APPLIED TEST SYSTEMS

THE MARK OF RELIABILITY

Instruction Manual

CC Burst Test System

Series 1835

APPLIED TEST SYSTEMS

Instruction Manual

THE MARK OF RELIABILITY

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Revised August 2014

Preface

Unpacking

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

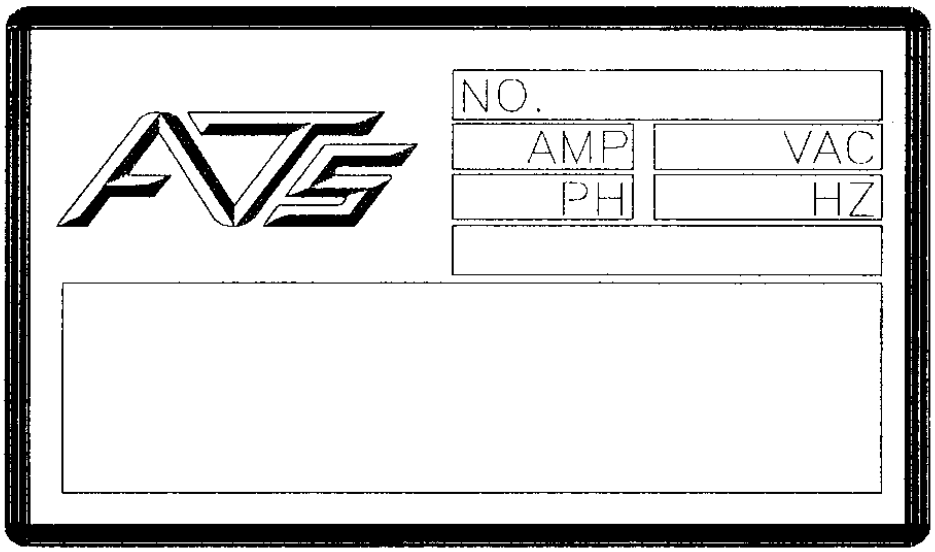
Warranty

All new ATS systems are shipped with a warranty. Units have a warranty against defective parts and workmanship for one full year from date of shipment. Please see Appendix A of this manual for complete details on the warranty.

NOTE: Please see the warranty information included with the computer. It details information that will ensure proper transfer of the computer warranty from ATS to the appropriate company.

After-Sale Support

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



Section 1: Introduction

1.1 General Description

The Applied Test Systems Series 1835 Computer-Controlled High Volume Burst Test System is custom-designed to provide an automatic, uniform ramp to failure of pipes per ASTM D-1599.

1.2 The Series 1835 Pressure Supply System is equipped with the following:

1. A 10-gallon accumulator provides up to 5 gallons of capacity to the specimen
2. Pressure gauges of up to 5000 psi of system pressure
3. A filter system is provided with both an air and water supply filter to remove contaminates that may cause malfunctions or damage to system components
4. Control valves and relief valves
5. Interconnecting high pressure hose and control cable for burst enclosure
6. Touch-screen panel computer and software package
7. Burst Enclosure

1.3 Specifications

Burst Tester:

Computerized pressurized rate control with electronically-controlled, domed regulator

115 VAC, 1 Phase, 60 Hz

Water Supply: clean water at 60-80 psi

Pneumatic Air Supply: clean, dry air at 80-90 psi

Instrument Air Supply: clean, dry air at 100-110 psi

Horizontal Burst Enclosure:

18 inches deep x 18 inches wide x 72 inches long

Section 2: Safety

All ATS equipment is designed to be operated with the highest level of safety. This manual and ATS endeavor to educate the operator about safety issues surrounding certain parts of the machinery by using equipment labeling.

2.1 For Owners, Operators, and Maintenance Personnel

Read and understand all instructions and safety precautions listed in this manual before installing or operating the unit. If there are any questions regarding operation of the unit or the instructions in this manual, contact the ATS Service Department at +1-724-283-1212.

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

2.2 Warnings

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

WARNING: Thoroughly understand the safety features and operation of the equipment.

WARNING: Perform maintenance procedures safely by shutting off electrical power and bleeding off pressure before servicing or transporting the system.

2.3 Cautions

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

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

CAUTION: Before energizing the electrical equipment, turn off all power switches and place all controls in an OFF position. Check that the power source is surge-protected and is of the appropriate voltage and amperage. Use appropriate power adapters for the region.

CAUTION: Follow the operational steps in proper sequence.

CAUTION: Completely drain test system before placing in storage area. Freezing temperatures may damage the system. All lines must be blown out with compressed air for complete drainage.

Section 3: Equipment Setup and Installation

Read and understand all instructions and safety precautions listed in this manual before installing or operating the unit. For questions regarding unit operation or installation, contact the ATS Service Department at +1-724-283-1212.

