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## Functional Check of Ebtron GTA116 Flow Transmitter

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for performing a functional check of the calibration of Ebtron GTA116 Flow Transmitters.

1.2 Scope

This procedure involves functionally checking the calibrated output of the Ebtron GTA116 Flow Transmitter and the associated equipment necessary for performing the functional check.

2.0 INFORMATION

NONE

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 All identified hazards will be addressed in the pre-job safety meeting.

3.1.2 If working around live circuits, extreme caution should be used. Failure to follow electrical safety practices as outlined in DOE-0359, Hanford Site Electrical Safety Program could result in injury.

3.1.3 If a lock and tag is required during the performance of this procedure, perform Lockout/Tagout in accordance with DOE-0336, Hanford Site Lockout/Tagout Procedure.

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.

3.3 Environmental Compliance

3.3.1 If performance of this procedure will result in a shutdown of the K-1 Building Exhauster, notify Environmental per the Environmental On-Call List in accordance with TFC-ESHQ-ENV_FS-C-01, Environmental Notification.
4.0 PREREQUISITES

4.1 Special Tools, Equipment and Supplies

The following supplies may be needed to perform this procedure:

- Digital Multimeter (DMM) or equivalent capable of measuring (4 – 20) milliamp output range
- Other tools, equipment and supplies as identified by Shift Manager/OE/FWS/User.

4.2 Performance Documents

The following documents may be needed to perform this procedure:

- H-2-830594, Sheets 2 and 3, 242-A Evaporator HVAC P&ID

4.3 Field Preparation

4.3.1 CONFIRM ventilation system is configured to allow de-energizing the flow transmitter and performing a functional check of the instrument.

4.3.2 INFORM Shift Manager/OE before removing flow transmitter from service.
5.0 PROCEDURE

NOTE - Performance of the functional check with instrument in service will result in low flow alarm.

5.1 Perform Functional Check

5.1.1 IF performance of any steps in this procedure is not required for procedure completion, MARK those steps with an "N/A" in the appropriate Data Table and/or signoff space AND RECORD an explanation that is initialed in the comments/remarks section of the Data Sheet.

5.1.2 RECORD the test equipment information per Data Sheet.

5.1.3 REMOVE Ebtron GTA116 Transmitter from service AND CONNECT test equipment per the following (reference Figure 1 and Figure 2.)

5.1.3.1 NOTIFY Shift Manager that the flow transmitter is being de-energized.

5.1.3.2 REMOVE cover plate from the transmitter.

5.1.3.3 MOVE transmitter power switch to the OFF position.

5.1.3.4 CONNECT DMM or equivalent to the 4 to 20 mA flow output as shown in Figure 1 and set to read milliamps.

NOTE - Pressing the ENTER and ESC button together within 10 seconds of turning the transmitter ON will place you in the initialization mode. (Figure 2)

5.1.4 MOVE transmitter power switch to ON position AND WITHIN 10 seconds, PRESS the “ENTER” and “ESC” buttons together. (Figure 2)
5.1 Perform Functional Check (Cont.)

5.1.5 CONFIRM transmitter is in the Initialization Mode (see Figure 3 for menu).

5.1.5.1 IF transmitter did not enter the Initialization Mode (see Figure 3), 
MOVE power switch to OFF AND 

REPEAT Step 5.1.4.

5.1.6 PRESS the down arrow (↓) until the LCD display reads
“*TESTOUT=0% ↑↓”.

5.1.7 PRESS ENTER button and the LCD display should read “SET TESTOUT?”.

NOTE - The next step will place the transmitter into a condition that will provide the 
ability to vary the output current manually.

5.1.8 PRESS ENTER button and the LCD display should read
“TESTOUT=0% ↑↓”.

5.1.9 PRESS the Up (↑) and/or Down (↓) button as necessary to set the output to
the % values provided on the Data Sheet AND 

PRESS ENTER button.

5.1.10 ENSURE output valves required by the Data Sheet are within tolerance.

5.1.11 RECORD the output values displayed by VCS that are required by the Data 
Sheet.

5.1.12 REPEAT Steps 5.1.5 to 5.1.11 until all inputs from Data Sheet have been 
addressed.

5.1.13 WHEN completed recording outputs, PRESS ESC button until transmitter is 
in normal mode of operation.

5.1.14 IF recorded values are not within specified tolerance per Data Sheet, 
NOTIFY Engineering for corrective action.
5.2 Restoration

5.2.1 **IF** any problems were encountered with the functional check, **INFORM** FWS.

