

**Windows**  
**ULTRASTAR-LFM™**

**OPERATION MANUAL**

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## 1.0 Introduction

### 1.1 Product Description

The A.V.K. UltraStar LFM is an in-line pressure relief valve testing device (also commonly referred to as an A.L.D., auxiliary lift device). Its primary function is to verify the set pressure of pressure-relief valves in-line. With the in-line testing of valves, the costly and time-consuming job of valve removal and reinstallation is eliminated. Only those valves failing the test need to be scheduled for repair during system scheduled shutdown.

Using the data acquired through system transducers, the UltraStar LFM provides a consistent and accurate valve set pressure.

The UltraStar LFM design includes a hydraulic actuator assembly that is mounted to the valve. A custom-designed robotic gripper-arm applies force to the valve spindle to determine set pressure.

In the event of an over-pressure condition, the UltraStar LFM does not hamper the normal operation of the valve regardless of the testing phase currently in progress. An additional feature provides for the controlled re-closing of the valve, preventing disk collapse and damage to the valve spindle.

The UltraStar LFM tester contains a state-of-the-art computer system, data acquisition hardware, and proprietary software to acquire, process, and store the test data. The test results can then be printed or downloaded to other applications.

### 1.2 Safety Features

#### Monitoring Features

The UltraStar LFM or the valve technician, in no way hinders the operation of the valve. The unique design of the gripper-arm allows the valve to function as a normal pressure-relief device during all testing stages.

#### Manual Re-closing Procedure

The actuator and gripper-arm assembly can also assist in re-closing the valve after an over-pressure condition. With the actuator in the "up" position, the gripper-arm can be closed and the actuator lowered to apply force to the spindle adapter to re-close the valve.

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## 1.3 Restrictions

To ensure consistent and accurate results, system operating pressure should be between 50% and 95% of the desired set point. When testing valves with inlet pressure below 80% the pressure transducer should be used to obtain the best accuracy. Although valves can be set with larger operating gaps, inlet pressure must always be present in sufficient quantities to avoid overloading the load cell.

The UltraStar LFM should not be used on non-bellows type valves when variable back pressure conditions exists due to media exposure when the sealed cap is removed from the valve.

Leaking pressure relief valves do not facilitate an accurate test. Although a test may be conducted, the user will have to determine the validity of the results.

In-line valve testing should be regarded as only one aspect of a maintenance and repair program. If a valve fails a test, it should be removed for repair.

### **CAUTION:**

1. Do not operate system where ambient temperatures exceed 130 Degrees F.
2. Do not continuously stroke actuator in the dead head position. This can result in serious damage to pump and motor.

## 1.4 Safety Considerations

Caution should be taken when using the UltraStar LFM during severe weather conditions. **Do not operate the UltraStar LFM during a lightning storm.** If utilized in light rain, sleet, or snow, cover with tarpaulin.

Always visually check pressure relief valve installation prior to test.

Never face or position body in path of open discharge.

Only allow trained personnel to perform test.



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## 2.0 System Design

The UltraStar LFM consists of primary cases, and hardware accessories.

- Located in a protective case is a state-of-the-art computer system, complete with an IBM compatible microprocessor, control unit, data acquisition system, LCD Flat Panel Display and Keyboard.
- The application software is contained on solid state chips to prevent accidental erasure. The drive specifications are as follows:
  - C: solid state

The C: Drive acts as a read / write hard drive to store calibration information and test results.

- The case also contains the hydraulic power actuation system.
- Also included with the system are the spindle adapters, the gripper-arm, the universal valve-mounting assembly, and the hydraulic cables.

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## **3.0 Setup Procedures**

This section contains information regarding the procedures to initially set up the information needed in the UltraStar-LFM prior to testing. The following steps should be completed in the suggested order.

### **3.1 Enter System Setup Information**

System Setup should be entered first. From menu bar, select “File-System Setup.” Select the default country, the type of units for the temperature display (F or C), and the type of units for the pressure display (PSIG, BAR, or KPA). See Section “7.4 System Setup” for further instructions.

### **3.2 Enter Company Information**

Company information should be entered next. From menu bar, select “File-Company Info.” Company name is required. See Section “7.2 Company Information” for further instructions.

### **3.3 Enter Additional Manufacturers**

Review the list of manufacturers loaded in the system. From menu bar, select “File-Manufacturer.” If you will be testing valves from other manufacturers, add the additional manufacturers to list. See Section “7.6 Manufacturer” for further instructions.

### **3.4 Enter Additional Valves to Master Valve List**

Review the list of valves initially loaded in the system. From menu bar, select “File-Valve Info.” This is the master list of valve types (not yet associated with a specific customer). If you will be testing additional valve types, add the additional valves to the list. See Section “7.3 Valve Information” for further instructions.

### **3.5 Enter Canned Text**

Review the canned text to be used for repetitive comments about the valve test. From menu bar, select “File-Canned Text.” See Section “7.5 Canned Text” for further instructions.

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## **4.0 View Calibration**

Verify the current pressure transducer and load cell setup. From the menu bar, select “Calibrate-View Calibration.” See Section “8.0 View Calibration” for further instructions.

## **4.1 Change Pressure Transducer**

After viewing the current calibration, if a different pressure transducer will be used for the next test, follow these steps to change the transducer. From the menu bar, select “Calibrate-Change Pressure Transducer. See Section “8.1 Change Pressure Transducer” for further instructions.

## **4.2 Change Load Cell**

After viewing the current calibration, if a different load cell will be used for the next test, follow these steps to change the load cell. From the menu bar, select “Calibrate-Change Load Cell.” See Section “8.2 Change/Setup Load Cell” for further instructions.

## **4.3 Import Transducer Files**

The calibration for each transducer is stored in a separate transducer file (file extension of txt). When the transducers are re-calibrated, new files will be provided. The calibration for the actuator is also stored in a separate actuator file. Run the Import File routine to import this information into the UltraStar-LFM program. From the menu bar, select “Calibrate-Import Files.” See Section “8.3 Import Files” for further instructions.

## **4.4 Enter Customer and Valve Information**

Customer information should be entered into the UltraStar-LFM program prior to testing. From menu bar, select “Setup-Customer & Valve Info.” The customer’s valves should also be set up, selecting the valve types from the Valve Master Information. See Section “9.0 Customer & Valve Information” for further instructions.

## **4.5 Set Up Work Order**

Set up the work order information including the list of customer valves that will be tested. See Section “9.4 Work Order” for further instructions.

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## 5.0 Test Procedures

This section contains information regarding the procedures to initially set up and calibrate the UltraStar LFM, attach the mounting hardware to your valves, conduct the valve test, and shut down the system.

### 5.1 Installing the Pressure Transducer and Cable

Locate the UltraStar LFM within 25' of the first valve to be tested. Install the Pressure Transducer to a gage tap closest to the valve location using standard snubber and/or pigtail gage connections. This distance can be up to 75' of the UltraStar LFM.

Attach the other end of the pressure transducer cable to the "P" port on the UltraStar LFM case. This port is color coded RED to match the red strain relief on the cable.

If a gage tap is not available, the inlet pressure can be manually entered prior to each test.

### 5.2 Attaching the Load Cell Transducer Cable

Attach the Load Cell cable to the connector on the Load Cell. Ensure that no load is applied. Attach the other end of the cable to the "L" port on the UltraStar LFM. This port is color coded GREEN to match the green strain relief on the cable.

### 5.3 Attaching the UltraStar LFM to AC Power

Connect the Power Cord from the UltraStar LFM Computer Case to the nearest external AC power source.

WARNING! Check the position of the fuse block on the power input connector. The voltage input that you are using should point to the white bar on the connector, 115 VAC or 230 VAC.

### 5.4 Performing the Zero Offset Routine

The Zero Offset routine should be performed when in the test screen. See Section 4.5 for a step-by-step procedure for running the calibration routines.

### 5.5 Attaching the Hydraulic Cables

Attach the hydraulic cable to the top connector on the Actuator. Attach the other end of the cable to the "T" connector on the UltraStar LFM hydraulic case.

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Attach the second hydraulic cable to the bottom connector on the Actuator. Attach the other end of the cable (with the speed control valve) to the "B" connector on the UltraStar LFM.

Attach the third hydraulic cable to the gripper connector. Attach the other end of the cable to the "G" connector on the UltraStar LFM.

Note: All hydraulic cables are color coded to their mating connectors.

## 5.6 Mounting the Hardware Assembly

Remove the cap and lever assembly from the valve.

Attach actuator to lower assembly of the universal mount using turnbuckles.

Install the universal mount to fit snugly around the valve bonnet or yoke assembly by rotating the two tension knobs in opposite directions. Use the alignment marks on either side to insure the mount is aligned with the valve center line.

## 5.7 Attaching the Spindle Adapter

Select the appropriate sized spindle adapter from the drawer. The following spindle adapters are provided:

<u>UNF</u>	<u>UNC</u>
1/4" - 28	1/4" - 20
5/16" - 24	5/16" - 18
3/8" - 24	3/8" - 16
7/16" - 20	7/16" - 14
1/2" - 20	1/2" - 13
9/16" - 18	9/16" - 12
5/8" - 18	5/8" - 11
3/4" - 16	3/4" - 10
7/8" - 14	7/8" - 9
1 " - 12	1" - 8
1 1/8" - 12	1 1/8" - 7

## 5.8 Adjusting Height of Coupler

Make the coarse vertical adjustment by using the turnbuckles to adjust the gripper fingers so that they are just below the lip of the spindle adapter.

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Note: Threads are right and left hand. It is important to maintain a minimum of 1" thread engagement inside the turnbuckle.

## 5.9 Setting the Actuator Ramp Speed

The speed control valve is located on the hydraulic cable attached to the "B" connector. When turned to the fullest clockwise position, the actuator ramp speed is set to 0% (stopped). When turned to the fullest counterclockwise position, the actuator ramp speed is set at 100% (fastest speed). Initially, set the ramp speed to the slowest speed possible. Then, adjust the speed as required to achieve the best stroke for the given valve conditions.

## 5.10 Testing a Valve

The valve is now ready for testing. Select "Test" from the menu bar and then "Test Valve." Select the valve to be tested from the "3010 Work Order Information" screen. The "3020 Test Valve" screen displays.

If a gage tap is not available, the (manual) inlet pressure can be entered and adjusted before each test. The automatic trigger can be turned off or on prior to each test

The Valve Test consists of an "As Found" Test, and two "Verification" tests. The user has the option of passing or failing any test. After each test the user can enter a compression screw adjustment. A cumulative screw adjustment is tracked and displayed on the "3020 Test Valve" screen. Comments can be entered after each test. Graphical representations of each test can be viewed after each test.

When the test is concluded, the user has the option of passing the valve test, failing the valve test, or rejecting the valve test.

See Section "10.0 Test Valve" for further instructions.

## 5.11 Testing another Valve

If the next valve is in the same bank as the previous valve and the same gage tap can be used, the system can remain on. Remove the hardware assembly from the valve and transfer to the next valve.

## 5.12 Viewing and Printing the Test Results

Test results can be viewed, exported to a txt file, or exported to a csv file. Work order summaries can be viewed, printed, or exported and multiple results for an entire work order can be printed or exported. See Section "11.0 Results" for further instructions.

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## 6.0 System Shutdown

From the menu bar, select “File” and “Exit” to exit the program. Power the UltraStar LFM down. Wipe the excess hydraulic fluid when disconnecting the hydraulic cables. Remove the hardware assembly from the valve. Store cables and assembly in the storage case provided.

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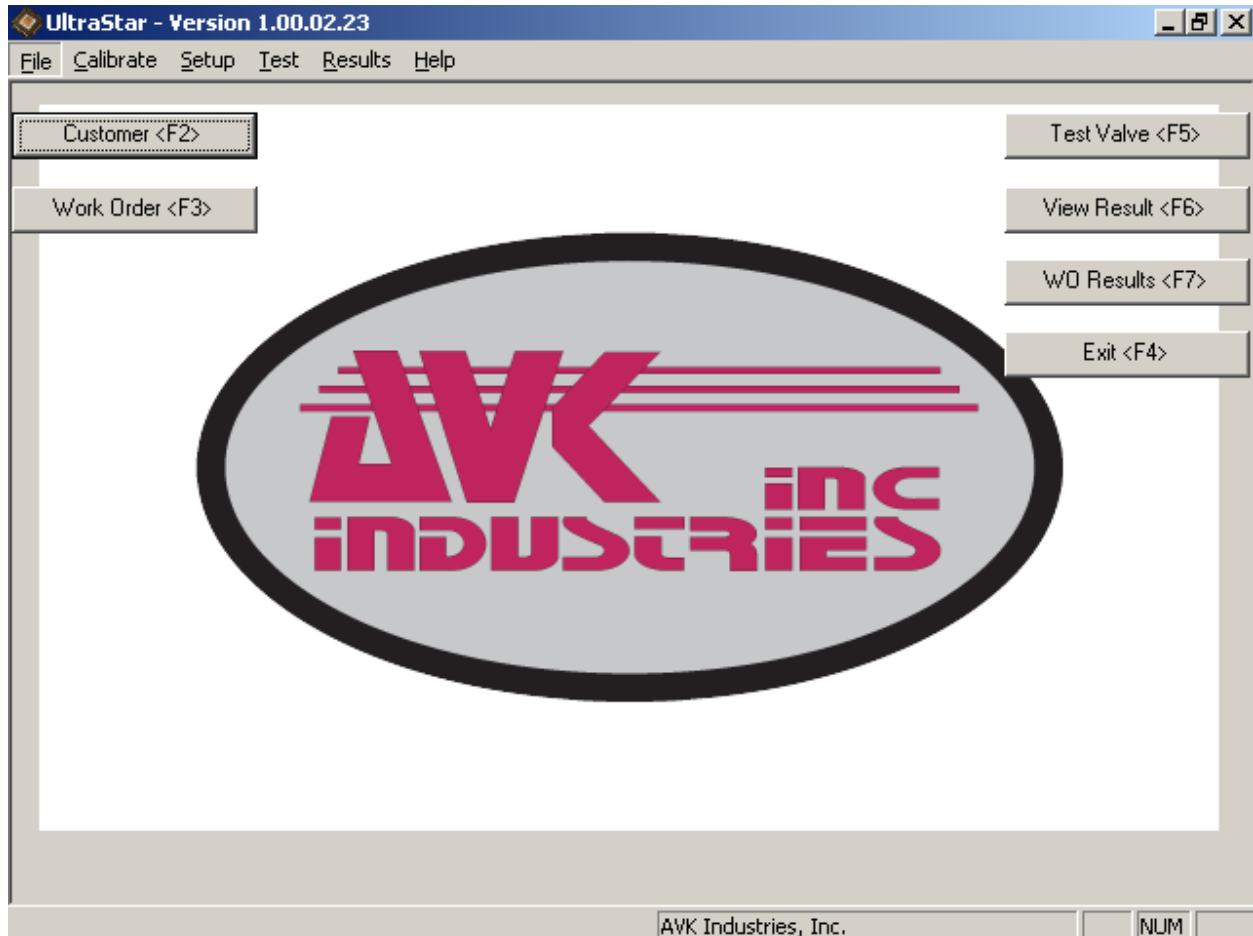
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## 7.0 Program Reference Guide

This section describes each function of the UltraStar-LFM software.

### 7.1 The Main Screen

When the UltraStar-LFM program is started, the Main Screen appears as follows:



The Main Menu bar is displayed along the top of the screen.

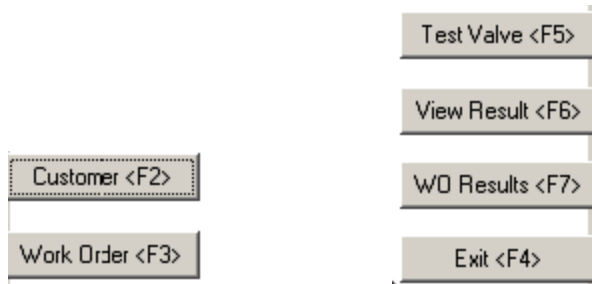


For easy selection, commonly used functions can be selected with buttons or function keys.



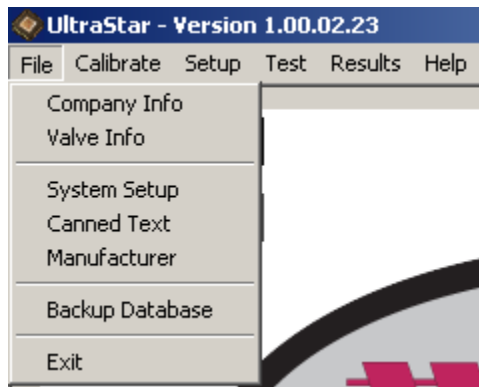
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## 7.2 Company Information

From the menu bar, select “File.” The following options will display:



Select “Company Info.” The “1010 Company Information” screen will display.

A screenshot of the '1010 Company Information' screen. The screen contains the following fields and buttons:

- Name: MACALJON VALVE SERVICES
- Address: 4526 OGEECHEE ROAD
- City: SAVANNAH
- State/Province: GA
- Country: USA
- Zip Code: 31405
- Telephone: 912-236-5411
- Buttons: Return <Esc>, Save <F9>

### Company Name

Enter the company's name, up to 35 characters. This information is required.

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## Address

Enter the up to 2 lines of the address of the company, up to 35 characters each. The address line is optional.

## City

Enter the city, up to 35 characters. This information is optional.

## State or Province

Enter the abbreviation for the state or province, up to 35 characters. This information is optional.

## Country

Enter the abbreviation for the country, up to 35 characters. This information is optional.

## Zip Code

Enter the zip code, up to 20 characters, alpha or numeric. Embedded spaces are allowed. This information is optional.

## Telephone

Enter the telephone number, up to 20 characters.

The <Enter> or the <Tab> key will move the cursor to the next field. The <Shift> <Tab> key combination will move the cursor to the previous field. Note that all information will be displayed and saved in upper case only, regardless of how it is entered.

## [Return <Esc>]

To return without saving, click the [Return] button or press the <Esc> key.

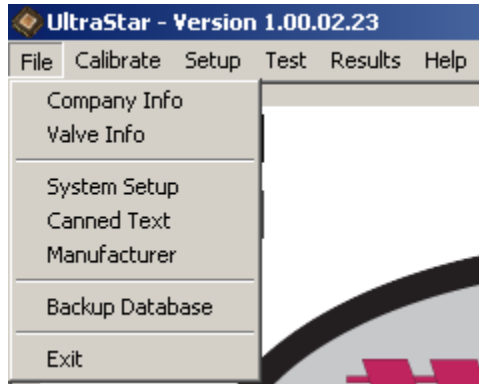
## [Save <F9>]

When finished, click the [Save] button or press the <F9> key to save the company information.

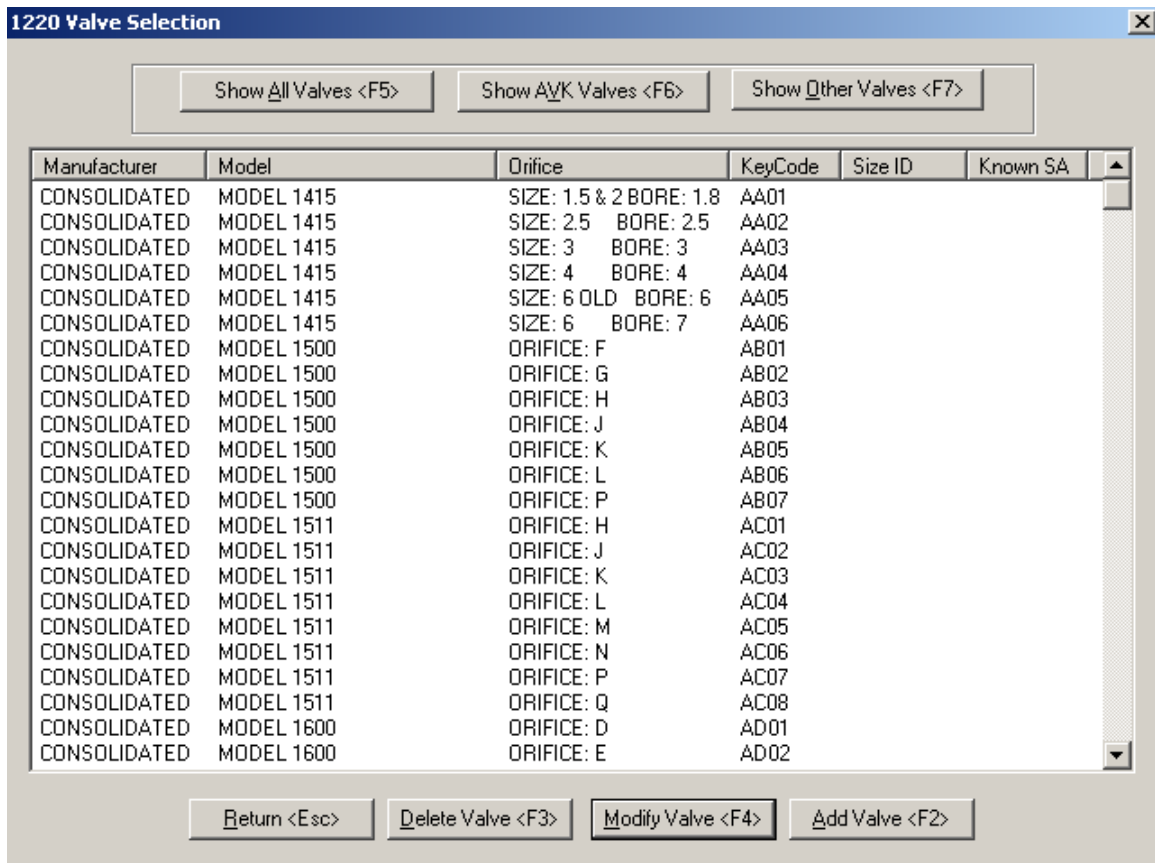
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## 7.3 Valve Information

From the menu bar, select “File.” The following options will display:



Select “Valve Info.” The “1220 Valve Selection” screen will display.



