

# VDO Touch

## Vacuum Degassing Oven



This manual contains important operating and safety information. Carefully read and understand the contents of this manual prior to the operation of this equipment.

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For assistance with set-up or operation, contact the ATS service department. Please have this manual and product serial number available when you call.

Telephone: +1-724-283-1212.

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# A. Introduction

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## A.1 Unpacking

Retain all cartons and packing materials until the unit is operated and found to be in good condition. If damage has occurred during shipping, notify Applied Test Systems (ATS) and the carrier immediately. If it is necessary to file a damage claim, retain the packing materials for inspection by the carrier.

## A.2 After Sale Support

If there are any questions concerning the operation of the unit or software, contact the ATS Service Department at +1-724-283-1212. Before calling, please obtain the software revision number and the serial number from the unit's data tag. A sample data tag is illustrated in Figure A.1, and can be completed with the unit's information for easy reference. Please be prepared to give a complete description of the problem to the ATS Service Department.



The image shows a rectangular data tag with a thick black border. On the left side, there is a stylized logo for 'ATS'. To the right of the logo is a table with four rows and two columns. The first row is labeled 'NO.' and is empty. The second row has 'AMP' in the left column and 'VAC' in the right column. The third row has 'PH' in the left column and 'HZ' in the right column. The fourth row is empty. Below the table is a large, empty rectangular box for additional information.

|     |     |
|-----|-----|
| NO. |     |
| AMP | VAC |
| PH  | HZ  |
|     |     |

Figure A.1 - ATS Sample Data Tag

# B. Safety

---

## B.1 For Owners, Operators, and Maintenance Personnel

All Applied Test Systems (ATS) equipment is designed to be operated with the highest level of safety. To maintain the safe operation of this equipment, ATS endeavors to educate the operator about safety issues surrounding certain parts of the machinery. These safety issues are addressed through the use of labeling on the equipment. The following labels may appear on your test unit:



Burn Hazard/Hot Surface



Electrical Shock/Electrocution



Hand Crush/Force From Above



Protective Earth (Ground)



European Directive CE Mark



General Danger



No Access For Unauthorized Persons



Read Operator's Manual

In addition to the safety warnings listed above, warnings are posted throughout the manual. Read and follow these important instructions. Failure to observe these instructions can result in permanent damage to the unit, significant property damage, personal injury, or death.

Read and understand all instructions and safety precautions listed in this manual before installing or operating your unit. If you have any questions regarding operation of the unit or instructions in this manual, contact the ATS service department at 724-283-1212

## B.2 Warnings

The following statements are warning statements. Unlike caution statements, warning statements alert the operator to conditions that may injure personnel. Operators must be aware of these conditions in order to prevent injuries

that may occur while operating this equipment.



**WARNING:** Disconnect power prior to performing maintenance. Turn off the unit and disconnect the line cord from the power source before performing any maintenance procedures.



**WARNING:** Hot / Burn surface, use personal protective gear when operating VDO, and handling materials associated with the testing procedure.



**WARNING:** Pinch hazard.



**WARNING:** Do not open the panel.



**WARNING:** Unpack and operate on a stable surface.

### B.3 Cautions

The following statements are caution statements. These statements alert the operator to conditions that may damage equipment. Operators must be aware of these conditions in order to ensure safe operation of this equipment.



**CAUTION:** Installation of electrical devices must be accomplished by competent personnel and done in accordance with any current local and national codes. Equipment grounding is a MUST.



**CAUTION:** Before energizing the electrical power to the vacuum degassing oven, turn off all power switches and place all controls in an OFF position. Check that your power source is of the appropriate voltage and is surge-protected. Use appropriate power adapters based upon your region.

# C. System Overview

---

## C.1 Equipment Parts

### Front of Unit



Figure C.1 - Front of Unit

- |                       |                        |
|-----------------------|------------------------|
| 1. Lid with View Port | 5. Touchscreen         |
| 2. Leveling Legs      | 6. Stylus & Holder     |
| 3. Power Indicator    | 7. Vacuum Relief Valve |
| 4. USB Port           |                        |



## Back of Unit

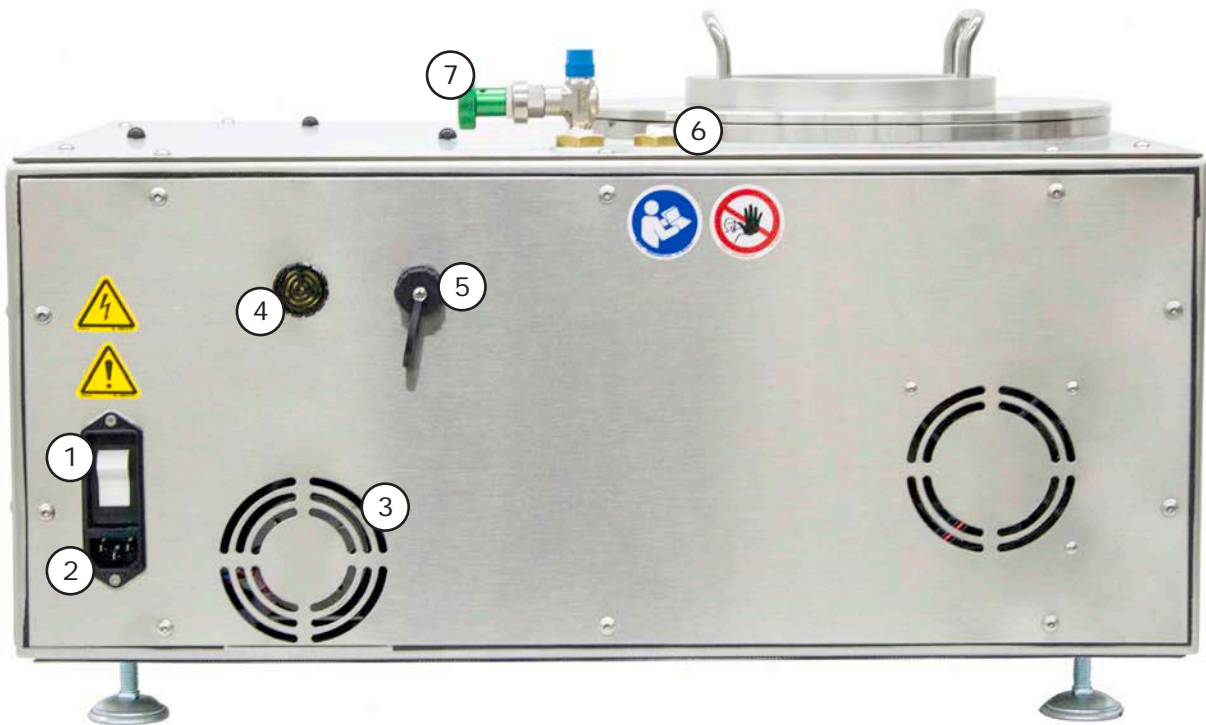


Figure C.2 - Back of Unit

- |                        |                                 |
|------------------------|---------------------------------|
| 1. ON/OFF Switch       | 5. Ethernet/LAN Connection Port |
| 2. AC Power Connection | 6. Vacuum Verification Port     |
| 3. Fan                 | 7. Vacuum Relief Valve          |
| 4. End of Test Alarm   |                                 |

