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| ORION® Automated Meter Reading System | ORION Integral Transmitter for Gas Meters | Installation & Operation Manual |
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Sensus®/Rockwell®/Equimeter®
Gas Meters

American®
Gas Meter

Actaris® Slope Face
Gas Meter

Actaris® Straight Face
Gas Meter

IMPORTANT: This manual contains important warnings and information.
READ AND KEEP FOR REFERENCE.

Disclaimer

The user/purchaser is expected to read and understand the information provided in this manual, follow any listed Safety Precautions and Instructions and keep this manual with the equipment for future reference.

Misuse, mishandling and/or inadequate maintenance may impair performance and/or compromise safety.

Questions or Service Assistance

If you have questions regarding the product or this document contact:

Badger Meter, Incorporated

P.O. Box 245036

Milwaukee, WI 53224-9536

Telephone: (414) 355-0400, (800) 876-3837

Fax: (888) 371-5982

On the Web: www.badgermeter.com
or call your local Badger Meter representative.

Product Identification Information

Record the product identification numbers from the nameplate.

Transmitter

Model Number _____

Serial Number _____

Tag Number _____

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Note Explanations

NOTE: *Communicates installation, operation or maintenance information that is safety related but not hazard related.*

SCOPE of MANUAL

This manual contains installation instructions for the **ORION® Integral Transmitter for Gas Meters**.

Proper performance and reliability of the ORION gas meter system depends upon installation in accordance with these instructions.

PRODUCT UNPACKING AND INSPECTION

Upon receipt of the product, perform the following unpacking and inspection procedures:

NOTE: *If damage to the shipping container is evident upon receipt, request the carrier to be present when the product is unpacked.*

Carefully open the shipping package, follow any instructions that may be marked on the exterior. Remove all cushioning material surrounding the product and carefully lift the product from the package.

Retain the package and all packing material for possible use in reshipment or storage.

Visually inspect the product and applicable accessories for any physical damage such as scratches, loose or broken parts, or any other sign of damage that may have occurred during shipment.

NOTE: *If damage is found, request an inspection by the carrier's agent within 48 hours of delivery and file a claim with the carrier. A claim for equipment damage in transit is the sole responsibility of the purchaser.*

License Requirements

This device complies with Part 15 of FCC Rules. Operation of this device is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

No FCC license is required by a utility to operate an ORION meter reading system.

Any changes made, but not approved by Badger Meter, can void the user's authority to operate the equipment.

**ORION® Integral Transmitters/Hardcase
Gas Meter Identification**

ORION integral transmitters for gas meters are designed for use with a variety of major brands of hardcase gas meters. Please refer to and use the following identification table.

Identification Table

| Gas Meter Manufacturer | Gas Meter Model | ORION® Transmitter # |
|---|-------------------------------|----------------------|
| Sensus®/Invensys®/ Rockwell®/Equimeter® Meters | R-175/200/250/275 11 tooth | 64989-001 |
| American® Meter | AL-175/250/425/630 | 64989-002 |
| Actaris® Slope Face Meter | 175/250/400 | 64989-003 |
| Actaris® Straight Face Meter | 175/250/400 | 64989-004 |

Installation Tools and Materials

Use magnetized screwdrivers.
1/8" flat screwdriver
1/4" flat screwdriver
#1 Phillips screwdriver

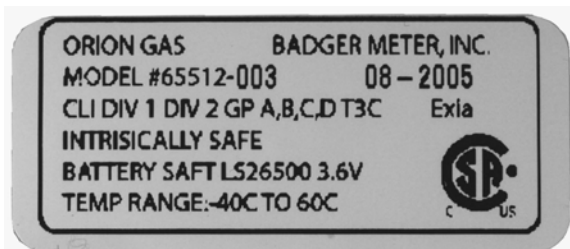
Radix® Hand Held
or
Optical Programming Probe and Laptop computer

Installation of ORION Integral Transmitter

This manual describes installing the ORION transmitter and index on Sensus, American, and Actaris gas meters.

Label Information

Certification markings are noted on the product label. Label markings include:



Model number 65512-003 08-2005
are completed with proper numbers printed at
003 08-2005.

