

# PRE-DELIVERY INSPECTION CERTIFICATION (PDIC)

Date: 10-27-2017

Serial Number: 17081148

Each dispenser must be inspected according to the following procedures at the appropriate times during manufacture. To complete each inspection, perform the described checks, marking the box as each is finished. When all checks are completed, the person performing or verifying the checks should sign and date the form in the designated area.

## 1. Visual/Mechanical Inspection

### Enclosure

- Are all outside and inside edges and surfaces of the metal body coated to prevent corrosion? Check for scratches and make sure that all holes made after delivery have been protected with paint, etc.
- Do doors swing and shut freely?
- Have locks been installed in all doors?
- Do locks work properly?
- Have push-buttons been installed as required?
- Have all necessary graphics and signage been applied? Includes all of the following:
  - Volume, price, and currency printing
  - Operation instructions
  - Labeling of all pushbuttons and switches
- Has a correctly filled information tag been affixed to the outside of the dispenser?

### Hydraulic System (Visual)

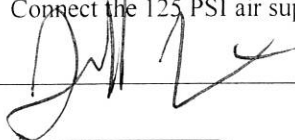
This test to be performed with no electrical or pneumatic power applied, and the system under no pressure.

- Have all threaded pipe fittings been assembled with gas seal tape (yellow, NOT white) and an adequate amount of seal compound (Swak)?
- Have all the tubing connections been made?
- Has the correct tubing been used? Bright finish, seamless, stainless steel
- Are all tube fittings used uniform? (i.e. no Gyrolock nuts on Swagelok bodies)
- Are all tube fittings swaged properly? Use appropriate swage gauge to verify connections.
- Do the air and gas vent lines exit the dispenser as specified by the work order?
- Are bleeder valves turned so gas will disperse away from the user? (usually downward or toward the back-panel)
- Are the mechanisms in all power-actuated valves in the off or "no-flow" position?
- Are all extra holes in filters, if any, plugged?

### Initial Pressure Check

- Block hose outlets, and close bleeder valves on dispenser. Connect a 125 PSI air supply to main gas inlet. Operate valves so that the high-pressure gas system is pressurized with air. Check for leaks by putting leak detector around all fittings and looking for escaping air (bubbles).
- Connect the 125 PSI air supply to air inlet. Check supply-air lines from inlet to valves with leak detector.

Signature



Date 10-27-2017



www.tulsagastech.com

**Tulsa Gas Technologies, Inc.**

4809 S. 101st E. Ave., Tulsa, OK 74146

Phone: 918-665-2641 Fax: 918-665-2657

## 2. Electrical Start-up

### Pre-Power Checks

- Have unions been installed where needed so that conduit can be disconnected and components may be removed?
- Are all extra holes in electrical enclosures plugged?
- Have all terminal blocks been correctly labeled?
- Has the protective film been removed from the displays?
- Has the jumper cable been installed between the displays?
- Is the jumper on each display in the correct position?

Verify that all connections have been made according to wiring diagram(s) and as necessary for correct operation. This includes checking for loose, frayed, or otherwise poorly connected wires. Check the following connections:

- Field connection terminals to TGT board.
- Field connection terminals to Micro Motion transmitter
- Connections from Micro Motion transmitter to TGT board
- Connections from Micro Motion transmitter to Micro Motion sensor including drain and case ground
- Harness connections to board
- Harness connections to external components according to wire diagram. This includes all of the following components:
  - Displays
  - Keyboard
  - Push-to-start buttons
  - Handle switches
  - Pressure switches
  - Pressure transducers
  - Temperature transducers
- Intrinsically Safe grounds as specified by diagrams
- Check electrically hot points with an ohmmeter to verify there is NO continuity to ground. Place one lead of the ohmmeter on a grounded surface (an explosion proof enclosure works well, as they are always connected to ground). Place the other lead on the following locations:
  - L1 (ACH) on the field connection terminals
  - L2 (Neutral) on the field connection terminals
- Check electrically hot points with an ohmmeter to verify there is NO continuity to ACN. Place one lead of the ohmmeter on field connection terminal L2 (ACN). Place the other lead on the following location:
  - L1 (ACH) on the field connection terminal
- Is there a jumper installed between field connections #8 and #9?
- Is there a jumper installed between field connections #1 (L1) and #14?
- Have the correct valve solenoids been installed?



