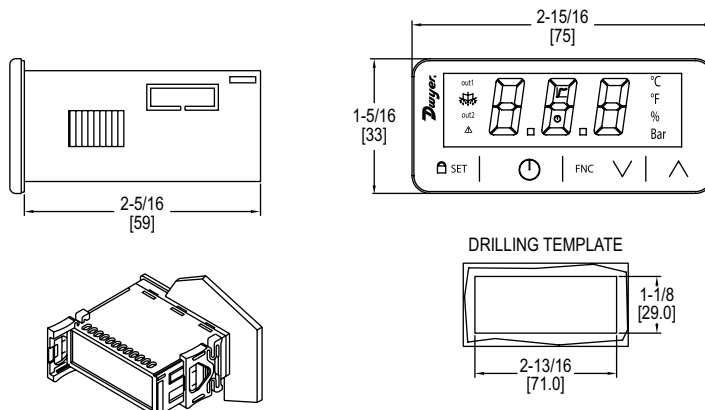




## Series 40T2 Digital Temperature Controller

### Specifications - Installation and Operating Instructions



The **Series 40T2 Digital Temperature Controller** accepts a variety of inputs for temperature measurements and set points up to 999°F/537°C. Observing the current status of the controller is made easier with the 3-digit, multi-color LED display that has alarm and output symbols. For added versatility, the temperature units can be field selected for °F or °C. A flashing alarm informs users when the current temperature exceeds preset limits. The Modbus® protocol TTL slave port can be used to communicate over a TTL/RS-485 interface. When programming multiple units, the 40X2-K programming key is available to reduce setup time.

#### INSTALLATION

**Note:** Unit must be mounted away from vibration, impacts, water, and corrosive gases.

- Cut hole in panel 2-51/64 x 1-9/64 in (71 x 29 mm).
- The thickness of the panel must be between 1/32 and 5/64 in (0.8 and 2.0 mm).
- Insert unit into hole from the front side of the panel.
- Slide the mounting bracket securely against the panel from the rear of the unit.
- Wiring diagram is displayed on top of the switch.

#### SPECIFICATIONS

**Sensor Input:** RTD, thermocouple, thermistor, current, or voltage. 1 digital multipurpose dry contact (not available if unit configured for Pt 100, Pt 1000, or Ni 120 3-wire input).

**Multipurpose Input:** Dry contact 3.3 V, 1 mA (not available if sensor input is configured for Pt 100, Pt 1000, or Ni 120 3-wire input).

**Sensor Input Types:** Current: 0-20 mA/4-20 mA, configurable; Voltage: 0-10 V/2-10 V, configurable; PTC probe: -58 to 302°F (-50 to 150°C); NTC probe: -40 to 230°F (-40 to 110°C); PT100 probe\*: -148 to 999°F (-100 to 650°C); PT1000 probe\*: -148 to 999°F (-100 to 650°C); Ni120 probe: -112 to 572°F (-80 to 300°C); J T/C\*: -130 to 999°F (-90 to 700°C); K T/C\*: -130 to 999°F (-90 to 999°C).

