IMI TA

EMO T

Actuators

High performance thermoelectric actuator –
For ON/OFF or PWM control

IMI Hydronic Engineering

Breakthrough Engineering

EMO T

Used in conjunction with small terminal valves e.g. TBV-C and TA-COMPACT-P 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.
- **High enclosure class IP54 (NEMA 3 equivalent)**
  For secure operations at any installation positions.
- **Position indicator visible from all sides**
  For straightforward maintenance.
- **M30x1.5 connection**
  Compatible with TA/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:
24 VAC/VDC +25% / -20%
115 VAC ±15%
Frequency 50-60 Hz

Power consumption:
24 V:
Starting ≤ 6 W (VA)
During operation ≤ 2 W (VA)
Starting current ≤ 250 mA, 60s
115 V:
Starting ≤ 29 VA
During operation ≤ 2.5 VA
Starting current ≤ 250 mA, 1s

Operating cycle time:
~ 4 min when starting from cold.

Adjusting force:
28 lbf

Stroke:
0.185 in; valve position visible due to position indicator.

Temperature:
Max. ambient temperature: 122°F
Min. ambient temperature: 23°F
Max. medium temperature: 248°F
Storage temperature: -13°F to 158°F

Enclosure class:
IP54 (NEMA 3 equivalent) at any position.

Protection class:
II, EN 60730

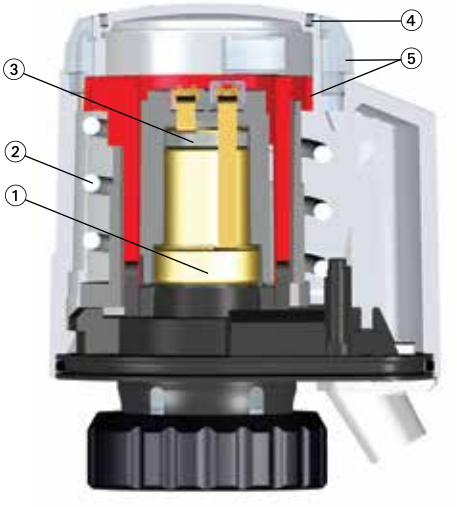
Certification:
CE, EN 60730-2-14

Cable:
Cable length: 2.62 ft, 6.56 ft or 16.4 ft.
32.8 ft cable length on request.
Connection cable: 2 x 18 AWG.
The cable is stripped 3.94 in and each wire is stripped 0.31 in.
Halogen free as option, fire class $B2_{ca}$ – s1a, d1, a1 according to EN 50575.

Connection to valve:
Retainer nut M30x1.5

Body:
Shock-resistant PC/ABS, white RAL 9016 (Traffic White).

Contruction



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.

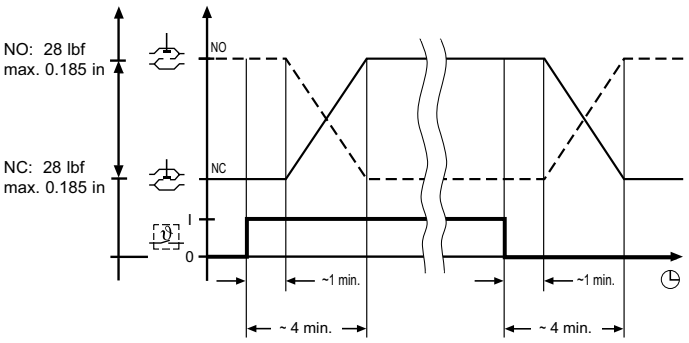
Function

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.

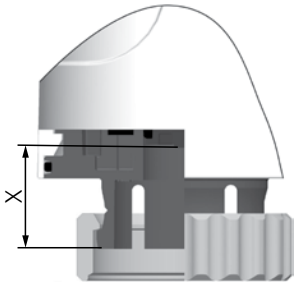
Note:
When conducting a performance test, be sure to check the time response (time lag)!
Opening and closing times are dependent on the ambient temperature.

Action chart



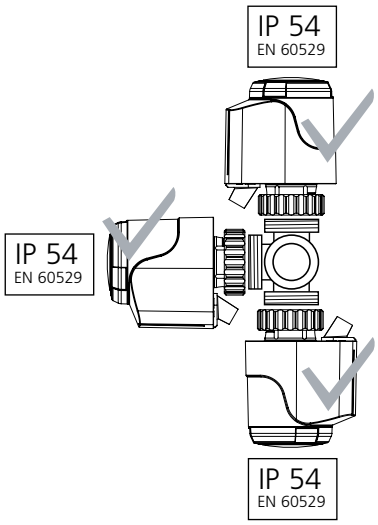
Working range

EMO T is designed to suit all TA/HEIMEIER valves and floor heating manifolds with M30x1,5 connection to actuator. The actuator has a working range corresponding to X = 0.437 – 0.622 in.



