

# Rosemount™ 140/141/142

## Contacting Conductivity Sensors





# Essential Instructions

## Read this page before proceeding!

Emerson designs, manufactures and tests its products to meet many national and international standards. Because these sensors are sophisticated technical products, you **MUST** properly install, use, and maintain them to ensure they continue to operate within their normal specifications. The following instructions **MUST** be adhered to and integrated into your safety program when installing, using, and maintaining Rosemount products. Failure to follow the proper instructions may cause any one of the following situations to occur: loss of life; personal injury; property damage; damage to this sensor; and warranty invalidation.

- Read all instructions prior to installing, operating, and servicing the product.
- If you do not understand any of the instructions, contact your Emerson representative for clarification.
- Follow all warnings, cautions, and instructions marked on and supplied with the product.
- Inform and educate your personnel in the proper installation, operation, and maintenance of the product.
- Install your equipment as specified in the Installation Instructions of the appropriate Instruction Manual and per applicable local and national codes. Connect all products to the proper electrical and pressure sources.
- To ensure proper performance, use qualified personnel to install, operate, update, program, and maintain the product.
- When replacement parts are required, ensure that qualified people use replacement parts specified by Emerson. Unauthorized parts and procedures can affect the product's performance, place the safe operation of your process at risk, and **VOID YOUR WARRANTY**. Third-party substitutions may result in fire, electrical hazards, or improper operation.
- Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified persons, to prevent electrical shock and personal injury.

The information contained in this document is subject to change without notice.

### 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.

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### CAUTION

Before removing the sensor, be absolutely certain the process pressure is reduced to 0 psig and the process temperature is at safe level.

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# About This Document

This manual contains instructions for installation and operation of the Rosemount 140/141/142 Contacting Conductivity Sensor

The following list provides concerning all revisions of this document.

<b>Rev. Level</b>	<b>Date</b>	<b>Notes</b>
F	05/17	Reformatted to reflect the latest Emerson documentation style Specifications and Wiring Diagrams.

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# Section 1: Specifications

## 1.1 Specifications

**Table 1-1: Rosemount 140 contacting conductivity sensor specifications**

<b>Wetted Materials</b>	
Electrodes	316 stainless steel
Body	316 stainless steel
Insulator	PEEK
O-rings	Viton
<b>Temperature range</b>	
Standard	32 °F to 302 °F (0 °C to 150 °C) maximum
High temperature	32 °F to 392 °F (0 °C to 200 °C) maximum
<b>Pressure</b>	
100 psig (791 kPa abs) maximum	
<b>Maximum retraction pressure</b>	
100 psig (791 kPa abs)	
<b>Vacuum</b>	
At 1.6 in. Hg (5.2 kPa) air leakage is less than 0.005 SCFM (0.00014 m <sup>3</sup> /min)	
<b>Junction box</b>	
cast aluminum	
<b>Process connection</b>	
1 in. MPT through 1inch full port ball valve (retractable)	
<b>Weight/Shipping Weight</b>	
5 lb /6 lb (2.5 kg / 3.0 kg) Weights rounded up to nearest whole lb or 0.5 kg	

**Table 1-2: Rosemount 141 contacting conductivity sensor specifications**

<b>Wetted Materials</b>	
Electrodes	316 stainless steel
Body	316 stainless steel
Insulator	PEEK
O-rings	Viton
<b>Temperature and pressure</b>	
See <a href="#">Figure 1-1</a>	
<b>Vacuum</b>	
At 1.6 in. Hg (5.2 kPa) air leakage is less than 0.005 SCFM (0.00014 m <sup>3</sup> /min)	
<b>Junction box</b>	
cast aluminum	
<b>Process connection</b>	
¾ in. MPT	
<b>Weight/Shipping Weight</b>	
2 lb / 3 lb (1.0 kg / 1.5 kg) Weights rounded up to nearest whole lb or 0.5 kg	



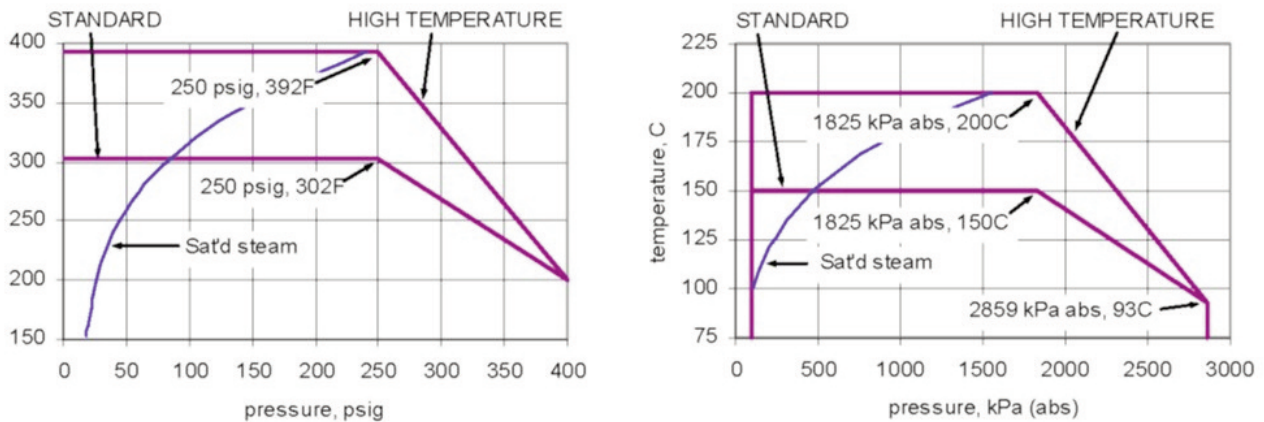
**Table 1-3: Rosemount 142 contacting conductivity sensor specifications**

