Cecomp® ThermoPro® Digital Temperature Transmitters

- 100Ω Platinum RTD
- 316 Stainless Steel Probe
- 2 wire 4-20 mA Output with Programmable Range

- –58.0°F to 392.0°F or –50.0°C to 200.0°C
- NEMA 4X Housing
- Spring-Loaded Versions Available for Thermowells

Specifications

Ranges and Resolution
–58.0°F to 392.0°F or –50.0°C to 200.0°C
Extrapolated range for out-of-range conditions
0.1°F or 0.1°C resolution
User selectable °F or °C

Accuracy
Includes linearity, hysteresis, repeatability
±0.3°C at 0°C, ±1.1°C at 150°C
11-point linearization

Sensor
IEC-751 Class B 100Ω ±0.003S5 alpha curve RTD
1/2” NPT male, 316 stainless steel sheath
Spring-loaded probe versions fit standard thermowells
Standard probes are welded to hex fitting
Consult factory other sensor types

Display
4 readings per second nominal display update rate
4 digit LCD, 0.5” H
5 character 0.25” H alphanumeric

Analog Output
12,000 count 4-20 mA output
Updated approximately 4 times per second
Temperature range configurable to correspond to 4-20 mA output
Configurable for upscale or downscale burnout
Indication on display for low loop power

Power
Any DC supply/loop resistance that maintains 8 to 32 VDC at output
Temperature range configurable to allow testing of system operation. Test level is user set.
Output test function can be pass code protected

Calibration
User settable pass code required to enter calibration mode
Zero and span temperature calibration
Non-interactive zero, span, and linearity, ±10% of range

Weight
Product: 12 ounces (approximately)
Shipping: 1 pound (approximately)

Housing Material
ABS/polycarbonate NEMA 4X case, rear gasket, polycarbonate label, aluminum sensor block

Housing Size
3.5” W x 3.0” H x 2.0” D (not including probe or cable strain relief)
Add approximately 1” to depth for strain relief and wire clearance

Storage Temperature
–40 to 203°F (–40 to 95°C)

Operating Range
–4 to 185°F (–20 to 85°C) at housing

Wiring
Connection to the T16L is made with the 2-wire cable at the gauge rear. Reversing the connections will not harm the gauge but will not operate with incorrect polarity. See the wiring examples below for connecting to a 4-20 mA current loop.

How to Order
Spring-loaded RTD probes MUST be used with a thermowell. Length = thermowell “S”, “L”, “A” or “stem length” dimension. See your thermowell manufacturer’s specifications.

NOTE: probe length is NOT the same as thermowell insertion depth.
Consult factory for custom probe lengths.

<table>
<thead>
<tr>
<th>Model</th>
<th>Length</th>
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<tbody>
<tr>
<td>T16L2</td>
<td>2.5” L fixed length</td>
</tr>
<tr>
<td>T16L4</td>
<td>4” L fixed length</td>
</tr>
<tr>
<td>T16L6</td>
<td>6” L fixed length</td>
</tr>
<tr>
<td>T16L9</td>
<td>9” L fixed length</td>
</tr>
<tr>
<td>T16L12</td>
<td>12” L fixed length</td>
</tr>
<tr>
<td>T16L2S</td>
<td>2.5” L spring-loaded</td>
</tr>
<tr>
<td>T16L4S</td>
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<td>T16L6S</td>
<td>6” L spring-loaded</td>
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<tr>
<td>T16L9S</td>
<td>9” L spring-loaded</td>
</tr>
<tr>
<td>T16L12S</td>
<td>12” L spring-loaded</td>
</tr>
</tbody>
</table>

If you require a certain programming configuration to be pre-set from the factory, please indicate it on your order.

Option—add to end of model number
- C Destination

Cecomp maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. Consult factory for your specific requirements.
Installation and Precautions
Read these instructions before installation. Configuration may be easier before installation.
Avoid shock hazards! Turn power off before connecting or disconnecting wiring. All wiring must be performed by a qualified electrician or instrumentation technician. See diagrams on other side for wiring examples. Consult factory for assistance.
Install or remove thermometer using a wrench on the hex fitting only. Do not attempt to turn by forcing the housing.
Do not exceed maximum allowable housing temperature.
The spring-loaded design must be used with a thermowell. The non-spring-loaded design can be used in non-pressurized applications or applications with no flux flow. Due to the hardness of 316 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.

Loop Voltage
Select a loop power supply voltage and total loop resistance so that when the loop current is 20 mA, the transmitter will have at least 8 VDC at its terminals. For correct operation, the terminal voltage must never fall below 8 VDC. Below about 7.6 VDC erratic operation may occur. Too large a loop resistance will cause the output to “lim- it” or saturate before reaching its full 20 mA output. The minimum loop supply voltage may be calculated from the formula:

Vmin = 8V + (20mA x Total loop resistance)

This is an indication that the loop supply/resistance may not allow adequate headroom for reliable operation. This should never occur in normal use. If it does, examine the loop supply/resistance.

Normal Operation
To turn the unit on, apply power. The ThermoPro is designed for continuous operation. Warm-up time is negligible.
When power is first applied, the ThermoPro will set the loop current to 20 mA and check the voltage available. If there is sufficient voltage available to power the unit, all active segments will be displayed briefly. Then the display and the loop current will correspond to maximum and check the voltage available. If there is sufficient voltage available to power the unit, the ThermoPro will set the loop current to 20 mA.

