General Information

This manual will assist you in operating and maintaining the CPU of the Turbine Flowmeter unit. For best results, take the time to fully acquaint yourself with all information about all components of your Turbine Flowmeter prior to installation and use.

Safety

For your safety, review the major warnings and cautions below before operating your equipment.

1. The equipment is approved to handle only fluids which are compatible with the housing material.
2. When measuring flammable liquids, observe precautions against fire or explosion.
3. When handling hazardous liquids, always follow the liquid manufacturer's safety precautions.
4. When working in hazardous environments, always exercise appropriate safety precautions.
5. For best results, always verify accuracy before use.

Product Description

Liquid flows through the turbine housing causing an internal rotor to spin. As the rotor spins, an electrical signal is generated in the pickup coil. This pulse data is translated from the turbine into calibrated flow units shown on the computer's readout.

Information is clearly displayed on a large 5-digit LCD readout with two-point floating decimal for total from 0.01 to 99,999. All operations are easily accessed with the two buttons on the front panel.

Installation

All Turbine Flowmeters are designed o measure flow in only one direction. The direction is indicated by the arrow cast-moulded in the turbine outlet. If the opposite direction is desired, simply rotate the computer electronics 180 degrees prior to installation.

Avoid "noisy" environments. Install at least 6 inches (15.2cm) away from motors, relays, or transformers.

To ensure accurate measurement, remove all air from the system before use.

1. Ensure some back pressure on the turbine.
2. Open the discharge valve or nozzle and allow fluid to completely fill the system. Make sure the stream is full and steady.
3. Close discharge valve or nozzle.
4. Start normal operations.

It is strongly recommended that accuracy be verified prior to use. To do this, remove all air from the system, measure an exact known volume into an accurate container, and verify the volume against the readout or recording equipment. If necessary, use a correction factor to figure the final volume. For best results, accuracy should be verified periodically as part of a routine maintenance schedule.

Operations

Turn on
The meter is on when any display is present. It turns on automatically when liquid flows through the meter. It can be turned on manually by pressing and releasing the DISPLAY button.

Turn off
The meter turns off automatically approximately 1 minute after flow stops. When the meter is off, the readout is blank.

Batch and Cumulative totals
Total flags are displayed on the left of the display screen. A Batch Total indicates flow during a single use. It is labelled with TTL1 followed by a number. To zero a batch total, make sure TTL1 is displayed and hold down DISPLAY button for three seconds until the display changes to zero.

The Cumulative Total is the total of all liquid measured since the meter's power was connected. At your first use, the Cumulative Total is not zero because of calibration at the factory. The Cumulative Total is labelled TTL2 and cannot be manually zeroed. The cumulative total is zeroed only when batteries are removed or go dead or when the Cumulative Total reached the maximum value of 99,999.

To change between totals, press and release DISPLAY button.

Flow Rate
When this feature is activated, the label FLW will be found on the left of the screen. When this flag is displayed, the numbers on the middle line reflect the rate of flow. To activate this feature, press and release isplay until FLW appears on the left of the screen.

Switching between Units Displayed
Press the CALIBRATE button to switch between display option either in Gallons labelled as GAL or in Litres labelled as LTR. (both labels are located at the bottom left corner of the screen)

Calibration Procedure

Press both DISPLAY and CALIBRATE button and hold for 2 seconds allows you to go into calibration mode, in this mode you will be able to fix the constant (K) which allows for calibration of the flowmeter.

Constant (K) is given by,

$$K = \frac{L \times Ko}{Lo}$$

Where K = constant to be ascertained
L = volume reading on the display screen
Lo = the actual volume of liquid that flowed through
Ko = the current K value displayed.

Should you wish to calibrate the flowmeter, the procedure is simple:

1. Fill a tank with a fixed amount of liquid that you will be allowing to flow through the flowmeter (this will give you value Lo), record this amount before allow the liquid to flow through.
2. Switch on the valve and allow the fixed amount of liquid to flow freely flowmeter and record the volume displayed on the screen (this will give you value L)
3. Press down both DISPLAY and Calibrate button for 2s, you will enter calibration mode, record the displayed number (this will give you value Ko)
4. To find out the correct K value, simple substitute the value of L, Lo, and Ko into the above equation, this will give you the K value to input.

   Note: Make sure the measurement units used in all values are the same, either all in litres or all in gallons.

5. **If you have not exited** from the calibration mode this are the steps you should take to change the K value:
   a. Pressing the DISPLAY button and releasing allows you to move along and select any digit to be changed on the K value
   b. Pressing the CALIBRATE button and releasing allows you to change the selected digit
   c. Once done simple press both DISPLAY and CALIBRATE button for 2s to set the K value
6. **If you have already exited** the calibration mode, simply press down both DISPLAY and CALIBRATE button for 2s to enter the mode and repeat steps 5a to 5c.

Maintenance

The computer electronics are powered by lithium batteries which provide at least 5,000 hours of actual use. If the meter's readout should become dim or blank, the batteries should be replaced.

When batteries are disconnected or fail, the Batch and Cumulative Totals return to zero. Calibrations are retained in the meter's computer when the power is lost.

It is strongly recommended that battery check and terminal cleaning be part of a routine maintenance schedule. Battery terminals should be cleaned annually. Batteries can be replaced without removing the meter from the piping system.

Replace Batteries

1. Remove the corner screws from the meter face and lift the computer electronics from the turbine.
2. Remove the batteries
3. Check the battery terminals and remove any corrosion
4. Install the new batteries and make sure the positive posts are positioned correctly. When the batteries are installed correctly, the computer powers on automatically and the readout displays information
5. Make sure the O-ring is fully seated before placing the computer electronics on the turbine. Tighten the four screws.

Troubleshooting

Symptoms	Probable cause	Corrective Action
Meter is not accurate	1. Calibration not performed correctly	Perform Calibration again.
	2. Meter Operated below minimum flow rate	Increase flow rate.
	3. Meter partially clogged with dried liquid	Remove meter. Clean carefully. Make sure rotor spins freely.
	4. Turbine bearings partially clogged with dried liquid	Remove meter. Clean carefully. Make sure rotor spins freely.
	5. Sealant material wrapped around rotor	Remove meter. Make sure rotor spins freely.
	6. Installed too close to fittings	Install correctly.
	7. Installed too close to motors or electrically "noisy" environment	Install correctly.
Readout faded or blank	1. Batteries weak, dead, or not connected	Remove computer and replace batteries.
	2. Computer defective	Contact the factory
Normal flow rate but meter does not count	1. Calibration not performed correctly	Calibrate again
	2. Rotor stuck or damaged	Remove meter. Make sure rotor spins freely.
	3. Sealant material wrapped around rotor	Remove meter. Make sure rotor spins freely.
	4. Computer defective	Contact factory
Reduced flow rate but meter does not count	1. Meter clogged with dried liquid	Remove meter. Clean carefully. Make sure rotor spins freely.