

DESCRIPTION

APPLICATIONS: The assembled Badger® RTR® ORION® Integral consists of the Recordall® Transmitter Register (RTR) in a unique shroud which incorporates the ORION RF Module. When assembled, the product is fully configured for use with Recordall disc series, turbo series and compound series water meters, (excluding Turbo I meter) which are installed as indoor meter settings, i.e., in basements, utility rooms, etc. (This product is not designed for vault or meter pit installations which are subject to flooding or submergence.) Remote units can be also installed with Fire Service meters and assemblies.

The assembled Integral RTR-ORION is designed to communicate with Badger interrogation devices, including handheld and mobile.

The RTR-Remote ORION consists of the 3-wire (brown) RTR assembly wired to the ORION Remote. This product is used in inside meter locations where the integral RTR-ORION assembly is not suitable, or in outside applications.

OPERATION: The RTR provides a digital signal from Badger Meter's patented piezoelectric solid-state switch. This signal has the characteristics of an open drain Field Effect Transistor (FET) and has no electrical contacts to stick, wear or corrode. It is fully compatible with the input circuitry of the ORION RF Module. The ORION Integral and Remote Modules use the RF bubble-up (broadcast) mode.

RESOLUTION: Digital output from the RTR has resolution of 1/10th of the register test circle. Output resolution of the ERT may vary with meter size. The resolution table on the back page of this technical brief lists output resolution for all Recordall meter applications.

LEAK DETECTION: The Orion system provides optional leak detection notification when the meter is read. The system reports leak detection when a two hour window of no usage is found within a 24 hour time period. The system automatically resets when the next two hour window of no usage is found.

MOUNTING: The RTR-Integral ORION in its shroud assembly uses a bayonet connection compatible with all Recordall® Disc, Turbo and Compound Series meters. A TORX® seal screw is provided to allow positioning and to secure the register to the meter body in a tamper resistant mode. The RTR-ORION can be removed from the meter without disrupting water service.

MAGNETIC DRIVE: Direct drive, high-strength, magnetic coupling through the meter body to the wetted magnet provides reliable and dependable register coupling.

SEALED REGISTER: The RTR local register consists of a six-digit straight-reading mechanical odometer totalizer, a 360° test circle with sweep hand, and a flow finder to detect leaks. The register gearing is self-lubricating, thermoplastic to minimize friction and provide long, reliable life. Permanent sealing eliminates moisture, dirt, and other contaminants.

TAMPER-PROOF FEATURES: Removal of the RTR-Integral ORION from the meter can be minimized by using a tamper resistant TORX seal screw. TORX seal screws are provided as standard accessories with the RTR. Optional tamper detection seal wire screws are also available.

CUT WIRE TAMPER INDICATION: The ORION remote/integral RF Module has the capability to detect a tamper should it exist. Proper setup in ORION Reading System software needed.

CONSTRUCTION: The housing of the RTR is constructed of a tempered glass lens top and a copper alloy metal bottom. Internal construction materials are thermoplastic for long-life and high reliability. The integrity of the adhesive seal joining the glass top to the metal base provide unmatched protection in water meter applications. A corrosion and tamper resistant TORX seal screw is provided to secure the RTR to the meter. The shroud assembly is polycarbonate.

TEMPERATURE: The operating range of the RTR is -40°C to 49°C (-40°F to 120°F). The operating range of the Integral and Remote ORION Modules is -40°C to 60°C (-40°F to 140°F). The water meter should not be subjected to temperatures below freezing.

MOISTURE: The RTR-Integral ORION is designed for dry applications, i.e., meters located in basements, utility rooms, etc. The RTR-remote ORION can be mounted indoors or outdoors where it is not subjected to submergence. It is not intended for outdoor meter pits or vaults.



SPECIFICATIONS

Transmitter/Register	Straight reading, permanently sealed, magnetic drive
Unit of Measure	U.S. Gallons, Cubic Feet, Cubic Meters, clearly identified on register face
Number Wheels	Six with 3/16" high numerals Namel font type
Test Circle	360° circle with ten major increments with ten divisions each
Weight	9 Ounces
Humidity	0% to 100% Condensing
Signal Characteristics	Open Drain (FET)
Visual Resolution	1/100th of Test Circle
Electronic Resolution	1/10th of Test Circle
Typical Signal Duration	15 ms to 75 ms @ 25°C (77°F) 8 ms to 75 ms over operating temperature range at 67 µA
On State Resistance	7.5 Ohms @ 25°C (77°F)
Power Source	External
Maximum Switching	30 VDC @ 1 mA @ 25°C (77°F)
Battery on Integral and Remote ORION	(2) 3.6V 2.4 Ahr Lithium Batteries

See Badger Technical Brief RTR-T-05 for RTR® specifications.



WIRE CONNECTIONS: The RTR can be factory prewired with pre-sized wire harness of up to 75 feet to the ORION® Remote.

ELECTRONICS: The piezoelectric switch circuit board is completely sealed against moisture inside the unit and sealed to ensure protection from humidity. The ORION RF Module is coated to protect against the effects of humidity.