In addition to the safety information listed here, there are cautions and warnings throughout this manual. Failure to follow these instructions could result in permanent damage to the unit, significant property damage, personal injury, or death.

Read Operator's Manual

General Danger

Protective Earth (Ground)

Electrical Shock/Electrocution

No Access for Unauthorized Persons

3.1 Safety Instructions

1. Read and follow all warning and caution statements in all related equipment manuals before attempting to operate this machine. If in doubt about any statement or sequence, contact ATS Service.

2. Installation of electrical devices must be accomplished by competent personnel and done in accordance with any current local and national codes. Equipment grounding is a MUST for both safety and proper operation.

3. Follow the operational steps in proper sequence.

4. Completely drain test system before storing or if it is subject to freezing temperatures. All lines must be blown out with compressed air for complete drainage.

5. All red labels on the system are critical and signify that these hoses should be free of leaks.

3.2 Unpacking Equipment

Carefully unpack the equipment and inspect it for damage during shipment. Retain all cartons and packaging materials until the unit is operated and found to be in good condition. If damage has occurred during shipping, notify the carrier and ATS immediately. If it is necessary to file a damage claim, retain the packing materials for inspection by the carrier.

Unpacking and Setup

1. Carefully remove the shipping crate and packing materials. Do not discard the packing materials until all items on the invoice have been accounted for.

NOTE: Be sure to check that all hoses are accounted for.

2. Use an overhead crane or forklift to remove the pressure supply system from the pallet and position it in the desired location.

3. If casters are supplied with the unit, install them in the cabinet base when it is lifted off the pallet.

NOTE: The supply area should be equipped with floor drains.

NOTE: Use moving blankets between unit components, and follow accepted moving practices to avoid damage to the test system.

NOTE: Position the test frame and console to allow ample room for maintenance.

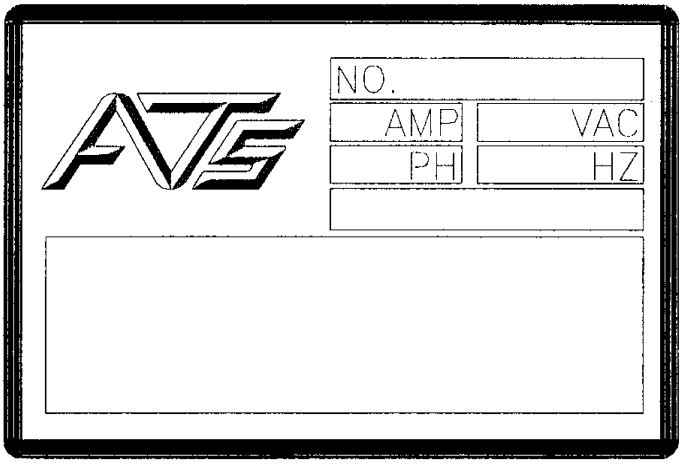
3.3 Connections

NOTE: All red labels on the system are critical and signify a warning.

Set up the connections in the following order:

1. Electrical

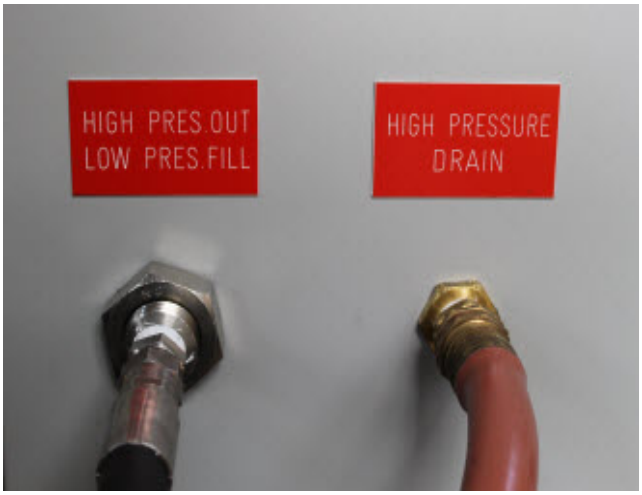
    a. Provide electrical power with a ground in accordance with specifications on the data label.



    b. Plug in the unit. The ports are labeled Control Cable Out and Control Cable In.

2. Drainage

a. Provide water drainage hookups to the test equipment as required. There is a High Pressure Drain and a Burst Enclosure drain.



3. Water Lines and Supply

a. Install the high pressure water line between the Burst Test System and the Burst Enclosure. The High Press Out/Low Press Fill on the system connects to the High Press In on the enclosure.

b. Provide a supply of clean, fresh water, such as from a municipal water supply.

CAUTION: The supply water MUST be connected first before the air is connected.

CAUTION: Codes normally require a backflow preventor or check valve be installed between the pressure system and the water supply to eliminate any chance of contaminated water being flushed back into the supply in the event of equipment failure.

c. It is recommended that shutoff valves are provided for the water and plant air hookups.

