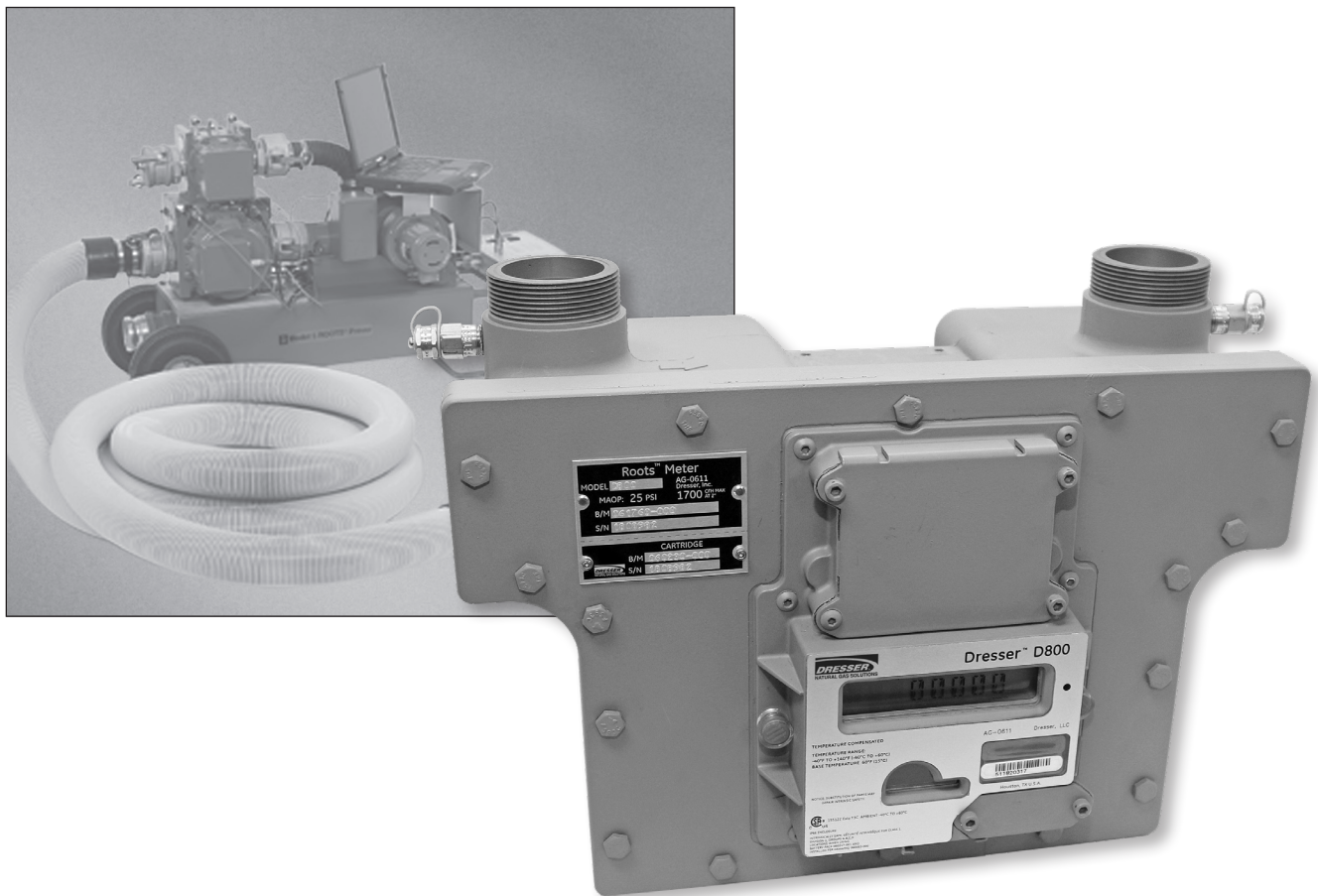


# Dresser Series D Meters

## Models D630, D800 and D1000

Prover Testing Guide



# Dresser D800 and D1000 Meter Prover Testing Guide

## 1. Testing Procedures

The Series D meters are easily tested for accuracy using several industry accepted methods, including sonic nozzle, bell and transfer provers. A proving cable is available for testing the Series D meters using the same IrDA (infrared) interface used for communication with the meter. The prover cable allows for rapidly testing Compensated and Non-Compensated accuracy on the Dresser Natural Gas Solutions (NGS) Model 5 prover and the Elster American SNAP® Proving Systems. (Contact the factory for compatibility with other systems.) A black/white RPM wheel is also allows for testing the non-compensated accuracy using an optical scanner.

