



CSE MIX G60 1F

Installation and Operation Manual
CSE MIX G60 1F PUMP STATION
with mixing valve

EN

1. Introduction

CSE MIX G60 1F pump station is designed to be installed in heating circuits where it provides heating water mixing and circulation through the circuit. Its typical application is in mixed heating circuits in buildings where it provides circulation and mixing of heating water to a desired temperature, or for solid-fuel boiler circuits where it provides circulation and mixing to a min. heating water temperature as a protection against low-temperature corrosion. Actuator of the mixing valve is controlled by an external controller through 3-point control with 230V outputs. The circulation pump is switched by an external controller with a 230 VAC output. The controller is not included in supply. The pump station is designed to be installed directly on the pipe, with 100 mm min. distance of the pipe axis from a wall.

2. Description of the pump station

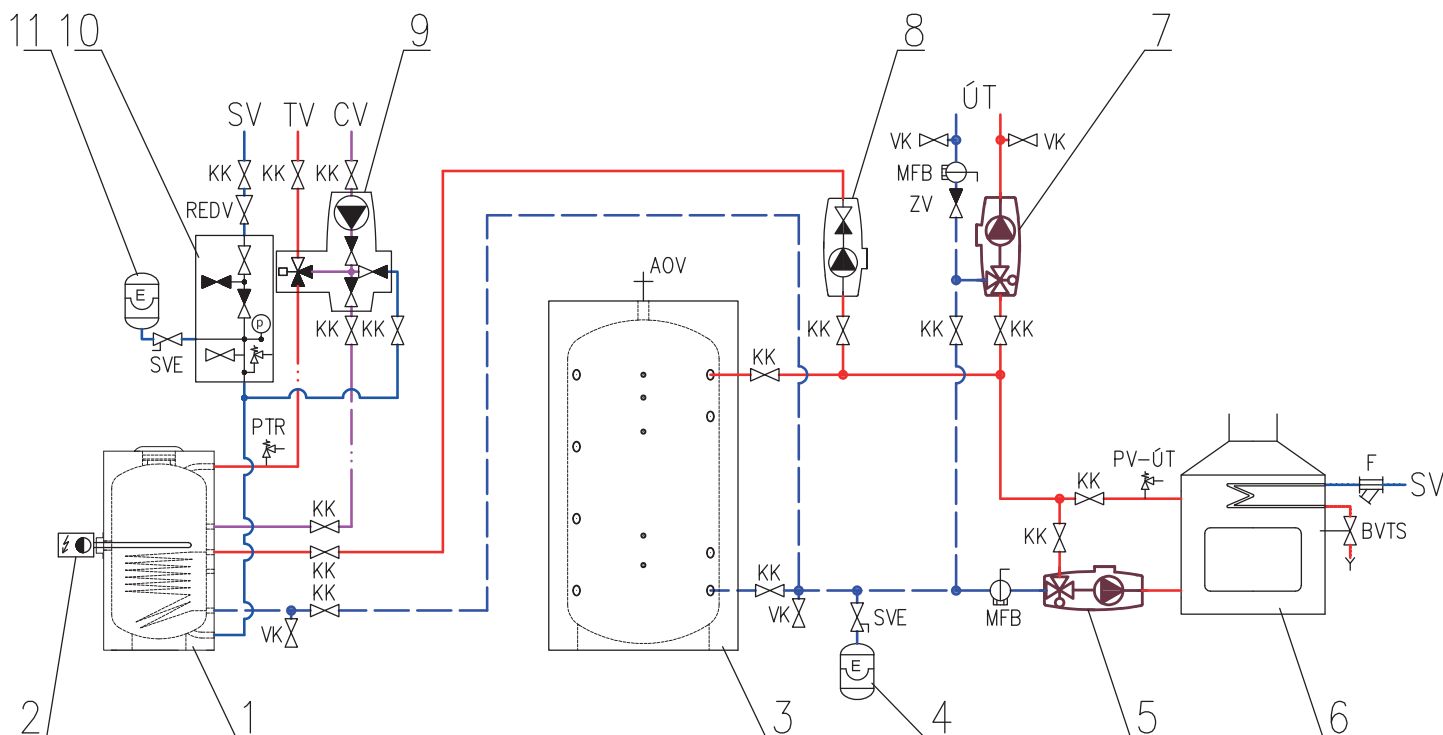
The pump station consist of a Grundfos UPM3 AUTO 25-60 pump incl. a power cable, a 3-way mixing valve with actuator incl. a power cable, a ball valve and insulation.

