed or return to the heat/cooling source. They mix the medium flow in the right proportions to obtain the required temperature of the medium. They can also act as switching valves between two parts of the system.

PREDICTABLE INCORRECT APPLICATION

ARV Vario ProClick 3-way mixing valves is not intended for use in the following cases and with the following media:

- mixtures of water and glycol with a glycol concentration of more than 50%, steam, oil, petrol, drinking water;
- for safety-related purposes;
- under conditions exceeding the maximum permissible pressure and temperature limits for the medium.

DESCRIPTION

ARV Vario ProClick 3-way rotary mixing valves have a body made of brass. The closing element and internal components are made of plastic. It is possible to adjust the Kvs coefficient value on each valve. A dedicated lever on the underside of the valve is used to change this parameter. The connections on internal threaded models are octagonal.

The valves are equipped with knobs for manual adjustment and angle limiters. The rotating scale on one side is printed with the graduation „0 to 10" and the symbol „L", while the other side has the graduation „10 to 0" and the symbol „R". This allows the valve to operate in different mounting positions.

The knob is made of non-slip material. For the connection of ARV ProClick valves to ProClick actuators or controllers, there are plastic parts under the knob. With these parts, ProClick actuators and controllers are mounted without using any tools.

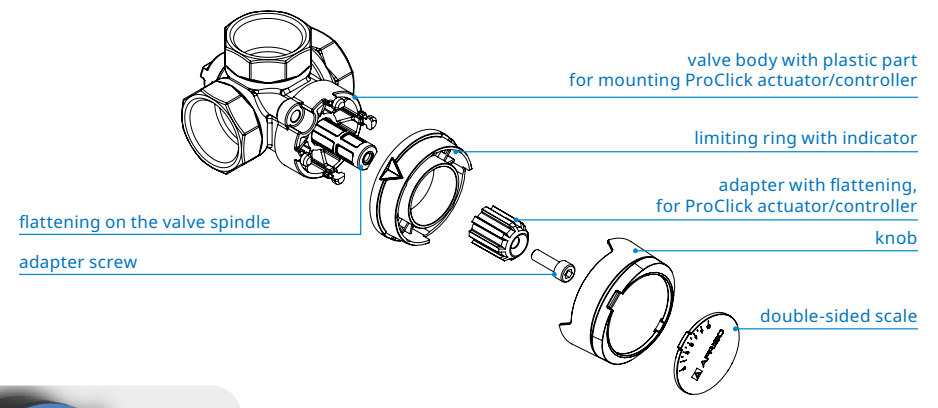
KVS VARIO FUNCTION

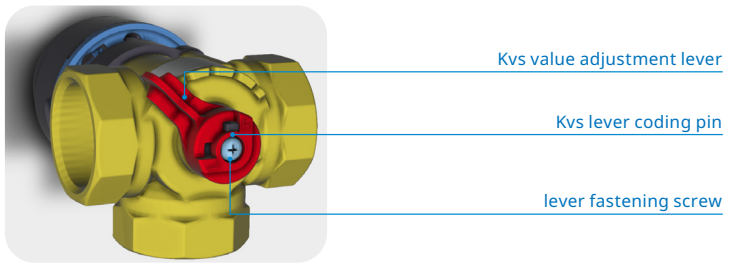
ARV Vario ProClick 3-way rotary mixing valves enable to select the optimum Kvs coefficient value for a particular installation and subsequently changed. The correct Kvs value is a key aspect to the correct operation of the mixing valve.

If the Kvs value is too low, this will result in increased pressure losses through the valve and thus throttle the flow in the system. This may result in underheating of rooms. Too high value of the Kvs coefficient will result in too small pressure drop across the mixing valve and thus large fluctuations in the temperature of the medium which feeds the installation. This is particularly unfavourable in the case of surface heating systems.

Optimum selection of the Kvs coefficient enables smooth and economical operation of the whole installation.

