



NTEP Approved Custody Transfer Meter

2" Over Gear Pulse Meter Installation and Operation Manual

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To the customer

Please take a few minutes to read through this manual before installing and operating your meter. Always retain this manual for future reference. If you have any problems with the meter, refer to the maintenance and trouble shooting sections of this manual. This manual contains connection and operating instructions for meters with Pulse outputs. If you need further assistance, contact Titan for advice. This Flow Meter has incorporated the oval rotor principal into its design. This has proven to be a reliable and highly accurate method of measuring flow. Exceptional repeatability and high accuracy over a wide range of fluid viscosities and flow rates are features of the oval rotor design. With low pressure drop and high pressure rating oval rotor flow meters are suitable for both gravity and pump (in line) applications.

Important Information

PLEASE READ THIS INFORMATION CAREFULLY BEFORE USE !

Before use, confirm the fluid to be used is compatible with the meter. Refer to industry fluid compatibility charts or consult Titan for advice. To prevent damage from dirt or foreign matter it is recommended that a Y or Basket type 60 mesh strainer be installed as close as possible to the inlet side of the meter. Contact your local representative for advice.

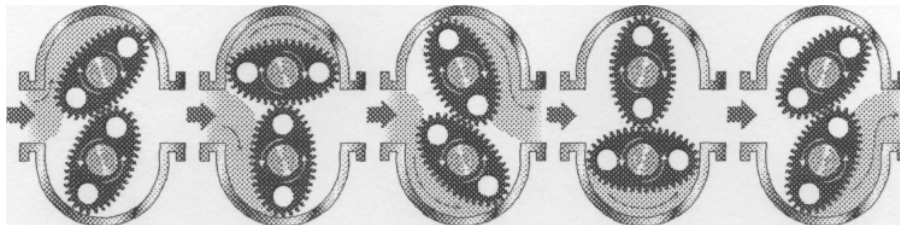
Note: When a strainer is installed it should be regularly inspected and cleaned. Failure to keep the strainer clean will dramatically affect flow meter performance.

Note: To prevent damage caused by air purge slowly fill the meter with fluid. To reduce pressure build up turn off the pump at the end of each day.

Maintenance can be carried out to the pulse units without removing or isolating the meter from the line. When maintenance to any other part of the meter is required, the meter must be isolated and the line pressure reduced.

Operating Principle

When fluid passes through the meter the rotors turn, as shown below. The magnets which are located in the rotors will pass across the pulser circuit board (containing the Hall Effect sensors). A signal is generated which is then sent by the Pulse Circuit Board

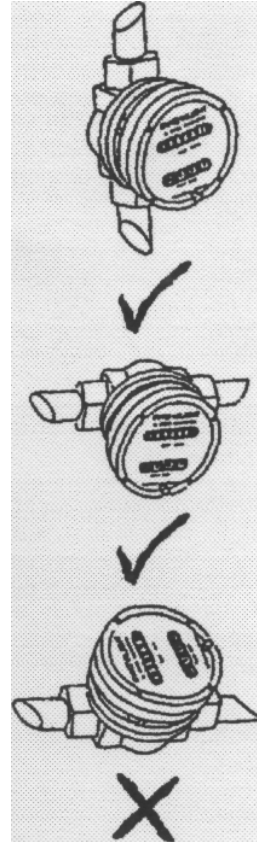


(PCB) to the relevant receiving instrument.

Figure 1

Installation

- The meter can be installed in any orientation as long as the meter shafts are in a horizontal plane. (Refer to Fig.2 for correct installation) The register assembly may be orientated to suit the individual installation.
- Use thread sealant on all pipe threads.
- For pump applications ensure pipe work has the appropriate working pressure rating to match the pressure output of the pump. See Meter Specifications section for further details.
- Install a wire mesh strainer (Y or basket type 60 mesh as close as possible to the inlet side of the meter.
- Ensure that the meter is installed so that the flow of the liquid is in the direction of the arrows embossed on the meter body.
- Note: Incorrect installation can cause premature wear of meter components.
- Do not over tighten meter connections.
- It is important that after initial installation you fill the line slowly, high speed air purge could cause damage to the rotors.
- Test the system for leaks.
- Check the strainer for swarf or foreign material, after the first 200 litres check periodically, particularly if the flow rate decreases.
- It is recommended that when setting up pipe work for meter installations a bypass line be included in the design. This provides the facility for a meter to be removed for maintenance without interrupting production. (See Fig.3)