CAUTION: The system must be protected with a Ground Fault Interruptor device.

d. Open the Maintenance Bypass and Drain located inside the control cabinet. This will bleed air out of the system.

e. Close the Maintenance Bypass and Drain before using the system.

4. Air Supply

   a. Supply Instrument air with 100-110 psi.

   b. Supply Pneumatic air with 80-90 psi.

CAUTION: The regulator is preset at the ATS factory. Do not adjust the internal system regulator to a higher pressure or damage to the system will result.

5. Charge the accumulator to 1250-2500 psi with nitrogen. See the manufacturer's literature.

3.4 Assistance/Field Support

If there are any problems while setting up any ATS equipment, please contact the ATS Service Department at +1-724-283-1212.

Section 4: Controls

4.1 Standard Controls

1. Main Power Switch: This switch controls electrical power to the system. The main power indicator illuminates amber when electrical power is turned on.

2. Controls: These controls and indicators are located on the front of the control panel.

    b. Low Pressure Fill: This is used to fill the specimen with water that has the same pressure as regular city tap water.

    c. High Pressure Output Valve: This controls the high pressure water.

4.2 Internal Controls and Components

1. Pump Drive Air Pressure Regulator: This controls output of the hydraulic pump.

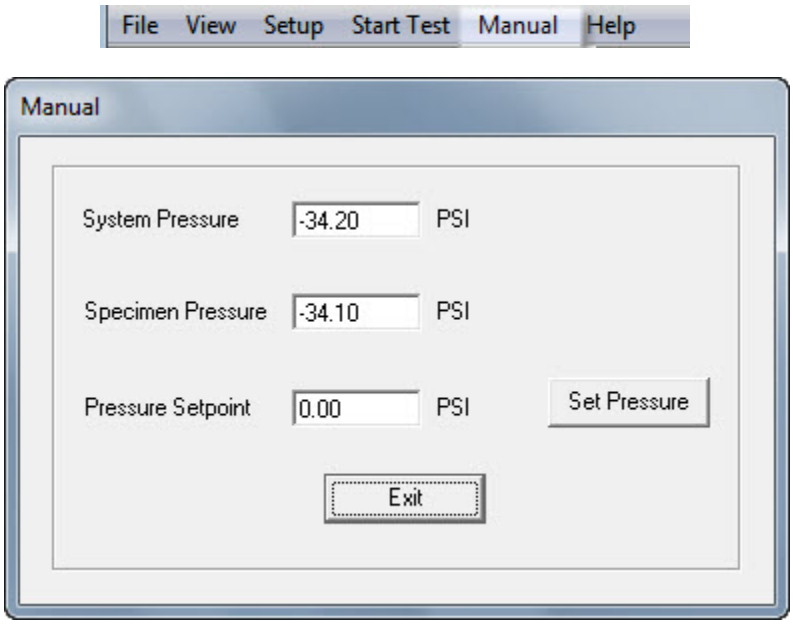
2. Air Pressure Safety Valve: This protects against excessive pump drive pressure.

CAUTION: These are factory-adjusted. Do not readjust without consulting the ATS Service Department.

Section 5: Setting Up the System

5.1 Turning On the Unit

1. Ensure all the wires and hoses are connected.
2. Turn on the main power switch (the black knob next to the POWER ON indicator). The computer will boot up automatically.
3. On the Windows desktop, double-click the ATS Gauge Test icon to launch the software.
4. Click on the Manual tab to monitor System Pressure.



CAUTION: This should not exceed the maximum pressure of the system. If it does, relieve pressure in the system and call service immediately at +1-724-283-1212. For a 5000 psi system, do not exceed 5100 psi.

5. Turn on the water supply valve.

CAUTION: Water supply must be turned on before the air supply or damage to the pump may result.

6. Allow the water to run through the system. Make sure the constant water stream is observed at the drain.
7. Open the left door on the back of the cabinet and locate the Maintenance Bypass Valve.

8. Open the valve by turning the black handle counter-clockwise. Leave the valve open for five seconds to clear the air bubbles inside the tube.

