

# Model 45 APV Automatic Programmable Viscometer Instruction Manual



**Manual No. D00887181 Revision B**

**Instrument No. 102410859**

**Model 45 APV Instruction Manual**

©2018 Fann Instrument Company

Houston, Texas, USA

All rights reserved. No part of this work covered by the copyright hereon may be reproduced or copied in any form or by any means (graphic, electronic, or mechanical) without first receiving the written permission of Fann Instrument Company, Houston, Texas, USA.

Printed in USA.

The information contained in this document includes concepts, methods, and apparatus which may be covered by U.S. Patents. Fann Instrument Company reserves the right to make improvements in design, construction, and appearance of our products without prior notice.

FANN<sup>®</sup> and the FANN logo are registered trademarks of Fann Instrument Company in the United States and/or other countries. All other trademarks mentioned in the operating instructions are the exclusive property of the respective manufacturers.

**Contact Fann Instrument Company**

<b>Phone</b>	1-281-871-4482 1-800-347-0450
<b>Fax</b>	1-281-871-4358
<b>Postal Address</b>	Fann Instrument Company P.O. Box 4350 Houston, Texas, 77210 USA
<b>Shipping Address</b>	Fann Instrument Company 14851 Milner Road, Gate 5 Houston, Texas, 77032, USA
<b>Online</b>	<a href="http://www.fann.com">www.fann.com</a> <a href="mailto:fanmail@fann.com">fanmail@fann.com</a>

## Table of Contents

1	Introduction .....	5
	1.1 Document Conventions .....	6
2	Safety .....	7
	2.1 Safe Electrical Operation .....	7
	2.2 Standard B1 Bob .....	8
3	Features and Specifications .....	9
4	Installation and Setup .....	10
	4.1 System Power up .....	10
	4.2 Software Upgrade Check .....	11
	4.3 Initial Display after Power up .....	14
	4.4 System Options .....	14
5	Software and Touchscreen Functions .....	16
	5.1 Test Profiles .....	16
	5.2 Test Descriptions .....	17
	5.3 Run and Graphic Display Screen .....	18
	5.4 Zero Key .....	19
	5.5 System Check .....	19
	5.6 Test in Progress .....	20
6	Test Programming and Editing .....	22
	6.1 Programming a Viscosity Test .....	22
	6.2 Programming a Gel Test .....	28
	6.3 Programming a PV/YP Test .....	35
	6.4 PV/YP Approximation Test .....	37
	6.5 Editing Sequences .....	39
7	Manual Mode .....	42
8	Quick Start Test Procedure .....	44
9	Test Results .....	48
10	Calibration Check .....	49
	10.1 View Fluid #1 Verification .....	49
	10.2 Fluid #1 Verification .....	50
11	Parts List .....	52
12	Warranty and Returns .....	53
	12.1 Warranty .....	53
	12.2 Returns .....	53

## **List of Tables**

Table 3-1 Model 45 APV Specifications .....	9
Table 11-1 Model 45 APV Included Parts, P/N 102410859 .....	52
Table 11-2 Model 45 APV Spares Kit, P/N 102410857.....	52

## **1 Introduction**

The Model 45 Automatic Programmable Viscometer (APV), with its 100 % digital measuring technology, will provide the oil and gas industry with accuracy and simplicity of operation. This couette, coaxial viscometer measures the shear stress in the gap between an outer rotating cylinder (rotor) and an inner suspended bob. The viscosity measurements are made by rotating the rotor at a known velocity and measuring the drag (torque) that is exerted on the bob. This measured torque value is then used to compute the viscosity in centipoise and dial units.

This document presents instructions and reference material for the safe and effective use of the Model 45 APV.

### 1.1 Document Conventions

The following icons are used as necessary in this instruction manual.



**NOTE.** Notes emphasize additional information that may be useful to the reader.



**CAUTION.** Describes a situation or practice that requires operator awareness or action in order to avoid undesirable consequences.



**MANDATORY ACTION.** Gives directions that, if not observed, could result in loss of data or in damage to equipment.



**WARNING!** Describes an unsafe condition or practice that if not corrected, could result in personal injury or threat to health.



**ELECTRICITY WARNING!** Alerts the operator that there is risk of electric shock.



**HOT SURFACE!** Alerts the operator that there is a hot surface and that there is risk of getting burned if the surface is touched.



**EXPLOSION RISK!** Alerts the operator that there is risk of explosion.

## 2 Safety

Safe laboratory practices and procedures should be observed while operating and maintaining the Model 45 APV. This section lists some precautions to follow.



A surge protector is recommended as a protective measure against electrical noise.

---

### 2.1 Safe Electrical Operation



The Model 45 APV is supplied for use with a 120/ 220 VAC 50/60 Hz. Consult Fann Instrument Company for operation with other voltages.

---

This instrument is driven by 115 volt or 220 volt electrical power. Keep hands, clothes and other objects away from the rotating parts of the machine. The optional heated sample cups and recirculating sample cups are electrically heated. Make sure the power cord and other wiring associated with these cups and the Model 45 rheometer assembly is in good condition and properly grounded.

Make sure the viscometer's power switch is the OFF position and unplugged from the source before cleaning, repairing or performing maintenance.



Please note that when motor speed /control power switch is in the OFF position, power is only removed from the motor. However, the power switch and the capacitor will still have a charge.

---

Do not allow the viscometer base to get wet. If samples have been spilled or splattered, wipe clean with a damp cloth. Do not allow water to run into the base; excessive water could cause damage to the electrical components.

## 2.2 Standard B1 Bob



---

The standard B1 bob (furnished with the Model 45 viscometer) is a hollow bob that must not be used to test samples hotter than 200°F (93°C).

---

Solid bobs are available for testing at higher temperatures.

### 3 Features and Specifications

The Model 45 APV system includes the viscometer, sample cup, R1 rotor, B1 bob, AC input power cable, and AC-to-DC transformer. Table 3-1 lists the specifications.

**Table 3-1 Model 45 APV Specifications**

Category	Specification
Speed Range	0.01 to 999 RPM
Dimensions (Width x Depth x Height)	9 x 20 x 12 inches 22.8 x 50.8 x 30.5 centimeters
Weight	30 lb (13.6 kg)
Power Supply	120/220 VAC, 50/60 Hz



**Figure 3-1 Model 45 APV Rheometer**

## 4 Installation and Setup

This viscometer was inspected, both electrically and mechanically before shipment. Upon receiving this system, carefully unpack all items from the shipping container and check for any signs of damage that may have occurred during shipment. Retain and use the original packing materials in case re-shipment is necessary.

The Model 45 viscometer should be placed in a position where there is easy access to the power cord plug for disconnection.

Consideration should be given to the location where samples are prepared and equipment is cleaned when the test is completed. There should be sufficient storage area nearby for commonly used tools, as well as consumables.

### 4.1 System Power up

1. Insert the AC power cable into the transformer.
2. Connect the transformer to the receptacle on rear panel of the tower, marked 24V DC.
3. Plug the other end of the AC power cable into an AC outlet.
4. Activate the ON switch (rear panel).



---

Using a surge protector with this system is recommended as a protective measure against electrical noise.

---



---

Model 45 APV is supplied for use with 120 or 220 VAC 50 or 60Hz.

---

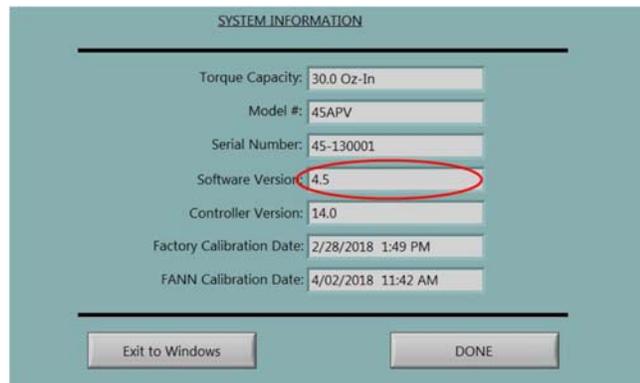
## 4.2 Software Upgrade Check

The latest software version for the Model 45 is version 4.5. If your unit has an older version, follow the below instructions to update to the latest version.

