TCY-BH-U Humidistat



Features

- Control for binary humidifiers and dehumidifiers with or without fan support
- Low power energy consumption: < 1W per unit
- Relays switching for outputs each up to 300W
- Cost saving option with Economy functionality and setpoint limitations
- External sensor input for setpoint setback based on outdoor temperature
- Password protected programmable user and control parameters
    - Setpoint range limitation
    - Access control for setpoints and mode change
    - Access control for clock and time programs
    - Select your display contents
    - Selectable behavior after return from power failure
- Temperature display of external input in Celsius or Fahrenheit

Deluxe version:

- Clock and time schedule functions
- Blue backlight for LCD

Applications

- Humidifiers:
    - On / Off type humidifiers
    - On / Off type humidifiers with single speed fan support
- Dehumidifiers:
    - On / Off type dehumidifiers
    - On / Off type dehumidifiers with single speed fan support
- Combination humidifiers and dehumidifiers without fan support

General description

The TCY-BH-U is a stand-alone electronic binary humidity stat. The TCY-BH-U 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-U can be configured using the standard operation terminal. No special tools or software is required.

Ordering

Item name	Item code	Variant	Features
TCY-BH-U TCY-BH-U-W04 TCY-BH-U-W05	40-100055 40-100055-04 40-100055-05	standard humidifying de-humidifying	Binary controller with: 1 Internal humidity input 1 external temperature input (for setpoint shift) 1 DO (Relay) for humidifier or dehumidifier 1 DO (Relay) for fan (optional)
TCY-BH-U-D TCY-BH-U-D-W04 TCY-BH-U-D-W05	40-100056 40-100056-04 40-100056-05	Deluxe humidifying de-humidifying	
Accessories			
S-Tn10-2 SD-Tn10-12-2 SD-Tn10-20-2 SDB-Tn10-12 SDB-Tn10-20 SOA-Tn10 AES3-HT-A5	40-200001 40-200002 40-200003 40-200051 40-200004 40-200006 40-500104		Flying lead sensor with 2 m cable Flying lead duct sensor 12cm immersion depth, 2m cable Flying lead duct sensor 20cm immersion depth, 2m cable Duct sensor with housing, 12cm immersion depth Duct sensor with housing, 20cm immersion depth Outdoor sensor Replacement humidity sensor 5% accuracy

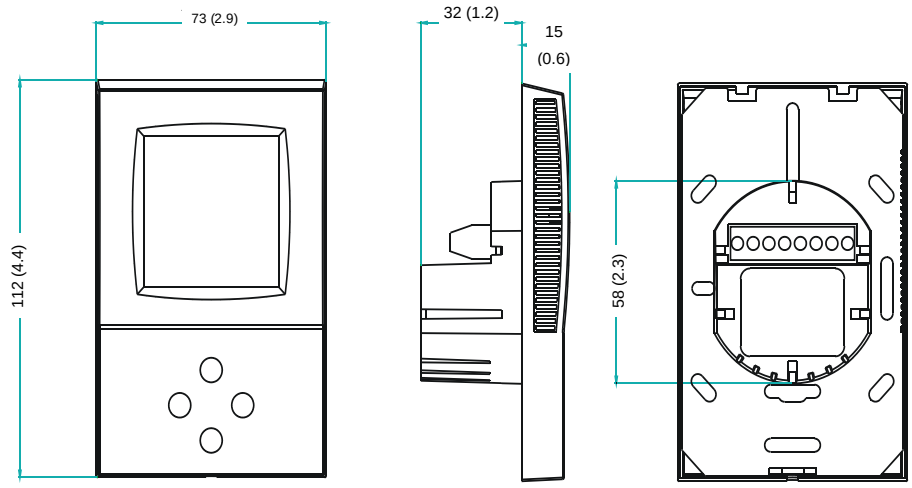
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Technical specifications

Caution! This device is intended to be used for comfort applications. Where a device failure endangers human life and/or property, it is the responsibility of the owner, designer and installer to add additional safety devices to prevent or detect a system failure caused by such a device failure. Vector Controls or its affiliates cannot be held liable for any damage caused by such a failure. Failure to follow specifications and local regulations may endanger life, cause equipment damage and void warranty.

