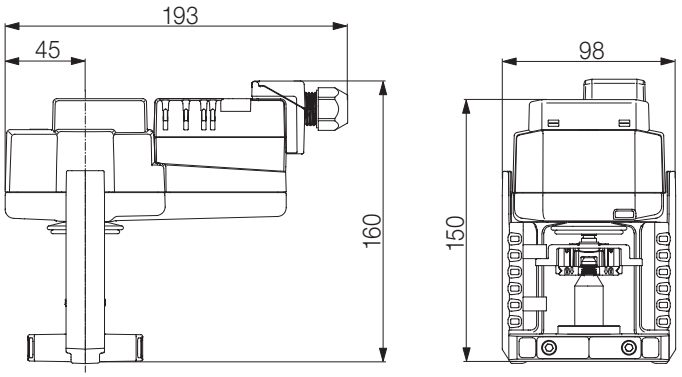
# HERZ-Actuators

## for HERZ Combi Valves and Control Valves

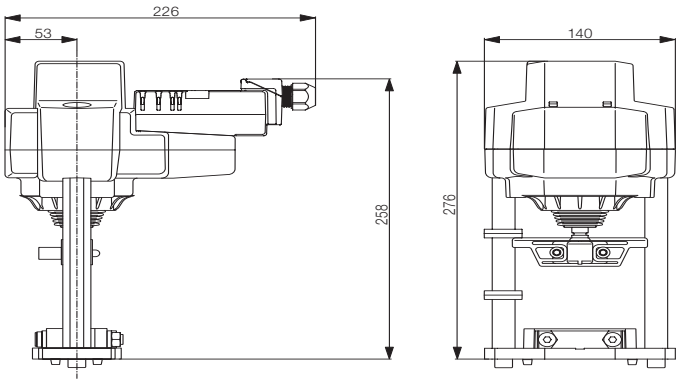
Data sheet for Actuators 7712, Issue 0514

☑ **Dimensions in mm**

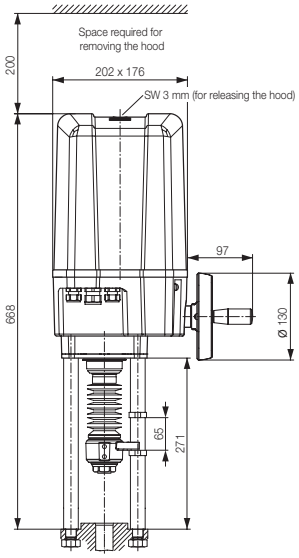
**F 7712 90, F 7712 95, F 7712 81**
**F 7712 91, F 7712 96, F 7712 82**
**F 7712 93, F 7712 97, F 7712 83**




**F 7712 92, F 7712 98, F 7712 84**




**F 7712 94, F 7712 85**



## Technical data

| **Modulating** | F **7712** 90 | F **7712** 91 | F **7712** 92 | F **7712** 93 | F **7712** 94 |
|---|---|---|---|---|---|
| Nominal voltage | AC/DC 24 V | | | | AC 24 V |
| Nominal voltage frequency | 50/60 Hz | | | | |
| Nominal voltage range | AC 19.2 V...28.8 V / DC 21.6 V...28.8 V | | | | AC 21.6...26.4 V |
| Power consumption in operation | 1 W | 1.5 W | 4 W | 2 W | - |
| Power consumption in rest position | 0.5 W | 0.5 W | 1.5 W | 1.5 W | - |
| Power consumption for wire sizing | 2 VA | 3 VA | 6 VA | 3.5 VA | 91 VA |
| Connection supply / control | Terminals 4 mm² and cable 1 m, 4 x 0.75 mm² | | | | Terminals 1.5 mm² |
| Parallel operation | Yes | | | | - |
| Actuating force | 500 N | 1000 N | 2500 N | 1500 N | 12 000 N |
| Positioning signal Y | DC 0 V...10 V | | | | |
| Positioning signal Y note | Input impedance 100 kΩ | | | | |
| Operating range Y | DC 2 V...10 V | | | | DC 2 V...10 V, can be switched to 0.5...10V |
| Position feedback U | | | | | |
| Position feedback U note | max. 0.5 mA | | | | |
| Position accuracy | 5% absolute | | | | - |
| Manual override | Gear disengagement with push-button, can be locked | | | | Handwheel, can be locked |
| Nominal stroke | 15 mm | 20 mm | 40 mm | 20 mm | 65 mm |
| Actuating time | 150 s / 15 mm | 150 s / 20 mm | 150 s / 40 mm | 150 s / 20 mm | 0.79 mm/s |
| Sound power level motor max. | 55 dB (A) | 45 dB (A) | 55 dB (A) | 35 dB (A) | 67 dB (A) |
| Position indication | Mechanical 5… 15 mm stroke | Mechanical 5… 20 mm stroke | Mechanical 5… 40 mm stroke | Mechanical 5… 20 mm stroke | Mechanical 30 ...65 mm stroke |
| Protection class IEC/EN | III Safety extra-low voltage | | | | |
| Degree of protection IEC/ EN | IP54 | | | | IP65 |
| EMC | CE in accordance to 2004/108/EC | | | | |
| Certification IEC/EN | Certified to: IEC/EN 60730-1 and IEC/EN 60730-2-14 | | | | |
| Mode of operation | Type 1 | | | | |
| Rated impulse voltage supply / control | 0.8 kV | | | | 2 kV |
| Control pollution degree | 3 | | | | |
| Ambient temperature | 0 °C ... 50 °C | | | | -20 °C ... 70 °C |
| Non-operating temperature | -40 °C ... 80 °C | | | | - |
| Ambient humidity | 95% r.h., non-condensing | | | | |
| Maintenance | Maintenance-free | | | | |
| Weight approx. | 1.340 kg | 1.340 kg | 4.320 kg | 1.390 kg | 10.5 kg |