Main Features	
Application	providing circulation and mixing of a heating circuit or a solid-fuel boiler circuit; circulation pump switching and mixing valve control is performed from an external controller
Description	consists of a Grundfos UPM3 AUTO 25-60 pump, a 3-way mixing valve LK 840 with AVC actuator and insulation
Working fluid	water; water/glycol mixture (max. 1:1) or water-glycerine mixture (max. 2:1)
Installation	flow pipe to heating circuit / on solid fuel boiler return pipe, min. pipe centre distance from wall is 100 mm
Code	19106

Technical data of CSE MIX G60 1F pump station	
Fluid working temperature	5 - 95 °C
Max. working pressure	10 bar
Min. working pressure	0.5 bar
Ambient temperature	5 - 40 °C
Max. relative humidity	80% non condensing
Insulation material	EPP RG 60 g/l
Mixing valve Kvs	10 m ³ /h
Max. pressure difference	5 mH ₂ O (at mixing valve inlets)
Leak rate	< 1 % Kvs at 5 mH ₂ O pressure difference (at mixing valve inlets)
Overall dimensions	305 x 140 x 220 mm
Total weight	3.9 kg
Connections	3x G1"F

3. Pump Station Connection

The diagram shows a typical connection of a solid fuel boiler, thermal store and heating circuit. If there is also the indicated hot water circuit, install the CSE OTS ZV pump station (not included in the supply).



KEY

- 1 hot water storage tank
- 2 electric heating element w. thermostat
- 3 thermal store for heating system
- 4 expansion vessel for heating system
- 5 **pump station for boiler – CSE MIX**
- 6 biomass boiler (fireplace insert/stove)
- 7 **pump station for heating system – CSE MIX**
- 8 pump station for DHW heating – CSE OTS ZV
- 9 pump station for DHW recirculation – CSE TVMIX ZV
- 10 safety kit for HW storage tank
- 11 expansion vessel for DHW

- SV cold water
- TV hot water
- CV hot water recirculation
- ÚT central heating (heating system)

- KK ball valve
- ZV check valve
- AOV automatic air vent valve
- PTR pressure temperature relief valve
- REDV pressure reducing valve (optional)
- VK drain valve
- SVE expansion vessel service valve
- PV-ÚT central heating safety valve
- MFB Magnet Filterball
- F filter
- BVTS thermal safety relief valve for boiler

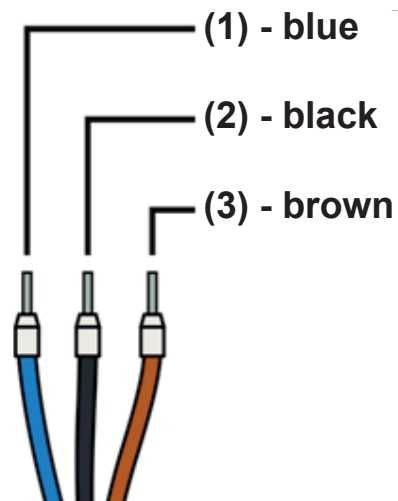
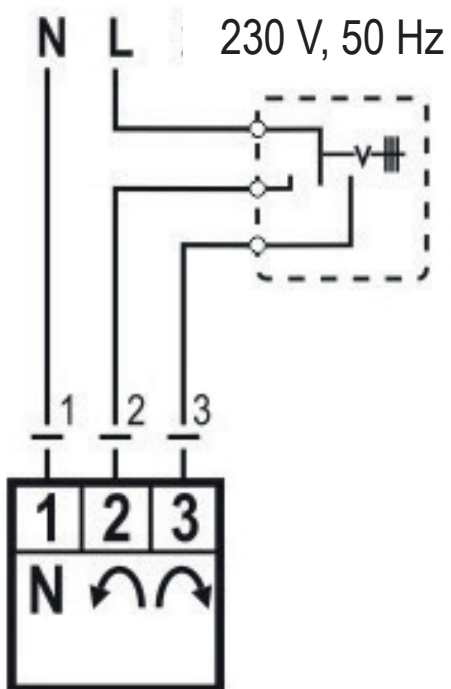
4. Mixing Valve Actuator



Technical Data	
Torque	5 Nm
Angle of rotation	90°
Shift time	120 s
Control	3-point
Auxiliary switch	no
Power supply	230 V AC
Max. power input	2,5 VA
IP rating	IP42
Protection class	II by EN 60730-1
Cable (cross section - length)	3 x 0.5 mm ² - 2 m

