

INSTALLATION GUIDE

Residential Water Meters



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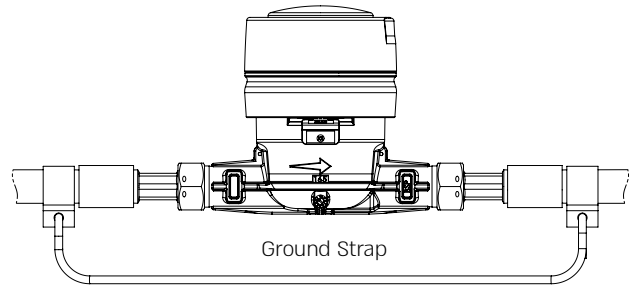
A. General Instructions for Residential Meters

1. Prior to Installation, Inspect and Ensure:

I. Service lines, valves, connections and meters must be watertight.

II. **GROUNDING: CHECK LOCAL CODES AND REGULATIONS**

Before a meter is removed for service, replaced, or installed, settings must be checked for electrical continuity through the service pipe (provided the pipe is metallic). Certain local codes or national legislations state that service pipes are to be used as electrical ground. A permanent ground strap, shunt, or metal setter which provides electrical continuity must be used if electrical grounding to water services is used. This shall be assembled by an eligible professional, and with parts/equipment approved by the local codes and regulations. THESE ITEMS ARE NOT PROVIDED WITH THE WATER METER, and Arad assumes no responsibility for the electrical grounding of its water meters.

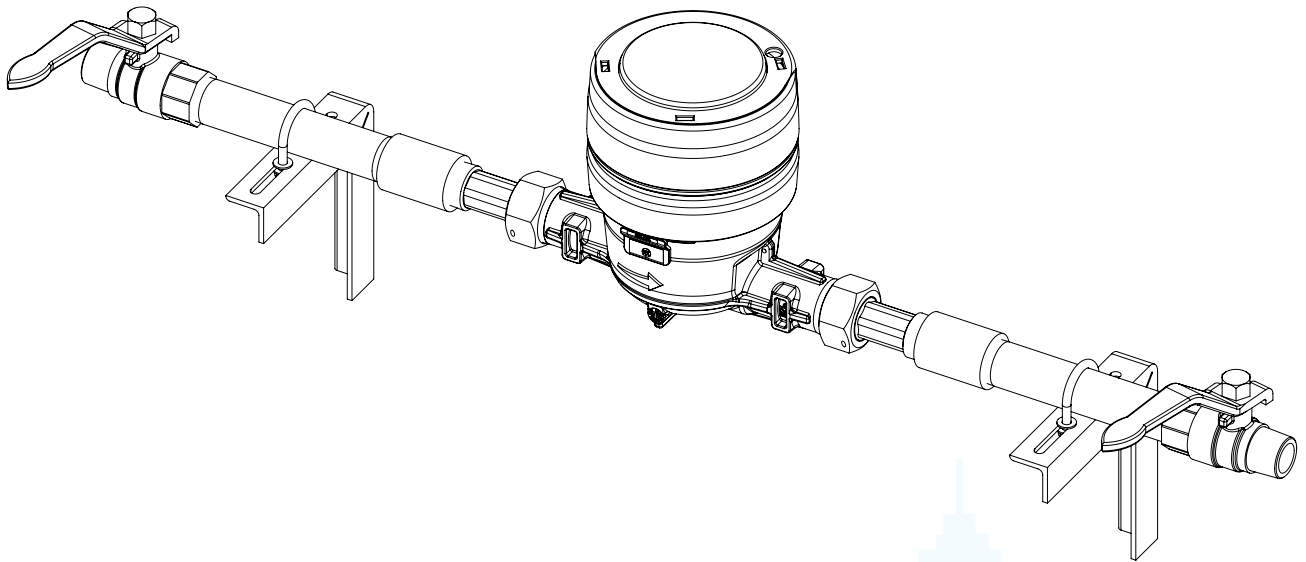


III. Repair the piping system if pipes are corroded or damaged.

IV. Provide an upstream and downstream shut-off valve of high quality and with low pressure drop. (A valve before the meter will allow local shutoff of the water if change or repair is later needed. A valve or check valve on the outlet side of the meter will keep water from draining from the building if you change or remove the meter.)