9. Close the Maintenance Bypass Valve by turning the handle clockwise.

10. On the control panel, push the RESET button. The water stream at the drain will stop flowing.

11. Turn on the main air supply valve.

12. Open the valve at the INSTRUMENT AIR IN and PNEUMATIC IN, located on the left side of the machine.

13. At this point, the pump will run to charge the accumulator tank. Monitor the System Pressure on the screen.

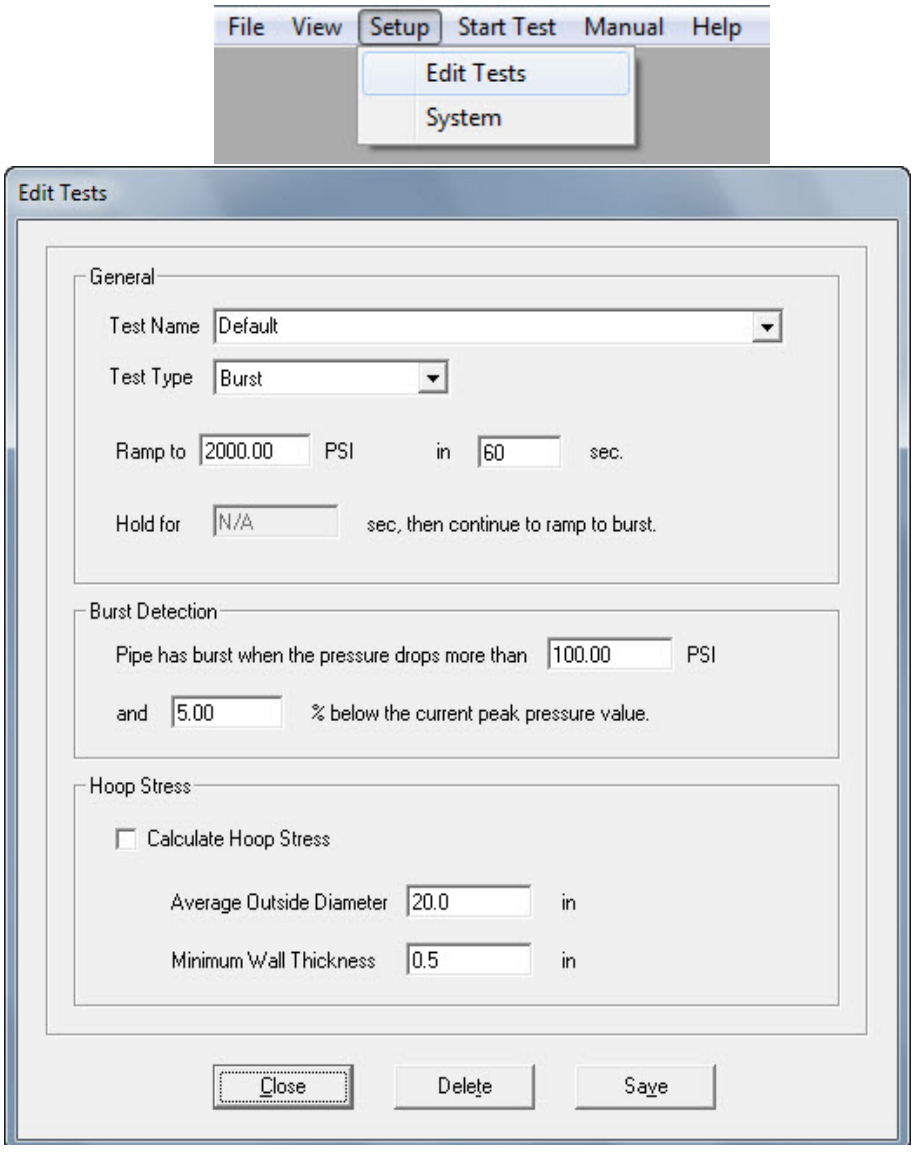
WARNING: If the System Pressure exceeds 5100 psi, turn off the main air supply valve immediately. Call ATS for further instructions.

5.2 Setting Preferences in the Software

Under the Setup menu, select System from the drop-down menu. From here, the operator can choose units of measurement and graph axis/scaling preferences for tests and data.

5.3 Setting Up a Test

1. Click Setup along the top menu bar and select Edit Tests from the drop-down menu.



2. Choose the test type (either Burst or Burst Withhold), set the ramp pressure and test time, and set a hold time.

3. Click Save to save the test.

Section 6: Operation

6.1 Verify Connections and Power

Verify that the electrical, water, and air lines are connected. Refer to Section 3.3 of this manual.

6.2 Prepare the Specimen

1. Wipe the pipe's outer surface if there is a significant amount of dust.
2. Make sure the outer corners of the two pipe ends are slightly smaller than actual pipe OD. This will allow easier end cap installation. If not, wedge off the corners to create a chamfer.
3. Apply a small amount of plumbing grease around the O-rings of both end caps.
4. Place the end cap without the water-connecting plugs on the floor.
5. Insert one pipe end into the end cap that has no water-connecting plugs. Use a rubber hammer to tap the other pipe end, ensuring the pipe end fits tightly onto the end cap.
6. Tighten the screws on the cap so the end cap will not slide out easily.
7. Place the end cap with the water-connecting plugs onto the other pipe. Use a rubber hammer to tap the flat surface of the end cap, ensuring the pipe end fits tightly onto the end cap.
8. Tighten the screws on the cap so the end cap will not slide out easily.
9. Tighten the screws on both end caps using a torque wrench with 500 in/lb of torque.