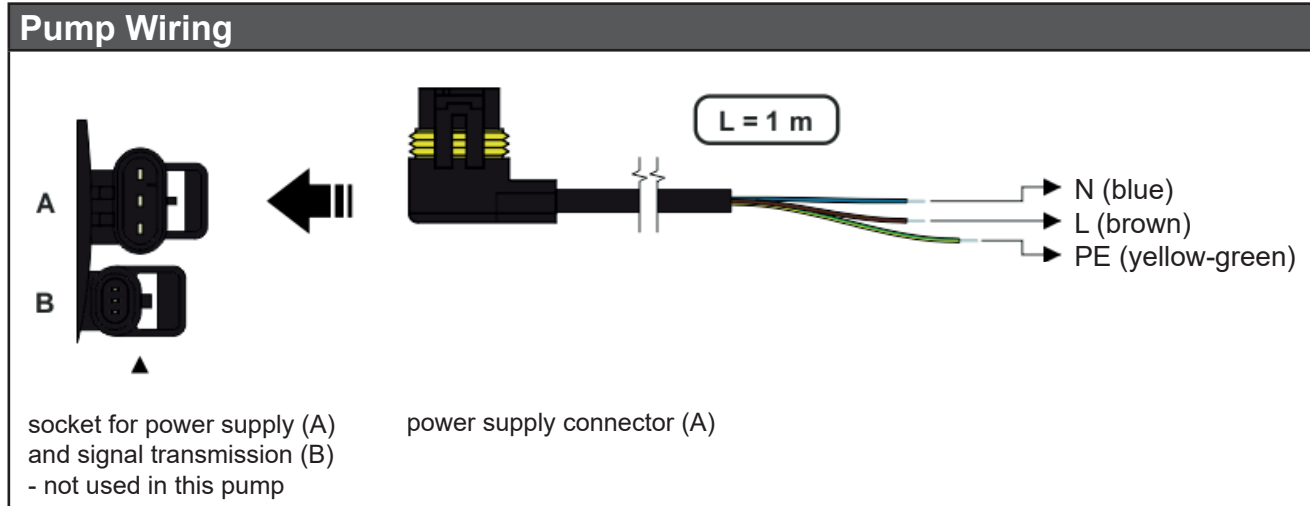
actuator wiring

- marking 1, 2, 3 located on the cables



5. Grundfos UPM3 AUTO 25-60 130 mm Pump

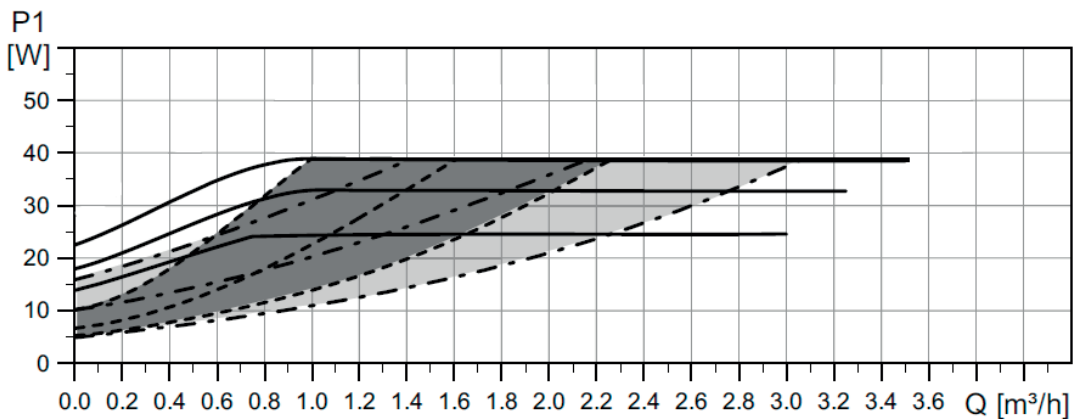
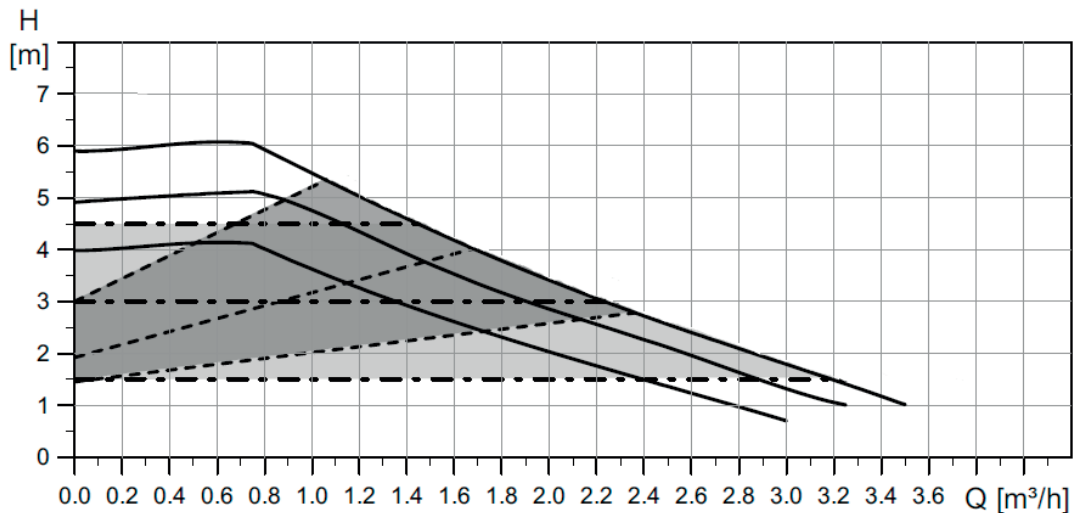
Wet-running circulation pump with G 6/4" M connection.



