

# TC400A Series Commercial Thermostat

## CONNECTED DEVICE FOR COMMERCIAL BUILDINGS

### PRODUCT DATA

#### Disclaimer

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



## APPLICATION

TC400A Series Thermostat is an advanced, configurable, connected device for commercial buildings. It controls and monitors RTU, AHU, Heat Pump equipment, and their configurations. This device communicates over Wi-Fi, Bluetooth, BACnet IP, Sylk, easily integrates with the building automation system.

The built-in intelligent control algorithms of the device help to achieve the perfect balance between Energy Efficiency and Comfort. The device is packaged with numerous presets suitable for most commercial building requirements that enable the easy and quick initial setup.

The firmware of the device can be upgraded via Wi-Fi network. The device has four universal terminals and a pair of Sylk terminals to connect with sensors or other accessories. It also has a built-in temperature sensor, humidity sensor.

## FEATURES

- The device can be easily commissioned through the Connect mobile app.
- Easily customizable and intuitive UI.
- Supports BACnet system schedule and holiday configuration.
- Multiple, configurable, levels of user privilege access for features such as Reminders, Occupancy set points, Date/Time, Schedules, Calendars of special events, remote and local Manual Override, remote and local Occupancy Override, Choice of language and units, and screen lockouts to prevent unauthorized settings changes.
- High level control algorithms such as Auto Changeover, Adaptive Intelligent Recovery, Pre-occupancy Purge, Power up disable time, Freeze protection, and Demand limit controls are supported.
- Settings to switch Fahrenheit to Celsius and vice-versa.
- All set points are limited automatically between 40°F to 120°F.
- Real-Time Clock time keeping accuracy with 72 hour retention during power loss.

## Equipment Control Features

- 2H/2C Heat Pump, 2H/2C Conventional and modulating heat system
- Constant speed Fan, 2-speed Fan, and Variable Speed Fan
- Packaged Economizer Coordination Output
- Multiple Dehumidification and Humidification options
- Service mode to manually command the outputs to test the operation of the mechanical equipment
- Auto mode to switch between heating and cooling according to the current space temperature
- Staging control, PID Tuning, CPH, OAT Lockout, DAT Lockout, Modulating control
- Demand Limit Control to save energy
- System Switch Options
- Smoke Monitor

## TECHNICAL SPECIFICATIONS

### Power Characteristics

Table 1. 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 BOs OFF, No Sylk sensor)
Max. Load	96VA (all BOs ON)

### Display

Table 2. Display

Display Type	24 BPP TFT display with CTP
Resolutions	320x480 pixel
Active Display Area	4" diagonally
Backlight	LCD (Dimmable)

### IO Characteristics

Table 3. IO Characteristics

UIO x 2	<ul style="list-style-type: none"> <li>• Resistive Input           <ul style="list-style-type: none"> <li>— For 10K NTC type II, C7021 series</li> <li>— For 10K NTC type III, C7023 series</li> <li>— For 20K NTC, TR21 and C7041 series.</li> </ul> </li> <li>• <math>\pm 0.5^{\circ}\text{C}</math> (<math>\pm 1^{\circ}\text{F}</math>) at 10 – 32°C (50 – 90°F)</li> <li>• <math>\pm 1.1^{\circ}\text{C}</math> (<math>\pm 2^{\circ}\text{F}</math>) at -1.1 – 50°C (30 – 122°F)</li> <li>• Voltage Input, SELV           <ul style="list-style-type: none"> <li>— 0-10V, <math>\pm 5\%</math> of full scale</li> </ul> </li> <li>• Digital Input           <ul style="list-style-type: none"> <li>— Dry contact closure</li> <li>— Open circuit (<math>\geq 100\text{Kohms}</math>)</li> <li>— Closed circuit (<math>\leq 100\text{ohms}</math>)</li> </ul> </li> <li>• Voltage Output           <ul style="list-style-type: none"> <li>— 0-10V, <math>\pm 3\%</math> of full scale @2K ohms</li> </ul> </li> </ul>
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Table 3. IO Characteristics (Continued)

DO (G, Y1,Y2,W1,W2)	<ul style="list-style-type: none"> <li>• Relay Output           <ul style="list-style-type: none"> <li>— 1 Amps Max. at 24VAC</li> </ul> </li> </ul>
DO (AUX)	<ul style="list-style-type: none"> <li>• Relay Dry Contact           <ul style="list-style-type: none"> <li>— 1 Amps Max. at 24VAC/DC</li> </ul> </li> </ul>

### Operating Environment

Table 4. 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

## Compliances

Table 5. Compliances

Certificates	CE, FCC, ICES, UL/cUL, RoHs, REACH, Title 24, BTL, ASHRAE, LEED, and Prop65.
Standards	EN 60730-1, EN 60730-2-9, EN 301489-1, EN 301489-17, EN 300328, EN 301893, EN 62479, UL60730-1, UL60730-2-9, Title 47 part 15 subpart B, Title 47 part 15 subpart C, RSS 210, ICES-003

