

# Paddlewheel Liquid Tradewaste Measurement System

- a budget measurement solution.
- for clean pumped liquids.
- with Tradewaste sampler output.
- accuracy:  $\pm 1\%$  (for velocity range 0.5 to 8.5 metres/second)
- accuracy:  $\pm 2.5\%$  (for velocity range 0.7 to 7.0 metres/second)
- 240vac ac powered
- reading retained in the event of power loss.

The system design has taken into consideration the requirements of both the consulting engineers within the pre-treatment design and construction area, and those of the various Government and trade waste statutory authorities.

The ManuFlo paddlewheel-based tradewaste measurement system (shown below) has three components:

## Indicator

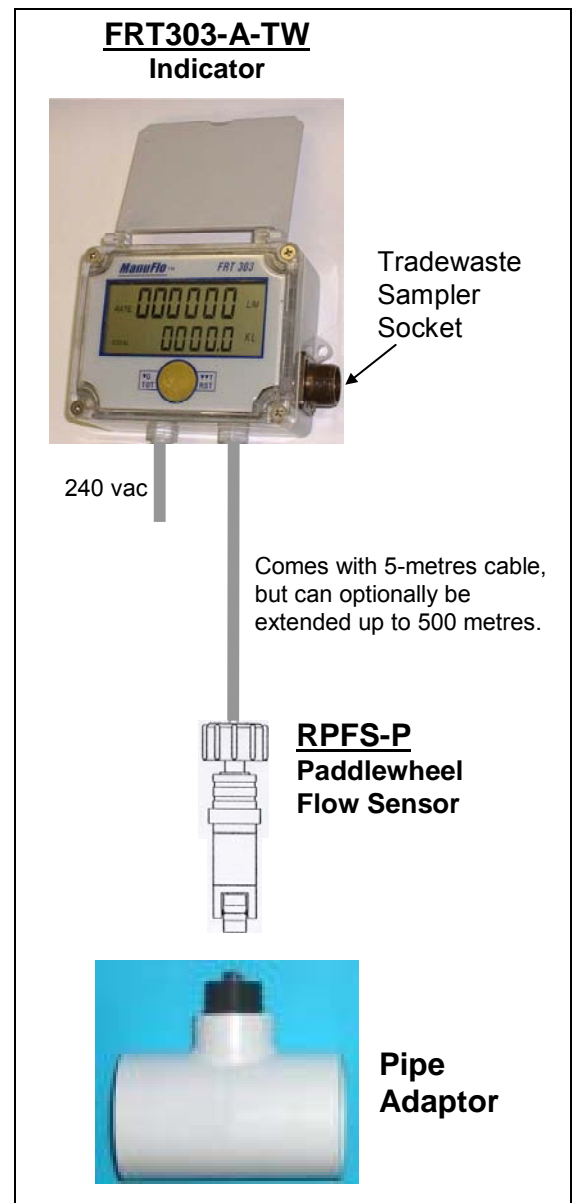
- The **FRT303-A-TW** indicator displays Flowrate in Litres/sec, a resettable Total in Litres and a non-resettable Grand Total in KiloLitres. The reset total in Litres is ideal for checking calibration against a reference volume.
- An internal Lithium battery (5-10 year battery life) retains readings in the event of power failure.
- A sampler pulse output signal is available via a 6-pin MIL-spec socket as per tradewaste requirements (programmed either to 100 or 1000 Litres/pulse according to the discharge rate).
- The FRT303 IP65 ABS enclosure can be wall mounted. A hinged lid protects the LCD from UV rays.
- For more information, see the FRT303 datasheet, available from the ManuFlo website at <http://www.manuelectronics.com.au/pdfs/FRT303.pdf>