Pump Control

The circulation pump can be controlled by selecting a suitable mode and pump performance curve.

Performance Curves



Line type	Description
—	Constant speed
- - -	Proportional pressure
- · - · -	Constant pressure

Description of Pump Profiles

a) Proportional pressure

- Head (pressure): reduced with growing system pressure drop and increased with sinking system pressure drop.
- Pump operating point: moves up or down on the selected proportional pressure curve depending on the current system pressure drop.
- This mode is suitable for twin-line heating systems with radiators, to reduce noise caused by heating fluid flowing through thermostatic valves.



CONTROL MODE		DESCRIPTION
Proportional pressure	I	The lowest curve of proportional pressure
	II	The middle curve of proportional pressure
	III	The highest curve of proportional pressure
	AUTO _{ADAPT}	Automatically controls performance in the range from the highest to the lowest proportional pressure curve

b) Constant pressure

- Head (pressure): kept constant, disregarded of the system pressure drop.
- Pump operating point: moves on the selected constant pressure curve depending on the current system pressure drop.
- This mode is suitable for underfloor heating or for piping of a bigger size. It is also suitable for all applications without variable characteristics (e.g. pumps for heating up a HW storage tank) and for single-line heating systems with radiators.



CONTROL MODE		DESCRIPTION
Constant pressure	I	The lowest curve of constant pressure
	II	The middle curve of constant pressure
	III	The highest curve of constant pressure
	AUTO _{ADAPT}	Automatically controls performance in the range from the highest to the lowest constant pressure curve

c) Constant speed

- The pump runs at constant speed.
- Pump operating point: moves up or down on the selected curve depending on the current system pressure drop.
- This mode is suitable for systems with constant resistance which require a constant pumping performance.

CONTROL MODE		Max. H (upper graph)	Max. P ₁ (lower graph)
Constant speed	I	4 m	25 W
	II	5 m	33 W
	III	6 m	39 W

Settings Display

	DISPLAY	CONTROL MODE	
	green LED FLASHING	INTERNAL	
1		Proportional pressure AUTO _{ADAPT}	
2		Constant pressure AUTO _{ADAPT}	
3		Proportional pressure	I
4			II
5			III
6		Constant pressure	I
7			II
8			III
9		Constant speed	I
10			II
11			III

WARNING: LEDs may be turned by 90° or 180°, or mirrored, depending on the specific pump type.

When switched on, the pump runs at factory settings or the last setting. The display shows the current pump performance.

Setting selection

To select your desired setting, press the button repeatedly until you find the setting you need (see the table above). If you pass the desired setting, you have to go one more round until it appears again. The order of modes corresponds to the table.

Error Display

	DISPLAY	CONTROL MODE
		Seized pump
		Too low power supply voltage
		Electric fault

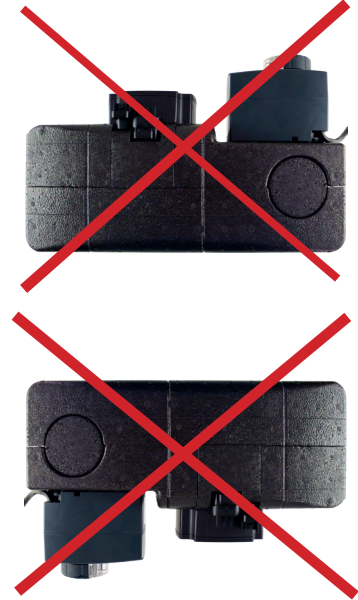
6. Permissible and Prohibited Pump Station Positions

The pump station may be installed either horizontally or vertically.

Permissible positions



Prohibited positions



7. Pump Station Installation Options

The pump station comes with a mixing valve in the left-hand position (see Fig. 1). If this installation position is convenient, there is no need to make any adjustments. If you remove the actuator during installation, do not turn the valve control manually and refit the actuator in the same position. When needed, the mixing valve can be rotated to the right-hand position (see Fig. 2). After the valve is turned by 180° and the fittings tightened, the actuator lock shall be unscrewed and screwed into the opening at the other valve side (see Fig. 2), and the position of the valve member and of the actuator changed (see the paragraph and pictures below).

