

Quiksert In-Line Turbine Flow Meter Installation & Operation Manual



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Operation and Specifications

1. **TEMPERATURE:** Do not subject the meter to temperatures above 350° F (177° C), or below-150° F (-101° C), or the freezing point of the metered liquid. Higher temperatures will damage the pick-up, and lower temperatures will limit the rotation of the rotor.

2. **PRESSURE:** The pressure rating of the meter is dependent upon the class of ANSI flanges that the meter is to be mounted between. The pressure rating Table 1 below is based on carbon steel flanges at 100° F (37.8° C).

WARNING: Pressure in excess of allowable rating may cause the housing to burst and cause serious personal injury.

Table 1

Flange Rating (ANSI)	150#	300#	600#	900#	1500#
Working Pressure (psi)	285	740	1480	2220	3705
Working Pressure (Mpa)	1.97	5.10	10.20	15.31	25.55
* Test Pressure (psi)	427.5	1110	2220	3330	5557.5
* Test Pressure (Mpa)	2.95	7.65	15.31	22.96	38.32

*Test Pressured Based on 1.5 SF

3. **CORROSION:** The internal parts of the meter are constructed of stainless steel and tungsten carbide. Be sure that the operating fluid is compatible with these materials. Incompatible fluids will deteriorate internal parts, and cause the meter to read inaccurately.

4. **PULSATION:** Severe pulsation will affect accuracy, and shorten the life of the meter.

5. **VIBRATION AND SHOCK:** Severe mechanical vibration may decrease service life of the meter.

6. **FILTRATION:** A strainer should be installed upstream of the meter if small particles are present (see Table 1 for filtration requirements).

General Description

The QuikSert™ turbine flow meter is designed with wear resistant moving parts to provide trouble free operation and long service life. The Quiksert™ Meter Repair Kit is designed for easy field service of a damaged flow meter, rather than replacing the entire flow meter (see Appendix B for repair kit information). Repair parts are constructed of stainless steel alloy and tungsten carbide.

Fluid moving through the turbine flow meter causes the rotor to turn at a speed proportional to the flow rate. The rotor blade cuts the magnetic field of the magnetic pick-up, which in turn generates a frequency output signal that is directly proportional to the speed. The signal is used to represent flow rate and/or totalization of fluid passing through the turbine flow meter and is always expressed as the number of electric pulses that the meter produces per US gallon. This value is constant over each flow meter's range and is unique to the meter.

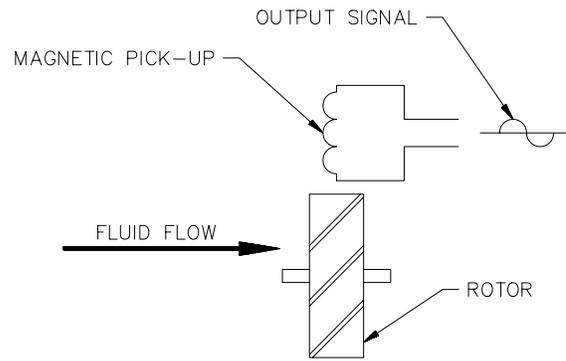


Fig. 1 Schematic illustration of electric signal generated by rotor movement.

