Electrical ARM Actuator

CAUTION!

The ARM actuator may only be installed, commissioned and dismounted by properly trained staff. Only trained electricians may perform work on electrical circuits.

Any changes and modifications made by unauthorized staff may cause hazards and are prohibited for safety reasons.

Depending on the version, the ARM actuator can be operated with a mains voltage of 230 V. Mains voltage can cause severe injuries or death.

The actuator must never come into contact with water.

Disconnect the supply voltage before opening the actuator.

No modifications whatsoever may be made to the actuator.

Mounting the actuator to the mixing valve

The ARM actuator is factory-set to 50 % open (position "5" on the adjustment scale at the adjustment handle). The mixing valve must also be set to a position of 50 % open so that the actuator can be properly mounted to the valve. For this purpose, the regulating element must be set exactly to the centre position between the hot water supply and the cold water supply in 3-way valve and exactly along the axis of the supply to the system and the return to the boiler in 4-way valve, after you have mounted the mounting element to the valve shaft and tightened the locking screw. After you have set the mixing valve as described above, the valve and the actuator are ready for mounting.

Mounting instructions

1. Fit the mounting element "b" to the valve shaft and screw the locking screw "c" into the valve. **(fig 1)**.
2. Set the mixing valve to "50% open". The regulating element must be set exactly to the centre position between the hot water supply and the cold water supply in 3-way valve **(fig. 2.1)** and exactly along the axis of the supply to the system and the return to the boiler in 4-way valve **(fig. 2.2)**.
3. Remove the cap with the adjustment scale from the adjustment handle and fit the actuator to the valve in such a way that the locking screw is positioned one of the several grooves at the rear wall of the actuator.
4. Screw in the screw "h" to fixate the actuator to the valve **(fig. 1)**.
5. Select one of the adjustment scales included with the actuator, corresponding to the shut-off and opening directions of the valve, and fit it to the adjustment handle of the actuator.
6. Connect the actuator as per corresponding wiring diagram **(fig. 4)**.

Detailed mounting description

1. Fit the mounting element "b" to the valve shaft and screw the locking screw "c" into the valve **(fig. 1)**. In the case of AFRISO ARV valves (and in the case of most other valves), mark "a" at the mounting element coincides with the flat at the valve shaft; it also indicates the centre position of the regulating element in the valve **(fig. 2.1)**. You must loosen one of the housing screws **(fig. 1.1)** so that the locking screw can properly fit into the ARV valves sizes DN40 and DN50.

2. **3-way mixing valve:** Determine the operating range of the regulating element and the shut-off direction of the mixing valve and then set the regulating element to 50% open **(fig. 2.1)**. First, determine the hot water and the cold water supply of the valve installed in the heating system. It should be possible to move the regulating element between the hot water supply and the cold water supply within a range of 90°. Then adjust the regulating element exactly in the centre between the hot water supply and the cold water supply **(fig. 2.1)**. During this phase, you should also determine the valve shut-off direction (shutting off the hot water supply) and the valve opening direction (opening the hot water supply).
   4-way mixing valve: Determine the operating range of the regulating element of the mixing valve. To do so, determine the water supply from the boiler, the water supply into the system, the water return from the system and the water return to the boiler. Then adjust the regulating element exactly along the axis of the supply to the system and the return to the boiler **(fig. 2.2)** This corresponds to a valve opening of "50%". The regulating element should be operated in a range of +/-45° with reference to this position.

3. Fit the actuator onto the valve. The actuator is designed in such a way as to allow for mounting to the valve in any position **(fig. 2.2)**. The indicator element at the blue ring "g" should point upwards **(fig. 1)**. If this element has another position after you have fitted the actuator, pull out the adjustment handle, dismount the blue ring and refit it so that the indicator element points upward. Then plug on the adjustment handle (two notches at the circumference of the adjustment handle should be positioned horizontally) and screw in fixing screw "h" **(fig. 1)**.

