

Your Company Name / Logo	INSTRUMENT LOOP CHECKING SOP (HOT LOOP)	Doc no: SOP COM 001	Rev: 0
Department: Instrumentation	Standard operating procedure	Date:	Page: see footer

1. Purpose

To prove that every instrument loop works correctly from the field device to the control system before start up.

2. Scope

Analog and digital inputs and outputs connected to DCS, PLC and SIS during commissioning or after modifications.

3. References

- Loop drawings, I/O list and instrument index
- Alarm and trip set point list
- Cold loop and installation check records

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.
- Energised loops: avoid short circuits on terminals; in IS circuits use only certified test equipment.
- Confirm that moving valves or starting motors during the test is safe.

6. Tools and equipment

- Loop calibrator (mA source and measure)
- Multimeter
- Radios
- Loop drawings and the loop check sheet

7. Prerequisites

- Installation and cold loop checks complete and signed.
- Control system powered and configured; field device configured to the data sheet.

8. Procedure

8.1 Analog input loops

- 8.1.1 Disconnect the transmitter or use loop test mode.
- 8.1.2 Inject 4, 8, 12, 16 and 20 mA at the field end.
- 8.1.3 Confirm the DCS reading at each point against the expected engineering value.
- 8.1.4 Simulate each alarm and trip and confirm it on the HMI and in the event log.
- 8.1.5 Simulate below 3.6 mA and above 21 mA (or open circuit) to confirm bad PV alarms.

8.2 Analog output loops

- 8.2.1 Set the output from the DCS to 0, 25, 50, 75, 100 % and measure the current or the valve position.

8.3 Digital loops

8.3.1 Operate each field contact and confirm the state change in the DCS.

8.3.2 Force each digital output and confirm the field device responds (solenoid, motor start relay).

8.4 Completion

8.4.1 Reconnect field devices and confirm live process readings.

8.4.2 Sign the loop check sheet with all parties and raise punch items for faults.

9. Acceptance criteria

- Readings within the loop tolerance (typically ± 0.5 % of span).
- Alarms and trips at the correct set points.
- Correct device response for outputs.

10. Records

- Loop check sheet (free template: instrumentationblog.in/downloads/templates/loop-check-sheet/)
- Punch list (free template: instrumentationblog.in/downloads/templates/punch-list-template/)

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.