

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. High rate of pulses for precision measurements.
- Easy installation and maintenance.
- Large range of pipe adapter fittings: Standard sizes 15 to 100mm, Long Stem version 110 - 315mm (with BSPB-LS up to 500mm)
- 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

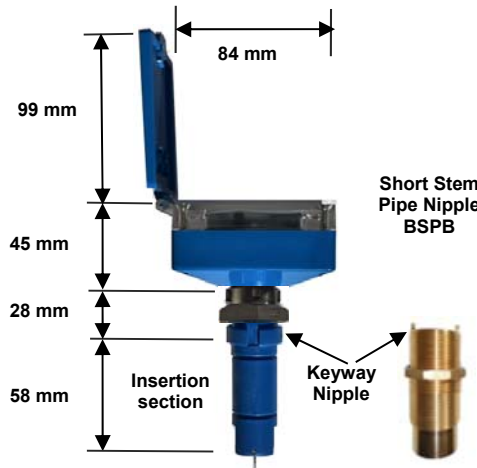
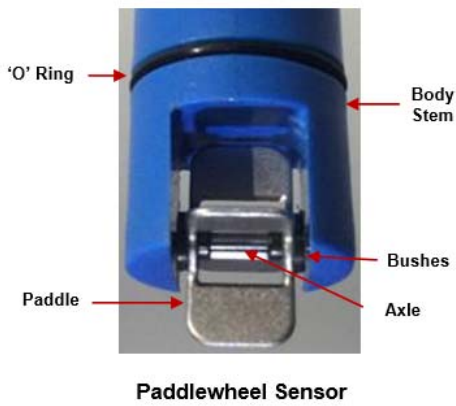
RPFS-LOD

| 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. |

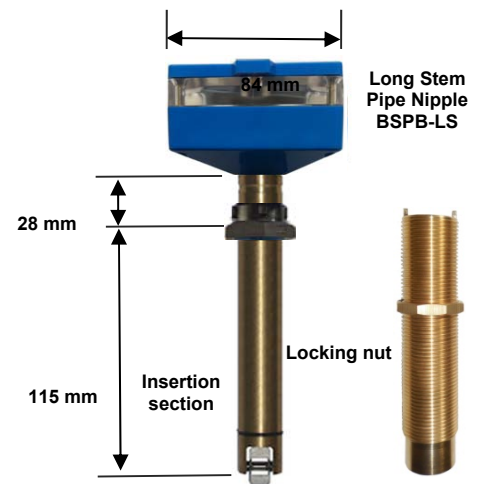
SENSOR CONSTRUCTION

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



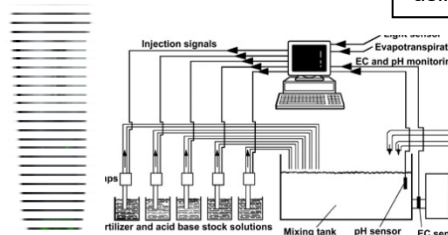
Pulse Output cabling:
BLUE = Drain (Pin 3)
BLACK = Pulse (Pin 4)



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 | 116 |
| 25 | 20 | 250 | 75 |
| 32 | 30 | 410 | 46 |
| 40 | 50 | 640 | 30 |
| 50 | 90 | 1000 | 20 |
| 63 | 132 | 1580 | 11.7 |
| 65 | 120 | 1690 | 12 |
| 75 | 180 | 2250 | 8.3 |
| 80 | 190 | 2560 | 7.3 |
| 90 | 244 | 3240 | 5.7 |
| 100 | 300 | 4005 | 4.6 |
| 110 | 343 | 4845 | 3.8 |
| 125 | 426 | 6255 | 3.0 |
| 140 | 516 | 7850 | 2.4 |
| 150 | 600 | 9010 | 2 |
| 160 | 650 | 10200 | 1.8 |
| 195 | 900 | 15200 | 1.22 |
| 200 | 950 | 16000 | 1.16 |
| 250 | 1480 | 25000 | 0.7 |
| 280 | 1850 | 31400 | 0.6 |
| 315 | 2280 | 39720 | 0.46 |

For >315mm diameter pipes:

Pulses per Litre = 50273 / [(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).

