

**DG Series
Mechanical Force Gauges**

User Manual



WARRANTY

This instrument is warranted against defects in workmanship, material and design for two (2) years from date of delivery to the extent that AMETEK will, at its sole option, repair or replace the instrument or any part thereof which is defective, provided, however, that this warranty shall not apply to instruments subjected to tampering or, abuse, or exposed to highly corrosive conditions.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED AND AMETEK HEREBY DISCLAIMS ALL OTHER WARRANTIES, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. AMETEK SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, ANY ANTICIPATED OR LOST PROFITS.

This warranty is voidable if the purchaser fails to follow any and all instructions, warnings or cautions in the instrument's Instruction Manual.

If a manufacturing defect is found, AMETEK will replace or repair the instrument or replace any defective part thereof without charge; however, AMETEK's obligation hereunder does not include the cost of transportation, which must be borne by the customer. AMETEK assumes no responsibility for damage in transit, and any claims for such damage should be presented to the carrier by the purchaser.

TRADEMARKS

AMETEK is a registered trademarks of AMETEK, Inc.

CHATILLON is a registered trademark of AMETEK, Inc.

Other trademarks are the property of their respective owners.

ICONS



WARNING

The raised hand icon warns of a situation or condition that may lead to personal injury or death. Do not proceed until the warning is read and thoroughly understood. Warning messages are shown in bold type.



DANGEROUS VOLTAGE

The lightning icon warns of the presence of an uninsulated dangerous voltage within the product enclosure that might be of sufficient magnitude to cause serious shocks or death. Never open the enclosures unless you are an authorized and qualified CHATILLON service personnel. Never open any enclosure when power is connected to the system or its components.



CAUTION

The exclamation point icon indicates a situation or condition that may lead to equipment malfunction or damage. Do not proceed until the caution message is read and thoroughly understood. Caution messages are shown in bold type.



NOTE

The note icon indicates additional or supplementary information about the action, activity or concept. Notes are shown in bold type.

CAUTION

HIGH FORCES ARE OFTEN INVOLVED WITH THE MATERIAL TESTING PROCESSES.

IF THE EQUIPMENT IS USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED.

TO MAINTAIN ALL ASPECTS OF THE SPECIFICATION, ONLY AMETEK APPROVED ACCESSORIES, CONNECTIONS AND COMPONENTS SHOULD BE USED.

STRICTLY ADHERE TO ALL SPECIFIED SAFETY PROCEDURES

READ THIS MANUAL BEFORE USING THIS PRODUCT.

General Safety

General safety precautions must be followed when using this CHATILLON product. Failure to observe precautions and warnings may result in damage to the equipment, or injury to personnel.

It is understood that safety rules within companies vary. If a conflict exists between the material contained in all CHATILLON User's Guides and the rules of a company using a CHATILLON product, the more stringent rules should take precedence.

Safety Considerations

The DG Series is completely enclosed and provides no potentially hazardous outputs.

Mechanical components housed within the DG Series covers are to be serviced by authorized CHATILLON representatives only.



When designing a custom fixture ensure the load rating of the custom fixture exceeds the load rating of the force gauge. i.e. If the load rating of the force gauge is 500 LBF the custom fixture should have a load rating greater than 500 LBF

INTRODUCTION

The DG Series mechanical force gauge is ideal for a wide range of force testing applications. Based on our popular DPPH Series force gauge, the DG Series features a 2.25-inch dial for improved resolution and readability, peak hold button, ergonomic shape and improved accuracy of $\pm 0.5\%$ of full scale. The DG gauge is an excellent, economical solution for tensile or compression testing.

The DG series gauge can be used as a hand held device with a handle adapter assembly that can be purchased separately. Gauges may be mounted to a test stand for even greater control and consistent results in repetitive testing applications. Easy to read concentric dial measures clockwise direction only. Dial rotates 360-degrees for taring. A peak hold button captures peak readings. Available in lbf, kgf or N units of measure. DG Series gauges come complete with protective carrying case and a set of stainless steel attachments. A Certificate of Calibration with Data is supplied standard.

OPERATION

The zero point of the gauge may not always be in the 12 o'clock position due to gravity effects and the weight of fixtures or grips on the force gauge shaft. To zero the gauge, rotate the bezel on the dial indicator so that the indicator pointer lines up with the zero on the dial face.

Gauges are designed for axial loading. Ensure the load is not applied at an angle or an error can be introduced in the force readings. The gauges are designed to have a 10% tare for fixtures and grips. If this 10% tare is exceeded, the force gauge may not measure up to full scale.

