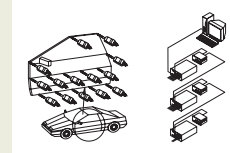


Linear Gauge Application Examples Page 379



SENSORPAK Page 380



Digimatic and Incremental Linear Gauge Page 381



Counters and Display Units Page 392



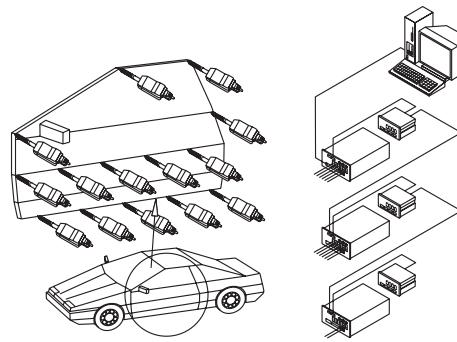
Mu-Checker Page 397

Motorized Low Force High Precision Gauges LITEMATIC Page 399

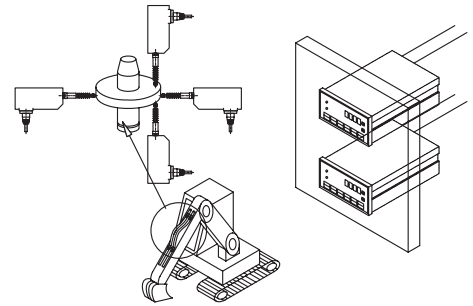


Linear Gauge Application Examples

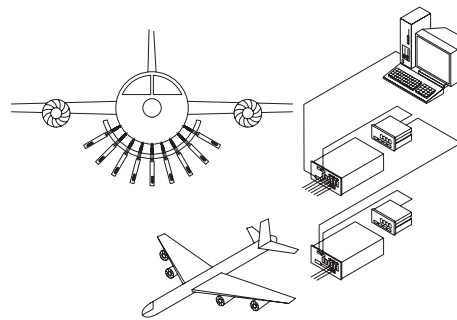
Linear Gage Applications



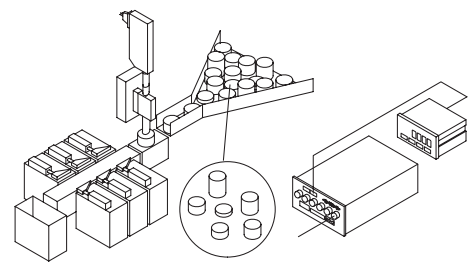
Multi-point measurement on car doors



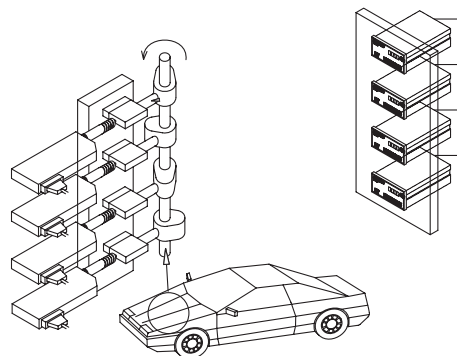
Dimensional measurement of fluid flywheels



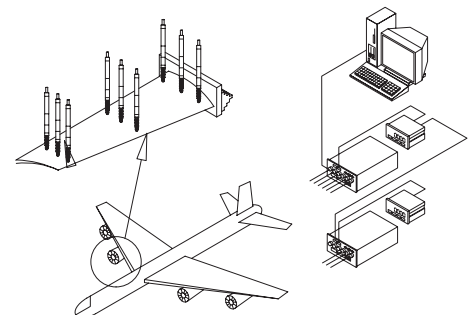
Measurement of aeroplane body deformation



