COBHAM

TEST-A-PACK SYSTEMS

F100-2600
SEAL STRENGTH TESTER

OPERATOR'S MANUAL

CRM 3361
Rev. B
26 March 2015

Carleton Technologies, Inc., 10 Cobham Drive, Orchard Park, NY 14127 USA

REVISION RECORD

Revision	Affected Pages	Description of Revision	Date
A	8	Added Section “Installing the Control Console”	16 Sept. 2014
B	A-1	AC Line Power: WAS: 85 to 264 volts, 47 to 63 Hz IS: 100 to 240 volts, 50 to 60 Hz Added: Current Draw:< 1 amp @ 120 VAC (0.6 amp Typical) Operating Temperature: WAS: 60 to 110 deg F (5 to 43 deg C) IS: 60 to 110ºF (15 to 43ºC) Storage Temperature: WAS: 0 to 125ºF (-17 to 51 deg C) IS: 0 to 125ºF (-17 to 51ºC)	26 Mar. 2015

Seal Strength Tester
F100-2600

Closed Package Test
Fixture
F100-1320

Open Package Test
Fixture
F100-1600

Restraining Plate Test
Fixture
F100-1750

Table of Contents

CAUTIONS AND NOTICES

The following warnings are presented throughout this manual, where appropriate, to ensure safe, efficient operation of the 2600 System:

WARNINGS

This symbol indicates that failure to follow the warning could result in severe bodily injury.

Eye and ear protection required for all tests.

To protect personnel from electric shock hazards; always connect the control unit to an adequately grounded 2-pole 3-wire electrical supply receptacle.

Rigid packages and/or package contents can become hazardous airborne projectiles. Personnel must be shielded from packages during testing.

Exercise caution when using the Closed Package Test Fixture. The exposed needle probes are extremely sharp and can cause injury.
When the START switch is pressed and the display shows PREFILL or TESTING, air is being fed to the needle probe assembly. To prevent self-injection with pressurized air, do not handle the needle probe during Prefill or Testing.

CAUTION AND NOTICES (continued)

The following cautions are presented throughout this manual, where appropriate, to ensure safe, efficient operation of the 2600 System:

NOTICES

! This symbol indicates that failure to follow the notice could result in damage to the test equipment that will void the warranty.

!

Avoid testing packages containing fluids. Introduction of moisture through the pressure sensing line during testing, will damage the 2600 control console, and void any warranty.

!

The model F100-2600 Automatic Control Console requires a dry, instrument quality air supply. The use of a contaminated air source may damage internal components and void the warranty.

PREFACE

About This Guide

This is your 2600 Test-A-Pack System User's Manual. With it you'll learn important facts about the system's features and functions, as well as techniques for performing and interpreting burst and creep tests on a variety of packages.

How This Guide is Organized

CHAPTER 1 introduces Test-A-Pack components with an overview of system features, testing techniques, and utility functions. Within this chapter, you will learn about the unit's front and rear panels, membrane switches, alphanumeric display and air connections required for operation.

CHAPTER 2 gives specific instructions for preparing the system for testing.

CHAPTER 3 provides step-by-step procedures for system set-up, testing, printing and interpreting test results, and exporting (downloading) results files to a remote computer or data collection device.

Appendix A explains the control console specifications. Appendix B provides instructions for verification of calibration for your F100-2600.

CHAPTER 1 - INTRODUCTION TO THE F100-2600 SEAL STRENGTH TESTER

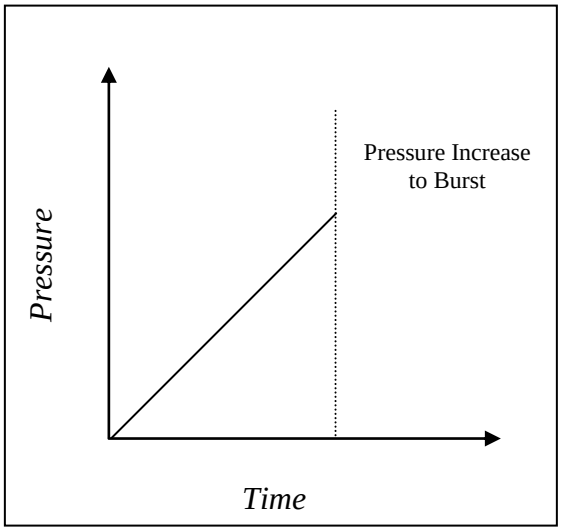
Test Modes

Your 2600 Control Unit provides for three automatically controlled tests: Burst, Timed Creep, and Creep-to-Burst (dual test). You'll learn how to program the control unit for each type of test in Chapter 3 of this guide.

Other 2600 Functions

The 2600 control console is flexible, offering several menu-driven test and utility options. Four initial modes may be selected from the top-level menu a) Burst Test, b) Creep Test, c) Data Export, and d) Set Up. You'll learn more about these menus when you use the step-by step procedures in Chapter 3.

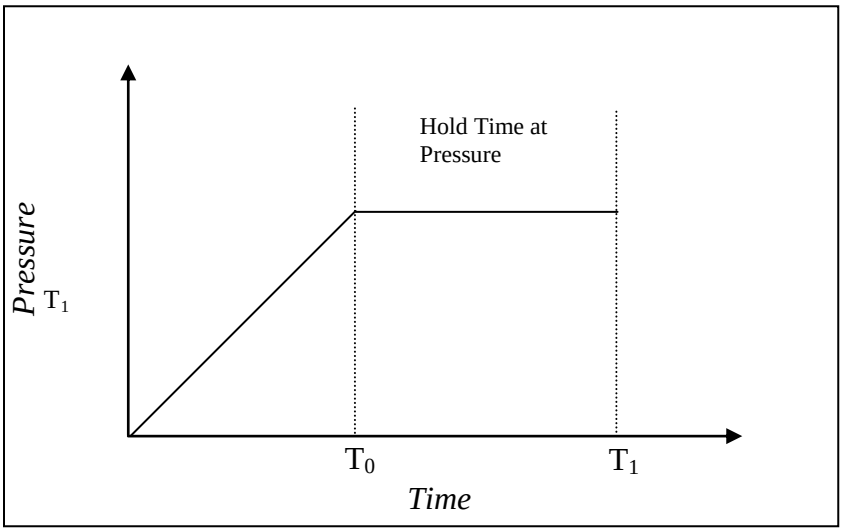
Burst Test



Plot 1

This form of test pressurizes a package until it experiences a failure (Plot 1). The control console monitors internal package pressure, as well as stores and displays the peak pressure at the instant of burst. The average of several tests may be used as a failure criteria value for a specific package.

Creep Test



Plot 2

A Creep test measures the ability of a package to withstand constant pressure without experiencing a failure (Plot 2). The test is usually performed at a suggested starting pressure equal to 80% of the average burst test pressure, with a time duration set by the operator. If the package fails during the test, the control unit displays the pressure, time to failure, and a “REJECT” message.

Data Export

The options in this mode include baud rate selection, export one record or export all (stored) records. Note: available baud rates are: 300, 1200, 2400, 4800, or 9600 baud.

Set Up

In this mode you can set the control unit’s internal clock, move to an export sub-menu to select data file download and communication parameters.

Note: The Calibrate option is for system calibration and should only be used by a factory authorized technician following an established procedure. To verify calibration, refer to Appendix B.

The 2600 Control Unit

Functioning as test controller and operator interface manager, the F100-2600 Seal Strength Tester is the “brain” of the Test-a-Pack System. The unit is illustrated in Figures 1 and 2. Prior to testing, connect air lines and a PC or printer if desired, to the rear panel of the unit.

Front Panel

Figure 1: Front Panel

Five membrane switches and a four-line alphanumeric (text) display comprise the front panel (Figure 1). The switches are:

SET – select nested menus, select parameters to be programmed, store selected parameters or store programmed values.