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## AVK Valves

Valves listed with Key Codes are valves from the AVK database and cannot be deleted. Only the size can be modified.

## Other Valves

Additional valves can be entered and saved in the Valve Master. Manufacturer, Model, Orifice, Size and Known Seat Area must be entered.

The list can be filtered by clicking on the appropriate button at the top of the screen. Choices are to show all valves, to show just the AVK valves, or to show other valves.

## [Add Valve <F2>]

To add a new valve to the master list, click the [Add Valve] button or press the <F2> key.

## [Modify Valve <F4>]

To modify a valve from the master list, highlight the valve to be modified and click the [Modify Valve] button or press the <F4> key.

## [Delete Valve <F3>]

To delete a valve from the master list, highlight the valve to be deleted and click the [Delete Valve] button or press the <F3> key. Note that AVK Valves cannot be removed from the master list.

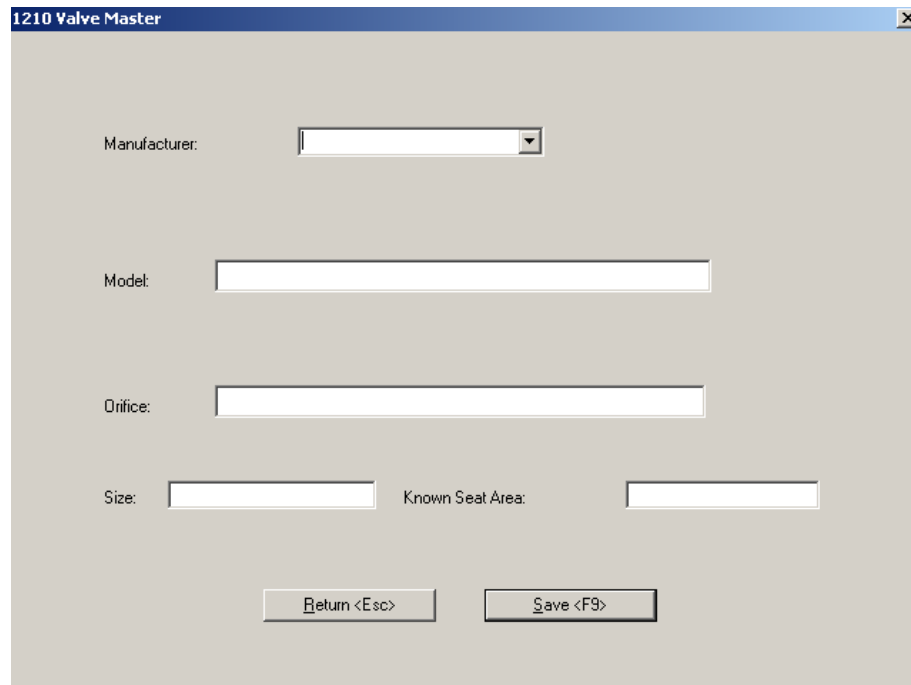
## [Return <Esc>]

To return without selecting a valve, click the [Return] button or press the <Esc> key.

When adding a new valve or modifying an existing valve, the “1210 Valve Master” will display.

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The screenshot shows a software window titled "1210 Valve Master". It contains several input fields: a dropdown menu for "Manufacturer", a text box for "Model", a text box for "Orifice", a text box for "Size", and a text box for "Known Seat Area". At the bottom, there are two buttons: "Return <Esc>" and "Save <F9>".

## Manufacturer

Enter or select the Manufacturer. This information is required and must be one of the items in the combo box.



The screenshot shows a dropdown menu with a list of manufacturer names: BIRKETT, CONBRACO, CONSOLIDATED, CROSBY, FARRIS, FOSTER, KUNKLE, LESER, LONERGAN, SEMPELL, SPENCE, and SPIRAX SARCO.

If the manufacturer does not appear in the list, exit from this function. From the menu bar, select "File-Manufacturer", to enter additional manufacturers. See Section "5.7 Manufacturer" for further instructions.

## Model

Enter the model description, up to 25 characters. This information is required.

## Orifice

Enter the orifice description, up to 25 characters. This information is required.

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## Size

Enter the Size of the Valve, up to 20 characters. This information is optional.

## Known Seat Area

Enter the known seat area. This information is required.

## [Save <F9>]

When finished, click the [Save] button or press the <F9> key to save the information.

## [Return <Esc>]

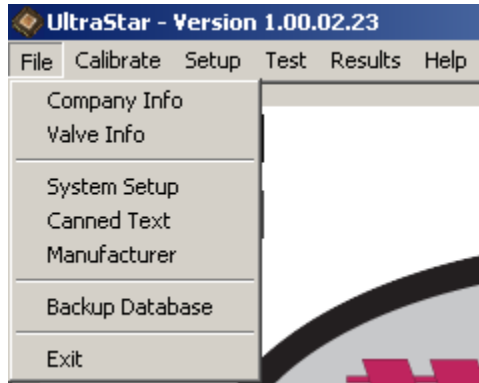
To return without saving, click the [Return] button or press the <Esc> key.

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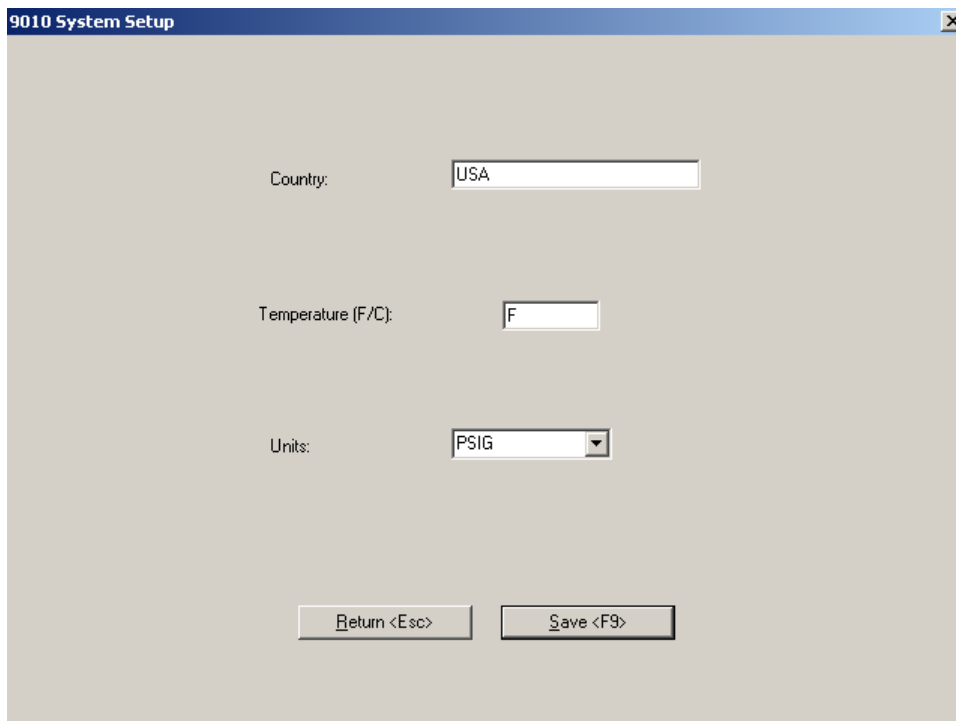
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## 7.4 System Setup

From the menu bar, select “File.” The following options will display:



Select “System Setup.” The “9010 System Setup” screen will display.

A screenshot of the "9010 System Setup" window. The window title is "9010 System Setup". It contains three input fields: "Country:" with a text box containing "USA", "Temperature (F/C):" with a text box containing "F", and "Units:" with a dropdown menu showing "PSIG". At the bottom, there are two buttons: "Return <Esc>" and "Save <F9>".

### Country

The default entry is USA. This can be changed, but cannot exceed 20 characters.

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## Temperature Display

The default entry is "F" (Fahrenheit). To change to Centigrade, enter "C" in the Temperature field...

## Units Display

The default entry is PSIG. To change, select the BARS or KPA from the drop-down box.

## [Save <F9>]

When finished, click the [Save] button or press the <F9> key to save the information.

## [Return <Esc>]

To return without saving, press the [Return] button or press the <Esc> key.

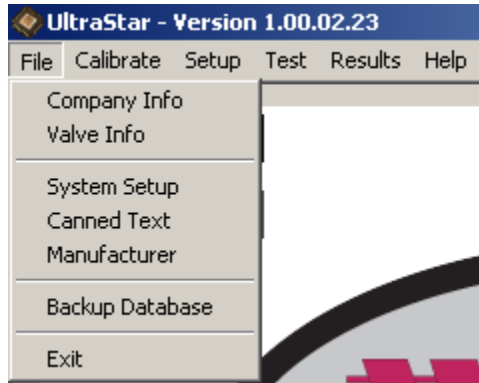


# A.V.K. Industries, Inc.

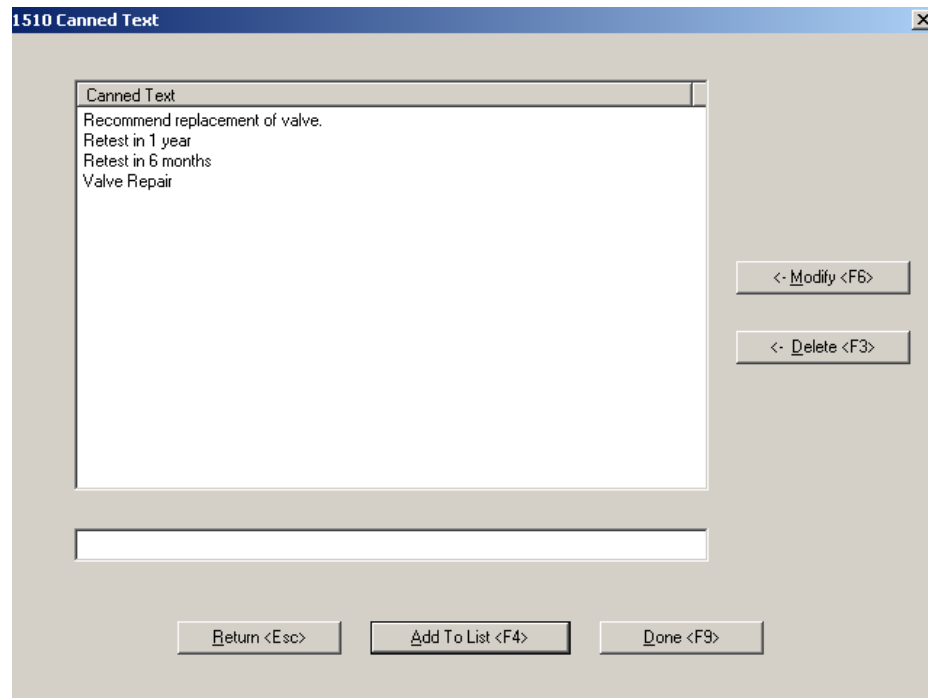
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## 7.5 Canned Text

From the menu bar, select “File.” The following options will display:



Select “Canned Text.” The “1510 Canned Text” screen will display.



### [Add To List <F4>]

To enter a new canned text line, enter the text in the edit box in the lower portion of the screen. The length of the canned text line cannot exceed 50 characters. Click the [Add To List] button or press the <F4> key. The new text should appear in the list box in the upper portion of the screen.

### [Modify <F6>]

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To modify existing text, highlight the line of text in the list box in the upper portion of the screen. Click the [Modify] button or press the <F6> key. The line of text should now display in the edit box in the lower portion of the screen. Make the change in the edit box and click the [Add To List] button or press the <F4> key. The change should now display in the list box.

## [Delete <F3>]

To delete an existing text, highlight the line of text in the list box in the upper portion of the screen. Click the [Delete] button or press the <F3> key. The line of text should now be removed from the list box.

## [Return <Esc>]

To exit the screen, click the [Return] button or press the <Esc> key.

## [Done <F9>]

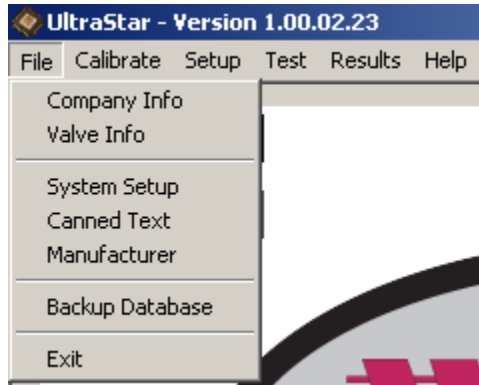
When finished, click the [Done] button or press the <F9> key to save the information and exit the screen.

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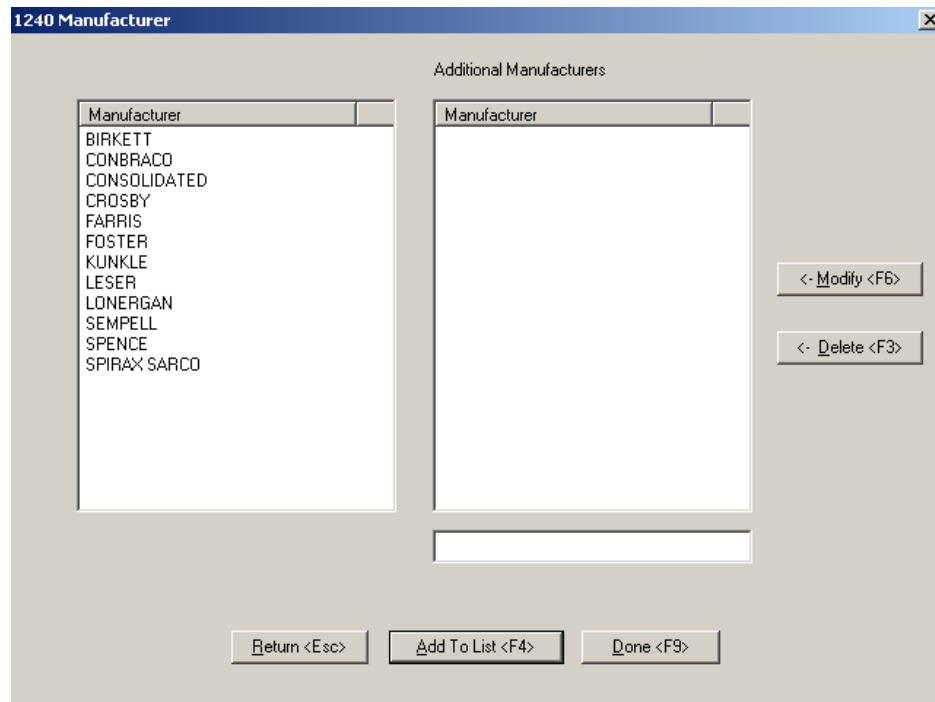
---

## 7.6 Manufacturer

From the menu bar, select “File.” The following options will display:



Select “Manufacturer.” The “1240 Manufacturer” screen will display.



In the list box on the left side of the screen, the manufacturers for the A.V.K. valves are displayed. These cannot be changed or deleted. Additional manufacturers that are added will display in the list box on the right side of the screen.

### [Add To List <F4>]

To enter a new manufacturer, enter the manufacturer in the edit box in the lower portion of the screen. The length of the manufacturer cannot exceed 25 characters. Click the

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# A.V.K. Industries, Inc.

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[Add To List] button or press the <F4> key. The new manufacturer should appear in the list box on the right side of the screen.

[Modify <F6>]

To modify an existing manufacturer, highlight manufacturer in the list box on the right side of the screen. Click the [Modify] button or press the <F6>. The manufacturer should now display in the edit box in the lower portion of the screen. Make the change in the edit box and click the [Add To List] button or press the <F4> key... The change should now display in the list box on the right side of the screen.

[Delete <F3>]

To delete an existing manufacturer, highlight manufacturer in the list box on the right side of the screen. Click the [Delete] button or press the <F3> key. The manufacturer should now be removed from the list box.

[Return <Esc>]

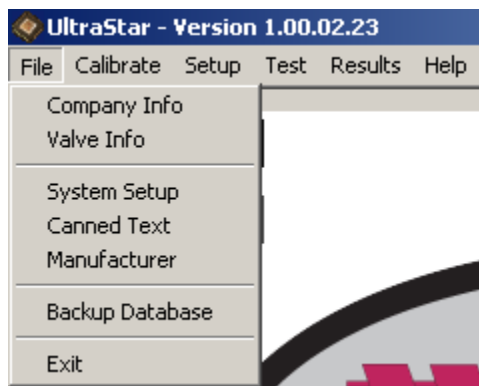
To exit the screen, click the [Return] button or press the <Esc> key.

[Done <F9>]

When finished, click the [Done] button or press the <F9> key to save the information and exit the screen.

## 7.7 Backup Database

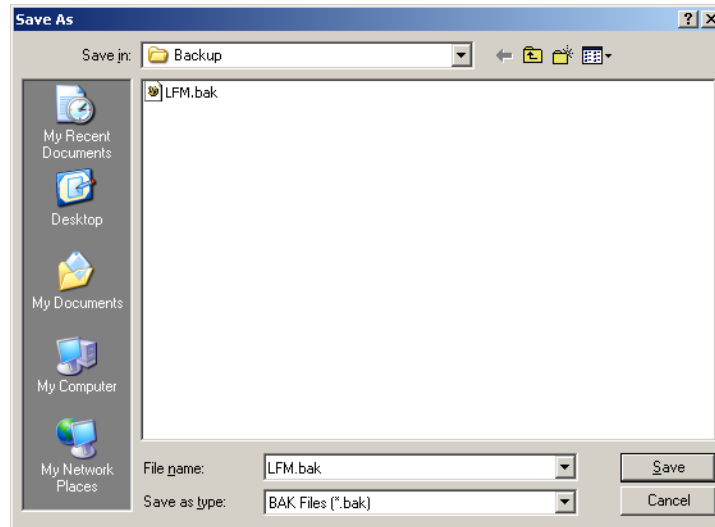
From the menu bar, select "File." The following options will display:



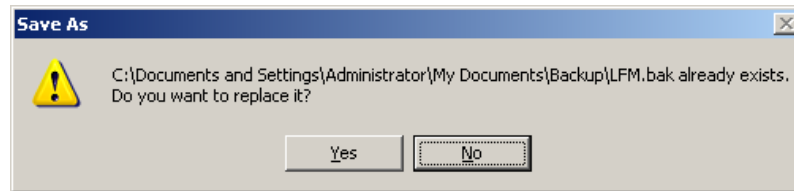
Select "Backup Database." The "Save As" File Dialog screen will display. By default the backup file will be stored with the name LFM.BAK in the folder, C:\Documents and Settings\Administrator\My Documents\Backup.

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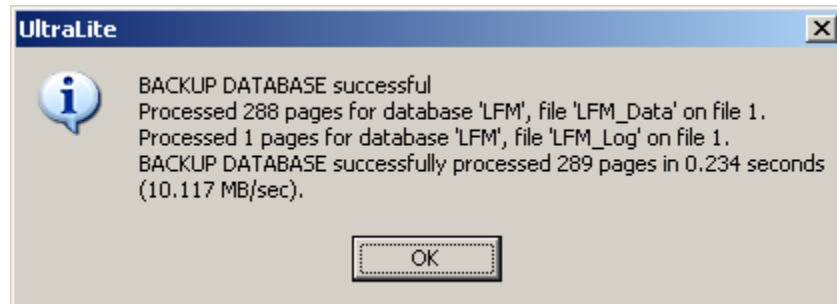
---



If a backup file of the same name already exists, the following message will display. To overwrite the existing file, click the “Yes” button. To return to the “Save As” File Dialog screen to enter a different file name, click the “No” button.