First, check your unit to find its current software version. From the main menu, select the Info button located in the lower left corner of the screen.



The following screen will appear below showing the System Information.



If version 4.5 is displayed, no action is needed.

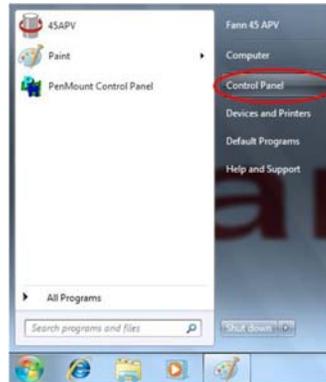
If the version shown is lower than version 3.2, follow the steps in 4.2.1 (below). This includes uninstalling the version lower than 3.2, and installing version 4.3.

If the version shown is higher than version 3.2, follow the steps in 4.2.2 (further below) to install version 4.5 from version 4.3.

For both scenarios, recent copies of the Model 45 APV software is required. Contact Fann Service to obtain a copy.

4.2.1 Software update from version 3.2 or lower

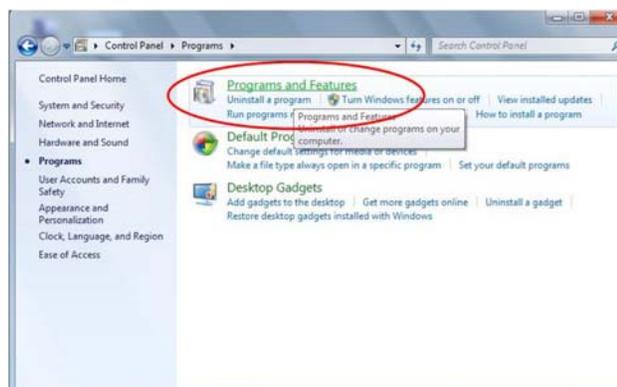
Go to Control Panel.



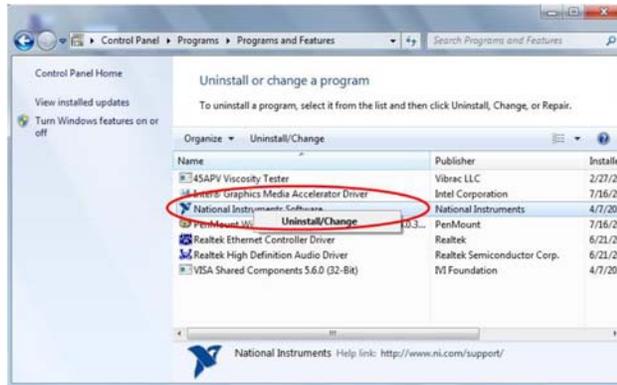
Click on Programs.



Click on Programs and Features.



Click Uninstall National Instruments Software.



This should remove the 45APV Viscosity Tester software as well. If the 45APV Viscosity Tester software still remains right click and click uninstall to remove the 45APV Viscosity Tester software.

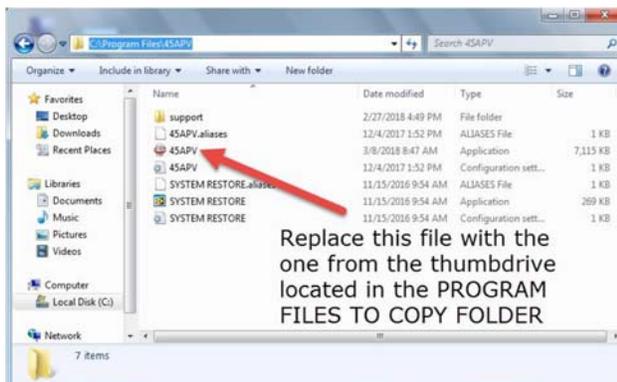
Next, via USB copy the folder titled 45APV V4.3 Full Installer to your computer desktop. Follow the directions listed in the 45APV Installation Instructions V4.3.pdf in the folder to install Version 4.3

#### 4.2.2 Software update from version 3.2 or higher

Copy the folder titled 45APV V4.5 Upgrade to your computer desktop.

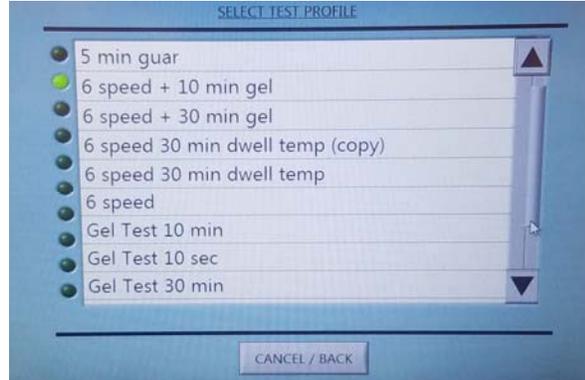
You have two options to update Version 4.3 to Version 4.5.

- Option 1: Run 45APV UPDATE.exe and it will automatically upgrade the Version 4.3 "45APV.exe" to Version 4.5
- Option 2: Copy the 45APV.exe from the "PROGRAM FILES TO COPY" folder into the location C:\Program Files\45APV where the 45APV.exe is located. This will also update 45APV.exe from Version 4.3 to Version 4.5



### 4.3 Initial Display after Power up

The following menu, **Select Profile To Run**, will appear on the touch screen whenever the system is turned on.



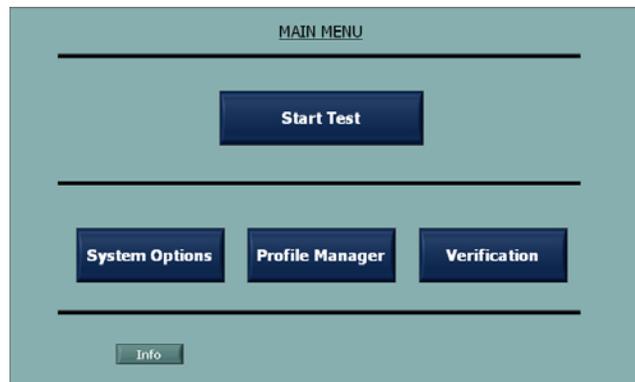
This instrument features a LCD Back Light Saving Mode. The touch screen display will shut down automatically after 30 minutes of inactivity. Touch the screen to refresh the display

### 4.4 System Options

These program features normally will be selected once when the system is installed and seldom changed again.

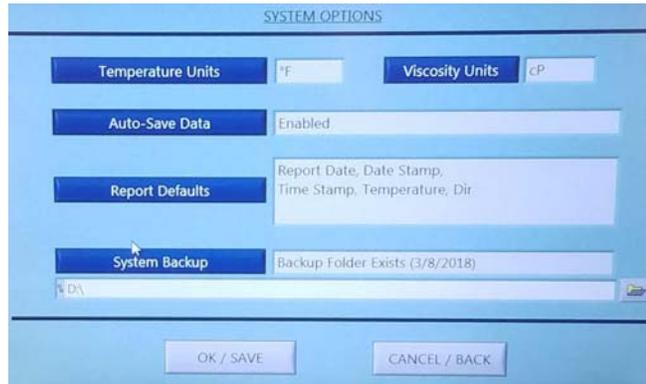
On **Select Profile To Run** screen, select **Main Menu**.

Select **System Options** on the **Main Menu**. The software will display page 1 of **System Options**.



The default selections in these option menus have been carefully selected to fit most applications.

### System Options Menu



#### Temperature Units

Pressing the **Temperature Units** button will guide the program through the possible settings for the system.

#### Viscosity Units

Pressing the **Viscosity Units** button will guide the program through the possible settings for the system.

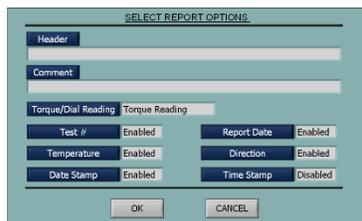


#### Auto-Save Data

Pressing **Auto Save Data** will toggle from Disables to Enabled (default selection).