UP ARROW – moves the cursor up. In Test Setup modes (BURST, CREEP or DUAL), UP ARROW increments (increases by one) the selectable test parameters.

DOWN ARROW – moves the cursor down. In Test Setup modes when a selectable parameter has more than one digit (i.e. Test Pressure in a Creep Test) this DOWN ARROW will set the most significant digit and move to the next digit to the right.

RESET – a multi-function switch used to abort an ongoing test, or to recall a previous screen when pressed during setup or parameter selection.

START – when pressed, causes unit to begin pre-configured burst or creep test sequence. In the export mode, pressing START causes the control unit to transmit stored test result data.

Rear Panel

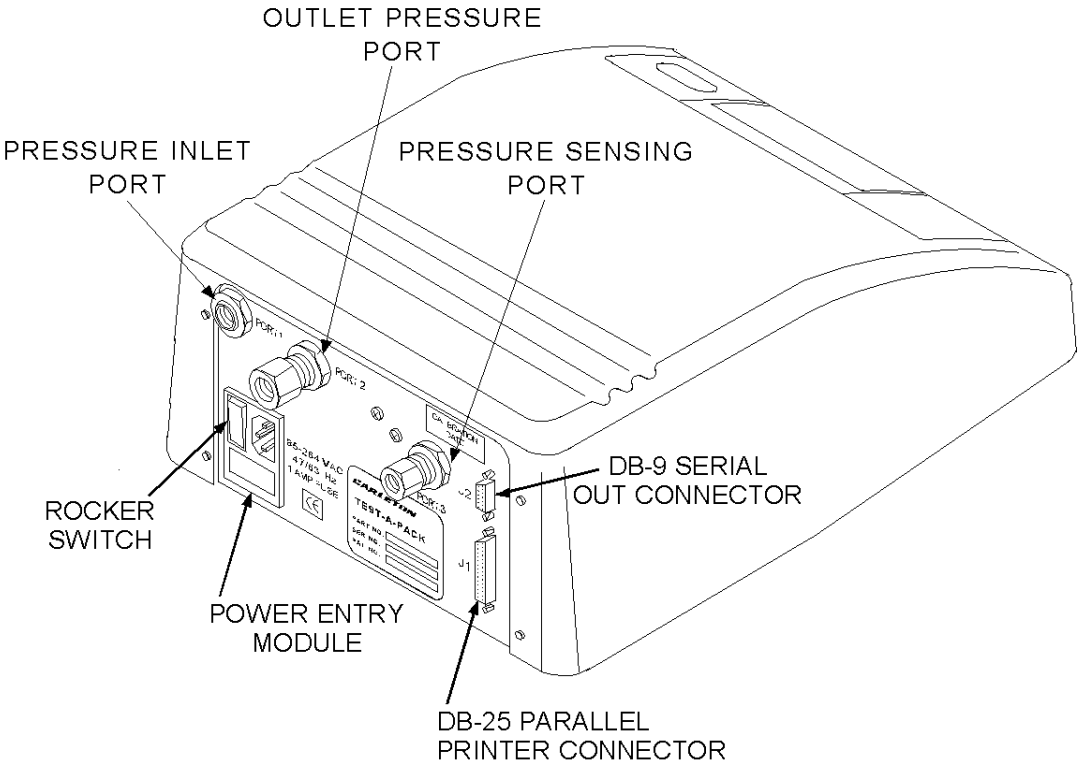


Figure 2: Rear Panel

This panel is the point of interconnection for all 2600 System components (Figure 2). Note: configuration of rear panel may vary.

- PORT 1- Connect instrument quality, 70-100 psi regulated inlet air through the threaded bulkhead pressure inlet fitting.

- PORT 2- Source air supplied to the open or closed package test fixture is routed through the outlet pressure fitting.

- PORT 3- Pressure from an inflated package returns to the control unit through the pressure sensing fitting.

- DB-25 PARALLEL PRINTER CONNECTOR (J1) - May be used with the optional dot matrix printer. This parallel printer port supports certain continuous roll paper printers only.

- DB-9 SERIAL OUT CONNECTOR (J2) - Serial data port available for use in downloading test results to a remote computer or data collection device. Used with the Export function, this port is configured to the RS-232 specification.

- POWER ENTRY MODULE - 85-264 Volts AC is applied to the unit through the switched Power Entry Module. The module requires two 5 x 20mm, 250 volt, 1 amp, time delay fuses (included and preinstalled) for proper operation.

- Use the ROCKER SWITCH to turn the unit on or off.

CHAPTER 2 - 2600 SYSTEM SET UP

In this chapter learn how to unpack the new 2600 Test-A-Pack System, and interconnect the components and the air supply.

Unpacking Your New System

Be sure to inspect all shipping containers and equipment for damage that might have occurred during transport. Report any damage to the carrier.

Shipping Contents

- F100-2600-3 Seal Strength Tester
- N.I.S.T. traceable Certificate of Calibration
- User Manual
- 110V power cord
- 3' long, 1/4"dia. pressure sensing line
- 3' long, 3/8" dia. air source line

Control Console

a. Unpack the unit from its shipping carton and packing material. Save all packing material in case you need to ship the unit at some future time.

b. Inspect the unit. If parts are missing, contact Test-A-Pack Systems.

c. Unpack the AC power cord, and plug the female end of the cord into the power entry module on the rear panel of the console (Figure 2).

Test Fixtures

a. If a fixture was ordered with the system, unpack the fixture and inspect for damage. If parts are missing, contact Test-A-Pack Systems. Save packing materials for future use.

Printer

a. If the optional printer kit was purchased, unpack and inspect the 2-1 DMP-24 ribbon printer and printer cable.

Installing the Control Console

For safety, place the console on a sturdy table capable of supporting the weight of the test console and test fixture. Reserve an area on the table for the selected test fixture. Connect the power cord to the receptacle at the rear of the tester. Plug the male end into a grounded receptacle no more than 6 feet away from the console. Refer to Figure 3 for unit placement.

Plug the female end of the AC power cord into the power entry module on the side panel of the console. Connect the other end to an appropriate 3-wire power receptacle, capable of supplying 100–240 VAC at 50/60 cycles per second (Hz).

