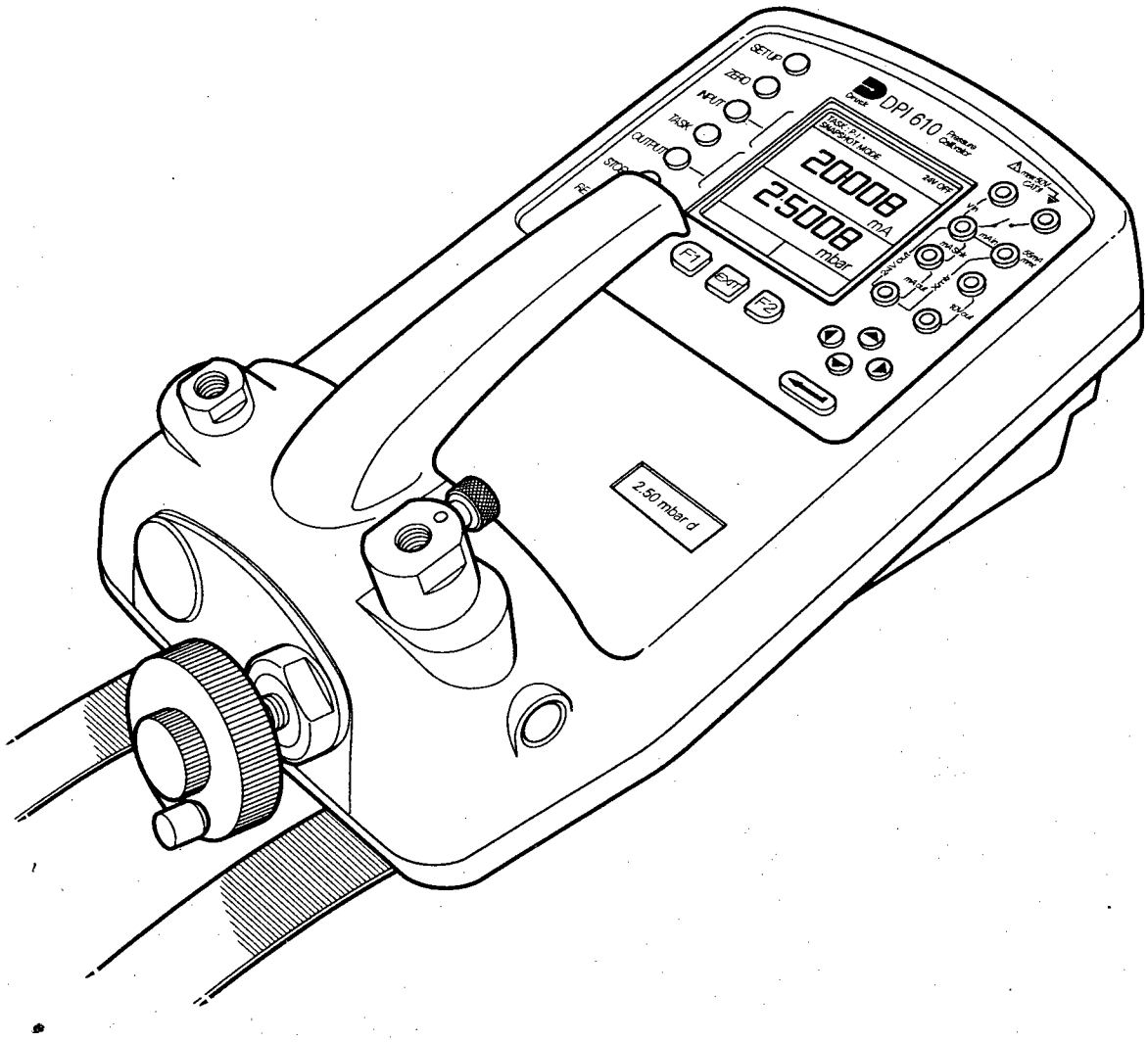
DPI 610 PORTABLE
LOW PRESSURE CALIBRATOR/INDICATOR
USER GUIDE - K264



DPI 610 Low Pressure Portable Pressure Calibrator

SAFETY

The Manufacturer has designed this product to be entirely safe when operated correctly.

