TLC3-BCR-U Series Thermostat



Features

- Low power energy consumption: < 1W per unit
- Relays switching for outputs each up to 300W
- Temperature control for 2 or 4-pipe heating or cooling systems.
- Optional external temperature input
- **New Feature:** high temperature range of external input up to 150°C (302°F)
- Choose between one 3-point actuator and two binary heating/cooling stages
- Reversing valve options
- New with V3.1 dual stage option
- Cost saving option with Economy functionality and set point limitations
- Multiple auxiliary functions: heat-cool auto changeover, automatic enable, high or low limits.
- Password protected programmable user and control parameters.

TLC3-BCR-U-D also includes

- Power Cap protected real-time clock with 48hr power backup.
- Time schedule events, with many options.
- Blue backlight.

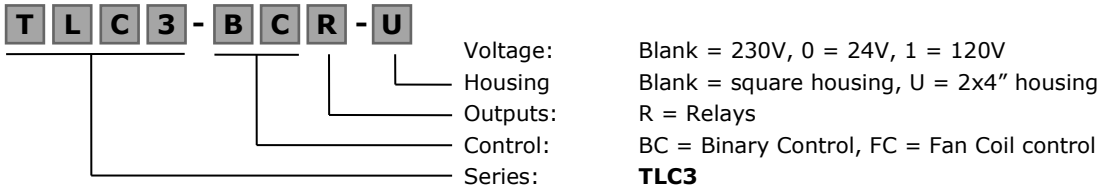
Applications

- Radiant heating
- Radiant cooling
- Small air handlers
- Constant air volume systems
- Frost protection
- General temperature control

General

- TLC3-BCR-U: 1 independent temperature control loop with 1 heating and 1 cooling sequence. 1 internal temperature sensor, 1 external temperature input, 1 auxiliary input for heat – cool changeover or high/low limit
- Flexible application configuration is made with a parameter-setting routine using the standard operation terminal.

Name



Ordering

Model	Item code	Variation	Option
TLC3-BCR-U-230 TLC3-BCR-U-230-W01	40-10 0160 40-10 0160-01	Standard Cooling only	Binary controller with: 1 RT int, 2 RT ext 2 DO (Relay) Binary valve control
TLC3-BCR-U-D-230 TLC3-BCR-U-D-230-W01	40-10 0161 40-10 0161-01	Deluxe Cooling only	

Temperature sensors: Use Vector Controls NTC sensors to achieve maximum accuracy: SDB-Tn10-20 (duct), SRA-Tn10 (room), SDB-Tn10-20 + AMI-S10 as immersion sensor. Choose cable types of wired temperature sensors based on temperature of application.

Binary auxiliary devices (e.g. pumps, fans, on/off valves, etc): Do not directly connect devices that exceed specified limits in technical specifications – observe startup current on inductive loads.