## Interior Chamber



Figure C.3 - Tank Interior

- |                             |                       |
|-----------------------------|-----------------------|
| 1. O-Ring                   | 4. Vacuum Pump Intake |
| 2. Vacuum Verification Port | 5. Exhaust            |
| 3. Vacuum Relief Valve      | 6. RTD                |

## Interior Controls

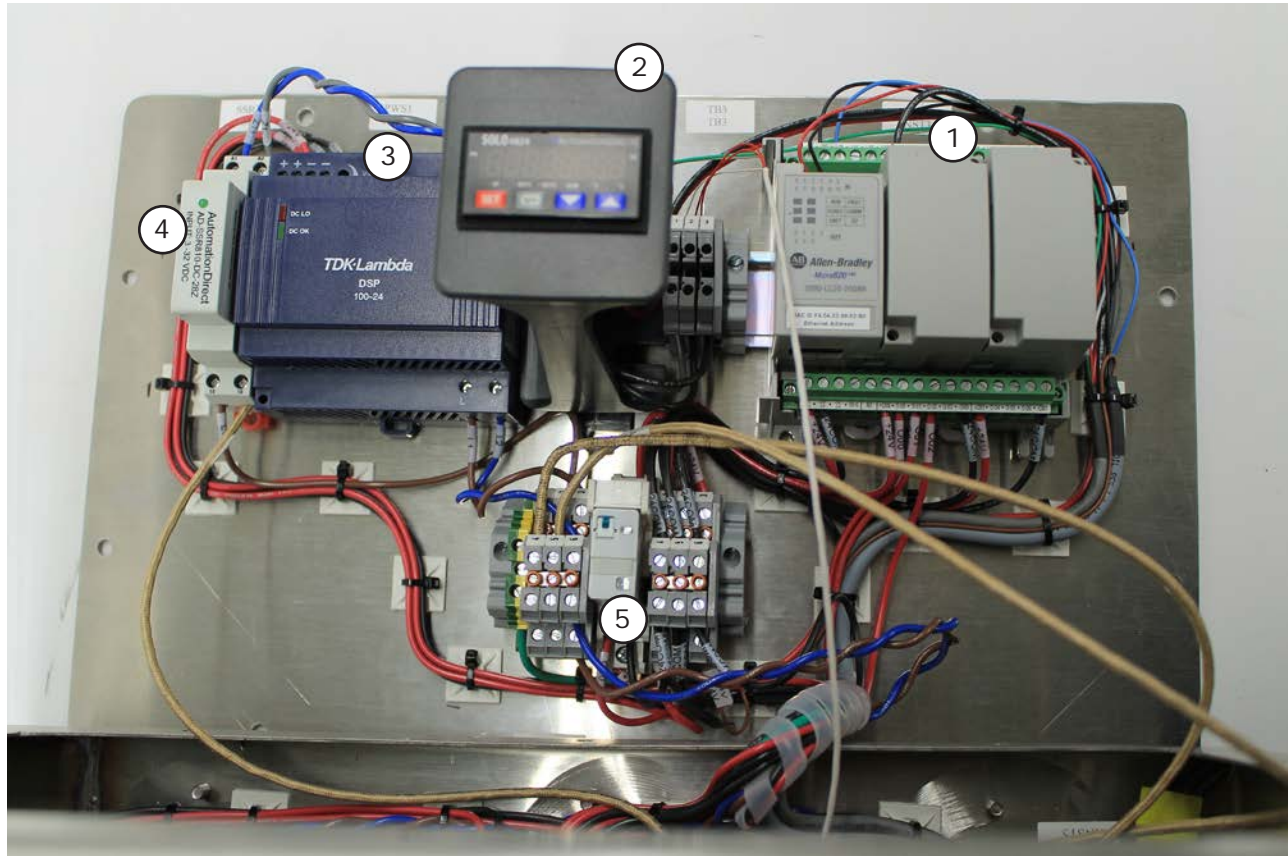


Figure C.4 - Controls

- |  |                     |
|--|---------------------|
| 1. Programmable Logic Controller (PLC) | 4. Heat Control SSR |
| 2. VDO Temperature Controller          | 5. Vacuum Pump SSR  |
| 3. DC Power Supply (24 voc)            |                     |

## C.2 General Product Description

The Vacuum Degassing Oven is designed for degassing pressure aged binder samples to precisely and accurately meet AASHTO R28, ASTM D-6521, and EN 14769 test standards.

## C.3 Product Specifications

|                                      |   |
|--------------------------------------|---|
| Unit Design                          | Bench Top Unit  |
| Specimen Capacity                    | 4 eight ounce or 8 four ounce specimen containers   |
| Product Dimensions                   | 24 inches wide x 16 inches deep x 12 inches high  |
| Weight                               | 78 lbs.   |
| Temperature Range                    | Ambient to 410°F (210°C)  |
| Temperature Accuracy                 | 0.2°F (±0.1°C)  |
| RTD Temperature Measurement Accuracy | Class A RTD at max. temperature ±1°F (±0.55°C)  |
| Over-Temperature Protection          | Disc Thermostat open on rise Auto reset, Open 425°F ±15°F (218°C ±8°C), Close 375°F ±20°F (191°C ±12°C) |
| Vacuum Range                         | 6.6 KPA   |
| Power Requirements                   | 115 V / 60 Hz or 230 V / 50 Hz  |

## C.4 Accessory Items

- Specimen Containers (4 included with unit)
- Specimen Removal Tool (included with unit)
- VDO Verification Kit consisting of a Temperature Monitor, RTD Probe, VDO Chamber Cover, Vacuum Gauge, Brass Extension Fitting Parts, and Calibration Fixture (Figure C.5).



Figure C.5 - VDO Touch Verification Kit

- |                        |                                  |
|------------------------|----------------------------------|
| 1. Temperature Monitor | 4. Calibration Fixture           |
| 2. RTD Probe           | 5. VDO Calibration Cover         |
| 3. Vacuum Gauge        | 6. Brass Extension Fitting Parts |

## D. Installation

---

### D.1 Unpacking the VDO Touch

Carefully remove the VDO Touch from the packing crate and set it on a level work surface. Make sure to remove any packing materials and/or accessories that may have been placed inside of the vacuum chamber for shipment.

### D.2 Assembling the VDO Touch

1. Place the O-Ring Gasket in the groove on the vacuum chamber flange. These may already be in place. See Figure D.1.



Figure D.1 - O-Ring in Place

2. Replace the lid on the vacuum oven.

3. Level the VDO Touch using the adjusting screws on the four unit feet. This is done by loosening the nuts and adjusting the leveling screws in or out as required. Use a bubble level to ensure the unit is properly balanced.

### D.3 Connecting and Powering Up

1. Make sure the ON/OFF switch on the back of the unit is in the OFF position. Connect the power cord to the AC power connection below it (See Figure D.2).