4. Select the appropriate adjustment scale. The actuator kit is delivered with two adjustment scales: "from 0 to 10" and "from 10 to 0". Hold them to the valve; select the adjustment scale whose setting "0" corresponds to the cold water supply and whose setting "10" corresponds to the hot water supply - as shown in **fig. 2.1**. You may also use another simple rule to select the adjustment scale.
   - If the vale is to be closed by turning to the right (clockwise), select the adjustment scale "from 0 to 10".
   - If the vale is to be closed by turning to the left (counter- clockwise), select the adjustment scale "from 10 to 0".

5. Fit the adjustment scale selected in section 4 onto the adjustment handle. The blue indicator should show position "5" on the adjustment scale. If the indicator has a different position, the adjustment handle has not been fitted as required. In this case, go back to section 3.

6. Connect the actuator as per wiring diagrams in **fig. 4**.
   A. **3-point control:** After you have made the electrical connections, check whether the actuator turns in the required direction. If necessary, interchange wires 2 and 3.
   B. **2-point control:** You can change the shut-off direction by changing the position of the armature; dismount the actuator housing to access it.
   C. **Versions with auxiliary switch:** One of the two black wires connected to the auxiliary switch contacts has a red connection. This wire should be connected to the phase of the controlled system. If this is not the case, the red signal LED will not work properly.
   D. **Proportion control:** After you have made the electrical connections, make the following settings by means of a micro-switch which is accessible after you have opened the actuator housing:
   - Time for rotation by 90° (60/90/120 s),
   - Type of control signal (U / I),
   - Range of control signal (0..10 V / 2..10 V or 0..20 mA / 4..20 mA).