## Technical data

| Open-close, 3-point | F **7712** 95 | F **7712** 96 | F **7712** 97 | F **7712** 98 |
|---|---|---|---|---|
| Nominal voltage | AC/DC 24 V | | | |
| Nominal voltage frequency | 50/60 Hz | | | |
| Nominal voltage range | AC 19.2 V...28.8 V / DC 21.6 V...28.8 V | | | |
| Power consumption in operation | 1 W | 1.5 W | 3 W | 2.5 W |
| Power consumption in rest position | 0.5 W | | | |
| Power consumption for wire sizing | 1 VA | 3 VA | 5 VA | 4.5 VA |
| Connection supply / control | Terminals 4 mm² and cable 1 m, 3 x 0.75 mm² | | | |
| Parallel operation | Yes | | | |
| Actuating force | 500 N | 1000 N | 1500 N | 2500 N |
| Manual override | Gear disengagement with push-button, can be locked | | | |
| Nominal stroke | 15 mm | 20 mm | 20 mm | 40 mm |
| Actuating time | 150 s / 15 mm | 150 s / 20 mm | 150 s / 20 mm | 150 s / 40 mm |
| Sound power level motor max. | 45 dB (A) | 45 dB (A) | 35 dB (A) | 55 dB (A) |
| Position indication | Mechanical 5 … 15 mm stroke | Mechanical 5 … 20 mm stroke | Mechanical 5 … 20 mm stroke | Mechanical 5 … 40 mm stroke |
| Protection class IEC/EN | III Safety extra-low voltage | | | |
| Degree of protection IEC/EN | IP54 | | | |
| EMC | CE in accordance to 2004/108/EC | | | |
| Certification IEC/EN | Certified to: IEC/EN 60730-1 and IEC/EN 60730-2-14 | | | |
| Mode of operation | Type 1 | | | |
| Rated impulse voltage supply / control | 0.8 kV | | | |
| Control pollution degree | 3 | | | |
| Ambient temperature | 0 °C ... 50 °C | | | |
| Non-operating temperature | -40 °C ... 80 °C | | | |
| Ambient humidity | 95% r.h., non-condensing | | | |
| Maintenance | Maintenance-free | | | |
| Weight approx. | 1.320 kg | 1.320 kg | 1.340 kg | 4.220 kg |

## Technical data

| Open-close, 3-point | F **7712** 81 | F **7712** 82 | F **7712** 83 | F **7712** 84 | F **7712** 85 |
|---|---|---|---|---|---|
| Nominal voltage | AC 230 V | | | | |
| Nominal voltage frequency | 50/60 Hz | | | | |
| Nominal voltage range | AC 198...264 V | | | | AC 207...253 V |
| Power consumption in operation | 3.5 W | 2 W | 3.5 W | 5.5 W | - |
| Power consumption in rest position | 0.5 W | 1 W | 1 W | 1 W | - |
| Power consumption for wire sizing | 6.5 VA | 4.5 VA | 6.5 VA | 9.5 VA | 109 VA |
| Connection supply / control | Terminals 4 mm² and cable 1 m, 3 x 0.75 mm² | | | | Terminals 1.5 mm² |
| Parallel operation | Yes | | | | - |
| Actuating force | 500 N | 1000 N | 1500 N | 2500 N | 12 000 N |
| Manual override | Gear disengagement with push-button, can be locked | | | | Handwheel, temporary |
| Nominal stroke | 15 mm | 20 mm | 20 mm | 40 mm | 65 mm |
| Actuating time | 150 s / 15 mm | 150 s / 20 mm | 150 s / 20 mm | 150 s / 40 mm | 0.79 mm/s |
| Sound power level motor max. | 45 dB (A) | 45 dB (A) | 35 dB (A) | 55 dB (A) | 67 dB (A) |
| Position indication | Mechanical 5… 15 mm stroke | Mechanical 5… 20 mm stroke | Mechanical 5… 20 mm stroke | Mechanical 5… 40 mm stroke | Mechanical 30... 65 mm stroke |
| Protection class IEC/EN | II Protective insulated | | | | |
| Degree of protection IEC/ EN | IP54 | | | | IP65 |
| EMC | CE in accordance to 2004/108/EC | | | | |
| Certification IEC/EN | Certified to: IEC/EN 60730-1 and IEC/EN 60730-2-14 | | | | |
| Mode of operation | Type 1 | | | | |
| Rated impulse voltage supply / control | 4 kV | | | | 2 kV |
| Control pollution degree | 3 | | | | |
| Ambient temperature | 0 °C ... 50 °C | | | | -20 °C ... 70 °C |
| Non-operating temperature | -40 °C ... 80 °C | | | | - |
| Ambient humidity | 95% r.h., non-condensing | | | | |
| Maintenance | Maintenance-free | | | | |
| Weight approx. | 1.320 kg | 1.320 kg | 1.400 kg | 4.250 kg | 10.5 kg |

## Principle of operation

### Actuator F 7712 90 - 94

The actuator is connected with a standard modulating signal of DC 0/2 ... 10V and travels to the position defined by the positioning signal. The measuring voltage U serves for the electrical display of the actuator position 0 ... 100% and as slave control signal for other actuators.

