



KITTITAS COUNTY

DEPARTMENT OF PUBLIC WORKS

Kittitas County Water Meter and Endpoint Installation Specifications

Water Meter and Endpoint Specifications:

Water meters shall be manufactured by Badger Meter, Inc. and be the Recordall Disc Series model 25 or model 55. Endpoints shall be ORION® Cellular LTE or LTE-M model with Twist Tight connectors. Water meters, endpoints and endpoint extension cords are provided by Kittitas County Public Works. All other water meter installation materials can be purchased at an irrigation or plumbing supply store.

Outdoor Water Meter Box Installation:

1. The meter must be installed on the mainline prior to any residential lateral connections.
2. Meters must be accessible.
3. The meter must be installed according to manufacturer specifications despite varying pipe-fitting, pipe size, well locations and landscape conditions
4. Meter installation must have an even velocity profile. Installer must insure proper design and installation.
5. Meter must be installed below the Kittitas County frost line (KCC Chapter 14.04.020). Insulation is recommended to be installed in the meter pit to avoid freezing in winter months.
6. The endpoint must be installed through the water meter box lid with provided lock nut assembly.
7. Proper installation of metering equipment and functional water flow must be complete prior to the final meter inspection.

Items required for meter box installations:

- Meter setter (1) Cambridge Brass, Ford Copper, or industry equivalent
- Water meter boxes (3) Armorcast, Nicor, or industry equivalent
- Water meter box lid (1) Armorcast, Nicor, or industry equivalent

Indoor Water Meter Installation:

1. Indoor installation is permitted in pump houses and garages only.
2. The meter must be installed on the mainline prior to any residential lateral connections or spigots.
3. Meters must be accessible.
4. The meter must be installed according to manufacturer specifications despite varying pipe-fitting, pipe size, well locations and landscape conditions
5. Meter installation must have an even velocity profile. Installer must insure proper design and installation.
6. If the meter is installed in a pump house or garage that is not heated, insulation is recommended to be installed around the pipes to prevent freezing in winter months.
7. The endpoint must be installed through an exterior wall of the pump house or garage with provided lock nut assembly.
8. Proper installation of metering equipment and functional water flow must be complete prior to the final meter inspection.

Water Meter Installation Cost Reimbursement:

Itemized invoices or receipts must be submitted with a signed copy of the Reimbursement Request Form prior to the final meter inspection. Reimbursement cannot be requested after the final meter inspection has been conducted.



Badger Meter

Recordall® Disc Series Meters

Cold Water Disc Meters, 5/8 in. to 2 in.



SAFETY INFORMATION

The installation of the Recordall® Disc Series Meters must comply with all applicable federal, state, and local rules, regulations, and codes.

Failure to read and follow these instructions can lead to misapplication or misuse of the Recordall® Disc Series Meters, resulting in personal injury and damage to equipment.

PRODUCT UNPACKING AND INSPECTION

Upon opening the shipping container, 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.

METER PRE-INSTALLATION

Take into account the following considerations before you begin an installation:

- Inspect the piping around the meter for suitable conditions. The service line, valves, connections and meter must be watertight. Repair the piping system if pipes are corroded or damaged.
- Install the meter in the pipeline in a horizontal position so that the flow arrow on the meter housing points in the same direction as water flow. Registration should be upright and protected from damage, freezing, and tampering.
- Position the meter so it is accessible for installation, removal and reading.
- Verify that a suitable electrical grounding wire is properly attached to the upstream and downstream pipe connections of the meter. The grounding wire provides an alternative path for any electrical current that may exist across the opening in the line.
- Close the curb (shutoff) valve to relieve water pressure in the line before starting the cutting operation. Provide a high-quality upstream shut-off valve with a low pressure drop.
- When cutting into a new section of service pipe, flush the pipe to clear chips, pipe dope or other plumbing residue.
- The installed meter must not be an obstacle or a hazard to the customer or interfere with public safety.

CAUTION

- **DO NOT ATTEMPT TO USE ANY METER AS A LEVER OR CROWBAR TO STRAIGHTEN A MISALIGNED METER POSITION. THIS COULD DAMAGE THE METER.**
- **DO NOT ATTEMPT TO INSTALL A METER INTO AN OPENING THAT IS TOO LONG BY FORCING THE PIPING INTO PLACE WITH THE METER'S COUPLING NUTS. THIS WILL CAUSE SERIOUS DAMAGE TO THE THREADED ENDS OF THE METER AND HOUSING.**
- **TO AVOID POTENTIAL PROBLEMS, CORRECT ANY IRREGULARITIES IN PIPE SPACING AND MISALIGNMENT BEFORE PLACING THE METER INTO ITS POSITION.**

SPECIAL INSTRUCTIONS FOR REMOVING A METER

⚠ WARNING

DEPRESSURIZE THE LINE BEFORE STARTING ANY DISASSEMBLY OPERATION. REMOVING A METER THAT IS UNDER LINE PRESSURE CAN RESULT IN COMPONENTS BECOMING PROJECTILES, CAPABLE OF CAUSING PERSONAL INJURY.