© Vector Controls GmbH, Switzerland

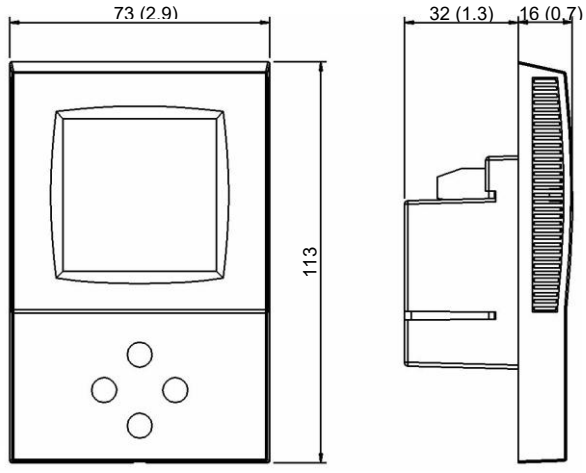
Technical specifications

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	Power Requirements		210 – 250 V AC 50/60 Hz
	Power Consumption		Max 1W, 1.5VA
	Electrical Connection		Terminal Connectors
	Clock backup		Min 48h if charged for 24h
Signal inputs	Temperature Inputs Range Accuracy		RT Internal 0…50 °C (32…122 °F) 0.5°C (1°F)
	Input type: Range Accuracy		External (Sxx-Tn10 sensor) -40..150°C (-40…302°F 0.5°C (1°F) if 0…50°C (32…122°F) 1.0°C (2°F) if -40…100°C (-40…212°F) 5°C (10°F) if > 100°C (212°F)
Signal outputs	Digital Switching Outputs Switching Type AC Switching power Insulation strength between relays contacts and system electronics: between open relays contacts		Y1 to Y2 Relays 0…250V AC 1.25A max. each output 4000V AC 1000V AC
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 conformity RoHS Directive EMC Directive Low Voltage Directive		 2011/65/EU 2004/108/EC 2006/95/EC
	Product standards Automatic electrical controls for household and similar use Special requirement on temperature dependent controls		 EN 60 730 –1:2011 EN 60 730 – 2 – 9:2010
	Electromagnetic compatibility for domestic sector		Emissions: EN 60 730-1:2011 Immunity: EN 60 730-1:2011
	Degree of Protection		IP30 to EN 60 529
	Pollution Class		II (EN 60 730-1:2011)
	Safety Class		II (IEC 61140:2001 + A1:2004)
	Overvoltage Category		III (EN 60 730-1:2011)
	Restriction of the use of certain hazardous substances		EN 50581:2012
General	Dimensions (H x W x D)	Front part: Power case:	16 x 73 x 113mm (0,7 x 2.9 x 4.5 in.) 60 x 50 x 32mm (2.4 x 2.0 x 1.3 in.)
	Material:	Cover, back part Mounting Plate	ABS plastic (UL94 class V-0) Galvanized Steel
	Weight (including package)		Standard: 295g (10.4oz) Deluxe (-D): 305g (10.7oz)

© Vector Controls GmbH, Switzerland

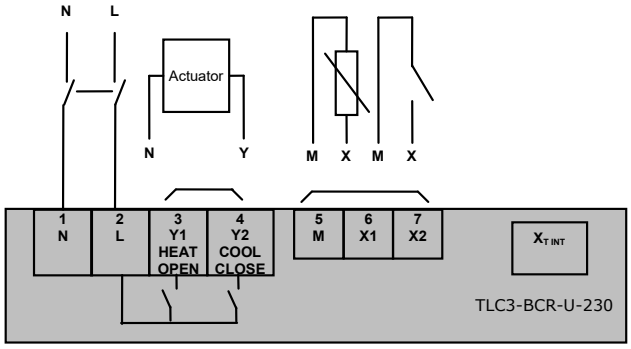
Dimensions, mm (inch)



Space required in flush mounting box:
(H x W x D)
60 x 50 x 32mm (2.4 x 2.0 x 1.3 in.)

Distance for mounting screws:
Horizontal 55 to 60mm (2.2 to 2.4 in.)
Vertical: 55 to 93mm (2.2 to 3.7 in.)

Connection



Warning:
Live Electrical Components!
During installation, testing, servicing and troubleshooting of Vector Controls products, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

Terminal Description

N	Power supply:	0V Neutral
L	Power supply:	230VAC
Y1	Binary output 230V AC:	
		Heat for binary or PWM actuators if in 4-pipe or single stage mode Open for 3-point actuators Stage 1 if in reversing valve mode Stage 1 if in 2-stage mode
Y2	Binary output 230V AC:	
		Cool for binary or PWM actuators if in 4-pipe mode or single stage mode Close for 3-point actuators Reversing valve if activated Stage 2 if 2-stage mode
X1	External control input:	NTC 10kΩ @ 25°C (77°F) Automatic detection for control input
X2	Changeover input:	NTC 10kΩ @ 25°C (77°F) or open contact to SGND Function according to setup

