TC300 THERMOSTAT
CONNECTED DEVICE FOR COMMERCIAL BUILDINGS

TC300 Thermostat is an advanced, highly configurable device providing building automation connectivity well-suited for indoor commercial building applications. The product has flexible I/O that will satisfy the needs of most 2-pipe or 4-Pipe fan coil applications. Supported functions include dehumidification w/reheat using an embedded humidity sensor, auxiliary heat functions, and more rapid transitional 2-pipe system seasonal changeover.

This device supports BACnet MS/TP and Modbus communications via RS485 bus as is needed for typical HVAC building control systems. This same bus is used to facilitate future firmware updates and enhanced functionality as they are released to the market.

The integral intelligent control algorithms plus scheduling help to achieve the perfect balance between Energy Efficiency and Comfort. The thermostat utilizes an attractive, color, capacitive-touch screen interface providing an intuitive configuration process with minimal installer training. This functionality is enhanced through the usage of embedded help screens reducing reliance on technical manuals for complex installation.

FEATURES AND BENEFITS

- Color, capacitive-touch screen display for intuitive, fast commissioning and exceptional user experience.
- Multiple, configurable user types with customizable privileges to prevent unauthorized usage.
- Embedded system monitoring screen for equipment and I/O status.
- Customizable daily schedule for Occupancy set points, up to "X" Holidays including floating, and up to 3 special events.
- Advanced commercial control algorithms such as auto changeover.
- Customizable inactive display modes, Auto dim display, always on, or dark mode.
- A LED ring indicator to show the operational status.
- Real-Time Clock time keeping accuracy with 72 hour retention during power loss.
- Thermostat can be configured via HMI, or BACnet.

EQUIPMENT CONTROL FEATURES

- Fan coil, On/Off Valve, Floating Valve, Modulating Valve, and 6-Way Modulating Valve.
- Discharge Air Control
- 1-3 or variable speed fan
- Dehumidification with and without reheat.
- Enhanced 2-Pipe fan coil functionality during seasonal or system changeover providing heating or cooling functionality before CW/HW has reached optimal operating temperature.
- Service mode for manually enabling outputs for faster diagnostics and equipment testing.
- Auxiliary heating options supporting peripheral or supplemental types
- Auto mode to switch between heating and cooling according to the current space temperature
- Staging control, PID Tuning, DAT Lockout, Modulating control
- System Switch and Ventilation options.
- Integration with a variety of external wired sensor types including: Discharge air, Drain pan, occupancy, Proof or airflow, Space temp, CO2, and Humidity.

- Complies with ASHRAE guideline 36-2021, Section 5.22 sequence of operations for high-performance operation when using floating/modulating valves and multi-speed/variable speed fan.

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TECHNICAL SPECIFICATION

POWER CHARACTERISTICS

Power Supply	Rated voltage: 24VAC 50/60Hz, Working voltage range: 20–30VAC, UL listed class–2 transformer or IEC 61558 listed transformer.
Power Consumption (Display ON)	Max. 8.5VA @ 24VAC (355mA @ 24VAC)
Min. Load	4VA (all DOs OFF, No Sylk sensor)
Max. Load	96VA (all DOs ON)

DISPLAY

Display Type	16 BPP TFT display with CTP
Resolutions	320*240 pixel
Active Display Area	2.4" diagonally
Backlight	LCD (Dimmable)
LED Color Ring	Blue (cooling) Orange (heating)

IO CHARACTERISTICS

UIO x 3	• Resistive Temperature Sensor Input — NTC10K Type II, C7021 series — NTC10K Type III (Space Temperature Sensor only), C7023 series — NTC20K, TR21, and C7041 series • Voltage Input, SELV — 0-10V, ±5% of full scale • Digital Input — Dry contact closure — Open circuit (≥ 100Kohms) — Closed circuit (≤100ohms) • Voltage Output — 0-10V, ±3% of full scale @2K ohms
AI (DIO1 DIO2) x 2	• Resistive Temperature Sensor Input — NTC10K Type II, C7021 series — NTC10K Type III (Space Temperature Sensor only), C7023 series — NTC20K, TR21, and C7041 series • Digital Input — Dry contact closure — Open circuit (≥ 100Kohms) — Closed circuit (≤100ohms)
DO1–3, DIO1-2	• Relay Output • Rated Average Current — 1A Resistive at 24VAC • Rated Pulse Current — 3.5A Resistive at 24VAC

OPERATING ENVIRONMENT

Ambient Operating Temperature	32 to 122 °F (0 to 50°C)
Ambient Operating Humidity	10 to 90% relative humidity (non-condensing)
Storage Temperature	–40 to 150 °F(–40 to 65.5°C)
Protection Class	IP20

