Rosemount® Model 1151DP/AP/GP Pressure Transmitter

Tank Farm Maintenance Procedure

Effluent Treatment Facility

USQ Not Required – ETF is a <Hazard Category 3 Radiological Facility

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Attachment 1 - Water Trap/Pressure M&TE

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Figure 3 - Command Map for Model 1151

Figure 4 - How the Trap Works

Figure 5 – Negative Pressure Connection

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for a safe uniform method of calibration for Rosemount® Model 1151 Pressure Transmitters using Model 268 Smart Family Interface.

1.2 Scope

This procedure applies to the calibration of Rosemount Model 1151 Pressure Transmitters using Model 268 Smart Family Interface. Steps have been provided for calibration using installed Zero and Span buttons if no M268 interface is available.

2.0 INFORMATION

2.1 Terms and Definitions

- M268 - Model 268 Interface.

2.2 General Information

2.2.1 Transmitters are normally calibrated using either a hardwired LOI or Rosemount M268. If unit being calibrated is LOI equipped, steps referring to M268 (except loop connection) are performed on LOI. There may be minor differences between M268 (shown) and LOI menus.

2.2.2 Unused M268/LOI menu choices/screens are not explained.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Radiation and Contamination Control

3.1.1 Work in radiological areas will be performed using a radiological work permit following review by Radiological Control per ALARA Work Planning procedure, TFC-ESHQ-RP_RWP-C-03.

3.1.2 The opening of any system or component within a Radiological Area requires presence of a Health Physics Technician to verify contamination control.

3.1.3 When disconnecting, breaching, or opening systems or system components that are currently or previously connected to waste tanks or waste transfer systems:
   - Follow the RWP for radiological control requirements
   - Pre-job and post-job surveys are required

3.1.4 Follow Calibration Instructions (Attachment 2)

3.2 Environmental Protection

3.2.1 In the event of a spill/leak/release, notify the SOM/FWS and respond per ETF-ERP-85B-003, Emergency Spill or Release at ETF.

4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

NOTE - M&TE used to collect acceptance criteria data during performance of this procedure shall meet the following requirements:

- Be within its current calibration cycle as evidenced by an affixed calibration label
- Be capable of desired range
- Have an accuracy consistent with state-of-the-art limitations
- Accuracy is equal to or greater than M&TE tolerance specified on PM data sheet or is at least four times greater than specified device tolerance.

The following supplies may be needed to perform this procedure:

- M268 smart family interface
- CMD capable of reading 4 to 20maDC meeting required M&TE tolerance specified on data sheet
- Pressure source ranged for the transmitter being calibrated and meeting required M&TE tolerance specified on data sheet
- Water trap device Figure 4.
4.2 Performance Documents

The following documents may be required during the performance of this procedure.

- Radiological survey plan
- Waste planning checklist
- Pressure M&TE vendor manual.
5.0 PROCEDURE

NOTE - Figure 1, Figure 2, and Figure 3 provide M&TE connections and information.

5.1 Initial Setup

5.1.1 IF performing this procedure on a system that has the potential for free liquids or moisture to enter the Pressure M&TE, USE a water trap device.

5.1.1.1 ENSURE the Water Trap is installed in a vertical position to operate correctly Figure 4.

5.1.1.2 IF liquids or moisture gets into the Water Trap or Pressure M&TE REFER to Attachment 1.

5.1.1.3 IF performing this procedure on a system that is potentially contaminated, FOLLOW Calibration Instructions (Attachment 2).

5.1.2 IF calibrating unit with installed Zero and Span buttons, GO TO Section 5.5.

5.1.3 CONNECT CMD (mADC) in series with current loop (Figure 2).

5.1.4 CONNECT M268 in parallel with loop.

NOTE - There must be a minimum of 250 ohms resistance in the loop in order for the M268 to work properly.

5.1.5 TURN ON M268 AND

WAIT for M268 to perform self-test.

5.1.6 WHEN M268 displays option to SAVE or RECALL transmitter configuration data in safe memory, PRESS SAVE.

5.1.7 ENSURE transmitter is isolated from process.

5.1.8 CONNECT pressure source to high input of transmitter AND

VENT low side.
5.2  As-Found Data

Transmitter Test
5.2.1  PRESS TEST to initiate testing.
5.2.2  PRESS XMTR TEST to select transmitter test.
5.2.3  PRESS PROCEED.
5.2.4  WAIT for 1151DP to complete self-test.
5.2.5  PRESS PROCEED to return to top level test menu.
5.2.6  PRESS EXIT to end test session.
5.2.7  PRESS PROCEED to return loop to automatic control.