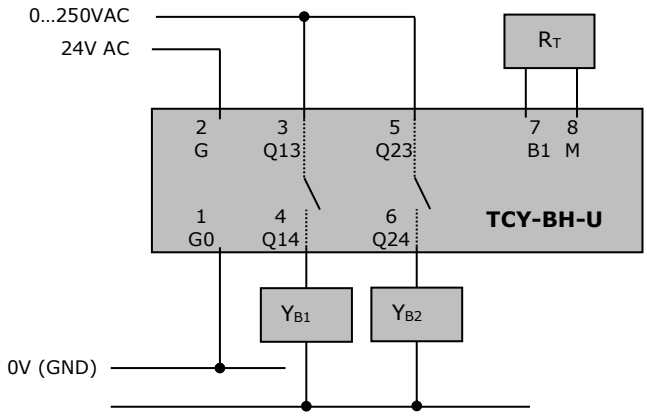
Power supply	Operating voltage	24 V AC/DC ± 10 %, 50…60 Hz
	Power consumption	Max. 1.5 VA
	Electrical connection	Terminal connectors, wire 0.34…2.5 mm² (AWG 24…12)
	Deluxe type only: Power backup for real time clock	 Min 48h if charged for 24h
Signal inputs	Humidity input: Range Accuracy Hysteresis	Element: 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	External NTC (Sxx-Tn10 sensor): -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
Signal outputs	Digital switching outputs Switching type AC Switching power	DO1…DO2 Relays 2(1.2) A, 250VAC (max fan power 300W)
Environment	Operation Climatic conditions Temperature Humidity	To IEC 721-3-3 class 3 K5 0°C …50°C (32°F…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°C…70°C (-13°F…158°F) <95% R.H. non-condensing class 2M2
General	Degree of protection	IP30 to EN 60 529
	Safety class	III (IEC 60536)
	Material: Cover, back part Mounting plate	Fire proof ABS plastic (UL94 class V-0) Galvanized steel
	Dimensions (H x W x D) Front part: Power case:	 112 x 73 x 15 mm (4.4 x 2.9 x 0.6 in) ø 58 x 32 mm (ø 2.3 x 1.3 in)
	Weight (including package)	270g

Dimensions mm (inch)



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Wiring diagram



Description

Connections depend on parameter CP10 and CP11!

CP10	YB1 DO1	YB2 DO2	RT
CP10 = 0	Humidify	Dehumidify	Temperature input for setback NTC 10kΩ @ 25°C (77°F)
CP10 = 1	Humidify	CP11 = ON: FAN	
CP10 = 2	If CP11 = ON: FAN	Dehumidify	

Selection of devices 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!

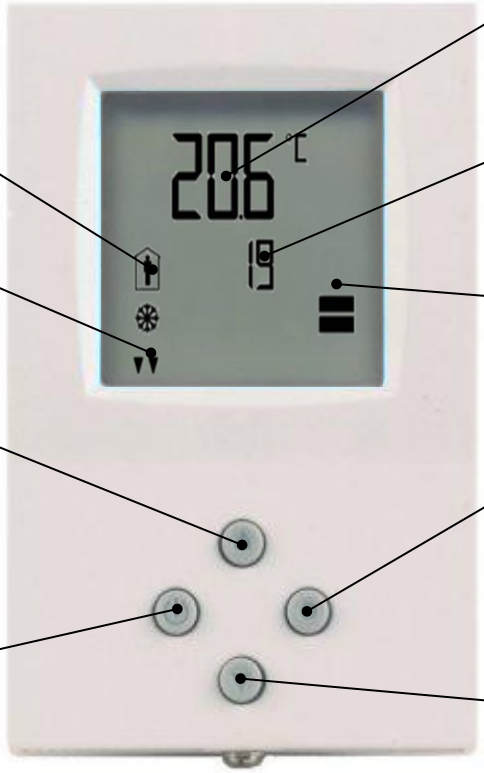
Mounting and installation

Mount the controller on an interior wall, approx. 1.5 m (4.5 ft) above the floor, in a place with average room temperature and humidity. Avoid direct sunlight, heat and moisture sources, doors, outside walls and air outlets.

Mount and connect the controller as shown in the installation sheet supplied with the device, and wire it according to the wiring diagram above.

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Display and Operation



Mode
Display of operation mode

Indicators
1 Temperature setback error

Up
Increment SETPOINT
(Parameter setting: SCROLL menu options and parameters)

Left (POWER)
Press < 2 sec.: Toggle STANDBY-COMFORT mode or switch from OFF to ON
Press > 2 sec.: Turn unit OFF. Text OFF displayed with current time (deluxe) temperature (standard)
(Parameter setting: ENTER to select menu option, accept parameter change)

Large Digits
Display of input or parameter value.

Small Digits
Display of setpoint, clock or parameter number.