CONSTRUCTION





Caution! Pay attention to the position of the closing element, which is on the opposite side to the flattening on the adapter and on the valve spindle.

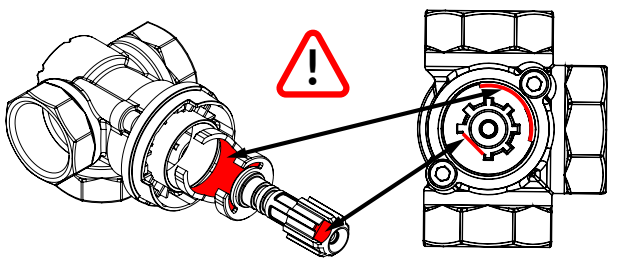
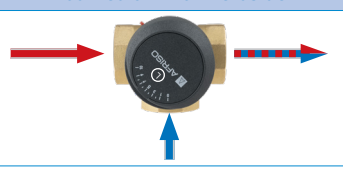
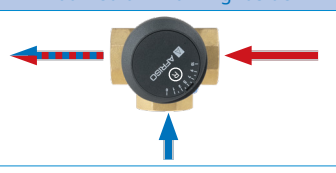
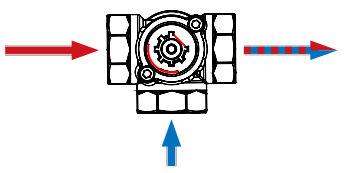
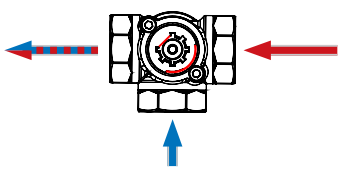
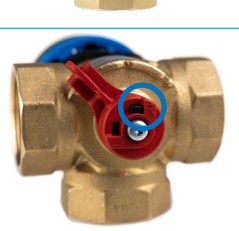
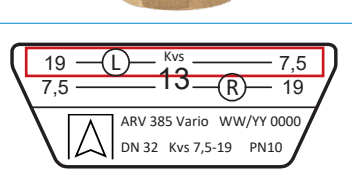
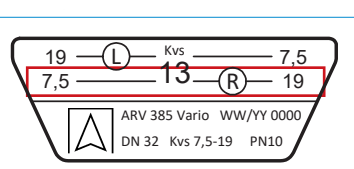
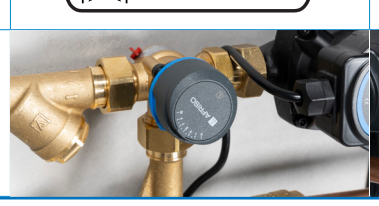
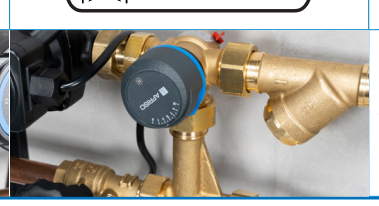


Fig. 1. Position of the closing element respect to the flattening on the adapter and valve spindle

The ARV Vario ProClick mixing valve is supplied with a fitted plastic knob. In order to prevent plastic components from damage, we recommend that lid with the scale, the knob and the blue limiting ring should be removed from valve before mounting the valve in installation. These elements are mounted with a snap. If you have problems removing the knob, you can gently lever it off with a flathead screwdriver.

VALVE INSTALLATION

Step	Position "L" - hot medium from left side	Position "R" - hot medium from right side	Action to be taken
Orientation of the valve in installation			Determine the orientation of the valve in the system and remove the knob and blue limiting ring.
Position of the closing element (view from the front of the valve)			Position the closing element midway between the hot water inlet and the cold water inlet to the valve. The closing element moves 90° range between these connections.
Application of the blue limiting ring			Position the limiting ring so that the indicator is midway between the hot water inlet and the cold water inlet to the valve.
Application of the knob			Position the knob onto the white adapter. The knob only fits in one position.
Scale selection			Select the appropriate side and place the lid with the scale. 0 on the scale means the valve is fully closed (no hot water supply) and 10 fully open (no cold water supply).
Kvs lever position (in maximum setting) (view from the underside of the valve)			Unscrew the screw which is holding the red lever on the underside of the valve, and then replace the lever so that the black coding pin is in the "L" or "R" position. Tighten the lever with the screw.
Selecting and reading the correct Kvs value (example)			Manually set the appropriate Kvs value for the installation. See section "VALVE SELECTION AND KVS SETTINGS" for guidelines.
Installation of the valve in the system			Install the valve in the system using a appropriate seal.

