Calibrate Foxboro E27R Series Single-Station Electronic Indication Recorders

Tank Farm Maintenance Procedure

MAINTENANCE

USQ # Routine Maintenance

CHANGE HISTORY (LAST 5 REV-MODS)

<table>
<thead>
<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
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<tr>
<td>E-2</td>
<td>07/10/2017</td>
<td>PCA from Periodic Review</td>
<td>Add to Section 2.1 General Information, Update Records Section to comply with writer’s standard.</td>
</tr>
<tr>
<td>E-1</td>
<td>10/30/2014</td>
<td>CHAMPS Removal.</td>
<td>CHAMPS removal, new records statement.</td>
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<td>E-0</td>
<td>04/23/2014</td>
<td>Periodic Review</td>
<td>Add Steps 3.1, 5.2.1 – 5.2.6, Add “Obtain As-Found values after 5.1, “Calibrate Recorder” prior to Step 5.1.5, Note prior to Step 5.1.11. Reword Steps 4.2.1, 5.1.4, 5.1.9, 5.1.11 - 5.1.13, 5.3. Struck Steps 5.2.1, 5.2.2, Notes prior to Steps 5.1.3 &amp; 5.1.6.</td>
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<td>D-0</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for calibrating the Foxboro E27R series single-station electronic indicating recorders.

1.2 Scope

This procedure involves the Foxboro E27R series single-station electronic indicating recorders.

2.0 INFORMATION

2.1 General Information

Pen(s) and chart are synonymous with ribbon indicator level indicator (Gauge Reading Columns). Either reading method can be used to calibrate the instrument.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

Failure to comply with electrical safety practices as outlined in DOE-0359 Hanford Site Electrical Safety Program could result in serious injury.

3.2 Radiation and Contamination Control

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

4.1 Special Tools, Equipment, and Supplies

The following tools may be needed to perform this procedure:

- Milliamp source
- Digital multimeter
- Other tools, equipment and supplies as identified by Shift Manager/OE/FWS/User.

4.2 Field Preparation

4.2.1 OBTAIN release from Shift Manager prior to calibrating the recorder.
5.0 PROCEDURE

5.1 Perform Calibration

Obtain As-Found Values

NOTE - Calibration may be performed in-place or the instrument may be returned to the shop for bench calibration.

5.1.1 SECURE any control systems affected by this calibration.

5.1.2 DISCONNECT input and output signals, as necessary, from process AND CONNECT test equipment (see Figure 1).

5.1.3 APPLY each test input signal specified on the data sheet AND RECORD each corresponding output value in the As-Found section.

5.1.4 IF recorder As-Found output values are within tolerance specified on the data sheet, and no calibration adjustments are required, RECORD As-Found values in the As-Left column of Data Sheet AND GO TO Restoration, Section 5.2.

Calibrate Recorder

5.1.5 ENSURE recorder pen(s) or associated mechanisms do not bind or contact any mechanical stops.

5.1.6 ADJUST current source for lowest specified input signal value per Data Sheet.

5.1.7 ADJUST ZERO adjustment (clockwise to increase reading) so that pen reads ZERO on chart (Figure 2).

5.1.8 TURN corresponding ribbon adjustment (Figure 2) on pen carriage (clockwise to increase reading) so that ribbon indicator reads ZERO on scale.

5.1.9 ADJUST current source for highest specified input signal value per Data Sheet.
5.1 Perform Calibration (Cont.)

5.1.10 ADJUST SPAN adjustment (clockwise to increase span) so that pen reads 100% on chart.

NOTE Due to the interaction between the Zero and Span adjustments it may be necessary to repeat the adjustments several times to achieve tolerance.

5.1.11 REPEAT Steps 5.1.5 through 5.1.10, until pen under calibration is within tolerance,

OR

IF unable to bring to tolerance, NOTIFY FWS for resolution.

5.1.12 REPEAT Steps 5.1.2 through 5.1.11, for each recorder pen that is being adjusted per Data Sheet.

5.1.13 RECORD values in the As-Left column on Data Sheet.

5.2 Restoration

5.2.1 IF any problems were encountered with calibration, INFORM FWS.

5.2.2 IF not already removed; DISCONNECT AND REMOVE Test Equipment.

5.2.3 RECONNECT field wires removed in Step 5.1.2.

5.2.4 RECORD the Test Equipment information and calibration status on Data Sheet.

5.2.5 CHECK equipment restoration by observing indications are consistent with expected conditions.

5.2.6 NOTIFY Operations that testing is complete and system may be returned to desired configuration.
5.3 Acceptance Criteria

Acceptance Criteria has been met when Steps in this procedure have been satisfactorily performed and As-Left values meet the specifications and tolerance(s) per the Data Sheet.

5.4 Review

5.4.1 INFORM FWS calibration is complete.

5.4.2 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 initiated
- As applicable work package numbers are recorded on Data Sheet.

5.5 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.
Figure 1 - Signal Wiring Diagram

MEASUREMENT - SIGNAL WIRING

WITH POWER SUPPLIED TO TRANSMITTER BY RECORDER: 4 to 20 mADC MEASUREMENT RANGE (SHOWN CONNECTED TO FOXBORO d/p CELL TRANSMITTER)

WITH POWER NOT SUPPLIED BY RECORDER TO TRANSMITTER: 4 to 20 mADC, 1 to 5 VDC, or 0 to 10 VDC MEASUREMENT RANGE

1a. 250 OHM RESISTORS ARE LOCATED INSIDE TERMINAL ASSEMBLIES
b. WITH CURRENT MEASUREMENT SIGNALS, LEAVE RESISTORS INSTALLED.
c. WITH VOLTAGE MEASUREMENT SIGNALS, DISCONNECT RESISTORS FROM TERMINALS. FOR ACCESS TO RESISTORS, SLIDE SERVICE COVER OFF TERMINAL ASSEMBLY & CONNECT A JUMPER BETWEEN ANY UNUSED INPUT - TERMINAL PAIR.

2. JUMPER FOR BLUE-PEN INPUT WIRING IS SUPPLIED WITH RECORDER. THIS JUMPER IS INCLUDED IN PACKAGE CONTAINING PEN CARTRIDGES.
Figure 2 - Recorder Calibration Adjustments