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1. FEATURES

- * 5000 g, wide capacity, high resolution, high accuracy, high repeatability.
- * 3 kind display unit : gram, Newton & oz.
- * Tension & compression capability .
- * Peak hold (Max. load) can be held in display during make tension or compression measurement.
- * Zero button can operate both for normal measuring & the " peak hold " operation.
- * Full capacity zero (tare) control capability.
- * Fast/Slow response time push button.
- * Positive or reverse display direction select.
- * Full line accessories (adapters) are included.
- * Hand held & stand mounted gauges are available.
- * Low power consumption gives long battery life.
- * Build in low battery indicator.
- * Microprocessor circuit & exclusive load cell transducer.
- * Over load protection.
- * RS - 232 computer interface (optional).
- * Professional test stand (optional).

2. SPECIFICATIONS

| | |
|-------------------|--|
| Display | LCD (Liquid crystal display). 5 digits, 10 mm (0.4") digit size. |
| Display Direction | Positive or Reverse direction, select by the push button on the front panel. |
| Function | Tension & Compression (Push & Pull). Normal force, Peak hold (Max. load). |

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| Peak hold | Will freeze the display value of the Peak load (Max. load). |
| Zero | Zero button can be operated both for "normal force" or "peak hold" operation. |
| Measure | 5000 g/176.40 oz/49.03 Newton. |
| Capacity | |
| Resolution | 1 g/0.05 oz/0.01 Newton. |
| Min. Display | 3 g/0.10 oz/0.03 Newton. |
| Accuracy | ± (0.4 % + 1 d), within 23 ± 5°C and under the test weight on 3000 g & 5000 g. |
| Unit select | g/oz/Newton. |
| Update time | Fast Approx. 0.2 second. |
| | Slow Approx. 0.6 second. |
| Over range | Display show " - - - - " when in over range status. |
| Indicator | |
| Overload | Max. 7 kg. |
| Capacity | |
| Zero | Max. full capacity. |
| Control | |
| Circuit | Exclusive microprocessor LSI - circuit. |
| Full Scale | Approx. 2.0 mm max. |
| Deflection | |
| Power Supply | 6 x 1.5 V AA (UM-3) size battery or DC 9V adapter (not included). |
| Power Consumption | Approx. DC 24 mA. |
| Transducer | Exclusive load cell. |
| Operating Temperature | 0°C to 50°C (32°F to 122°F). |

| | |
|----------------------|--|
| Operating Humidity | Less than 80% RH. |
| Dimension | 227 x 83 x 39 mm (8.9 x 3.3 x 1.5 inch). |
| Weight | 551 g (1.2 LB)/with batteries. |
| Mounting Holes | Mounting holes are provided on the back case, easy stand mounting. |
| Data output | Optional, RS-232 serial computer interface |
| Accessories Included | Operating manual 1 PC. Flat - head adapter 1 PC. Hook adapter 1 PC. Cone head adapter 1 PC. Chisel head adapter 1 PC. 120 mm extension rod 1 PC. Carrying case 1 PC. |
| Optional Accessories | Test stand, Model : FS-1001 Wedge grip, Model : WG-01 |