The Differential Rate Test is unique to rotary meters and is an accurate and convenient method of determining the meter's condition by comparing the meter's performance to previous or original performance records. Differential testing is accepted by many State regulatory agencies as a means of periodically substantiating the original accuracy of a meter has remained unchanged. The D800/D1000 meters provide upstream and downstream ports for differential testing as well as the capability of displaying the gas flow rate on the LCD screen.

Prover testing and differential testing procedures for the D800 and D1000 meter are outlined in the following segments.

### 1.1. Configure for Prove Mode

This section details how to configure the meter to go into the prover test mode. If you are able to scroll to a screen stating "PROV C.V" (for compensated testing) or to "PROV NC.V" (for non-compensated testing) the meter is already configured for prover testing.

If the meter is already configured for testing, the following steps are not necessary. Proceed to the next section.

1. Using the Dresser MeterWare software, go to the **Configuration** screen (Figure 1), and select **Customize LCD**, which will open the **LCD Settings** screen.
2. From the **LCD Settings** screen (Figure 2), choose either **Compensated Prove Mode** or **Non Compensated Prove Mode**, or both, and then select **OK** to return to the **Configuration** screen.

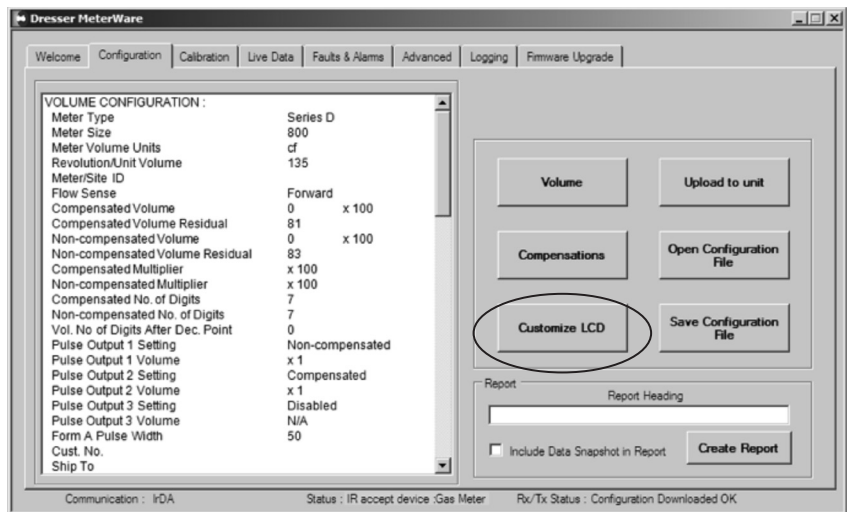


Figure 1 - Configuration screen in Dresser MeterWare

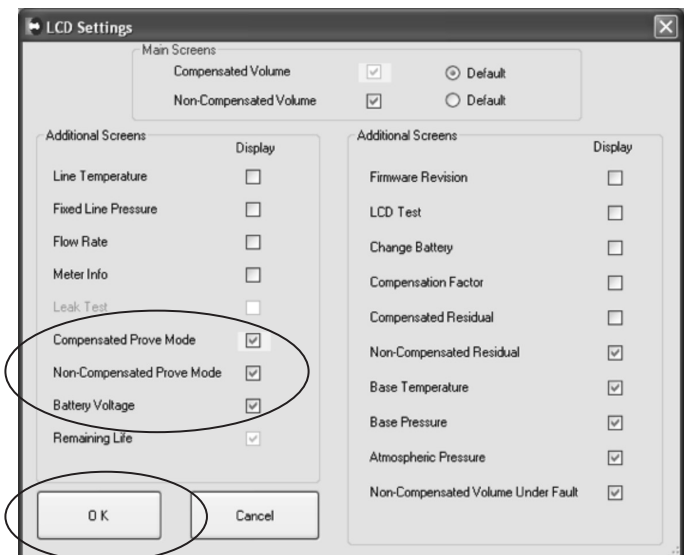


Figure 2 - LCD Settings screen in Dresser MeterWare

- Once back on the **Configuration** screen (Figure 3), select **Upload to unit**.