- Please pay close attention to the Safety Instructions outlined on this page and elsewhere in this manual. They have been designed to protect the user from personal injury and the equipment from damage.

Potentially hazardous operations are indicated in the text by means of a hazard warning triangle. Specific warnings relating to each section of the manual are given at the beginning of that section. On the instrument, this symbol indicates that the user should refer to the User Manual.

- Please observe the installation advice and any operational limits given in this manual.

- This equipment must only be used for the purpose for which it was designed.

Electrical Safety

The instrument is designed to be completely safe when used with options and accessories supplied by the manufacturer for use with the instrument.

Test leads

Only use the test leads supplied with this instrument; the test leads must not be used with any other test equipment.

Toxic Materials

No toxic materials are employed in this equipment.

Repair and Maintenance

The instrument must be maintained, either by the manufacturer or a competent person. Please refer to supplier for details of approved service agents. A list of Druck subsidiaries who will be able to assist and advise is given on page 42 of K213.

Software Issue

This guide contains operating instructions for instruments with software DK175 Ver. 2.XX.

CE

This product meets the essential protection requirements of the relevant EEC directives. Further details of applied standards may be found in the product specification.

CONTENTS

Associated Publications

DPI 610 Portable Pressure Calibrator User Guide, K213

DPI61X Portable Pressure Calibrator (Calibration Instructions), K235

Introduction

This low pressure version of the DPI 610 provides both manual and pump assisted generation of pneumatic pressure. For low volume sytems or devices, test pressures are generated by a two stage (coarse/fine) volume adjuster as shown in Figure B1 below. For larger volume external devices or systems, an external, hand operated, pneumatic pump may be used to generate the required positive or negative test pressures. The calibrator's output pressure is internally limited to 120% of the full scale pressure. If this pressure is exceeded for more than approximately 1 second, a valve within the calibrator opens, directly connecting the positive and negative pressure ports together, therby relieving the excess pressure. When the pressure falls to within the operational limits, the valve automatically closes to allow normal operation to resume.

The instrument may be supplied with full scale differential output ranges of either 2.5, 12.5, 25, 50, 75 or 150 mbar.

This supplement should be read in conjunction with Druck Publication K213 which is supplied with the instrument. All the operational features described for the standard calibrator are available on this low pressure version of the instrument.