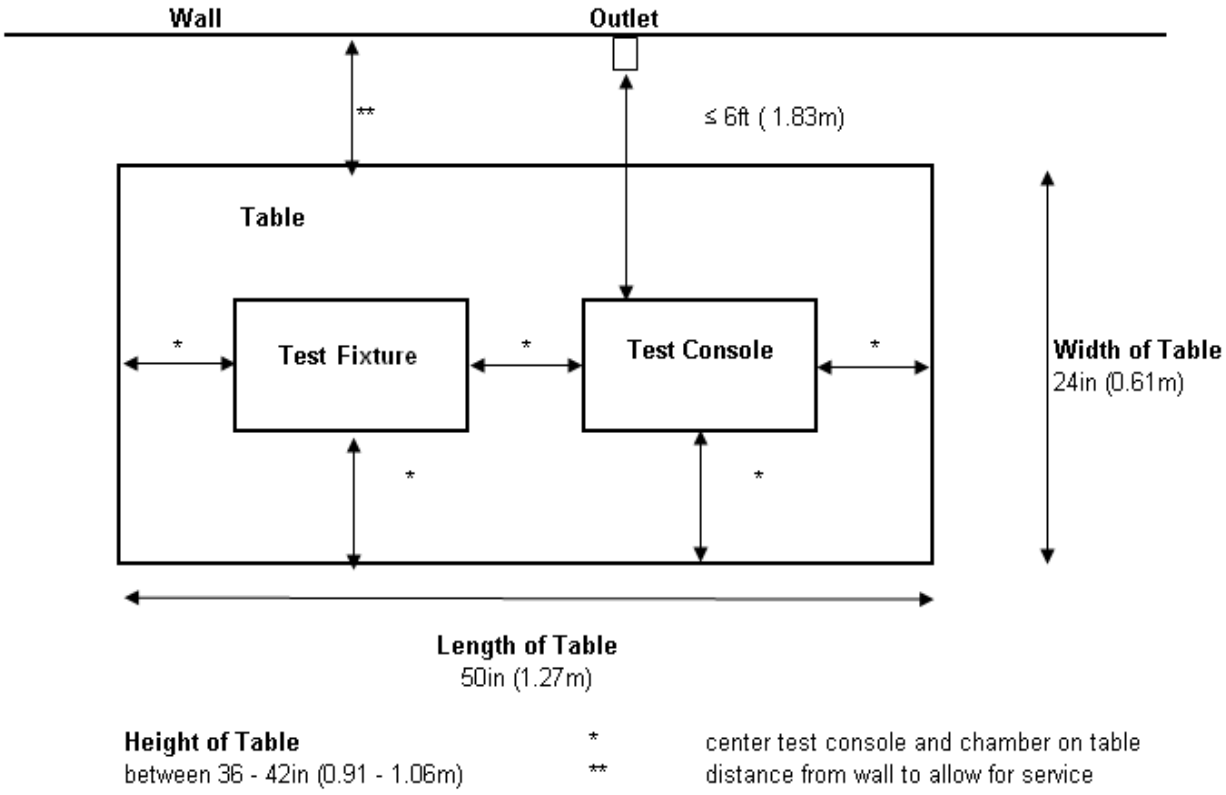


Figure 3: Unit Placement and Table Dimensions

System Setup

a. Firmly insert the bare end of the1/4” dia. Sensing line firmly into the sensing line fitting (Figure 2, PORT 3). Be sure the tube is in as far as it will go.

b. Firmly insert the bare end of the 3/8” dia. supply line into the OUTLET PRESSURE fitting (PORT 2) on the rear panel. It is important to verify that the tubing is in as far as it will go.

c. Using thread-sealing tape, screw the user-supplied air fitting (male 1/4” NPT) into the INLET PRESSURE bulk-head fitting (PORT 1) on the rear panel.

> **!**
> NOTICE
> The model F100-2600 Automatic Control Console requires a dry, instrument quality air supply. The use of a contaminated air source may damage internal components and void the warranty.

d. If applicable, connect the printer cable to the printer, and to the DB-25 connector (J1) on the rear panel.

e. If applicable, connect the serial cable to the computer, and to the DB-9 connector (J2) on the rear panel.

> NOTE
> If the user selects the import mode in the set-up menu, the computer must be connected to the 2600. If not, at the end of the test, the display will read: ‘Device Fault. Target Offline.’

Connecting Package Testing Fixtures

See the manual supplied with the test fixture for complete installation instructions.

Optional Closed Package Test Fixture

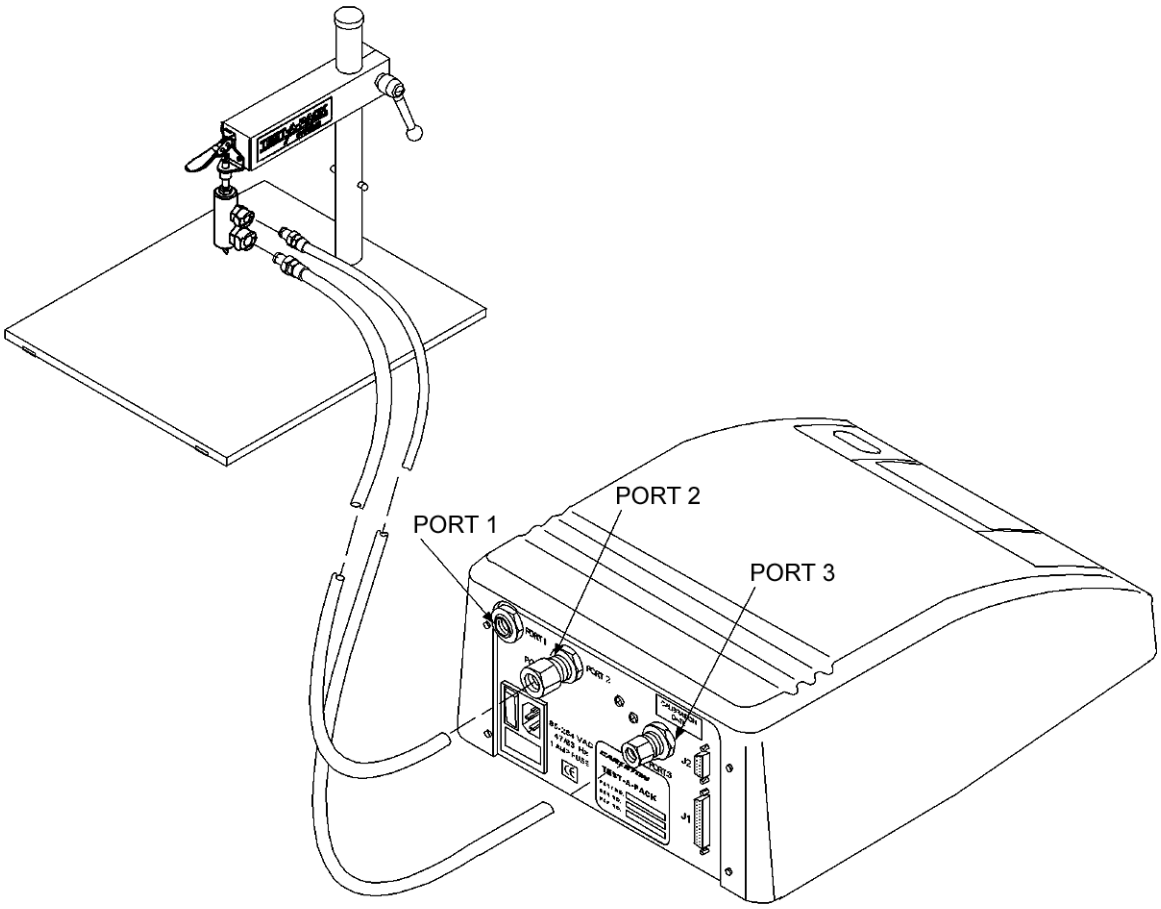


Figure 4: F100-1320 Closed Package Test Fixture

Note: configuration of rear panel may vary

WARNING
The F100-1320 Closed Package Test Fixtures use sharp needles to pierce the package. Exercise caution, as contact with these needles can cause severe personal injury. When testing, air is fed through the needle probe assembly. To prevent self-injection with pressurized air, do not handle the needle probe during Prefill or Testing.