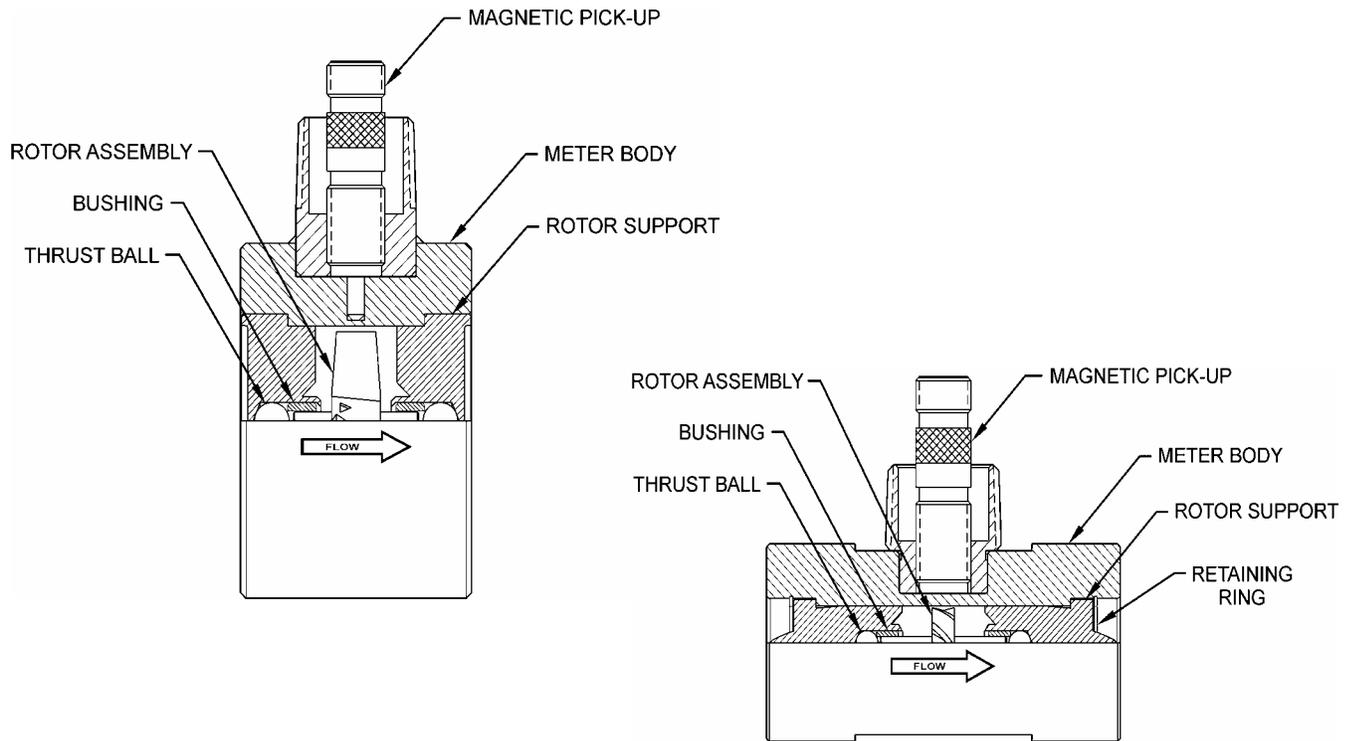


Fig. 2 Typical cross-section of a QuikSert™ turbine flow meter.

Installation Instructions

Before installation, the flow meter should be checked internally for foreign material and to be sure that the rotor spins freely. Fluid lines should also be cleared of all debris. The flow meter must be installed with the flow indication arrow, etched on the exterior of the meter body, pointing in the correct direction of flow. The preferred mounting orientation is to have the meter installed in horizontal piping, with the pick-up facing upward. However, the meter will function in any position.

The liquid that is to be measured must be free from any large particles that may obstruct rotation of the rotor. If particles are present, a mesh strainer should be installed upstream before operation of the flow meter. (See Table 2)

TABLE 2

PART NUMBER	STRAINER MESH	CLEARANCE
B131-038	60X60	.0092
B131-050	60X60	.0092
B131-075	60X60	.0092
B131-088	60X60	.0092
B131-100	60X60	.0092
B132-050	60X60	.0092
B131-075	60X60	.0092
B132-088	60X60	.0092
B132-100	60X60	.0092
B132-150	20X20	.0340
B132-200	10X10	.0650
B133-300	8X8	.0900
B134-400	10X10	.0650
B136-600	4X4	.1875
B138-800	8X8	.0900

The preferred plumbing setup is one containing a by-pass line (Fig. 3) that allows meter inspection and repair without interrupting flow. If a by-pass line is not utilized, it is important that all control valves be located down-stream of the flow meter (Fig. 4).

CAUTION: Damage can be caused by striking an empty meter with high velocity flow stream.

This is true with any restriction in the flow line that may cause the liquid to flash. If necessary, air eliminators should be installed to ensure that the meter is not incorrectly measuring entrained air or gas.

It is recommended that a minimum length, equal to 10 (10) pipe diameters of straight pipe, be installed on the up-stream side and five (5) diameters on the down-stream side of the flow meter. Otherwise meter accuracy may be affected. Piping should be the same size as the flange size.

Do not locate the flow meter or connection cable close electronic motors, transforming, sparking devices, high voltage lines, or place connecting cable in conduit with wires furnishing power for such devices. These devices can induce false signals in the flow meter coil or cable, causing the meter to read inaccurately.

If problems arise with the flow meter and monitor consult Appendix A (Trouble Shooting Guide). If further problems arise, consult factory. Turbine Meter Repair Kits are also available, see Appendix B. If the internal components of the turbine flow meter are damaged beyond repair, these repair kits are available. Information pertaining the turbine meter repair kits are referenced in Appendix B.

Operational Startup

The following practices should be observed when installing and starting the meter.

WARNING: Make sure that fluid flow has been shut off and pressure in the line released before attempting to install the meter in an existing system.

1. After meter installation, close the isolation valves, and open the by-pass valve. Flow liquid through the by-pass valve for sufficient time to eliminate any air or gas in the flow line

CAUTION: High velocity air or gas may damage the internal components of the meter.

2. Open up-stream isolating valve slowly to eliminate hydraulic shock while charging the meter with the liquid. Open the valve to full open.

3. Open down-stream isolating valve to permit meter to operate.

4. Close the bypass valve to a full position.

5. Adjust the downstream valve to provide the required flow rate through the meter. Note: The downstream valve may be used as a control valve.

