

EMOtec



Actuators

Thermal actuator for heating, ventilation, and air conditioning systems

*Engineering
GREAT Solutions*

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



Technical description

The EMOTec thermal actuator is a twopoint actuator for connection to a temperature controller with two-point output, e.g. room Thermostat P or Radiocontrol F-System for floor heating.

The actuator NC is equipped with a position indicator on the top (valve closed / valve open).

Models with 230 V (with built-in overvoltage protection 2.5 kV) and 24 V operating voltages, each NC or NO.

EMOTec has an electrically heated expansion system which is secured against overtravel.

The positioning force within the close range is adapted to thermostatic valve bodies with soft valve discs.

It is maintenance free and functions without noise.

Depending on the model, in a currentless status, EMOTec holds the valve closed (NC model) or open (NO model).

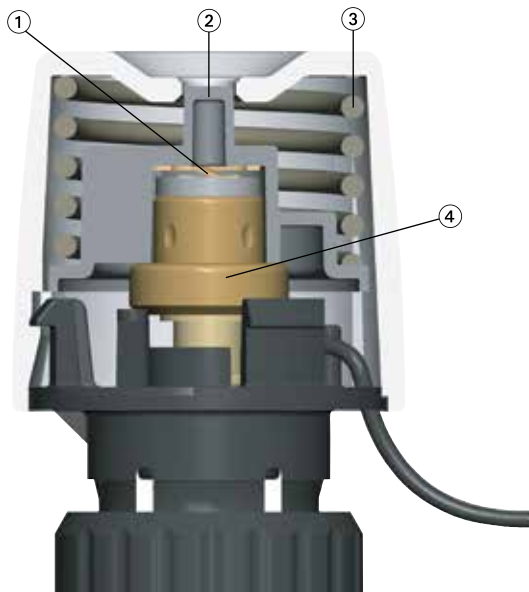
The body is designed in a white RAL 9016, heat-resistant, shock-proof plastic.

The EMOTec is designed to be installed on all IMI Heimeier thermostatic valve bodies and three-way valves. Adapters enable the mounting of thermostatic valve bodies of other manufacturers, see accessories.

Its compactness also makes it especially suited to install in manifold cabinets.

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.

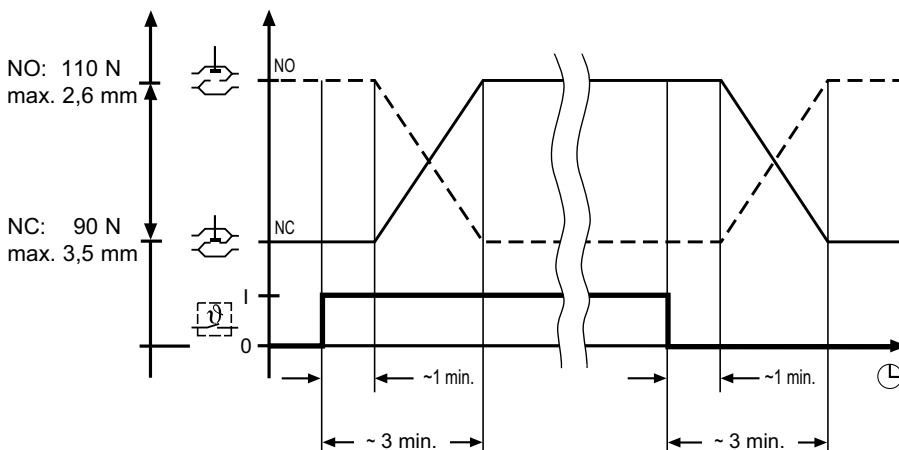
Open when currentless (NO model)

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



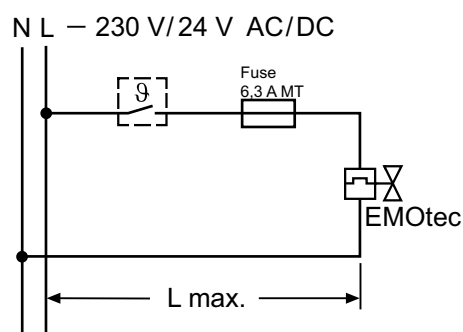
Application

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)

