

Your Company Name / Logo	LEVEL SWITCH FUNCTIONAL TEST SOP	Doc no: SOP INST 010	Rev: 0
Department: Instrumentation	Standard operating procedure	Date:	Page: see footer

1. Purpose

To prove that level switches detect the liquid at the right point and that the alarm or trip they initiate works.

2. Scope

Vibrating fork, float and displacer type point level switches in alarm, interlock and safety service.

3. References

- Switch manufacturer manual (test function)
- Alarm and trip list, cause and effect matrix
- Proof test procedure for SIS switches

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.
- If the switch is part of a SIS trip, use the approved bypass and proof test procedure.
- Removing a switch from a vessel may need the vessel drained and isolated: never open a nozzle under pressure.

6. Tools and equipment

- Multimeter
- Manufacturer test magnet or test button tool (for switches with a test function)
- Bucket of process compatible liquid for removed switches
- Radio for communication with the control room

7. Prerequisites

- Permit approved; operations informed which alarms and trips will be activated.
- Bypass in place where required for trips.
- Switch set point and action (open or close on high level) known from the alarm and trip list.

8. Procedure

8.1 Choose the test method

- 8.1.1 Best: raise or lower the real level to the switch point under controlled conditions (proves switch and installation).
- 8.1.2 Next: use the built in or magnetic test function, which simulates the switch state (proves electronics and wiring, not the process contact).
- 8.1.3 Otherwise: remove the switch and immerse it in liquid (proves the sensor, but needs isolation and drain).

8.2 Test the switch

- 8.2.1 Perform the test using the chosen method and observe the switch status LED or output.

- 8.2.2 Check that the switch changes state at the expected condition and returns when the condition clears.
- 8.2.3 For fork switches, check the time delay setting if fitted.

8.3 Check the alarm and trip path

- 8.3.1 Confirm with the control room that the correct alarm appears with the correct tag and priority.
- 8.3.2 For trip switches, confirm the logic solver output and, where the procedure allows, the final element action.
- 8.3.3 Check that the switch fails to the safe state on loss of power (disconnect the supply briefly if the procedure allows).

8.4 Restore

- 8.4.1 Reset alarms, remove bypasses and confirm the switch shows the normal state for the current level.
- 8.4.2 Close the permit and record the test.

9. Acceptance criteria

- Switch changes state at the required level (or test condition) and resets correctly.
- Correct alarm or trip received in the control system.
- Switch goes to the safe state on loss of power where designed fail safe.

10. Records

- SIL proof test record (for SIS switches) (free template: instrumentationblog.in/downloads/templates/sil-proof-test-record/)
- Alarm and trip list (free template: instrumentationblog.in/downloads/templates/alarm-and-trip-list/)

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.