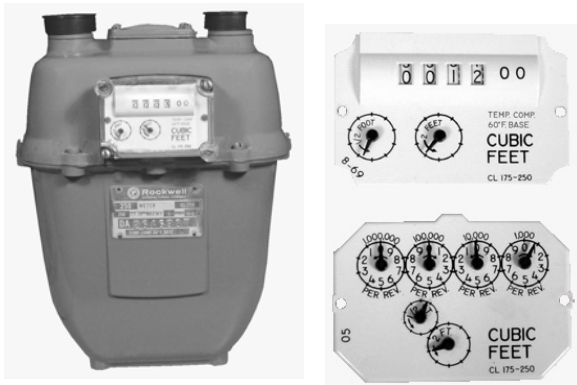
Battery SAFT LS26500 is a 3.6V Lithium C cell.

Battery SAFT LSI7500 is a 3.6V Lithium A cell.

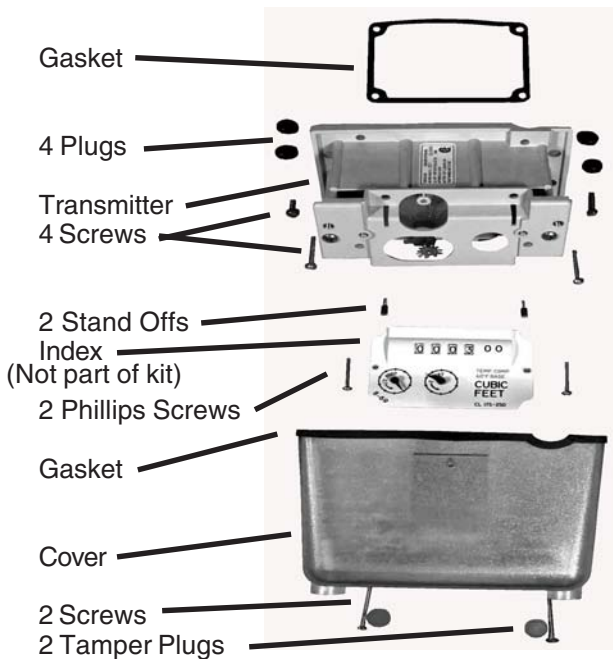
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SENSUS®/ROCKWELL®/EQUIMETER® MODELS R-175/200/250/275 11 Tooth With Dial or Odometer Index

| Gas Meter Mfg | Gas Meter Model | ORION® Transmitter # |
|--|----------------------------|----------------------|
| Sensus/Invensys®/ Rockwell/Equimeter Meters | R-175/200/250/275 11 tooth | 64989-001 |



Sensus Gas Meter and Indexes



ORION® for Sensus Transmitter Kit

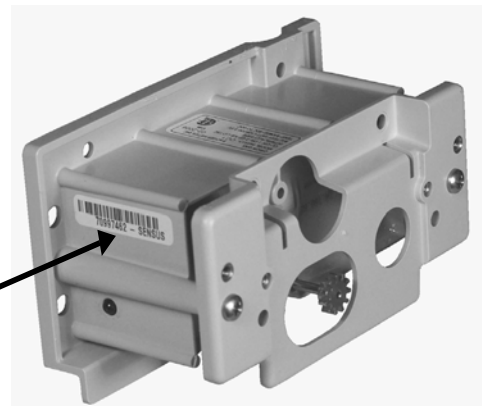
Before Starting Installation

Remove the two screws holding the cover onto the transmitter.

Place a screwdriver in a hole in the rear of the transmitter and gently break the cover and gasket from the transmitter.



Before proceeding with an installation, make sure the ORION transmitter name matches the model required for the specific gas meter.



Transmitter Name

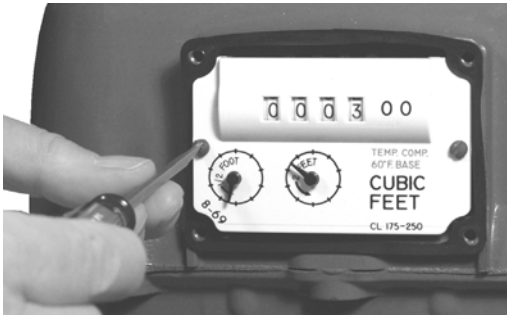
Index Removal From Sensus Meter

Step 1: Use a screwdriver to puncture and remove tamper plugs, if present.

