neptronic®

Universal Wall-Mount Controller
Specification and Installation Instructions

(❄) (🔥) (💧💧) (((•))) (🌀) (AO2) (BO6) (BI2) (AI2)

Model
TUCB24C6X2
with Internal Temperature Sensor
TUHB24C6X2
with Internal Temperature and Humidity Sensor

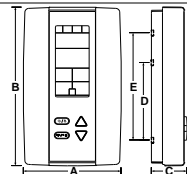**TUCB24C6X2 / TUHB24C6X2**

Description
The TUCB24C6X2 / TUHB24C6X2 is a Universal Wall-Mount Controller with built-in temperature sensor and scheduler. The unit is designed for simple and accurate control of a heat pump or other heating/cooling equipment. Its field configurable algorithms enable versatile implementation of required control sequences.

The TUCB24C6X2 / TUHB24C6X2 also provides an external humidity sensor input for simple and accurate humidity control and provides a dehumidification sequence compensated by auto activation of reheat output.

Features
- Heat pump, humidity control or general unit controller
- Fan control: 1, 2 or 3-speed (auto/on), or analog (ECM)
- External humidity sensor input for simple and accurate humidity control. Built-in humidity sensor available only with TUHB24C6X2 models
- Dehumidification sequence (compensated by auto activation of reheat output)
- Precise temperature control with configurable PI (Proportional-Integral) function
- Selectable internal or external temperature sensor (10KΩ, or 0-10Vdc for external temperature)
- Freeze protection
- Compressor anti-cycling delay (configurable)
- Low limit set protection (10°C/50°F)
- Occupancy and Night Set Back (NSB) mode
- Select direction on analog outputs
- Select controller's default display
- Multi level lockable access menu and setpoint
- Selectable Fahrenheit or Celsius scale

Network Communication
- BACnet® MS/TP or Modbus communication port (selectable via configuration menu)
- Select MAC address via menu or via network
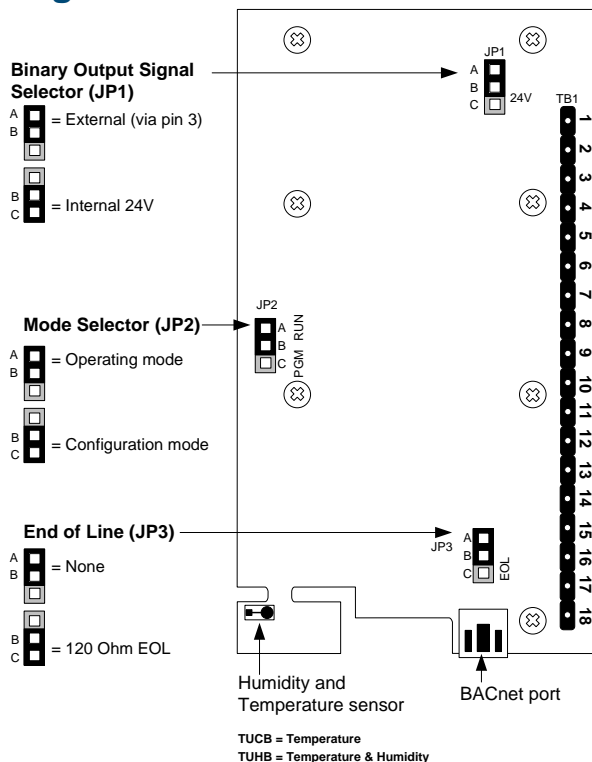- Automatic baud rate detection

BACnet MS/TP®
- Automatic device instance configuration
- Copy & broadcast configuration via menu or via BACnet to other controllers
- BACnet scheduler (up to 6 events per day)
- Firmware upgradeable via BACnet
- Supports COV (change of value)

Modbus
- Modbus @ 9600, 19200, 38400 or 57600 bps
- RTU Slave, 8 bits (configurable parity and stop bits)
- Connects to any Modbus master

Technical Specifications

Description	TUCB24C6X2/TUHB24C6X2
Inputs	2 Binary Inputs 2 Analog Inputs (0 to 10Vdc, sensor 10KΩ, dry contact)
Outputs	6 dry contacts 24Vac, 1A max 3A in-rush 2 Analog Outputs (0-10Vdc, adjustable)
Power supply	22 to 26 Vac 50/60Hz
Power consumption	1 VA max
Setpoint range	10ºC to 40ºC [50ºF to 104ºF], Humidity 10% to 90% RH
Control accuracy	Temperature: +/-0.4ºC [0.8ºF], Humidity: ±3.5%
Proportional band	0.5ºC to 5ºC [1ºF to 9ºF] adjustable (heat/cool/reheat independent)
Dead band	0.0ºC to 5ºC [0.0ºF to 9ºF] adjustable (heat/cool/reheat independent)
Electrical connection	0.8 mm² [18 AWG] minimum
Operating temperature	0ºC to 50ºC [32ºF to 122ºF]
Storage temperature	-30ºC to 50ºC [-22ºF to 122ºF]
Relative Humidity	5 to 95% non condensing
Degree of protection of housing	IP 30 (EN 60529)
Weight	160 g. [0.36 lb]
Dimensions: A = 2.85" | 73mm B = 4.85" | 123mm C = 1.00" | 24mm D = 2.36" | 60mm E = 3.27" | 83mm	

Wiring

Binary Output Signal Selector (JP1)

A B = External (via pin 3)

B C = Internal 24V

Mode Selector (JP2)

A B = Operating mode

B C = Configuration mode

End of Line (JP3)

A B = None

B C = 120 Ohm EOL

Humidity and Temperature sensor

BACnet port

TUCB = Temperature
TUHB = Temperature & Humidity

We strongly recommend that all Neptronic products be wired to a separate grounded transformer and that transformer shall service only Neptronic products. This precaution will prevent interference with, and/or possible damage to incompatible equipment.

Terminal Description

Terminals		Option Heat Pump			Analog Option			
		1-Speed Fan	2-Speed Fan	3-Speed Fan	Fan analog	1-Speed Fan	2-Speed Fan	3-Speed Fan
TB1 1	COM (PWR)	Common (power input)			Common (power input)			
2	24 Vac (PWR)	24 Vac (power input)			24 Vac (power input)			
3	COM (Relay)	External signal for BO (24Vac or common) see JP1			External signal for BO (24Vac or common) see JP1			
4	BO1	Reversing Valve			select any ramp*			
5	BO2	Compressor Y1			select any ramp*			
6	BO3	Heat W1			select any ramp*			
7	BO4	Compressor Y2	Compressor Y2	Fan (speed 3)	select any ramp*			Fan (speed 3)
8	BO5	Heat W2	Fan (speed 2)	Fan (speed 2)	select any ramp*		Fan (speed 2)	Fan (speed 2)
9	BO6	Fan (speed 1)	Fan (speed 1)	Fan (speed 1)	select any ramp*	Fan (speed 1)	Fan (speed 1)	Fan (speed 1)
10	BI1	Binary Input selection: • Off, Override, Flow Switch, Local/Remote Selector Switch, Overheat, Dirty Filter, Window & Door Contacts, Occupancy & NSB Sensor, Changeover Input			Binary Input selection: • Off, Override, Flow Switch, Local/Remote Selector Switch, Overheat, Dirty Filter, Window & Door Contacts, Occupancy & NSB Sensor, Changeover Input			
11	BI2							
12	COM	Common			Common			
13	AI1	Analog Input selection: • 0-10 Vdc (External sensor, humidity, CO$_2$) • 10K Ohm (External sensor, changeover) • Dry Contact (All logic mentioned under BI)			Analog Input selection: • 0-10 Vdc (External sensor, humidity, CO$_2$) • 10K Ohm (External sensor, changeover) • Dry Contact (All logic mentioned under BI)			
14	AI2							
15	AO1	select any ramp*			select any ramp*			
16	AO2	select any ramp*			Fan Speed option • Modulating 0-10Vdc for ECM Motors • Steps of 3,6,9V for 3 Speed	select any ramp*		
17	A+	BACnet communication port (A+)			BACnet communication port (A+)			
18	B-	BACnet communication port (B-)			BACnet communication port (B-)			

* = select from any of the following ramps:

- Cooling 1 w/ fan
- Cooling 2 w/ fan
- Heating 1 w/ fan
- Heating 2 w/ fan
- Heating 2 without fan
- Cool/Heat 1 w/ fan
- COR (changeover) w/ fan
- Humidify w/ fan
- CO$_2$ Alarm
- Off

Interface

Icon	Description	Icon	Description	Icon	Description
	Cooling ON A: Automatic	((•))	Communication Status	⚠	Alarm status
	Heating ON A: Automatic	🔒	Menu set-up Lock	🌙	Energy saving mode
	Fan ON A: Automatic	🔧	Programming mode (Technician setting)	%RH	Percentage of humidity
	Humidity ON 33, 66 or 100% output		Dehumidification ON 33, 66 or 100% output	°C or °F	°C: Celsius scale °F: Fahrenheit scale

Mounting Instructions

⚠ **CAUTION: Remove power to avoid a risk of malfunction.**

A. Remove the captive screw that's holding the base and the front cover of the unit together.
B. Lift the front cover of the unit to separate it from the base.
C. Pull all wires through the holes in the base.
D. Secure the base to the wall using wall anchors and screws (supplied). Make the appropriate connections.
E. Mount the control module on the base and secure using the screw.
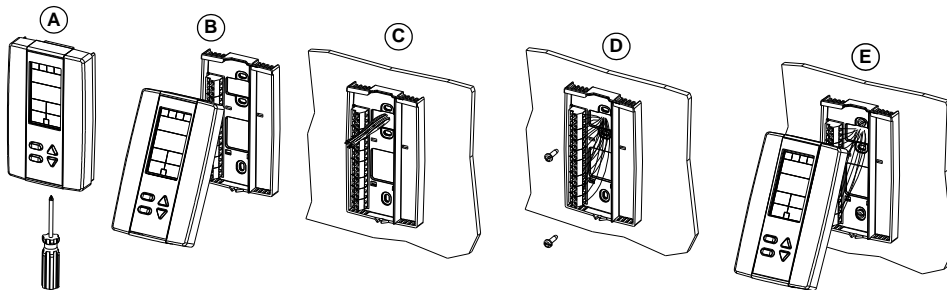
Programming Mode

The Mode Selector jumper JP2 must be set to the PGM position (Programming Mode). Refer to Wiring on page 2. To exit, set the jumper back to the RUN position (Operation Mode). Changes are saved as soon as they are made.

Icon indicates in "Programming Mode"
Setting description (e.g "INTERN TEMP SENSOR OFFSET")
Setting value
Advance to next setting
Change value
Return to previous setting
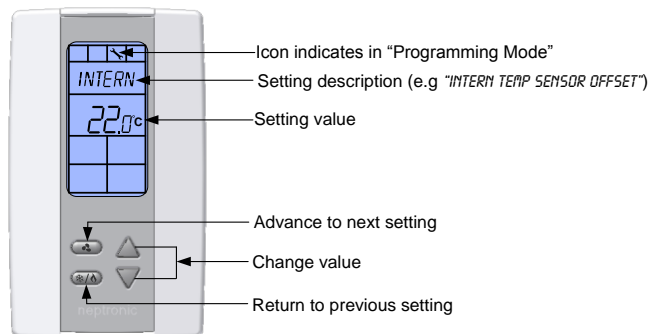
Symbols used in this Manual

Icon	Description	Icon	Description	Icon	Description	Icon	Description
	Temperature		Heating		Cooling		Humidity
	Fan	AO1	Analog Output 1	AO2	Analog Output 2		Time
BO1	Binary Output 1	BO2	Binary Output 2	BO3	Binary Output 3	BO4	Binary Output 4
BO5	Binary Output 5	BO6	Binary Output 6	AI1	Analog Input 1	AI2	Analog Input 2
BI1	Binary Input 1	BI2	Binary Input 2	NSB	Night Set Back	OCC	Occupancy
	Communication		Valve				

Setpoint and User Control

1. "INTERN TEMP SENSOR OFFSET"

Range:	0ºC to 50ºC	[32ºF to 122ºF]
Offset:	Max. ± 5ºC	[± 9ºF]
Increment:	0.1ºC	[0.2ºF]

Compare the displayed temperature reading with a known value from a thermometer or other temperature sensing device. To offset or calibrate the sensor, use the arrow buttons to set the desired temperature reading. This is useful for controllers installed in areas where the temperature read is slightly different than the room's actual temperature. For example, a controller placed right under the air diffuser.

2. "MINIMUM USER SETPNT"

Default:	15ºC	[59ºF]
Range:	10ºC to 40ºC	[50ºF to 104ºF]
Increment:	0.5ºC	[1.0ºF]

In Operation mode, you cannot decrease the setpoint to less than the value set as the minimum user point. The minimum value is restricted by the maximum value set at Step 3 "Maximum User Setpnt". In other words, the value that is set as the minimum cannot be greater than the maximum value.

