Executive Order VR-202-N
Healy Phase II EVR System
Including In-Station Diagnostic (ISD) System

Exhibit 10
INCON VRM Operability Test Procedure

The following procedures shall be used at field sites to determine the operability of the INCON VRM system to satisfy the requirements documented in VAPOR RECOVERY CERTIFICATION PROCEDURE, CP-201, CERTIFICATION PROCEDURE FOR VAPOR RECOVERY SYSTEMS AT GASOLINE DISPENSING FACILITIES. Testing the VRM equipment in accordance with this procedure will verify the equipment's operability for Vapor Containment Monitoring and Vapor Collection Monitoring.

The INCON Vapor Recovery Monitoring system uses Self Testing functions to verify the proper selection, setup, and operation of the console modules and sensors. Upon a detection of a failed module or sensor, the VRM system will follow the assessment period alarming sequencing for the particular device and will shutdown the dispenser(s).

- Vapor Flow Meter or Probe Module Failure will issue a Daily A/L Warning/Failure after day 1 and 2. A shutdown of the dispenser will follow day 2.
- A Vapor Pressure Sensor or 4-20mA Module failure will follow the Weekly Pressure Monitoring Warning/Failure after week 1 and 2. A shutdown of all the dispensers will follow week 2.
- A shutdown of the console, incorrect setup mapping of sensors, or failure of Console Modules not listed above will not complete test or report passing test results.

Franklin Fueling recommends printing a copy of the VRM DAILY report and viewing the VRM STATUS page on either the touch-screen display or web page periodically to determine that compliance tests are being completed in accordance with local and state regulations.

A step-by-step worksheet for recording data from the following operability tests is provided at the end of this Exhibit.

VRM Operability Testing

The Vapor Recovery Monitoring (VRM) Operability Testing procedures are intended to assist the installer with verifying all the vapor recovery equipment is functioning and operational.

Upon finishing an installation of an INCON VRM System, a certified technician will need to run the procedures listed in Section 2 below.

Note: The following procedures and checks are only related to the INCON VRM system; see the Executive Order for all inspections and test required for all certified equipment.

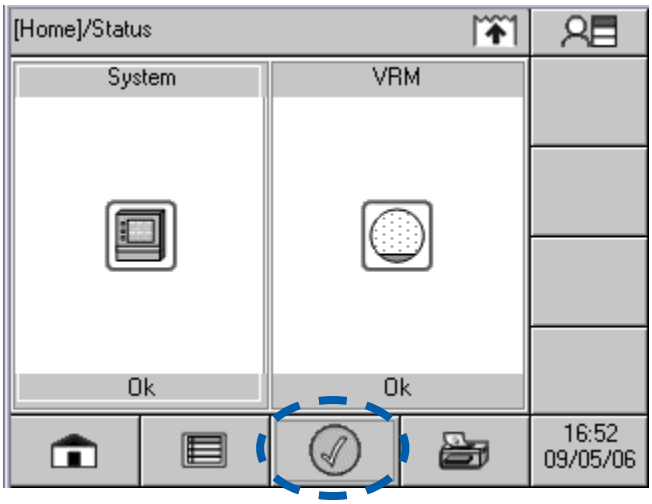
Procedures for after Installation or major Upgrade:

1. Active Alarm Check and Printout
2. Dispenser Shutdown Test
3. Vapor Flow Meter A/L Check
4. Vapor Pressure Sensor Ambient Test

Active Alarm Check and Printout

The purpose of checking the active alarm list is to see if there are any current alarms in the system. If there are then these issues may need to be corrected before running any operability tests.

To check the active alarm list, look to see if the alarm icon on the LCD of the Console is showing a Check Mark or Exclamation Point. If the Alarm icon is showing a Check Mark as shown below, then there are no active alarms. If there is an Exclamation Point Icon showing then press the icon to view the alarms. At this point a printout of the alarms can be done by pressing the Print Icon.

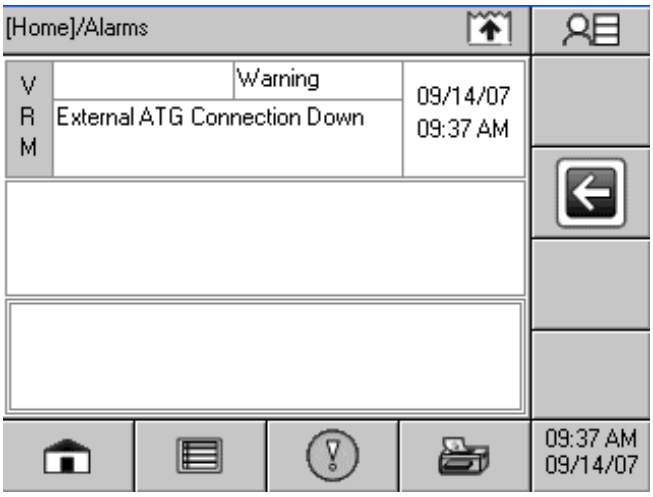


External ATG Connection Alarm Test (if not using internal inventory probes)
An External Automatic Tank Gauge (ATG) Connection Alarm Test will verify the proper setup to the External ATG. Use the following instructions to do the External ATG Connection Check.

Tools Needed

- No tools are required for this test

1. Disconnect the serial cable from either the External ATG or the INCON Vapor Recovery Monitoring system.
2. Verify the alarm "External ATG Connection" is generated within one minute. See Figure to the right. Also verify the Yellow LED is now Flashing.
3. Re-connect the serial cable.
4. Re-run the **Active Alarm Check and Printout** procedure. Note it may take up to one minute for the alarm to clear. Verify the Yellow LED goes OFF.