Optional Open Package Test Fixture

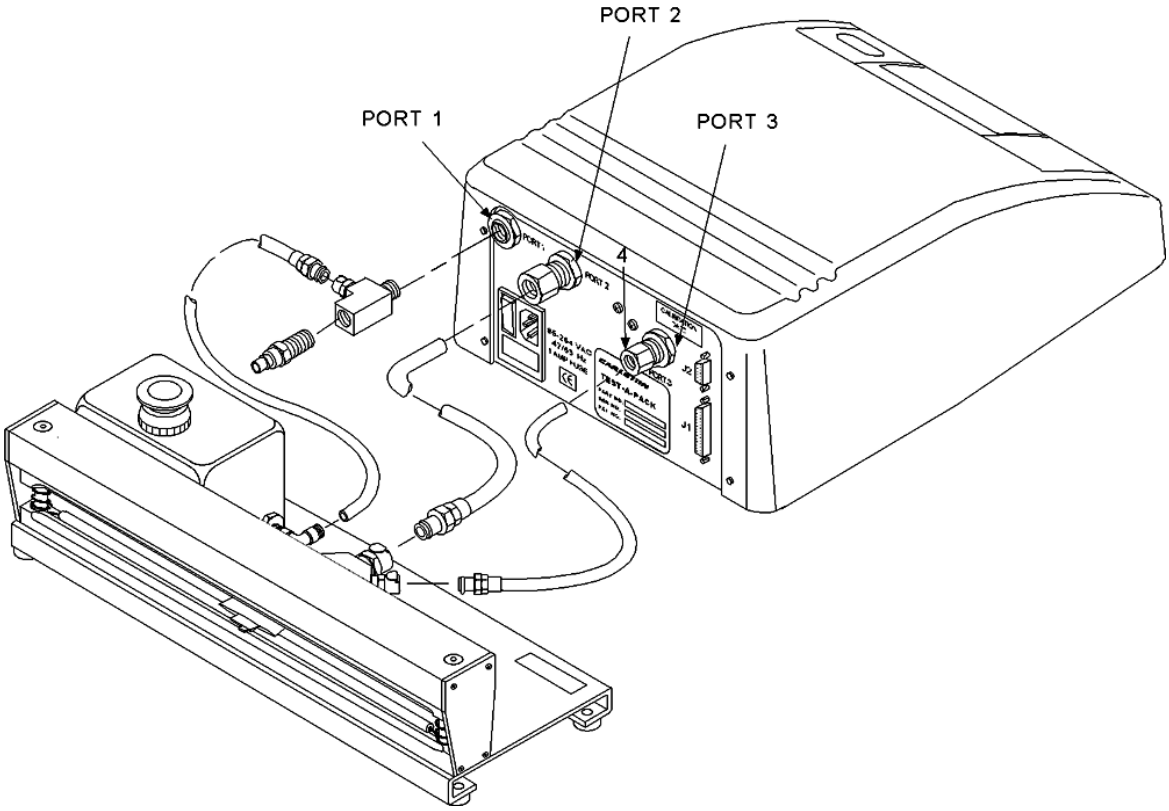


Figure 5: F100-1600 Open Package Test Fixture

Note: configuration of rear panel may vary

CHAPTER 3 - OPERATING INSTRUCTIONS

In this chapter you will power-up and initialize the 2600 control console, then begin testing packages.

> **!**
> NOTICE
> Avoid testing packages containing fluids. Introduction of moisture through the pressure sensing line during testing will damage the 2600 control console, and void any warranty.

Pre-Test Setup

a. Turn on the AC power by pressing the rocker switch on the rear panel of the Console. A block cursor in the upper left segment of display will blink for a few seconds.

The Carleton logo screen will appear followed by the DATE TIME START screen (Figure 6).

b. Verify the displayed DATE and TIME. Press START. If the DATE and TIME need to be changed, follow the next steps. If not, go to PACKAGE TESTING.

Figure 6

Set Date-Time

a. Press the START button. The SELECT MODE menu will appear (Figure 7).

Figure 7

b. Press the UP or DOWN arrow until the arrow points to SET UP.

c. Press SET. The SET UP menu will appear.

d. Press UP or DOWN arrow, moving cursor to SET DATE-TIME selection.

e. Press SET. Press Arrow Up or Down to toggle between DATE and TIME.

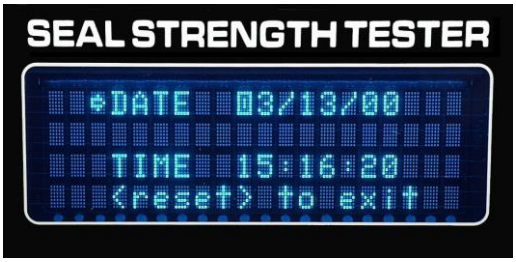


Figure 8

Press SET and the first digit will display in inverse character (Figure 8).

Press the UP ARROW to increase the digit value or the DOWN ARROW to accept the first digit and proceed to the next digit. When the complete time or date has been entered, press the DOWN ARROW or SET, to lock in the DATE and TIME. Press RESET to exit then press START to continue. This will take you back to the SELECT MODE menu.

Package Testing

WARNING
Rigid packages and/or package contents can become hazardous airborne projectiles. Personnel must be shielded from packages during testing. **ALWAYS WEAR PROPER EYE AND HEARING PROTECTION.**

Burst Test

Before you begin Burst testing, you will need to determine parameters for the type of package to be tested. Use the five membrane switches on the front panel to enter the parameters into the console's memory. The factory presets are: FLOW = 5, SENSIT =1, PREFILL =Y, PKG Counter = #001, and Units = In.H_2O (Figure 9).

To access Burst Test Setup Screen:

a. At the SELECT MODE menu, press the UP or DOWN arrow until the cursor steps to BURST TEST.

b. Press SET. The Burst Test Setup screen will appear (Figure 9).

Figure 9

Setting Flow:

Flow is the parameter used to set the speed of the test. '1' is the slowest speed, '9' is the fastest. There are no units of measurement associated with flow. No rates are measured or established. For most packages, flow of '5' is adequate.

To set flow:

a. Press the UP or DOWN arrow, moving the cursor to “FLOW = n” (n = 1 to 9).

b. Press SET. The FLOW number resets to ‘1’.

c. Press and hold the UP ARROW until desired flow value (1 to 9) is displayed.

d. Press SET. The new FLOW value is entered into memory.

Setting Burst Detection Sensitivity:

Sensitivity is the parameter used to set the ‘burst criteria’ for a test. To calculate the pressure drop associated with a programmed flow value, multiply the sensitivity value by 4 in.H_2O. A sensitivity of ‘1’ is the most sensitive setting. Packages tested with a sensitivity of ‘1’ must experience a pressure drop of 4 in H_2O from the highest pressure measured to end a test.

To set the Burst Detection Sensitivity:

a. Press the UP or DOWN arrow until the cursor points to “SENSIT = n” (n = 1 to 9).

b. Press SET. The Sensitivity number resets to ‘1’ as an inverse character.

c. Press and hold the UP arrow until the desired sensitivity value is displayed. (1 = most sensitive, 9 = least sensitive)

d. Press SET. The sensitivity value is stored in memory.

Setting Prefill

Prefill inflates a package to approximately 1 in.H_2O and then restarts the test. This function prevents creep test overshoot and premature burst due to rapid inflating in large sensitive packages.

To set the Prefill Option:

a. Press the UP or DOWN arrow until the cursor points to “PREFILL = y/n”.

b. Press SET.

c. The Prefill status automatically changes.

d. To save the change, Press SET.

Setting the Test Counter

The TEST COUNTER may be reset to 'Pkg #001' using this parameter.

Resetting the TEST COUNTER:

a. Press the UP or DOWN arrow until the cursor points to #XXX at the top of the right column where XXX represents any 3-digit number from #001 – #999.

b. Press SET to reset the package counter to #001 if desired.

Setting the Burst Test Units

The 2600 allows the test results to be displayed in 4 units of measurement, inches of water (in H_2O), pounds per square inch (psi), kilopascals (kPa) and centimeters of water (cmH_2O).

To set the Burst Test Units:

a. Press the UP or DOWN arrow until cursor points to the Units field in the right column of the Burst Test Setup screen.

b. Press SET. The BURST TEST UNITS screen will appear (Figure 10).

Figure 10

c. Press and hold the UP or DOWN arrow until the cursor points to the desired unit of measurement.

d. Press SET. The selected unit of measurement is stored in memory, and is displayed on the screen.

Burst Test Start Screen

a. Press the UP or DOWN arrow until the cursor points to BURST TEST.

b. Press SET. The Burst Test Start Screen appears.

Attach a package to a Test-A-Pack test fixture by following the instructions provided with the fixture.

When you're ready to begin the test, press START. Testing will begin automatically.

Saving Test Results

If you are using a PC with Test-A-Pack data collection software, the test results will be stored automatically in a user named file on the PC hard drive.

When the package bursts, the Burst Test Complete screen will appear giving test number, and the highest internal pressure measured in the package prior to burst.

This information will be available as hardcopy if a printer is being used. If a printer or a computer is unavailable, remember to record the information, since this data will be used for package quality analysis.