Pressure Test
5.2.8  VARY input values per PM/S data sheet AND RECORD output readings in as-found section of data sheet.
5.2.9  IF as-found values are within tolerance per PM/S data sheet and no adjustments are required, RECORD as-found values in as-left column AND GO TO Section 5.6, Restoration.

5.3  4 to 20 mA Trim

5.3.1  PRESS FORMAT.
5.3.2  PRESS PROCEED.
5.3.3  PRESS DGTL TRIM to adjust 4 to 20 mA output circuitry.
5.3.4  PRESS OUTPUT TRIM to perform 4 to 20 mA trim.
5.3.5  PRESS 4 to 20 mA to select standard 4 to 20 mA scale.
5.3.6  PRESS PROCEED (twice).
5.3.7  PRESS <- and -> keys to move underline cursor AND ENTER value read on CMD using alphanumeric keys of M268.
5.3.8  IF error made in entering value, PRESS CLR to clear number and start over.
5.3 4 to 20 mA Trim (Cont.)

5.3.9 PRESS ENTR after value is keyed.

5.3.10 IF transmitter output indicated in next screen is equal to CMD reading, PRESS YES AND

GO TO Step 5.3.12.

5.3.11 PRESS NO AND

REPEAT Steps 5.3.7 through 5.3.10 until values are equal.

5.3.12 PRESS PROCEED to obtain 20 mA output.

5.3.13 PRESS <- and -> keys to move underline cursor AND

ENTER value read on CMD using alphanumeric keys of M268.

5.3.14 IF error made in entering value, PRESS CLR to clear number and start over.

5.3.15 PRESS ENTR after value is keyed.

5.3.16 IF transmitter output indicated in next screen is equal to CMD reading, PRESS YES AND

GO TO Step 5.3.18.

5.3.17 PRESS NO AND

REPEAT Steps 5.3.13 through 5.3.16 until values are equal.

5.3.18 PRESS ABORT to exit 4 to 20 mA trim.
5.4 Full Sensor Trim

5.4.1 PRESS FORMAT.

5.4.2 PRESS PROCEED.

5.4.3 PRESS DGTL TRIM.

5.4.4 PRESS SNSR TRIM.

NOTE - When full trim is pressed, the last trim/input values used appear briefly on the screen.

5.4.5 PRESS FULL TRIM.

5.4.6 PRESS LOW TRIM.

5.4.7 APPLY low pressure per PM/S data sheet.

NOTE - After pressing PROCEED, the display then indicates PRESSURE STABILIZING for ten seconds to allow for a stable reading.

5.4.8 PRESS PROCEED.

5.4.9 WAIT ten seconds for a stable reading.

5.4.10 IF display reading equals input value, PRESS ENTER AND
GO TO Step 5.4.14.

5.4.11 PRESS <-> and -> keys to move underline cursor AND
ENTER correct value using alphanumeric keys of M268.

5.4.12 IF error made in entering value, PRESS CLR to clear number and start over.

5.4.13 PRESS ENTR after value is keyed.

5.4.14 PRESS HIGH TRIM.

5.4.15 APPLY high pressure per PM/S data sheet.

NOTE - After pressing PROCEED, the display then indicates PRESSURE STABILIZING for ten seconds to allow for a stable reading.

5.4.16 PRESS PROCEED.
5.4 Full Sensor Trim (Cont.)

5.4.17 WAIT ten seconds for a stable reading.

5.4.18 IF display reading equals input value, PRESS ENTER AND

GO TO Step 5.4.22.

5.4.19 PRESS <- and -> keys to move underline cursor AND

ENTER correct value using alphanumeric keys of M268.

5.4.20 IF error made in entering value, PRESS CLR to clear number and start over.

5.4.21 PRESS ENTR after value is keyed.

5.4.22 PRESS END to review or make a change.

5.4.23 PRESS ABORT.

5.4.24 PRESS PV on 268 AND

PERFORM the following:

5.4.24.1 VARY test input values per PM/S data sheet.

5.4.24.2 IF values are not within tolerance, CONTACT FWS or cognizant engineer for direction.

5.4.24.3 IF values are within tolerance per PM/S data sheet and no other adjustments are needed, RECORD values in as-left column on data sheet AND

GO TO Section 5.6, Restoration.
5.5 Zero and Span Button Calibration

5.5.1 CONNECT CMD (mADC) in series with current loop.

5.5.2 CONNECT pressure source to input of transmitter.

5.5.3 VARY input values per PM/S data sheet AND RECORD output readings in as-found section of data sheet.

5.5.4 IF as-found values are within tolerance per PM/S data sheet and no adjustments are needed, RECORD as-found values in as-left column AND GO TO Section 5.6, Restoration.

