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- 6.0 Governing Law.** This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts.

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FOREWARD

DI Peak Load Indicator has been designed and constructed with great care in every phase of assembly. In order to insure reliability, both the mechanical and electrical components have been built with the best available materials. The sections of this manual provide description and instruction on the operation and maintenance of the mechanical, electrical and software components.

You as a customer are our most valued asset. We take pride in our systems and are proud that you have become an owner. We welcome your comments about our products and wish that you express them. It is the only way that we can continue to build the best available test systems to satisfy your needs. Thank-you for your support.

HOW TO USE THIS MANUAL

This manual is intended to educate the customer on the capabilities, operation and maintenance of the ***DI Peak Load Indicator***. In addition, it is to be used as a supplement for any information supplied by the load frame manufacturer. Maintenance procedures specified by the load frame manufacturer should be followed unless specifically noted herein. Read this manual and become familiar with the operation of your test machine prior to operating the ***DI Peak Load Indicator***.

TECHNICAL SUPPORT

If a problem should occur with your testing machine:

- 1) Check that all external inputs are properly connected.
- 2) Call the supplier/manufacturer of your test machine.
- 3) Call Test Mark's technical support at (724) 847-8600 (9AM to 4PM EST).

1.0 INTRODUCTION

The **DI Peak Load Indicator** is a low cost load indicator designed for materials testing machines. Features include an Auto-Test-Reset mode for hands free operation, automatic sample break detection and three points of calibration for maximum accuracy, which exceeds ASTM E4. Load rate indication is also offered as an option.

DI Peak Load Indicator is ideal for:

- Beam Bend Testing
- Concrete Cylinder Testing
- Cement Cube Testing
- Force Calibration
- Remote On-Site Testing
- Quality Control
- Product Evaluation
- Proof Testing

Features:

- Display Live Load and Peak Load numerically.
- Select engineering units of Lb, N, KN, and Kg.
- Three software programmable calibration points with password protection (No need to turn a potentiometer to adjust calibration.). Accuracy exceeds ASTM E4.
- Sample Break Detector set for 50% of peak load.
- Auto-Test-Reset automatically "readies" the indicator for the start of the next test without requiring operator interaction.
- Optional load rate indication in force units per sec.
- 1x16 LCD with 0.38" high characters.
- Three key tactile keypad.

1.1 **DI Peak Load Indicator Accessories**

- 1,000 2,500 5,000 10,000 psi pressure transducers with cable pre-wired for the pi Indicator.
- Load cells of various capacities.

2.0 THE KEYS AND SCREEN DISPLAY

2.1 The <SET ENTER> Key

The ENTER key performs the following functions.

- Changes engineering units (KN,KG,LB,N)
- Accepts/assigns the value in a data entry field to that field.

2.2 The <MENU/UP ARROW> Key

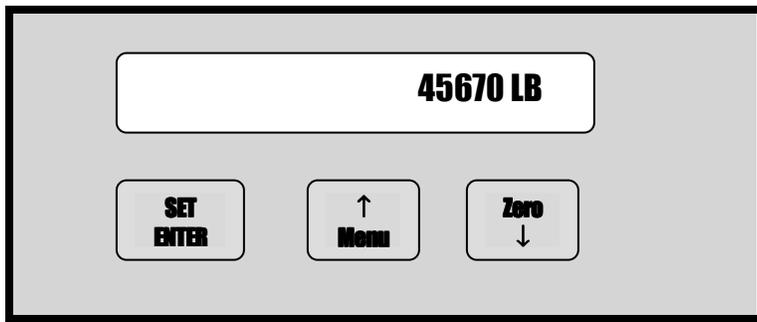
- Selects the calibration menu for setting load resolution (**RES**), full scale (**FS**) load and calibration.
- Increases the value of a numeric digit.

2.3 The <ZERO/DOWN ARROW> Key

The ZERO key performs the following functions.