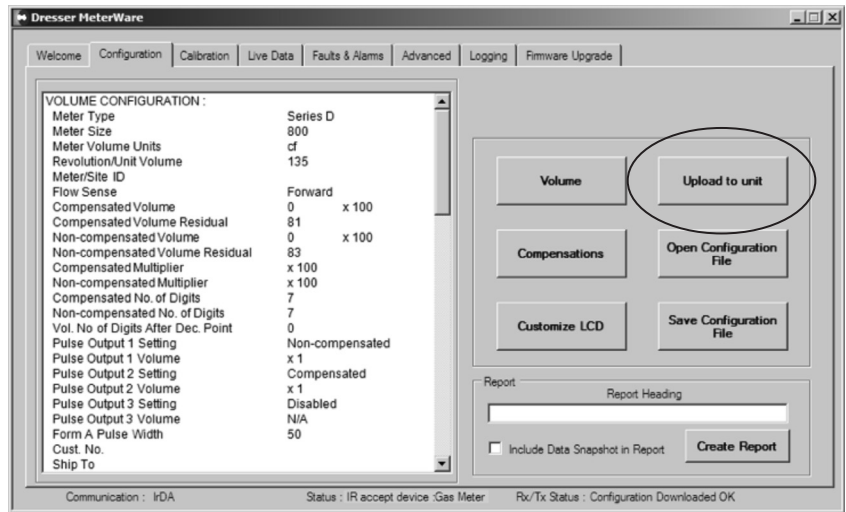


Figure 3 - Configuration screen in Dresser MeterWare

- The chosen prove mode can then be selected on the LCD screen display of the D800 or D1000 meter.

### 1.2. Placing into Compensated Prove Mode

- Using the magnet, swipe across the black dot, which is to the right of the LCD display screen, until the screen displays **PROV C.V** (Figure 4), and then stop swiping.

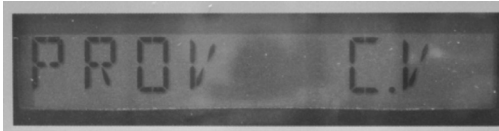


Figure 4 - LCD screen displays **PROV C.V**

- After five seconds, the display will change to **PROVE I.C.V** (Figure 5).



Figure 5 - LCD screen changes to **PROVE I.C.V**

- Hold the magnet for about five seconds on the black dot until the display changes to **PRVE\_CO.R** (Figure 6).

The meter is now ready to be proved using the compensated volume output.



Figure 6 LCD screen changes to **PRVE CO.R**

- Exit Prove Mode by holding the magnet on the black dot for five seconds.

### 1.3. Placing into Non-Compensated Prove Mode

- Swipe the magnet across the black dot until the screen displays **PROV NC.V** (Figure 7), and then stop swiping.

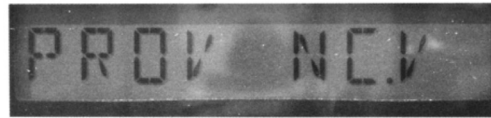


Figure 7 - LCD screen changes to **PROV NC.V**

- After five seconds, the display will change to **PROVE I.U.V** (Figure 8).



Figure 8 - LCD screen changes to **PROVE I.U.V**

- Hold the magnet for about five seconds on the black dot until the display changes to **PRVE\_NC.V** (Figure 9).

The meter is now ready to be proved using the non-compensated volume output.



Figure 9 - LCD screen changes to **PRVE\_NC.V**

- Exit Prove Mode by holding the magnet on the black dot for five seconds.

## 1.4 Proving with the Elster American SNAP Prover

### 1.4.1 Configuring SNAP Series II and II Version with Legacy Software Platforms

1. The first step of the process is to create a meter test file in the prover. In order to do this you need to log into the system as a supervisor.
2. Once logged in as a supervisor you then click on "PROVE METER", then click on "SELECT METER TYPE", then click on the "OTHER" for the manufacturer. Click on any one of the meters that are listed on the "OTHER" manufacturer category and click on the "CHANGE SPECS" and then click on the "ADD METER" button. This will clear all of the areas or change them to zeros.
3. Every box needs to be filled in with data, remember to click the "ENTER" button after each input to save the data in each box. The following list is an example of the type of data listed in each field.