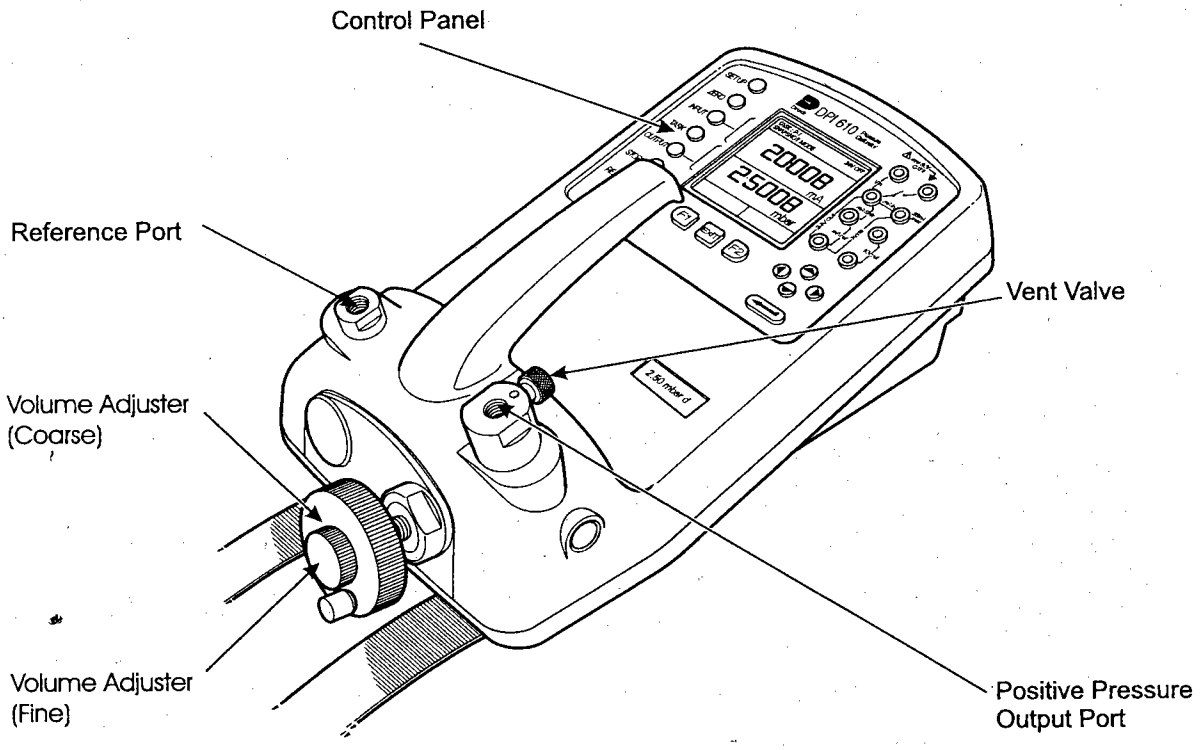


Figure B1 - DPI 610LP Calibrator Controls

Preparation for Use (Low Volume Systems)

- Use the TASK key to setup the calibrator for an appropriate test (e.g.) P-DISPLAY. To record test data for other tasks, setup the calibrator to either Datalog or Snapshot as required. Refer to pages 30 or 31 of K213.

- Fit the an appropriate pressure fitting to both the positive (+) and negative (-) ports using a bonded seal as shown in Figure B2. Ensure that both fittings are tight.

- To generate pressure, start with the volume adjuster wound fully out.
  To generate vacuum, start with the volume adjuster wound fully in.

- Ensure that the vent valve is open (fully anticlockwise).

- Connect the device or system under test to both the reference (-) and the pressure port (+). Connect the ribbed arm of the double tubing to the high (+) pressure input of the device under test.

  Note: *To minimise temperature effects, always use double tubing, separating the arms of the tubing only by the minimum amount necessary to make the pressure connections. A typical application, P-DISPLAY, showing test connections to a Magnehelic pressure gauge are shown in Fig.B2.*

WARNING

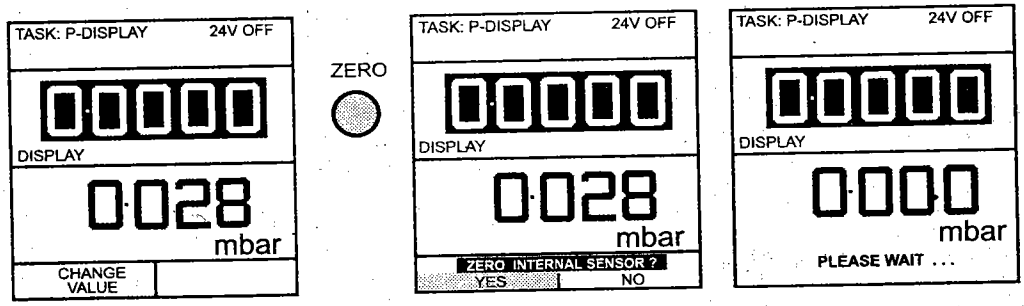
ENSURE THAT THE DEVICE OR SYSTEM UNDER TEST IS CAPABLE OF WITHSTANDING THE MAXIMUM DIFFERENTIAL PRESSURE THAT COULD BE APPLIED BY THE CALIBRATOR (120% OF THE CALIBRATOR'S FULL SCALE PRESSURE).