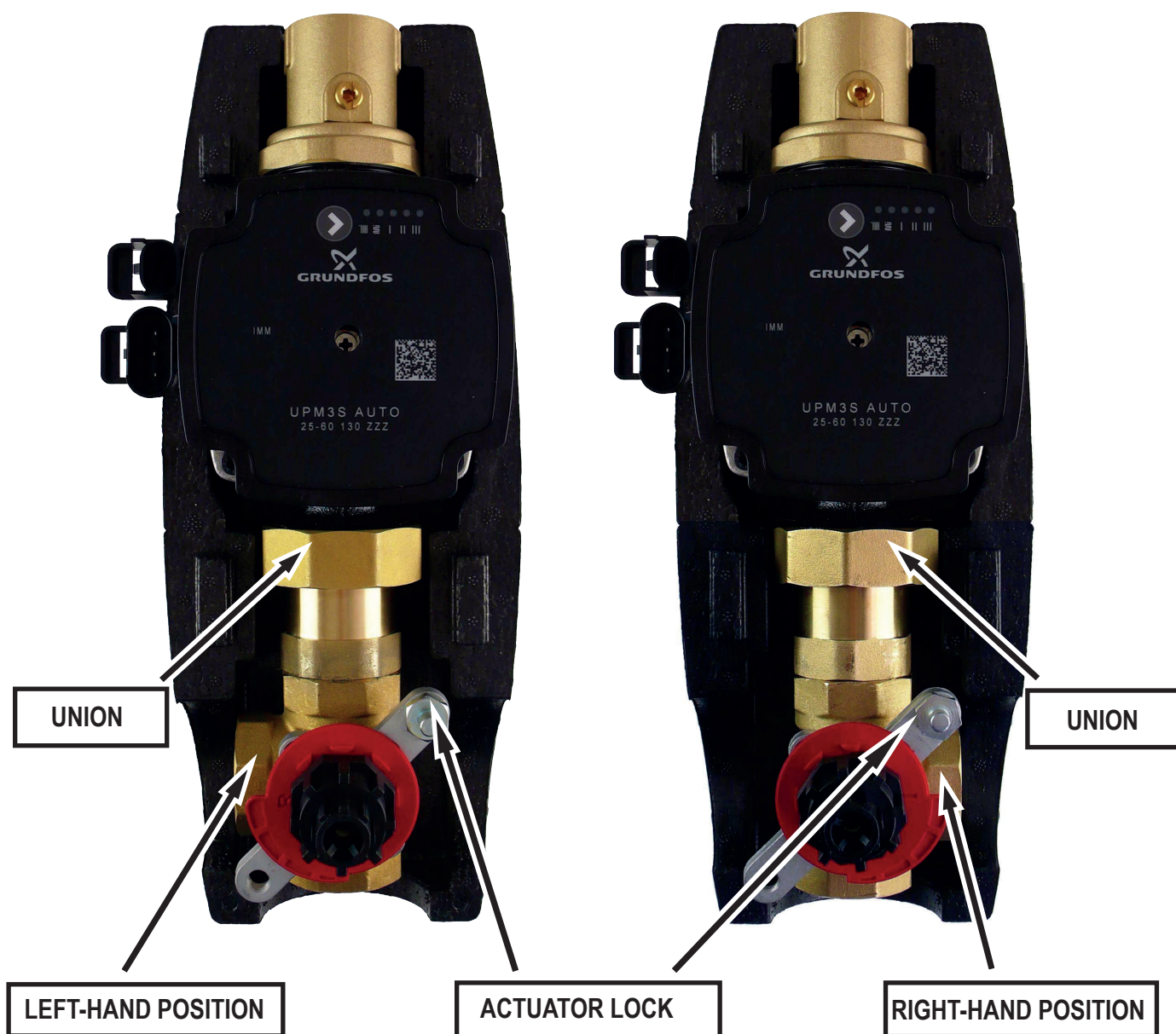


Fig. 1

Fig. 2

Valve Actuator Adjustment

Having turned the valve to the right hand position, turn the D-shaft in such a manner that the valve member is between inlets 1 and 3, turn the red plastic wheel properly (see Fig. 4) and finally fit the plastic adapter (the arrow on the plastic adapter forms an angle of 45° with inlets 1 and 3, see Fig. 4).

The flat spot on the shaft and the arrow on the plastic adapter shall be on the same side as the valve member!