Meter Name:	D800	D1000
Proof Open:	100	100
Proof Check:	100	100
Proof Other:	100	100
Rate Open:	800	1000
Rate Check:	80	100
Rate Other:	400	500
Revs Open:	4	4
Revs Check:	2	2
Revs Other:	3	3
Exercise Revs:	2	2
Jog Rate:	100	100
Revs/Unit Volume:	1	1
Max Diff Set Point:	0.5	0.5
Tolerances Pos:	1	1
Tolerances NEG:	-1	-1
Slope:	1	1
Repair:	2	2
Meter Size:	S	S

4. Once every field is updated with the correct data, click on "SAVE SPECS," you should see the caption "SPECS SAVED" in the blue caption box. If this did not auto fill the meter file was not saved. Retry until the meter test file is saved.
5. When you exit the test setup screen, you should see the meter test file in the "OTHER" manufacturer category. After you verify the meter test is added, install the meter on the test bench. (Refer to Section 1.4.3)

6. Exit out to the test screen and then continue the normal process for running a test. Refer to Section 1.4.4 for more information on running a test.

**NOTE:** on SNAP Series II Provers, the Series D meters must be tested using a Large Meter Kit for flows greater than 500cfh.

### 1.4.2 Configuring SNAP Series II and II Version with MMX Software Platforms

1. The first step of the process is to create a meter test file in the prover. In order to do this you need to log into the system as a supervisor.
2. From the main screen click on "SPECIAL FUNCTIONS", then click the "EDIT CONFIG FILES" button. Next click the "EDIT METER FILE" button. Make sure you are in the "Other" category in the "Mfr Type" area on the upper part of the screen.
3. Click on "ADD METER" and fill in the areas. Every box requires data. The MMX prover leaves information in each box, so change the areas requiring updates.

**NOTE:** You will need to hit the "ENTER" button every time a new value is input. The following list is an example of the type of data listed in each field.

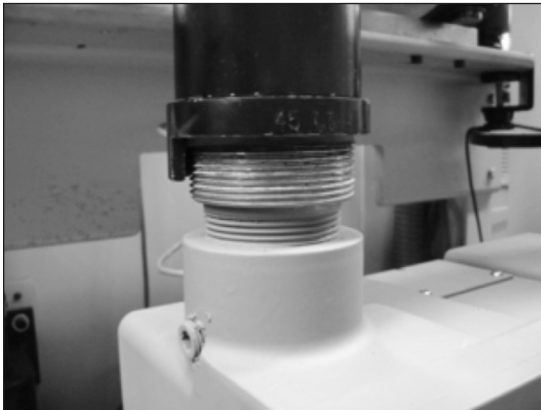
Meter Name:	D800	D1000
Proof Open:	100	100
Proof Check:	100	100
Proof Other:	100	100
Rate Open:	800	1000
Rate Check:	80	100
Rate Other:	400	500
Revs Open:	4	4
Revs Check:	2	2
Revs Other:	3	3
Exercise Revs:	2	2
Jog Rate:	100	100
Revs/Unit Volume:	1	1
Max Diff Set Point:	0.5	0.5
Tolerances Pos:	1	1
Tolerances NEG:	-1	-1
Slope:	1	1
Repair:	2	2
Meter Size:	S	S

4. Once the fields on this screen are updated, click on "SAVE SPECS," you should see the caption "SPECS SAVED" in the blue caption box. If this did not auto fill the meter file was not saved. Retry until the meter test file is saved.
5. Install the meter on the test bench. (Refer to Section 1.4.3)
6. Exit out to the test screen and then continue the normal process for running a test. Refer to Section 1.4.4 for more information on running a test.

**NOTE:** on SNAP Series II Provers, the Series D meters must be tested using a Large Meter Kit for flows greater than 500cfh

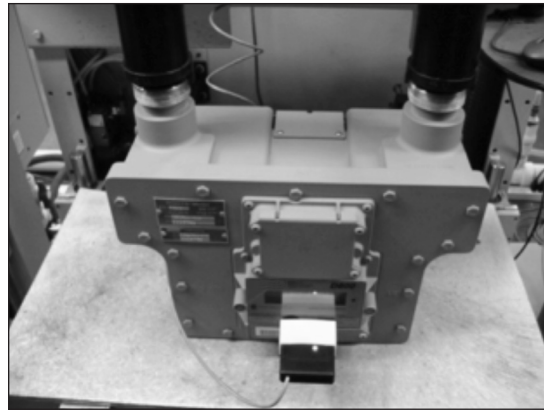
### 1.4.3. Installation of Meter On Bench

1. Install the meter on the prover table and adjust the meter arms to fit the appropriate height and width of the meter as shown in Figure 10.  
On the Series III prover, extensions are required for the meter connections due to shorter height of the meter. Utilize the correct meter connections per what is installed on the meter. (Example: If you ordered 45LT connections on the meter use the 45LT swivels on the prover.)



