Action PAK® Model AP4390 DC - Input Dual Channel Isolator

Tank Farm Maintenance Procedure

Effluent Treatment Facility

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

<p>| CHANGE HISTORY (≤ LAST 5 REV-MODS) |
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for a safe, uniform method of calibration for the Action-PAK® Model AP4390 DC input dual channel isolators. Action-PAK Model AP4390s are field-configurable DC input, dual channel isolators that accept DC voltage input spans from 10mV to 100 volts or current input spans from 1mA to 100mA.

1.2 Scope

This procedure applies to the initial setup and calibration check, calibration, and channel restoration of Action-PAK Model AP4390 DC input dual channel isolators.

2.0 INFORMATION

2.1 General Information

2.1.1 Channels may be calibrated simultaneously or individually.

2.1.2 Power source (120/240 VAC) on pins 1 (hot) and 3 (neutral); see Figure 2. Use caution when lifting leads and making connections.

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-ESH-RP_RWP-C-03.

3.2 Environmental Compliance

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 - Measuring and Test Equipment 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
- Accuracy is equal to or greater than M&TE tolerance specified on PM/S data sheet or is at least four times greater than specified device tolerance.

The following supplies may be needed to perform this procedure:
- CMD (two CMDs if reading outputs simultaneously)
- Current source (range 4 to 20 mA)
- Action-PAK II pin base (if performing bench calibration).

4.2 Performance Documents

The following documents may be needed to perform this procedure:
- DOE-0336, Hanford Site Lockout/Tagout Procedure
- VI-22600, Sup. 16, Action PAK DC Input Dual Channel Isolator, Model AP4390 Instruction Sheet.
5.0 PROCEDURE

NOTE - Figure 1 depicts input/output card locations.
- Figure 2 depicts terminal/pin connections.

5.1 Initial Set Up and Calibration Check (Bench Calibration)

NOTE - Power source (120/240 VAC) on pins 1 (hot) and 3 (neutral); see Figure 2.

5.1.1 ENSURE lock and tag is installed per DOE-0336.

5.1.2 REMOVE Action-PAK from field mount.

NOTE - Current channels may be calibrated simultaneously by connecting inputs in series (i.e., input 5(+) & 11(-), jumper 6 and 10).

5.1.3 CONNECT current source to test channel input(s) per the following:

5.1.3.1 CHANNEL A INPUT: pins 5(+) and 6(-).

5.1.3.2 CHANNEL B INPUT: pins 10(+) and 11(-).

NOTE - Two CMDs may be used to read outputs simultaneously.

5.1.4 LABEL AND LIFT negative output lead AND

CONNECT CMD in series with lifted lead and terminal pin per the following:

5.1.4.1 CHANNEL A OUTPUT: pin 8(-) and 7(+).

5.1.4.2 CHANNEL B OUTPUT: pin 9(-) and 11(-).

5.1.5 INSTALL Action-PAK into Action-PAK bench test set.

5.1.6 ENABLE power to Action-PAK and current source.

5.1.7 WITH power applied, WAIT a minimum of five minutes.
5.1 Initial Set Up and Calibration Check (Bench Calibration) (Cont.)

5.1.8 VARY input per data sheet AND

RECORD as-found output values.

5.1.9 IF as-found values are not within specified tolerance per data sheet, GO TO Section 5.3,

OR

IF as-found values are within specified tolerance, but deemed marginal, and optimization is desired, GO TO Section 5.3,

OR

IF as-found values are within specified tolerance, RECORD as-found values in as-left column of data sheet AND

GO TO Section 5.4.

5.2 Initial Setup and Calibration Check (Field Calibration)

5.2.1 REMOVE Action-PAK from mount.

5.2.2 LABEL AND DISCONNECT test channel(s) input leads per the following:

- CHANNEL A INPUT: pins 5(+) and 6(-).
- CHANNEL B INPUT: pins 10(+) and 11(-).

NOTE - Current channels may be calibrated simultaneously by connecting inputs in series (i.e., input 5(+) & 11(-), jumper 6 and 10).

5.2.3 CONNECT current source to test channel input(s) per the following:

- CHANNEL A INPUT: pins 5(+) and 6(-).
- CHANNEL B INPUT: pins 10(+) and 11(-).

NOTE - Two CMDs may be used to read outputs simultaneously.

5.2.4 LABEL and lift negative output lead AND

CONNECT CMD in series with lifted lead and terminal pin per the following:

- CHANNEL A OUTPUT: pin 8(-) and 7(+).
- CHANNEL B OUTPUT: pin 9(-) and 11(-).
5.2 Initial Setup and Calibration Check (Field Calibration) (Cont.)

5.2.5 INSTALL Action-PAK into mount.

5.2.6 ENABLE power to Action-PAK and current source.

5.2.7 WITH power applied, WAIT a minimum five minutes.

5.2.8 VARY input per data sheet AND

RECORD as-found output values.

5.2.9 IF as-found values are not within specified tolerance per data sheet, GO TO Section 5.3,

OR

IF as-found values are within specified tolerance, but deemed marginal, and optimization is desired, GO TO Section 5.3,

OR

IF as-found values are within specified tolerance, RECORD as-found values in as-left column of data sheet AND

GO TO Section 5.4.

5.3 Calibration

5.3.1 APPLY minimum input per data sheet AND

ADJUST fine Zero.

5.3.2 APPLY maximum input per data sheet AND

ADJUST fine Span.

5.3.3 REPEAT Steps 5.3.1 and 5.3.2 until both values are within tolerance.

5.3.4 VARY input per data sheet AND

RECORD as-left values on data sheet.
5.4 Restoration

5.4.1 RE-LAND field wiring.
5.4.2 INSTALL Action-PAK if removed for bench cal.
5.4.3 ENABLE power.
5.4.4 RESTORE to as-found conditions.
5.4.5 INFORM SOM that test is complete and instrument/equipment/system may be returned to service.

5.5 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).

5.6 Review

5.6.1 INFORM FWS test is complete.
5.6.2 (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.

5.7 Records

The performance of this procedure generates no records. However PM/S 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 - Input/Output Card Locations
Figure 2 - Terminal/Pin Connections

1. POWER (HOT)
2. SPARE
3. POWER (NEU)
4. OUTPUT B (+)
5. INPUT A (+)
6. INPUT A (-)
7. OUTPUT A (+)
8. OUTPUT A (-)
9. OUTPUT B (-)
10. INPUT B (+)
11. INPUT B (-)