When the backup completes, the following message will display indicating that the backup was successful. If the backup process failed, the message will indicate that “BACKUP DATABASE failed.”

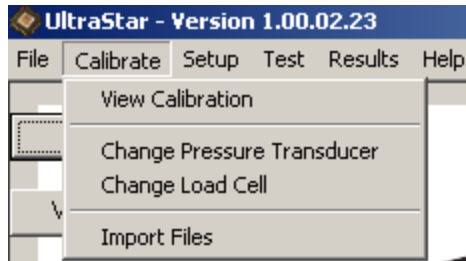


# A.V.K. Industries, Inc.

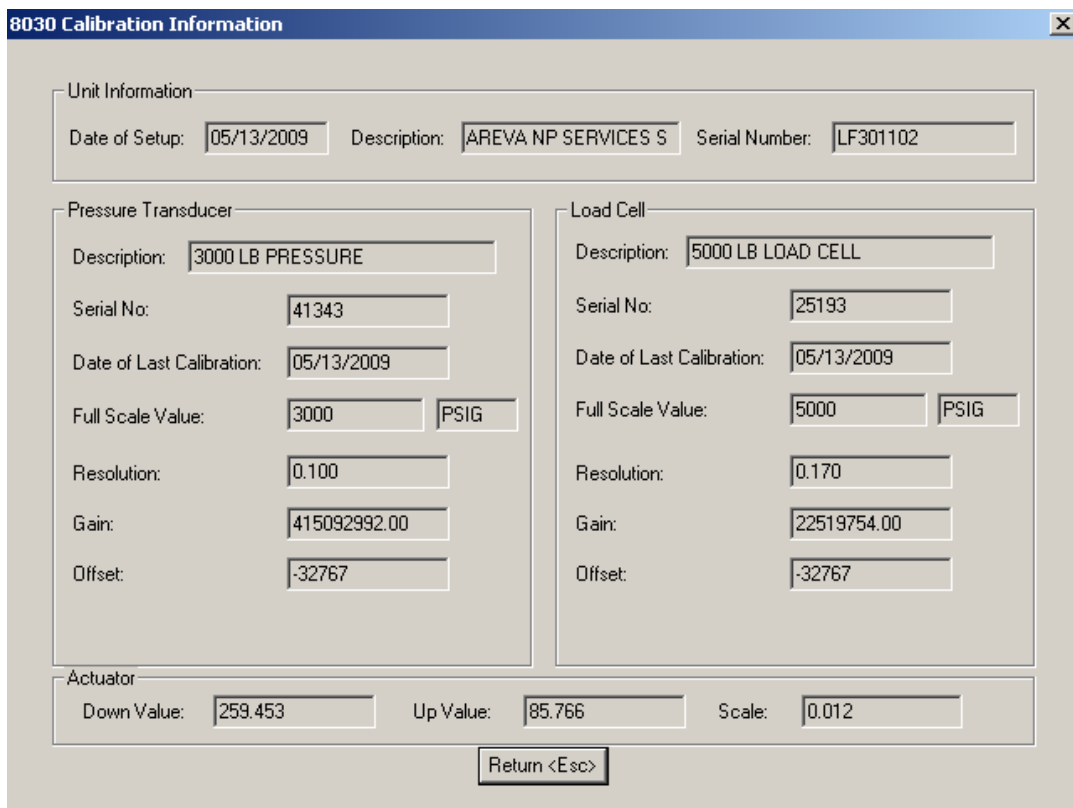
---

## 8.0 View Calibration

From the menu bar, select “Calibrate.” The following options will display:



Select “View Calibration.” The “8030 Calibration Information” screen will display.



The unit information is displayed at the top of the screen. This includes the date of setup, the description and the unit serial number.

The currently selected Pressure Transducer is displayed on the left side of the screen. Information displayed includes the description, the transducer serial number, the date of last calibration and the full scale value. Verify that this is the correct pressure transducer to be used in the next test.

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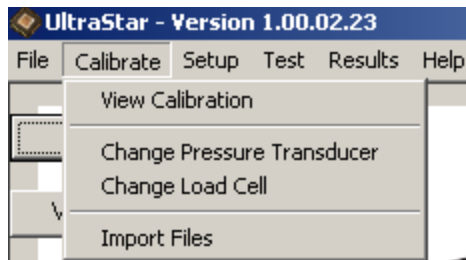
---

The currently selected Load Cell is displayed on the right side of the screen. Information displayed includes the description, the transducer serial number, the date of last calibration and the full scale value. Verify that this is the correct load cell to be used in the next test.

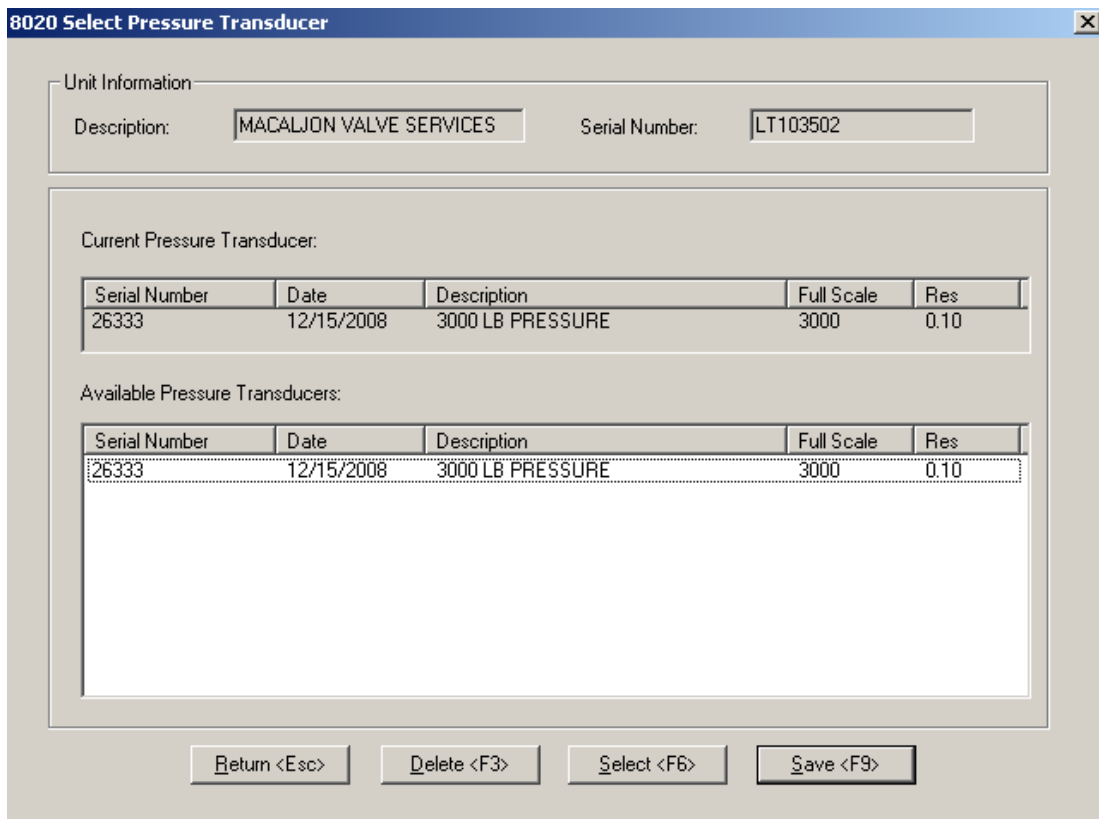
Actuator information is displayed at the bottom of the screen.

## 8.1 Change Pressure Transducer

From the menu bar, select “Calibrate.” The following options will display:



Select “Change Pressure Transducer.” The “8020 Select Pressure Transducer” screen will display.



The screenshot shows the '8020 Select Pressure Transducer' window. It contains the following information:

Unit Information:

Description:  Serial Number:

Current Pressure Transducer:

Serial Number	Date	Description	Full Scale	Res
26333	12/15/2008	3000 LB PRESSURE	3000	0.10

Available Pressure Transducers:

Serial Number	Date	Description	Full Scale	Res
26333	12/15/2008	3000 LB PRESSURE	3000	0.10

Buttons at the bottom:

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The currently-selected pressure transducer is displayed in the list box in the upper portion of the screen. All available pressure transducers that have been calibrated and imported into the UltraStar-LFM program are displayed in the list box in the lower portion of the screen.

## [Select <F6>]

To change pressure transducers, highlight the correct pressure transducer in the list of available transducers in the lower portion of the screen and click the [Select] button or press the <F6> key. The new transducer will now be displayed as the currently-selected pressure transducer in the list box in the upper portion of the screen.

## [Delete <F3>]

To delete a pressure transducer that will no longer be used, highlight the pressure transducer in the list of available transducers in the lower portion of the screen and click the [Delete] button or press the <F3> key. The pressure transducer will be removed from the list of available transducers.

## [Save <F9>]

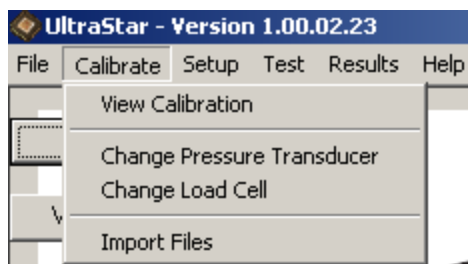
When finished, click the [Save] button or press the <F9> key to save the information.

## [Return <Esc>]

To return without saving, press the [Return] button or press the <Esc> key.

## 8.2 Change Load Cell

From the menu bar, select "Calibrate." The following options will display:



Select "Change Load Cell." The "8020 Select Load Cell" screen will display.



# A.V.K. Industries, Inc.

8020 Select Load Cell

Unit Information

Description:  Serial Number:

Current Load Cell:

Serial Number	Date	Description	Full Scale	Res
233339	12/15/2008	5000 LB LOAD CELL	5000	0.17

Available Load Cells:

Serial Number	Date	Description	Full Scale	Res
233339	12/15/2008	5000 LB LOAD CELL	5000	0.17
30277	12/15/2008	10000 LB LOAD CELL	10000	0.31

The currently-selected load cell is displayed in the list box in the upper portion of the screen. All available load cells that have been calibrated and imported into the UltraStar-LFM program are displayed in the list box in the lower portion of the screen.

## [Select <F6>]

To change load cells, highlight the correct load cell in the list of available load cells in the lower portion of the screen and click the [Select] button or press the <F6> key. The new load cell will now be displayed as the currently-selected load cell in the list box in the upper portion of the screen.

## [Delete <F3>]

To delete a load cell that will no longer be used, highlight the load cell in the list of available load cells in the lower portion of the screen and click the [Delete] button or press the <F3> key. The load cell will be removed from the list of available load cells.

## [Save <F9>]

When finished, click the [Save] button or press the <F9> key to save the information.

## [Return <Esc>]

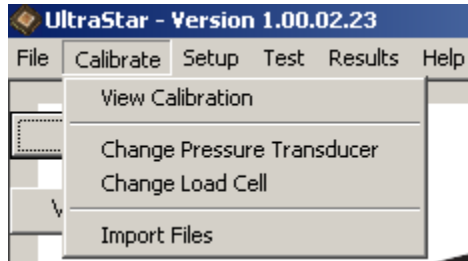
To return without saving, press the [Return] button or press the <Esc> key.

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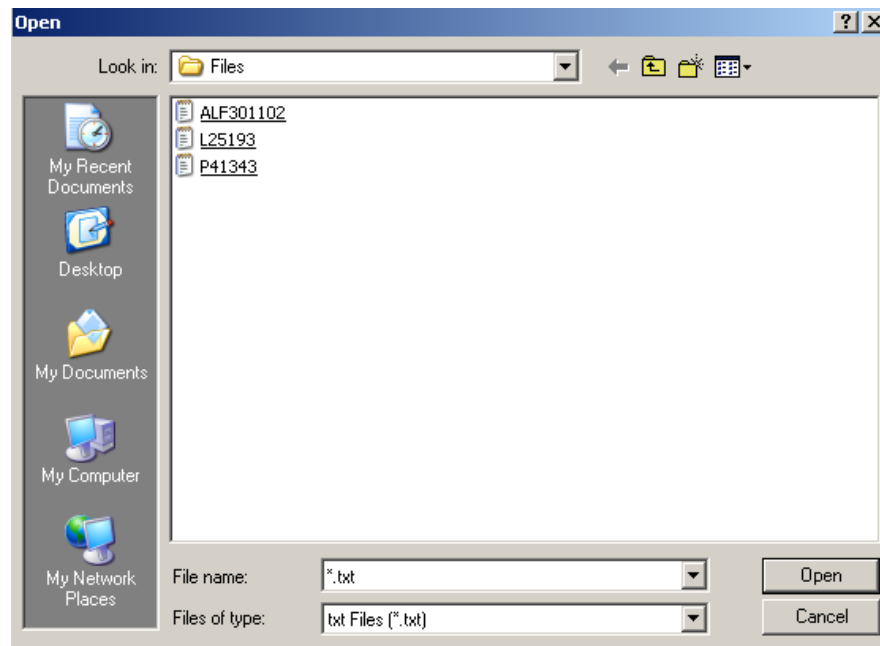
---

## 8.3 Import Files

From the Main Menu, select “Calibrate.” The following options will display:



Select “Import Files.” The “Open” File Dialog screen will display.



The contents of the folder containing the transducer files are displayed. Highlight the file to import and press the [Open] button. Files beginning with the letter “P” are Pressure Transducer files. Files beginning with the letter “L” are Load Cell files. The remaining number in the file name represents the serial number of the transducer. Files beginning with the letter “A” are Actuator files. The remaining number in the file name represents the serial number of the unit.

If the import is successful, the following message displays:

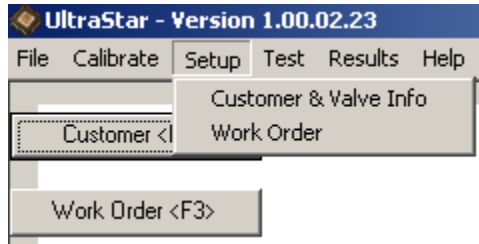
# A.V.K. Industries, Inc.

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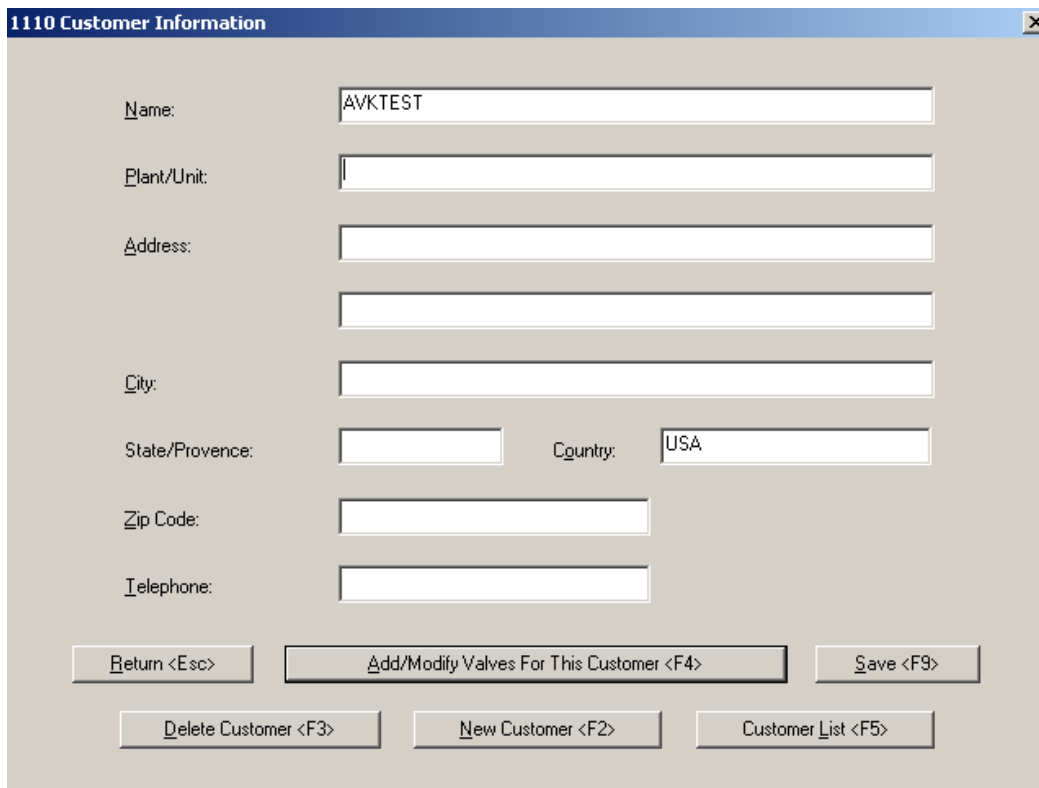
## 9.0 Customer & Valve Information

From the menu bar, select "Setup." The following options will display:



## 9.1 Customer Information

Select "Customer & Valve Info." The "1110 Customer Information" screen will display.

A screenshot of the "1110 Customer Information" form. The form has a title bar that reads "1110 Customer Information" with a close button (X) in the top right corner. The form contains several input fields: "Name:" with the value "AVKTEST", "Plant/Unit:", "Address:" (two stacked fields), "City:", "State/Province:", "Country:" with the value "USA", "Zip Code:", and "Telephone:". At the bottom of the form, there are several buttons: "Return <Esc>", "Add/Modify Valves For This Customer <F4>", "Save <F9>", "Delete Customer <F3>", "New Customer <F2>", and "Customer List <F5>".

# A.V.K. Industries, Inc.

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Enter the information as follows:

## Customer Name

Enter the customer's name, up to 35 characters. This information is required.

## Plant/Unit

Enter the customer's plant/unit description, up to 50 characters.

## Address

Enter the up to 2 lines of the address of the customer, up to 35 characters each. The address line is optional.

## City

Enter the city, up to 35 characters. This information is optional.

## State or Province

Enter the abbreviation for the state or province, up to 35 characters. This information is optional.

## Country

Enter the abbreviation for the country, up to 35 characters. This information is optional.

## Zip Code

Enter the zip code, up to 20 characters, alpha or numeric. Embedded spaces are allowed. This information is optional.

## Telephone

Enter the telephone number, up to 20 characters.

The <Enter> or the <Tab> key will move the cursor to the next field. The <Shift> <Tab> key combination will move the cursor to the previous field. Note that all information will be displayed and saved in upper case only, regardless of how it is entered.

## [New Customer <F2>]

Click the [New Customer] button or press the <F2> to enter new customer information.

## [Delete Customer <F3>]

Click the [Delete Customer] button to delete the customer displayed on the screen.

## [Save <F9>]

When finished, click the [Save] button or press the <F9> key to continue.

## [Return <Esc>]

To cancel without saving, click the [Return] button or press the <Esc> key.

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## [Customer List <F5>]

To view a list of all customers entered into the UltraStar-LFM program, click the [Customer List] button or press the <F5> key. The following “1120 Customer Selection” screen will display.

Name	Address	City	State	Zip Code	Phone
AVKTEST					

Return <Esc>      Select <F9>

## [Select <F9>]

Highlight the customer that you want to edit, delete or view and click the [Select] button or press the <F9> button.

## [Return <Esc>]

To exit without selecting an item from the list, click the [Return] button or press the <Esc> key.

After selecting a customer from the list, the “1110 Customer Information” will display with the customer information.

# A.V.K. Industries, Inc.

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## 9.2 Customer Valve List

[Add/Modify Valves For This Customer <F4>]

To enter, edit, delete, or view a customer's valve list, click the [Valve List] button. The following "1130 Customer Valve List" screen will display.

Location	Serial Number	Name Plate	Manufacturer Model Orifice
AVKSHOP	123	1905	CONSOLIDATED MODEL 1900-XDA O-RING ...

[Delete Valve <F3>]

To delete a valve from the customer's valve list, highlight the valve to be deleted and click the [Delete Valve] button or press the <F3> key...

[Modify Valve <F6>]

To modify an existing valve in the customer's valve list, highlight the valve to be modified and click the [Modify Valve] button or press the <F6> key. The "1140 Customer Valve Information" screen displays.

[Add Valve <F4>]

To add a valve to the customer's valve list, click the [Add Valve] button or press the <F4> key. The "1140 Customer Valve Information" screen displays.

[Return <Esc>]

To exit this function, click the [Return] button or press the <Esc> key.

