

General Information

The TB are bronze-bodied turbine meters designed for use in pipe sizes 1-1/2" to 4". High-quality jewel bearings and ceramic shafts are used in the standard version. Low-flow performance is superior. The rotation of the rotor is detected by a non-drag Hall-effect sensor. Output is a pulse-type square wave, which can be sent long distances (up to 2,000 feet) without a transmitter. This signal can be connected directly to SeaMetrics controls, as well as PLC's, counters, and computer cards. Battery operation using the FT415 battery-operated Flow Computer is also available as an option (requires micro-power sensor).

SeaMetrics TB Turbine Meters are ideal for chemical proportioning applications. If no display is required, a simple divider such as the PD10 provides adjustable pump pacing. For rate and total display, as well as pump pacing, the FT415/420 flow indicator can be mounted directly on the TX80 Series, or remotely on a wall or panel.

The TB consists of a brass machined insert and a cast bronze flow tube. The rotor, sensor, and all replaceable parts are removable by pulling a simple u-clip lock.

Specifications

Sensor

GMR

12 VDC current sinking pulse square wave

Micro-power sensor

Materials

Sensor Body

Brass

Rotor

Kynar

Shaft

Ceramic

Bearings

Ruby ring, sapphire endstone

Pipe Size

1-1/2"-4" (25-100mm)

FNPT

1-1/2"-4" (25-100mm)

Female coppersweat

Maximum Pressure

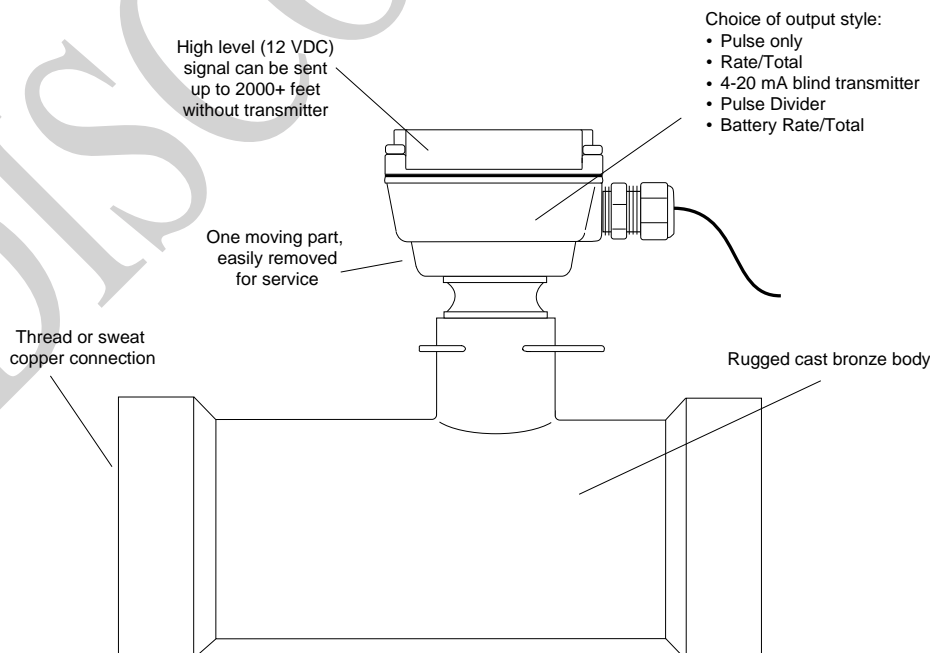
200 PSI (14 bar)

Maximum Temperature

200° F (93° C)

| | 1-1/2" | 2" | 3" | 4" |
|-------------|--------|-----|-----|------|
| Min. | 1.9 | 3.1 | 6.9 | 12 |
| Max. | 190 | 314 | 691 | 1200 |