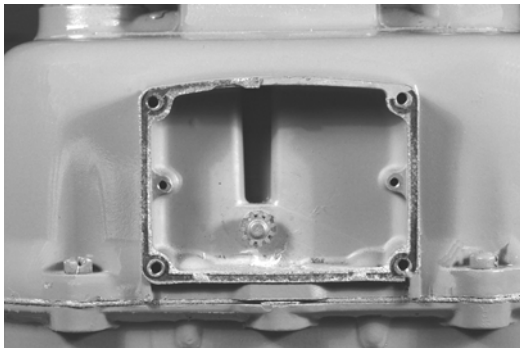
Step 2: Use a screwdriver to remove and discard the four (4) cover mounting screws and the cover.



Step 3: Use a screwdriver to remove and discard the two (2) index mounting screws.



Step 4: Remove and discard old gasket.

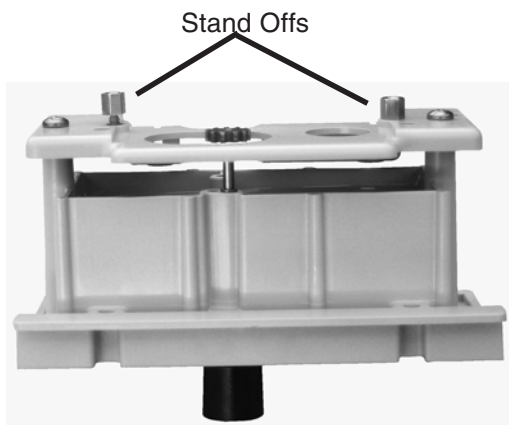


Install ORION® Transmitter and Sensus Index on Meter

Use care when handling the ORION transmitter to insure the drive pawl is not subjected to any physical abuse. Abuse may cause this spindle to become bent, misaligned or otherwise inoperative.

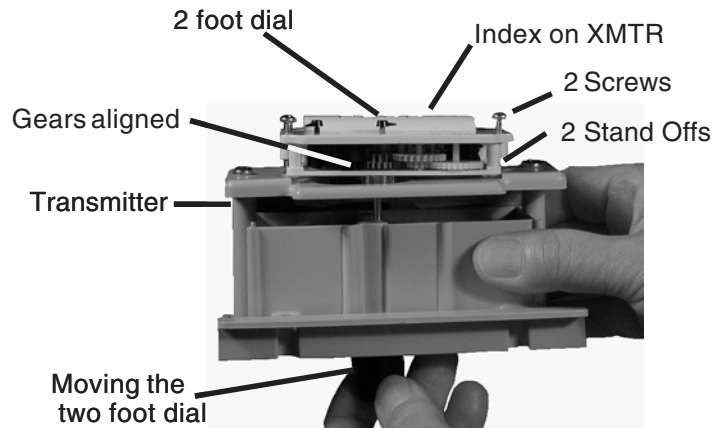
When attaching a meter index to an ORION transmitter, make sure it mounts securely. The two drive gears must mate without causing any binding or potential for disengagement.

Step 1: Place the two (2) supplied stand offs in the transmitter.

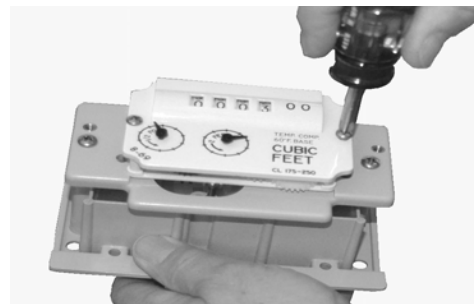


Step 2: Place the index on the front of the ORION transmitter.