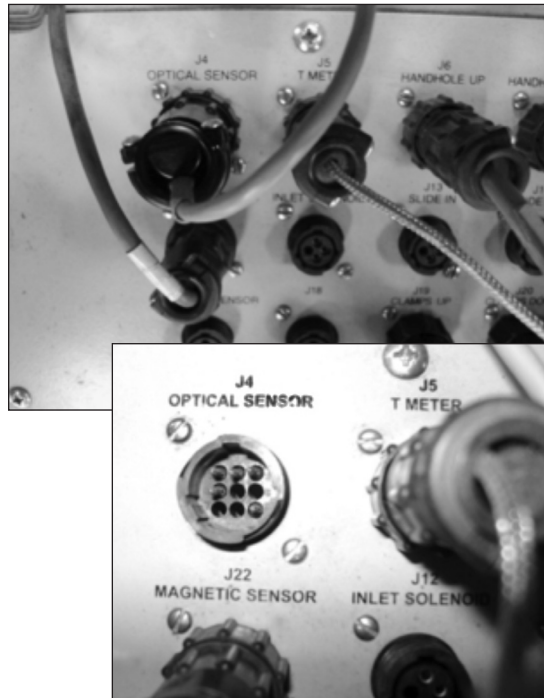
**Figure 10** - SNAP connections properly fitted to the meter

2. Install the "optic" IrDA test cable to the meter and the prover as shown in Figure 11. The black box should slide into the adapter for the IrDA slot on the bottom of the electronic index for the meter.



**Figure 11** - IrDA Proving cable installed on the meter

3. Once the cable is connected to the meter the other end is connected to the optical outlet port (J4) on the prover as shown in Figure 12. This is a keyed 9 pin connector which can only install in one orientation.



**Figure 12** - Optical sensor port (J4) with and without the connector

**Note:** If you just set up the "D800/D1000" meter test and exited you should see the "METER" area in the center of the screen that stated that the test is for the "D800/D1000". If you were testing another meter prior to the D800/D1000 then you will need to click on "SELECT METER TYPE" and then click on the "OTHER" button and then click on the "D800/D1000" meter, then click "EXIT" and now you should see "D800/D1000" in the "METER" area.

### 1.4.4 Testing Modes

The following sections explain the testing modes for the D800/D1000 meter. The meter provides the capability to test both the compensated and non-compensated accuracy with the IrDA prover cable.

#### 1.4.4.1 Testing Compensated Accuracy

1. If testing the compensated accuracy of the meter the following steps need to be completed:
  - TC
  - %PROOF, % ERROR or % ACCY – depending on company standards
  - INTEST or OUTTEST – depending on how the company tests
  - ENGLISH
  - Either 2-RATE or 3-RATE
  - OPTIC
  - INDEX 1
2. Once each of the fields is set then you need to fill in the required screens on the left side of the prover display screen to enable the “PRESS CLAMP BUTTONS” button. Click on the “PRESS CLAMP BUTTONS” button to start the tests. You will need to press both clamp buttons at the same time to lower the arms to the meter.
3. Place the meter into the Compensated Prove mode. (Refer to Section 1.2 for information assistance.) Once the meter goes into prove mode the red light will switch from a flashing red light to a solid red light as shown in Figure 13. Now the meter test will start.