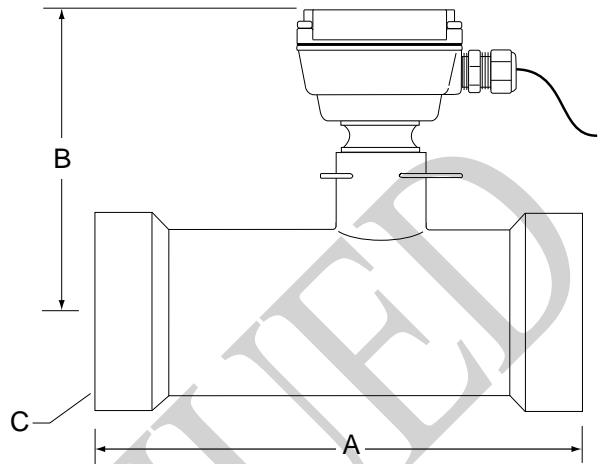
Features



Electronic Options Specifications

| | |
|------------------------------------------|--------------------------------------------------------------------|
| TB100 (Pulse Only) | |
| Power | 6-24 VDC |
| Pulse Type | Current sinking |
| TB101 | |
| Power | 12-32 VDC, 1.5 mA current loop powered 24 VDC optional |
| Rate | 8-digit autorange |
| Total | 8-digit, selectable decimal Reset standard, non-reset option |
| Memory | Nonvolatile (no battery needed) |
| K-factor Range | .050 - 1,999.999 |
| Pulse Output | 0.1 second, open collector |
| Pulse Range | 0.1 - 99,999 gallons per pulse |
| Analog Output | 4-20 mA, user-programmed span, two wire |
| TB102 (Blind Transmitter) | |
| Output | 4-20 mA |
| Loop Power | 12 - 36 VDC (isolated) |
| Accuracy | ± 1% |
| Response Time | 3 sec., 95% FS |
| TB104 (Battery-powered Ratemeter) | |
| Rate & Total | LCD readout w/resettable totalizer display |
| Battery Life | 3 Years |
| Battery Type | Lithium, replaceable |

Dimensions



| Size | A | B | C ₁ (NPT) | C ₂ (sweat) |
|--------|-------|------|-------------------------|---------------------------|
| 1-1/2" | 3.80 | 6.50 | 1-1/2" | 1.625 |
| 2" | 4.00 | 6.75 | 2" | 2.125 |
| 3" | 8.00 | 6.80 | 3" | 3.125 |
| 4" | 10.00 | 7.02 | 4" | 4.125 |

Installation



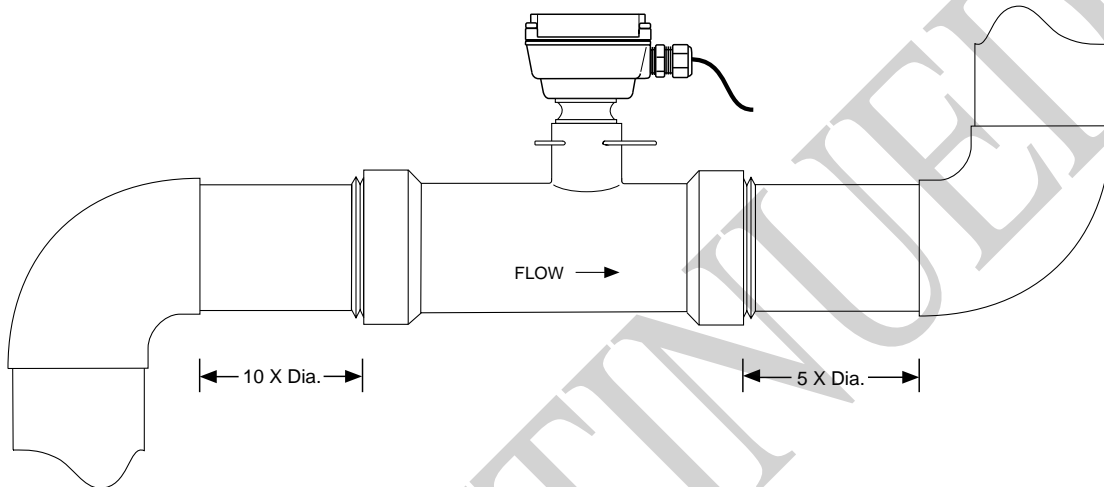
These water meters are not recommended for installation downstream of the boiler feedwater pump where installation fault may expose the meter to boiler pressure and temperature. Maximum recommended temperature is 200°F.

Maintenance and Repair

Recalibration. If it is necessary to recalibrate the meter for any purpose, this can be done by any SeaMetrics-authorized facility. Call the factory for information.



Caution! Before removing insert, first remove pressure from the line. Do not remove the u-clip which holds the insert in place until the line is depressurized.



Piping Conditions. In general, the standard practice of installing the meter with ten diameters of straight pipe upstream and five downstream are recommended. Some conditions require more upstream pipe. The Seametrics technical bulletin called "Flow Meter Installation: Straight Run" is a useful guide in this regard.

Connections. Standard connections are NPT pipe: thread and sweat solder, for copper water tube. For threaded connections, use a standard thread sealer or tape to prevent leakage.

Position. The TB Series are all-position meters, and can be operated in a vertical or horizontal position, and with the meter inserted in any radial position. A horizontal insert position is preferred if there is a risk of air becoming trapped due to constant low flows. Operating the meter in partially-filled pipe will result in inaccuracies.

Connections. Most TB meters require electrical connections. See the connections diagram for the one relevant to your meter.