3. "MAXIMUM USER SETPNT"

Default:	30ºC	[86ºF]
Range:	10ºC to 40ºC	[50 to 104ºF]
Increment:	0.5ºC	[1.0ºF]

In Operation mode, you cannot increase the setpoint to more than the value set as the maximum user point. The maximum value is restricted by the minimum value set at Step 2 "Minimum User Setpnt". In other words, the value that is set as the maximum cannot be less than the minimum value.

4. "USER SETPNT LOCKED"

Default:	No (Unlocked)
Range:	No (Unlocked), yES (Locked)

If set to **No**, the user setpoint option is not locked and the user can adjust the desired temperature setpoint. If set to **yES**, the user setpoint option is locked and the user cannot set the desired temperature setpoint. A lock symbol 🔒 appears to indicate that the setpoint is locked.

5. "USER SETPNT"

Default:	22ºC	[72ºF]
Range:	10ºC to 40ºC	[50ºF to 104ºF]
Increment:	0.5ºC	[1.0ºF]

Set the desired temperature setpoint within the defined range. If the setpoint option was locked at Step 4 "User Setpnt locked", a lock symbol 🔒 is displayed. The setpoint value is restricted by the minimum at Step 2 "Minimum User Setpnt" and maximum at Step 3 "Maximum User Setpnt" values. In other words, the setpoint should be within the minimum and maximum setpoint range.

6. "TEMP CONTROL MODE"

Default:	Auto (Automatic)
Range:	Auto (Automatic), HEAt (Heating Only), COOL (Cooling Only), On (Cooling or Heating), CLHt (Automatic only)

Select the control mode that you want to authorize to the user. To authorize all the available modes, select Auto (Automatic Mode). The cooling ❄ and heating ♨ symbols are also displayed. The selection made at this step determines the options available via the Control Mode (see page 27).

7. "ENABLE ON OFF CONTROL MODE"

Default:	yES (Enable)
Range:	yES (Enable), No (Disable)

If set to **yES**, the user can set the unit to "Off" via the Control Mode (see page 27). If set to **No**, the "Off" selection does not appear in the Control Mode.

8. "DISPLAY INFO"

Default: t - Hu %RH °C (temperature, humidity, and cooling heating demand)
Range: t - Hu %RH °C (temperature, humidity), StP %RH °C (temperature, humidity setpoint), OFF (no display),
t - Hu %RH °C (temperature, humidity, and cooling heating demand),
StP %RH °C (temperature, humidity setpoint, and cooling heating demand)

Select the desired information to appear on the display.

Heat Pump Settings

9. "HEAT PUMP OPTION"

Default: OFF (Disable)
Range: ON (Enable), OFF (Disable)

Enable or disable the heat pump option.
If you select **OFF**:

- *Heat Pump options (Steps 10 to 12 and 28) will not be available.*
- *Binary Output ramps (Steps 29, 34, 39, 44, 49 and 54) will be available.*

If you select **ON**:

- *Heat Pump options (Steps 10 to 12 and 28) will be available.*
- *Binary Output ramps (Steps 29, 34, 39, 44, 49 and 54) will not be available.*

10. "REVERS VALVE O/B"

Default: o
Range: o, b

This option appears only if you have selected **ON** at Step 9, "Heat Pump Option". Set the mode in which the reversing valve is energized; cooling mode (o) or heating mode (b). The cooling ❄ symbol is displayed if you select **o** and heating ◊ symbol is displayed if you select **b**.

11. "EMH OUTPUT"

Default: dIS (Disable)
Range: dIS (Disable), ENA (Enable)

This option appears only if you have selected **ON** at Step 9, "Heat Pump Option". Select **ENA** to enable emergency heat (EMH) outputs W1 and W2, and the EMH option via the Control Mode (see page 27). Select **dIS** to disable EMH availability. The heating ◊ symbol is also displayed.

If you select **dIS**, Step 12 "EMH Auto Mode" will not be available.

If you select **ENA**, Step 12 "EMH Auto Mode" will be available.

12. "EMH AUTO MODE"

Default: NO (Disable)
Range: YES (Enable), NO (Disable)

This option appears only if you have selected **ENA** at Step 11, "EMH Output". If you select **YES**, the emergency heat (EMH) will be operational in Automatic mode. If you select **NO**, the EMH will not be operational in Automatic mode. The heating ◊ symbol is also displayed.

Valve Settings

13. "VALVE SIZE"

Default: 1"
Range: 1/2", 3/4", 1"

Select the desired valve size in inches for the 6-way valve from the available options.

Analog Output 1 (AO1)

14. "AO1 RAMP"

Default: Cr1 (Cooling Ramp 1)
Range: Cr1, Cr2, Hr1, Hr2 (heat with fan), Hr2 (heat without fan), CH1, HU, CO2, 6W, OFF, COr

Select the desired signal from the available options.

- *Cr1 (Cooling Ramp 1) or Cr2 (Cooling Ramp 2). The Cr1 and Cr2 ramps are used for cooling. If selected, the controller performs cooling based on the cooling proportional, integral, and dead band values.*

- *Hr1, Hr2 (heat with fan), or Hr2 (heat without fan). The Hr1 and Hr2 ramps are used for heating. If selected, the controller performs heating based on the heating proportional, integral, and dead band values.*

- *CH1 (Cooling and Heating). If selected, the controller performs cooling regularly. If another output is set to heat, it performs heating regularly.*

- *HU (Humidify). If selected, the controller modulates the output based on the humidify demand.*

- *CO2 (Carbon dioxide). If selected, the controller will activate or deactivate the output based on carbon dioxide levels.*

- *6W (6-way Valve). If selected, the controller will modulate the 6-way valve depending on the heating or cooling demand.*

- *OFF. If selected, the controller does not use the output.*

- *COr (Changeover). If selected, the controller will modulate heating and cooling, as appropriate.*

If you select **OFF**, Steps 15 to 17 will not be available.

If you select **CH1**, Step 22 "Minimum Cool 1 Heat 1 Percent" will be available.

Cr1	Cr2	Hr1	Hr2 (with fan)	Hr2 (without fan)	CH1

HU	CO2	6W	OFF	COr
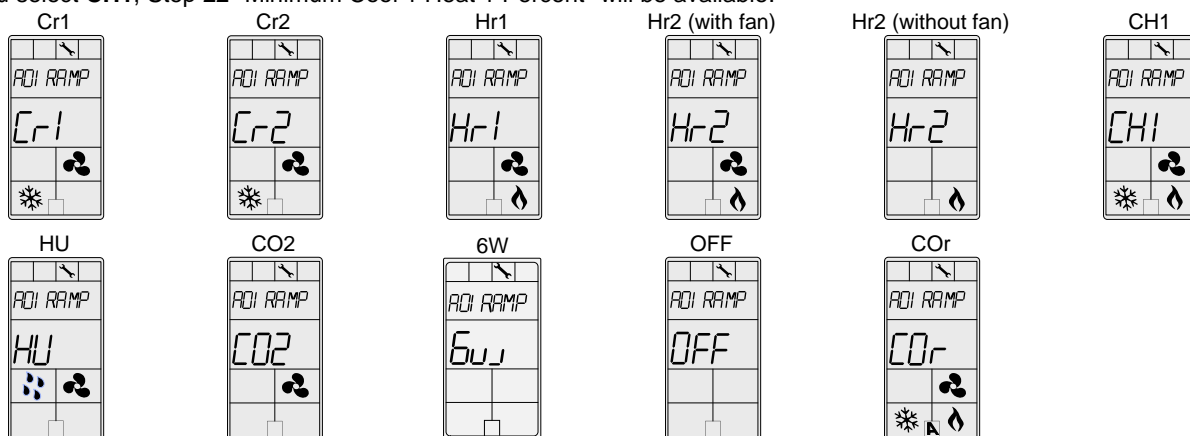
15. "AO1 MINIMUM VOLTAGE"

(AO1)
Default: 0.0 Volt
Range: 0.0 to 10.0 Volts
Increment: 0.1 Volt

This option does not appear if the signal ramp for AO1 is set to **OFF** (Step 14, "AO1 Ramp"). Select the desired minimum voltage ("zero" value) for the AO1 ramp. The minimum value is restricted by the maximum value at Step 16, "AO1 Maximum Voltage". In other words, the minimum value should be less than the maximum value.

16. "AO1 MAXIMUM VOLTAGE"

(AO1)
Default: 10.0 Volts
Range: 0.0 to 10.0 Volts
Increment: 0.1 Volt

This option does not appear if the signal ramp for AO1 is set to **OFF** (Step 14, "AO1 Ramp"). Select the desired maximum voltage ("span" value) for the AO1 ramp. The maximum value is restricted by the minimum value at Step 15, "AO1 Minimum Voltage". In other words, the maximum value should not be less than the minimum value.

17. "AO1 DIRREV"

(AO1)
Default: dir (Direct)
Range: dir (Direct), rEV (Reverse)

This option does not appear if the signal ramp for AO1 is set to **OFF** (Step 14, "AO1 Ramp"). Set the direction of the analog signal to either Direct (e.g. 0 to 10Vdc), or Reverse (e.g. 10 to 0Vdc).

Analog Output 2 (AO2)

18. "AO2 RAMP"

(AO2)
Default: Hr1 (Heating Ramp 1)
Range: Cr1, Cr2, Hr1, Hr2 (heat with fan), Hr2 (heat without fan), CH1, HU, CO2, 6W, FAN, OFF, COr

Select the desired signal from the available options. The AO1 input signal has priority over AO2.

- *Cr1 (Cooling Ramp 1) or Cr2 (Cooling Ramp 2). The Cr1 and Cr2 ramps are used for cooling. If selected, the controller performs cooling based on the cooling proportional, integral, and dead band values.*
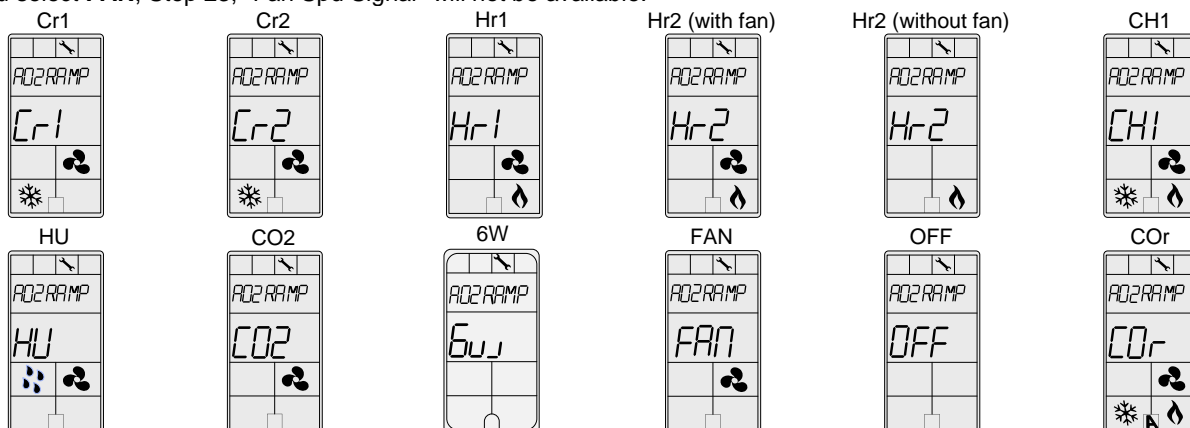
- *Hr1, Hr2 (heat with fan), or Hr2 (heat without fan). The Hr1 and Hr2 ramps are used for heating. If selected, the controller performs heating based on the heating proportional, integral, and dead band values.*

- *CH1 (Cooling and Heating). If selected, the controller performs cooling regularly. If another output is set to heat, it performs heating regularly.*

- *HU (Humidify). If selected, the controller modulates the output based on the humidify demand.*

- *CO2 (Carbon dioxide). If selected, the controller will activate or deactivate the output based on carbon dioxide levels.*

- *6W (6-way Valve). If selected, the controller will modulate the 6-way valve depending on the heating or cooling demand.*

- *FAN. The FAN option is available only if you selected **OFF** at Step 9 "Heat Pump Option". If selected, the controller modulates the output based on the Fan demand.*

- *OFF. If selected, the controller does not use the output.*

- *COr (Changeover). If selected, the controller will modulate heating and cooling, as appropriate.*

If you select **OFF**, Steps 0 to 21 will not be available.

If you select **CH1**, Step 22, "Minimum Cool 1 Heat 1 Percent" will be available.

If you select **FAN**, Step 23, "Fan Spd Signal" will not be available.

Cr1	Cr2	Hr1	Hr2 (with fan)	Hr2 (without fan)	CH1
AO2 RAMP Cr1	AO2 RAMP Cr2	AO2 RAMP Hr1	AO2 RAMP Hr2	AO2 RAMP Hr2	AO2 RAMP CH1

HU	CO2	6W	FAN	OFF	COr
AO2 RAMP HU	AO2 RAMP CO2	AO2 RAMP 6u	AO2 RAMP FAN	AO2 RAMP OFF	AO2 RAMP COr

19. "AO2 MINIMUM VOLTAGE"

(AO2)
Default: 0.0 Volt
Range: 0.0 to 10.0 Volts
Increment: 0.1 Volt

This option does not appear if the signal ramp for AO2 is set to **OFF** (Step 18, "AO2 Ramp"). Select the desired minimum voltage ("zero" value) for the AO2 ramp. The minimum value is restricted by the maximum value at Step 20, "AO2 Maximum Voltage". In other words, the minimum value should be less than the maximum value.

