

TDC-BH Intelligent duct humidistat

General description

The TDC-BH is a stand-alone electronic binary humidity stat. The TDC-BH features one duct 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 TDC-BH can be configured using the standard operation terminal. No special tools or software is required. Ordering, Name convention

TDC-BH	Housing:	U = Vertical (2" x 4") housing, Standard is square housing
	Function	H = Humidity
	Output:	B = Binary
	Series Indication	TCY

Item Name	Item code	Variant	Features
TDC-BH	40-10 0061	standard	Binary controller with:
TDC-BH-W04	40-10 0061-04	humidifying	1 Internal humidity input
TDC-BH-W05	40-10 0061-05	de-humidifying	1 external temperature input (For set point shift)
TDC-BH-D	40-10 0062	Deluxe	1 DO (Relay) for humidifier or dehumidifier
TDC-BH-D-W04	40-10 0062-04	humidifying	1 DO (Relay) for fan (optional)
TDC-BH-D-W05	40-10 0062-05	de-humidifying	
Accessories			
SOD-Tn10-1	40-20 0108	Outdoor sensor	
AES1-HT-A5	40-50 0069	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

The Duct controller should be installed directly on the duct, in an area where the air stream is well mixed:

- Locate a supply air sensor two or three meters downstream from the nearest fan and coil.
- Mount the return air sensor close to the air inlet but downstream from a return fan if one is present.

Installation

1. Drill a hole with a diameter of 16mm (5/8") in the air duct.
2. Connect the wires to be connected to the terminals of the back part according to wiring diagram.
3. Insert the probe in the hole; secure the back part to the duct with two –self-tapping screws.
4. Connect the cable of the operating unit to the matching connector on the back part.
5. Slide the two latches located on the left side of the front part into the hooks at the upper left side of the back part.
6. Carefully lower the front part until the interconnector reaches the back part. Continue pressing in a gentle way until the front part is fully connected.
7. With a Philips-type screw driver of size #2, carefully tighten the front holding screw to secure the front part to the back part. This screw is located on the front right side of the front part. There is no need to tighten the screw too much.

Technical Specification

Power Supply	Operating Voltage	24 V AC/DC $\pm 10\%$, 50...60 Hz
	Power Consumption	Max. 2 VA
	Electrical Connection	Terminal Connectors, wire 0.34...2.5 mm ² (AWG 24...12)
	Deluxe type only: Power backup for real time clock	Min 48h if charged for 24h
Signal Inputs	Humidity Input:	Element: Polymer-Based Capacity Sensor
	Range	0...100% r.H.
	Accuracy	10%...90% r.H. $\pm 5.0\%$
	Hysteresis	0...10% and 90...100% $\pm 7.0\%$ $\pm 1\%$ r.H.
Signal Outputs	Temperature Input	External NTC (Sxx-Tn10 sensor):
	Range	-40...70°C (-40...158°F)
	Accuracy	-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
	Digital Switching Outputs	DO1...DO2
Environment	Switching type	Relays, Normally open
	Switching power	2(1.2) A
	Operation	To IEC 721-3-3 class 3 K5
	Climatic Conditions	0...50 °C (32...122 °F)
Standards	Humidity	<95 % r.H. non-condensing
	Transport & Storage	To IEC 721-3-2 and IEC 721-3-1
	Climatic Conditions	class 3 K3 and class 1 K3
	Temperature	-25...70 °C (-13...158 °F)
CE	Humidity	<95 % r.H. non-condensing
	Mechanical Conditions	class 2M2
	conform according to EMC Standard	EN 61 000-6-1/ EN 61 000-6-3
	Product standards	EN 60 730 –1
Housing	Automatic electrical controls for household and similar use	EN 60 730 – 2 - 9
	Special requirement on temperature dependent controls	
	Degree of Protection	IP52 to EN 60 529
	Safety Class	III (IEC 60536)
General	Cover, back part	Polycarbonate PC (UL94 class V-0)
	Filter material	PTFE coated 1µm pores
	Dimensions (H x W x D):	91 x 68 x 47mm (3.7" x 2.7" x 1.9")
	Transmitter case: Probe:	Ø14 x 77 mm (Ø 0.55 x 3")
Weight (including package)		220g