If the package burst pressure exceeds the pressure capability of the 2600, or the porosity of the package is too great, the test will terminate, and the Package Out of Range message will appear. This screen displays the test number and the pressure reached when the test ended.

Creep Test

NOTICE
Rigid packages and/or package contents can become hazardous airborne projectiles. Personnel must be shielded from packages during Burst or Creep tests.

Before you begin Creep testing, you'll need to determine test parameters for the type of package to be tested. Use the five membrane switches on the front panel to enter the parameters into the console memory. The factory Presets are: FLOW = 5, SENSIT = 1, PREFILL = Y, PKG COUNT = #001, UNITS = IN H_2O, PRESSURE = 25. TIME = 10 (Figure 12).

Creep Test Setup Screen

a. At the Select Mode menu, press the UP or DOWN arrow until the cursor points to CREEP TEST.

b. Press SET. The Creep Test Type screen will appear.

c. Press the UP or DOWN arrow until the cursor points to "STANDARD CREEP' (Figure 11).

d. Press SET. The Creep Test Setup menu will appear (Figure 12).

Figure 11

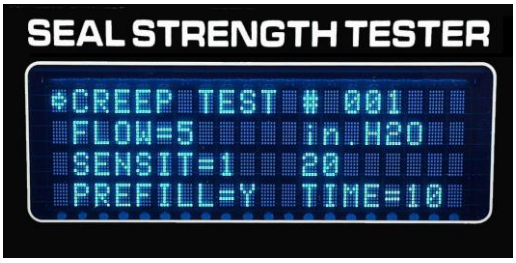


Figure 12

Setting Flow

a. Press the UP or DOWN arrow, until cursor points to “FLOW = n” (n=1 to 9).

b. Press SET.

c. Press and hold the UP arrow until the desired flow value is displayed.

d. Press SET. The new flow value is stored in memory.

Setting Sensitivity

a. Press the UP or DOWN arrow until the cursor points to “SENSITIVITY = n” (n=1 to 9).

b. Press SET.

c. Press and hold the UP arrow until the desired sensitivity value is displayed.

d. Press SET. The new sensitivity value is stored in memory.

Choosing Prefill

a. Press the UP or DOWN arrow until the cursor points to “PREFILL = y/n”.

b. Press SET.

c. The prefill status automatically changes.

d. To save the change, press SET.

Resetting the Test Counter

a. Press the UP or DOWN arrow until the cursor points to #XXX, where XXX represents a 3-digit number from #001-#999.

b. Press SET to reset the package counter to #001 if desired.

Set Creep Test Units

a. Press the UP or DOWN arrow until the cursor points to the UNITS field in the right column of the Creep Test Setup screen (Figure 11).

b. Press SET. The Creep Test Units screen will appear (Figure 13).

Figure 13

c. Press and hold the UP or DOWN arrow until the cursor points to the desired units of measurement.

d. Press SET. The selected unit of measurement is entered into memory, and is displayed on the screen.

> **NOTE**
> The Creep Test Pressure Level must be reset whenever the creep test pressure unit of measurement is changed. This selection is automatic.

Set Creep Test Pressure Level

a. Press the UP or DOWN arrow until the cursor points to the row immediately below the units of measurement in the right side of the Creep Test Setup Screen.

b. Press SET. The first digit of the test pressure appears.

c. Press the UP arrow until the first digit of the desired creep pressure is displayed.

d. Press the DOWN arrow to advance the cursor to the right. The second digit of the test pressure appears, reset to zero, as an inverse character.

e. Press the UP arrow until the second digit is displayed.

f. Continue this process until all desired digits are set.

g. Press SET. The Creep Test pressure is stored in memory.

Set Creep Test Time

a. Press the UP or DOWN arrow until the cursor points to “time = nnn” where nnn = 001 to 999 seconds.

b. Press SET. The first digit of the test time, set to zero, appears in inverse character.

c. Press the UP arrow until the desired first digit of test time is displayed.

d. Press the DOWN arrow. The second digit of Test Time appears in inverse character.

e. Repeat steps (c) and (d) for the second and third digits as required.

f. Press SET. The Creep Test hold time is stored in memory.

Creep Test Start Screen

a. Press the UP or DOWN arrow until the cursor points to CREEP TEST.

b. Press SET. The Creep Test Start Screen appears.

Attach a package to be tested on a Test-A-Pack package test fixture following the instructions provided with the fixture.

WARNING
Eye and ear protection required for all tests.

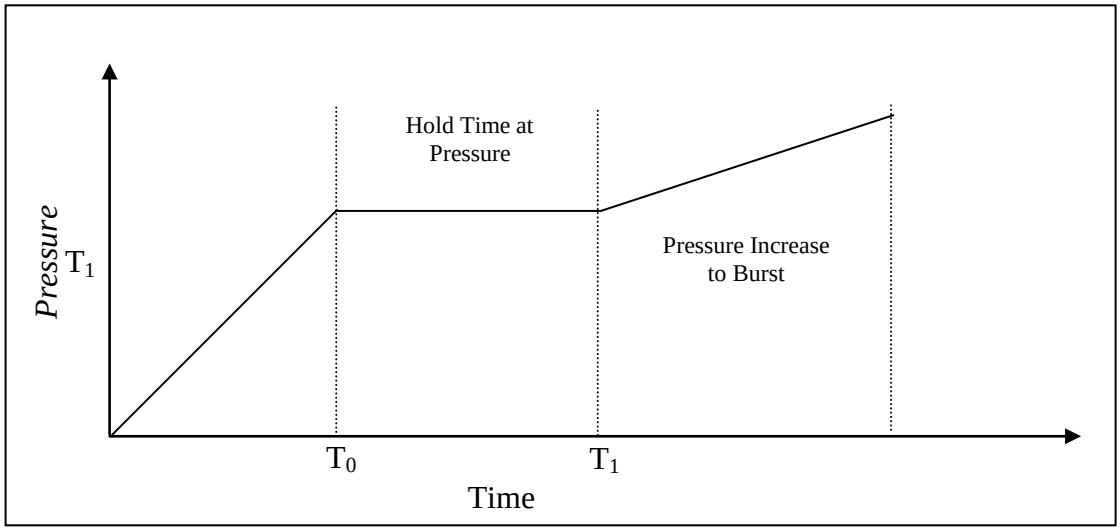
When you’re ready to begin the test, press START. Testing will begin automatically.

Save Creep Test Results

This information will be available as hardcopy if a printer is being used. If you are using a PC with Test-A-Pack data collection software, the test results will automatically be stored in a user named file on the PC hard drive. If a printer or computer is unavailable, record the information, since you’ll use this data in your package quality analysis.

Creep-To-Burst-Dual Test

The DUAL TEST executes a standard Creep Test, followed immediately by a burst test (Plot 3).



Plot 3

Before you begin Creep-to-Burst testing, you'll need to determine test parameters for the type of package to be tested. The factory presets are: FLOW = 5, SENSIT = 1, PREFILL = Y, PKG COUNTER = 001, UNITS = In.H_2O, TEST PRESSURE = 20, TIME = 10 (Figure 15).

Dual Test Setup Screen

a. At the Select Mode menu, press the UP or DOWN arrow until the cursor points to CREEP TEST.

b. Press SET. The Creep Test Type screen will appear.

Figure 14

c. Press the UP or DOWN arrow until the cursor points to CREEP-TO-BURST (Figure 14).

d. Press SET. Dual Test Menu screen appears (Figure 15).

Figure 15

e. Program the dual test parameters as described previously in the Creep Test Setup Screen section.

Attach a package to be tested on a Test-A-Pack package test fixture following the instructions provided with the fixture.

WARNING
Eye and ear protection required for all tests.

Press START to begin a dual test. If the package successfully completes the creep test, the burst test will immediately follow.