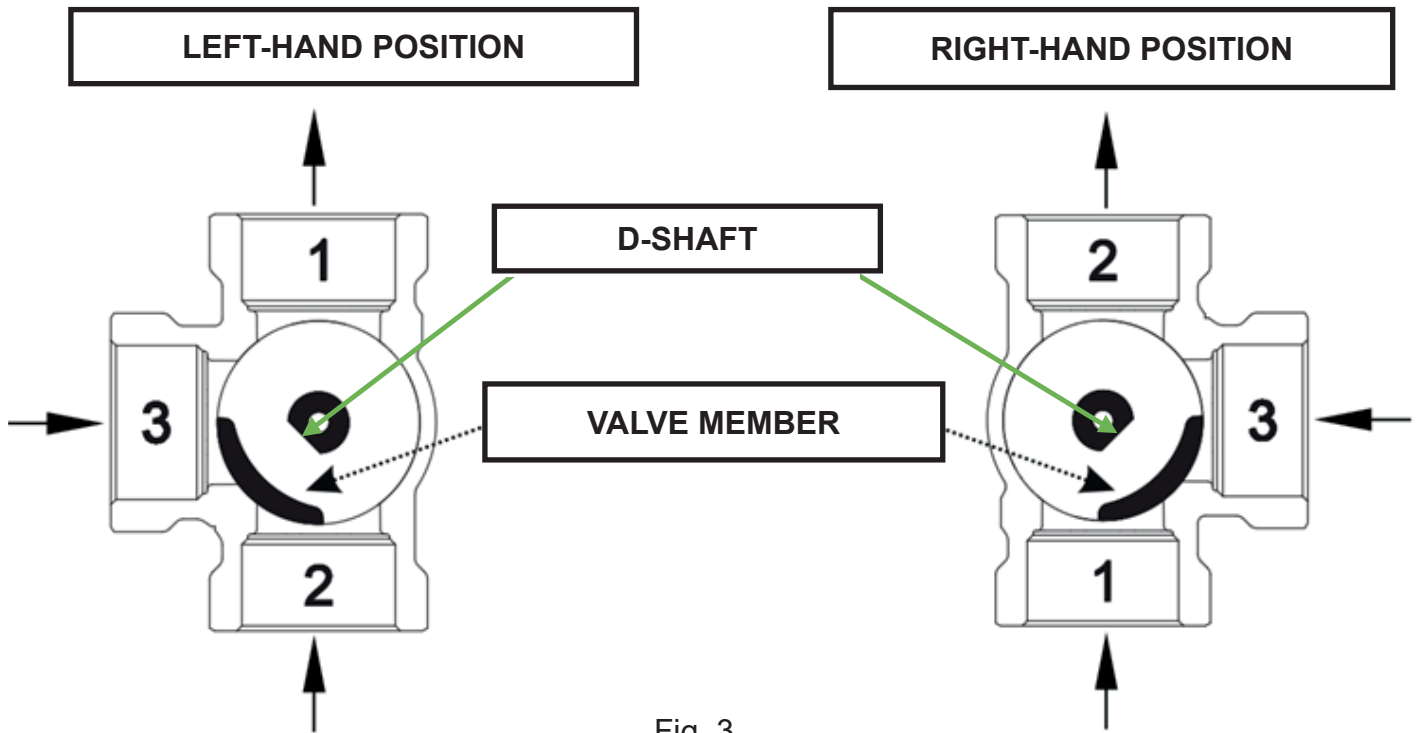


Fig. 3