Vertical Bar
Scrolls up = humidifying
Scrolls down = dehumidifying

Right (OPTION)
Press < 2 sec.: Switch display
Press > 2 sec.: Access time programs, change time.
(Parameter setting: ENTER to select menu option, accept parameter change)

Down
Decrement SETPOINT
(Parameter setting: SCROLL menu options and parameters)

Operation mode and state indication		
	Comfort (occupied)	All control functions operating per setpoints.
	Economy (unoccupied):	Setpoints shifted according to *Parameters CP04.* Economy mode and setpoint shift may be disabled with UP04
OFF	Energy hold Off	Outputs are off, inputs monitored for alarm condition
	Fan active	Fan is running
	Temperature setback	Temperature setback is active and shifts setpoint

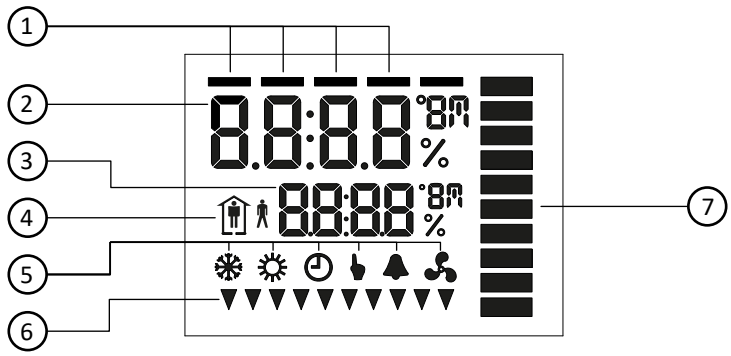
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LCD Display

Overview

This section explains the meaning of the symbols on the LCD Display.

Some of the symbols shown have no meaning depending on the type and version of the device used.



1	Control loop indication
2	Large digits
3	Small digits
4	Operating Mode
5	Controlling Mode Alarm Fan is active / fan auto mode
6	Triangle indication
7	Indication side bar

Power failure

All the parameters and setpoints are memorized and don't need to be reentered. Depending on Parameter UP-03 the unit will remain switched off, switch on automatically or return to the operation mode it was in before the power failure. The deluxe version includes a real time clock with a 48h backup battery powered through a super capacitor. The time does not need to be re-entered after a power failure.

Error messages

The TCY-BH-U may display the following error condition:

Err1: Humidity sensor faulty. The humidity sensor is damaged or removed. Verify if sensing element!
Err2: External input for temperature setback missing or damaged.

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Advanced user setup menu

To enter the advanced user setup menu, activate the controller by pressing the POWER button. Press the ENTER key for 3 sec until SEL is shown in the large digits. The menu can be left by pressing the POWER / ESC button or by not pressing a button for more than 5 minutes.

Temperature Unit setup (°C/°F)

Start the advanced menu as described above. Select C-F with the UP/DOWN buttons.

Press the ENTER key to change the temperature unit (°C or °F).
Press the POWER button to exit the advanced user setup menu.

Sensor calibration

Start the advanced menu as described above. Select CALH or CALt with the UP/DOWN buttons.

Small digits show CALH (internal humidity sensor calibration) and CALt (temperature setback sensor calibration). The current calibration value is displayed. Press ENTER and then change the value with the UP/DOWN buttons, and save it with the ENTER button.

Time Programming

Clock Operation

Overview

This section gives an overview of the clock and the available timed functions of the device.

Note on Accuracy

Warning: Devices with a "D" addition (e.g. TCY-BH-U-D) have a real-time clock. This clock is accurate to two seconds a day.

Time Programs

Up to 4 time and weekday programs can be programmed (Pro1 to Pro4). Each of the time programs support up to 4 switching events. A switching event can change the operating mode of the controller.

Devices with a "D" addition (e.g. TCY-BH-U-D) have a real-time clock with a maintenance-free power backup.

A flashing clock 🕘 indicates that the time has not been set or that the device has been without power for more than 48 hours. The time must be set for the schedules to work.

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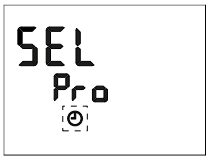
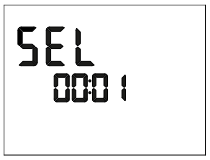
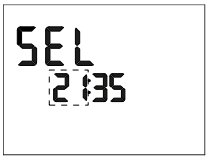
Clock Setting

Setting time and date of clock

Overview

This section describes how to set the time and date of the system clock.

Procedure

1. Press the (▷ / ●) button longer than 3 seconds. ➔ **SEL** and **PRO** is displayed and the clock symbol flashes. 2. Press the (△) (▽) button to select the time display. ➔ **SEL** and the actual **Time** is displayed.	 
3. Press the (▷ / ●) button briefly to start changing the time and date: **Minutes** flashes: (△) (▽) button for adjustment, (▷ / ●) button to save. **Hours** flashes: (△) (▽) button for adjustment, (▷ / ●) button to save. **Day of the week** flashes: (△) (▽) button for adjustment, (▷ / ●) button to save. Note: Monday is day 1 of the week.	Set Minutes  Set Hours  Set Day of Week 
Press the (⏻) button (1x) to go back.	

Set Time Schedules

Overview

Up to 4 individual time programs can be programmed (Pro1 to Pro4).

Each of the time programs support up to 4 switching events.

