

UltraVIS[®] 192

High-Speed, Solvent-Free
Kinematic Viscometer

Operation Manual



Copyright

Copyright © 2023 Cannon Instrument Company®. All rights reserved.

Trademarks

UltraVIS®, Cannon Instrument Company®, CANNON® and the CANNON logo are registered trademarks of Cannon Instrument Company.

Contact

Address: Cannon Instrument Company
2139 High Tech Road
State College PA, 16803 | USA

Phone: 1-814-353-8000 | 1-800-676-6232

Fax: 1-814-353-8007

Website: CannonInstrument.com

Email

Sales: sales@CannonInstrument.com

Service: service@CannonInstrument.com



Contents

Contents	i
List of Figures	ii
List of Tables	iv
Overview	1
Specifications / Compliances.....	2
Notes / Cautions / Warnings	3
Safety Precautions	3
Getting Started	4
Unpack and Inspect.....	4
Setup	6
Plug in the MAINS Power	6
Connect Vacuum Pump.....	7
Connect Vacuum Control Pump	7
Connect Vacuum Control Cord to UltraVIS.....	8
Route Waste to Waste Receiver	8
Insert Viscometer Cell Assembly	9
Home	11
Beacon Light.....	12
Backpack.....	12
Shutdown.....	12
Calibrate Temperature.....	13
Setting Standards	17
Calibrate Viscometer.....	20
Run a Sample	22
UltraVIS Touchscreen Overview.....	22
Procedure	23
Fill Sample Vials and Choose Tray	23
Load Standards in Backpack	24
Load Samples.....	25
Run Tray.....	28
Load Second Tray	29
Monitoring Testing Status.....	30
Review and Export Data	31
View Results Onscreen.....	31
View Results Onscreen with Dashboards.....	32

View Results on Dashboard Page	32
Create a New Dashboard.....	33
Delete a Dashboard.....	35
Rename a Dashboard	36
Change Dashboard Settings.....	39
Export Data to USB drive	41
Export Data Using FlowHub	42
Connect to FlowHub.....	42
Retrieved Date Function	45
Change Instrument Settings in FlowHub.....	45
Remove Instrument from FlowHub	45
Warranty	46
Products Limited Warranty	46
Reagent and Chemical Warranty.....	46
Returning a Product to CANNON.....	46
Required Information	47
Hazardous Materials	47
Shipping Notification	47

List of Figures

Figure 1: UltraVIS Overview	1
Figure 2: Rear Connections with MAINS Power.....	6
Figure 3: Vacuum Pump Connections.....	7
Figure 4: Vacuum Control Pump	7
Figure 5: Connect Pump Control	8
Figure 6: Waste Line Connection.....	8
Figure 7: Waste Receiver	8
Figure 8: AC Power Switch.....	9
Figure 9: At a Glance Screen	9
Figure 10: Control Option from Main Menu.....	10
Figure 11: Gantry Control Screen	10
Figure 12: Insert Viscometer Cell Assembly.....	11
Figure 13: Home Instrument.....	11
Figure 14: Backpack for Standards	12
Figure 15: Power On/Off Button.....	12
Figure 16: Calibrate Temperature	13
Figure 17: Adaptor Placement.....	14
Figure 18: Cradle Placement	14
Figure 19: Insert Thermometer Probe	15

Figure 20: Inject Viscosity Standard N100	15
Figure 21: Edit Temperature	16
Figure 22: UltraVIS Menu/Settings.....	17
Figure 23: UltraVIS Menu/Settings/Standards.....	17
Figure 24: UltraVIS Add New Standard	18
Figure 25: Name New Standard	18
Figure 26: Naming Standards Screen	19
Figure 27: Standard Added.....	19
Figure 28: Select Calibrate Viscometer	20
Figure 29: Note C and E Constants.....	20
Figure 30: Select at Least Three Known Standards	21
Figure 31: Commit to Recalibrate Viscometer	21
Figure 32: Touchscreen Tray 1 Overview	22
Figure 33: Sample Fill Line.....	23
Figure 34: Choose Tray.....	23
Figure 35: Load Backpack.....	24
Figure 36: Select Standard for Sample Group	25
Figure 37: Add Sample Group.....	25
Figure 38: Sample Name	26
Figure 39: Starting Index.....	26
Figure 40: Multiple Sample Groups	27
Figure 41: Remove Samples	27
Figure 42: Start Sample Testing.....	28
Figure 43: Load for Tray 2	29
Figure 44: Sample and Test Status.....	30
Figure 45: GUI "At a Glance"	30
Figure 46: Single Sample Results	31
Figure 47: Tray Sample Results	31
Figure 48: Select Dashboard	32
Figure 49: Dashboard Page.....	33
Figure 50: Settings Menu/Dashboards	34
Figure 51: Dashboard Files Screen.....	34
Figure 52: Add New Dashboard.....	35
Figure 53: Dashboard Files Menu Screen.....	36
Figure 54: Delete Dashboard.....	36
Figure 55: Accessing Dashboard Details Screen	37
Figure 56: Dashboard Details Screen	37
Figure 57: Change Dashboard Name	38
Figure 58: Return to Dashboard Files	38
Figure 59: Selecting Dashboard Details Settings Page	39
Figure 60: Dashboard Details Settings Page	40
Figure 61: Export Data Menu.....	41

Figure 62: Export to USB Drive.....	41
Figure 63: Network Settings Navigation	42
Figure 64: Network Settings Entry Screen	43
Figure 65: FlowHub Output Format Screen.....	44
Figure 66: FlowHub Instruments Menu Screen.....	44
Figure 67: FlowHub Instrument Setup Screen	45

List of Tables

Table 1: Specifications and Compliances.....	2
Table 2: Packing List (Main Components)	4
Table 3: Packing List (Installation).....	5
Table 4: Packing List (Spare Parts Kit)	5
Table 5: Optional Accessories & Consumables	6
Table 6: Beacon Light Descriptions.....	12
Table 7: Temperature Calibration Tools and Materials	13



Overview

The CANNON UltraVIS[®] 192 (referred to as “UltraVIS”), see Figure 1, is a fully automated, high speed, solvent-free viscometer for rapid kinematic viscosity measurement of transparent and opaque liquids. With fast analysis times, it follows most ASTM D445 principles but with shorter flow times to accommodate rapid analysis. A 192-position sample handler (comprised of two standard 96-position trays) allows unattended processing of up to 24 samples per hour. The fast-run tube covers a viscosity range of 5 to 50 mm²/s (cSt) at 100 °C or 30 to 680 mm²/s (cSt) at 40 °C. The cost-saving, eco-friendly performance eliminates solvent, disposable pipette tips, and mixed oil/solvent waste disposal expense. Features include an easy-to-use touchscreen, configurable LIMS output, and multi-colored beacon light to quickly distinguish sample phase from across the lab.

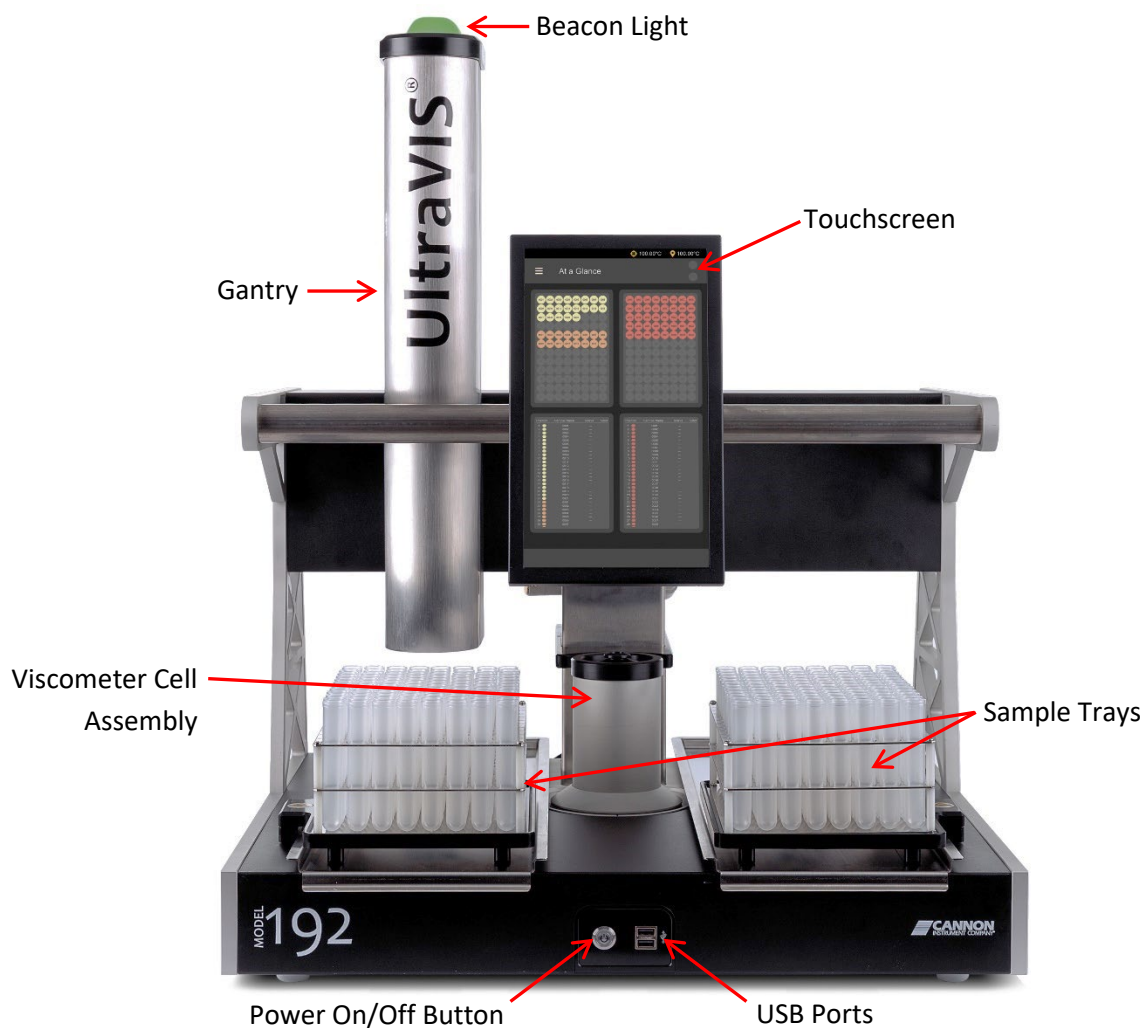


Figure 1: UltraVIS Overview

Specifications / Compliances

Refer to Table 1 for specifications and compliances of the UltraVIS.

Table 1: Specifications and Compliances

Specifications	Details
Model	UltraVIS High Speed, Solvent-Free Kinematic Viscometer
Applications	In-service oil viscosity, used oil analysis, fleet maintenance, condition monitoring
Dimensions (W × D × H)	Unit: 60.9 cm × 60.9 cm × 77.5 cm (24 in. × 24 in. × 30.5 in.) Vacuum Pump: 23 cm × 32.4 cm × 20 cm (9.1 in. × 12.75 in. × 8 in.)
Weight	Unit: 47.2 kg (104 lb.) Vacuum Pump: 7.25 kg (16 lb.)
Test Temperatures & Accuracy	100 °C (± 0.02 °C) 40 °C (± 0.02 °C)
Maximum throughput	Up to 24 tests per hour
Automated sample capacity	192 positions (2 × 96 positions)
Recommended sample volume	10 mL
Viscosity range	5 to 50 mm ² /s (cSt) at 100 °C 30 to 680 mm ² /s (cSt) at 40 °C <i>Note: 40 °C viscometer tube range is 30 to 300 mm²/s (cSt) but viscosity may be measure up to 680 mm²/s (cSt).</i>
Timing resolution	0.001 seconds
Power requirements	100 VAC, 50/60 Hz, 250 W 115 VAC, 50/60 Hz, 250 W 230 VAC, 50/60 Hz, 250 W
Operating conditions	15 °C to 30 °C, 10% to 75% relative humidity (non-condensing), Installation Category II, Pollution Degree 2
Compliance	CE Mark: EMC Directive (2004/108/EC); Low Voltage Directive (2006/95/EC); ROHS

Notes / Cautions / Warnings

Notes, caution, and warnings are used in the manual to call an operator's attention to important details prior to performing a procedure or step. Read and follow these important instructions. Failure to observe these instructions may void warranties, compromise operator safety, and/or result in damage to the UltraVIS.



Note: *Provides more information about the content that follows.*



Caution: *Alerts the operator to conditions that may damage equipment.*



Warning: *Alerts the operator to conditions that may cause injury.*

Safety Precautions

Please observe the following general safety precautions for proper and safe operation of the UltraVIS.

- Only qualified personnel should operate the UltraVIS.
- Make sure that you read and understand all operating instructions and safety precautions listed in this manual before installing or operating your unit. Direct questions regarding instrument operation or documentation to Cannon Instrument Company.
- Do not deviate from the installation, operation, or maintenance procedures described in this manual. Improper use of the UltraVIS may result in a hazardous situation and/or void the manufacturer's warranty.
- Handle and transport the unit with care. Sudden jolts or impacts may cause damage to components.
- Observe all warning labels. Never remove warning labels.
- Never operate damaged or leaking equipment.
- Unless procedures specify otherwise, always turn off the unit and disconnect the MAINS AC power cable from the power source before performing service or maintenance procedures, or before moving the unit.
- Keep hands and other materials away from sample trays, the gantry, and the viscometer cell assembly while the instrument is in a state of motion.
- Refer all service and repairs to qualified personnel.



Getting Started

This chapter covers all steps necessary to set up, calibrate, and understand the components for the UltraVIS. The procedures are intended to be performed in the order written. These are basic, simplified procedures designed to familiarize an operator with the instrument.

The UltraVIS Automatic Viscometer is designed to automate the time-consuming sample testing and cleaning operations required for determination of kinematic viscosity. It offers the advantages of high output and no need for solvent. The operator places the test sample vials in the sample trays, then enters the sample information and initiates testing through the UltraVIS touchscreen. Without any further operator involvement, the instrument determines kinematic viscosity. All pertinent test data is stored in the instrument and can be viewed using customized Dashboards. Additionally, all data can be exported to a USB drive or to a personal computer using FlowHub™ software.

Unpack and Inspect

Unpack and inspect the complete CANNON UltraVIS and all accessories as soon as they are received.



Caution: Many components are fragile. Use caution when moving and handling the UltraVIS and accessories.

1. Carefully unpack the entire contents of the shipment.
2. Refer to the Packing List to verify that all materials are present. See Table 2, Table 3, and Table 4. See Table 5 for optional accessories and consumables.
3. Inspect materials for defects and shipping damage. Contact your CANNON representative to resolve any issues.