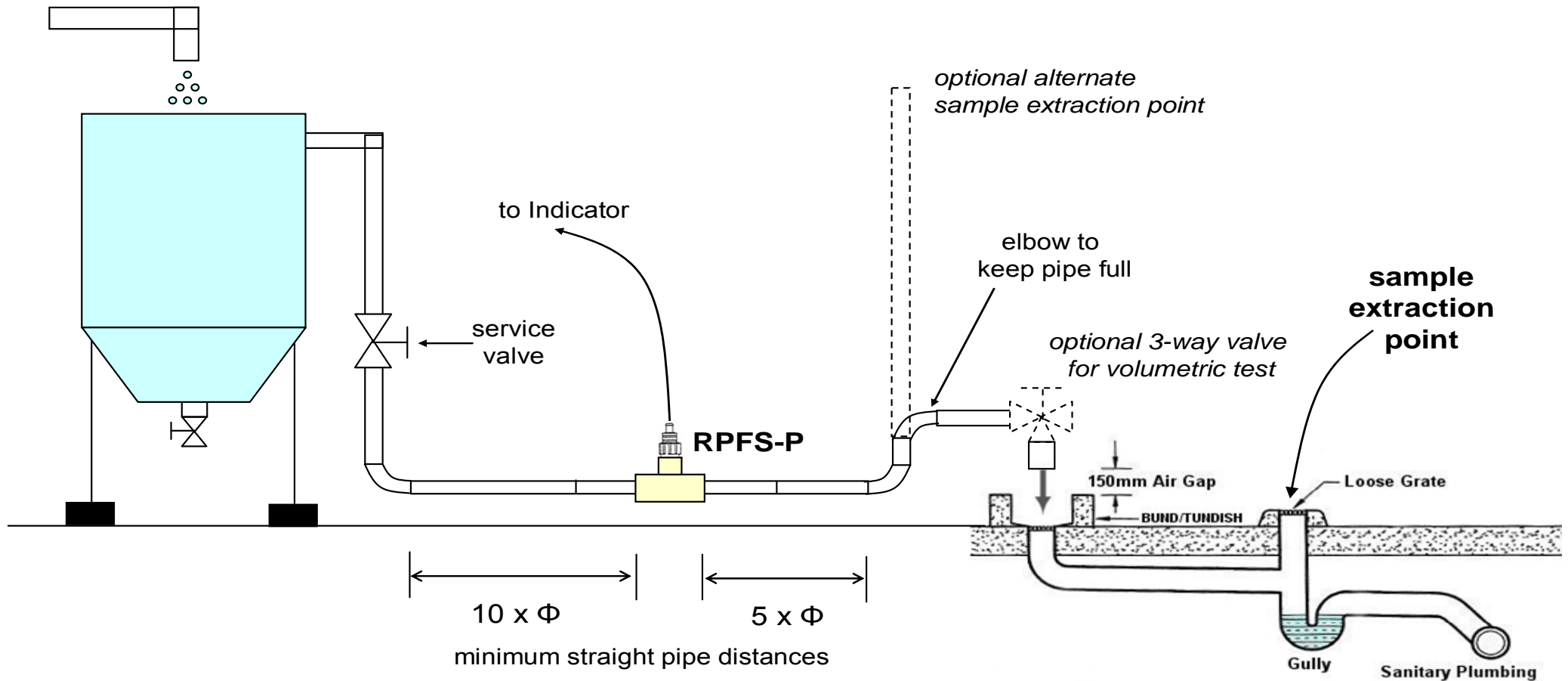
## Flow Sensor

- The **RPFS-P** is an insertion-type paddlewheel flow sensor.
- Accuracy is  $\pm 2.5\%$  (for 0.5 to 8.5 metres/sec flow speed).
- With its limited intrusion into the pipe and liquid, the RPFS-P sensor makes possible economical measurement of relatively clean liquid tradewastes i.e. where the liquid is not thick and is free of large particles and fibrous matter (where this is not the case, a ManuFlo Electromagnetic Flowmeter will be required - see web page [http://www.manuelectronics.com.au/pdfs/TWMS\\_MFS.pdf](http://www.manuelectronics.com.au/pdfs/TWMS_MFS.pdf) )

## Pipe Adapter

- The RPFS-P flow sensor inserts into a pipe adaptor fitting that is appropriate for the size and type of pipe that is carrying the liquid waste to be measured. For the range of available pipe adapters, see the RPFS datasheet, available from the ManuFlo website at <http://www.manuelectronics.com.au/pdfs/RPFS.pdf>





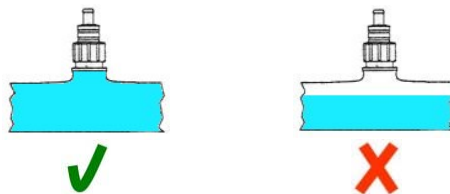
**Typical Tradewaste Separator Discharge Installation**

**INSTALLATION - Flow Sensor**

- To ensure optimum accuracy and to help eliminate turbulence, straight pipe of a length of at least 10x the pipe diameter must be fitted before (upstream of) the sensor, and straight pipe of a length of at least 5x the pipe diameter must be fitted after (downstream of) the sensor, with no reductions, enlargements, restrictions, valves etc within these straight pipe sections (see the diagram on page 2).

