ThermoPro® Loop Powered Temperature Transmitters F16LT

Input: ***Built-In RTD Probe, –58.0°F to 392.0°F or –50.0°C to 200.0°C***
Output: ***4-20 mA***

- ***User-Programmable Temperature Range***
- ***Precision RTD Temperature Element***
- ***NEMA 4X Housing***
- ***Powered by 4-20 mA Current Loop***
- ***316 Stainless Steel Probe***
- ***1/2" NPT Fitting for Standard Thermowells***



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.
Probe length is measured from top of full threads to tip of probe.
Consult factory for custom probe lengths.

Specifications

Range
–58.0°F to 392.0°F or –50.0°C to 200.0°C, selectable °F or °C
Keypad programmable range to correspond to 4-20 mA output

Resolution
0.1°F or 0.1°C

Accuracy (linearity, hysteresis, repeatability)
±0.3°C at 0°C, ±1.1°C at 150°C

Sensor
IEC-751 Class B 100 Ω 0.00385 alpha curve RTD
Consult factory for other probe types or configurations

Display
4 readings per second nominal display update rate
4½ digit LCD, ½" digit height, alphanumeric lower display for units

Controls & Functions
TEST When held sets loop current and display to test level, independent of temperature input, to allow testing of system operation
▲ Up: increase output or calibration values during setup
▼ Down: decrease output or calibration values during setup

Calibration
User settable passcode required to enter calibration mode
Zero and span temperature calibration

Loop Supply Voltage
Any DC supply/loop resistance that maintains 8 to 32 VDC at gauge terminals
Reverse polarity protected
3 ft long, 2-conductor 22 AWG cable
Order optional **9046-24-008** loop power supply to power 4-20 mA loop

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

Mechanical Specifications

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

Weight (approximate)
Transmitter: approx. 12 ounces
Shipping weight: approx. 1 pound

Material and Color
ABS/polycarbonate housing. Gasketed rear cover, NEMA 4X
Light gray body, light gray/blue front

Connection and Probe Material
½" NPT male, 316 stainless steel. Consult factory other connections

Environmental
Storage temperature –40 to 203°F (–40 to 95°C)
Operating temperature –4 to 185°F (–20 to 85°C) for housing

Model	Type	Fitting	Length
F16LT2	Fixed RTD	1/2 NPT	2.5" L
F16LT4	Fixed RTD	1/2 NPT	4" L
F16LT6	Fixed RTD	1/2 NPT	6" L
F16LT9	Fixed RTD	1/2 NPT	9" L
F16LT12	Fixed RTD	1/2 NPT	12" L
F16LT2S	Spring-Loaded RTD	1/2 NPT	2.5" L
F16LT4S	Spring-Loaded RTD	1/2 NPT	4" L
F16LT6S	Spring-Loaded RTD	1/2 NPT	6" L
F16LT9S	Spring-Loaded RTD	1/2 NPT	9" L
F16LT12S	Spring-Loaded RTD	1/2 NPT	12" L

Cecomp Electronics

ThermoPro® F16LT Series Installation and Setup

DESCRIPTION

The ***ThermoPro*** series is microprocessor controlled industrial temperature indicator with a digital temperature display and 4-20 mA retransmission in a rugged NEMA 4X housing. The 2-wire connection allows the ***ThermoPro*** to be used as a temperature display powered by a low-voltage DC source and/or as a loop-powered 4-20 mA transmitter. All operating power is supplied by the 4-20 mA current loop.

The 316 stainless steel RTD probe with a 1/2" NPT fitting is available in either a fixed-length or a spring loaded design to fit standard industrial thermowells. A high accuracy 0.00385 alpha curve RTD element with a three-wire transitionless design is used. The temperature probe assembly is replaceable. Contact factory for special probe versions.

The RTD temperature reading is linearized for both the digital display and the 4-20 mA output. The temperature display may be set up to read °F or °C and the 4-20 mA output may be set to correspond to a desired temperature range.

The ***ThermoPro*** NEMA 4X housing, when properly installed, is suitable for indoor or outdoor non-hazardous locations and provides a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water, corrosion and ice formation.

The ***ThermoPro*** features a TEST pushbutton which, when depressed, switches the display and output loop to a preset user-selectable level. This test mode will allow setup and testing of the current loop by switching to this test level whenever desired without having to alter the system temperature.

INSTALLATION AND PRECAUTIONS

Install or remove using wrench on probe hex fitting only. Do not attempt to tighten by turning housing or any other part of the gauge.

The spring-loaded design is intended for use only with a thermowell. Use a thermowell appropriate for the process. A thermowell is required for pipelines with flowing material or pressurized applications. Consult thermowell manufacturer for proper thermowell selection with regard to material compatibility, pressure and flow rates.

The non-spring-loaded design can be used in non-pressurized applications or applications with no flow. Due to the hardness of 316 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.

ELECTRICAL CONNECTION

Connection to the ***ThermoPro*** is made with the 2-wire cable at the gauge rear. Connect the loop (+) supply to the RED lead and the loop (–) supply to the BLACK lead. Reversing the connections will not harm the transmitter but it will not operate with incorrect polarity.

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 and to avoid erratic or erroneous readings, the terminal voltage must not fall below 8 VDC. Too large a loop resistance will cause the output to "limit" 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)

If the terminal voltage falls below about 7.8 VDC erratic operation may occur. 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.

SETUP AND OPERATION

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 maximum 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 the temperature of the RTD probe.

