

**1 YEAR**  
WARRANTY

# Ω OMEGA™ User's Guide



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## **DFG207** **Digital Force Gauge**



**omega.com info@omega.com**

**Servicing North America:**

**U.S.A.  
Headquarters**

Omega Engineering, Inc.  
800 Connecticut Ave. Suite 5N01, Norwalk, CT 06854  
Toll-Free: 1-800-826-6342 (USA & Canada only)  
Customer Service: 1-800-622-2378 (USA & Canada only)  
Engineering Service: 1-800-872-9436 (USA & Canada only)  
Tel: (203) 359-1660 Fax: (203) 359-7700  
e-mail: info@omega.com

**Servicing UK:**

Omega Engineering, Limited  
One Omega Drive, Northbank  
Irlam, Manchester M44 5BD

**Servicing DE:**

Omega Engineering, GmbH  
Daimlerstrasse 26, Deckenpfronn,  
Germany 75392

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# 1 Introduction

Thank you for purchasing an Omega Model DFG207 digital force gauge; designed for push force and pull force testing in numerous applications across virtually every industry.

With proper usage, we are confident that you will get many years of great service with this product. Omega instruments are ruggedly built for many years of service in laboratory and industrial environments.

This User's Guide provides setup, safety, and operation instructions. Dimensions and specifications are also provided. For additional information or answers to your questions, please do not hesitate to contact us. Our technical support and engineering teams are eager to assist you.

**Before use, each person who is to use a Model DFG207 should be fully trained in appropriate operation and safety procedures.**

## 1.1 Safety/Proper Usage



**Caution:** Please read this manual carefully before measurement, keep it properly after reading, in preparation to read again.

- It is possible to damage the gauge or cause serious accident if the device is operated incorrectly. Proper usage of the device is described in the manual.
- If the device is being used to test impact load, select a model with a safe load range of at least double the impact load.
- In destructive testing, protective masks and gloves should be worn to prevent the occurrence of the damage to the human body because of material splashing during testing.
- Do not use fixtures which have been damaged or severely bent. For users, please refer to the relevant specifications in this manual when using a self-made fixture (various types of fixtures are provided for customers to select according to need).
- Do not test force exceeding the maximum range of the gauge. Otherwise, it may cause damage to the sensor, or even an accident.
- When the tested force exceeds 110% of the range, a continuous buzzer alarm will activate. In this case, please remove the load quickly, or reduce the load.
- When using the power adapter, the voltage of power supply should be the same as the rated voltage, or it may cause electric shock or fire
- Do not pull out or insert the plug with wet hands, or it may lead to electric shock.
- Don't pull the cable of the power adapter to pull the plug, to avoid wire broken and electric shocks.
- Please use a soft cloth to clean the gauge. Soak the cloth in the water with cleaning agent, wring it out, and then use it to remove the dust and dirt.



**Note:** Do not use volatile chemicals to clean the gauge (such as volatile agents, thinner, alcohol, etc.).

- Do not use the gauge in the following environment:
  - Wet environment
  - Dusty environment
  - Next to an environment with chemicals or oils
  - Next to a vibration source
- After use, please put the force gauge into the portable box to protect the testing shaft from damage.
- Do not disassemble or repair the machine by yourself, which may cause permanent fault of the gauge.

## 2 Power

### 2.1 Power On & Off

#### Power On

Install the batteries correctly or plug in the DC power supply. Then press the Power/Exit Key (POWER/EXIT) to power on the gauge.

#### Power Off

##### *Manual Power Off*

In the state of power-on, press and hold the Power/Exit Key (POWER/EXIT) for about 2 seconds, the indicator 'OFF' appears. Then release the key and the gauge will be powered off.

##### **Auto Power Off**

The Auto power off function can be activated by the user. When it is activated, the gauge will be powered off automatically after 10 minutes with no key operation. For details, please refer to Section **5.5 Setting Auto Power Off**.

