

Features:

- ± 2.5% accuracy @ velocity range 0.5 to 8.5 m/sec.
- ± 1.5% accuracy over linear range 0.7 to 7.0 m/sec.
- Repeatability of rate ± 0.6%.
- No external power supply is required for this model, ideal for operation in remote areas with Data-loggers etc.
- High Pulse output rate to 330hz. ideal for precision rate monitoring.
- Volt free contact closure (Open-Drain) output with superior switching performance.
- Easy installation and maintenance.
- Pipe adapter fittings: Standard Pipe Sizes 15 – 100 mm
- Long Stem version: 110 – 315 mm
- Stainless Steel 17- 4PH paddlewheel rotor without magnets.



The RPFS-LOD paddlewheel pulse output flowmeters insert directly into a wide range of pipe adapter fittings available in PVC, Galvanized Iron, Brass, Stainless Steel or Polypipe materials, covering pipe sizes 15 to 100mm (standard sizes), and RPFS-LOD-LS for sizes 110-500mm.

This makes the RPFS-LOD series units ideal for a wide range of water / irrigation flow measurement, monitoring and batching for battery powered or low current requirement applications. **IDEAL for DATALOGGERS/devices with input speeds to 300hz..**

With only one moving part and limited intrusion into the pipe, and combined with its flow-through design, the paddlewheel allows accurate measurement of liquid flows with virtually no headloss.

Each of the four blades of the rotor (paddlewheel) extends approximately one centimetre into the flowing liquid. The RPFS-LOD sensor generates a contact closure pulse with the frequency output proportional to flow velocity and proportional to pipe diameter.

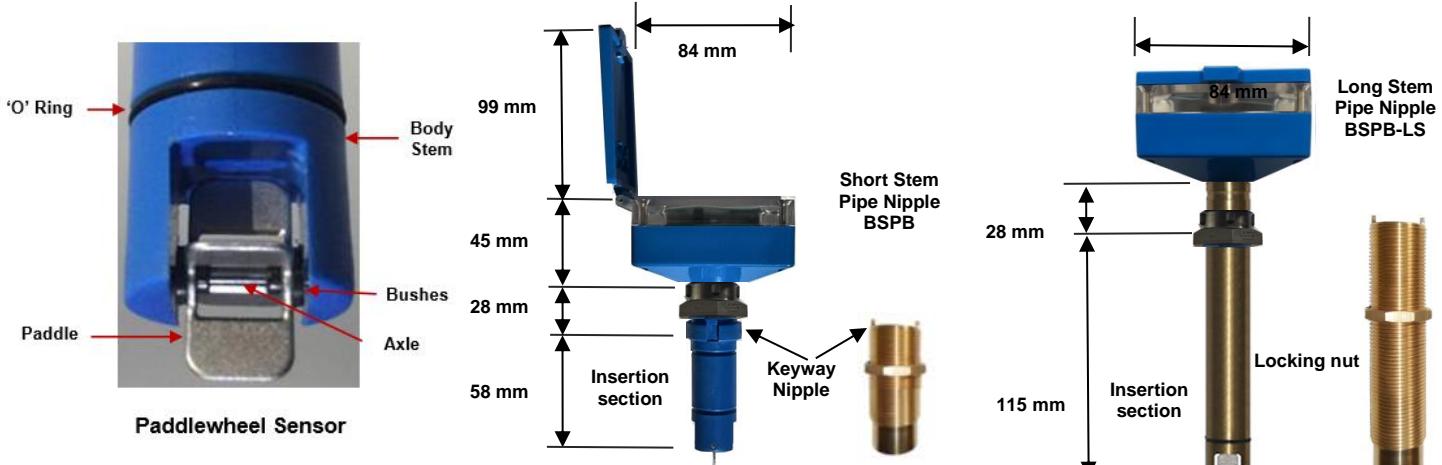
Unlike other models, Magnets are NOT used in the rotor, thereby eliminating iron particles attaching & jamming the rotor. The alloy rotor used makes the unit less susceptible to turbulence & particles hitting the rotor, therefore giving superior flow results.

