

EMO T



Actuators

High performance thermoelectric actuator

Engineering
GREAT Solutions

EMO T

Used in conjunction with the TBV-C terminal valve or thermostatic valve bodies, the high performing EMO T actuator offers reliable on/off control and a high enclosure class. A long lifetime is ensured by the unique design. The position indicator is visible from all sides and allows easy maintenance procedures. A high adjusting force further enhances reliability.



Key features

- > **High adjusting force and long stroke**
For reliable and versatile operations.
- > **Position indicator visible from all sides**
For straightforward maintenance.
- > **High enclosure class IP 54**
For secure operations at any installation positions.
- > **M30x1.5 connection**
Compatible with IMI TA or IMI Heimeier valves and floor heating manifolds with a M30x1,5 connection to the actuator.

Technical description

Applications:

Designed for ON/OFF or PWM control.

Supply voltage:

24V AC/DC +25% / -20%
230V AC ±15%; Frequency 50-60 Hz

Power consumption:

	24 V	230 V
Starting	≤ 6 W (VA)	≤ 58 W (VA)
During operation	≤ 2 W (VA)	≤ 2,5 W (VA)
Starting current	≤ 250 mA, 60s	≤ 250 mA, 1s

Operating cycle time:

~ 4 min when starting from cold.

Adjusting force:

125 N

Temperature:

Max. ambient temperature: 50°C
Min. ambient temperature: -5°C
Max. medium temperature: 120°C
Storage temperature: -25°C to +70°C

Enclosure class:

IP 54 at any position.

Protection class:

II, EN 60730

Certification:

CE, EN 60730-2-14

Cable:

Cable length: 1 m, 2 m or 5 m. 10 m cable length on request.
Connection cable: 2 x 0,75 mm².
The cable is stripped 100 mm and each wire is stripped 8 mm.

Stroke:

4,7 mm; valve position visible due to position indicator.

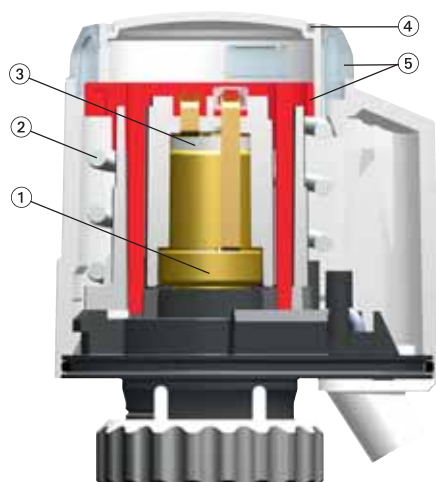
Connection to valve:

Retainer nut M30x1,5 of nickle plated brass.

Body:

Shock-resistant PC/ABS, white RAL 9016.

Construction



1. Expansion system
2. Spring
3. PTC heating element
4. Groove to take up "colour clips" or specially printed "partner clips"
5. Position indicator

Application

The EMO T thermal actuator can be installed in temperature and/or timerelated 2-point control systems in, for example:

Heating installations

For floor, ceil, and radiator heating systems for individual room temperature control or group control in:

- Apartments, conference rooms, storage rooms, schools, etc.
- For reverse switching, mass flow control, etc.

Ventilation installations

For room temperature control, e.g. controlling the flow of hot water through the air heaters.

Air conditioning systems

For room temperature control, e.g. regulating the flow of cold water from fan-coil units, ceil cooling systems, etc.

Function

Closed when currentless (NC model)

Initiating operating voltage heats up the expansion system of the actuator. After the time lag, a uniform opening process ensues. If the voltage is cutoff, the actuator closes via the cooling of the expansion system after the time lag.

Open when currentless (NO model)

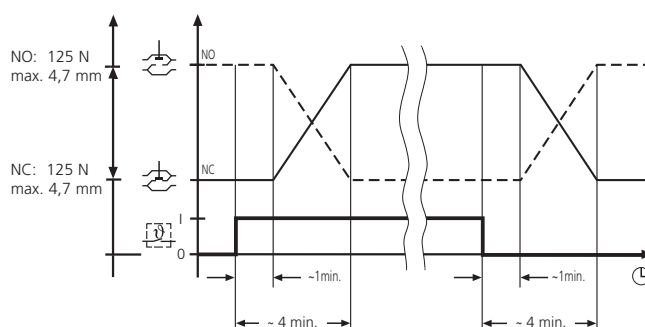
Initiating operating voltage heats up the expansion system of the actuator. After the time lag, a uniform closing process ensues. If the voltage is cutoff, the actuator opens via the cooling of the expansion system after the time lag.

