

Electromagnetic - self-contained, with no certificate of approval

The electromagnetic (self-contained) are water meters for the measurement of water flow in a full pipe.

The following requirements do not replace the operating manual of the manufacturer. The manual is essential for the successful installation, commissioning, operation, and maintenance of these devices, and must always be used.

However, for use of these water meters under this module of the standard the following requirements must be met, as a minimum, and have been formulated from recommendations/advice in manufacturer manuals and where required with input from the manufacturer.

Requirements to be confirmed by validation type

Ongoing (revalidation) or Faulty meter (maintenance)	Section 2.0, Section 3.0, Section 4.0, Section 5.0, and Section 6.0
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1.0 Key terms

Term	Definition
Controller	The transmitter/logger/ brains of the device
Electromagnetic	A self-contained water meter with a transmitter/controller, that operates a magnetic field in a flow tube/flow sensor, interprets the signal from the sensor and calculates the volume of water passing through the meter.
Flow sensor	The water passes through this component, which has an electromagnetic field and provides a signal to the controller.

2.0 Installation

- The flow sensor must not be located where another magnetic field is present.
- The cable length and cable shielding, between the flow sensor and controller must be in accordance with manufacturer recommendations or specification.
- Arrow direction must be in the flow direction.
- Where there is no disturbance upstream, the water meter must be installed in a straight uniform pipe:
 - 5 times nominal diameter of the meter must be upstream of meter coupling (as a minimum)
 - 3 times nominal diameter of the meter must be downstream of meter coupling (as a minimum).
- For all other installation scenarios, the water meter must be installed in a straight uniform pipe in accordance with manufacturer recommendations or specification.
- Must only be used in a full pipe while measuring.
- Must only be mounted in the orientation shown on the water meter data plate. Where orientation is not shown, a horizontal orientation must be used.

3.0 Configuration

3.1 Calibration settings

Confirm the calibration settings for the electromagnetic are consistent with the water meters factory calibration certificate/report.

3.2 Alarms

Where the water meter can activate alarms for the following faults, these must be switched on:

Alarm	Description
Insulation	An insulation fault with the coil current and the electrodes reading each other.
Coil current	An error in the coil e.g., the coils have been disconnected.
Amplifier overload	Instability in the electrode circuit e.g., the electrode(s) have been disconnected.
Checksum	Checksum test shows corrupted or invalid data. May indicate a failed printed circuit board or a damaged/defective transmitter.
Lower power / low battery	Battery capacity is below pre-set threshold.
Empty pipe	Flow sensor is not full of water.

4.0 Output

Where the department requires meter health as an output from the meter:

Where not already incorporated into the Electromagnetic, a serial communication module must be added to the water meter in accordance with manufacturer's requirements. To have a validation certificate issued, where an electromagnetic:

- is installed after this document came into effect, it must have a serial communication module installed as part of validation post-installation
- was installed prior to the effect of this document, it must have a serial communication module installed as part of the next process of validation for the meter

The serial communication module provides serial output (allows the notification of alarms e.g., low battery) from the electromagnetic for interface with transmission devices.

Where the department requires pulse output only from the water meter:

The electromagnetic must have the pulse output connection in place, which registers a pulse each time a set volume of water passes through the meter. To have a validation certificate issued, where electromagnetic:

- is installed after this document came into effect, it must have the pulse output connection in place and configured as part of the process of validation, post-installation
- was installed prior to the effect of this document, it must have a pulse output connection in place and configured as part of the process of ongoing validation (revalidation) of the electromagnetic

The pulse output connection allows the meter to interface with third party transmission devices.

5.0 Maintenance

The electromagnetic internal battery must be replaced every 5 years, as a minimum, regardless of perceived battery status.