## Communication Baud Rates

BACnet IP	Over Wi-Fi
Wi-Fi	802.11 b/g/n
Bluetooth	BLE 4.2 with 1 Mbps Classic Bluetooth with max. 3 Mbps

## Electrical Characteristics

Table 6. Electrical Characteristics

Rated Impulse Voltage	500 V
Construction of Control	Independently Mounted Control
Operation Method	Type 1 Action
Pollution Degree	2
Purpose of Control	Operating Control

## Supported Sensors and Devices

- Indoor/Outdoor Air Temp Sensor
- Discharge sensor/Supply air sensor
- CO2 sensor
- Mixed air sensor
- Occupancy sensor
- Dirty filter
- Proof of airflow
- Proof of waterflow
- Sylk Sensor Bus devices (TR40 series and C7400S)
- Up to four TR40 series room sensors
- Up to four C7400S duct sensors

## Terminal Identification

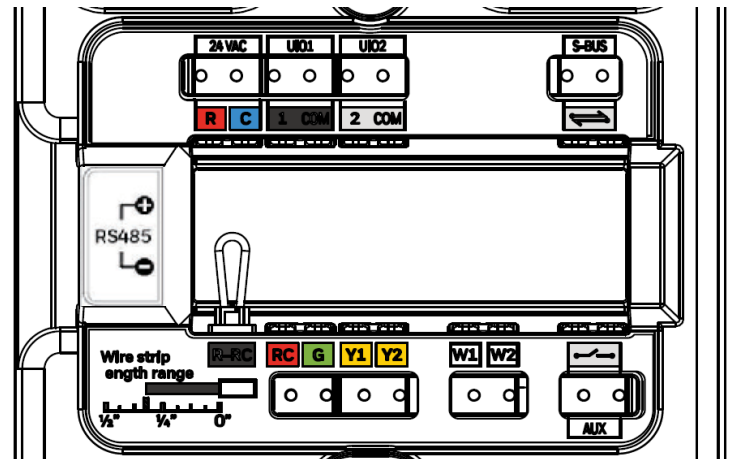




Fig. 1. Terminals

Table 7. Terminal identification

Terminal	Label	Connection
24VAC	R	24VAC power from heating transformer
	C	24VAC common (Neutral). For 2 transformer systems, use common wire from cooling transformer
UIO1	1	Universal input/output
	COM	Common
UIO2	2	Universal input/output
	COM	Common
Sylk	↔	Sylk bus, master, power output
	↔	Sylk bus, master, power output
RS485	+	BACnet Communications
	-	BACnet Communications
	R-RC	Jumper between R and RC for single transformer system

Table 7. Terminal identification

Terminal	Label	Connection
24VAC	RC	24VAC power from cooling transformer
	G	Fan
	Y1	Relay output, Compressor contactor (stage1)
	Y2	Relay output, Compressor contactor (stage2)
	W1	Relay output, Heat (stage1)
	W2	Relay output, Heat (stage2)
Aux		Relay dry contact, Aux-1
		Relay dry contact, Aux-2

## Thermostat Ordering Part Numbers

Table 8. Thermostat Part Numbers

TC400A-NK	Thermostat with North American Wi-Fi conformance
TC400A-WK	Thermostat with outside of North American Wi-Fi conformance