2. Plug the other end of the power cord into a standard outlet appropriate for the voltage purchased (110-125 VAC 60Hz outlet, 10 amp or greater capacity or use 230-240 VAC 50 Hz 5 amp capacity).

3. Switch the ON/OFF switch upwards to the ON



Figure D.2 - AC Power Connection and ON/OFF Switch



position (see Figure D.2). The orange light on the front of the VDO Touch should illuminate, indicating that the power is now on.

## D.4 Adjusting the Vacuum Readout for Altitude

After the VDO Touch is connected and installed, you will need to adjust the vacuum readout for altitude. This needs to be done when VDO is first installed, and should be checked periodically thereafter. Absolute pressure varies with altitude, and the VDO Touch uses a relative pressure transducer to measure vacuum. Therefore, the readout needs to be corrected for differences in altitude from our location, which is about 1040 feet above Sea level. Absolute pressure also varies from day to day with changes in weather, but these changes are usually less than 1 kPaa.

This procedure will require the use of a calibrated pressure or vacuum gauge, preferably one capable of displaying pressure in absolute kilopascals (kPaa). If the calibrated pressure or vacuum gauge you are using does not display in absolute pressure units, it will be necessary to obtain the current atmospheric pressure reading in in. hg or millibars, and correct this reading for the elevation at your location before converting this value to kPaa (absolute kilopascals).

This can be done by subtracting 0.85 in. Hg for each 250 meters of altitude above sea level (28.8 millibars) or 0.52 in. Hg for each 500 ft of altitude above sea level (17.6 millibars). To convert in. Hg to kilopascals, multiply by 3.386. To convert millibars to kilopascals, divide millibars by 10. Note the value obtained in kilopascals, as it will be used in the steps below:

1. From View Screen, press the Password field to select it. The Password field is located just above the “Settings” button and to the right of the box labeled “ID” (see Figure D.3).

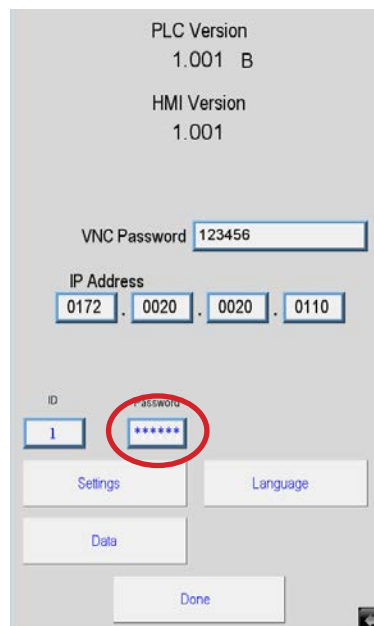


Figure D.3 - Password Field

2. Enter the Password “111111” in the pop-up window that appears, and press the “Enter” key to accept. See Figure D.4.

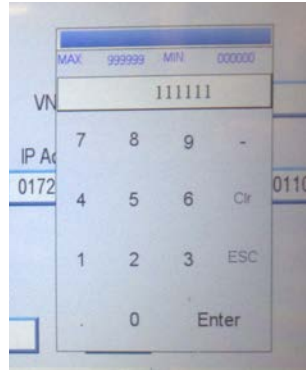


Figure D.4 - Enter Password

3. A new yellow button labeled “Engineering” should appear on the View Screen (Figure D.5).

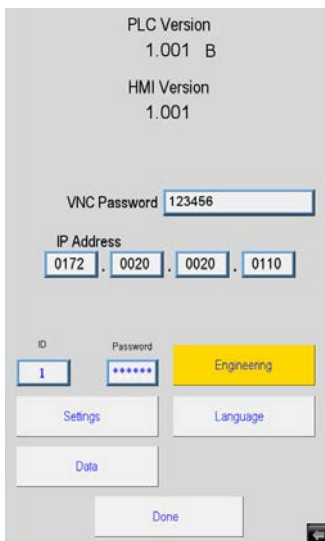


Figure D.5 - View Screen with Engineering Button

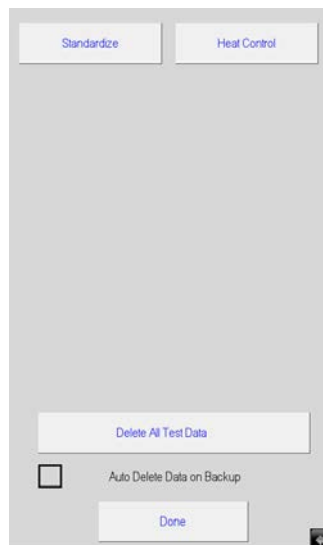


Figure D.6 - Engineering Screen

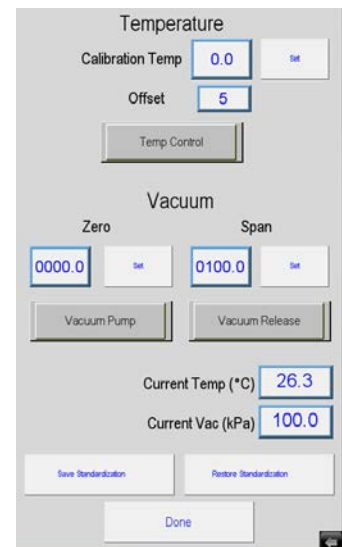


Figure D.7 - Standardization Screen

4. Press the “Engineering” button. A new screen will appear as shown in Figure D.6. Press the “Standardize” button to enter the Standardization Screen, shown in Figure D.7.

5. If using the pressure vacuum gauge in the VDO Touch verification kit, attach the two portions of the brass extension fitting by screwing one into the other, then attach to the base of the pressure vacuum gauge. Secure the connections with teflon tape.

6. Attach the calibrated pressure gauge to the pressure port on the top of the VDO Touch. If using a relative



pressure gauge, enter the value in kilopascals corrected for altitude obtained earlier into the field labeled “Zero”, and press the “Set” button next to the box to save this value to the software. If using an absolute pressure gauge, enter the value displayed by the gage without the vacuum pump running, converted to kPa into the field labeled “Zero”, and press the “Set” button beside this value to save this value to the software (Figure D.8).

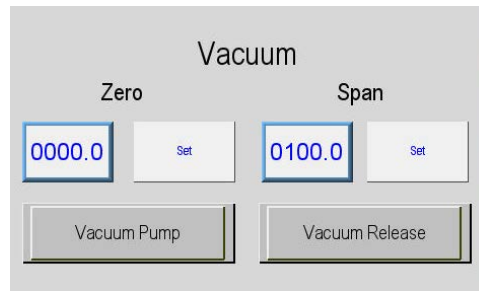


Figure D.8 - Zero Field

7. Press the button labeled “Vacuum Pump” to initiate the vacuum pump evacuating the VDO Touch oven. The green bleed valve on the top of the VDO Touch should be completely closed at this time to allow the VDO Touch vacuum pump to draw its maximum vacuum. If the button marked Vacuum Pump is grayed out, press the Vacuum Release button to close (de-energize) the solenoid valve inside the VDO Touch. This should allow the vacuum pump button to operate and run the vacuum pump.