20. "AO2 MAXIMUM VOLTAGE"

(AO2)
Default: 10.0 Volts
Range: 0.0 to 10.0 Volts
Increment: 0.1 Volt

This option does not appear if the signal ramp for AO2 is set to **OFF** (Step 18, "AO2 Ramp"). Select the desired maximum voltage ("span" value) for the AO2 ramp. The maximum value is restricted by the minimum value at Step 19, "AO2 Minimum Voltage". In other words, the maximum value should not be less than the minimum value.

21. "AO2 DIRREV"

(AO2)
Default: dir (Direct)
Range: dir (Direct), rEV (Reverse)

This option does not appear if the signal ramp for AO2 is set to **OFF** (Step 18, "AO2 Ramp"). Set the direction of the analog signal to either Direct (e.g. 0 to 10Vdc), or Reverse (e.g. 10 to 0Vdc).

22. "MINIMUM COOL 1 HEAT 1 PERCENT"

(AO2)
Default: 0 %
Range: 0 to 100%
Increment: 5 %

This option appears if you have selected **CH1** at Step 14, "AO1 Ramp" or 18, "AO2 Ramp". Set the percentage at which the controller sets the CH1 output during heating, provided another output has also been set to heating.

Fan Settings

23. "FAN SPD SIGNAL"

Default: 3
Range: 1, 2, 3

This option does not appear if you have selected **FAN** at Step 18, "AO2 Ramp". Select the desired number of fan speed contacts. The fan ⚙ symbol is also displayed.

24. "FAN SPEED OPTION"

Default: Std (Standard)
Range: AdV (Advanced), Std (Standard)

This option is not applicable for TUCB24C6X2 and TUHB24C6X2 models.

25. "FAN AUTO MODE"

Default: yES (Enable)
Range: yES (Enable), No (Disable)

If set to **yES**, the user can set the fan speed to "Automatic" via the Fan Speed Selection Mode (see page 28). If set to **No**, the "**Automatic**" speed does not appear in the Fan Speed Selection Mode. The fan ⚙ symbol is also displayed.

If you select yES, Step 26 "Fan Auto Timeout Seconds" will be available.

If you select No, Step 26 "Fan Auto Timeout Seconds" will not be available.

26. "FAN AUTO TIMEOUT SECONDS"

Default: 120 seconds
Range: 0 to 255 seconds
Increment: 1 second

This option appears only if you have selected **yES** at Step 25, "Fan Auto Mode". Select the desired value for the automatic shutoff delay when there is no demand. The fan ⚙ symbol is also displayed.

27. "DAMPING FACTOR TIME IN SECONDS"

Default: 0 second
Range: 0 to 255 seconds
Increment: 1 second

Select the desired damping factor value for the fan. The fan ⚙ symbol is also displayed.

28. "Y2 OUTPUT"

Default: dIS (Disable)
Range: dIS (Disable), ENA (Enable)

This option appears if you have selected **ON** at Step 9, "Heat Pump Option" and fan speed of 1 or 2 at Step 23, "Fan Spd Signal". Select **ENA** to enable the compressor Y2 output and **dIS** to disable compressor Y2 output.

Binary Output 1 (BO1)
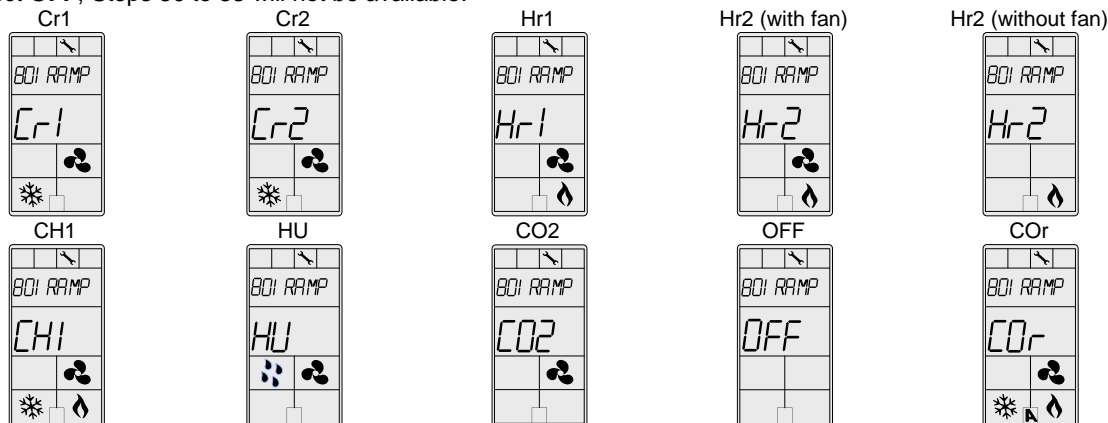
29. "BO1 RAMP"

Default: Cr1 (Cooling Ramp 1)
Range: Cr1, Cr2, Hr1, Hr2 (heat with fan), Hr2 (heat without fan), CH1, HU, CO2, OFF, COr

This option does not appear if you selected **ON** at Step 9, "Heat Pump Option". Select the desired ramp from the available options.

- Cr1 (Cooling Ramp 1) or Cr2 (Cooling Ramp 2). The Cr1 and Cr2 ramps are used for cooling. If selected, the controller performs cooling based on the cooling proportional, integral, and dead band values.
- Hr1, Hr2 (heat with fan), or Hr2 (heat without fan). The Hr1 and Hr2 ramps are used for heating. If selected, the controller performs heating based on the heating proportional, integral, and dead band values.
- CH1 (Cooling and Heating). If selected, the controller performs cooling regularly. If another output is set to heat, it performs heating regularly.
- HU (Humidify). If selected, the controller modulates the output based on the humidify demand.
- CO2 (Carbon dioxide). If selected, the controller will activate or deactivate the output based on carbon dioxide levels.
- OFF. If selected, the controller does not use the output.
- COr (Changeover). If selected, the controller will modulate heating and cooling, as appropriate.

If you select **OFF**, Steps 30 to 33 will not be available.

Cr1	Cr2	Hr1	Hr2 (with fan)	Hr2 (without fan)
BO1 RAMP	BO1 RAMP	BO1 RAMP	BO1 RAMP	BO1 RAMP
Cr1	Cr2	Hr1	Hr2	Hr2

CH1	HU	CO2	OFF	COr
BO1 RAMP	BO1 RAMP	BO1 RAMP	BO1 RAMP	BO1 RAMP
CH1	HU	CO2	OFF	COr

30. "BO1 CLOSE PERCENT"

BO1

Default:	20% of the demand
Range:	15 to 80%
Increment:	1%

This option does not appear if the signal ramp for BO1 is set to **OFF** (Step 29, "BO1 Ramp"). Select the percentage at which you want BO1 to close (at % of demand of the ramp selected at Step 29, "BO1 Ramp").

31. "BO1 OPEN PERCENT"

BO1

Default:	0% of the demand
Range:	0 to (BO1 Close)-4%
Increment:	1%

This option does not appear if the signal ramp for BO1 is set to **OFF** (Step 29, "BO1 Ramp"). Select the percentage at which you want BO1 to open (at % of demand of the ramp selected at Step 29, "BO1 Ramp").

32. "BO1 DIRREV"

BO1

Default:	dir (Direct)
Range:	dir (Direct), rEV (Reverse)

This option does not appear if the signal ramp for BO1 is set to **OFF** (Step 29, "BO1 Ramp"). Set the direction of the binary signal to either Direct or Reverse.

33. "BO1 CONTACT DELAY MINUTES"

BO1

Default:	0 minute
Range:	0 to 15 minutes
Increment:	1 minute

This option does not appear if the signal ramp for BO1 is set to **OFF** (Step 29, "BO1 Ramp"). Select the closing delay for BO1 output.

Binary Output 2 (BO2)

34. "BO2 RAMP"

BO2

Default:	Hr1 (Heating Ramp 1)
Range:	Cr1, Cr2, Hr1, Hr2 (heat with fan), Hr2 (heat without fan), CH1, HU, CO2, OFF, COr

Select the desired ramp from the available options. Same as BO1 options.

If you select **OFF**, Steps 35 to 38 will not be available.

35. "BO2 CLOSE PERCENT"

BO2

Default:	25% of the demand
Range:	15 to 80%
Increment:	1%

This option does not appear if the signal ramp for BO2 is set to **OFF** (Step 34, "BO2 Ramp"). Select the percentage at which you want BO2 to close (at % of demand of the ramp selected at Step 34, "BO2 Ramp").

36. "BO2 OPEN PERCENT"

BO2

Default: 0% of the demand
Range: 0 to (BO2 Close)-4%
Increment: 1%

This option does not appear if the signal ramp for BO2 is set to **OFF** (Step 34, "BO2 Ramp"). Select the percentage at which you want BO2 to open (at % of demand of the ramp selected at Step 34, "BO2 Ramp").

37. "BO2 DIRREV"

BO2

Default: dir (Direct)
Range: dir (Direct), rEV (Reverse)

This option does not appear if the signal ramp for BO2 is set to **OFF** (Step 34, "BO2 Ramp"). Set the direction of the binary signal to either Direct or Reverse.

38. "BO2 CONTACT DELAY MINUTES"

BO2

Default: 0 minute
Range: 0 to 15 minutes
Increment: 1 minute

This option does not appear if the signal ramp for BO2 is set to **OFF** (Step 34, "BO2 Ramp"). Select the closing delay for BO2 output.

Binary Output 3 (BO3)

39. "BO3 RAMP"

BO3

Default: Hr1 (Heating Ramp 1)
Range: Cr1, Cr2, Hr1, Hr2 (heat with fan), Hr2 (heat without fan), CH1, HU, CO2, OFF, COr

Select the desired ramp from the available options. Same as BO1 options.

If you select **OFF**, Steps 40 to 43 will not be available.

40. "BO3 CLOSE PERCENT"

BO3

Default: 50% of the demand
Range: 15 to 80%
Increment: 1%

This option does not appear if the signal ramp for BO3 is set to **OFF** (Step 39, "BO3 Ramp"). Select the percentage at which you want BO3 to close (at % of demand of the ramp selected at Step 39, "BO3 Ramp").

41. "BO3 OPEN PERCENT"

BO3

Default: 25% of the demand
Range: 0 to (BO3 Close)-4%
Increment: 1%

This option does not appear if the signal ramp for BO3 is set to **OFF** (Step 39, "BO3 Ramp"). Select the percentage at which you want BO3 to open (at % of demand of the ramp selected at Step 39, "BO3 Ramp").

42. "BO3 DIRREV"

BO3

Default: dir (Direct)
Range: dir (Direct), rEV (Reverse)

This option does not appear if the signal ramp for BO3 is set to **OFF** (Step 39, "BO3 Ramp"). Set the direction of the binary signal to either Direct or Reverse.

43. "BO3 CONTACT DELAY MINUTES"

BO3

Default: 0 minute
Range: 0 to 15 minutes
Increment: 1 minute

This option does not appear if the signal ramp for BO3 is set to **OFF** (Step 39, "BO3 Ramp"). Select the closing delay for BO3 output.

Binary Output 4 (BO4)

The Binary Output 4 settings appear only if you have selected fan speed 3 at Step 23, "Fan Spd Signal".

44. "BO4 RAMP"

BO4

Default: OFF
Range: Cr1, Cr2, Hr1, Hr2 (heat with fan), Hr2 (heat without fan), CH1, HU, CO2, OFF, COr

Select the desired ramp from the available options. Same as BO1 options.

If you select **OFF**, Steps 45 to 48 will not be available.

45. "BO4 CLOSE PERCENT"

BO4

Default: 20% of the demand
Range: 15 to 80%
Increment: 1%

This option does not appear if the signal ramp for BO4 is set to **OFF** (Step 44, "BO4 Ramp"). Select the percentage at which you want BO4 to close (at % of demand of the ramp selected at Step 44, "BO4 Ramp").

46. "BO4 OPEN PERCENT"

BO4

Default: 0% of the demand
Range: 0 to (BO4 Close)-4%
Increment: 1%

This option does not appear if the signal ramp for BO4 is set to **OFF** (Step 44, "BO4 Ramp"). Select the percentage at which you want BO4 to open (at % of demand of the ramp selected at Step 44, "BO4 Ramp").

47. "BO4 DIRREV"

BO4

Default: dir (Direct)
Range: dir (Direct), rEV (Reverse)

This option does not appear if the signal ramp for BO4 is set to **OFF** (Step 44, "BO4 Ramp"). Set the direction of the binary signal to either Direct or Reverse.