Wetted Materials	
Electrodes	316 stainless steel
Body	316 stainless steel
Insulator	PEEK (high temperature option)
	PCTFE (low temperature option)
O-rings	Viton
Temperature and Pressure	
See Figure 1-1	
Vacuum	
At 1.6 in. Hg (5.2 kPa) air leakage is less than 0.005 SCFM (0.00014 m <sup>3</sup> /min)	
Junction box	
cast aluminum	
Process connection	
¾ in. MPT	
Weight/Shipping Weight	
2 lb/3 lb (1.0 kg / 1.5 kg) Weights rounded up to nearest whole lb or 0.5 kg	

**Table 1-4: Specifications for PN 23724-00 ball valve kit**

Wetted Materials
316 stainless steel except Teflon® seat and seals in ball valve

**Figure 1-1 Rosemount 141 and 142 sensor pressure/temperature graphs**





## Section 2: Installation

### 2.1 Unpacking and Inspection

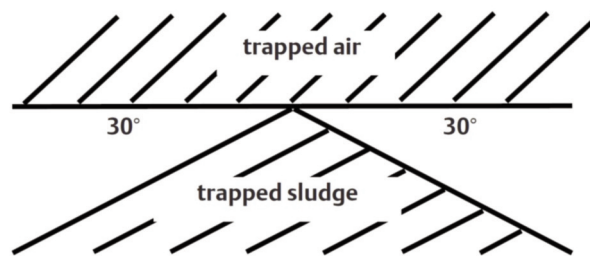
Inspect the outside of the carton for any damage. If damage is detected, contact the carrier immediately. Inspect the instrument and hardware. Make sure all items in the packing list are present and in good condition. Notify the factory if any part is missing.

### 2.2 Sensor Installation

Keep 1/4 in. (6 mm) clearance between electrodes and piping. The electrodes must be completely submerged in the process liquid, i.e., to the level of the threaded connection. See [Figure 2-1](#) for recommended orientation.

If the sensor is installed in a side stream with the sample draining to open atmosphere, bubbles may accumulate on the electrodes. Trapped bubbles will cause errors. As bubbles accumulate, the conductivity reading drops. To control bubble formation, apply a small amount of back pressure to the drain.