VALVE SELECTION AND KVS SETTINGS

Caution! The correct Kvs coefficient of the valve must be set before the first start of the installation. Subsequent change is possible but may be difficult due to lack of free access to the valve.

The size and value of the Kvs coefficient of the mixing valve should be specified in the design of the installation. In the absence of a design, the valve and the Kvs coefficient can be based on simplified selection charts. The Kvs selection charts for each valve are included in the **appendix to this manual**.

The simplified selection procedure goes as follows:

1. Determine the heat demand of the installation in kW.
2. Select the value for the temperature difference ΔT between supply and return (e.g. ΔT=5K for underfloor heating; ΔT=15K or ΔT=20K for radiator heating).
3. Run a vertical line from the selected power in kW to the selected temperature difference ΔT.
4. Guide the horizontal line to the end of the coloured box in the diagram on the right.
5. Select the smallest Kvs value from those with which the horizontal line in the coloured area intersects. The coloured field defines the optimal pressure drop in the valve. In typical installations this should be between 3 and 15 kPa.
6. Select the appropriate valve size that enable setting selected value.

The selected valve may be equal or smaller compared to diameter of pipes used in the system. The valve on the system feed may be two diameters smaller, and on the return to the solid fuel boiler, one diameter smaller than the nominal diameter of pipes used.

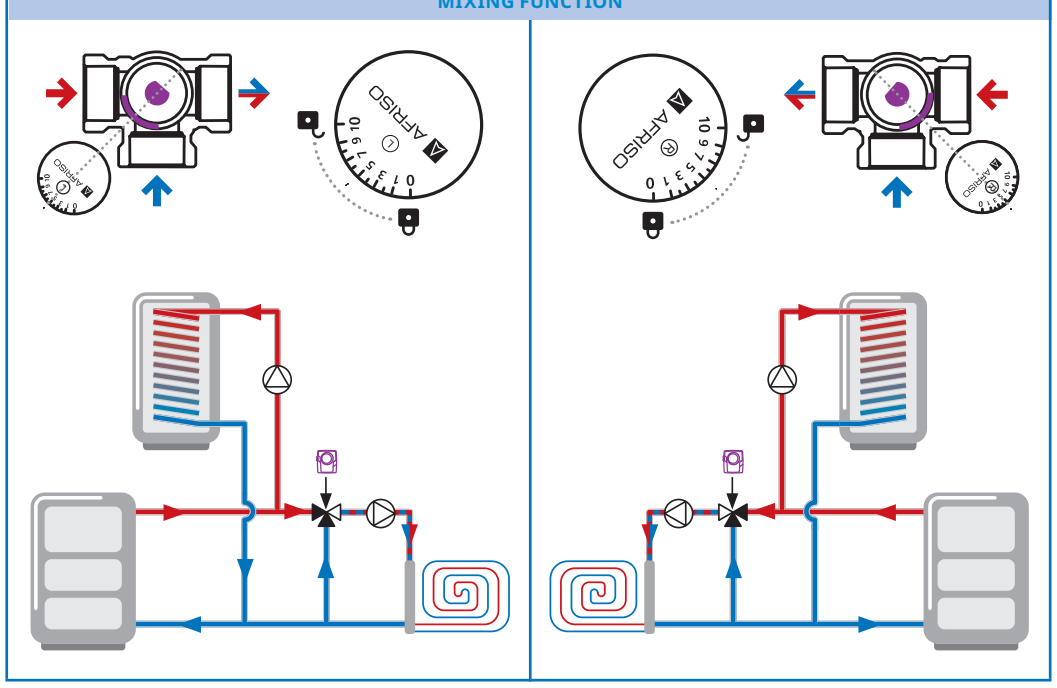
Example: pipe diameter DN32 is used in the system, so the valve in the system feed should be sized in range of DN20-DN32 and on the return to the heat source DN25-DN32.