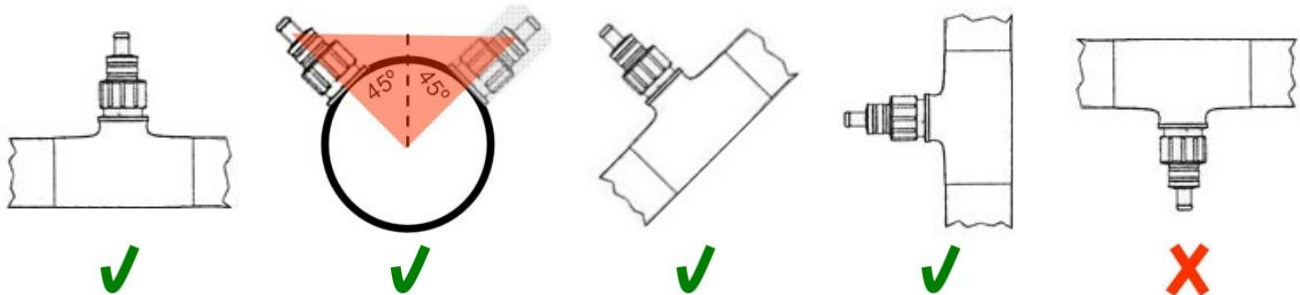
Outside the required straight pipe sections, larger pipe diameters can be fitted prior to the sensor, and preferably the same or smaller diameters after the sensor, to prevent flow cavitations.

- The RPFS sensor must be in a section of pipe that is full at all times, and where the flowrate is within the flowrange requirements for the pipesize (see page 3).



- The RPFS sensor can be installed in a horizontal, inclined or vertical pipe.

Note: If mounted in a horizontal or inclined pipe, the insertion position of the sensor must not be more than 45° from the top of the pipe, and must not be on the underside of the pipe.



- RPFS sensors can be installed in gravity-fed installations where the static upstream head exceeds one metre, subject to the pipesize flowrange requirements (see page 3) being met. In some situations, a pump may be necessary.

- To enable calibration checks, in every installation using RPFS sensors an access must be provided to place a calibrated vessel (e.g. a 50 Litre container) below the outlet prior to entering the sewer line. If this is not possible, a calibration test via an ultrasonic flowmeter can be performed.

**INSTALLATION - Indicator**

- Sydney Water require that the FRT303 Indicator be hard wired to the 240vac supply.
- The display must be easy visible, and away from direct sunlight, so that readings can be easily taken.
- There must be enough access to the Tradewaste Sampler Plug for connection of Sydney Water’s monitoring equipment.

**FLOWRANGES**

- To ensure accurate measurement, the flowrate of the liquid must be within the range specified in the table below for the pipesize.
- For the pipe adapters available, see the separate RPFS datasheet, available from the ManuFlo website at <http://www.manuelectronics.com.au/pdfs/RPFS.pdf>

| Pipe size (mm) | Flowrange (Litres/min) |      |
|----------------|------------------------|------|
|                | Min                    | Max  |
| 15             | 5.5                    | 90   |
| 20             | 9.5                    | 160  |
| 25             | 15                     | 250  |
| 32             | 25                     | 410  |
| 40             | 38                     | 640  |
| 50             | 60                     | 1000 |
| 65             | 100                    | 1690 |
| 80             | 151                    | 2560 |
| 100            | 236                    | 4005 |
| 150            | 535                    | 9010 |

Saddleclamp. GAL adapter. PVC adapter.



**Various pipe adapter fittings and sizes.**

**CALIBRATION**

**Pre-delivery calibration:** All systems are calibrated at the ManuFlo factory, with pumped or gravity fed water, using a Water Board designed weir tank rating facility, cross-referenced with a NSW Weights and Measures certified load cell and Magmaster flowmeter verification system.

**Installation calibration:** (Sydney Metro area only) Irrespective of the factory calibration check, the water authority will require a calibration check on-site immediately after installation. This can be performed at additional cost by a ManuFlo representative or recommended contractor/company. A certificate will be issued that verifies the system to tradewaste requirements and can be submitted to your tradewaste inspector.

**Regular calibration:** Unless otherwise directed by the water authority, the tradewaste flowmeter/indication system should be checked and calibrated once a year. The time taken to calibrate will vary according to installation, but one hour should be taken as a guide.

If ongoing onsite calibration services are not possible due to installation constraints, ManuFlo can perform a calibration (with certificate) conducted at our Brookvale premises using our Weights and Measures certified flowrig.

**MANUFLO CUSTOMERS**

We are proud to be one of the founding local companies involved with Sydney Water, when design and implementation of flowmetered tradewaste measurement systems were first enforced back in 1984. Sydney's waterways are cleaner than ever before in the last 80 years, due to programs like tradewaste monitoring implemented by Sydney Water. Our customers include many prominent manufacturing companies large and small, Municipal Councils, and government authorities.