Test Method (Low Volume System Tests)

- Connect the device under test to the calibrator and prepare for test as detailed above.

- Close the vent valve (turn fullyclockwise).

- Zero the calibrator by pressing the ZERO key. The sequence is shown below.



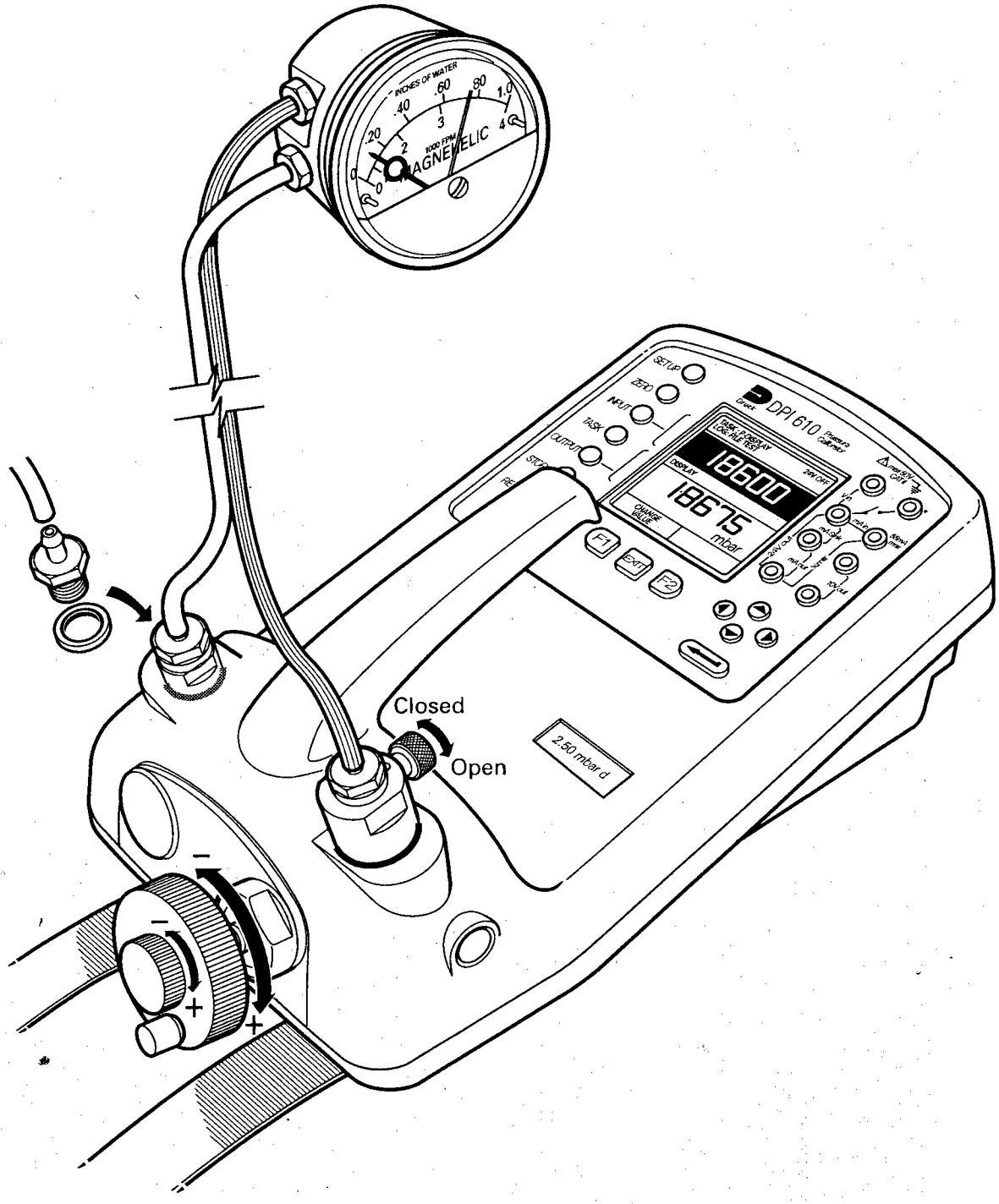


Figure B2 - DPI 610LP Test Connections

Test Method (Low Volume System Tests) [Contd.]

