



M4410E/K

SMALL LINEAR THERMOELECTRIC ACTUATORS

APPLICATION

The M4410E/K Small Linear Thermoelectric Actuators are used for time coupled modulating regulation of heating and cooling systems. A microprocessor-based positioner guarantees accurate control. The actuators are designed for applications where space is limited.

The actuator (together with the M44-VA10 adapter included in the delivery) is suitable for use with the following valves (having a closing dimension of 11.5 ± 0.3 mm):

- the 2-way and 3-way V58xxA4, V58xxC4, and VSO series of small linear valves with 2.5-mm stroke
- TRVs V300 and V2000
- Therafix TRV V2464 and V2474 series with 2.5 to 3-mm stroke

SPECIAL FEATURES

- Small size allows installation in confined spaces
- Function display
- Reliable longterm operation
- No mounting tools required (easily mounted using valve adapter)
- Noiseless operation
- Ready-to-wire connection cable
- Visual valve position indicator furnished with actuator
- M30 x 1.5 connection according to EN 215
- Fits on specified Resideo 2- and 3-way valves, thermostatic radiator, zone valves and valve inserts for manifolds and compact radiators



TECHNICAL DATA

Specifications	
Material:	Polyamide
Colour:	white
Type:	3 x 0.22 mm ² PVC
Weight:	92 g (without connection cable, but with adapter)
Maximum stroke:	4.0 mm (minus 0.5 mm overelevation)
Protection standard:	IP54
Protection class:	III
CE conformity:	EN 60730
Surge protection:	1 kV
Connection type:	plug (cable as accessory)
Transmission delay:	30sec/mm (typical)
Control direction:	NC
Actuation force:	100 N + 5%

Electrical specifications	
Initial current:	max. < 320 mA for max. 2 min.
Power supply:	M4410E1510: 24 VAC -10...+20%, 50/60 Hz M4410K1515: 230 VAC - 20...+20%
Control voltage range:	0...10V(reverse polarity-protected)
Power consumption:	1 W
Resistance of control voltage input:	100 kOhm
Open/closing time:	Depend upon ambient temperature
Temperature	
Fluid temperature:	0 ... +100 °C
Storage temperature:	-25 ... +60 °C
Ambient temperature:	0 ... +60 °C

METHOD OF OPERATION

The function display (all-round display) of the actuator shows at first glance whether the valve is open or closed; this can be also felt in the dark.

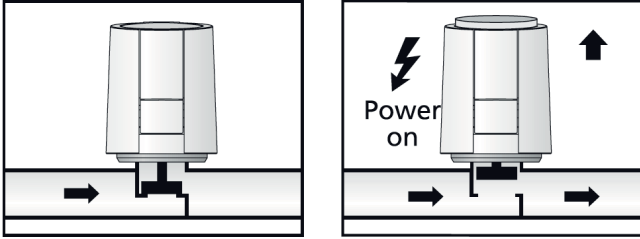


Fig. 1 Extrusion of the function display when valve opens

"FIRST OPEN" FUNCTION

At delivery, the actuator is normally open; this is due to the "First Open" function. This enables heating operation during early construction phases even before completion of the electric wiring. When subsequently commissioning the system, the "First Open" function is automatically unlocked by applying the operating voltage (for more than 6 minutes); the actuator then becomes fully operable.

Each time the operating voltage is applied, a calibration process optimally adjusts the actuator to the given valve. During this process, the actuator completely opens and closes the valve, while prominent points are simultaneously stored. The control signal is ignored during this process. After the calibration process, the actuator is ready for use and converts the applied control signal into a proportional stroke. The power-on procedure takes approx. 15 minutes.

