

Your Company Name / Logo	CORIOLIS FLOWMETER ZERO CHECK AND VERIFICATION SOP	Doc no: SOP INST 009	Rev: 0
Department: Instrumentation	Standard operating procedure	Date:	Page: see footer

1. Purpose

To confirm that a Coriolis flowmeter reads zero at true no flow and that its sensor tubes are healthy, and to correct the zero only when the check shows it is needed.

2. Scope

Coriolis mass flowmeters in liquid and gas service that can be blocked in to a no flow, full condition.

3. References

- Flowmeter manufacturer manual (zero and verification sections)
- Instrument data sheet (zero stability, accuracy)
- Site isolation procedure

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.
- Blocking in a line may affect upstream equipment: agree the isolation plan with operations.
- Do not open the meter housing in a hazardous area unless the permit allows it.

6. Tools and equipment

- HART communicator or the meter local display and keypad
- Meter vendor diagnostic software (for verification reports), if used on site
- Stopwatch for zero stability observation

7. Prerequisites

- Permit approved; the flow loop and any totaliser based batching put in manual or paused.
- Upstream and downstream block valves available and tight shut off.
- Data sheet zero stability value known (for example in kg/h).

8. Procedure

8.1 Establish true zero flow

- 8.1.1 Run the process at normal temperature and pressure so the meter is at operating conditions.
- 8.1.2 Close the downstream block valve first, then the upstream block valve, so the meter stays full and pressurised.
- 8.1.3 Confirm there is no flow through bypasses and that the meter is completely full (no gas pockets in liquid service, no condensate in gas service).
- 8.1.4 Wait for the temperature to stabilise, typically several minutes.

8.2 Zero check (as found)

- 8.2.1 Observe the mass flow reading for at least one minute and note the average and the spread.

- 8.2.2 Compare the average with the data sheet zero stability. If it is within the zero stability, do not adjust the zero.
- 8.2.3 Record the as found zero reading and the density reading for comparison with the expected fluid density.

8.3 Zero adjustment (only if required)

- 8.3.1 If the as found zero is outside the zero stability and the no flow condition is confirmed, start the zero routine from the communicator or display.
- 8.3.2 Do not disturb the meter or the piping while the routine runs.
- 8.3.3 Record the new zero value and check the reading again for one minute.

8.4 Meter verification

- 8.4.1 Run the built in meter verification (tube stiffness or sensor health test) where the meter supports it.
- 8.4.2 Record the result (pass or fail) and save or print the verification report.
- 8.4.3 If verification fails, report it to the instrument engineer; possible causes are coating, erosion or tube damage.

8.5 Return to service

- 8.5.1 Open the upstream block valve slowly, then the downstream valve.
- 8.5.2 Confirm the flow reading with operations and release the loop to normal operation.

9. Acceptance criteria

- As found or as left zero reading within the data sheet zero stability.
- Meter verification result PASS (where available).
- Density reading consistent with the process fluid.

10. Records

- Calibration master list (free template: instrumentationblog.in/downloads/templates/calibration-master-list/)
- Instrument PM schedule (free template: instrumentationblog.in/downloads/templates/instrument-preventive-maintenance-schedule/)

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.