VALVE IN SWITCHING/DIVERTING FUNCTION

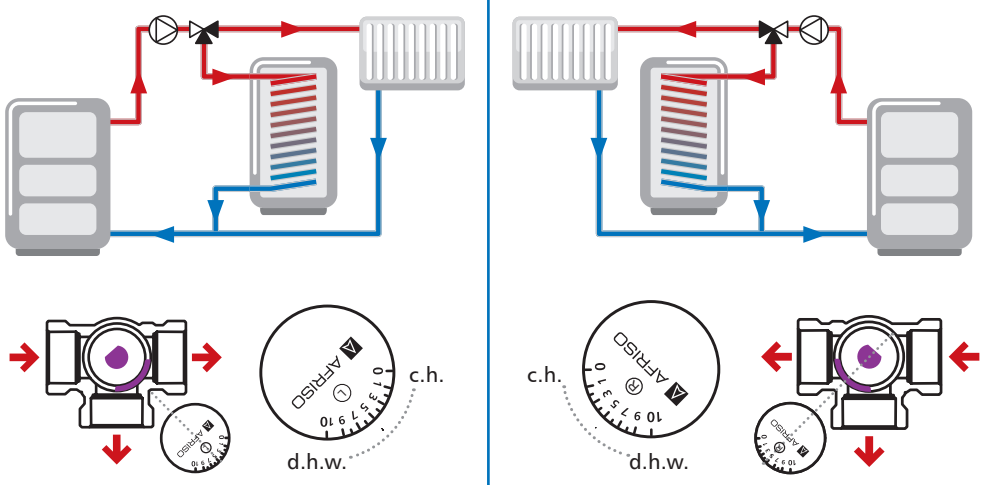
When using the valve in a switching or diverting function, there is no need to change the factory (maximum) Kvs coefficient setting.

EXAMPLE APPLICATION SCHEMES

MIXING FUNCTION



SWITCHING/DIVERTING FUNCTION



OPERATION OF THE VALVE

1. Position of the knob with scale

Once the valve has been correctly set and the scale was selected, position “0” will mean that the valve is fully closed (hot water supply is closed) and position “10” will mean the valve is fully open (hot water supply is open). Any other position on the scale will indicate the percentage of valve opening (e.g. position “4” will mean the valve is 40% open).

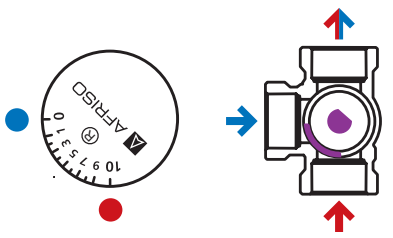


Fig. 2. Position of dial with scale

2. Position of closing element

The closing element is located on the opposite side of the flattening on the adapter. To check the correct operation of the valve, remove the knob from the adapter and check the location of the flattening.