### 2.2 Battery Replacement

When it is necessary to replace the battery, the battery symbol will appear on the device display. Follow the instructions below to replace the battery:

**Step 1:** Slide the Battery Cover away from the gauge and remove the batteries.

**Step 2:** Install new batteries correctly into the case.

**Step 3:** If the gauge is not to be used for any extended period, remove the batteries.

\*Power can be supplied by either alkaline batteries or 6V DC power supply.

## 3 Hardware Setup

### 3.1 Installation & Measurement

Once the gauge is powered on, press the operation keys to select the intended measurement mode according to the use case, or measure directly with the factory default settings.

**Step 1:** Select the appropriate test fixtures to install on the force gauge (to use self-made fixtures, please refer to the relevant data on the next page).

**Step 2:** When measuring, hold the force gauge firmly or install it on a suitable test machine. Apply the force and the sensing rod in a straight line, so that measurements of load are accurate.

**Step 3:** After measuring, remove the load, turn off the gauge, remove the fixtures, and then put the items back in the toolbox after cleaning, to prepare for the next use.

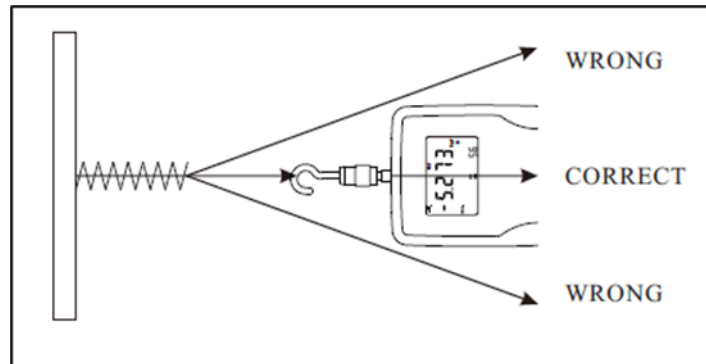


Figure 1: The Correct Measurement Direction