48. "BO4 CONTACT DELAY MINUTES"

BO4

Default: 0 minute
Range: 0 to 15 minutes
Increment: 1 minute

Select the closing delay for BO4 output.

Binary Output 5 (BO5)

The Binary Output 5 settings appear only if you have selected fan speed 2 or 3 at Step 23, "Fan Spd Signal".

49. "BO5 RAMP"

BO5

Default: OFF
Range: Cr1, Cr2, Hr1, Hr2 (heat with fan), Hr2 (heat without fan), CH1, HU, CO2, OFF, COr

Select the desired ramp from the available options. Same as BO1 options.

If you select **OFF**, Steps 50 to 53 will not be available.

50. "BO5 CLOSE PERCENT"

BO5

Default: 20% of the demand
Range: 15 to 80%
Increment: 1%

This option does not appear if the signal ramp for BO5 is set to **OFF** (Step 49, "BO5 Ramp"). Select the percentage at which you want BO5 to close (at % of demand of the ramp selected at Step 49, "BO5 Ramp").

51. "BO5 OPEN PERCENT"

BO5

Default: 0% of the demand
Range: 0 to (BO5 Close)-4%
Increment: 1%

This option does not appear if the signal ramp for BO5 is set to **OFF** (Step 49, "BO5 Ramp"). Select the percentage at which you want BO5 to open (at % of demand of the ramp selected at Step 49, "BO5 Ramp").

52. "BO5 DIRREV"

BO5

Default:	dir (Direct)
Range:	dir (Direct), rEV (Reverse)

This option does not appear if the signal ramp for BO5 is set to **OFF** (Step 49, "BO5 Ramp"). Set the direction of the binary signal to either Direct or Reverse.

53. "BO5 CONTACT DELAY MINUTES"

BO5

Default:	0 minute
Range:	0 to 15 minutes
Increment:	1 minute

This option does not appear if the signal ramp for BO5 is set to **OFF** (Step 49, "BO5 Ramp"). Select the closing delay for BO5 output.

Binary Output 6 (BO6)

The Binary Output 6 settings appear only if you have selected FAN at Step 18, "AO2 Ramp".

54. "BO6 RAMP"

BO6

Default:	OFF
Range:	Cr1, Cr2, Hr1, Hr2 (heat with fan), Hr2 (heat without fan), CH1, HU, CO2, OFF, COr

Select the desired ramp from the available options. Same as BO1 options.

If you select **OFF**, Steps 55 to 58 will not be available.

55. "BO6 CLOSE PERCENT"

BO6

Default:	20% of the demand
Range:	15 to 80%
Increment:	1%

This option does not appear if the signal ramp for BO6 is set to **OFF** (Step 54,"BO6 Ramp"). Select the percentage at which you want BO6 to close (at % of demand of the ramp selected at Step 54,"BO6 Ramp").

56. "BO6 OPEN PERCENT"

BO6

Default:	0% of the demand
Range:	0 to (BO6 Close)-4%
Increment:	1%

This option does not appear if the signal ramp for BO6 is set to **OFF** (Step 54,"BO6 Ramp"). Select the percentage at which you want BO6 to open (at % of demand of the ramp selected at Step 54,"BO6 Ramp").

57. "BO6 DIRREV"

BO6

Default:	dir (Direct)
Range:	dir (Direct), rEV (Reverse)

This option does not appear if the signal ramp for BO6 is set to **OFF** (Step 54,"BO6 Ramp"). Set the direction of the binary signal to either Direct or Reverse.

58. "BO6 CONTACT DELAY MINUTES"

BO6

Default:	0 minute
Range:	0 to 15 minutes
Increment:	1 minute

This option does not appear if the signal ramp for BO6 is set to **OFF** (Step 54,"BO6 Ramp"). Select the closing delay for BO6 output.

Proportional and Deadband Settings

59. "CH OVER PROP BAND"

	Default:	2.0ºC	[4ºF]
	Range:	0.5ºC to 5.0ºC	[1ºF to 9ºF]
	Increment:	0.5ºC	[1ºF]

Select the desired proportional band value of the changeover ramp. The cooling ❄ and heating ◊ symbols are also displayed.

60. "CH OVER DEAD BAND"

	Default:	0.3ºC	[0.6ºF]
	Range:	0.0ºC to 5.0ºC	[0ºF to 9ºF]
	Increment:	0.1ºC	[0.2ºF]

Select the desired dead band value of the changeover ramp. The cooling ❄ and heating ◊ symbols are also displayed.

61. "HEAT 1 PROP BAND"

	Default:	2.0ºC	[4ºF]
	Range:	0.5ºC to 5.0ºC	[1ºF to 9ºF]
	Increment:	0.5ºC	[1ºF]

Select the desired proportional band value of the heating ramp 1. The heating ◊ symbol is also displayed.

62. "HEAT 1 DEAD BAND"

	Default:	0.3ºC	[0.6ºF]
	Range:	0.0ºC to 5.0ºC	[0ºF to 9ºF]
	Increment:	0.1ºC	[0.2ºF]

Select the desired dead band value of the heating ramp 1. The heating ◊ symbol is also displayed.

63. "HEAT 2 PROP BAND"

	Default:	2.0ºC	[4ºF]
	Range:	0.5ºC to 5.0ºC	[1ºF to 9ºF]
	Increment:	0.5ºC	[1ºF]

Select the desired proportional band value of the heating ramp 2. The heating ◊ symbol is also displayed.

64. "HEAT 2 DEAD BAND"

	Default:	0.3ºC	[0.6ºF]
	Range:	0.0ºC to 5.0ºC	[0ºF to 9ºF]
	Increment:	0.1ºC	[0.2ºF]

Select the desired dead band value of the heating ramp 2. The heating ◊ symbol is also displayed.

65. "COOL 1 PROP BAND"

	Default:	2.0ºC	[4ºF]
	Range:	0.5ºC to 5.0ºC	[1ºF to 9ºF]
	Increment:	0.5ºC	[1ºF]

Select the desired proportional band value of the cooling ramp 1. The cooling ❄ symbol is also displayed.

66. "COOL 1 DEAD BAND"

	Default:	0.3ºC	[0.6ºF]
	Range:	0ºC to 5.0ºC	[0ºF to 9ºF]
	Increment:	0.1ºC	[0.2ºF]

Select the desired dead band value of the cooling ramp 1. The cooling ❄ symbol is also displayed.

67. "COOL 2 PROP BAND"

	Default:	2.0ºC	[4ºF]
	Range:	0.5ºC to 5.0ºC	[1ºF to 9ºF]
	Increment:	0.5ºC	[1ºF]

Select the desired proportional band value of the cooling ramp 2. The cooling ❄ symbol is also displayed.

68. "COOL 2 DEAD BAND"

Default:	0.3ºC	[0.6ºF]
Range:	0.0ºC to 5.0ºC	[0ºF to 9ºF]
Increment:	0.1ºC	[0.2ºF]

Select the desired dead band value of the cooling ramp 2. The cooling ❄ symbol is also displayed.

69. "COOLING ANTI CYCLE MINUTES"

Default:	2 minutes
Range:	0 to 15 minutes
Increment:	1 minute

To protect the compressor, set the delay in minutes before activating or reactivating the cooling output. The cooling ❄ symbol is also displayed.

70. "HEATING INTGRAL TIME IN SECONDS"

Default:	0 seconds
Range:	0 to 250 seconds
Increment:	5 seconds

Set the desired value for heating integration factor compensation. The heating ◊ symbol is also displayed.

71. "COOLING INTGRAL TIME IN SECONDS"

Default:	0 seconds
Range:	0 to 250 seconds
Increment:	5 seconds

Set the desired value for cooling integration factor compensation. The cooling ❄ symbol is also displayed.

72. "CL HT SWITCH TIMER MINUTES"

Default:	0 minutes
Range:	0 to 120 minutes
Increment:	1 minute

Time required in minutes before a changeover can take place. The cooling ❄ and heating ◊ symbols are also displayed.

Analog Input 1 (AI1)

73. "AI1 SIGNAL TYPE"

Default:	OFF
Range:	OFF, t10.0, SENs, noCL, noHt, OAS, t10V, CO2, OCC, nSb, oVrd, win, door, dFt, FLS, oVht, SEL, HU

Select the input signal type for AI1(Analog Input 1).

Note: All binary options (Step 87, "BI1 Signal Type") are available in addition to the AI1 options.

- *OFF. If selected, the controller does not use the input.*
- *t10.0. If selected, the controller uses a 10kΩ type III external temperature sensor. If you select **t10.0**, Step 81, "Extern Temp Sensor Offset" will be available.*
- *SENs. If selected, heating mode activates when the temperature read by the external sensor is above the Changeover Setpoint and cooling mode activates when the temperature read by the external sensor is below the Changeover Setpoint. If you select **SENs**, Step 82, "CH Over Setpnt" will be available.*
- *NoCL. If selected, the heating mode activates when the contact is closed and cooling mode activates when the contact is opened.*
- *NoHt. If selected, the cooling mode activates when the contact is closed and heating mode activates when the contact is opened.*
- *OAS. If selected, the controller uses a 10kΩ type III outside air sensor. Note that the temperature read cannot be used as the control temperature.*
- *t10v. If selected, the controller uses a 0 to 10 Vdc external temperature sensor. If you select **t10v**, Step 81, "Extern Temp Sensor Offset" will be available.*
- *CO2. If selected, the controller uses a 0 to 10 Vdc CO_2 sensor. If you select **CO2**, Step 83, "CO2 Maximum Range" will be available.*
- *OCC. If selected, the controller activates the occupancy status.*
- *nSb. If selected, the controller activates the night set back status.*
- *oVrd. If selected, the controller activates an alarm to indicate that there has been an override and the controller is forced into OFF mode.*

- *win. If selected, the controller activates an alarm to indicate that the window is open. If you select **win**, Steps 93, "Window Open Mode" and 94, "Window Fan Mode" will be available.*

- *door. If selected, the controller activates an alarm to indicate that the door is open. If you select **door**, Steps 95, "Door Open Mode" and 96, "Door Fan Mode" will be available.*

- *dFt. If selected, the controller activates an alarm to indicate that the filter is dirty.*

- *FLS. If selected, the controller activates an alarm to indicate that the airflow is absent. The controller shuts off all outputs.*

- *oVht. If selected, the controller activates an alarm to indicate that the heating equipment has overheated. The controller shuts off the heating outputs.*

- *SEL If selected, the controller activates the Local mode. The controller shuts off fan outputs.*

- *HU. If selected, the controller activates the humidity mode.*

If you select one of the following options: **OFF**, **t10.0**, **SENs**, **noCL**, **noHt**, **OAS**, **t10V**, **CO2**, or **HU**, Steps 74 and 75 will not be available.

OFF	t10.0	SENs	noCL	noHt
OFF	t10.0	SENs	noCL	noHt

OAS	t10V	CO2	OCC	nSb
OAS	t10u	CO2	OCC	nSb

oVrd	win	door	dFt	FLS
oVrd	win	door	dFt	FLS

oVht	SEL	HU
oVht	SEL	HU
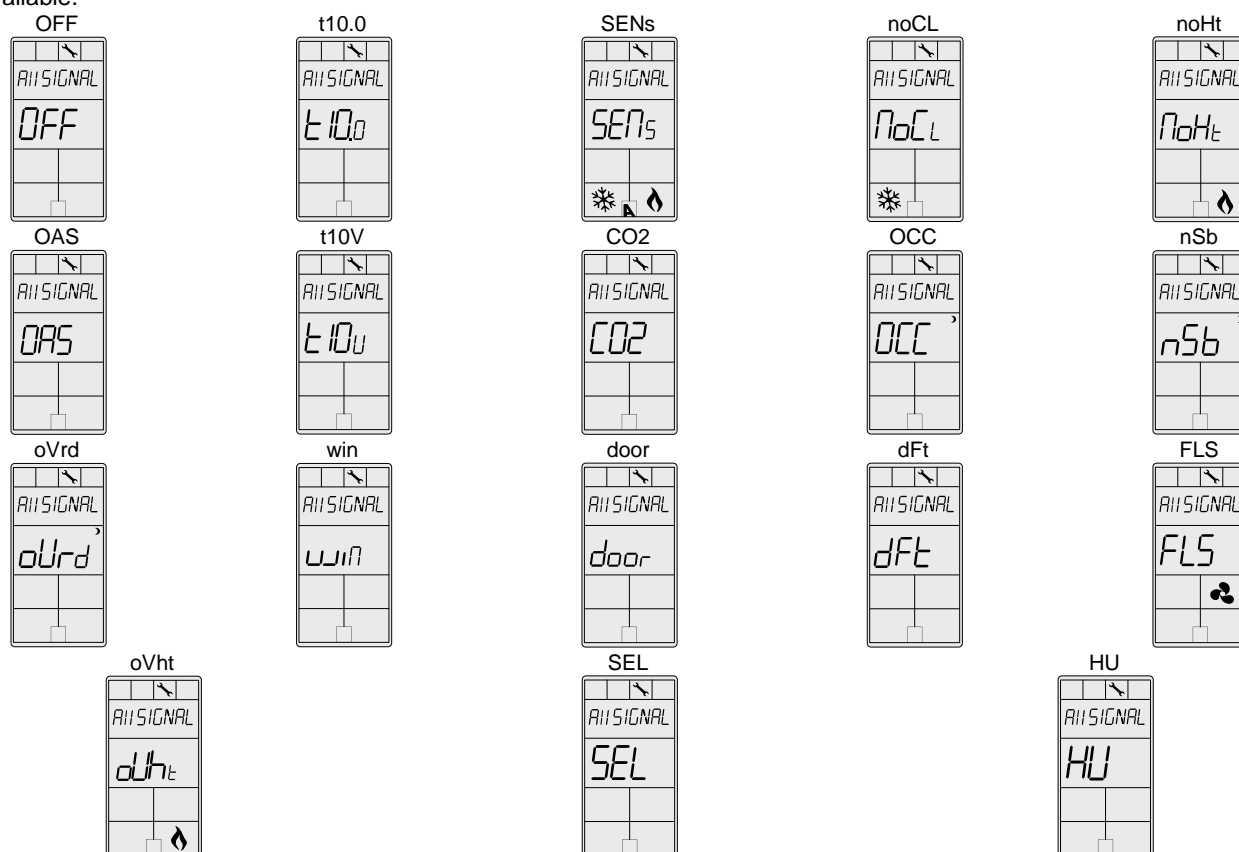
74. "AI1 CONTACT"

AI1
Default: NO (Normally Open)
Range: NO (Normally Open), NC (Normally Close)

This option appears only if you have selected any one of the options: **OCC**, **nSb**, **oVrd**, **win**, **door**, **dFt**, **FLS**, **oVht**, **SEL** at Step 73, "AI1 Signal Type". Select the desired contact option.