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## 9.3 Customer Valve Information

Customer: AVKTEST

Key Code:  Manufacturer:

Model:  Orifice:

Serial Number:  Size:  ASME Code:

Nameplate Model Number:  Service Media:

Nameplate Set Pressure:  PSIG Known Seat Area:

Inlet:  AUTO Pressure:  PSIG Tolerance:

General Location:

Specific Location:

Return <Esc> Dup <F8> Valve List <F5> Clear <F7> Save <F9>

### Key Code

If the four-character key code is known, enter the code and press the <Enter> or <Tab> key. The Manufacturer, Model and Orifice are filled in from the selection.

### Manufacturer

Select the Manufacturer from the drop-down list.

Manufacturer:  CONSOLIDATED

Orifice:

Size:  1.5

Pressure:  PSIG

Tolerance:

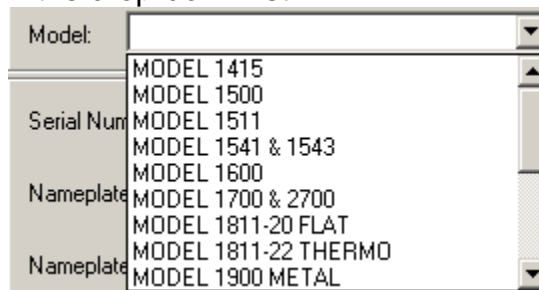
BIRKETT  
CONBRACO  
CONSOLIDATED  
CROSBY  
FARRIS  
FOSTER  
KUNKLE  
LESER  
LONERGAN  
SEMPELL  
SPENCE  
SPIRAX SARCO

### Model

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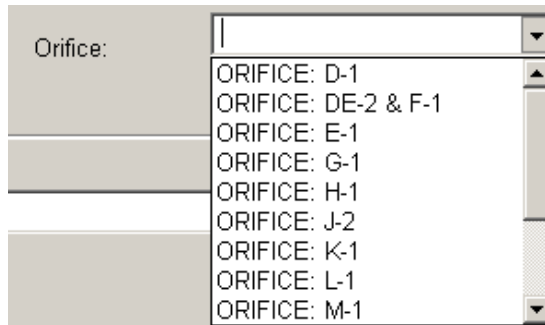
Select the Model from the drop-down list.



A screenshot of a software interface showing a drop-down menu for 'Model'. The menu is open, displaying a list of model names: MODEL 1415, MODEL 1500, MODEL 1511, MODEL 1541 & 1543, MODEL 1600, MODEL 1700 & 2700, MODEL 1811-20 FLAT, MODEL 1811-22 THERMO, and MODEL 1900 METAL. The 'Model:' label is visible to the left of the menu.

## Orifice

Select the Orifice from the drop-down list.



A screenshot of a software interface showing a drop-down menu for 'Orifice'. The menu is open, displaying a list of orifice types: ORIFICE: D-1, ORIFICE: DE-2 & F-1, ORIFICE: E-1, ORIFICE: G-1, ORIFICE: H-1, ORIFICE: J-2, ORIFICE: K-1, ORIFICE: L-1, and ORIFICE: M-1. The 'Orifice:' label is visible to the left of the menu.

## Serial Number

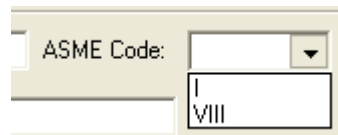
Enter the Serial Number of the Valve, up to 25 characters. This information is required.

## Size

Enter the Size of the Valve, up to 20 characters. This information is required.

## ASME Code

Enter or select the ASME Code. This information is required and must be one of the items in the combo box.



A screenshot of a software interface showing a field for 'ASME Code'. The field is a combination of a text box and a drop-down menu. The text box contains the value 'VIII'.

## Nameplate Model Number

Enter the nameplate model number, up to 35 characters. This information is required.

## Nameplate Set Pressure

Enter the Nameplate (or desired) Set Pressure in the current display units, i.e. PSIG. . This information is required.

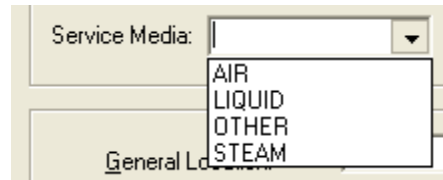
## Service Media



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Enter or select the Service Media. This information is required and must be one of the items in the combo box.



## General Location

Enter a general location of the valve, up to 50 characters.

## Specific Location

Enter a more specific location of the valve, up to 50 characters.

## [Save <F9>]

When finished, click the [Save] button or press the <F9> key to save and continue.

## [Return <Esc>]

To return without saving, click the [Return] button or press the <Esc> key.

## [Clear <F7>]

To clear the information without saving, click the [Clear] button or press the <F7> key.

## [Dup <F8>]

To duplicate the information entered on the previous valve, click the [Dup] button or press the <F8> key. All information except the Serial No and the Nameplate Model Number is duplicated.

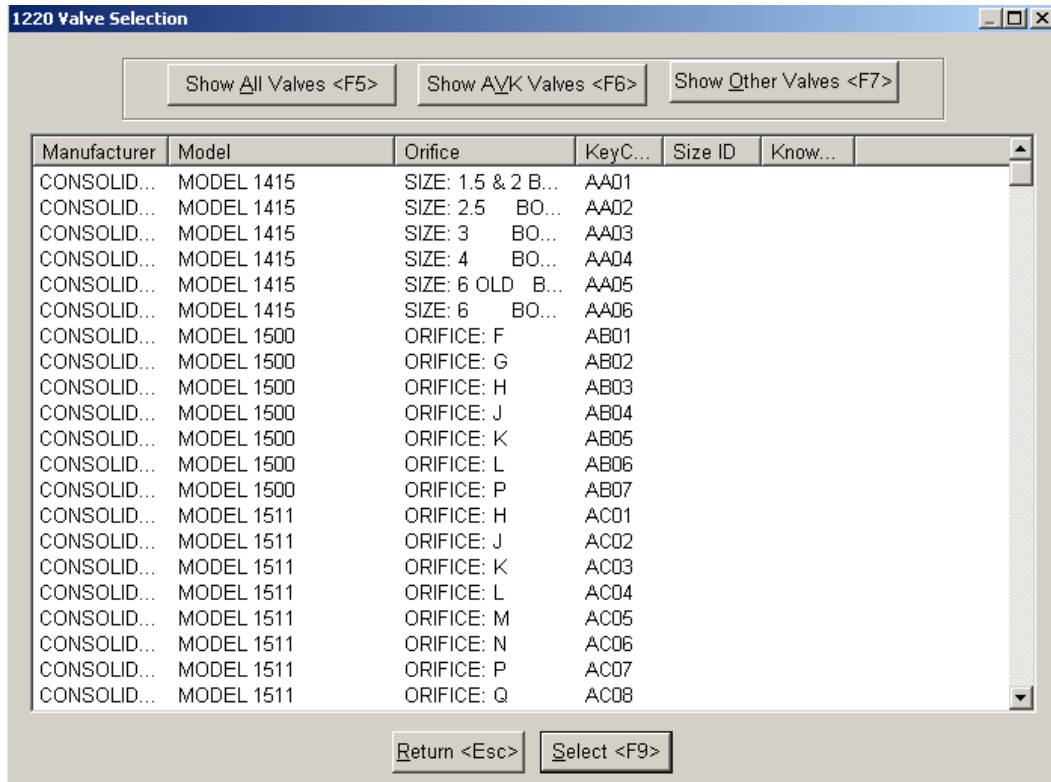
## [Valve List <F5>]

To select a valve from the master valve list, click the [Valve List] button or press the <F5> key.

The following “1220 Valve Selection” screen displays.

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To display only the AVK valves, click the “Show AVK Valves” button or press the <F6> key.

To display valves that are not AVK valves, but have been added to the master valve list, click the “Show Other Valves” button or press the <F7> key.

To show a combination of both AVK and other valves from master valve list, click the “Show All Valves” button or press the <F5> key.

[Select <F9>]

Highlight the valve to be added to the customer’s valve list and click the [Select] button or press the <F9> key.

[Return <Esc>>

To return without saving, click the [Return] button or press the <Esc> key.

After selecting a valve from the list, the “1140 Customer Valve Information” will display with the valve information.

Complete the information and click the [Save] button or press the <F6> to save the customer valve information.

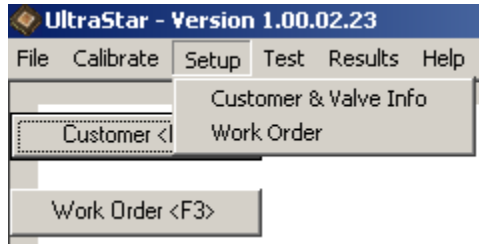
---

# A.V.K. Industries, Inc.

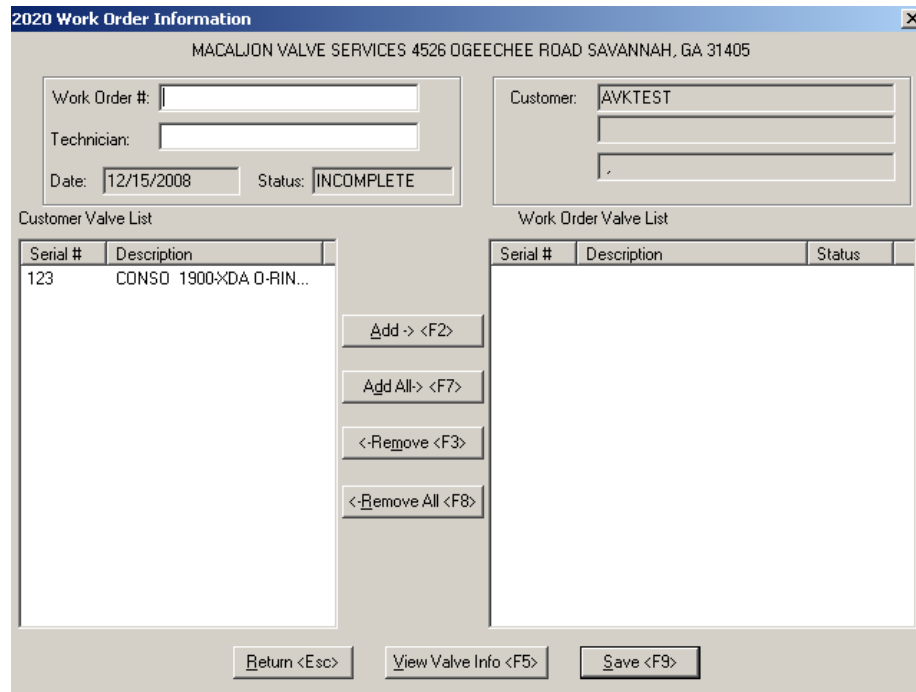
---

## 9.4 Work Order

From the menu bar, select “Setup.” The following options will display:



Select “Work Order.” The program displays the “2020 Work Order Information” screen.



The Customer Valve list on the left of the screen displays all the valves that have been set up for this customer. The Work Order Valve List on the right of the screen will display valves added to this work order.

### Work Order #

Enter the work order number, up to 25 characters.

### Technician

Enter the technician name, up to 50 characters.

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## [Add <F2>]

To select the valves to be tested on this work order, highlight the valve in the Customer Valve List and click the [Add] button or press the <F2> key. The valve will be removed from the Customer Valve List and added to the Work Order Valve List.

## [Add All <F7>]

To select all of the valves shown in the Customer Valve List, and click the [Add All] button or press the <F7> key. All the valves will be removed from the Customer Valve List and added to the Work Order Valve List.

## [Remove <F3>]

To remove a valve from this work order, highlight the valve in the Work Order Valve List and click the [Remove] button or press the <F3> key. The valve will be removed from the Work Order Valve List and added back to the Customer Valve List.

## [Remove All <F8>]

To remove all of the valves to shown in the Work Order Valve List, and click the [Remove All] button or press the <F8> key. All the valves will be removed from the Work Order Valve List and added back to the Customer Valve List.

## [Save <F9>]

When finished, click the [Save <F9>] button or press the <F9> key to save the information.

## [Return <Esc>]

To return without saving, click the [Return] button or press the <Esc> key.

## [View Valve Info <F5>]

To view the valve information, highlight a valve in either list and click the [View Info] button or press the <F5> key. The "1140 Customer Valve Information" screen displays.

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1140 Customer Valve Information

Customer: AVKTEST

Key Code: AJ03 Manufacturer: CONSOLIDATED

Model: MODEL 1900XDA O-RING Orifice: ORIFICE: DE-2 & F-1

Serial Number: 123 Size: 1.5 ASME Code: VIII

Nameplate Model Number: 1905 Service Media: AIR

Nameplate Set Pressure: 92 PSIG

Inlet: AUTO Pressure: PSIG Tolerance: 89 PSIG TO 95 PSIG

General Location: AVKSHOP

Specific Location:

[Return <Esc>] [Dup <F8>] [Valve List <F5>] [Clear <F7>] [Save <F9>]

[Return <Esc>]

To exit the screen, click the [Return] button or press the <Esc> key.

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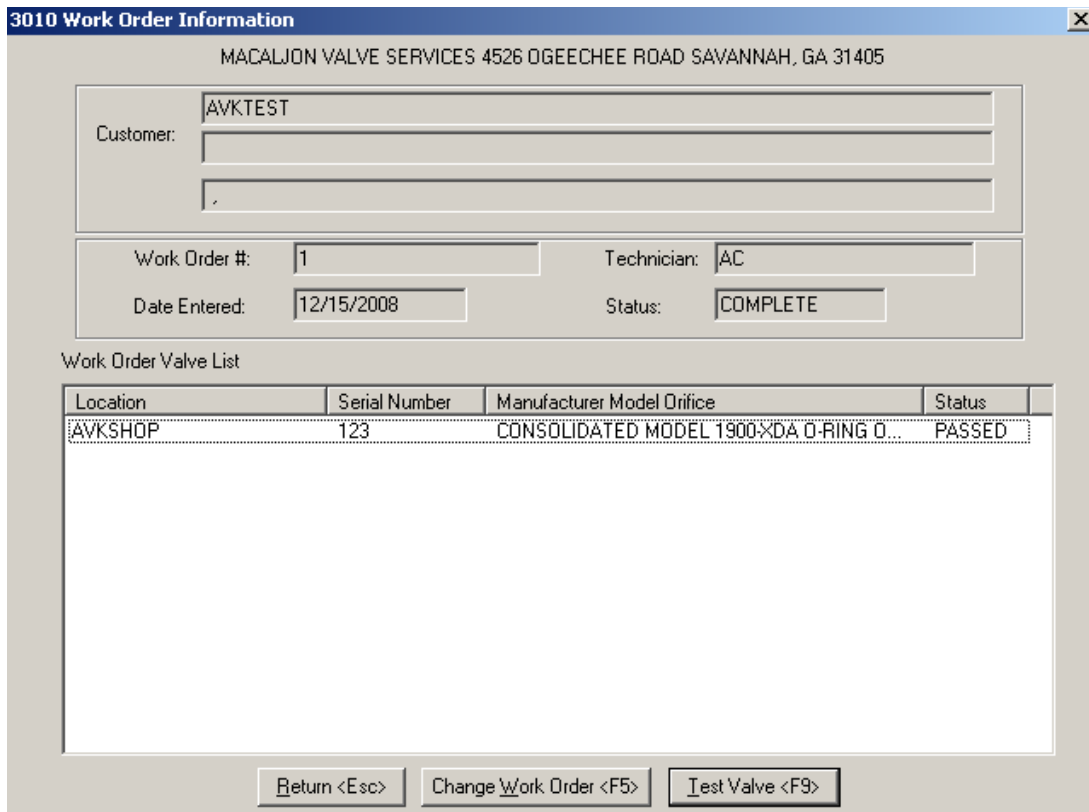
---

## 10.0 Test Valve

From the menu bar, select “Test.” The following options will display:



Select “Test Valve.” The program displays the “3010 Work Order Information” screen with the most recent Work Order information displayed.

A screenshot of the "3010 Work Order Information" window. The title bar reads "3010 Work Order Information". The address bar shows "MACALJON VALVE SERVICES 4526 OGEECHEE ROAD SAVANNAH, GA 31405". The form contains the following fields:

- Customer: AVKTEST
- Work Order #: 1
- Technician: AC
- Date Entered: 12/15/2008
- Status: COMPLETE

Below the form is a table titled "Work Order Valve List":

Location	Serial Number	Manufacturer Model Orifice	Status
AVKSHOP	123	CONSOLIDATED MODEL 1900XDA O-RING O...	PASSED

At the bottom of the window are three buttons: "Return <Esc>", "Change Work Order <F5>", and "Test Valve <F9>".

[Test Valve <F9>]

To exit the screen, click the [Return] button or press the <Esc> key.

[Change Work Order <F5>]

To change to a different Work order, click the [Change Work Order] button or press the <F5> key.

[Return <Esc>]

To exit the screen, click the [Return] button or press the <Esc> key.

# A.V.K. Industries, Inc.

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When “Change Work Order” is selected, the “3015 Work Order Selection” screen displays.

Work Order Number	Date Entered	Technician	Status
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[Select <F9>]

Highlight the Work Order and click the [Select] button or press the <F9> key. The “3010 Work Order Information” screen displays with the selected Work Order.

[Return <Esc>]

To exit the screen, click the [Return] button or press the <Esc> key.

# A.V.K. Industries, Inc.

---

## 10.1 Test Valve Screen

When "Test Valve" is selected, the "3020 Test Valve" screen displays.

**3020 Test Valve**

Customer: AVK

Valve Information:

Valve: [AJ03] CONSOLIDATED 1900

Serial #: 44444 NamePlate S.P. 92 PSIG ASME: VIII Tol: 89 PSIG TO 95 PSIG

WO#: 1 Leak Test: 83 Screw Adj:

INLET	SET POINT	TOL	IN	LIFT

**INLET**  
**254**  
**PSIG**

**Force Vector**  
**38**  
**UNITS**

**Position**  
**0.354**  
**Lift**  
18%

EXPECTED FORCE AT TRIGGER: 37 Date: 05/13/2009 Temp: **93 F**

SET OFFSET FOR BOTH GAGES Time: 7:21 PM

AUTO Trigger<F9> Set Offset<F8> Start Test<F2> Record Trigger<F4> View Graphs<F12> Abort Test <Esc>

AUTO Inlet <F6> Screw Adj<F7> Stop Test<F3> Comments<F5> Done <F10>

### Customer Information

Customer name and address is displayed on the line at the top of the screen.

### Valve Information

Next, the valve key code, manufacturer, model, orifice, serial number, nameplate set pressure, ASME code, tolerance, work order number, and cumulative screw adjustment will display.

### Test Results

Next, the Test Results will display as the tests are completed. The first test to be performed is the ASF or "As Found Test", followed by the VT1 or "Verification Test #1", and the VT2 or "Verification Test #2." For each test, the inlet pressure, calculated set point, tolerance and Y or N indicating whether the set point is within tolerance.

### Inlet and Force Vector

Next the inlet and force vector are displayed.

---

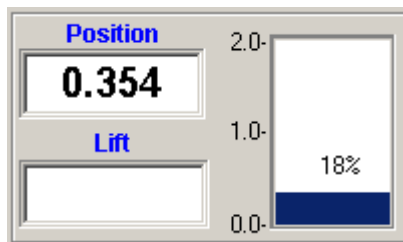


# A.V.K. Industries, Inc.

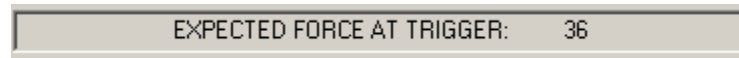
---



Next, the actuator position is displayed. Below it, is the lift calculation. To the right, an actuator bar displays the position of the actuator using a range from 0 to 2 inches.



The expected force at the expected trigger point is calculated at the start of each test and recalculated periodically and displayed throughout the test.

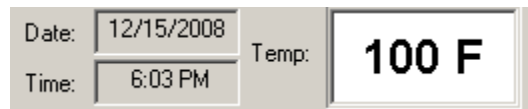


If the zero offset has not been set for either the pressure transducer or the load cell a reminder message is displayed next.



## Date/Time and Temperature

Next, the current date and time and board temperature is displayed.



## The Testing Process

The testing process is controlled by the buttons at the bottom of the screen. Alternatively, function keys can be used.



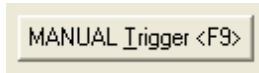
# A.V.K. Industries, Inc.

---

## 10.2 Auto/Manual Trigger

[AUTO Trigger <F9>]

By default the auto trigger is on. To turn this feature off, click the [AUTO Trigger] button or press the <F9> key. The description on the button will change to “MANUAL Trigger <F9>.”



When manual trigger is selected, the “Record Trigger” button must be clicked or the <F4> key pressed to record the trigger. To switch back to auto trigger, click the [MANUAL Trigger] button or press the <F9> key again. The description on the button will change back to “AUTO Trigger <F9>.”