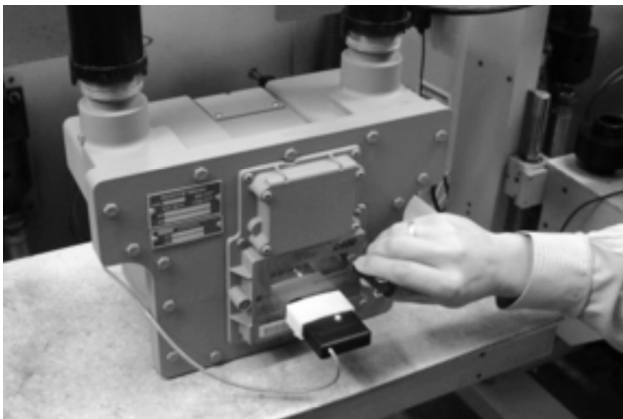


Figure 13 - Light on IrDA cable indicates connection is established

4. Once the meter tests are complete you can press the “ACCEPT” button and the meter test will be saved.

#### 1.4.4.2 Testing Non-Compensated Accuracy

1. If you are testing the non-compensated accuracy the center buttons will need to say:
  - REG
  - %PROOF, % ERROR or % ACCY – depending on company standards
  - INTEST or OUTTEST – depending on how the company tests
  - ENGLISH
  - Either 2-RATE or 3-RATE
  - OPTIC
  - INDEX 1
2. Once each of the fields is set then you need to fill in the required screens on the left side of the prover display screen to enable the “PRESS CLAMP BUTTONS” button. Click on the “PRESS CLAMP BUTTONS” button to start the tests. You will need to press both clamp buttons at the same time to lower the arms to the meter.
3. Place the meter into the Non-Compensated Prove mode. (Refer to Section 1.3 for information assistance.) Once the meter goes into prove mode the red light will switch from a flashing red light to a solid red light as shown in Figure 14. Now the meter test will start.

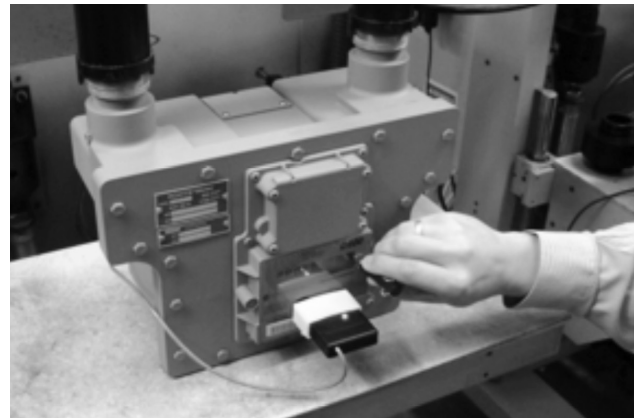


Figure 14 - Light on IrDA cable indicates connection is established

4. Once the meter tests are complete you can press the “ACCEPT” button and the meter test will be saved.

## 1.5 Proving with Dresser Model 5 Transfer Prover

### 1.5.1 Establish IrDA Cable Connection

- Insert the IR prover cable holder in the open slot under the meter label, as shown in Figure 15.
- Attach the cable connector of the IrDA to the ID Pulser connection port on the Prover field meter junction box, as shown in Figure 16.
- Turn on the power switch of the Model 5 Prover, and wait for light on the IrDA to turn on and start flashing.
- Once the meter is put into "Prove Mode," the flashing light changes to a solid light, as shown in Figure 17.



Figure 15 - IrDA adapter placed into slot

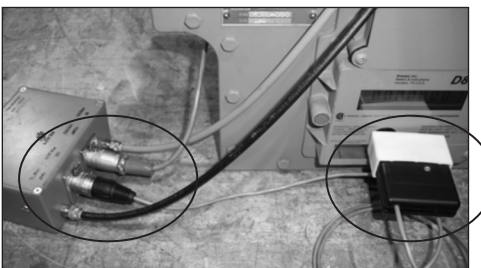


Figure 16 - Connect IrDA to the meter and Model 5 Prover



Figure 17 - Light indicating connection established

### 1.5.2. Model 5 Prover Software Configuration

The Model 5 Prover software must be set up as circled on the left side of the screen shot in Figure 18. The TC options box must also be set for Diaphragm TC for all meter sizes, as circled in Figure 18. For reference, the values for the prover configuration are explained in Section 1.5.3.

**Note:** The recommended pulses per test and test volume are shown in Table 1 according to meter capacity. Using the shown values will allow for a test lasting a minimum of the factory recommended 30 seconds. If your Model 5 Prover is not equipped with a 2M master meter, you will not be able to test below 100 cfh. If this is the case, the minimum flow rate for testing a meter rated at 800cfh is 100cfh. Still use a minimum of 2 pulses with a minimum test volume of 2 cubic feet.

Click start and the prover test will begin to run.