SENSOR SPECIFICATIONS**RPFS-LOD**

Model	RPFS-LOD (Standard)	RPFS-LOD-LS (Long Stem Version)
Pulse Output	Contact closure (100mtrs+) 330hz. max.	Contact closure (100mtrs+) 330hz. max
Switching capacity	100VDC, 1.7A	100VDC, 1.7A
Internal battery	3.6v., 15+ yrs	3.6v., 15+ yrs
Cable type & length	M12 Plug and socket, 5 meter cable	M12 Plug and socket, 5 meter cable
Cable conductors	2-core shielded (2 wire)	2-core shielded (2 wire)
Fluid temperature	80 °C max.	80 °C max.
Weather rating	IP67	IP67
Pressure rating	150psi	200psi (depends on adaptor used)
Accuracy statement	± 2.5% for 0.5 to 8.5 m/s, ±1% for 0.7 to 7.0 m/s,	± 2.5% for 0.5 to 8.5 m/s, ±1% for 0.7 to 7.0 m/s,
Repeatability statement	+/- 0.6%	+/- 0.6%
For Pipe Sizes	15 to 100mm standard,	110 to 315mm (via ManuFlo saddle clamps) > 110 to 500mm (via BSPB-LS & connect to customer supplied 1" BSP-f entries on pipe).

SENSOR CONSTRUCTION**RPFS-LOD**

Model	RPFS-LOD	RPFS-LOD-LS (Long Stem)
Body stem / Housing	Delron / ABS	Brass / ABS
O-rings x 2	Neoprene BSO20 nitrile	Neoprene BS020 nitrile
Rotor	Stainless Steel 17-4PH	Stainless Steel 17-4PH
Bush	Delron	Delron
Axle	Tungsten Carbide	Tungsten Carbide
Lockcap	PVDF	PVDF



Standard 'Short Stem' body version, pipe ID up to 100mm ID Side view dimensions

'Long Stem' body version (-LS) for pipe sizes > 100mm ID



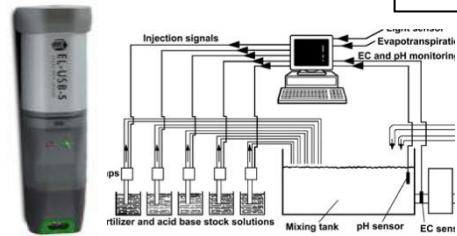
Pulse Output cabling:
BLUE = Drain (Pin 3)
BLACK = Pulse (Pin 4)



RPFS-LOD installed on a 50mm PVC pressure pipe line using PVC50 adaptors.



RPFS-LOD installed on a 50mm PVC pressure pipe line and 25mm galvanised steel pipe, using PVC50 and GAL25 adaptors.



Most types of Data-Loggers or PLC's can be connected to the RPFS-LOD for economical water measurement / monitoring.

Since the original RPFS Flow Sensor was first manufactured in 1984, over 35,000 units are now in use worldwide. They are used in a large variety of applications, including measurement of fresh and recycled water in concrete batch plants, measurement of water irrigation, salt water, chlorinated water and countless other low viscosity liquid measurement processes.

The RPFS-LOD sensors are unique in that they include their own long life built in battery source that provides the flexibility to install a reliable flowmeter virtually anywhere without sacrificing accuracy or performance. The RPFS-LOD is designed for use with 3rd party loggers installed in remote areas **and will not drain any power whatsoever from the connected device.**

SPARE PARTS

Order Code	Description	Picture
PW	Paddlewheel, with bushes	
PWAH	Axle for paddlewheel	
BS020	Neoprene O-ring	
LC	Locking Cap	
PC5	M12 Plug-in cable 5m length (Longer lengths on request)	
BSPB BSPSS	Standard Brass nipple adaptor Standard SST nipple adaptor with locating key and locknut	
BSPB-LS	Long stem adapter nipple with locating key and locknut	
SLC	Sealer Locking Cap, 1"bsp-f (To cap off adaptors)	

