

DFE Series Digital Force Gauge

Specification Sheet

SS-FM-3003-1104

November 2004

The CHATILLON® DFE Series marks a new era in digital force measurement. This compact, easy-to-use force gauge is designed for economy applications without compromising functionality. Ideal for handheld or test stand applications. The DFE is available with capacities from 2 lbf (10 N) to 500 lbf (2500 N). The DFE features an integral loadcell with a measurement accuracy of better than 0.25% full scale. A large, easy-to-read, high resolution dot matrix LCD display supports a variety of standard gauge functions including normal and peak readings, high/low limits, setpoints, pass/fail results, statistical results, loadcell actuation and direction. Loads are displayed in ozf, gf, lbf, kgf and N units. The display can be inverted and displayed results may be "hidden" from the operator. The DFE gauge may be specified with or without RS232 serial communication. All DFE Series force gauges come with a carrying case, battery adapter/charger, testing accessories and NIST Certificate of Calibration with data.

Features

- ❑ Two Models and Seven Capacities Each
 - DFE Series (No Outputs)
 - E-DFE Series (With Digital and Analog Outputs)
- ❑ Advanced Operating Modes
 - Normal
 - Peak Tension and Compression
 - Load Limits
 - Pass-Fail Limits
- ❑ Statistical Calculations
 - Mean with Maximum and Minimum Values
 - Coefficient of Variation with Mean and Standard Deviation
 - Standard Deviation with Variance and Mean
 - % Differentiation
- ❑ Integral Loadcells
 - Accuracy $\pm 0.25\%$ Full Scale
 - Mechanical Overload Protection to 150% Full Scale
- ❑ Simple Operator Interface
 - High Resolution Display
 - Menus, Prompts and Function Keys for Easy Use
- ❑ Optional Outputs (Standard on E-DFE Models)
 - RS232 Serial Data
 - Mitutoyo Digimatic
 - ± 2 Vdc Analog
- ❑ NIST Calibration Certificate with Data
 - Available IEC/ISO17025 Cert with Uncertainty
- ❑ 2 Year Warranty



You Get More with Your CHATILLON Gauge.



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Because You Expect More from a Chatillon® Gauge...

Do More... Pay Less!

The new CHATILLON DF Series deliver more features without compromising ease of use, accuracy and very importantly cost. You'll do more with a DF Series and you'll get the reliability and quality that you come to expect from Chatillon force measurement instruments.

Easy-to-Read Display.

A large, easy-to-read 128 x 64 dot matrix display can display up to 8 lines of information. The high resolution display features contrast adjustments and can be inverted when required. The display can even be "hidden" at the press of a button. A load bargraph indicated load direction, measured load and safe load and helps prevent overloads. The integral loadcells feature mechanical overload protection at 150% Full Scale.

Single Touch Operation.

The rubber keypad features dedicated and dynamic function keys. The function keys correspond to displayed options and guide the user during operation. A navigation pod lets you navigate through the menus and to scroll and change values quickly. The innovative "I" key can be used to display critical information on the gauge such as gauge capacity and resolution, battery life remaining, loadcell overload history, even service information including last calibration date, or the location of service centers.

Dependable Measurements.

The DF Series features an integral loadcell sensor that delivers repeatable, accurate results. The innovative load bargraph shows dynamic load, direction of load and warns you of pending overload conditions. Smart technology in the gauge even keeps track of overload history to aide in maintenance and troubleshooting.

Comprehensive Results.