Table 2: Packing List (Main Components)

Quantity	Description	Part Number
1	Assembled UltraVIS	9729-A00, -A05, -A10
1	MAINS AC Power Cable	Varies by locale
1	Viscometer Cell Assembly	83.0380 (40 °C) 83.0281 (100 °C)
1	CE Note	N/A

Table 3: Packing List (Installation)

Quantity	Description	Part Number
3	Elbow, 1/2"	62.1500.2
1	Ethernet Cable, 2.1 m (7 ft)	61.3378
1	Sample Vials (Polypropylene, Round Bottom, Case of 1,000)	81.2548
1	Tee, 1/2"	62.1500.4
12	Tubing, 1/2" White Nylon	62.1500.3
1	Tubing Cutter	81.1074
1	Transporter to Cell Alignment Jig	83.0371
1	Transporter to Sample Rack Alignment Jig	83.0372
1	USB Flash Drive (Operation Manual/FlowHub™ Software)	N/A
1	Viscosity Reference Standard (0.5 L) N35	9727-C37.016
1	Viscosity Reference Standard (0.5 L) N100	9727-C42.016
1	Viscosity Reference Standard (0.5 L) N350	9727-C47.016

Table 4: Packing List (Spare Parts Kit)

Quantity	Description	Part Number
1	2.5 mm Allen Wrench	80.5465
1	Fuse T250V x 2A	30.0040
1	Fuse T250V x 4A	74.4025
1	Transporter Plunger Tip	83.0018
1	Transporter to Cell Alignment Jig	83.0371
1	Transporter to Sample Rack Alignment Jig	83.0372
1	Transporter Syringe Tube Wiper Seal	83.0019
12	Tray Pad	83.0192
5	Viscometer Cell Nut	83.0554

Table 5: Optional Accessories & Consumables

Description	Part Number
Extra Sample Tray	83.0196
Pedestal Base	61.3422
Temperature Calibration Kit	83.0420

Setup

Easy setup of the UltraVIS involves attaching the viscometer cell assembly, connecting the hoses and cables, and plugging in the MAINS power.

Plug in the MAINS Power

Assemble the UltraVIS on a solid, level, and secure workbench located near a MAINS AC power connection with sufficient room behind the instrument to maintain a clear airflow and allow for unimpeded connection of the waste outlet tubing.

1. Connect the MAINS AC power cord to the UltraVIS. See Figure 2



Figure 2: Rear Connections with MAINS Power

2. Plug the power cord into the MAINS AC outlet at the workstation, ensuring power requirements comply with instrument needs.
3. Next, connect the vacuum pump.

Connect Vacuum Pump

The vacuum control cable is already attached to the vacuum pump; you will need to attach the vacuum pump tube and power cord. See Figure 3.

1. Measure and cut ½" white nylon tubing to use as vacuum pump tube.
2. Connect vacuum pump tube to "vacuum port" on the back of the vacuum pump. Fully insert tubing to lock fitting.
3. Connect power cable to vacuum pump.

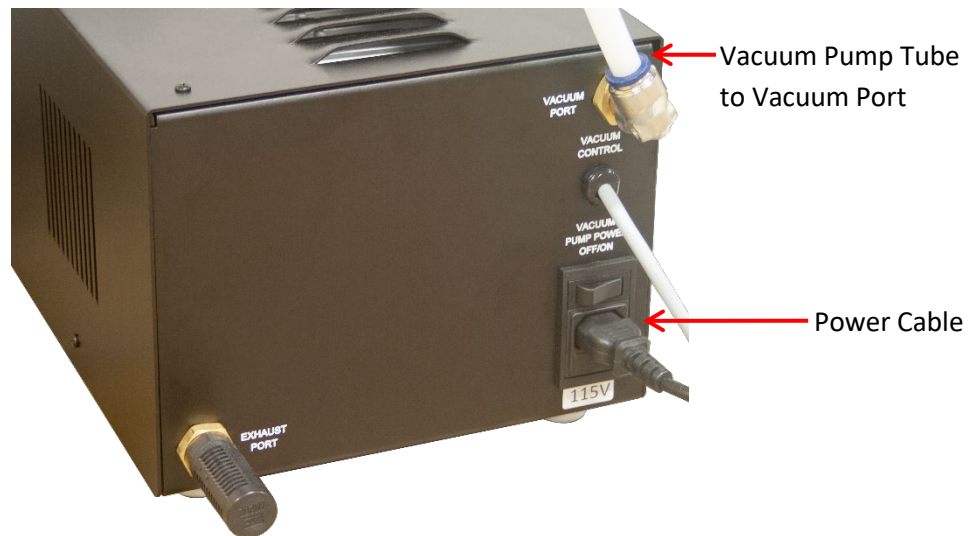


Figure 3: Vacuum Pump Connections

Connect Vacuum Control Pump

1. Connect the other end of the vacuum pump tubing to vacuum control pump on back of UltraVIS. See Figure 4.

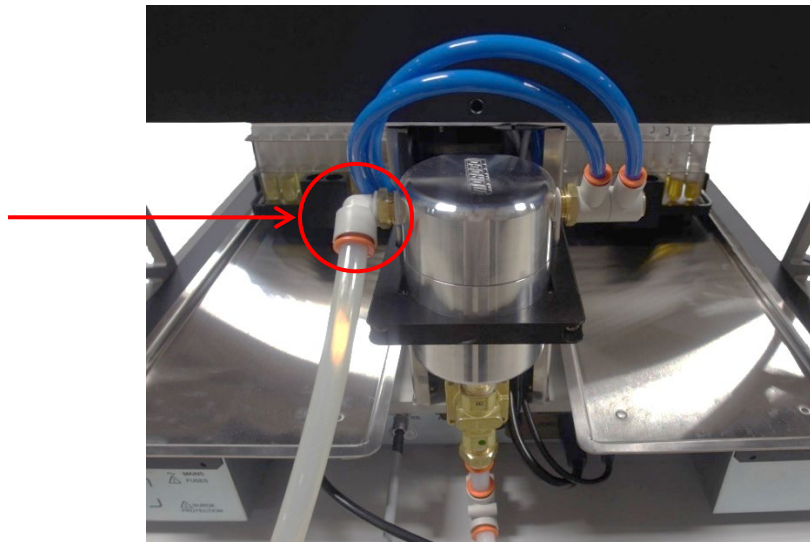


Figure 4: Vacuum Control Pump

Connect Vacuum Control Cord to UltraVIS

1. Connect the other end of the vacuum control cable to the back of the UltraVIS. See Figure 5.



Figure 5: Connect Pump Control

2. Next, route waste to waste receiver.

Route Waste to Waste Receiver

1. Place the waste receiver beneath the UltraVIS. To promote proper gravity drainage, the top of the waste receiver must be lower than the waste outlets on the back of the instrument.
2. Measure and cut the $\frac{1}{2}$ " white nylon tubing to use as the waste tubing.



Caution: Do not overtighten the waste outlet compression nut.

3. Connect the bath waste tubing to the UltraVIS—fully insert tubing into push to lock fitting. See Figure 6.

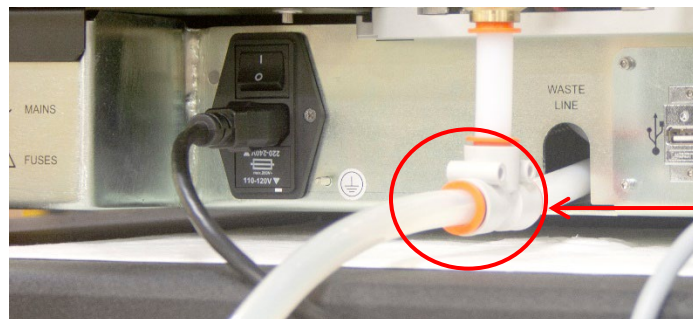


Figure 6: Waste Line Connection

4. Connect the waste tubing to the waste receiver. See Figure 7.



Warning: Follow all lab policies regarding the safe handling and disposal of all hazardous materials.



Figure 7: Waste Receiver

5. If needed, use the included elbow to route waste tube around corner of lab bench and tee to join waste tubes from two UltraVIS instruments into one waste receiver.
6. Next, insert the viscometer cell assembly.

Insert Viscometer Cell Assembly

1. First, you will need to move the position of the gantry to gain access to the viscometer cell assembly area. Turn on the AC power from the rear power switch. See Figure 8.

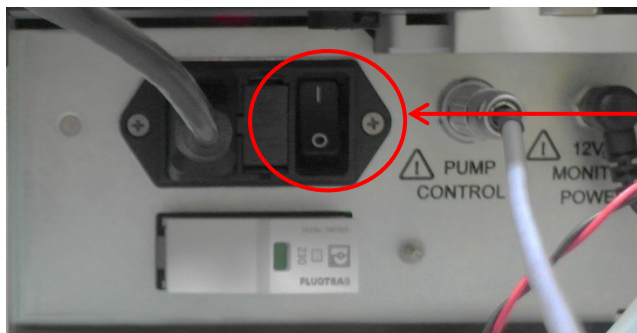


Figure 8: AC Power Switch

2. Power on the instrument from the front panel on/off button. See Figure 1.
3. From the main screen, **At a Glance**, use a single touch to select the “hamburger” or three-line button in top left corner next to the title **At a Glance**, to view the **Main Menu** Screen. See Figure 9.

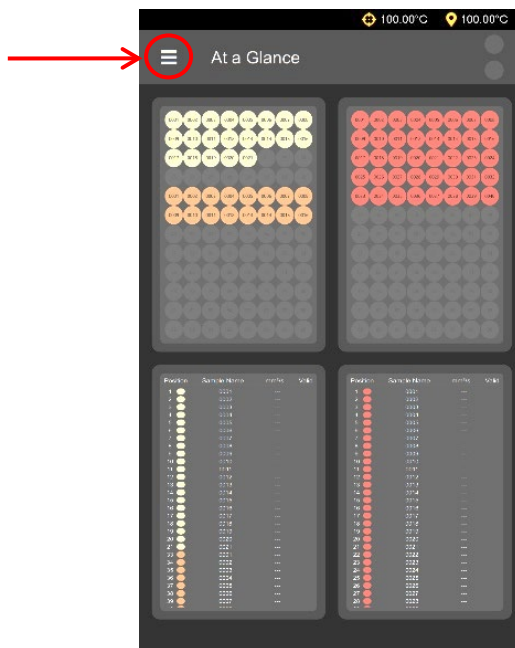


Figure 9: At a Glance Screen

- From the Main Menu screen, use a single touch to select **Control**. See Figure 10.

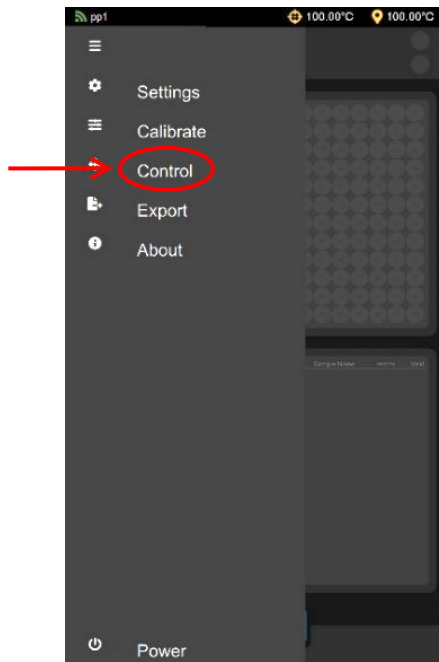


Figure 10: Control Option from Main Menu

- Use left or right arrow keys to move the gantry position to allow access to the viscometer cell assembly area. See Figure 11.

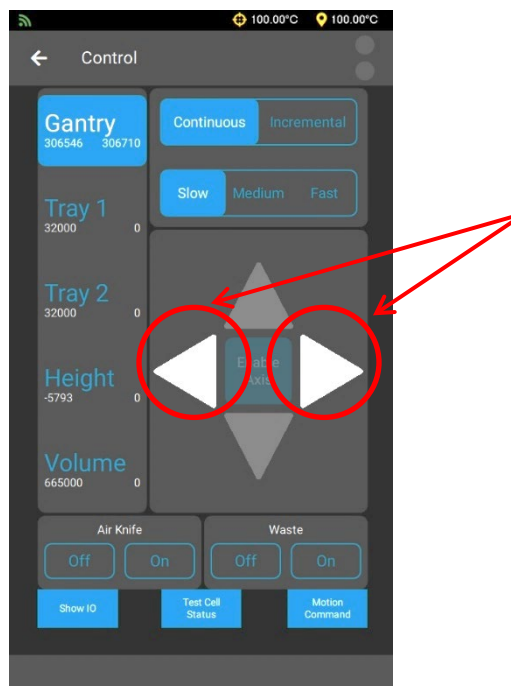


Figure 11: Gantry Control Screen

- Turn power off from front of machine and rear of machine. See Figure 1 and Figure 8.

7. Insert the viscometer cell assembly. See Figure 12.
 - a. Position so arrow is facing forward to ensure the connection for the board is aligned.
 - b. Place over hole
 - c. Lower gently
 - d. Cell will click into place.

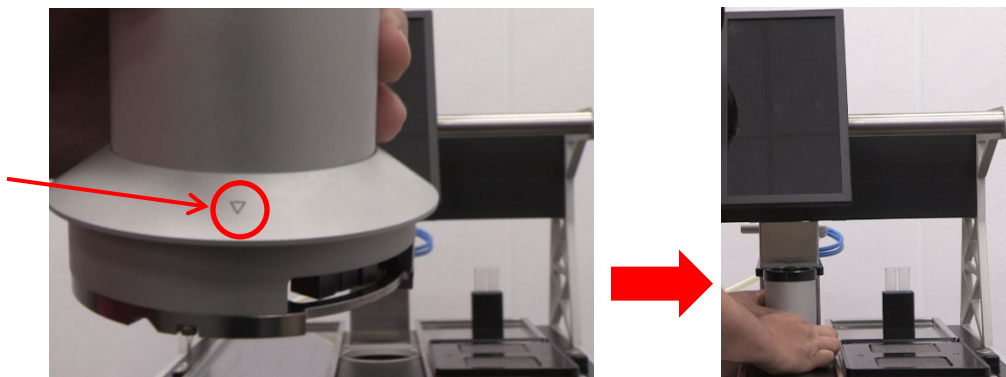


Figure 12: Insert Viscometer Cell Assembly

8. Restore power to the machine.
9. Home the motors by selecting **Home** from the bottom of the screen. See Figure 13.

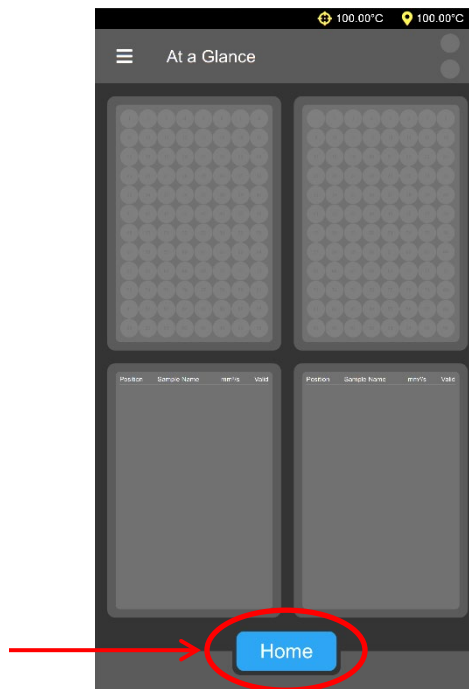


Figure 13: Home Instrument

Home

The home position of the UltraVIS is when the sample trays are in the load/unload position and the gantry is centered over the viscometer cell assembly. The **Home** button, located in the bottom center of the touchscreen, is used to return the instrument to the home position (see Figure 12). The beacon light will blink blue when the instrument needs homed. Once the instrument is homed and ready to run samples, the beacon light will turn white.

Beacon Light

The beacon light on top of the UltraVIS changes color to easily indicate the status of the instrument. Refer to Table 6 for description of each color phase.

Table 6: Beacon Light Descriptions

Color	Description
Blue (Blinking)	Needs homed
Green (Solid)	Running samples
Green (Blinking)	Finished running samples successfully
Red	Error state
Yellow (Blinking)	Paused
White	Homed and ready to run samples

Backpack

The backpack is a separate pack that is intended for sample standards. There are two cells for vials, on the back of each sample tray, for a total of four standards. See Figure 14.