Out-of-Range Indications
RTD over-range condition >392.0°F or >200.0°C
RTD under-range condition <58.0°F or <-50.0°C
If the RTD temperature is outside of the extrapolated range, a burnout condition is assumed.
1...1 if upscale burnout is selected. The loop current will be at 20 mA.
-1...-1 if downside burnout is selected. The loop current will be 0 mA.

User Configuration Mode
From the normal operating mode, press and hold ↑ and then press the TEST button until CFG is displayed.
When the buttons are released the upper display will indicate __________ with the left position blinking, and the lower display will indicate PASS.
Pressing and releasing TEST exits configuration. The unit will automatically revert to normal operating mode if no buttons are operated for approximately 15 seconds.
Enter the user-defined pass code (3510 factory default).
Use the ↑ and ↓ buttons to increase or decrease the numerical value.
Press and release the TEST button to index to the next position.
If an incorrect pass code was entered, the loop will alternate between CAL and 4 MA.
Press and release the TEST button to proceed to the configuration sequence.

Temperature Scale Selection
The upper display will be blank, and the lower section will display DEG C or DEG F.
To change from Celsius to Fahrenheit, press and release the ↓ button. The lower display will change to DEG F.
To change from degrees Fahrenheit to Celsius, press and release the ↑ button. The lower display will change to DEG C.
Whether or not a change is made, the Test value will be reset to 0.0°C or to 32.0°F.
Press and release the TEST button to move on to the next parameter.

Upscale/Downscale Burnout
The upper display will be blank, and the lower display will indicate UP BO or DN BO.
To change from upscale burnout to downside burnout, press and release the ↑ button. The display will change to DN BO.
To change from downside burnout to upscale burnout, press and release the ↓ button. The display will change to UP BO.
Press and release the TEST button to move on to the next parameter.

Output Range
The upper display will indicate the temperature corresponding to a loop current of 4 mA. The lower display will indicate RNGLO.
To change the temperature corresponding to a loop current of 4 mA, use the ↑ and ↓ buttons to set the desired value. Press and release the TEST button to move on to the next parameter.
The upper display will indicate the temperature corresponding to a loop current of 20 mA. The lower display will indicate RNGHI.
To change the temperature corresponding to a loop current of 20 mA, use the ↑ and ↓ buttons to set the desired value.
Press and release the TEST button to save the configuration parameters and restart the gauge. The configuration parameters will not be saved if the procedure is interrupted before completion.

Output Test Level
To set the test output level, press and hold the front-panel TEST button and press the ↑ and ↓ buttons to adjust the test output to the desired temperature. This setting is stored in non-volatile memory.
When the TEST button is held depressed, the display and loop current are switched, independent of the RTD temperature, to a level determined by the test setting. When the button is released, normal operation is resumed.

Calibration Mode
The ThermoPro is factory calibrated and there is generally no need to alter calibration settings. Required calibration equipment includes a temperature reference and milliamp meter of at least four times headroom for reliable operation. This should never occur in normal use. If it does, examine the loop supply/resistance.

Loop Calibration
Note: to store the calibration parameters and exit calibration mode at any time, press and hold the TEST button for more than 2 seconds until the display indicates __________. Press the TEST button and release it when the display indicates LCAL. During loop calibration only the loop current will change. The pre-configured temperatures will not change.
The upper display will indicate the temperature corresponding to a 4 mA loop current. The lower display will alternate between CAL and 4 MA.
Use the ↑ and ↓ buttons to adjust the actual loop current to 4 mA.
Press the TEST button and release it when the display indicates LCAL.
The upper display will indicate the pre-configured temperature corresponding to a 20 mA loop current. The lower display will alternate between CAL and 20 MA.
Use the ↑ and ↓ buttons to adjust the actual loop current to 20 mA.

Ice Point Calibration
Press the TEST button and release it when the display indicates CAL.
Apply 0.0°C or 32.0°F to the RTD. At approximately 12°C (54°F), the ice-point calibration mode will automatically be selected.
The lower display will alternate between IC60 and IC60°F. Use the ↑ and ↓ buttons to adjust the upper display to indicate 0.0°C or 32.0°F.

Second Point Calibration
Press the scale reference to the RTD. The lower display will alternate between CAL and DEG C or DEG F. Use the ↑ and ↓ buttons to adjust the upper display to indicate the applied temperature value.
To store the calibration parameters and exit calibration mode, press and hold the TEST button until the display indicates - - - - - . The unit will restart in the normal mode.

Change Pass Code
From the normal operating mode, press and hold the ↑ button and then press the TEST button until CFG is displayed.
When buttons are released the upper display will indicate __________ with the left position blinking, and the lower display will indicate PASS.
Pressing and releasing TEST exits configuration. The unit will automatically revert to normal operating mode. If no buttons are operated for approximately 15 seconds or if an incorrect pass code was entered,
Enter pass code 1220 (factory default). Use the ↑ and ↓ buttons to increase or decrease the numerical value. Press and release the TEST button to index to the next position.
After 1220 has been entered press and release the TEST button to proceed to the pass code change sequence.
The present pass code will be displayed. Operate the ↑ or ↓ button to select the first character of the new pass code.
Press and release the TEST button to proceed to the next character. Repeat until the new pass code is complete and the last number stops blinking. To correct any entry errors press the ↑ or ↓ button again. Write down the new pass code in a secure place.
To exit, press and hold the TEST button until the display indicates - - - - - . The unit will restart in the normal mode.