Test Results Screens

a. If the package fails before reaching the programmed creep pressure, the test will automatically terminate and the Test Complete screen will appear. This screen displays the test number, TEST COMPLETE message, and the highest pressure measured during the test.

b. If the package fails the Creep Test while the creep test timer is counting, the Test Reject screen will appear. This screen displays the test number, a REJECT message, the elapsed time, and the pressure at the moment of failure.

c. If the package successfully completes both tests, the Dual Test Complete screen will appear displaying the test number, the TEST COMPLETE message, and the burst pressure.

Export Test Result Files

With the EXPORT function you can “download” test results data files individually (automatically after each test) or in groups of up to 850 tests. Connect the control console to a Windows® based PC by plugging a 9-pin serial cable into DB-9 Serial Port (J2) and the serial port on the back of the computer.

> **NOTE**
> When the “test results” memory is full, a MEMORY BUFFER FULL message appears on the screen. See MEMORY BUFFER FULL at the end of this Chapter.

Export Setup Screen

a. At the Select Mode menu, press the UP or DOWN arrow until the cursor points to SET UP.

b. Press SET. The SET UP menu appears.

c. Press SET. The EXPORT SETUP screen appears (Figure 16).

Figure 16

Baud Rate Selection Screen

a. Press the DOWN arrow until the cursor points to BAUD RATE.

b. Press SET. The BAUD RATE selection screen appears (Figure 17).

Figure 17

c. Press the UP or DOWN arrow until the cursor points to the desired baud rate.

> **NOTE**
> Be sure that the Baud rate of the F100-2600 Control Unit is the same as the Baud rate of receiving device.

d. Press SET. The Export Setup screen reappears showing the updated baud rate.

Export All Records

a. Press the UP or DOWN arrow to point to “EXPORT ALL RECORDS” or “EXPORT ONE RECORD”.

b. Press SET. The choice is stored into memory and a diamond is displayed to the left of your choice.

c. Press SET to return to the main menu.

Exporting Test Results

a. Press RESET until the “SELECT MODE” screen appears.

b. Press the UP or DOWN arrow until the cursor points to “EXPORT”.

c. Press SET. The “READY TO SEND” screen appears.

If you haven't done so already, place a receiving device or computer on line, with the baud rate matching the baud rate of the F100-2600.

Press START to initiate download. "TRANSMITTING" will be displayed on the screen while records are transferred. When the transmit cycle is complete, the EXPORT COMPLETE menu appears and the cursor points to "SEND AGAIN".

Re-Export All Stored Results

a. If you need to re-transmit the test results, press SET. The "READY TO SEND" screen reappears.

b. Press START to send again. When the transmission is finished, EXPORT COMPLETE menu appears with cursor at "SEND AGAIN".

Record Test Results Using Test-A-Pack Interface Software

a. Follow the instructions provided with the CD-ROM to load software onto a personal computer.

b. Be sure the serial port of the PC is connected to the DB-9 Serial Output Port (J2).

c. The software will provide instructions on how the 2600 control console must be setup before test results can be recorded.

Exporting One Record

Use this function if connected to a PC during testing, but not using the Test-A-Pack Systems data collection software.

a. At the Select Mode menu, press the UP or DOWN arrow until the cursor points to SET UP.

b. Press SET. The SET UP menu appears.

c. Press SET. The EXPORT SETUP screen appears (Figure 16).

d. Press the UP or DOWN arrow to choose "EXPORT ONE RECORD".

e. Press SET. The choice is stored into memory and a diamond is displayed to the left of your choice.

f. Press SET to return to the main menu.

g. Choose appropriate test, results will be transmitted automatically after each test.

> **NOTE**
> If EXPORT ONE RECORD is selected, but the 2600 is not connected to a PC, the 2600 will not continue until a proper export is performed. A 'device fault' message will appear.

Resetting the Test Counter

a. Press the UP or DOWN arrow until the cursor steps to RESET PKG COUNTER.

Press SET. The test counter field on the Test Setup and Start screens (Burst, Creep, etc.) will be reset to "001". In addition, stored results (old) records are overwritten (and inaccessible) beginning with the next test cycle.

Memory Buffer Full

The Memory buffer is able to store the results of up to 850 tests. If the test results storage memory is at capacity, a screen appears that will give the user the option to EXPORT or RESET DATA BUFFER.

Use the arrows to choose "EXPORT" or "RESET DATA BUFFER", then press SET to continue. Choose "EXPORT" to begin data transmission of all results to a collection device. After transmission, the memory will be cleared. If there is no need to save the data in memory, choose "RESET DATA BUFFER" to clear the data memory without exporting the saved data.

Security Protection

The control console is equipped with user-definable security code. The code can be used to prevent unauthorized alteration of the test parameters.

The security protection is factory set to code '0000'. This code disables the password protection feature.

Changing the Security Code

a. Press RESET until the control console returns to the “SELECT MODE” screen.

b. Press the DOWN ARROW to point to “SETUP”.

c. Press SET. The cursor will point to “IMPORT”.

d. Press SET. The display will show the “SECURITY SET UP” screen with the cursor pointing to “BEGIN TESTING”.

e. Press the DOWN ARROW to point to “SET PASSWORD”.

f. Press SET.

g. Enter a 4-digit code number using the UP ARROW to scroll digits and the DOWN ARROW to shift the cursor to the right.

h. Press SET to save the new code and restart the tester.

i. To disable the password, enter 0000 in step (g).

Note: If a user forgets the password and wishes to remove the password protection so others can change the parameters, the password protection must be removed by resetting the factory presets.

Resetting the Factory Presets

If, for any reason, it is ever necessary to return to the factory presets, use the following procedure:

a. Turn off the control console

b. Press and hold the UP ARROW

c. Turn on the control console.

d. Release the UP ARROW when the title screen appears.

e. Re-Enter the current date and time.

Note: This factory reset procedure should be used if the performance of the tester has been affected by harsh electrical line spikes, drops in line voltage (brown out) or if the password protection must be removed.

NOTE
Performing a Factory Reset will erase ALL test data stored in the memory buffer, and all user defined test parameters.

Prefill Override

If the porosity or size of a package prevents a quick prefill, the following message will appear on the screen: UP ARROW = OVERRIDE

By pressing the UP ARROW to override the factory prefill limit, additional air will fill the package. When the control console senses 1 in. H_20 pressure in the package, the unit will automatically end the override cycle.

Maintenance and Service

Cleaning
Do not use any harsh chemicals to clean the F100-2600 or its fixtures. Use a soft cloth or sponge dampened with a mild detergent and water only. Use of any other chemicals or solvents could damage the exterior of the unit.

Service
The electrical fuses found in the power module are the only user-serviceable parts within the F100-2600 control console. In the unlikely event that the fuses blow, this indicates that the machine experienced voltage or current levels that exceeded the rated specifications. The cause of this incident should be determined and corrected before the unit is returned to service. Blown fuses should be replaced with two 5 x 20mm, 250 volt, 1 amp, time delay fuses. Due to high voltages within the unit and the danger posed by improperly installed components, all servicing, maintenance or calibration must be performed by a factory authorized service technician. Any work performed by a non-factory authorized service technician will void the warranty and certificate of calibration and potentially place the operator of the unit in physical danger.

Calibration
The F100-2600 must be returned to the factory annually for calibration/service. A calibration verification procedure is provided in Appendix B. However, this procedure is *not a substitute* for annual service performed by a certified Test-A-Pack technician which comprises pressure sensor calibration and if necessary, pneumatic system adjustment.