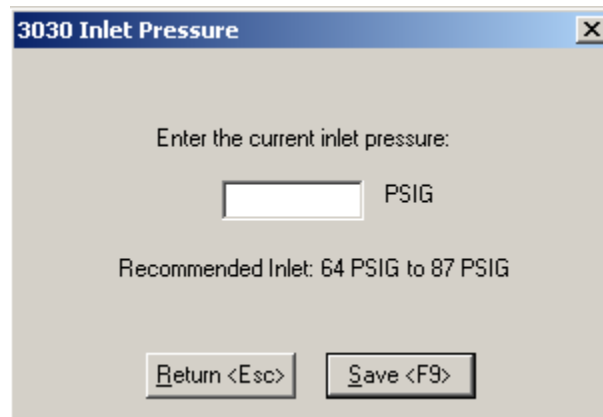
## 10.3 Auto/Manual Inlet

[AUTO Inlet <F6>]

By default the auto inlet is on. If a pressure transducer can be attached to a gage tap, the inlet pressure will automatically be entered in all calculations. If no transducer is being used to record the inlet, click the [AUTO Inlet] button or press the <F6> key. The description on the button will change to “MANUAL Inlet <F6>.”



The following screen will display:



Enter the current inlet pressure in the units displayed. The recommended range is calculated follows: Minimum inlet is 70% of desired set point. Maximum inlet is 95% of desired set point.

[Save <F9>]

# A.V.K. Industries, Inc.

---

When finished, click the [Save] button or press the <F9> key to save and continue.

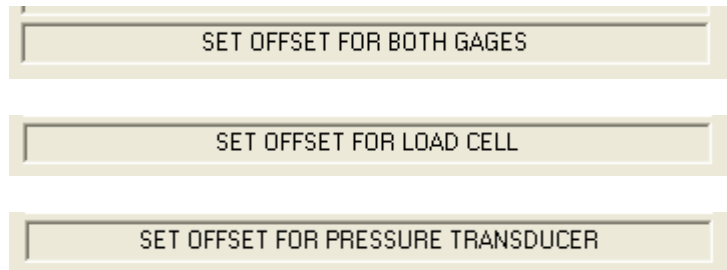
[Return <Esc>>

To return without saving, click the [Return] button or press the <Esc> key.

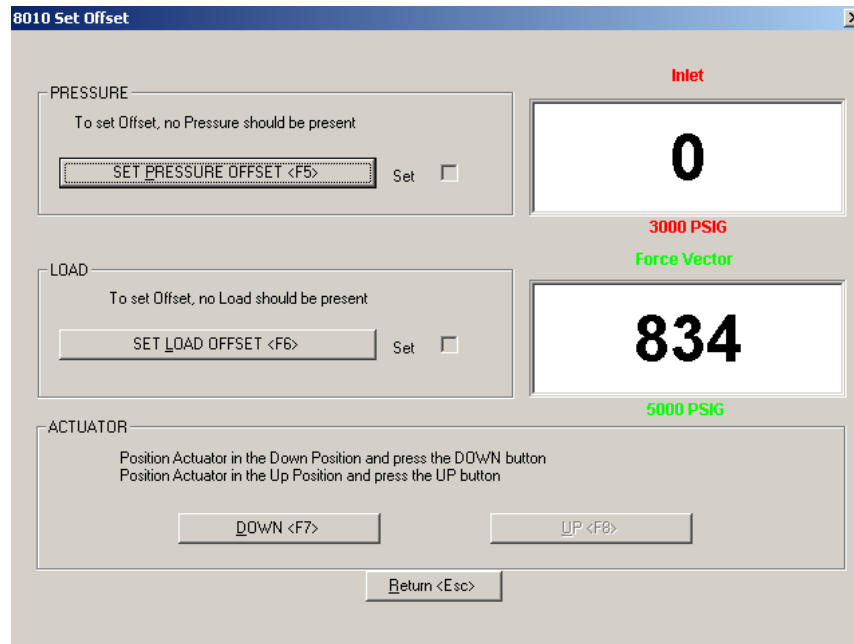
## 10.4 Set Offset

[Set Offset <F8>]

A zero offset must be completed on each gage before testing. If one of the following messages displays, click the [Set Offset] button or press the <F8> key to set the zero offset.



The “8010 Set Offset” screen will display.



[SET PRESSURE OFFSET <F5>]

# A.V.K. Industries, Inc.

---

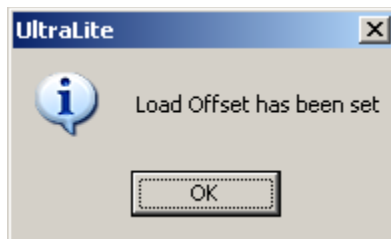
To set the offset for the pressure transducer, no pressure should be present on the system. Click the [SET PRESSURE OFFSET] button or press the <F5> key. The following message displays:



The "Set" checkbox next to the [SET PRESSURE OFFSET] button will now be checked.

[SET LOAD OFFSET <F6>]

To set the offset for the load cell, no load should be present on the system. Click the [SET LOAD OFFSET] button or press the <F6> key. The following message displays:



The "Set" checkbox next to the [SET LOAD OFFSET] button will now be checked.

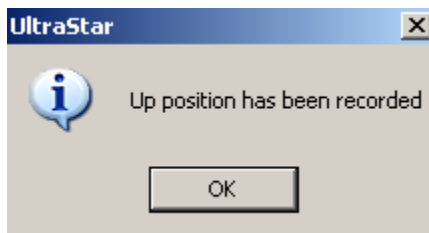
## Actuator calibration

Position the actuator in the "down" position. Press the [DOWN <F7>] button.

The following message displays:



Position the actuator in the "up" position. Press the [UP <F8>] button. The following message displays:



# A.V.K. Industries, Inc.

---

[Return <Esc>]

To exit the screen, click the [Return] button or press the <Esc> key.

## 10.5 Screw Adjustments

[Screw Adjustments <F6>]

To record the screw adjustment, click the [Screw Adjustments] button or press the <F6> key.

Screw adjustments can be entered in Turns or Flats. Initially the display will show Turns.

3040 Screw Adjustment

Previous Cumulative Adjustment:

New Cumulative Adjustment:

Change: NONE

Select One:

Turns

Flats

Change To Turns <F2>

Change To Flats <F3>

1 3/8 TURNS DOWN

1 1/4 TURNS DOWN

1 1/8 TURNS DOWN

1 TURN DOWN

7/8 TURN DOWN

3/4 TURN DOWN

5/8 TURN DOWN

1/2 TURN DOWN

3/8 TURN DOWN

1/4 TURN DOWN

1/8 TURN DOWN

**0 TURNS**

1/8 TURN UP

1/4 TURN UP

Return <Esc> Clear <F7> Save <F9>

[Change To Flats <F3>]

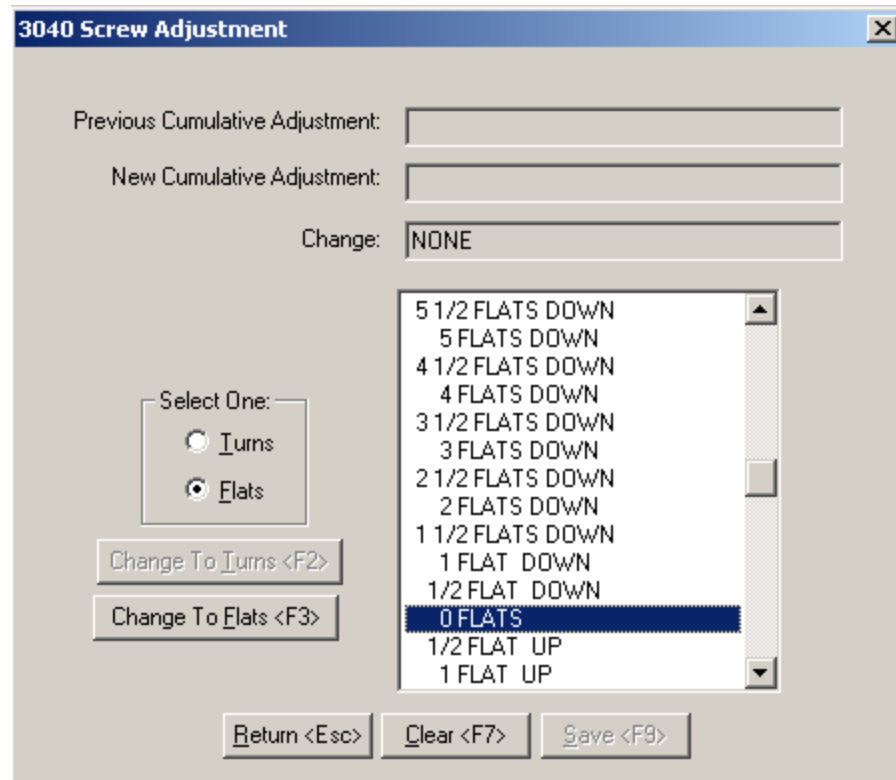
To switch to the Flats display, click the [Change To Flats] button or press the <F3> key.

[Change To Turns <F2>]

To switch to the Turns display, click the [Change To Turns] button or press the <F2> key.

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---



The “Previous Cumulative Adjustment” field displays any adjustments that have been recorded during the current test.

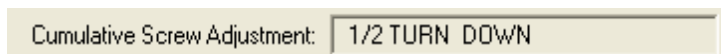
The “New Cumulative Adjustment” field displays the adjustment that is currently highlighted in the selection box.

### [Clear <F7>]

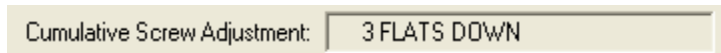
Click the [Clear] button or press the <F7> key to clear the current selection.

### [Save <F9>]

Highlight the appropriate amount in the selection box. Click the [Save] button or press the <F9> key. The Cumulative Screw Adjustment field on the “3020 Test Valve” screen will now display the new cumulative adjustment.



or



### [Return <Esc>]

To exit the screen, click the [Return] button or press the <Esc> key.

---

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---

## 10.6 Start/Stop Test, Record Trigger

### [Start Test <F2>]

When ready to begin the test, click the [Start Test] button or press the <F2> key. A message will display to indicate the test has been started.

TEST STARTED

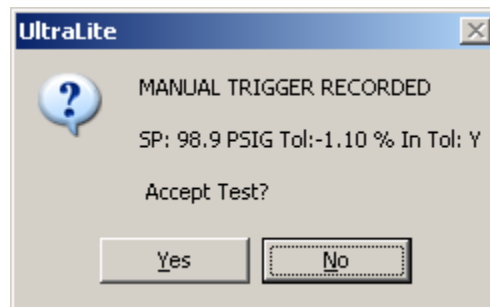
### [Stop Test <F3>]

To stop a test in progress, click the [Stop Test] button or press the <F3> key. A message will display to indicate the test has been stopped.

TEST STOPPED

### [Record Trigger <F4>]

To manually record a trigger, click the [Record Trigger] button or press the <F4> key. The following screen displays:



To accept the test, click the [YES] button. To repeat the test, click the [No] button. If the test is accepted, a message will display to indicate that the test was accepted.

ACCEPTED...PRESS F2 TO START NEXT TEST

The first test is recorded as the AFT or As Found Test.

	INLET	SET POINT	TOLERANCE	IN TOL
AFT	80.1 PSIG	98.9 PSIG	-1.10 %	Y

Continue the testing procedure for the VT1 (Verification Test #1) and VT2 (Verification Test #2).

# A.V.K. Industries, Inc.

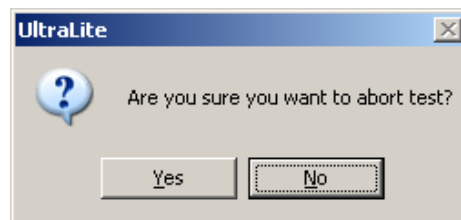
---

	INLET	SET POINT	TOLERANCE	IN TOL
AFT	80.1 PSIG	98.9 PSIG	-1.10 %	Y
VT1	80.1 PSIG	98.7 PSIG	-1.30 %	Y
VT2	80.1 PSIG	98.7 PSIG	-1.30 %	Y
AVE	80.1 PSIG	98.7 PSIG	-1.30 %	Y

The average is calculated from the VT1 and VT2 tests.

## [Abort Test <Esc>]

To abort the test, click on the [Abort Test]” button or press the <Esc> key. The following message displays.



To end the test, click the [YES] button. To return to the test screen, click the [No] button.

## 10.7 Comments

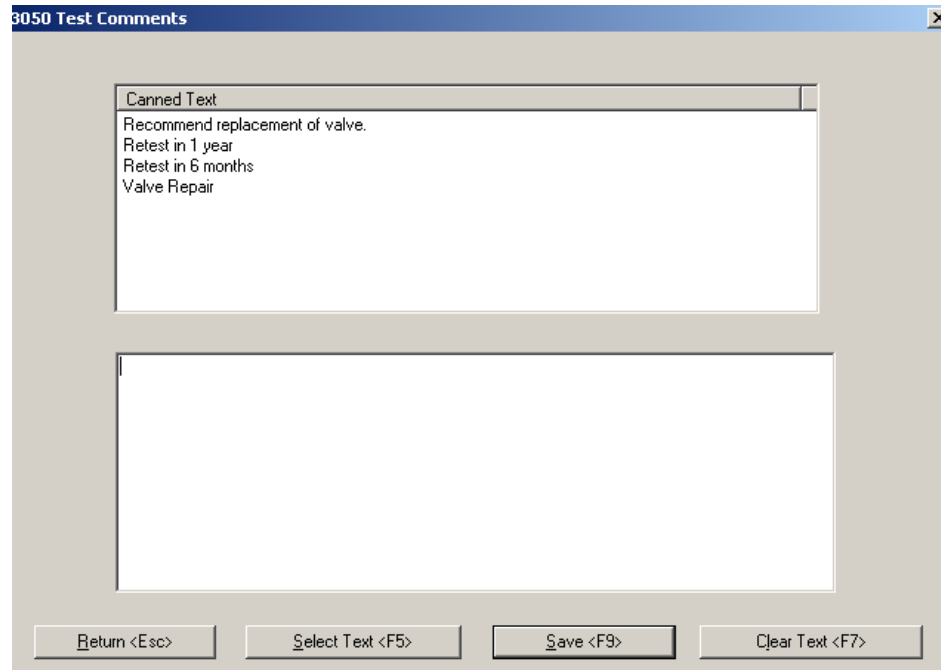
### [Comments <F5>]

To view or enter comments about the valve, click on the [Comments] key or press the <F5> key. The following screen will display.



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---



## [Select Text <F5>]

To select the canned text, highlight the line in the upper box and click the [Select Text] button or press the <F5> key. The line will be added to any text entered in the lower box. To type in additional comments, click at the appropriate location in the lower box and type the comments.

## [Clear Text <F7>]

To clear all text from the lower box, click the [Clear Text] button or press the <F7> key.

## [Save <F9>]

When finished, click the [Save <F9>] button or press the <F9> key to save the information.

## [Return <Esc>]

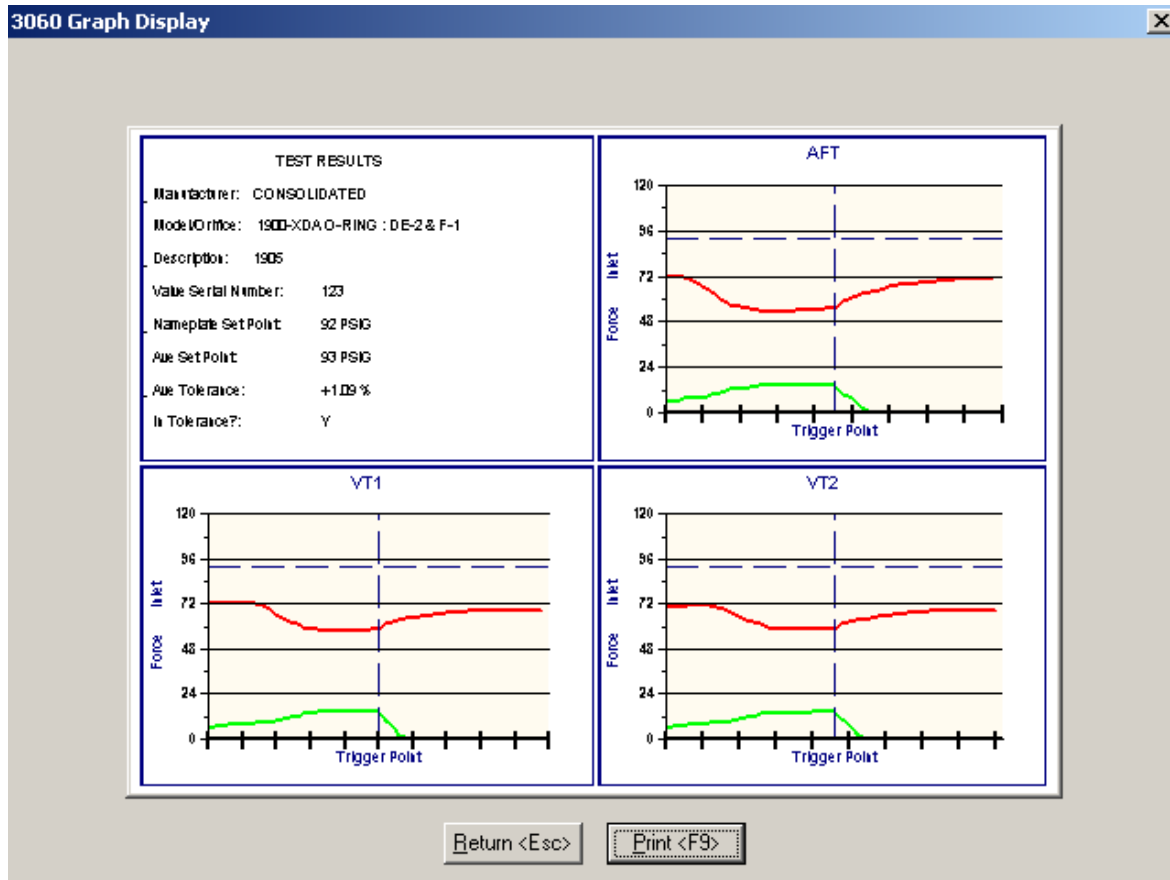
To return without saving, click the [Return] button or press the <Esc> key.

## 10.8 Graphs

### [View Graphs <F12>]

To view the graphs of the test data, click on the [View Graphs] button or press the <F12> key. The "3060 Graph Display" screen is displayed.

# A.V.K. Industries, Inc.



The data points from each test are displayed in a separate graph. Two lines are plotted along the horizontal axis over time.

The first line represents the inlet pressure. This line usually appears at the top of the graph.

The second line represents the force vector. This line sweeps upward until the trigger point is reached. The trigger is indicated by the vertical dotted line. After the trigger point the force vector drops back to its original value. The nameplate set point is indicated by the horizontal dotted line.

[Print <F9>]

To print the graph, click the [Print] button or press the <F9> key...

[Return <Esc>]

To exit the screen, click the [Return] button or press the <Esc> key.

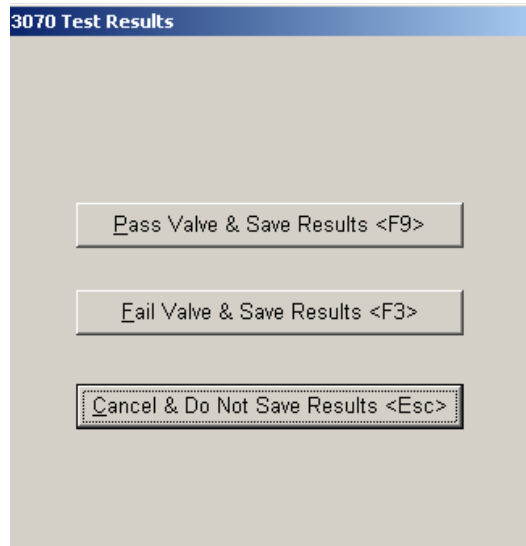
## 10.9 Completing the Test

# A.V.K. Industries, Inc.

---

[Done <F10>]

When all tests have been completed and all information entered for this valve, click on the “Done” button or press the <F10> key. The “3070 Test Results” screen displays.

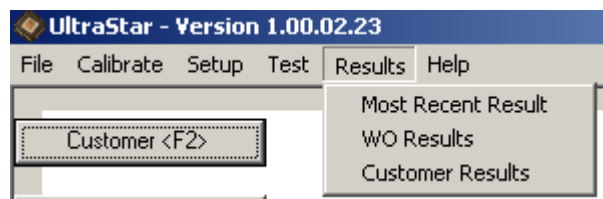


Select one of the following buttons:

- 1) Pass the valve test and save the results (<F9> key).
- 2) Fail the valve test and save the results (<F3> key).
- 3) Cancel the valve test without saving the results (<Esc> key).