### Actuator F 7712 95 - 98 and F 7712 81 - 85

The actuator is activated with a 3-point signal. If the actuator reaches the end position, then the motor will be switched off via (two) load-dependent switches. These switches protect the motor when there are foreign objects between the fitting seat and the cone.

## Direct mounting

Simple direct mounting on the globe valve by means of form-fit hollow clamping jaws. The actuator can be rotated by 360° on the valve neck.

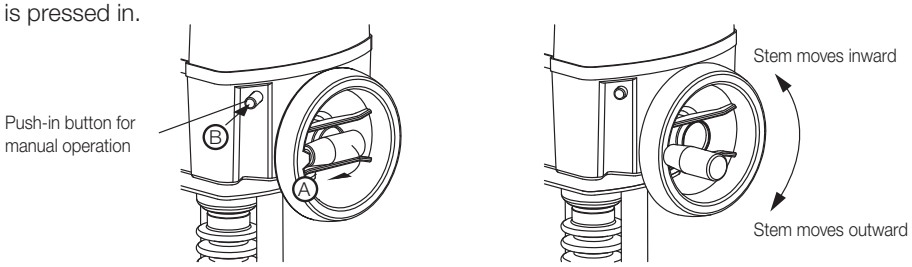
## Manual override

### Actuator F 7712 90 - 93, F 7712 95 - 98 and F 7712 81 - 84

Manual override possible with push-button - temporary or permanently. The gear is disengaged and the actuator decoupled for as long as the button is pressed / latched. The stroke can be adjusted by using a hexagon socket screw key (4 mm or 5 mm), which is inserted into the top of the actuator. The stroke spindle extends when the key is rotated clockwise.

### Actuator F 7712 94 and F 7712 85

In deenergised state and/or when the motor is shut off, upward and downward movement can be accomplished when the handwheel is pressed in.




To accomplish this, proceed as follows:

- Unfold rotary handle from the handwheel **A**
- Press in the engagement button for manual operation while rotating the handwheel slightly, **B** → Button engages
- Rotate handwheel in clockwise direction → Stem moves outward ↓
- Rotate handwheel counterclockwise → Stem moves inward ↑

The motor is no longer coupled when the handwheel is pressed in. The handwheel is pushed out automatically when the motor starts and the motor is once again coupled.

**Caution**

Manual operation may be initiated only when the motor is shut off. Switching while the motor is running can cause damage to the stroke actuator! When in manual operation, do not fail to note that, when in end position, the handwheel is rotated only to the point that the torque switches are actuated (audible clicking), because otherwise the stroke actuator will be damaged.

## High functional reliability

The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

## High operational reliability for F 7712 94 and F 7712 85

The actuator is protected against short circuits, polarity reversal and overloading.

## Combination valve/actuator

Refer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures. A quick selection can be done with the Selection Matrix.

## Installation actuator - valve

The power connection is accomplished with form closure. The power transmission is accomplished by means of the coupling that is secured against torsion.

### Actuator replacement

If an actuator must be replaced in an emergency situation, then the installation instructions for replacement actuators must be followed.

### Position indication

The stroke is indicated mechanically on the bracket with tabs. The stroke range adjusts itself automatically during operation.

### Home position

Setting ex-works: Actuator spindle is retracted. When valve-actuator combinations are shipped, the direction of motion is set in accordance with the closing point of the valve.

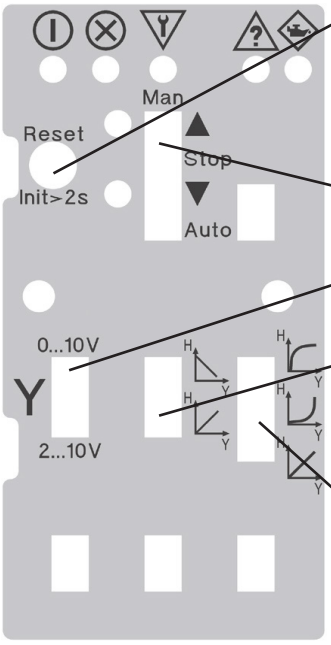
### Direction of stroke switch

When actuated, the direction of stroke switch changes the running direction in normal operation.

### Adaption of stroke range for F 7712 90 - 93

The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out a stroke adaption, which is when the operating range and position feedback adjust themselves to the mechanical stroke. Manual triggering of the adaption can be carried out by pressing the "Adaption" button. The actuator then moves into the position defined by the positioning signal.

### Settings and parameterisation for F 7712 94




Reset and initialisation:
- Reset (press <2s): Restart of software and deletion of stored errors is carried out.
- Initialisation (press >2s): Actuator travels to end stops and determines the valve stroke while doing so.