The DF Series supplies you with comprehensive results that are easy to view and understand. The gauge displays:

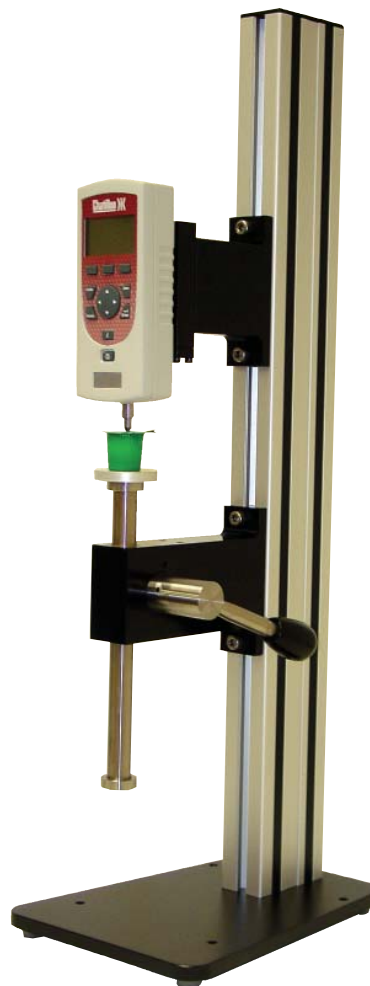
- Measured Result with Units
- Operating Mode
- Pass-Fail Result
- High and Low Load Results
- Saved Results
- Statistical Calculations
 - Average with MIN and MAX Results
 - Cv with Average and Standard Deviation
 - % Differentiation between Successive Results
 - Standard Deviation based on Total Population or (n-1)

Outputs

The E-DFE Series comes standard with digital and analog outputs. RS232 outputs are supported with baud rates from 9600 to 115,600. Simply select the baud rate and whether or not you want to gauge to transmit with or without units. You may select the Mitutoyo output when communicating with a Mitutoyo device. Or, you may use the $\pm 2V$ analog output to drive alarms or other ancillary devices.

We Validate It.

Frankly, a Certificate of Conformance isn't worth much! The DF Series comes standard with a Certificate of Calibration with data certified to NIST. And we offer Calibration Certificates with uncertainty calculations since AMETEK is an ISO17025 accredited manufacturer.



Calibrate and Verify Status.

The DFE Series incorporates flash memory and hosts a set of self-diagnostic functions for monitoring the display, keypad and electronics. Using the "I" key, you have immediate access to battery conditions, including estimated battery life remaining. You can also view loadcell status, including the number of overloads that have been applied to the gauge. Zero offset verification is standard and a step-by-step calibration procedure is built-in allowing you to calibrate your DFE gauge with certified standards.

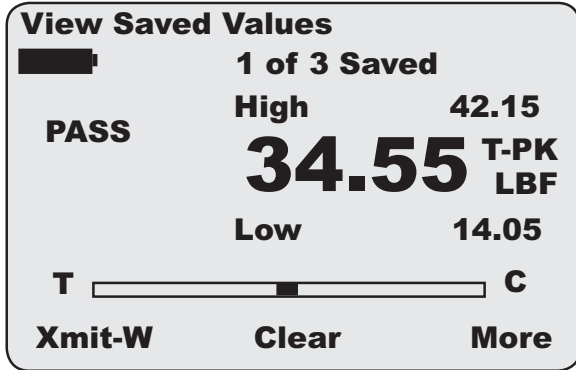
Test Stand Compatibility.

The DF Series has a universal mounting backplate that enables you to fit the gauge to commonly used Chatillon force testers including the MT Series, LTCM Series, TCM Series and TCD Series.

... You Get More from a Chatillon® Gauge.

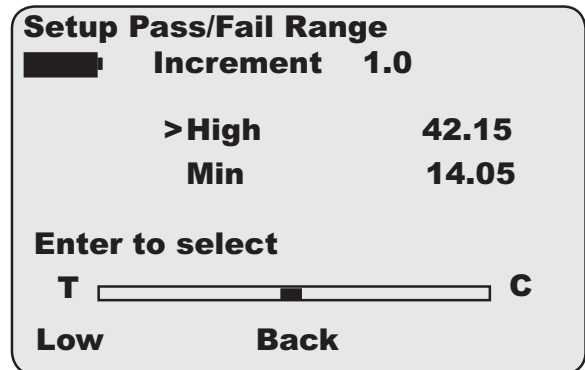
High & Low Load or Pass-Fail Limits

The DFE Series may be configured with High and Low Load Limits or Pass-Fail Limits. Load limits allow you to establish setpoints for your testing. If the gauge exceeds a setpoint value, the gauge can provide a visual and audible alarm. You can also setup the gauge to operate as a pass-fail system. You can setup a pass-fail limit based on a limit range or on a nominal value with a % bandwidth. Based on your setup, the gauge will provide you with a Pass-Fail indication.