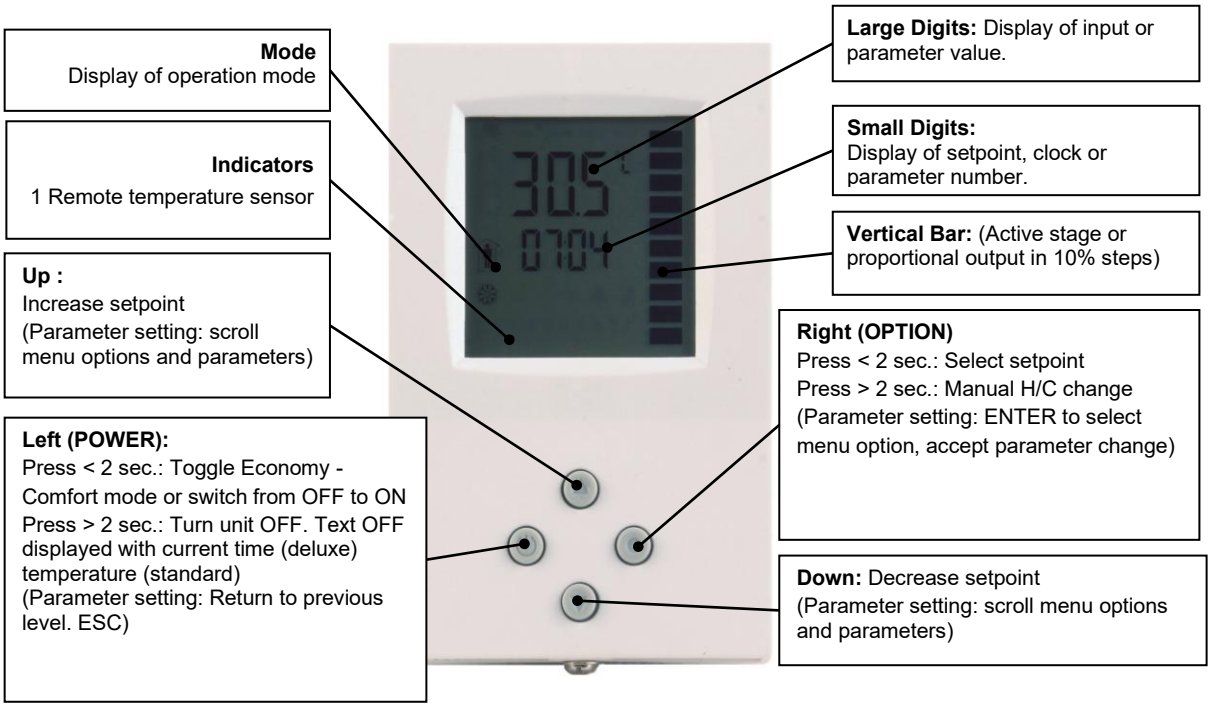
Mounting and installation

Mount the controller on an interior wall, approx. 1.5 m above the floor, in a place with average room temperature. Avoid direct sunlight, heat sources, doors, outside walls and air outlets. The location is less critical if an external temperature sensor is used.

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

© Vector Controls GmbH, Switzerland

Display and Operation



Operation mode		
	Comfort (occupied)	All control functions operating per set points.
	Economy (unoccupied):	Set points shifted according to *Parameters CP04.* Economy mode and setpoint shift may be disabled with UP06
OFF	Energy Hold Off	Outputs are off, inputs monitored for alarm condition
	Heating	Output activates if temperature lower than setpoint
	Cooling	Output activates if temperature higher than setpoint
	Manual mode	Deluxe only: Override of time schedule active.
	Schedule	Deluxe only: Time schedule is active

Standard display (Parameters UP10, UP11)

- Active when no key has been pressed for 30 seconds.
- Contents may be chosen with parameters.

Loop display

- Active when changing set points. Large digits show input value. Small digits show set point. Vertical bars show analog output value. Arrows in position 1, 2 and/or 3 show active binary (digital) output stages

Power Failure

- All parameters and set points are memorized and do not need to be re-entered.
- Upon return of power: Set *Parameter UP05* to keep the unit off, switch on, or operation mode before power failure.
- Clock and time schedule settings retained for 48 hours (after powered for at least 10 hours).