Figure 14: Backpack for Standards

Shutdown

1. Press the Power On/Off Button on the front of unit. See Figure 15.



Figure 15: Power On/Off Button

2. To turn off MAINS AC power, use button on rear of machine. See Figure 8.

Calibrate Temperature

The UltraVIS temperature is calibrated by inserting the thermometer through an access hole in the viscometer cell assembly, measuring the actual temperature, and entering that temperature into the UltraVIS software. Refer to Table 7 for necessary tools and materials.

Table 7: Temperature Calibration Tools and Materials

Description	Part Number
Assembled UltraVIS	9729-A00, -A05, -A10
UltraVIS Calibration Kit (Digital Thermometer, Probe, Adaptor, Cradle, Probe, and 10 Syringes)	83.0420

1. First, you will need to move the position of the gantry in order to have access to the viscometer cell assembly. From the main screen, **At a Glance**, use a single touch to select the “hamburger” or three-line button in top left corner next to the title **At a Glance**, to view the **Main Menu** Screen. Refer to Figure 9.
2. From the Main Menu screen, use a single touch to select **Control**. See Figure 10.
3. By using the onscreen left or right arrow key, move the gantry position in order to allow access to the viscometer cell assembly. See Figure 11.
4. Return to the main menu by using the back arrow key in the upper left-hand corner. Then, navigate to the temperature calibration screen. See Figure 16.

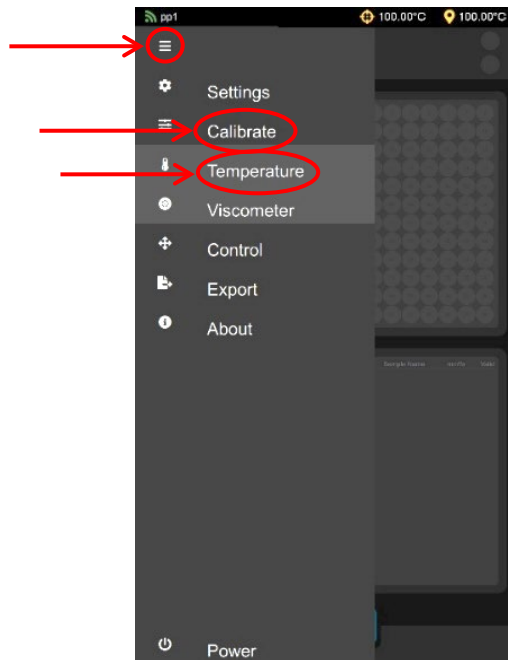


Figure 16: Calibrate Temperature

- Next, place the adaptor on top of the viscometer cell assembly, with the syringe port to the rear. See Figure 17.

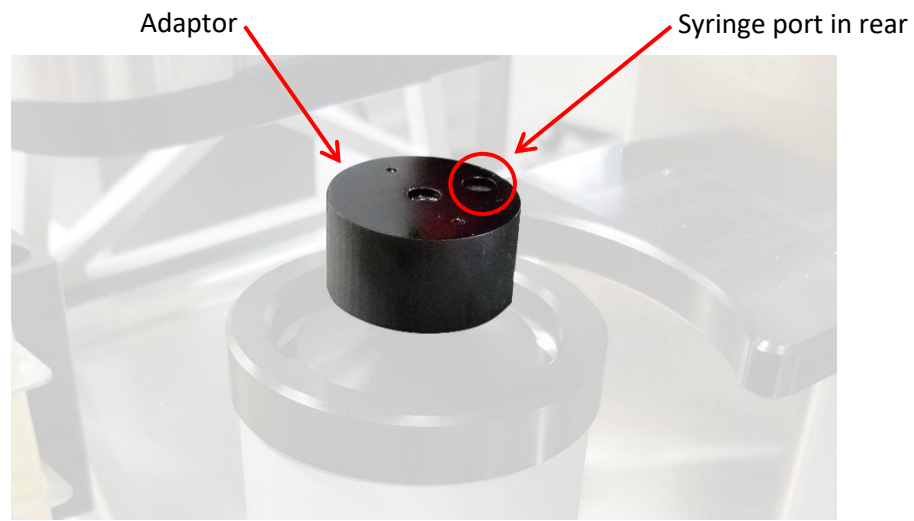


Figure 17: Adaptor Placement

- Place the cradle over the adaptor, making sure the access hole lines up with the access hole on the adaptor, until it snaps into place. See Figure 18.



Figure 18: Cradle Placement

7. Insert thermometer probe. See Figure 19.



Figure 19: Insert Thermometer Probe

8. Fill syringe with Viscosity Standard N100 and carefully inject into opening on the viscometer cell assembly. See Figure 20.

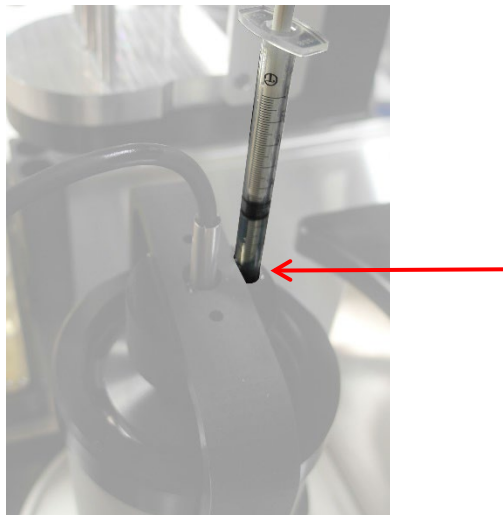


Figure 20: Inject Viscosity Standard N100

- Once the thermometer reaches temperature, enter the reference temperature measured into the UltraVIS by using the edit button and entering the thermometer reading on the next screen. Once finished, use a single touch to select the **Green Checkmark**. See Figure 21.

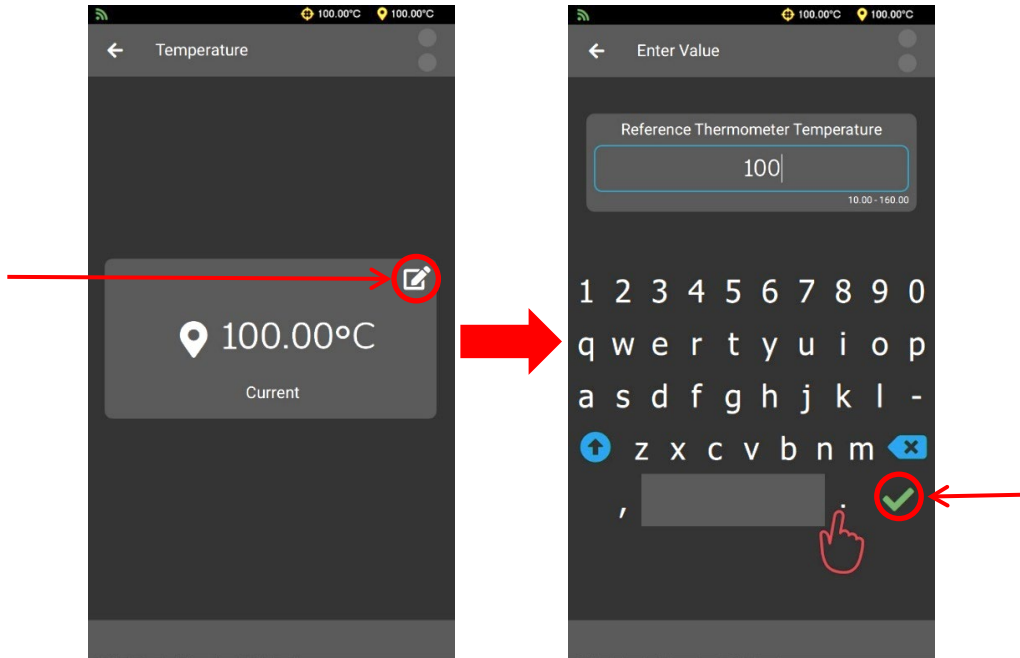


Figure 21: Edit Temperature

- The temperature of your UltraVIS is now calibrated. Remove and clean thermometer, then store safely.

Setting Standards

Setting standards is necessary to run standards and calibrate the UltraVIS.

1. From the main screen, **At a Glance**, use a single touch to select the “hamburger” or three-line button in top left corner next to the title **At a Glance**, to view the **Main Menu Screen**. Refer to Figure 9.
2. From the **Main Menu Screen**, select **Settings**. From the **Settings Menu**, select **Standards**. See Figure 22.

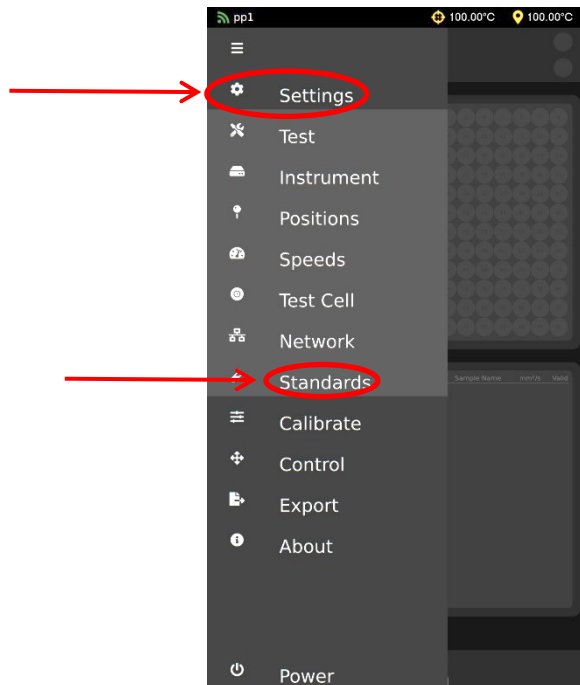


Figure 22: UltraVIS Menu/Settings

3. From the Standards Screen, use a single touch on the three dots, on the upper right-hand side of screen, to access the Standards Menu. See Figure 23.

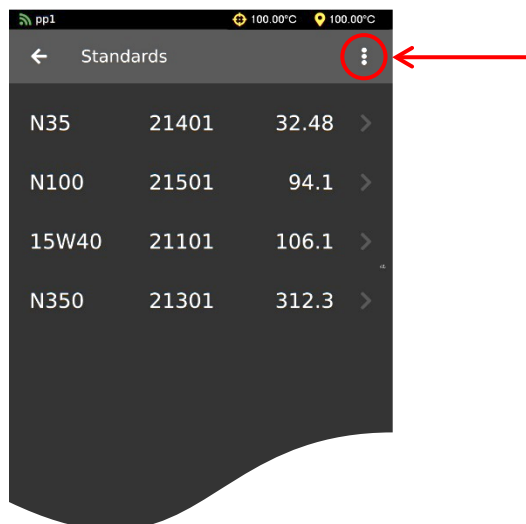


Figure 23: UltraVIS Menu/Settings/Standards

4. From the **Standards Menu**, select **Add New**. See Figure 24.

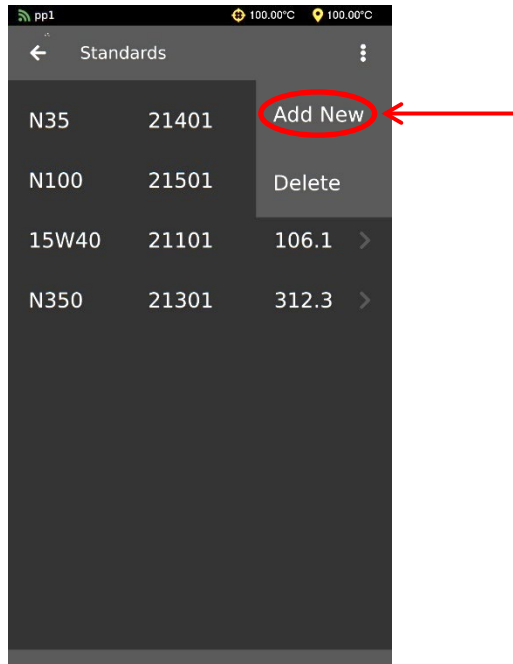


Figure 24: UltraVIS Add New Standard

5. From the **Add New** screen, use a single touch to select the arrow next to **New Item**. See Figure 25.

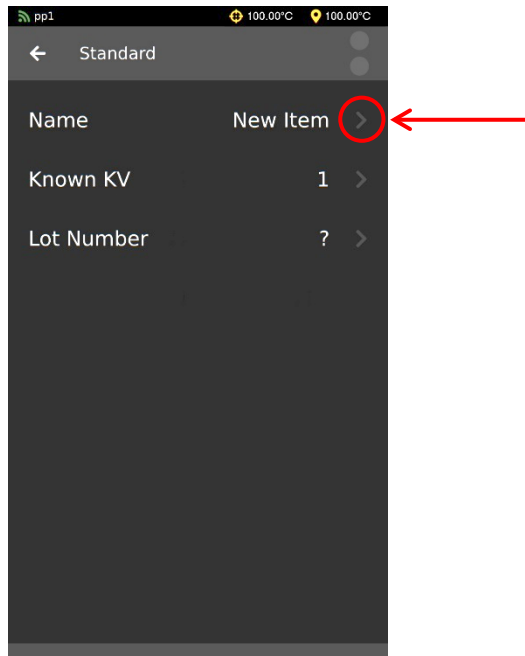


Figure 25: Name New Standard

6. Use the touchscreen keyboard to enter the name of your Standard. Once finished, use a single touch to select the **Green Checkmark**. See Figure 26

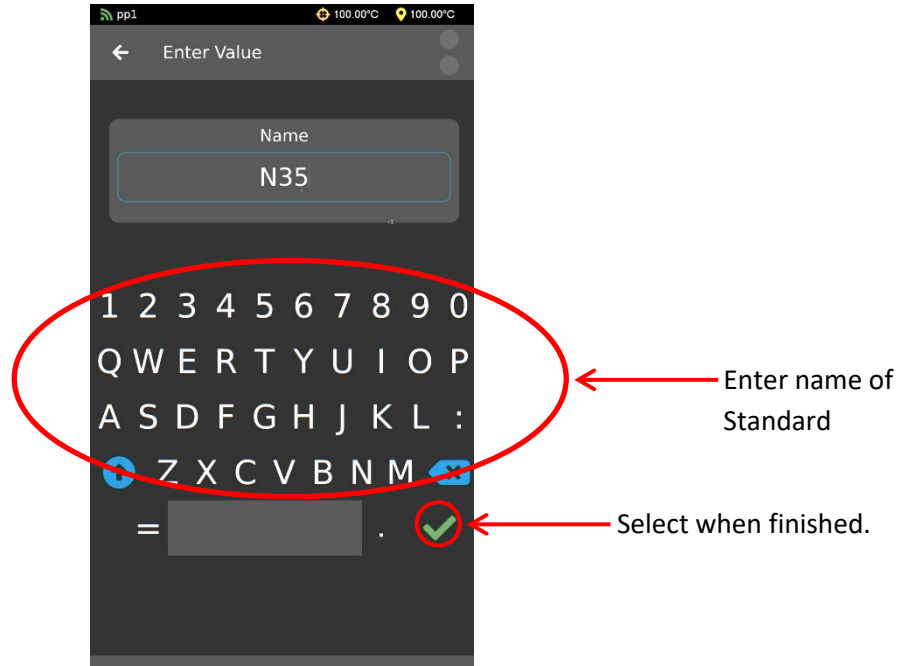


Figure 26: Naming Standards Screen

7. After selecting the **Green Checkmark**, you will return to the previous screen; you will now see the name of the Standard you have just entered. Continue by adding **Known KV** and **Lot Number** of the standard you are using.
8. Once finished, use a single touch to select the **Back Arrow** and return to the **At a Glance** screen. See Figure 27.

