CE

User's Guide

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DFG60 SERIES
Digital Force Gauge

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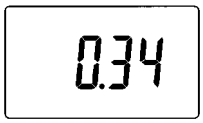
It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

GENERAL OPERATION

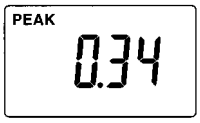
1 Press ON/OFF. The capacity of the gauge is displayed and the gauge will automatically enter into the measuring mode. Press and hold UNITS for at least four (4) seconds each time you wish to select between pounds (ounces), kilograms (grams) and Newtons.

2 **Hand tighten** (no tool!) selected attachment to the measuring shaft.

3 When the gauge is turned on, it will go directly to its real time measuring mode. Press PEAK to measure peak forces. "Peak icon" on the display indicates peak measuring mode, whereas the peak reading will not change until a higher value is measured. To delete the last peak reading, press ZERO . To end peak reading mode and go to real time measuring mode, press PEAK again.



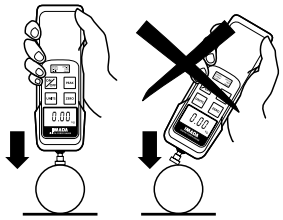
real time mode display



peak mode display

4 If necessary, press ZERO to tare the weight of the attachment and shaft orientation. Pressing ZERO will also clear the peak reading.

5 Make sure to apply tension and compression (-) forces to the gauge in line with the measuring shaft. DO NOT attempt to measure forces at an angle to the measuring shaft - damage to load cell and/or shaft may result.



PRECAUTIONS

1 WARNING! REGARDLESS of whether the unit is ON or OFF, **do not** exceed the capacity of the gauge. At 105% of the rated capacity, the display will flash. *Never* exceed 200% of the rated capacity, or the load cell will be damaged.

2 When mounting, use M4 mounting screws with a maximum insertion depth of 5 mm into the gauge.

3 Measure in line tension and compression forces only. **Do not** attempt to measure forces at an angle to the measuring shaft - damage to load cell and/or shaft may result.

4 Hand tighten attachments only. **Do not** use tools.

5 Make sure this gauge and all peripherals are powered down before attaching any cables.

6 **Do not** remove the warranty seal or disassemble the gauge. Disassembly voids warranty.

RECHARGING NI-CAD BATTERY

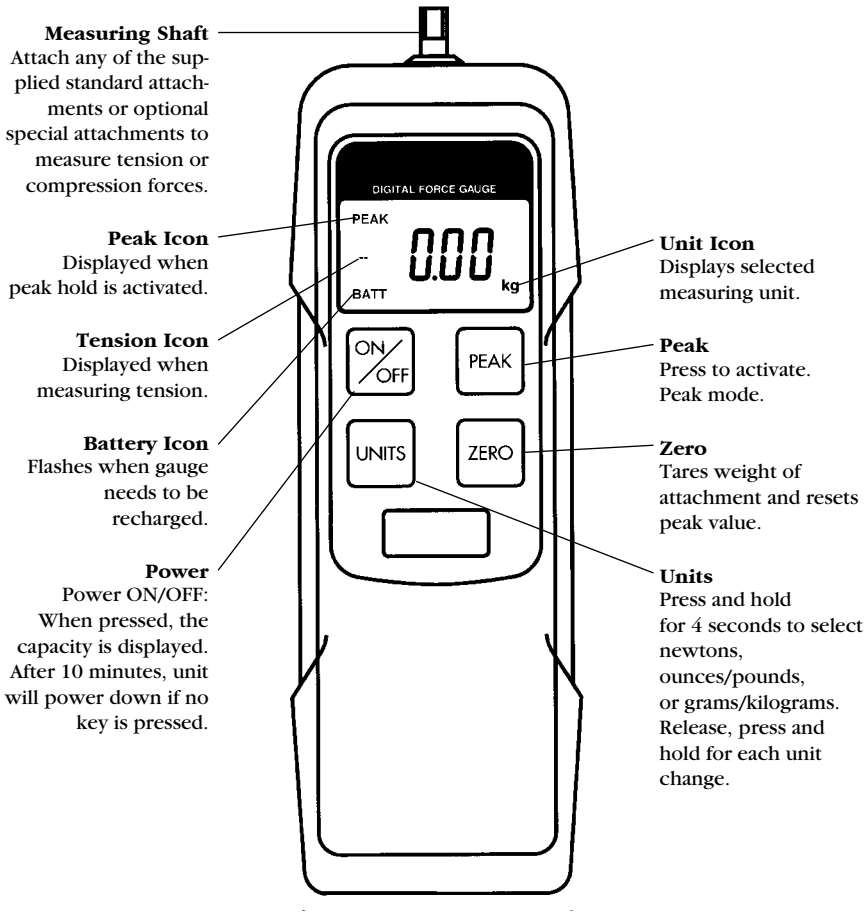
1 To maximize the life of the battery, power will automatically shut off after 10 minutes of non-use. This automatic shut off feature can be bypassed and the gauge may be used continuously when the AC adapter/charger is used.