5.5.5 REMOVE circuit side cover to expose Zero and Span buttons.

5.5.6 PRESS Zero and Span buttons together AND HOLD for at least five seconds.

5.5.7 APPLY Zero value input per PM/S data sheet.

5.5.8 PRESS Zero button for five seconds.

5.5.9 APPLY maximum value input per PM/S data sheet.

5.5.10 PRESS Span button AND HOLD for five seconds.

5.5.11 VARY test input values per PM/S data sheet AND RECORD as-left values on data sheet.

5.5.12 IF values are not within tolerance, CONTACT FWS or DA for direction.
5.6 Restoration

5.6.1 RESTORE to as-found condition.

5.6.2 INFORM SOM test is complete instrument/equipment/system may be returned to service.

5.7 Acceptance Criteria

Acceptance criteria has been met when steps in this procedure have been satisfactorily performed and results are recorded on the data sheet(s).

5.8 Review

5.8.1 INFORM FWS test is complete.

5.8.2 (FWS) REVIEW AND ENSURE the following:

- Completed data sheets meet the acceptance criteria
- Comments sections are filled out appropriately
- Work requests needed as a result of this procedure are identified and generated
- Work request number(s) of any work documents generated as a result of this procedure, are recorded in the Comments/Remarks section of the data sheet.

5.9 Records

This procedure is performed within a work package, as such, the procedure in its entirety will be maintained as a record per the Work Control process.

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.
Attachment 1 - Water Trap/Pressure M&TE

**Water Trap with Potentially Contaminated Liquid**

1. If potentially contaminated liquid gets into Water Trap, Suspend the work.
2. Notify the FWS.
3. When provided approval from the FWS proceed as follows.
4. Return to a RMA.
5. Disassemble the Water Trap.
6. Allow trap to dry overnight.
7. Survey disassembled trap components in accordance with Radcon survey plan.
8. If the Water Trap can be released return it to tool crib.
9. If the Water Trap cannot be released, dispose of it per waste planning checklist.

**Water Trap with Clean Liquid (NOT Contaminated)**

1. If clean liquid gets into Water Trap, disassemble the Water Trap.
2. Allow Water Trap to dry overnight.
3. Re-assemble the Water Trap.
4. Return the Water Trap to the tool crib.
Attachment 1 - - Water Trap/Pressure M&TE (Cont.)

M&TE with Potentially Contaminated Liquid

1. If potentially contaminated liquid gets past water trap and inside Pressure M&TE, Suspend the work.
2. Notify FWS.
3. Wait for further directions.

M&TE with Clean Liquid (NOT Contaminated)

1. If clean liquid gets past the water trap disassemble and dry out Pressure M&TE per manufactures direction.
2. Return the M&TE to the tool crib.
3. Request the M&TE to be returned to NIST calibration lab for recalibration.
Attachment 2 – Calibration Instructions

Positive pressure calibrations:

Note: Vent Valve assembly is required on all positive pressure calibrations to ensure M&TE is not contaminated by venting potential process air back through M&TE.

Install vent valve assembly Per Figure 6

Ensure IV is open and VV is closed

Proceed with calibration per work package

- Whenever venting is required during calibration steps, vent stored pressure as follows.

NOTE – Valve IV can remain open when reading is required via M&TE.

Ensure IV valve is closed
Ensure VV valve is opened
Repeat sequence as necessary to complete the calibration.
After all steps are completed for the calibration, perform RCT survey release plan XXX

Negative pressure calibrations:

Note: use of surrogate filter is required for negative pressure calibrations to ensure M&TE is not contaminated by pulling process air into M&TE while drawing Vacuum.

Negative calibrations should be performed as Follows.

Ensure surrogate filter holder has media installed.
Connect filter in-line per Figure 5
Ensure IV is open.
Pull a representative vacuum into M&TE through filter
Ensure IV is closed.
Vent through VV

RCT to perform survey of the media.

IF no contamination found remove surrogate filter holder and proceed with calibration.
Figure 1 - Model 268 Interface
Figure 2 - Test Connections
Figure 3 - Command Map for Model 1151
Figure 4 - How the Trap Works

1. Gas/Air enters through the top slot which goes into the chamber.
2. Dirt and Moisture particles are collected in the chamber, which is visible through the clear transparent glass window.
3. Then Gas/Dry Air goes into the centre slot where it enters the instrument.
Figure 5 – Negative Pressure Connection
Figure 6 – Positive Pressure Connection