(Note: «Init» is to be carried out after assembly)

Operating mode of the actuator: Open, Stop, Close, Auto
- Presetting Auto (below): Actuator follows the positioning signals

Positioning signal configuration: 0/2…10V
- Presetting control voltage: 2…10V (below)

Signal inversion:
- Signal inversion presetting: NOT inverted (below)
  - Setting: **not inverted** (below) with installation on H6..W..-S7
  - Setting: **inverted** (above) with installation on H7..W..-S7

Characteristic curve:
- Characteristic curve correction presetting: Linear (below)

Default setting for all adjustable rocker switches thus **=** below

### LED status displays

If an actuator must be replaced in an emergency situation, then the installation instructions for replacement actuators must be followed.

| LED | Color | Meaning | Description |
|---|---|---|---|
| ⏻ | green | Power | Electronics is supplied with voltage |
| ⊗ | red | Fault | Actuator is not initialised, actuator cannot reach the setpoint position (for better localisation of the failure cause, see the «LED coding for errors») |
| ⚠ | orange | Functional check | Blockade, manual operation (handwheel or slide switch) |
| ⚠ | yellow | Does not comply with specification | The LED lights up when the following parameters are exceeded:<br>- ED (Power-on time)<br>- Temperature range<br>- Flashing during the initialisation run |
| ◈ | blue | Maintenance | The maintenance message is displayed when predefined limit values or parameters are exceeded, depending on the setting of the diagnostics switch. |

**LED coding with faults**

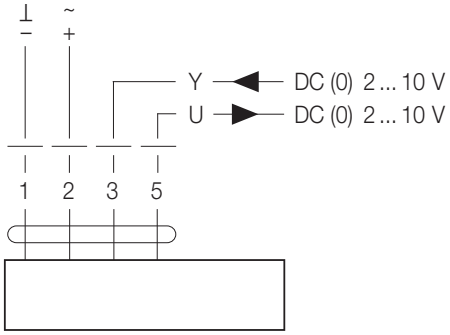
| | ⏻ | ⊗ | ▽ | ? | ◈ |
|---|---|---|---|---|---|
| No initial run | green | red | | | |
| Blockade | green | red | orange | | |
| Y in positioning signal has failed | green | red | | yellow | |
| ADV - outside the valid travel path | green | red | orange | yellow | |
| Position cannot be reached | green | red | orange | | blue |
| Valve stroke too small | green | red | orange | yellow | blue |

## Electrical installation for F 7712 90 - 93

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible.
- Direction of stroke switch factory setting: Actuator spindle retracted.

**Wiring diagram**

**AC/DC 24V, modulating**



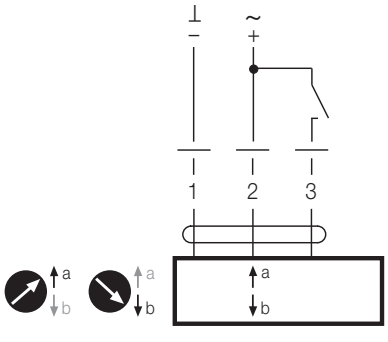

Cable colors:
1 = black
2 = red
3 = white
5 = orange

## Electrical installation for F 7712 95 - 98

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible.
- Direction of stroke switch factory setting: Actuator spindle retracted.

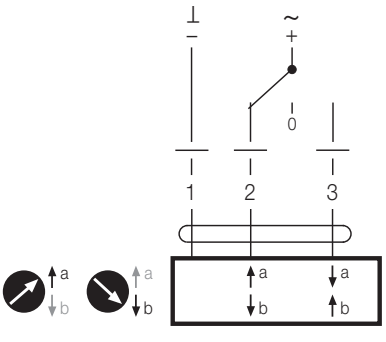
**Wiring diagram**

**AC/DC 24V, open-close (one wire)**




Cable colors:
1 = black
2 = red
3 = white

**AC/DC 24V, 3-point**



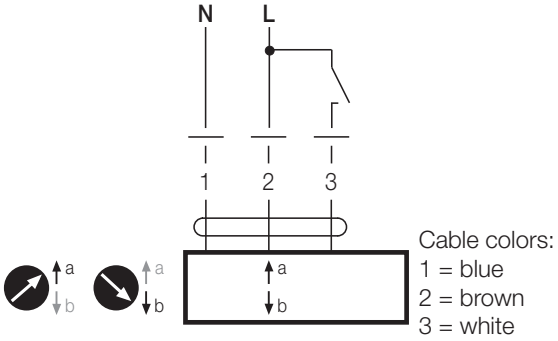

Cable colors:
1 = black
2 = red
3 = white

## Electrical installation for F 7712 81 - 84

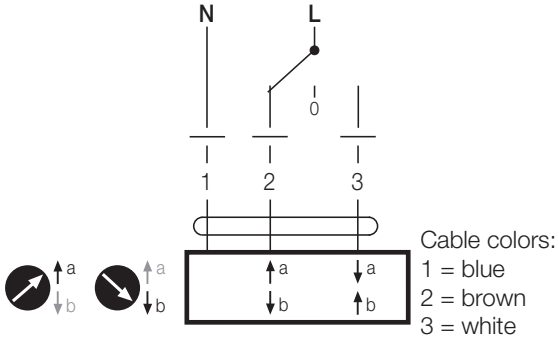
- Parallel connection of other actuators possible.
- Direction of stroke switch factory setting: Actuator spindle retracted.

### Wiring diagram

**AC 230V, open-close (one wire)**




**AC 230V, 3-point**

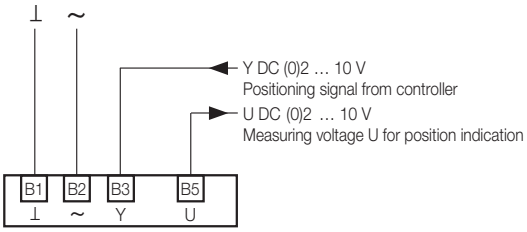


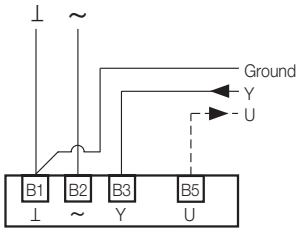

## Electrical installation for F 7712 94

- Connection via safety isolating transformer.
- Shared ground for supply and signal with max. conductor lengths of 25 m with 1,5 mm² conductor cross - section or 10 m with 0,75 mm² conductor cross - section. Guide suppy and signal separately with longer signal cable lengths (Ground Signal).
- Use twisted cables.