FIG.1

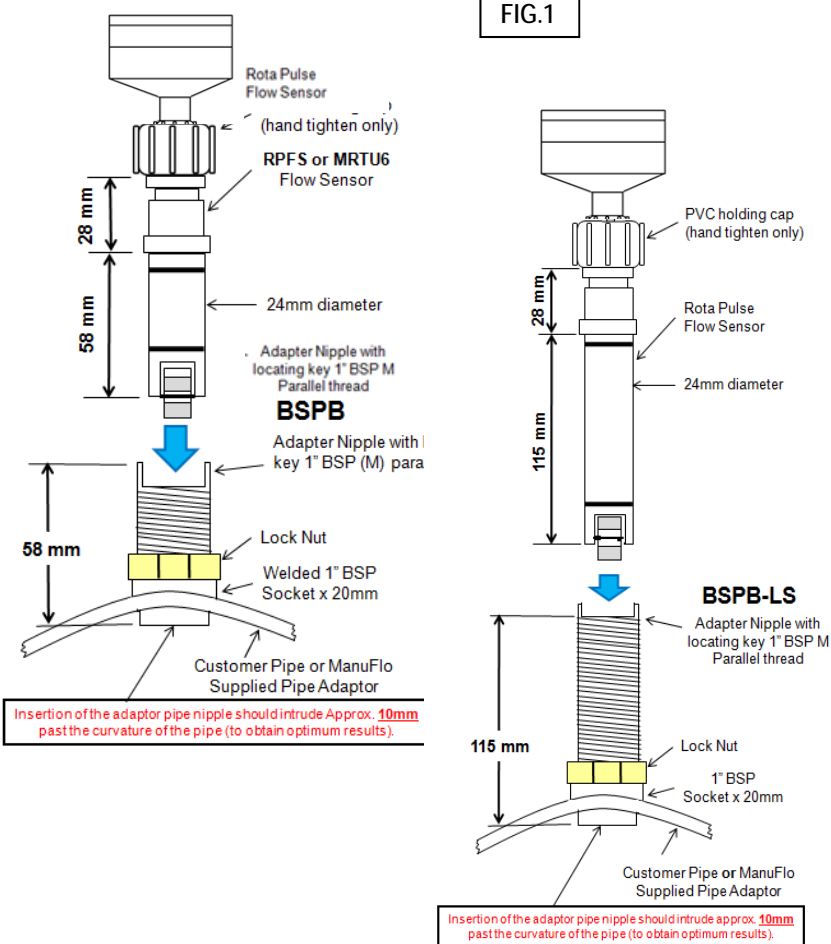
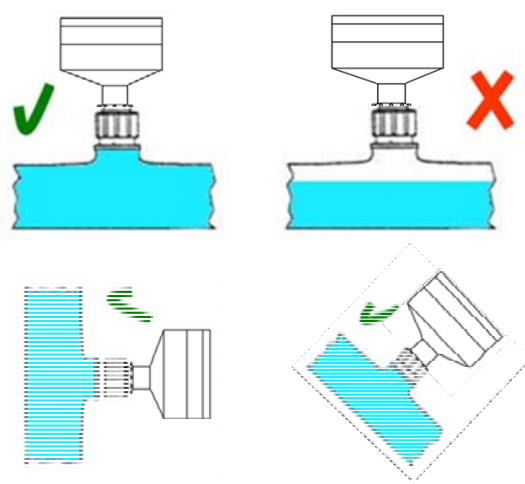
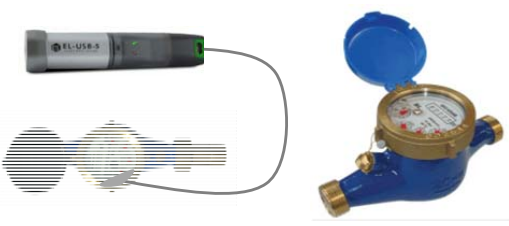
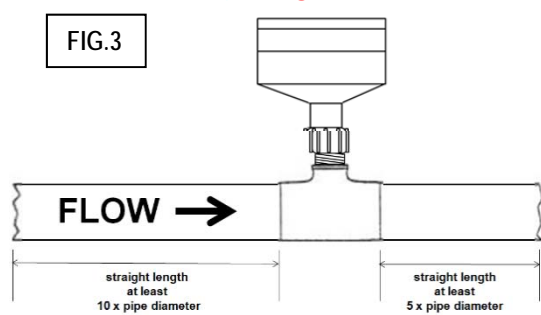


FIG.2



⚠ IMPORTANT:

