

# ENDURANCE™ Conductivity Sensor

For additional information, please visit our website  
at [www.emersonprocess.com/raihome/liquid/](http://www.emersonprocess.com/raihome/liquid/).

**⚠ CAUTION**  
**SENSOR/PROCESS**  
**APPLICATION COMPATIBILITY**

The wetted sensor materials may not be compatible with process composition and operating conditions. Application compatibility is entirely the responsibility of the user.

**⚠ WARNING** 

Before removing the sensor, be absolutely certain that the process pressure is reduced to 0 psig and the process temperature is lowered to a safe level!

## SENSOR SPECIFICATIONS

SPECIFICATIONS	MODEL 404-16 (PVC body)	MODEL 404-17 (stainless steel body)
Wetted Materials	Titanium, PEEK (glass filled), PVC, EPDM, polyethylene	Titanium, PEEK (glass filled), 303 SST, EPDM
Temperature Range	32-140°F (0-60°C)	32-212°F (0-100°C)
Maximum Pressure	20 psig (239 kPa abs) at 60°C (140°F) 100 psig (791 kPa abs) at 25°C (77°F) (use FNPT fittings only)	100 psig (791 kPa abs)

## INSTALLATION

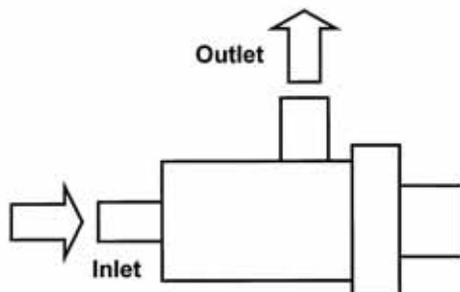
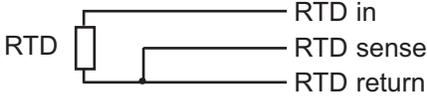


FIGURE 1. Installation of Model 404 Sensor

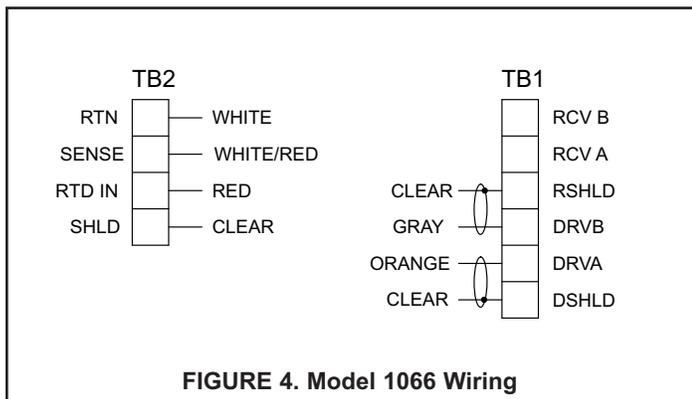
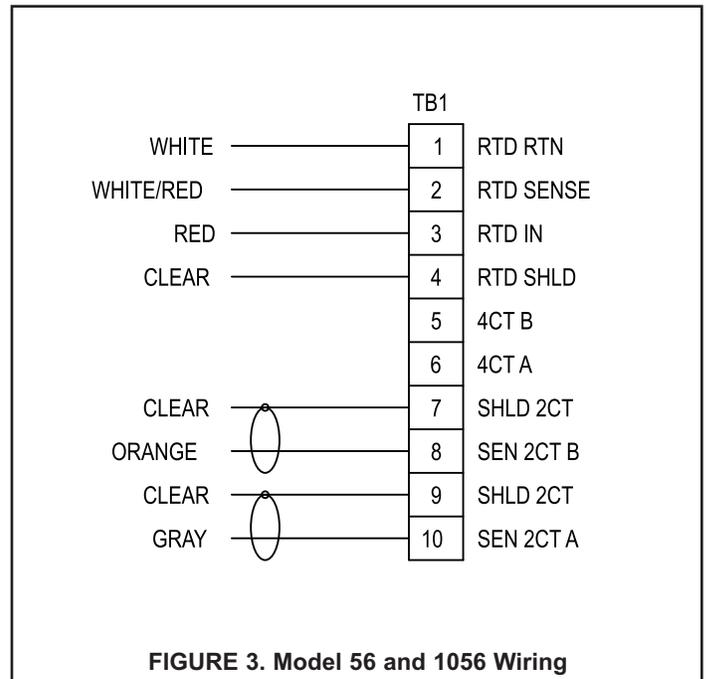
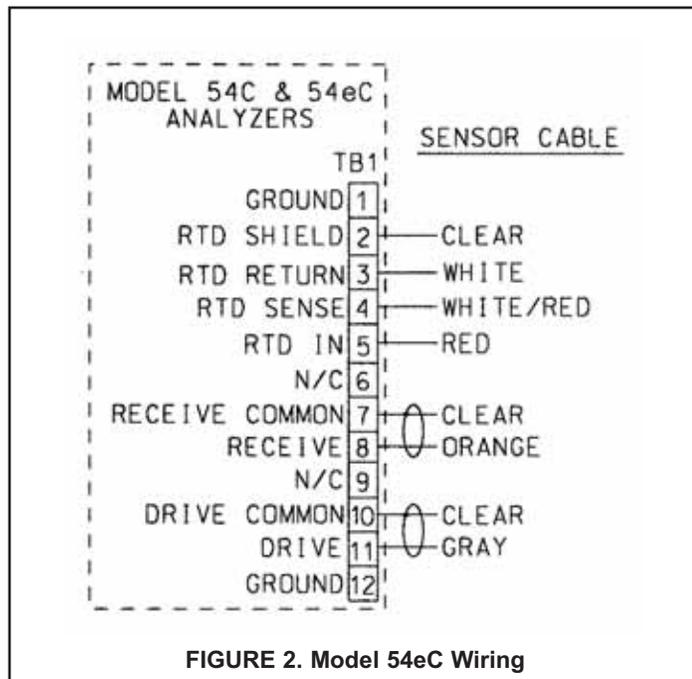
If the sensor is installed in a sidestream with the sample draining to open atmosphere, bubbles may accumulate on the electrodes. Trapped bubbles will cause errors. Normally, as bubbles accumulate the conductivity reading drifts down. To control bubble formation, apply a small amount of back pressure to the sensor.