INSTALLATION GUIDELINES

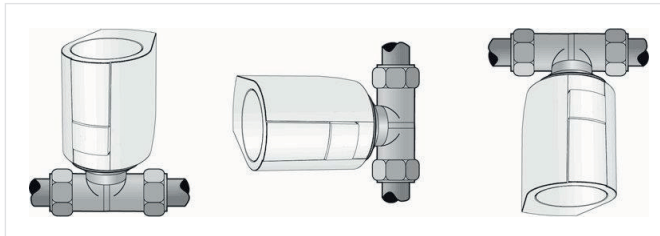


Fig. 2 Installation orientations (vertical, horizontal, "overhead")

The actuator is installed preferably in the vertical or the horizontal orientation.

i Connection cables must not touch the piping (heat transfer)! Only a safety-isolating transformer in accordance with EN 60335 may be used. The rated capacity of the transformer must be based on the initial current of the actuators. Rule of thumb: $P_{\text{TRANSFORMER}} = n \times 6 \text{ W}$ (where "n" = the number of drives)

Installation

The valve adapter assortment guarantees a perfect match of the actuator to almost all valve bottoms and heating circuit distributors available on the market. The actuator is simply plugged on to the appropriate valve adapter previously installed manually.

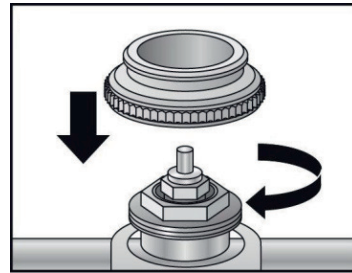


Fig. 3 Step 1: Manually screwing the adapter onto valve

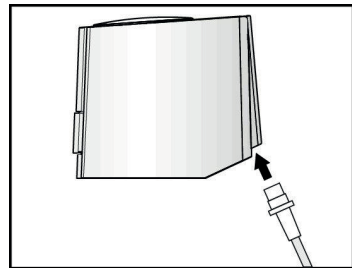


Fig. 4 Step 2: Connecting the cable

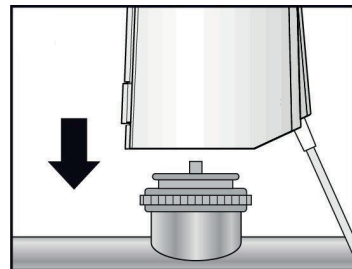


Fig. 5 Step 3: Manually positioning actuator

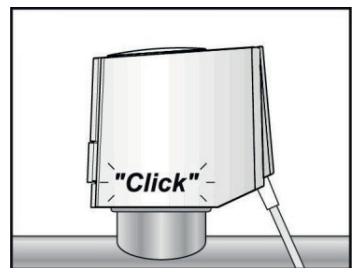


Fig. 6 Step 4: Pressing down actuator onto valve adapter

Wiring

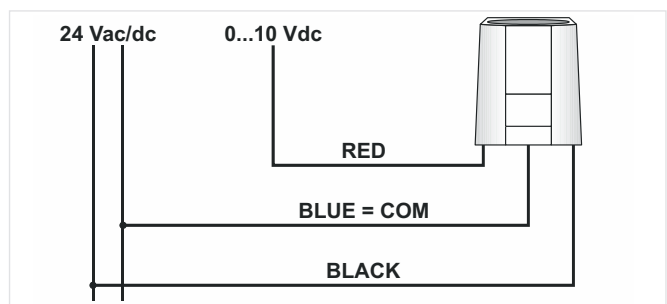


Fig. 7 Wiring diagram

i To protect against overloading, fusing appropriate to the given cable cross-section must be installed.