Note:

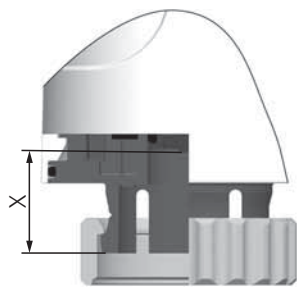
When conducting a performance test, be sure to check the time response (time lag)!

Opening and closing times are dependent on the ambient temperature.

Action chart



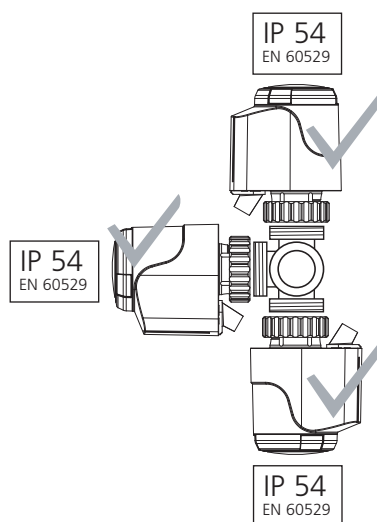
Working range



EMO T is designed to suit all IMI TA/IMI Heimeier valves and floor heating manifolds with M30x1,5 connection to actuator.
The actuator has a working range corresponding to X = 11,10 – 15,80 mm.

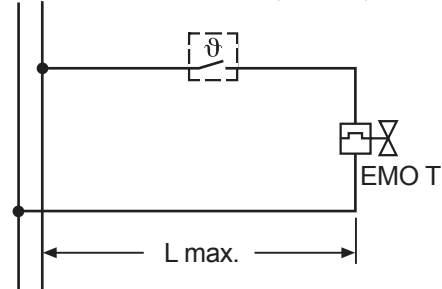
Installation

Enclosure class:



Connection diagram

N L — 1833/1837: 230 V AC (+15%/- 15%); nom. 2,5 W (max. 58 W/<1 sec.)
 ~ — 1843/1847: 24 V AC/DC (+25%/- 20%); nom. 2 W (max. 6 W/<60 sec.)



(L max. see planning notes)

Planning notes

24 V transformer dimensioning

For operation with 24 V low voltage, a transformer is required which is in compliance with EN 60335 and possesses sufficient capacity.

For dimensioning transformer performance, the value for the starting phase needs to be taken into account. The same applies to the layout of switching contacts of room temperature controllers.

Minimum transformer power delivery results from: the sum of the take-up of the 24 V EMO T (in the starting phase) in addition to the sum of the take-up capacities of Thermostat P. Room temperature controllers (art. no. 1946/48-00.500) need not be taken into account.

Calculation example:

2 ea. Thermostat P 24 V (art. no. 1942-00.500) at 1.5 VA each = 3 VA

6 ea. EMO T 24 V (art. no. 1843/47-00.500) at 6 VA each = 36 VA

Total of take-up = 39 VA

(= minimum transformer power delivery)

Selected transformer = 50 VA

24 V protective low voltage

With the required protective low voltage (SELV based on DIN VDE 0100) a safety isolating transformer in compliance with EN 61558 must be used.

Length of cable

In order to maintain the declared opening times for the actuators, the voltage loss (depending on length of cable and cross section) in the operating phase on the supply lines to the actuators may not exceed 4%.

For general dimensioning with copper lines, use the following standard formula:

$$L \text{ max.} = l / n$$

L max.: max. length of cable in [m] (see "Connection diagram")

l: table value in [m]

n: number of actuators

Line: Type/name	Cross section: A [mm ²]	I for each model:		Note: Application; comparison
		230 V [m]	24 V [m]	
LiY/twin flexible rod	0,34	-	38	only for 24 V; corresponds to ø 0.6 mm
Y(R)/bell wire	0,50	-	56	only for 24 V; model Y(R) 2 x 0.8
H03VVF/PVC mains cable	0,75	840	84	not to be concealed under plaster
NYM/house wiring cable	1,50	1680	168	also for NYIF 1.5 mm ²
NYIF/flat webbed house wire	2,50	2800	280	also for NYM 2.5 mm ²

Calculation example

Goal:

max. length of cable L max.