ONBOARD SENSOR

Temperature	Heat: 40 to 100°F (4.5 to 37.7°C) Cool: 50 to 99°F (10 to 37°C) Resolution: 1 °F (0.5°C) Control Accuracy: ±1.5°F (0.8°C) at Room Temperature
Humidity	Range: 20~90% RH Resolution: 1%RH Control Accuracy: ±5%RH at Room Temperature and 20~90%RH

COMPLIANCES

Certificates	• CE • FCC • ICES • UL/cUL • RoHs • REACH • Prop65 • UK
Standards	• EN 60730-1 • EN 60730-2-9 • BS EN 60730-1 • BS EN 60730-2-9 • UL60730-1 • UL60730-2-9 • Title 47 part 15 subpart B • ICES-003

COMMUNICATION TECHNOLOGIES

Sylk™	Honeywell Sylk™
BACnet MS/TP	Over RS485 (9.6, 19.2, 38.4, 76.8, 115.2 Kbps)
Modbus RTU	0.3 to 115.2 Kbps

ELECTRICAL CHARATERISTICS

Rated Impulse Voltage	500 V
Construction of Control	Independently Mounted Control

ELECTRICAL CHARATERISTICS

Operation Method	Type 1.B Action
Pollution Degree	2
Purpose of Control	Operating Control

SUPPORTED SENSORS AND FUNCTIONS

| SENSORS	OPTIONS	PART NUMBERS
Occupancy Sensor	Direct (Normally Open) Reverse (Normally Closed)	Dry contact occupancy sensor
Proof Of Air Flow Sensor	Direct (Normally Open) Reverse (Normally Closed)	DPS200 DPS400 DPS1000 MCS, CS, CSP current switches (Dry contact switches)
Discharge Air Temperature Sensor	NTC 20K NTC 10K Type II NTC 10K Type III Sylk	C7250A C7041 C7021 C7023 C7400S
Space Temperature Sensors	NTC 20K NTC 10K Type II NTC 10K Type III Sylk	TR21 C7041, C7772A, C7021, C7772F, C7023, C7772G, TR40, TR40-H, TR40-CO2, TR40-H-CO2, TR120 (max 1)
Pipe Sensor	NTC 20K NTC 10K Type II NTC 10K Type III	C7250A C7041 C7021 C7023
Changeover Switch	Closed with heat Closed with cool	Digital input
Drain Pan / Leak Detector	Direct (Normally Open) Reverse (Normally Closed	Dry contact float switch or water sensor

TERMINAL IDENTIFICATION
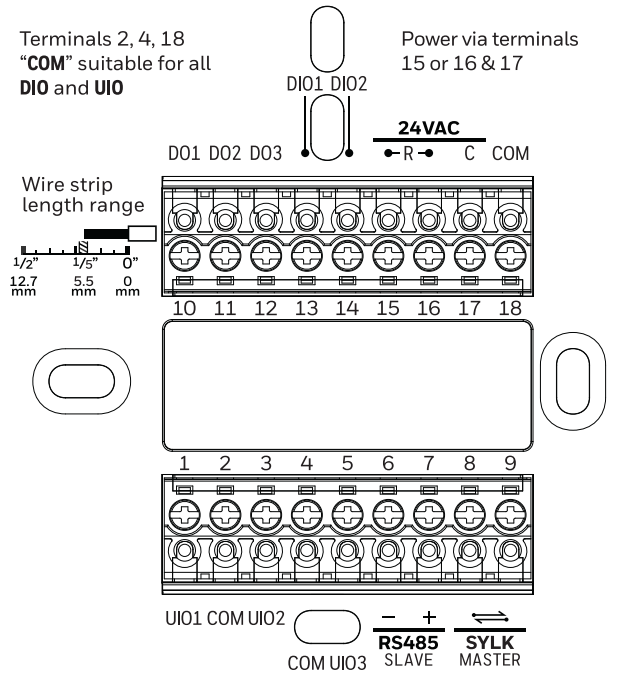
Fig. 1. Terminals of TC300 Thermostat

TERMINAL IDENTIFICATION

TERMINAL NAME	TERMINAL LABEL	DESCRIPTION
UIO1	UIO1	Universal input/output
COM	COM	Common
UIO2	UIO2	Universal input/output
COM	COM	Common
UIO3	UIO3	Universal input/output
RS485 SLAVE	–	BACnet/Modbus Communications
RS485 SLAVE	+	BACnet/Modbus Communications
SYLK MASTER	⇄	Sylk bus
SYLK MASTER	⇄	Sylk bus
DO1	DO1	Configurable relay output
DO2	DO2	Configurable relay output

TERMINAL IDENTIFICATION

TERMINAL NAME	TERMINAL LABEL	DESCRIPTION
DO3	DO3	Configurable relay output
DIO1	DIO1	Configurable relay output, configurable analog/relay input
DIO2	DIO2	Configurable relay output, configurable analog/relay input
24VAC POWER	R	24VAC power from Class2 transformer
24VAC POWER	C	24VAC common (Neutral) from Class2 transformer
COM	COM	Common

NOTE: Other terminals except R and C can be wired by 14–26AWG, Cu (type).

