



MESUR™ Lite data acquisition software is included with the 5i



The 5i advanced digital force / torque indicator is designed to work with a wide range of Mark-10 remote force and torque sensors (see page 3). With exclusive Plug & Test™ technology, all calibration and configuration data is saved within the sensor's smart connector, not the indicator, allowing for true interchangeability. In addition, all sensors are fully compatible with the more basic 3i force / torque indicator.

The 5i shares its menu structure and most specifications with Series 5 digital force gauges. The sampling rate is a blazing fast 7,000 Hz, producing accurate results even for quick-action tests. A large, backlit graphics LCD displays large, legible characters, while the simple menu navigation allows for quick access to the indicator's many features and configurable parameters. Data can be transferred to a PC or data collectors via USB, RS-232, Mitutoyo (Digimatic), or analog outputs.

On-board data memory for up to 1,000 readings is included, as are statistical calculations with output to a PC. Integrated set points with indicators and outputs are ideal for pass-fail testing and for triggering external devices such as an alarm, relay, or test stand. An analog load bar is shown on the display for graphical representation of applied force or torque.

The 5i's averaging mode addresses the need to record the average load over time, while external trigger mode makes switch activation testing simple and accurate.

The 5i includes MESUR™ Lite data acquisition software. MESUR™ Lite tabulates continuous or single point data. Data saved in the indicator's memory can also be downloaded in bulk. One-click export to Excel easily allows for further data manipulation.



5i is shown mounted to an optional AC1008 tabletop stand with Series R50 torque sensor

Features

- Interchangeable force and torque sensors through Plug & Test™ technology
- Sensor password protection, for preventing use of an unauthorized sensor
- High-speed 7,000 Hz sampling rate
- USB, RS-232, Mitutoyo, and analog outputs
- 1,000-point data memory with statistics and outputs
- Live load bar graph with set point markers
- Programmable set points, with indicators and outputs
- Peak readings and set points always displayed
- Averaging mode - calculates average readings over time
- External trigger mode - for switch contact testing or remotely stopping display update
- Configurable audio alarms and key tones
- Password protection of individual keys and calibration

Display Indicators



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Focus on Engineering: Reversible Housing

Display and keypad are upright

Sensor connector oriented down



Housing separates into reversible halves, electrically connected by gold-plated spring contacts.



Sensor connector oriented up

Reversible housing allows the sensor connector to be oriented up or down.

The display and keypad remain upright.

Focus on Engineering: Plug & Test™ Technology



^ Unique Plug & Test™ technology allows for interchangeable sensors to be used with a Mark-10 model 5i or 3i indicator. All calibration and configuration data is saved in the smart connector.



^ The Plug & Test™ connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.

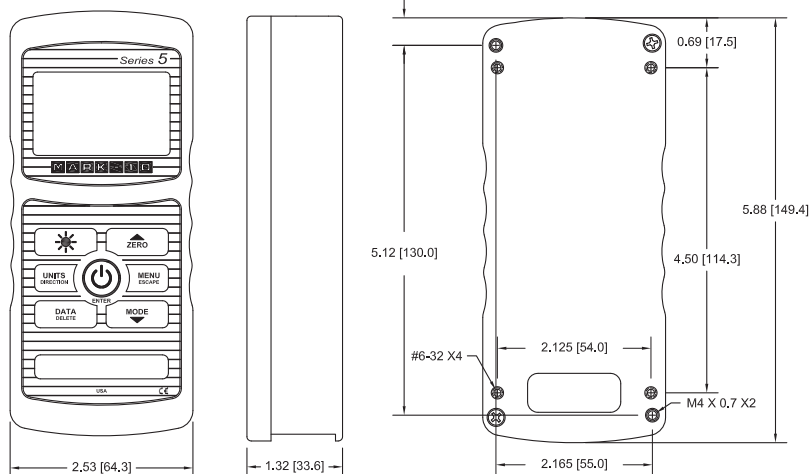
Ordering Information

Model	Description
M5I	Advanced Force / Torque Indicator, 110V
M5IE	Advanced Force / Torque Indicator, 220V, European Plug
M5IU	Advanced Force / Torque Indicator, 220V, UK Plug
M5IA	Advanced Force / Torque Indicator, 220V, Australian Plug
AC1008	Tabletop mounting kit for 5i/3i

Specifications

Accuracy:	±0.1% of full scale ±1 digit + sensor
Sampling Rate:	7,000 Hz, pulse response of 1/3,500 sec. minimum
Power:	AC or rechargeable battery. Multi-step low battery indicator is displayed, gauge shuts off automatically when power is too low.
Battery life:	Backlight on / off: up to 7 / 24 hours of continuous use
Outputs:	USB / RS-232: Configurable up to 115,200 baud. Includes Gauge Control Language 2 for full computer control. Mitutoyo (Digimatic): Serial BCD suitable for all Mitutoyo SPC-compatible devices. Analog: ±1 VCD, ±0.25% of full scale at capacity, General purpose: Three open drain outputs, one input. Set points: Three open drain lines.
Configurable settings:	Digital filters, outputs, automatic output (via USB/RS-232), automatic shutoff, default settings, averaging mode, external trigger, passwords, key tones, audio alarms, backlight, calibration
Weight:	0.7 lb [0.3 kg]
Included items:	Carrying case, universal voltage AC adapter, battery, quick-start guide, USB cable, resource CD (USB driver, MESUR™ Lite software, MESUR™ gauge DEMO software, and user's guide), and certificate of calibration.
Warranty:	3 years (see individual statement for further details)

Dimensions in [mm]



Models 5i and 3i force / torque indicators are designed for use with Mark-10's Plug & Test™ remote force and torque sensors. All calibration and configuration data is saved within the sensors' smart connectors - not the indicator - allowing for true interchangeability. Each sensor series is available in a range of capacities, from 0.25 to 10,000 lbf (1 N to 50 kN) full scale and from 10 ozFin to 5,000 lbFin (7 Ncm to 550 Nm) full scale. Refer to individual sensor data sheets for further details.

Series R50

Universal torque sensors, fixed chuck



Series R51

Universal torque sensors, interchangeable attachments



Series R54

Wrench extension torque sensors



Series R52

Static torque sensors



Series R01

Tension / compression sensors



Series R03

Inline tension / compression sensors



Series R04

Miniature tension / compression sensors



Series R02

Compact compression sensors



Series R05

Ergonomics testing push / pull sensors



Model 5i
Advanced Indicator

Model 3i
Basic Indicator



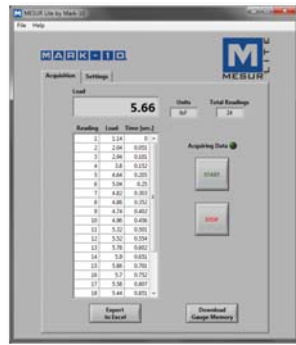
Series R53
Closure torque sensors



The 3i digital force / torque indicator is designed to work with a wide range of Mark-10 remote force and torque sensors (see page 3). With exclusive Plug & Test™ technology, all calibration and configuration data is saved within the sensor's smart connector, not the indicator, allowing for true interchangeability. In addition, all sensors are fully compatible with the more advanced 5i force / torque indicator.