CAUTION: Alternately tighten each screw to ensure equal torque on the end cap collar. Unequal torque may cause water leakage.

6.3 Run a Test

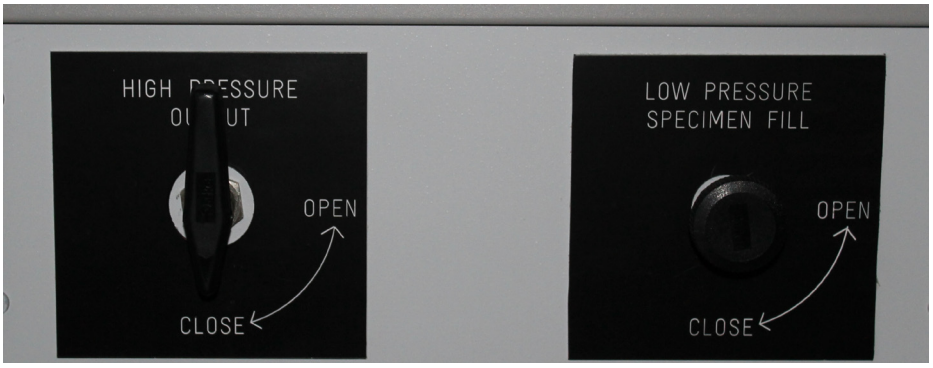
1. Double-click the ATS Gauge Test icon on the computer screen.
2. Click on the Manual tab. Click the Door Unlock button.

NOTE: If the tank lid is not opened within 60 seconds, the lid will automatically relock. If the door locks, click the Door Unlock button again on the Manual screen.

3. Carefully place the pipe into the enclosure tank.

CAUTION: Lifting the pipe assembly may require more than one operator to prevent any injury.

4. Before connecting the water hoses to the plugs on the end cap, make sure the HIGH PRESSURE OUTPUT valve is in the CLOSED position.



5. Connect both water inlet and outlet hoses inside the enclosure tank to the two water-connecting plugs on the end cap (the sequence does not matter). Hold the pipe vertically to fill up the water.

6. Open the PRESSURE RELIEF VALVE.

7. Open the LOW PRESSURE SPECIMEN FILL by turning the knob counter-clockwise in the OPEN direction.

8. Air will be displaced as the pipe fills with water.

9. The air-water mixture will exit from the bleeding nipple located at the lower left corner of the inside of the enclosure tank.

10. Shake the pipe assembly to help displace air bubbles inside the pipe.

11. Monitor the bleed until the water flow is constant and without air.

WARNING: Air trapped inside the pipe can cause serious damage.

12. Turn off the LOW PRESSURE SPECIMEN FILL by turning the knob clockwise to the CLOSED position.

13. Close the PRESSURE RELIEF VALVE.

14. Lay the pipe in a horizontal position inside the enclosure. Make sure the end cap with the water-connecting plugs faces the right-hand direction, ensuring the inlet and outlet hoses are not kinked.

15. Secure the safety net to all six D-rings. Make sure the inlet and outlet hoses are positioned above the safety net.

16. Carefully close the tank lid. Latch the three safety latches.

NOTE: If any of the three latches are loose, the nuts may need tightening.

17. Turn the HIGH PRESSURE VALVE to the OPEN position.

18. Click Exit on the Manual screen.

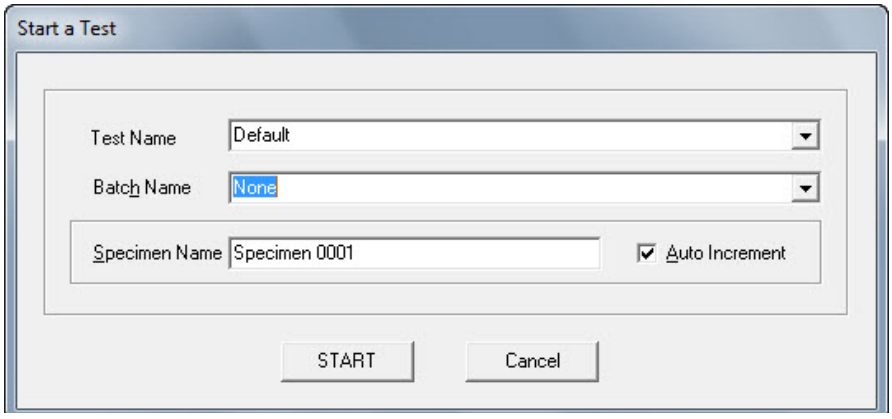
19. Before starting a test, perform the following:

    a. Make sure the tank lid is fully latched.

    b. Make sure the HIGH PRESSURE OUTPUT is in an OPEN position.

    c. Make sure the PRESSURE RELIEF VALVE is in a CLOSED position.