Dispenser Shutdown Mapping Verification

This is a procedure to test the shutdown feature of the INCON VRM System. The purpose is to verify the dispenser mapping for proper shutdown.

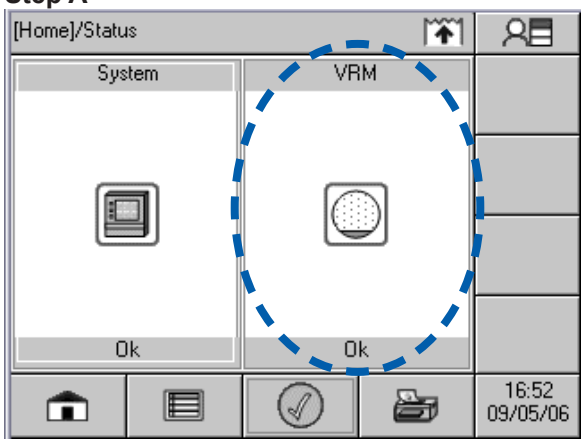
This procedure can be done from either the touch-screen or the web page.

Dispenser Shutdown Test via Touch Screen Display:

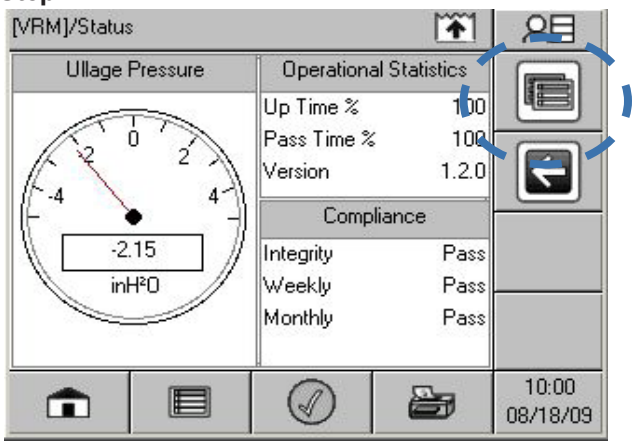
1. Navigate to the dispenser status page by the following steps (see Figure 1):
   a. Selecting the VRM Application icon
   b. Selecting the Sub-menu icon
   c. Selecting the Control icon
   d. You should see this screen

Figure 1 – Steps to Shutdown and Re-enable a Dispenser

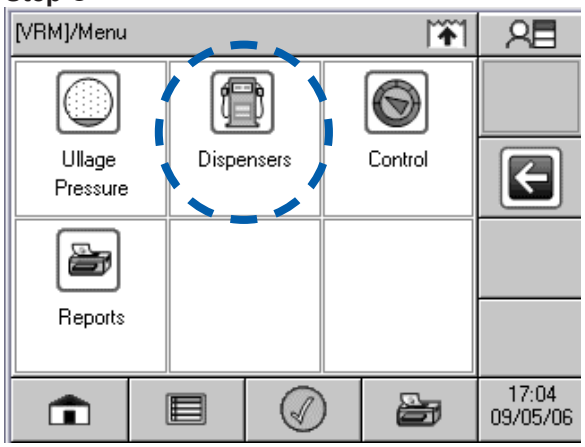
Step A



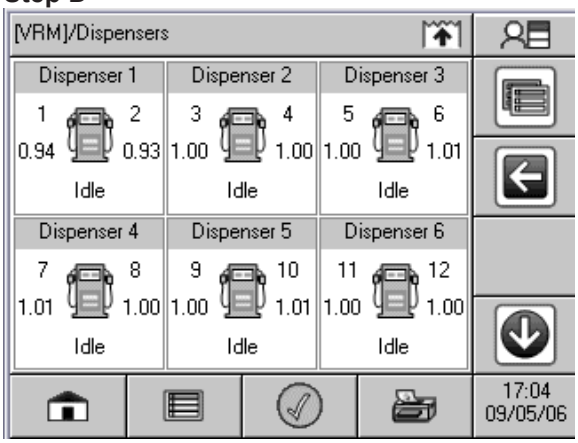
Step B



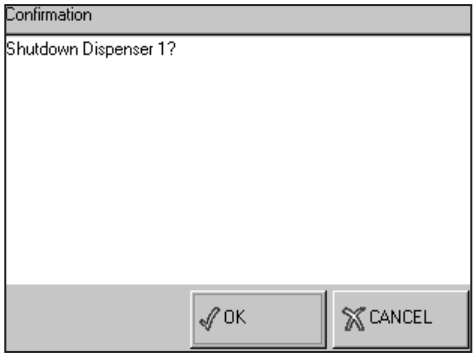
Step C



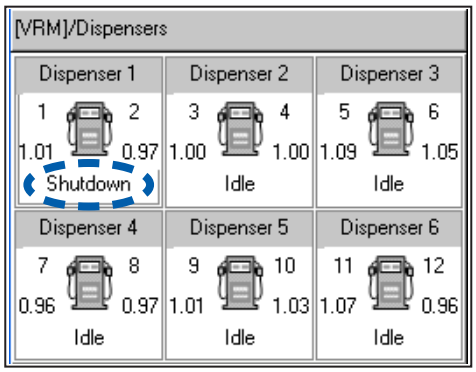
Step D



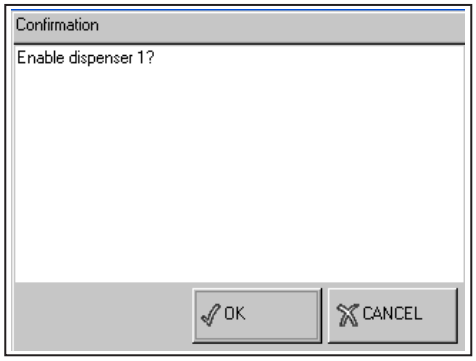
2. Once at the Dispenser Status page, if you touch one of the dispenser icons, a message will ask you if you want to disable that dispenser. If you press the OK button then the dispenser will shutdown.