V. Provide a drain cock between the meter and the downstream valve.

VI. In general, install the meter horizontally in the line to obtain optimum performance. Volumetric meters may also be installed vertically or at an incline.



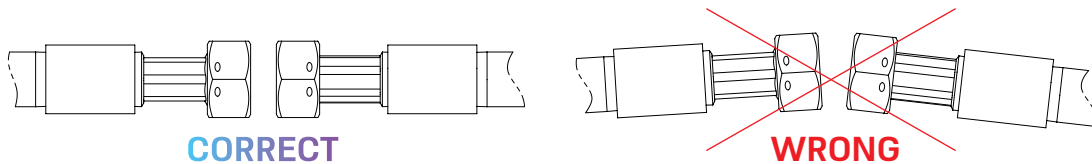
VII. Ensure that the installed meter will be easily accessible for reading, inspection, and service.

VIII. Protect the meter and piping against frost, flooding, mechanical damage and tampering.

IX. The installed meter must not be an obstacle or a hazard to the customer or interfere with public safety.

X. ALWAYS FLUSH THE UPSTREAM AND DOWNSTREAM PIPING PRIOR TO INSTALLATION. ENSURE THAT THE WATER IN THE PIPES IS COMPLETELY FREE OF ANY DEBRIS.

- XI. Standard water meters are for cold potable water only. For hot water (temperatures greater than 50°C(120°F)), you must get a "hot water meter" which is designed with materials that will withstand heat.
 - XII. If you have high pressure you must install a pressure regulator. Most meters are rated to 16 BAR (150 psi). If you already have a pressure regulator, verify that the regulator works and is adjusted correctly.
2. **HANDLING:** The meter is an accurate measuring device, and although robust in design and construction, should be handled, transported, and installed with care. The meter should remain within its protective packaging until the point of installation.
 3. **STORAGE:** Storage temperatures shall remain within the range of -20°C to +60°C (-4°F to +140°F), avoiding direct sunlight.
 4. Special fittings and accessories are available to provide easier meter installation, and proper alignment.
 5. Meters may be installed indoors or outdoors. When meters are installed outdoors, they should generally be located in a meter box. The box should have ample clearance around the meter to avoid damage or strain to the service piping and meter.
 6. The service pipe entering and exiting the meter box should be properly bedded to insure that it is not axially misaligned. Ensure that pipe alignment is maintained so that the service pipe or meter will not be damaged by eventual ground shifts.



7. **⚠ CAUTION!**
DO NOT attempt to use any meter as a lever or crowbar to straighten misaligned meter settings.
DO NOT attempt to set a meter into a meter opening which is too long and attempt to force the piping into place with the coupling nuts on the meter setting. This can cause serious damage to the threaded ends of the meter and to the meter itself.
8. Indoor meter settings may be located in basements, crawl spaces, utility rooms, or in a garage.
9. The meter installation should include a valve just downstream from the meter to prevent damage to the floor during meter servicing or removal from the line.
10. For meters that are located indoors, a remote reading system is recommended. This eliminates access problems and avoids customer complaints concerning strangers entering the home. The system is installed so that the meter can be read at a convenient outdoor location.
11. Your meter may have a frost protection device. Take particular care to install the meter in a location where water damage will not occur if the frost device releases or functions. Arad assumes no responsibility for damages.
12. Service Lines, especially water meters, should be protected from freezing. The amount of earth covering service lines must be adequate to protect against frost penetration. Because of the relatively small volume of water in service lines, these pipes freeze more rapidly than mains. Where outside meter settings are used, the meter boxes and pits should be excavated below the frost line. Even though the meter itself is not installed below the frost line, the heat rising from the warmer earth excavation below the frost line will reduce the possibility of freezing.

B. Installation Instructions For Residential Meters

All meters should be installed according to the standards of the local jurisdiction or water utility. Contact ARAD in case local rules conflict with any of the following instructions.

1.  **WARNING!**

BEFORE STARTING ANY DISASSEMBLY OPERATION, THE WATER LINE MUST BE DEPRESSURIZED. REMOVING A METER THAT IS UNDER LINE PRESSURE CAN RESULT IN SERIOUS PERSONAL INJURY.