20. Click on the Start Test tab.



21. Choose the appropriate Test Name from the drop-down menu.

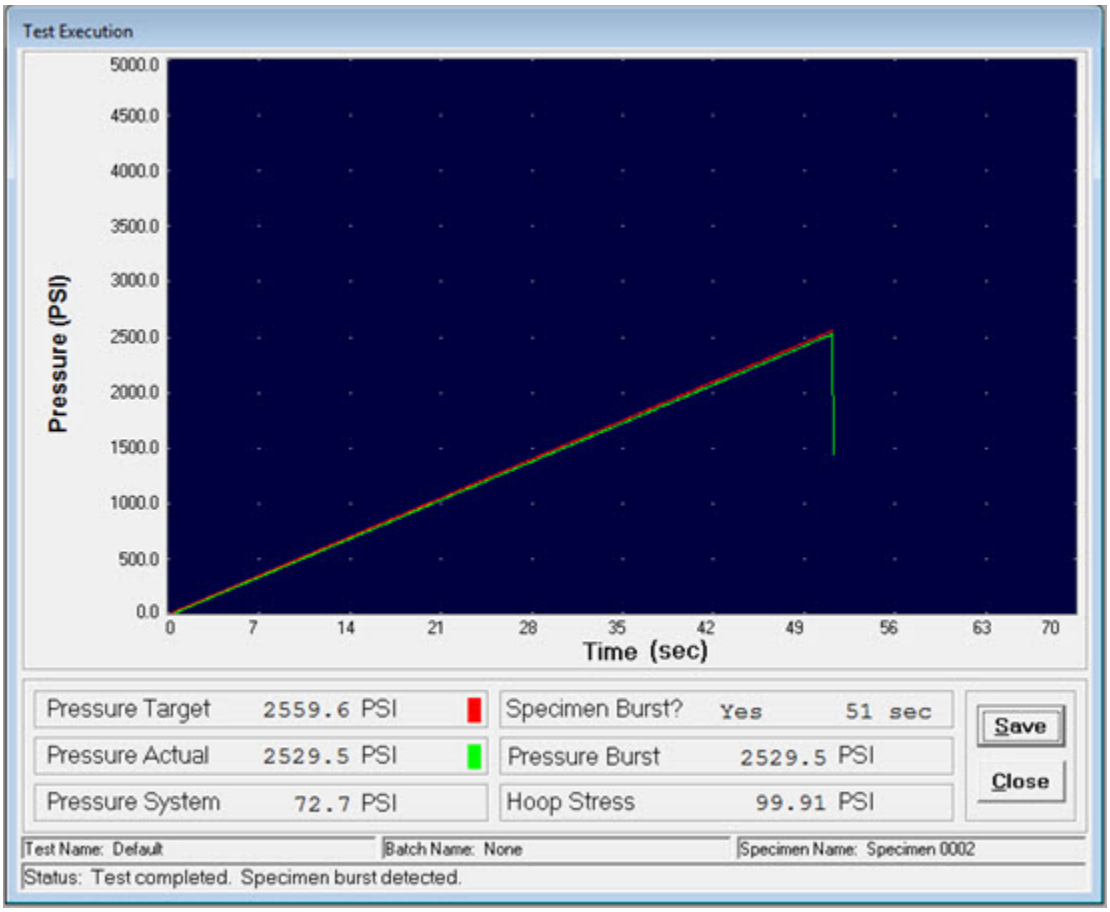
22. Provide the appropriate Batch Name and Specimen Name.

CAUTION: If the tank lid is not fully latched, the software will indicate DOOR OPEN and DOOR UNLOCKED on the Start a Test screen.

23. Click Start to begin testing.

CAUTION: Abort the test if water is leaking from the end caps.

CAUTION: If the specimen does not fail within the expected amount of time and the operator wishes to discontinue testing, click Cancel to stop the system from ramping. Close the HIGH PRESSURE OUTPUT VALVE and drain the water by opening the PRESSURE RELIEF VALVE on the enclosure tank. Remove the specimen and close the PRESSURE RELIEF VALVE.



24. Once burst occurs, close the HIGH PRESSURE OUTPUT VALVE. The software will display the maximum pressure, burst point, and elapsed time. Record these values on the tested pipe accordingly.

25. Save the data by clicking the Save button. At this point, an operator can view graphs and charts for both individual and multiple tests.

26. After saving the data, click on the Door Unlock button.

27. Open the latches and the tank lid.

28. Disconnect both inlet and outlet hoses.

29. Drain the water inside the pipe and remove the pipe from the enclosure tank.

6.4 Turning Off the Quick Burst Unit

1. At the end of the day, the unit needs to be shut down.

2. Turn off the main air supply valve.

CAUTION: The air supply must be turned off before turning off the water supply.