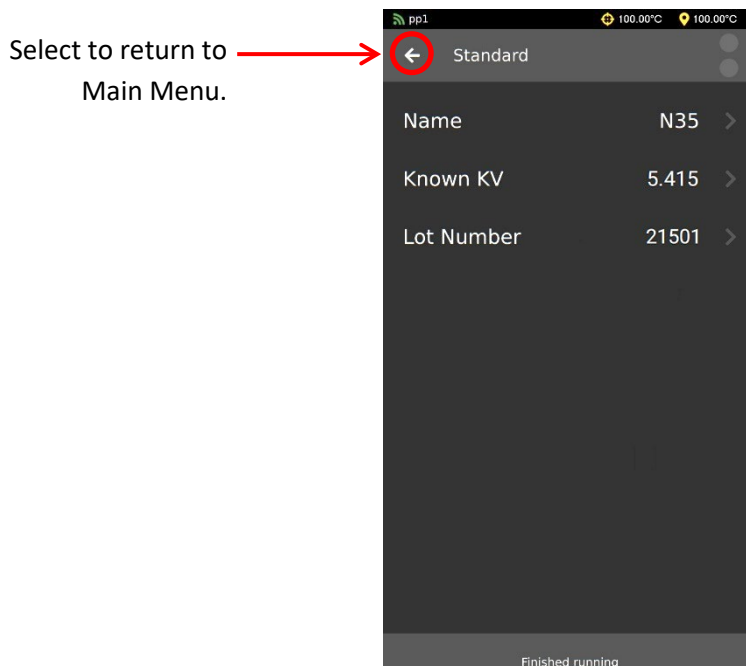


Figure 27: Standard Added

Calibrate Viscometer

The UltraVIS comes pre-calibrated from CANNON. However, if you choose to recalibrate the viscometer, follow the procedure outlined in this section. You must choose at least three known standards for recalibration. If you have not yet set standards on your instrument, refer to the **Setting Standards** section of this manual.

1. From the main screen, At a Glance, use a single touch to select the “hamburger” or three-line button in top left corner next to the title At a Glance, to view the Main Menu Screen. Refer to Figure 9.
2. From the **Main Menu** screen, select **Calibrate**. From the **Calibrate** menu, use a single touch to select **Viscometer**. See Figure 28

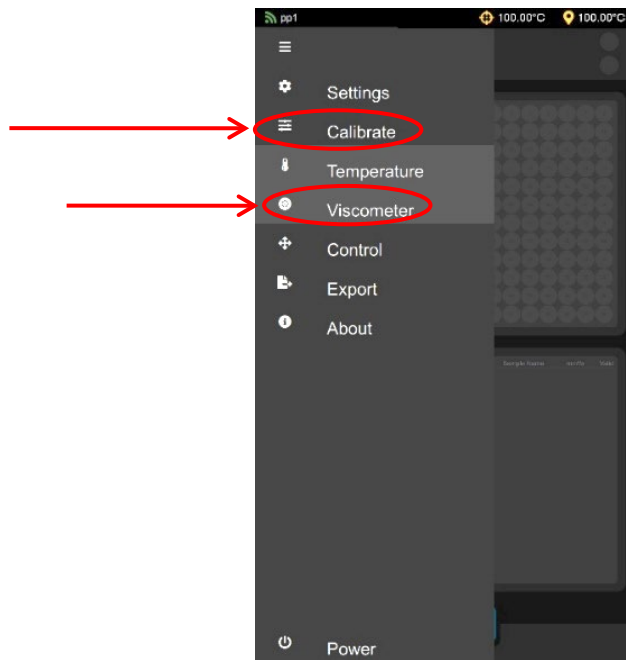


Figure 28: Select Calibrate Viscometer

3. Take note of the current C and E constants listed on screen. See Figure 29.

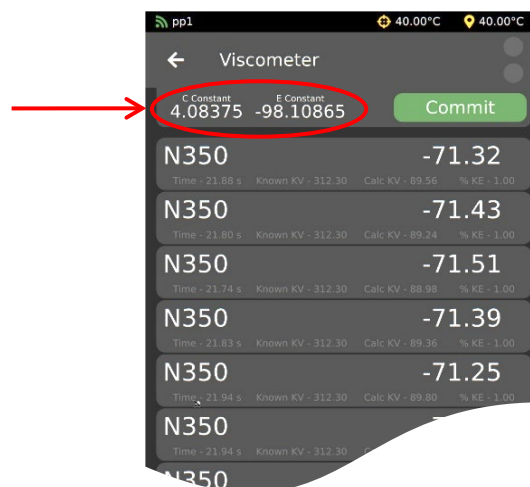


Figure 29: Note C and E Constants

- From the **Viscometer** menu, use a single touch to select at least three known standards. If you have not yet set standards on your instrument, refer to the **Setting Standards** section of this manual before proceeding. Note the C and E constants change based upon your selection. See Figure 30.

Choose at least three different standards



C and E constants change based upon the selection.

Figure 30: Select at Least Three Known Standards

- Once you have made the selection of at least three known standards, select the green **Commit** button. See Figure 31.



Figure 31: Commit to Recalibrate Viscometer

- The new constants are now applied to the instrument and the viscometer is now recalibrated.



Run a Sample

The large, intuitive GUI (graphical user interface)—or touchscreen—allows for easy navigation of the software for stand-alone testing of samples. It also allows various samples to be tested and grouped, according to color, for ease of adding information and distinguishing between samples.

Once the instrument is installed and powered ON, it is ready to run samples. For proper setup, see the **Setup** section of this manual. See Figure 32 below, for an overview of the touchscreen features.

UltraVIS Touchscreen Overview

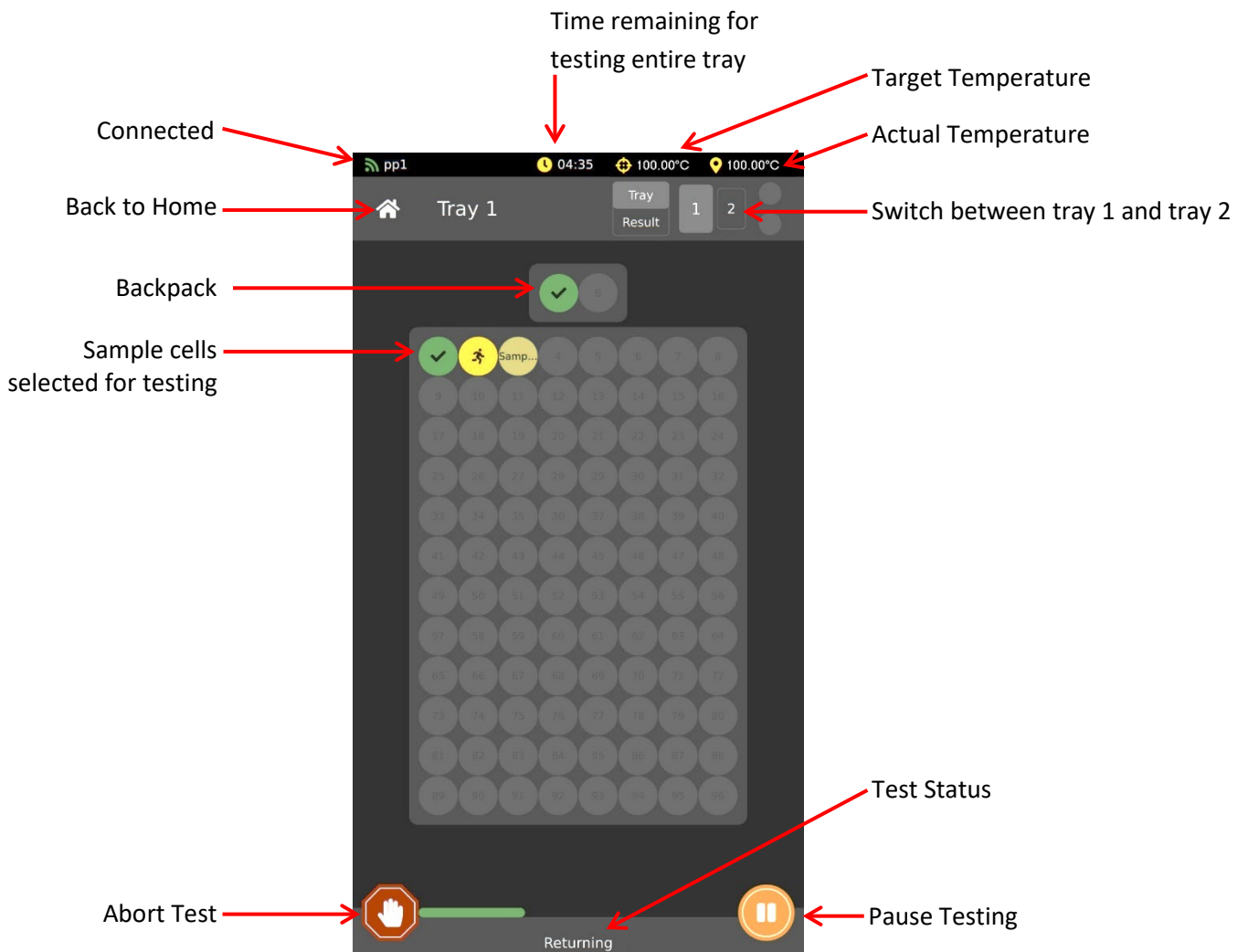


Figure 32: Touchscreen Tray 1 Overview

Procedure

Fill Sample Vials and Choose Tray



Note: When a sample is drawn from the vial, the liquid will be displaced. DO NOT fill sample to the top of the vial because it will cause spillage when the sample is drawn.

1. Fill sample vial to above the tray line (where the top of the tray meets the vial) but below the top of the vial, see Figure 33. Then place tray on instrument for testing.

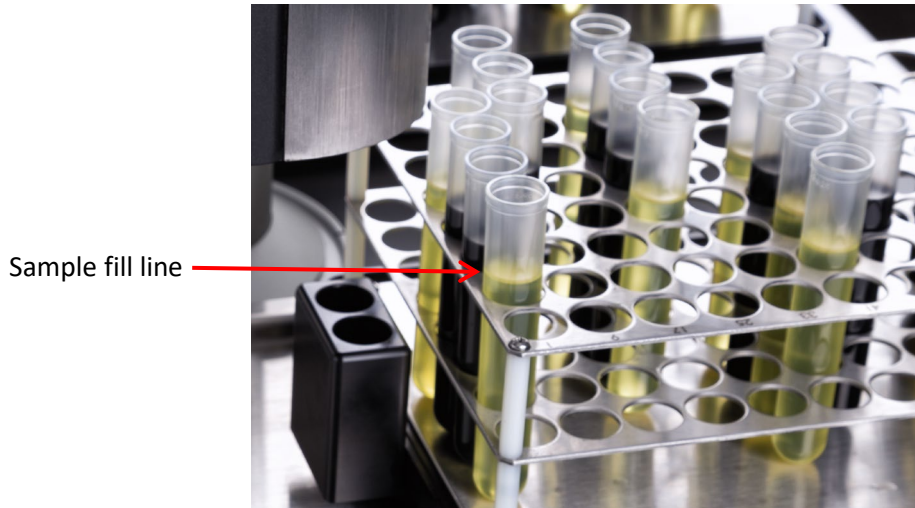


Figure 33: Sample Fill Line

2. From the **At a Glance** screen, use a single touch to select the desired Tray. See Figure 34.

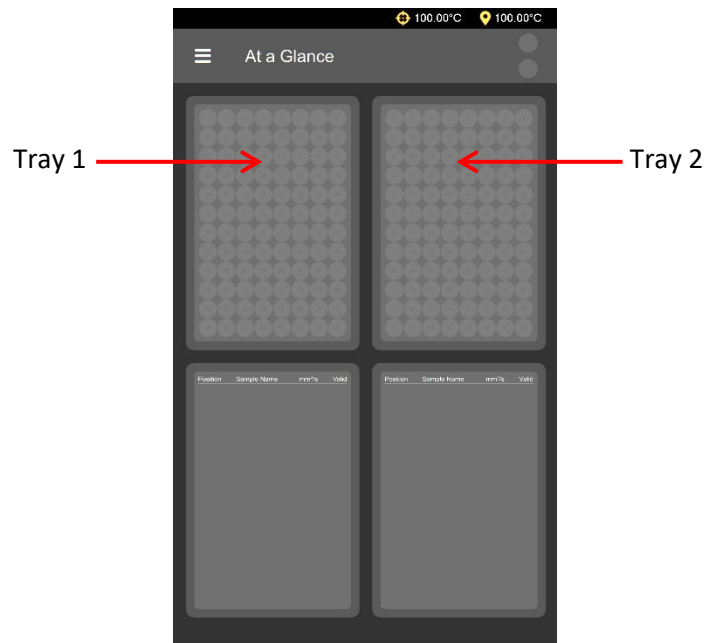


Figure 34: Choose Tray

Load Standards in Backpack

Loading and running standards in the backpack is optional but the use of this feature allows you to verify the UltraVIS is in calibration before and/or after a sample tray is run.

1. Choose position for the standard by using a single touch to select position **A** or **B** in backpack and then selecting **Standard** button. See Figure 35.
 - a. Position **A** will run the standard BEFORE the samples in tray
 - b. Position **B** will run the standard AFTER the samples in tray
 - c. To run both standards either before or after the tray, navigate to the **Main Menu** screen and select **Test**. From the **Test** menu, scroll to **Run Time A/Run Time B** and use dropdown on right to change to preferred run time.

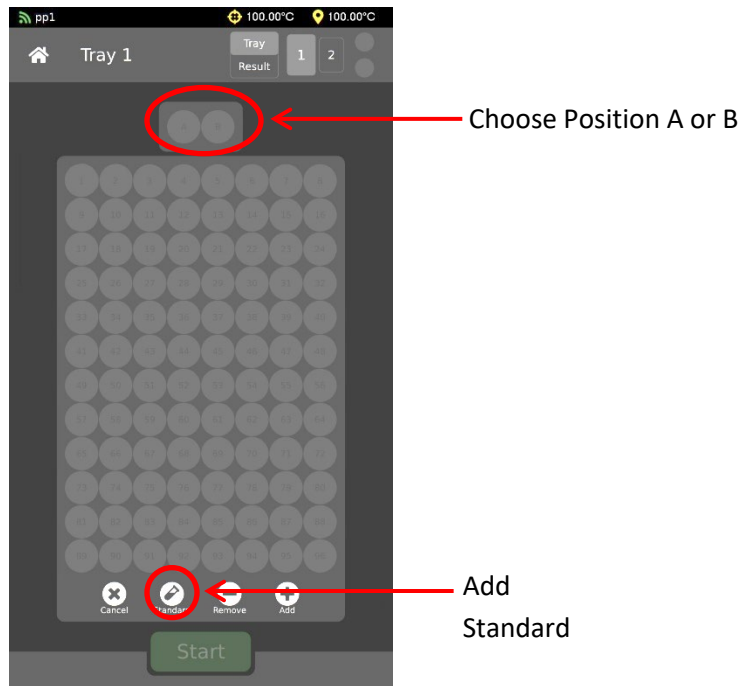


Figure 35: Load Backpack

2. Select appropriate standard. See Figure 36.

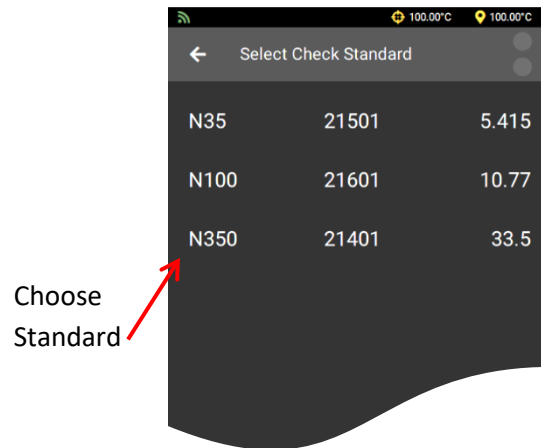


Figure 36: Select Standard for Sample Group

3. If needed, repeat steps 1-2 to load second position.

Load Samples

The software allows the instrument to test multiple groups of samples per tray.