3. Verify the Dispenser under test is disabled and fuel cannot be pumped. From the Dispenser Status page, the dispenser under test should show “Shutdown”. See picture to right.



4. Once verified, if you press the same Dispenser again, a message will ask if you want enable Dispenser 1. Select “Yes” and the dispenser should come back to normal operation.



5. If the Dispenser under test did not shutdown or the wrong dispenser shutdown, then the wiring and setup should be checked and Steps 1 - 4 run again.

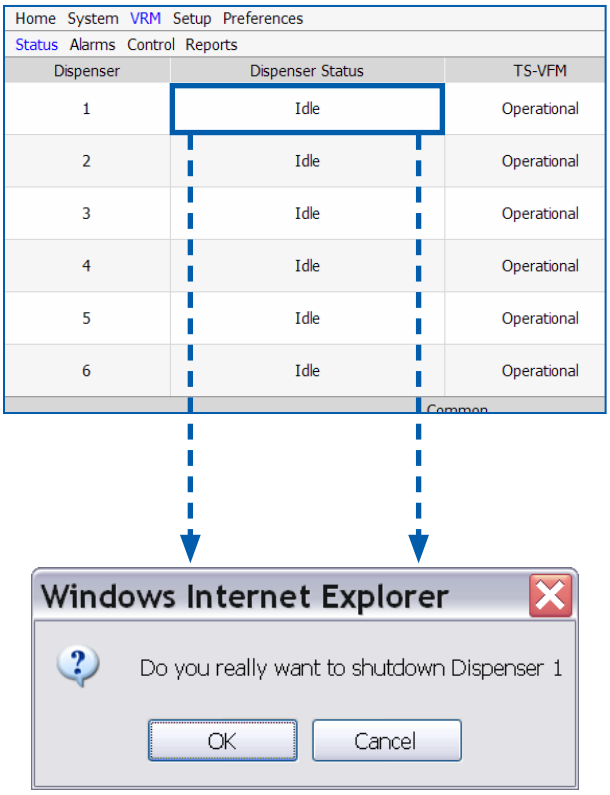
6. Repeat Steps 1 - 5 for all dispensers and record the results in the Test Form.

Dispenser Shutdown Test via Web Pages

The dispenser shutdown test can alternatively be run through the web pages. The following procedure can be done from either the LCD or the web page.

From the Web Page:

1. This procedure requires administrator privileges.
2. Navigate to the dispenser status page.
   http://Ip_address/vrm_status.html
3. In the **Dispenser Status** column, select the Dispenser under test. A message will appear asking if you want to disable the dispenser, click “OK”.
4. Verify the Dispenser under test is disabled and fuel cannot be pumped. From the Dispenser Status page, the dispenser under test should show “Shutdown”.
5. Once verified, if you press the same Dispenser again, a message will ask if you want enable Dispenser 1. Select “Yes” and the dispenser should come back to normal operation.



6. If the Dispenser under test did not shutdown or the wrong dispenser was shutdown, then the wiring and setup should be checked and Steps 1 - 4 run again.
7. Repeat Steps 1 - 5 for all dispensers and record the results in the Test Form.

Vapor Flow Meter V/L Check (Assist)

To verify the Vapor Flow Meters (VFM) is operating correctly, a technician will need to run the TP-201.5 as listed in the executive order.

Note 1: Only one fueling point/hose is needed to verify each VFM.

Follow this procedure to validate the INCON VFM is within proper range of a reference measurement. Fill out the INCON VRM Operability Test Form as required. These procedures must be run for each VFM. When generating an V/L on a fueling point/hose, be sure to stop dispensing from the opposite side of the dispenser. Other dispensers may be allowed to run normally.

1. Beginning at the first dispenser, run a V/L per Exhibit 5 of Executive Order VR-202-N.
   a. Record on the Test Form the V/L value from the reference test fixture.
   b. Record on the Test Form the V/L value from the INCON Console.
      This value is located on the Dispenser Status page, refer to Figure 1 to navigate to that screen. This status page will show the last V/L run for each fueling point/hose. Note that the very next fueling transaction on the same fueling point/hose will overwrite the screen V/L value.
   c. Subtract the V/L value from Steps A and B and record the difference on the Test Form.
2. Is the value from Step c less than -0.15 or greater than +0.15? If yes, then proceed to the next step. Otherwise, the test passes.
3. Following Exhibit 5, run an additional two V/Ls.
   d. Record on the Test Form the two V/L values from the reference test fixture.
   e. Calculate the average of the three V/L values from the reference fixture.
   f. Record on the Test Form the two V/L values from the INCON Console.
   g. Calculate the average of the three V/L values from the INCON Console.
   h. Subtract the average V/L value of Step E from Step G.
4. Is the value from Step H less than -0.15 or greater than +0.15? If yes, then proceed to the next step. Otherwise, the test passes.
5. Repeat this procedure, beginning at Step 1 through 4 for the fueling point/hose on the opposite side of this dispenser. if the second fueling point/hose does not pass, then proceed to the next step.
6. Run the A/B Sheet vacuum (Healy VP1000 vacuum pump) test to confirm dispenser piping tightness (Side B, Step 3). If the tightness test fails then make the proper repairs and repeat steps the above 1 through 4. If the tightness test passes then proceed to next step.