The 3i shares its menu structure and most specifications with Series 3 digital force gauges. The sampling rate is 2,000 Hz, producing accurate results under a wide range of test conditions. A backlit graphic LCD displays large characters, and a menu is available to access the gauges' features and configurable parameters. The display also features an analog load bar for graphical representation of applied load, as well as set point indicators for pass-fail testing. USB output is provided for data collection purposes.

The gauges include MESUR™ Lite data acquisition software. MESUR™ Lite tabulates continuous or single point data. One-click export to Excel allows for further data manipulation.



MESUR™ Lite data acquisition software is included with the 3i



3i is shown mounted to an optional AC1008 tabletop stand with Series R03 force sensor

Features

- Interchangeable force and torque sensors through Plug & Test™ technology
- High-speed 2,000 Hz sampling rate
- USB data output
- Ultra-compact size
- Large backlit graphic display
- Programmable set points with pass/fail indicators
- Live load bar graph with set point markers
- Peak readings and set points always displayed
- Configurable audio alarms and key tones
- 4 selectable units of measurement
- MESUR™ Lite data collection software included

Display Indicators

Set points	→	→	Tension / compression indicator / Clockwise / counter-clockwise indicator
Pass/fail indicators	→	→	Peak readings
Current reading	→	→	Measurement mode
Battery indicator	→	→	Units of measurement
		→	Analog load bar w/set point markers

Focus on Engineering: Plug & Test™ Technology



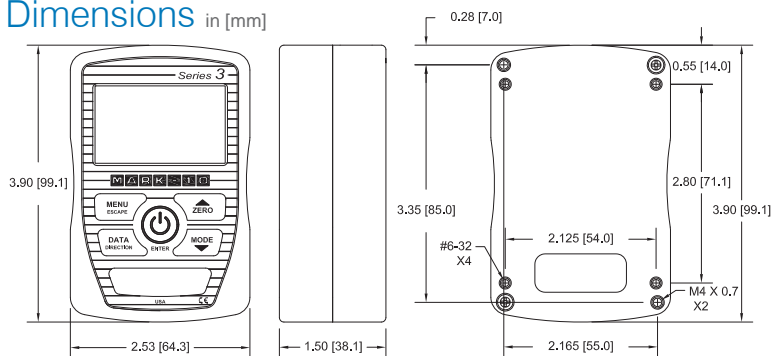
^ Unique Plug & Test™ technology allows for interchangeable sensors to be used with a Mark-10 model 5i or 3i indicator. All calibration and configuration data is saved in the smart connector.

^ The Plug & Test™ connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.

Specifications

Accuracy:	±0.2% of full scale ±1 digit + sensor
Sampling Rate:	2,000 Hz, pulse response of 1/1,000 sec. minimum
Power:	AC or rechargeable battery. Multi-step low battery indicator is displayed, gauge shuts off automatically when power is too low.
Battery life:	Backlight on: up to 7 hours of continuous use Backlight off: up to 24 hours of continuous use
USB Output:	By pressing DATA key only. Configurable up to 115,200 baud.
Configurable settings:	Digital filters, USB output, automatic shutoff, default settings, key tones, audio alarms, calibration.
Weight:	0.7 lb [0.3 kg]
Included items:	Carrying case, universal voltage AC adapter, battery, quick-start guide, USB cable, resource CD (USB driver, MESUR™ Lite software, MESUR™ gauge DEMO software, and user's guide), and certificate of calibration.
Warranty:	3 years (see individual statement for further details)

Dimensions in [mm]



Ordering Information

Model	Description
M3I	Advanced Force / Torque Indicator, 110V
M3IE	Advanced Force / Torque Indicator, 220V, European Plug
M3IU	Advanced Force / Torque Indicator, 220V, UK Plug
M3IA	Advanced Force / Torque Indicator, 220V, Australian Plug
AC1008	Tabletop mounting kit for 3i/5i



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Models 3i and 5i force / torque indicators are designed for use with Mark-10's Plug & Test™ remote force and torque sensors. All calibration and configuration data is saved within the sensors' smart connectors - not the indicator - allowing for true interchangeability. Each sensor series is available in a range of capacities, from 0.25 to 10,000 lbf (1 N to 50 kN) full scale and from 10 ozFin to 5,000 lbFin (7 Ncm to 550 Nm) full scale. Refer to individual sensor data sheets for further details.

Series R50

Universal torque sensors, fixed chuck



Series R51

Universal torque sensors, interchangeable attachments



Series R54

Wrench extension torque sensors



Series R52

Static torque sensors



Series R01

Tension / compression sensors



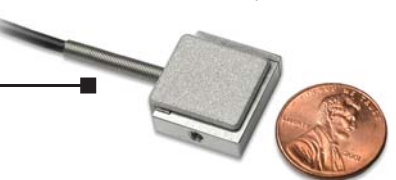
Series R03

Inline tension / compression sensors



Series R04

Miniature tension / compression sensors



Series R02

Compact compression sensors



Model 5i
Advanced
Indicator

Model 3i
Basic
Indicator

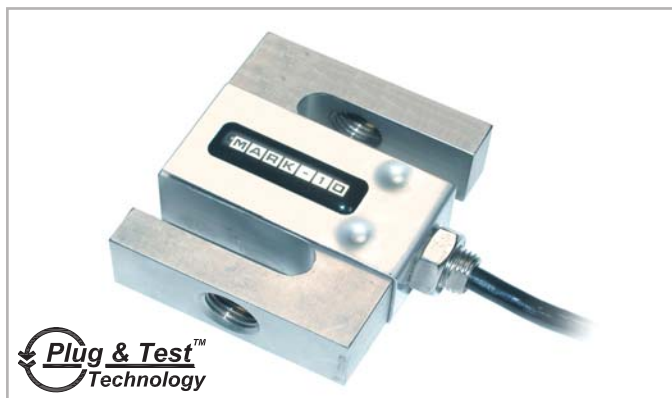


Series R53
Closure torque sensors



Series R05
Ergonomics testing push / pull sensors

32-1130

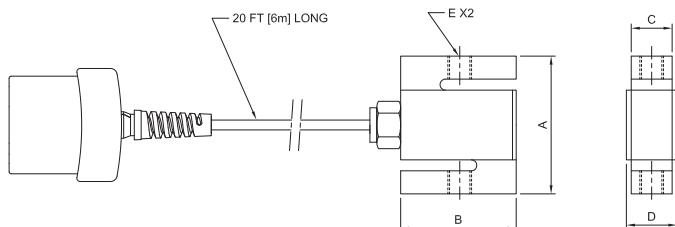


Series R01 rugged smart sensors are designed for measuring tension and compression force, with applications in virtually every industry. Durable S-Beam design with threaded holes on two sides allows for many configurations. Steel construction ensures many years of use. The sensor can be integrated into an existing system or mounted to a Mark-10 test stand. Capacities available from 50 to 10,000 lbf [250 N to 50 kN]. Compatible with Mark-10 model 5i and 3i indicators (sold separately) through unique Plug & Test™ technology.