**Tulsa Gas Technologies, Inc.**

4809 S. 101st E. Ave., Tulsa, OK 74146

Phone: 918-665-2641 Fax: 918-665-2657

## Applying Power:

Connect a cord to the field connection terminals according to the following:

- Black to #1 (L1)
- White to #2 (L2)
- Green to Earth

Connect a 125 PSI air supply to air inlet to operate the valves.

You are now ready to apply power to the dispenser. Once you have applied power to the dispenser, complete the following checks:

(NOTE: It is normal for the solenoid valves to make some noise as the board powers up.

- Are the LCD displays operating?
- Is the LCD display backlighting working?

If Micro-Motion has not been configured according to Software Setup Sheet, it should be at this time.

Enter parameters into TGT board according to Software Setup Sheet at this time.

- Do the displays cycle to 8's and then 0's when the handle switch is made and push-to-start button is pressed?

Connect either a PC or a Hart communicator to the Micro Motion and establish communication. Enter the test function and set the frequency output to 100 hertz. Connect a pulse counter in parallel with the pulse outputs of the Micro Motion transmitter. If dispenser has multiple Micro Motion transmitters, this procedure should be repeated for each side.

- Does the pulse counter accumulate 100 pulses per second?

Push the start button and turn the handle switch on. The display should read 8's then cycle to 0's before counting.

- Does the volume display accumulate one whole unit per second?

Signature



Date

10-27-2017



**Tulsa Gas Technologies, Inc.**

4809 S. 101st E. Ave., Tulsa, OK 74146

Phone: 918-665-2641 Fax: 918-665-2657

### 3. High Pressure and Operation Check

#### Pressurizing the System

**SAFETY NOTE:** This test should be performed in an area free of any open flames or other ignition sources. Dispenser and any CNG containers should be grounded to prevent static arcing during charging and discharging.

Attach hoses to the gas outlets of the dispenser and make sure all bleeder valves are closed. Connect an operating pressure source (compressor and cascade) to the gas inlets of the dispenser. Do not connect electrical power to the dispenser at this time. Electrical power can only be applied when it has been determined that there are no gas leaks in case of any accidental arcing.

If possible, pressurize the system gradually, and in sections to simplify troubleshooting and enhance safety.

Large leaks in the system are usually audible. **IF A LARGE LEAK IS HEARD, SHUT OFF GAS FLOW INTO THE DISPENSER IMMEDIATELY.** Only attempt to fix large leaks after all pressure has been relieved from the system, as loose fittings can blow off and cause serious injuries. Pressure can be safely relieved through the bleeder valve and filter drain(s).

Apply leak detector to fittings to check for escaping gas. Repeat each for each section pressurized, and each time pressure is increased until all sections are under full operating pressure and no leaks are detected.

- System has been tested at full operating pressure and is now free of leaks.

#### Operational Test

**SAFETY NOTE: DO NOT CONNECT ELECTRICAL POWER TO DISPENSER UNTIL GAS PRESSURE IS COMPLETELY RELIEVED. FAILURE TO RELIEVE PRESSURE COULD RESULT IN AN EXPLOSION IN CASE OF AN ACCIDENTAL SPARK OR SHORT.**

Now that the dispenser is completely leak-free, discharge all CNG pressure from the dispenser. Connect electrical and pneumatic power to the dispenser. Be sure that all connections are made securely.

If the dispenser does not power up correctly and/or operates unexpectedly or erratically, **DO NOT PRESSURIZE THE SYSTEM.** A dispenser operating improperly under pressure can be dangerous.

If the dispenser powers up correctly, refill the system with CNG.

- Does pressure indication on display match gauge pressure?

Connect the dispenser to an appropriate CNG container. Operate the dispenser as a typical user would, dispensing CNG into the container. Verify that the volume display is accumulating appropriately.

- Did the main valve open at the appropriate time to allow gas to flow into the dispenser?
- Did the volume display track the dispensed CNG correctly?
- Did the mid and high bank valves operate after the flow rate slowed?\*
- Did the dispenser end the transaction at the appropriate time?