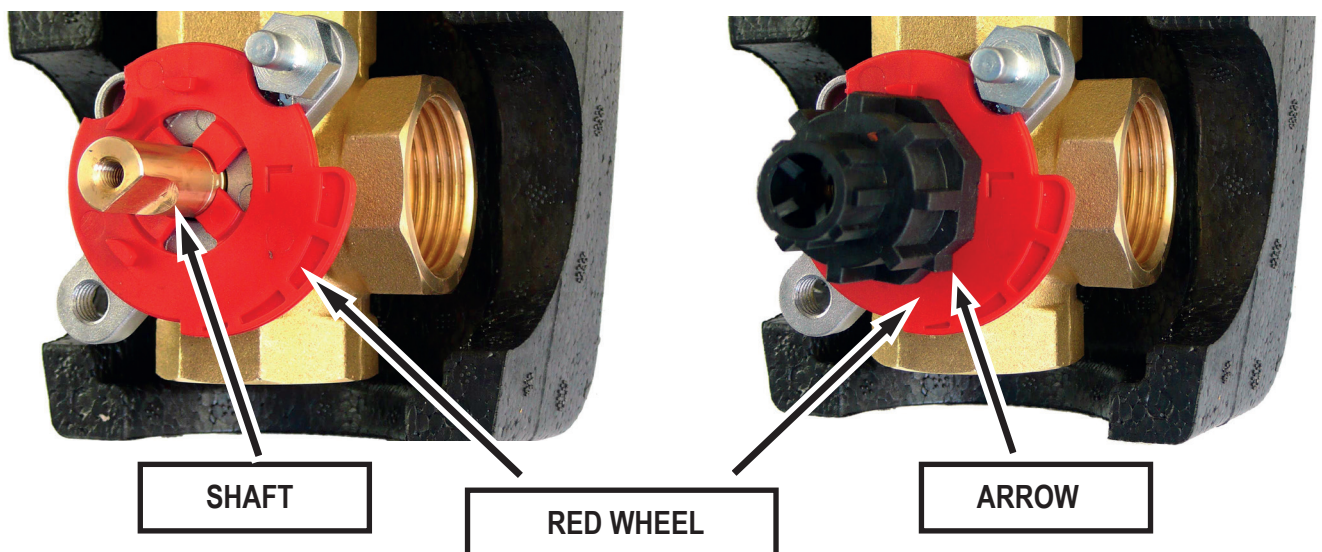
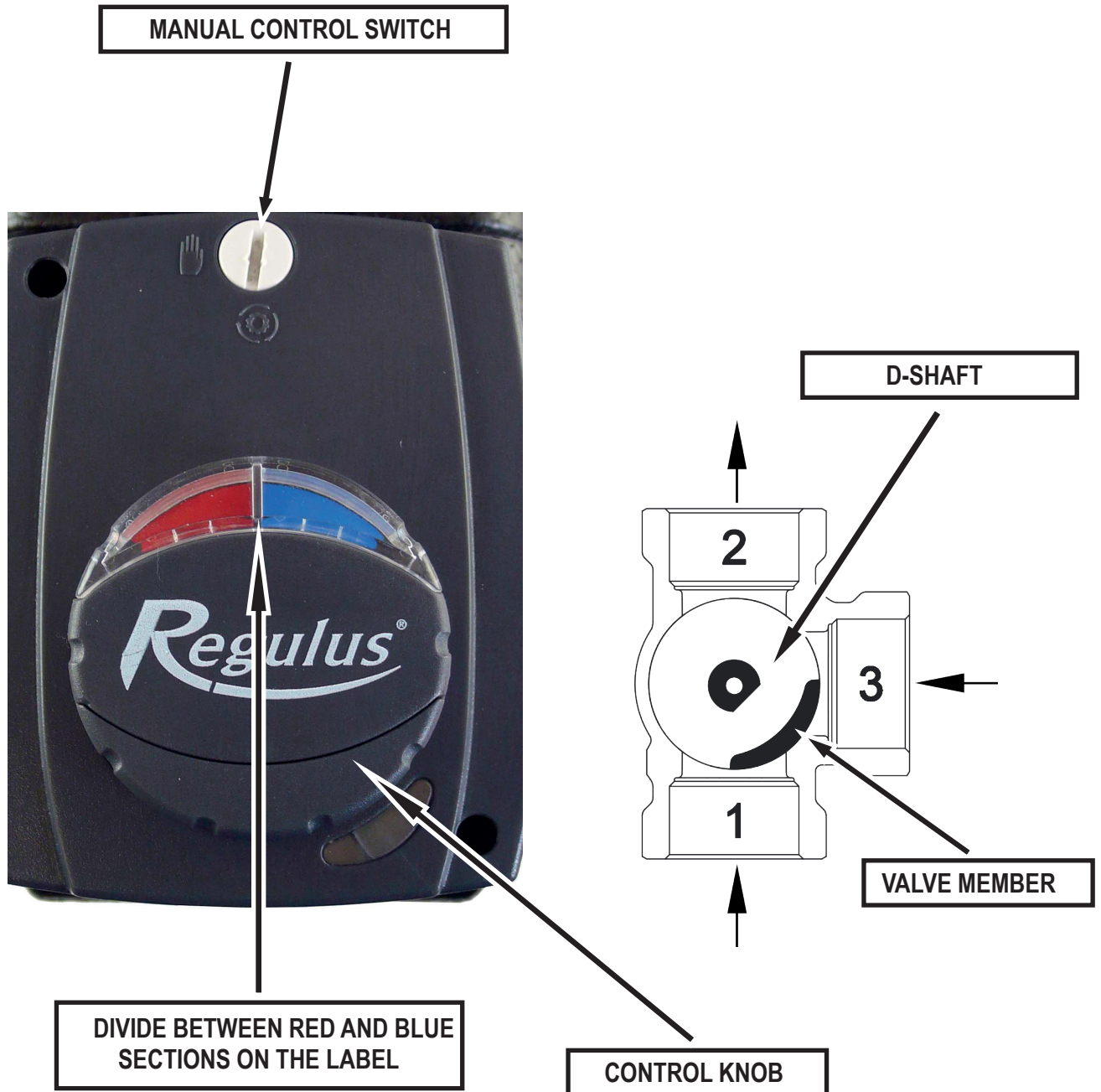