**Figure 2-1 Sensor orientation**

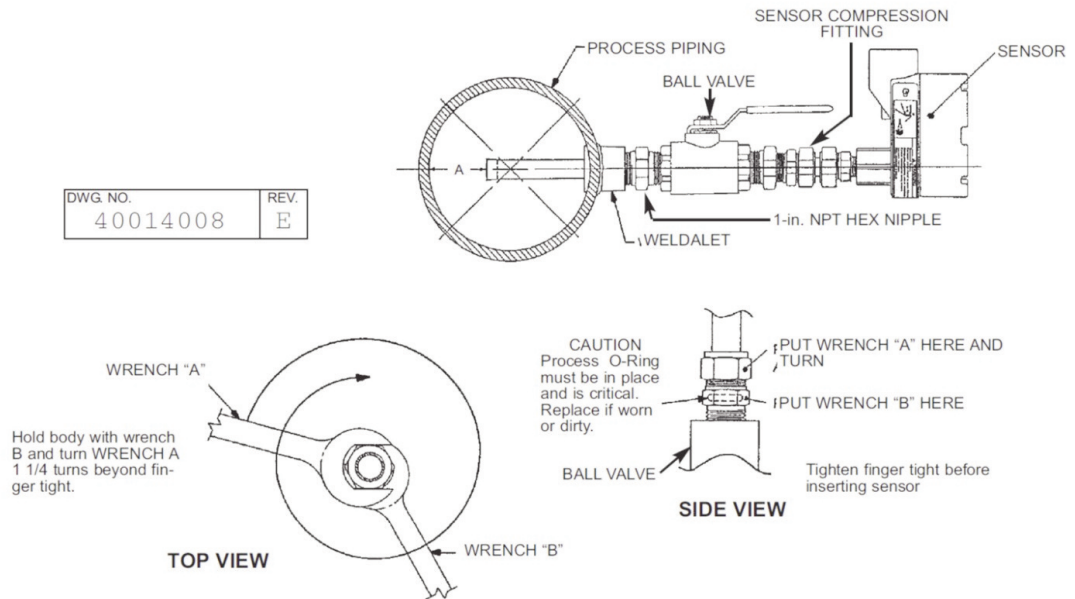


### 2.3 Installation - Rosemount 140 Sensor with Ball Valve Kit (PN 23724-00) \*

1. Install the sensor in either a 1 in. NPT weldolet or in a 1 in. pipe tee.
2. Remove the plastic shipping cap from the sensor.
3. Screw the 1 in. hex nipple into the weldolet or pipe tee. See [Figure 2-2](#). Use pipe tape on the threads.
4. Position the sensor for easy access to the ball valve handle, sensor compression fitting nut, and junction box.
5. Make sure the ball valve is in the fully open position.
6. Finger tighten the sensor compression fitting nut. Do not over tighten because the next step is to press the sensor into the process pipe.
7. Insert the sensor tube until the sensor tip is no closer than 1 in. (25 mm) from the far wall of the process pipe. See [Figure 2-2](#).
8. Tighten the sensor compression fitting nut to hold the sensor tip in position.

\* *If the ball valve assembly is already in place and the process line is pressurized, refer to [Inserting the Sensor](#).*

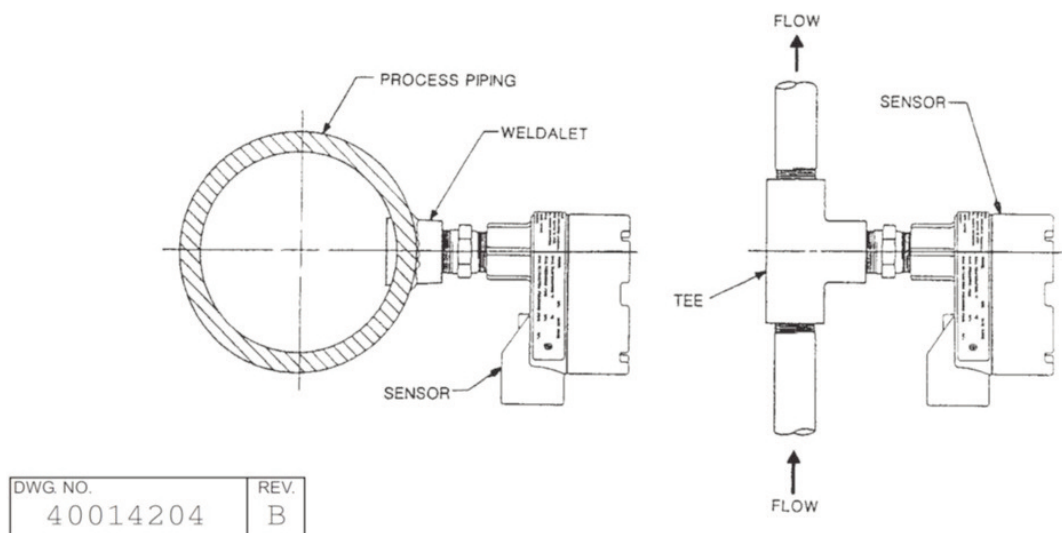
Figure 2-2 Installing the Rosemount 140 sensor with ball valve kit (PN 23724-00)



## 2.4 Installation - Rosemount 141 Sensor

1. Install the sensor in a 3/4 in. NPT weldalet or in a 1 in. pipe tee.
2. Remove the plastic shipping cap from the sensor.
3. Screw the sensor into the fitting. Use pipe tape on the threads. See Figure 2-3.

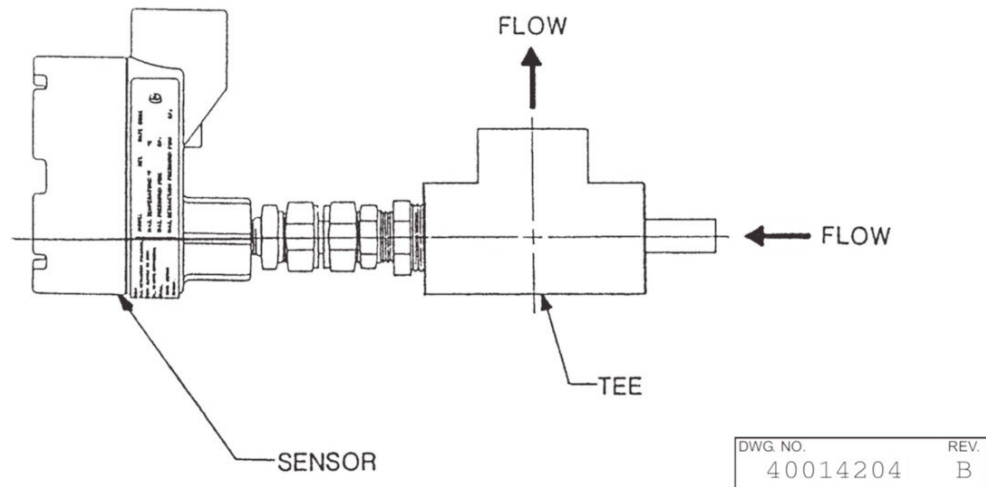
Figure 2-3 Installing Rosemount 141 sensor



## 2.5 Installation - Rosemount 142 Sensor

1. Install the sensor in a 3/4 in. NPT weldolet or in a 1 in. pipe tee. See Figure 2-4.
2. Remove the plastic shipping cap from the sensor.
3. Screw the sensor into the fitting. Use pipe tape on the threads. DO NOT tighten the sensor compression fitting until the sensor is correctly positioned.
4. If necessary, loosen the sensor compression fitting and position the sensor so that the tip of the sensor is at least 1 in. (25 mm) from the far wall of the pipe.
5. Tighten the compression fitting using the procedure shown in Figure 2-2.