7. Authorize the dispenser for fueling and close the ball valve at the pump inlet. The VP1000 should begin to run but do not dispense any fuel. Look into the site glass indicator on the side of the Vapor Flow Meter and verify the indicator is not spinning. if the indicator is spinning then there may be leak between the Healy Ball Valve and the Vapor Flow Meter. Make necessary repairs and repeat Steps 1 through 4. If the indicator is not spinning then the Vapor Flow Meter doest not comply with Exhibit 2.

Vapor Pressure Sensor Verification Test procedure

1. Purpose and Applicability

1.1 The purpose of this test procedure is to determine if the INCON ISD System Vapor Pressure Sensor (listed in Exhibit 1) is operating in accordance with the vapor pressure sensor requirements of Exhibit 2. This procedure is used:

1.1.1 To determine whether the Vapor Pressure Sensor complies with the performance specification when the sensor is exposed to ambient pressure.

1.1.2 To determine the measured ullage pressure in underground gasoline storage tanks (USTs) installed at gasoline dispensing facilities (GDFs) equipped with a Healy Phase II Enhanced Vapor Recovery system with Clean Air Seperator (CAS) Including INCON ISD and compare to the pressure reading of the INCON ISD System at the Vapor Recovery Monitoring (VRM) console.

1.2 This procedure is applicable for compliance testing.

2. Principle and Summary of Test Procedure

Determining Ambient Pressure - The Vapor Pressure Sensor (VPS) is subjected to ambient pressure by turning the Vapor Pressure Sensor valve, which is located in the dispenser closest to the tanks, to the Atmospheric Valve Position as shown in Figure 2. This test can be performed while product is being dispensed into motor vehicles.

Determining UST Pressure - The pressure of the Underground Storage Tank (UST) is determined at the Phase I vapor recovery adaptor (dry break assembly) with a vapor coupler test assembly as shown in Figures 2 and 3 of TP-201.3 (*Determination of 2 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities*) or a modified dust cap test assembly as shown in Figures 1a and 1b of this exhibit. The test assembly is equipped with a center probe, which opens the dry break, and a quick connect fitting that is connected to an electronic pressure measuring device or digital manometer. The test assembly should open the dry break with minimal venting of the USTs. This test can be performed while product is being dispensed into motor vehicles.

3. Biases and Interferences

3.1 This test shall not be conducted within 30 minutes following gasoline transfer from a cargo tank.

3.2 This test shall not be conducted if the system ullage pressure is less than negative eight (-8.0) inches WC or greater than positive eight (+8.0) inches WC.

4. Range and Accuracy

Digital Manometer (Electronic Pressure Measuring Device)

Minimum readability shall be 0.01 inches WC with measurement range(s) to include at least up to positive and negative ten (±10) inches WC with a minimum accuracy of plus or minus 0.05 inches WC of full scale.

5. Equipment

5.1 The dust cap test assembly shall be modified in the following manner:

5.1.1 Install a probe in the center of the dust cap as shown in Figure 1a (one method is to tap and thread probe). The probe shall be of sufficient length to open approximately ½ inch of the dry break while allowing the cap to maintain a leak tight seal on the adaptor.

5.1.2 Install female quick connect fitting on the top of the dust cap, offset from the center probe as shown in Figure 1a. A Swagelok, part number SS-QC4-B-4-PM, quick connect fitting or equivalent can be used.

5.1.3 Use “Tygon tubing” or equivalent to connect the manometer to the dust cap (Figure 1b). Install a male quick connect fitting (Swagelok

part number SS-QC4-5-400 or equivalent can be used) on one end of a ferrule stainless steel tube (or equivalent material). Connect one end of the “Tygon tubing” to the stainless steel tube and connect the other end to the digital manometer (Figure 1b).

5.2 Alternatively, the vapor coupler test assembly, Figures 2 and 3 of TP-201.3 may be used in lieu of the dust cap test assembly.

5.3 Digital Manometer (Electronic Pressure Measuring Device)

Use a minimum range ±10.00 inches WC digital manometer to monitor the UST pressure with a minimum readability of 0.01 inches of WC. Dwyer Series 475 Mark III Digital manometer or equivalent can be used. A copy of the manufacturer's operating instructions shall be kept with the equipment.

6. Digital Manometer Calibration Requirements

6.1 A copy of the most current calibration of the digital manometer shall be kept with the equipment.

6.2 All digital manometers shall be bench tested for accuracy using a reference gauge, incline manometer or National Institute of Standards and Technology (NIST) traceable standard at least once every twelve (12) consecutive months. Accuracy checks shall be performed at a minimum of five (5) points (e.g., 10, 25, 50, 75 and 90 percent of full scale) each for both positive and negative pressure readings. Accuracy shall meet the requirements of Section 3.2 of TP-201.3.

7. Pre-Test Procedure

7.1 Turn on digital manometer and allow instrument to warm up for five minutes.

7.2 Zero out digital manometer using adjustment pod on top of instrument in accordance with manufacturer's instructions. Drift may be minimized by re-zeroing immediately after use by venting both pressure ports to atmosphere and adjusting the knob until the display reads exactly zero.

7.3 Attach the male quick connect fitting to the female quick connect fitting on the modified vapor dust cap.

7.4 Attach digital manometer to open end of Tygon tubing.

Determining Ambient Pressure

8. Test Procedure for Testing the INCON ISD System Vapor Pressure Sensor at Ambient Pressure

8.1 Access the INCON ISD System Vapor Pressure Sensor, which is located in the dispenser closest to the USTs. Record the Vapor Pressure Sensor location and serial number on the INCON VRM Startup Test Form 1 and 2.

8.2 Turn the Vapor Pressure Sensor ball valve to the closed position. This isolates the Vapor Pressure Sensor from the UST ullage space (see Figure 2).