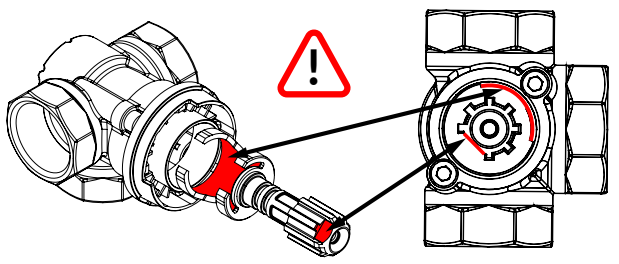


Fig. 3. Closing element position

TECHNICAL DATA

Parameter / part	Value / material
Operating temperature	5-95°C
Operating pressure	max. 10 bar
Differential pressure	max. 1 bar
Torque	DN15-DN25: max. 0.5 Nm DN32-DN50: max. 2.5 Nm
Kvs coefficient in a mixing function	DN20: 3.5-9 m^3/h DN25: 4.5-12 m^3/h DN32: 7.5-19 m^3/h DN40: 14-36 m^3/h DN50: 17-50 m^3/h
Internal leakage as a function of mixing (% of maximal Kvs value valve)	DN20: <0.1% at Δp=50kPa; <0.2% at Δp=100kPa DN25: <0.1% at Δp=50kPa; <0.2% at Δp=100kPa DN32: <0.3% at Δp=50kPa; <0.7% at Δp=100kPa DN40: <0.7% at Δp=100kPa DN50: <0.7% at Δp=100kPa
Kvs coefficient in switching/diverting function	with the flow straight ahead: DN20: 9 m^3/h DN25: 12 m^3/h DN32: 19 m^3/h DN40: 36 m^3/h DN50: 50 m^3/h with a flow at 90°: DN20: 3.4 m^3/h DN25: 5.4 m^3/h DN32: 9.8 m^3/h DN40: 16.2 m^3/h DN50: 24 m^3/h
Internal leakage in the switching/diverting function (% of maximal Kvs value valve)	DN20-DN32: <0.05% DN40-DN50: <0.2%
Swivel angle	90°
Glycol concentration	max. 50%
Material	brass, plastic

3. Installation of the ProClick electric actuator or controller

Under the knob of the ARV Vario ProClick valve, there is always an adapter for mounting the ProClick electric actuator or the controller. With the ProClick mounting system (Fig. 4), simply remove the knob and blue limiting ring from the valve and then slide the ProClick actuator or controller into position until the mounting mechanism engages on the valve. When using the valve in the mixing function, ACT/ARC ProClick controller or a 3-point actuator must be used (e.g. AFRISO ARM 343 ProClick). In order to automate the valve in the switching function, a 2-point actuator (e.g. AFRISO ARM 703 ProClick) must be used.

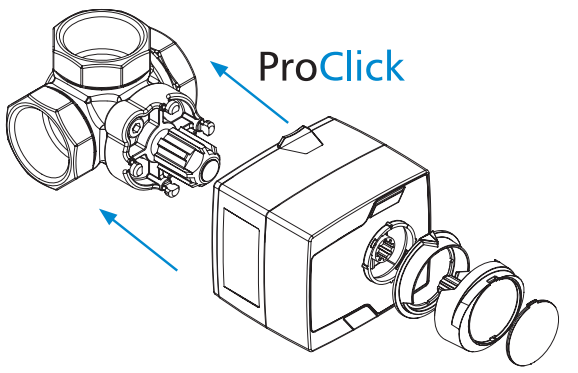


Fig. 4. ProClick system

APPROVALS AND CERTIFICATES

ARV Vario ProClick 3-way rotary mixing valves are subject to the Pressure Directive 2014 /68/EU and are not CE marked in accordance with Article 4.3 (recognised engineering practice).

The products have been marked with the B construction mark, in accordance with the regulations in force in Poland.

MAITENANCE

ARV Vario ProClick 3-way rotary mixing valves does not require any maintenance.

DECOMMISSIONING, DISPOSAL

1. Dismount the device.
2. Dispose of the product in accordance with applicable regulations, standards and safety guidelines.

This product is made from recyclable materials.

If you have any questions or problems with disposal, please contact the proper distributor or manufacturer.

WARRANTY

Product guarantee in accordance with the general conditions of sale and delivery.

CUSTOMER SATISFACTION

For AFRISO customer satisfaction is paramount. If you have any questions, suggestions or product problems, please contact us.