FIG.3



**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.

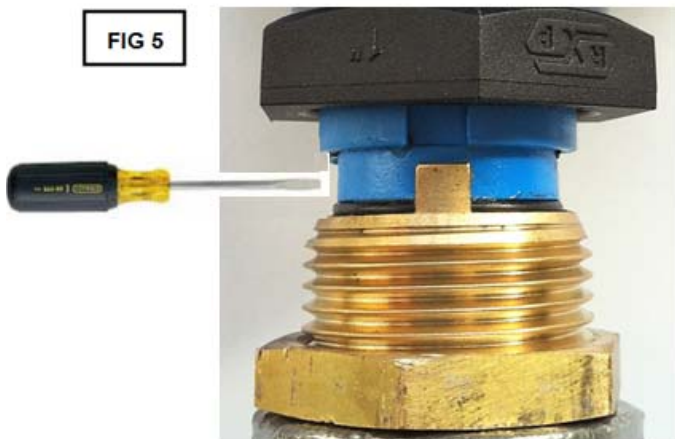
Removal of RPFS-LOD from Pipe adaptor Fitting ‘Square’ Keyway Type Nipple Adaptor :(see FIG 5)

- 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).

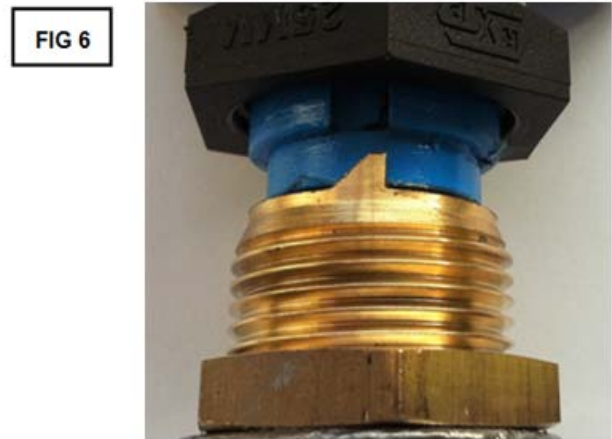
Removal of RPFS-LOD from Pipe adaptor Fitting ‘Triangular’ NEW Keyway Type Nipple Adaptor :(see FIG 6)

- 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 then push down until they locate. Screw the black locking cap clockwise to hold the sensor in place (hand tightened only).



Standard fitting ‘Square’ Keyway



New ‘Triangular’ turn replace fitting

Cleaning:

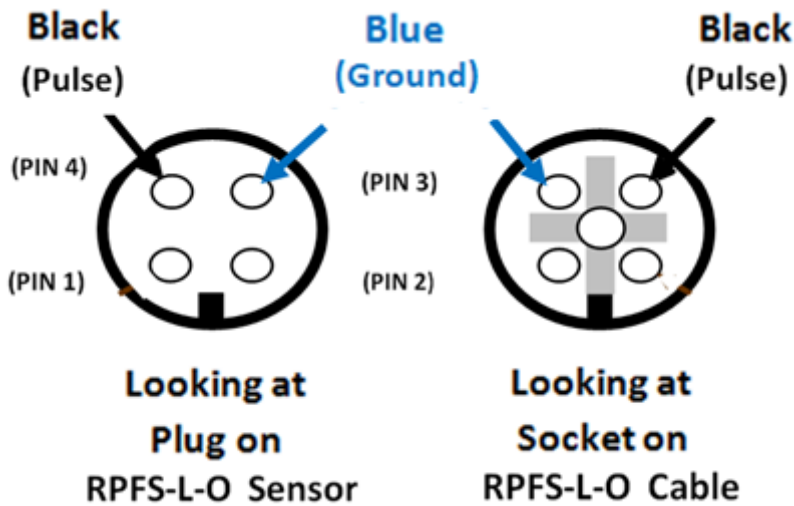
- 1 - If the paddlewheel (rotor) and or sensor body is coated with scale, immerse the sensor section in diluted hydrochloric acid, scour gently if required.
- 2 - **For ease of removal or refitting of sensor we strongly recommend to lubricate the body O-rings using petroleum jelly.**
- 3 - If the paddlewheel 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:

