

Multifunction digital thermostat TER-9

Advantages

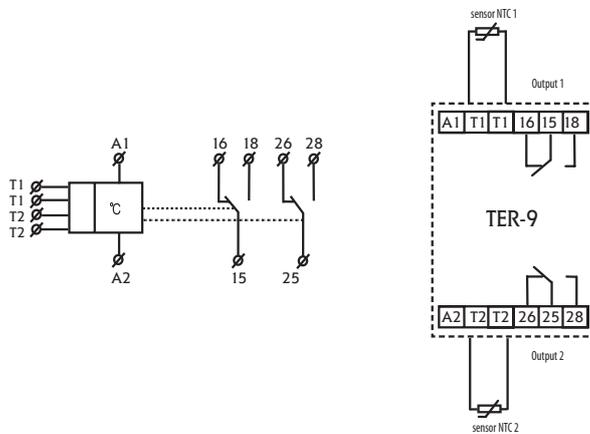
- Digital thermostat with 6 functions and in-built time switch clock, with daily and weekly program (as SHT-1). Thermo functions can be managed also in real time
- Complex control of heating and water heating in buildings, solar heating etc
- 2 thermostats in one, 2 temperature inputs, 2 outputs with potential free contact
- Functions: two independent thermostats, 1x dependent, differential thermostat, 2-stage thermostat, thermostat with dead zone, heating functions
- Program setting of output function, calibration of sensors according to reference temperature (off set)
- Thermostat is inferior to a program of digital switch clock
- 2 -module, DIN rail mounting

- Supply AC 230 V or AC/DC 24 V galvanically separated
- Output contact 1x changeover 8 A / 250 V AC1 for each output
- Memory for the most often used temperatures
- Well-arranged display of set and measured data, illuminated LCD by backlight
- Zero error when value setting
- Function of monitoring short-circuits or sensor disconnection

Technical data

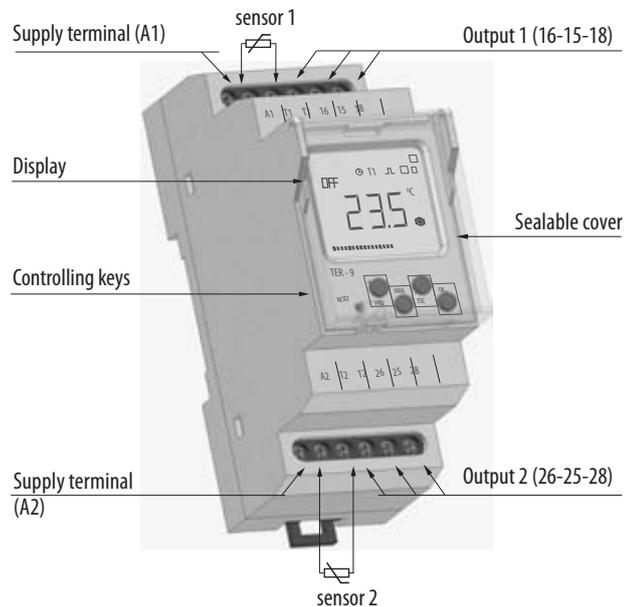
	TER-9
Number of functions	6
Supply	A1-A2
Supply voltage	AC 230V or AC/DC 24V, galvanically separated
Consumption	max. 3,5 VA
Supply voltage tolerance	-15% - +10%
Measuring circuit	
Measuring terminals	T1 - T1 in T2-T2
Temperature range	-40...+110 °C
Hysteresis (sensitivity):)	adjustable in range 0.5...5K
Difference temperature	adjustable 1.. 20 °C
Sensor	termistor NTC 12Ω at 25°C
Sensor fault indication	sign "Err"
Measuring accuracy	5 %
Repeat accuracy	<0,5 %
Temperature coefficient	< 0.1 % / °C
Output	
Number of contacts	1 x changeover for each output (AgNi)
Rated current	8 A / AC1
Breaking capacity	2500 VA / AC1, 240W / DC
Switching voltage	250V AC1/ 24V DC
Min. breaking capacity DC	500 mW
Output indication	ON / OFF
Mechanical life	1x10 ⁷
Electrical life	1x10 ⁵
Controlling	
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Electrical strength	4 kV (supply - contact)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from front panel
Oversvoltage category	III.
Pollution degree	2
Max. cable size	2.5 mm ²
Dimensions	90 x 35,6 x 64 mm
Standards	EN 60730-2-9, EN 61010-1, EN 61812-1

Connection

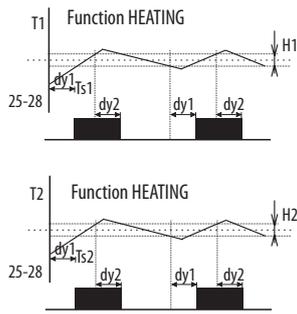


Note: It is possible to operate the device with one sensor. In such case it is necessary to connect resistor 10kΩ. This resistor is a part of delivery.