Simplified Setup

Menus and intelligent prompts make gauge setup fast and easy. Gauge options are presented in a "List Format". Using the navigation pod and function keys, you simply select the functions and parameters required. The gauge will guide you through the setup process. Default settings are provided and a "Quick Reset" allows you to re-establish defaults with a single key press. If your gauge features digital outputs, you can print your gauge setup parameters for record archiving or use it as a setup template for other DFE force gauges in your plant.

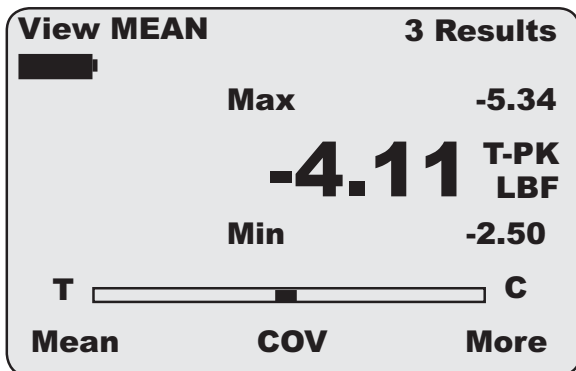


Advanced Testing with Statistics

The DFE Series operates in Normal and Peak modes. When peak operation is required, the display will indicate the peak reading and direction. Load values may be displayed in ozf, gf, lbf, kgf or N values.

Your DFE force gauge can store up to 10 test results in memory. Results may be viewed, cleared and used to calculate statistics. The gauge will display the number of results stored and will alert you when the memory is full.

- Calculate Mean and also show you the MAX and MIN values for your calculation
- Coefficient of Variation is calculated and displayed with the Mean and Standard Deviation value
- Standard Deviation is calculated and displayed with the Mean and the Variance value. User may specify Total Population or Sample (n-1)
- Calculate and display % Difference between consecutive test results



Personal Computer Integration

The E-DFE gauge features digital and analog outputs. RS-232 for integration with our NEXYGEN™ software and a Mitutoyo Digimatic output is available. The gauge will also supply an analog output of ±2Vdc. Use Nexygen software for data acquisition, graphical load v. time results, analysis and reporting. With Nexygen software, store an unlimited number of results for analysis.



Self Diagnostics

The DFE Series incorporates flash memory and hosts a set of self-diagnostic functions for monitoring the display, keypad and electronics. Using the "i" key, you have immediate access to battery conditions, including estimated battery life remaining. You can also view loadcell status, including the number of overloads that have been applied to the gauge. Zero offset verification is standard and a step-by-step calibration procedure is built-in allowing you to calibrate your DFE gauge with certified standards.

Specifications

Accuracy: $\pm 0.25\%$ of full scale

Certification: Calibration with NIST Data, IEC/ISO17025 optional

Data Sampling Rate: 5000 Hz

Peak Capture Rate: 5000 Hz

Display Update Rate: 10 Hz

Tare Capacity: 10% full scale

Overload Protection: 150% full scale

Display Characteristics: High resolution, dot-matrix LCD, 8 lines, 40 characters, adjustable contrast, invert and "hide" capability

Automatic Shut Down: Configurable time. May be disabled.

Data Storage: 10 results, Optional NEXYGEN™ software for unlimited storage and automated testing and analysis

Test Stand Control: Compatible with TCD Series testers.