**Output:** Relay contact.

**Control Type:** On-off.

**Power Requirements:** 115 VAC or 230 VAC (50/60 Hz), or 12-24 VAC/DC (50/60 Hz) depending on model.

**Accuracy:** ±2°F (1°C).

**Communication:** TTL/RS-485 interface, Modbus® protocol port for programming or BMS.

**Display:** 3 digit LED display.

**Relay Output:** K1 16 A in rush res. @ 250 VAC, SPDT, type 1.

**Alarm:** Built in buzzer.

**Operating Humidity:** 10-90% RH non-condensing.

**Operating Temperature:** 23 to 131°F (-5 to 55°C).

**Storage Temperature:** -13 to 158°F (-25 to 70°C).

**Weight:** 2.3 oz (65 g).

**Front Panel Rating:** IP65.

**Compliance:** CE, UKCA, cURus.

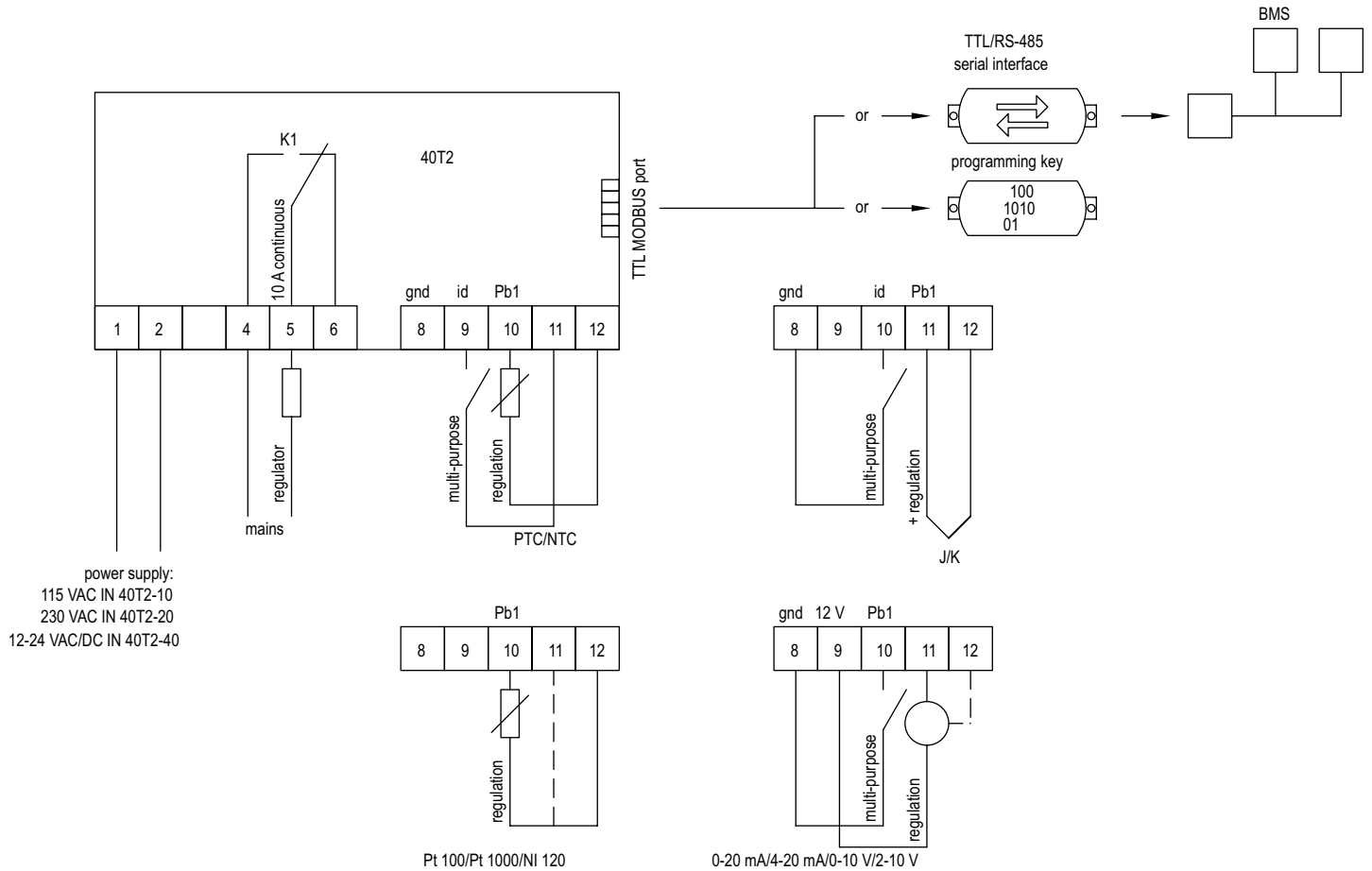
\*Upper range limited by 3-digit display.

**WIRING**

Avoid installing the temperature probe cables in close proximity of any power cables. Maximum cable length of 10 m (32.8 ft) for all cables. A temperature offset adjustment may be made using the CA1 parameter. Connection methods include fixed and plug-in screw terminal blocks for wires up to 14 AWG (2.5 mm<sup>2</sup>) and picoblade connector.

**NOTICE** To reduce any electromagnetic interference, mount the power cables as far away as possible from the signal cables.

- Disconnect the power supply before carrying out any type of maintenance.



**INITIAL SETUP**

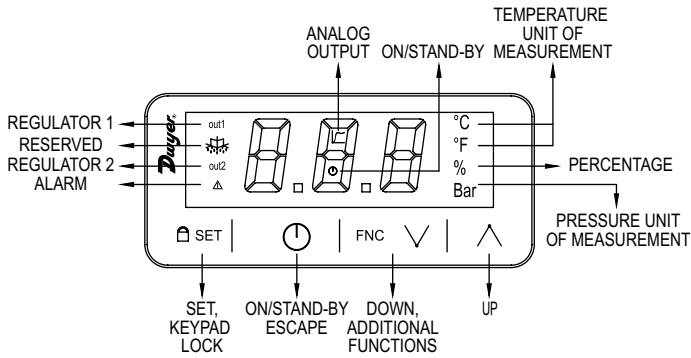
1. Install unit with the provided instructions above.
2. Electrically wire the device as described in the wiring section. A power-on self-test will begin once power is applied. This test will take a few seconds and the display will switch off when it's complete.
3. Configure the device as shown in the section SETTING CONFIGURATION PARAMETERS. The recommended parameters for first time use are listed in the chart below:

Parameter	Description	Range or Options	Factory Setting
SP	Set point	r1 or r2	0
P0	Type of input probe	0 = PTC	2
P0	Type of input probe	1 = NTC	2
P0	Type of input probe	2 = J Type Thermocouple	2
P0	Type of input probe	3 = K Type Thermocouple	2
P0	Type of input probe	4 = 3 wires Pt 100	2
P0	Type of input probe	5 = 2 wires Pt 100	2
P0	Type of input probe	6 = 3 wires Pt 1000	2
P0	Type of input probe	7 = 2 wires Pt 1000	2
P0	Type of input probe	8 = 4-20 mA	2
P0	Type of input probe	9 = 0-20 mA	2
P0	Type of input probe	10 = 2-10 V	2
P0	Type of input probe	11 = 0-10 V	2
P0	Type of input probe	12 = 3 wires Ni 120	2
P0	Type of input probe	13 = 2 wires Ni 120	2
P2	Display units	0 = °C	0
P2	Display units	1 = °F	0
r5	Cooling or heating	0 = Cooling	0
r5	Cooling or heating	1 = Heating	0

## USER INTERFACE AND MAIN FUNCTIONS

### A. Switching the Device On and Off

Press the POWER key for 4 seconds. When switched on, the display will show the P5 value.



### B. Unlocking the Keypad

Touch any key for one second, until the display shows "UnL".

### C. Setting the Set Point

1. Ensure the keypad is not locked.

2. Press the SET key. The display should show the label "SP."

3. Touch the UP or DOWN key within 15 seconds to set the value within the limits r1 and r2. The r1 and r2 defaults are 0 and 350.

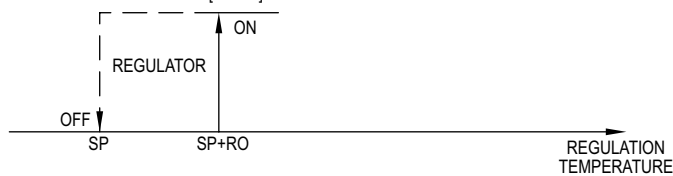
4. Press the SET key or take no action for 15 seconds to set the set point.

### D. Alarm Buzzer Reset

The audible alarm can be silenced by pressing any key.

## CONTROL MODES

COLD MODE REGULATION [R5 = 0].



HOT MODE REGULATION [R5 = 1].



ICON DESCRIPTIONS			
Icon	If Icon is On	If Icon is Off	If Icon is Flashing
out1	Regulator is Active	-	Regulator protection active
	Unused	-	Set point being set
out2	Unused	-	-
	Unused	-	-
	Alarm Active	-	-
	Unused	-	-
	Device Switched Off	Device On	Device being switched on/off
°C/°F	Temperature Display	-	-
%	Percentage Display	-	-
Bar	Pressure Display	-	-

## ADDITIONAL FUNCTIONS

### A. Displaying the number of start-ups of the relay.

1. Press the DOWN key for 4 seconds.

2. Press the UP or DOWN key within 15 seconds to select a label. nS1 = display the number of start-ups of the K1 relay in thousand.

3. Press the SET key.

4. Press the ON/STANDBY key (or take no action for 60 seconds) to exit the procedure.

### B. Displaying the temperature detected by the compressor probe.

1. Press the DOWN key for 4 seconds.

2. Press the UP or DOWN key within 15 seconds to select a label. Pb1 = regulation temperature.

3. Press the SET key.

4. Press the ON/STANDBY key (or take no action for 60 seconds) to exit the procedure.

## SETTINGS

### A. Setting Configuration Parameters

1. Press the SET key for 4 seconds. The display will then show the label "PA".

2. Press the SET key.

3. Press the UP or DOWN key within 15 seconds to set the PAS value. \*Default is "-19".

4. Press the SET key or take no action for 15 seconds and the screen will show the label "SP".

5. Touch the UP or DOWN key to select a parameter.

6. Touch the SET key.

7. Touch the UP or DOWN key within 15 seconds to set the value.

8. Touch the SET key or take no action for 15 seconds.

9. Hold the SET key for 4 seconds or take no action for 60 seconds to exit the procedure.

### B. Restoring to Default Factory Settings and Saving Customized Settings (Saving customized settings overwrites the factory settings).