Figure 1

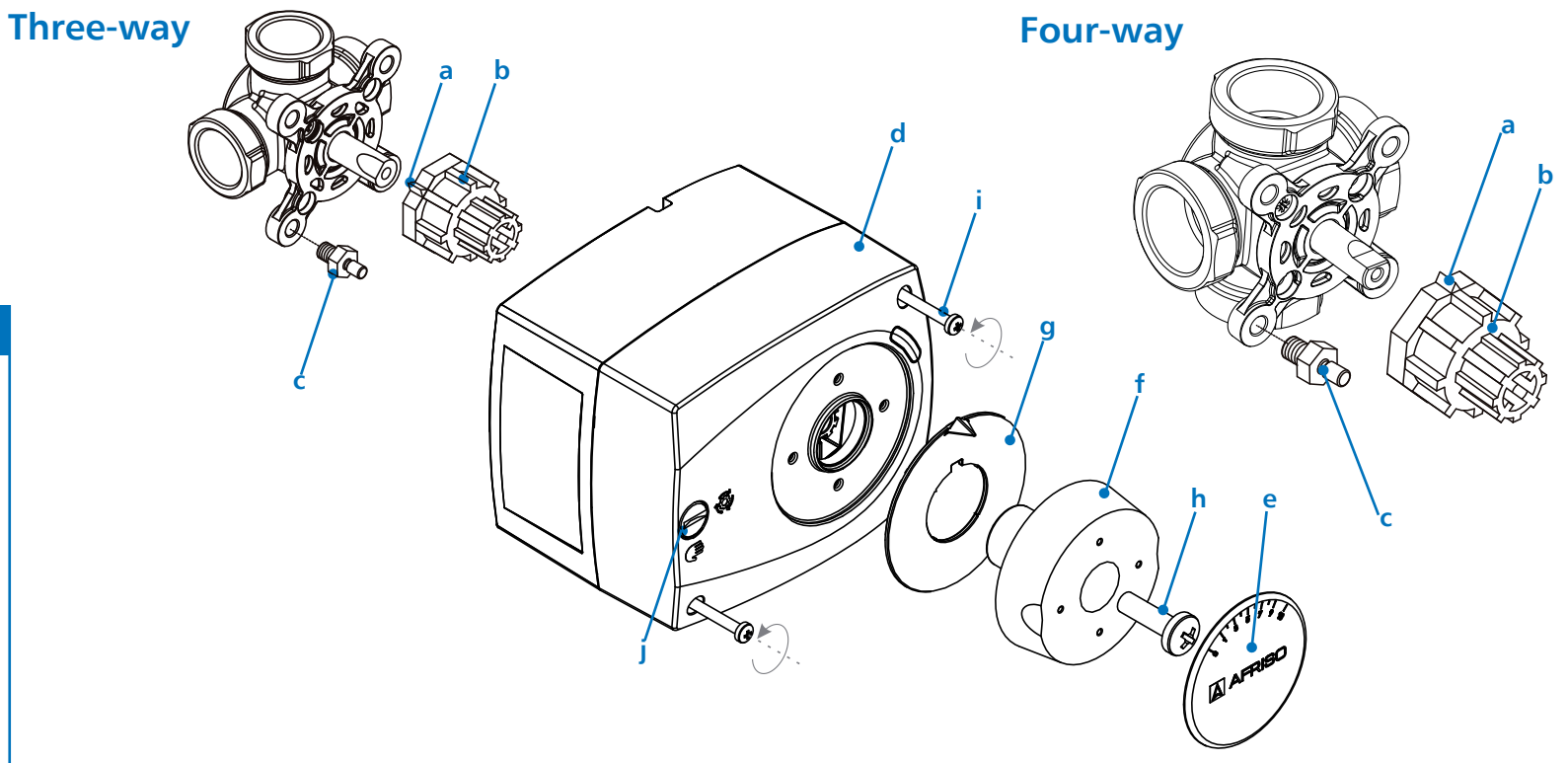


Figure 1.1

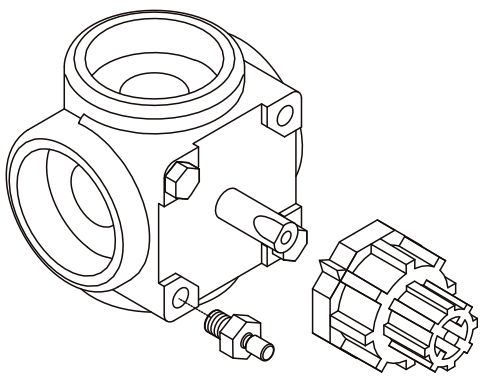
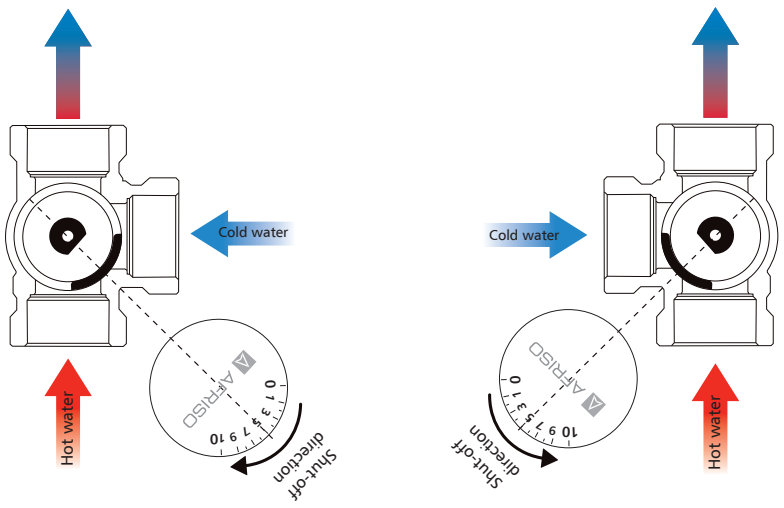
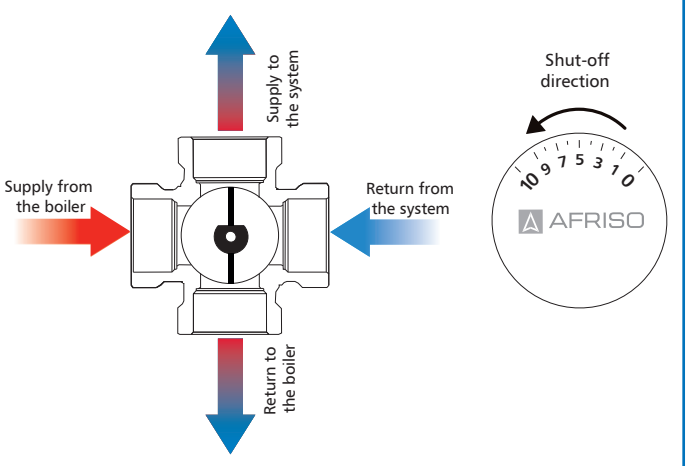