Outputs (E-DFE): RS-232, Mitutoyo (Digimatic) and ± 2 Vdc Analog

Power: Battery or direct AC operation. Universal Power 120V/230V, Rechargeable Nickel Metal Hydride (supplied)

Battery Life: Approximately 30 hours, continuous use
Gauge may be operated with direct AC Power Source

Instrument Weight: 1.5 lbs (0.7 kg)

Operating Temperature: 40° to 100°F (4° to 38°C)

Warranty: 2 year

Ordering

DFE Series Without Outputs

Model	ozf	gf	lbf	kgf	N
DFE-002	32 x 0.02	1000 x 1	2 x 0.002	1 x 0.001	10 x 0.01
DFE-010	160 x 0.2	5000 x 5	10 x 0.01	5 x 0.005	50 x 0.05
DFE-025	400 x 0.5	10,000 x 10	25 x 0.02	10 x 0.01	110 x 0.1
DFE-050	800 x 0.8	25,000 x 20	50 x 0.05	25 x 0.02	250 x 0.2
DFE-100	1600 x 2	50,000 x 50	100 x 0.1	50 x 0.05	500 x 0.5
DFE-200	-	-	200 x 0.2	100 x 0.1	1000 x 1

Note: Gauge is supplied with US Mains Plug standard and 120V Charger/Adapter. Use the following prefixes if you require a UK or EU Mains Plug.
 -UK 230V UK Style Mains Plug (Example: E-DFE-100-UK)
 -EU 230V EU Style Mains Plug (Example: DFE-050-EU)



DFE Gauge shown with optional Handle Assembly (p/n SPK-DF-Handle).

DFE Series Accessories

Item	Capacity	Part No.	Included
Carrying Case		SPK-DF-118	Standard
Flat	100 lbf (500 N)	SPK-FMG-011A	Standard ¹
Flat	500 lbf (2.5 kN)	SPK-FMG-011B	Standard ¹
Hook, Stationary	50 lbf (225 N)	SPK-FMG-012A	Standard ¹
Hook, Stationary	100 lbf (500 N)	SPK-FMG-012B	Standard ¹
Hook, Stationary	500 lbf (2.5 kN)	SPK-FMG-012C	Standard ¹
Battery Charger, 120V, US Mains Plug		SPK-DF-US120	Standard ¹
Battery Charger, 230V, EU Mains Plug		SPK-DF-EU230	Standard ¹
Battery Charger, 230V, UK Mains Plug		SPK-DF-UK230	Standard ¹
Extension Rod, 6-inch	100 lbf (500 N)	SPK-FMG-013A	Optional
Extension Rod, 6-inch	500 lbf (2.5 kN)	SPK-FMG-013B	Optional
Hook, Swivel	20 lbf (112 N)	ML3867	Optional
Hook, Swivel	100 lbf (500 N)	ML3850	Optional
Hook, Swivel	500 lbf (2.5 kN)	ML3868	Optional
Hook, Clasp	500 lbf (2.5 kN)	NC002500	Optional
Chisel Point	100 lbf (500 N)	SPK-FMG-008A	Optional
Chisel Point	500 lbf (2.5 kN)	SPK-FMG-008B	Optional
Point	100 lbf (500 N)	SPK-FMG-009A	Optional
Point	500 lbf (2.5 kN)	SPK-FMG-009B	Optional
Notch	100 lbf (500 N)	SPK-FMG-010A	Optional
Notch	500 lbf (500 N)	SPK-FMG-010B	Optional
Adapter, #10-32 to 5/16-18		P-10020	Optional
Handle Assembly		SPK-DF-HANDLE	Optional

Note: ¹ Capacity dependent.