Figure 2-4 Installing Rosemount 142 sensor





## Section 3: Wiring

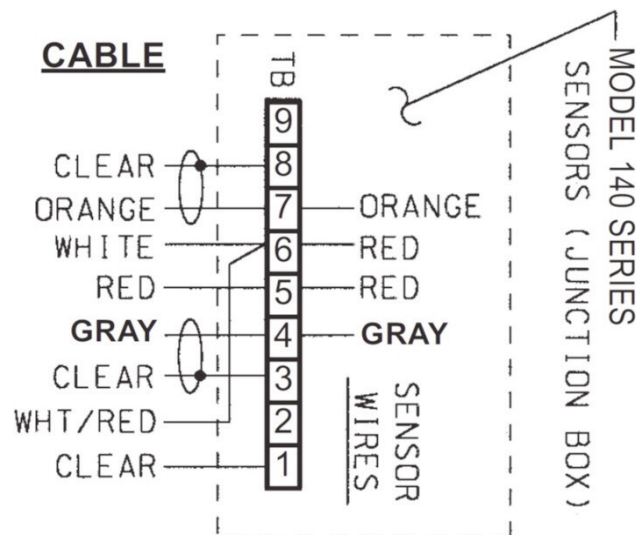
### 3.1 Wiring for Rosemount 140/141/142

For other wiring diagrams not shown below, please refer to the [Liquid Transmitter Wiring Diagrams](#).

All Rosemount 140 series sensors have a junction box mounted on the back of the sensor. Wiring connections in the junction box are shown in [Figure 3-1](#).

Rosemount 141 and 142 sensors have one gray wire (shown). The Rosemount 140 sensor has two gray wires attached to the terminal.

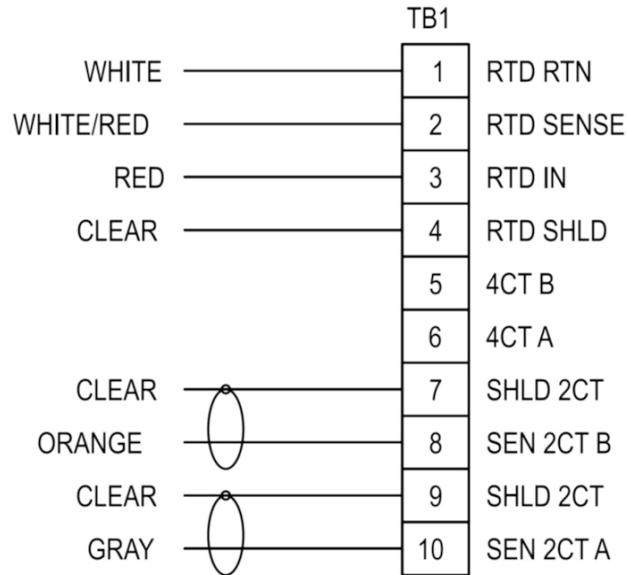
**Figure 3-1: Sensor junction box wiring. Terminals in the junction box are not numbered.**



**Figure 3-2: 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

**Figure 3-3: Rosemount 140/141/142 Sensor Wiring to Rosemount 1056, 56, and 1057 Transmitters**

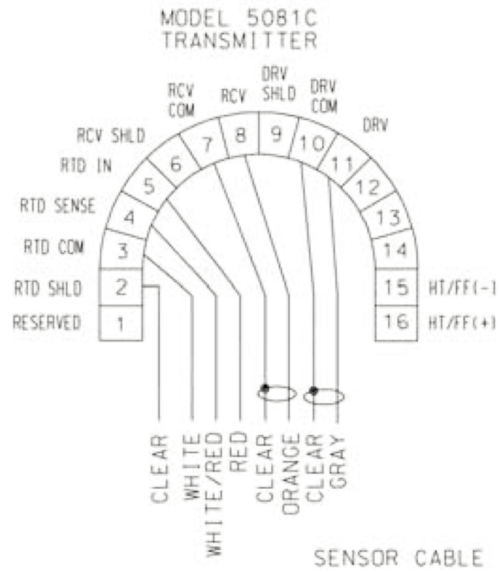


**Figure 3-4: Rosemount 140/141/142 Sensor Wiring to Rosemount 1066 Transmitter**





Figure 3-5: Rosemount 140/141/142 Sensor Wiring to Rosemount 5081 Transmitter





## Section 4: Retracting and Inserting the Rosemount 140 Sensor

### CAUTION

Rosemount 140 sensors are retractable. Before retracting the sensor, be absolutely certain the process pressure is less than 100 psig (791 kPa abs) and the process temperature is at a safe level!

