

EMOtec



Actuators

Thermal actuator for heating, ventilation, and air conditioning systems

EMOTec

The EMOTec thermal actuator with position indicator (NC) can be installed in temperature and/or timerelated 2-point control systems.

Key features

- > **Compact sizes especially suited to manifold cabinets**
- > **Safe because of overvoltage protection (with 230 V model)**
- > **Simple functional testing by means of position indicator (with NC model)**
- > **Trouble-free because it is silent and needs no maintenance**



Technical description

Applications:

Designed for ON/OFF or PWM control.

Supply voltage:

24 V AC/DC (+25%/-10%)
230 V AC/DC (+10%/-15%)
0-60 Hz

Power consumption:

24 V:
Starting: ≤ 9 W (VA)
During operation: ≤ 3 W (VA)
230 V:
Starting: ≤ 90 W (VA)
During operation: ≤ 3 W (VA)

Operating cycle time:

~ 3 min

Adjusting force:

NO 110 N / NC 90 N

Temperature:

Max. ambient temperature: 50°C
Min. ambient temperature: 0°C
Max. medium temperature: 100°C
Storage temperature: -20°C to +70°C

Enclosure class:

EN 60529, IP43 at any position.

Protection class:

II, EN 60730

Overvoltage protection:

Varistor with 230 V model.

Certification:

CE, EN 55014-1, EN 60730-2-14

Cable:

Cable length: 1 m, up to 2 m cable length on request.
Connection cable: 2 x 0,50 mm².

Stroke:

NO 2,6 mm.
NC 3,5 mm, valve position visible due to position indicator.

Connection to valve:

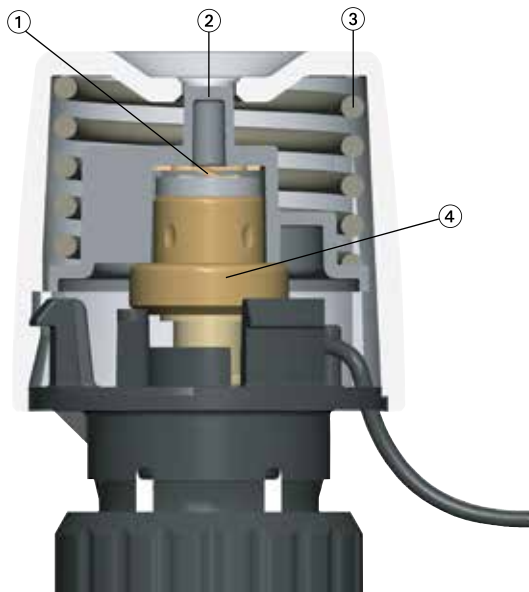
M30x1,5

Body:

Shock-resistant PC/ABS, white
RAL 9016.

Construction

EMOtec 230 V model (NC)



1. PTC heating element
2. Position indicator
3. Spring
4. Expansion system

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.

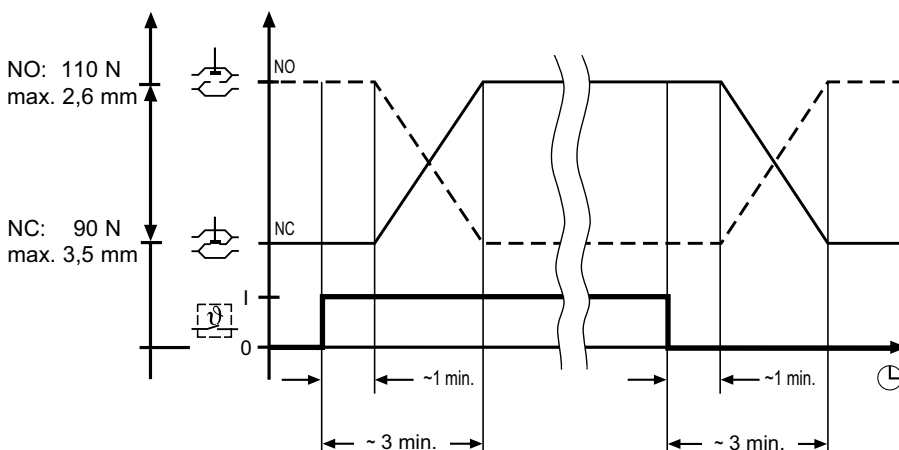
If the voltage is cutoff, the actuator opens via the cooling of the expansion system after the time lag.