## 11.0 Results

From the Main Menu, select “Results.” The following options will display:



Select “Most Recent Result.” The “4010 Test Results” screen will display.

# A.V.K. Industries, Inc.

**4010 Test Results** X

AVK SHOP USA

<div style="border-bottom: 1px solid gray; padding-bottom: 5px;">Valve</div> <div style="border-bottom: 1px solid gray; padding-bottom: 5px;">Location: <input style="width: 90%;" type="text" value="SHOP"/></div> <div style="border-bottom: 1px solid gray; padding-bottom: 5px;">Serial #: <input style="width: 90%;" type="text" value="434343"/></div> <div style="border-bottom: 1px solid gray; padding-bottom: 5px;">Manufacturer: <input style="width: 90%;" type="text" value="CONSOLIDATED"/></div> <div style="border-bottom: 1px solid gray; padding-bottom: 5px;">Model/Orifice: <input style="width: 90%;" type="text" value="1900-XDA O-RING : DE-2 &amp; F-1"/></div> <div style="border-bottom: 1px solid gray; padding-bottom: 5px;">Valve Size: <input style="width: 40%;" type="text" value="1.5"/> ASME: <input style="width: 40%;" type="text" value="VIII"/></div>	<div style="border-bottom: 1px solid gray; padding-bottom: 5px;">Nameplate Model #: <input style="width: 90%;" type="text" value="1905"/></div> <div style="border-bottom: 1px solid gray; padding-bottom: 5px;">Nameplate SP: <input style="width: 40%;" type="text" value="92"/> PSIG</div> <div style="border-bottom: 1px solid gray; padding-bottom: 5px;">Leak Test: <input style="width: 40%;" type="text" value="83"/> PSIG</div> <div style="border-bottom: 1px solid gray; padding-bottom: 5px;">Tolerance: <input style="width: 90%;" type="text" value="89 PSIG TO 95 PSIG"/></div> <div style="border-bottom: 1px solid gray; padding-bottom: 5px;">Cum Screw Adj: <input style="width: 90%;" type="text"/></div>
---	---

Test Results

	INLET PRESSURE-A	SET POINT	TOLERANCE	IN TOL	
AFT	63 PSIG	92 PSIG	+0.00 %	Y	▲
VT1	61 PSIG	92 PSIG	+0.00 %	Y	
VT2	60 PSIG	93 PSIG	+1.09 %	Y	▼

Date/Time:  Status:

WO #:  Test Seq#:

Technician:

Pressurer:

Serial #:

Last Calibration:

Load Cell:

Serial #:

Last Calibration:

The above valve was tested using the A.V.K. UltraStar device in accordance with ASME Code VIII and was found to be within set point tolerance.

Return <Esc>

Comments <F5>

Graphs <F12>

Export <F8>

Print <F9>

# A.V.K. Industries, Inc.

**4010 Test Results**
✕

AVK SHOP USA

<div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Valve</div> <div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Location: <input style="width: 90%;" type="text" value="SHOP"/></div> <div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Serial #: <input style="width: 90%;" type="text" value="434343"/></div> <div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Manufacturer: <input style="width: 90%;" type="text" value="CONSOLIDATED"/></div> <div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Model/Orifice: <input style="width: 90%;" type="text" value="1900-XDA O-RING : DE-2 &amp; F-1"/></div> <div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Valve Size: <input style="width: 40%;" type="text" value="1.5"/> ASME: <input style="width: 40%;" type="text" value="VIII"/></div>	<div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Nameplate Model #: <input style="width: 90%;" type="text" value="1905"/></div> <div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Nameplate SP: <input style="width: 40%;" type="text" value="92"/> PSIG</div> <div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Leak Test: <input style="width: 40%;" type="text" value="83"/> PSIG</div> <div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Tolerance: <input style="width: 90%;" type="text" value="89 PSIG TO 95 PSIG"/></div> <div style="border-bottom: 1px solid gray; padding-bottom: 2px;">Cum Screw Adj: <input style="width: 90%;" type="text"/></div>
---	---

Test Results

	INLET PRESSURE-A	SET POINT	TOLERANCE	IN TOL	
AFT	63 PSIG	92 PSIG	+0.00 %	Y	▲
VT1	61 PSIG	92 PSIG	+0.00 %	Y	
VT2	60 PSIG	93 PSIG	+1.09 %	Y	▼

Date/Time: 
Status:

WO #: 
Test Seq#:

Technician:

Pressurer: 
Serial #: 
Last Calibration:

Load Cell: 
Serial #: 
Last Calibration:

The above valve was tested using the A.V.K. UltraStar device in accordance with ASME Code VIII and was found to be within set point tolerance.

Return <Esc>
Comments <F5>
Graphs <F12>
Export <F8>
Print <F9>

If entered during the testing process, the following items will be included in the display of the results.

Cumulative Compression screw adjustment as recorded during the test.

Compression Screw Adjustment:

Comments entered during the test.

Comments:

Retest in 1 year.

The date and time of the completion of the test and the status of “PASSED” or “FAILED.”

Date/Time:  Status:

# A.V.K. Industries, Inc.

---

The description, serial number, and date of last calibration of the pressure transducer and the load cell used during the test.

Pressurer:	<input type="text" value="3000 PSIG"/>	Serial #:	<input type="text" value="26333"/>	Last Calibration:	<input type="text" value="12/15/2008"/>
Load Cell:	<input type="text" value="5000 PSIG"/>	Serial #:	<input type="text" value="233339"/>	Last Calibration:	<input type="text" value="12/15/2008"/>

The statement describing the final conclusion of the test.

The above valve was tested using the A.V.K. UltraStar device in accordance with ASME Code VIII and was found to be within set point tolerance.

[Comments <F5>]

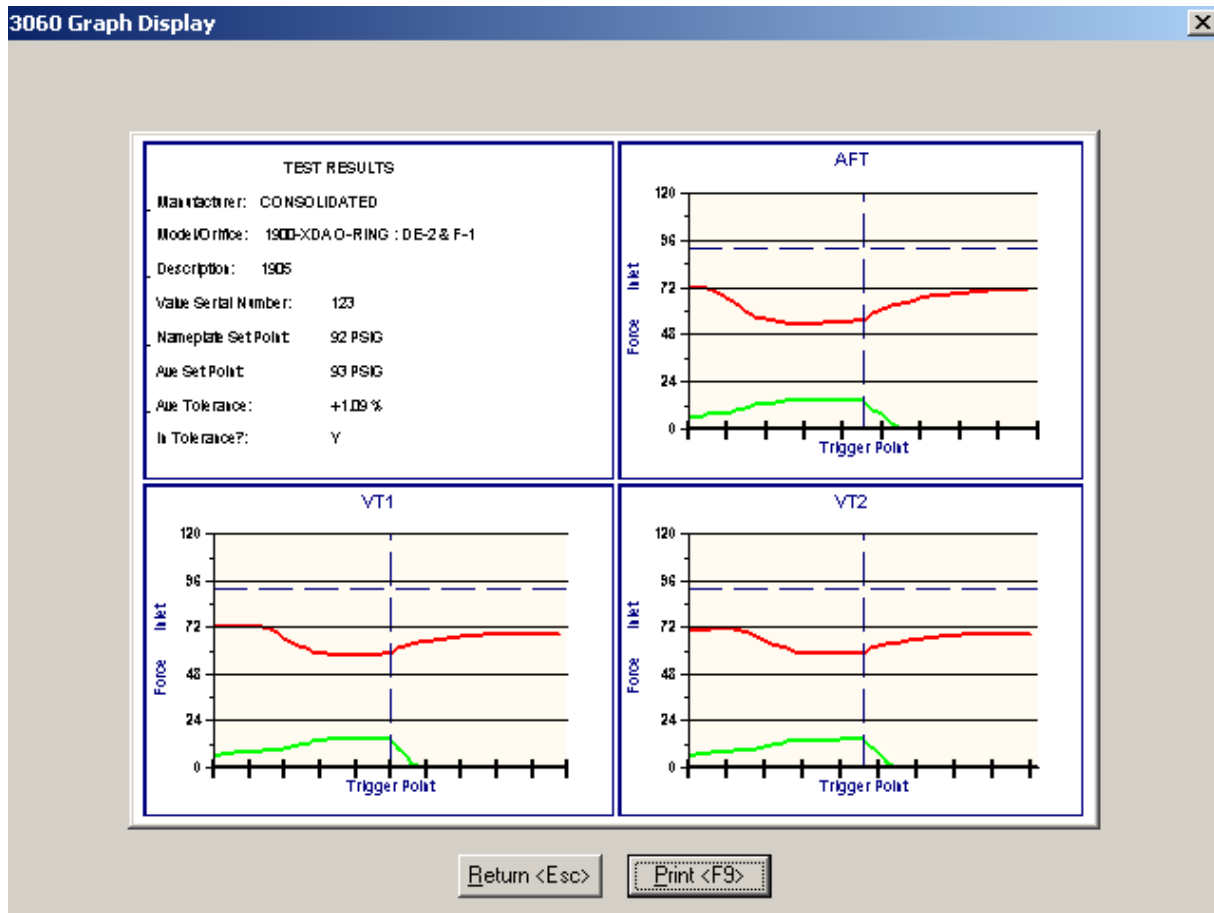
To add comments to the test results, click the [Comments] button or press the <F12> key.

# A.V.K. Industries, Inc.

## 11.1 Graphs

[Graphs <F12>]

To view the graphs, click the [Graphs] button or press the <F12> key. The “3060 Graph Display” screen displays.



The test results for the As Found Test (AFT), the Verification Test #1 (VT1) and Verification Test #2 (VT2) are graphically displayed.

The data points from each test are displayed in a separate graph. Two lines are plotted along the horizontal axis over time.

The first line represents the inlet pressure. This line usually appears at the top of the graph.

The second line represents the force vector. This line sweeps upward until the trigger point is reached. The trigger is indicated by the vertical dotted line. After the trigger point the force vector drops back to its original value. The nameplate set point is indicated by the horizontal dotted line.

# A.V.K. Industries, Inc.

---

[Print <F9>]

To print the graph, click the [Print] button or press the <F9> key...

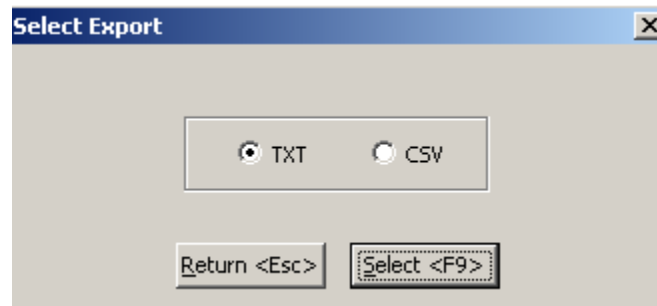
[Return <Esc>]

To exit the screen, click the [Return] button or press the <Esc> key.

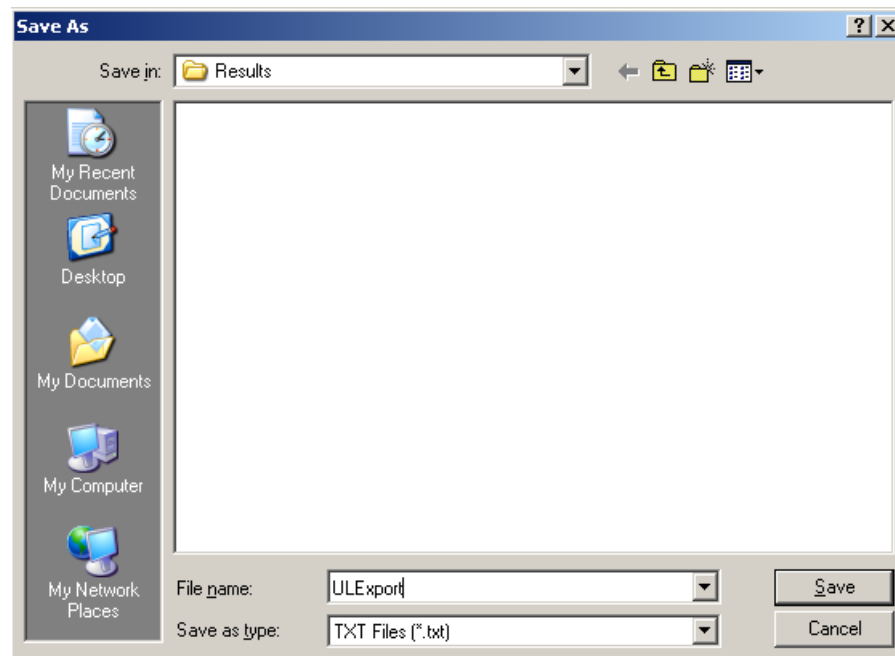
## 11.2 Exporting Results to a Text File

[Export <F8>]

To export the results to a text file or comma delimited file, click on the [Export] button or press the <F8> key. The following screen displays:



To export the results to a text file, click the TXT radio button. The next screen displays the default directory and file name which can be changed.





# A.V.K. Industries, Inc.

---

[Save]

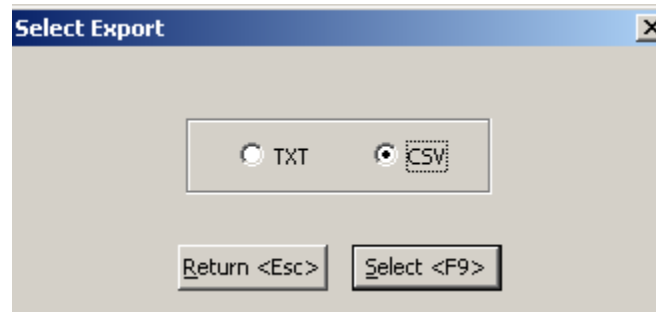
To complete the export, click the [Save] button.

[Cancel]

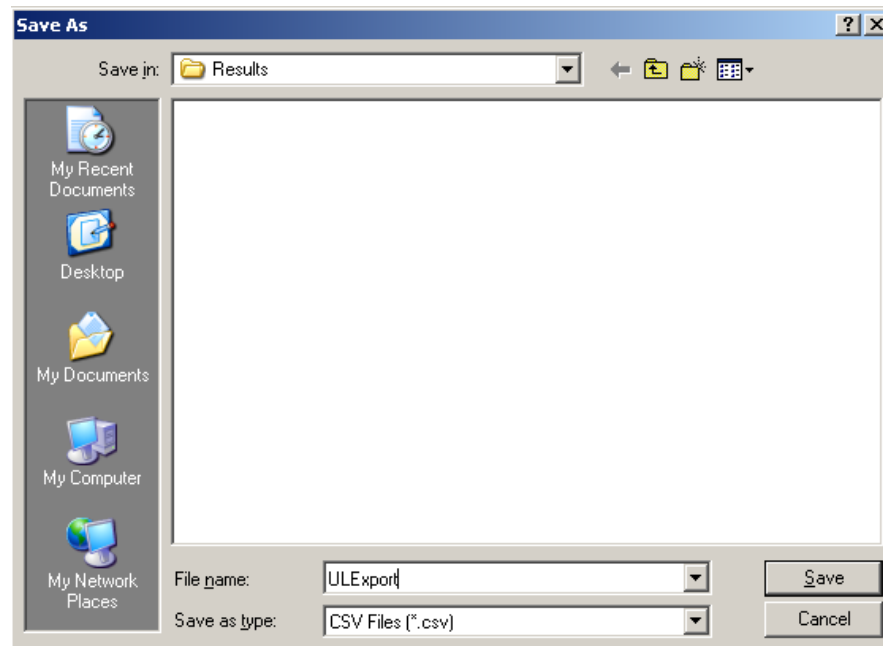
To exit the screen without completing the export, click the [Cancel] button.

## 11.3 Exporting Results to a Comma Delimited (csv) File

To export the results to a comma delimited file, click the CSV radio button.



The next screen displays the default directory and file name which can be changed.



[Save]

To complete the export, click the [Save] button.

# A.V.K. Industries, Inc.

---

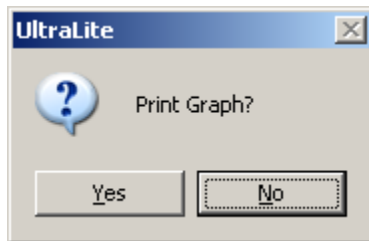
[Cancel]

To exit the screen without completing the export, click the [Cancel] button.

## 11.4 Printing Results

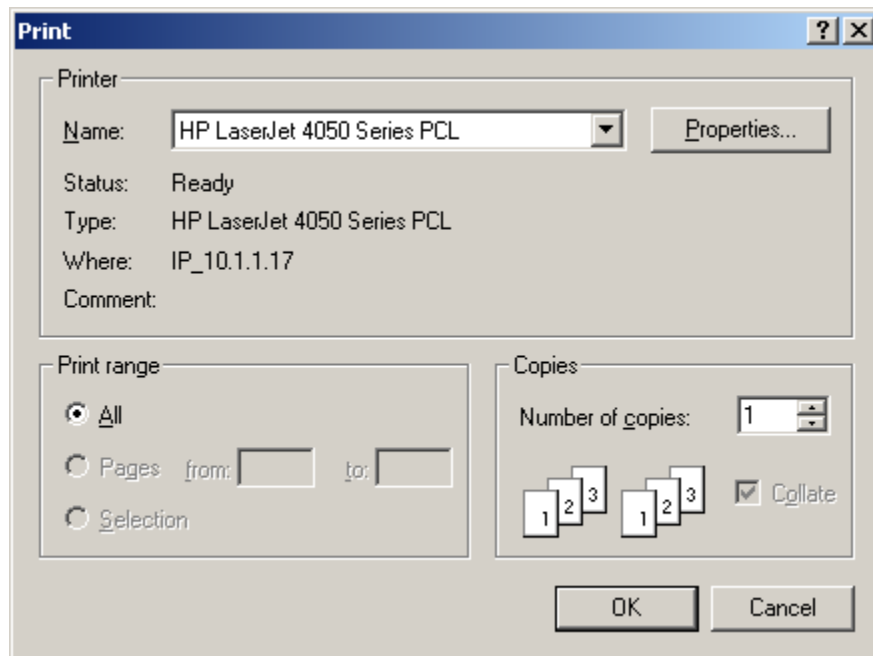
[Print <F9>]

To print the results, click on the [Print] button or press the <F9> key. The following message displays:



To print the graph as well as the results, click the [YES] button. To print the results with no graph, click the [No] button.

The standard windows print dialog is then displayed.



[OK]

To complete the printing, click the [OK] button.

# A.V.K. Industries, Inc.

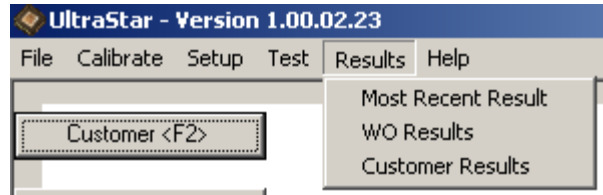
---

[Cancel]

To exit the screen without printing, click the [Cancel] button.

## 11.5 WO Results

From the Main Menu, select “Results.” The following options will display:



Select “WO Results.” The “4020 Work Order Test Results” screen will display.

The screenshot displays the '4020 Work Order Test Results' window. It features several input fields and a table. The 'Customer' field contains 'AVKTEST'. The 'Work Order #' field contains '1', and the 'Technician' field contains 'AC'. The 'Date Entered' field contains '12/15/2008', and the 'Status' field contains 'COMPLETE'. Below these fields is a table titled 'Work Order Valve List' with the following data:

Test Date	Serial Number	Manufacturer	Model	Orifice	Status
12/15/2008 3:0...	123	CONSOLIDA...	MODEL 1900XD...	ORIFICE: DE-2 &...	PASSED

At the bottom of the window, there are five buttons: 'Export All Results <F2>', 'Export Summary <F3>', 'Print All Results <F4>', 'Print Summary <F5>', and 'View Result <F9>'. A 'Return <Esc>' button is also present.

All completed tests for the valves associated with this work order are listed.

---

# A.V.K. Industries, Inc.

---

## [Export All Reports <F2>]

To export the test results of each valve on the work order, click the [Export All Reports] button or press the <F2> key. All results are exported to a csv or txt file.

## [Export Summary <F3>]

To export the list of all the valves on the work order, click on the [Export Summary] button or press the <F3> key... The list of valves is exported to a csv or txt file.

## [Print All Reports <F4>]

To print the test results of each valve on the work order, click on the [Print All Reports] button or press the <F4> key.

## [Print Summary <F5>]

To print the list of all the valves on the work order, click on the [Print Summary] button or press the <F5> key.

## [View Result <F9>]

To view a particular test result, highlight the valve in the list and click the [View Result] button or press the <F9> key. The "4010 Test Results" screen will display.