At power-up, if the voltage available is not sufficient, only the low power segment will be displayed. This is an indication that the loop impedance is too high or the loop power supply voltage is too low. After successful power-up, if the loop voltage falls below the minimum required for reliable operation, the ***ThermoPro*** will continue to indicate the temperature of the RTD with the low power segment blinking at a slow rate.

If the RTD temperature goes above 392°F or 200°C, ALARM1 will be displayed. If the RTD temperature goes below the –58°F or –50°C, ALARM2 will be displayed. If the RTD temperature continues beyond these limits, the display will eventually indicate 1.-.-.-. and the loop current will be minimum if downscale burnout is configured or maximum if upscale burnout is configured.

To configure the ***ThermoPro*** press and hold the Up and then press the TEST button until the upper display indicates **CFG**. When the buttons are released the the upper display will indicate _ _ _ _ with the left-most position blinking, and the lower display will indicate **PASS**. Pressing and releasing TEST exits configuration.

Enter the factory default passcode of **3510**. Use the up and down buttons to set the digit and the TEST button to move to the next position. Press and release the TEST pushbutton to proceed to the configuration sequence. If an incorrect passcode was entered, the gauge will exit to the normal operating mode.

The upper display section will be blank, and the lower section will display either **DEG C** or **DEG F**. To change from °C to °F, press and release the UP pushbutton. The lower section of the display will change to **DEG F**. To change from °F to °C, press and release the Down pushbutton. The lower section of the display will change to **DEG C**. Note: 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 pushbutton to move on to the next parameter.

The upper display section will be blank, and the lower section will display either **DN BO** or **UP BO**. To change from downscale burnout to upscale burnout, press and release the Up button. The lower section of the display will change to **UP BO**. To change from upscale burnout to downscale burnout, press and release the Down button. The lower section of the display will change to **DN BO**. Press and release the TEST pushbutton to move on to the next parameter.

The upper display section will indicate the temperature corresponding to a loop current of 4 mA. The lower section will display **RNGLO**. To change the temperature corresponding to a loop current of 4 mA, use the Up and the Down pushbuttons to set the desired value. Press and release the TEST pushbutton to move on to the next parameter.

The upper display section will indicate the temperature corresponding to a loop current of 20 mA. The lower section will display **RNGHI**. To change the temperature corresponding to a loop current of 20 mA, use the Up and the Down buttons to set the desired value. Press and release the TEST pushbutton to save the configuration parameters and restart the gauge. The configuration parameters will not be saved if the procedure is interrupted before completion.

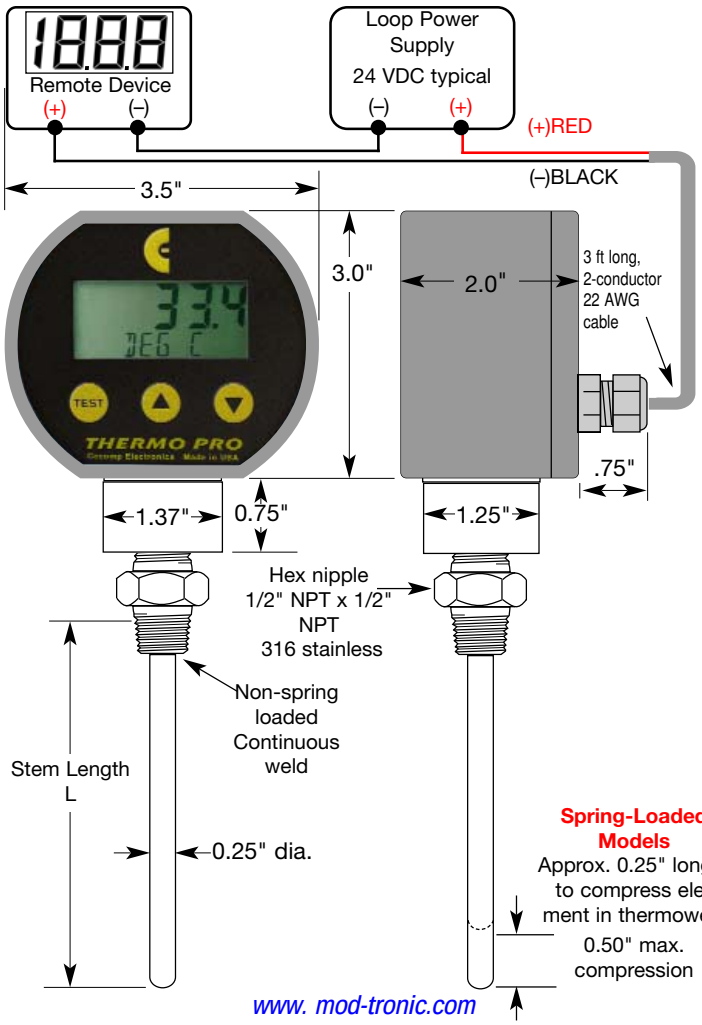
TEST BUTTON

To set the test output level, press and hold the front-panel TEST button and press the up or down arrow buttons to adjust the test output to the desired temperature setting. 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

The ***ThermoPro*** is factory calibrated and there is generally no need to alter calibration settings. If recalibration is necessary, consult factory, or refer to **cecomp.com** for calibration information. Calibration should only be attempted if the user has access to a temperature reference of known accuracy. The quality of the calibration is only as good as the accuracy of the calibration equipment and ideally should be at least four times the unit's accuracy.



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Cecomp maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. Consult factory for your specific requirements.

Temperature