75. "AI1 DELAY SECONDS"

AI1
Default: 120 seconds
Range: 0 to 3600 seconds
Increment: 10 seconds

This option appears if you have selected any one of the options: **oVrd**, **win**, **door**, **dFt**, **FLS**, **oVht**, **SEL** at Step 73, "AI1 Signal Type". Set the delay in seconds before the state of input for AI1 is changed.

76. "AI2 SIGNAL TYPE"

AI2
Default: OFF
Range: OFF, t10.0, SENs, noCL, noHt, OAS, t10V, CO2, OCC, nSb, oVrd, win, door, dFt, FLS, oVht, SEL, HU

Select the input signal type for AI2 (Analog Input 2). Same options as Step 73, "AI1 Signal Type".

- *The AI1 input signal has priority over AI2. If you select the same input signal type as AI1, AI2 will not be functional.*

If you select one of the following options: **OFF**, **noCL**, **noHt**, **OAS** or **HU**, Steps 77 to 84 will not be available.

If you select **t10.0**, Steps 77 to 80 will not be available.

If you select **t10V**, Steps 77 and 78 will not be available.

If you select **SENs**, Steps 77 to 81 will not be available.

If you select **CO2**, Steps 77 to 82 will not be available.

77. "AI2 CONTACT"

(AI2) Default: NO (Normally Open)
Range: NO (Normally Open), NC (Normally Close)

This option appears only if you have selected any one of the options: **OCC**, **nSb**, **oVrd**, **win**, **door**, **dFt**, **FLS**, **oVht**, **SEL** at Step 76, "AI2 Signal Type". Select the desired contact option.

78. "AI2 DELAY SECONDS"

(AI2) Default: 120 seconds
Range: 0 to 3600 seconds
Increment: 10 seconds

This option appears if you have selected any one of the options: **oVrd**, **win**, **door**, **dFt**, **FLS**, **oVht**, **SEL** at Step 76, "AI2 Signal Type". Set the delay in seconds before the state of input for AI2 is changed.

Temperature Settings

79. "EXTERN TEMP MINIMUM"

Default: 0ºC   [32ºF]
Range: -40.0ºC to 0ºC   [-40ºF to 32ºF]
Increment: 0.5ºC   [1ºF]

This option appears only if you have selected **t10V** at Step 73, "AI1 Signal Type" or Step 76, "AI2 Signal Type". Set the minimum external temperature value. The minimum value is restricted by the maximum value set at Step 80, "Extern Temp Maximum". In other words, the value that is set as the minimum cannot be greater than the maximum value.

80. "EXTERN TEMP MAXIMUM"

Default: 50ºC   [122ºF]
Range: 50ºC to 100ºC   [122ºF to 212ºF]
Increment: 0.5ºC   [1ºF]

This option appears only if you have selected **t10V** at Step 73, "AI1 Signal Type" or Step 76, "AI2 Signal Type". Set the maximum external temperature value. The maximum value is restricted by the minimum value set at Step 79, "Extern Temp Minimum". In other words, the value that is set as the maximum cannot be less than the minimum value.

81. "EXTERN TEMP SENSOR OFFSET"

Range: -40.0ºC to 100ºC [-40ºF to 212ºF]
Offset: Max. ± 5ºC   [± 9ºF]
Increment: 0.1ºC   [0.2ºF]

This option appears only if you have selected **t10.0** or **t10V** at Step 73, "AI1 Signal Type" or Step 76, "AI2 Signal Type". The display shows the temperature read by the external temperature sensor. Adjust the offset by comparing it with a known value (e.g. thermometer). If the sensor is not connected or short circuited, the unit displays the sensor's limit.

82. "CH OVER SETPNT"

Default: 24.0ºC   [75ºF]
Range: 10.0ºC to 40.0ºC [50ºF to 104ºF]
Increment: 0.5ºC   [1ºF]

This option appears only if you have selected **SENs** at Step 73, "AI1 Signal Type" or Step 76, "AI2 Signal Type". Set the desired changeover temperature setpoint. Note that the heating mode activates when the temperature read by the external sensor is above the changeover setpoint and cooling mode activates when the temperature read by the external sensor is below the changeover setpoint.

CO2 Sensor Settings

83. "CO2 MAXIMUM RANGE"

Default:	2000 PPM	
Range:	100 to 5000 PPM	
Increment:	50 PPM	

This option appears only if you have selected **CO2** at Step 73, "AI1 Signal Type" or Step 76, "AI2 Signal Type". Select the maximum range value for carbon dioxide (CO2).

84. "CO2 SETPOINT"

Default:	800 PPM	
Range:	100 to 2000 PPM	
Increment:	10 PPM	

This step appears only if you have selected **CO2** at Step 73, "AI1 Signal Type" or Step 76, "AI2 Signal Type". Indicates the maximum limit of the CO2 concentration beyond which an alarm is activated. The setpoint value is restricted by the maximum range at Step 84, "CO2 Setpoint"

Temperature Control Source Settings

85. "TEMP CONTROL SOURCE"

Default:	itS (internal)	
Range:	itS (internal), EtS (External), nEt (Network)	

Select the source for temperature control.

- *itS. If selected, the controller will be controlled by its internal temperature sensor.*
- *EtS. If selected, the controller will be controlled by an external temperature sensor.*
- *nEt. If selected, the controller will be controlled by the temperature sent via the BMS.*

If you select **itS** or **EtS**, Step 86, "Network Timeout Minutes" will not be available.

If you select **nEt**, Step 86, "Network Timeout Minutes" will be available.

86. "NETWORK TIMEOUT MINUTES"

Default:	5 minutes	
Range:	0 to 60 minutes	
Increment:	1 minute	

This option appears only if you have selected **nEt** at Step 85, "Temp Control Source". Select the duration in minutes after which the controller will go to OFF mode if it does not receive the temperature value via BMS.

Binary Input 1 (BI1)

87. "BI1 SIGNAL TYPE"

Default:	OCC	
Range:	nSb, OCC, OFF, oVrd, win, door, dFt, FLS, oVht, SEL, noCL, noHt	

Select the input signal type for BI1 (Binary Input 1).

- *OCC. If selected, the occupancy status is activated. If you select **OCC**, the Occupancy options (Steps 102 to 107) will be available.*
- *nSb. If selected, the night set back status is activated. If you select **nSb**, the night set back options (Steps 97 to 101) will be available.*
- *OFF. If selected, the controller does not use the input.*
- *oVrd. If selected, the controller activates an alarm to indicate that there has been an override and the controller is forced into OFF mode.*
- *win. If selected, the controller activates an alarm to indicate that the window is open. If you select **win**, Steps 93, "Window Open Mode" and 94, "Window Fan Mode" will be available.*
- *door. If selected, the controller activates an alarm to indicate that the door is open. If you select **door**, Steps 95, "Door Open Mode" and 96, "Door Fan Mode" will be available.*
- *dFt. If selected, the controller activates an alarm to indicate that the filter is dirty.*
- *FLS. If selected, the controller activates an alarm to indicate that the airflow is absent. The controller shuts off all outputs.*
- *oVht. If selected, the controller activates an alarm to indicate that the heating equipment has overheated. The controller shuts off the heating outputs.*

- *SEL. If selected, the controller activates the Local mode. The controller shuts off fan outputs.*
- *NoCL. If selected, the heating mode activates when the contact is closed and cooling mode activates when the contact is opened.*
- *noHt. If selected, the cooling mode activates when the contact is closed and heating mode activates when the contact is opened.*

If you select any one of the options: **OFF**, **noCL** or **noHt**, Steps 88 and 92 will not be available.

If you select any of the other options, Step 88, "BI1 Contact" will be available.
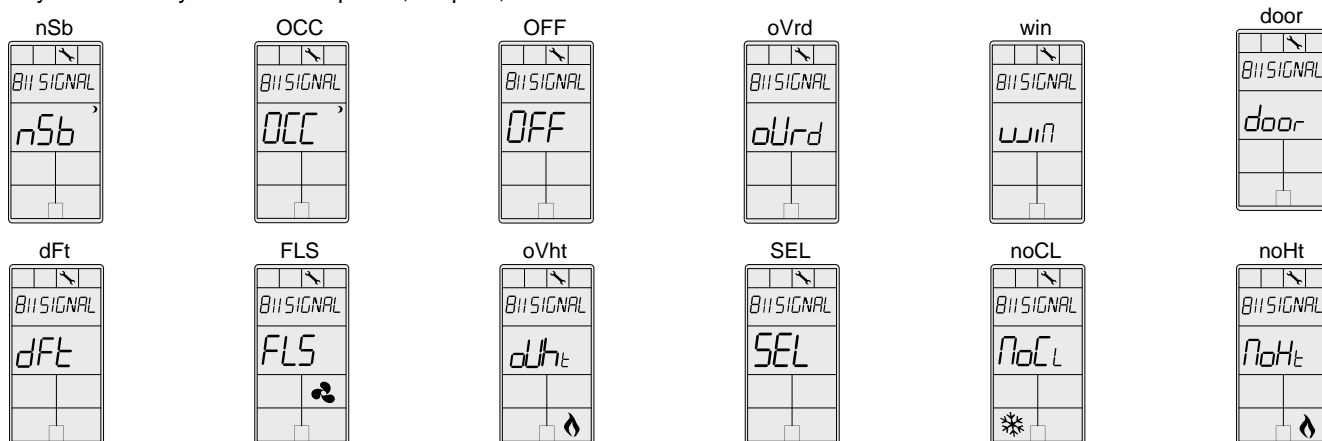
nSb	OCC	OFF	oVrd	win	door
BI1 SIGNAL	BI1 SIGNAL	BI1 SIGNAL	BI1 SIGNAL	BI1 SIGNAL	BI1 SIGNAL
nSb	OCC	OFF	oVrd	win	door

dFt	FLS	oVht	SEL	noCL	noHt
BI1 SIGNAL	BI1 SIGNAL	BI1 SIGNAL	BI1 SIGNAL	BI1 SIGNAL	BI1 SIGNAL
dFt	FLS	oVht	SEL	NoCL	NoHt

88. "BI1 CONTACT"

BI1

Default: NO (Normally Open)
Range: NO (Normally Open), NC (Normally Close)

This option appears only if you have selected any of the options: **nSb**, **OCC**, **oVrd**, **win**, **door**, **dFt**, **FLS**, **oVht**, **SEL** at Step 87, "BI1 Signal Type". Select the desired contact option.

89. "BI1 DELAY SECONDS"

BI1

Default: 120 seconds
Range: 0 to 3600 seconds
Increment: 10 seconds

This option appears only if you have selected any of the options: **oVrd**, **win**, **door**, **dFt**, **FLS**, **oVht**, **SEL** at Step 87, "BI1 Signal Type". Set the delay in seconds before the state of input for BI1 is changed.

Binary Input 2 (BI2)

90. "BI2 SIGNAL TYPE"

BI2

Default: nSb
Range: nSb, OCC, OFF, oVrd, win, door, dFt, FLS, oVht, SEL, noCL, noHt

Select the input signal type for BI2 (Binary Input 2). Same options as BI1.

- *The BI1 input signal has priority over BI2.*

If you select any one of the options: **nSb**, **OCC**, **oVrd**, **win**, **door**, **dFt**, **FLS**, **oVht** or **SEL**, Step 91 "BI2 Contact" will be available.