- Defines a new zero load.
- Places the Indicator Test Status in Ready Mode.
- Clears out the previous test results from the test buffer and initializes the indicator for the next test.
Make sure the previous test result was recorded prior to pressing ZERO or it will be lost.
- Decreases the value of a numeric digit.

2.4 DI Peak Load Indicator Keypad and Screen Display.



Live Screen Display Standard Model, DI
Displays live load while specimen under test and peak load when sample break is detected.

Live Screen Display Load Rate Model, DIR
Displays load rate and live load while specimen under test and peak load when sample break is detected.

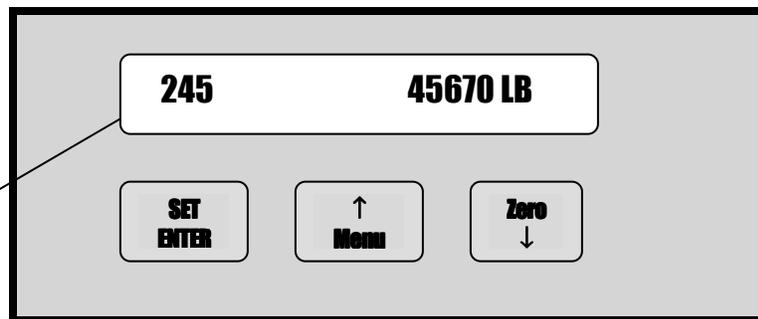


Figure 2.1 - *DI Peak Load Indicator* Keypad and Screen Display.

3.0 SETTING FULL SCALE AND LOAD RESOLUTION for indicator with Version numbers of 0.19 / 0.19R and higher

- 1) Turn the indicator ON, after it boots up press the < Set Enter > key to select the required Load Unit: lbs, N, kN or Kg. when the correct Load Unit is selected.
- 2) Press the <MENU> key then enter the PASSWORD code by pressing < ZERO > key, then < SET ENTER > key and then < MENDU > key.
- 3) The screen should display “ FS “ Full Scale which should be the maximum capacity of the testing machine FS: XXXXX in the selected Load Unit.
- 4) To change FS: value: Use the < UP > and < DOWN > arrow keys to change the first place X in full scale, when correct number is displayed.
- 5) Press the < ENTER > key once to set the place.
- 6) Repeat Steps 4 – 5 until all places in the full scale number are defined correctly. Then Press < ENTER > key to set full scale value. **“ RES “: Counting Resolution should now appear on the screen.**
- 7) Use the UP and DOWN ARROW key to change the first place in the resolution.
- 8) Press <ENTER> once to set the place.
- 9) Repeat steps 7-8 until all places in the resolution number are defined correctly. Then press <ENTER> to set the resolution. The indicator has exited to the Line Screen.

3.1 Performing Calibration for indicators with Version numbers of 0.19 / 0.19R and higher

- 1) Turn the indicator “ OFF “.
- 2) Press and hold down the < SET / ENTER > key, turn the indicator “ON” while continuing to hold down the < SET / ENTER > key for several seconds until “Password” prompt is displayed, enter the correct password to enter the calibration program.
- 3) Password code press < ZERO > key, <SET / ENTER > key and < MENU > key.
- 4) The screen should display “ FS “ Full Scale Load, if correct full scale load value is displayed. Press < ENTER > to set full scale value.
- 5) The screen now displays “ RES “ Resolution if correct counting resolution value is displayed, press < ENTER > key to set resolution value.

If “FS” Full Scale or “RES” Resolution values are incorrect see section 3.0 for instructions on how to enter and set required “FS” and “RES” values.

The screen will now read "**MENU) CAL ENT)ESC**". Press <ENTER> to exit to the Live Screen or <MENU> to proceed to calibration.

Note: The DI / DIR Peak Load Indicator requires three calibration points. All three-calibration points MUST be used. The first calibration point should be set at zero load, the second calibration point at low load (5% of full scale load) and the third calibration point at or near full scale load.