## Terminal Assignments

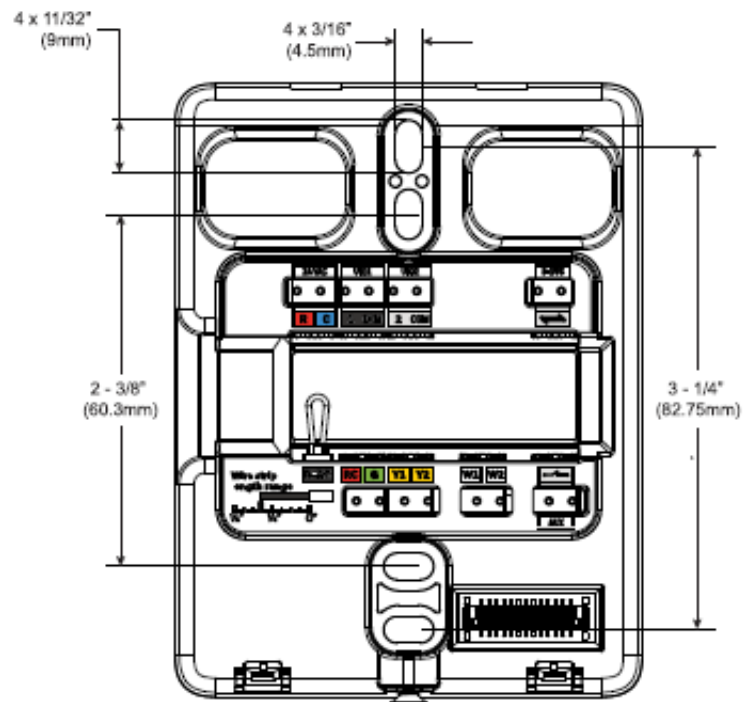
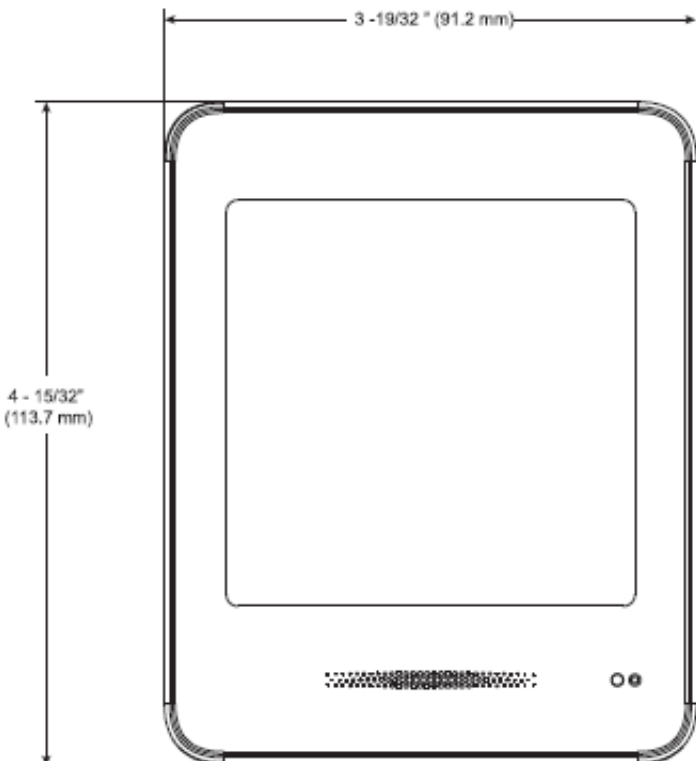
Table 9. Terminal Assignments

Type	Terminal	Label	Terminal Assignments (Default & Optional Assignments)		
			DEFAULT	INPUTS	OUTPUTS
Digital Outputs	DO1	G	Supply Fan		High Speed Fan
	DO2	W1	Heat Stage 1		
	DO3	W2	Heat Stage 2		
	DO4	Y1	Cool Stage 1		
	DO5	Y2	Cool Stage 2		
	DO6 (Dry Contact, 2 terminals)	Aux			

Table 9. Terminal Assignments

Type	Terminal	Label	Terminal Assignments (Default & Optional Assignments)		
			DEFAULT	INPUTS	OUTPUTS
Universal Inputs/Outputs	UIO1 (2 terminals)	UIO1	NA	Occupancy Sensor, Dirty Filter, Proof of Airflow, Shutdown, Mixed Air Sensor, Outdoor Air Sensor, Discharge Air Sensor, CO2 Sensor, Proof of Waterflow, and Space Temp Sensor.	Multi-Speed Fan (UIO1)
	UIO2 (2 terminals)	UIO2	NA		Modulating Heat (UIO2)
Power	R	R		24v Power	
	C	C		Common	
	RC	RC		24v Power / Cooling	
Sylk Bus	1	S-Bus		Sylk connection	
	2				
BACnet MS/TP	1	MS/TP		BACnet MS/TP	
	2				

DIMENSIONS



## GENERAL SAFETY INFORMATION

- When performing any work (installation, mounting, start-up), all manufacturer instructions and in particular the Installation and Commissioning Instructions (MU1B-0208IE10) are to be observed.
- TC400A Series Thermostat may be installed and mounted only by authorized and trained personnel.
- Rules regarding electrostatic discharge should be followed.
- If TC400A Series 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 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 TC400A Series Thermostat, as it contains no user-serviceable parts inside!
- CE declarations according to LVD Directive 2014/35/EU and EMC Directive 2014/30/EU.
- Product standards are EN 60730-1 and EN 60730-2-9.
- TC400A Series 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.
- This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
  1. This device may not cause interference.
  2. This device must accept any interference, including interference that may cause undesired operation of the device.
- L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada

applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. L'appareil ne doit pas produire de brouillage;
  2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
- 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.
  - To satisfy FCC&IC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended.
  - Les antennes installées doivent être situées de façon à ce que la population ne puisse y être exposée à une distance de moins de 20 cm. Installer les antennes de façon à ce que le personnel ne puisse approcher à 20 cm ou moins de la position centrale de l'antenne. Region Selection (for Wi-Fi 2.4G device)
  - Limited by local law regulations, version for North America does not have region selection option.

### Safety Information as per EN60730-1

TC400A Series Thermostat is intended for residential, commercial environments.

TC400A Series Thermostat is an independently mounted electronic control system with fixed wiring.

TC400A Series 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.

Honeywell Building Solutions

Honeywell

715 Peachtree Street NE

Atlanta, GA 30308

customer.honeywell.com

buildingcontrols.honeywell.com

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