SPECIAL FITTINGS AND ACCESSORIES

To accommodate 5/8 in., 3/4 in. and 1 in. meter installations, special fittings and accessories are available. Metal meter setters, re-setters, horns and meter yokes are available for holding the service pipe in proper alignment to the meter and laying length spacing. The metal setters and meter yokes can provide an electrical continuity to protect meters and consumers from electrical shocks.

NL bronze connections are available from Badger Meter. To compensate for minor service pipe and setting misalignment for a 5/8 in., 3/4 in. and 1 in. meter, plastic swivel connections are also available.

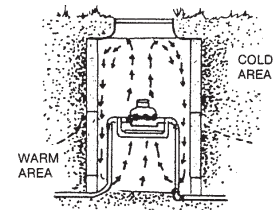
Cast iron or NL bronze companion flanges are available for a 1-1/2 in. and 2 in. meter.

INSTALLING RECORDALL DISC SERIES METERS

Outdoor Installations

When installed outdoors in a meter box, the disc meter should have a two- to three-inch clearance to avoid damage or strain to the service piping or meter, and to accommodate any "settling" that may occur after installation.

The service pipe in the meter box should be properly bedded to ensure that it is not axially misaligned and that it lays evenly on the bottom of the pipe trench. The backfill material covering the pipe should be placed appropriately to maintain pipe alignment in the event of eventual ground shifts. This will prevent damage to the pipe.



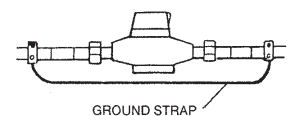
The service lines and the water meter must be protected from freezing. The earth covering the service line must be adequate to prevent frost penetration. Due to the smaller volume of water, service line pipes will freeze sooner than the main distribution line.

For those locations in which a remote possibility of freezing exists, thermoplastic or lead-free bronze alloy meters with cast iron bottoms are recommended.

The meter box pit should be excavated below the frost line. Even though the meter itself may be positioned above the frost line, the warmer air rising from the earth below the frost line will reduce the possibility of freezing.

Indoor Installations

As a precautionary measure when working with metallic pipes, indoor settings must be checked for electrical continuity through the service pipe before you remove or service a meter. American Water Works Association (AWWA) policy specifies that service pipes must not be used as an electrical ground. Check your local codes and practices. A permanent ground strap or metal setter must be used if electrical grounding to water services is required in your community. This is especially important for the engineered polymer meter.



To prevent floor damage, close the valve downstream from the meter before installing or removing a meter.

INSTALLATION INSTRUCTIONS

To prepare for meter installation, follow these steps:

1. Close the meter's inlet-side valve.
2. Open a faucet and wait until water flow stops, to depressurize the system. Do not remove the meter until the flow stops.
3. Check valves and make necessary repairs to the curb (shut-off) valve or inlet side valve if necessary.
4. Close the meter's outlet-side valve. Protect the floor below the meter against potential spills or leaks that could occur. Protect the coupling area from debris, so that the new meter will not be damaged or contaminated.
5. To replace an existing meter, continue with Step 6. To install a new meter, skip to Step 8.
6. Loosen meter couplings or flange bolts and remove the meter and the old gaskets in the coupling nuts.

IMPORTANT

Replace the entire connection set when you replace the meter (or earlier, if necessary).

7. Clean the coupling nuts or flange ends, removing any pipe dope or dirt from the threads or flange ends.
8. Check the existing setting for proper alignment and spacing. Correct any misalignment and spacing in the setting.
9. Place the new connection gaskets inside the connection coupling nuts.
10. Install the meter in the pipeline in a horizontal position so that the flow arrow on the meter housing points in the same direction as water flow.

5/8 in. to 2 in. Threaded Ends

11. Start the coupling nuts at the threaded meter ends. Verify that the nuts are properly aligned to avoid cross-threading or damage to the meter ends. This is especially important for the engineered polymer meter.

An effective method for starting a coupling nut is:

- a. Position the nut squarely against the meter's spud end.
- b. Turn the nut counterclockwise (in reverse) while holding the nut against the meter spud end. When the first threads on both the nut and the spud end coincide, you will hear a slight click and feel the nut move into the starting position.
- c. Tighten the nut by hand until it is snug.
- d. With an open-end wrench, apply a partial turn. Do not over tighten. For plastic swivel connections, a one-quarter turn is usually sufficient.

1-1/2 in. to 2 in. Elliptical Flange Ends

12. With meter and gaskets in place, tighten the flange connection bolts. Verify the nuts are properly aligned to avoid damage to the flanged ends.