Fig. 4

Prior to fitting the actuator on the plastic adapter, switch it to manual control, set the control knob to the middle of its control range (i.e. to the divide between red and blue on the label) and then fit the actuator onto the adapter already on the valve. The control knob shall be able to turn freely both to left and right by 45°. When turned to the right by 45°, the path 1 is closed, and when turned to the left by 45° the path 3 is closed. Having performed the check, turn the knob back to automatic control.



After the actuator is fitted, the correct position of the round indication label, i.e. hot/cold shall be checked (the marking shall correspond to the manner how the hot and cold piping is connected) as to the right function and position of the valve. In case of a vertical installation in central heating, the red mark on the label shall be on the right-hand side for left-hand installations (see Fig. 5) and on the left-hand side for right-hand installations (see Fig. 6).



Fig. 5



Fig. 6

In case of a horizontal installation with a solid fuel boiler, the red mark on the label shall be on the right-hand side for right-hand installations (boiler to the left from the pump station), see Fig. 7, and on the left-hand side for left-hand installations (boiler to the right from the pump station), see Fig. 8.

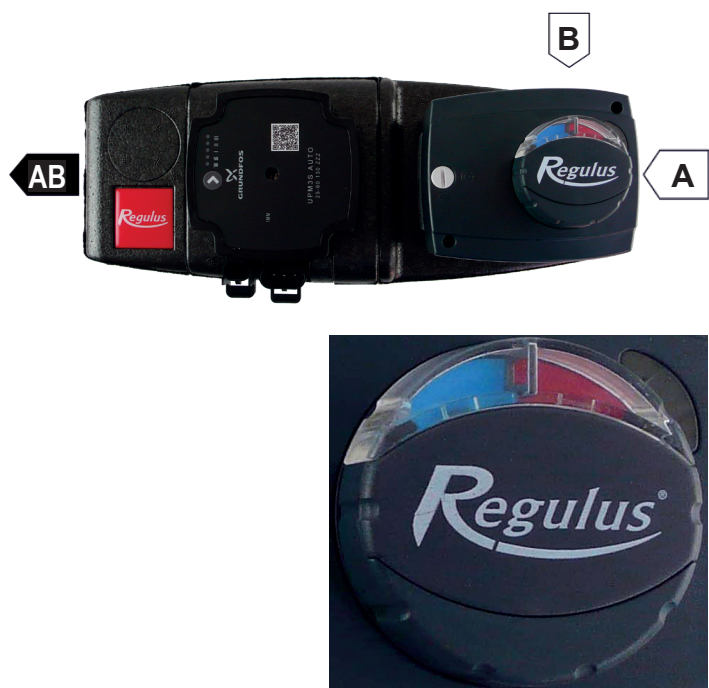


Fig. 7

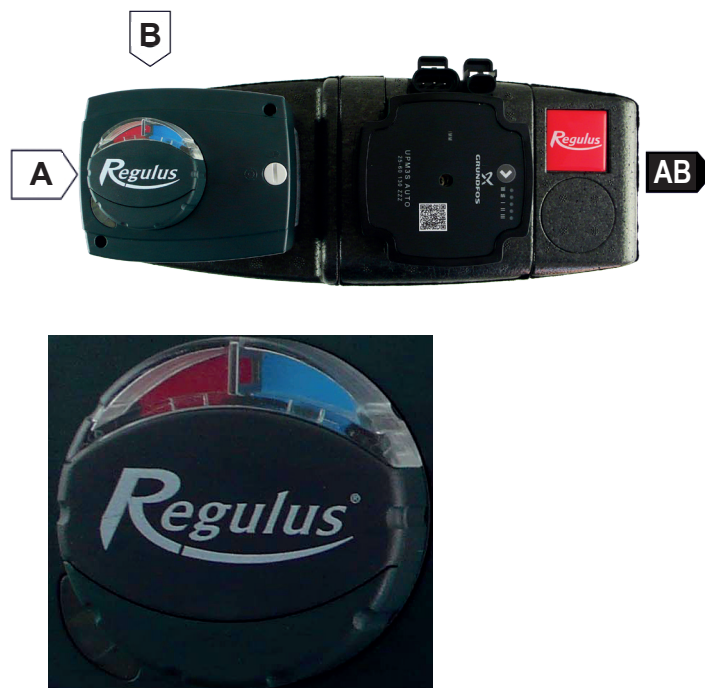


Fig. 8