2. Close the meter's inlet-side valve.
3. Open a faucet and wait until water flow stops, to depressurize the system. Do not remove the meter until the flow stops.
4. Check valves and make necessary repairs to the curb (shut-off) valve or inlet side valve if necessary.
5. For proper sealing, use NEW meter gaskets when changing a meter.
6. Do not use thread sealant or pipe dope on meter or meter coupling threads. Meters are sealed by the gasket only.
7. 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 contaminated or damaged.

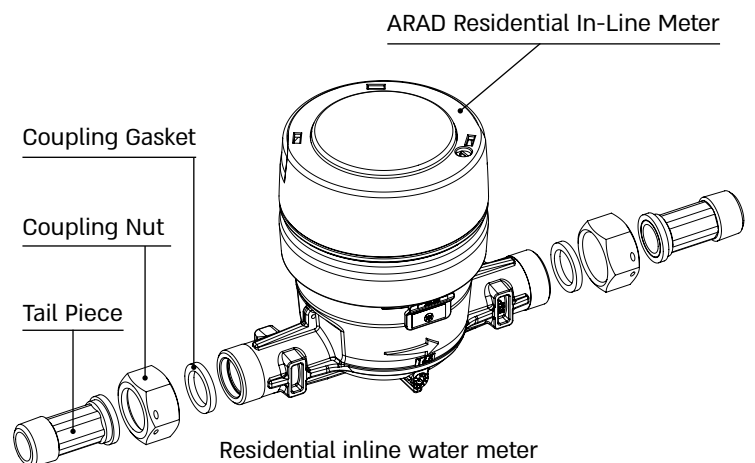
8. **Installing ARAD In-Line Residential Meters sizes: 1/2" to 1"**

- I. If installing a new meter skip to Step iv.
- II. When replacing an existing water meter, loosen meter couplings and remove the meter and the old gaskets in the coupling nuts.
- III. Clean the coupling nuts, removing any pipe dope or dirt from the threads.
- IV. Verify the existing setting for proper alignment and spacing. Correct any misalignment and spacing in the setting.
- V. Place the connection gaskets inside the connection coupling nuts.

Use rubber gasket hardness of 80-90 Shore A.

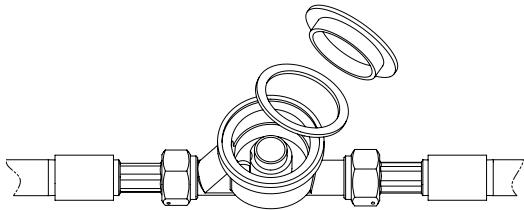
- VI. Set the meter between the coupling nuts, properly positioned so that the flow indication/arrow on the meter housing points in the direction of flow.
- VII. **Start the coupling nuts at the threaded meter ends. Verify that the coupling nuts are properly aligned to avoid cross threading damage (stripping) to the meter ends. This is especially important for the engineered composite/polymer meter.**
- VIII. The best method for properly starting meter coupling nuts is to position the nuts squarely against the meter spud end. Turn the nut counterclockwise (in reverse) while holding the nut against the meter spud end. When the first threads on both the coupling nut and the meter spud end coincide, a slight click will be heard and the movement of the nut into the starting position will be felt. At this point, turn the nut clockwise to complete the connection. In a good installation, this can be accomplished by turning the nut by hand until it is tight. When firmly hand-tight, apply an additional 1/4 to 1/2 turn using an open-end wrench with a short handle.

DO NOT over tighten (TIGHTENING TORQUE SHALL NOT EXCEED 8 Nm for a 3/4" nut, and 17 Nm for a 1" nut). Do not use pipe dope or sealants.