3. FRONT PANEL DESCRIPTION

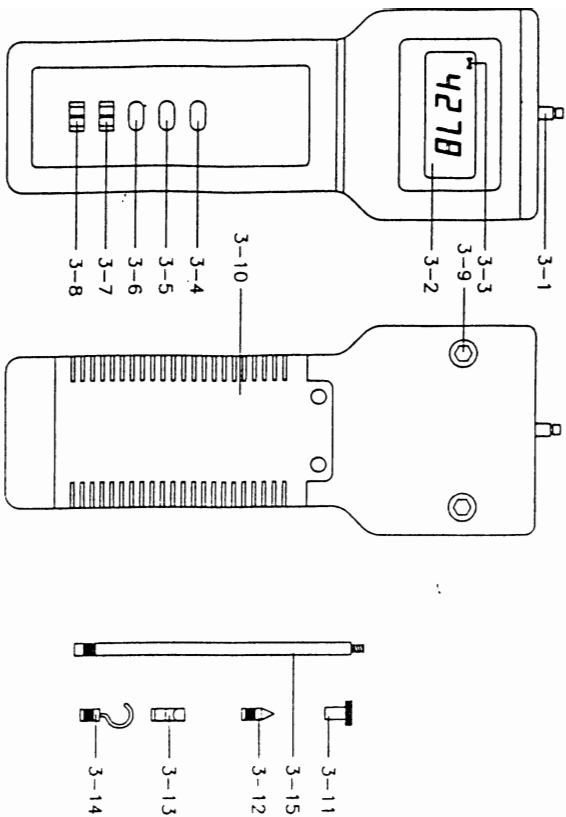


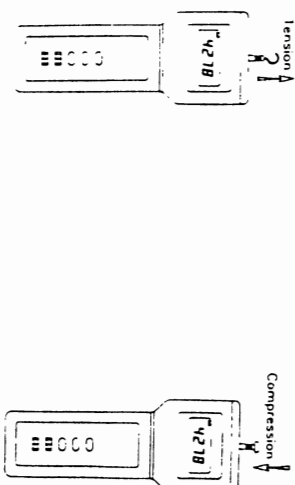
Fig. 1

- | | |
|--------------------------------|--|
| 3-1 Universal Sensing Head | 3-8 Power Off/On/Peak Hold <i>0 = Off, 1 = On</i> |
| 3-2 LCD Display | 3-9 Mounting Holes/fixing Screws |
| 3-3 Fast Indicator | 3-10 Battery Cover/Compartment |
| 3-4 FAST/SLOW Button | 3-11 Flate-head Adapter |
| 3-5 LCD Reverse Display Button | 3-12 Cone Adapter |
| 3-6 Zero Button | 3-13 Chisel Adapter |
| 3-7 g/oz/Newton Unit Switch | 3-14 Hook Adapter |
| | 3-15 120 mm Extension Rod |

4. MEASURING PROCEDURE

4-1 Measuring Consideration

- 1) The Tension & Compression measuring function is executed automatically.
When make the compression measurement, the display will show the "n" mark automatically.



- 2) When make the measurement, the SENSING HEAD along the adapter has to be on a line with measuring object. (ref. Fig. 2)

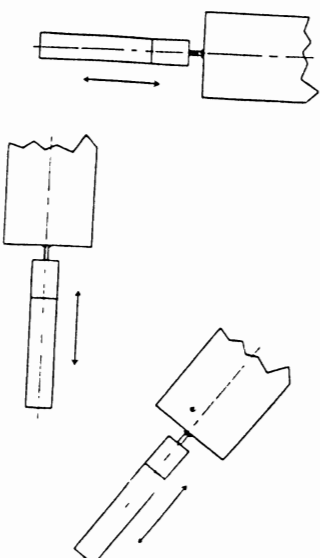


Fig. 2

- 3) Rotate the SENSING HEAD is prohibited. Some certain angles between SENSING HEAD & measuring object are not allowed (ref. Fig. 3).

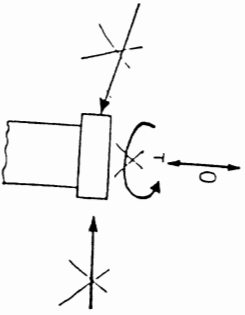


Fig. 3

4-2 Normal Measurement

- 1) Slide the " Power Off/On/Peak Hold Switch " (3-8, Fig. 1) to the " On " position.

$$0 = \text{Off}, 1 = \text{On}$$

- 2) Determine display unit of g, oz or Newton by selecting " g/oz/Newton Unit Switch " (3-7, Fig. 1).
 3) Connect " Sensing Head " (3-1, Fig. 1) with proper " Adapter " (3-11 to 3-14, Fig. 1) and the " Measuring Object " should be in straight line. Don't give any force in standby mode..
 5) " Zero Adjust " by pushing " Zero Button " (3-6, Fig. 1) before every measurement.
 6) Start measurement by giving force (push or pull), then the LCD will display the Average reading value.

