Calibrate VEL-Trol II Transmitter-Controller

Tank Farm Maintenance Procedure

Calibration

USQ # Routine Maintenance

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<th>Rev-Mod</th>
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<tr>
<td>C-0</td>
<td>06/02/2016</td>
<td>Periodic Review</td>
<td>Reword Steps - 3.1.1, 5.3.2, Changed Note to Special Inst. @5.1, Changed Step 5.1.1 to Special Inst. @5.1. Add - Step 3.1.2. Struck - 3rd bullet @4.1 Add Safety and RadCon per TA directions.</td>
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<td>B-1</td>
<td>11/03/2014</td>
<td>CHAMPS Removal</td>
<td>CHAMPS removal, new records statement.</td>
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<td>Periodic Review</td>
<td>Removed vague phrases and reworded note to a step.</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions to calibrate the VEL-Trol II Transmitter-Controller.

1.2 Scope

This procedure includes the VEL-Trol II Transmitter-Controller versions 5.3X and associated test equipment necessary for calibration.

2.0 INFORMATION

NONE

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Instrument is found throughout Tank Farms and all hazards will be identified in accordance with TFC-ESHQ-S_SAF-C-02.

3.1.2 Follow electrical safety practices per DOE–0359, Hanford Site Electrical Safety Program.

3.2 Radiation and Contamination Control

Work in radiological areas will be performed using a radiation 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 equipment may be needed to perform this procedure:

- Digital multimeter capable of measuring range and accuracy stated on Data Sheet
- Digital manometer (or equivalent) capable of range and tolerance per Data Sheet
- Other tools, equipment, and supplies as identified by Shift Manager/OE/FWS/User.

4.2 Field Preparation

NOTE - This procedure is only used for calibration and testing. Initial specified design criteria and field installation will be performed using an approved work package.

4.2.1 IF new equipment is being installed, CHECK configuration is set to factory specification.

4.2.2 ENSURE system has been configured for calibration and testing of the equipment.
Calibrate VEL-Trol II Transmitter-Controller

5.0 PROCEDURE

Special Instructions

Sections that are not required may be skipped with concurrence of the field work supervisor with those directions being recorded on Work Record or Data Sheet Comments Section.

If any step is not required for procedure completion, record “N/A” in the applicable space(s) on the Data Sheet and document explanation in the Data Sheet’s Comments/Remarks section.

5.1 Initial Setup

5.1.1 VALVE OUT Low signal line to the VEL-Trol II.

5.1.2 CONNECT test equipment.

5.1.3 APPLY pressure per Data Sheet AND RECORD data in As-Found reading(s) on Data Sheet.

5.1.4 IF As-Found reading(s) are not within tolerance per Data Sheet, GO TO Section 5.2.

5.1.5 IF As-Found data is within tolerance per Data Sheet, RECORD data in As-Left reading(s) on Data Sheet AND GO TO Section 5.3.
5.2 Calibrate Display

5.2.1 WHILE in main menu, SCROLL to:

Transmitter Input Calibration

5.2.2 PRESS ENT until display reads:

Transducer Zero Calib: 0.00 in WC

5.2.3 PRESS ENT until display reads:

Transducer Zero -- Push ENTER --

5.2.4 ADJUST input pressure to ZERO scale value per Data Sheet.

5.2.5 PRESS ENT until display reads (count down from 4 to 0):

Transducer Zero Settle Time:4

5.2.6 WAIT until display reads:

Input Zero Done -- Push ESCAPE –

5.2.7 PRESS ESC button.

5.2.8 PRESS UP button until display reads.

Transducer Span Calib: X.XX in. WC
5.2 Calibrate Display (Cont.)