### 4.1 Retracting the Sensor

1. Push in on the sensor junction box and slowly loosen the sensor compression fitting nut by reversing the sensor tightening procedure illustrated in [Figure 2-2](#).
2. When the sensor compression nut is completely unscrewed, slowly ease the sensor out until the flared tip of the electrode rests firmly within the body of the compression fitting body.
3. Close the ball valve completely.

### CAUTION

Before removing the sensor be sure the ball valve is completely closed.

4. Unscrew the compression fitting body from the reducing bushing and remove the sensor from the ball valve assembly.

### 4.2 Inserting the Sensor

### CAUTION

Make sure process O-ring is clean, lubricated, and in place before installing sensor. Replace if worn.

1. Do not open the ball valve.

### CAUTION

The system pressure must be less than 100 psig (791 kPa).

2. Thread the sensor compression fitting body into the reducing bushing in the rear of the ball valve and tighten.

*Note: Do not push past this point. Damage to the sensor could result.*

### WARNING

If the sensor comes free of the valve, refer to [Figures 2-2 and 7-1](#) and verify that the valve and associated fittings are as shown. Do not proceed until the sensor is correctly restrained.

3. Slowly open the valve.

### WARNING

Stand clear of the sensor.

1. Insert the sensor up to the desired insertion depth and turn the sensor compression fitting nut until it is finger tight.
2. Position the entire sensor for easy access to the ball valve handle, sensor compression fitting nut and J-box terminal block.
3. Tighten sensor compression fitting nut.



### CAUTION

**For initial installation of the sensor, tighten the compression fitting nut 1-1/4 turns after finger tight. If it is a reinstallation, turn no more than 1/4 to 1/2 additional turns.**

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## Section 5: Removing and Reinstalling the Rosemount 142 Sensor

### 5.1 Removing the Sensor

 **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!

1. Reduce process temperature and pressure to a safe level. If necessary drain the process line.
2. Loosen the sensor compression fitting and slowly slide the sensor from the pipe fitting or weldolet.

### 5.2 Reinstalling the Sensor

1. Slide the sensor into the process fitting and position the sensor the way it was originally installed.

 **CAUTION**

Be sure the sensor is in the original position. The sensor tube takes a permanent set and could become weakened if the new set is adjacent to the original set.

2. Tighten the sensor compression fitting 1/4 to 1/2 turn after it is finger tight.



## Section 6: Calibration and Maintenance

### 6.1 Calibrating the sensor

Rosemount 140/141/142 sensors are not calibrated at the factory. The cell constant on the label is a nominal value only. The true cell constant can differ from the nominal value by as much as  $\pm 5\%$ . For improved accuracy, calibrate the sensor using either a solution of known conductivity or a referee meter and sensor. If using a standard solution, choose one having conductivity in the recommended operating range for the sensor cell constant.

Do not use standard solutions having conductivity less than about  $100 \mu\text{S}/\text{cm}$  for calibration. They are susceptible to contamination by atmospheric carbon dioxide, which can alter the conductivity by a variable amount as great as  $1.2 \mu\text{S}/\text{cm}$  (at  $25^\circ\text{C}$ ). Because  $0.01/\text{cm}$  sensors must be calibrated in low conductivity solutions, they are best calibrated against a referee meter and sensor in a closed system. For more information about calibrating refer to [Application Data Sheet](#).

#### 6.1.1 Calibrating using a standard solution

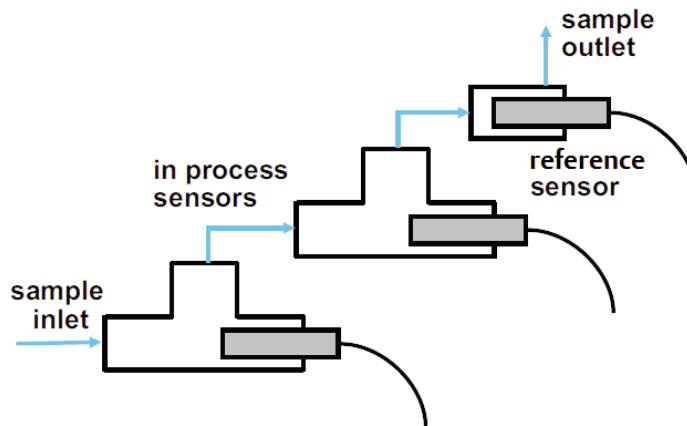
If using a standard solution, choose one having conductivity in the recommended operating range for the sensor cell constant.

