

Thermostat E



Thermostats

Electronic room temperature controller for proportional and three-point actuators

*Engineering
GREAT Solutions*

Thermostat E

The constantly operating and three-point thermostatic room temperature controllers E 1 or E 3 respectively in conjunction with the corresponding actuators are employed in the field of heating, aerating and air condition engineering. Especially in those cases where elevated requirements for an accurate temperature control or a controlled system of high degrees of difficulty prevail optimal control results can be achieved.

Key features

- > **Uncomplicated temperature set back by "presence" push-button**
- > **Adjustable limitation of the setting value range**
- > **Flexible use due to adaptable regulating parameters**
- > **Thermostat E 3 adjustable to puls-width modulated output signal (PWM)**



Technical description

The Thermostats E 1 and E 3 are micro-processor-operated electronic room temperature controllers with incorporated sensors and adjustable PI control behaviour.

The Thermostat E 1 with constant control behaviour (0 – 10 V) allows connecting proportionally operating motorized actuators, e.g. EMO 1 or EMO TM.

The Thermostat E 3 with a three-point output signal will be used in conjunction with three-point motorized actuators such as e.g. EMO 3 or in case of a puls-width modulated output signal (PWM) with two-point actuators, e.g. EMO T or EMOtec.

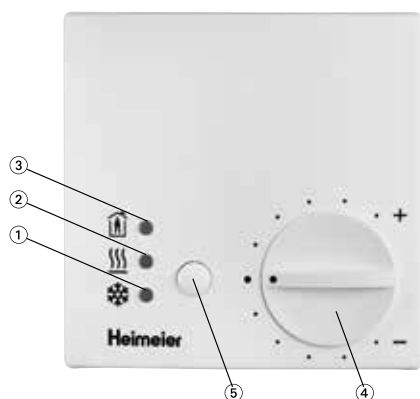
The setting value is adjustable between 10° and 30°C. An upper or lower limitation of the setting value range can be effected by arranged hidden stops. A "presence" push-button allows during heating mode, e.g. a room temperature set back by 4 K. Control lights indicate the operating mode such as "presence" and heating or cooling.

Two inputs for potential-free normally open (n/o) contacts allow connecting, for the temperature set back (X1), an external timing clock or for the purpose of a change-over from heating to cooling mode (c/o) an external switch respectively. There are further connecting possibilities for an external temperature sensor (Text), dew point detector (TP) and for a setting value shift (w).

The thermostatic controllers E 1 and E 3 are designed for an installation on a wall or on a recessed (concealed) socket.

Construction

Thermostat E



1. Control light cooling mode
2. Control light heating mode
3. Control light "presence"
4. Setting value adjuster
5. "Presence" push-button
6. Fuse (only E 3)
7. Internal switches
8. Sensor

Function

The measured room air temperature (X_1) is compared with the setting value (X_2). The thus resulting deviations will be amplified by the adjustable proportional range (X_p) and converted into the following output signals:

Thermostat E 1

constant output signal to the P(I) control with constantly operating actuators. For the operating mode “heating” and “cooling” the controller output Y_1 provides the triggering sens “heating” and the controller output Y_2 the triggering sens “cooling”. For the operating mode “heating” **or** “cooling”, in case an external change-over switch has been installed, the triggering sens “heating” can be changed over to “cooling” at the controller output Y_1 .

Thermostat E 3

An internal switch allows various output signal settings.

Three-point output signal for a PI control with three-point

actuators. The operating mode “heating” can be shifted to “cooling” by an external change-over switch.

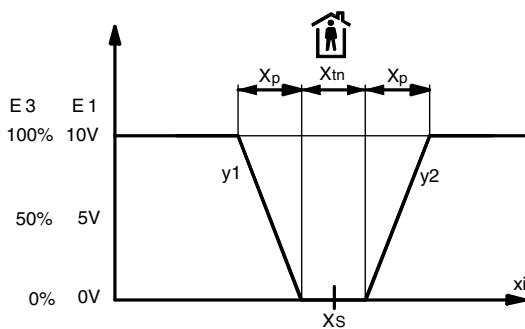
Puls-width modulated output signal for a P(I) control with thermal two-point actuators. For the operating mode “heating” **and** “cooling” the controller output (Y_1) provides the triggering sens “heating” and the controller output (Y_2) provides the triggering sens “cooling”. For the operating mode “heating” **or** “cooling” the controller output (Y_1) can provide the triggering sens “heating” but an integrated external change-over switch allows a change-over to “cooling”.

