



# User Manual

Dynamometer PCE-FM 1000



User manuals in various languages (Deutsch, français, italiano, español, português, nederlands, türk, polski, русский, 中文) can be downloaded here:

[www.pce-instruments.com](http://www.pce-instruments.com)

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## 1 Safety notes

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. Damage or injuries caused by non-observance of the manual are excluded from our liability and not covered by our warranty.

- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, ...) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not expose the device to shocks or strong vibrations.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet.
- You must not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth. Use only pH-neutral cleaner, no abrasives or solvents.
- The device must only be used with accessories from PCE Instruments or equivalent.
- Before each use, inspect the case for visible damage. If any damage is visible, do not use the device.
- Do not use the instrument in explosive atmospheres.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.

We do not assume liability for printing errors or any other mistakes in this manual.

We expressly point to our general guarantee terms which can be found in our general terms of business.

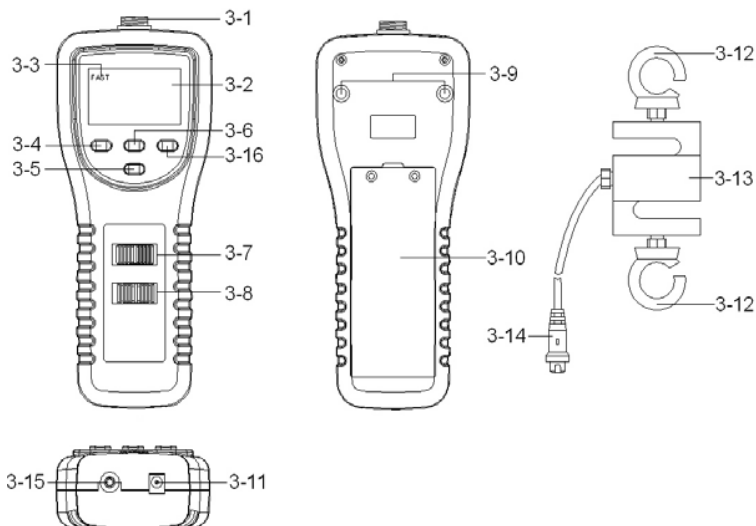
If you have any questions please contact PCE Instruments. The contact details can be found at the end of this manual.



## 2 Technical Specifications

|                           |  |
|---------------------------|--|
| Measurement ranges        | 0 ... 100 kg / 0 ... 220 lb / 0 ... 980 N                      |
| Resolution                | 0.05 kg / 0.05 lb / 0.2 N                                      |
| Accuracy                  | ±0.5 % + 0.1 kg  |
| Units                     | Kilograms (kg) / Pounds (lb) / Newton (N)                      |
| Maximum overload          | 50 % (up to 150 kg)  |
| Cable length              | 2 meters   |
| Connection port           | RS-232   |
| Software and RS-232 cable | Optional (Soft-Lut-D)  |
| Display                   | 16 mm 5 digit LCD  |
| Battery                   | 6 AA batteries or 9 V power adaptor                            |
| Power consumption         | Approx. 28 mA  |
| Operating temperature     | 0 °C ... 50 °C (32 °F ... 122 °F)                              |
| Operating humidity        | Less than 80 % rh  |
|                           |  |
| Mounting holes cell       | M10  |
| Dimensions                | Cell without hook: 76 x 51 x 21 mm<br>Device: 215 x 90 x 45 mm |
| Weight                    | Cell: approx. 640 g<br>Device: approx. 415 g                   |

### 3 Operating elements



- |  |   |
|--|---|
| <b>3-1</b> Sensor socket                     | <b>3-9</b> Mounting holes / fixing screws |
| <b>3-2</b> LCD                               | <b>3-10</b> Battery cover                 |
| <b>3-3</b> Fast indicator                    | <b>3-11</b> Power adaptor socket          |
| <b>3-4</b> Fast / Slow Button                | <b>3-12</b> Sensor hook                   |
| <b>3-5</b> LCD reverse display button        | <b>3-13</b> Loading cell                  |
| <b>3-6</b> Zero button                       | <b>3-14</b> Sensor plug                   |
| <b>3-7</b> Kg / LB / N unit switch           | <b>3-15</b> RS-232 output                 |
| <b>3-8</b> Power off / on / Peak Hold switch | <b>3-16</b> LCD backlight button          |

### 4 Measuring

#### 4.1 Measuring Consideration

- 1)The Tension & Compression measuring function is executed automatically. When make the compression measurement, the display will show the " - " mark automatically.
  - 2)When make the measurement, the " Sensor " (3-13) should be on a line with measuring object.
  - 3)Rotate the sensor's body is prohibited.
- Some certain angles between " Sensor " (3-13) & measuring object are not allowed.