PROTECT AGAINST LEAKAGE

Before turning on the service water, use care to protect against potential leakage.

1. Shut off the valves on both the inlet and outlet sides of the meter.
2. Open the curb (shutoff) valve slowly to pressurize the service line to the meter.
3. Slowly open the meter's inlet-side valve to fill the meter.
4. Check for leaks around the meter and its connections.
5. Slowly open the meter's outlet-side valve to pressurize the consumer side of the system.
6. Open a faucet to allow entrapped air to escape.
7. Once water is flowing normally, turn off the faucet.

ORION CELLULAR ENDPOINTS

This section covers identification, installation, encoder compatibility, and activation for the ORION Cellular LTE endpoints. ORION Cellular LTE endpoints use serial numbers starting with 11xxxxxxx.

ORION Cellular LTE Endpoints

The ORION Cellular LTE endpoint is pictured in [Figure 5](#). The serial number is engraved on one side of the endpoint base, and a yellow FCC label is displayed on the other side.

Endpoint Configurations

ORION Cellular LTE endpoints can be ordered in the configurations listed here. They can be deployed in indoor, outdoor and pit applications.



Figure 5: ORION Cellular LTE endpoint

Installation Guidelines

Connect the endpoint to an encoder to complete the assembly and install according to these guidelines:

- **Indoor Installation:** Mount through an exterior wall of the garage or pump house in an area that can be easily accessed for future maintenance or replacement.
- **Pit Installation:** Mounting through a non-metal pit lid is **required**.

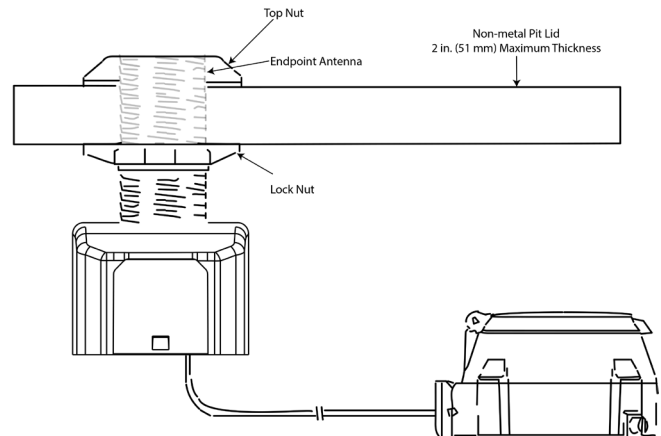


Figure 6: ORION LTE endpoint thru non-metal pit lid or exterior wall of garage/pump house.

NOTE: Endpoints that are not properly installed may not be covered under warranty.

Sample Professional Invoice

BILL TO

Customer name and address

INVOICE #	DATE	TOTAL DUE	DUE DATE	ENCLOSED

DATE	ACTIVITY	QTY	RATE	AMOUNT
07/17/2019	1 1/4 X 1 Stainless Bell Reducer 1 1/4" X 1" Stainless Bell Reducer	2	6.44	12.88
07/17/2019	Wirsbo male 1 Wirsbo male 1" M	1	18.31	18.31
07/17/2019	Male Adapt Sharkbite 1 Male Adapt Sharkbite 1"	1	18.71	18.71
07/17/2019	Ball valve 1 Sharkbite Ball valve 1 Sharkbite	1	22.246	22.25
07/17/2019	Wirsbo 90 1 plastic Wirsbo 90 1" plastic	2	4.99	9.98
07/17/2019	Labor Labor	1	102.50	102.50
07/17/2019	Wirsbo ring 1 Wirsbo ring 1" M	7	0.71	4.97

SUBTOTAL	189.60
TAX (8%)	15.17
TOTAL	204.77
BALANCE DUE	\$204.77



KITTITAS COUNTY DEPARTMENT OF PUBLIC WORKS

Water Meter Installation Reimbursement Request Form

Reimbursement documents must be submitted prior to the final meter inspection

Remit Payment To:

Owner Name: _____

Permit # _____

Mailing Address: _____

Phone Number: _____

Email Address: _____

Meter Installation Location: Garage Pump House Meter Pit

Location of meter pit: _____

Assessor's Parcel #: _____

Date Stamp

Item	Description	QTY	Rate	Total Price	Verified Material
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Notes: _____

Tax: \$

Total Requested: \$

Kittitas County Public Works is not responsible for payment owed to the company hired to perform the water meter installation. Reimbursement will be issued directly to the parcel owner. Kittitas County Public Works reserves the right to verify all invoices and suspect or fraudulent invoices will be reported to law enforcement for investigation and possible referral of criminal charges.

Owner Signature: _____

Supervisor Verification:

Signature: _____ Date: _____ Verified Reimbursement Total: \$ _____