Specifications

Accuracy:	±0.15% of full scale + indicator
Safe Overload:	150% of full scale
Weight:	1.9 to 3.0 lb [0.9 to 1.4 kg], depending on model

Dimensions in [mm]



Optional Items

AC1018	Mounting kit, Series R01/R03 to test stand
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Capacity x Resolution

Model No.	Capacity x Resolution - with Model 5i indicator						Capacity x Resolution - with Model 3i indicator			
	lbf	ozF	gF	kgF	N	kN	lbf	kgF	N	kN
MR01-50	50 x 0.02	800 x 0.5	25000 x 10	25 x 0.01	250 x 0.1	-	50 x 0.05	25 x 0.02	250 x 0.2	-
MR01-100	100 x 0.05	1600 x 1	50000 x 20	50 x 0.02	500 x 0.5	-	100 x 0.1	50 x 0.05	500 x 0.5	-
MR01-200	200 x 0.1	3200 x 2	-	100 x 0.05	1000 x 0.5	1 x 0.0005	200 x 0.2	100 x 0.1	1000 x 1	-
MR01-500	500 x 0.2	8000 x 5	-	250 x 0.1	2500 x 1	2.5 x 0.001	500 x 0.5	250 x 0.2	2500 x 2	-
MR01-1000	1000 x 0.5	16000 x 10	-	500 x 0.2	5000 x 2	5 x 0.002	1000 x 1	500 x 0.5	5000 x 5	-
MR01-2000	2000 x 1	32000 x 20	-	1000 x 0.5	10000 x 5	10 x 0.005	2000 x 2	1000 x 1	10000 x 10	-
MR01-5000	5000 x 2	-	-	2500 x 1	25000 x 10	25 x 0.01	5000 x 5	2500 x 2	-	25 x 0.02
MR01-10000	10000 x 5	-	-	5000 x 2	50000 x 25	50 x 0.02	10000 x 10	5000 x 5	-	50 x 0.05



< Unique Plug & Test™ technology allows for interchangeable sensors to be used with a Mark-10 model 5i or 3i indicator. All calibration and configuration data is saved in the smart connector.



< The Plug & Test™ connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.



< Optional AC1018 mounting kit adapts a Series R01 sensor to a Mark-10 test stand.

Model No.	A	B	C	D	E
MR01-50	2.40 [61.0]	2.00 [50.8]	0.46 [11.7]	0.65 [16.5]	1/4-28 UNF
MR01-100			0.71 [18.0]	0.90 [22.9]	1/2-20 UNF
MR01-200					
MR01-5000			3.90 [99.1]	3.00 [76.2]	

32-1131



Series R02 button type smart sensors are designed for compression measurement applications in virtually every industry. Compact and rugged, Series R02 sensors are ideal for heavy duty applications with space constraints. Capacities available from 100 to 10,000 lbF [500 N to 50 kN]. Compatible with Mark-10 model 5i and 3i indicators (sold separately) through unique Plug & Test™ technology.



< Unique Plug & Test™ technology allows for interchangeable sensors to be used with a Mark-10 model 5i or 3i indicator. All calibration and configuration data is saved in the smart connector.

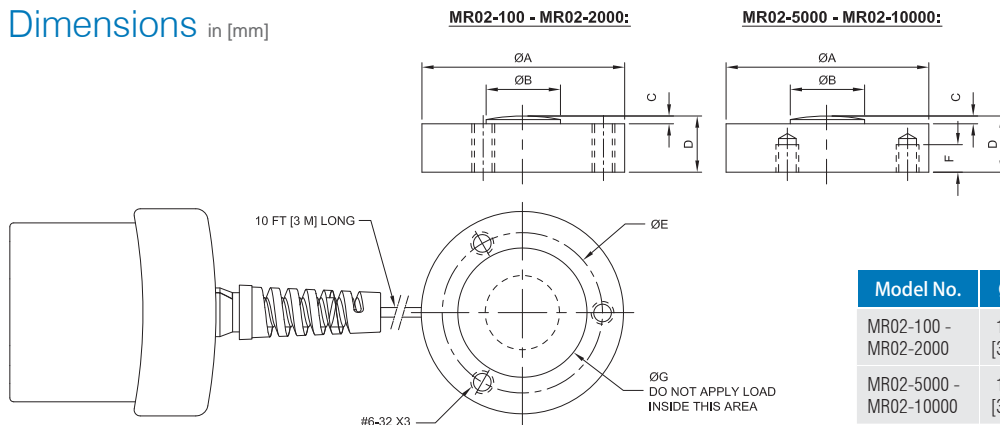


< The Plug & Test™ connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.

Specifications

Accuracy:	±0.5% of full scale + indicator
Safe Overload:	150% of full scale
Weight:	MR02-100 - MR02-2000: 0.3 lb [0.1 kg] MR02-5000-MR02-10000: 0.5 lb [0.2 kg]

Dimensions in [mm]



Model No.	ØA	ØB	C	D	ØE	F	ØG
MR02-100 - MR02-2000	1.23 [31.3]	0.32 [8.1]	0.05 [1.3]	0.39 [9.9]	1.0 [25.4]	THRU	0.83 [21.1]
MR02-5000 - MR02-10000	1.48 [37.6]	0.43 [10.9]	0.07 [1.8]	0.62 [15.8]	1.25 [31.8]	0.25 [6.4]	1.08 [27.4]

Capacity x Resolution

Model No.	Capacity x Resolution - with Model 5i indicator						Capacity x Resolution - with Model 3i indicator			
	lbF	ozF	gF	kgF	N	kN	lbF	kgF	N	kN
MR02-100	100 x 0.05	1600 x 1	50000 x 20	50 x 0.02	500 x 0.2	-	100 x 0.1	50 x 0.05	500 x 0.5	-
MR02-200	200 x 0.1	3200 x 2	-	100 x 0.05	1000 x 0.5	1 x 0.0005	200 x 0.2	100 x 0.1	1000 x 1	-
MR02-500	500 x 0.2	8000 x 5	-	250 x 0.1	2500 x 1	2.5 x 0.001	500 x 0.5	250 x 0.2	2500 x 2	-
MR02-1000	1000 x 0.5	16000 x 10	-	500 x 0.2	5000 x 2	5 x 0.002	1000 x 1	500 x 0.5	5000 x 5	-
MR02-2000	2000 x 1	32000 x 20	-	1000 x 0.5	10000 x 5	10 x 0.005	2000 x 2	1000 x 1	10000 x 10	-
MR02-5000	5000 x 2	-	-	2500 x 1	25000 x 10	25 x 0.01	5000 x 5	2500 x 2	-	25 x 0.02
MR02-10000	10000 x 5	-	-	5000 x 2	50000 x 25	50 x 0.02	10000 x 10	5000 x 5	-	50 x 0.05