TECHNICAL CHARACTERISTICS

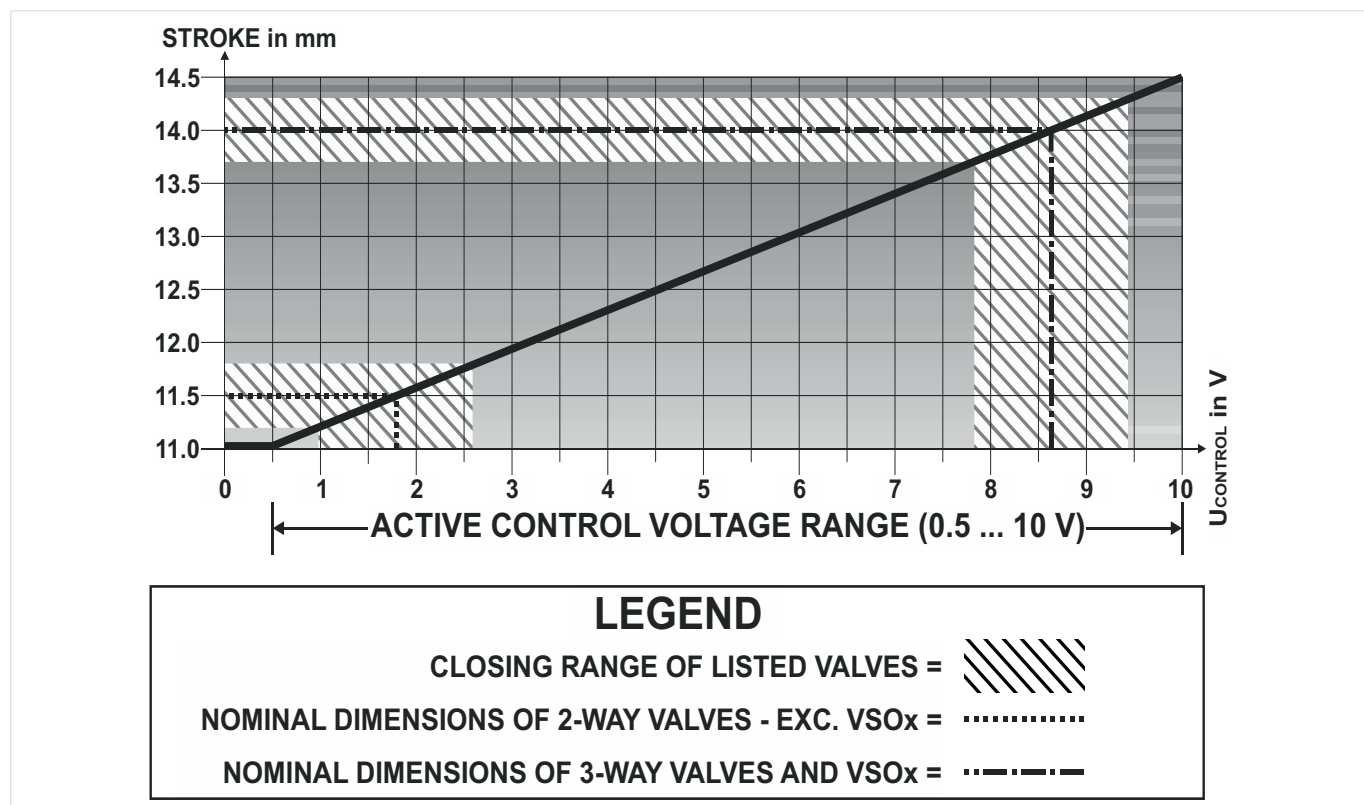
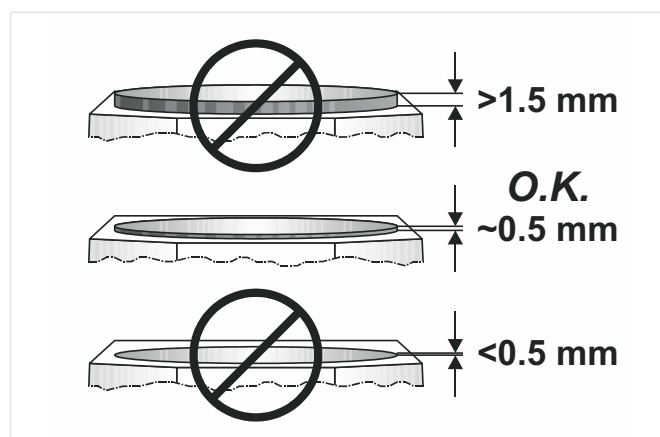


Fig. 8 Characteristic (stroke vs. voltage)

ADAPTION CHECK



After the calibration process (drive is stopped), and if no control signal is applied, you can check whether the correct valve adapter is mounted.