1. Immerse the rinsed sensor in the standard solution and adjust the transmitter reading to match the conductivity of the standard.
2. For an accurate calibration:
  - a. Choose a calibration standard near the midpoint of the recommended conductivity range for the sensor.
  - b. Do not use calibration standards having conductivity less than  $100 \mu\text{S}/\text{cm}$ .
  - c. Turn off automatic temperature compensation in the transmitter.
  - d. Use a standard for which the conductivity as a function of temperature is known.
  - e. Use a good quality calibrated thermometer with an error rate less than  $\pm 0.1^\circ\text{C}$  to measure the temperature of the standard.
  - f. Follow good laboratory practice. Rinse the beaker and sensor at least twice with standard. Be sure the rinse solution reaches between the inner and outer electrodes by tapping and swirling the sensor while it is immersed in the standard.
  - g. Be sure air bubbles are not trapped between the electrodes. Place the sensor in the standard and tap and swirl to release bubbles. Note the reading and repeat. If readings agree, no trapped bubbles are present. Repeat until two subsequent readings agree.

## 6.1.2 Calibrating using a reference meter and sensor

1. Connect the process sensors and reference sensor in series and allow the process liquid to flow through all sensors.
2. Calibrate the process sensor by adjusting the process transmitter reading to match the conductivity measured by the reference meter. See [Figure 3-1](#) for the calibration setup.

**Figure 3-1 In process calibration setup**



### NOTICE

The above figure shows two process sensors connected in series with a reference sensor. The horizontal sensor orientation ensures good circulation of the process liquid past the electrodes. The staircase orientation provides an escape path for bubbles.

3. The method is ideal for calibrating the sensors used in low conductivity water (0.01/cm cell constants) because the calibration system is closed and cannot be contaminated by atmospheric carbon dioxide.

Following precautions are necessary for successful calibration:

1. If the normal conductivity of the process liquid is less than about 1.0  $\mu\text{S}/\text{cm}$ , adjust the conductivity so that it is near the upper end of the operating range.

The difference between the conductivity measured by the process and reference meter usually has both a fixed (constant error) and relative (proportional error) component. Because the cell constant calibration assumes the error is proportional only, calibration at low conductivity allows the fixed component to have an outsized influence on the result.

For example, assume the only difference between reference meter and process sensor is fixed and the process sensor always reads 0.002  $\mu\text{S}/\text{cm}$  high. If the process sensor is calibrated at 0.100  $\mu\text{S}/\text{cm}$ , the new cell constant will be changed by 0.100/0.102 or 2%. If the sensor is calibrated at 0.500  $\mu\text{S}/\text{cm}$ , the change will be only 0.500/0.502 or 0.4%.

Calibration at higher conductivity produces a better result because it minimizes the effect of the offset.



2. Orient the sensors so that air bubbles always have an easy escape path and cannot get trapped between the electrodes.
3. Turn off automatic temperature compensation in the transmitter.

Almost all process conductivity transmitter feature automatic temperature compensation in which the transmitter applies one of several temperature correction algorithms to convert the measured conductivity to the value at a reference temperature, typically 25 °C.

Although temperature correction algorithms are useful for routine measurements, they should not be used during calibration.

There are two following reasons:

- a. No temperature correction is perfect. If the assumptions behind the algorithm do not perfectly fit the solution being measured, the temperature-corrected conductivity will be in error.
- b. If the temperature measurement itself is in error, the corrected conductivity will be in error.

The purpose of calibrating the sensor is to determine the cell constant. To minimize the error in the cell constant, all sources of avoidable error, e.g., temperature compensation should be eliminated.

4. Keep tubing runs between the sensors short and adjust the sample flow as high as possible. Short tubing runs and high flow ensure the temperature of the liquid does not change as it flows from one sensor to another.

If the process temperature is appreciably different from ambient, high flow may not be enough to keep the temperature constant. In this case, pumping sample at room temperature from a reservoir through the sensors might be necessary. Because such a system is likely to be open to atmosphere, saturate the liquid with air to prevent drift caused by absorption of atmospheric carbon dioxide.

5. To prevent contamination of low conductivity ( $<1 \mu\text{S}/\text{cm}$ ) process liquids, use clean tubing to connect the sensors. To prevent drift caused desorption of ionic contaminants from tube walls, keep the sample flow greater than 6 ft/sec (1.8 m/sec).

### 6.1.3 Calibrating using a grab sample

1. Use the grab sample method when it is impractical to remove the sensor for calibration or to connect a reference sensor to the process line.
2. Take a sample of the process liquid, measuring its conductivity using a reference instrument, and adjusting the reading from the process transmitter to match the measured conductivity.
3. Take the sample from a point as close to the process sensor as possible.
4. Keep temperature compensation turned on. There is likely to be a lag time between sampling and analysis, so temperature is likely to change.
5. Be sure the reference and process instruments are using the same temperature correction algorithm.

6. Grab sample calibration should be used only when the conductivity is fairly high.
  - a. The temperature compensation algorithm will most likely be linear slope.
  - b. Confirm that both instruments are using the same temperature coefficient in the linear slope calculation.
  - c. If the reference meter does not have automatic temperature correction, calculate the conductivity at 25 °C using the equation:

$$C_{25} = \frac{C_t}{1 + \alpha(t - 25)}$$

Where: C<sub>25</sub> = the conductivity at 25 °C

C<sub>t</sub> = the conductivity at t °C

α = the temperature co-efficient expressed as a decimal fraction.