### Wiring diagram

**AC 24V, modulating**



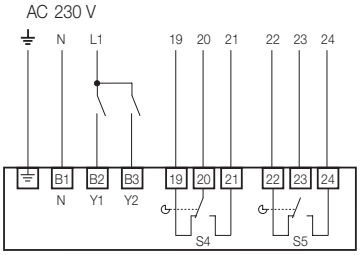

| | ⋈ | ⋈ | A – AB |
|---|---|---|---|
| Y = 0/2 V | ↓ | ↑ | 0 % |
| Y = 10 V | ↑ | ↓ | 100 % |

## Electrical installation for F 7712 85

- Connection via safety isolating transformer.
- Shared ground for supply and signal with max. conductor lengths of 25 m with 1,5 mm² conductor cross - section or 10 m with 0,75 mm² conductor cross - section. Guide suppy and signal separately with longer signal cable lengths (Ground Signal).
- Use twisted cables.

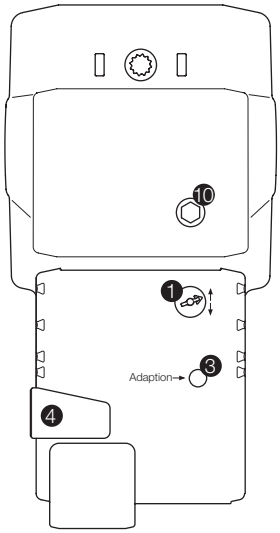
### Wiring diagram

**AC 230V, 3-point**




| | Ⓜ | A – AB ⋈ | A – AB ⋈ |
|---|---|---|---|
| Y1 | ↓ | 0% | 100% |
| Y2 | ↑ | 100% | 0% |

## Operating controls and indicators for F 7712 90 - 91



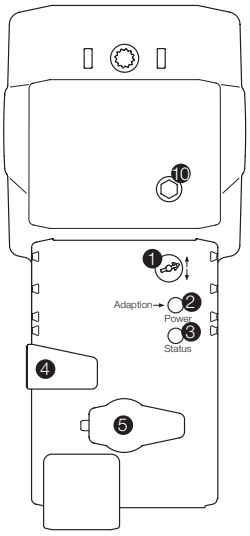

**(1) Direction of stroke switch**
Switching: Direction of stroke changes

**(3) Push-button and LED display yellow**
Off: Standard mode
Illuminated: Adaption procedure active
Press button: Triggers stroke adaption, followed by standard mode

**(4) Gear disengagement button**
Press button: Gear disengages, motor stops, manual override possible
Release button: Gear engages, standard mode

**(10) Manual override**
Clockwise: Actuator spindle extends
Counterclockwise: Actuator spindle retracts

## Operating controls and indicators for F 7712 92 - 93




**(1) Direction of stroke switch**
Switching: Direction of stroke changes

**(2) Push-button and LED display green**
Off: No power supply or malfunction
Illuminated: In operation
Press button: Triggers stroke adaption, followed by standard mode

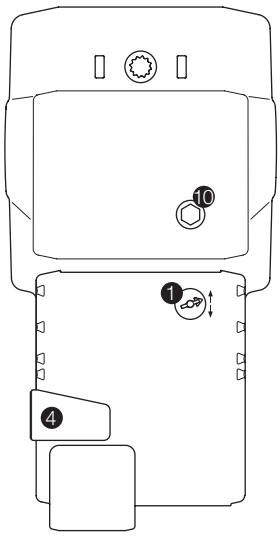
**(3) LED display yellow**
Off: Standard mode
Illuminated: Adaption procedure active

**(4) Gear disengagement button**
Press button: Gear disengages, motor stops, manual override possible
Release button: Gear engages, standard mode