1. Enter the first group of samples to be tested by highlighting the circles on screen that correspond with the location of those samples in the tray. Touch again to deselect. Once all samples for one group are highlighted, select **Add**. See Figure 37.



Note: If you highlighted the incorrect circles, press **Cancel** to deselect everything that is highlighted. Or, to remove individual highlights, touch the individual circle.

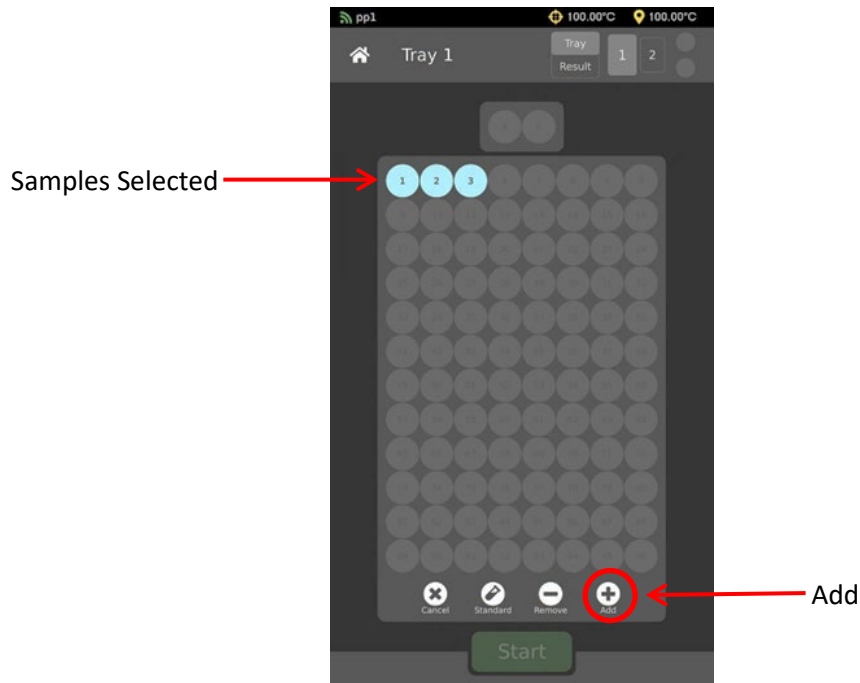


Figure 37: Add Sample Group

2. Once the Sample Group has been added, enter the **Sample Name**. When finished, move to the next screen by selecting the **Green Checkmark**. See Figure 38.

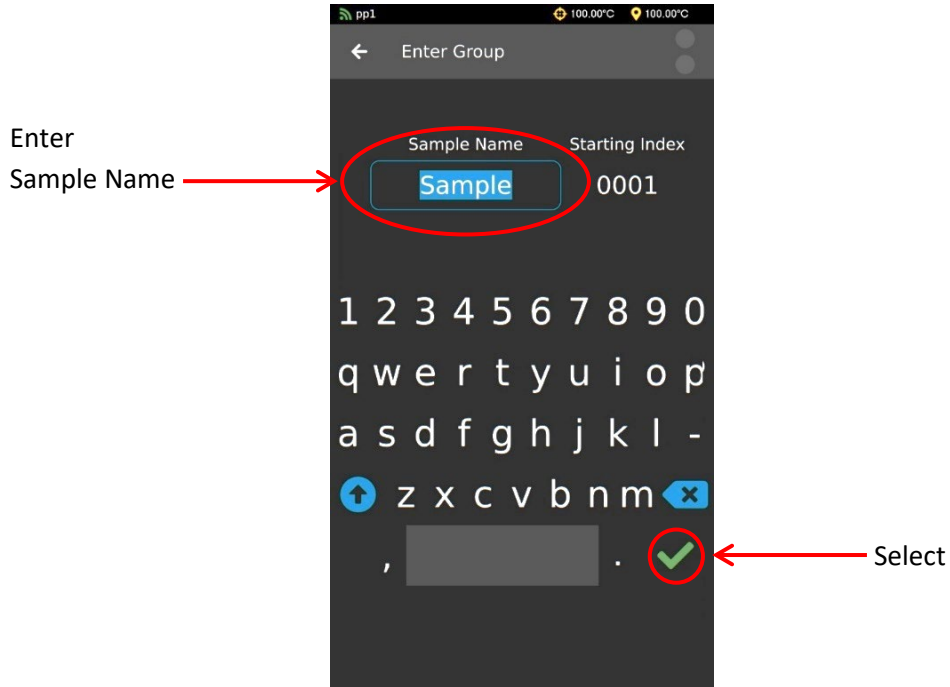


Figure 38: Sample Name

3. Next, enter the **Starting Index** and select the **Green Checkmark**. See Figure 39.

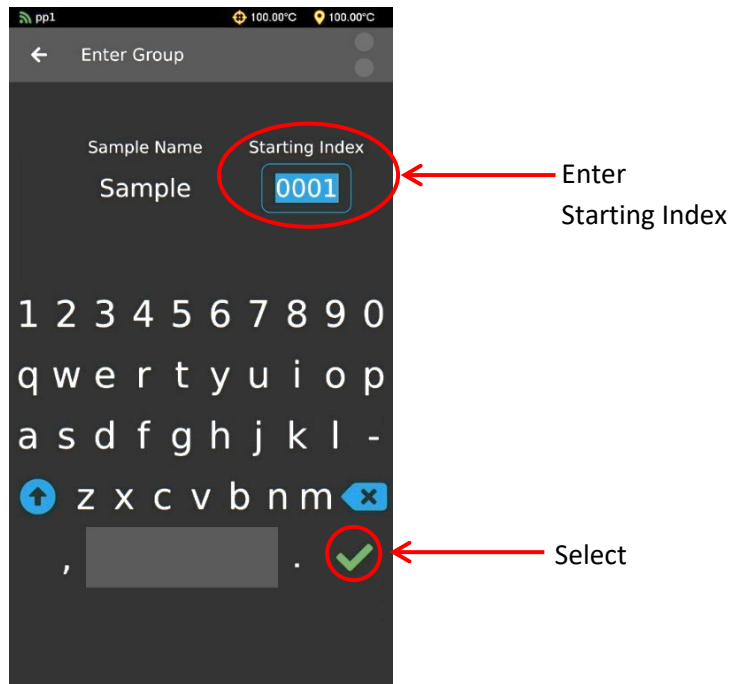


Figure 39: Starting Index

- Repeat steps 1-3 for all sample groups in selected tray. The software will display each sample group in a different color for easy identification of groups. For example, in Figure 40 there are four sample groups in tray 1.

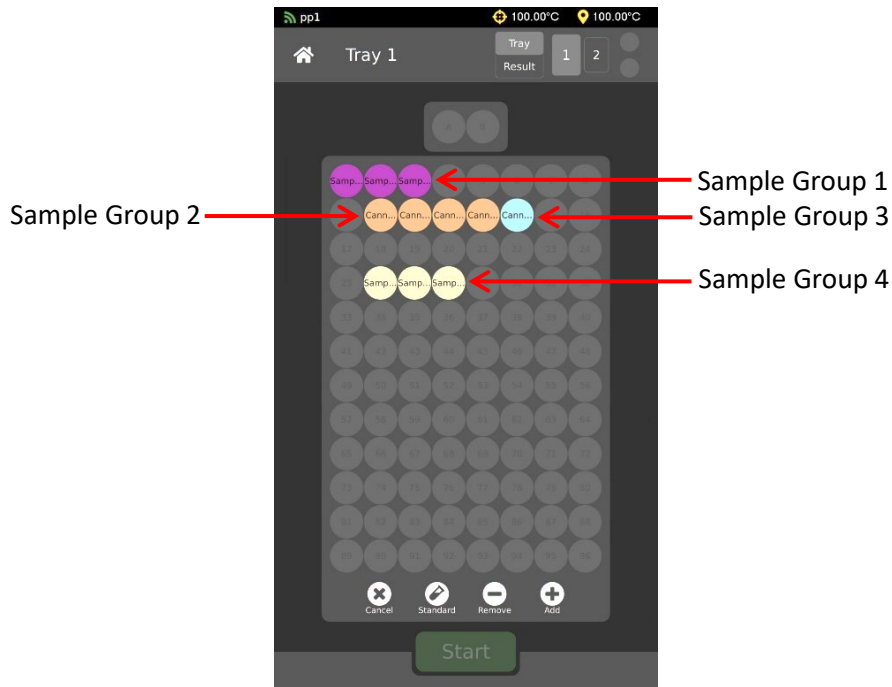


Figure 40: Multiple Sample Groups

- To remove samples once they are entered, simply highlight the circle(s) representing the sample(s) you'd like to delete and press the remove button. See Figure 41.

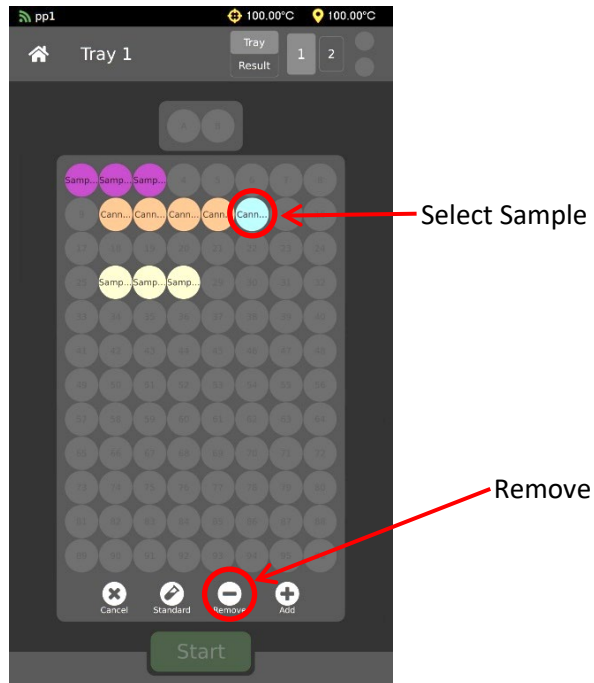


Figure 41: Remove Samples

Run Tray

1. Once all standards and samples for selected tray are entered, press **Start**. See Figure 42

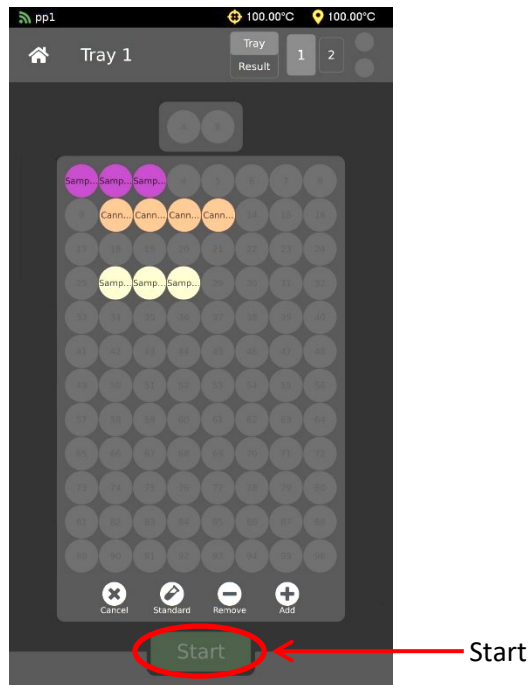


Figure 42: Start Sample Testing

2. Once **Start** is pressed, the tray slides back into place, the Gantry moves to the selected vial in the sample tray and injects the sample into the viscometer cell twice; the first sample drop cleans the cell, the second drop is measured.
3. When the sample test is complete for the first vial, the Gantry moves on to the next sample vial and continues testing.

Load Second Tray

After all sample information is entered for the first tray, you may now load Tray 2. See Figure 43.

1. Select second tray
2. Repeat process above to load standards in backpack and samples in tray.
3. Next, press **Load** button to ensure the gantry automatically switches from **Tray 1** to **Tray 2** when tray 1 testing is completed.

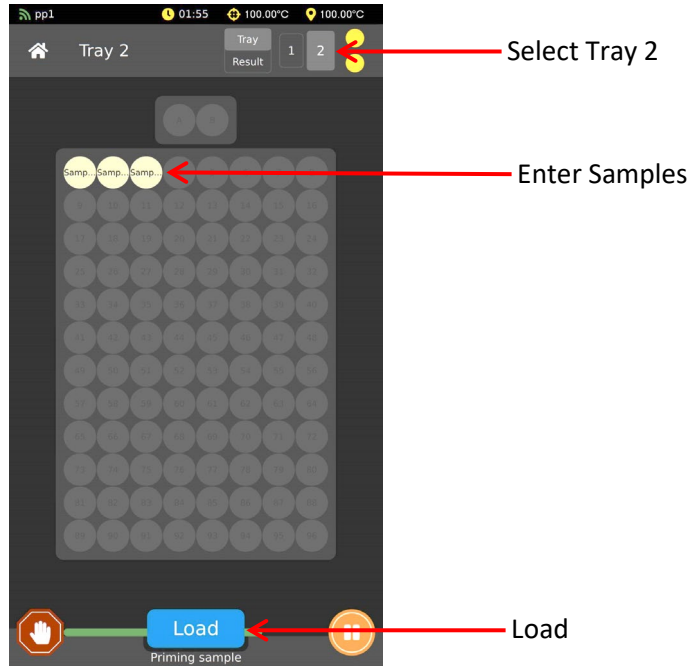


Figure 43: Load for Tray 2

Monitoring Testing Status

1. The touchscreen displays the sample and test status as well as which sample it is testing. See Figure 44.

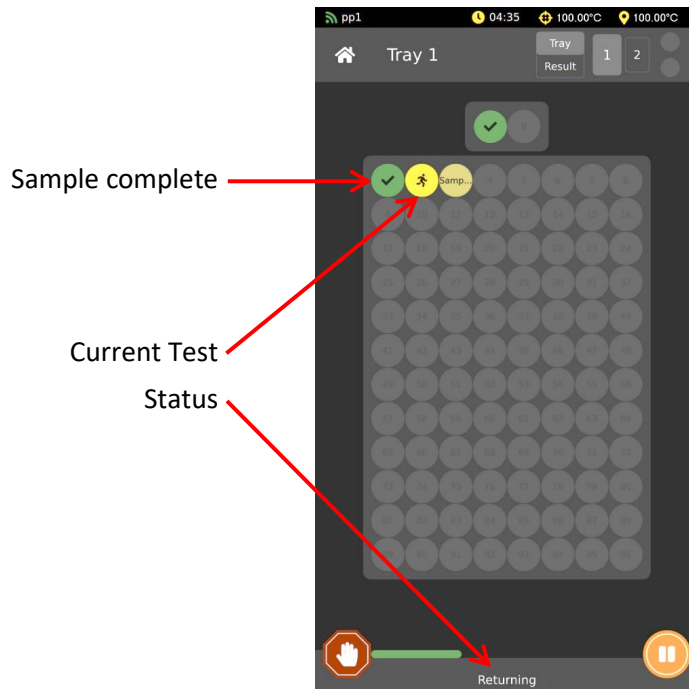


Figure 44: Sample and Test Status

2. The **At a Glance** view (the home screen) provides information for sample testing for both trays as well as results. See Figure 45.