5.2.2 **ENSURE** Test Equipment has been disconnected and removed as follows;

   5.2.2.1 **MOVE** transmitter power switch to the OFF position.

   5.2.2.2 **REMOVE** test equipment **AND**

   **RECONNECT** the output lead(s).

   5.2.2.3 **MOVE** transmitter power switch to the ON position.

   5.2.2.4 **CONFIRM** transmitter is running in the normal mode.

   5.2.2.5 **REPLACE** cover plate on the transmitter.

5.2.3 **ENSURE** Test Equipment information and calibration status are recorded on Data Sheet.

5.2.4 **ENSURE** equipment system restoration by observing indications are consistent with expected conditions.

5.2.5 **NOTIFY** Shift Manager 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 recorded values meet the specifications and tolerance(s) per the Data Sheet.
5.4 Review

5.4.1 INFORM FWS test 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 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, as applicable.

5.5 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 – Transmitter Circuit Diagram

- **Airflow (Output 1)**
- **Temperature (Output 2)**
- **Signal Common**
- **DMM (mA)**
- **To FIC**
- **OUTPUT**
- **Power Switch**
- **LCD Display**
- **Analog Output Card**
- **P.N. 800-5015**
- **Output 1 Fuse**
- **Airflow Output**: Replace with UL® listed, 0.125 Amp only. P.N. 800-1105 (10 Pack)
- **Output 2 Fuse**
  - Temp. Output: Replace with UL® listed, 0.125 Amp only. P.N. 800-1105 (10 Pack)
- **Switch 2 Temp. Output**: 4-20 mA or 0-10 VDC (default: 4-20 mA)
- **Switch 1 Airflow Output**: 4-20 mA or 0-10 VDC (default: 4-20 mA)
- **4-20 mA or 0-10 VDC (default: 4-20 mA)**
- **COMP**
Figure 2 – Ebtron Flow Transmitter

- OUTPUT
- ON/OFF Power Switch
- LCD Display
- Expansion Port
- Positive Lock Cable Receptacle (for type A smart probes)
- LDC Display
- Contrast Adjust
- ESC Button
- Up (↑) Button
- Down (↓) Button
- ENTER Button
**Figure 3 – Transmitter Initialization Mode Menu**

- **GTX116 INITIALIZE**
  - **RESET ALL**
    - **ARE YOU SURE?**
      - **YES**
        - **NO**

- **RESET SENSORS**
  - **ARE YOU SURE?**
    - **YES**
    - **NO**

- **DISPLAY=ON**
  - **SET DISPLAY?**
    - **DISPLAY=ON**
    - **DISPLAY=OFF**

- ***LCD TRB=ON**
  - **SET LCD TRB?**
    - **LCD TRB=ON**
    - **LCD TRB=OFF**

- ***TESTOUT = 0%**
  - **SET TESTOUT?**
    - **TESTOUT = 0%**

- ***EXCABLE = 0FT**
  - **SET CABLE EXT?**
    - **EXCABLE = 0FT**

**PRESS Enter/ESC together within the first 10 seconds of turning on:**

- **Enter (Move) ESC (Normal Operation)**
- **Enter (Move) ESC (Move)**
- **Enter (Action, Move) ESC (Move)**

**ACTION**

- **RESET ALL**
  - **YES**
  - **NO**

- **RESET SENSORS**
  - **YES**
  - **NO**

- **DISPLAY=ON**
  - **DISPLAY=ON**
  - **DISPLAY=OFF**

- ***LCD TRB=ON**
  - **LCD TRB=ON**
  - **LCD TRB=OFF**

- ***TESTOUT = 0%**
  - **TESTOUT = 0%**

- ***EXCABLE = 0FT**
  - **EXCABLE = 0FT**

Reset transmitter to initial “Factory Default Settings” for selected units of measure (*return to normal operating mode). No Action.

Clears existing sensor data and download data from connected sensor probes (*return to normal operating mode). No Action.

Display Airflow and Temperature.

Display “Ebtron GTX116” at all times in lieu of airflow and temperature.

LCD displays lower case for last digit of airflow units when error is detected.

Disable LCD trouble indication. LED trouble indication (flash) remains enabled.

Sets both output signals between 0 and 100 % of span (GTA116 Transmitters only).

Enter the length of the EXTENTION cable(s) if they have been added. **Important:** An equal length extension cable must be added to each sensor probe for proper operation.

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* = Factory Default/Current Setting