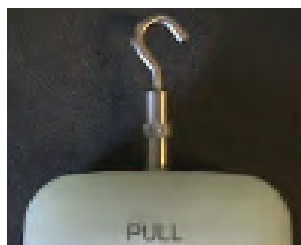
COMPRESSION TESTING

For compression testing, assemble the appropriate attachment or grip to the bottom shaft of the force gauge. For compression testing the shaft should be pushed into the gauge, causing the indicator to rotate in the clockwise direction. Attachments should be applied "finger-tight". Do NOT overtighten.



TENSILE TESTING

For tension testing, assemble the appropriate hook, attachment or grip to the top shaft of the force gauge. For tension testing the shaft should be pulled out of the top of the force gauge, causing the indicator to rotate in the clockwise direction. Attachments should be applied "finger-tight". Do NOT overtighten.



CAUTION: NEVER apply a load to the DG Series force gauge so the indicator rotates in the counterclockwise direction. If excessive loads are applied in the counterclockwise direction, damage may occur to the force gauge.



CAUTION: The DG Series is a unidirectional force gauge. When applying a load to the instrument the dial indicator **MUST** rotate in the clockwise direction.

PEAK HOLD

The DG Series force gauge has a maximum hold feature. This allows the peak force to be held after the load is removed.

ACTIVATE PEAK HOLD

To activate this feature, rotate the knob to “MAX ON” position.

RESET PEAK HOLD

To reset the reading, simply rotate the switch to “MAX OFF” and then return back to “MAX ON” position. To deactivate this feature, rotate the knob to the “MAX OFF” position.



TEST STAND MOUNTING

The DG Series force gauge has four #10-32 female threads for mounting to CHATILLON test stands. Ensure the #10-32 screws are not too long, otherwise it may bind and damage the force gauge.

The screw thread length going into the back of the gauge should not exceed 3/8 inch.

MAINTENANCE

Gauge accuracy should be checked periodically to ensure the gauge is within its calibration limits. The calibration can be verified by applying known weights (adjusted for local gravity) to the extension hook. If adjustment is required, the gauge should be returned to AMETEK for calibration.

Test Stand Adapters

Item No.	Fits Tester
SPK-MT-0005	MT150, MT500
SPK-DG-TT	TT Testers

SPECIFICATIONS

Accuracy:	±0.5% of Full Scale
Overload Capacity:	110% of Rated Capacity
Maximum Overload:	150% of Rated Capacity
Tare Capacity:	10% of Rated Capacity
Dial Resolution:	0.5% of Full Scale
Deflection:	10mm (.394 inches) at Full Scale
Operating Temperature:	+40°F to +110°F (+5°C to +45°C)
Instrument Weight:	4.7 lbs (2.12 kg)
Shipping Weight with case:	8.4 lbs (3.80 kg)
Warranty:	2 Years

ORDERING

Dial Style - LBF

Model	Capacity
DG-200	200 x 1 lbf
DG-300	300 x 1.5 lbf
DG-400	400 x 2 lbf
DG-500	500 x 2.5 lbf

Dial Style - KGF

Model	Capacity
DG-100KG	100 x 0.5 kgf
DG-250KG	250 x 1.25 kgf

Dial Style - N

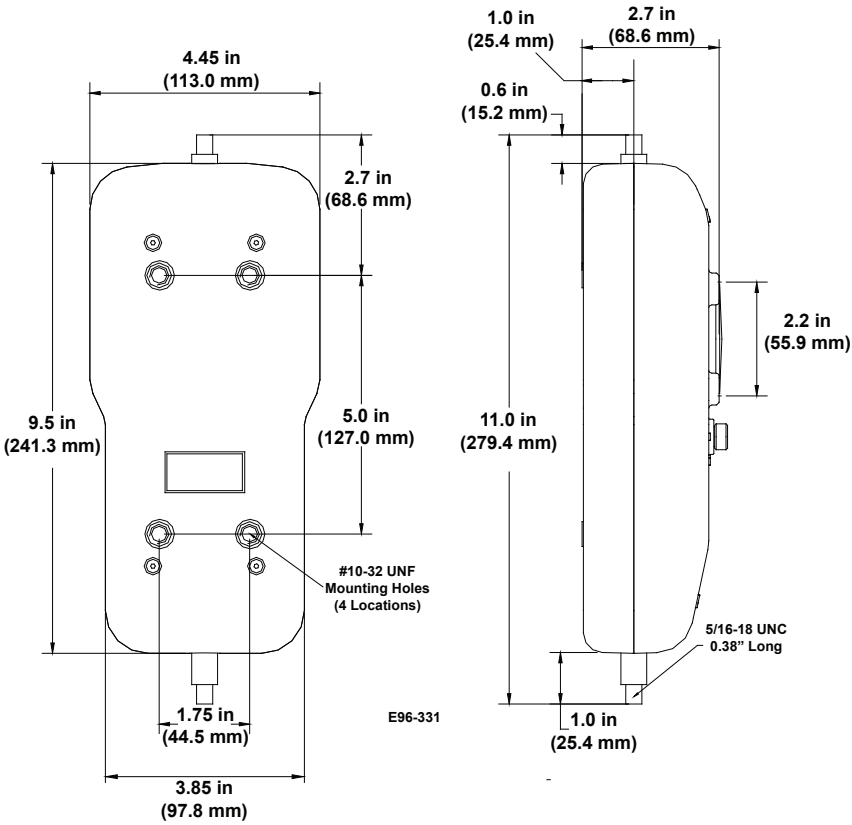
Model	Capacity
DG-1000N	1000 x 5N
DG-2500N	2500 x 12.5N