In case of the thermostatic controllers E 1 and E 3 the control signal of the “presence” push-button or of the timing clock will shift the setting value, depending upon the operating mode, by 4 K. The regulating parameters as set when supplied ex works can, of course, be adapted to the installation conditions later (please, see Technical Data). The once set values will remain active even in case of a voltage failure.

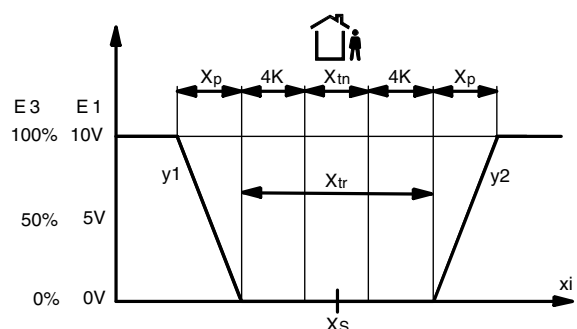
Functional diagrams

operating mode heating and/or cooling

Normal temperature

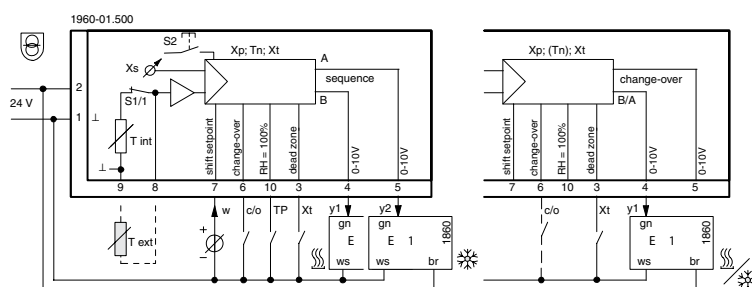


Set-back temperature

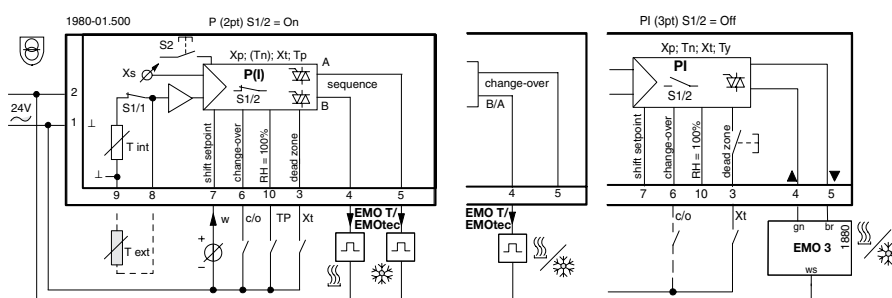


Connection diagram

Thermostat E 1



Thermostat E 3



Application

The constantly operating and three-point thermostatic room temperature controllers E 1 or E 3 respectively in conjunction with the corresponding actuators (e.g. EMO 1 and EMO 3) are employed in the field of heating, aerating and air condition engineering. For the temperature control of individual or separate rooms constantly operating and three-point controllers are used in residential and business buildings where heating radiators, underfloor heating, ceiling cooling systems or blower convectors etc. are installed.

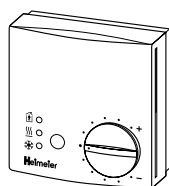
Especially in those cases where elevated requirements for an accurate temperature control or a controlled system of high degrees of difficulty prevail optimal control results can be achieved. In case of a similarly constant control by two-point actuators (e.g. EMO T or EMOtec) the Thermostat E 3 can be adjusted to puls-width modulated output signals (PWM).