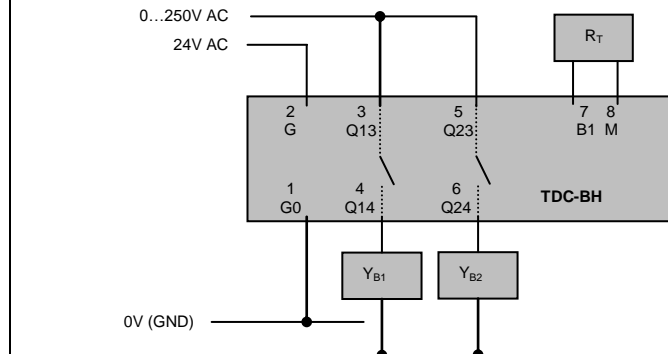
Power Failure

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

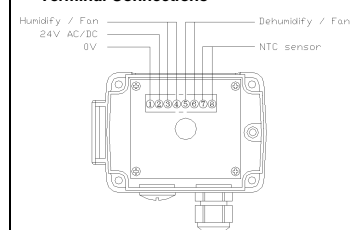
Error messages

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

Wiring Diagram



Terminal Connections

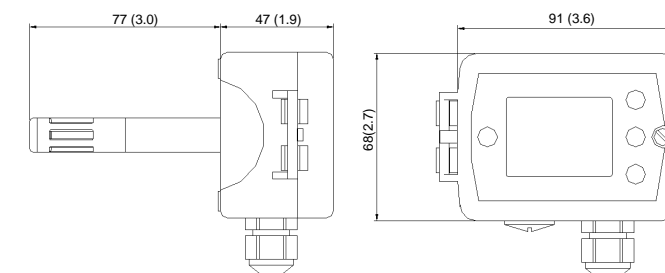


Description:

1. Connection for power-supply (24 V AC/DC, $\pm 10\%$). In case of DC, connect the negative power-terminal. Common connection for analog in- and outputs.
2. Connection for power-supply (24 V AC/DC, $\pm 10\%$). In case of DC, connect the positive power-terminal
3. Normally open contact "DO 1" Humidify or Fan
4. Normally open contact "DO 1" Humidify or Fan
5. Normally open contact "DO 2" Dehumidify or Fan
6. Normally open contact "DO 2" Dehumidify or Fan
7. Thermistor input "RT" (Thermistor Sxx-Tn10)
8. Thermistor input "RT" (Thermistor Sxx-Tn10)

Observe maximum switching power of 2(1.2)A per output!

Dimensions [mm] (in)



Configuration parameters for firmware version 1.3

The TDC-BH 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 TDC-BH 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:

- 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.
- Pressing the OPTION button will indicate CODE on the small digits and 000 on the large digits.
- The code for accessing the user parameters is 009
- Select this using UP or DOWN buttons.
- Press OPTION button after selecting the correct code.
- Once logged in, the parameter is displayed immediately.
- 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.
- 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 set points	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 = Set point 02 = Humidity Sensor 03 = External Temperature Sensor 04 = Clock	0...5	04 Deluxe: show clock 01 Standard: show set point
UP 07 Deluxe only	Clock display type: OFF = Show 24hour clock ON = Show 12hour clock (AM, PM)	ON, OFF	OFF (24h)
UP 08 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)

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_{02}	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	TDC-BH: 0 TDC-BH-W4: 1 TDC-BH-W5: 2
Output configuration			
CP 11	Enable fan (only if CP 10 ≠0)	ON, OFF	TDC-BH: OFF TDC-BH-W4: ON TDC-BH-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	Set point limit at full setback	0...100%	20%
CP 16	Lower temperature limit: Outside temperature with maximum setback The set point 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