Warranties

a) Carleton Technologies, Inc. (Carleton, CTI) warrants that each item of its manufacture is free from defects in material and workmanship at the date of shipment. This warranty shall not apply to any parts or parts supplied to but not manufactured by Carleton. As to such parts, Carleton agrees to purchase the same from a reputable supplier and to assign to its customer whatever right Carleton may have under warranties.

b) CTI's obligation under this warranty is limited to replacing or repairing a control console which within (12) twelve months from either the date of shipment or the date of assignment to storage at Buyer's request, whichever first occurs, is proven by Carleton Inspection to have been defective at the time of shipment. Warranty for any Test-A-Pack fixture is 90 days. A defect in a component of any unit shall not, when that component is capable of repair or replacement, operate to require replacement of the entire unit. As a condition of this warranty, Buyer shall notify Carleton in writing of any claimed defect immediately upon discovery and shall return the item, transportation prepaid, to Carleton for inspection. However, the Buyer is responsible for damages during shipment to and from Carleton and is also responsible for transportation charges of return shipment. Carleton shall not provide uncompensated field service under this warranty and no allowance will be made for repairs or alterations. Carleton shall not be responsible for work or repairs performed which are not performed either by Carleton employees or by personnel expressly authorized by Carleton to perform the particular work or repair. This assembly by anyone other than personnel authorized by Carleton shall, at the option of Carleton, void the terms of this warranty.

c) Unless Carleton is contractually obligated to provide installation assistance, proper installation and checkout shall be the sole responsibility of the Buyer.

d) The warranties provided under this agreement shall be void as to any equipment or accessories which, in the opinion of Carleton, have been abused or subjected to abnormal use or for which Carleton factory representatives are denied free and safe access.

e) CTI shall not be liable for improper use, installation, operation or maintenance of items manufactured by Carleton, nor for any damage resulting from improper use, installation, operation or maintenance, or from the failure of Buyer to fulfill the instructions or recommendations contained in the Carleton installation, maintenance and/or operations manuals. In addition, Carleton shall not be responsible for any damages or loss of production or profits, damage to product or economy of operation, damage to tools or work pieces, or any other consequential or incidental damages occasioned by defects in or failure of any goods supplied by Carleton, or by defects in or failure of any product in which a component manufactured by Carleton is incorporated.

f) Carleton shall not be responsible for the performance of any product which incorporates component parts manufactured by Carleton unless such performance is expressly designated as Carleton's responsibility under the terms of the written agreement between Carleton and the Buyer.

g) Carleton shall not be responsible for any defect arising from or related to any specification, design, or design change requested by the Buyer.

h) THE WARRANTIES CONTAINED HEREIN ARE EXCLUSIVE AND ARE GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

APPENDIX A - 2600 CONTROL UNIT SPECIFICATIONS

Air Source:	70 psi (483 kPa) (min) 100 psi (689 kPa) (max)
Air Quality:	Instrument Quality, Dry, Uncontaminated (no vapor, water or solids)
AC Line Power:	100 to 240 volts, 50 to 60 Hz
Current Draw:	< 1 amp @ 120 VAC (0.6 amp Typical)
Fuses:	Two: 5 x 20mm, 250 volt, 1 amp, time delay
Operating Temperature:	60 to 110ºF (15 to 43ºC)
Storage Temperature:	0 to 125°F (-17 to 51ºC)
Relative Humidity:	90% (Max)
Unit of Measure:	Inches Water (in H_2O) Pounds per Square Inch (psi) Centimeters of Water (cm H_2O) Kilo Pascal (kPa) (Metric Pressure)
Pressure Testing Range:	5 in H_2O to 50.0 psi
Creep Test Stabilization:	Target Pressure ± 1.0 in H_2O

Flow (Pressurization Speeds)

Level		
1	**Slowest**	
2		**NOTE:**
3		**Pressurization**
4		**speeds vary**
6		**with package**
7		**volume and**
8		**porosity**
9	**Fastest**	

Burst Sensitivity Levels (max to min)	**Package Pressure Decrease** (in H_2O)
1	4
2	8
3	12
4	16
5	20
6	24
7	28
8	32
9	36

Pressure Limits	psi	in H_2O	kPa	cm H_2O
Burst Pressure (max):	50	1384	344	3515
Burst Pressure (min):	0.3	5	2.1	13
Creep Pressure (max)	50	1384	344	3515
Creep Pressure (min):	1.0	5	3.0	13

Timer Range: 1 to 999 seconds

Test Resolution: Within ± 0.2% full scale

Serial Data Port: Configured to Electronic Industries Association Specification RS-232 format w/DB-9 female connector

Selectable Baud Rates: 300, 600, 1200, 2400, 4800, 9600

Parallel Printer Port: Simplified Centronics format w/DB-25 female connector

Dimensions

Length: 15.0 inches (381 mm)
Width: 11.5 inches (292 mm)
Height: 6.25 inches (159 mm)
Weight: 13 lb (5.89 kg)

APPENDIX B - CALIBRATION VERIFICATION PROCEDURE

Warnings:

- This procedure does not replace an annual calibration performed by a certified Test-A-Pack Technician. The procedure below only verifies the calibration of the pressure sensors, not the proper operation of the pneumatic systems of the 2600. The 2600 must be returned to the factory annually for service.

- Carleton Technologies is not responsible for damage done to the 2600 console by non-factory service technicians. Service performed by a non-factory service technician will void all warranties.

- Although the 2600 circuit board and related electronics operate on low voltage DC, the power entry module and power supply are connected to a high current AC power source. NEVER open the console or handle any components within the console when the power cord is connected to the console. Severe electrical shock could result.

- The 2600 circuit boards within the console are ESD (Electro-Static Discharge) sensitive devices. NEVER open the console or handle the circuit boards within the console.

- Never adjust any circuit board potentiometers. Adjusting any potentiometers will always cause the F100-2600 to malfunction. The console will then have to be returned to the factory for repair. Field servicing of the console is not possible.

1.0 Scope

The purpose of this document is to verify the calibration of the gauge pressure sensor within the F100-2600 console.

2.0 Equipment

The following equipment is required:

1. Pressure manifold with the following fittings (Figure 1):

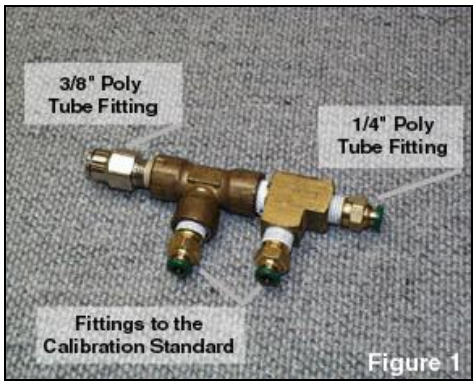


Figure 1

- 3/8” poly tube fitting to connect to the outlet pressure port (PORT 2) of the 2600 console
- 1/4” poly tube fitting to connect to the pressure sensing port (PORT 3) of the 2600 console
- An appropriate fitting (or fittings) to connect to the calibration standard(s)

2. 0-60 psi Digital Pressure Gauge (or 2 gauges with overlapping ranges) with resolution to 2 decimal places over the range of calibration for psi or in H_2O (Figure 2).

Figure 2

Note: If you are calibrating over the full range in In.H_2O, you will need a calibration standard capable of measuring and displaying 1385.99 In.H_2O.

If you are only calibrating up to 800 In.H_2O, you will need a calibration standard capable of measuring and displaying 800.99 In.H_2O.

3. A 70 to 100 psi pressure source.

3.0 Preparation

3.1 Turn on the 2600 console and allow it to “warm up” for at least 1/2 hour.

3.2 Connect shop air to PORT 1, the Inlet Pressure port of the 2600.

3.3 Connect a length of 3/8” poly tube from PORT 2, the Outlet Pressure port of the console to the 3/8” poly tube fitting on the pressure manifold.

3.4 Connect a length of 1/4” poly tube from PORT 3, the Sensing Pressure port of the console, to the 1/4” poly tube fitting on the pressure manifold.

3.5 Connect the appropriate tubing from the gauge fitting(s) on the pressure manifold to the calibration standards (See Figure 3 for complete setup).

