TCY-BH-230 Intelligent Indoor humidistat for wall mounting

General description

The TCY-BH-230 is a stand-alone electronic binary humidity stat. The TCY-BH-230 features one internal humidity sensor, one external NTC temperature sensor input and two binary outputs (Relays).
A detailed parameterization is possible with the use of a simple configuration routine. The TCY-BH-230 can be configured using the standard operation terminal. No special tools or software is required.
Ordering, Name convention

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TCY-BH-230-U
  | || └──── Housing:          U = Vertical (2" x 4") housing, Standard is square housing
  | |└────── Function          H = Humidity
  | └─────── Output:           B = Binary
  └──────────Series Indication TCY
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Item Name	Item code	Variant	Features
TCY-BH-230 TCY-BH-230-W04 TCY-BH-230-W05	40-10 0063 40-10 0063-04 40-10 0063-05	standard humidifying de-humidifying	Binary controller with: 1 Internal humidity input 1 external temperature input (For set point shift) 1 DO (Relay) for humidifier or dehumidifier 1 DO (Relay) for fan (optional)
TCY-BH-D-230 TCY-BH-D-230-W04 TCY-BH-D-230-W05	40-10 0064 40-10 0064-04 40-10 0064-05	Deluxe humidifying de-humidifying	
Accessories			
SOD-Tn10-1 AES3-HT-A5	40-20 0108 40-50 0104	Outdoor sensor Replacement humidity sensor 5% accuracy	

Selection of actuators and sensors

External temperature sensors: Use only our approved NTC sensors to achieve maximum accuracy.
Recommended is SDB-Tn10-15 as Duct sensor and SOA-Tn10 as outdoor sensor.
Binary auxiliary devices: E.g. humidifiers, de-humidifiers and fans. Do not directly connect devices that exceed 2(1.2)A. Observe startup current on inductive loads!

Mounting location

- Install the controller on an easy accessible interior wall, approx. 1.5 m above the floor in an area of average temperature.
- Avoid direct sunlight or other heat sources, e.g. the area above radiators and heat emitting equipment.
- Avoid locations behind doors, outside walls and below or above air discharge grills and diffusers.
- Location of mounting is less critical if external temperature sensors are used.

Installation

1. Connect the wires to be connected to the terminals of the power case according to wiring diagram
2. Install the mounting plate to the flush mounting box. Make sure that the nipple with the front holding screw is facing to the ground. Make sure the mounting screw heads do not stand out more than 5 mm (0.2") off the surface of the mounting plate.
3. Ensure that the jumpers are set correctly.
4. Slide the two latches located on the top of the front part into the hooks at the upper side of the mounting plate.
5. Carefully lower the front part until the interconnector reaches the mounting-plate. Continue pressing in a gentle way until the front part is fully connected. While inserting the connectors, a slight resistance can be felt. This is normal. Do not use excessive force!
6. With a Philips-type screw driver of size #2, carefully tighten the front holding screw to secure the front part to the mounting plate. This screw is located on the front lower side of the unit. There is no need to tighten the screw too much.

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Technical specification

Power supply	Operating voltage	230V AC ± 10 %, 50…60Hz
	Power consumption	Max. 2VA
	Electrical connection	Terminal connectors, wire 0.34…2.5 mm² (AWG 24…12)
	Deluxe type only: Power backup for real time clock	Min 48h if charged for 24h
Signal inputs	Humidity input: Range Accuracy Hysteresis	Element: Polymer-Based Capacity Sensor 0…100% r.H. 10%...90% r.H. ± 5.0% 0…10% and 90…100% ± 7.0% ±1% r.H.
	Temperature input Range Accuracy	External NTC (Sxx-Tn10 sensor): -40…70°C (-40…158 °F) -40…0 °C (-40…32 °F): 0.5 K 0…50 °C (32…122 °F): 0.2 K 50…70 °C (122…158 °F): 0.5 K
Signal outputs	Digital switching outputs Switching type Switching power	DO1…DO2 Relays, normally open 2(1.2) A
Environment	Operation Climatic conditions Temperature Humidity	To IEC 721-3-3 class 3 K5 0…50 °C (32…122 °F) <95 % r.H. non-condensing
	Transport & storage Climatic conditions Temperature Humidity Mechanical conditions	To IEC 721-3-2 and IEC 721-3-1 class 3 K3 and class 1 K3 -25…70 °C (-13…158 °F) <95 % r.H. non-condensing class 2M2
Standards	CE conform according to EMC Directive 2004/108/EU LV Directive 2006/95/EU	EN 61 000-6-1/ EN 61 000-6-3
	Product standards Automatic electrical controls for household and similar use	EN 60 730 –1
	Degree of protection	IP30 to EN 60 529
	Safety class	II (IEC 60536)
	Overvoltage category	III (EN 60 730-1)
Housing	Materials Cover, back part Mounting plate	 Fire proof ABS plastic (UL94 class V-0) Galvanized steel
General	Dimensions (H x W x D)	Front part: 88 x 88 x 21 mm (3.5 x 3.5 x 0.8 in) Power case: 60 x 50 x 32 mm (2.4 x 2.0 x 1.3 in)
	Weight (including package)	260 g (9.2 oz.)

