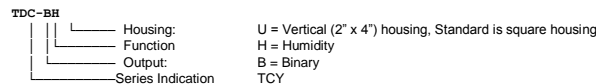


## TDC-BH Intelligent duct humidistat

### 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



| Item Name          | Item code    | Variant  | Features   |
|--------------------|--------------|--|--|
| TDC-BH-W50         | 40-100061-50 | standard humidifying de-humidifying                    | Binary controller with:<br>1 Internal humidity input<br>1 external temperature input (For set point shift)<br>1 DO (Relay) for humidifier or dehumidifier<br>1 DO (Relay) for fan (optional) |
| <b>Accessories</b> |              |  |  |
| S-Tn10-2           | 40-20 0001   | Flying lead sensor with 2 m cable                      |  |
| SD-Tn10-12-2       | 40-20 0002   | Flying lead duct sensor 12cm immersion depth, 2m cable |  |
| SD-Tn10-20-2       | 40-20 0003   | Flying lead duct sensor 20cm immersion depth, 2m cable |  |
| SDB-Tn10-12        | 40-20 0051   | Duct sensor with housing, 12cm immersion depth         |  |
| SDB-Tn10-20        | 40-20 0004   | Duct sensor with housing, 20cm immersion depth         |  |
| SOA-Tn10           | 40-20 0006   | Outdoor sensor   |  |
| AES-HT-A5          | 40-50 0031-5 | 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

- Drill a hole with a diameter of 16mm (5/8") in the air duct.
- Connect the wires to be connected to the terminals of the back part according to wiring diagram.
- Insert the probe in the hole; secure the back part to the duct with two –self-tapping screws.
- Connect the cable of the operating unit to the matching connector on the back part.
- 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.
- 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.
- 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 <sup>2</sup> (AWG 24...12)   |
|                   | Deluxe type only: Power backup for real time clock          | Min 48h if charged for 24h   |
| Signal Inputs     | Humidity Input: Range                                       | Element: Polymer-Based Capacity Sensor 0...100% r.H.   |
|                   | Accuracy  | 10%...90% r.H. $\pm 5.0\%$   |
|                   | Hysteresis  | 0...10% and 90...100% $\pm 7.0\%$<br>$\pm 1\%$ r.H.  |
|                   | Temperature Input Range                                     | External NTC (Sxx-Tn10 sensor):<br>-40...70°C (-40...158°F)<br>-40...0°C (-40...32°F): 0.5 K<br>0...50°C (32...122°F): 0.2 K<br>50...70°C (122...158°F): 0.5 K |
| Signal Outputs    | Digital Switching Outputs                                   | DO1...DO2  |
|                   | Switching type  | Relays, Normally open  |
|                   | Switching power   | 2(1.2) A   |
| Environment       | Operation Climatic Conditions                               | To IEC 721-3-3 class 3 K5  |
|                   | Temperature   | 0...50 °C (32...122 °F)  |
|                   | Humidity  | <95 % r.H. non-condensing  |
|                   | Transport & Storage Climatic Conditions                     | To IEC 721-3-2 and IEC 721-3-1 class 3 K3 and class 1 K3   |
| Standards         | Temperature   | -25...70 °C (-13...158 °F)   |
|                   | Humidity  | <95 % r.H. non-condensing  |
|                   | Mechanical Conditions                                       | class 2M2  |
|                   | conform according to EMC Standard EMEI Standard 73/23/EEC   | EN 61 000-6-1/ EN 61 000-6-3   |
| Product standards | Automatic electrical controls for household and similar use | EN 60 730 –1   |
|                   | Special requirement on temperature dependent controls       | EN 60 730 – 2 - 9  |
|                   | Degree of Protection  | IP52 to EN 60 529  |
|                   | Safety Class  | III (IEC 60536)  |
| Housing           | Cover, back part  | Polycarbonate PC (UL94 class V-0)  |
|                   | Filter material   | PTFE coated 1µm pores  |
| General           | Dimensions (H x W x D): Transmitter case:                   | 91 x 68 x 47mm (3.7" x 2.7" x 1.9")  |
|                   | Probe:  | Ø14 x 77 mm (Ø 0.55 x 3")  |
|                   | Weight (including package)                                  | 220g   |