SELECTION OF PIPE DIAMETER

Pipe size (mm)	Flowrange (Litres/min)	Pulses/Litre (approx.) ⁽¹⁾⁽²⁾
	Min	Max
20	13	160
25	20	250
32	30	410
40	50	640
50	90	1000
63	132	1580
65	120	1690
75	180	2250
80	190	2560
90	244	3240
100	300	4005
110	343	4845
125	426	6255
140	516	7850
150	600	9010
160	650	10200
195	900	15200
200	950	16000
250	1480	25000
280	1850	31400
315	2280	39720

For >315mm diameter pipes:

Pulses per Litre = $50273 / [(\text{Pipe diameter in mm})^{2.016}]$

NOTE: Due to gravitational forces, the pulse output value can differ up to 6% between a vertical flow that is upwards or downwards. Where possible, perform a calibration check to determine pulse rate given the pipe diameter and flow conditions. Once calibrated, meter will give linear and repeatable results within the flow range.

MRTU6-P with Local integral LCD display with SCALED Pulsed options

MRTU6-P

For Data-Loggers which do not have pulse scaling capability or need low resolution unity pulses or the application demands a local display with flowrate and totaliser then refer to the MRTU6-P as the ideal option. See Datasheet "MRPU6".



**MRTU6-P Rate/Total with IP67 rated M12 Pulse output.
Pulse values scalable 1/10/100/1000 Ltrs or KL. / pulse.**

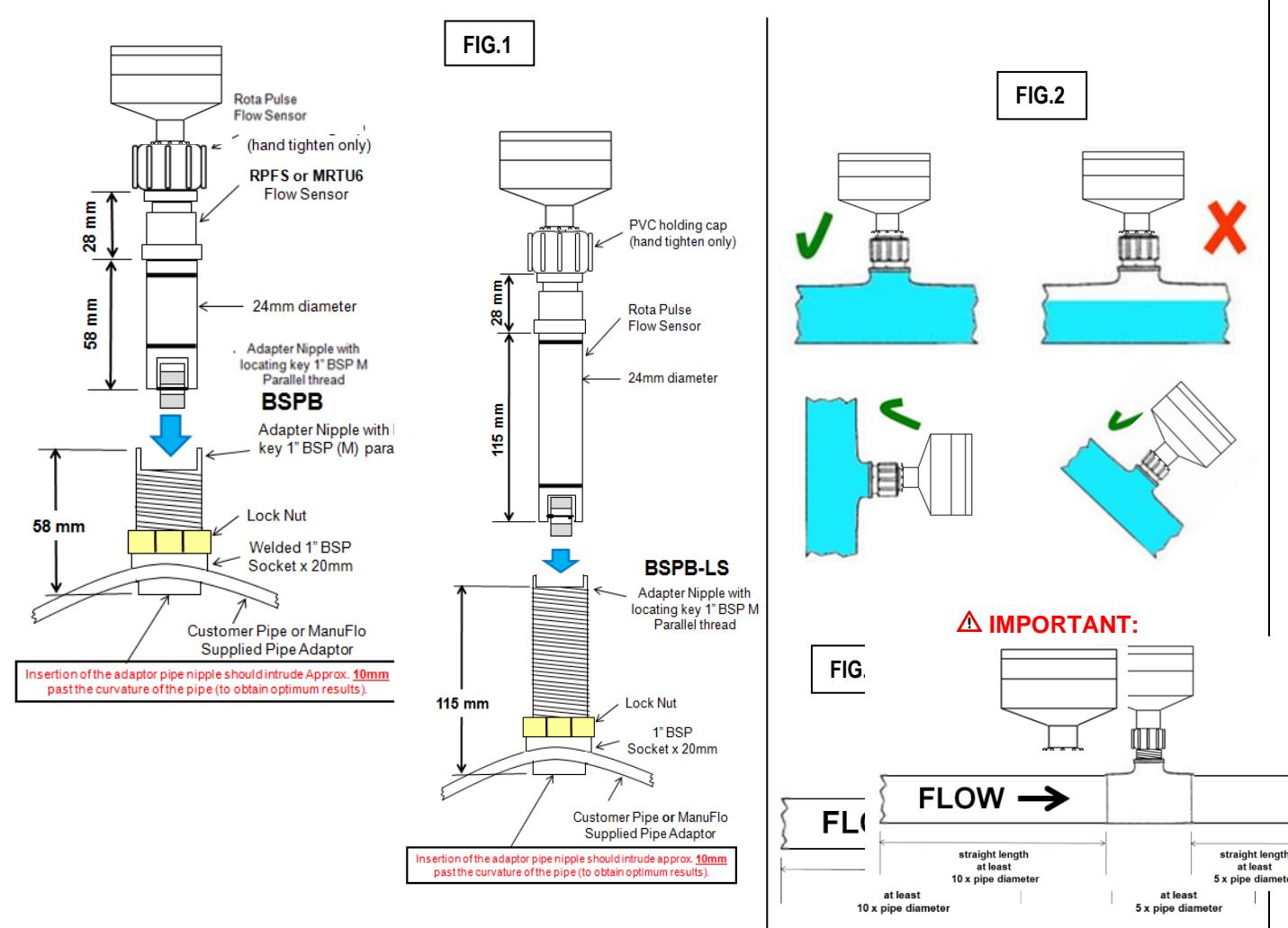
Adapter Tee and Saddle-clamp keyway pipe fittings are available in:

1. PVC Class 18 Cat. 19 Slip tees (F-glue-ends) pressure pipe, Sizes: 20, 25, 32, 40, 50, 65, 80 & 100 mm.
- PVC high-pressure saddle clamps: 40, 50, 80, 100, 150, 200 & 300mm.
2. Galvanized Iron threaded connections: BSP (F): pipe sizes 25, 32, 40 & 50 mm; BSP (M) pipe sizes 80 & 100mm.
3. Gunmetal BSP (m) threaded connection end pipe tube tees 20 mm. Brass in 25mm
4. Polypipe saddle clamps in pipe sizes 40, 50, 63, 75, 90, 110, 125, 140, 150, 160, 180, 200, 225, 250, 275 & 300mm
5. PVC saddles 40, 50, 80, 100mm and above in various formats.
6. Stainless steel 25, 32, 40 & 50mm, others sizes fabricated on request.
7. FOR PIPE SIZES 110mm and larger refer to the -LS model **Further custom made fittings are available on request.

Use ManuFlo **BSPB** or **BSPB-LS** (Long Stem) Brass or **BSPSS** Stainless Steel pipe adapter keyway nipple - with locknut, which has a 1" OD BSP thread for screwed insertion into 1"(female BSP) half-sockets which can be welded directly to pipe, the BSPB fittings can be coupled to any 1" BSP female entries including saddle clamps (Fig 1)

Installation Conditions

- **IMPORTANT:** A minimum of 10 x pipe diameters before (upstream of) the sensor and at least 5 x pipe diameters after sensor of straight pipe section must be fitted, with no bends, reductions, enlargements, restrictions, valves etc within this section. This will help eliminate flow turbulence to ensure optimum accuracy performance (Fig 3 below).
- The RPFS sensor must measure in a full pipe flow section (Fig 2) Can be installed in a horizontal, inclined or vertical pipe position. (Note: If mounted in horizontal or inclined pipe, make sure insertion position of sensor is at top or 45° from top, not on the underside).



**Options for:
LOW Flowrate capture**

NOTE: If flowrates are lower than the minimum capture rate of RPFS-LOD paddlewheels, then consider MEHR multi-jet / Turbine flowmeters. Ideal for low to medium flowranges.

Recommended Periodic Checks:

If the unit stops pulsing or becomes erratic, check the paddlewheel sensor for blockages/contamination or make sure the minimum flowrate is met for the selected pipe diameter used. In applications with reclaimed or contaminated fluids periodic maintenance checks are recommended.