## 4 Home Screen & Controls

### 4.1 Overall Structure

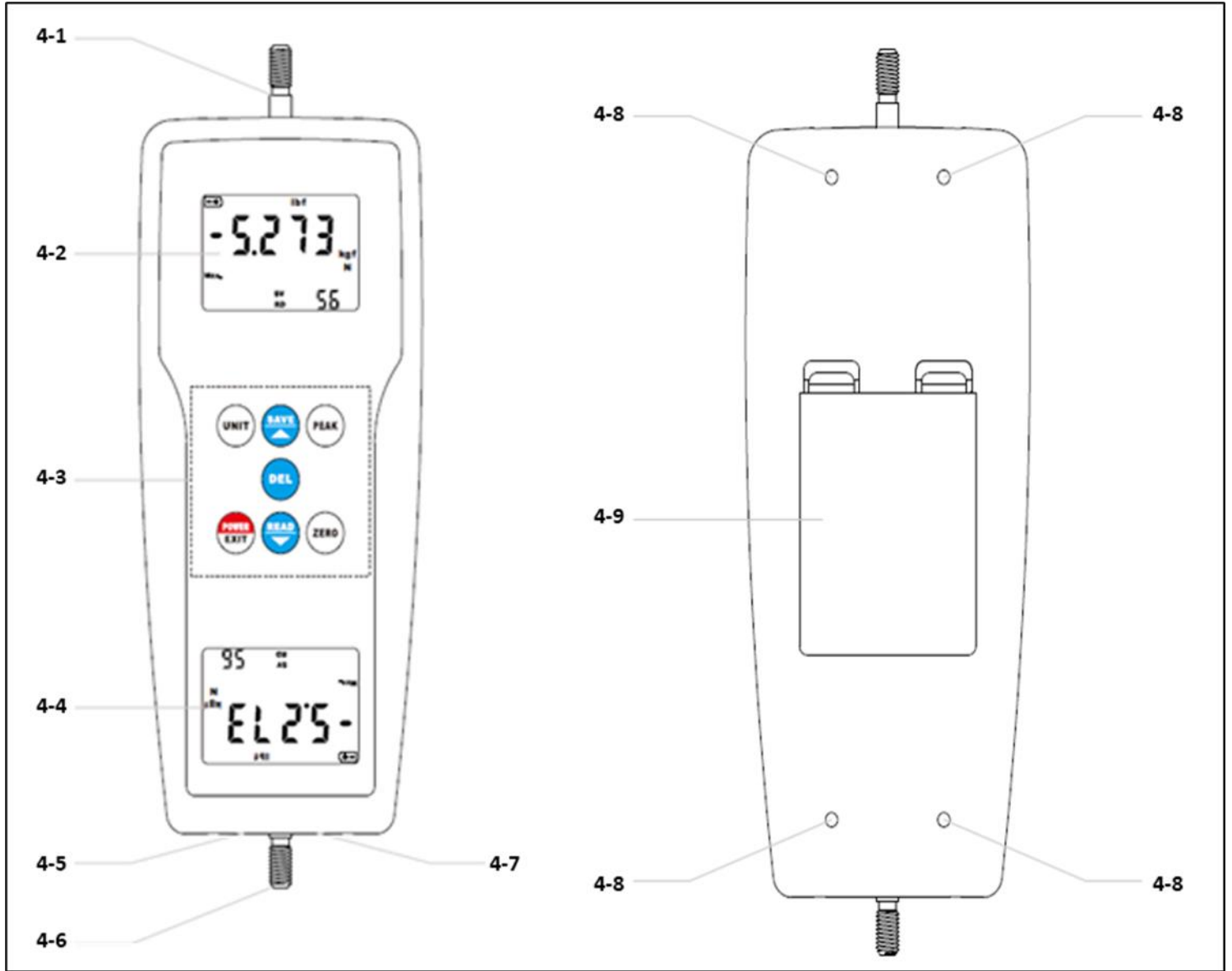


Figure 2: DFG207 Unit Structural Diagram

#### Function Description of Overall Structure

4-1 Sensing Screw	The screw is the main force-sensing structure component of the whole instrument. The function of the screw is to conduct the outer applied force into the gauge. It can be connected to accessories such as the pull hook, the flat measurement head, the conical measurement head, the V shape groove measurement head, the V shape wedge measurement head, the lengthening connection rod, etc. For details of accessories, see <b>Page 12</b> .
4-2 Display A	Display A is used to display the readings of measurement, units of measurement, the indications of the operation, etc.
4-3 Operation Key Area	All operation keys are distributed on this area. Thus, all keys of the gauge can be found here.

4-4 Display B	Display B is used to display the readings of measurement, units of measurement, the indications of the operation, etc. It is designed for more convenient reading on multiple directions.
4-6 Fixing Screw	The fixing screw allows the gauge sensor to be connected to external components.
4-7 Power Interface	The power interface accepts a 6 V DC power supply.
4-8 Screw Holes	Device casing screw holes.
4-9 Rear Battery Case	The location of the battery compartment for battery power supply.