Figure 2.1



- **a** mark
- **b** mounting element
- **c** locking screw
- **d** actuator
- **e** adjustment scale
- **f** adjustment handle
- **g** blue ring with indicator element
- **h** fixing screw actuator
- **i** fixing screw housing
- **j** selector manual mode

Figure 2.2



Setting the auxiliary switch (selected versions)

Procedure for setting the auxiliary switch:

1. Loosen two fixing screws "i" and remove the actuator housing **(fig. 1)**.
2. Carefully remove the switching ring **(fig. 5)**. The thicker ring section which moves below the switch while the actuator operates, applies pressure to the lever and thus opens of contacts 4-5 of the auxiliary switch.The function of the auxiliary switch (closing of contacts 4-5) is initiated when the thinner ring section faces the switch which triggers the lever. At the same time, the signal lamp lights up.
3. After the actuator has been set to position "5" of the adjustment scale at the adjustment handle (50 % open) and the valve opening direction has been determined, set the angle of the actuator (range 0 - 90°) at which the function of the auxiliary switch is to be triggered.
4. Carefully push in the ring in such a way that the end of the thicker section of the circumference coincides with the specified switch triggering angle.
5. Refit the upper part of the actuator housing and tighten the fixing screws "i".

Operation of the actuator

1. **Operating mode of the actuator**

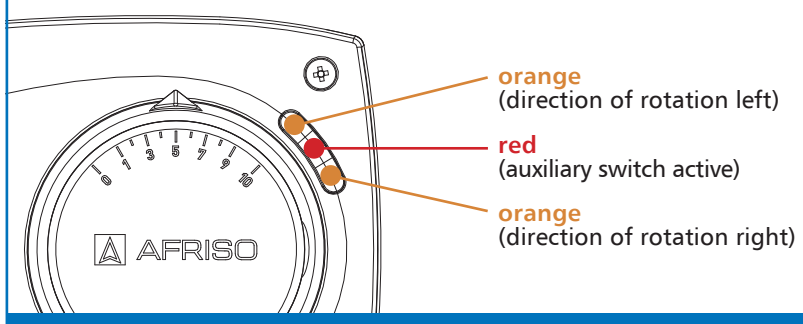
   The operating mode is set by means of the selector for manual mode "j" **(fig. 1)**.
   Operating mode Automatic: The actuator is in operating mode Automatic when the selector "j" is in position ⚙.
   Operating mode Manual: The actuator is in operating mode Manual when the selector "j" is in position ✋.

2. **Indication via signal LEDs**

   Three signal LEDs are integrated into the housing of the actuator. The outer LEDs indicate the direction of rotation of the actuator. The centre LED indicates the operating state of the auxiliary switch (depending on the version of the actuator).

3. **Position of adjustment handle with adjustment scale**

   After the actuator has been mounted to the mixing valve and the proper adjustment scale selected, position "0" means that the valve is fully closed (hot water supply closed) and position "10" means that the valve is fully opened (hot water supply open). The other settings of the adjustment scale represent the degree of opening (for example, "4" means that the valve is open by 40%).



Maintenance

The AFRISO ARM actuator is maintenance-free.