1. Hold the SET key for 4 seconds. The display will show the label "PA".

2. Press the SET key.

3. Press the UP or DOWN key within 15 seconds to set the value.  
a) Value: 149 – value for restoring the factory information (default)

b) Value: 161 – value for saving customized settings

4. Press the SET key or take no action for 15 seconds.

5. Press the SET key.

6. Press the UP or DOWN key within 15 seconds to set "1".

7. Press the SET key or take no action for 15 seconds. The display will show "- -" flashing for 4 seconds and then it will exit the procedure.

8. Disconnect the device from the power supply.

9. Hold the SET key for 2 seconds before action 6 if you would like to exit the procedure.

FACTORY PARAMETER SETTINGS				
Parameter	Description	Units	Range or Options	Factory Setting
SP	Set point	Degrees	r1 to r2	0.0
CA1	Probe adjustment	Degrees	-25 to 25	0.0
P0	Type of input probe	Option	0-PTC, 1-NTC, 2-J Type, 3-K Type, 4-3 wires Pt 100, 5-2 wires Pt 100, 6-3 wires Pt 1000, 7-2 wires Pt 1000, 8-4 to 20 mA, 9- 0 to 20 mA, 10-2 to 10 V, 11-0 to 10 V, 12-3 wires Ni 120, 13-2 wires Ni 120	2
P1	Decimal point enable	Option	0-disable, 1-enable	0
P2	Engineering units	Option	0-C, 1-F, 2-%, 3-bar, 4-blank	0
P3	Minimum process input value	Counts	-199 to 999	0.0
P4	Maximum process input value	Counts	-198 to 999	100
P5	Value displayed during normal operation	Option	0-probe temp, 1-set point	0
P8	Display refresh time	Tenths of a second	0 to 250	5
r0	Set point differential	Degrees	1 to 99	2.0
r1	Minimum set point value	Degrees	-199.0 to r2	0.0
r2	Maximum set point value	Degrees	r1 to 999	350.0
r5	Cooling or heating	Option	0-cooling, 1-heating	0
r11	Digital input second set point	Degrees	-199 to 999 set point + r11	0.0
C1	Minimum time between regulator starts	Minutes	0 to 240	0
C2	Minimum regulator stoppage time	Minutes	0 to 240	0
C3	Minimum on time of regulator	Seconds	0 to 240	0
C4	Regulator behavior during probe alarm	Minutes	0-off, 1-on	0
A1	Temperature alarm set point	Degrees	-199 to 999	0.0
A2	Temperature alarm type	Option	0-disabled, 1-abs min, 2-abs max, 3 min relative to SP, 4-max relative to SP	0
A3	Temperature alarm delay	Minutes	0 to 999	0
A7	Temperature alarm delay upon set point modification and power On	Minutes	0 to 999	0
A8	Temperature alarm delay after silencing and persistent alarm condition	Minutes	0 to 240	0
A11	Temperature alarm switch off from set point	Degrees	1 to 99	2.0
A13	Enable alarm buzzer	Option	0-disable, 1-enable	1
i5	Multi-purpose input function	Option	0-disable, 1-alarm iA, 2-alarm iA+compressor off, 3-switch device on/off, 4-modifies set point	0
i6	Multi-purpose input activation	Option	0-contact closed, 1-contact open	0
i7	Multi-purpose input alarm delay	Seconds	0 to 999	0
POF	Enable "ON/Stand-by" button	Option	0-disable, 1-enable	1
PAS	Set password	Number	-99 to 999	-19
LA	Modbus® protocol address	Number	1 to 247	247
Lb	Modbus® protocol baud rate	Option	0-2,400 baud, 1-4800 baud, 2-9600 baud, 3-19,200 baud even	3

ALARMS			
Code	Description	Reset	How to Correct
Pr1	Compressor probe alarm	Automatic	Check P0 Check integrity of the probe Check electrical connection
AL	Temperature alarm	Automatic	Check A1, A2 and A3
iA	Multi-purpose input alarm	Automatic	Check i5 and i6

#### MAINTENANCE/REPAIR

Upon final installation of the Series 40T2, no routine maintenance is required. The Series 40T2 is not field serviceable and is not possible to repair the unit. Field repair should not be attempted and may void warranty.



This symbol indicates waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your Local Authority or retailer for recycling advice.

#### WARRANTY/RETURN

Refer to "Terms and Conditions of Sale" in our catalog and on our website. Contact [returns@dwyermail.com](mailto:returns@dwyermail.com) to receive a Return Materials Authorization number before shipping the product back for repair. Be sure to include a brief description of the problem, PO#/Order#/or Invoice# that this unit was purchased on plus any additional application notes.

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