## 4.2 Normal Measurement

- 1) Connect the " Sensor Plug " (3-14) to the " Sensor socket " (3-1).  
the " Power Off/On/Peak Hold Switch " (3-8) to the " On " position.
- 2) Determine display unit of Kg, LB or Newton by selecting  
" Kg/LB/Newton Unit Switch " (3-7).
- 3) Connect " Sensor " (3-13) with the " Measuring Object " via the " Sensor hook " (3-12) in straight line.
- 4) " Zero Adjust " by pushing " Zero Button " (3-6) before every measurement.
- 5) 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 " everse Button " (3-5) once.

\* There are two kinds of sampling time of display, FAST and SLOW.

Push the " FAST/SLOW Button " once (3-4), if the upper left corner of LCD shows " FAST " (3-3), 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), 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).

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

## 4.4 LCD Back Light On/Off

During the measurement, press the " LCD Back Light Button " ( 3-16, Fig. 1 ) momentarily, will turn on the LCD Back Light structure approx. 15 seconds automatically then off.

## 5 Battery replacement

- 1) When the LCD shows " Lo ", it is necessary to replace the batteries. However, in-spec. measurement may still be made for several hours after low battery indicator appears before the instrument become inaccurate.
- 2) Take out the battery cover (3-10) away from the instrument and remove the batteries.
- 3) Install the batteries (6 x 1.5 V AA) correctly into the battery case.

## 6 RS-232 PC serial interface

The instrument features an RS232 output via 3.5 mm Terminal ( 3-15, Fig. 1 ).

The connector output is a 16 digit data stream which can be utilized to the user's specific application.

An RS232 lead with the following connection will be required to link the instrument with the PC serial input.

Meter: 3.5 mm jack plug

PC: 9W D – Connector

Center Pin to Pin 4

Ground to bin 2 with 2.2k resistor between Pin 2 and Pin 5

The 16 digit data stream will be displayed in the following format:

D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0

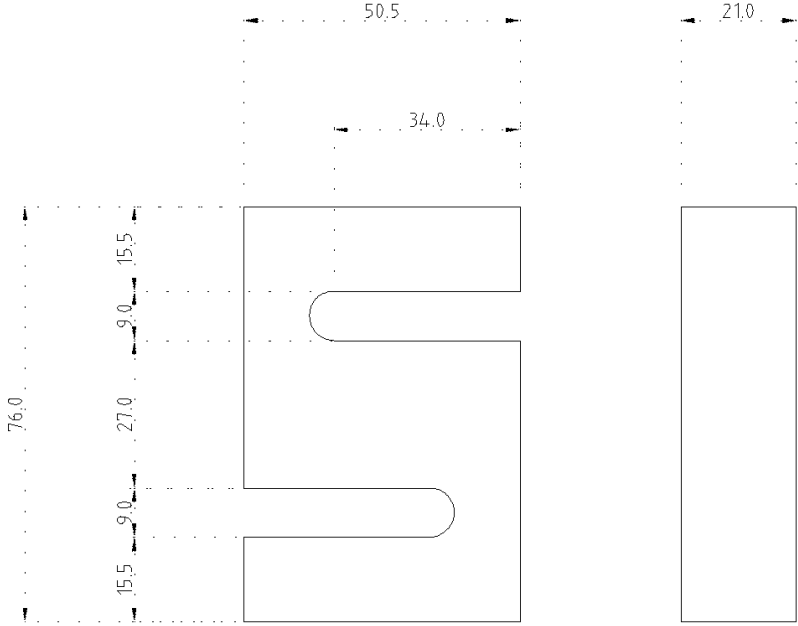
Each digit indicate the following status:

|           |  |
|-----------|--|
| D0        | End Word   |
| D1 & D8   | Display reading, D1 = LSD, D8 = MSD<br>for example:<br>If the display reading is 1234 then D8 to D1 is: 1234 |
| D9        | Decimal point (DP) position from the right to left<br>0 = No DP, 1 = 1 DP, 2 = 2 DP, 3 = 3 DP                |
| D10       | Polarity<br>0 = Positive, 1 = Negative   |
| D11 & D12 | Anunciator for Display<br>Kg = 55, LB= 56, g = 57, N = 59, oz = 58   |
| D13       | 1  |
| D14       | 4  |
| D15       | Start Word   |

### RS 232 setting

|              |             |
|--------------|-------------|
| Baud rate    | 9600        |
| Parity       | No parity   |
| Data bit no. | 8 data bits |
| Stop bits    | 1 stop bit  |

# 7 Dimensions loading cell





## 8 Warranty

You can read our warranty terms in our General Business Terms which you can find here: <https://www.pce-instruments.com/english/terms>.

## 9 Disposal

For the disposal of batteries in the EU, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.





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