Description



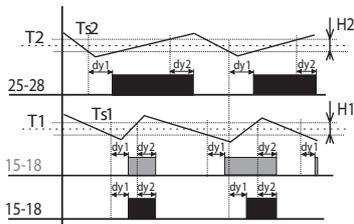
2 independent single-stage thermostat



Legend:
 Ts1 - real (measured) temperature 1
 Ts2 - real (measured) temperature 2
 T1 - adjusted temperature T1
 T2 - adjusted temperature T2
 H1 - adjusted hysteresis for T1
 H2 - adjusted hysteresis for T2
 dy1 - set switching delay of the output
 dy2 - set delay on output breaking
 15-18 output contact (for T1)
 25-28 output contact (for T2)

Output contact switched until adjusted temperature is reached. Hysteresis eliminates frequent switching. Heating/cooling function adjusted in the menu.

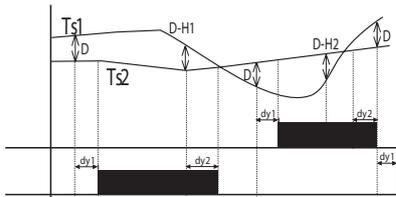
Dependent functions of 2 thermostats



Legend:
 Ts1 - real (measured) temperature 1
 Ts2 - real (measured) temperature 2
 T1 - adjusted temperature T1
 T2 - adjusted temperature T2
 H1 - adjusted hysteresis for T1
 H2 - adjusted hysteresis for T2
 dy1 - set switching delay of the output
 dy2 - set delay on output breaking
 25-28 output contact (for T2)
 15-18 output contact (intersection T1 and T2)

Output 15-18 is closed, if temperature of both thermostats is below an adjusted level. When any thermostat reaches adjusted level, the contact 15-18 open. Serial inner connection of thermostats (logic function AND).

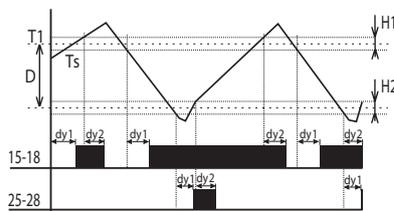
Differential thermostat



Legend:
 Ts1 - real (measured) temperature T1
 Ts2 - real (measured) temperature T2
 D - adjusted difference
 dy1 - set switching delay of the output
 dy2 - set delay on output breaking
 15-18 output contact (for T1)
 25-28 output contact (for T2)

Switching of output corresponds with input, which has lower temperature when difference is exceeded differential thermostat is used for keeping two identical temperature e.g. in heating systems (boiler and reservoir), solar systems (collector-reservoir, exchanger), water heating (water heater, water distribution) etc.

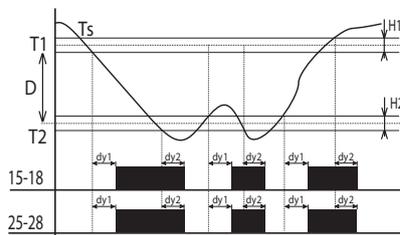
2-stage thermostat



Legend:
 Ts - real (measured) temperature
 T1 - adjusted temperature
 D - adjusted difference
 H1 - adjusted hysteresis for T1
 H2 - adjusted hysteresis for T2
 dy1 - set switching delay of the output
 dy2 - set delay on output breaking
 15-18 output contact
 25-28 output contact

Typical example of use for two-stage thermostat is e.g. in boiler-room, where there are two boilers from which one is main and the other one is auxiliary. The main boiler is managed according to set temperature and auxiliary boiler is switched in case temperature falls under set difference. Thus it helps to the main boiler in case outside temperature dramatically falls. In the range of difference (D) output 15-18 functions as normal thermostat to input 1 (type 1). In case temperature falls under set difference, output 2 switches.

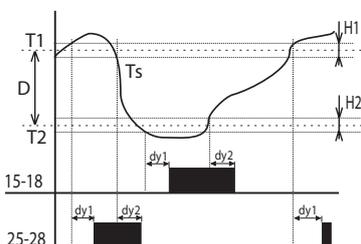
Thermostat with "WINDOW"



Legend:
 Ts - real (measured) temperature
 T1 - adjusted temperature MAX
 T2 - adjusted temperature MIN (T2=T1-D)
 H1 - adjusted hysteresis for T1
 H2 - adjusted hysteresis for T2
 dy1 - set switching delay of the output
 dy2 - set delay on output breaking
 15-18 output contact
 25-28 output contact

Output is closed (heating) only if temperature is within adjusted range. If temperature is out of range, the contact opens. T2 is set as T1-D. The function is used for protection of gutters against freezing.

Thermostat with dead zone



Legend:
 Ts - real (measured) temperature
 T1 - adjusted temperature T1
 T2 - adjusted temperature T2 (T2=T1-D)
 H1 - adjusted hysteresis for T1
 H2 - adjusted hysteresis for T2
 dy1 - set switching delay of the output
 dy2 - set delay on output breaking
 15-18 output contact (heating)
 25-28 output contact (cooling)

In case of thermostat with a „dead zone“, it is possible to set temperature T1 and a difference (respectively a width of dead zone D). In case the temperature with set hysteresis H1 is lower than T1, the output contact switches heating ON and when T1 is reached it opens. In case the temperature falls under T2, contact switches cooling down and opens when T2 is reached. This function can be used for example for automatic air warming and cooling in ventilation so the site is always within the range T1 and T2.