## 4.2 Display

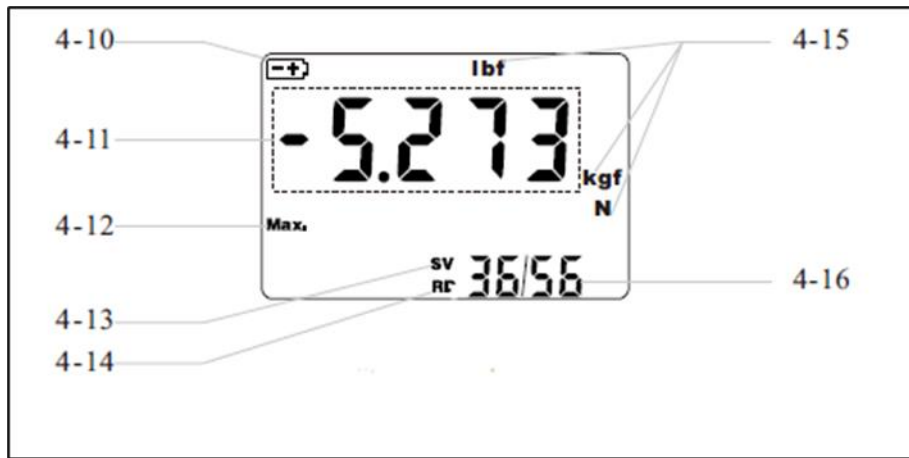




Figure 3: Unit Display Diagram

### Function Description of Display

4-10 Battery Indicator 	When the battery voltage is low, the battery icon '  ' appears on the top left corner of the display, indicating lack of voltage and the batteries need to be replaced.
4-11 Displayed Reading	For this gauge, the pushing force is a positive value (not shown "+"); the pulling force is a negative value (display "-").
4-12 Peak Value Indicator MAX	When the indicator 'MAX.' appears, it indicates that the device is in Peak Value Hold Mode, in which the displayed reading is the peak value during measurement. When the indicator 'MAX.' does not appear, it indicates that it is in Real-Time Measurement Mode, in which the displayed reading changes according to the applied load.
4-13 Memory Indicator SV	When 'SV' appears, it indicates that it is in measurement mode, in which the displayed reading can be memorized into the gauge.
4-14 Scanning Indicator RD	When 'RD' appears, it indicates the device is in Data Scanning Mode, in which the displayed value is one of the data stored in the device memory.
4-15 Measurement Unit	It indicates the current measurement unit, which includes 'kgf', 'gf', 'N', 'lbf'.
4-16 Amount of Data in Memory / Serial Number of Data	In the Measurement Mode, the device indicates the amount of data in memory, for example '56'. While in the Scanning Mode, it indicates 'Serial Number Of Data / Amount Of Data In Memory', for example '36/56'.



### 4.3 Operation Key

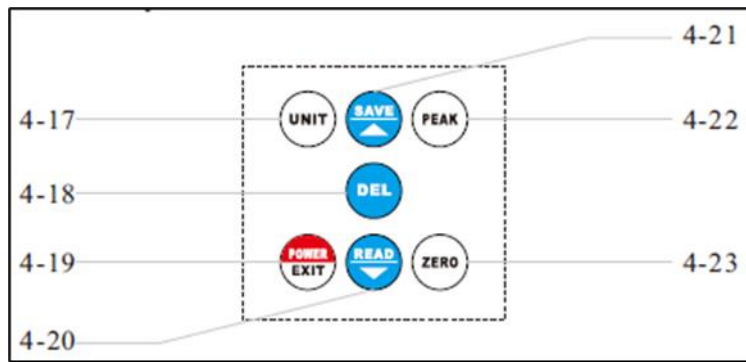


Figure 4: Unit Operation Key Diagram

#### Function Description of Operation Key

4-17 Unit Conversion Key (UNIT)	The key for unit conversion.
4-18 Delete Key (DEL)	The key for deleting the memorized data.
4-19 Power/Exit Key (POWER/EXIT)	The key for powering on/off the gauge. It is also the key for exiting from Data Scanning Mode. Additionally, it is the key for going into the Auto Power Off Settings.
4-20 Read/Downward Key (READ/▼)	The key for entering Data Scanning Mode, for transferring data from the gauge to the computer, for downward scanning in Data Scanning Mode, and for time conversion in Power Off Setting Mode.
4-21 Save/Upward Key (SAVE/▲)	The key for memorizing data, for upward scanning in Data Scanning Mode, and for time conversion in Power Off Setting Mode.
4-22 Peak Value Key (PEAK)	The key for conversion between the Peak Value Hold Mode and the Real-Time Measurement Mode.
4-23 Zero Key (ZERO)	The key for zero calibration of the gauge.

## 5 Operating Modes

### 5.1 Real-Time Measurement Mode & Peak Hold Mode

Two kinds of measurement modes can be set for this gauge, the Real-Time Measurement Mode and the Peak Hold Mode. When there is no peak indicator "MAX" on the display, it is in the Real-Time Measurement Mode. The displayed test value changes according to the load.