2 "BATT" icon will flash when gauge needs to be recharged. To maximize battery life, do not recharge until "BATT" icon flashes. With proper recharging, battery can be recharged 500 times.

3 Push ON/OFF to turn off power.

IMPORTANT! Use the provided adapter/charger exclusively and plug into the correct AC output. It takes 8 hours to charge fully.

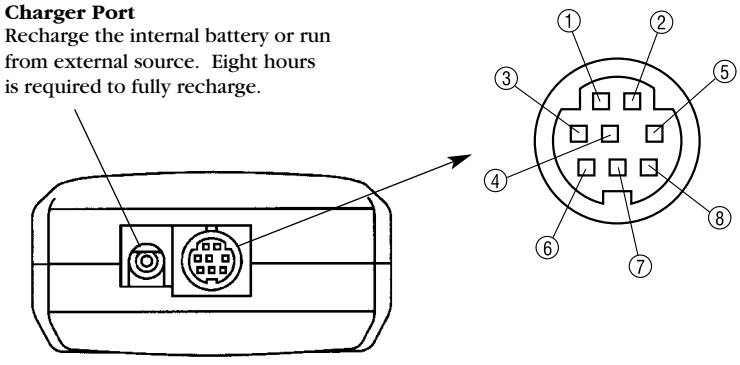
4 When the gauge is turned off, make sure the AC adapter/charger is disconnected to avoid overcharging.



COMMUNICATIONS PORT

The standard outputs of RS-232C and ±1 VDC analog allow you to capture data and SPC as well as peripheral control of all keypad functions.

Charger Port
Recharge the internal battery or run from external source. Eight hours is required to fully recharge.



PORT PIN ASSIGNMENTS

1 RS-232C and Digimatic Ground
2 RS-232C Transmit Data
3 Analog Output (±1VDC)
4 Digimatic Data Request
5 RS-232C Receive Data
6 Analog Ground
7 Digimatic Clock
8 Digimatic Transmit Data

1 RS-232C bi-directional interface functions

All gauge functions can be duplicated from a remote location by utilizing RS-232C interface. All commands must be sent in uppercase ASCII character format followed by a carriage return (CR).

Signal level: RS-232C
Data bits: 8 bits
Stop bits: 1 bit
Parity bits: No
Baud Rate: 2400 bps

2 ±1 VDC ANALOG SIGNAL

Connect the CB-101 analog cable to the communications port and the device receiving the data.

RS232 COMMAND/RESPONSE

COMMAND*	FUNCTION	RESPONSE
K [CR]	Select "kg" units	R [CR] executed E [CR] error
N [CR]	Select "N" units	
L [CR]	Select "lb" units	
O [CR]	Select "oz" units (DPS - 0.5 and DPS - 1 only)	
P [CR]	Select peak mode	
T [CR]	Select real time mode	
Z [CR]	Tare display	
Q [CR]	Turn off power	
D [CR]	Transmit display data	[value] [units] [mode] [CR]

