



INDUSTRIAL WASTE FLOW METERING – IW PUB 09

The most appropriate method/instrument to measure an industrial waste effluent volume is based on a number of factors. The flow can be measured by any of the following:

- an approved effluent flow meter
- a sub water meter on the process water incoming line or
- a percentage of the mains incoming water meter.

Advice on the appropriate type of metering for your business can be obtained by contacting the Commercial and Industrial Services Section of the Water Corporation.

Specifications for Effluent Flow Meters

All industrial waste meters are to employ electromagnetic flow sensors or ultrasonic sensors and are to comply with the following requirements:

- **Accuracy:** The accuracy is to be plus or minus 2% of actual flow at the lowest typical flows. The basis of sizing is to be stated in the documentation.
- **Power Supply:** The power supply is to be provided by a separate dedicated circuit, and is to be direct wired through an on/off switch to the meter. Any on/off switch is to be secured (locked) to prevent unauthorised use.
- **Flow Meter Totaliser:** A flow meter totaliser must have a visual display with a minimum of six (6) digits, displaying in kilolitres. The display can be mechanical or LCD, with battery backup and password protection. The totaliser display is to be clearly marked with 'Display in whole kilolitres'.
- **Instantaneous Flow Rate Display:** The display must be in digital format showing instantaneous flow rate in litres per second, with a minimum indication of one (1) decimal point. The indicator is to be clearly marked as displaying in litres per second.
- **External Output Plug:** There is to be an Amphenol 6 pin output plug (part number MS 3102E14S-6P) with dust cover (part number MS 25043-14) from the flow meter. The plug is to be located above ground and within two (2) metres of the sample point.

The output pulse is to be set at one (1) pulse per 100 litres.

The plug is to be wired as follows:

Pin A + Pulse output (voltage free)
Pin C - Pulse output (voltage free)

If no chart recorder is required a 4-20 mA output signal must be available at points E and F on the pulse plug, as follows:

Pin E + Analogue output (4-20 mA)
Pin F - Analogue output

Additional Specifications for Electromagnetic Flow Meters

- **Pumped discharge requirement:** Electromagnetic flow meters shall only be installed in situations where the effluent is pumped to sewer unless the following criteria can be achieved:

Electromagnetic flow meters must be sized such that the meter maximum flow rate is equal to twice the flow rate allowed by the Water Corporation. This meter maximum flow rate must be equal to a minimum linear flow through the meter of three (3) meters per second. This is to ensure acceptable accuracy at near zero flow conditions. A line sized meter is not to be used unless the linear flow rate through the meter at meter maximum flow (full scale) is equal to a minimum linear velocity of three (3) meters per second. Where flows are extremely low, a pumping system must be employed to ensure a steady measurable flow.

- **Isolating Valve:** An isolating valve must be installed upstream of the meter for maintenance purposes. (This is not required if a pumped discharge is used).
- **Installation:** The pipe work into and out of an electromagnetic flow meter must be designed using pipe bends to ensure the meter tube remains full at all times as detailed in Water Corporation Typical Drawing: Industrial Waste Monitoring Point No HX33-20-00.
- **Flow Disturbance:** The meter is to be installed a minimum of five (5) diameters downstream and five (5) diameters upstream of any flow disturbance in the discharge line.
- **Conductivity:** The conductivity of the process liquid is to be a minimum of 20 microSiemens per centimetre ($\mu\text{S}/\text{cm}$).
- **Calibration, Commissioning and Verification:** The meter is to be commissioned by an approved company at the time of installation. Frequency of subsequent verification is to be appropriate to the application to ensure accuracy remains within the Water Corporation's requirements. Each time the meter is checked, an Industrial Waste Monitoring System Commissioning Report F 1-8-2 is to be supplied to the Water Corporation.
- **Inspection and Maintenance:** Meters are to be installed such that they are able to be inspected at least annually and are not to be installed where they will or may be submerged. Installation should also facilitate meter removal for repair and recalibration.

Additional Specifications for Ultrasonic (V-Notch Open Weir Type) Flow Meters

- **Meter size:** V notch open weir ultrasonic flow meters must be sized such that the meter maximum flow rate is equal to twice the flow rate allowed by the Water Corporation. This meter maximum flow rate must give a minimum height across the V notch of 100 mm.
- **Flow Pit:** The flow pit must conform to British Standard 3680 Part 4A (1965).
- **Installation:** The V notch is to be installed in accordance with the theory of hydromechanics.
- **Temperature Compensation:** The sensor must have temperature compensation unless the manufacturer can guarantee that in its absence, the meter can achieve 2% accuracy over the expected range of flows for the application.
- **Calibration, Commissioning and Verification:** The meter is to be commissioned by an approved company at the time of installation and subsequently verified at a frequency recommended by the manufacturer or supplier. The frequency is to be appropriate to the application to ensure accuracy remains within the Water Corporation's requirements. Each time the meter has maintenance done an Industrial Waste Monitoring System Commissioning Report is to be supplied to the Water Corporation. Where the meter is not calibrated in situ, verification must be confirmed once the meter is reinstalled.

Maintenance of Effluent Flow Meters

The meter is to be maintained in accordance with the manufacturer's requirements and is to be inspected, cleaned and repaired as necessary by a service provider approved by the manufacturer. The details of all work performed shall be supplied to the Water Corporation within seven (7) days of occurrence.

Flow Records for Effluent Flow Meters

For most businesses, there is a direct relationship between water consumption and effluent volumes. It is therefore recommended that weekly readings of water consumption and effluent volumes be made and the ratio of effluent to water consumption be calculated. This will help prompt identification of leaks, excessive water use per unit of production, and meter malfunctions.

Failure of Industrial Waste Meters

Customer Responsibilities

If the industrial waste meter indicates unusual readings or ceases to operate, the customer will:

- advise the Water Corporation of the date and time of failure and the last meter reading (if available)
- contact the manufacturer or supplier and request to have the meter serviced by an appropriately qualified technician. (This must be done within one week of the fault being recognised.)
- advise the Water Corporation of the date when the meter is back in operation or replaced, and the initial meter reading.

Estimating Volumes

The Corporation shall estimate the volume discharged to sewer during the period when the meter is out of operation using best available information, usually historical data. This estimate will be used for billing purposes.

Where the customer fails to take reasonable and timely action to have the meter repaired or replaced the estimate will be based on the upper value of appropriate historical data.

Customers for whom chargeable industrial waste quality is lower than business domestic waste

If the customer fails to install an industrial waste meter or fails to repair or replace an existing failed industrial waste meter, the Water Corporation at its discretion may charge the industrial waste volume as commercial sewerage charges.

The non-residential discharge factor will be re-set to include both industrial and non-residential domestic volumes.

Attachments

The following documents referred to in the text are available on the Water Corporation website: http://www.watercorporation.com.au/industrialwaste_library.cfm

- Application Forms: Industrial Waste Monitoring System Commissioning Report F 1-8-2
- Typical Design Drawings Industrial Waste Monitoring Point (HX33-20-00)

More Information?

Further information on the issues detailed on this sheet can be obtained by phoning 13 13 95, visiting the Industrial Waste website (http://www.watercorporation.com.au/industrialwaste_index.cfm) or visiting your nearest Water Corporation office.