**(5) Service plug**
No function

**(10) Manual override**
Clockwise: Actuator spindle extends
Counterclockwise: Actuator spindle retracts

## Operating controls and indicators for F 7712 81 - 84 and F 7712 95 - 98

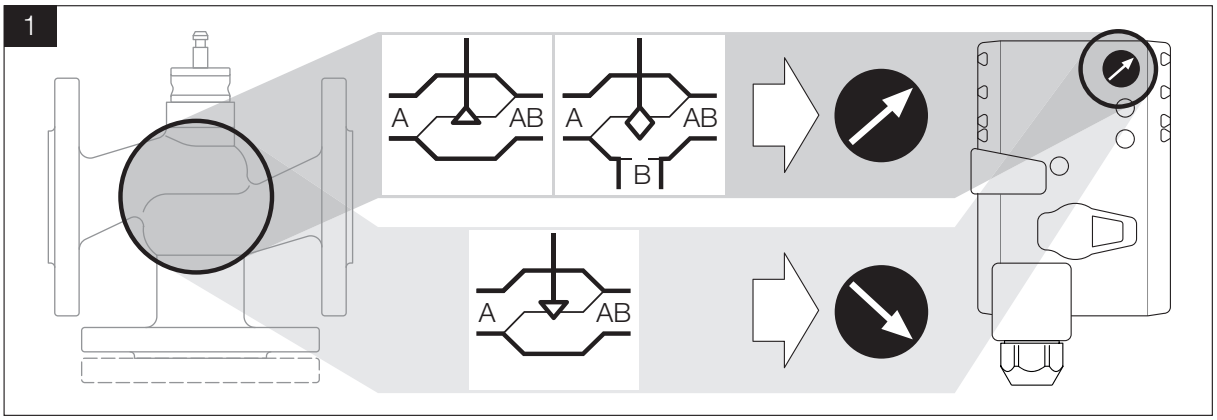


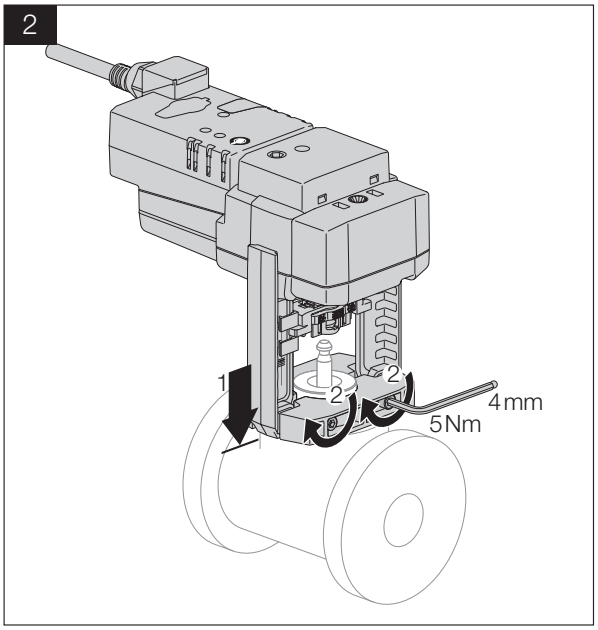

**(1) Direction of stroke switch**
Switching: Direction of stroke changes

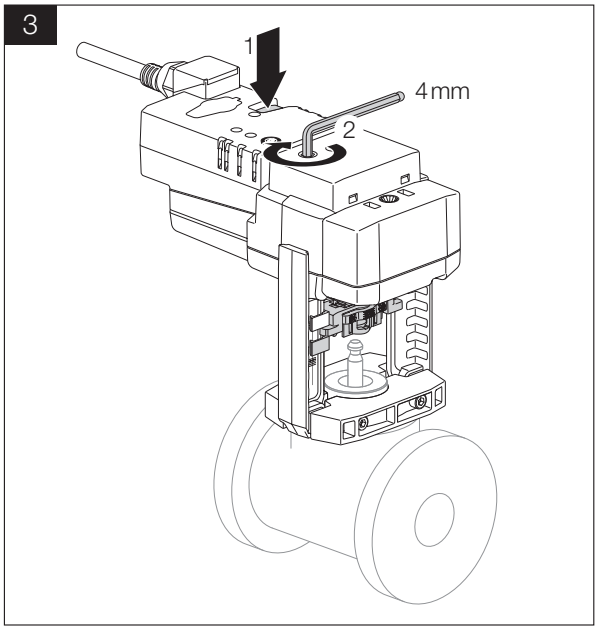
**(4) Gear disengagement button**
Press button: Gear disengages, motor stops, manual override possible
Release button: Gear engages, standard mode

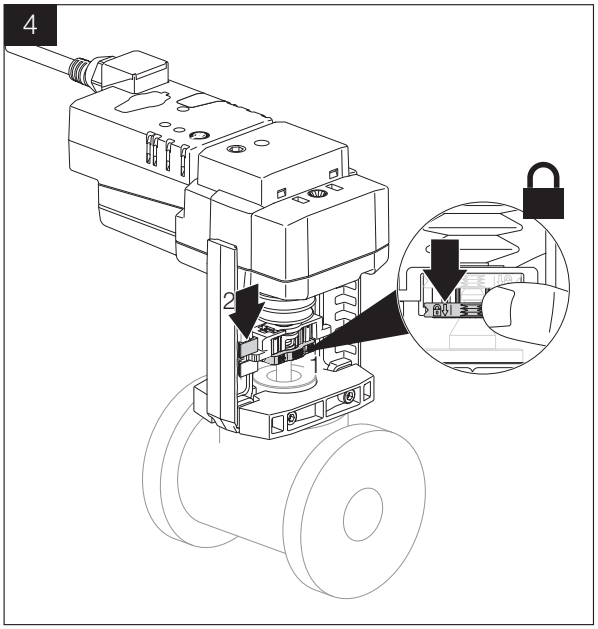
**(10) Manual override**
Clockwise: Actuator spindle extends
Counterclockwise: Actuator spindle retracts

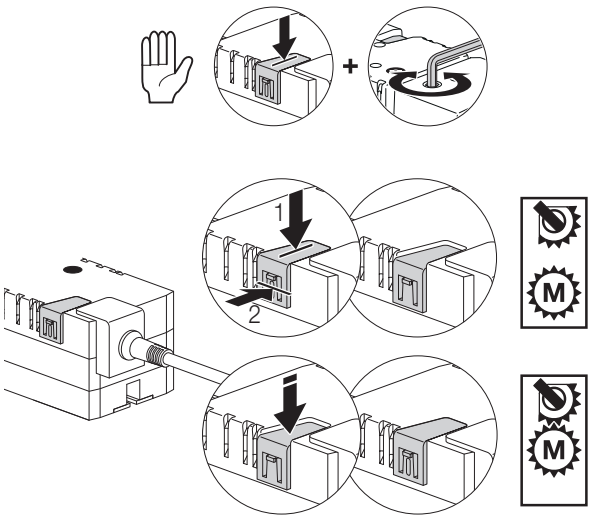
## Assembling valve with actuators F 7712 90 - 91 and F 7712 93, F 7712 95 - 97, F 7712 81 - 83