**LOAD CELL REQUIRED FOR CALIBRATION
CALIBRATION SHOULD BE PERFORMED
BY A CERTIFIED CALIBRATION CO**

- 6) The screen will read "**ENT) Set PT1**". Unload the machine and press <ENTER> to set the zero load calibration point.
- 7) The screen will now read "**ENT) Set PT2**". Load the machine to the second calibration point then press <ENTER>. Note the load value for the second calibration point.
- 8) The screen will now read "**ENT) Set PT3**". Continue loading the machine to the third calibration point then press <ENTER>. Note the load value for the last calibration point.
- 9) The screen will now read "**PT1:**". Enter a value of zero for the first calibration point.
- 10) The screen will now read "**PT2:**". Enter the load value for the second calibration point. Remember that the UP/DOWN ARROW keys change place values just like for full scale load.
- 11) The screen will now read "**PT3:**". Enter the load value for the last calibration point. Remember that the UP/DOWN ARROW keys change place values just like for full scale load.

Calibration is complete. You are now ready to verify the load readings.

4.0 OPERATION

Note that the unit must be calibrated prior to running any tests. See Section 3.0 for the calibration procedure.

4.1.1 Setting the Engineering Units

Press the <ENTER> key from the Live Screen. The four possible values for engineering units are **KN, KG, LB, and N.**

4.1.2 Running a Test

There are two modes, manual mode and hands free mode, available for running a test. Under manual mode, the operator presses <ZERO> prior to each test to remove any tare weight. With hands free mode, the operator zeros the load once prior to running a batch of samples. Then three seconds after the completion of the previous test, the pi Indicator begins waiting for the load to exceed the threshold (0.5% of Full Scale), which signals the beginning of the next test. During a test, the pi Indicator will continue monitoring for peak load until the load decreases below 50% of peak load. Once the load drops below the 50% peak point, the test ends and the peak load will be displayed on the screen. The peak will remain on the screen until a) <ZERO> is pressed or b) a new test is started.

Note: Before <ZERO>ing the load make sure that the piston is floated and the loading platen is close to the specimen.

5.0 ELECTRICAL/MECHANICAL DATA

5.1 User Connections

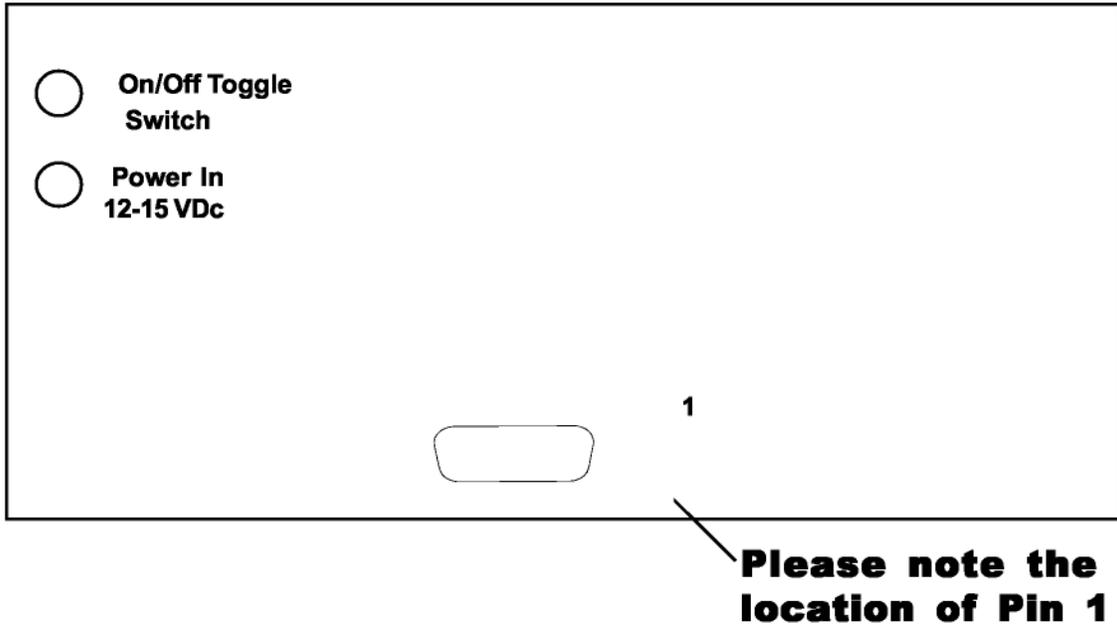
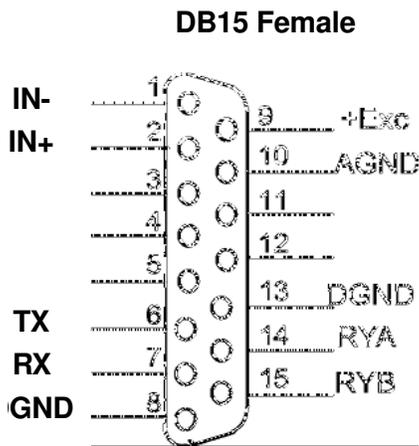