TERMINAL	WIRE GUAGE	NORMAL LOAD	WIRE TYPE
R,C	14–18AWG	0-4A, 0-96VA	Cu
	20–22AWG	0-3A, 0-72VA	
	24–26AWG	0-2A, 0-48VA	

PART NUMBER	COM PROTOCOL	POWER
TC300B-G	RS485 BACnet MS/TP and Modbus	24VAC

NOTE: These accessories are available by separate order.

ACCESSORIES

TRTC-DECOPLATE-1	TC300 decorative wall plate

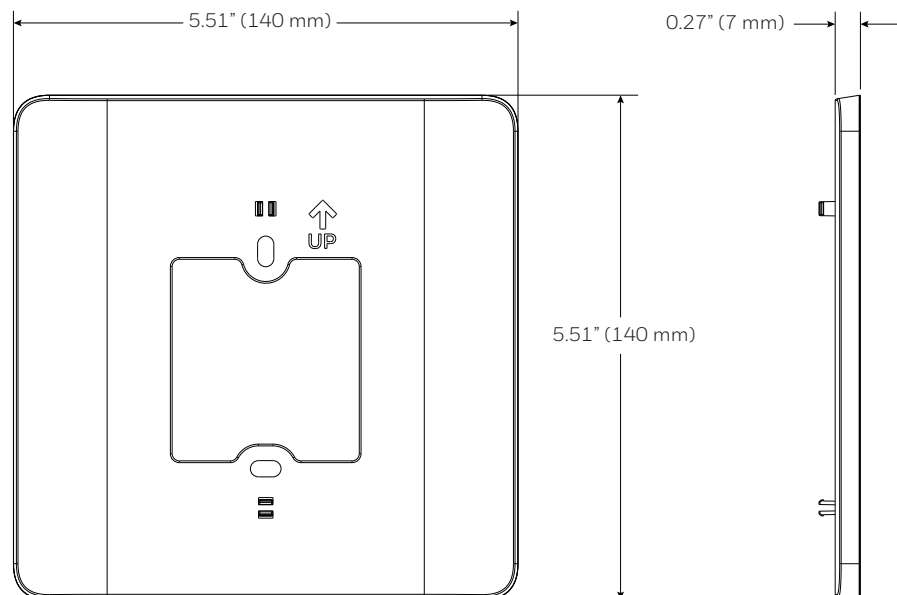| TYPE	TERMINAL	LABEL	TERMINAL ASSIGNMENTS		
			DEFAULT	INPUTS	OUTPUTS
Digital Output	DO1	DO1	On/Off Heat	NA	Heating On/Off, Heating Floating Open, Cooling Floating Open, Valve On/Off, Valve Floating Open, Changeover Valve, Fan Command, High Speed Fan, Medium Speed Fan, Low Speed Fan, Auxiliary Heat, Heat Stage1, Valve Stage1
	DO2	DO2	On/Off Cool	NA	Heating Floating Close, Cooling Floating Close, Cooling On/Off, Valve Floating Close, Changeover Valve, Fan Command, High Speed Fan, Medium Speed Fan, Low Speed Fan, Auxiliary Heat, Cool Stage1
	DO3	DO3	NA	NA	Cooling Floating Open, Changeover Valve, Fan Command, High Speed Fan, Medium Speed Fan, Low Speed Fan, Auxiliary Heat, Heat Stage1, Cool Stage1
	DIO1	DIO1	NA	Discharge Air Sensor, Drain Pan Sensor, Occupancy Sensor, Proof of Airflow, Pipe Sensor, Space Temp Sensor, Changeover Switch	Cooling Floating Close, Changeover Valve, Fan Command, High Speed Fan, Medium Speed Fan, Low Speed Fan, Auxiliary Heat
	DIO2	DIO2	NA	Discharge Air Sensor, Drain Pan Sensor, Occupancy Sensor, Proof of Airflow, Pipe Sensor, Space Temp Sensor, Changeover Switch	Changeover Valve, Fan Command, High Speed Fan, Medium Speed Fan, Low Speed Fan, Auxiliary Heat