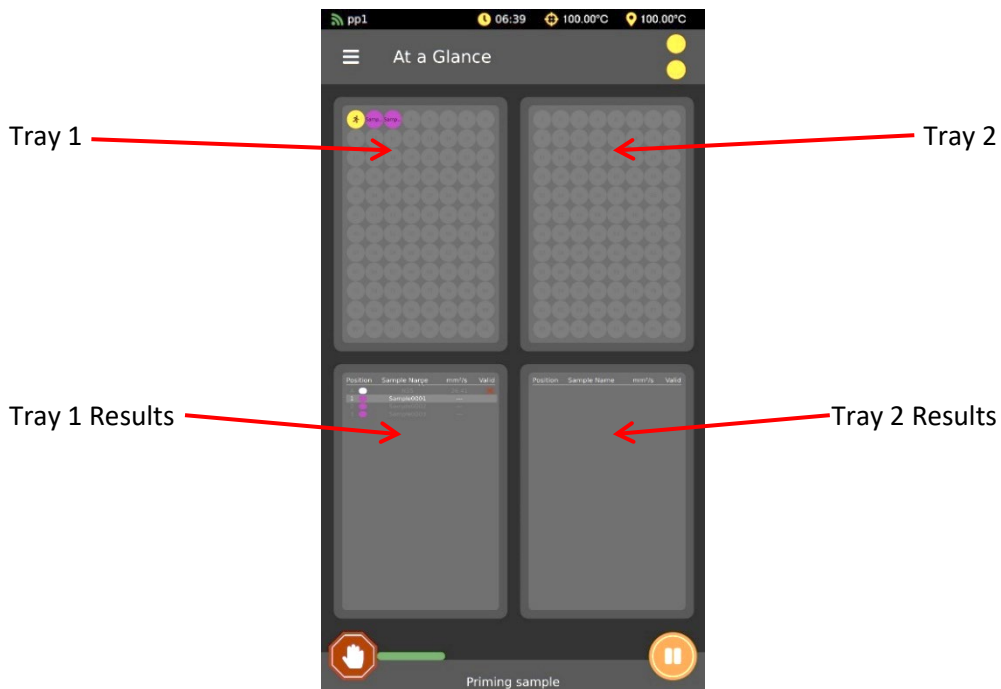


Figure 45: GUI "At a Glance"

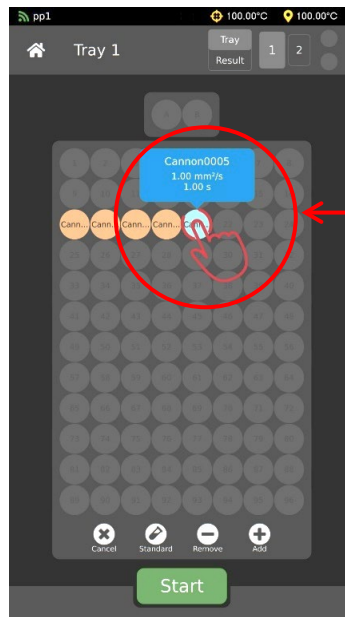


Review and Export Data

View Results Onscreen

Results can be viewed onscreen at any point during testing.

1. To review individual detailed information, press and hold down on a sample from the **Tray** screen. See Figure 46.



Press and hold for detailed sample information.

Figure 46: Single Sample Results

2. All sample results from a particular tray may be viewed from the **Results** screen. See Figure 47.

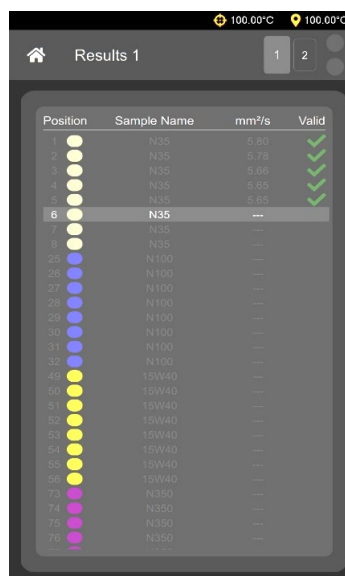


Figure 47: Tray Sample Results

View Results Onscreen with Dashboards

Dashboards allow you to view past samples and customize how the data is displayed onscreen. You can select time range and the data of interest, e.g., sample name, time stamp, efflux time, etc.

View Results on Dashboard Page

1. From the main screen, **At a Glance**, use a single touch to select the “hamburger” or three-line button in top left corner next to the title **At a Glance**, to view the **Main Menu** Screen. See Figure 8.
2. From the **Main Menu** select **Dashboard**. See Figure 48.

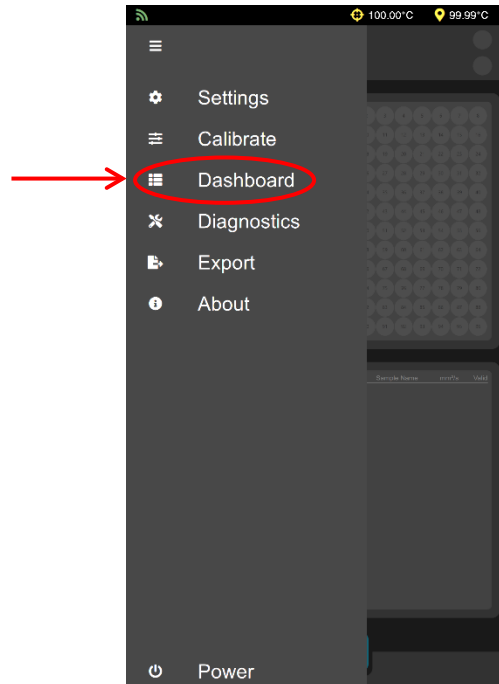


Figure 48: Select Dashboard

- When Dashboard Page opens, results are display based on the current Dashboard Settings. See Figure 49.

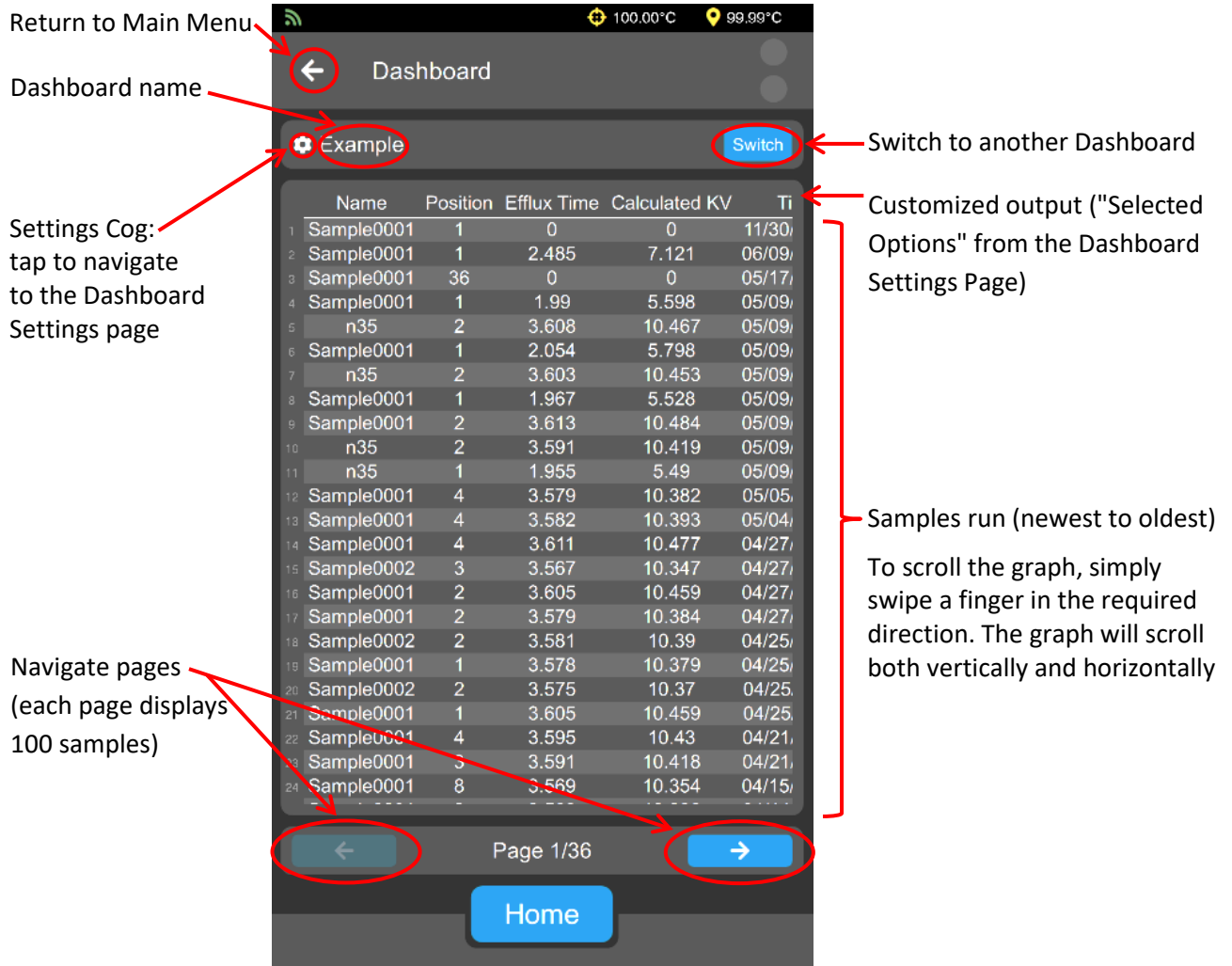


Figure 49: Dashboard Page

Create a New Dashboard

- From the main screen, **At a Glance**, use a single touch to select the “hamburger” or three-line button in top left corner next to the title **At a Glance**, to view the **Main Menu** Screen. See **Figure 8**.

- From the **Main Menu**, choose **Settings**. The **Settings** menu will expand, choose **Dashboards**. See Figure 50.

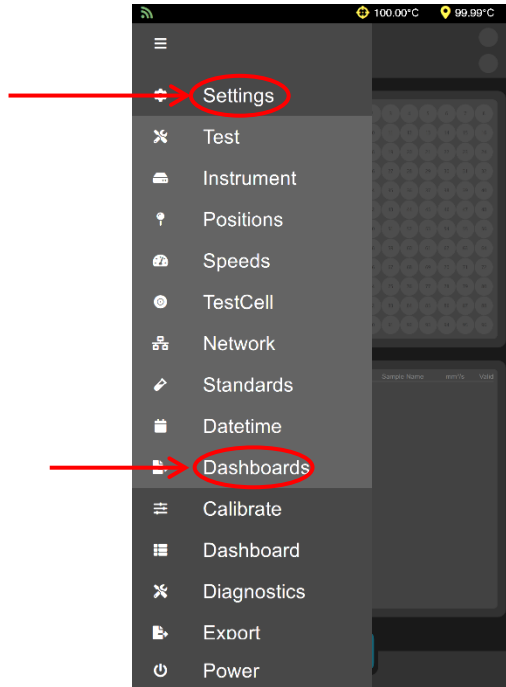


Figure 50: Settings Menu/Dashboards

- From the Dashboard Files Screen, use a single touch on the three dots in the upper right-hand side of screen. See Figure 51.

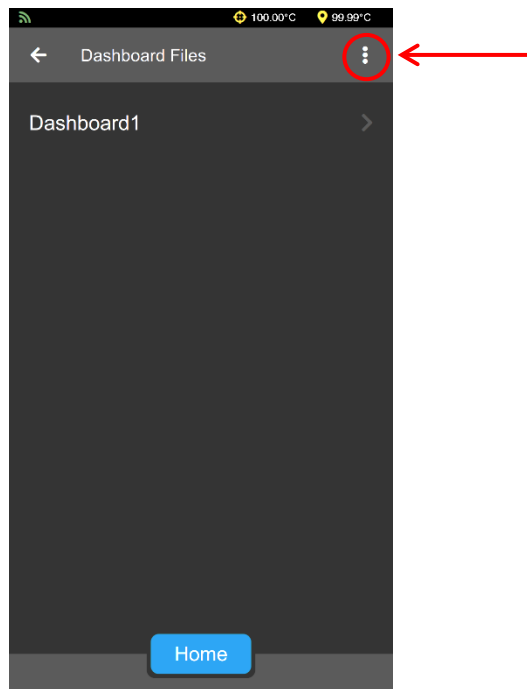


Figure 51: Dashboard Files Screen

4. Select **Add New** from the dropdown list and a new default Dashboard will be created. See Figure 52.

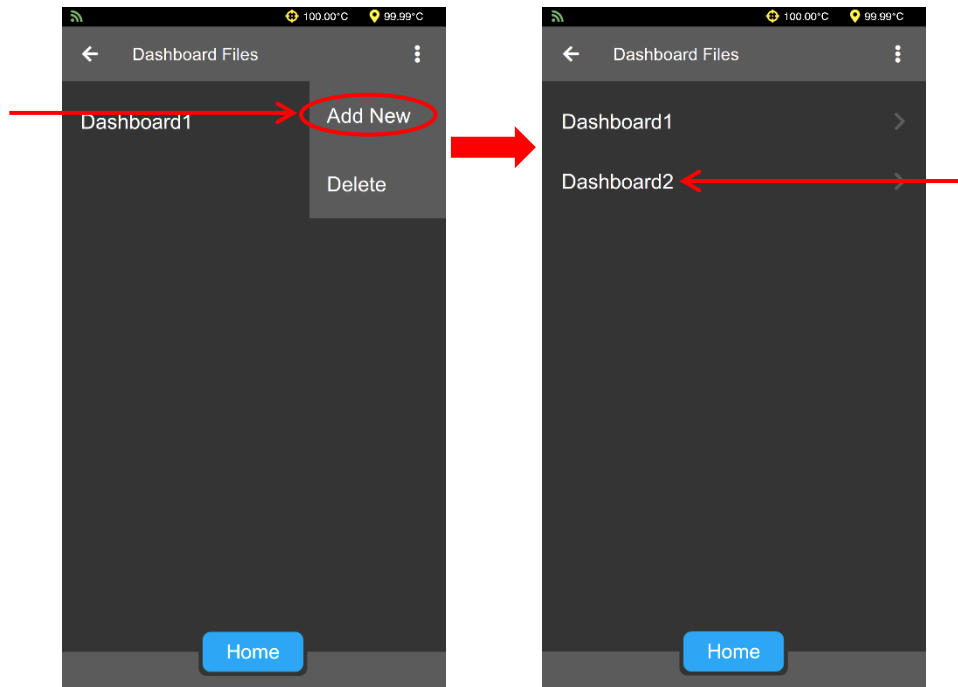


Figure 52: Add New Dashboard

Delete a Dashboard

1. From the main screen, **At a Glance**, use a single touch to select the “hamburger” or three-line button in top left corner next to the title **At a Glance**, to view the **Main Menu** Screen. See Figure 9.
2. From the **Main Menu**, choose **Settings**. The **Settings** menu will expand, choose **Dashboards**. See Figure 50.
3. From the Dashboard Files Screen, use a single touch on the three dots in the upper right-hand side of screen. See Figure 51.