If you select any one of the options: **noCL**, **noHt**, **OFF**, Steps 91 to 107 will not be available.

91. "BI2 CONTACT"

BI2

Default: NO (Normally Open)
Range: NO (Normally Open), NC (Normally Close)

This option appears only if you have selected any of the options: **nSb**, **OCC**, **oVrd**, **win**, **door**, **dFt**, **FLS**, **oVht**, **SEL** at 90, "BI2 Signal Type". Select the desired contact option.

92. "BI2 DELAY SECONDS"

BI2

Default: 120 seconds
Range: 0 to 3600 seconds
Increment: 10 seconds

This option appears only if you have selected any of the options: **oVrd**, **win**, **door**, **dFt**, **FLS**, **oVht**, **SEL** at 90, "BI2 Signal Type". Set the delay in seconds before the state of input for BI2 is changed.

Window and Door Settings

93. "WINDOW OPEN MODE"

Default: StP (on TUCB24C6X2), OFF (on TUHB24C6X2)
Range: StP (Setpoint/override enabled), OFF

This option appears only if you have selected **win** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". The alarm ⚠ symbol is also displayed.

- *StP. If selected, the controller uses the NSB/No Occupancy setpoints when the window is open.*
- *OFF. If selected, the controller is forced into OFF mode when the window is open.*

94. "WINDOW FAN MODE"

Default: AUto (Automatic)
Range: AUto (Automatic), LO (Low), mEd (Medium), HI (High)

This option appears only if you have selected **win** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Select the fan speed mode when the window is open. The fan ❧ and alarm ⚠ symbols are also displayed.

95. "DOOR OPEN MODE"

Default: StP (on TUCB24C6X2), OFF (on TUHB24C6X2)
Range: StP (Setpoint/override enabled), OFF

This option appears only if you have selected **door** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type".

- *StP. If selected, the controller uses the NSB/No Occupancy setpoints when the door is open.*
- *OFF. If selected, the controller is forced into OFF mode when the door is open.*

96. "DOOR FAN MODE"

Default: AUto (Automatic)
Range: AUto (Automatic), LO (Low), mEd (Medium), HI (High)

This option appears only if you have selected **door** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Select the fan speed when the door is open. The fan ❧ and alarm ⚠ symbols are also displayed.

Night Set Back (NSB)

97. "NSB OVERIDE DELAY MINUTES"

Default: 120 minutes
Range: 0 to 180 minutes
Increment: 15 minutes

This option appears only if you have selected **nSb** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". When in Night Set Back (NSB) Mode, the user can override Night Set Back (NSB) (see page 28) for the duration of this delay. To disable night set back override, set the delay to 0. The moon ☽ symbol is displayed to indicate Night Set Back (NSB) Mode.

98. "NSB FAN MODE"

Default: AUto (Automatic)
Range: AUto (Automatic), LO (Low), mEd (Medium), HI (High)

This option appears only if you have selected **nSb** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Select the fan speed mode for night set back. The fan ❧ symbol is also displayed.

99. "NSB MODE"

Default: StP (Setpoint/override enabled)
Range: StP (Setpoint/override enabled), OFF

This option appears only if you have selected **nSb** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type".

- *StP. If selected, the controller uses the NSB setpoints when in Night Set Back (NSB) Mode. (see page 28).*
- *OFF. If selected, the controller is forced into OFF mode when in Night Set Back (NSB) Mode. (see page 28).*

100. "NSB HEATING SETPNT"

(NSB)
Default:	16ºC	[61ºF]
Range:	10ºC to 40ºC	[50ºF to 104ºF]
Increment:	0.5ºC	[1ºF]

This option appears only if you have selected **nSb** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Set the heating setpoint that will be used when the system is in Night Set Back (NSB) Mode (see page 28). The heating setpoint value is restricted by the cooling setpoint value at Step 101, "NSB Cooling Setpnt". The moon ☽ and heating ♦ symbols are also displayed.

101. "NSB COOLING SETPNT"

(NSB)
Default:	28ºC	[82ºF]
Range:	10ºC to 40ºC	[50ºF to 104ºF]
Increment:	0.5ºC	[1ºF]

This option appears only if you have selected **nSb** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Set the cooling setpoint that will be used when the system is in Night Set Back (NSB) Mode (see page 28). The cooling setpoint value is restricted by the heating setpoint value at Step 100, "NSB Heating Setpnt". The moon ☽ and cooling ❄ symbols are also displayed.

Occupancy (OCC)

102. "OCC MINIMUM TIME IN MINUTES"

(OCC)
Default:	30 minutes
Range:	0 to 240 minutes
Increment:	1 minute

This option appears only if you have selected **OCC** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Set the minimum time in minutes the controller must remain in the occupied state before it can be enabled to enter or re-enter the No Occupancy Mode (see page 28). The moon ☽ symbol is also displayed.

103. "NO OCC OVERRIDE DELAY MINUTES"

(OCC)
Default:	120 minutes
Range:	0 to 180 minutes
Increment:	15 minutes

This option appears only if you have selected **OCC** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". When in no occupancy mode, the user can override the No Occupancy Mode (see page 28) up to the duration of this delay by pressing the ❧ button. To disable the no occupancy override, set the delay to 0. The moon ☽ symbol is displayed to indicate the No Occupancy Mode .

104. "NO OCC FAN MODE"

(OCC)
Default:	AUto (Automatic)
Range:	AUto (Automatic), LO (Low), mEd (Medium), HI (High)

This option appears only if you have selected **OCC** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Select the fan speed mode for no occupancy mode. The fan ❧ symbol is also displayed.

105. "NO OCC MODE"

(OCC)
Default:	StP (Setpoint/override enabled)
Range:	StP (Setpoint/override enabled), OFF

This option appears only if you have selected **OCC** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". The moon symbol ☽ is also displayed.

- *StP: If selected, the controller uses the No OCC setpoints when in No Occupancy Mode (see page 28).*
- *OFF: If selected, the controller is forced into OFF mode when in No Occupancy Mode (see page 28).*

If you select **OFF**, Steps 106 and 107 will not be available.

106. "NO OCC HEATING SETPNT"

(OCC)
Default:	16ºC	[61ºF]
Range:	10ºC to 40ºC	[50ºF to 104ºF]
Increment:	0.5ºC	[1ºF]

This option appears only if you have selected **OCC** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Set the heating setpoint that will be used when the system is in Night Set Back (NSB) Mode/No Occupancy Mode/Window Open Mode/Door Open Mode. The heating setpoint value is restricted by the cooling setpoint value at Step 107, "No OCC Cooling Setpnt". The moon ☽ and heating ♦ symbols are also displayed.

107. "NO OCC COOLING SETPNT"

(OCC)

Default:	28ºC	[82ºF]
Range:	10ºC to 40ºC	[50ºF to 104ºF]
Increment:	0.5ºC	[1ºF]

This option appears only if you have selected **OCC** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Set the heating setpoint that will be used when the system is in Night Set Back (NSB) Mode/No Occupancy Mode/Window Open Mode/Door Open mode. The cooling setpoint value is restricted by the heating setpoint value at Step 106, "No OCC Heating Setpnt". The moon ☽ and cooling ❄ symbols are also displayed.

Humidity Settings

The following humidity settings only appear in the following conditions:
- **TUCB24C6X2 models with HU selected at Step 73 or Step 76**
- **TUHB24C6X2 models regardless of selected options**

108. "EXTERN HUMIDTY SENSOR OFFSET"

Offset:	± 5%
Range:	10% RH to 90% RH
Increment:	0.1% RH

The display shows the relative humidity percentage read by the external humidity sensor. Adjust the offset by comparing it with a known value humidistat. If the sensor is not connected or short circuited, unit displays the sensor's limits. The humidify symbol is also displayed.

109. "INTERN HUMIDTY SENSOR OFFSET"

Offset:	± 5%
Range:	10% RH to 90% RH
Increment:	0.1% RH

This option appears only with models **TUHB24C6X2.** Compare the displayed humidity percentage reading with a known value from a humidistat. This is useful for humidistats installed in areas where the humidity read is slightly different than the rooms's actual humidity. For example, a humidistat placed right under the air diffuser. The humidify symbol is also displayed.

110. "HUMIDTY CONTROL MODE"

Default:	OFF
Range:	OFF, Auto (Automatic humidify and dehumidify), dEHU (dehumidify only), Hu (humidify only)

- *OFF (Disabled). If selected, the controller disables all humidify and dehumidify functions.*
- *AuTo (Automatic humidify and dehumidfy). If selected, the ramp of atleast one analog or binary must be set to Hu (humidify) and another output must be set to COOl (cooling).*
- *dEHU (Dehumidify only). If selected, the ramp of at least one analog or binary output must be set to COOl (cooling).*
- *Hu (Humidify only). If selected, the ramp of at least one analog or binary output must be set to Hu (humidify).*

If you select **OFF**, Steps 111 to 121 will not be available.

If you select **Hu** or **deHU**, Step 112, "Humidty User Setpnt Minimum" will be available.

111. "HUMIDTY CONTROL SOURCE"

Default:	irh (Internal humidity sensor)
Range:	irh (Internal humidity sensor), Erh (External humidity sensor)

This option appears only with model **TUHB24C6X2.** Select the source for humidity control.
- *irh. If selected, the controller will be controlled by its internal humidity sensor.*
- *Erh. If selected, the controller will be controlled by an external humidity sensor.*

112. "HUMIDTY USER SETPNT MINIMUM"

Default:	30% RH
Range:	10% RH to 90% RH
Increment:	0.5% RH

This option appears only if you have selected **AuTo**, **Hu** or **deHU** at Step 110, "Humidty Control Mode". In Operation Mode, you cannot decrease the setpoint to less than the value set as the minimum humidity setpoint. The minimum value is restricted by the maximum value set at Step 113, "Humidty User Setpnt Maximum". In other words, the value that is set as the minimum cannot be greater than the maximum value.

113. "HUMIDTY USER SETPNT MAXIMUM"

Default: 65% RH
Range: 10% RH to 90% RH
Increment: 0.5% RH

This option appears only if you have selected **AuTo**, **Hu** or **deHU** at Step 110, "Humidty Control Mode". In Operation mode, you cannot increase the setpoint to more than the value set as the maximum humidity setpoint. The maximum value is restricted by the minimum value set at Step 112, "Humidty User Setpnt Minimum". In other words, the value that is set as the maximum cannot be less than the minimum value.

114. "HUMIDITY USER SETPNT LOCKED"

Default: No (Unlocked)
Range: No (Unlocked), Yes (Locked)

This option appears only if you have selected **AuTo**, **Hu** or **deHU** at Step 110, "Humidty Control Mode". If set to **No**, the user setpoint option is not locked and the user can adjust the desired humidity setpoint. If set to **Yes**, the user setpoint option is locked and the user cannot set the desired humidity setpoint. A lock ⚿ symbol appears to indicate that the setpoint is locked.

115. "HUMIDTY USER SETPNT"

Default: 40% RH
Range: 10% RH to 90% RH
Increment: 0.5% RH

This option appears only if you have selected **AuTo**, **Hu** or **deHU** at Step 110, "Humidty Control Mode". Set the desired humidity setpoint. If the setpoint option was locked at Step 114, "Humidity User Setpnt Locked", a lock ⚿ symbol is displayed. The setpoint value is restricted by the minimum at Step 112, "Humidty User Setpnt Minimum" and maximum at Step 113, "Humidty User Setpnt Maximum" values.

116. "NSB HUMIDIF SETPNT"

Default: 30% RH
Range: 10% RH to 65% RH
Increment: 0.5% RH

This option appears only if you have selected **AuTo**, **Hu** or **deHU** at Step 110, "Humidty Control Mode", and also **nSb** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Adjust the humidify setpoint during Night Set Back (NSB) Mode. The humidify setpoint is restricted by the dehumidify value at Step 117, "NSB Dehumi- Setpnt". The moon ☾ and humidify ⁑ symbols are also displayed.

117. "NSB DEHUMI- SETPNT"

Default: 45% RH
Range: 10% RH to 65% RH
Increment: 0.5% RH

This option appears only if you have selected **AuTo**, **Hu** or **deHU** at Step 110, "Humidty Control Mode", and also **nSb** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Adjust the dehumidify setpoint during Night Set Back (NSB) Mode. The dehumidify setpoint is restricted by the humidify setpoint at Step 116, "NSB Humidif Setpnt". The moon ☾ and dehumidify ⊛ symbols are also displayed.

118. "NO OCC HUMIDIF SETPNT"

Default: 30% RH
Range: 10% RH to 65% RH
Increment: 0.5% RH

This option appears only if you have selected **AuTo**, **Hu** or **deHU** at Step 110, "Humidty Control Mode", and also **OCC** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Adjust the humidify setpoint during No Occupancy Mode. The humidify setpoint is restricted by the dehumidify value at Step 119, "No OCC Dehumi - Setpnt". The moon ☾ and humidify ⁑ symbols are also displayed.