- In the case of standard Resideo valves having a closing dimension of 11.5 mm, when using the M44-VA10 (incl. in the delivery), the actuator's stroke cap will protrude slightly (approx. 0.5 mm), and none of the white will be visible.
- In the case of non-standard or non-Resideo valves having a smaller closing dimension, when using the M44-VA10, the actuator's stroke cap will protrude less, and not even the blue may be visible. In such cases, the M44-VA50 (accessory) can be used to increase the protrusion by max. 1 mm.

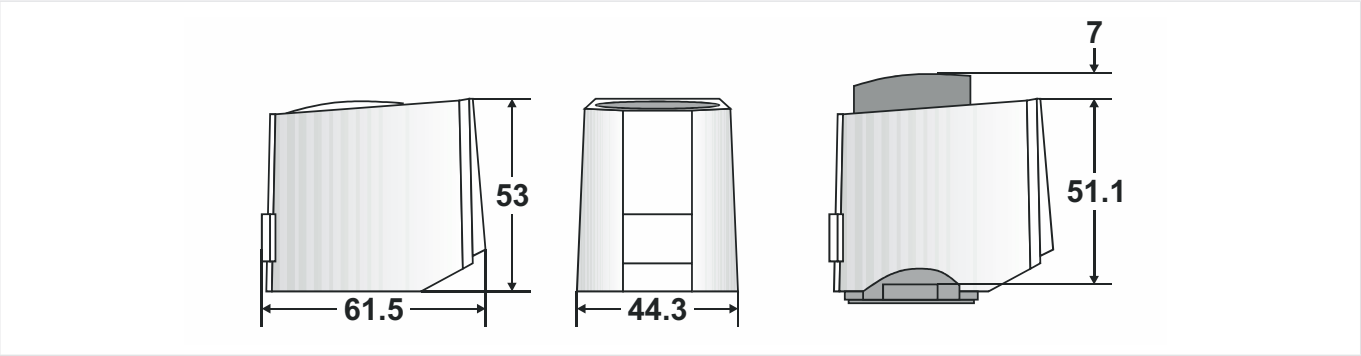
AUTO-CALIBRATION

The closing point (drive is closed) is checked twice daily in the active status ($U_{ST} > 0.5$ V). If there is a deviation, then the calibration process is repeated.

HASH (DISTURBING SIGNALS)

The actuator reacts only to a control signal > 0.5 V; this is in order to ignore interference voltage and hum voltage.

DIMENSIONS



Note: All dimensions in mm unless stated otherwise.

ORDERING INFORMATION

The following tables contain all the information you need to make an order of an item of your choice. When ordering, please always state the type, the ordering or the part number.

Options

Order number	Description
M4410E1510	AC version: thermoelectric actuator, 24 Vac, NC, proportional 0...10 V, incl. M44-VA10 adapter
M4410K1515	DC version: thermoelectric actuator, 24 Vdc, NC, proportional 0...10 V, incl. M44-VA10 adapter
M44-MOD-1M/U	Connector cable, 1 meter in length, 3 x 0.22 mm ² , 1 pc.
M44-MOD-1M	Connector cable, 1 meter in length, 3 x 0.22 mm ² , bulk package with 10 pcs.
M44-MOD-3M	Connector cable, 3 meters in length, 3 x 0.22 mm ² , bulk package with 10 pcs.
M44-MOD-5M	Connector cable, 5 meters in length, 3 x 0.22 mm ² , bulk package with 10 pcs.
M44-VA50	Valve adapter VA50, M30 x 1.5, bulk package with 10 pcs.; for valves with a closing dimension of 10.5 mm
M44-VA10	Valve adapter VA10, M30 x 1.5, bulk package with 10 pcs.; for valves with a closing dimension of 11.5 mm
M44-MOD-1MH/U	Non-halogen connector cable, 1 meter in length, 3 x 0.22 mm ² , 1 pc.
M44-MOD-1MH	Non-halogen connector cable, 1 meter in length, 3 x 0.22 mm ² , bulk package with 10 pcs.
M44-MOD-3MH	Non-halogen connector cable, 3 meters in length, 3 x 0.22 mm ² , bulk package with 10 pcs.
M44-MOD-5MH	Non-halogen connector cable, 5 meters in length, 3 x 0.22 mm ² , bulk package with 10 pcs.

For more information
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