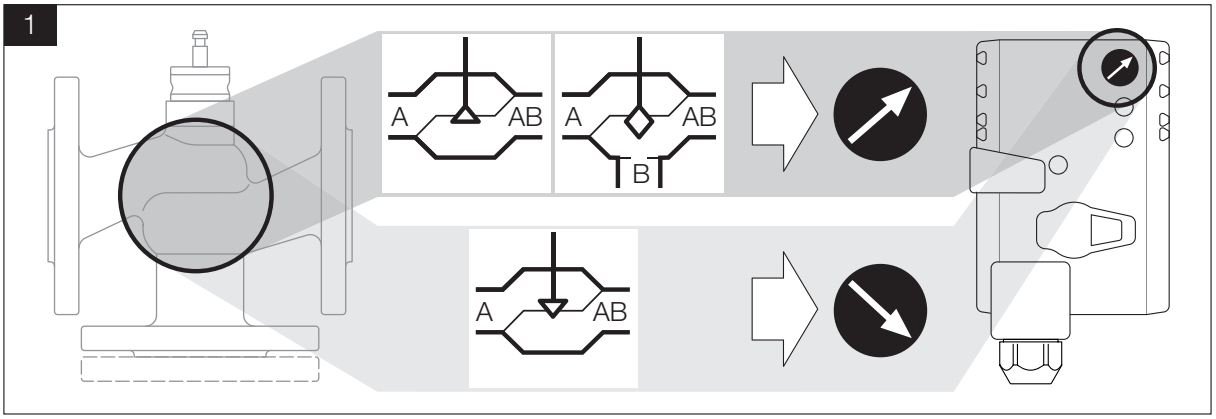



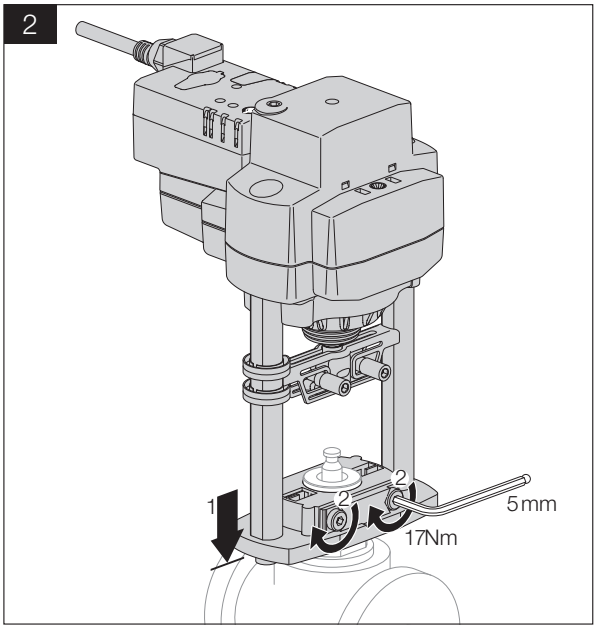



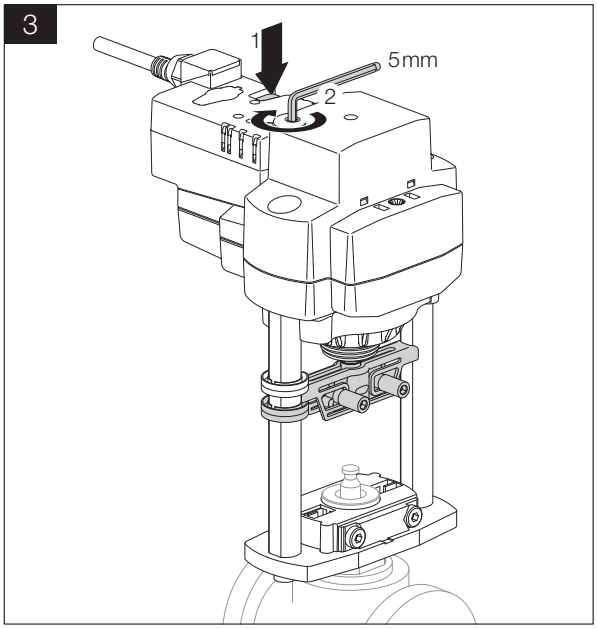



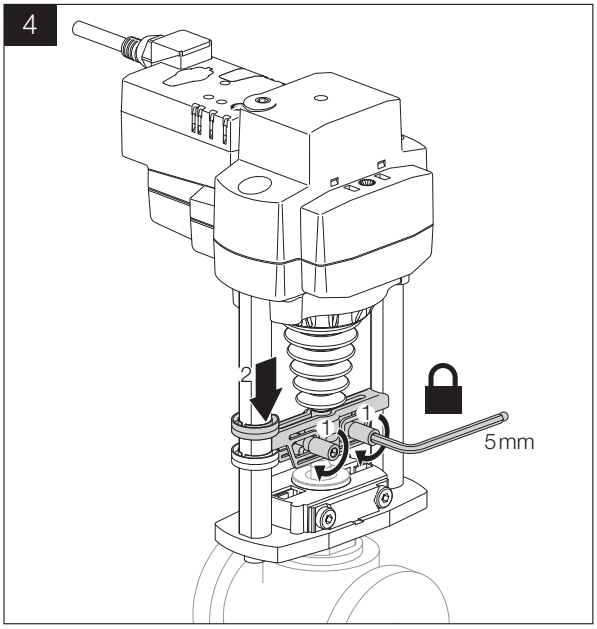



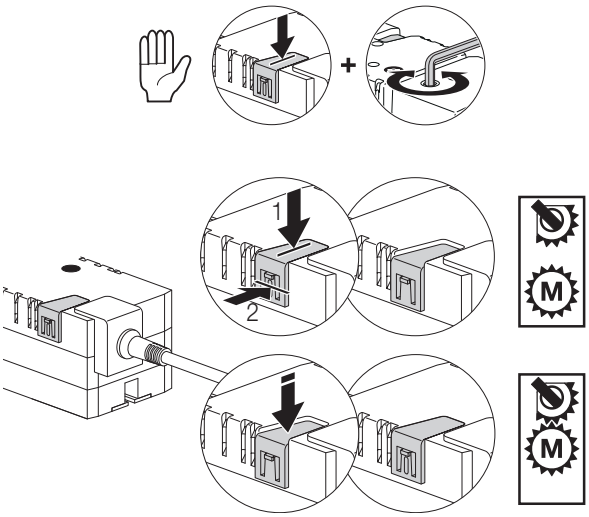
## Assembling valve with actuators F 7712 92, F 7712 98 and F 7712 84



## Actuator selection for HERZ valves

| PIBCV | DN | F **7712** 90 24V, mod | F **7712** 91 24V, mod | F **7712** 92 24V, mod | F **7712** 93 24V, mod | F **7712** 94 24V, mod | F **7712** 95 24V, 3-pt | F **7712** 96 24V, 3-pt | F **7712** 97 24V, 3-pt | F **7712** 98 24V, 3-pt | F **7712** 81 230V, 3-pt | F **7712** 82 230V, 3-pt | F **7712** 83 230V, 3-pt | F **7712** 84 230V, 3-pt | F **7712** 85 230V, 3-pt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F **4006** 71 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4006** 72 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4006** 73 | 25 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4006** 93 | 25 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4006** 74 | 32 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4006** 75<br>F **4006** 61 | 40 | | ✓ | | | | | ✓ | | | | ✓ | | | |
| F **4006** 80<br>F **4006** 62 | 50 | | ✓ | | | | | ✓ | | | | ✓ | | | |
| F **4006** 81<br>F **4006** 63 | 65 | | | ✓ | | | | | | ✓ | | | | ✓ | |
| F **4006** 82<br>F **4006** 64 | 80 | | | ✓ | | | | | | ✓ | | | | ✓ | |
| F **4006** 83<br>F **4006** 65 | 100 | | | ✓ | | | | | | ✓ | | | | ✓ | |
| F **4006** 84<br>F **4006** 66 | 125 | | | ✓ | | | | | | ✓ | | | | ✓ | |
| F **4006** 39 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4006** 40 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4006** 41 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4006** 42 | 20 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| 2 - Way | | | | | | | | | | | | | | | |
| F **4035** 01 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4035** 11 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4035** 21 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4035** 31 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4035** 03 | 25 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4035** 13 | 25 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4035** 04 | 32 | | ✓ | | | | | ✓ | | | | ✓ | | | |