#### Report Defaults

Pressing **Report Defaults** will display the following screen for selecting the report options.



These optional features can be turned on and off as required.

## **5 Software and Touchscreen Functions**

### **5.1 Test Profiles**

This instrument has five preprogrammed sample test profiles that cannot be deleted:

- Speed CW Test
- Gel 30 Min
- Gel 10 sec
- PV/YP Test
- Gel 10 Min

On the menu (below), select the profile by touching its name. When the profile is selected, the green indicator will light as shown below and the software will advance to the Run screen.

A detailed description of these test profiles is provided in Section 5.2.

**5.2 Test Descriptions**



All tests are a sequence of events; therefore, some terminology is the same for a Sequence, Gel, and PV/YP test.



By using the tests described below, a Sequence can be created for any application. The maximum number of steps in a sequence is 50.

**Viscosity**

This test lets user combine Speeds, Run-Ins, Moves, and Naps in a single test profile. This test can be performed in one or both directions. The features of this test are described in Programming a Sequence.

**Gel Test**

This test is designed to perform in accordance with the API procedure for measuring gel strength.

**PV/YP Approximation**

This test is designed to perform in accordance with the API procedure for measuring plastic viscosity and yield point of a test sample.

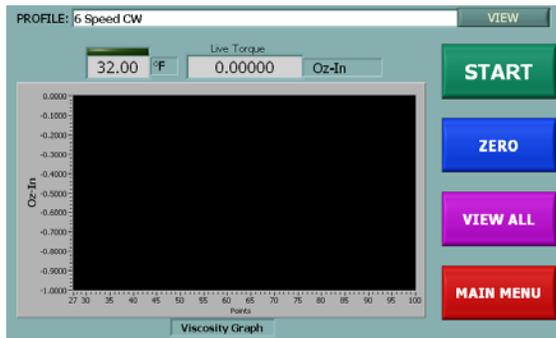
**MANUAL MODE**

This test enables the user to select a speed, program a time and then observe the torque or dial unit that are displayed as the test is performed. Data can be captured with the push of a button.



Manual Mode is a test type, but it cannot be used as a test profile.

### 5.3 Run and Graphic Display Screen



This screen is the starting point for all tests. Its appearance will change slightly after a test has been performed.



Observe this portion of the screen located above the graph. When the system is at rest and the rotor and bob are not in the test fluid, the display should read Zero.

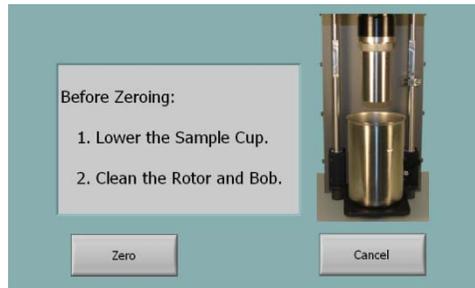


The system must never be zeroed when the rotor and bob are in the test sample. This action can result in an offset that will affect the accuracy of the measurements.

### 5.4 Zero Key



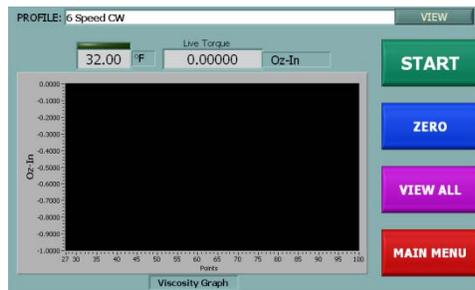
If the display does not read 0, press the **Zero** key.



When the **Zero** button is pressed this instruction screen will be displayed. Follow these directions and then press **Zero** to continue.



This instructional screen will be displayed briefly, and then the software will advance to the **Run** screen.



The system is now ready to perform a power up check.

### 5.5 System Check

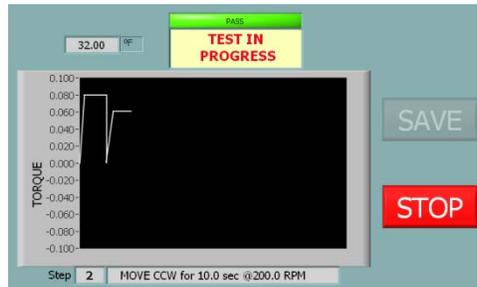


The rotor and bob should not be installed when performing a system check.

Press the Start button to begin the system check. Observe the rotor flange as it performs during the selected test.

The test profile 6 Speed CW Test will cause the rotor flange to turn clockwise at six different speeds for short intervals. The test in progress screen will be displayed.

### 5.6 Test in Progress



This screen provides a live graphic display of torque during the test. Each test step is defined in a window beneath the graph as it is being performed.



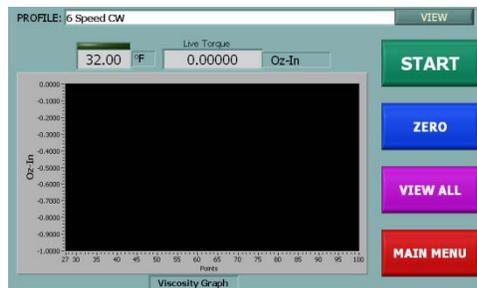
At any time during the test, the **Stop** button will halt the test.



At the conclusion of a test, when **Auto Save** is disabled, the user must select either **Save** or **Clear** to return to the **Run** screen.



The Show Data button displays the numerical test results so the user can decide to save the data or discard the data using the **Clear** key



When **Auto Save** is enabled, the test results will automatically save in memory and the software will advance to the Run screen.



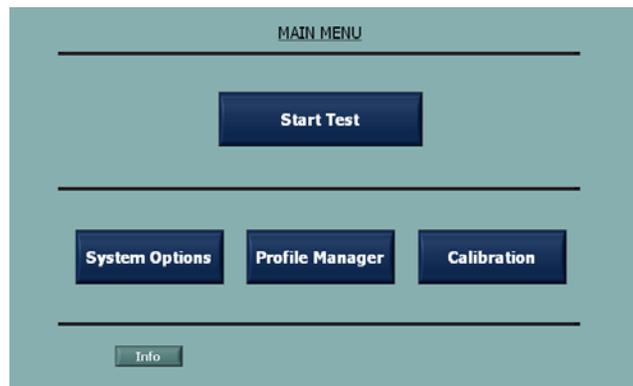
The **E-Stop** button (on front panel) can always be used to stop the drive motor.

## 6 Test Programming and Editing

This section describes the step-by-step procedures for programming tests.

### 6.1 Programming a Viscosity Test

1. On the **Select Profile** screen (displayed at power up), choose **Main Menu**.
2. Select **Profile Manager**. The software will display the features of the currently selected profile.

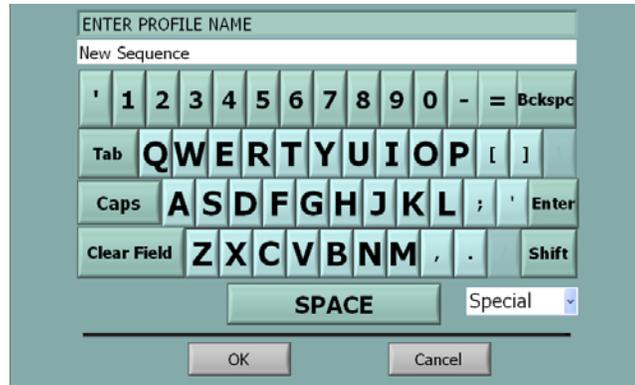


**Main Menu**

3. On the **Profile Manager** screen, select **New**. The software will advance to the **Enter Profile Name** screen.



4. On the keyboard, enter a name for the new profile. Then press **OK**. The Profile Manager screen will display.



5. Default values that are loaded when New is selected will be displayed. Select **Edit**. The software will advance to the Sequence Setup screen.
6. The steps in a sequence can be created to produce a desired step. Select **Add** and the New Sequence screen will display.