5.2.9 APPLY input pressure (as read on manometer) to the high port of the VEL-Trol II as indicated on the display.

5.2.10 PRESS ENT button until display reads:

```
Transducer Span
Push ENTER
```

5.2.11 PRESS ENT button until display reads (count down from 4 to 0):

```
Transducer Span
Settle Time:4
```

5.2.12 WAIT until display reads:

```
Input Span Done
-- Push ESCAPE --
```

5.2.13 PRESS ESC button.

5.2.14 IF display reads:

```
Bad Input Span
-- Push ESCAPE --
```

PRESS ESC button.

5.2.14.1 REPEAT Steps 5.2.9 through 5.2.14 a maximum of two times.

5.2.15 REMOVE input pressure from High port on VEL-Trol II

5.2.16 PRESS ESC button.

5.2.17 PRESS UP button until display reads:

```
Ext. Setpoint Zero
Calib: Aux. 1 Minimum
```
5.2 Calibrate Display (Cont.)

5.2.18 CONNECT a voltage/current generator adjusted for minimum value of external setpoint input across terminals 8 and 10. (See Figure 1)

5.2.19 PRESS ENT button until display reads:

```
Ext Setpoint Zero
Push ENTER
```

5.2.20 PRESS ENT button until display reads:

```
Ext Setpoint Zero
Settle Time: 4 Sec
```

5.2.21 WAIT until display reads:

```
Input Zero Done
-- Push ESCAPE --
```

5.2.22 PRESS ESC button.

5.2.23 PRESS UP button until display reads:

```
Ext. Setpoint Span
Calib: Aux. 1 Maximum
```

5.2.24 PRESS ENT button until display reads:

```
Ext Setpoint Span
Push ENTER
```
5.2 Calibrate Display (Cont.)

5.2.25 ADJUST to maximum value of External Setpoint input.

5.2.26 PRESS ENT button until display reads.

5.2.27 WAIT until display reads:

Ext Setpoint Span
Settle Time: 4 Sec

5.2.28 IF display reads:

Input Span Done
-- Push ESCAPE –

5.2.28.1 REPEAT Steps 5.2.23 through 5.2.27 a maximum of two times.

5.2.29 PRESS ESC button.

5.2.30 PRESS UP button until display reads.

5.2.31 PRESS ENT button to return to main menu.

5.2.32 IF re-testing is required, PERFORM Section 5.1.
5.3 Restoration

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

5.3.2 IF not already removed, DISCONNECT AND REMOVE Test Equipment.

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

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

5.3.5 NOTIFY Operations that testing is complete and system may be returned to desired configuration.

5.4 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.

5.5 Review

5.5.1 INFORM FWS calibration is complete.

5.5.2 FWS must 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 Comments/Remarks section of Data Sheet.

5.6 Records

The performance of this procedure generates no records. However, PM Data Sheets associated with the procedure, are records and are maintained in the work package as record material.

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 – VEL-Trol II Connections

- TRANSMITTER OUTPUT 1
- CONTROLLER OUTPUT 2
- SIGNAL COMMON FOR TERMINALS 1 & 2
- ANALOG OUTPUT 3
- ANALOG OUTPUT 4
- SIGNAL COMMON FOR TERMINALS 4 & 5
- EXTERNAL SETPOINT INPUT
- * SPECIAL FUNCTION INPUT
- SIGNAL COMMON FOR TERMINALS 8 & 9
- * EXTERNAL PURGE START (MOMENTARY DRY CONTACT)
- SYSTEM SOFT START
- GROUND FOR TERMINALS 11 & 12
- EARTH GROUND
- POWER SUPPLY NEUTRAL (-)
- POWER SUPPLY LINE (+)
- SWITCH TO EXTERNAL SETPOINT
- GROUND FOR TERMINAL 17
- NET A
- NET B
- AUTO-purge PURGE VALVES (SV-1A & SV-1B)
- OR
- ALARM 1
- AUTO-PURGE ACKNOWLEDGE
- OR
- ALARM 2
- AUTO-PURGE MAIN AIR VALVE (SV-2)

* USED ONLY WHEN THIS OPTION IS PURCHASED
Figure 2 - Operator Set-up for Controller Configuration