8. Once the calibrated pressure gauge reaches a stable vacuum reading, enter the vacuum pressure achieved in kPa as indicated by the calibrated pressure gauge into the “Span” field (see Figure D.8) and press the “Set” button to save this reading to the VDO software. If using a relative pressure gauge, this value will be the value obtained by subtracting the vacuum reading displayed by the pressure gauge from the value entered in step 5 above. If using an absolute pressure gauge, this will be the value displayed by the absolute pressure gauge.

9. The standardization of the VDO Touch vacuum transducer is now complete. The reading shown for “Current Vacuum (kPa)” at the bottom right corner of the screen (Figure D.9) should now match the reading shown by the calibrated pressure gauge within +/- 1.0 kPa.

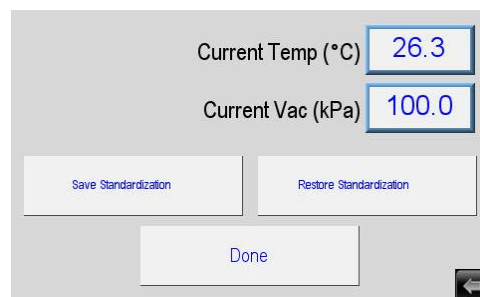


Figure D.9 - Current Vacuum Reading

10. Pressing the “Save Standardization” button at the bottom of the Standardization Screen will store the current standardization values from the PLC to the HDMI so that, if need be, they can be restored later by pressing the

“Restore” button.

Once you have completed your setup, press “Done” until you return to the Main Screen.

## D.5 Remote Communication (Optional)

The VDO Touch is equipped with the ability to connect remotely, and is ready to be connected as soon as it is uncrated. All you will need is an internet connection and a VNC Viewer program.

Both the VNC Password and IP Address fields (located on the View Screen) are programmed with factory default numbers when each unit is shipped. Before connecting remotely, the administrator will need to change both the password and IP address to custom numbers unique to your system. See Figure D.10.

Users attempting to access the VDO Touch remotely using the VNC Viewer program will need both the VNC Password and IP address to login. Caution should be used when distributing this information as the remote login can control the machine.

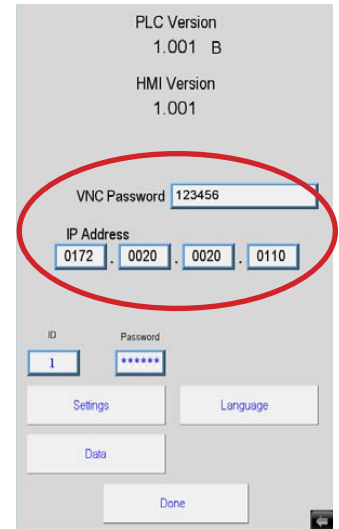


Figure D.10 - View screen

# E. Verification

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## E.1 Verify Temperature

In order to perform an accurate verification of the VDO Touch's temperature, it is recommended that customers purchase a VDO Touch Verification kit from ATS. This kit contains the necessary parts to properly connect a calibrated thermometer to the temperature sensor of the VDO Touch. It also includes the parts needed to provide the insulating material necessary to create a stable oven temperature to perform the verification process.

Should you choose to attempt a temperature verification of the VDO Touch without the use of an ATS VDO Touch Verification Kit, you should be aware of the following:

- It is necessary to have a good thermal coupling between the temperature sensor of the VDO Touch and the temperature probe of the reference temperature measuring device being used to verify the temperature readout of the VDO Touch. This is typically done by means of a brass block or other device suitable to create a stable thermal conductivity between the two devices.
- The VDO oven should have some type of insulating material covering the top of the oven to prevent excessive heat loss during the verification process.

The following temperature verification instructions assume that the customer is using an ATS VDO Touch Verification kit:

1. Place the smaller end of the VDO Touch Temperature Calibration Fixture over the end of the RTD protruding from the bottom of the VDO Touch oven (Figures E.1 and E.2). Secure the brass setscrew in the side of the calibration fixture to the RTD.



Figure E.1 - VDO Touch RTD



Figure E.2 - Calibration Fixture over RTD

2. Place the probe of the calibrated thermometer through the hole in the calibration cover, and insert the probe tip into the larger end of the VDO Touch calibration fixture as far as it will go. Tighten the thumb screw on the top of the calibration fixture against the RTD probe. See Figures E.3 and E.4.

3. Carefully place the cover over the VDO Touch oven, being careful not to dislodge the calibration fixture from the RTD of the VDO Touch. Wrap a rag or other suitable insulation around the end of the temperature probe

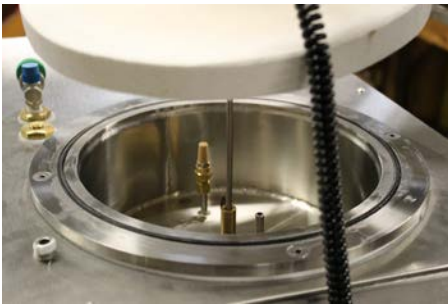


Figure E.3 - Insert probe into fixture



Figure E.4 - Placing cover over oven



Figure E.5 - Wrag wrapped around probe

protruding from the top of the cover to minimize heat loss from the VDO Touch oven. See Figure E.5.

3. From the VDO Touch start up screen, press the “Preheat” button to begin heating the VDO Touch to the setpoint temperature of 170°C. Allow at least 1 to 1-1/2 hours for the VDO Touch to heat and stabilize at the setpoint temperature of 170°C +/- 5 deg. C before taking any comparison readings.
4. Once the temperature of the VDO Touch has stabilized, record a minimum of three comparison readings between the VDO Touch displayed temperature and the temperature shown by the calibrated thermometer. The allowable difference in temperature between the two devices is +/- 1.0°C. Allow a minimum of five minutes between readings. If any of the three readings differ by more than the allowable +/- 1.0°C., wait a minimum of fifteen minutes to allow the temperature of the VDO to stabilize, and repeat the three readings.
5. If a large temperature difference is noted (+/- 5 °C or greater), re-check the physical coupling of the two RTD probes and repeat. If adjustments to the VDO Touch temperature display are required, follow the instructions given in Section F.3 to enter the VDO Touch Standardization Screen.
6. From the VDO Touch Standardization Screen, enter the temperature displayed by your reference thermometer into the box labeled “Calibration Temp.”, and press the SET button next to this box to store this value to the VDO Touch software. The VDO Touch temperature controller will automatically calculate the offset required to correct the temperature displayed by the VDO Touch to match the temperature displayed by the reference thermometer to within +/- 0.2 °C. This offset value will appear in the box labeled Offset on the Standardization screen. This value is displayed in whole numbers , and does not show any decimal point, so a displayed offset of -5 is actually an offset of -0.5 degrees C.
7. Allow the VDO Touch temperature to stabilize at 170°C +/- 1.0 °C , and repeat the verification process.

## E.2 Verify Vacuum

The instructions that follow are based on the assumption that the customer is using a relative pressure vacuum gauge to verify the vacuum readout of the VDO Touch. If an absolute pressure gauge is being used to perform the verification process, the reading from the reference gauge may be directly compared to the readout of the VDO Touch.

