Instruction sheet

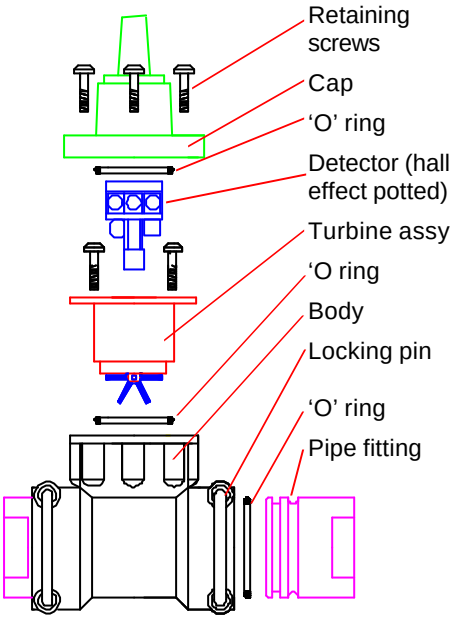
FT2
instruction sheet

- **FT2 Optical**
- **FT2 Hall effect**
- **All fitting types**

A Installation
B Electrical
C Commissioning

The pipe work must be designed in such a way as to eliminate reverse flow, and the flow passes through the meter in the direction of the arrow. The meter should be installed in a position that prevents it from draining down as on start-up serious damage could result by "impacting" an empty flowmeter with a high velocity fluid stream. The fluid should be clean and homogenous and in the case of optical detection, be able to transmit infra-red light. In all cases an upstream filter of at least 80 microns **must** be fitted. **It is recommended that before the flowmeter is installed in the line a "dummy" section of pipe is inserted and the system flushed.** This is to eliminate any debris in that section of the line. The pipe must not stress the body of the meter and should be fully supported either side with appropriate isolation valves and in some cases a by-pass valve. When screwing fittings into a threaded body **always** place the second spanner next to the fitting being inserted, **never** tighten one fitting against the other across the meter body. On initial start-up increase the flow slowly to ensure no over speeding of the meter occurs as the air is forced from the line. This is best achieved by monitoring the flow rate and ensuring that a 50% over-range is not exceeded. **Never blow a flowmeter with an airline.** Care should be taken to ensure that no air enters the system (e.g. leaky pump gland) or that no cavitations takes place. With a volatile liquid we recommend at least twice the vapour pressure plus 1 Bar as the operating pressure. The user must ensure that the materials of construction are compatible with their fluid. We accept no responsibility for material compatibility, it is the users responsibility.

The principle of operation is very simple. A jet of low viscosity liquid (less than 15cP) is directed at a free running Pelton wheel turbine in a specially shaped chamber. The rotation of the rotor is detected either optically or with a Hall effect sensor. The output frequency of these pulses is directly proportional to flow rate and the total number of pulses the total volume passed. The standard bearing material is sapphire as this gives a long trouble free life to the meter. Non-metallic options mean that these meters may be used with very aggressive chemicals and ultra-pure water. Custom fittings are available for OEM use.



It is recommended that all "signal" cables are screened and run separately to power lines and switched inductive loads and are located well away from inverters and other "noisy" apparatus. Always use sound wiring practice. Both Hall effect and optical detectors **(NPN)** require an external pull-up resistor connected between the output and a suitable power supply to attain a pulse. Typically the flowmeter PSU may be used but sometimes a dc pulse, which is of a different voltage, may be required e.g. using a PLC with a 24V PSU and an internal 5V rail for the pull-up resistor/pulse input.

Electrical characteristics

Hall effect sensors

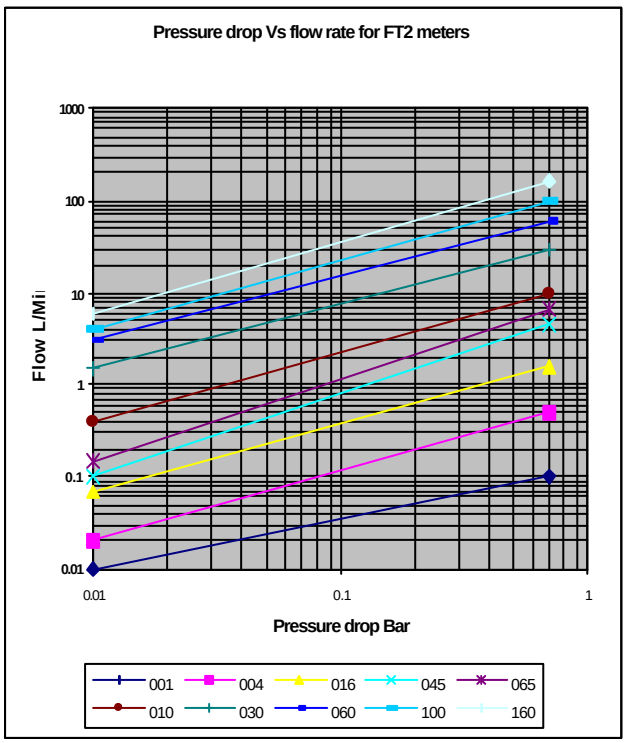
Supply voltage	4.5-24Vdc
Temp range	-40 to150°C
Rise & fall times	1.5uS max
Supply current	7.5mA typ.
Switch current	10mA max

Optical detector

Supply voltage	7.5 - 24Vdc
Rise time	1.5uS max
Switch Voltage	24 max
Switch current	20mA max
Supply current	25mA max

All turbine flowmeters require a fully formed upstream flow profile. This is usually attained by positioning the flow meter in a straight length of pipe some distance from any component that is likely to introduce an asymmetric or swirling velocity profile. The chart below gives some indication of the straight lengths of pipe expressed in pipe diameters required for various site conditions.

Flow range L/Min	Filter, pump or 1 bend	Regulator or 2 bends	2 bends @90°
10 - 160	15	50	100
1 - 10	10	15	50
0 - 1	5	10	15



If problems occur during commissioning always check the fundamentals first.

- **Is the flowmeter/instrument the correct one for the installation?**
- **Is the power connected to the meter and the instrument, and is it turned on?**
- **Is the instrument set/wired correctly? I/P port, pulse type, frequency span, units etc.**
- **Where possible check the O/P from the flowmeter with an oscilloscope before proceeding**
- **Was the line flushed prior to installing the meter?**
- **Was the flow increased slowly?**
- **Is the meter blocked?**

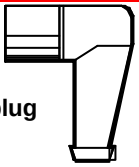
If you cannot find a solution ask your supplier for technical support.

Problem	Reading Low	High	Erratic	Action required
Air in system		*	*	Check plumbing raise back pres.
Pulsations		*	*	Distance pump—provide damping
Flow disturbance	*	*	*	Re-site flowmeter or disturber
Poor connections	*	*	*	Check all terminations and wiring
Debris in meter	*	*	*	Clean meter - install filter
Opaque fluid	*		*	Use Hall effect flowmeter
Incorrect inst cal	*	*		Re-set instrument and recalibrate
Blocked filter	*			Replace filter element

Connection options

Wireable plug

Pin 1	+4.5-24V
Pin 2	Not used
Pin 3	0 Volts
Pin 4	Output



Moulded plug

Blue	0 Volts
Brown	+4.5-24V
Black	Output
White	Not used

Connector block

	Optical	Hall Effect
0V	0V	0V
OP	Pulse out	Pulse out
+V	7.5-24Vdc (5 volt optional)	4.5-24Vdc

Flying lead

Screen	0 Volts
Red	+4.5-24V
Blue	Output