8.3 Remove the plug from the Vapor Pressure Sensor ball valve (see Figure 2).

8.4 Verify on the VRM Status on the LCD of the console that the pressure value is zero inches WC, ±0.20 inches WC.

If the vapor pressure sensor is within ±0.2 inches WC of zero, proceed to Section 8.5 of this exhibit.

If the pressure value is not within ±0.2 inches WC of zero, the vapor pressure sensor will need to be calibrated. Proceed to section 8.4.1-8.4.3.

8.4.1 On the LCD of the console, go to the VRM Control page, refer to Figure 3, and perform the following steps

a. Press the CONTROL icon. This allows access to the control menu screen.
b. Press the CALIBRATE ZERO OFFSET icon.
c. Press anywhere in the upper calibration box. Select “Yes” to calibrate the sensor. This will zero the pressure reading for atmospheric pressure.

8.4.2 Verify on the VRM Status page that the pressure value is now reading zero (0.0) inches WC, ±0.20 inches WC.

8.4.3 If the pressure reading from the INCON VRM Console is NOT within ±0.2 inches WC from zero, **the Vapor Pressure Sensor is not in compliance with the pressure sensor requirements of Exhibit 2.** Proceed to the INCON ISD System trouble shooting manual available on the Franklin Fueling Systems website.

8.5 Record the above information on Form 1 Section A-1 data form for "Vapor Pressure Sensor Ambient Reference Test." Districts may require the use of an alternate form, provided it includes the same minimum parameters as identified in the Data Form.

8.1 Reinstall the plug on the Vapor Pressure Sensor ball valve. Turn the ball valve handle to the "normal position" (See Figure 2).

Determining UST Pressure

9. Test Procedure for Testing the INCON ISD System Vapor Pressure Sensor at UST Pressure

9.1 Attach the dust cap or vapor coupler test assembly to the vapor adaptor (Figure 1b).

9.2 On the touch-screen display at the INCON VRM console, go to the *VRM»Status* page.

9.3 Simultaneously record the ullage pressure from the digital manometer (connected to the vapor coupler test assembly) and the INCON VRM Console. Record the above information on Form 2, Section A-2 data form for "Vapor Pressure Sensor UST Pressure Test." Districts may require the use of an alternate form, provided it includes the same minimum parameters as identified in the Data Form.

9.4 Verify the vapor pressure sensor reading from the INCON VRM Console is within ±0.2 inches WC from the digital manometer reading. If difference is not within ±0.2 inches WC, **the Vapor Pressure Sensor is not in compliance with the pressure sensor requirements of Exhibit 2.** Proceed to the INCON ISD System trouble shooting manual available on the Franklin Fueling Systems website.

10. Alternate Procedures

This procedure shall be conducted as specified. Any modifications to this test procedure shall not be used unless prior written approval has been obtained from the ARB Executive Officer, pursuant to Section 14 of CP-201.

Figure 1a - Typical Modified Vapor Adaptor Dust Cap (Bottom View)

