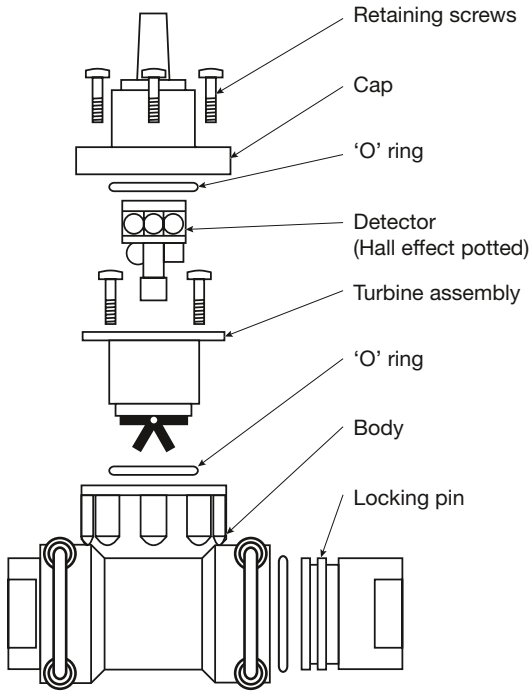
TECHNICAL PRODUCT
INSTRUCTION SHEET

FT2 Optical, FT2 Hall Effect
and all fitting types



Screws Torque Level = 0.55N-m

INSTALLATION

Liquid passes through the meter in the direction of the arrow and the connecting pipework must be designed in such a way as to eliminate reverse flow. The flowmeter should be installed in a position that prevents it from draining down to avoid serious damage on start-up, which could result when an empty flowmeter is 'impacted' 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 possible 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. DO NOT 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 cavitation takes place. With a volatile liquid we recommend at least twice the vapour pressure plus 1 bar as the operating pressure. It is the user's responsibility to ensure that the materials of construction are compatible with the fluid being monitored. Titan Enterprises accepts no responsibility for material compatibility.

TITAN ENTERPRISES LTD.
www.flowmeters.co.uk

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The principle of operation is simple. A jet of low viscosity liquid (less than 15cP) is directed at a free running Pelton wheel turbine in a specially designed 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, as is the total number of pulses to the total volume passed. The standard bearing material is sapphire giving a long 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.

COMMISSIONING

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 are unable to find a solution, ask your supplier for technical support or visit Titan's Troubleshooting webpage.

To view the wiring tutorial for the FT2 meter, scan the QR code.

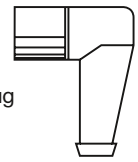
ELECTRICAL CHARACTERISTICS

It is recommended that all 'signal' cables are screened and run separately to power lines and switched inductive loads. Locate well away from inverters and other 'noisy' apparatus. Always use sound engineering practice. Both Hall Effect and Optical detectors (NPN) require a 10K Ohm 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 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.

Hall effect sensors		**Optical detector**	
Supply voltage	4.5-24Vdc	Supply voltage	7.5-24Vdc/5V
Temp range	-25 to 125°C	Temp range	-10 to 60°C
Rise and fall	1.5uS max	Switch voltage	24 max
Supply current	7.5mA typ	Supply current	25mA max
Switch current	10mA max	Switch current	20mA max

M12 connector

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



Moulded plug

Blue (Pin 3)	0 Volts
Brown (Pin 1)	+V
Black (Pin 4)	Output
White (Pin 2)	Not used

Standard connector block

	Optical	Hall effect
0V	0V	0V
OP	Pulse out	Pulse out
+V	7.5–24Vdc (5V optional)	4.5–24Vdc

Flying lead

Screen	0 Volts
Red	+V
Blue	Output

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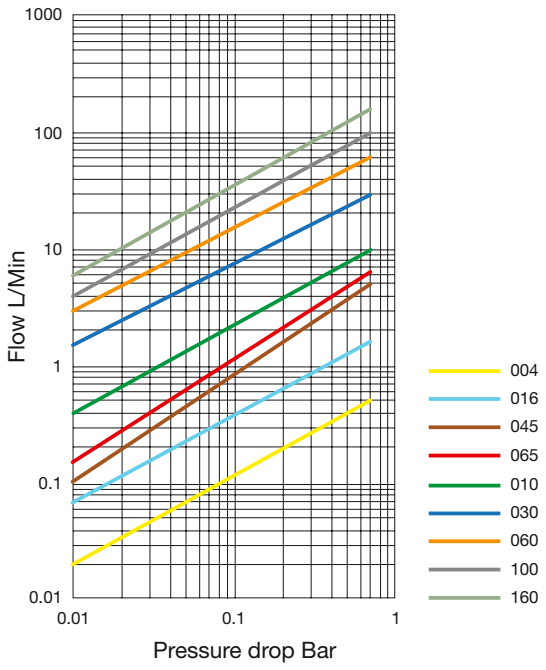
All turbine flowmeters require a fully formed upstream flow profile. This is usually attained by positioning the flow meter in a straight length of pipe some distance from any component that is likely to introduce an asymmetric or swirling velocity profile. The chart below gives some indication of the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

Pressure drop Vs flow rate for FT2 meters



Problem	Reading			Action required
	Low	High	Erratic	
Air in system		•	•	Check plumbing; raise back pressure
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

Weight in kg				
Fitting	PVC	PVDF	Brass	316 St St
8mm hose	0.082			
13mm hose	0.156			
¼" BSP female			0.195	0.187
½" BSP male		0.124	0.279	0.319
¾" BSP male	0.107	0.108	0.344	0.250
1" BSP male	0.120	0.124	0.377	0.404

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