

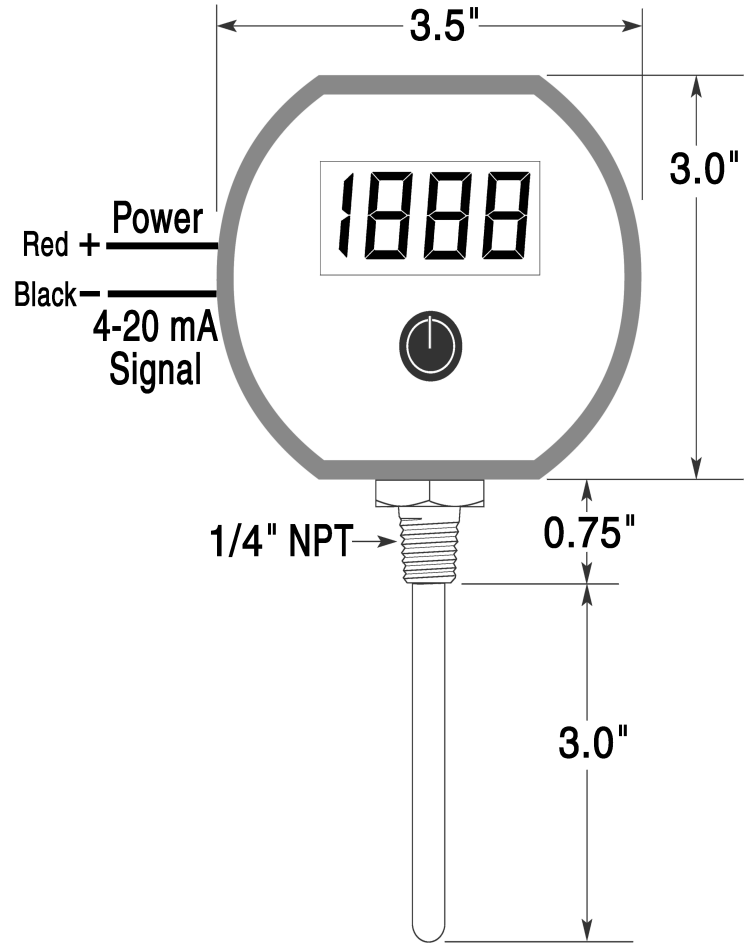
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# F4L-300F-I (RTD)

## 2-Wire 4-20 mA Loop-Powered Indicating RTD Transmitter (0-300° F)

- 4-20 mA Analog Output
- Output Test Function
- NEMA 4 Housing with Polycarbonate Display Window



### Size

3.5"W x 3.0"H x 2.0"D

Add approximately 3.00" to height for temperature fitting and 1" to depth for strain relief and wire clearance

### Weight (approximate)

9 ounces

Shipping weight: 1 pound

**Storage temperature** . . . . . -40 to 203°F  
 (-40 to 95°C)

**Operating temperature** . . . . . -4 to 185°F  
 (-20 to 85°C)

### Output Characteristics

True analog output, not digitized

70 millisecond typical response time

If gauge terminal voltage falls below approximately 7.8VDC erratic operation may occur.

### Housing

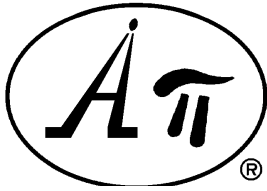
NEMA 4X UV stabilized polycarbonate/ABS case, light gray color

Clear polycarbonate window to protect display

Gasketed rear cover, six captive stainless steel screws



*I love America because she allows people to chase their dreams whatever they may be and triumph. America is a land of opportunity*



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**Accuracy** (linearity, hysteresis, repeatability)  
 Standard:  $\pm 0.25\%$  of full scale  $\pm 1$  least significant digit

**Display** (update rate, type, size)  
 3 readings per second nominal display update rate  
 3 1/2 digit LCD, 1/2" digit height

**Controls**  
 Non-interactive zero and span,  $\pm 10\%$  range  
 Test calibration level: 0-100% of range  
 Retransmission zero and span: internal potentiometers

**Loop Supply Voltage**  
 Any DC supply/loop resistance that maintains 8 to 32 VDC at F4L terminals. F4L is reverse polarity protected.  
 3 ft long, 2-conductor 22 AWG shielded cable

**Test Function**  
 Front panel button (Test Button), when depressed sets loop current and display to "test calibration" level, independent of temperature input, to allow testing of system operation. "Test Cal" level is set by a multiturn potentiometer to any value from 0 to 100% of Full scale output.

- **Operation of Test Function**  
 The TEST pushbutton on the front of the gauge, when depressed, switches the display and output loop to a preset level determined by the setting of a Test potentiometer. This test mode will allow setup and testing of the current loop and all connected output devices by switching to this test level whenever desired without having to alter the system temperature. To set the test output level, see F4L label for location of Test potentiometer. Press and hold the front-panel TEST button and adjust the Test potentiometer to set the display and loop current to the desired test level.

**Electrical Connection**  
 Connection to the F4L is made with the 2-wire cable at the gauge rear. Connect the loop positive (+) supply to the RED lead and the loop negative (-) supply to the BLACK lead. Reversing the connections will not harm the unit but the F4L will not operate with incorrect polarity. NEVER connect the wires to voltage greater than 32 VDC or permanent damage not covered by warranty will result.

**Installation and Precautions**  
 Install or remove F4L using wrench on hex fitting only. Do not attempt to tighten by turning housing or any other part of the unit. It is recommended that a thread sealant be used to ensure leak-free operation.

**Description**  
 All operating power for the F4L unit is supplied by the 4-20 mA current loop. The 2-wire connection allows the F4L to be used as a digital indicating transmitter in any 4-20 mA current loop application. The output is a continuous analog signal based on the temperature transducer output rather than the display. The output is filtered to improve noise immunity and has a response time of about 70 msec.

**Calibration**  
**\*Display** — See unit label for location of individual controls to adjust the zero and span of the display. Adjust the Zero control until the gauge reads zero with the minus (-) sign occasionally flashing. Span 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 F4L's accuracy. Zero calibration must be done before span calibration. Record readings at three to five points over the range of temperature transmitter and adjust span control to minimize error and meet specifications.

**\*Current Loop** — The F4L has internal controls to adjust the agreement between the displayed value and the 4-20 mA loop current. These are set at the factory and should not normally be adjusted. If adjustment is necessary, consult factory. Accurate temperature generation and measurement and current measurement equipment are required to successfully complete this calibration.

**Loop Voltage**

Select a loop power supply voltage and total loop resistance so that when the loop current is 20 mA, the F4L will have at least 8 VDC at its terminals. For correct operation and to avoid erratic or erroneous readings, the F4L terminal voltage must not fall below 8 VDC. Too large a loop resistance will cause the unit's output to "limit" or saturate before reaching its full 20 mA output. The **minimum** loop supply voltage may be calculated from the formula:

$$V_{min} = 8V + (20mA \times \text{Total loop resistance})$$

If the terminal voltage of the F4L 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.