| F **4035** 05 | 40 | | ✓ | | | | | ✓ | | | | ✓ | | | |
| F **4035** 06 | 50 | | | ✓ | ✓ | | | | ✓ | ✓ | | | ✓ | ✓ | |
| F **4035** 07 | 65 | | | ✓ | | | | | | ✓ | | | | ✓ | |
| F **4035** 08 | 80 | | | ✓ | | | | | | ✓ | | | | ✓ | |
| F **4035** 09 | 100 | | | ✓ | | | | | | ✓ | | | | ✓ | |
| F **4035** 10 | 125 | | | | | ✓ | | | | | | | | | ✓ |
| F **4035** 41 | 150 | | | | | ✓ | | | | | | | | | ✓ |
| 3 - Way | | | | | | | | | | | | | | | |
| F **4037** 01 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4037** 11 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4037** 21 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4037** 31 | 15 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4037** 03 | 25 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4037** 13 | 25 | ✓ | | | | | ✓ | | | | ✓ | | | | |
| F **4037** 04 | 32 | | ✓ | | | | | ✓ | | | | ✓ | | | |
| F **4037** 05 | 40 | | ✓ | | | | | ✓ | | | | ✓ | | | |
| F **4037** 06 | 50 | | | ✓ | ✓ | | | | ✓ | ✓ | | | ✓ | ✓ | |
| F **4037** 07 | 65 | | | ✓ | | | | | | ✓ | | | | ✓ | |
| F **4037** 08 | 80 | | | ✓ | | | | | | ✓ | | | | ✓ | |
| F **4037** 09 | 100 | | | ✓ | | | | | | ✓ | | | | ✓ | |
| F **4037** 10 | 125 | | | | | ✓ | | | | | | | | | ✓ |
| F **4037** 41 | 150 | | | | | ✓ | | | | | | | | | ✓ |

## Safety notes

- This actuator has been designed for application in stationary heating, ventilation and air-conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.
- The switch for changing the direction of motion/the closing point may be adjusted only by authorised personnel. The direction of stroke is critical, particularly in connection with frost protection circuits.
- The device may only be opened at the factory by the manufacturer. It does not contain any parts that can be replaced or repaired by the user.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. Local legislations must be obeyed when disposing the components.
- For installation the local and international standards and regulations have to be followed.