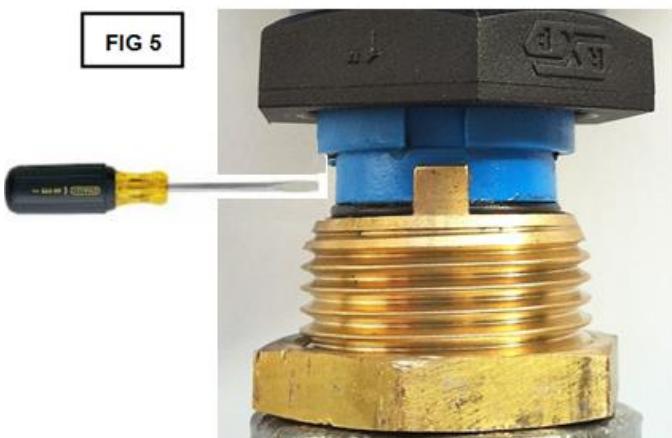
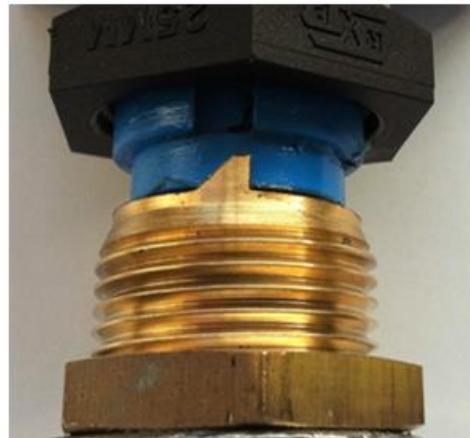
Removal of RPFS-LOD from Pipe adaptor Fitting 'Square' Keyway Type Nipple Adaptor :(see FIG 5)

- 1 - Unscrew the black PVC locking cap (anti-clockwise).
- 2 - Place a small to medium sized flat thin bladed screwdriver in the join where the insertion sensor body meets the nipple adaptor (See FIG 4), twist the screw driver to prize the two apart till the slots clear the keyways, then pull or twist upwards until the sensor is released (never pull via the cable).

Removal of RPFS-LOD from Pipe adaptor Fitting 'Triangular' NEW Keyway Type Nipple Adaptor :(see FIG 6)

- 1 - Unscrew the black PVC locking cap (anti-clockwise).
- 2 - Hold the neck of the Tee piece in your left hand, grasp the RPFS body with your right hand and turn slowly anti-clockwise until the sensor hydraulically raises out of slot then pull upwards out of the socket (never by the cable).

**When returning the sensor to nipple adaptor insert so the keyway and slots line up then push down until they locate. Screw the black locking cap clockwise to hold the sensor in place (hand tightened only).

FIG 5**Standard fitting 'Square' Keyway****FIG 6****New 'Triangular' turn replace fitting****Cleaning:**

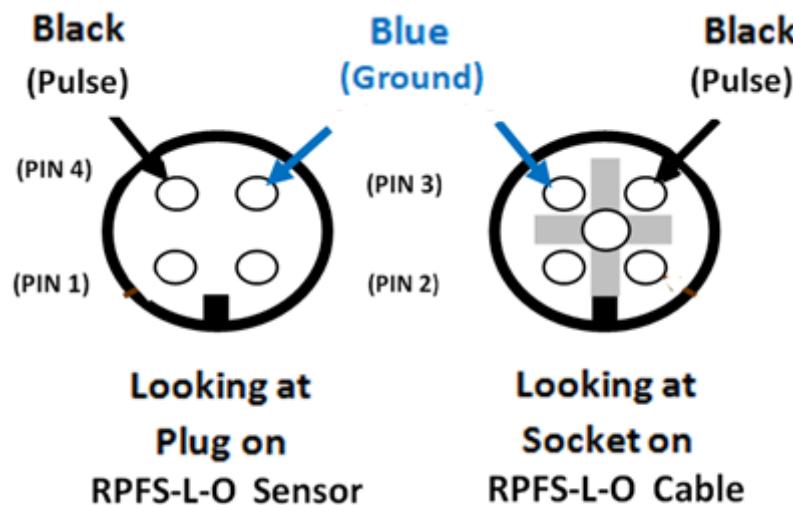
- 1 - If the paddlewheel (rotor) and or sensor body is coated with scale, immerse the sensor section in diluted hydrochloric acid, scour gently if required.
- 2 - **For ease of removal or refitting of sensor we strongly recommend to lubricate the body O-rings using petroleum jelly.**
- 3 - If the paddlewheel requires servicing, push out the axle using a small hole punch or similar implement, remove the paddle wheel and service or replace rotor and/or axle as required (spare parts available from ManuFlo).