119. "NO OCC DEHUMI - SETPNT"

Default: 45% RH
Range: 10% RH to 65% RH
Increment: 0.5% RH

This option appears only if you have selected **AuTo**, **Hu** or **deHU** at Step 110, "Humidty Control Mode", and also **OCC** at Step 73, "AI1 Signal Type", Step 76, "AI2 Signal Type", Step 87, "BI1 Signal Type", or Step 90, "BI2 Signal Type". Adjust the dehumidify setpoint during No Occupancy Mode. The dehumidify setpoint is restricted by the humidify setpoint at Step 118, "No OCC Humidif Setpnt". The moon ☾ and dehumidify ⊛ symbols are also displayed.

120. "HUMIDTY PROP RAMP"

Default:	5% RH
Range:	3% RH to 10% RH
Increment:	0.5% RH

This option appears only if you have selected **AuTo**, **Hu** or **deHU** at Step 110, "Humidty Control Mode". Set the desired proportional ramp value for the humidity control. This value applies to both humidification and dehumidification.

121. "HUMIDTY DEAD BAND"

Default:	1% RH
Range:	0% RH to 5% RH
Increment:	0.5% RH

This option appears only if you have selected **AuTo**, **Hu** or **deHU** at Step 110, "Humidty Control Mode". Set the desired dead band value for the humidity control. This value applies to both humidification and dehumidification.

Anti Freeze

122. "ENABLE ANTI FREEZE PROTECT"

Default:	No (Disable)
Range:	No (Disable), Yes (Enable)

If this option is enabled, heating starts automatically when the temperature drops to 4°C [39°F], even if the controller is in Cooling or OFF mode. Once the temperature reaches 5°C [41°F], the heating stops.

Network Settings

123. "SELECT NETWORK PROTO"

Default:	bAC (BACnet)
Range:	bAC (BACnet), mOd (Modbus)

Select the desired network protocol.

BACnet

124. "BACNET AUTO BAUDS RATE"

Default:	Yes (Enabled)
Range:	Yes (Enabled), No (Disabled)

Enable or disable Auto Baud Rate Detection. When enabled, the controller automatically configures its baud rate by detecting the network speed upon connection to the network.

125. "BACNET BAUDS RATE"

Default:	No default (information display only)
Range:	9.6k, 19.2k, 38.4k, 76.8k

If you enabled Auto Baud Rate Detection at Step 124,"BACnet Auto Bauds Rate" the controller displays the automatically detected baud rate.

126. "MSTP MAC ADDRESS"

Default:	0
Range:	0 to 254
Increment:	1

Select the desired MSTP MAC Address. Each device on the network must have a unique MAC address.

127. "MSTP MAX MASTER"

Default:	127
Range:	1 to 127
Increment:	1

Select the desired MSTP MAX address for the master device.

128. "COPY CONFIG"

Default:	No (Disable)
Range:	No (Disable), Yes (Enable)

Select **Yes** to copy the configuration of the existing device to other devices of the same type on the network. If you select **No**, go to Step 132, "Adjust Device Instance 0153000".

129. "SELECT BEGIN ADDRESS"

Default:	0
Range:	0 to 254
Increment:	1

Select the first address you want to copy to. For example, if you select MAC address 1 as the "begin address" and 54 as the "end address", all the devices from 1 to 54 will receive the configuration of the current device.

130. "SELECT END ADDRESS"

Default:	"begin address"
Range:	"begin address" + 63
Increment:	1

Select the last address you want to copy to. You cannot copy more than 64 addresses at once.

131. "COPY CONFIG"

Range:	"Copy Config" followed by one of these results: "Succeed", "Progerr", "Typeerr", "Modlerr", "Memerr", "Slave", "Commerr"

Displays "Succeed" if the addresses have been copied successfully. Otherwise, an error message appears with the associated MAC address. You can scroll through the addresses and see the error message associated with each address. See below for a complete list of error messages.

"copy config succeed"

Copy config was successful.

"copy config progerr"

Copy config failed because the target device is in Program Mode.

"copy config typeerr"

Copy config failed because the target device is not the same as the source device. For example, copying an EVC configuration to an EFC device.

copy config modlerr"

Copy config failed because the model number of the source device and the target device is not the same. For example, copying a TUCB configuration to an EFCB.

"copy config mem err"

Copy config failed because the software/application version of the source device and the target device is not the same.

"copy config Slave"

The target device has a slave address and it cannot respond to the master. Manually verify that the configuration was copied correctly or avoid using a slave address (128 - 254).

"copy config commerr"

Copy config failed because the target device did not respond after 3 attempts. Either the address does not exist or there is a problem with the wiring or with noise.
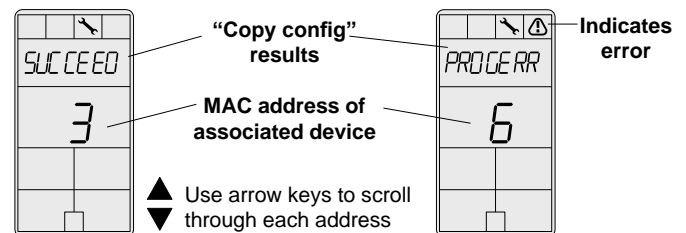
### 132. "ADJUST DEVICE INSTANCE 0153000"

Default:	No
Range:	No, Yes

To change the device instance, select **Yes** and continue to the next step. If you select **No**, the device instance will be modified automatically according to the MAC address (the menu starts over at Step 1, "Intern Temp Sensor Offset").

133. "0153000"

Default:	"current value"
Range:	0 to 4194302
Increment:	1

Use the arrow keys to change the value and press the ⊙ button to move to the next digit or press ⊛ to move to the previous digit. Ensure that you provide a unique device instance.

Modbus

134. "MODBUS AUTO BAUDS RATE"

Default: Yes (Automatic)
Range: No (Manual), Yes (Automatic)

Enable or disable Modbus Auto Baud Rate Detection. When enabled, the controller automatically configures its baud rate by detecting the network speed upon connection to the network.

135. "MODBUS BAUDS RATE"

Default: No default (information display only)
Range: 9.6k, 19.2k, 38.4k, 57.6k

If you enabled Modbus Auto Baud Rate Detection at Step 134, "Modbus Auto Bauds Rate", the controller displays the automatically detected baud rate.

136. "MODBUS COMPORT CONFIG"

Default: NP2s (no parity, 2 stop bits)
Range: EP1s (even parity, 1 stop bit), OP1s (odd parity, 1 stop bit), NP2s (no parity, 2 stop bits)

Select the desired parity and number of stop bits for the modbus communication.

137. "MODBUS ADDRESS"

Default: 1
Range: 1 to 246
Increment: 1

Select the desired Modbus address. Each device on the network must have a unique Modbus address.

Network Setup Menu

This menu is accessible through normal operation mode. The Mode Selector Jumper (JP2) must be set to the RUN position (Operation Mode).

1. Press the and keys for 5 seconds. The "ENTER PASSWORD" screen appears.
2. Enter the password (**637**) within 1 minute. Use the △ and ▽ arrow keys to increase or decrease the value and the , buttons to toggle between the digits. If you enter the wrong password, the controller displays "**Eror**" and returns to Operation Mode.

   Use the same menu operations as described in Programming Mode on page 3.

   The controller will return to normal mode if you navigate through the entire menu and do not make any selection, or if you do not press any key for 5 minutes. The changed values will be saved automatically.

1. "SELECT NETWORK PROTO" TO "MODBUS ADDRESS"

Range: Steps 123 to 137
Page: Page 23 to 25

These network setup steps are exactly the same as those in the Programming Mode. Please refer to Steps 123 to 137, starting on page 23. When complete, continue to the following step.

Sensor Offset Menu

This menu is accessible through normal operation mode. The Mode Selector Jumper (JP2) must be set to the RUN position (Operation Mode).

1. Press the ⊛/◊ and ♣ keys for 5 seconds. The *"ENTER PASSWORD"* screen appears.
2. Enter the password (**372**) within 1 minute. Use the △ and ▽ arrow keys to increase or decrease the value and the ⊛/◊, ♣ buttons to toggle between the digits. If you enter the wrong password, the controller displays "**Eror**" and returns to Operation Mode.

   Use the same menu operations as described in Programming Mode on page 3.

   The controller will return to normal mode if you navigate through the entire menu and do not make any selection, or if you do not press any key for 5 minutes. The changed values will be saved automatically.

1. "INTERN TEMP SENSOR OFFSET"

Range:	0ºC to 50ºC	[32ºF to 122ºF]
Offset:	Max. ± 5ºC	[± 9ºF]
Increment:	0.1ºC	[0.2ºF]

Compare the displayed temperature reading with a known value from a thermometer or other temperature sensing device. To offset or calibrate the sensor, use the arrow buttons to set the desired temperature reading. This is useful for controllers installed in areas where the temperature read is slightly different than the room's actual temperature. For example, a controller placed right under the air diffuser.

2. "EXTERN TEMP SENSOR OFFSET"

Range:	-40.0ºC to 100ºC	[-40ºF to 212ºF]
Offset:	Max. ± 5ºC	[± 9ºF]
Increment:	0.1ºC	[0.2ºF]

This option appears only if you have selected **t10.0** or **t10V** at Step 73, "AI1 Signal Type" or Step 76, "AI2 Signal Type". The display shows the temperature read by the external temperature sensor. Adjust the offset by comparing it with a known value (e.g. thermometer). If the sensor is not connected or short circuited, the unit displays the sensor's limit.

3. "EXTERN HUMIDTY SENSOR OFFSET"

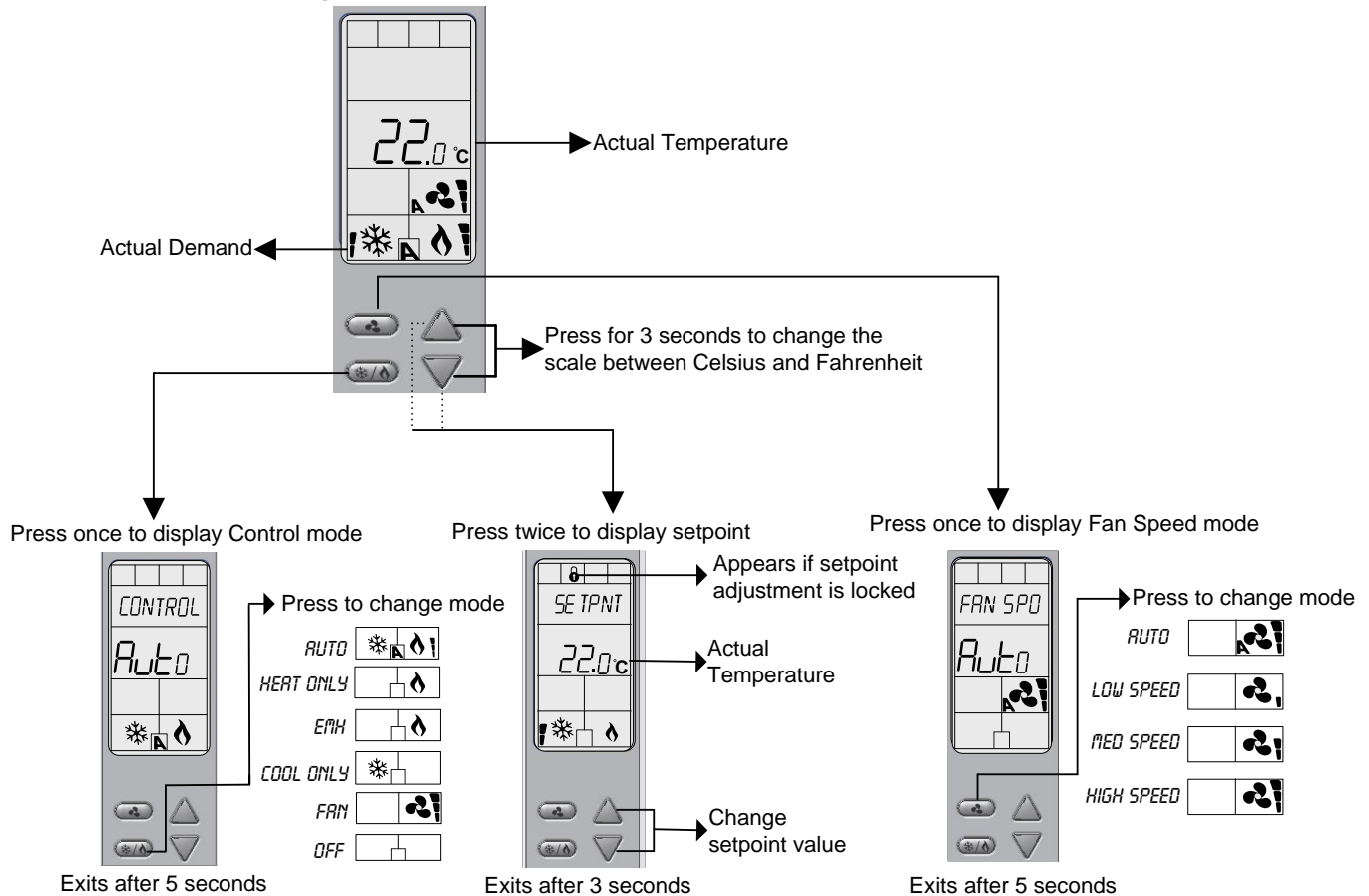|	
Offset:	± 5%
Range:	10% RH to 90% RH
Increment:	0.1% RH

This option appears if the controller is set to use an external humidity sensor. The display shows the relative humidity percentage read by the external humidity sensor. Adjust the offset by comparing it with a known value humidistat. If the sensor is not connected or short circuited, unit displays the sensor's limits. The humidify ⁑ symbol is also displayed.