Perform the following tests to verify proper operation of controller:

- Test Side 1 pressure switch circuit by disconnecting cable while dispensing gas. Transaction should end immediately.
- Test Side 2 pressure switch circuit by disconnecting cable while dispensing gas. Transaction should end immediately.
- Force frequency output to simulate a slow fill condition. Check for normal sequencing.
- Force frequency output to simulate a stop flow condition. Check for normal end of fill operation.



**Tulsa Gas Technologies, Inc.**

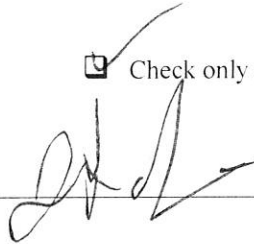
4809 S. 101st E. Ave., Tulsa, OK 74146

Phone: 918-665-2641 Fax: 918-665-2657

**SAFETY NOTE: EVERY DISPENSER MUST BE PURGED OF GAS AND ANY OTHER HAZARDOUS MATERIAL BEFORE CRATING/SHIPPING. THIS IS ESPECIALLY IMPORTANT ON DISPENSERS TO BE SHIPPED VIA AIR FREIGHT. NATURAL GAS WILL REMAIN IN THE SYSTEM EVEN AFTER ALL PRESSURE HAS BEEN RELIEVED AND ALL VALVES ARE OPENED. BECAUSE NATURAL GAS IS LIGHTER THAN AIR, IT WILL RISE AND REMAIN IN ANY AREAS OF THE SYSTEM HIGHER THAN THE HIGHEST OPEN VENT. FLOW COMPRESSED AIR THROUGH THE DISPENSER TO PURGE THE ENTIRE SYSTEM OF ANY REMAINING GAS.**

Check only after all hazardous materials been purged from dispenser.

Signature



Date

10-27-2017

#### 4. Hose assembly

Hoses must be assembled in accordance with Tulsa Gas Technologies, Inc. Hose Assembly/Certification Sheet.

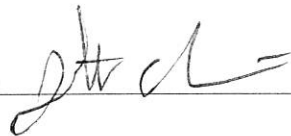
- Has the Hose Assembly/Certification Sheet been completed and signed/dated?
- Does the hose and nozzle assembly match the customer work order?
- Do hose inlet fittings match dispenser outlets?

### Functional Checklist Is Complete

Complete the following steps to prepare dispenser for shipping:

- Affix information plate to outside of dispenser
- Clean Dispenser
- Close all electrical enclosures, making sure that all safety devices are in place
- Plug all inlets and outlets to protect from dirt and contaminants
- Include appropriate hose and nozzle assembly

Signature



Date

10-27-2017



www.tulsagastech.com

**Tulsa Gas Technologies, Inc.**

4809 S. 101st E. Ave., Tulsa, OK 74146

Phone: 918-665-2641 Fax: 918-665-2657

## 5. Dispenser Customer Manual Checklist

Dispenser manual should contain all of the following items:

- Serial Number Matched TGT Technical and Installation Manual
- Location diagram
- Wiring diagram
- Piping and instrumentation diagram
- Hose drawing
- Hose certification sheet
- Component documentation
- Flow meter documentation and CDs
- A copy of this inspection procedure

Signature



Date

10-27-17

## 6. Final Pre-Shipment Check

- Has the dispenser been completely cleaned?
- Have all enclosures been closed?
- Have the displays been shrink-wrapped to prevent damage during shipping?
- Are there keys shipping with the dispenser?
- Is the customer documentation for the dispenser complete and ready to ship?
- Have the dispenser and all other components shipping with it been packed in such a way to prevent damage during shipping?
- Has a "Caution" sticker been affixed to all filters?
- Has a "Caution" sticker for Regulator Set Pressure been affixed?
- Have Door and Display seals been properly installed?
- If dispenser is dual pressure, are PSI labels attached?
- Have all Inlet, Outlet & Electrical Connections been labeled?
- Are default changes placed inside front door?
- Program Number and Date DSP 1.04, 21

Signature

  
(Quality Control Manager)

Date

10-27-2017