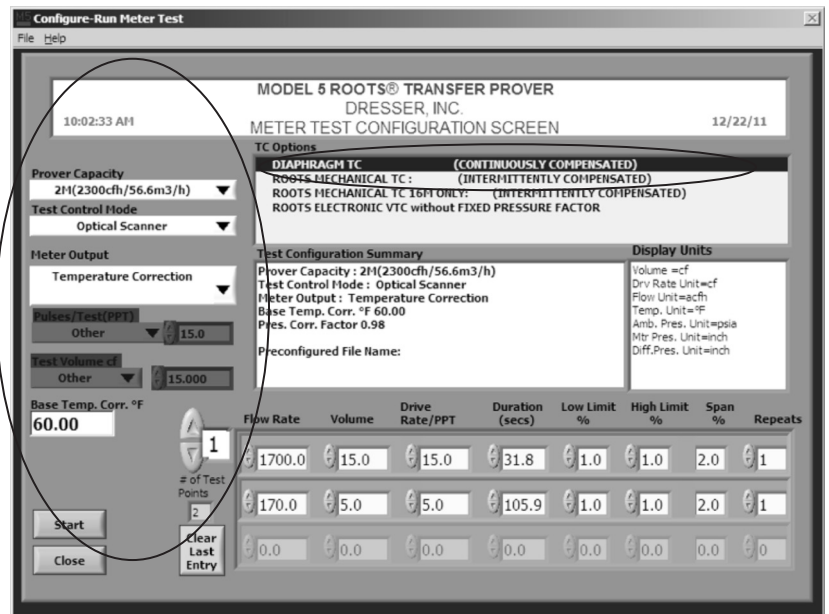


Figure 18 - Prover Configuration screen for Model 5 Prover software

Table 1- Recommended prover configuration settings based on meter size

Meter Differential	Flow Rate (% of Maximum Flow Rate)			
	100%		10%	
	Min. # of Pulses	Min Test Volume	Min. # of Pulses	Min. Test Volume
1/2" w.c (0-800CFH) (0-1000CFH)	10	10	2	2
2" w.c. (0-1700CFH)	15	15	5	5

### 1.5.3 Explanation of Prover Configuration Screen

#### 1.5.3.1. Left Side of Prover Configuration Screen

- Prover Capacity: Select “10M (10,000cfh/283.2 m<sup>3</sup>)” for flow rates above 100 cfh. For flow rates between under 35 cfh and 100 cfh, select the “2M (2,300cfh/65.1 m<sup>3</sup>)” master meter if the prover is equipped with this option. This will allow for testing a Series D meter rated at ½” w.c. at 10% capacity (80 CFH)
- Test Control Mode: Select “Optical Scanner”
- Meter Output: Select “Temperature Correction”
- Pulses/Test (PPT): Select “Other”. Also select the pulses per test based on Table 1. This information is entered in the small box attached to the right of the “Pulses/Test” box.
- Test Volume cf: Select “Other”. In the small box on the right, enter the same number as the value input in the “Pulses/Test (PPT)”. This is necessary since one pulse = 1 cf.

#### 1.5.3.2. Top Right side of Prover Configuration Screen

- TC Options: Select “Diaphragm TC (Continuously Compensated)”

#### 1.5.3.3. Bottom Portion of Prover Configuration Screen

- Flow Rate: Enter the desired flow rate for the first test.

**Note:** The “Volume” and “Drive Rate/PPT” and other boxes will automatically populate based on the information provided on the left side for the Prover Configuration Screen.

### 1.5.4 Adding Test Points

- Flow Rate: To add additional test points, enter the desired flow rate in the next available box in the “Flow Rate” column.
- Volume: Enter the desired test volume. Suggested values are provided in Table 1.
- Drive Rate/PPT: As stated previously, the drive rate will always match the volume.
- The remaining boxes in the row will auto populate based on the current prover default settings.
- Start this process again to continue adding additional test points. Always start with the highest flow rate and progress downward to the lowest flow rate.

**Note:** When entering values, always move to the next box by either hitting “Enter” or using the cursor. Using “Tab” will cause errors in the test configuration.

**Note:** Contact factory to request pre-configured test files if preferred.

#### Dresser Meters & Instruments

16240 Port Northwest Drive

Houston, TX 77041

T: 1-800-521-1114

F: 1-800-335-5224

© 2018 Natural Gas Solutions North America, LLC – All rights reserved. Natural Gas Solutions reserves the right to make changes in specifications and features shown herein, or discontinue the product described at any time without notice or obligation. Contact your Dresser Natural Gas Solutions representative for the most current information. The Dresser Logo and all Trademarks containing the term “Dresser” are the property of Dresser, LLC, a subsidiary of Baker Hughes, a GE Company.



[www.dresserngs.com](http://www.dresserngs.com)