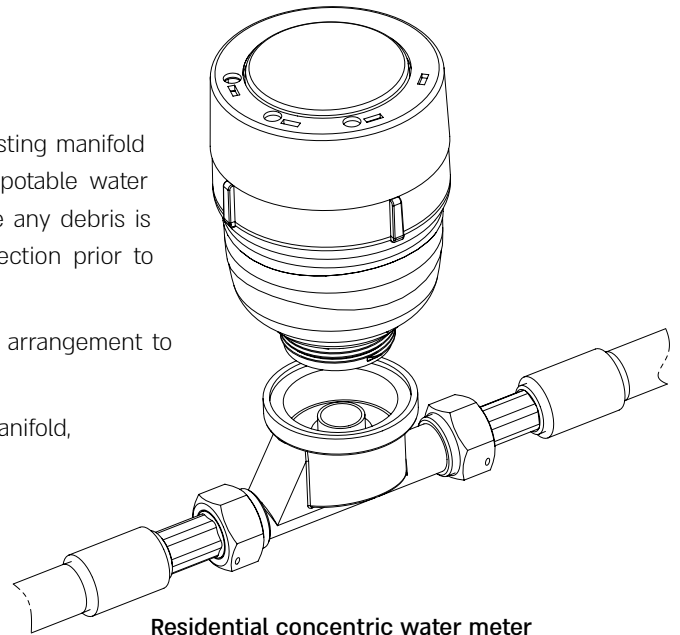


9. Installing ARAD Concentric Water Meters

- I. It is essential prior to the meter installation that all new or existing manifold both inlet/outlet pipework is thoroughly flushed with clean potable water & completely free from any foreign matter. Please also ensure any debris is removed and cleaned around the meter box manifold connection prior to installing the meter.
- II. If any debris does enter the manifold please use a standpipe arrangement to flush the manifold and pipe work clear.
- III. Remove the manifold blanking cap and O-ring from the meter manifold, this will expose the meter location thread.

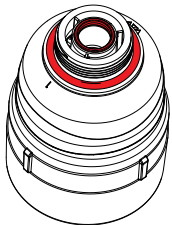


Mainfold blanking cap and O-ring of the meter manifold



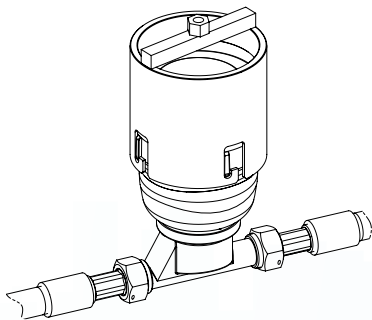
Residential concentric water meter

- IV. Remove the plastic thread protection cap from the meter.
- V. Ensure the meter's 'Centre O-ring & Outer Body O-ring Seals' are clean & located correctly. Great care must be taken to ensure these seals are free from any damage and maintain their position during installation as this is essential for the meter's accurate performance.



Center O-ring & Body O-ring Seals

- VI. Engage the meter body thread into the threaded pipe-work manifold socket. Rotate clockwise and hand-tighten, ensuring the threads run smoothly and are not crossed threaded. Tighten with the appropriate 'Arad Installation Key Tool' until resistance is reached against the Outer Body's 'O-ring seal'. This should be sufficient to seal the installation.



Arad Concentric Installation Key Tool

- VII. **Over-tightening of the meter into the manifold will cause undue stress to the meter & should be avoided at all times.**

10. The meter can be damaged if subjected to full flow conditions prior to expelling all the air from the pipeline.
11. After installation is complete, and prior to opening the upstream/inlet water valve ensure that the valve on the downstream/outlet side of the meter is shut.
12. In case the main/service shut-off valve is closed, open it slowly to pressurize the service line to the meter setting. Water meters are meant to measure water, not air. Air in the lines may damage a meter and other equipment. Water hammer from a quick turn-on can damage your plumbing and appliances or cause a water line rupture.
13. Slowly open the inlet side valve which will fill the meter with water. Once the water is on, be sure the meter inlet valve is fully open. Partially open valves can make the meter inaccurate and lead to low water pressure.
14. Check for leaks around the meter and connections. Open a downstream/consumer faucet to allow entrapped air to escape once the outlet valve is opened. Open the meter outlet side valve slowly to pressurize the downstream/consumer side of the system. Turn off the consumer faucet when normal water flow occurs.
15. Ensuring that all consumer faucets are shut, observe the low flow detector in the meter to identify downstream leaks in the consumer's system.
16. If the meter is in a cold climate, make sure it won't freeze. Meter pits should be to the depth of the frost line in your area. If they've filled with silt or sand, clean them out or insulate the meter.

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