Given:

Voltage U = 24 V

Conductor cross section A = 2 x 1.5 mm²

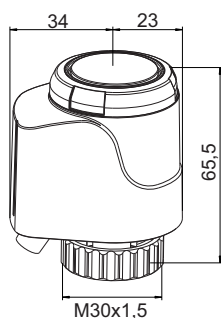
Value in table l = 168 m

Number of actuators n = 4

Solution:

$$l \text{ max.} = l / n = 168 \text{ m} / 4 = 42 \text{ m}$$

Articles



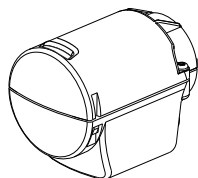
24V AC/DC

Cable length	EAN	Article No
EMO T, NO (Normally open)		
1 m	4024052836413	1847-00.500
2 m	4024052836710	1847-01.500
5 m	4024052837014	1847-02.500
EMO T, NC (Normally closed)		
1 m	4024052835218	1843-00.500
2 m	4024052835515	1843-01.500
5 m	4024052835812	1843-02.500

230V AC

Cable length	EAN	Article No
EMO T, NO (Normally open)		
1 m	4024052836611	1837-00.500
2 m	4024052836918	1837-01.500
5 m	4024052837212	1837-02.500
EMO T, NC (Normally closed)		
1 m	4024052835416	1833-00.500
2 m	4024052835713	1833-01.500
5 m	4024052836017	1833-02.500

Accessories

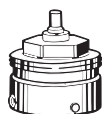


Protective cover for EMO T and EMO TM

For high strain applications (e.g. public buildings, schools, kindergartens, etc) and as theft protection.

With M12x1,5 thread for protective conduit fitting. Delivery without conduit and fitting.

	EAN	Article No
White RAL 9016	4024052930111	1833-40.500



Connecting to other brands

Adapter for mounting the EMO T/EMO TM on valve bodies of other manufacturers. Threads M30x1.5 factory standard.

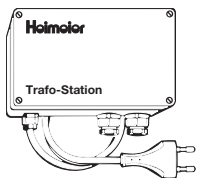
Manufacturer	EAN	Article No
Danfoss RA	4024052297016	9702-24.700
Danfoss RAV	4024052300112	9800-24.700
Danfoss RAVL	4024052295913	9700-24.700
Vaillant (Ø≈30 mm)	4024052296019	9700-27.700
TA (M28x1,5)	4024052336418	9701-28.700
Herz	4024052296316	9700-30.700
Markaryd	4024052296514	9700-41.700
Comap	4024052296712	9700-55.700
Oventrop (M30x1,0)	4024052428519	9700-10.700
Giacomini	4024052429714	9700-33.700
Ista	4024052511419	9700-36.700
Rotex	4024052429615	9700-32.700
Uponor (Velta) - Euro-compact distributor or return valve 17	4024052448111	9700-34.700
Uponor (Velta) - Provario distributor	4024052510917	9701-34.700



Connecting to radiators with integrated valves

Adapter for mounting the EMO T/EMO TM with M30x1.5 connection on thermostatic insert for **Series 2** or **Series 3** clamping joint. M30x1.5 threading, factory standard.

Model	EAN	Article No
Series 2	4024052297214	9703-24.700
Series 3	4024052313518	9704-24.700

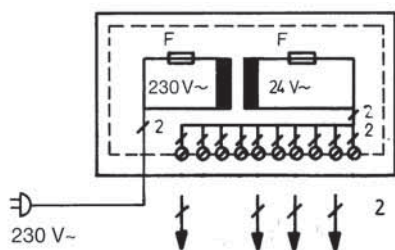


Transformer station

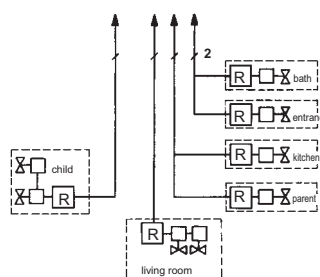
The transformer station is a 24V/ max. 60VA low-voltage transformer in accordance with EN 60335 in a protective insulation and a shock-proof plastic body. It is used as a power supply for actuators and room temperature controllers. The transformer station is protected at the output and line ends by standard finewire fuses.

EAN	Article No
4024052139613	1600-00.000

Connection diagram



Application example



R = Room thermostat

Technical data – Transformer station

Operating voltage:	230 V AC (+ 6% / -15%); 50/60 Hz; 60 VA
Output voltage:	24 V AC (+ 25%/-10%); 50 / 60 Hz
Power output (in continuous operation):	max. 56 VA
Output connections:	max. 10 actuators and 10 room temperature controllers (see connection diagram/application example)
Length of cable Ø:	max. values see "Planning notes"
Type of protection:	IP 22 based on EN 60529 (depending on installation requirements)
Safety class:	II, EN 60335
Body, -color:	ABS (shock-proof), light grey based on RAL 7035
Power supply connection:	plug-in device; 1 m; 2 x 0.75 mm ² with European plug
Connector terminal (clamping area):	max. 2.5 mm ²
CE certification (EMV/NS):	EN 55014-1, EN 55014-2 / EN 60335-1
Ambient temperature (in operation):	0°C – 60°C (32°F – 140°F)
Mounting:	Mounted to wall; cable fed from below
Dimensions (w x h x d):	200 mm x 120 mm x 90 mm