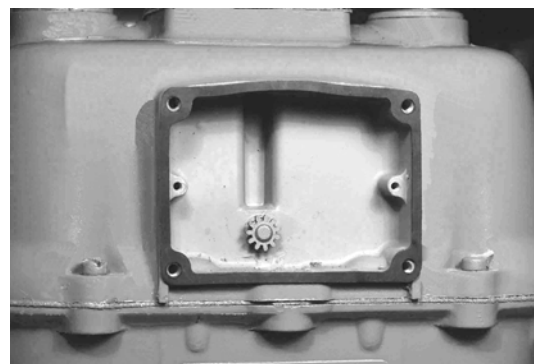
Line up two front gears. Test to ensure the gears are engaged and moving freely by moving the 2 foot dial.



Step 3: Secure the index to the transmitter with the two (2) supplied Phillips screws placed in the stand offs.

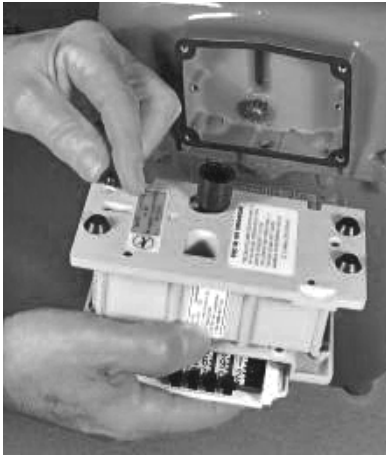


Step 4: Mount the gasket to the meter.



Step 5: Care must be taken when placing a transmitter/index unit on the meter.

Before placing the transmitter/index on the gas meter put four (4) supplied plugs into the rear of the transmitter.



Step 6: When mounting an ORION® transmitter to a gas meter, make sure the gas meter drive gear engages the transmitter drive pawl. These two drive pawls must mate without causing any binding or potential for disengagement.

Drive Gear
Drive Pawl



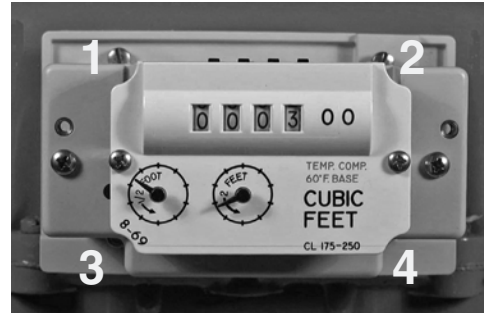
Step 7: There is some adjustment in the position of the index plate. Make sure the index is positioned so the shaft turns freely about 1/2 turn.

Step 8: There are three (3) different lengths of mounting screws in the transmitter kit.

Install the shortest screw in the top left (#1) of the ORION transmitter.

Install the second longest screw in the top right (#2).

Install the two (2) longest screws in the bottom (#3 and #4).



Program the ORION Transmitter
Badger Meter uses the Badger®-Radix® system to display and process screens.



Please reference the document “**Instructions for Installing ORION Gas Meters Using the Radix Programming Tool**”.

The meter is now installed. On the Badger-Radix you’ll see the next meter number and the process starts again.

Complete the Installation

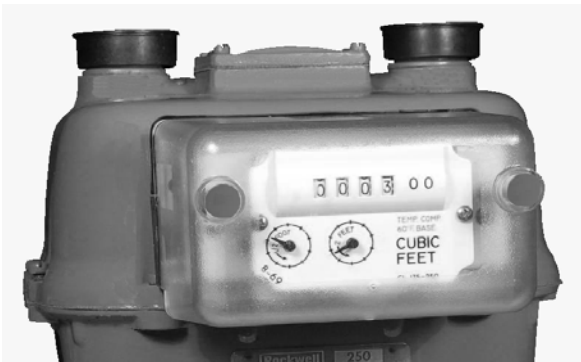
Step 1: Place the ORION® cover over the outside of the index and transmitter.



Step 2: Install the cover with the two (2) supplied screws.



Step 3: For security purposes, insert the two (2) supplied red tamper plugs over the screws and push them in.



Installation of **ORION** for **SENSUS® MODEL R-175/200/250/275 (11 Tooth)** with dial or odometer index is now complete.