32-1132

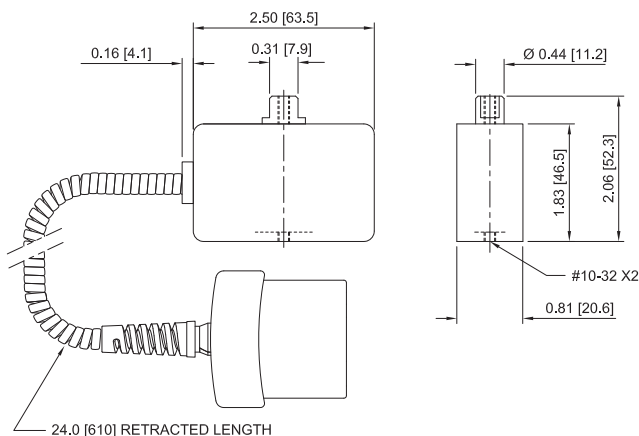


Series R03 smart sensors are designed for tension and compression measurement applications in virtually every industry. Threaded holes on two sides can accept a variety of hooks and implements, making this sensor particularly well suited for inline tests. Capacities available from 0.25 to 100 lbf [1 to 500 N]. Compatible with Mark-10 model 5i and 3i indicators (sold separately) through unique Plug & Test™ technology.

Specifications

Accuracy:	±0.15% of full scale + indicator
Safe Overload:	MR03-025 - MR03-2: 200% of full scale MR03-5 - MR03-100: 150% of full scale
Weight:	0.4 lb [0.2 kg]

Dimensions in [mm]



< Unique Plug & Test™ technology allows for interchangeable sensors to be used with a Mark-10 model 5i or 3i indicator. All calibration and configuration data is saved in the smart connector.



< The Plug & Test™ connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.



^ The load cell shaft includes flat surfaces as well as a threaded hole to accommodate attachments.



^ Optional AC1018 mounting kit adapts a Series R03 sensor to a Mark-10 test stand.

Optional Items

AC1018	Mounting kit, Series R01/R03 to test stand
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Capacity x Resolution

Model No.	Capacity x Resolution - with Model 5i indicator						Capacity x Resolution - with Model 3i indicator			
	lbf	ozF	gF	kgF	N	mN	lbf	gF	kgF	N
MR03-025	0.25 x 0.0001	4 x 0.002	100 x 0.05	-	1 x 0.0005	1000 x 0.5	0.25 x 0.0002	100 x 0.1	-	1 x 0.001
MR03-05	0.5 x 0.0002	8 x 0.005	250 x 0.1	-	2.5 x 0.001	2500 x 1	0.5 x 0.0005	250 x 0.2	-	2.5 x 0.002
MR03-2	2 x 0.001	32 x 0.02	1000 x 0.5	1 x 0.0005	10 x 0.005	-	2 x 0.002	-	1 x 0.001	10 x 0.01
MR03-5	5 x 0.002	80 x 0.05	2500 x 1	2.5 x 0.001	25 x 0.01	-	5 x 0.005	-	2.5 x 0.002	25 x 0.02
MR03-10	10 x 0.005	160 x 0.1	5000 x 2	5 x 0.002	50 x 0.02	-	10 x 0.01	-	5 x 0.005	50 x 0.05
MR03-20	20 x 0.01	320 x 0.2	10000 x 5	10 x 0.005	100 x 0.05	-	20 x 0.02	-	10 x 0.01	100 x 0.1
MR03-50	50 x 0.02	800 x 0.5	25000 x 10	25 x 0.01	250 x 0.1	-	50 x 0.05	-	25 x 0.02	250 x 0.2
MR03-100	100 x 0.05	1600 x 1	50000 x 20	50 x 0.02	500 x 0.5	-	100 x 0.1	-	50 x 0.05	500 x 0.5

32-1133

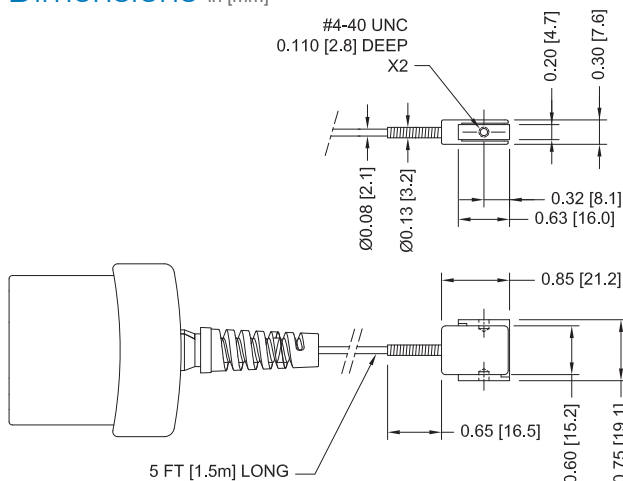


Series R04 smart sensors are designed for tension and compression measurement applications with tight space constraints. These extremely compact force sensors feature threaded holes on two sides, which can accept a variety of hooks and implements. Capacities available from 0.25 to 100 lbF [1 to 500 N]. Compatible with Mark-10 model 5i and 3i indicators (sold separately) through unique Plug & Test™ technology.

Specifications

Accuracy:	±0.2% of full scale + indicator
Safe Overload:	200% of full scale
Weight:	0.015 lb [0.007 kg]

Dimensions in [mm]



< Unique Plug & Test™ technology allows for interchangeable sensors to be used with a Mark-10 model 5i or 3i indicator. All calibration and configuration data is saved in the smart connector.



< The Plug & Test™ connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.



< Force is applied to these surfaces. Threaded holes are supplied on both sides to accommodate various mounting configurations and attachments.