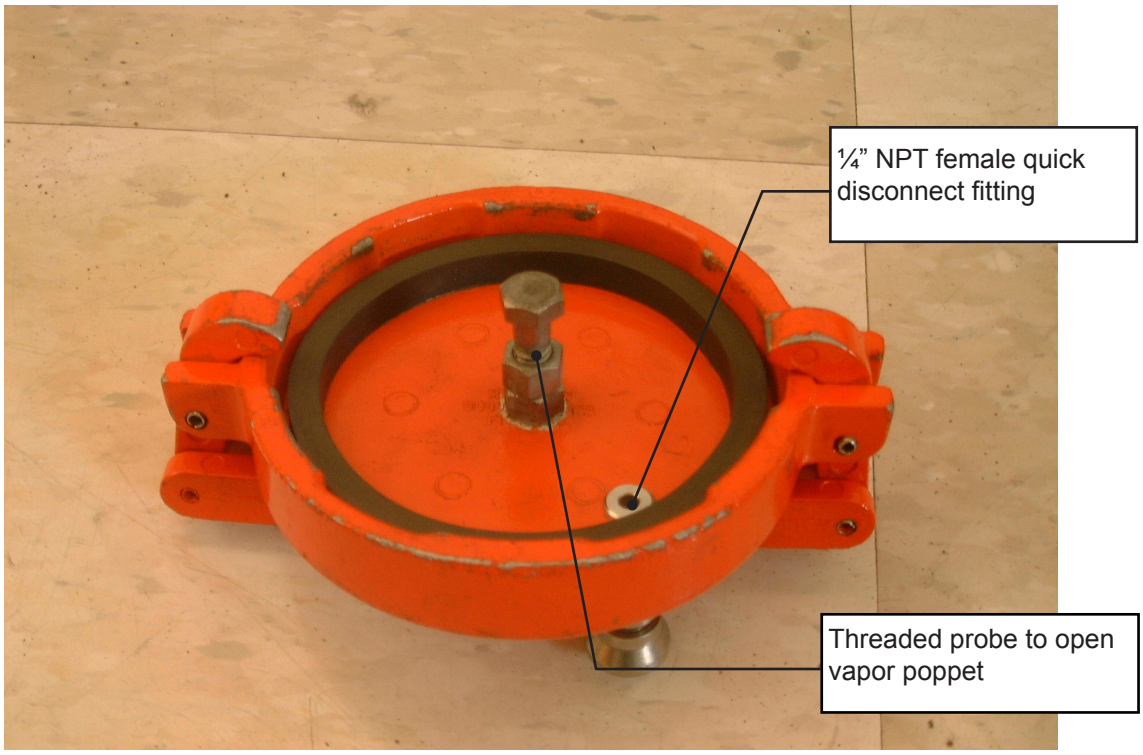


Figure 1b - Typical Field Installation of UST Pressure Measurement Assembly

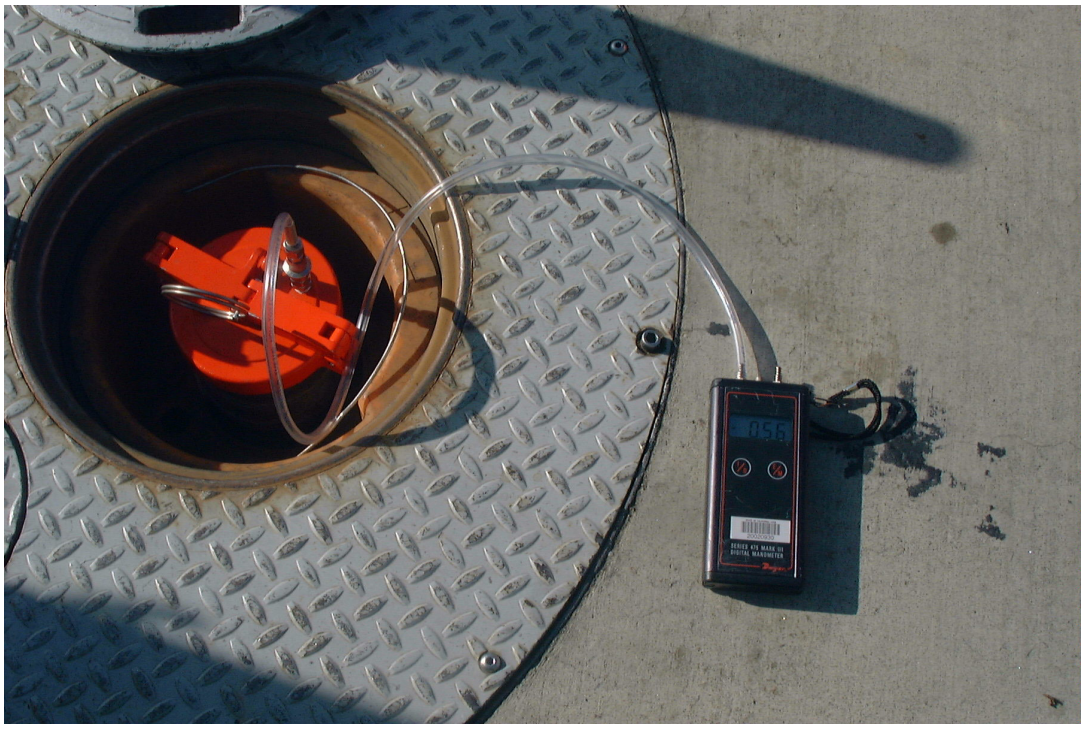


Figure 2 – Vapor Pressure Sensor Test Port

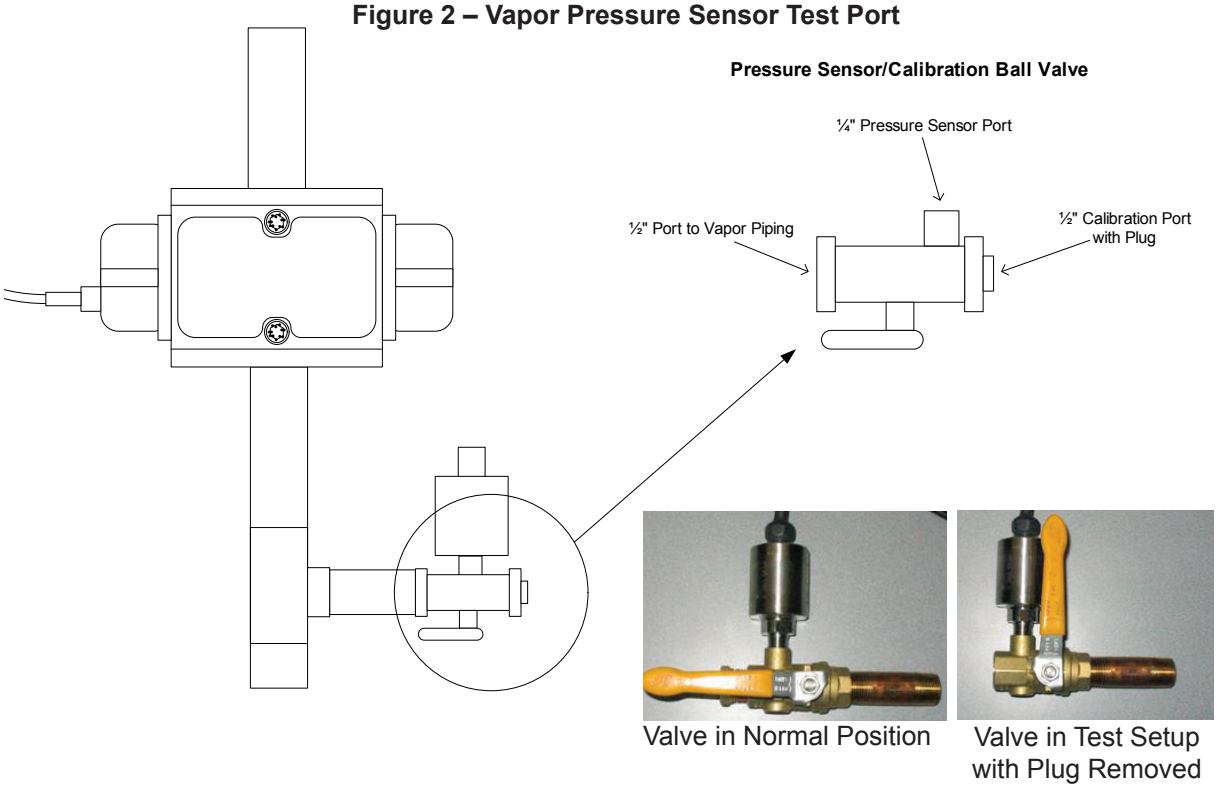
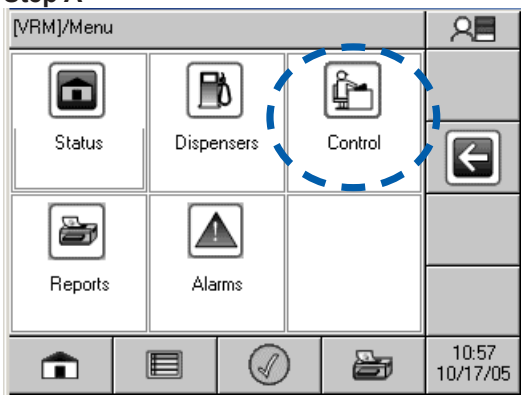
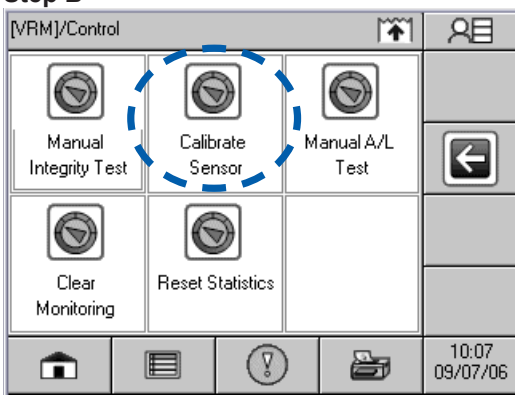


