

Model 3051 Sensor Module Replacement

00809-0400-4001
English
Rev. BA

SAFETY MESSAGES

Procedures and instructions in this manual may require special precautions to ensure the safety of the personnel performing the operations. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

Warnings

WARNING

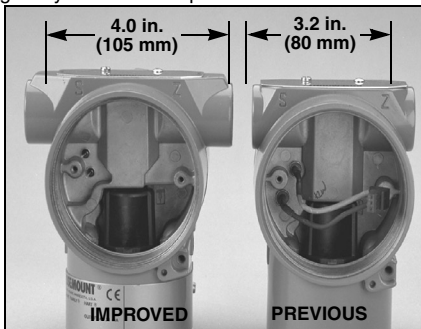
Explosions can result in death or serious injury.

- Do not remove the instrument cover in explosive environments when the circuit is alive.
- Both transmitter covers must be fully engaged to meet explosion-proof requirements.
- Before connecting a communicator in an explosive atmosphere, make sure the instruments in the loop are installed in accordance with intrinsically safe or nonincendive field wiring practices.


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BEFORE YOU DISASSEMBLE THE TRANSMITTER

Maintenance procedures differ for improved and previous style transmitter housings. Verify the specific physical characteristics of your transmitter before you begin any maintenance procedures.



DISASSEMBLY PROCEDURES

 Do not remove the instrument cover in explosive atmospheres when the circuit is alive.

Remove the Transmitter from Service

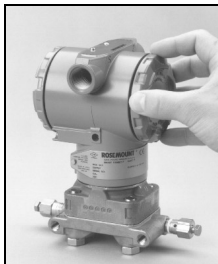
NOTE

Once you have determined a transmitter to be inoperable, remove it from service.

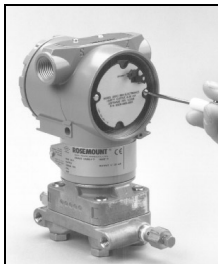
Be aware of the following:

- Isolate and vent the process from the transmitter before removing the transmitter from service.
- Remove all electrical leads and conduit
- Detach the process flange by removing the four flange bolts and the two alignment screws that secure it.
- Do not scratch, puncture, or depress the isolating diaphragms.
- Clean the isolating diaphragms with a soft rag and a mild cleaning solution, and rinse with clear water.
- Whenever you remove the process flange or flange adapters, visually inspect the Teflon O-rings. Replace the O-rings if they show any signs of damage, such as nicks or cuts. If they are undamaged, you may reuse them.

Remove the Electronics Board



Step 1



Step 2

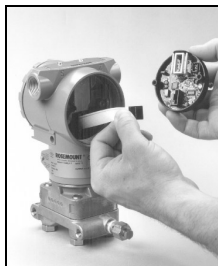


Step 3

1. Remove the housing cover opposite the field terminal side.
2. Loosen the two captive screws that anchor the board. The circuit board is electrostatically sensitive. To prevent damage to the circuit board, be sure to observe handling precautions for static-sensitive components.
3. Gently pull the electronics board out of the housing to disconnect the power connection. With the board free of the housing, only the sensor module ribbon cable connects the board to the housing.

NOTE

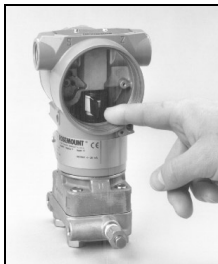
Previous versions of the electronics board use a snap-in power plug and receptacle. Carefully unplug the power plug from the receptacle to free the board from the power cord.



Step 4

4. Disconnect the sensor module ribbon cable to release the electronics board from the transmitter.

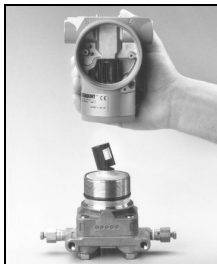
Remove the Sensor Module from the Electronics Housing



Step 1



Step 2



Step 3

1. Carefully tuck the cable connector completely inside the internal shroud.

IMPORTANT

Do not remove the housing until after you tuck the cable connector completely inside of the internal shroud. The shroud protects the cable from damage that can occur when you rotate the housing.

2. Loosen the housing rotation set screw with a 5/64-inch hex wrench and back off one full turn.

IMPORTANT

To prevent damage to the sensor module ribbon cable, disconnect it from the electronics board before you remove the sensor module from the electrical housing.

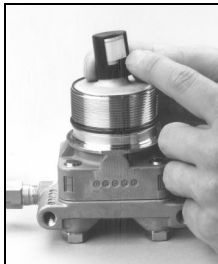
3. Unscrew the housing from the module, making sure the shroud and sensor cable do not catch on the housing.

IMPORTANT

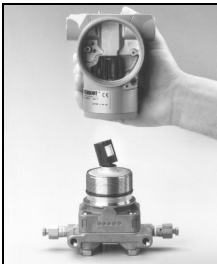
Make sure the sensor ribbon cable and internal shroud remain completely free of the housing as you rotate it. Damage can occur to the cable if the internal shroud and sensor cable rotate with the housing.