Fault Diagnosis & Rectification:

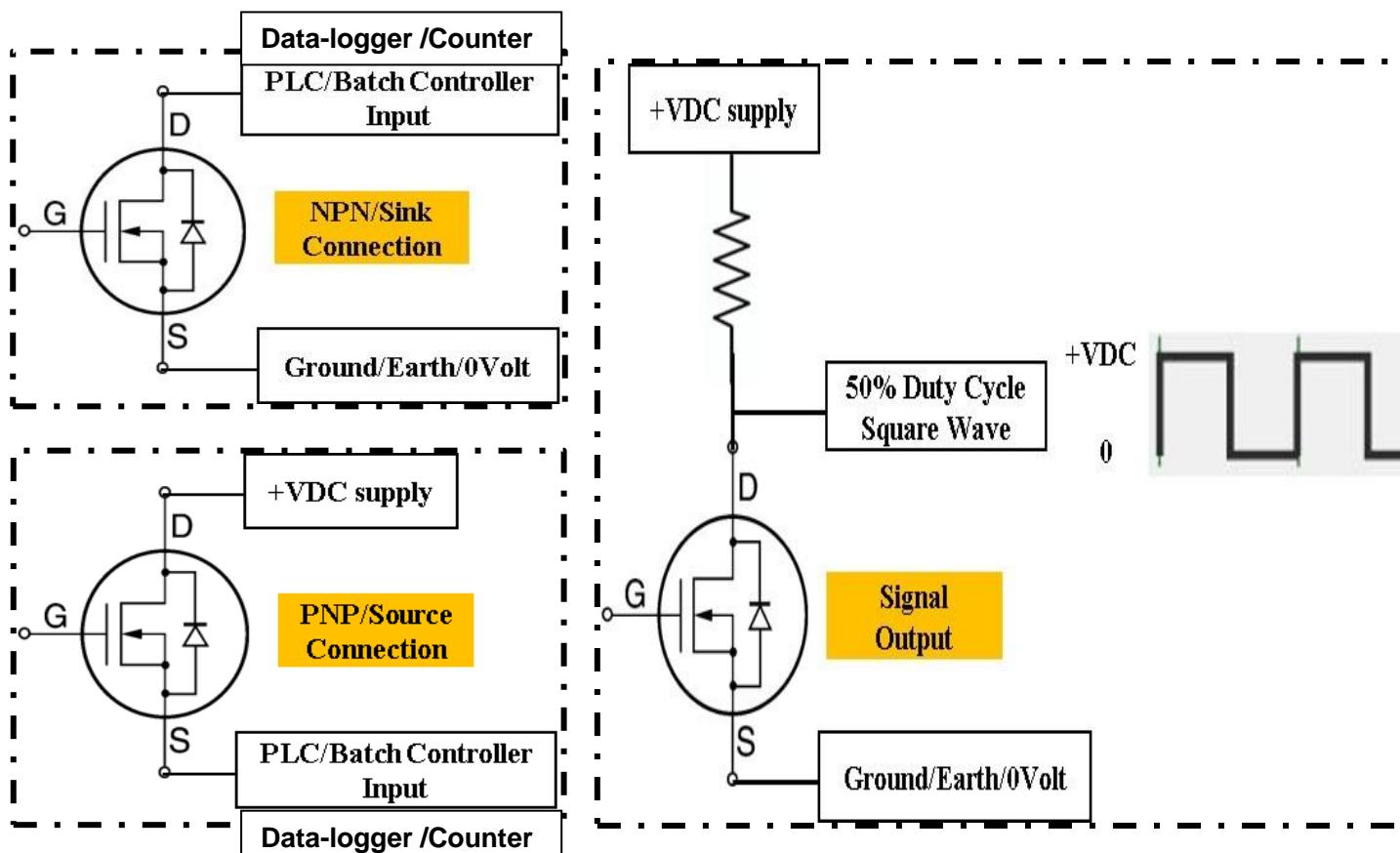
- If the RPFS sensor ceases to count, the paddlewheel may be blocked, remove inspect and clean as described above.
- If the RPFS pulses when there is no flow, an immediate (powerline) nearby 50Hz AC field is probably causing these false counts. Move the flow sensor away from the 50Hz field, or move the source of the field if practical.
- If the standard cable length supplied is not sufficient and needs extending contact ManuFlo for suitable 'screened' cable and never run extended cable across or near to other cables that are potential EMF sources.