Ordering

E-DFE Series With RS232, Mitutoyo and Analog Outputs

Model	ozf	gf	lbf	kgf	N
E-DFE-002	32 x 0.04	1000 x 1	2.2 x 0.002	1 x 0.001	10 x 0.01
E-DFE-010	180 x 0.2	5000 x 5	11 x 0.01	5 x 0.005	50 x 0.05
E-DFE-025	400 x 0.4	11,000 x 11	25 x 0.25	11 x 0.01	110 x 0.1
E-DFE-050	900 x 0.9	25,500 x 25	55 x 0.05	25 x 0.025	250 x 0.25
E-DFE-100	1800 x 2	50,000 x 50	110 x 0.1	50 x 0.05	500 x 0.5
E-DFE-200	-	-	225 x 0.2	100 x 0.1	1000 x 1
E-DFE-500	-	-	550 x 0.5	250 x 0.25	2500 x 2.5

Note: Gauge is supplied with US Mains Plug standard and 120V Charger/Adapter.

Use the following prefixes if you require a UK or EU Mains Plug.

-UK 230V UK Style Mains Plug (Example: E-DFE-100-UK)

-EU 230V EU Style Mains Plug (Example: DFE-050-EU)

E-DFE Series Accessories

Item	Capacity	Part No.	Included
Carrying Case		SPK-DF-118	Standard
Chisel Point	100 lbf (500 N)	SPK-FMG-008A	Standard ¹
Chisel Point	500 lbf (2.5 kN)	SPK-FMG-008B	Standard ¹
Point	100 lbf (500 N)	SPK-FMG-009A	Standard ¹
Point	500 lbf (2.5 kN)	SPK-FMG-009B	Standard ¹
Notch	100 lbf (500 N)	SPK-FMG-010A	Standard ¹
Notch	500 lbf (500 N)	SPK-FMG-010B	Standard ¹
Flat	100 lbf (500 N)	SPK-FMG-011A	Standard ¹
Flat	500 lbf (2.5 kN)	SPK-FMG-011B	Standard ¹
Hook, Stationary	50 lbf (225 N)	SPK-FMG-012A	Standard ¹
Hook, Stationary	100 lbf (500 N)	SPK-FMG-012B	Standard ¹
Hook, Stationary	500 lbf (2.5 kN)	SPK-FMG-012C	Standard ¹
Battery Charger, 120V, US Mains Plug		SPK-DF-US	Standard ¹
Battery Charger, 230V, EU Mains Plug		SPK-DF-EU	Standard ¹
Battery Charger, 230V, UK Mains Plug		SPK-DF-UK	Standard ¹
Extension Rod, 6-inch100 lbf (500 N)		SPK-FMG-013A	Standard ¹
Extension Rod, 6-inch500 lbf (2.5 kN)		SPK-FMG-013B	Standard ¹
Hook, Swivel	20 lbf (112 N)	ML3867	Optional
Hook, Swivel	100 lbf (500 N)	ML3850	Optional
Hook, Swivel	500 lbf (2.5 kN)	ML3868	Optional
Hook, Clasp	500 lbf (2.5 kN)	NC002500	Optional
Adapter, #10-32 to 5/16-18		P-10020	Optional
Handle Assembly		SPK-DF-HANDLE	Optional

Note: ¹ Accessories are Model dependent.