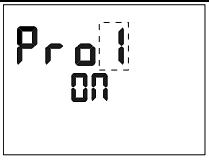
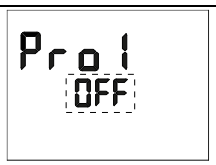
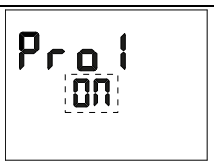
A switching event can change the operating mode of the controller.

Set daily/weekly time schedules

Overview

This section describes how to set a daily, weekly repeated action/function.

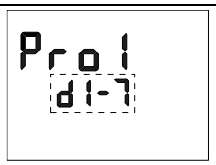
Procedure

1. Press the (▷ / ●) button longer than 3 seconds. ➔ **SEL** and **PRO** is displayed and the clock symbol flashes.	
2. Press the (▷ / ●) button. ➔ **Pro1** and the actual schedule status of Pro1 is displayed. 3. Press the (△) (▽) button to select time program Pro1, Pro2, Pro3 or Pro4. ➔ Number of time program flashes.	   ...
4. Press the (△) button briefly to go to the scheduler submenu. ➔ Schedule status indicates whether it is **OFF** or **ON**. 5. Press the (△) (▽) button to change the status. 6. Press the (▷ / ●) button to save the status. Note: An "OFF" status disables all switching events for this time program!	 

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7. Press the (△) (▽) button to select day/days of the switching event:
   - **d1-7** = Monday (day 1) to Sunday (day 7)
   - **d1-5** = Monday to Friday
   - **d1-6** = Monday to Saturday
   - **d6-7** = Saturday to Sunday
   - **dAY1** = Monday
   - **...** …
   - **dAY7** = Sunday
8. Press the (▷ / ●) button to save.

Note: Monday is day 1 of the week!

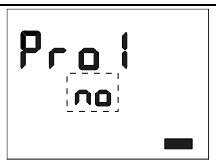


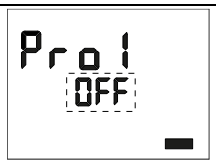
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9. Press the (△) (▽) button to select operating mode of switching event number 1 indicating by 1 bar:
   - **no** = Switching event not used
   - **OFF** = Operating mode changes to off mode
   - **ECO** = Operating mode changes to unoccupied (economy) mode
   - **ON** = Operating mode changes to occupied (comfort) mode
   - **UNI** = Operating mode does not change

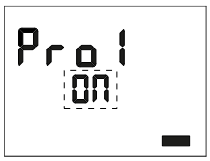
   ➔ 1 bar indicate setting of switching event 1 of 4 is executed.

   Note: Not used switching events should be set to "no".
10. Press the (▷ / ●) button to save.











11. Press the (△) (▽) button to adjust the time the switching event will execute from 00:00…23:45 in 15 minutes steps.

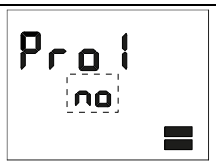
    ➔ 1 bar indicate setting of switching event 1 of 4 is executed.
12. Press the (▷ / ●) button to save.



13. Now you can select the operating mode of the next switching event if needed by pressing the (△) (▽) button:
    - **no** = Switching event not used
    - **OFF** = Operating mode changes to off mode
    - **ECO** = Operating mode changes to unoccupied (economy) mode
    - **ON** = Operating mode changes to occupied (comfort) mode
    - **UNI** = Operating mode does not change

    ➔ 2 bars indicate setting of switching event 2 of 4 is executed.

    Note: Not used switching events should be set to "no".
14. Press the (▷ / ●) button to save.











15. Press the (△) (▽) button to adjust the time the switching event will execute from 00:00…23:45 in 15 minutes steps.

    ➔ 2 bars indicate setting of switching event 2 of 4 is executed.
16. Press the (▷ / ●) button to save.



17. Now you can select the operating mode of the next switching event if needed by pressing the (△) (▽) button.

    …

…

To go back to the previous submenu/menu, press the (⏻) button.

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Switching modes and override reset

Name on display	Function	Override reset
no	Switching event not used	
OFF	Operation mode changes to off mode	Reset is active
ECO	Operation mode changes to economy mode	Reset is active
ON	Operation mode changes to comfort mode	Reset is not active
UNI	Operation mode does not change	Reset is not active

UNI: University mode: This switching mode is used for rooms such as lecture rooms and auditoriums that might be occupied during a certain time. During this time the reset is not active. The unit will not start itself when UNI mode is active. It still needs to be manually activated. This is to avoid unnecessary heating or cooling of such rooms while they are not occupied.

Override reset function: The override reset applies when the unit is manually switched on, while in scheduled off or ECO mode. The unit will return to the scheduled mode when the reset time defined in UP08 expires.
Setting UP08 to 0 disables the override reset.

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