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|---------------------------------|------------------------------------------------|-------------------------|------------------|
| <b>Your Company Name / Logo</b> | <b>MAGNETIC FLOWMETER<br/>VERIFICATION SOP</b> | Doc no: SOP<br>INST 008 | Rev: 0           |
| Department: Instrumentation     | Standard operating procedure                   | Date:                   | Page: see footer |

## 1. Purpose

To confirm that a magnetic flowmeter is measuring correctly without removing it for a wet calibration.

## 2. Scope

Electromagnetic flowmeters in conductive liquid service with 4 to 20 mA, pulse or digital outputs.

## 3. References

- Flowmeter manual and the manufacturer's verification procedure
- Instrument data sheet

## 4. Responsibilities

- Instrument technician: carries out the work and records results.
- Instrument engineer or supervisor: reviews and approves the records.
- Operations: grants the permit, isolates the process and returns the equipment to service.

## 5. Safety precautions

- Work only under a valid permit to work and follow the site isolation (lockout tagout) procedure.
- Wear the PPE required for the area: safety helmet, glasses, gloves and safety shoes as a minimum.
- In hazardous areas use certified or intrinsically safe test equipment, or obtain a gas free certificate and hot work permit.
- Inform the control room before starting, and before returning the instrument to service.
- Opening the sensor or transmitter terminal box may require power isolation and a gas free certificate in hazardous areas.

## 6. Tools and equipment

- Manufacturer verification tool or software (where available)
- Multimeter and insulation tester (only as allowed by the manual)
- mA meter or loop calibrator

## 7. Prerequisites

- Process able to provide a full pipe with zero flow for the zero check (both valves closed).

## 8. Procedure

### 8.1 Visual and installation checks

- 8.1.1 Check that the pipe is full at the meter (no air), grounding rings or electrodes are connected, and cables are intact.

### 8.2 Zero check

- 8.2.1 Stop the flow with the pipe full (close downstream valve, then upstream).
- 8.2.2 Check the reading is close to zero; perform a zero adjustment only if the manual recommends it.

### 8.3 Verification

- 8.3.1 Run the built in verification (for example coil resistance, electrode integrity, transmitter electronics).
- 8.3.2 Save or print the verification report.
- 8.3.3 If no built in tool exists, measure coil resistance and electrode resistance as described in the manual and compare with the factory values.

## 8.4 Output check

- 8.4.1 Simulate a flow value from the transmitter and check the mA output and the DCS reading at 0, 50 and 100 %.

## 9. Acceptance criteria

- Verification passed (or measured values within the manual limits).
- Zero reading within the manufacturer specification.
- Output and DCS reading within loop tolerance.

## 10. Records

- Calibration master list (free template: [instrumentationblog.in/downloads/templates/calibration-master-list/](http://instrumentationblog.in/downloads/templates/calibration-master-list/))
- Instrument breakdown report (if faults found) (free template: [instrumentationblog.in/downloads/templates/instrument-breakdown-report/](http://instrumentationblog.in/downloads/templates/instrument-breakdown-report/))

## 11. Approval

|           | Prepared by | Reviewed by | Approved by |
|-----------|-------------|-------------|-------------|
| Name      |             |             |             |
| Signature |             |             |             |
| Date      |             |             |             |

*This procedure is a generic template. Adapt it to your site permit system, the manufacturer instructions and your quality system before use.*