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



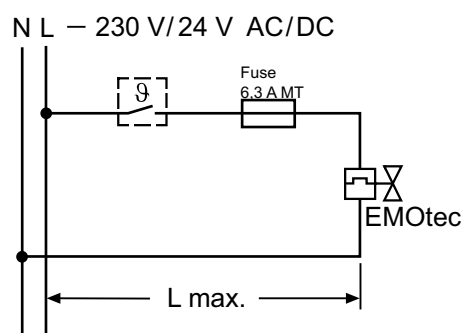
Application

The EMOTec thermal actuator can be installed in temperature and/or time-related 2-point control systems, especially for floor heating.

The position indicator with model NC enables simple functional testing, e.g. during the mounting of the actuator on heating manifolds.

Depending on the operating conditions to be fulfilled, EMOTec can also be used in other applications in heating, ventilation and air-conditioning systems.

Connection diagram



(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 60730 and possesses sufficient capacity.

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

The minimum transformer power supplied results from:

the sum of the power consumed by the EMOTec 24 V (in the switch-on phase) plus the sum of the power consumed by the room thermostat.

Room temperature controller (art. no. 1946-00.500) needs 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:

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

$L_{\text{max.}}$: 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 \varnothing 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 $L_{\text{max.}}$

Given:

Voltage $U = 24 \text{ V}$

Conductor cross section $A = 2 \times 1.5 \text{ mm}^2$

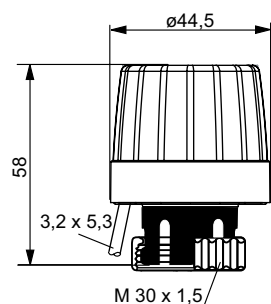
Value in table $l = 168 \text{ m}$

Number of actuators $n = 4$

Solution:

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

Articles



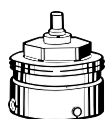
EMOTec

Type	EAN	Article No
230 V		
Currentless closed (NC)	4024052460359	1807-00.500
Currentless open (NO)	4024052490752	1809-00.500
24 V		
Currentless closed (NC)	4024052460458	1827-00.500
Currentless open (NO)	4024052491551	1829-00.500

1 mm = 0,0394 inch

110 V model on request

Accessories



Connecting to other brands

Adapter for mounting the EMOTec on valve bodies of other manufacturers. Threads M30x1.5 factory standard.

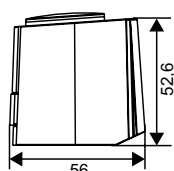
Manufacturer	EAN	Article No
Danfoss RA (Ø≈20 mm)	4024052297016	9702-24.700
Danfoss RAVL (Ø≈34 mm)	4024052300112	9800-24.700
Danfoss RAVL (Ø≈26 mm)	4024052295913	9700-24.700
Vaillant (Ø≈30 mm)	4024052296019	9700-27.700
TA (M28x1,5)	4024052336418	9701-28.700
Herz (M28x1,5)	4024052296316	9700-30.700
Markaryd (M28x1,5)	4024052296514	9700-41.700
Comap (M28x1,5)	4024052296712	9700-55.700
Oventrop (M30x1,0)	4024052428519	9700-10.700
Giacomini (Ø≈22,6 mm)	4024052429714	9700-33.700
Ista (M32x1,0)	4024052511419	9700-36.700
Uponor (Velta)	4024052448111	9700-34.700
- Euro-/compact distributor or return valve 17		
Uponor (Velta)	4024052510917	9701-34.700
- Provario distributor		



Connecting to radiators with integrated valves

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

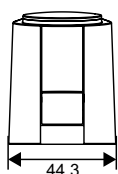
Model	EAN	Article No
Series 2	4024052297214	9703-24.700
Series 3	4024052313518	9704-24.700



Thermal actuator with auxiliary switch

Max. switching current auxiliary switch:
Type 230 V: 5 (1) A; Type 24 V: 3 (1) A.
Stroke: 4 mm.
Connection to valve: HEIMEIER M30x1.5, with enclosed adapter.
Adjusting force: 100 N.
Cable length: 1 m fixed.
Connection cable: 4 x 0,75 mm²

Model	EAN	Article No
230 V		
Currentless closed (NC)	4024052977819	4968-03.000
24 V		
Currentless closed (NC)	4024052977918	4988-03.000



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