1. Obtain the current barometric pressure for your location, and correct this reading for the altitude above sea level of your location. Convert this reading to kPaa as described earlier in this manual (Section D.4), and compare this value to the value displayed on the VDO main screen. These two values should agree within 1 kPa absolute, otherwise, an adjustment may be required. Note this value for reference, as it will be used in the next steps of the

verification process.

2. Attach the two portions of the brass extension fitting by screwing one into the other, then attach to the base of the pressure vacuum gauge. Secure the connections with teflon tape, as seen in Figure E.6. Once assembled, attach the pressure vacuum gauge to the vacuum verification port on the top of the VDO Touch (Figure E.7).



Figure E.6 - Brass extension fitting on gauge



Figure E.7 - Pressure vacuum gauge attached

2. From the View Screen, press the “Password” field to select it. The Password field is located just above the “Settings” button and to the right of the box labeled “ID”. See Figure E.8.

3. Enter the Password “111111” in the pop-up window that appears, and press the “Enter” key to accept. A new yellow button labeled “Engineering” should appear on the View Screen (Figure E.9).



Figure E.8 - View Screen without Engineering button

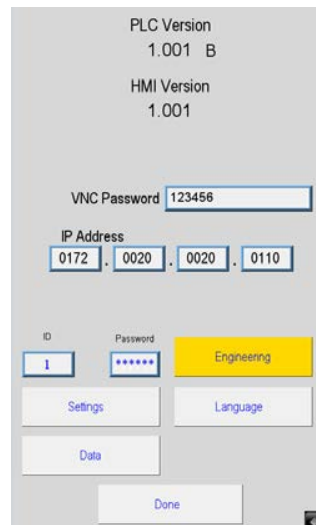


Figure E.9 - View Screen with Engineering button

4. Press the “Engineering” button. A new screen will appear (Figure E.10). Press the “Standardize” button on this screen to enter the Standardization Screen (Figure E.11).



Figure E.10 - Engineering Screen

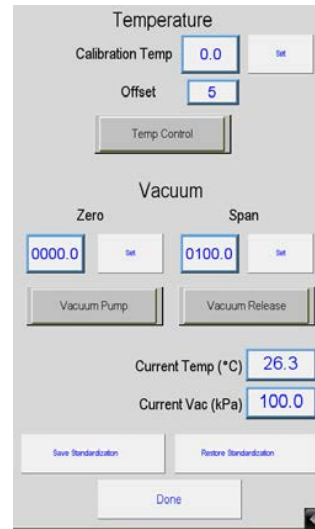


Figure E.11 - Standardization Screen

3. Ensure that your pressure vacuum gauge is securely attached to the vacuum verification port, and make certain that the lid is in place on top of the VDO oven. Press the button labeled “Vacuum Pump” on the Standardization Screen to begin evacuating air from the VDO oven. If the button is grayed out, press the button labeled “Vacuum Release” to re-set the solenoid valve and enable the vacuum pump. Allow 5 - 10 minutes for the vacuum inside the oven to stabilize.

4. Note the reading of the reference vacuum gauge once the vacuum has stabilized. Convert this reading to kPa absolute by subtracting it from the value obtained in Step 1 of this procedure. Compare this reading to the displayed pressure shown at the bottom right hand corner of the VDO standardization screen. The two values should be within +/- 1.0 kPa of each other, otherwise, standardization of the machine is required. To perform a standardization of the vacuum pressure, follow the procedure given in Section D.4 for adjusting the vacuum readout for altitude.

# F. Operation

## F.1 Software Map

Figure F.1 illustrates the VDO Touch's software screen map. Use this map along with the test setup instructions below to guide you through setting up your test.

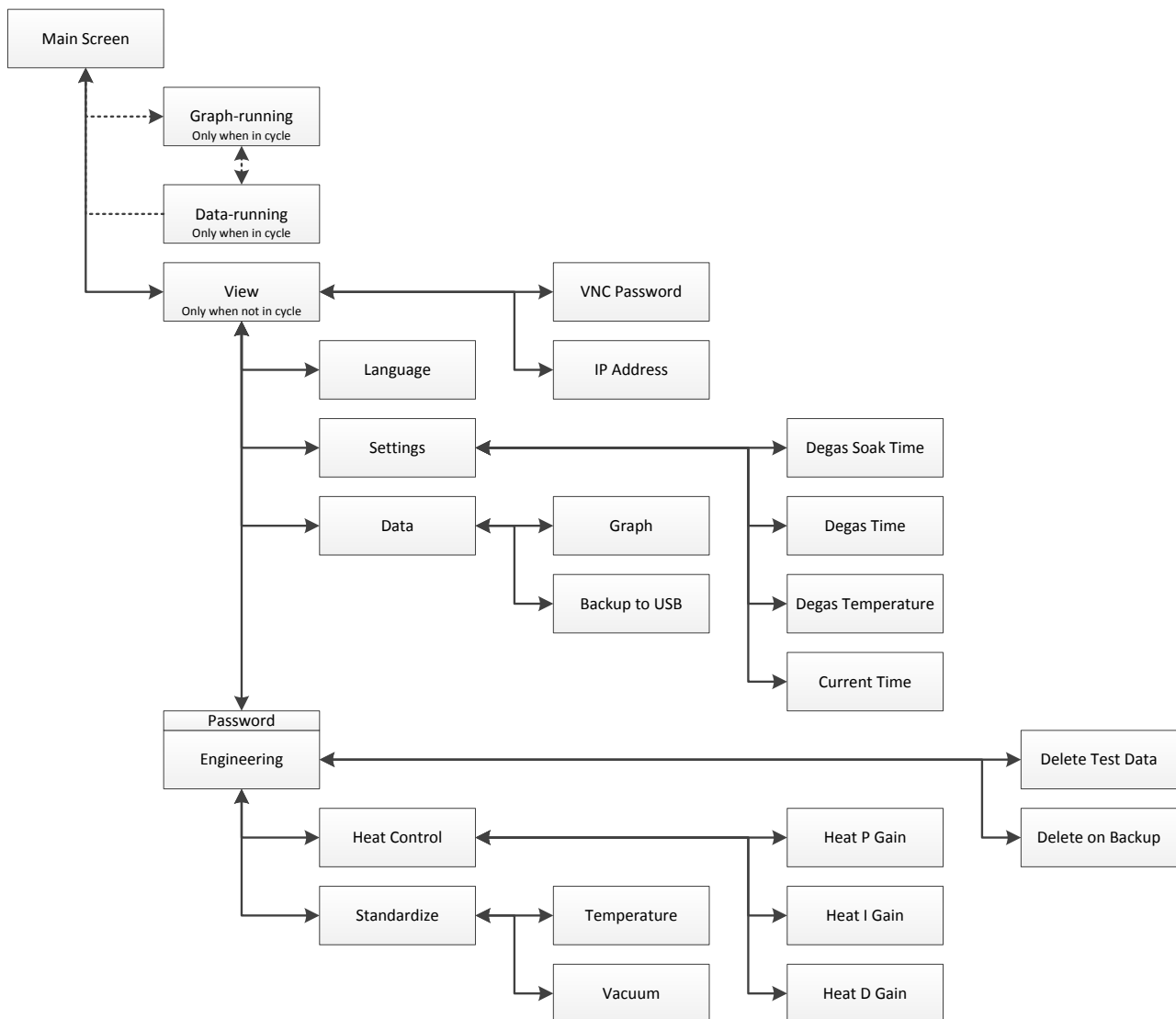


Figure F.1 - VDO Touch Software Map



## F.2 Test Setup

Ensure that your unit has been properly connected and powered up (Section D.3). If the unit is connected and is receiving power, the orange light on the front will be lit and the touchscreen will light up and display the Main Screen. See Figure F.2.