Power failure

Upon power-interruption, all parameters and set points are memorized in non-volatile memory and therefore do not have to be re-entered again.

Error messages

Err1: Humidity sensor faulty. The humidity sensor is damaged.
Err2: External input for temperature setback missing or damaged.

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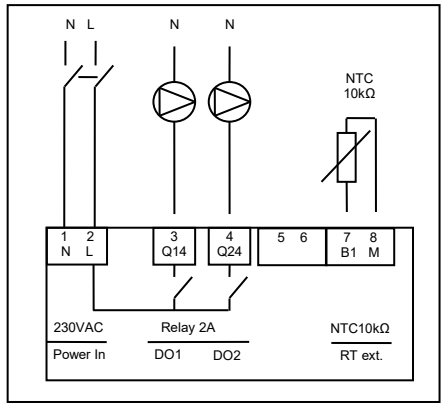
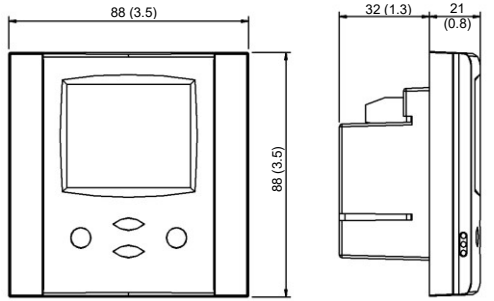
Wiring diagram



Dimensions mm (in)



Space required in flush mounting box: (H x W x D) 60 x 50 x 32 mm (2.4 x 2.0 x 1.3 in.)
Distance for mounting screws: Horizontal and vertical: 45 to 63 mm (1.8 to 2.5 in.)

Configuration parameters for firmware version 1.4

The TCY-BH-230 can be adapted to wide variety of applications. The adaptation is done with parameters. The parameters can be changed on the unit without the need of additional equipment.

Identifying the firmware version

The parameters and functionality of controller depend on its firmware revision. It is therefore important to use a matching product version and parameter set. The firmware version is marked on the package box of your product. In order to identify the firmware version of an installed controller, press UP and DOWN keys simultaneously for three seconds: The display will indicate the firmware version in the upper large digits and the revision in the lower small digits. Press the LEFT key to return to normal operation.

Setting of user parameters

The TCY-BH-230 can be adapted to fit perfectly into your application. The control operation is defined by parameters. The parameters are set during operation by using the control buttons.
The parameters may only be accessed by entering a code. There are two levels of parameters: User operation parameters for access control settings, and Expert parameters for control functions and unit setup. The codes for user levels and expert levels are different. Only control experts should be given the control parameter code.
The parameters can be changed as follows:

1. Press UP and DOWN button simultaneously for three seconds. The display shows the software version in the large digits and the product code in the small digits.
2. Pressing the OPTION button will indicate CODE on the small digits and 000 on the large digits.
3. The code for accessing the user parameters is 009
4. Select this using UP or DOWN buttons.
5. Press OPTION button after selecting the correct code.
6. Once logged in, the parameter is displayed immediately.
7. Select the parameters with the UP/DOWN buttons. Change a parameter by pressing the OPTION button. Three triangles will show up on the lower right and indicate that the parameter may be modified now. Use UP or DOWN buttons to adjust the value.
8. After you are done, press OPTION or POWER in order to return to the parameter selection level.