Accessories

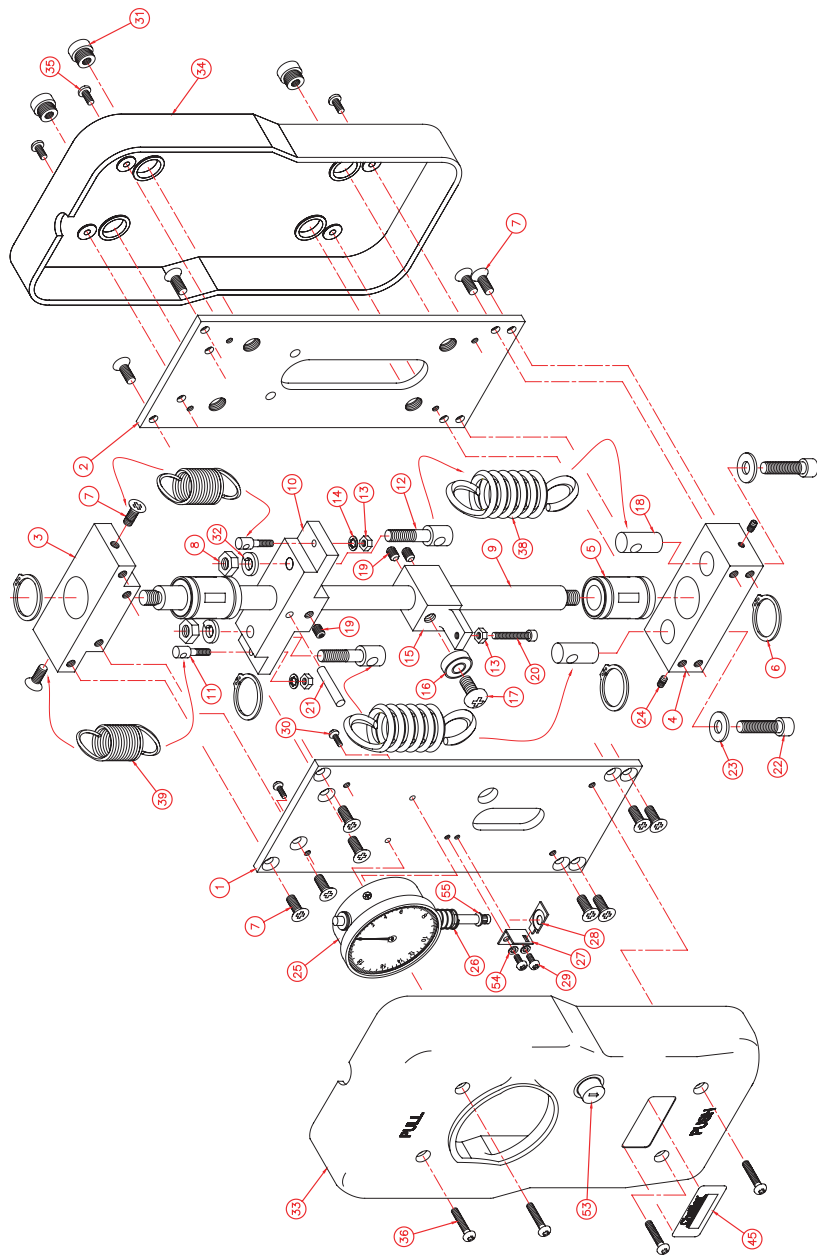
Item No.	Description	Standard
SPK-FMG-008B	Adapter, Chisel Point	Yes
SPK-FMG-009B	Adapter, Point	Yes
SPK-FMG-010B	Adapter, Notch	Yes
SPK-FMG-011B	Adapter, Flat	Yes
SPK-FMG-012C	Hook	Yes
SPK-FMG-013B	Extension Rod, 6"	Yes
NC002728	Carrying Case	Yes
NC002500	Hook, Snap Clip	Option
NC00721	V-Notch, Small	Option
NC00725	V-Notch, Large	Option
NC002844	Grasping Cable	Option
SPK-DG-HANDLE	Handle Assembly	Option
SPK-FMG-142	Curved Compression Plate	Option
SPK-FMG-143	Compression Plate, Circle	Option
SPK-FMG-144	Palm Fixture	Option
SPK-FMG-145	Rectangle Plate, large	Option
SPK-FMG-146	Rectangle Plate, small	Option
NC002845	Soft Carrying Case	Option