- Rotate the volume adjuster clockwise (anticlockwise for vacuum) to set up a required test pressure. Use the fine adjustment to trim the output pressure of the calibrator to exactly the required level.

- Use the TASK key to setup the calibrator for an appropriate test (e.g.) P-DISPLAY. To record test data for other tasks, setup the calibrator to either Datalog or Snapshot as required. Refer to pages 30 or 31 of K213.

- Rotate the volume adjuster clockwise to set up any additional test pressures required. Recommended test pressures are Zero, 10%, 25%, 50%, 75% and 100% full scale on an ascending run, followed by, 75%, 50%, 25%,10% and zero on a descending run.

  Note: *To release the output pressure at any point during a test or series of tests, open the vent valve. Allow sufficient time for the connected system to vent (particularly important when larger system volumes i.e. >0.25 litres are connected).*

Preparation for Use (Larger Volume Systems)

- Setup the calibrator to record the test data, using either Datalog or Snapshot facilities. Refer to pages 30 or 31 of K213.

- Fit an appropriate pressure fitting to both the positive (+) and negative (-) ports using a bonded seal as shown in Figure B3. Ensure that both fittings are tight.

- Wind out the volume adjuster (anticlockwise) to approximately half way (approximately 30mm of thread showing).

- Ensure that the vent valve is open (fully anticlockwise).

- Connect the handpump and Tee piece as shown in Fig B3. Connect the device or system under test to both the reference (-) and the pressure port (+) as shown. Connect the ribbed arm of the double tubing to the high (+) pressure input of the device under test.

  Note: *To minimise temperature effects, always use double tubing, separating the arms of the tubing only by the minimum amount necessary to make the pressure connections. See Figure B3.*