Operation Mode

The Mode Selector Jumper JP2 must be set to the RUN position (Operation Mode). Refer to Wiring on page 2.

Operation Mode

Actual Temperature

Actual Demand

Press for 3 seconds to change the scale between Celsius and Fahrenheit

Press once to display Control mode

Press twice to display setpoint

Press once to display Fan Speed mode

Press to change mode

AUTO
HEAT ONLY
EMK
COOL ONLY
FAN
OFF

Exits after 5 seconds

Appears if setpoint adjustment is locked

Actual Temperature

Change setpoint value

Exits after 3 seconds

Press to change mode

AUTO
LOW SPEED
MED SPEED
HIGH SPEED

Exits after 5 seconds

Power Up

Upon power up, the LCD illuminates and all segments appear for 2 seconds. The controller then displays its current version for 2 seconds.

LCD Backlight

Pressing any key illuminates the LCD for 4 seconds.

Default Display

The controller displays temperature and humidity readings or setpoints, with or without demand according to the selection made at Step 8, "Display Info". If a humidity sensor is not used, the temperature values will always be displayed. If a sensor is disconnected or short circuited, then the unit displays the sensor's limits. To toggle the temperature scale between °C and °F, press both the up △ and down ▽ arrow keys for 3 seconds.

Temperature Setpoint Display and Adjustment

To display the setpoint, press the △ or ▽ key twice. The setpoint appears for 3 seconds. To adjust the setpoint, press the arrow keys while the setpoint is displayed. If the setpoint adjustment has been locked (Step 5, "User Setpnt"), the lock 🔒 symbol appears.

Humidity Setpoint Display and Adjustment

To access the Humidity setpoint, press the 💧 button for 5 seconds. The humidity setpoint will be displayed for 5 seconds. To adjust the setpoint, press the △ and ▽ keys while the setpoint is displayed. The unit automatically exits this menu if you do not press any key for 3 seconds. The changed values will be saved automatically.

Control Mode

To access the Control Mode, press the ❄/🔥 key. The Control Mode appears for 5 seconds. Press the ❄/🔥 key to scroll through the following control modes. These options can vary depending on the options selected at the following:
Step 6, "Temp Control Mode"
Step 7, "Enable On Off Control Mode"
Step 9, "Heat Pump Option"

Step 24, "Fan Speed Option"

- Auto (Automatic Cooling or Heating)
- Cooling only (on, with cooling ❄ symbol)
- Heating only (on, with heating ◊ symbol)
- EmH (on, with heating ◊ symbol)
- FAN (on, with fan ♣ symbol)
- OFF (if it is not disabled in Programming Mode)

Fan Speed Selection Mode

To access the Fan Speed selection mode, press the ⊛ key. The mode appears for 5 seconds. These options can vary depending on the fan speed signal and auto mode settings at Step 25 "Fan Auto Mode" and Step 23, "Fan Spd Signal". If in No Occupancy mode, the ⊛ button now serves as the override button.
The Fan Speed Selection Mode is not available when **Yes** is selected at Step **Error! Reference source not found. Error! Reference source not found.**.

- Automatic speed. This option is available if you have selected **yES** (Enable) at Step 25, "Fan Auto Mode" in Programming Mode.
- Low speed
- Medium speed
- High speed
- OFF. OFF is not selectable by the user, it appears only if the "Control Mode" is "OFF" and it indicates that the user can not change the speed of the fan.

Night Set Back (NSB) Mode

This function is only available if you have set input to **nSb** (Night Set Back contact). If the contact is triggered, the controller enters NSB Mode (the ☽ symbol appears) and uses the NSB setpoints defined at Steps 100, "NSB Heating Setpnt", 101, "NSB Cooling Setpnt" and 98, "NSB Fan Mode". Press any key to override NSB for the delay defined at Step 97, "NSB Overide Delay Minutes". The ☽ symbol flashes to indicate that the NSB mode is overridden (during this time the standard setpoints are used).

No Occupancy Mode

This function is only available if you have set input to **OCC** (occupancy contact). If the contact is triggered and the minimum occupancy time defined at Step 102, "OCC Minimum Time In Minutes" has elapsed, the controller enters Occupancy Mode (the ☽ symbol appears) and uses the OCC setpoints defined at Steps 106, "No OCC Heating Setpnt", 107 "No OCC Cooling Setpnt" and 104, "No OCC Fan Mode".
Press the fan ⊛ button to override no occupancy. Each time you press the ⊛ button, 15 minutes are added to the override up to a maximum defined by Step 103, "No OCC Override Delay Minutes". Press the fan ⊛ button until "0" is displayed to disable the override. The ☽ icon will flash and the remaining override time will be displayed in minutes.

Notes
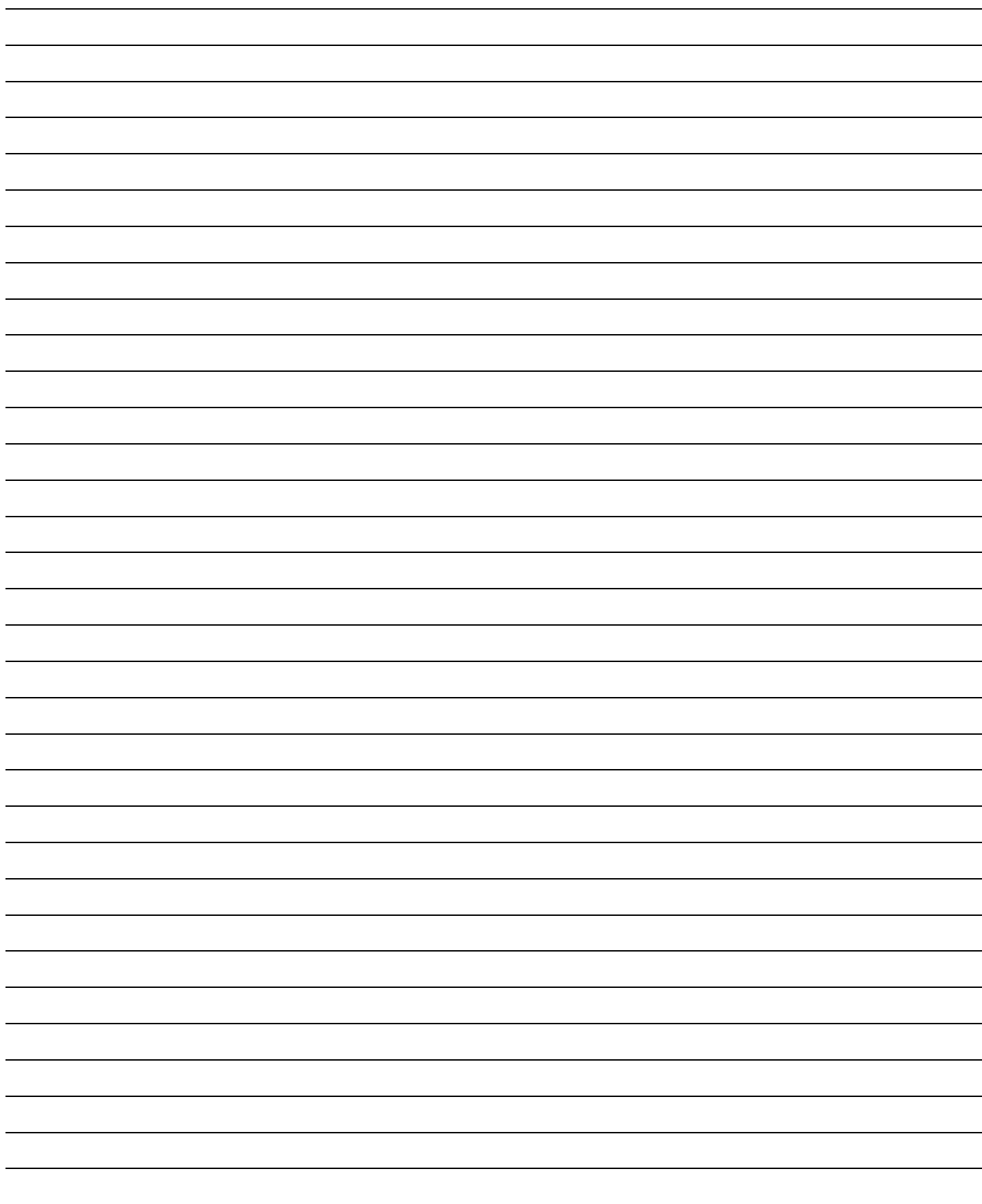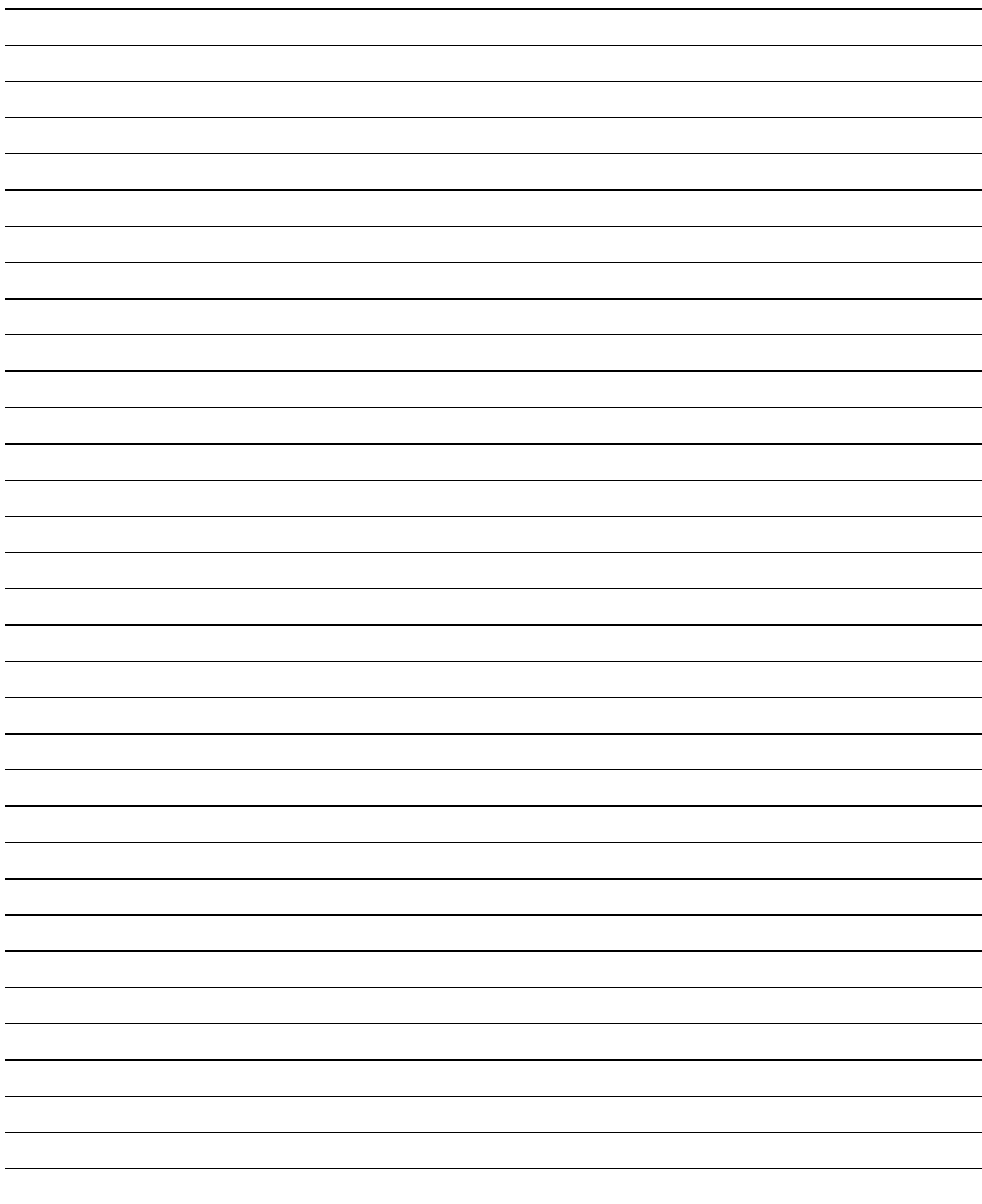
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