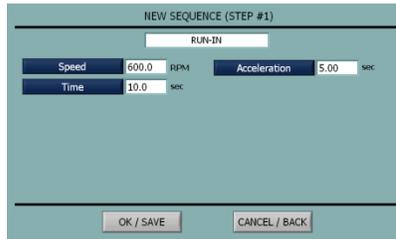




Add is the only selection available is when starting a new sequence. As steps are added, additional options will be displayed.

7. From this menu, the sequence can be tailored to fit the user's requirements. When an item is selected, the programming options will be displayed. Each option is described below.

### 6.1.1 Run-In



When **Run-in** is selected, the programmable features for this step in the sequence will be displayed.



Pressing the **Direction** button will toggle between CW and CCW.



Pressing the **Time** button will display the input screen for entering time.



Observe the minimum and maximum values. Pressing min (minutes) will toggle the value to sec (seconds). To input a value press **Clear Entry**, and then key in the desired value. Press **OK** to save the new value.



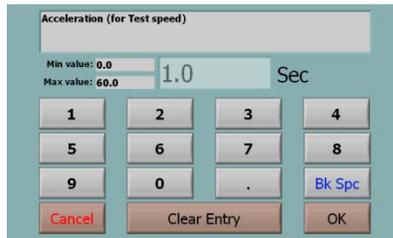
Pressing the **Speed** button will display the input screen for entering the speed.



Observe the minimum and maximum values. To input a value, press **Clear Entry**, and then key in the desired value. Press **OK** to save the new value.

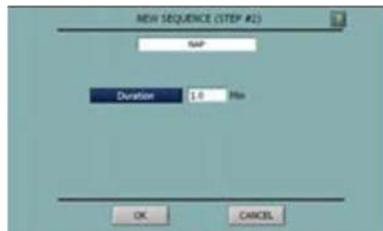


Pressing the **Acceleration** button will display the input screen for entering the acceleration



Observe the minimum and maximum values. To input a value, press **Clear Entry**, and then key in the desired value. Press **OK** to save the new value.

### 6.1.2 Nap



When **Nap** is selected, the programmable features for this step will be displayed.



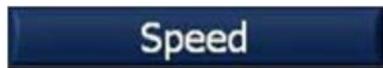
Pressing the **Duration** button will display the input screen for entering the name.



Observe the minimum and maximum values. Pressing min (minutes) will toggle the value to sec (seconds). To input a value, press **Clear Entry**, and then key in the desired value. Press to save the new value



This selection is made to create a step in a sequence that will measure viscosity



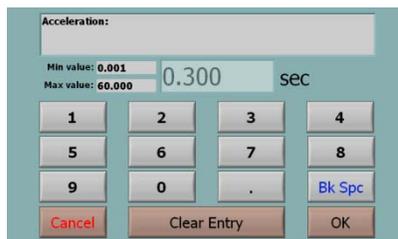
Pressing the **Speed** button will display the input screen for entering the speed



Observe the minimum and maximum values. To input a value, press, **Clear Entry** and then key in the desired value. Press OK to save the new value.



Pressing the **Acceleration** button will display the input screen for entering the acceleration.



Observe the minimum and maximum values. To input a value, press, and then key in the desired value. Press **OK** to save the new value.



Pressing the **Time** button will display the input screen for entering the time.



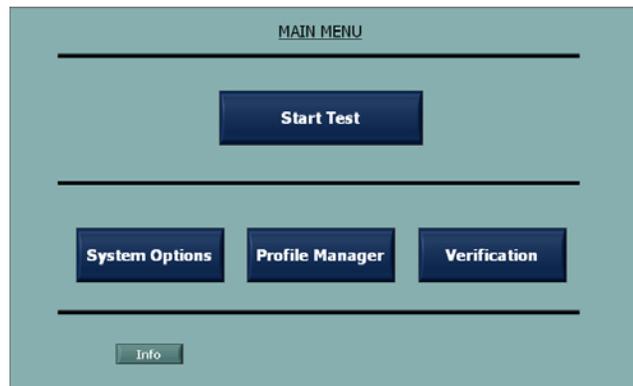
Observe the minimum and maximum values. Pressing min (minutes) will toggle the value to sec (seconds). To input a value, press **Clear Entry**, and then key in the desired value. Press **OK** to save the new value

## 6.2 Programming a Gel Test

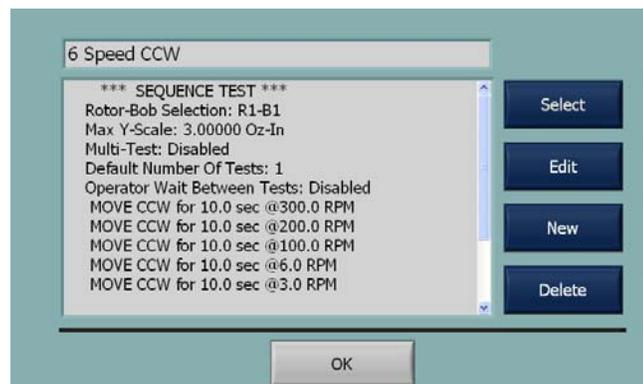


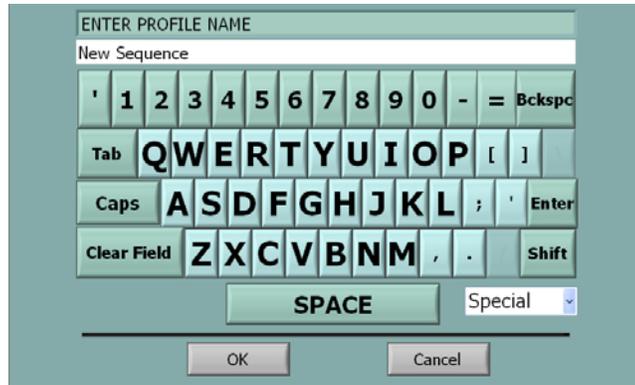
This test is also a sequence. By definition, the Gel Test has only three steps — Run-in, Nap, and then Move while measuring peak torque.

1. On the **Select Profile** screen (displayed at power up), choose **Main Menu**.
2. Select **Profile Manager**. The software will display the features of the currently selected profile.

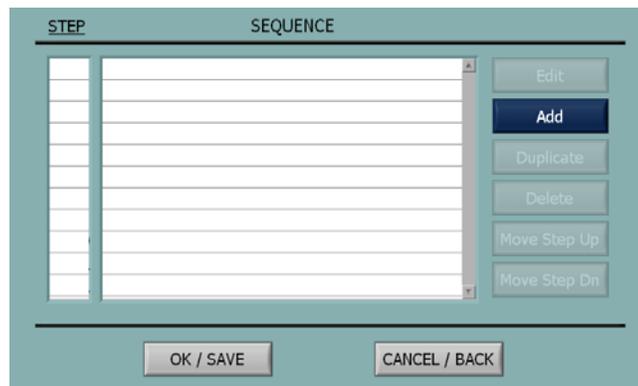
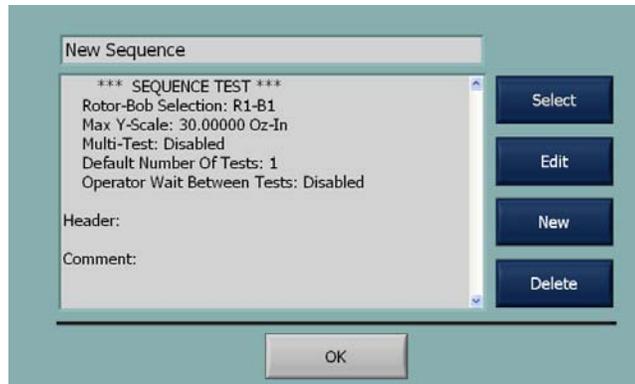


3. On the **Profile Manager** screen, select **New**. The software will advance to the **Enter Profile Name** screen.





4. On the keyboard, enter a name for the new profile. Then press OK. The system will advance to the Profile Manager screen.
5. Default values that are loaded when New is selected will be displayed. Select **Edit**. The software will advance to the **Sequence Setup** screen.