From the VDO Touch's Main Screen, press the "View" button to launch the View Screen. See Figure F.3. From the View Screen, you will be able to enter your Language, Test, and Remote Connection settings.



Figure F.2 - Main Screen

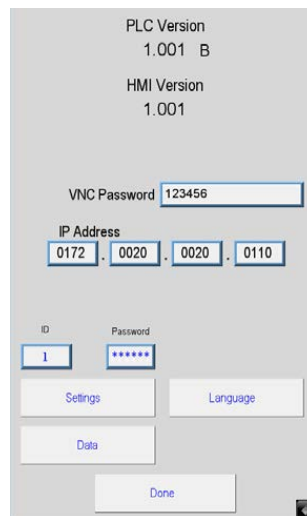


Figure F.3 - View screen



Figure F.4 - Language screen

## Language

From the View Screen, press the "Language" button to bring up a chart of available language translations. Select the appropriate language by pressing on the corresponding flag (see Figure F.4). Pressing the "Done" button will return you to the View Screen.

## Test Settings

From the View Screen, press the "Settings" button. This will display the Settings Screen (Figure F.5) which will allow you to adjust the Degas Soak Time, Degas Time, Degas Temperature, and current date and time.

- **DEGAS SOAK:** The amount of time the system soaks the samples after the "Degas" button is pressed. The system will show "Degas Preheat" for status during this time. Default factory Soak Time is 15 minutes, programmable from 0 - 65,099 minutes.
- **DEGAS TIME:** The amount of time the system runs the vacuum after the Degas Soak. Default factory Degas Time is 30 minutes, programmable from 0 - 65,099 minutes.
- **DEGAS TEMPERATURE:** The temperature set point the system needs

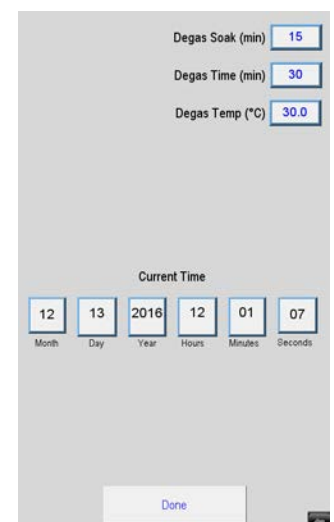


Figure F.5 - Settings screen



to reach during preheat before you load samples. Default factory set point is 170°C, programmable from 0 - 200°C.

- **CURRENT TIME:** Allows the operator to set the current time and date of the system, which is used in the log files.

After you have entered your desired test settings, pressing the “Done” button will return you to the View Screen.

### F.3 Running a Test

1. At least 30 - 40 minutes before you need to degas a sample, press the “Preheat” button on the Main Screen. The control will flash “Preheat” until the programmed degas temperature is reached. See Figure F.6.



Figure F.6 - Preheat Mode

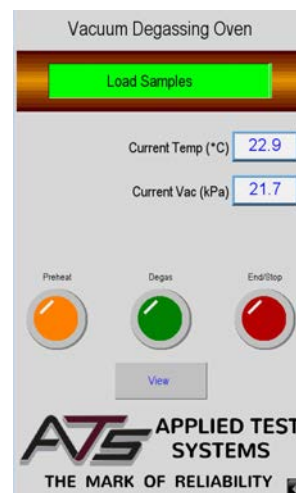


Figure F.7 - Load Samples Mode

2. When the chamber reaches the set point, the display will change to read “Load Samples”. See Figure F.7.

3. Lift the lid off using the two handles and place it to the side on the three rubber pads (Figure F.8). Then carefully place specimens in the chamber.



Figure F.8 - Lift lid, place samples

4. Place the lid back over the chamber and press the green “Degas” button.

5. When pressed, the screen shown in Figure F.9 will display. You can leave this screen on the monitor during the test or press the “Done” button in the lower left to return you to the Main Screen while the test is running.

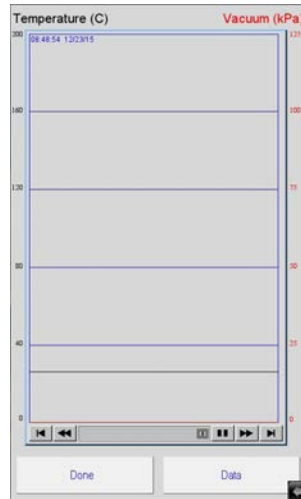


Figure F.9 - Graph Screen, test running

6. The Main Screen will show that the “Degas Preheat” is running, as seen in Figure F.10. Note that R28-12 requires a 15 minute soak period at 170°C ± 5°C. If the VDO Touch falls out of temperature range, the 15 minute timer will pause until it recovers.

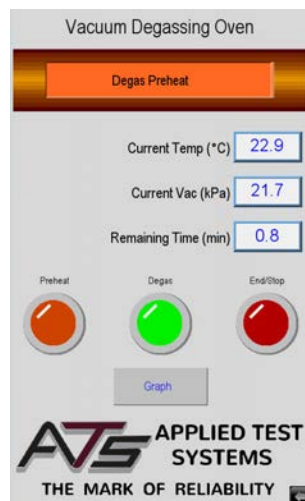


Figure F.10 - Degas Preheat

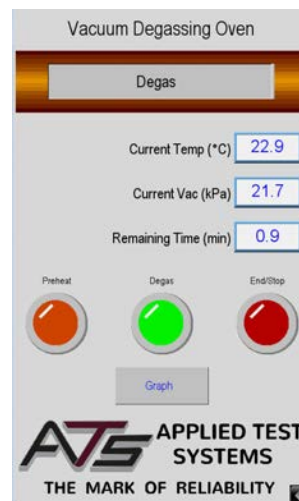


Figure F.11 - Degas

7. After the programmed soak period, the vacuum pump will automatically turn on, and the display will read “Degas” (Figure F.11). The specimen will degas for the programmed amount of time.

8. At the end of the degassing period when the process is complete the pump will shut off, an audible alarm will

sound, and the “End/Stop” button will pulse approximately every five seconds.

9. Press the “End/Stop” button.

10. Wearing high temperature gloves, carefully open the lid and remove the asphalt samples from the Vacuum Degassing Oven using the specimen grips provided.



**WARNING: HOT/BURN SURFACE.** The lid will be extremely hot. Always use personal protective gear when operating the VDO Touch and handling materials associated with the testing procedure.