## [Return <Esc>]

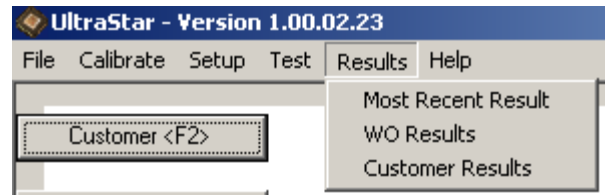
To exit the screen, click the [Return] button or press the <Esc> key.

# A.V.K. Industries, Inc.

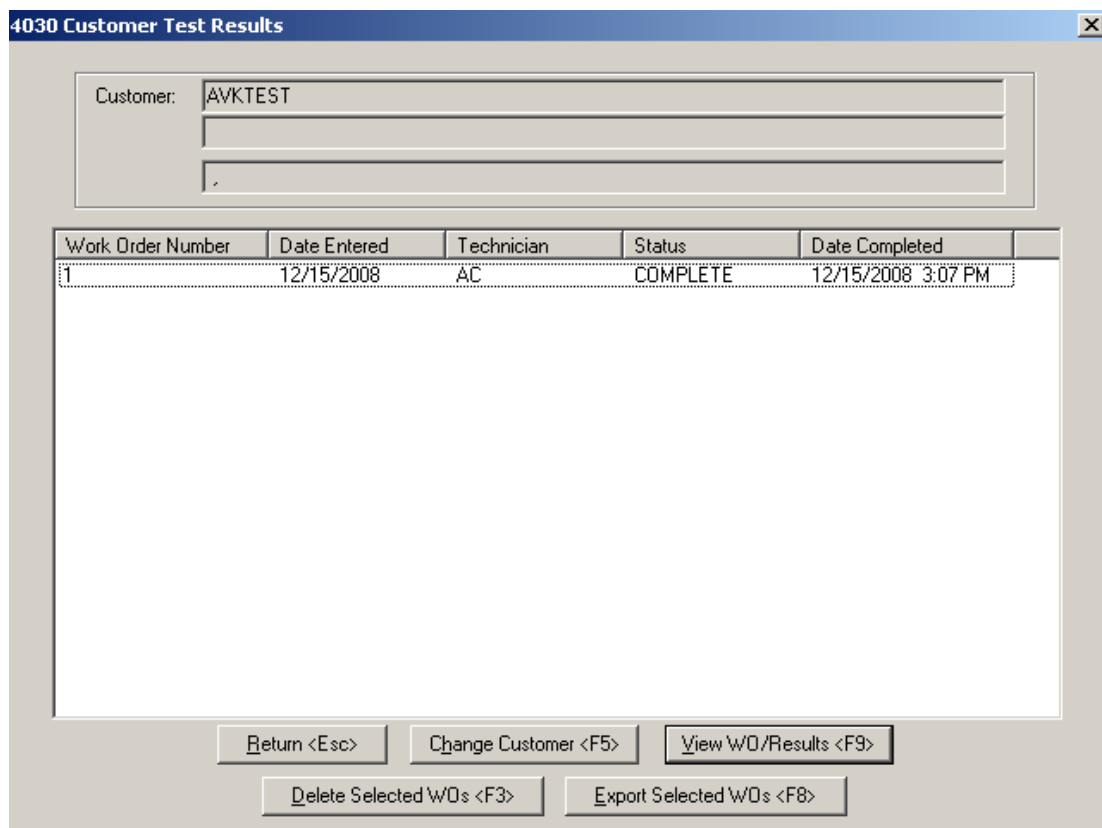
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## 11.6 Customer Results

From the Main Menu, select “Results.” The following options will display:



Select “Customer Results.” The “4030 Customer Test Results” screen will display.



All work orders for the customer are listed.

### [Change Customer <F5>]

To switch to a different customer, click the [Change Customer] button or press the <F5>. The “2010 Customer Selection” screen displays. Highlight the customer in the list box and click the [Select] button.

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[View WO Results <F9>]

To view a particular work order, highlight the work order in the list and click the [View WO Results] button or press the <F9> key. The “4020 Work Order Test Results” screen will display.

[Return <Esc>]

To exit the screen, click the [Return] button or press the <Esc> key.

# A.V.K. Industries, Inc.

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## 12.0 Reference

### 12.1 Appendix A - Technical Specifications and Support

#### TECHNICAL SPECIFICATIONS

##### Component List

##### Cases (1)

IBM - compatible microprocessor

LCD Flat Panel Display

Parallel Printer Port

Keyboard with integrated mouse

USB Ports (2)

Electro-hydraulic Actuator

Robotic Gripper / Load Cell Assembly

System Pressure Transducer

Universal Valve-Mounting Assembly

Set of Spindle Adapters (Universal-sized)

<u>UNF</u>	<u>UNC</u>
1/4" - 28	1/4" - 20
5/16" - 24	5/16" - 18
3/8" - 24	3/8" - 16
7/16" - 20	7/16" - 14
1/2" - 20	1/2" - 13
9/16" - 18	9/16" - 12
5/8" - 18	5/8" - 11
3/4" - 16	3/4" - 10
7/8" - 14	7/8" - 9
1" - 12	1" - 8
1 1/8" - 12	1 1/8" - 7

25' Hydraulic Actuator Control Cable (1)

75' Pressure Transducer Cable (1)

25' Load Cell Data Cable (1)

Spare Battery (1)

Power Supply / Battery Charger (1) Universal 115 VAC / 230 VAC

Power Cord (1) 115 VAC

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## 12.2 Appendix B - Model /Orifice Codes

### Consolidated

AA01 - CONSOLIDATED - Model 1415 - Size: 1.5 & 2 - Bore: 1.8  
AA02 - CONSOLIDATED - Model 1415 - Size: 2.5 - Bore: 2.5  
AA03 - CONSOLIDATED - Model 1415 - Size: 3 - Bore: 3  
AA04 - CONSOLIDATED - Model 1415 - Size: 4 - Bore: 4  
AA05 - CONSOLIDATED - Model 1415 - Size: 6 Old - Bore: 6  
AA06 - CONSOLIDATED - Model 1415 - Size: 6 - Bore: 7

AB01 - CONSOLIDATED - Model 1500 - Orifice: F  
AB02 - CONSOLIDATED - Model 1500 - Orifice: G  
AB03 - CONSOLIDATED - Model 1500 - Orifice: H  
AB04 - CONSOLIDATED - Model 1500 - Orifice: J  
AB05 - CONSOLIDATED - Model 1500 - Orifice: K  
AB06 - CONSOLIDATED - Model 1500 - Orifice: L  
AB07 - CONSOLIDATED - Model 1500 - Orifice: P

AC01 - CONSOLIDATED - Model 1511 - Orifice: H  
AC02 - CONSOLIDATED - Model 1511 - Orifice: J  
AC03 - CONSOLIDATED - Model 1511 - Orifice: K  
AC04 - CONSOLIDATED - Model 1511 - Orifice: L  
AC05 - CONSOLIDATED - Model 1511 - Orifice: M  
AC06 - CONSOLIDATED - Model 1511 - Orifice: N  
AC07 - CONSOLIDATED - Model 1511 - Orifice: P  
AC08 - CONSOLIDATED - Model 1511 - Orifice: Q

AD01 - CONSOLIDATED - Model 1600 - Orifice: D  
AD02 - CONSOLIDATED - Model 1600 - Orifice: E  
AD03 - CONSOLIDATED - Model 1600 - Orifice: F  
AD04 - CONSOLIDATED - Model 1600 - Orifice: G  
AD05 - CONSOLIDATED - Model 1600 - Orifice: H  
AD06 - CONSOLIDATED - Model 1600 - Orifice: J  
AD07 - CONSOLIDATED - Model 1600 - Orifice: K  
AD08 - CONSOLIDATED - Model 1600 - Orifice: L  
AD09 - CONSOLIDATED - Model 1600 - Orifice: N  
AD10 - CONSOLIDATED - Model 1600 - Orifice: P  
AD11 - CONSOLIDATED - Model 1600 - Orifice: Q  
AD12 - CONSOLIDATED - Model 1600 - Orifice: R

AE01 - CONSOLIDATED - Model 1700 & 2700 - Orifice: 9  
AE02 - CONSOLIDATED - Model 1700 & 2700 - Orifice: 1  
AE03 - CONSOLIDATED - Model 1700 & 2700 - Orifice: 2  
AE04 - CONSOLIDATED - Model 1700 & 2700 - Orifice: K  
AE05 - CONSOLIDATED - Model 1700 & 2700 - Orifice: 3

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AE06 - CONSOLIDATED - Model 1700 & 2700 - Orifice: 5  
AE07 - CONSOLIDATED - Model 1700 & 2700 - Orifice: 4  
AE08 - CONSOLIDATED - Model 1700 & 2700 - Orifice: 6  
AE09 - CONSOLIDATED - Model 1700 & 2700 - Orifice: Q & 7  
AE10 - CONSOLIDATED - Model 1700 & 2700 - Orifice: 8  
AE11 - CONSOLIDATED - Model 1700 & 2700 - Orifice: R  
AE12 - CONSOLIDATED - Model 1700 & 2700 - Orifice: N  
AE13 - CONSOLIDATED - Model 1700 & 2700 - Orifice: T

AF01 - CONSOLIDATED - Model 1811-20 FLAT - Orifice: F  
AF02 - CONSOLIDATED - Model 1811-20 FLAT - Orifice: G  
AF03 - CONSOLIDATED - Model 1811-20 FLAT - Orifice: H  
AF04 - CONSOLIDATED - Model 1811-20 FLAT - Orifice: J  
AF05 - CONSOLIDATED - Model 1811-20 FLAT - Orifice: K  
AF06 - CONSOLIDATED - Model 1811-20 FLAT - Orifice: L  
AF07 - CONSOLIDATED - Model 1811-20 FLAT - Orifice: M  
AF08 - CONSOLIDATED - Model 1811-20 FLAT - Orifice: N  
AF09 - CONSOLIDATED - Model 1811-20 FLAT - Orifice: P  
AF10 - CONSOLIDATED - Model 1811-20 FLAT - Orifice: Q

AG01 - CONSOLIDATED - Model 1811-22 THERMO - Orifice: F  
AG02 - CONSOLIDATED - Model 1811-22 THERMO - Orifice: G  
AG03 - CONSOLIDATED - Model 1811-22 THERMO - Orifice: H  
AG04 - CONSOLIDATED - Model 1811-22 THERMO - Orifice: J  
AG05 - CONSOLIDATED - Model 1811-22 THERMO - Orifice: K  
AG06 - CONSOLIDATED - Model 1811-22 THERMO - Orifice: L  
AG07 - CONSOLIDATED - Model 1811-22 THERMO - Orifice: M  
AG08 - CONSOLIDATED - Model 1811-22 THERMO - Orifice: N  
AG09 - CONSOLIDATED - Model 1811-22 THERMO - Orifice: P  
AG10 - CONSOLIDATED - Model 1811-22 THERMO - Orifice: Q

AH01 - CONSOLIDATED - Model 1900 METAL - Orifice: D-1  
AH02 - CONSOLIDATED - Model 1900 METAL - Orifice: E-1  
AH03 - CONSOLIDATED - Model 1900 METAL - Ori: D-2,E-2,F  
AH04 - CONSOLIDATED - Model 1900 METAL - Orifice: G  
AH05 - CONSOLIDATED - Model 1900 METAL - Orifice: H  
AH06 - CONSOLIDATED - Model 1900 METAL - Orifice: J  
AH07 - CONSOLIDATED - Model 1900 METAL - Orifice: K  
AH08 - CONSOLIDATED - Model 1900 METAL - Orifice: L  
AH09 - CONSOLIDATED - Model 1900 METAL - Orifice: M  
AH10 - CONSOLIDATED - Model 1900 METAL - Orifice: N  
AH11 - CONSOLIDATED - Model 1900 METAL - Orifice: P  
AH12 - CONSOLIDATED - Model 1900 METAL - Orifice: Q  
AH13 - CONSOLIDATED - Model 1900 METAL - Orifice: R  
AH14 - CONSOLIDATED - Model 1900 METAL - Orifice: T  
AH15 - CONSOLIDATED - Model 1900 METAL - Orifice: V

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AH16 - CONSOLIDATED - Model 1900 METAL - Orifice: W

AI01 - CONSOLIDATED - Model 1900/P SERIES - Ori: D-2,E-2,F  
AI02 - CONSOLIDATED - Model 1900/P SERIES - Orifice: G  
AI03 - CONSOLIDATED - Model 1900/P SERIES - Orifice: H  
AI04 - CONSOLIDATED - Model 1900/P SERIES - Orifice: J  
AI05 - CONSOLIDATED - Model 1900/P SERIES - Orifice: K  
AI06 - CONSOLIDATED - Model 1900/P SERIES - Orifice: L  
AI07 - CONSOLIDATED - Model 1900/P SERIES - Orifice: M  
AI08 - CONSOLIDATED - Model 1900/P SERIES - Orifice: N  
AI09 - CONSOLIDATED - Model 1900/P SERIES - Orifice: P  
AI10 - CONSOLIDATED - Model 1900/P SERIES - Orifice: Q  
AI11 - CONSOLIDATED - Model 1900/P SERIES - Orifice: R  
AI12 - CONSOLIDATED - Model 1900/P SERIES - Orifice: T

AJ01 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: D  
AJ02 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: E  
AJ03 - CONSOLIDATED - Model 1900-XDA O-RING - D-2,E-2,F  
AJ04 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: G  
AJ05 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: H  
AJ06 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: J  
AJ07 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: K  
AJ08 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: L  
AJ09 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: M  
AJ10 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: N  
AJ11 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: P  
AJ12 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: Q  
AJ13 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: R  
AJ14 - CONSOLIDATED - Model 1900-XDA O-RING - Orifice: T

AK01 - CONSOLIDATED - Model 1970 - Size: 3/4 & 1  
AK02 - CONSOLIDATED - Model 1970 - Size: 1 1/2 & 2  
AK03 - CONSOLIDATED - Model 1970 O-RING - Size: 3/4 & 1  
AK04 - CONSOLIDATED - Model 1970 O-RING - Size: 1 1/2 & 2

AL01 - CONSOLIDATED - Model 1990 METAL - Orifice: 0.110  
AL02 - CONSOLIDATED - Model 1990 METAL - Orifice: 0.196  
AL03 - CONSOLIDATED - Model 1990 METAL - Orifice: 0.292  
AL04 - CONSOLIDATED - Model 1990 METAL - Orifice: 0.442  
AL05 - CONSOLIDATED - Model 1990 METAL - Orifice: 0.754

AM01 - CONSOLIDATED - Model 1990-XDA O-RING - Orifice: 0.110  
AM02 - CONSOLIDATED - Model 1990-XDA O-RING - Orifice: 0.196  
AM03 - CONSOLIDATED - Model 1990-XDA O-RING - Orifice: 0.292  
AM04 - CONSOLIDATED - Model 1990-XDA O-RING - Orifice: 0.442  
AM05 - CONSOLIDATED - Model 1990-XDA O-RING - Orifice: 0.754

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AN01 - CONSOLIDATED - Model 1541 & 1543 - Orifice: DRL  
AN02 - CONSOLIDATED - Model 1541 & 1543 - Orifice: D  
AN03 - CONSOLIDATED - Model 1541 & 1543 - Orifice: E  
AN04 - CONSOLIDATED - Model 1541 & 1543 - Orifice: F  
AN05 - CONSOLIDATED - Model 1541 & 1543 - Orifice: G  
AN06 - CONSOLIDATED - Model 1541 & 1543 - Orifice: H  
AN07 - CONSOLIDATED - Model 1541 & 1543 - Orifice: J

AP01 - CONSOLIDATED - Model 19000-L&M METAL Orifice: 0.096  
AP02 - CONSOLIDATED - Model 19000-L&M METAL Orifice: 0.126  
AP03 - CONSOLIDATED - Model 19000-L&M METAL Orifice: 0.226  
AP04 - CONSOLIDATED - Model 19000-L&M METAL Orifice: 0.357  
AP05 - CONSOLIDATED - Model 19000-L&M METAL Orifice: 0.567

AP11 - CONSOLIDATED - Model 19000-H METAL Orifice: 0.096  
AP12 - CONSOLIDATED - Model 19000-H METAL Orifice: 0.126  
AP13 - CONSOLIDATED - Model 19000-H METAL Orifice: 0.226  
AP21 - CONSOLIDATED - Model 19000-DA O-RING Orifice: 0.096  
AP22 - CONSOLIDATED - Model 19000-DA O-RING Orifice: 0.126  
AP23 - CONSOLIDATED - Model 19000-DA O-RING Orifice: 0.226  
AP24 - CONSOLIDATED - Model 19000-DA O-RING Orifice: 0.357  
AP25 - CONSOLIDATED - Model 19000-DA O-RING Orifice: 0.567

## Crosby

BA01 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - D-JO & JP  
BA02 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - D-JB - TD  
BA03 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - E-JO & JP  
BA04 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - E-JB - TD  
BA05 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:F  
BA06 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:G  
BA07 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:H  
BA08 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:J  
BA09 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:K  
BA10 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:L  
BA11 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:M  
BA12 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:N  
BA13 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:P  
BA14 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:Q  
BA15 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:R  
BA16 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:S  
BA17 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:T  
BA18 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:AA  
BA19 - CROSBY - Model JO-JB/HN-HNA/HS-HSA - Ori:V

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BB01 - CROSBY - Model HC - Orifice: F-G  
BB02 - CROSBY - Model HC - Orifice: H  
BB03 - CROSBY - Model HC - Orifice: J  
BB04 - CROSBY - Model HC - Orifice: K  
BB05 - CROSBY - Model HC - Orifice: K2  
BB06 - CROSBY - Model HC - Orifice: M-M2  
BB07 - CROSBY - Model HC - Orifice: P  
BB08 - CROSBY - Model HC - Orifice: Q  
BB09 - CROSBY - Model HC - Orifice: R  
BB10 - CROSBY - Model HC - Orifice: T

BC01 - CROSBY - Model JOS-JBS - Orifice: D  
BC02 - CROSBY - Model JOS-JBS - Orifice: E  
BC03 - CROSBY - Model JOS-JBS - Orifice: F  
BC04 - CROSBY - Model JOS-JBS - Orifice: G  
BC05 - CROSBY - Model JOS-JBS - Orifice: H  
BC06 - CROSBY - Model JOS-JBS - Orifice: J  
BC07 - CROSBY - Model JOS-JBS - Orifice: K  
BC08 - CROSBY - Model JOS-JBS - Orifice: L  
BC09 - CROSBY - Model JOS-JBS - Orifice: M  
BC10 - CROSBY - Model JOS-JBS - Orifice: N  
BC11 - CROSBY - Model JOS-JBS - Orifice: P  
BC12 - CROSBY - Model JOS-JBS - Orifice: Q  
BC13 - CROSBY - Model JOS-JBS - Orifice: R  
BC14 - CROSBY - Model JOS-JBS - Orifice: T

BD01 - CROSBY - Model HCI - Orifice: H2  
BD02 - CROSBY - Model HCI - Orifice: J2  
BD03 - CROSBY - Model HCI - Orifice: K2  
BD04 - CROSBY - Model HCI - Orifice: L2  
BD05 - CROSBY - Model HCI - Orifice: M2  
BD06 - CROSBY - Model HCI - Orifice: P2  
BD07 - CROSBY - Model HCI - Orifice: Q2  
BD08 - CROSBY - Model HCI - Orifice: R  
BD09 - CROSBY - Model HCI - Orifice: RR

BE01 - CROSBY - Model HSJ - Orifice: F  
BE02 - CROSBY - Model HSJ - Orifice: G  
BE03 - CROSBY - Model HSJ - Orifice: H  
BE04 - CROSBY - Model HSJ - Orifice: J  
BE05 - CROSBY - Model HSJ - Orifice: K  
BE06 - CROSBY - Model HSJ - Orifice: L  
BE07 - CROSBY - Model HSJ - Orifice: M  
BE08 - CROSBY - Model HSJ - Orifice: N  
BE09 - CROSBY - Model HSJ - Orifice: P  
BE10 - CROSBY - Model HSJ - Orifice: Q

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- BF01 - CROSBY - Model HE-Design II: K
- BF02 - CROSBY - Model HE-Design II: K2
- BF03 - CROSBY - Model HE-Design II: M
- BF04 - CROSBY - Model HE-Design II: M2
  
- BG01 - CROSBY - Model HE-Design III: K
- BG02 - CROSBY - Model HE-Design III: K2
- BG03 - CROSBY - Model HE-Design III: M
- BG04 - CROSBY - Model HE-Design III: M2
  
- BH01 - CROSBY - Model HC/HCA-Design III: K
- BH02 - CROSBY - Model HC/HCA-Design III: K2
- BH03 - CROSBY - Model HC/HCA-Design III: M-M2
  
- BJ01 - CROSBY - Model HL Series Flexidisc: F
- BJ02 - CROSBY - Model HL Series Flexidisc: G
- BJ03 - CROSBY - Model HL Series Flexidisc: H
- BJ04 - CROSBY - Model HL Series Flexidisc: J
- BJ05 - CROSBY - Model HL Series Flexidisc: K
- BJ06 - CROSBY - Model HL Series Flexidisc: L
- BJ07 - CROSBY - Model HL Series Flexidisc: M
- BJ08 - CROSBY - Model HL Series Flexidisc: N
- BJ09 - CROSBY - Model HL Series Flexidisc: P
- BJ10 - CROSBY - Model HL Series Flexidisc: Q

## Farris

- CA01 - FARRIS - Model 2500 & 2600 - Orifice: D
  - CA02 - FARRIS - Model 2500 & 2600 - Orifice: E
  - CA03 - FARRIS - Model 2500 & 2600 - Orifice: F
  - CA04 - FARRIS - Model 2500 & 2600 - Orifice: G
  - CA05 - FARRIS - Model 2500 & 2600 - Orifice: H
  - CA06 - FARRIS - Model 2500 & 2600 - Orifice: J
  - CA07 - FARRIS - Model 2500 & 2600 - Orifice: K
  - CA08 - FARRIS - Model 2500 & 2600 - Orifice: L
  - CA09 - FARRIS - Model 2500 & 2600 - Orifice: M
  - CA10 - FARRIS - Model 2500 & 2600 - Orifice: N
  - CA11 - FARRIS - Model 2500 & 2600 - Orifice: P
  - CA12 - FARRIS - Model 2500 & 2600 - Orifice: Q
  - CA13 - FARRIS - Model 2500 & 2600 - Orifice: R
  - CA14 - FARRIS - Model 2500 & 2600 - Orifice: T
  - CA15 - FARRIS - Model 2500 & 2600 - Orifice: W2
  
  - CB01 - FARRIS - Model 4500 - Orifice: H
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# A.V.K. Industries, Inc.