6. The steps in a sequence can be created to produce a desired step. Select Add and the New Sequence screen will display.

From this menu, the sequence can be tailored to fit the user’s requirements. When an item is selected, the programming options will be displayed.



7. The pre-programmed gel tests have fixed nap times (10sec, 10 min, and 30 min) as described on the selection button. Select **Gel x-sec** to create a step.

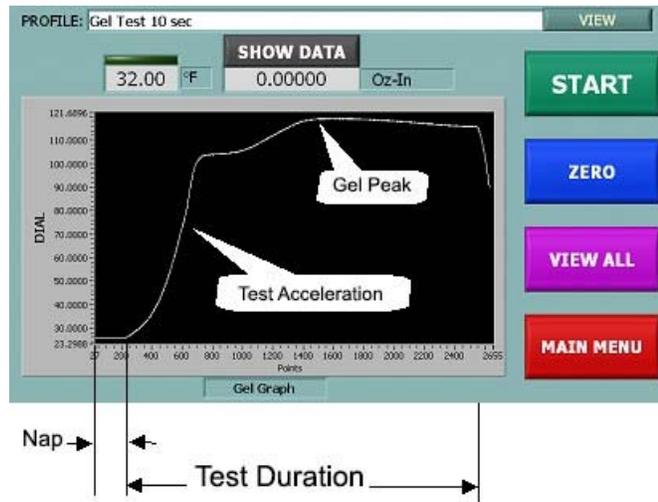
This screen enables the user to program all the features of a gel test.

### 6.2.1 Gel Test Editing Features



The buttons shown below enable the user to rapidly modify the features of a the Gel Test.

The following test screen does not show the Run-in portion of the test. Only the last two seconds of the nap appear on this graph.



**Test Speed**

The **Test Speed** button will display the programming screen for this test parameter shown below.

Observe the minimum and maximum values. To input a value, press **Clear Entry**, and then key in the desired value. Press **OK** to save the new value

**Test Duration**

The **Test Duration** button will display the programming screen for this test parameters shown below.

Observe the minimum and maximum values. To input a value, press **Clear Entry**, and then key in the desired value. Press **OK** to save the new value.

**Gel Nap Duration**

The **Gel Nap Duration** button will display the programming screen for this test parameter, shown below.

Observe the minimum and maximum values. To input a value, press **Clear Entry**, and then key in the desired value. Press OK to save the new value.

**Run-In Speed**

The **Run-In Speed** button will display the programming screen for this test parameter shown below

Observe the minimum and maximum values. To input a value, press **Clear Entry**, and then key in the desired value. Press OK to save the new value.

**Run-In Duration**

The **Run-In Duration** button will display the programming screen for this test parameter shown below.

Observe the minimum and maximum values.. To input a value, press **Clear Entry**, and then key in the desired value. Press OK to save the new value.

**Test Acceleration**

The **Test Acceleration** button will display the programming screen for this test parameter shown below.

Observe the minimum and maximum values. To input a value, press **Clear Entry**, and then key in the desired value. Press OK to save the new value.

**Gel Peak Detect**

The **Gel Peak Detect** button will display the programming screen for this test parameter, shown below.

Observe the minimum and maximum values. To input a value, press **Clear Entry**, and then key in the desired value. Press OK to save the new value.

**Test Acceleration**

The **Test Acceleration** button will display the programming screen for this test parameter, shown below.

Observe the minimum and maximum values. To input a value, press **Clear Entry**, and then key in the desired value. Press OK to save the new value.

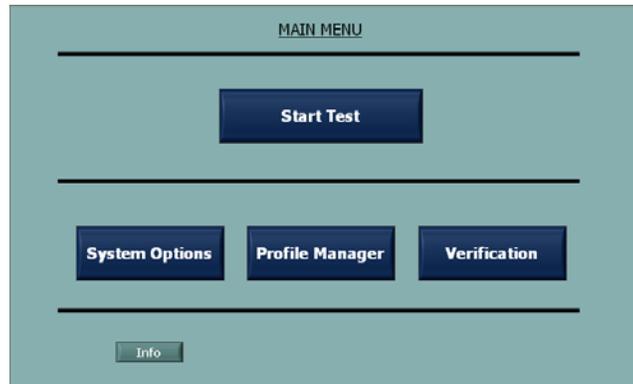


### 6.3 Programming a PV/YP Test

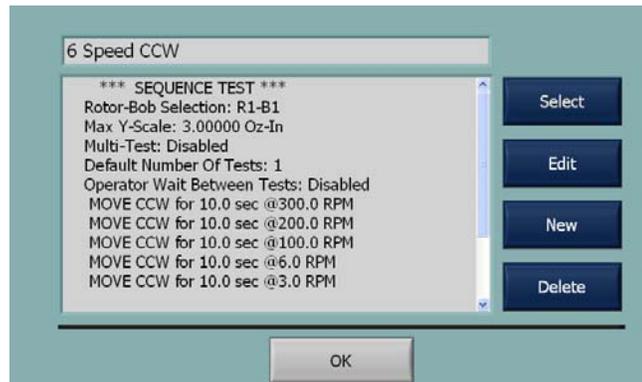


This test is also a sequence. By definition, the PV/YP Test has only two steps — Run Speed 1 and Run Speed 2.

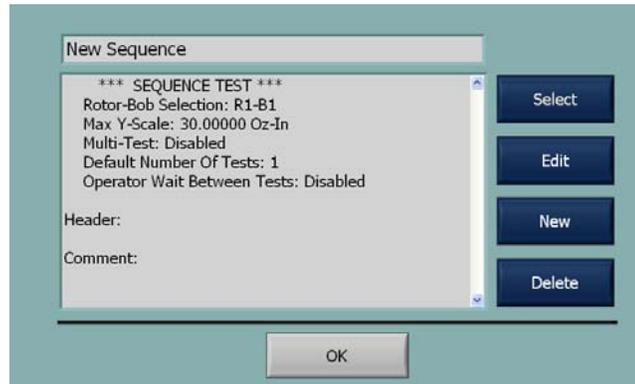
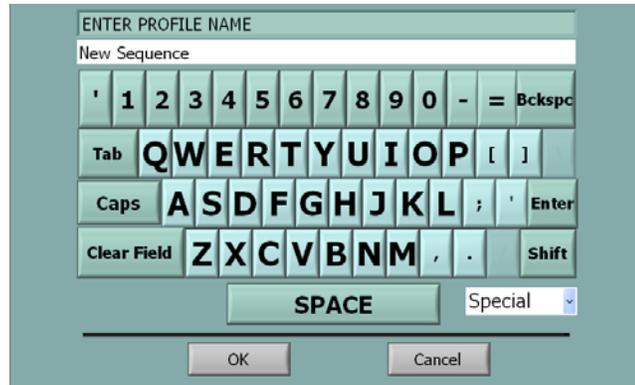
1. On the Select Profile screen (displayed at power up), choose **Main Menu**.
2. Select **Profile Manager**. The software will display the features of the currently selected profile.



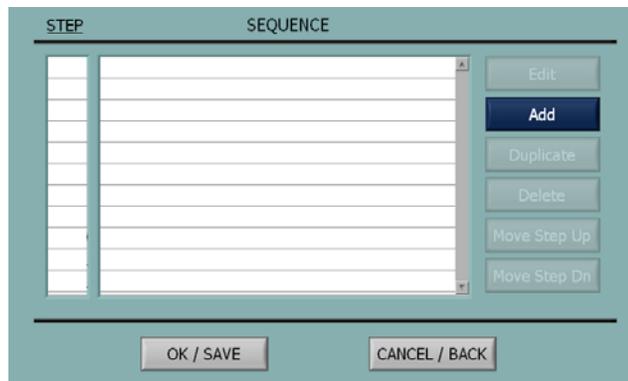
3. On the Profile Manager screen, select **New**. The software will advance to the Enter Profile Name screen.