Figure 3 – Steps to Calibrate the Vapor Pressure Sensor

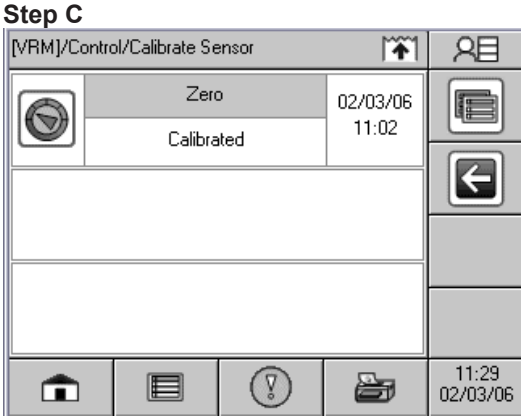
Step A



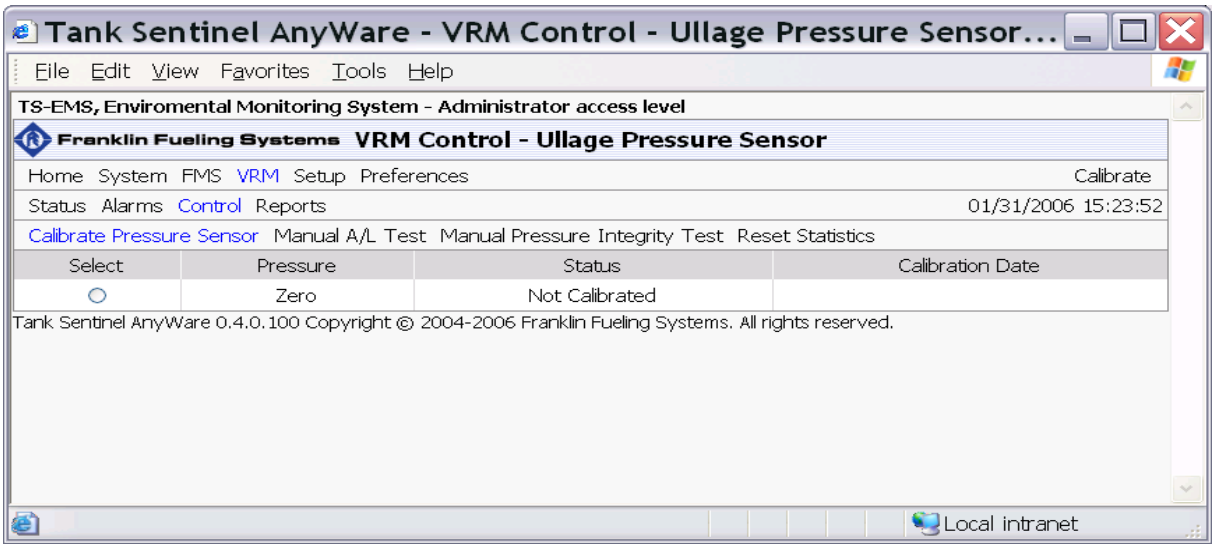
Step B



Step C



Calibrate Pressure Sensor Web Page View



START-UP/NEW INSTALLATION FORM
INCON VAPOR RECOVERY MONITORING SYSTEM

DATE: _____

BOTH SIDES OF THIS TEST FORM MUST BE COMPLETED FOR ALL NEW INSTALLATIONS

INCON VRM Startup Test Form 1

Service Company Name	Serivce Company's Telephone Number	
Service Technician	INCON Tech Cert # (as Applicable)	ICC or District Training Cert (as Applicable)
Station Name	District Permit #	
Station Address	City	