REASSEMBLY PROCEDURES

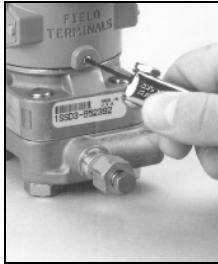
Attach the Sensor Module to the Electronics Housing



Step 2



Step 3



Step 6

Follow these procedures carefully to ensure proper reassembly:

1. Inspect all cover and housing (non-process-wetted) O-rings and replace if necessary. Lightly grease with silicone lubricant to ensure a good seal.
2. Carefully tuck the cable connector completely inside of the internal shroud. To do this, turn the shroud and cable counterclockwise one rotation to tighten the cable.
3. Lower the electronics housing onto the module, and guide the internal shroud and cable through the housing and into the external shroud.
4. Turn the housing clockwise to fasten it to the module.

IMPORTANT

To prevent damage to the cable connector, watch the cable and shroud as you attach the housing to the module. Make sure the cable connector does not slip out of the internal shroud and begin to rotate with the housing. Reinsert the cable connector into the shroud if it escapes before the housing is fully fastened.

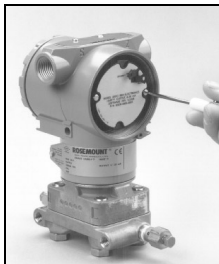


5. Thread the housing completely onto the sensor module. To comply with explosion-proof requirements, the housing must be no more than one full turn from flush with the sensor module.
6. Tighten the housing rotation set screw using a 5/64-inch hex wrench.

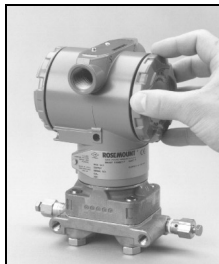
Attach the Electronics Board



Step 1



Step 3




Step 4

1. Remove the cable connector from its position inside of the internal shroud, and attach it to the electronics board.
2. Insert the electronics board into the housing, making sure that the posts from the electronics housing properly engage the receptacles on the electronics board.

NOTE

If you are reassembling a previous version of the electronics board, or if you are placing a shrouded version of the electronics board in a previous version of the housing, attach the snap-in power connection to the receptacle on the board with the black and red wires routed toward the center of the board and below the white reed switch holder.

3. Tighten the captive mounting screws.
4.  Replace the electronics housing cover. The transmitter covers must be engaged metal-to-metal to ensure a proper seal and to meet explosion-proof requirements.

NOTE

Electronics board revision 5.3.163 or later (all shrouded designs) have increased functionality that allows verification testing of alarm current levels. If you repair or replace the transmitter electronics board, sensor module, or LCD meter, verify the transmitter alarm level before you return the transmitter to service. Refer to the Model 3051 Product Manual, Rosemount doc. no. 00809-0100-4001 for more information.

Reassemble the Process Sensor Body

1. Visually inspect the Teflon sensor module O-rings. If the O-rings are undamaged, you may reuse them. If the O-rings show signs of damage, such as nicks or cuts, or if there is any doubt about their ability to seal properly, replace them with new O-rings.

IMPORTANT

If replacing the O-rings, take care not to scratch or deface the O-ring grooves or the surface of the isolating diaphragm while you remove the damaged O-rings.

2. Install the process flange on the sensor module. To hold the process flange in place, install the two hex head alignment screws. These screws are not pressure retaining and need only be finger tight. Do not overtighten; this will affect the module/flange alignment.
3. Where applicable, install the appropriate flange bolts:
 - For installations requiring a $1/4$ -18 NPT mounting, install the four 1.75-inch process flange bolts. First finger-tighten, then tighten the bolts incrementally in a cross pattern until they are tightened to the appropriate torque values. When fully tightened, the bolts should extend through the top of the module housing. Refer to The Model 3051 Product Manual (Rosemount pub. no. 00809-0100-4001) for complete bolt installation information and torque values.
 - For installations requiring a $1/2$ -14 NPT mounting, hold the flange adapters and flange adapter O-rings in place while finger-tightening the four 2.88-inch process flange/adaptor bolts (use two 2.88-inch bolts and two 1.75-inch bolts for gage pressure configurations). Tighten the bolts incrementally in a cross pattern until they are tightened to the appropriate torque values. When fully tightened, the bolts should extend through the top of the module housing. Refer to The Model 3051 Product Manual (Rosemount pub. no. 00809-0100-4001) for complete bolt installation information and torque values.
 - For installations with a three-valve manifold (differential pressure applications only), align the process flange with the three-valve manifold, and finger-tighten the four 2.25-inch manifold flange bolts following the procedure outlined above. Tighten the bolts incrementally in a cross pattern until they are tightened to the appropriate torque values. When fully tightened, the bolts should extend through the top of the module housing. Refer to The Model 3051 Product Manual (Rosemount pub. no. 00809-0100-4001) for complete bolt installation information and torque values. Install flange adapters on the process end of the three-valve manifold using the 1.75-inch flange bolts supplied with the transmitter.

4. If you replaced the Teflon sensor module O-rings, torque the flange bolts after installation to compensate for cold flow.
5. Install the drain/vent valve:
 - a. Apply sealing tape to the threads on the seat. Starting at the base of the valve with the threaded end pointing toward the installer, apply two clockwise turns of the sealing tape.
 - b. Take care to place the opening on the valve so that process fluid will drain toward the ground and away from personnel when the valve is opened.
 - c. Tighten the drain/vent valve to 70 in-lb (0.5 N-m).

NOTE

After replacing O-rings on Range 1 transmitters and re-installing the process flange, expose the transmitter to a temperature of 185 °F (85 °C) for two hours. Then re-tighten the flange bolts in a cross pattern, and again expose the transmitter to a temperature of 185 °F (85 °C) for two hours before calibration.

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