Press the POWER button again so as to leave the menu. The unit will return to normal operation if no button is pressed for more than 5 minutes.

User parameters (password 09)

Parameter	Description	Range	Default
UP 00	Enable change of operation modes	ON, OFF	ON (Enabled)
UP 01	Enable change of setpoints	ON, OFF	ON (Enabled)
UP 02	Enable access to Time programs	ON, OFF	ON (Enabled)
UP 03	State after power failure: 0 = Switched OFF, 1 = Switched ON, 2 = state before power failure	0, 1, 2	2
UP 04	Enable Economy functionality	ON, OFF	OFF (Disabled)
UP 05	Celsius or Fahrenheit, Select ON for Fahrenheit, OFF for Celsius	ON, OFF	OFF (Celsius)
UP 06	Select contents of small digits in standard mode: 00 = OFF 01 = Setpoint 02 = Humidity Sensor 03 = External Temperature Sensor 04 = Clock	0…5	04 Deluxe: show clock 01 Standard: show set point
UP 07	New: Resolution 0.5% or 1% RH OFF = Display resolution is 0.5% RH ON = Display resolution is 1% RH	ON, OFF	OFF (0.5% RH)
UP 08 Deluxe only	Clock display type: OFF = Show 24 hour clock ON = Show 12 hour clock (AM, PM)	ON, OFF	OFF (24h)
UP 09 Deluxe only	Reset timer for override mode: Only available for deluxe version 0 = Reset of override mode is not active. 1…255 = delay in minutes to return to scheduled operation if the device is activated while scheduled to be in OFF or ECO mode.	0…255	60 (Min)

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Control parameters (access code: 241)

Warning! Only experts should change these settings! See user parameters for login procedure.

Parameter	Description	Range	Default
CP 00	Minimum set point limit in humidification mode	0…100%	10%
CP 01	Maximum set point limit in humidification mode	0…100%	90%
CP 02	Minimum set point limit in de-humidification mode	0…100%	10%
CP 03	Maximum set point limit in de-humidification mode	0…100%	90%
Controls configuration			
CP 04	Economy humidity shift	0…100%	10%
CP 05	Dead zone between humidifying & de-humidifying set point X_{DZ}	0…100%	10%
CP 06	Delay on humidify – de-humidify change over	0…255 min	5 min
CP 07	Switching hysteresis	0…100%	3%
CP 08	Delay OFF (Minimum running time) [MM:SS]	00:00 to 98:30	00:10s
CP 09	Delay ON (Minimum stopping time) [MM:SS]	00:00 to 98:30	00:10s
CP 10	Configuration of control mode 0 = Both Humidification and de-humidification 1 = W04 = Humidification only 2 = W05 = De-humidification only	0 - 2	TCY-BH-230: 0 TCY-BH-230-W4: 1 TCY-BH-230-W5: 2
Output configuration			
CP 11	Enable fan (only if CP 10 ≠0)	ON, OFF	TCY-BH-230: OFF TCY-BH-230-W4: ON TCY-BH-230-W5:ON
CP 12	Start delay for fan [MM:SS] (Time the fan runs before control output starts)	00:00 – 98:30	00:10
CP 13	Stop delay for fan [MM:SS] (Time the fan keeps running after control output stops)	00:00 – 98:30	01:30
Temperature setback configuration			
CP 14	Enable temperature setback OFF = Temperature setback is disabled ON = Temperature setback is enabled	ON, OFF	OFF
CP 15	Setpoint limit at full setback	0…100%	20%
CP 16	Lower temperature limit: Outside temperature with maximum setback The setpoint will be equal to the minimum set point limit	-40…60 °C -40…160 °F	-30 °C (-22 °F)
CP 17	Upper temperature limit: Outside temperature at begin of setback.	-40…60 °C 40…160 °F	0 °C (32 °F)
Input signal configuration			
CP 18	Number of seconds taken into account to calculate the averaging input signal. Low value = fast response High value = slow response	0…100	10

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