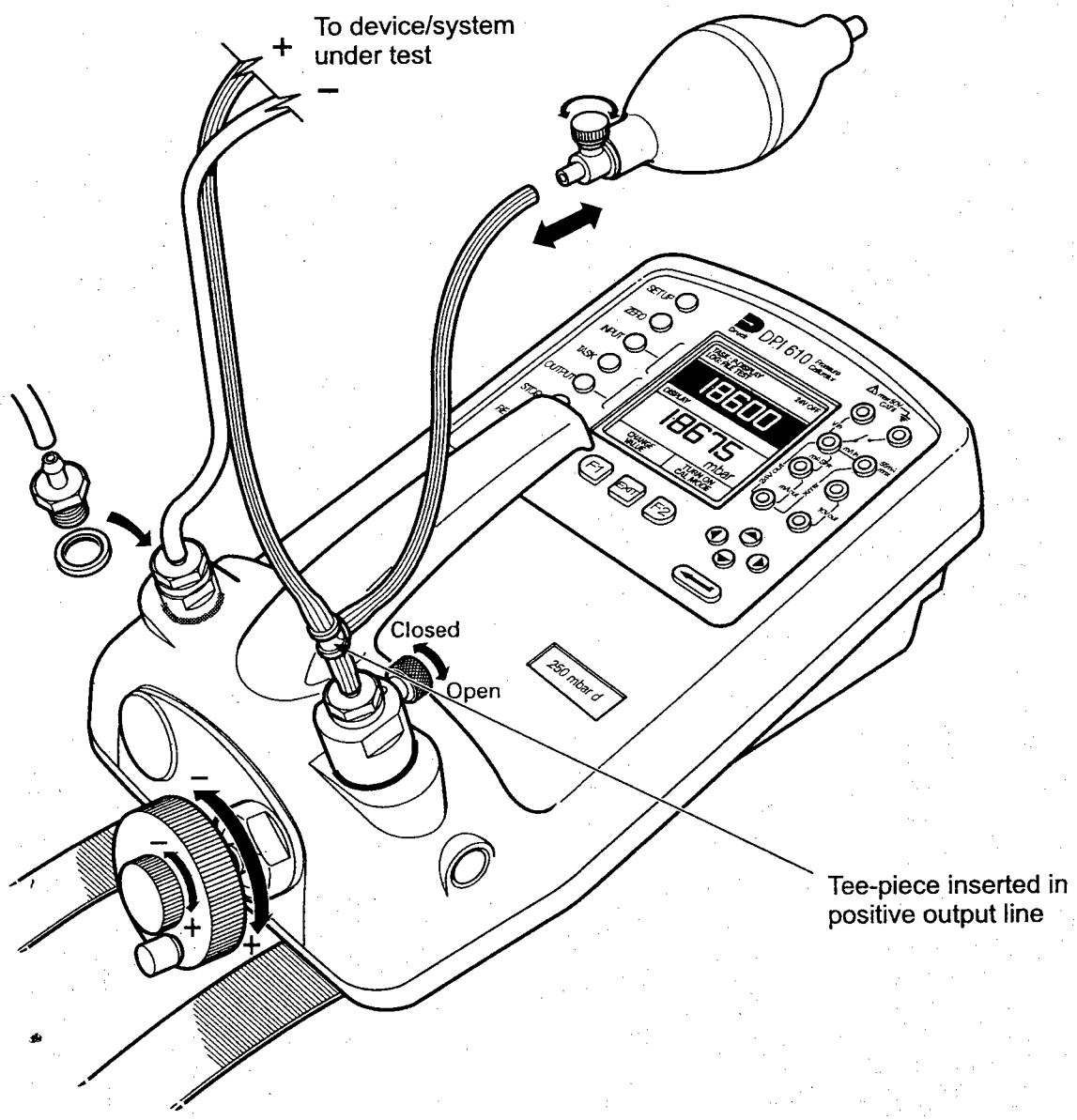


Figure B3 - DPI 610LP Hand Pump Connections

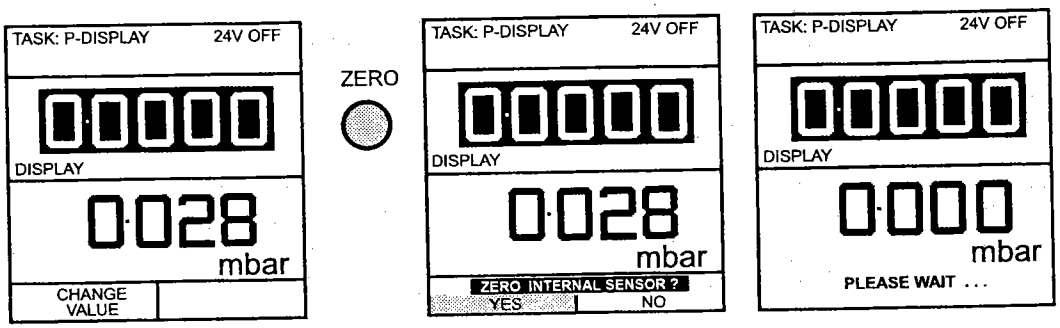
Test Method (Larger Volume System Tests)

- Connect the device or external system under test to the calibrator and prepare for test as detailed on Page 4.

  Note: *To apply a negative differential pressure, connect the tee piece (refer to Fig B3), to the negative port and use the handpump to apply a positive pressure to the negative port.*

- Close the vent valve (turn fully clockwise).

- Zero the calibrator by pressing the ZERO key. The sequence is shown below.



WARNING: **TO AVOID THE APPLICATION OF TRANSIENT OVERPRESSURE PULSES TO SENSITIVE EXTERNAL SYSTEMS, SQUEEZE THE HANDPUMP SLOWLY.**

- Close the pump valve and operate the handpump to pressurise or depressurise the device or system under test to just above/below the required level.