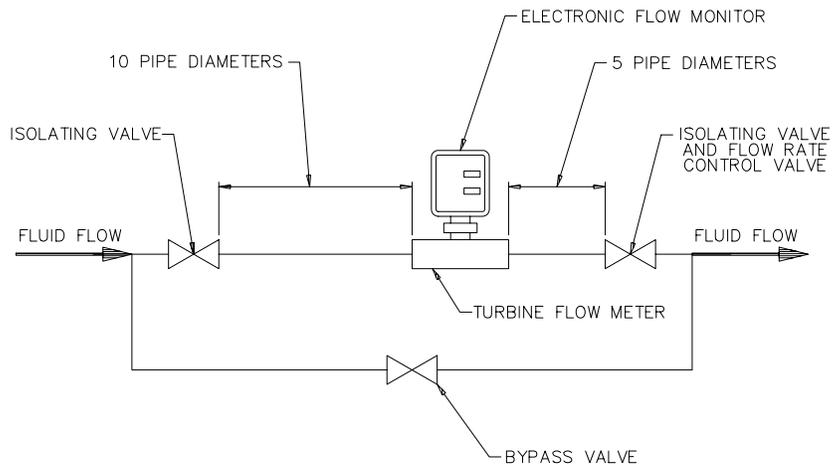


Fig. 3 Meter installation utilizing a bypass line

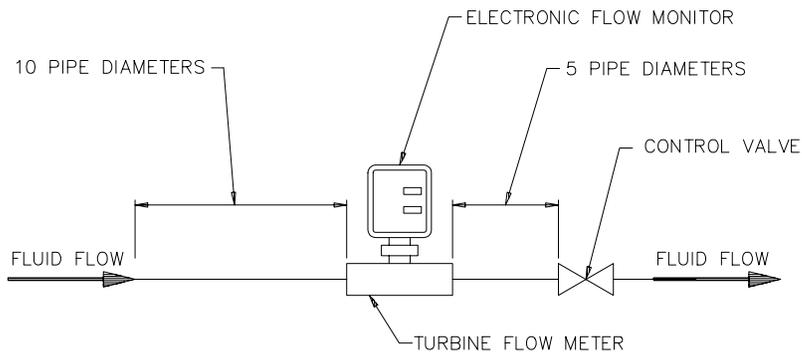


Fig. 4 Meter installation without utilizing a bypass line

Calibration

The meter is calibrated on water at the factory and tagged with a K-Factor (pulses per US Gallon). Also all attached electronics have been calibrated to match the flow meter's K-Factor. For maximum accuracy, the meter should be calibrated with the actual fluid being measured. The QuikSert™ meter can be recalibrated by any conventional meter proving processes used to calibrate standard meters.

**APPENDIX A
TROUBLE SHOOTING GUIDE**

TROUBLE	POSSIBLE CAUSE	REMEDY
Meter indicates higher than actual rate	Cavitation Debris on rotor support Build up of foreign material on meter bore. Gas in liquid	Increase back pressure Clean meter Clean meter Install gas eliminator ahead of meter
Meter indicates lower than actual flow rate	Debris on rotor Worn bearing Viscosity higher than calibrated	Clean meter and add filter Clean meter and add filter Recalibrate monitor (Appendix A)
Erratic system indication, meter alone works well (remote monitor application only)	Ground loop in shielding	Ground shield one place only. Look for internal electronic instrument ground. Reroute cables away from electrical noise.
Indicator shows flow when shut off.	Mechanical vibration causes rotor to oscillate without turning	Isolate meter
No flow indication. Full or partial open position	Fluid shock, full flow into dry meter or impact caused bearing separation or broken rotor shaft.	Rebuild meter with repair kit and recalibrate monitor. Move to location where monitor is full on start-up or add downstream flow control valve.
Erratic indication at low flow, good indication at high flow	Rotor has foreign material wrapped around it.	Clean meter and add filter
No flow indication	Faulty pick-up	Replace pick-up
System works perfect, except indicates lower flow over entire range	Bypass flow, leak	Repair or replace bypass valves, or faulty solenoid valves
Meter indicating high flow, upstream piping at meter smaller than meter bore	Fluid jet impingement on rotor	Change piping.
Opposite effects of above	Viscosity lower than calibrated	Change temperature, change fluid or recalibrate meter.

**APPENDIX B
REPAIR KIT INFORMATION**

Meter Size X Flange Size	Repair Kits fits Meter Part No.	Repair kit Part Number
3/8 x 1"	B131-038	B253-102
1/2 x 1"	B131-050	B253-105
3/4 x 1"	B131-075	B253-108
7/8 x 1"	B131-088	B253-109
1 x 1"	B131-100	B253-112
1/2 x 2"	B132-050	B253-202
3/4 x 2"	B132-075	B253-205
7/8 x 2"	B132-088	B253-208
1 x 2	B132-100	B253-209
1-1/2 x 2"	B132-150	B253-216
2 x 2"	B132-200	B253-220
3 x 3"	B133-300	B253-330
4 x 4"	B134-400	B253-440
6 x 6	B136-600	B253-660
8 x 8"	B138-800	B253-880
Standard Magnetic Pick-up	All Meter Sizes	B111109



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