Note :

*** During the measurement, if intend to change the display direction, just push the " Reverse Button " (3-5, Fig. 1) once.**

*** There are two kind sampling time of display, FAST and SLOW. Push the " FAST/SLOW Button " once (3-4, Fig. 1), if the upper left corner of LCD show " (LO) " (Fast Indicator, 3-3, Fig. 1), then the display reading is under the operation of fast sampling time.**

*** If the upper left corner of LCD not show the " Fast Indicator " (3-3, Fig. 1), the display reading is under the slow sampling time.**

*** Over range display of tension function, LCD will show " ----- "**

*** Over range display of compression function, LCD will show " ----- "**

4-3 Peak Hold Measurement

The meter can measure the peak value of force both of tension & compression operation. The operation procedures of Peak Hold Measurement are same as above " 4-2 Normal Measurement " but should slide the " Power Off/On/Peak Hold Switch " (3-8, Fig. 1) to the " PEAK H. " position.

Slide the " Power Off/On/Peak Hold Switch " (3-8, Fig. 1) to the " On " position will cancel the peak hold function.

5. BATTERY REPLACEMENT

- 1) When it is necessary to replace the battery (battery voltage less than approx. 6.8 V.), " Lo " will appear on the display.
- 2) Remove battery cover (3-10, Fig. 1) to expose batteries.
- 3) Install the batteries correctly into the case. Permanent damage to the circuit may result from incorrect installation.

6. MOUNTING HOLES

Due to the FORCE GAUGE is a precise instrument best results are obtained when the gauge is fitted to a test stand. Mounting holes are provided on the back of the gauge for easy stand mounting.

Optional Test Stand & accessory :

* TEST STAND, Model : FS-1001

Test stand, cooperate with Force gauge, whole system will be become the useful tool for material's tension & compression analysis.

Size : 630 x 250 x 230 mm. Weight : 7.02 Kg (15.4 LB).

* WEDGE GRIP, Model : WG-01

Wedge grip, the optional accessory to install to the base of FS-1001 be used to hold the tested material.

7. APPLICATIONS

7-1 Electronics

- * Test strength of solder points and spot welds on circuit boards.
- * Pull test external leads bonded to ceramic substrates.
- * Test wire wraps on clip connection.
- * Test pull strength of modified wire wrap connection on posts.
- * Test spring clip insertion and withdrawal forces.
- * Pull test welds in micro - electronic devices.
- * Measure torque, timing belt tension, sliding friction, etc., on computer peripheral equipment.
- * Test P.C. board insertion force.
- * Test insertion and withdrawal forces of various circuit components such as transistors and integrated circuits.
- * Test actuating force of snap action switches.

7-2 Business Equipment

- * Measure force required to perforate cards.
- * Measure load on slitter knives.
- * Measure actuating requirements of typewriter.
- * Test clutch release force.
- * Measure torque, timing belt tension (by deflection), sliding friction, etc., on computer peripheral equipment.
- * Test adhesion strength of labels and stickers.
- * Test load on paper thickness gages.
- * Measure tension of pencils.
- * Test actuating requirements on push buttons and flip switches.

7-3 Chemical & Plastics

- * Test film bond strengths.
- * Tensile test rubber, fibers and filaments.
- * Measure firmness of polyurethane foam.
- * Test crush strength of pills (medicine)
- * Test peel strength of adhesives.
- * Test peel compression of ceramic compounds.
- * Test vacuum take—down pressure on process machines.

7-4 Machinery & Manufacturing

- * Test load on wire feel
- * Test force to open cabinet doors.
- * Test sprocket chain tension.
- * Test pull—out forced of drive shaft.
- * Rate testing of springs in systems.
- * Calibrate a cantilever beam—type Apparatus to obtain a force/deflection relationship.

7-5 Automotive

- * Measure force of seat belt retractors.
- * Measure arm pressure of windshield wipers.
- * Measure flip force in mechanical snap action switches.
- * Test effort to operate hand tool.
- * Test forces required to move linkages and tension cables.
- * Measure force of odometer pull.
- * Test peel strength of vinyl insert bonded to body side moldings
- * Evaluate physical efforts (door, look, hood, glove compartment, brake pedal, etc.).

7-6 Other Industries

- * Measure pedal depression force in aircraft.
- * Test hardness of gypsum wallboard.
- * Test keyboard and pedal contact force of organs and pianos.
- * Test force to remove cover tops of aerosol cans.
- * Measure trigger pulling forces on firearms, hand tools etc.
- * Test firmness of sausages in casings.
- * Test integrity of seals on blister packages and plastic bags.
- * Test pressure of surgical instruments (forceps, scissors).
- * Test fruit removal force and fruit firmness.
- * Measure force on spindles of photographic equipment