The pulse output from the flowmeter is an open-drain, 0-volt, contact closure that is suitable for most data loggers, counters and totalisers.

Pin	Colour	Description	Symbol
1	not used	n/a	n/a
2	not used	n/a	n/a
3	Blue	Ground (Source)	S
4	Black	Pulse (Drain)	D



NOTE: RPFS-LOD
(in lieu of RPFS-P)
Can be used with the
complete range of
ManuFlo Batch
Controllers, Indicators &
Interface products



Material	GAL	PVC	PVC	Polypropylene	Polypropylene	STAINLESS	BRASS	BRASS
Type	T-Piece	slip T-piece	Saddle Clamp	Saddle Clamp	Saddle Clamp	T-Piece	T-piece	Socket
For	Gal pipe	Pressure pipe	Pressure pipe	Pressure pipe	Poly Pipe Black	S/Steel pipe	Brass pipe	
20 mm	GAL20	PVC20					BRA20	
25 mm	GAL25 (-T2)	PVC25				SS25	BRA25	
32 mm	GAL32	PVC32				SS32		BSOC: 1" BSP Brass pipe socket adaptor for 25-100mm pipes also BSPB & BSPSS nipple adaptor
40 mm	GAL40	PVC40	PVC40SC	SCP40	SC40	SS40		
50 mm	GAL50	PVC50	PVC50SC	SCP50	SC50	SS50		
63 mm					SC63			
65 mm	GAL65	PVC65		SCP65				
75 mm					SC75			
80 mm	GAL80	PVC80	PVC80SC	SCP80	SC80			
80 mm	GAL80-F (Table D flanged)							
90 mm					SC90			
100 mm	GAL100	PVC100	PVC100SC	SCP100				
100 mm	GAL100-F (Table D flanged)							
110 mm					SC110-LS			BSOC: 1" BSP Brass pipe socket adaptor for 100-500 mm pipes also BSPB-LS Long Stem nipple adaptor
125 mm				SCP125-LS	SC120-LS			
140 mm					SC140-LS			
150 mm			PVC150SC-LS	SCP150-LS				
160 mm					SC160-LS			
200 mm			PVC200SC-LS	SCP200-LS	SC200-LS			
225 mm				SCP225-LS	SC225-LS			
250 mm				SCP250-LS	SC250-LS			
280 mm					SC280-LS			
300 mm			PVC300SC-LS	SCP300-LS				
315 mm					SC315-LS			
500 mm								
	Galvanised iron threaded ends BSP (female) 2000 kPa Note: 25mm can be supplied with straight pipe sections already fitted (Part GAL25-T2)	PVC T-piece Class 18 Cat 19 Glue-in (female) 1100 kPa	PVC 1400 kPa	PVC ≤ 150mm: 1600 kPa > 150mm: 1000 kPa	Poly-pipe agricultural Saddle Clamps ≤ 150mm: 1600 kPa > 150mm: 1000 kPa	Stainless Steel 316 T-piece. BSP (female) threaded entry 2000 kPa	Brass T-piece BSP (female) threaded entry 2000 kPa	1" BSP Brass pipe socket adaptor & BSPB-LS BSPSS nipple adaptors (see Fig 1 Page 3)
GAL80 - 80mm Galvanized Iron pipe adapter (80mm φ x 600mm long)				BSPSS Stainless Steel BSPB Brass adapter nipples for 25-100mm pipes		BSPB-LS brass LONG-STEM nipples for 110-500mm pipes		

Due to continuous product improvement, specifications are subject to change without notice.

** Pipe fitting options for the RPFS_LOD are as per the table however other fitting types may also be available on request**