Error messages

Err1: Error temperature sensor. The internal temperature sensor may be damaged or not present
FP: Steady: Frost protection is active.
Blinking: Frost protection activated in the past and is now inactive. Confirm with OPTION key.

© Vector Controls GmbH, Switzerland

Manual heat – cool change

To manually change heating or cooling mode press the OPTION key for more than 2 seconds.
Access to manual heat – cool change may be disabled with parameter UP03.

For TLC3-BCR-U: Press OPTION > 2 sec. SEL and H-C is displayed. For TLC3-BCR-U-D: Press OPTION > 2 sec. SEL and current time is displayed. Press UP key twice. SEL and H-C is displayed. Press OPTION again to toggle H or C.	SEL H-C 

Clock operation

TLC3-BCR-U-D contains a quartz clock with battery back-up (not available in TLC3-BCR-U). Up to 8 mode changes based on time and day of the week may be programmed. Also position an output or select a set point directly with a time schedule. A blinking clock indicates that the time has not been set or that the unit has been without power for longer than 48 hours. The time needs to be set to allow time schedules to operate.

Clock setup

Press OPTION > 2 sec. SEL and current time displayed Press OPTION < 2 sec. to change time, Minutes blink: UP/DOWN to change, OPTION to save minutes, Hours blink: UP/DOWN to change, OPTION to save hour, Press OPTION to save time, DAY1 blinks: UP/DOWN to change, OPTION to save day	SEL 00:00 DAY1 (Mon)

Creating time schedules

There are a total of 4 switching events grouped into 4 time schedule group. A switching event consists of an operation mode and a switching time.

Step 1: Select time schedule group

Press OPTION > 2 sec. SEL and current time displayed Press UP: SEL and PRO displayed, clock symbol blinks Press OPTION: Select time schedule program. Pro 1 to Pro 4. PRO 1 is shown. 1 is blinking. UP/DOWN to change, OPTION to select	SEL PRO 	Pro 1 to Pro 4 OFF/ON

Step 2: Enable/disable time schedule group

Pro x is fixed now, ON / OFF blinks Press UP/DOWN to set ON or OFF. This disables or enables the time schedule group. Press OPTION to continue In case OFF has been selected, return to Step 1. If ON is selected, continue to step 3.	Pro 1 OFF/ON

Step 3: Selected switching day (Pr01) to DAY1 (Mon) – DAY 7 (Sun) for time schedule group

While Pro1 is displayed and day selection is blinking: Press UP / DOWN: select day group: d1-7, d1-5, 1-6, d6-7, day 1, day 2, day 3, day 4, day 5, day 6, day 7 d1-7 will activate the time schedule group for all 7 week days, d1-5 activates it only for day 1 (Mon) to day 5 (Fri) etc. Press OPTION to save day selection and move to first switching event.	Pr01 DAY1

Step 4: Select action for switching event

The bar on the right side indicates the current number of the switching event. There are a total of 4 switching events per group. Press UP / DOWN to select desired operation mode. (no, OFF, ECO, ON, UNI), no = disables this switching time OFF = switches unit Off, enables reset timer ECO = sets operation mode to On and Economy, disables reset timer ON = sets operation mode to On and Comfort, disables reset timer UNI = Does not change operation mode, only disables reset timer Press OPTION to continue	Pr01 no

Step 5: Select a switching time for switching event

Press UP / DOWN Switching time 07:30 blinks. Select switching time in 15 min steps from 00:00–23:45. Press OPTION to save switching time:	Pr01 08:00

Step 6: Complete time schedule group definition

Repeat steps 4 and 5 for all 4 switching events. In case a switching event is not used, set its mode to "no". To review the entire schedule group, step through by repeatedly pressing the OPTION key from step 1 onwards to step 6.	Pr01 08:00 

© Vector Controls GmbH, Switzerland

Smart Sensors and Controls Made Easy!

Quality - Innovation – Partnership

Vector Controls GmbH
Switzerland

info@vectorcontrols.com
www.vectorcontrols.com/

© Vector Controls GmbH, Switzerland