TYPE	TERMINAL	LABEL	TERMINAL ASSIGNMENTS		
			DEFAULT	INPUTS	OUTPUTS
Universal Input/ Output	UIO1	UIO1	NA	Discharge Air Sensor, Drain Pan Sensor, Occupancy Sensor, Proof of Airflow, Pipe Sensor, Space Temp Sensor, Changeover Switch	6-Way Valve, Modulating Cool , Modulating Heat ,Modulating Valve, UIO2 UIO2 NA Variable Speed Fan
	UIO2	UIO2	NA		
	UIO3	UIO3	NA		

DIMENSIONS

THERMOSTAT

3.93" (100mm)

4.47" (113.6 mm)

1.02" (26mm)

0.76" (19.4mm)

TRTC-DECOPLATE-1

5.51" (140 mm)

0.27" (7 mm)

5.51" (140 mm)

UP
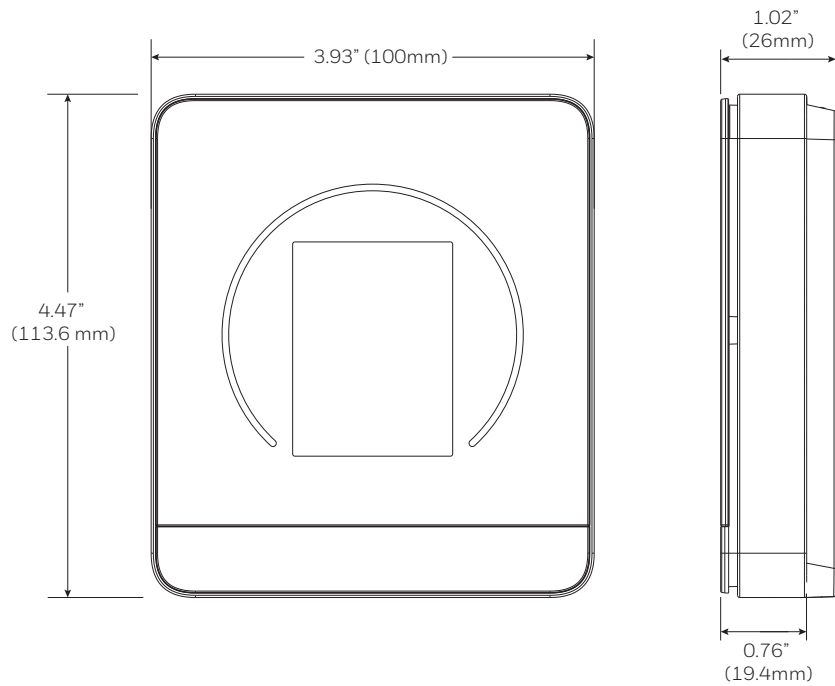
GENERAL SAFETY INFORMATION

- When performing any work (installation, mounting, start-up), all manufacturer instructions and in particular the Mounting and Installation Instructions guide (31-00642) and the user guide (31-00644) are to be observed.
- TC300 Thermostat may be installed and mounted only by authorized and trained personnel.
- Rules regarding electrostatic discharge should be followed.
- If TC300 Thermostat is modified in any way, except by the manufacturer, all warranties concerning operation and safety are invalidated.
- Make sure that the local standards and regulations are observed at all times.
- Use only accessory equipment which comes from or has been approved by Honeywell.
- It is recommended that out-of-the-box devices be kept at room temperature for at least 24 hours before applying power. This is to allow any condensation resulting from low shipping/storage temperatures to evaporate.
- Investigated according to United States Standard UL-60730-1, and UL60730-2-9.
- Investigated according to Canadian National Standard(s) C22.2, No. 205-M1983 (CNL-listed).
- Do not open TC300 Thermostat, as it contains no user-serviceable parts inside!
- CE declarations according to EMC Directive 2014/30/EU.
- UK declarations according to Electromagnetic Compatibility Regulations 2016.
- Product standards are EN 60730-1 and EN 60730-2-9.
- TC300 Thermostat is Class B digital apparatus and complies with Canadian ICES-003.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- Caution: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- Prudence: Les changements ou modifications apportés à cet appareil non expressément approuvés par la partie responsable de la conformité pourraient annuler le droit de l'utilisateur à utiliser l'équipement.
- This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
  — Reorient or relocate the receiving antenna.
  — Increase the separation between the equipment and receiver.
  — Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  — Consult the dealer or an experienced radio/TV technician for help.
- Limited by local law regulations, version for North America does not have region selection option.

SAFETY INFORMATION AS PER EN60730-1

TC300 Thermostat is intended for residential and commercial environments.

TC300 Thermostat is an independently mounted electronic control system with fixed wiring.

TC300 Thermostat is used for the purpose of building HVAC control and is suitable for use only in non-safety controls for installation on or in appliances.

Note
All images used in this document are for illustrative purposes only and may not match the actual product.

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