4. On the keyboard, enter a name for the new profile. Then press **OK**. The Profile Manager screen will display.



5. Default values that are loaded when **New** is selected will be displayed. Select **Edit**. The software will advance to the **Sequence Setup** screen.

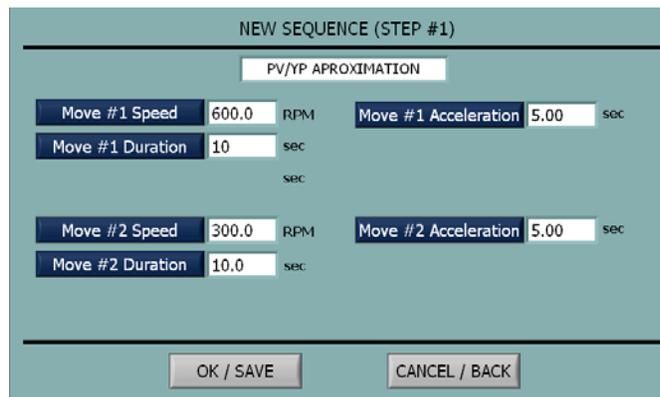


6. The steps in a sequence can be created to produce a desired step. Select **Add** and the **New Sequence** screen will display.



7. From this menu, the sequence can be tailored to fit the user’s requirements. When an item is selected, the programming options will be displayed.
8. Select **PV/YP Approximation** to create a step that can be defined by the user.

### 6.4 PV/YP Approximation Test



This screen enables the user to program all the features of a PV/YP Approximation test.

#### 6.4.1 PV/YP Test Editing Features



The buttons shown below enable the user to rapidly modify the features of the PV/YP Approximation Test. The three screens shown are duplicated for Speed #2.

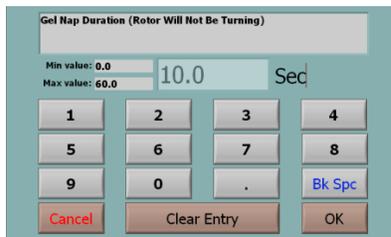
Move #1 Speed



The Move #1Speed button will display the programming screen for this test parameter, shown below.

Observe the minimum and maximum values. To input a value, press Clear Entry, and then key in the desired value. Press OK to save the new value.

Move #2 Duration



The Gel Nap Duration button will display the programming screen for this test parameter shown below

Observe the minimum and maximum values.. To input a value, press **Clear Entry**, and then key in the desired value. Press **OK** to save the new value.

Move #1 Acceleration



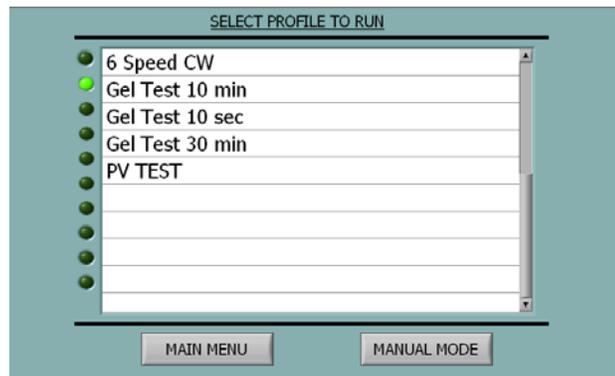
The Move #1Acceleration button will display the programming screen for this test parameter shown below.

Observe the minimum and maximum values. To input a value, press **Clear Entry**, and then key in the desired value. Press **OK** to save the new value.

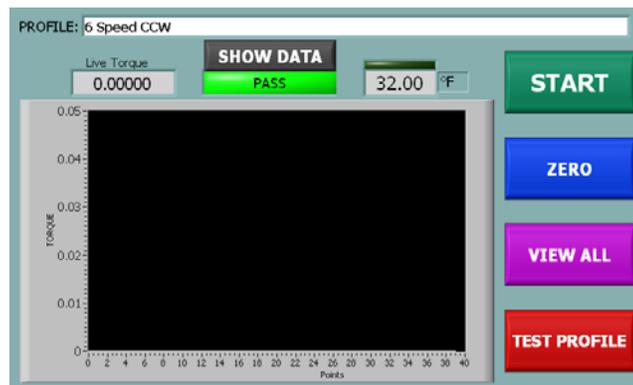
## 6.5 Editing Sequences

On power up the select profile screen is displayed and for this section of the manual the 6 Speed CW profile will be selected.

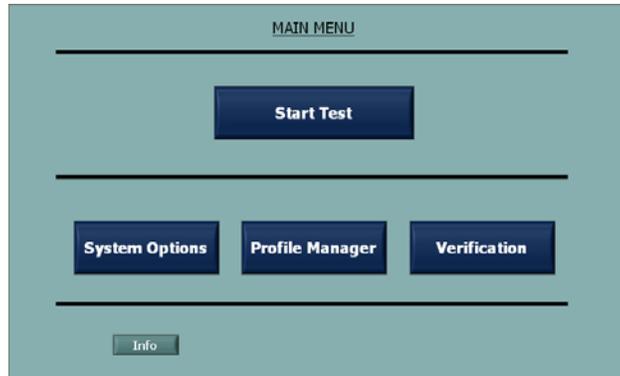
When the 6 Speed CW Test is selected the green indicator to the left of the name will come on and the software will advance to the **Run** screen.



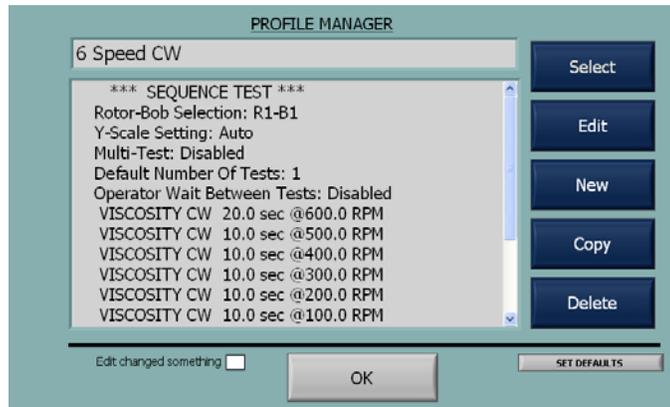
1. On the **Run** Screen, select Main Menu.



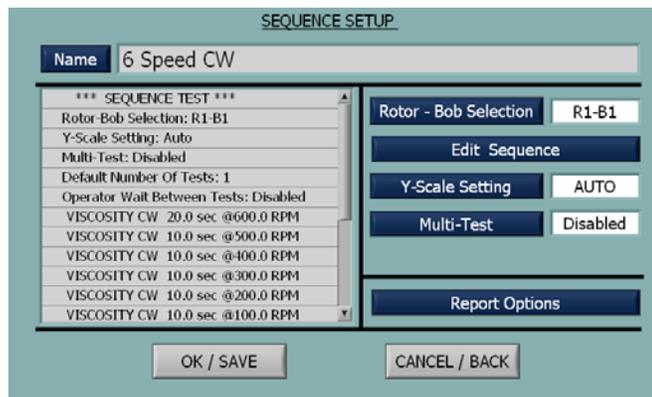
2. Select **Profile Manager**. The software will display the features of the currently selected profile.

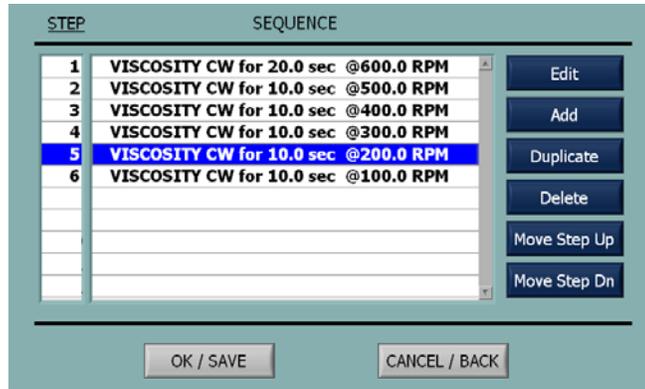


- The Profile **Manager** screen displays the currently programmed steps in the selected profile. Now, select **Edit**. The software will advance to the **Sequence Setup** screen.