Capacity x Resolution

Model No.	Capacity x Resolution - with Model 5i indicator						Capacity x Resolution - with Model 3i indicator			
	lbF	ozF	gF	kgF	N	mN	lbF	gF	kgF	N
MR04-025	0.25 x 0.0001	4 x 0.002	100 x 0.05	-	1 x 0.0005	1000 x 0.5	0.25 x 0.0002	100 x 0.1	-	1 x 0.001
MR04-05	0.5 x 0.0002	8 x 0.005	250 x 0.1	-	2.5 x 0.001	2500 x 1	0.5 x 0.0005	250 x 0.2	-	2.5 x 0.002
MR04-2	2 x 0.001	32 x 0.02	1000 x 0.5	1 x 0.0005	10 x 0.005	-	2 x 0.002	-	1 x 0.001	10 x 0.01
MR04-5	5 x 0.002	80 x 0.05	1000 x 0.5	2.5 x 0.001	25 x 0.01	-	5 x 0.005	-	2.5 x 0.002	25 x 0.02
MR04-10	10 x 0.005	160 x 0.1	5000 x 2	5 x 0.002	50 x 0.02	-	10 x 0.01	-	5 x 0.005	50 x 0.05
MR04-20	20 x 0.01	320 x 0.2	10000 x 5	10 x 0.005	100 x 0.05	-	20 x 0.02	-	10 x 0.01	100 x 0.1
MR04-50	50 x 0.02	800 x 0.5	25000 x 10	25 x 0.01	250 x 0.1	-	50 x 0.05	-	25 x 0.02	250 x 0.2
MR04-100	100 x 0.05	1600 x 1	50000 x 20	50 x 0.02	500 x 0.5	-	100 x 0.1	-	50 x 0.05	500 x 0.5



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Specifications subject to change without prior notice

32-1134



Series R05 fully enclosed smart sensors are designed for pull / push measurements. Useful in ergonomics testing, workplace safety testing, and general lifting or tension / compression requirements. Threaded holes are supplied to accommodate various mounting configurations and attachments. For up to 500 lbF [2,500 N]. Compatible with Mark-10 model 5i and 3i indicators (sold separately) through unique Plug & Test™ technology.

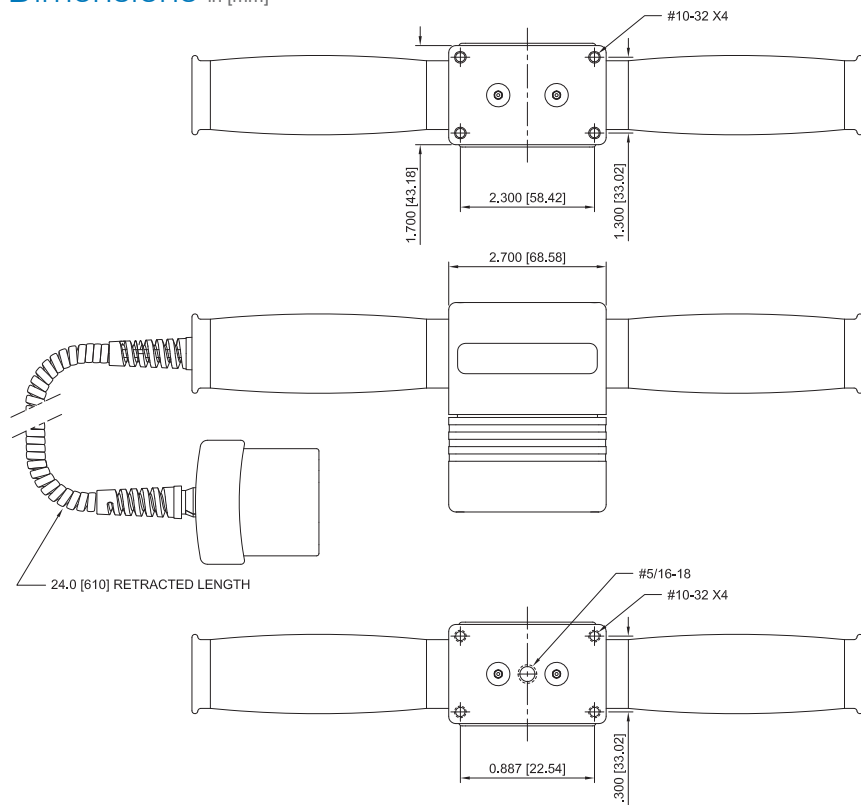


< Unique Plug & Test™ technology allows for interchangeable sensors to be used with a Mark-10 model 5i or 3i indicator. All calibration and configuration data is saved in the smart connector.



< The Plug & Test™ connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.

Dimensions in [mm]



^ A Series R05 sensor is shown in a typical pull testing application. Chain is not included.

Specifications

Accuracy:	±0.15% of full scale + indicator
Safe Overload:	150% of full scale
Weight:	2.0 lb [0,9 kg]

Capacity x Resolution

Model No.	Capacity x Resolution - with Model 5i indicator					Capacity x Resolution - with Model 3i indicator		
	lbF	ozF	kgF	N	kN	lbF	kgF	N
MR05-500	500 x 0.2	8000 x 5	250 x 0.1	2500 x 1	2.5 x 0.001	500 x 0.5	250 x 0.2	2500 x 2



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Specifications subject to change without prior notice

32-1135

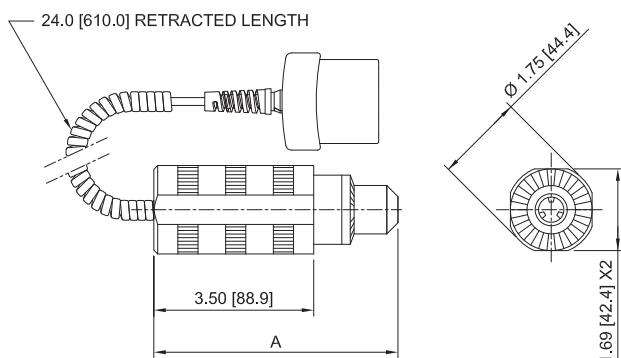


Series R50 smart sensors measure bi-directional torque for a wide variety of applications across virtually all industries. Contain a chuck for up to 0.5 in [12.7 mm] diameter samples, bits, or fixtures. The sensors can be used as hand held devices, or mounted to a test stand. Capacities available from 10 ozFin to 100 lbFin [7 to 1150 Ncm]. Compatible with Mark-10 model 5i and 3i indicators (sold separately) through unique Plug & Test™ technology.