Note: Threaded fixtures are 5/16-18.

DIMENSION



SPARE PARTS



SPARE PARTS LIST

Ref.	Item No.	Description
1	NC002689	Plate, Upper Support
2	NC002690	Plate, Lower Support
3	NC002681	Frame, Upper Support
4	NC002680	Frame, Lower Support
5	910-04-001	Ball Bushing
6	900-46-010	Retaining Ring
7	21047	Screw, #10-32 x 1/2 Flat Head
8	7970	Nut, 1/4-20 Hex
9	NC002685	Main Shaft
10	NC002684	Calibrator
11	NC002663	Support, Spring, Medium
12	NC002682	Support, Spring, Large
13	3168	Nut, #6 Hex
14	10390	Washer, #6 Lock
15	NC002683	Bearing Support
16	NC002668	Ball Bearing, Radial
17	E08-250	Screw, #1/4-20 x 1/2 Pan Head
18	NC002692	Spring Support, Calibrator
19	3127	Set Screw, #10-32 x 1/4
20	NC000124	Screw, #6-32 x 1 SHC
21	NC002688	Taper Pin, #2 x 1
22	E08-256	Screw, 1/4-28 x 1 SHC
23	900-30-021	Washer, 1/4 Flat
24	900-08-023	Set Screw, #6-32 x 1/4
25	NC002677-09	Dial Indicator, 200 lbf (DG-200)
	NC002677-10	Dial Indicator, 300 lbf (DG-300)
	NC002677-11	Dial Indicator, 400 lbf (DG-400)
	NC002677-12	Dial Indicator, 500 lbf (DG-500)
	NC002677-21	Dial Indicator, 100kgf (DG-100KG)
	NC002677-22	Dial Indicator, 250 kgf (DG-250KG)
	NC002677-32	Dial Indicator, 1000N (DG-1000N)
	NC002677-33	Dial Indicator, 2500N (DG-2500N)
26	NC002674	Spring, Compression
27	NC002672	Bracket, Maximum Capture
28	NC002673	Plate, Maximum Capture
29	E08-241	Screw, #4-40 x 3/16 Pan Head
30	E08-252	Screw, #4-40 x 5/16 Round Head
31	NC002691	Threaded Bushing
32	9766	Washer, Lock 1/4 ID
33	NC002730	Top Housing
34	NC002731	Bottom Housing
35	03-90041	Screw, #6-32 x 5/16 Pan Head
36	E08-251	Screw, #6-32 x 3/4 Pan Head
38	NC002734-1	Main Spring, 200 lbf (DG-200)
	NC002734-2	Main Spring, 300 lbf (DG-300)
	NC002734-3	Main Spring, 400 lbf (DG-400)
	NC002734-4	Main Spring, 500 lbf (DG-500)
	NC002734-5	Main Spring, 100 kgf (DG-100KG)
	NC002734-6	Main Spring, 250 kgf (DG-250KG)
	NC002734-7	Main Spring, 1000N (DG-1000N)
	NC002734-8	Main Spring, 2500N (DG-2500N)

Ref.	Item No.	Description
39	SPK-DG-200	Trim Spring Set, 200 lbf (DG-200)
	SPK-DG-300	Trim Spring Set, 300 lbf (DG-300)
	SPK-DG-400	Trim Spring Set, 400 lbf (DG-400)
	SPK-DG-500	Trim Spring Set, 500 lbf (DG-500)
	SPK-DG-100KG	Trim Spring Set, 100 kgf (DG-100KG)
	SPK-DG-250KG	Trim Spring Set, 250 kgf (DG-250KG)
	SPK-DG-1000N	Trim Spring Set, 1000N (DG-1000N)
	SPK-DG-2500N	Trim Spring Set, 2500N (DG-2500N)
45	NC002621	Label, Capacity
53	NC002678	Latch, Pawl Assembly
54	E02-235	Split Lock Washer, #4
55	E02-236	Washer, Flat, #5