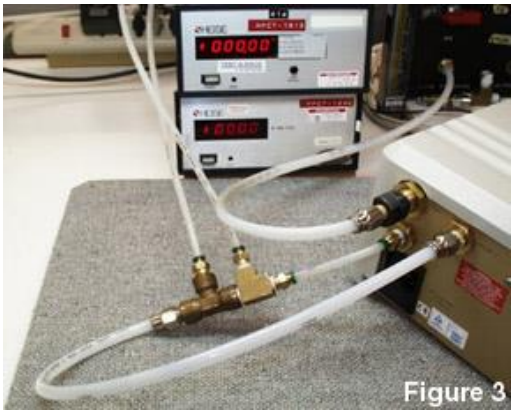


Figure 3

4.0 Initial Adjustments

4 Program the 2600 console for a **Creep Test** with the following parameters (Figure 4):

FLOW = 3 in H_2O

SENSITIVITY =9 (YOUR CHOICE FOR PRESSURE)

PREFILL = Y TIME = 60

- TIME SHOULD BE AT LEAST 60 SEC OR LONGER

Figure 4

4.2 Turn on 70-100 psi air source

4.3 Start the creep test.

4.4 Allow the console time to stabilize at the creep pressure. (Small fluctuations in pressure are due to the lack of volume in the pressure manifold.)

5.0 Verification of Calibration

5.1 After reaching a stable creep pressure verify the calibration of the 2600 by comparing the pressures displayed on the 2600 console and the calibration standard (Figures 5 and 6).

5.2 The pressures should be within 2.77 in H_2O (0.1 psi) of each other.

5.3 Disconnect the Calibration Standard, associated tubing and the Pressure Manifold.

Figure 5

Figure 6

QUESTIONS AND ANSWERS

Q. Air is escaping around the needle on the closed package test fixture; will it effect the test results?
A. The sensing line is used to monitor the pressure inside the package. Escaping air will have no effect on the measurement of internal pressure.

Q. What test parameters should be used on my pouch or tray to perform a burst test?
A. We find that the factory setting FLOW=5, and SENSITIVITY=1 with PREFILL= YES will test a wide range of commercially available products.

Q. What is the function of PREFILL?
A. PREFILL is used to fill up a pouch or tray to a sense value of 1 inch of water pressure. This is done so that the seals of the pouch/tray will not be shocked by excessive pressure rise rates.

Q. What test standard does the burst test conform to?
A. ASTM F1140 Standard Test Methods for Internal Pressurization Failure Resistance of Unrestrained Packages for Medical Applications.

Q. What is the correlation between the burst test and a peel test?
A. There is no direct mathematical relationship between a burst test and a peel test. A carefully prepared test procedure using both methods, and comparing the test results is the preferred method of correlation.

Q. Will the control console identify channels or pin holes in my package?
A. No, the control console cannot distinguish between porosity, pinholes or channels.

Q. Can any printer be used with the F100-2600 console?
A. No, only certain continuous feed printers will work with the console. The optional Test-A-Pack F100-2573-1 printer kit (or F100-2573-4 for 220V) is recommended for use with this system.

GLOSSARY OF TERMS

Base Value — A pressure value that the 2600 must exceed in order to perform a burst or any creep test. The unit will not test below the chosen sensitivity level. Example: A burst test with a sensitivity of 3 will require the 2600 to pressurize a package to at least 12 in H_2O before it enters the testing mode. See specification – Burst Sensitivity Levels for further clarification.

Baud Rate — Selectable data transmission speed through the 2600 Control Unit's Serial (RS-232) Output data port. Equivalent to bits per second, e.g., one baud equals one bit per second.

Burst Test — Increases internal air pressure until package wall or seal fails (bursts) – the tester will display the highest pressure sensed prior to burst

cm H_2O — Centimeters of water. Metric unit of pressure. Force required to move a column of water one-centimeter up an open vertical tube.

Creep Test — A method of testing package seal and/or wall strength by slowing filling it with air up to a predetermined steady-state pressure level safely below the burst level. Internal package pressure is monitored while the package is closely checked for burst due to seal stress.

Creep to Burst (Dual Test) — The same as creep testing except that after the predetermined pressure and hold time have been achieved, the pressure is increased until wall or seam failure occurs.

Export — A data transmission function within the 2600 Control Unit whereby stored groups of test result records are transmitted through a serial port, to a remote terminal, data collection device or personal computer.

Flow — The speed at which air pressure increases in a package under test. Some factors affecting flow rate are: a) Source air pressure, b) supply tubing diameter, orifice diameter, c) package size, wall flexibility and porosity.

in H_2O — Inches of water. English unit of pressure. Force required to move a column of water one inch up a vertical open tube.

kPa — Kilo-Pascal. Metric unit of pressure equivalent to one Newton per square meter times one thousand.

GLOSSARY OF TERMS (CONTINUED)

Parallel Printer — A 25-pin connector on the Control Unit's rear panel to which a printer cable is connected.

Prefill — A selectable feature of the 2600 Seal Strength Tester whereby packages are filled with air to a pressure of one inch H_2O immediately prior to a Burst, Creep, or Dual test. Prefill ensures uniform test conditions for a test run of a particular package type.

Pressure — The force exerted on package walls and seams, by compressed air, during all 2600 System package tests.

psi — Pounds per Square Inch. English units of pressure exerted on a surface divided by its area.

Sensitivity — A selectable pressure limit that a package must drop below to complete a burst test.

Test Complete — Message displayed on the Test Result screen at the conclusion of a Burst test.

Timer — User-configurable function within the Control Unit which controls creep test duration in seconds.

C.E. CERTIFICATION

Competent Body

TÜV Rheinland
Product Safety GmbH

Am Grauen Stein
D-51105 Köln

accredited by the

Regulierungsbehörde für Telekommunikation und Post

herewith grants a

Certificate of a Competent Body

within the meaning of Paragr. 4 (2) EMC Act respectively Art. 10 (2) of the EMC Council Directive on compliance with the EMC protection requirements

Certificate holder:
Carleton Technologies Inc.
10 Cobham Drive
Orchard Park, NY 14127-4195

USA

Product: TEST SYSTEM
Seal Tester

Identification: Model No.: 2600, 2700, 2800

This certificate was issued in accordance with Article 10 (2) of the Council Directive 89/336/EEC in its latest amended version on the approximation of the laws of the Member States relating to electromagnetic compatibility, implemented in Germany by the "Electromagnetic Compatibility Act of September 18th, 1998 (EMVG, Paragr. 4(2))". This certificate does not testify to compliance with the EMC protection requirements of other laws implementing Directives of the European Community other than Council Directive 89/336/EEC. This certificate relates to the sample submitted for testing or to the technical report.

Registration No.: AV 2279607 01
Reference No.: P 2271370 . 01 of: 13.09.2002
Cologne, 27.09.2002

Competent Body

Dipl.-Ing. Heinze

OPTIONAL ACCESSORIES

Open Package Test Fixtures:

F100-1600-2	24” Open package test fixture
F100-1600-3	12” Open package test fixture
F100-1600-4	40” Custom open package test fixture

Closed Package Test Fixtures:

F100-1320-4	6 ½” Maximum height - 3/16” needle probe
F100-1320-5	14” Maximum height - 3/16” needle probe
F100-1320-6	6 ½” Maximum height - double needle probe (for small packages)

Restraining Plates:

F100-1700-1	For pouches up to 14”W x 20”L – for use with the 1600 series
F100-1750-1	For closed packages up to 14”W x 20”L with variable gap

Printers:

F100-2573-1	110 Volt AC printer kit
F100-2573-4	220 Volt AC printer kit

Replacement Parts:

F100-2669-1	Pressure and sensing line kit
F100-1418-3	Inflation port with wing- for use with 1600 series
F100-1428-2	Inflation port without wing- for use with 1600 series
CTMANF006-1	3/16” single needle probe assembly- for use with 1320 series
CTMANF007-1	Double needle probe assembly- for use with 1320 series

Software:

CTSOFT001-1	Test-A-Pack Systems Data Collection Softwar

CONTACT INFORMATION

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