Technical data

	230 V	24 V
Operating voltage:	230 V AC/DC (+10%/-15%)	24 V AC/DC (+25%/-10%)
- Frequency	0-60 Hz	0-60 Hz
Power draw (continuous operation):	3 W (VA)	3 W (VA)
- when operating	90 W (VA)	9 W (VA)
Stroke:	NO 2,6 mm / NC 3,5 mm	NO 2,5 mm / NC 3,5 mm
Pressure power:	NO 110 N / NC 90 N	NO 110 N / NC 90 N
Close and open time:	~3 min.	~3 min.
Type of protection:	EN 60529	EN 60529
- horizontal installation	IP 43	IP 43
- vertical standing installation	IP 43	IP 43
Protection class:	II, EN 60730 only with appropriate installation	II, EN 60730 only with appropriate installation
Overvoltage protection:	Varistor	-
Body, colour:	ABS/PC (shock-resistant), white RAL 9016	ABS/PC (shock-resistant), white RAL 9016
Connection cable:	1 m ¹ , 2 x 0,50 mm ²	1 m ¹ , 2 x 0,50 mm ²
CE certification (EMC / LV):	EN 55014-1, EN 60730-2-14	EN 55014-1, EN 60730-2-14
Ambient temperature (in operation):	0°C - 50°C (32°F - 122°F)	0°C - 50°C (32°F - 122°F)
Medium temperature:	max. 100°C (212°F)	max. 100°C (212°F)
Storage temperature:	-20°C - +70°C (-4°F - +158°F)	-20°C - +70°C (-4°F - +158°F)
Mounting:	fits all HEIMEIER thermostatic valve bodies and three-way valves	fits all HEIMEIER thermostatic valve bodies and three-way valves

*) custom lengths upon request

Max. permissible differential pressure with which the valve is still closed: See prospectus for thermostatic valve body; three-way reversing valve; three-way mixing valve; control valves for floor heating systems.

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 Thermostat P.

Room temperature controller (art. no. 1946/48-00.500) needs 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. EMOTec 24 V (art. no. 1827-00.500) at 9 VA
each = 54 VA
Total consumption = 57 VA
(= minimum transformer power delivery)
Selected transformer = 63 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:

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

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

I: 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

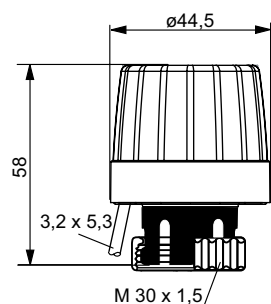
Value in table I = 168 m

Number of actuators n = 4

Solution:

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

Articles



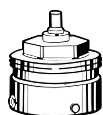
EMOTec

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

110 V model on request

1 mm = 0,0394 inch

Accessories



Connecting to other brands

Adapter for mounting the EMOTec on valve bodies of other manufacturers. Threads M 30 x 1.5 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)	4024052448111	9700-34.700
- Euro-/compact distributor or return valve 17		
Uponor (Velta)	4024052510917	9701-34.700
- Provario distributor		

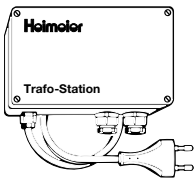


Connecting to radiators with integrated valves

Adapter for mounting the EMOTec with M 30 x 1.5 connection on thermostatic insert for **Series 2 or Series 3** clamping joint. M 30 x 1.5 threading, factory standard

Radiator manufacturers: thermostatic head prospectus

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

4024052139613

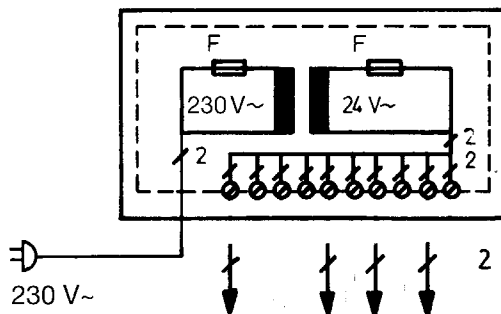
Article No

1600-00.000

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

Connection diagram



Application example