3. Turn off the water supply.

4. Push the red Stop button. This will drain the accumulator.

5. Exit the software.

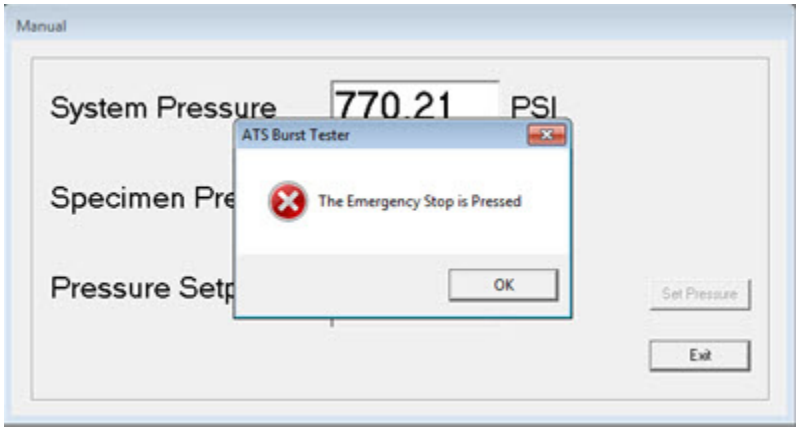
6. Shut down the computer.

7. Turn the black power knob to OFF.

6.5 Emergency (E-stop) and Burst Enclosure Information

1. The indicator light will illuminate when the E-stop switch has been activated.

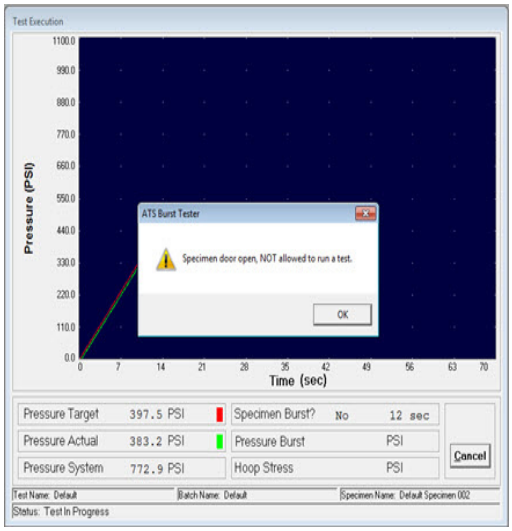
2. Activating the E-stop or opening the lid to the Burst Enclosure will stop a test and drain the accumulator. The test cannot continue until both the door has been closed and locked and the system has been reset.

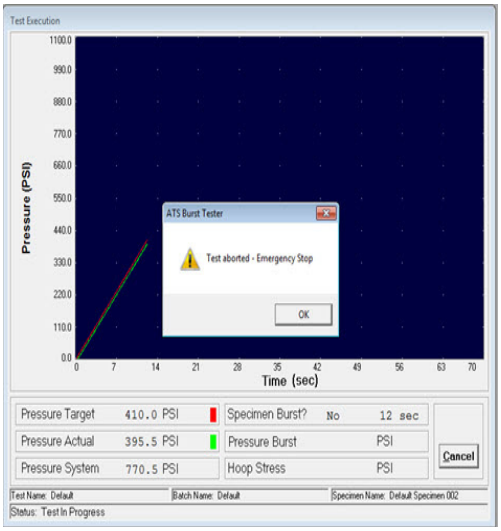


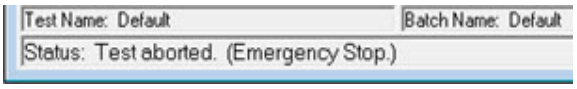
3. After an E-stop has been cleared, press the blue Reset button on the front panel to reset the system.

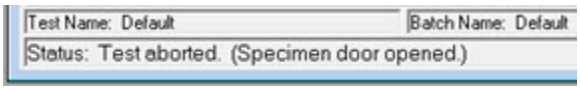
4. If the door to the Burst Enclosure is opened in Manual mode, a setpoint cannot be set in the system.

5. Any time the door is opened during a test or the E-stop is activated, warnings will display in the software. The status bar at the bottom left of the test screen will describe the reason a test was aborted.









6.6 Burst Enclosure Door Lock

The burst enclosure has an automatic lock that can be managed from either the Manual or Start a Test screens using the Unlock Door button. If the door is unlocked or open, the software will display this on the screen.

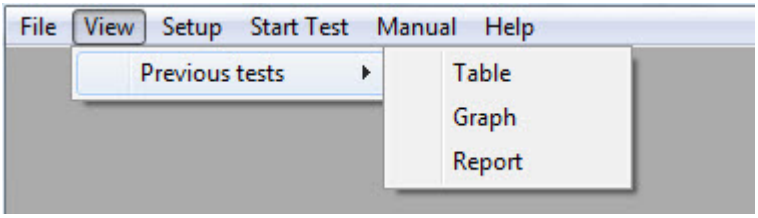
When the Unlock Door button is pressed, the system checks to ensure that the specimen pressure is below a factory-set level. If the pressure is below this level, the door will unlock. The lock will then reengage after one minute. If the door is opened within that timeframe, the lock will automatically engage. The door can be closed while the lock is engaged.