Do Not Install Meter This Way
Figure 2

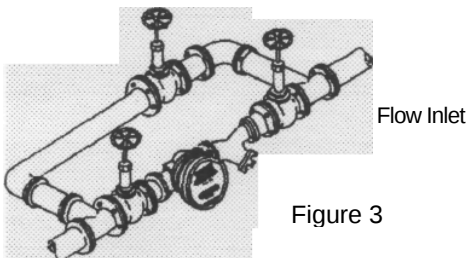
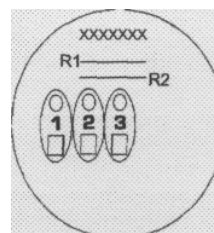


Figure 3

Electrical Connections

The electrical connections should be made as indicated in Figure 4. The PCB is fitted with two resistors;
R1=22K ohm Pullup resistor
R2=560 ohm current limiting resistor

If required R1 can be removed to suit a wider variety of indicating equipment.



Sensor Connections

- 1 - Supply 5 to 24V DC
- 2 - Supply GND
- 3 - Signal OUT

Figure 4

Service Instructions

Disassembly

Ensure that the fluid and electrical supplies to the meter are disconnected, and that the line pressure is released before disassembly. Refer to the exploded parts diagram, Figure 6, on subsequent pages for item numbers.

- 1] Undo the conduit connector, remove pulse cap (item 9) and remove the wires from the PCB (item 5).
- 2] Remove the gasket (Item 14).
- 3] Loosen the cap head screws (Item 7) that hold down the meter cap (Item 4), remove the screws and lift off the cap.
- 4] Remove the o'ring (Item 2) from the o'ring groove in the meter cap (Item 4).
- 5] Remove the rotors (Item 3).

Reassembly

- 1] Before reassembling check the condition of the rotors (replace if necessary).
- 2] Check that the plug side of the rotors is facing you when inserting the rotors, the plug side of the rotor is the magnet side. There is no difference between rotor one or rotor two.
- 3] Replace the rotors (Item 3) onto the shafts at 90° to each other (refer Fig. 5). Check the operation of the rotors by turning either by hand. If the rotors are not in mesh correctly or do not move freely, remove one of the rotors and replace correctly at 90° to the other rotor. Re-check the operation of the rotors.
- 4] Replace the o'ring (Item 2) into groove in the meter cap, if the o'ring has grown or is damaged in any way replace it with a new part.
- 5] Replace the meter cap making sure that the locating pin in the body lines up with the hole in the meter cap. Insert the cap head screws (Item 7) and tighten in a diagonal sequence 1, 3, 2, 4, etc.
- 6] The replacement of cables and connectors are a reversal of the disassembly procedure, replace conduit fitting if required. 7] Test the meter by turning the rotors with a finger or by applying very low air pressure to one end of the meter, before returning the meter to the line.

Pulse Circuit Board (PCB) Notes:

The pulse PCB (Item 5) is fitted with 4 Hall effect sensors. The PCB board is fastened to the meter cap (Item 4) by two screws and stand off's. All care and caution should be taken when removing or handling the PCB as the Hall effect sensor are fragile. Hall effect sensors are not available as individual replacement parts and are only available with the complete PCB (Item 5).

Rotors must be at 90° to each other.