Operation

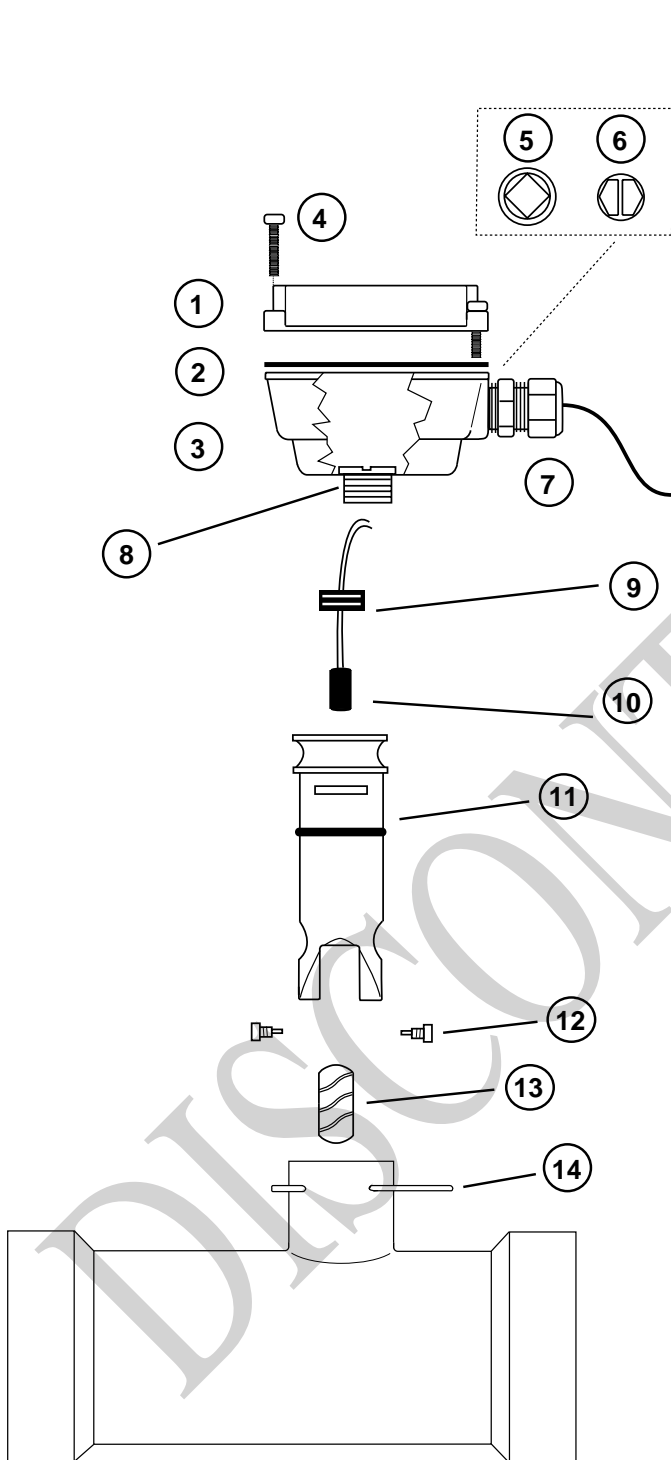
For operating instructions for the various electronic modules, consult the manual for the specific module. This should be included with the meter when purchased.

Turbine Insert Removal and Installation. In order to repair any mechanical parts (rotor or shafts) it is necessary to remove the turbine insert.

Rotor and Shaft Replacement. Examine the rotor to determine if bearings or shaft are damaged or excessively worn. The rotor should spin smoothly and freely with no visible wobble. Back and forth play should be very minor, less than 1/64". If it is necessary to replace the rotor or shafts, first back out both shafts with a blade screwdriver. The rotor will come free as soon as the shaft ends come free of the rotor bearings. Reverse the procedure to reinstall, taking care to maintain a small amount of free play between the shaft ends and the bearings.

Sensor Replacement. This procedure is rarely necessary. However, certain electrical conditions can damage the sensor. To replace it, disconnect the sensor leads from terminals on the electronics module. Then remove the screw which retains the sensor. Remove the sensor by tugging gently on the sensor leads. Reverse the process to install a new sensor.

Electronic Module Repair. None of the electronics modules have replaceable components. They must be replaced as complete units. In order to replace an electronic module, loosen the four screws which fasten each unit to the lower housing. Once the screws are loose, the unit will lift free.



| TB Parts | | |
|----------|---------------------------------|-------|
| 1 | Upper blind housing | 26181 |
| 1 | PD10 divider module | 26520 |
| 1 | FT420 rate/total display module | 26949 |
| 1 | AO55 4-20 mA transmitter module | 26521 |
| 1 | FT415 rate/total display module | 26519 |
| 2 | Gasket | 26211 |
| 3 | Lower housing | 29930 |
| 4 | Housing screw | 26229 |
| 5 | Plug, steel | 26073 |
| 6 | Plug, plastic | 26079 |
| 7 | Strain relief | 7655 |
| 8 | Housing retaining screw | 26508 |
| 9 | Sensor retaining screw | 25321 |
| 10 | Sensor | 26310 |
| 11 | O-ring | 25081 |
| 12 | Shaft screw | 16710 |
| 13 | Turbine rotor | 25947 |
| 14 | U-clip | 15527 |

SeaMetrics

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