- The **Sequence Setup** screen displays the currently programmed features and steps for editing. Now, select **Edit Sequence** and the edit options will be displayed.





The buttons described below enable the user to rapidly modify a test sequence.



Pressing the **Edit** button will enable the user to edit a selected step.



Pressing the **Add** button will enable the user to add a new step



Pressing the **Duplicate** button will enable the user to duplicate a selected step.



Pressing the **Delete** button will enable the user to delete a selected step.



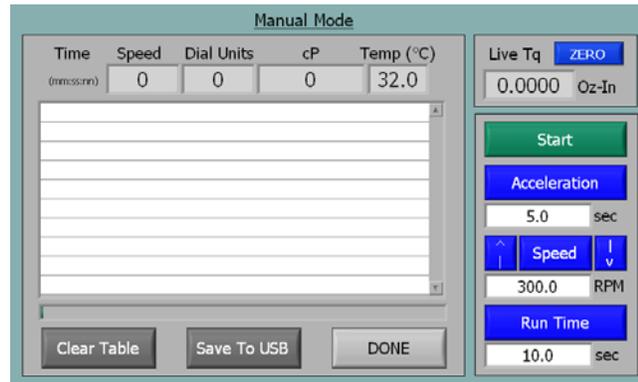
Pressing the **Move Step Up** button will enable the user to move a step up in the sequence.



Pressing the **Move Step Dn** button will enable the user to move a step down in the sequence

## 7 Manual Mode

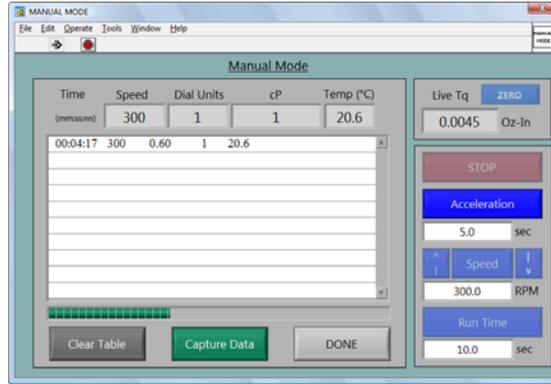
On the Select Profile screen (displayed at power up), press the **Manual Mode** key that appears in the lower right hand corner of the screen,



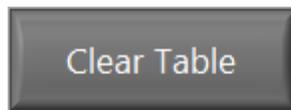
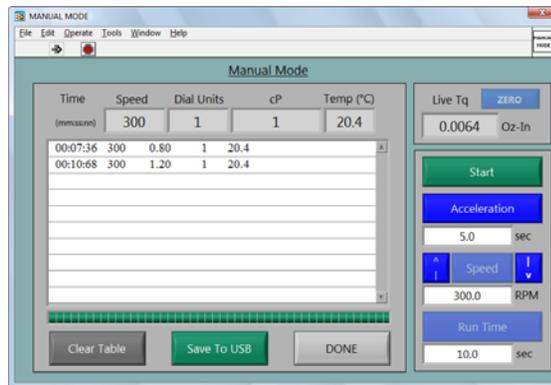
At the top of the screen there is a live display of speed, dial units, cP, temperature and torque. The buttons on the right enable the user to perform all of the features that are used to perform a viscosity test.



The arrows to the right and left of speed button will change the speed in increments of 10 RPM with each touch.



Press this button to capture the data that is displayed



This button is the only way to clear the data from the table. Exiting and re- entering this mode will not clear the data.



This button will enable the user to save the data in the table to a USB memory device as a text file

## 8 Quick Start Test Procedure

1. Install the B1 bob.
  - a) Carefully start threading the bob onto the torque measuring shaft.



- b) While holding the 7/16-in hex, tighten the bob.



- c) Make sure the bob is securely attached.



2. Install the R1 rotor.
  - a) Carefully position the rotor over the bob and start threading it onto the shaft.



- b) While holding the drive shaft, make sure the rotor is securely tightened.



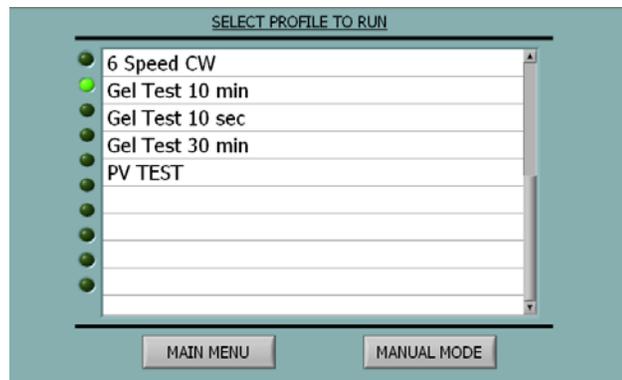
3. Level the system by adjusting the four corner feet and observing the bulls eye level (behind the top cover).



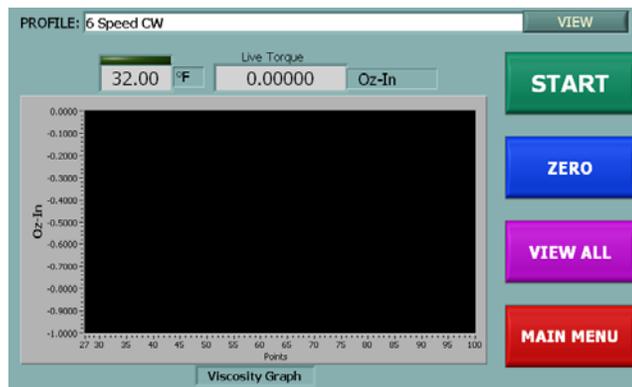
- Fill the sample cup to the fill line with test fluid.



- Select the Test Profile. The software will advance to the next screen for starting a test.



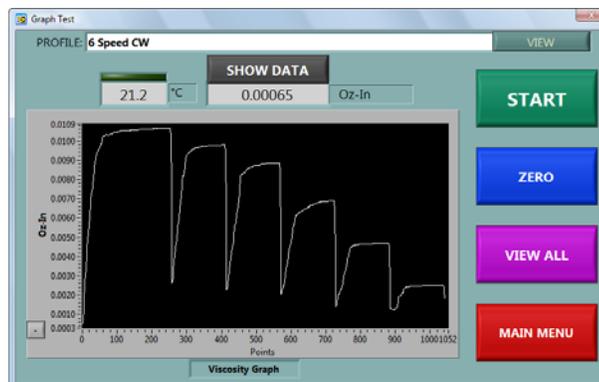
- On the Run screen (Start Test), observe the Zero display. If necessary press zero and follow the instructions.



- Raise the cup to the test position and press the Start key.



8. At the end of the test, the test results will be displayed in a graph. Press the **Show Data** button to display test data.

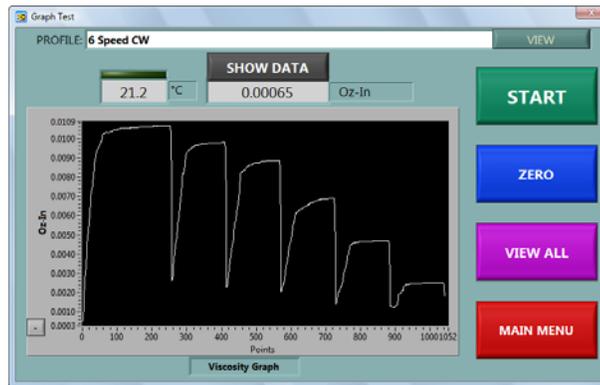


Speed	(Oz-In)	cP	(°C)	Dir
600.0	0.01062	1.0	21.20	CW
500.0	0.00977	1.1	21.20	CW
400.0	0.00884	1.2	21.20	CW
300.0	0.00688	1.2	21.20	CW
200.0	0.00467	1.2	21.20	CW
100.0	0.00250	1.2	21.20	CW

## 9 Test Results

This section describes the following procedures:

- Viewing data that has been saved in memory
  - Customizing data presentation
  - Saving data on an USB memory device for analyzing and printing
1. On the **Run** screen, select **View All**. This screen will display the data that is stored in memory for a given profile.