- d. Confirm the temperature measurements in both the process and reference instruments are accurate, ideally to within ±0.5 °C.
- e. Follow good laboratory practice when measuring the conductivity of the grab sample.
  - Rinse the beaker and sensor at least twice with sample. Be sure the rinse solution reaches between the inner and outer electrodes by tapping and swirling the sensor while it is immersed in the sample.
  - Be sure air bubbles are not trapped in the sensor. Place the sensor in the sample and tap and swirl to release bubbles. Note the reading. Then, remove the sensor and return it to the sample. Tap and swirl again and note the reading. If the two readings agree, trapped bubbles are absent. If they do not agree, bubbles are present. Continue the process until two subsequent readings agree.
  - While making the measurement, do not allow the sensor to touch the sides and, particularly, the bottom of the beaker. Keep at least 1/4 in. (6 mm) clearance.
- f. Be sure to compensate for process conductivity changes that might have occurred while the grab sample was being tested. Rosemount conductivity transmitters (Rosemount transmitter models 1056, 1066, and 56) do this automatically. They save the value of the process conductivity at the time the sample was taken and use that value to calculate the new cell constant when the user enters the result of the grab sample test. Older transmitters do not remember the process conductivity value. Therefore, the user must enter a value adjusted by an amount proportional to the change in the process conductivity. For example, suppose the process conductivity is 810 μS/cm when the sample is taken and 815 μS/cm when the test result is entered. If the grab sample conductivity is 819 μS/cm, the user should enter (815/810) × 819 or 824 μS/cm.

## 6.2 Cleaning the Sensor

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

## 6.3 Checking the Rosemount 140 Retraction Restraint

The integrity of the Rosemount 140 will become compromised if the flared tip of the electrode is allowed to blow out against the compression fitting body. In the event a blowout occurs, replace the sensor.

## 6.4 Replacing Rosemount 140 Sensor Seal

If the process seal is leaking owing to a pitted or uneven sensor tube, a replacement sensor is required. If the sensor tube surface is smooth and clean yet the process seal is leaking, the process O-ring is damaged and requires replacement according to the following procedure. Replacement parts can be obtained from the Process Fitting Rebuild Kit (PN 23731-00).

1. The junction box with attached compression fitting body, nut and compression fitting must be recovered from the sensor for reuse. Unscrew the junction box cover and set aside. Mark and disconnect the electrical connections from the terminal block. Remove the junction box compression fitting nut from the compression fitting body and separate the junction box from the sensor tube.
2. Remove the nylon ferrule and snap ring (discard both). Remove and save the junction box compression fitting nut.
3. Slide off the sensor compression fitting nut and set aside for reuse. Slide off the remaining PEEK ferrule and split ring (discard both).
4. Remove the sensor compression fitting body and replace the Viton O-ring. Lubricate the O-ring with the barium based lubricant provided.
5. Wrap the threads of the sensor compression fitting body with pipe tape and slide the body on to the sensor tube.
6. Slide on a new PEEK ferrule, beveled side facing the electrode tip, and a new PEEK split ring, flared end towards electrode tip. Slide on the sensor compression fitting nut and thread it onto the compression fitting body. Finger tighten.
7. Reinstall the J-box on the sensor tube. Finger tighten the J-box compression fitting nut. Use a wrench to turn the nut a 1/4 to 1/2 additional turn.



## Section 7: Accessories

### 7.1 Accessories

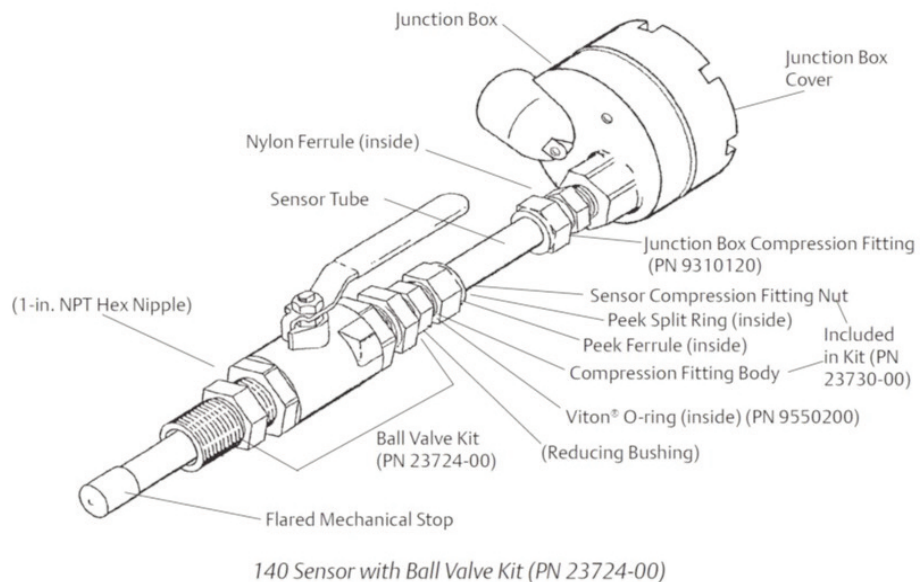
**Table 7-1 Rosemount 140/141/142 Sensor accessories information**