- Adjust the output pressure to the required level by using the volume adjuster as a fine adjustment. Allow a short period for the pressure to stabilise before fine trimming.

  Note: *The larger the external volume, the less effect the volume adjuster will have on the output pressure.*

- Record the test result using either datalog or snapshot facility as required.

- Use the pump and volume adjuster to set up any additional test pressures required. Recommended test pressures are Zero, 10%, 25%, 50%, 75% and 100% full scale on an ascending run, followed by 75%, 50%, 25%,10% and zero on a descending run. Record the results for each test pressure.

  Note: *To release the output pressure at any point during a test or series of tests, open the vent valve. Allow a few seconds for the connected system to vent. With larger volume systems connected, first disconnect both the reference and positive pressure lines from the calibrator and then reconnect before zeroing.*

Calibration

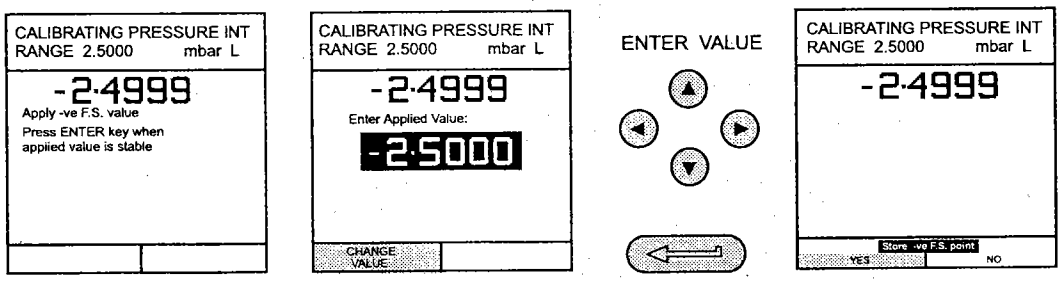
The calibration routines for the DPI 610 Low Pressure calibrator are as described in Druck publication No. K235, with the exception of the internal pressure range. The calibration procedure for the internal pressure range requires the application of five test pressures and is detailed below.

The general calibration procedures outlined on pages 6 and 7 of K235 should be followed for this equipment.

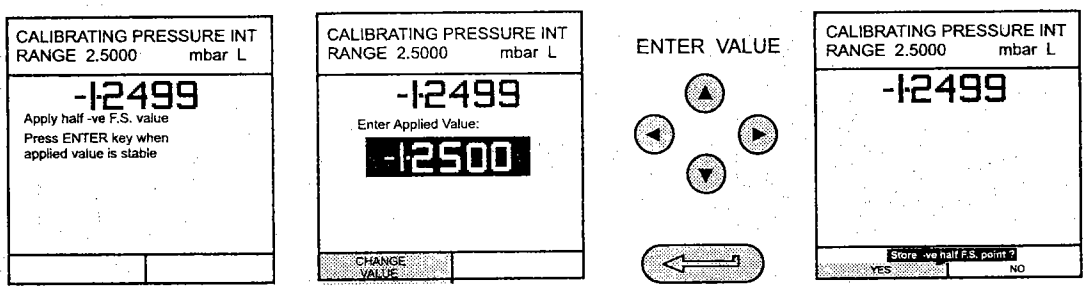
Calibrate Internal Pressure Range

The following procedure should be adopted for calibrating the internal pressure range.