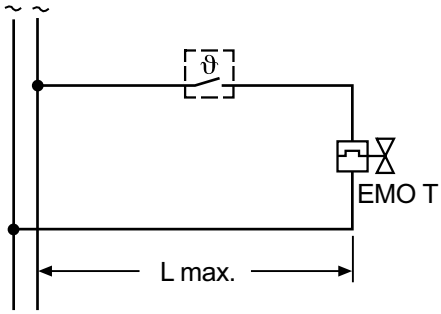
Installation

Enclosure class:
IP54 (NEMA 3 equivalent)



Connection diagram

N L —— **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 (IEC 60335 equivalent) 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 the room thermostat.
Room temperature controllers (art. no. 1946-00.500) need not be taken into account.

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 max. = l / n

L max.: max. length of cable in [ft] (see “Connection diagram”)
l: table value in [ft]
n: number of actuators

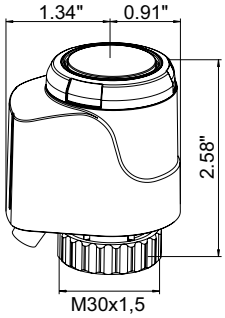
Line: **Type/name**	**Cross section:** **A** [AWG]	**l** **for model:** **24 V** [ft]	 **115 V** [ft]	**Note:** **Application; comparison**
LiY/twin flexible rod	22	125	-	only for 24 V; corresponds to ø 0.023 in (0.6 mm)
Y(R)/bell wire	20	184	-	only for 24 V; model Y(R) 2 x 0.0315
H03VVF/PVC mains cable	18	276	1410	not to be concealed under plaster
NYM/house wiring cable	16	551	2815	also for NYIF 16 AWG
NYIF/flat webbed house wire	14	919	4690	also for NYM 14 AWG

Calculation example
Goal:
max. length of cable L max.

Given:
Voltage U = 24 V
Conductor cross section A = 2 x 16 AWG
Value in table l = 551 ft
Number of actuators n = 4

Solution:
l max. = l / n = 551 ft / 4 = 137 ft

Articles



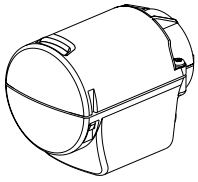
24 VAC/VDC

Cable length	Article No
EMO T, NO (Normally open)	
2.62 ft. (0.8 m)	1847-00.500
6.56 ft. (2 m)	1847-01.500
16.4 ft. (5 m)	1847-02.500
EMO T, NO (Normally open) - With halogen free cable	
2.62 ft. (0.8 m)	322041-40061
6.56 ft. (2 m)	322041-40062
16.4 ft. (5 m)	322041-40063
EMO T, NC (Normally closed)	
2.62 ft. (0.8 m)	1843-00.500
6.56 ft. (2 m)	1843-01.500
16.4 ft. (5 m)	1843-02.500
EMO T, NC (Normally closed) - With halogen free cable	
2.62 ft. (0.8 m)	322041-40058
6.56 ft. (2 m)	322041-40059
16.4 ft. (5 m)	322041-40060

115 VAC

Cable length	Article No
EMO T, NC (Normally closed)	
2.62 ft. (0.8 m)	1853-00.500

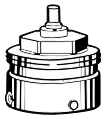
Accessories



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.

	Article No
White RAL 9016	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	Article No
Danfoss RA (Ø≈20 mm)	9702-24.700
Danfoss RAV (Ø≈34 mm)	9800-24.700
Danfoss RAVL (Ø≈26 mm)	9700-24.700
Vaillant (Ø≈30 mm)	9700-27.700
TA (M28x1.5)	9701-28.700
Herz (M28x1.5)	9700-30.700
Markaryd (M28x1.5)	9700-41.700
Comap (M28x1.5)	9700-55.700
Oventrop (M30x1.0)	9700-10.700
Giacomini (Ø≈22.6 mm)	9700-33.700
Ista (M32x1.0)	9700-36.700
Uponor (Velta) - Euro-/compact distributor or return valve 17	9700-34.700
Uponor (Velta) - Provario distributor	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	Article No
Series 2	9703-24.700
Series 3	9704-24.700

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