Technical specifications

Parameter	Value
Torque	Depending on version: 6 Nm, 10 Nm, 15 Nm
Rotation angle	90°
Time for turn by 90°	Depending on version: 15 s, 30 s, 60 s, 120 s, 240 s, 480 s
Supply voltage / control signal	2-point - 24 V AC / 230 V AC 3-point - 24 V AC / 230 V AC proportional - 24 V AC/DC (0..10 V, 2..10 V, 0..20 mA, 4..20 mA)
Operating temperature range	Setting in range 0 ÷ 90° (250 V AC, 3 A)
Power input	0 ÷ 50°C
Power consumption	2,5 ÷ 4 VA
Protection class	II
Degree of protection	IP42
Dimensions (H x W x D):	84 × 102 × 90 mm
Weight	Version 6 Nm: 390 g ÷ 630 g Version10 Nm and 15 Nm: 600 g ÷ 860 g
Housing material	PC

Approvals and certificates

The electrical actuator ARM complies with the Low Voltage Directive (LVD) (2006/95/EC), Electromagnetic Compatibility Directive (EMC) (2004/108/EC) and Restriction of Hazardous Substances Directive (RoHS) (2002/95/EC)

The electrical actuator ARM also complies with the following standards:
EN 60730-1, EN60730-2-14.

CE

Taking out of service, disposal

1. Disconnect the device from the supply voltage.
2. Dismount the device.
3. To protect the environment, this device must not be disposed of together with non-separated commercial waste. Take the device to an official waste disposal company.
   The electrical actuator ARM consists of recyclable materials.

Warranty

The warranty of the manufacturer for this product is 36 months after the date of purchase. The warranty shall be void if unauthorised modifications are made to the product or if the product is not installed in compliance with these instructions.

Customer satisfaction

Customer satisfaction is the prime objective of AFRISO-EURO-INDEX. Please contact us at info@afriso.de if you have any questions, suggestions or problems concerning product.