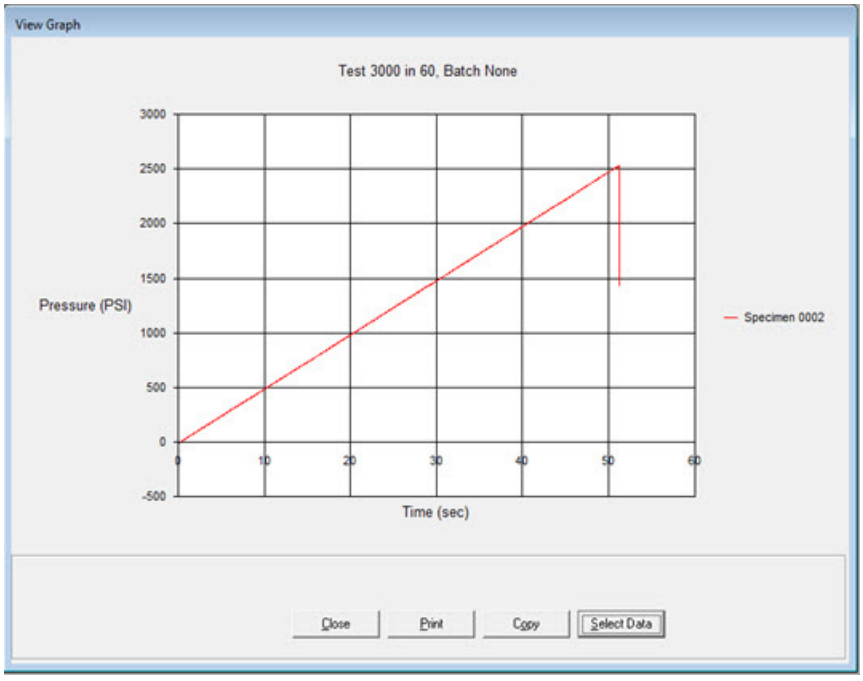
NOTE: The red light located on the door latch indicates it is in an unlocked state.

NOTE: A manual override is located on each latch, which allows it to be open for maintenance when the system is off.

6.7 Viewing Data

To view data in the system, select View from the menu bar. Select the type of data desired from the drop-down menu, and select the batch/test to be viewed.





A shortcut to saved test data is located on the desktop. From this location, it is possible to open and view test data in a Comma-Separated Values (.csv) or Microsoft Excel spreadsheet.

Section 7: Maintenance

7.1 Preventive Maintenance

Preventive maintenance will ensure the system functions properly. The components can be accessed through the back panel of the system. Always check the manufacturer's literature for additional maintenance information.

1. Burst Enclosure:

    a. Leave the lid open to ensure it dries out.

    b. Check latches to ensure they are tight and working properly.

    c. Leave the Pressure Relief Valve open if the enclosure is not in use.

2. Water Filter: Replace this filter twice a year or more frequently under dirty water conditions. Refer to the manufacturer's literature for instructions.

3. Air Filter Sediment Bowl and Filter Element:

    a. Check the air filter sediment bowl and filter elements before operating equipment.

    b. Drain the sediment bowl and clean the filter element as required by the manufacturer.

4. Accumulator:

    a. Check the accumulator precharge whenever volume storage and/or cushioning is lost.

    b. Recharge according to the information on the data label and the manufacturer's instructions.

CAUTION: The Maintenance Only tag in the system compartment shows an operator where to drain the accumulator. This should be done if the equipment needs to be moved or is not in use for more than a few days.

5. Check the Instrument Air filter periodically for signs it needs to be replaced.

7.2 Corrective Maintenance

For any additional maintenance, contact the ATS Service Department at +1-724-283-1212.

7.3 Storage Conditions

Store the equipment properly. Before placing the Pressure Supply System in storage, completely drain the system. All lines must be blown out with compressed air for complete drainage.

Appendix A: Warranty

Warranty Statement

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

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

To obtain warranty service:

1. Applied Test Systems must be promptly notified in writing of the defect.

2. Upon receipt of written authorization, said defective equipment is returned as directed, with transportation charges prepaid by the buyer and –

3. Applied Test Systems examination of such equipment discloses to its satisfaction that the defect exists and was not caused by negligence, misuse, improper installation, accident, or unauthorized repair or alteration.

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

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

Applied Test Systems reserves the right to change published specifications.

APPLIED TEST SYSTEMS
THE MARK OF RELIABILITY

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