100 lbf (500 N) capacities and below use a #10-32 fitting

200 and 500 lbf (1 kN and 2.5 kN) capacities use a 5/16-18 fitting



E-DFE shown with a TCD Digital Tester

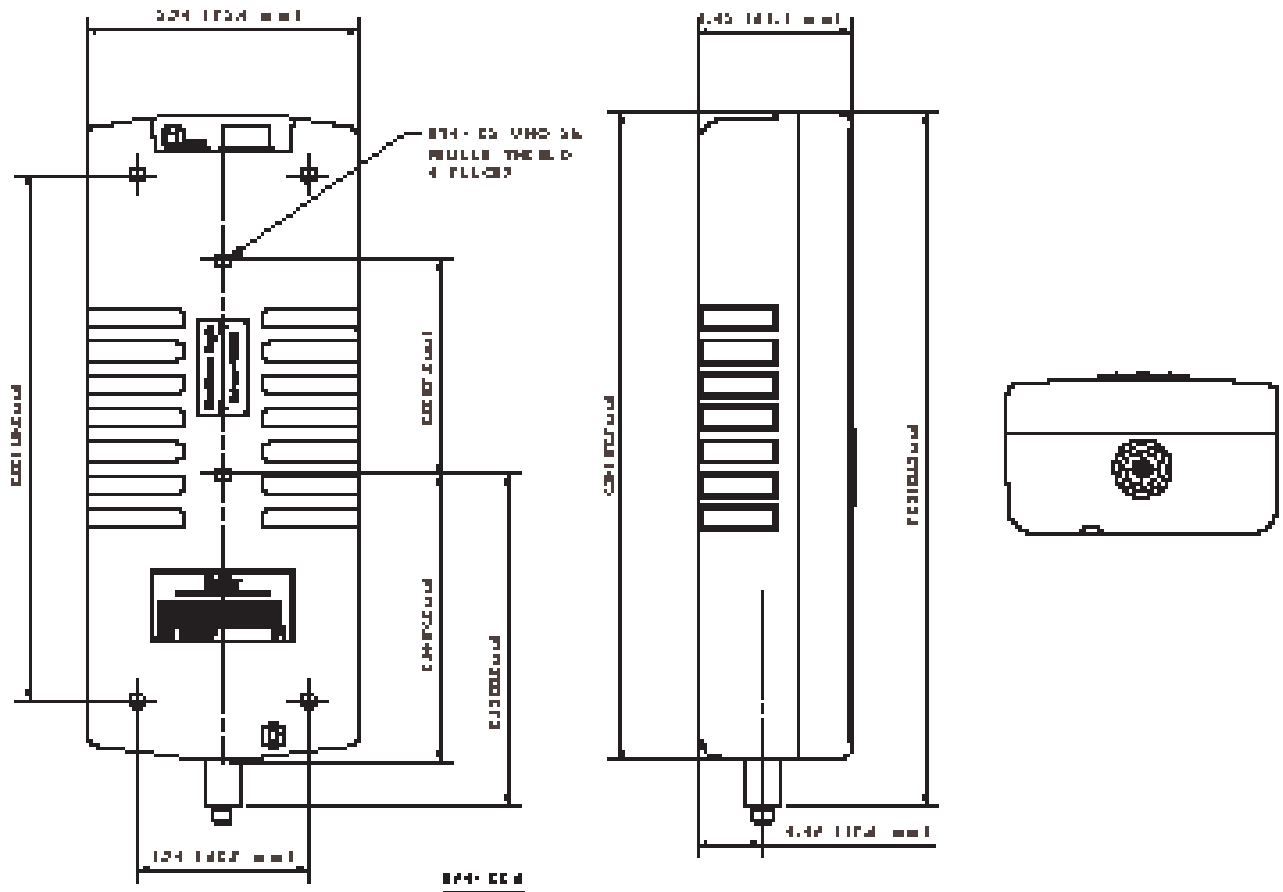
Test Stand Adapters

Item	Capacity	Part No.	Included
MT150 Series	150 lbf (660 N)	SPK-MT-0001	Optional
MT500 Series	500 lbf (2500 N)	SPK-MT-0004	Optional
LTCM-100 Series	100 lbf (500 N)	SPK-DF-LTCM	Optional
TT Tester	500 lbf (2500 N)	NC002582	Optional
TCM201 Series	225 lbf (1000 N)	SPK-FM200-019	Optional
TCD200 Series	225 lbf (1000 N)	SPK-FM200-019	Optional

Interface Cables, Adapters and Software

Item	Part No.	Included
RS232 Cable (6 ft, 2m)	NC000850-1	Standard
RS232 Cable (10 ft, 3m)	NC000850-2	Optional
Mitutoyo Cable, 10-Pin	NC000654	Optional
Mitutoyo Cable, RS232	NC000697	Optional
TCM201 Interface Cable	ENC0125	Optional
TCD200 Interface Cable	NC000647	Optional
RS232-USB Adapter	SPK-DF-USB	Optional
NEXYGEN Gauge Software	40/0739	Optional

Dimensions



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