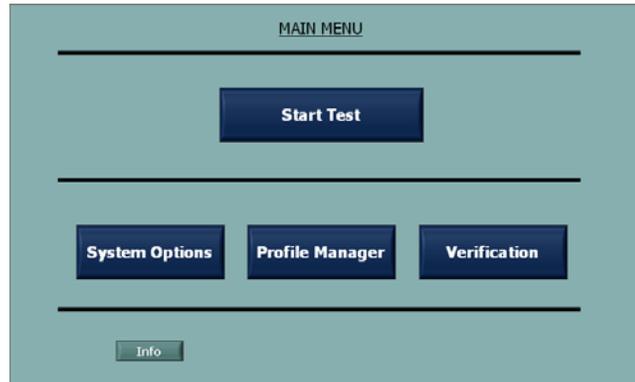


2. From the **View All Data** screen, choose options for customizing the data and putting it on a USB memory device.

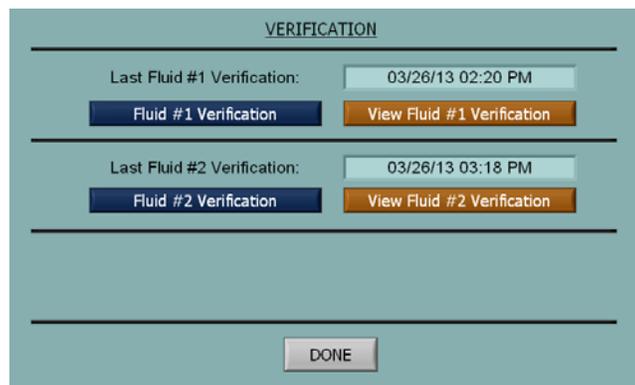
6 Speed CW - Summary Data - 2 Tests				
Date/Time: 03/26/13 04:47 PM				
----- Test # 1 3/26/2013 2:45 PM -----				
Viscosity Steps				
Speed	(Oz-In)	cP	(°C)	Dir
600.0	0.01062	1.0	21.20	CW
500.0	0.00977	1.1	21.20	CW
400.0	0.00884	1.2	21.20	CW
300.0	0.00688	1.2	21.20	CW
200.0	0.00467	1.2	21.20	CW
100.0	0.00250	1.2	21.20	CW
----- Test # 2 3/26/2013 4:34 PM -----				
Viscosity Steps				
Speed	(Oz-In)	cP	(°C)	Dir
600.0	0.01058	1.0	21.20	CW
500.0	0.00971	1.1	21.20	CW
400.0	0.00881	1.2	21.20	CW
300.0	0.00706	1.2	21.20	CW
200.0	0.00539	1.5	21.20	CW
100.0	0.00356	1.8	21.20	CW

## 10 Calibration Check

On the **Select Profile** screen that is displayed with power up, select **Main Menu**.



Select **Verification**. The software will advance to the **Verification** screen.



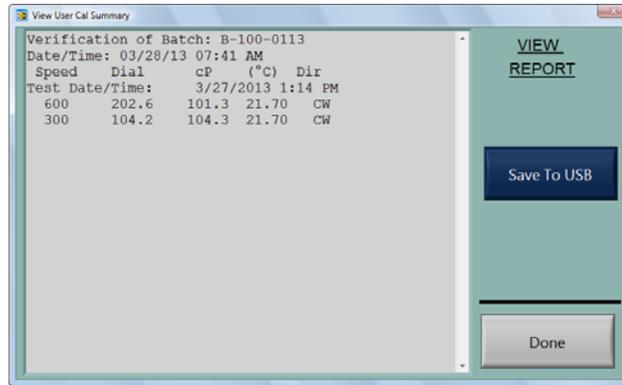
This screen enables the user to view the date and time when the test was performed and the actual data.

The menu items on this screen are described below.

### 10.1 View Fluid #1 Verification



When this button is pressed, the following screen will be displayed.



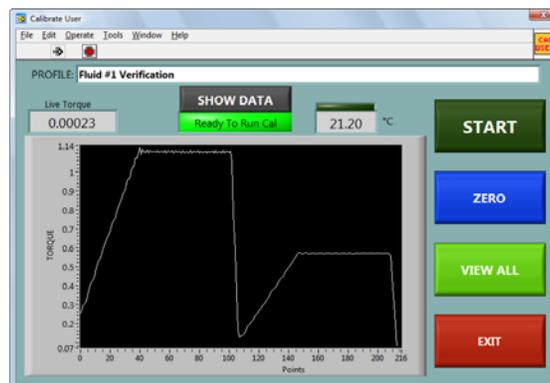
## 10.2 Fluid #1 Verification

### Fluid #1 Verification

Selecting this button will enable user to perform a new verification; the prior data will be deleted. The following screen will be displayed.



The user must enter the Batch Identification for the fluid. After the data is entered the software will advance to the **Run** screen.





---

Make sure the system is zeroed before starting a test

---

As the test is performed the data will be graphed on the screen and saved in memory.

The procedure described above should then be repeated for the second fluid.

**11 Parts List**

**Table 11-1 Model 45 APV Included Parts, P/N 102410859**

<b>Part No.</b>	<b>Quantity</b>	<b>Description</b>
102410851	1	BOB B1
102410852	1	ROTOR R1
102410853	1	BEAKER/CUP WITH PINS 3.5 IN DIA (NO. 207030)
102410854	1	POWER ADAPTER
102410855	1	WRENCH, BOB/ROTOR MOUNTING, CUSTOM

**Table 11-2 Model 45 APV Spares Kit, P/N 102410857**

<b>Part No.</b>	<b>Quantity</b>	<b>Description</b>
102410851	1	BOB B1
102410852	1	ROTOR R1
102410853	1	BEAKER/CUP WITH PINS 3.5 IN DIA (NO. 207030)
102410854	1	POWER ADAPTER, AC/DC, LOCKING CONNECTOR
102410855	1	WRENCH, BOB/ROTOR MOUNTING, CUSTOM
102410856	1	TEMPERATURE PROBE BLOCK ASSEMBLY

## **12 Warranty and Returns**

### **12.1 Warranty**

Fann Instrument Company warrants only title to the equipment, products and materials supplied and that the same are free from defects in workmanship and materials for one year from date of delivery. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED OF MERCHANTABILITY, FITNESS OR OTHERWISE BEYOND THOSE STATED IN THE IMMEDIATELY PRECEDING SENTENCE. Fann's sole liability and Customer's exclusive remedy in any cause of action (whether in contract, tort, breach of warranty or otherwise) arising out of the sale, lease or use of any equipment, products or materials is expressly limited to the replacement of such on their return to Fann or, at Fann's option, to the allowance to Customer of credit for the cost of such items. In no event shall Fann be liable for special, incidental, indirect, consequential or punitive damages. Notwithstanding any specification or description in its catalogs, literature or brochures of materials used in the manufacture of its products, Fann reserves the right to substitute other materials without notice. Fann does not warrant in any way equipment, products, and material not manufactured by Fann, and such will be sold only with the warranties, if any, that are given by the manufacturer thereof. Fann will only pass through to Customer the warranty granted to it by the manufacturer of such items.

### **12.2 Returns**

For your protection, items being returned must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Fann will not be responsible for damage resulting from careless or insufficient packing.

Before returning items for any reason, authorization must be obtained from Fann Instrument Company. When applying for authorization, please include information regarding the reason the items are to be returned.

Our correspondence address:

**Fann Instrument Company**  
P.O. Box 4350  
Houston, Texas USA 77210

Telephone: 281-871-4482  
Toll Free: 800-347-0450  
FAX: 281-871-4446

Email [fanmail@fann.com](mailto:fanmail@fann.com)

Our shipping address:

**Fann Instrument Company**  
14851 Milner Road, Gate 5  
Houston, Texas USA 77032