## WIRING

### WIRE COLOR AND CONNECTIONS IN SENSOR

COLOR	FUNCTION
Gray	Connects to outer electrode
Clear	Coaxial shield for gray wire
Orange	Connects to inner electrode
Clear	Coaxial shield for orange wire
Red	
White with red stripe	
White	
Clear	Shield for all RTD lead wires

### WIRING DIAGRAMS





## CLEANING THE SENSOR

The 404-17 (stainless steel body) sensor can be taken apart for cleaning. However, in some cases, disassembling and reassembling the sensor can cause the cell constant to change as much as 1%. For maximum accuracy, the cell constant should be rechecked after the sensor has been reassembled. The 400-16 (PVC body) sensor cannot be taken apart.

Use a warm detergent solution and a soft brush or pipe cleaner to remove oil and scale. Isopropyl alcohol (rubbing alcohol) can also be used to remove oily films. Avoid using strong mineral acids to clean conductivity sensors.

## CALIBRATION

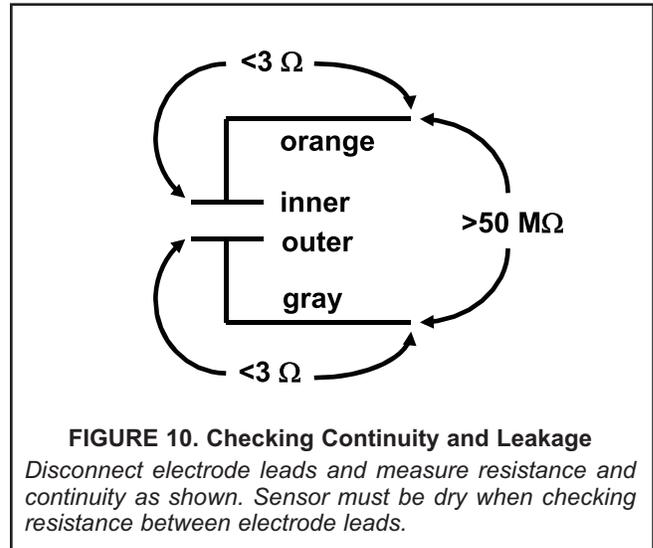
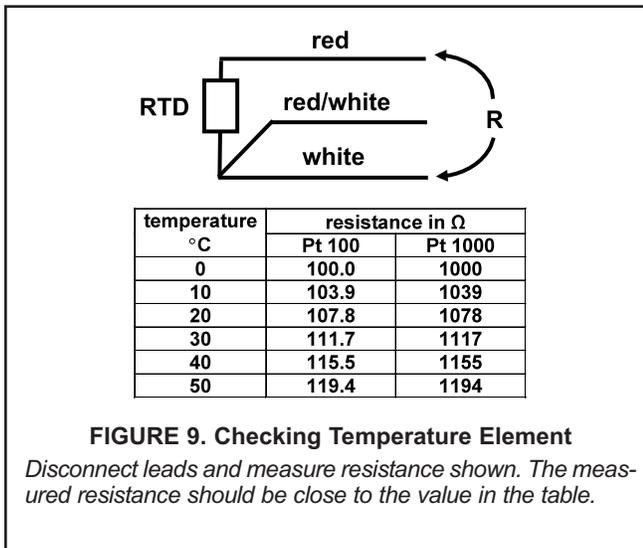
ENDURANCE conductivity sensors are calibrated at the factory and do not need calibration when first placed in service. Simply enter the cell constant printed on the label into the analyzer.

After a period of service, the sensor may require calibration. Because Model 404 sensors have a flow-through design, they are best calibrated against a referee meter and sensor where the two sensors are connected in series with the same liquid flowing through both.

For more information about calibrating contacting conductivity sensors, refer to application sheet ADS 43-024, available on the Rosemount Analytical website.

## TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	SOLUTION
Off-scale reading	Wiring is wrong.	Verify wiring.
	Temperature element is open or shorted.	Check temperature element for open or short circuits. See Figure 9.
	Sensor is not in process stream.	Be sure sensor is completely submerged in process stream.
	Variopol cable is not properly seated.	Loosen connector and reseal.
	Sensor has failed.	Perform isolation checks. See Figure 10.
Noisy reading	Sensor is improperly installed in process stream.	Be sure sensor is completely submerged in process stream.
	Variopol cable is not properly seated.	Loosen connector and reseal.
Reading seems wrong (lower or higher than expected)	Bubbles trapped in sensor.	Be sure sensor is properly oriented in pipe or flow cell. See Figure 1. Apply back pressure to flow cell.
	Wrong temperature correction algorithm.	Check that temperature correction is appropriate for the sample. See analyzer manual for more information.
	Wrong cell constant.	Verify that the correct cell constant has been entered in the analyzer and that the cell constant is appropriate for the conductivity of the sample. See analyzer manual.
Sluggish response	Electrodes are fouled.	Clean electrodes.
	Sensor is sampling a dead area.	Move sample line to a location more representative of the process liquid.



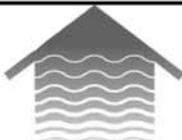
## NOTES

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the right answers,  
right now.*

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*Specifications subject to change without notice.*

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