The operating voltage must be provided by safety transformers in compliance with EN 60742 or equivalent appliances must be used.

Technical data

	Thermostat E 1(constant controller)	Thermostat E 3 (three-point controller)
Operating voltage:	24 V AC/DC ($\pm 20\%$), 50/60 Hz, 2,5 VA	24 V AC ($\pm 20\%$), 50/60 Hz, 2,5 VA
Output voltage:	0-10 V DC	24 V AC
Output current:	Y_1/Y_2 : max. 2 mA each load $> 5k\Omega$	nominal 0,5 (max. 0,9) A, each actuat. outp.
- Connection EMO:	EMO 1: max. 2 x 4 pcs	EMO 3: max. 10 pcs, EMO T/EMOtec max. 2 x 2 pcs
- Fuse protection:	secured against short-circuits	Fuse 5 x 20 mm, 4 A FF
Setting value range:	10°C–30°C (50°F–86°F) anti-frost position $\leq 6^\circ\text{C}$	10°C–30°C (50°F–86°F) anti-frost position $\leq 6^\circ\text{C}$
- Setback (X_i)	X_i = dead zone (X_{in}) ± 4 K	X_i = dead zone (X_{in}) ± 4 K
Operating modes:	Heating and/or cooling	Heating or cooling with three-point controller heating and/or cooling with PWM controller
Control behaviour:	P or PI controller (parametrically adjustable)	P or PI controller (parametrically adjustable)
Control parameter (nonvolatile):	ex works adjustment, setting range	ex work adjustment, setting range
- Controller type:	P controller	PI - Three-point controller
- Proportional range (Xp):	5 K; 2–22 K	5 K; 2–22 K
- Dead zone (Xm):	0,4 K; 0,4–5,5 K	0,4 K; 0,4–5,5 K
- Adjustment time (Tn):	0,0 (= off), 6-60 min. (= PI controller)	30 min.; 0,0 (= off), 6-60 min. (= PI controller)
- Period (Tp) or running time (Ty) actuator:	-	20 min; 0,5-20 min.
- Zero (nullification):	0; 10–30°C (50–86°F)	0; 10–30°C (50–86°F)
Run time limit (T_m):	-	3 x running time actuator (Ty) with 3-point controller
Type of protection/class of protection:	IP 30 (EN 60529/III, IEC 536)	IP 30 (EN 60529/III, IEC 536)
CE certification (EMC / L.T.):	EN 55081-1/-2, EN 50082-1/EN 60730-1	EN 55081-1/-2, EN 50082-1/EN 60730-1
Ambient temperature (in operation):	0°C – +50°C (+32°F – +113°F)	0°C – +50°C (+32°F – +113°F)
Housing, colour:	Plastic, white RAL 9010/socket black	Plastic, white RAL 9010/socket black
Connection cross-section:	screw terminals, max. 1 mm ²	screw terminals, max. 1 mm ²
Installation:	Fastened to the wall or on recessed box	Fastened to the wall or on recessed box

Articles



	EAN	Article No
Thermostat E 1 for proportional actuators	4024052432813	1960-01.500
Thermostat E 3 for three-point actuators	4024052432912	1980-01.500

Accessories

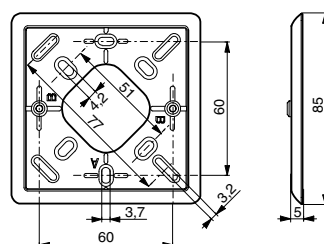
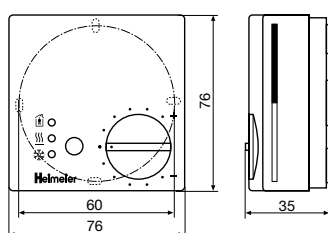
Intermediate plate

For installation of the Thermostat E on recessed (concealed) boxes. White RAL 9010.

EAN	Article No
4024052432714	1960-01.433

Dimensions

1 mm = 0,0394 inch



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