5 6 Page 7 8

Figure 3

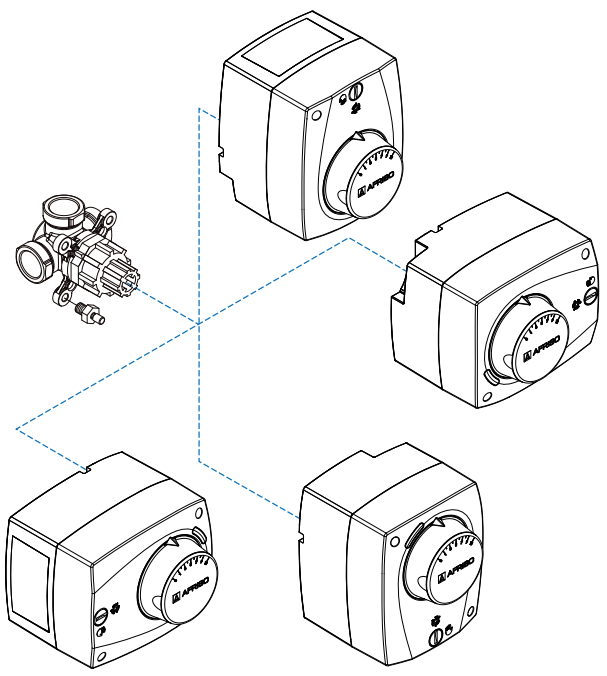


Figure 5

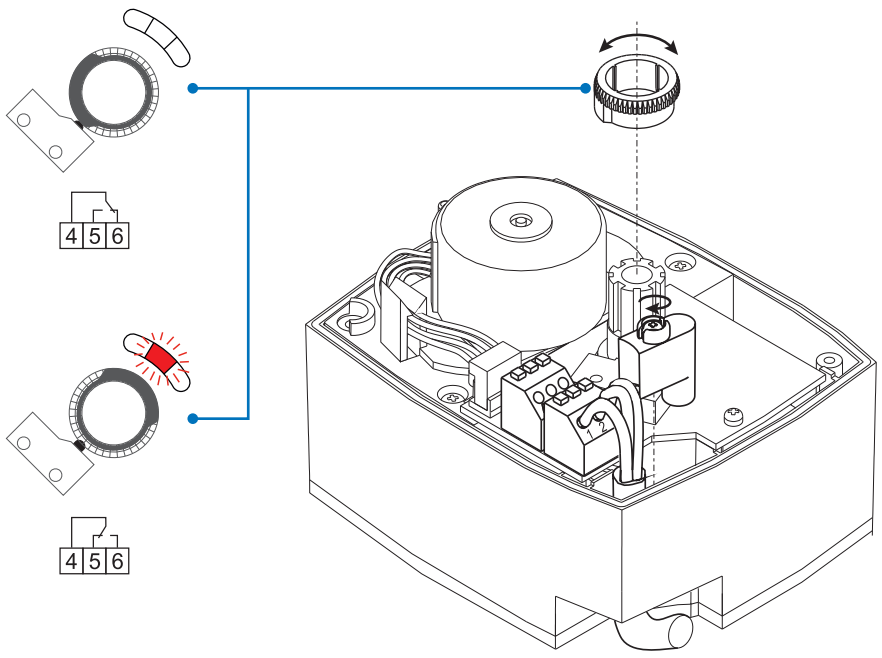
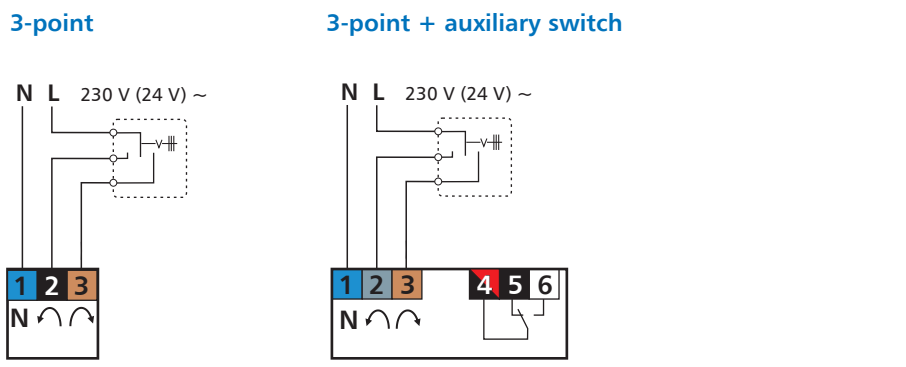
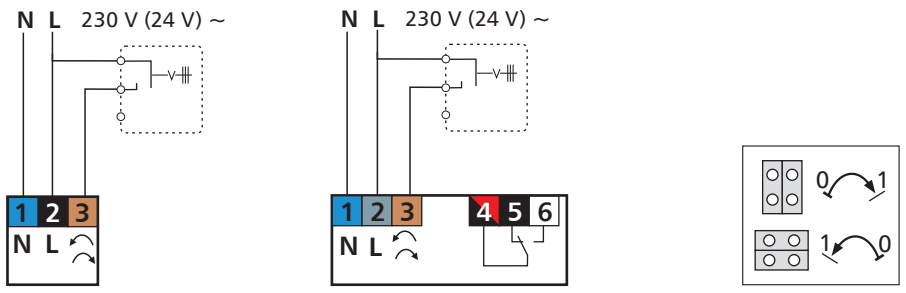
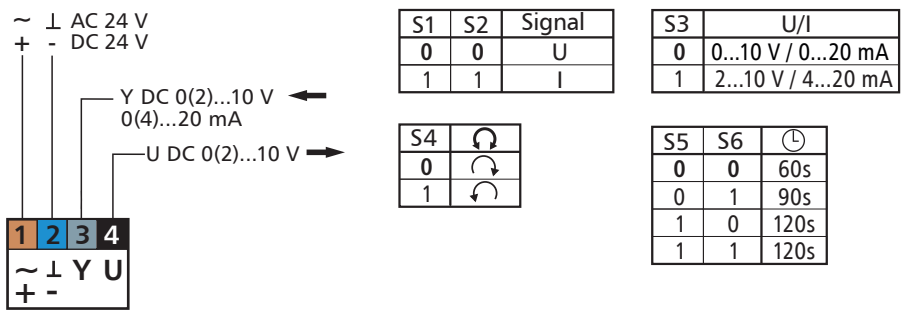


Figure 4







S1	S2	Signal
0	**0**	U
1	1	I

S3	U/I
0	0...10 V / 0...20 mA
1	2...10 V / 4...20 mA

S4	↻
0	↻
1	↺

S5	S6	🕒
0	**0**	60s
0	1	90s
1	0	120s
1	1	120s