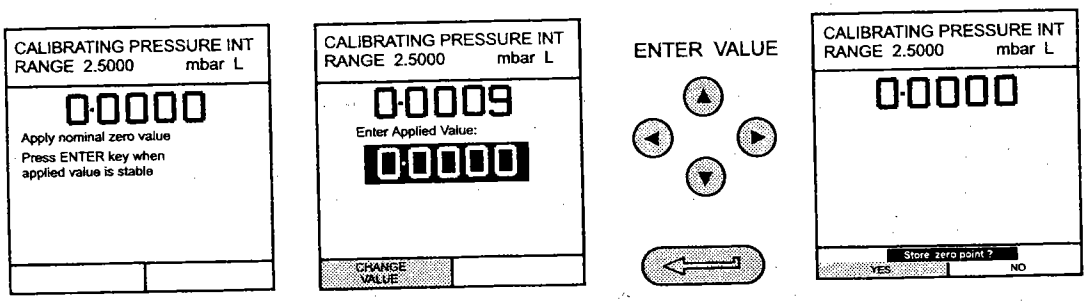
- Connect the outlet port of the instrument to a pressure standard.
- Allow the instrument's temperature to stabilise for a minimum of 1 hour.
- Switch the instrument on, select SETUP and enter the SETTINGS menu.
  Note: *SETUP cannot be selected from BASIC mode.*
- Select CALIBRATION from the SETTINGS menu and enter the calibration PIN number . Refer to page 8 of K235 for PIN number details.
- From the CALIBRATION select PRESSURE INT as shown on Page 8 of K235.
- Close the vent valve and zero the instrument.
  Note: *Once started, the calibration procedure must be completed(all 5 points).*
- Apply -ve full scale pressure and store the -ve FS point as shown below (e.g.),



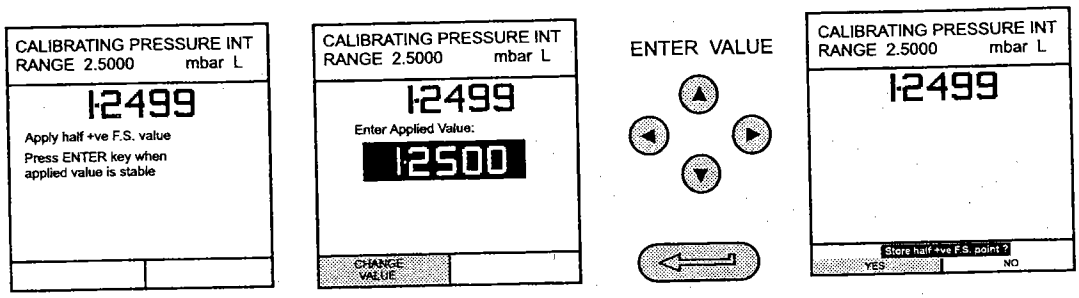
- Apply second calibration pressure(negative half full scale) pressure and store the half -ve FS point as shown below (e.g.),



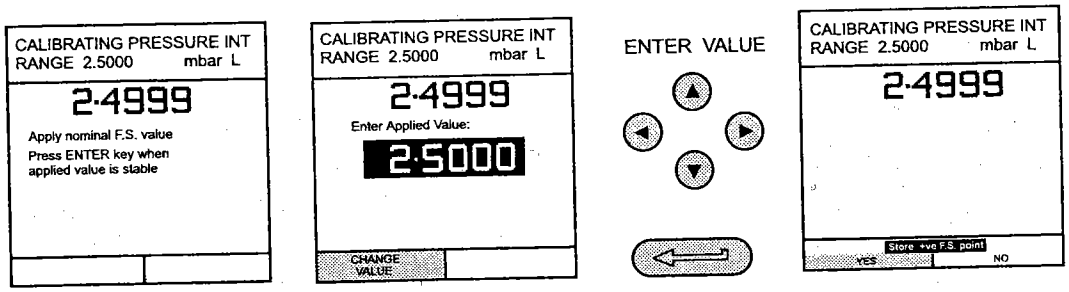
- Apply nominally zero pressure and store the zero point as shown below (e.g.),



- Apply fourth calibration pressure (positive half full scale) and store the half FS point as shown below (e.g.),



- Apply the fifth and final calibration pressure(positive full scale) and store the positive FS point as shown below (e.g.),



- After application of the final calibration pressure, the calibration results are displayed as shown below. To view the second page of calibration data press MORE (F1). Press ENTER complete the pressure calibration procedure.