Press the Peak Value Key (PEAK) and the peak indicator "MAX" will appear on the display. This indicates the device is in Peak Hold Mode. The displayed test value is the maximum value during the measurement.

### 5.2 Unit Conversion Function

In either Real-Time Measurement Mode or Peak Hold Measurement Mode, press the Unit Key (UNIT) for measurement unit conversions.

### 5.3 Setting of Auto Power Off

When the gauge is powered on, press and hold the Power/Exit Key (POWER/EXIT) for about 3 seconds. Release the key when the indicator (AUTO) appears on the display indicating auto power off in 10 minutes with no key operations and non-auto power off. Press the Save/Upward Key (SAVE/▲) or the Read/Downward Key (READ/▼) to convert between these two settings. Press the Power/Exit Key (POWER/EXIT) to quit.

## 6 Calibration

Install the gauge at the position of measurement according to the requirements. Then press the Zero Key (ZERO) to calibrate the gauge, a value of zero will appear on the display.

\* When the weight of the used fixture is more than 20% of the range, or the load of the gauge is more than 20% of the range, the gauge is not able to be calibrated. In this case, it is necessary to use a lighter fixture or remove the load, then calibrate afterward.

## 7 Data Memory & Statistics

### 7.1 Data Memory

When the gauge is in measurement mode, the memory indicator 'SV' will appear on the display. Press the Save/Upward Key (SAVE/▲), the displayed data will be memorized in the gauge, the amount of data in memory plus one. The gauge can store up to 99 sets of measured data.

### 7.2 Data Scanning

After a certain amount of data are memorized in the gauge, press Read / Downward Key (READ/▼) to enter the Data Scanning Mode. The memory indicator 'SV' will disappear and the Scanning Indicator 'RD' will appear on the display. Also, the present memorized data and the 'Serial Number Of Present Data / Amount Of Data In Memory', such as ' ', will appear on the display. Press the Save/Upward Key (SAVE/▲) or Read/Downward Key (READ/▼) for data switching. To exit the Data Scanning Mode, just press the Power/Exit Key (POWER/EXIT).

### 7.3 Data Deleting

In the Data Scanning Mode, press the Delete Key (DEL) to delete the present data. In measurement modes, press and hold the Delete Key (DEL) for about 3 seconds, all of the memorized data will be deleted.

## 8 Specifications

<b>Accuracy</b>	± 0.2% FS ± 1Digit
<b>Unit</b>	kgf, gf, N, Lbf
<b>Measurement</b>	Peak Value Measurement, Real Time Measurement
<b>Display</b>	2 Reversible 4 Digit LCD Displays
<b>Power Off</b>	10 Minutes Auto Power Off, Manual Power Off
<b>Backlight</b>	Blue Backlight
<b>Safe Load</b>	150%FS (Buzzer Alarm Over 110% FS)
<b>Power Supply</b>	2x AA Battery or 6V DC Power Supply
<b>Operating Conditions</b>	Temperature: 0-40°C (0-104°F) Humidity: <80%
<b>Surrounding</b>	No Vibration Source
<b>Weight</b>	390g
<b>Size</b>	211x80x36mm (8.3x3.15x1.42in)

### 8.1 Accessories

<b>Standard Accessories</b>	Digital Force Gauge
	Carrying Case
	Manual
	Pulling Hook
	Flat Tip
	Cone Tip
	V-shaped Groove Tip
	V-shaped Wedge Tip
	Lengthening Screw Rod
	Connection Rod Cap
	Nut

## 8.2 Specification and Application of Accessories

Accessory	Structure Diagram	Applications
Pulling Hook		To hang tested objects when testing pulling force.
Flat Tip		To test thrust of flat surface or convex surface.
Cone Tip		To test thrust of flat surface, concave surface or circular hole.
V-shaped Groove Tip		To test thrust of cylindrical surface or the edge of perpendicular planes.
V-shaped Wedge Tip		To test thrust of flat surface or groove surface.
Lengthening Connection Rod		It is used in the situation when the measurement tip is not long enough.