Specifications

Accuracy:	±0.35% of full scale + indicator
Chuck opening range:	MR50-10Z - MR50-50Z: 0.062 - 0.375 in [1.6 - 9.5 mm] MR50-12 - MR50-100: 0.078 - 0.5 in [2.0 - 12.7 mm]
Safe Overload:	MR50-10Z - MR50-50Z: 300% of full scale MR50-12 - MR50-100: 150% of full scale
Weight:	From 1.4 lb [0.6 kg]

Dimensions in [mm]



Capacity x Resolution

Model No.	Capacity x Resolution - with Model 5i indicator								Capacity x Resolution - with Model 3i indicator			
	ozFin	lbFin	lbFft	gFcm	kgFmm	Nmm	Ncm	Nm	ozFin	lbFin	kgFmm	Ncm
MR50-10Z	10 x 0.005	-	-	700 x 0.5	7 x 0.005	70 x 0.05	7 x 0.005	-	10 x 0.01	-	7 x 0.005	7 x 0.005
MR50-20Z	20 x 0.01	-	-	1400 x 1	14 x 0.01	140 x 0.1	14 x 0.01	-	20 x 0.02	-	14 x 0.01	14 x 0.01
MR50-50Z	50 x 0.02	-	-	3600 x 2	36 x 0.02	350 x 0.2	35 x 0.02	-	50 x 0.05	-	36 x 0.05	35 x 0.05
MR50-12	-	12 x 0.005	1 x 0.0005	-	140 x 0.1	-	135 x 0.1	1.35 x 0.001	-	12 x 0.01	140 x 0.1	135 x 0.1
MR50-50	-	50 x 0.02	4 x 0.002	-	580 x 0.5	-	570 x 0.5	5.7 x 0.005	-	50 x 0.05	580 x 0.5	570 x 0.5
MR50-100	-	100 x 0.05	8 x 0.005	-	1150 x 0.5	-	1150 x 0.5	11.5 x 0.005	-	100 x 0.1	1150 x 1	1150 x 1



< Unique Plug & Test™ technology allows for interchangeable sensors to be used with a Mark-10 model 5i or 3i indicator. All calibration and configuration data is saved in the smart connector.



< The Plug & Test™ connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.



^ Optional AC1007 tabletop mounting kit may be used to hold the sensor in place.



^ A Series R50 torque sensor is shown mounted to a model TSTM motorized torque test stand. The sensor fits into the stand without the need for additional adapters.

Model No.	A
MR50-10Z - MR50-50Z	4.82 [122.4]
MR50-12 - MR50-100	5.19 [131.8]

Optional Items

AC1007	Mounting kit, Series R50, table top
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32-1136

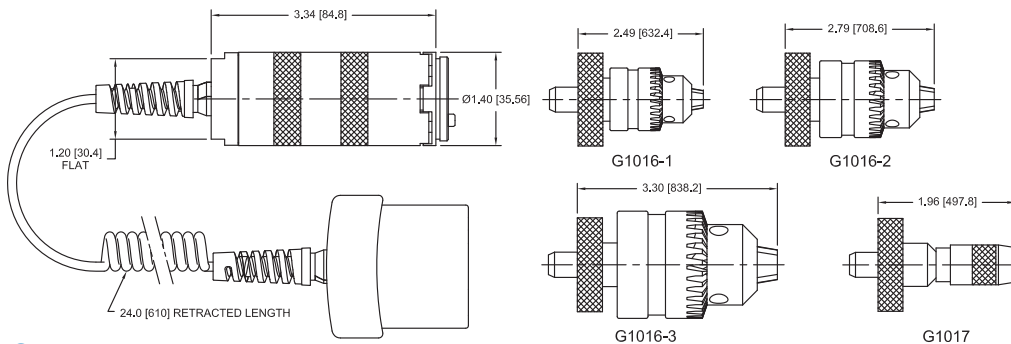


Series R51 smart sensors measure bi-directional torque for a wide variety of applications across virtually all industries. Interchangeable chucks and bit holder add flexibility for a variety of applications. The sensors can be used as hand held devices or mounted to a test stand. Superb overload protection adds peace of mind. Capacities available from 10 ozFin to 100 lbFin [7 to 1150 Ncm]. Compatible with Mark-10 model 5i and 3i indicators (sold separately) through unique Plug & Test™ technology.

Specifications

Accuracy:	±0.2% of full scale + indicator
Chuck opening range:	G1016-1: 0.028 - 0.25 in [0.7 - 6.3 mm] G1016-2: 0.062 - 0.375 in [1.6 - 9.5 mm] G1016-3: 0.078 - 0.5 in [2.0 - 12.7 mm] G1017: 0.25 in [6.3 mm] hex
Safe Overload:	MR51-10Z - MR51-50Z: 300% of full scale MR51-12 - MR51-100: 150% of full scale
Weight:	From 1.4 lb [0.6 kg]

Dimensions in [mm]



Capacity x Resolution

Model No.	Capacity x Resolution - with Model 5i indicator								Capacity x Resolution - with Model 3i indicator			
	ozFin	lbFin	lbFft	gFcm	kgFmm	Nmm	Ncm	Nm	ozFin	lbFin	kgFmm	Ncm
MR51-10Z	10 x 0.005	-	-	700 x 0.5	7 x 0.005	70 x 0.05	7 x 0.005	-	10 x 0.01	-	7 x 0.005	7 x 0.005
MR51-20Z	20 x 0.01	-	-	1400 x 1	14 x 0.01	140 x 0.1	14 x 0.01	-	20 x 0.02	-	14 x 0.01	14 x 0.01
MR51-50Z	50 x 0.02	-	-	3600 x 2	36 x 0.02	350 x 0.2	35 x 0.02	-	50 x 0.05	-	36 x 0.05	35 x 0.05
MR51-12	-	12 x 0.005	1 x 0.0005	-	140 x 0.1	-	135 x 0.1	1.35 x 0.001	-	12 x 0.01	140 x 0.1	135 x 0.1
MR51-50	-	50 x 0.02	4 x 0.002	-	580 x 0.5	-	570 x 0.5	5.7 x 0.005	-	50 x 0.05	580 x 0.5	570 x 0.5
MR51-100	-	100 x 0.05	8 x 0.005	-	1150 x 0.5	-	1150 x 0.5	11.5 x 0.005	-	100 x 0.1	1150 x 1	1150 x 1



< Unique Plug & Test™ technology allows for interchangeable sensors to be used with a Mark-10 model 5i or 3i indicator. All calibration and configuration data is saved in the smart connector.

< The Plug & Test™ connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.



^ A Series R51 torque sensor is shown mounted to a model TSTM motorized torque test stand using optional AC1015 mounting kit.



^ Series R51 feature unique interchangeability with three chuck attachment sizes as well as a bit holder. The attachment is mated to the main sensor body with a pin, while a threaded ring holds the attachment in place.

Optional Items

G1016-1	Jacobs chuck for R51, 0.028 - 0.25 in
G1016-2 *	Jacobs chuck for R51, 0.062 - 0.375 in
G1016-3 *	Jacobs chuck for R51, 0.078 - 0.5 in
G1017	Bit holder for R51, 0.25 in
AC1015	Mounting kit, R51 to torque test stand

* Due to the increased possibility of overload, these attachments are recommended for use only with an MR51-12 or higher capacity model.