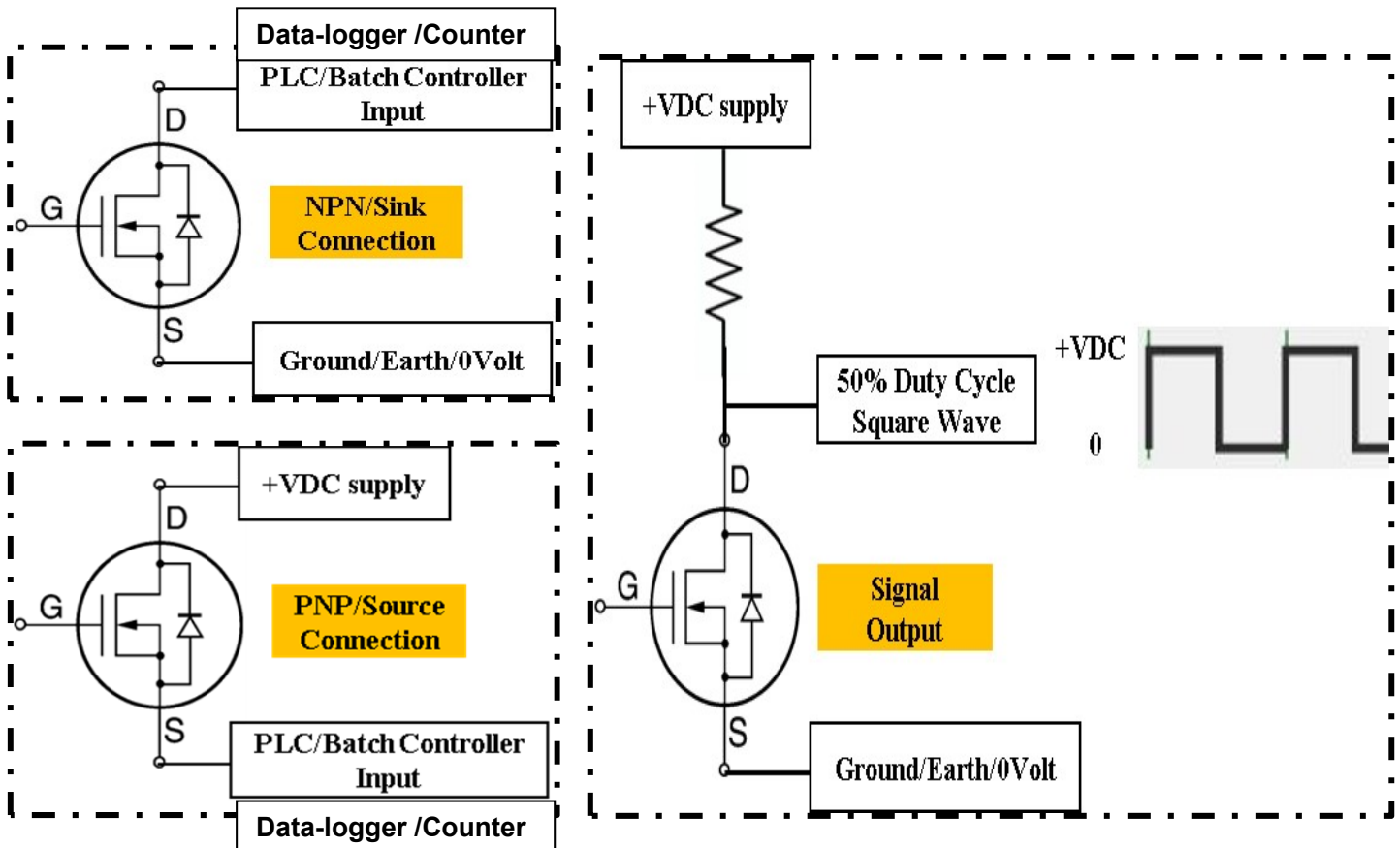
- If the RPFS sensor ceases to count, the paddlewheel may be blocked, remove inspect and clean as described above.
- If the RPFS pulses when there is no flow, an immediate (powerline) nearby 50Hz AC field is probably causing these false counts. Move the flow sensor away from the 50Hz field, or move the 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 Type For | GAL T-Piece Gal pipe | PVC slip T-piece Pressure pipe | PVC Saddle Clamp Pressure pipe | Polypropylene Saddle Clamp Pressure pipe | Polypropylene Saddle Clamp Poly Pipe Black | STAINLESS T-Piece S/Steel pipe | BRASS T-piece Brass pipe | BRASS Socket |
|-------------------|---|---|---|---|--|--|---|--|
| 20 mm | GAL20 | PVC20 | | | | | BRA20 | |
| 25 mm | GAL25 (-T2) | PVC25 | | | | SS25 | BRA25 | |
| 32 mm | GAL32 | PVC32 | | | | SS32 | | |
| 40 mm | GAL40 | PVC40 | PVC40SC | SCP40 | SC40 | SS40 | | BSOC: 1" BSP Brass pipe socket adaptor for 25-100mm pipes also BSPB & BSPSS nipple adaptor |
| 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 | | | | | | | | |
| |  |  |  |  |  |  |  |  |
| |  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****

| | | |
|---|--|---|
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|---|--|---|