[mode] = T: Real time, P: Peak
[units] = K: Kg, N: Newtons, L: Pounds, O: Ounces

DFG60 SPECIFICATIONS

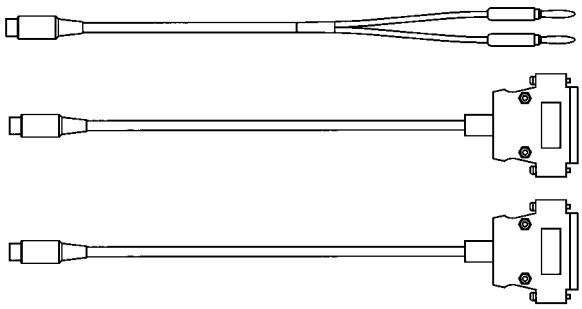
Accuracy	± 0.2% F.S. ± 1 LSD
Selectable Units	Pounds/Ounces, Grams/Kilograms or Newtons
Overload Capacity	200% of F.S. Display flashes beyond 105% of F.S.
Display Update	20 times/second
Power	Rechargeable NiCad battery pack or AC adapter
Low Battery Indicator	Display flashes BAT when battery is low
CPU	8-bit C-MOS
A/D Converter	13-bit Delta Sigma system
Outputs	RS-232 and ±1 VDC analog output
Operating Temperature	30° to 100°F (0° to 40°C)
Display	4-digit LCD
Weight	20 oz.
Shipping Weight	4 lbs.
Output Port	RS232C: full duplex, 2400 baud, 8 databits, no parity bit, 1-stop bit. Analog: ±1VDC
Included Accessories	AC adapter/charger 6 attachments: hook, flat tip, conical tip, chisel tip, notched tip, extension shaft

DFG60 Ranges (Resolution) ± 0.2% F.S. ± 1 LSD

Model	Capacity (Resolution)		
	Pounds Ounces	Kilograms Grams	Newtons
DFG60-0.5	8.819 oz (0.001 oz)	250.0 g (0.1 g)	2.452 N (0.001 N)
DFG60-1	17.64 oz (0.01 oz)	500.0 g (0.1 g)	4.903 N (0.001 N)
DFG60-4	4.409 lb (0.001 lb)	2.000 kg (0.001 kg)	19.61 N (0.01 N)
DFG60-11	11.02 lb (0.01 lb)	5.000 kg (0.001 kg)	49.03 N (0.01 N)
DFG60-44	44.09 lb (0.01 lb)	20.00 kg (0.01 kg)	196.1 N (0.01 N)
DFG60-110	110.2 (0.1 lb)	50.00 kg (0.01 kg)	490.3 N (0.1 N)

Note: Use an "R" suffix for reverse display units (for use on vertical test stand)

OPTIONAL CABLES

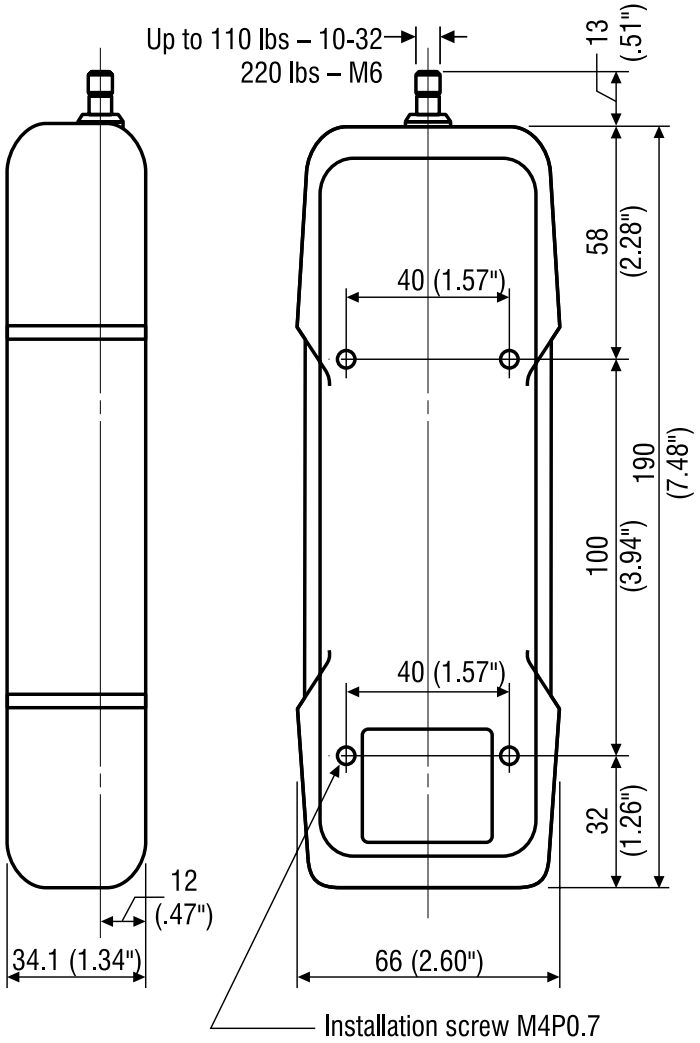


Analog cable (10')
CB-101

RS-232C cable (10')
9 pin female
CB-203

RS-232C Cable (10')
25 pin male
CB-202

DIMENSIONS



MADE IN USA

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. P.O. number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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M3513/1099