Dispenser Number	Pressure Sensor Location:	Vapor Pressure Sensor Serial #

Vapor Pressure Sensor Ambient Reference Test			Check	Initials
A-1	Refer to the Vapor Pressure Sensor Ambient Reference Test procedures in this Exhibit.			
	STEP 8.3	Vapor pressure sensor ball valve plug removed?		
		Valve set to ambient reference position (Per to Fig. 2)?		
	STEP 8.4	Ambient pressure sensor Value _____ Inches WC (Obtain Pressure Value From the VRM Status on the LCD of the console)		
		Calibration port plug is installed and the ball valve is open?		
		Is the Pressure Between +0.20 & -0.20? If NO, the vapor pressure sensor may need to be calibrated. To Calibrate pressure sensor, refer to section 8.4.1 of the vapor pressure sensor test procedure.	Yes / No	
		After successfully completing vapor pressure sensor calibration		
		Is the Pressure Between +0.20 & -0.20? If NO, the vapor pressure sensor is not in compliance with the pressure sensor requirements of Exhibit 2. Proceed to the INCON ISD system troubleshooting manual available on the Franklin Fueling Systems website.	Yes / No	
	STEP 8.5	Vapor pressure sensor ball valve plug removed?		
		Valve set to ambient reference position (Per to Fig. 2)?		

START-UP/NEW INSTALLATION FORM
INCON VAPOR RECOVERY MONITORING SYSTEM

DATE: _____

BOTH SIDES OF THIS TEST FORM MUST BE COMPLETED FOR ALL NEW INSTALLATIONS

INCON VRM Startup Test Form 2

Service Company Name	Serivce Company's Telephone Number	
Service Technician	INCON Tech Cert # (as Applicable)	ICC or District Training Cert (as Applicable)
Station Name	District Permit #	
Station Address	City	

Dispenser Number	Pressure Sensor Location:	Vapor Pressure Sensor Serial #

Vapor Pressure Sensor UST Pressure Test			Check	Initials
A-2	Refer to the Vapor Pressure Sensor Ambient Reference Test procedures in this Exhibit.			
	STEP 9.3	UST pressure digital manometer value _____ Inches WC		
		UST pressure from INCON ISD system VRM console _____ Inches WC (Obtain Pressure Value From the VRM Status on the LCD of the console)		
	STEP 9.4	VRM Console sensor value within Is the pressure between ± 0.20 inches WC of Digital Manometer Value? If NO, the vapor pressure sensor is not in compliance with the pressure sensor requirements of Exhibit 2. Proceed to the INCON ISD system troubleshooting manual available on the Franklin Fueling Systems website.	Yes / No	

External ATG Connection Check		Check	Initials
A-3	Refer to the External ATG Connection Alarm Test procedure in this Exhibit.		
	1. Serial Cable between External ATG and INCON Console was disconnected?		
	2. “External ATG Connection” alarm was generated? Yellow LED Flashing?		
	3. Serial Cable between External ATG and INCON Console was reconnected?.		
	4. “External ATG Connection” alarm has cleared? Yellow LED is OFF?		

START-UP/NEW INSTALLATION FORM
INCON VAPOR RECOVERY MONITORING SYSTEM

DATE: _____

BOTH SIDES OF THIS TEST FORM MUST BE COMPLETED FOR ALL NEW INSTALLATIONS
EACH DISPENSER/VFM MUST HAVE A SEPARATE COPY OF THIS SIDE

INCON ISD Operability Test Form

Service Company Name	Telephone Number
Service Technician	INCON Tech Cert #
Station Address	City
Dispenser Number	Vapor Flow Meter Serial #

Dispenser Mapping Test		Check	Initials
B-1	Refer to the Dispenser Shutdown Mapping Verification section of the ISD Operability Test Procedure.		
	Dispenser was shutdown properly?		
	Fuel was unable to be dispensed from nozzles?		
	Dispenser was re-enabled from console?		
	Fuel is able to be dispensed from nozzles?		

Vapor Flow Meter A/L Check		Yes/No	Initials
B-2	Refer to the Vapor Flow Meter V/L Check section of this ISD Operability Test Procedure. **Note 1**: This procedure is only required to be done on one fueling point/hose per dispenser.		
	1. Record the V/L from the test fixture and from the INCON VRM System. a. V/L Value from Test Fixture: b. V/L Value from ISD VRM: c. Difference between Steps A and B:	_____ _____ _____	
	2. Is the value of Step C greater than +0.15 or less than -0.15? If YES, then proceed to Step 3, otherwise the check passes.		
	3. Re-run the V/L test with the Air Inlet of the test fixture closed off. d. V/L Value # 2 from Reference: V/L Value # 3 from Reference: e. Average V/L from Reference: f. V/L Value # 2 from VRM Console: V/L Value # 3 from VRM Console: g. Average V/L from VRM Console: h. Difference between Steps E and G:	_____ _____ _____ _____ _____ _____	
	4. Is the value from Step H less than -0.15 or greater than +0.15? If YES, then proceed to the next step. Otherwise, the test passes.	_____	
	1. Repeat this procedure, beginning at Step 1 through 4 for the fueling point/hose on the opposite side of this dispenser. if the second fueling point/hose does not pass, then proceed to the next step.	_____	
	2. Run the A/B Sheet vacuum (Healy VP1000 vacuum pump) test to confirm dispenser piping tightness (Side B, Step 3). If the tightness test fails then make the proper repairs and repeat steps the above 1 through 4. If the tightness test passes then proceed to Step 6.	_____	
	3. Authorize the dispenser for fueling and close the ball valve at the pump inlet. The VP1000 should begin to run but do not dispense any fuel. Look into the site glass indicator on the side of the Vapor Flow Meter and verify the indicator is not spinning. if the indicator is spinning then there may be leak between the Healy Ball Valve and the Vapor Flow Meter. Make necessary repairs and repeat Steps 1 through 4. If the indicator is not spinning then the Vapor Flow Meter doest not comply with Exhibit 2	_____	