## F.4 View Test

1. Press the “View” button on the Main Screen.

2. From the View Screen, press the “Data” button to display test dates and information. The right hand side of the screen will have specific tests listed by date. See Figure F.11. Note that the “Graph” button has no function during this stage of testing.

3. Select the test you’d like to view by selecting the appropriate test date.

4. To download test data via USB, insert a USB flash drive into the port on the front of the machine and press the “Backup to USB” button. When this button is pressed, a pop-up window with several options and a countdown will appear. Do not select any of the options from the pop-up - simply wait for the countdown to expire and then the download will begin.

5. Press “Done” to return to the View Screen.

| Time     | Temperature | Vacuum |
|----------|-------------|--------|
| 11:17:12 | 22.5        | 0.0    |
| 11:17:11 | 22.5        | 0.0    |
| 11:17:10 | 22.5        | 0.0    |
| 11:17:09 | 22.5        | 0.0    |
| 11:17:08 | 22.5        | 0.0    |
| 11:17:07 | 22.5        | 0.0    |
| 11:17:06 | 22.5        | 0.0    |
| 11:17:05 | 22.5        | 0.0    |
| 11:17:04 | 22.5        | 0.0    |
| 11:17:03 | 22.5        | 0.0    |
| 11:17:02 | 22.5        | 0.0    |
| 11:17:01 | 22.5        | 0.0    |
| 11:17:00 | 22.5        | 0.0    |
| 11:16:59 | 22.5        | 0.0    |
| 11:16:58 | 22.5        | 0.0    |
| 11:16:57 | 22.5        | 0.0    |
| 11:16:56 | 22.5        | 0.0    |
| 11:16:55 | 22.5        | 0.0    |
| 11:16:54 | 22.5        | 0.0    |
| 11:16:53 | 22.5        | 0.0    |
| 11:16:52 | 22.5        | 0.0    |
| 11:16:51 | 22.5        | 0.0    |
| 11:16:50 | 22.5        | 0.0    |
| 11:16:49 | 22.5        | 0.0    |
| 11:16:48 | 22.5        | 0.0    |
| 11:16:47 | 22.5        | 0.0    |
| 11:16:46 | 22.5        | 0.0    |
| 11:16:45 | 22.5        | 0.0    |
| 11:16:44 | 22.5        | 0.0    |
| 11:16:43 | 22.5        | 0.0    |
| 11:16:42 | 22.5        | 0.0    |
| 11:16:41 | 22.5        | 0.0    |
| 11:16:40 | 22.5        | 0.0    |
| 11:16:39 | 22.5        | 0.0    |

Figure F.12 - Data Screen

# G. Troubleshooting

---

## G.1 Preface

Listed within this section are the most common troubleshooting errors that operators may encounter when using the VDO Touch. Users may follow the steps provided to work through these basic errors.

Any additional issues or system errors should be brought to the attention of the Applied Test Systems (ATS) Service Department immediately by calling +1-724-283-1212 or emailing [service@atspa.com](mailto:service@atspa.com).

**DO NOT attempt to independently fix any other system errors. Any additional errors fixed independent of technical support at Applied Test Systems could result in damage to the equipment, or injury on the part of the operator.**



**WARNING:** To prevent electrical shock, use extreme caution when removing covers or panels. Follow your company's electrical safety procedures thoroughly.

## G.2 No Power

1. Verify that the system is plugged into the power source.
2. Verify that the breaker is on and in the upright position.
3. Verify that the outlet is rated for correct amperage.

## G.3 System Will Not Hold Vacuum

1. Check the O-ring for damage and / or dirt. Also, inspect the bottom of the VDO lid for asphalt build-up or other debris and/or damage which could interfere with the O-ring seal.
2. Set the vacuum gauge based on elevation (refer to Altitude and Atmospheric Pressure chart).
3. Verify that the filter is not plugged and is free of dirt.
4. Ensure lid is properly aligned and completely closed.
5. Verify the valve is closed

## G.4 System Will Not Degas

1. Press and hold the degas button down for 2 seconds.

## **G.5 Controller Error**

1. Do not attempt to fix independently. Contact the ATS Service department by calling 724-283-1212.

## **G.6 Pump Error**

1. Do not attempt to fix independently. Contact the ATS Service department by calling 724-283-1212.

# H. Maintenance

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## H.1 Cleaning and Preventative Maintenance

1. Before cleaning the VDO, unplug the machine and allow it to cool. Any asphalt buildup or other debris which could interfere with the lid making a tight seal with the VDO oven should be carefully removed, using a soft cloth and suitable cleaning solvent. Be very cautious of using any type of mechanical scraper or other tool when removing any asphalt material from the bottom of the VDO lid, as this could potentially damage the sealing surface for the O-ring, preventing the VDO from applying a Vacuum to the Oven.



**WARNING:** Use personal protective gear as per the solvent being used.



**WARNING:** DO NOT USE FLAMABLE SOLVENTS TO CLEAN THIS MACHINE

2. It is also recommended to periodically apply a coating of Vacuum grease to the O-ring and O-ring groove on the VDO oven. The bottom of the VDO Lid should be inspected at this time for any signs of visible damage.

## H.2 Changing Fuses

The display of the VDO Touch is protected by a fuse located behind the display. In the event that a fuse needs changed, follow the steps below.

1. Make sure that the VDO Touch is powered off and is unplugged from your power source before opening the side panel. Failure to do so may result in electric shock.
2. Facing the VDO Touch, unscrew the right side panel. Lay it on a flat surface beside the VDO Touch.
3. Looking into the VDO Touch, the fuse box is located behind the display on the left side (Figure H.1). The fuse holder has a clear window to allow for visual inspection of the fuse (Figure H.2). Each fuse is a 1.25 A, 5x20 mm fast blow fuse.

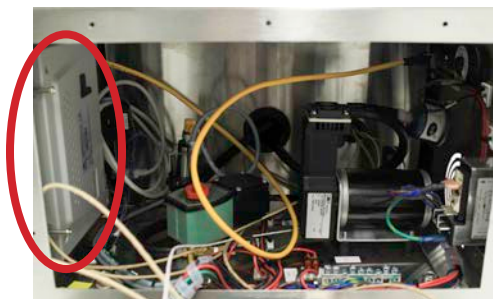


Figure H.1 - Fuse Box

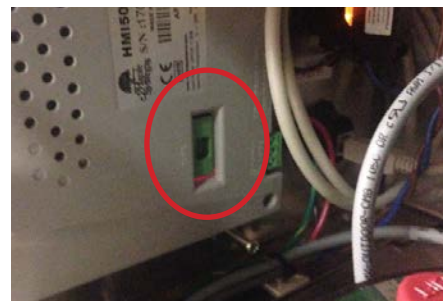


Figure H.2 - Fuse Indicator

3. A spare fuse should be taped to the inside base of the VDO (See Figure H.3). To change this fuse, remove the fuse holder by inserting a small screwdriver or other tool in the slots either at the top or bottom of the fuse holder, and pry it out. Replace the fuse if necessary, and re-insert fuse holder in to the display until it snaps in place.