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CB02 - FARRIS - Model 4500 - Orifice: J  
CB03 - FARRIS - Model 4500 - Orifice: K  
CB04 - FARRIS - Model 4500 - Orifice: L  
CB05 - FARRIS - Model 4500 - Orifice: M  
CB06 - FARRIS - Model 4500 - Orifice: N  
CB07 - FARRIS - Model 4500 - Orifice: P  
CB08 - FARRIS - Model 4500 - Orifice: Q  
CB09 - FARRIS - Model 4500 - Orifice: R  
CB10 - FARRIS - Model 4500 - Orifice: T

CC01 - FARRIS - Model 6400 - Orifice: D  
CC02 - FARRIS - Model 6400 - Orifice: E  
CC03 - FARRIS - Model 6400 - Orifice: F  
CC04 - FARRIS - Model 6400 - Orifice: G  
CC05 - FARRIS - Model 6400 - Orifice: H  
CC06 - FARRIS - Model 6400 - Orifice: J  
CC07 - FARRIS - Model 6400 - Orifice: K  
CC08 - FARRIS - Model 6400 - Orifice: L  
CC09 - FARRIS - Model 6400 - Orifice: M  
CC10 - FARRIS - Model 6400 - Orifice: N  
CC11 - FARRIS - Model 6400 - Orifice: P

CD01 - FARRIS - Model 4200 - Orifice: F  
CD02 - FARRIS - Model 4200 - Orifice: G  
CD03 - FARRIS - Model 4200 - Orifice: H  
CD04 - FARRIS - Model 4200 - Orifice: J  
CD05 - FARRIS - Model 4200 - Orifice: K  
CD06 - FARRIS - Model 4200 - Orifice: L  
CD07 - FARRIS - Model 4200 - Orifice: M  
CD08 - FARRIS - Model 4200 - Orifice: N  
CD09 - FARRIS - Model 4200 - Orifice: P  
CD10 - FARRIS - Model 4200 - Orifice: Q

CE01 - FARRIS - Model 2700 METAL - Orifice: C  
CE02 - FARRIS - Model 2700 METAL - Orifice: D  
CE03 - FARRIS - Model 2700 METAL - Orifice: E  
CE04 - FARRIS - Model 2700 METAL - Orifice: F  
CE05 - FARRIS - Model 2700 METAL - Orifice: G

## Foster

DA01 - FOSTER - Model 38 SV - Orifice: 1  
DA02 - FOSTER - Model 38 SV - Orifice: 1.25  
DA03 - FOSTER - Model 38 SV - Orifice: 1.5  
DA04 - FOSTER - Model 38 SV - Orifice: 2  
DA05 - FOSTER - Model 38 SV - Orifice: 2.5

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DA06 - FOSTER - Model 38 SV - Orifice: 3  
DA07 - FOSTER - Model 38 SV - Orifice: 4  
DA08 - FOSTER - Model 38 SV - Orifice: 6

## Lonergan

EA01 - LONERGAN - Model V & W - Orifice: D  
EA02 - LONERGAN - Model V & W - Orifice: E  
EA03 - LONERGAN - Model V & W - Orifice: F  
EA04 - LONERGAN - Model V & W - Orifice: G  
EA05 - LONERGAN - Model V & W - Orifice: H  
EA06 - LONERGAN - Model V & W - Orifice: J  
EA07 - LONERGAN - Model V & W - Orifice: K  
EA08 - LONERGAN - Model V & W - Orifice: L  
EA09 - LONERGAN - Model V & W - Orifice: M  
EA10 - LONERGAN - Model V & W - Orifice: N  
EA11 - LONERGAN - Model V & W - Orifice: P  
EA12 - LONERGAN - Model V & W - Orifice: Q  
EA13 - LONERGAN - Model V & W - Orifice: R  
EA14 - LONERGAN - Model V & W - Orifice: T

EB01 - LONERGAN - D, DB & DS Series - Orifice: D  
EB02 - LONERGAN - D, DB & DS Series - Orifice: E  
EB03 - LONERGAN - D, DB & DS Series - Orifice: F  
EB04 - LONERGAN - D, DB & DS Series - Orifice: G  
EB05 - LONERGAN - D, DB & DS Series - Orifice: H  
EB06 - LONERGAN - D, DB & DS Series - Orifice: J  
EB07 - LONERGAN - D, DB & DS Series - Orifice: K  
EB08 - LONERGAN - D, DB & DS Series - Orifice: L  
EB09 - LONERGAN - D, DB & DS Series - Orifice: M  
EB10 - LONERGAN - D, DB & DS Series - Orifice: N  
EB11 - LONERGAN - D, DB & DS Series - Orifice: P  
EB12 - LONERGAN - D, DB & DS Series - Orifice: Q  
EB13 - LONERGAN - D, DB & DS Series - Orifice: R  
EB14 - LONERGAN - D, DB & DS Series - Orifice: T

EC01 - LONERGAN - K Series - Orifice: F  
EC02 - LONERGAN - K Series - Orifice: G  
EC03 - LONERGAN - K Series - Orifice: H  
EC04 - LONERGAN - K Series - Orifice: J  
EC05 - LONERGAN - K Series - Orifice: K  
EC06 - LONERGAN - K Series - Orifice: L  
EC07 - LONERGAN - K Series - Orifice: M  
EC08 - LONERGAN - K Series - Orifice: N  
EC09 - LONERGAN - K Series - Orifice: P

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EC10 - LONERGAN - K Series - Orifice: Q

ED01 - LONERGAN - GIF, GIB Series - Orifice: J  
ED02 - LONERGAN - GIF, GIB Series - Orifice: K  
ED03 - LONERGAN - GIF, GIB Series - Orifice: L  
ED04 - LONERGAN - GIF, GIB Series - Orifice: M  
ED05 - LONERGAN - GIF, GIB Series - Orifice: N  
ED06 - LONERGAN - GIF, GIB Series - Orifice: P  
ED07 - LONERGAN - GIF, GIB Series - Orifice: Q  
ED08 - LONERGAN - GIF, GIB Series - Orifice: R

EE01 - LONERGAN - F Series - Orifice: D  
EE02 - LONERGAN - F Series - Orifice: E  
EE03 - LONERGAN - F Series - Orifice: F  
EE04 - LONERGAN - F Series - Orifice: G  
EE05 - LONERGAN - F Series - Orifice: H  
EE06 - LONERGAN - F Series - Orifice: J

EF01 - LONERGAN - LCT 11,13,14 & L14 Series - Ori: 1/2  
EF02 - LONERGAN - LCT 11,13,14 & L14 Series - Ori: 3/4  
EF03 - LONERGAN - LCT 11,13,14 & L14 Series - Ori: 1

EG01 - LONERGAN - LCT 20,30 L40,41 - Ori: 3/4 X 1  
EG02 - LONERGAN - LCT 20,30 L40,41 - Ori: 3/4 X 2  
EG03 - LONERGAN - LCT 20,30 L40,41 - Ori: 1 X 1 1/2  
EG04 - LONERGAN - LCT 20,30 L40,41 - Ori: 1 X 2  
EG05 - LONERGAN - LCT 20,30 L40,41 - Ori: 1 1/2 X 2  
EG06 - LONERGAN - LCT 20,30 L40,41 - Ori: 2 X 2

## Kunkle

FA01 - KUNKLE - 300, 600 Series - Orifice: F  
FA02 - KUNKLE - 300, 600 Series - Orifice: G  
FA03 - KUNKLE - 300, 600 Series - Orifice: H  
FA04 - KUNKLE - 300, 600 Series - Orifice: J  
FA05 - KUNKLE - 300, 600 Series - Orifice: K  
FA06 - KUNKLE - 300, 600 Series - Orifice: L  
FA07 - KUNKLE - 300, 600 Series - Orifice: M  
FA08 - KUNKLE - 300, 600 Series - Orifice: N  
FA09 - KUNKLE - 300, 600 Series - Orifice: P  
FA10 - KUNKLE - 300, 600 Series - Orifice: Q

FB01 - KUNKLE - 252, 253 Series - Orifice: J  
FB02 - KUNKLE - 252, 253 Series - Orifice: K  
FB03 - KUNKLE - 252, 253 Series - Orifice: L  
FB04 - KUNKLE - 252, 253 Series - Orifice: M

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FB05 - KUNKLE - 252, 253 Series - Orifice: N  
FB06 - KUNKLE - 252, 253 Series - Orifice: P  
FB07 - KUNKLE - 252, 253 Series - Orifice: Q  
FB08 - KUNKLE - 252, 253 Series - Orifice: R

FC01 - KUNKLE - 6000 Series - Orifice: D  
FC02 - KUNKLE - 6000 Series - Orifice: E  
FC03 - KUNKLE - 6000 Series - Orifice: F  
FC04 - KUNKLE - 6000 Series - Orifice: G  
FC05 - KUNKLE - 6000 Series - Orifice: H  
FC06 - KUNKLE - 6000 Series - Orifice: J

FD01 - KUNKLE - 6252 Series - Orifice: J  
FD02 - KUNKLE - 6252 Series - Orifice: K  
FD03 - KUNKLE - 6252 Series - Orifice: L  
FD04 - KUNKLE - 6252 Series - Orifice: M  
FD05 - KUNKLE - 6252 Series - Orifice: N  
FD06 - KUNKLE - 6252 Series - Orifice: P  
FD07 - KUNKLE - 6252 Series - Orifice: Q  
FD08 - KUNKLE - 6252 Series - Orifice: R

## **Birkett**

GA01 - BIRKETT - WB100,200,300,400 Metal - Ori: 25 D  
GA02 - BIRKETT - WB100,200,300,400 Metal - Ori: 1 D&E  
GA03 - BIRKETT - WB100,200,300,400 Metal - Ori: 1.5 D&E  
GA04 - BIRKETT - WB100,200,300,400 Metal - Ori: 1.5 F  
GA05 - BIRKETT - WB100,200,300,400 Metal - Ori: G  
GA06 - BIRKETT - WB100,200,300,400 Metal - Ori: H  
GA07 - BIRKETT - WB100,200,300,400 Metal - Ori: J  
GA08 - BIRKETT - WB100,200,300,400 Metal - Ori: K  
GA09 - BIRKETT - WB100,200,300,400 Metal - Ori: L  
GA10 - BIRKETT - WB100,200,300,400 Metal - Ori: M  
GA11 - BIRKETT - WB100,200,300,400 Metal - Ori: N  
GA12 - BIRKETT - WB100,200,300,400 Metal - Ori: P  
GA13 - BIRKETT - WB100,200,300,400 Metal - Ori: Q  
GA14 - BIRKETT - WB100,200,300,400 Metal - Ori: R  
GA15 - BIRKETT - WB100,200,300,400 Metal - Ori: T

## **Spence**

HA01 - SPENCE - FIG 31, 41, 41A - Ori: J  
HA02 - SPENCE - FIG 31, 41, 41A - Ori: K  
HA03 - SPENCE - FIG 31, 41, 41A - Ori: L  
HA04 - SPENCE - FIG 31, 41, 41A - Ori: M  
HA05 - SPENCE - FIG 31, 41, 41A - Ori: N

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HA06 - SPENCE - FIG 31, 41, 41A - Ori: P  
HA07 - SPENCE - FIG 31, 41, 41A - Ori: Q  
HA08 - SPENCE - FIG 31, 41, 41A - Ori: R

## Sempell

IA01 - SEMPELL - Model VSE-VSR - Orifice: A-Small  
IA02 - SEMPELL - Model VSE-VSR - Orifice: A  
IA03 - SEMPELL - Model VSE-VSR - Orifice: B-C  
IA04 - SEMPELL - Model VSE-VSR - Orifice: D-E  
IA05 - SEMPELL - Model VSE-VSR - Orifice: F  
IA06 - SEMPELL - Model VSE-VSR - Orifice: G  
IA07 - SEMPELL - Model VSE-VSR - Orifice: H  
IA08 - SEMPELL - Model VSE-VSR - Orifice: J  
IA09 - SEMPELL - Model VSE-VSR - Orifice: K  
IA10 - SEMPELL - Model VSE-VSR - Orifice: L  
IA11 - SEMPELL - Model VSE-VSR - Orifice: M  
IA12 - SEMPELL - Model VSE-VSR - Orifice: N  
IA13 - SEMPELL - Model VSE-VSR - Orifice: P  
IA14 - SEMPELL - Model VSE-VSR - Orifice: Q  
IA15 - SEMPELL - Model VSE-VSR - Orifice: R  
IA16 - SEMPELL - Model VSE-VSR - Orifice: T  
IA17 - SEMPELL - Model VSE-VSR - Orifice: V

## Conbraco

JA01 - CONBRACO - 119 SERIES - ORIFICE: J  
JA02 - CONBRACO - 119 SERIES - ORIFICE: K  
JA03 - CONBRACO - 119 SERIES - ORIFICE: L  
JA04 - CONBRACO - 119 SERIES - ORIFICE: M  
JA05 - CONBRACO - 119 SERIES - ORIFICE: N  
JA06 - CONBRACO - 119 SERIES - ORIFICE: P  
JA07 - CONBRACO - 119 SERIES - ORIFICE: Q  
JA08 - CONBRACO - 119 SERIES - ORIFICE: R

## Spirax-Sarco

KA01 - SPIRAX SARCO - SV73,SV74 - ORIFICE: F  
KA02 - SPIRAX SARCO - SV73,SV74 - ORIFICE: G  
KA03 - SPIRAX SARCO - SV73,SV74 - ORIFICE: H  
KA04 - SPIRAX SARCO - SV73,SV74 - ORIFICE: J  
KA05 - SPIRAX SARCO - SV73,SV74 - ORIFICE: K  
KA06 - SPIRAX SARCO - SV73,SV74 - ORIFICE: L  
KA07 - SPIRAX SARCO - SV73,SV74 - ORIFICE: M

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KA08 - SPIRAX SARCO - SV73,SV74 - ORIFICE: N  
KA09 - SPIRAX SARCO - SV73,SV74 - ORIFICE: P  
KA10 - SPIRAX SARCO - SV73,SV74 - ORIFICE: Q  
KA11 - SPIRAX SARCO - SV73,SV74 - ORIFICE: R

## Lesser

LA01 - LESER – Series 441,442 Orifice: 23 MM 1 X 2  
LA02 - LESER - Series 441,442 Orifice: 29 MM 1.5 X 2  
LA03 - LESER - Series 441,442 Orifice: 37 MM 1.5 X 2.5  
LA04 - LESER - Series 441,442 Orifice: 46 MM 2 X 3  
LA05 - LESER - Series 441,442 Orifice: 60 MM 3 X 4  
LA06 - LESER - Series 441,442 Orifice: 92 MM 4 X 6

## Sapag

MA00 - SAPAG – Type 9100 Orifice: 0  
MA01 - SAPAG – Type 9100 Orifice: 1  
MA02 - SAPAG – Type 9100 Orifice: 2  
MA03 - SAPAG – Type 9100 Orifice: 3  
MA04 - SAPAG – Type 9100 Orifice: 4  
MA05 - SAPAG – Type 9100 Orifice: 5  
MA06 - SAPAG – Type 9100 Orifice: 6  
MA07 - SAPAG – Type 9100 Orifice: 7  
MA08 - SAPAG – Type 9100 Orifice: 8  
MA09 - SAPAG – Type 9100 Orifice: 9

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## 12.3 Appendix C - Sample Reports

### 12.3.1 Test Results

AVK INDUSTRIES, INC  
ST JOHNS BLUFF RD S  
JACKSONVILLE, FL 32246 USA  
904-998-8400

#### CUSTOMER INFORMATION

Customer : ABC CUSTOMER  
Unit/Plant : GREENBRIAR  
Address : 34 MAIN ST  
          : LAKE CITY, FL 32256 USA

#### VALVE INFORMATION

Location : BUILDING 500 2ND FLOOR  
Serial Number : 123456  
Manufacturer : CONSOLIDATED  
Model/Orifice : (AJ03)MODEL 1900-XDA O-RING ORIFICE: DE-2 & F-1  
Nameplate Model # : 1900  
Size : 2  
ASME Code : I  
Nameplate S.P. : 100.0 PSIG  
Tolerance : 97.0 PSIG to 103.0 PSIG

#### TEST RESULTS

	Inlet	Set Point	Tolerance	
AFT	80.1 PSIG	98.4 PSIG	-1.60 %	PL
VT1	80.0 PSIG	98.6 PSIG	-1.40 %	PL
VT2	80.0 PSIG	98.5 PSIG	-1.50 %	PL
AVE	80.0 PSIG	98.6 PSIG	-1.40 %	

Compression Screw Adjustment:  
COMMENTS:

WorkOrder : W0002                      Date/Time: 12/15/2008 3:07 PM  
Technician : AC  
TestSeq #: 5  
Pressure Transducer : 3000 PSIG      Serial #: 00003                      Last Cal: 12/15/2008  
Load Cell : 10000 PSIG              Serial #: 00010                      Last Cal: 12/15/2008

The above valve was tested using the A.V.K. UltraStar-LFM device in accordance with ASME Code I and was found to be within set point tolerance.

Approval: \_\_\_\_\_

# A.V.K. Industries, Inc.

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## 6.3.2 Work Order Summary

### WORK ORDER SUMMARY

Customer: ABC CUSTOMER

WorkOrder #: W00012000

Date Entered: 12/15/2008  
Technician: JOHN SMITH

Date Completed: 12/15/2008  
Status: COMPLETE

Test Date	Serial Number	Manufacturer	Model	Orifice	Status
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--					
06/27/2006 2:01 PM PASSED	587896	CONSOLIDATED	MODEL 1600	ORIFICE:E	
06/20/2006 5:30 PM PASSED	245154	CONSOLIDATED	MODEL 1500	ORIFICE:F	
06/12/2006 4:46 PM	456754	CONSOLIDATED	MODEL 1600	ORIFICE:E	FAILED

# A.V.K. Industries, Inc.

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## 12.4 Appendix D - Charging Batteries

The UltraStar-LFM is normally powered by a single 12V sealed battery inside the test system case. When the AC Converter is utilized, the battery is being charged.

Once the initial battery is discharged, the spare battery can be installed. Carefully open the side battery door, remove the existing battery and remove the power leads.

**CAUTION:** Do not touch the two leads from the computer together or inverse connections on the battery poles. This could damage the test unit!  
The black lead is connected to the negative (-) terminal and the red lead to the positive (+) terminal.

To charge both batteries, connect the spare battery to the provided pigtail; plug the pigtail power connector to system case, then plug the AC converter into the power receptacle on the pigtail and main power into a 115 VAC outlet.

The charger has three LED lights:

- RED - Charger ON
- YELLOW - Charging
- GREEN - Charge Complete