Part Number	Description
23550-00	Junction box for remote cable connection
9200275	Connecting cable, unterminated, specify length
23747-00	Connecting cable, terminated, specify length
05010781899	Conductivity standard SS-6, 200 $\mu\text{S}/\text{cm}$ , 32 oz. (0.95 L)
05010797875	Conductivity standard SS-6A, 200 $\mu\text{S}/\text{cm}$ , 1 gal (3.78 L)
05010782468	Conductivity standard SS-5, 1000 $\mu\text{S}/\text{cm}$ , 32 oz (0.95 L)
05010783002	Conductivity standard SS-5A, 1000 $\mu\text{S}/\text{cm}$ , 1 gal (3.78 L)
05000705464	Conductivity standard SS-1, 1409 $\mu\text{S}/\text{cm}$ , 32 oz (0.95 L)
05000709672	Conductivity standard SS-1A, 1409 $\mu\text{S}/\text{cm}$ , 1 gal (3.78 L)
05010782147	Conductivity standard SS-7, 5000 $\mu\text{S}/\text{cm}$ , 32 oz (0.95 L)
05010782026	Conductivity standard SS-7A, 5000 $\mu\text{S}/\text{cm}$ , 1 gal (3.78 L)

**Table 7-2 Rosemount 140 Sensor accessories information**

Part Number	Description
23724-00	Ball valve kit
23730-00	Process compression fitting, $\frac{3}{4}$ inch NPT
23731-00	Process fitting rebuild kit
9310120	Junction box compression fitting
9550200	O-ring <sup>®</sup> 2-116, Viton <sup>®</sup>

**Figure 7-1: Rosemount 140 with Ball Valve Kit (PN 23724-00)**



**Table 7-2 Rosemount 142 Sensor accessories information**

<b>Part Number</b>	<b>Description</b>
33107-01	Compression fitting, 3/4 in.
9310063	Ferrule, 3/4 in.
9310066	Compression nut, 3/4 in.

## Section 8: Troubleshooting

### 8.1 Troubleshooting

Table 8-1: Troubleshooting

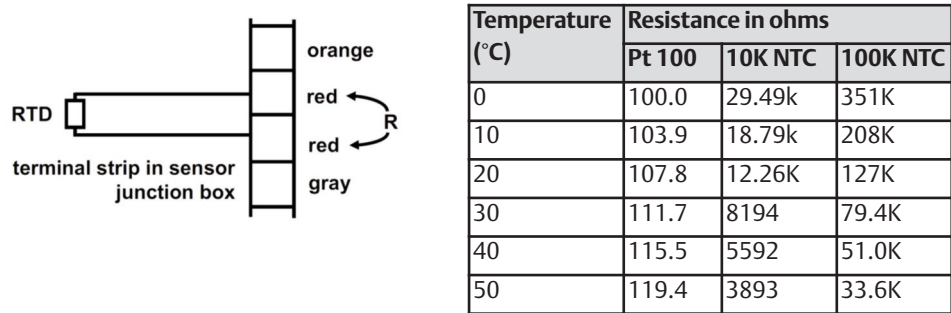
Trouble	Probable Cause	Remedy
Off-scale reading	Wiring is incorrect.	Verify wiring.
	Temperature element is open or shorted.	Check temperature element for open or short circuits. See Figure 8-1
	Sensor is not in process stream.	Be sure sensor is completely submerged in process stream.
	Sensor has failed.	Perform isolation checks. See Figure 8-2
Noisy reading	Sensor is improperly installed in process stream.	Be sure sensor is completely submerged in process stream.
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 2-1. Apply back pressure to flow cell.
	Wrong temperature correction algorithm.	Check that temperature correction is appropriate for the sample. See transmitter 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 transmitter manual.
Sluggish response	Electrodes are fouled.	Clean electrodes.
	Sensor is installed in dead area in piping	Move sensor to a location more representative of the process liquid.

**Note:** For any repair or warranty inquiries please contact our Customer Care group.

### 8.1.1 Checking the temperature element

Disconnect leads and measure resistance shown. The measured resistance should be close to the value in the table.

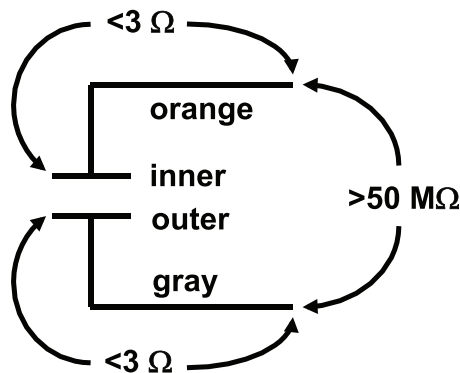
Figure 8-1 Checking the temperature element



### 8.1.2 Checking the continuity and leakage

Disconnect electrode leads and measure resistance and continuity as shown. Sensor must be dry when checking resistance between electrode leads.

Figure 5-2 Checking the continuity and leakage







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