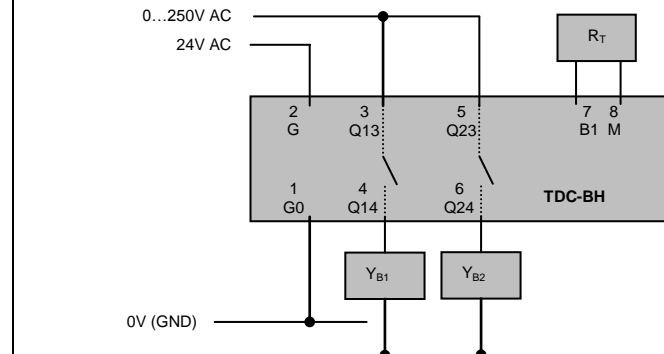
### Power failure

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

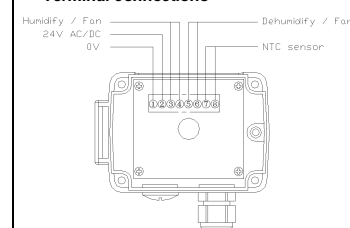
### Error messages

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

## Wiring diagram



### Terminal connections

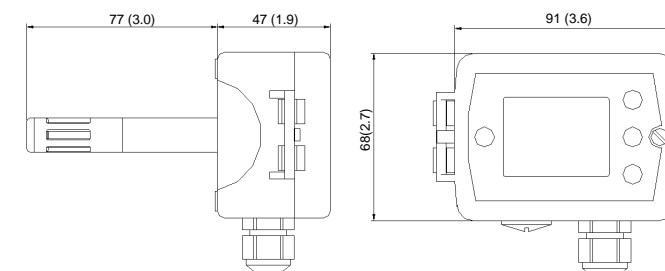


### Description:

- 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.
- Connection for power-supply (24 V AC/DC,  $\pm 10\%$ ). In case of DC, connect the positive power-terminal
- Normally open contact "DO 1" Humidify or Fan
- Normally open contact "DO 1" Humidify or Fan
- Normally open contact "DO 2" Dehumidify or Fan
- Normally open contact "DO 2" Dehumidify or Fan
- Thermistor input "RT" (Thermistor Sxx-Tn10)
- 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 1.2

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 setpoints  | ON, OFF | ON (Enabled)  |
| UP 02                | Enable access to Time programs  | ON, OFF | ON (Enabled)  |
| UP 03                | State after power failure:<br>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:<br>00 = OFF<br>01 = Setpoint<br>02 = Humidity Sensor<br>03 = External Temperature Sensor<br>04 = Clock  | 0...5   | 04 Deluxe: show clock<br>01 Standard: show setpoint |
| UP 07<br>Deluxe only | Clock display type:<br>OFF = Show 24hour clock<br>ON = Show 12hour clock (AM, PM)   | ON, OFF | OFF (24h)   |
| UP 08<br>Deluxe only | Reset timer for override mode: Only available for deluxe version<br>0 = Reset of override mode is not active.<br>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 setpoint limit in humidification mode   | 0...100%                  | 10%   |
| CP 01                                    | Maximum setpoint limit in humidification mode   | 0...100%                  | 90%   |
| CP 02                                    | Minimum setpoint limit in de-humidification mode  | 0...100%                  | 10%   |
| CP 03                                    | Maximum setpoint limit in de-humidification mode  | 0...100%                  | 90%   |
| <b>Controls configuration</b>            |   |                           |   |
| CP 04                                    | Economy humidity shift  | 0...100%                  | 10%   |
| CP 05                                    | Dead zone between humidifying & de-humidifying set point $X_{02}$   | 0...100%                  | 0   |
| CP 06                                    | Delay on humidify – de-humidify change over   | 0...255 min               | 0   |
| CP 07                                    | Switching Hysteresis  | 0...100%                  | 0   |
| CP 08                                    | Delay OFF (Minimum running time) [MM:SS]  | 00:00 to 98:30            | 0   |
| CP 09                                    | Delay ON (Minimum stopping time) [MM:SS]  | 00:00 to 98:30            | 0   |
| CP 10                                    | Configuration of control mode<br>0 = Both Humidification and de-humidification<br>1 = W04 = Humidification only<br>2 = W05 = De-humidification only | 0 - 2                     | TDC-BH: 0<br>TDC-BH-W4: 1<br>TDC-BH-W5: 2     |
| <b>Output configuration</b>              |   |                           |   |
| CP 11                                    | Enable fan (only if CP 10 ≠0)   | ON, OFF                   | TDC-BH: OFF<br>TDC-BH-W4: ON<br>TDC-BH-W5: ON |
| CP 12                                    | Start delay for fan [MM:SS]<br>(Time the fan runs before control output starts)   | 00:00 – 98:30             | 00:10   |
| CP 13                                    | Stop delay for fan [MM:SS]<br>(Time the fan keeps running after control output stops)   | 00:00 – 98:30             | 01:30   |
| <b>Temperature setback configuration</b> |   |                           |   |
| CP 14                                    | Enable temperature setback<br>OFF = Temperature setback is disabled<br>ON = Temperature setback is enabled  | ON, OFF                   | OFF   |
| CP 15                                    | Setpoint limit at full setback  | 0...100%                  | 20%   |
| CP 16                                    | Lower temperature limit:<br>Outside temperature with maximum setback<br>The setpoint will be equal to the minimum setpoint limit                    | -40...60°C<br>-40...160°F | -30°C (-22°F)                                 |
| CP 17                                    | Upper temperature limit:<br>Outside temperature at begin of setback.  | -40...60°C<br>40...160°F  | 0°C (32°F)                                    |
| <b>Input signal configuration</b>        |   |                           |   |
| CP 18                                    | Number of seconds taken into account to calculate the averaging input signal.<br>Low value = fast response<br>High value = slow response            | 0...100                   | 10  |