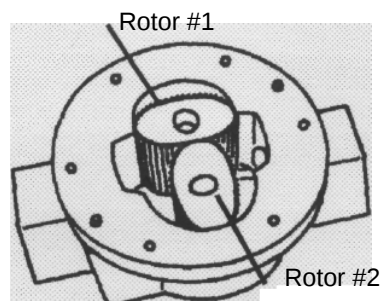


Figure 5

Meter Parts Listing

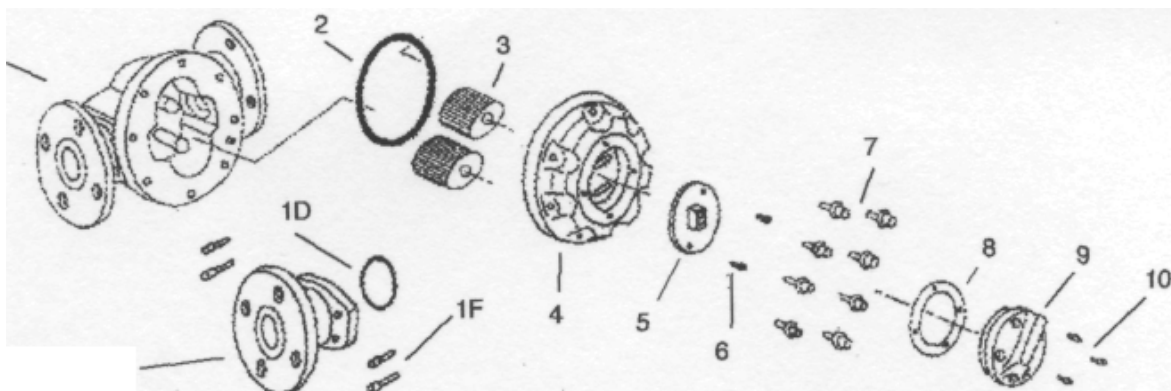


Figure 6

Item No.	No. Off.	Rec. Parts	Part or Set	Part Description
1	1		MS524-1S	Meter Body, excludes flanges (Stainless Steel)
1C	2		MS519-1S	2" ANSI - 150lb Flange (Stainless Steel)
1D	2	*	BS140TES	"O" Ring (Teflon, Viton Inner Core)
1F	4		MS180S	Bolt set (To suit item 1 C only)
2	1	*	BS252TES	"O" Ring (Teflon, Viton Inner Core)
3	2		MS147-1S	Rotors (Stainless Steel)
4	1		MS827S	Meter Cap (Stainless Steel)
5	1	*	MS826S	Hi Pulse Hall PCB
6	2		MS284S	PCB Board Screws
7	8	*	MS282S	Meter Cap Screws (Standard)
8	1	*	MS300S	Pulser Cap Gasket
9	1		MS170N	Pulser Cap (Stainless Steel) 1/2" NPT Thread
10	4		MS115S	Pulser Cap Screw (Stainless Steel)

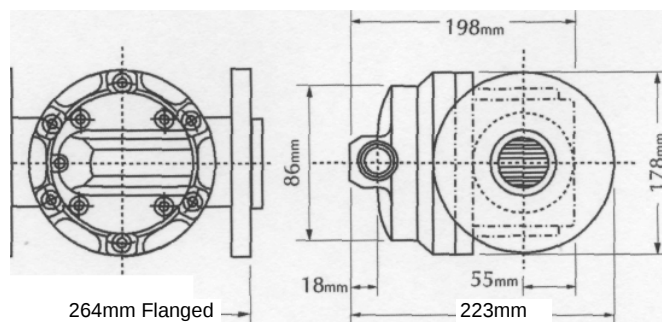
Meter Specifications

Meter Type	Pulse
Flow Ranges	
Litres/minute - US Gall/min	
Above 5 Centipoise	15 to 350/ 4 to 92 (150gpm PPS Gear option)
Below 5 Centipoise	to 300/9 to 79
Accuracy of Reading	+/- 0.15%
Maximum Viscosity	1000 Centipoise
Max. Operating Pressure**	18BAR / 260psi / 1800kPa
Operating Temp Range	-10°C/14°Fto120°C/248°F
Pulse Type	Hi Pulse Hall Effect
Pulses Per Litre / US Gall.	27.1 / 102.6

Meter Trouble Shooting

TROUBLE	CAUSE	REMEDY
Fluid will not flow through meter	a] Foreign matter blocking rotors b] Line strainer blocked c] Damaged rotors d] Meter connections over tightened e] Fluid is too viscous	a] Dismantle meter, clean rotors (Strainer must be fitted in line) b] Clean strainer c] Replace rotors (Strainer must be fitted in line) d] Re-adjust connections e] See specifications for maximum viscosity
Reduced flow through the meter	a] Strainer is partially blocked b] Fluid is too viscous	a] Clean strainer b] See specifications for maximum viscosity
Meter reading inaccurate	a] Fluid flow rate is too high or too low b] Fluid is too viscous c] Excess wear caused by incorrect installation	a] See specifications for minimum and maximum flow rates b] Bleed air from system c] Check meter body and rotors. Replace as required. Refer to installation instructions
Meter not giving a pulse signal	a] Faulty hall effect sensor b] Faulty reed switch c] Magnets failed	a] Replace PCB Board b] Replace PCB Board c] Replace magnets

Meter Dimensions



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