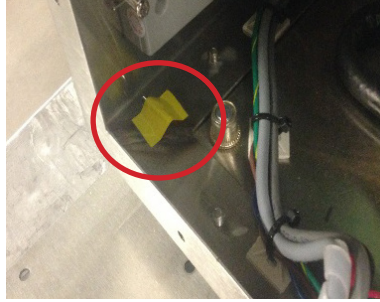


Figure H.3 - Extra Fuse

### H.3 Spare Parts

It is recommended that the customer purchase 1 or 2 spare O-rings for use with the VDO. The ATS part number for this O-ring is 100111.

# APPENDIX A: Warranty

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Your Applied Test Systems product has been manufactured and inspected by experienced craftsmen. Applied Test Systems warrants, for the original purchaser, each product to be free from defects in material and workmanship for a period of thirteen (13) months from date of shipment or twelve (12) months from date of installation - whichever comes first. This warranty does not apply to failures caused by normal usage, misuse, or repair or service by unauthorized personnel, nor does it cover limited life electrical components which deteriorate with age such as tubes, lamps, fuses, and heaters. Load cells are covered for manufactured defects only - incidents of over load or other customer misuse are not covered under warranty. The warranty does not extend to products not manufactured or assembled by Applied Test Systems.

This warranty is expressly limited to the repair, replacement, or adjustment of the product at Applied Test Systems' option. The product must be returned to the Applied Test Systems factory or an authorized repair center. Applied Test Systems shall not be liable for any labor, transportation, or installation costs that may arise in connection with the product or return.

To obtain warranty service:

1. Applied Test Systems must be promptly notified in writing of the defect.
2. Upon receipt of written authorization, said defective equipment is returned as directed, with transportation charges prepaid by the buyer and –
3. Applied Test Systems examination of such equipment discloses to its satisfaction that the defect exists and was not caused by negligence, misuse, improper installation, accident, or unauthorized repair or alteration.

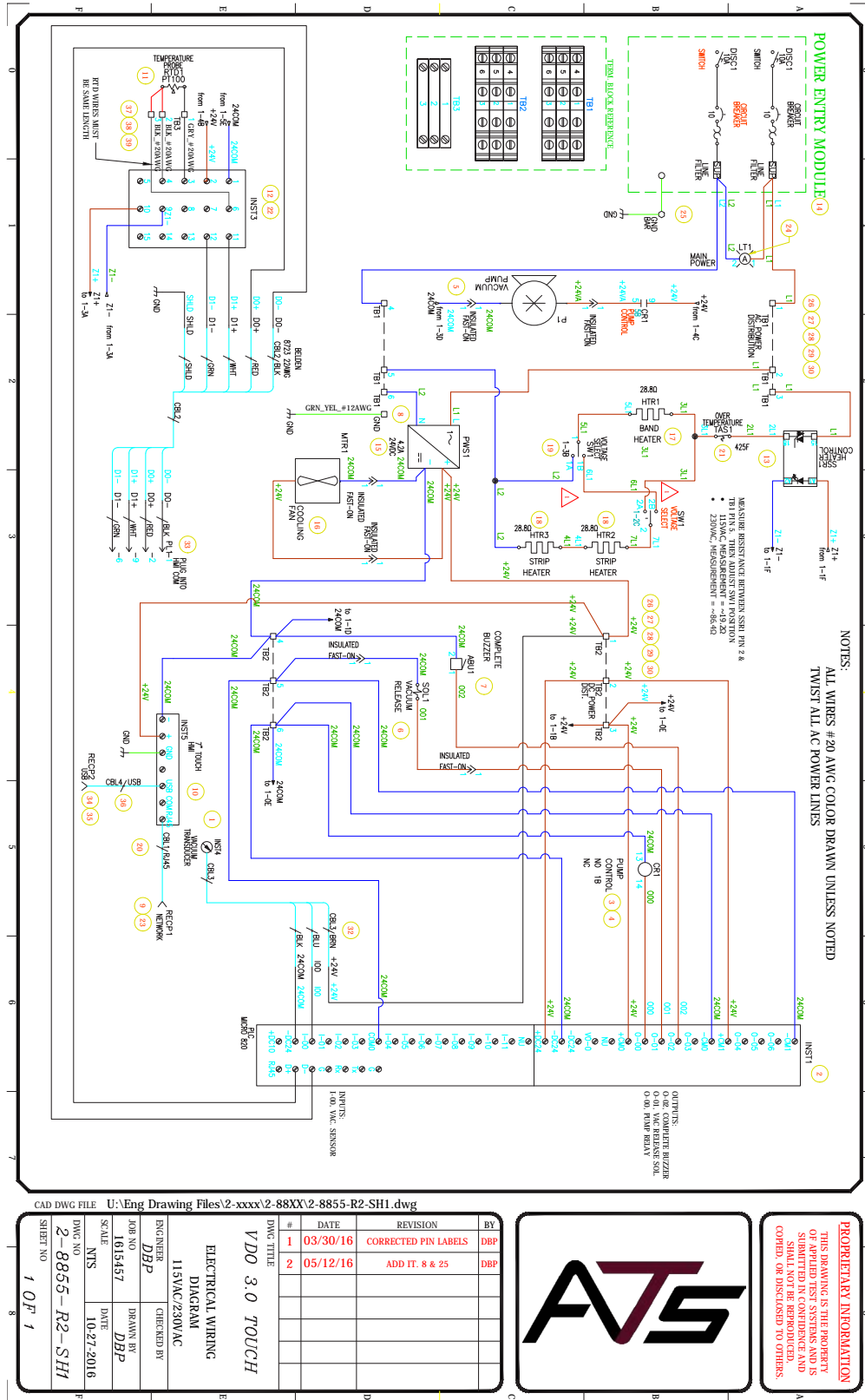
This warranty is in lieu of all other warranties, expressed or implied, including the implied warranty of merchantability or fitness for particular purpose. In no event shall Applied Test Systems be liable for direct, indirect, special, incidental, collateral, or consequential damages.

The aforementioned provisions do not extend the original warranty period of any article that has been either repaired or replaced by Applied Test Systems.

Applied Test Systems reserves the right to change published specifications.



# APPENDIX B: Wiring Diagram



# APPENDIX C: Declaration of Conformity

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## DECLARATION OF CONFORMITY

Applied Test Systems  
154 East Brook Lane  
Butler, PA 16002  
Telephone 724-283-1212

Product: Vacuum Degassing Oven  
Model Number: VDO-230-50HZ-CE

The undersigned hereby declares, on behalf of the Applied Test Systems of Butler, Pennsylvania, that the above referenced Product, to which this declaration relates, is in conformity with the following provisions:

Council Directive 98/37/EEC on the Approximation of the Laws the member States Relating to Machinery/ECM

Council Directive 2014/30/EU & EN61326-1 Electromagnetic Compatibility

Council Directive 2006/95/EC & EN 61010-1:2010 General Electrical Low Voltage Equipment

The technical Construction File required by these directives is maintained at corporate headquarters of Applied Test Systems, 154 East Brook Lane, Butler, Pennsylvania.

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rcarroll@atspa.com  
[www.atspa.com](http://www.atspa.com)

# APPENDIX D: Image Glossary

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