4. Select "Delete" from the dropdown list. See Figure 53

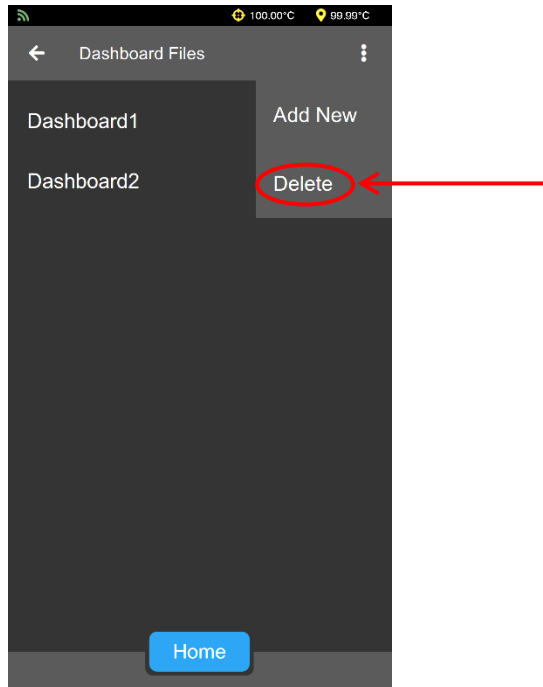


Figure 53: Dashboard Files Menu Screen

5. Find the desired Dashboard and delete it by selecting it with a single touch. See Figure 54.

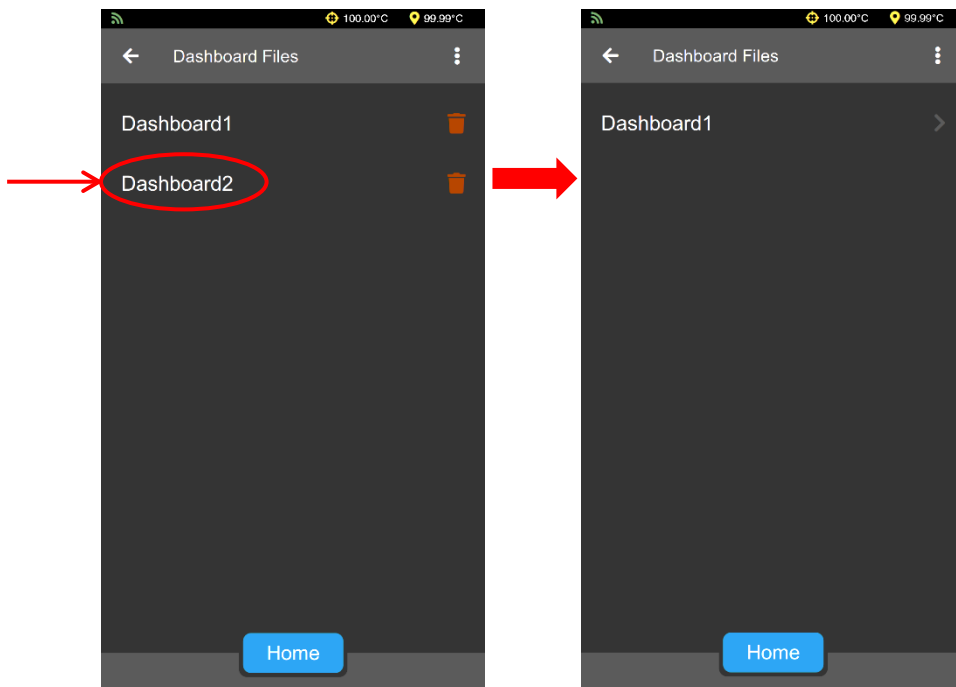


Figure 54: Delete Dashboard

Rename a Dashboard

1. From the main screen, **At a Glance**, use a single touch to select the "hamburger" or three-line button in top left corner next to the title **At a Glance**, to view the **Main Menu** Screen. See Figure 9.

2. From the **Main Menu**, choose **Settings**. The **Settings** menu will expand, choose **Dashboards**. See Figure 50.
3. From the **Dashboard Files** screen, use a single touch on the desired Dashboard to access the **Dashboard Details** screen. See Figure 55.

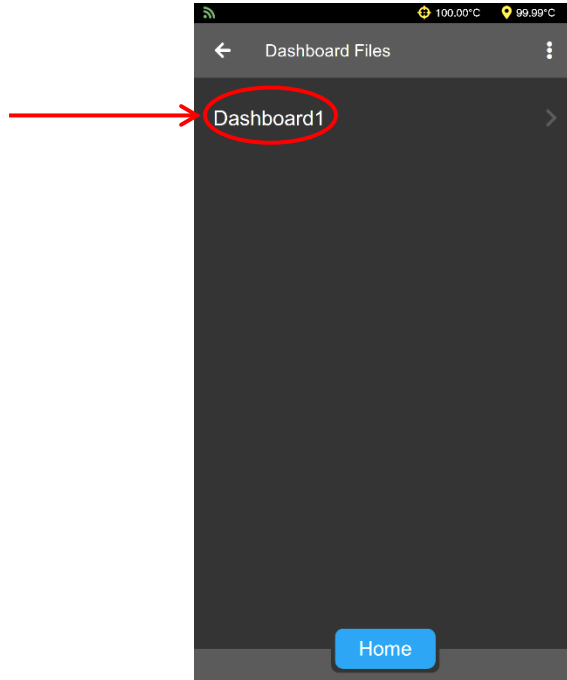


Figure 55: Accessing Dashboard Details Screen

4. Select **Name** to edit name. See Figure 56.

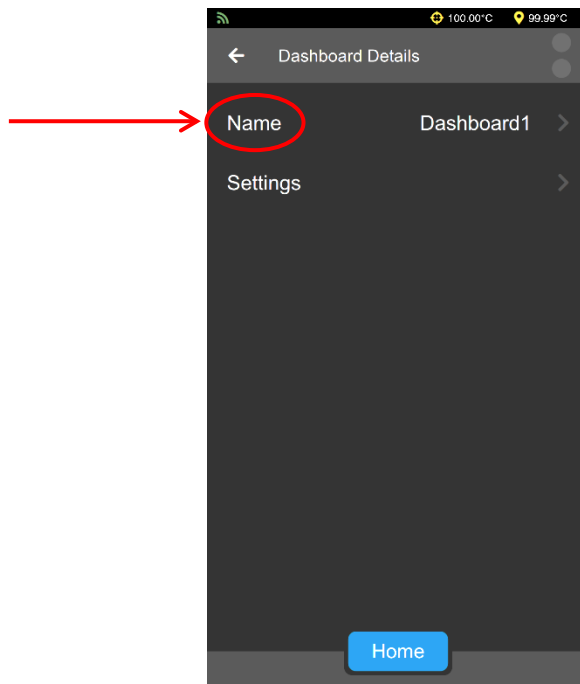


Figure 56: Dashboard Details Screen

5. Use keyboard to enter desired name and then tap the green checkmark. See Figure 57.

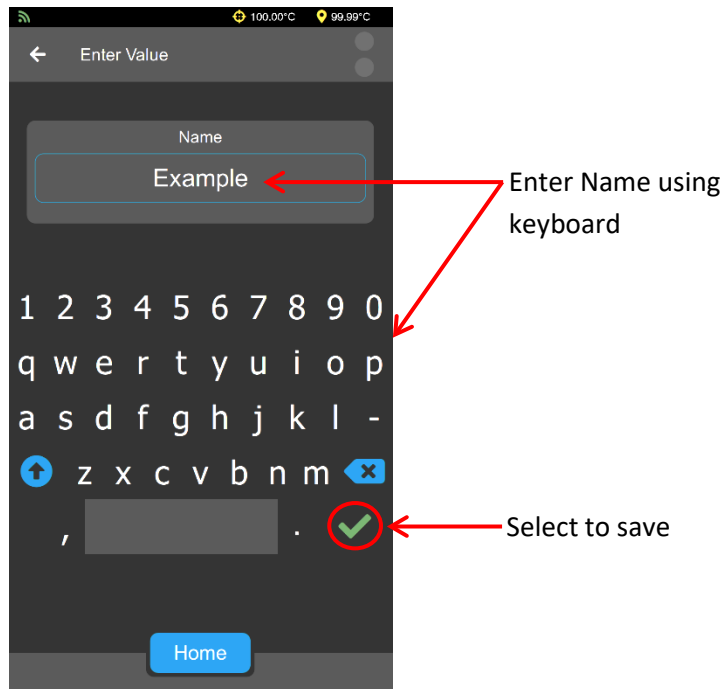


Figure 57: Change Dashboard Name

6. Last, tap the back arrow, in the top left of the screen, to return to the **Dashboard Files** screen. See Figure 58.

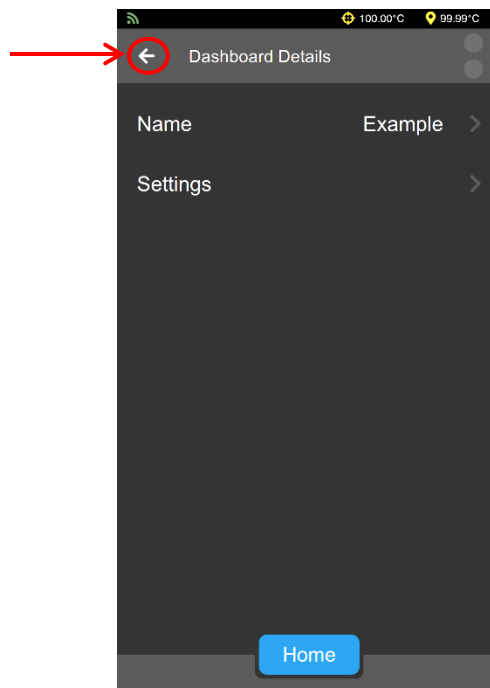


Figure 58: Return to Dashboard Files

Change Dashboard Settings

1. From the main screen, **At a Glance**, use a single touch to select the “hamburger” or three-line button in top left corner next to the title **At a Glance**, to view the **Main Menu** Screen. See Figure 9.
2. From the **Main Menu**, choose **Settings**. The **Settings** menu will expand, choose **Dashboards**. See Figure 49.
3. From the Dashboard Files Screen, tap to select the desired Dashboard to access the Dashboard Details screen. See Figure 55.
4. Select **Settings** to navigate to the **Dashboard Settings** Page. See Figure 59.

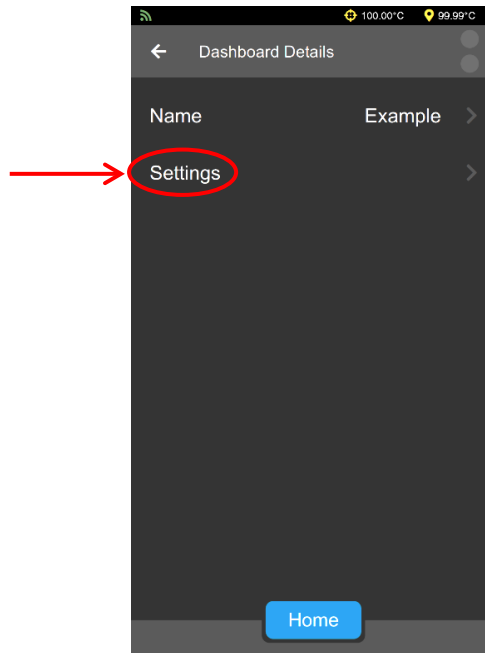


Figure 59: Selecting Dashboard Details Settings Page

5. Customize Dashboard settings by moving desired fields to **Selected Options** and setting the time range. See Figure 60.
 - a. Add fields to **Selected Options** by using a single touch on the necessary field(s) under **All Options**. Only fields under **Selected Options** will be viewable on the Dashboard screen.
 - b. Remove fields from **Selected Options** by using a single touch on necessary field(s) under **Selected Option**.
 - c. Select the timespan of the samples to retrieve by using the **-/+** buttons next to Hours to Retrieve. If Hours to retrieve is set to "8", then last 8 hours of samples will be retrieved. If it is set to ∞ , all samples will be retrieved.
 - d. To switch to a different dashboard from this screen, tap **Switch** and select the desired dashboard.
 - e. Once all changes have been made, use the back arrow in the top left of the screen to leave the page.

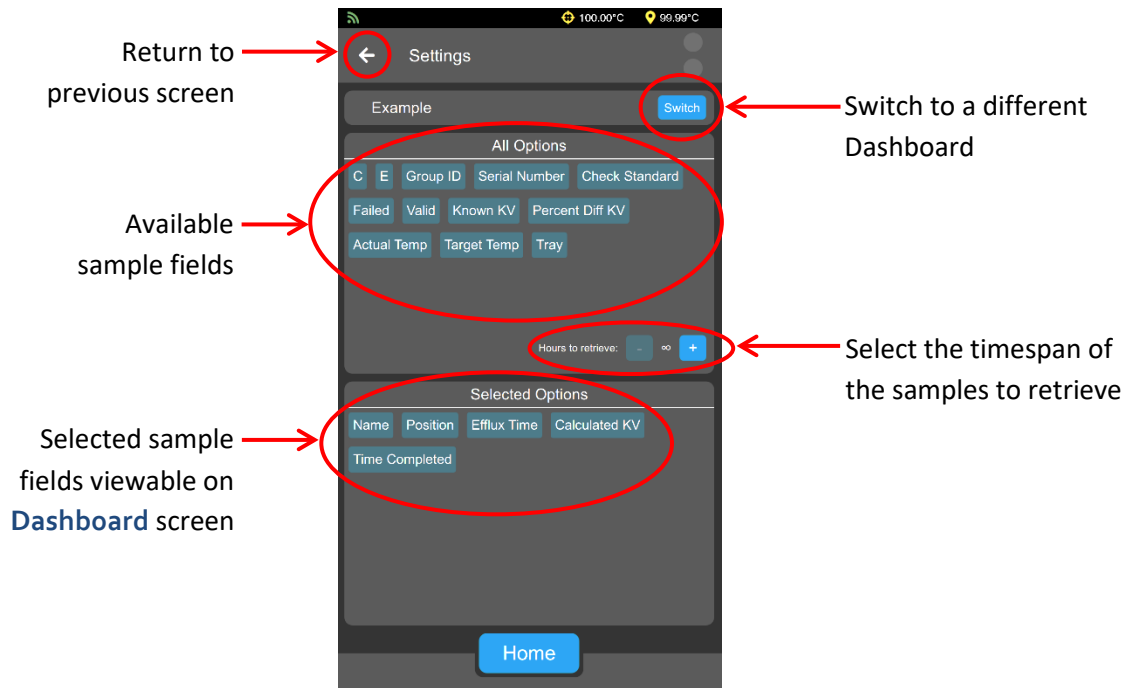


Figure 60: Dashboard Details Settings Page

Export Data to USB drive

Once a test completes, the results can be exported to a USB drive in CSV format.

1. From the main screen, **At a Glance**, use a single touch to select the “hamburger” or three-line button in top left corner next to the title **At a Glance**, to view the **Main Menu** Screen. See Figure 9.
2. From the **Main Menu**, choose **Export**. The **Export** menu will expand, choose **Data**. See Figure 61.

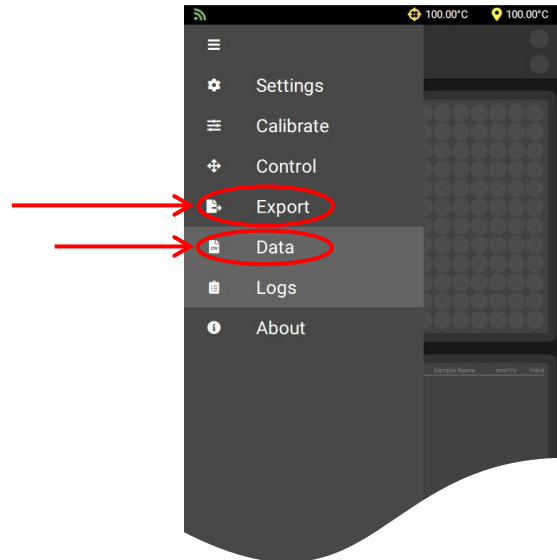


Figure 61: Export Data Menu

3. When prompted, insert your USB drive into the port on the front of the instrument. See Figure 1.
4. Once the drive is inserted, select **Export** and your data will be transferred from the instrument to your USB drive in CSV format. See Figure 62.