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32-1137

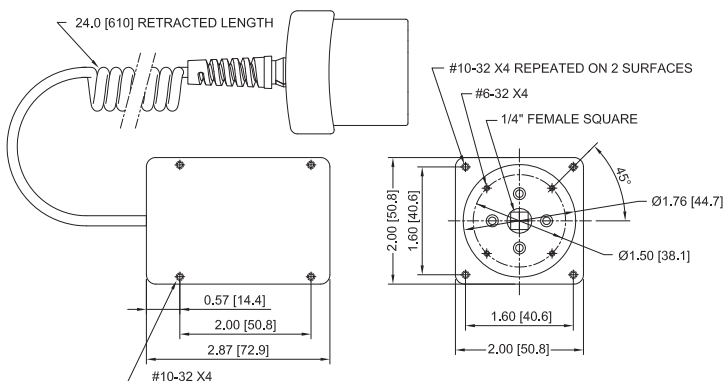


Series R52 smart sensors measure bi-directional torque for a wide variety of applications across virtually all industries. Calibrate torque tools, or use these sensors as components of a torque testing system. Tapped holes on every surface allow for easy mounting to a work bench or fixture. Capacities available from 10 ozFin to 100 lbFin [7 to 1150 Ncm]. Compatible with Mark-10 model 5i and 3i indicators (sold separately) through unique Plug & Test™ technology.

Specifications

Accuracy:	±0.35% of full scale + indicator
Safe Overload:	MR52-10Z - MR52-50Z: 300% of full scale MR52-12 - MR52-100: 150% of full scale
Weight:	1.2 lb [0.5 kg]

Dimensions in [mm]



< Unique Plug & Test™ technology allows for interchangeable sensors to be used with a Mark-10 model 5i or 3i indicator. All calibration and configuration data is saved in the smart connector.



< The Plug & Test™ connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.



^ Series R52 torque sensors include threaded holes on all surfaces for flexibility in a variety of mounting configurations. Shown above with the optional AC1006 tabletop mounting kit.



^ A Series R52 torque sensor is shown with the optional AC1014 Jacobs chuck attachment.

Optional Items

AC1006	Mounting kit, tabletop, Series R52
AC1014	3/8" Jacobs chuck, Series R52

Capacity x Resolution

Model No.	Capacity x Resolution - with Model 5i indicator								Capacity x Resolution - with Model 3i indicator			
	ozFin	lbFin	lbFft	gFcm	kgFmm	Nmm	Ncm	Nm	ozFin	lbFin	kgFmm	Ncm
MR52-10Z	10 x 0.005	-	-	700 x 0.5	7 x 0.005	70 x 0.05	7 x 0.005	-	10 x 0.01	-	7 x 0.005	7 x 0.005
MR52-20Z	20 x 0.01	-	-	1400 x 1	14 x 0.01	140 x 0.1	14 x 0.01	-	20 x 0.02	-	14 x 0.01	14 x 0.01
MR52-50Z	50 x 0.02	-	-	3600 x 2	36 x 0.02	350 x 0.2	35 x 0.02	-	50 x 0.05	-	36 x 0.05	35 x 0.05
MR52-12	-	12 x 0.005	1 x 0.0005	-	140 x 0.1	-	135 x 0.1	1.35 x 0.001	-	12 x 0.01	140 x 0.1	135 x 0.1
MR52-50	-	50 x 0.02	4 x 0.002	-	580 x 0.5	-	570 x 0.5	5.7 x 0.005	-	50 x 0.05	580 x 0.5	570 x 0.5
MR52-100	-	100 x 0.05	8 x 0.005	-	1150 x 0.5	-	1150 x 0.5	11.5 x 0.005	-	100 x 0.1	1150 x 1	1150 x 1



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Series R53 smart sensors measure bi-directional bottle cap torque and other applications in the food and beverage, cosmetics, consumer products, and other industries. Adjustable posts accommodate a range of sample sizes, while alternative gripping attachments (high capacities only) accommodate unique shapes. Capacities available from 10 ozFin to 100 lbFin [7 to 1150 Ncm]. Compatible with Mark-10 model 5i and 3i indicators (sold separately) through unique Plug & Test™ technology.

Specifications

Accuracy:	±0.7% of full scale + indicator
Safe Overload:	MR53-10Z - MR53-50Z: 300% of full scale MR53-12 - MR53-100: 150% of full scale
Weight:	MR53-10Z - MR53-50Z: 2.2 lb [1.0 kg] MR53-12 - MR53-100: 5.4 lb [2.5 kg]

Optional Items

CT001	Flat jaws, pair, for MR53-12 - MR53-100
CT003	Adjustable jaws, pair, for MR53-12 - MR53-100



< Unique Plug & Test™ technology allows for interchangeable sensors to be used with a Mark-10 model 5i or 3i indicator. All calibration and configuration data is saved in the smart connector.



< The Plug & Test™ connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.



^ Low capacity Series R53 torque sensor is shown in a cosmetic packaging test.



^ Higher capacity Series R53 torque sensors accommodate larger sample sizes, as shown in the beverage closure application above.



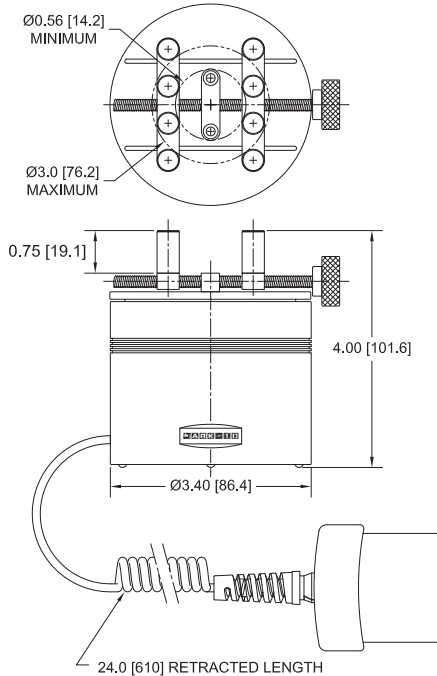
^ Optional CT001 flat rubber jaws are ideal for square or odd shaped samples.



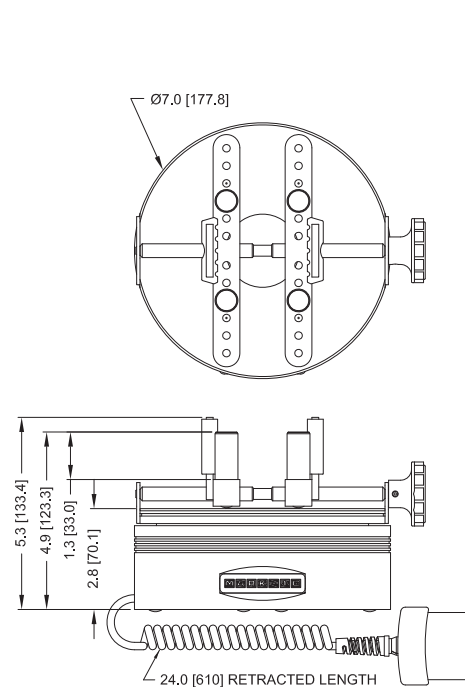
^ Optional CT003 adjustable jaws include 4 rubber-edged gripping arms per jaw. Arms may be independently repositioned in 45° increments to accommodate unique samples.

