Flowmeter selection for tradewaste

If your business produces tradewaste, then you have a legal obligation to get Sydney Water's permission (usually a permit) to discharge it to the sewer, and Sydney Water will charge for the amount and type of tradewaste discharged to the sewerage system.

Tradewaste is any liquid (and any substances it contains) produced by an industrial/commercial activity at a business premises. Tradewaste in some cases may contain high concentrations of substances which can:

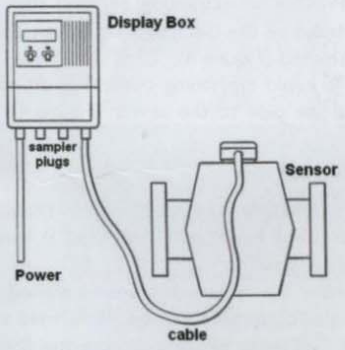

***Figure 1**: Magmaster electromagnetic flowmeter.*

- Harm people's health, safety, or the environment;
- Corrode or block sewer pipes;
- Create odours; or
- Put extra demands for the wastewater treatment at Sydney Water's plants.

Consequently, Sydney Water requires its customers to install equipment to monitor the amount of discharge — usually a tradewaste-suitable flowmeter. However, incorrect selection of flowmeter size, or incorrect installation of equipment, are the main factors in non-compliance with Sydney Water's Trade Waste Policy for liquid discharge.

ManuFlo (a division of Manu Electronics Pty Ltd), in consultation with Sydney Water, and using ABB's Magmaster electromagnetic flowmeters, has developed a streamlined procedure for supplying correct and easy-to-install tradewaste flowmeters which are compliant to Sydney Water requirements and have Sydney Water tradewaste sampler plugs fitted.

Selecting the correct flowmeter

In order to select the correct flowmeter for a tradewaste application, it is necessary to consider factors including:

- The type of liquid to be measured: if the liquid is not corrosive and does not contain large particles or stringy matter, then a simple paddlewheel-type flow sensor might be able to be used. However, most applications will probably require the use of an electromagnetic-type flow sensor which has an obstructionless bore (ie, the pipe is empty) which cannot be jammed and is virtually maintenance free.
- Pipe diameter: flowmeters come in different sizes and must be matched to the pipe size.
- Expected flowrange: each flowmeter size has different performance specifications, and the flowmeter's accurate measurement range must be suitable for the application.
- Approximate daily discharge volume: the flowmeter must be supplied displaying Sydney Water's preferred units ie, total in kilolitres, but can be in litres for small discharges (less than 5000 litres/day).

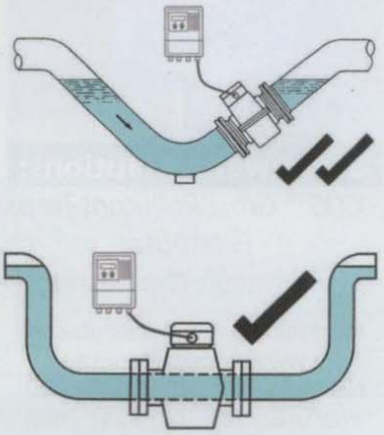

***Figure 2**: Pipe must be full at all times.*

• Type of pipe (eg, PVC, Stainless Steel, Poly pipe): determines the type of grounding and connection options to be used.
• Whether an optional connection kit is to be supplied with the flowmeter: this is highly recommended for PVC piping due to earthing requirements, and also results in quicker and easier on-site installation.

Factory set-up

As shown in Figure 1, the Magmaster range of electromagnetic flowmeters consists of an electromagnetic flow sensor (available in various pipe sizes of 25-150 mm) which is connected via a few metres of cable to a display box which displays flowrate and grand total and which also has a sampler output signal facility.

Once the correct flowmeter configuration is selected for the application, ManuFlo will program the flowmeter accordingly, will wire the sensor to the display, fit the connection kit, and will test the configured flowmeter and supply a calibration certificate. The result is a flowmeter fully compliant with Sydney Water requirements and that is set up to make on-site installation as simple and error-free as possible.

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On-site installation

All installation sites are different, but following some installation rules will ensure that the flowmeter operates correctly and Sydney Water requirements are met:
• Locate the flowmeter as close as possible to the pollutant source or immediately downstream of the pre-treatment plant.
• To ensure correct flow readings, avoid installing the flowmeter sensor in the vicinity of strong electromagnetic fields, and avoid areas of high vibration.
• Mount the flowmeter's display box in an area that allows easy access for readings of total, and for collection of sampler units.
• If mounted outdoors, install a sunshade.
• Have 240 VAC supply available. The flowmeter display box must be hardwired so that it cannot be unplugged from the power supply.
• Install the flowmeter sensor in a section of pipe that is full at all times (as shown in Figure 2).
• To prevent turbulence in the flow that may hinder correct flow readings, ensure that there is at least 10 diameters of straight pipe before the sensor and 5 diameters of straight pipe after (Figure 3) eg, for 50 mm diameter pipe, the straight pipe required is 10 x 50 mm = 500 mm of straight pipe before the meter, and 5 x 50 mm = 250 mm of straight pipe after the meter.
• Provide an extraction point so that samples of the discharge liquid can be extracted (Figure 4).
• To avoid syphoning occurring, do not seal the pipe to the sewer (Figure 4).

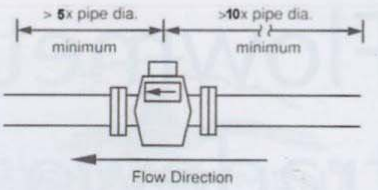

***Figure 3**: Straight pipe requirements.*

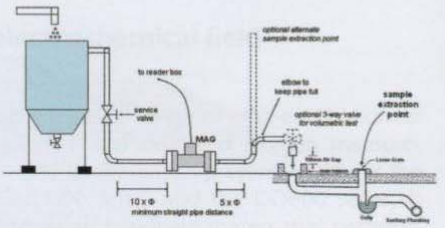

***Figure 4**: Typical tradewaste separator discharge installation.*

Calibration

A tradewaste flowmeter system should then be checked and calibrated at least once a year:
• After the system has been installed, on-site calibration can be performed via the CalMaster process, where the flowmeter is calibrated electronically without the need to remove the flowmeter or to collect liquid. A CalMaster calibration certificate can be submitted to the tradewaste inspector.
• If on-site calibration is not possible due to installation constraints, ManuFlo offers an in-house calibration with certificate at the ManuFlo factory, on its Weights and Measures certified flow-rig.

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