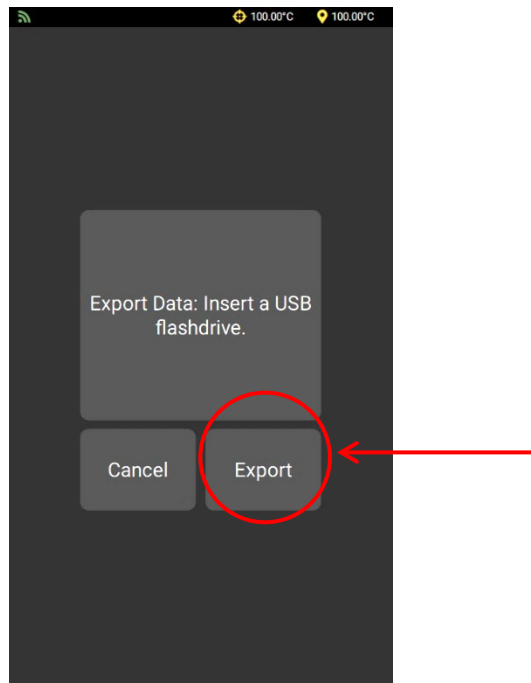


Figure 62: Export to USB Drive

Export Data Using FlowHub

FlowHub is an external data collection application for the UltraVIS. It allows you to customize and format the datapoints you would like to output for each sample run on the UltraVIS.

An external PC and application software are required to connect to FlowHub. Application software can be found on the USB flash drive received with your instrument or can be downloaded from CannonInstrument.com/Downloads.

Connect to FlowHub



Note: *UltraVIS does not support dynamic IP addresses.*

1. Request a static IP address for the instrument from your network administrator.
2. Setup the UltraVIS network settings.
 - a. From the **Main Menu** screen, select **Settings**, and then **Network**. See Figure 63.

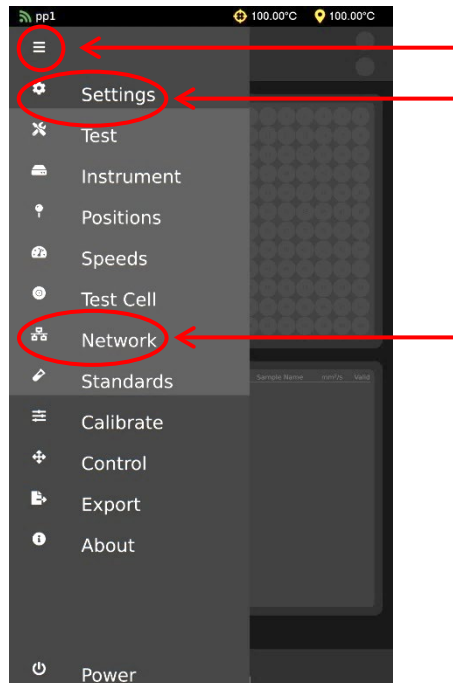


Figure 63: Network Settings Navigation

- b. Enter the IP Address, Subnet Mask, and Gateway to connect to the local network and press **Save**. See Figure 64.

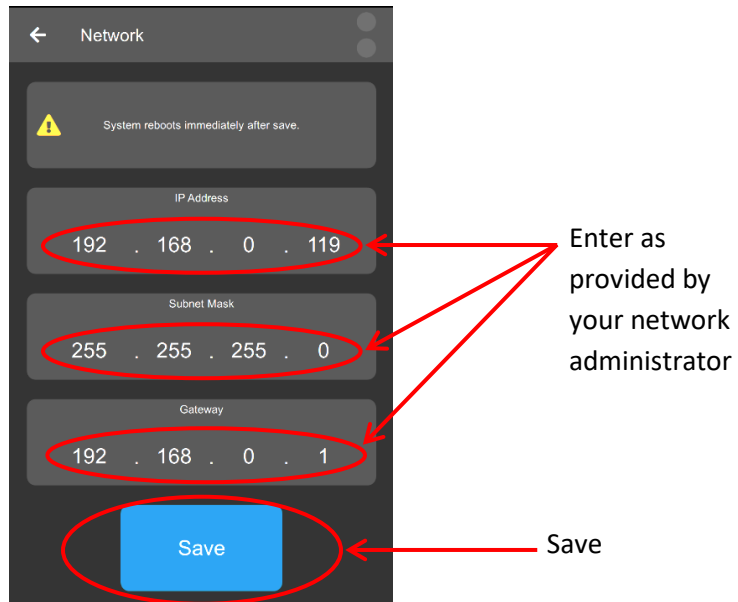


Figure 64: Network Settings Entry Screen

- c. Restart UltraVIS by turning instrument power off and back on again.

3. Setup Output Format in FlowHub. See Figure 65.
 - a. Click **Output Format** on the left side of the FlowHub Home Screen.
 - b. Choose the data for display: drag and drop boxes from the top section to the bottom section.
 - c. To change the decimal precision, double-click on the corresponding box.
 - d. To select a destination folder to save, select **Browse** and choose file location.
 - e. Enter file name under **Network File Name**.
 - f. Enter desired delimiter under **Delimiter**.

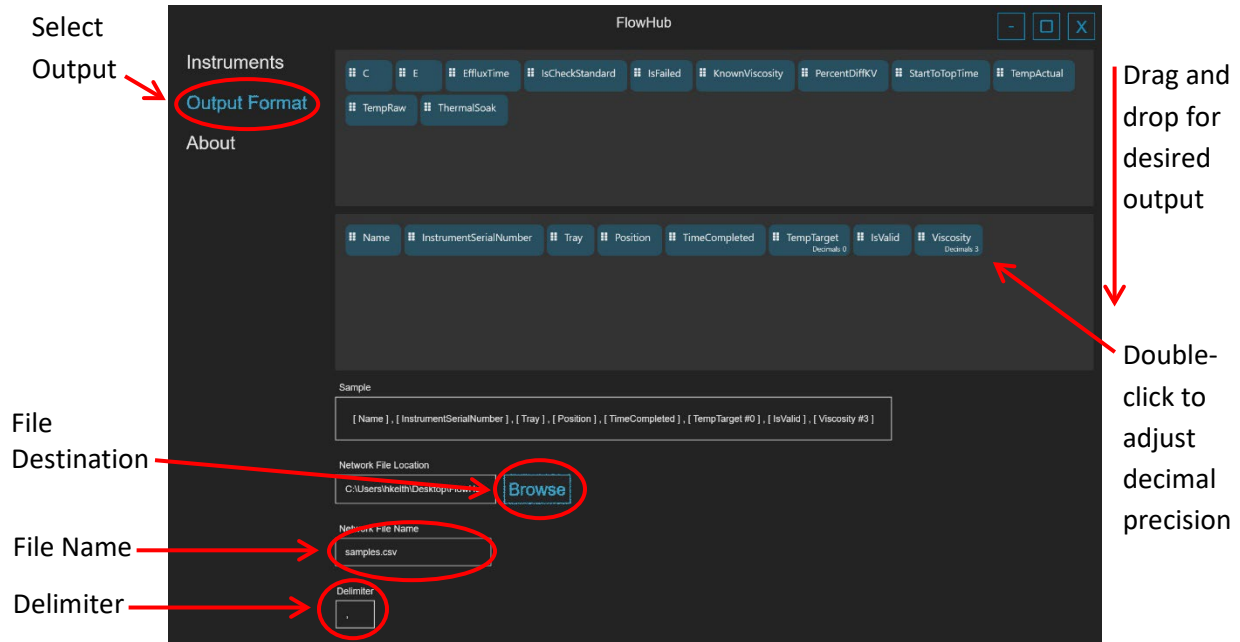


Figure 65: FlowHub Output Format Screen

4. Add instrument to FlowHub. See Figure 66.
 - a. Click **Instruments** on the left side of the Home Screen.
 - b. From the Instrument Menu, select **Add**.

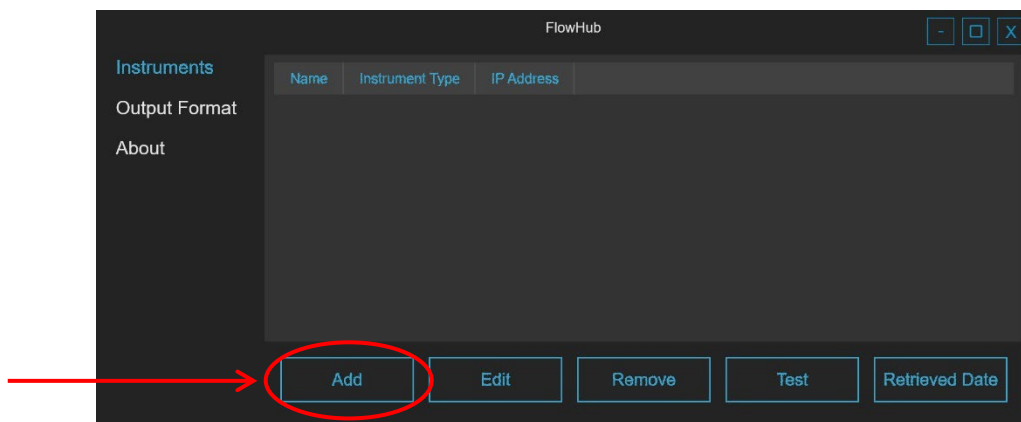


Figure 66: FlowHub Instruments Menu Screen

- c. Fill fields with the same IP Address, Sub Net Mask, and Gateway that you used to set up the UltraVIS network settings in Step 2 and press **Confirm**. See Figure 67.

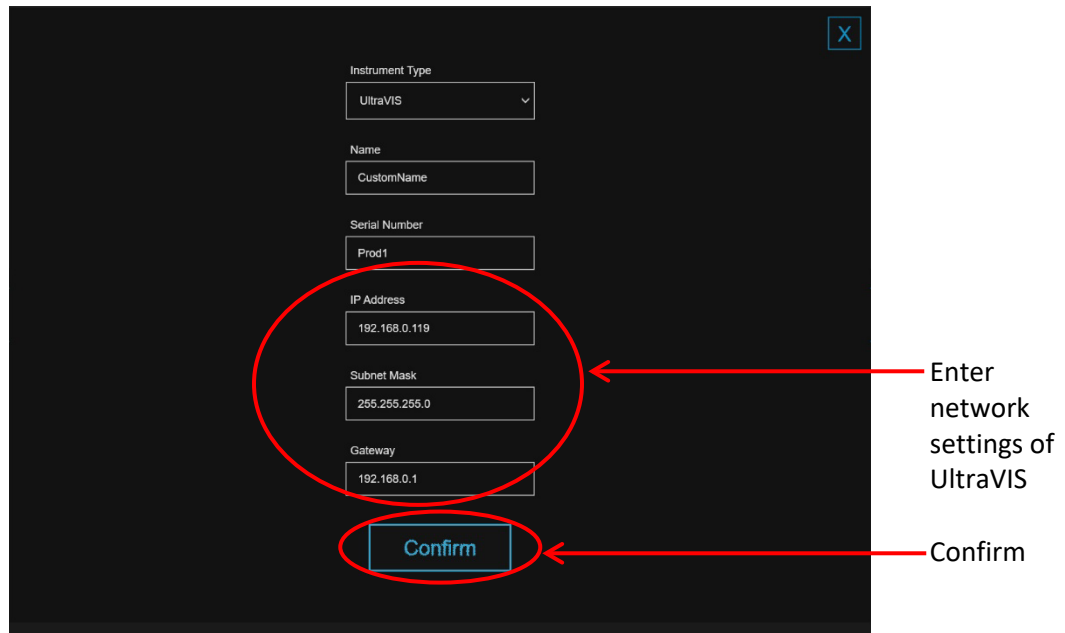


Figure 67: FlowHub Instrument Setup Screen

5. To add multiple instruments, repeat steps 1-4 for each UltraVIS.
6. FlowHub is now setup and will automatically start exporting data to the desired location starting with your next sample run.

Retrieved Date Function

The Retrieved Date Function allows you to export data for samples run prior to connecting to FlowHub and to reexport data from earlier dates after reconfiguring output data point.

1. Navigate to the Instruments Menu Screen in FlowHub.
2. Select desired instrument and click **Retrieved Data**.
3. Enter desired date and time, click **Confirm**.

Change Instrument Settings in FlowHub

To change the settings of a connected instrument, use the following steps.

1. Navigate to the Instruments Menu Screen in FlowHub.
2. Select desired instrument and click **Edit**.
3. Make changes and click **Confirm**.

Remove Instrument from FlowHub

To remove instrument connected to FlowHub, use the following steps.

1. Navigate to the Instruments Menu Screen in FlowHub.
2. Select desired instrument.
3. Click **Remove**.



Warranty

Products Limited Warranty

In addition to other manufacturers' warranties, Cannon Instrument Company ("the Company") warrants all products (other than reagents and chemicals) delivered to and retained by their original purchasers to be free from defect in material and workmanship for one year from the date of the Company's invoice to the purchaser. For a period of one year from the date of such invoice, the Company will correct, either by repair or replacement at the Company's sole discretion, any defect in material or workmanship (not including defects due to misuse, abuse, abnormal conditions or operation, accident or acts of God, or to service or modification of the product without prior authorization of the Company) without charge for parts and labor. The determination of whether any product has been subject to misuse or abuse will be made solely by the Company.

The Company shall not be liable for any special, incidental, or consequential damages, or any damage to plant, personnel, equipment, for products, directly or indirectly resulting from the use or misuse of any product. Representations and warranties made by any person, including dealers and representatives of the Company, which are inconsistent, in conflict with, or in excess of the terms of this warranty shall not be binding upon the Company unless placed in writing and approved by an officer of the Company.

Reagent and Chemical Warranty

Cannon Instrument Company ("the Company") warrants all reagents and chemicals sold by the Company and delivered to and retained by their original purchasers to conform to the weight, specifications and standards stated on the package. The Company will, at its sole option, either replace or refund the price (net of freight, handling charges and taxes), of any reagent or chemical sold by the Company which does not conform to such weight, specifications and standards upon the prompt return of the unused portion. Except for replacement or refund of the net price, the Company shall not be liable for any damages occurring as a consequence of the failure of any reagent or chemical sold by the Company to conform to the weight, specifications and standards stated on the package.

Returning a Product to CANNON

Before returning a CANNON product for repair or service, make every attempt to identify the problem. If, after careful checking, the problem remains unidentified or unsolved, telephone Cannon Instrument Company (or the local service agent) to consult with a product specialist. If the specialist cannot recommend a simple solution or repair, CANNON will authorize the return of the product through the issuance of a Return Authorization number (RA).

- CANNON Telephone Number: 814-353-8000
- CANNON Email: info@cannoninstrument.com

Products returned to CANNON must be carefully packed. Ship prepaid to the following address:

Cannon Instrument Company
ATTN: Return Authorization # _____
2139 High Tech Road
State College, PA 16803 USA

The following information must be included with the return shipment.

Required Information

- The Return Authorization number (RA).
- The name and telephone number of the person at your company to contact regarding the product.
- Shipping and billing instructions for the return of the product to your location.
- A detailed explanation of the reason for the return. If the product is not covered by warranty, the customer will be provided with an estimate of the repair costs and asked for approval before any repairs are made. The customer will be required to issue a purchase order for the cost of the repairs.

Hazardous Materials

Please contact CANNON before returning a product that could possibly contain hazardous material.

Shipping Notification

Products returned without CANNON's prior authorization will not be accepted. The customer may be billed a testing fee if a product is returned to CANNON and found to be working properly.



CANNON INSTRUMENT COMPANY®

2139 High Tech Road | State College, PA 16803 | USA
800-676-6232 | 814-343-8000 | Fax: 814-353-8007
sales@cannoninstrument.com | www.cannoninstrument.com