Dimensions in [mm]

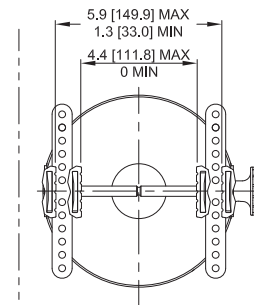
MR53-10Z - MR53-50Z



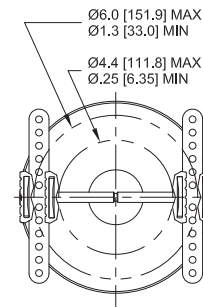
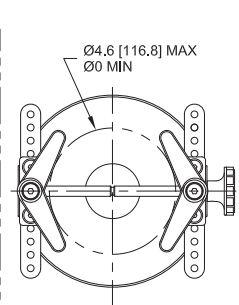
MR53-12 - MR53-100



WITH OPTIONAL FLAT JAWS:



WITH OPTIONAL ADJUSTABLE JAWS:



Capacity x Resolution

Model No.	Capacity x Resolution - with Model 5i indicator								Capacity x Resolution - with Model 3i indicator			
	ozFin	lbFin	lbFft	gFcm	kgFmm	Nmm	Ncm	Nm	ozFin	lbFin	kgFmm	Ncm
MR53-10Z	10 x 0.01	-	-	700 x 0.5	7 x 0.005	70 x 0.05	7 x 0.005	-	10 x 0.01	-	7 x 0.005	7 x 0.005
MR53-20Z	20 x 0.02	-	-	1400 x 1	14 x 0.01	140 x 0.1	14 x 0.01	-	20 x 0.02	-	14 x 0.01	14 x 0.01
MR53-50Z	50 x 0.05	-	-	3600 x 5	36 x 0.05	350 x 0.5	35 x 0.05	-	50 x 0.05	-	36 x 0.05	35 x 0.05
MR53-12	-	12 x 0.01	1 x 0.001	-	140 x 0.1	-	135 x 0.1	1.35 x 0.001	-	12 x 0.01	140 x 0.1	135 x 0.1
MR53-50	-	50 x 0.05	4 x 0.005	-	580 x 0.5	-	570 x 0.5	5.7 x 0.005	-	50 x 0.05	580 x 0.5	570 x 0.5
MR53-100	-	100 x 0.1	8 x 0.01	-	1150 x 1	-	1150 x 1	11.5 x 0.01	-	100 x 0.1	1150 x 1	1150 x 1

32-1139

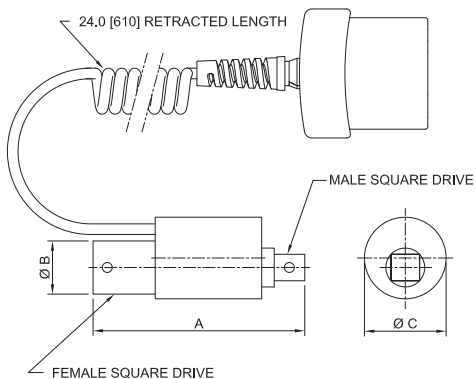


Series R54 smart sensors measure bi-directional torque for a wide variety of applications across virtually all industries. Convert any wrench to a torque tool with this sensor, or use it as a component of a torque testing system. Capacities available from 20 to 5,000 lbFin [2 to 550 Nm]. Compatible with Mark-10 model 5i and 3i indicators (sold separately) through unique Plug & Test™ technology.

Specifications

Accuracy:	±0.6% of full scale + indicator
Safe Overload:	150% of full scale
Weight:	0.6 - 2.0 lb [0.3 - 0.9 kg], depending on model

Dimensions in [mm]



Model No.	A	ØB	ØC	Drive Size
MR54-20 - MR54-100	1.88 [47.8]	0.56 [14.2]	1.00 [25.4]	1/4"
MR54-200 - MR54-400	3.00 [76.2]	0.73 [18.5]	1.12 [28.6]	3/8"
MR54-1000	3.50 [88.9]	0.98 [24.9]	20.0 [508.0]	1/2"
MR54-5000	5.00 [127.0]	1.48 [37.6]	2.0 [50.8]	3/4"

Capacity x Resolution

Model No.	Capacity x Resolution - with Model 5i indicator					Capacity x Resolution - with Model 3i indicator		
	lbFin	lbFft	kgFmm	Ncm	Nm	lbFin	kgFmm	Ncm
MR54-20	20 x 0.02	1.5 x 0.002	230 x 0.2	220 x 0.2	2 x 0.002	20 x 0.02	230 x 0.2	220 x 0.2
MR54-50	50 x 0.05	4 x 0.005	580 x 0.5	570 x 0.5	5.7 x 0.005	50 x 0.05	580 x 0.5	570 x 0.5
MR54-100	100 x 0.1	8 x 0.01	1150 x 1	1150 x 1	11.5 x 0.01	100 x 0.1	1150 x 1	1150 x 1
MR54-200	200 x 0.2	16 x 0.02	2300 x 2	2200 x 2	22 x 0.02	200 x 0.2	2300 x 2	2200 x 2
MR54-400	400 x 0.5	32 x 0.05	4600 x 5	4500 x 5	45 x 0.05	400 x 0.5	4600 x 5	4500 x 5
MR54-1000	1000 x 1	80 x 0.1	11500 x 10	11000 x 10	110 x 0.1	1000 x 1	11500 x 10	11000 x 10
MR54-5000	5000 x 5	400 x 0.5	55 x 0.05 kgFm	55000 x 50	550 x 0.5	5000 x 5	55 x 0.05 kgFm	550 x 0.5 Nm



< Unique Plug & Test™ technology allows for interchangeable sensors to be used with a Mark-10 model 5i or 3i indicator. All calibration and configuration data is saved in the smart connector.



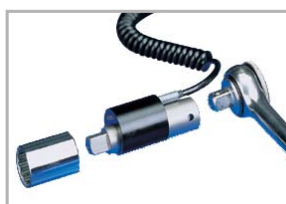
< The Plug & Test™ connector locks into the receptacle in the indicator when fully inserted. Dual buttons on the indicator housing release the connector for easy removal. Gold plated spring contacts ensure long lasting and reliable connection.



^ Optional AC1010 mounting kit is used to hold an MR54-200 or MR54-400 sensor in place.



^ Optional AC1016 mounting kit mounts an MR54-200 or MR54-400 sensor to a torque test stand.



< A Series R54 sensor is shown set up for a typical torque wrench testing application.

Optional Items

AC1010	Mounting kit, tabletop, MR54-200 - MR54-400
AC1016	Mounting kit, MR54-200 - MR54-400 to torque test stand



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