ELECTRICAL: The electronic circuitry of the RTR and ORION RF Module is designed to provide immunity to electrical surges and transients per IEC801-2, IEC801-4 Severity Level 4.

OPERATING CHARACTERISTICS: The RTR has an output equal to 1/10th of the meter test circle with the characteristics of an open drain FET. The on-state condition is a solid-state switch closure. Off-state condition is an open circuit. Powered by an external source, the RTR has a maximum rating of 30 VDC at 1 mA (25°C).

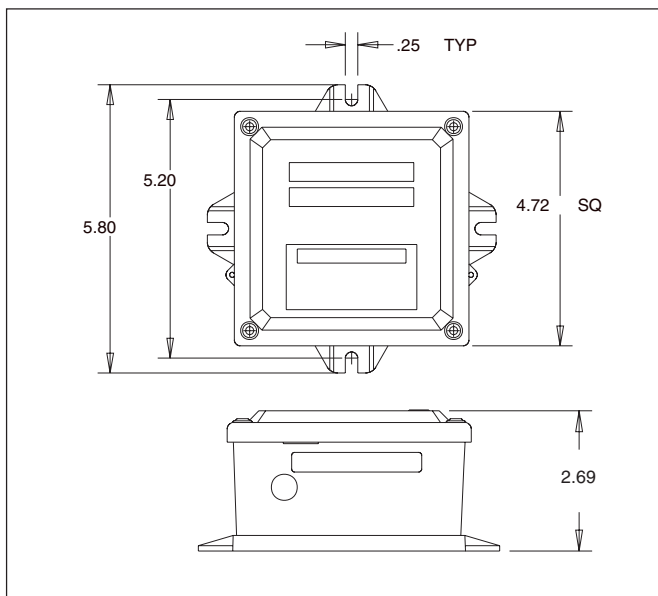
PATENT: The Badger Meter RTR-Integral ORION package is covered by U.S. Patent Nos. 348,384, 486,8566.

TRANSPORTATION WARNING: The Federal Aviation Administration prohibits operating transmitters and receivers on all commercial aircraft. When powered, the Model RTR-ORION RF module is considered an operating transmitter and receiver and cannot be shipped by air.

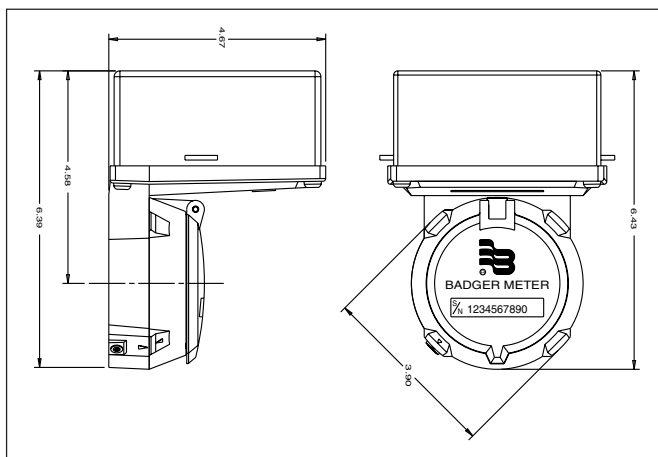
MEASUREMENT RESOLUTION: The minimum electronic resolution of the RTR is noted below. To verify the correct resolution for your application, contact Badger Meter Customer Solutions.

RECORDALL Model	Size	Gallons	Resolution Cubic Feet (Ft ³)	Resolution Cubic Meters (m ³)
M25	5/8"	1	0.1	0.01
M25	3/4"	1	0.1	0.01
M35	3/4"	1	0.1	0.01
M70	1"	1	0.1	0.01
M120	1 1/2"	10	1	0.1
M170	2"	10	1	0.1

RECORDALL Turbo Series (Size)	Gallons	Resolution Cubic Feet (Ft ³)	Resolution Cubic Meters (m ³)
2"	100	10	0.1
3"	100	10	0.1
4"	100	10	0.1
6"	100	10	1
8"	100	10	1
10"	100	10	
12"	1000	100	
16"	1000	100	
20"	1000	100	



RTR-Remote ORION Dimensional Drawings



RTR-Integral ORION Dimensional Drawings

METER COMPATIBILITY: Badger Meter's Recordall® Disc, Turbo, and Compound Series meters for Integral and Remote. Remote can be installed with Fire Service meters and assemblies.

LICENSE REQUIREMENTS

This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following two 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. Any changes made by the user not approved by Badger Meter can void the user's authority to operate the equipment. No license is required by the utility to operate a ORION meter reading system.

Badger®, ORION®, Recordall® and RTR® are registered trademarks of Badger Meter, Inc. TORX® is a registered trademark of Camcar, Division of Textron, Inc.



Please see our website at www.badgermeter.com for specific contacts.



BadgerMeter, Inc.

P.O. Box 245036, Milwaukee, WI 53224-9536
(800) 876-3837 / Fax: (888) 371-5982
www.badgermeter.com