Figure 5.1.1 DI Peak Load Indicator Rear Connection Panel



Load Channel Connections

Analog-Load Input

pins 9 & 10 (+Exc & AGND)
10 Vdc (5Vdc optional)

Analog Inputs:

pins 1 & 2 (+/- IN)
Input Range: 4.2 mv/v Standard
Contact factory for other input range options.

Connect all shields to chassis. Cable end requires a DB15 male.

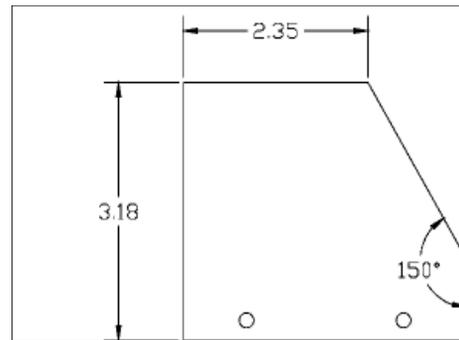
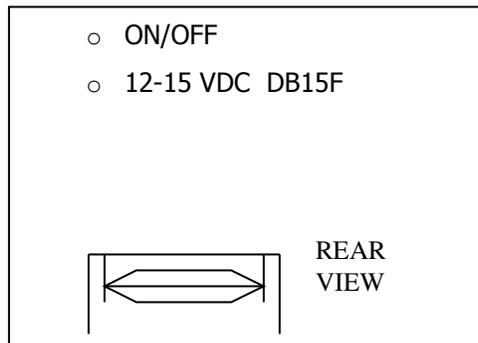
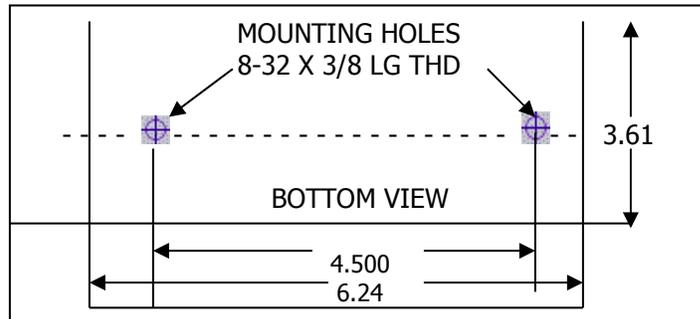
Figure 5.1.2

5.2 Power (DC) Input

The *DI Peak Load Indicator* requires a 12-15Vdc unregulated input voltage.

Contact Test Mark if the factory supplied power source is not used.

5.3 Dimensions



5.4 Password

Factory Password: <DN> <ENTER> <UP>

Test Mark suggests removing this page from the manual and placing it in a safe place.