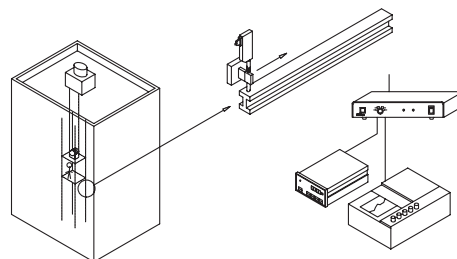
Sorting of parts according to size



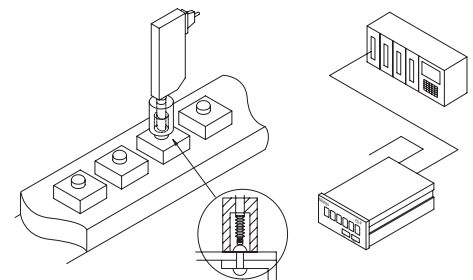
Cam measurement



Multi-point measurement on turbine blades



Measurement of deflection of lift guiding rails



Rivet head testing

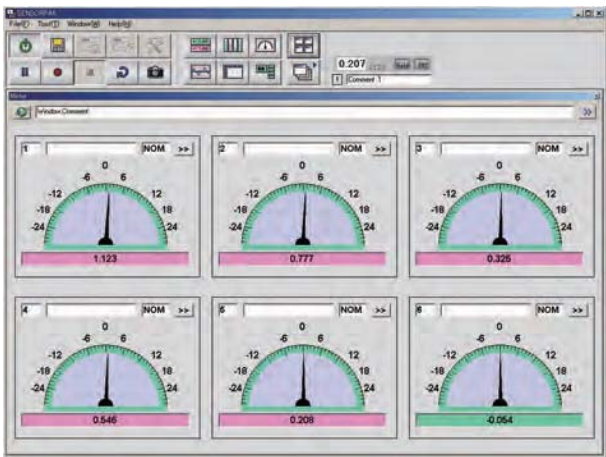
SENSORPAK

The SENSORPAK supports the development of measuring facilities and measuring stations. It offers you the following benefits:

- It can simultaneously display measurement values from up to 60 sensors in real time.
- You can make calculations using measurement values from up to 30 sensors in real time.
- It enables a huge range of different graphical presentations of using measurement, such as number representation, pointer representation, scale representation.
- Data registration can be made in control cards or data tables.
- You can also carry out further data processing with external software, such as Microsoft® Excel® or MeasurLink.



Measurement screen



Meter screen

Model	SENSORPAK
No.	02NGB072
Output function	Direct output to Microsoft® Excel® spreadsheet, CSV file output (compatible with MeasurLink)
Calculation function	Calculation items : Sum, difference, total, average, maximum, minimum, range (maximum-minimum), calculation with a constant. Connectable gauges : Max. 30 calculation items (between desired gauges)
Total tolerance judgement	GO/NG judgement (by specifying gauges to be used for total tolerance judgement) GO/NG signal output with optional I/O cable
Input function	Trigger function : by means of keys timer or external TRG (with optional I/O cable) Data input frequency : Max. 9999 times (with 60 gages connected) to 60000 times (with 6 gages connected)
Applicable counter types	Counters with RS-232C interface (EH and EV), with USB interface (EH)
Display	Display type : Counter, bar graph, meter, chart (capable of simultaneous display) Tolerance judgement result : Color display (green/red) Connectable gauges : Max. 60 gages

Specifications

OS compatibility	Windows® 7 (32/64 bit) Windows® 8. 1 (32/64 bit) Excel® 2007, 2010, 2013
Delivered	License Key, Software CD

Optional accessories

No.	Description
12AAA807D	RS-232C cable (2m)

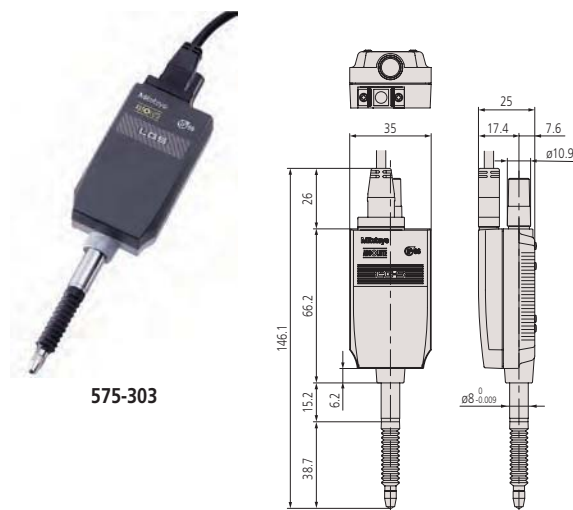
ABSOLUTE Digimatic Linear Gauge LGS Series



Series 575

The LGS is a compact ABS linear gauge that offers you the following benefits:

- Its ABSOLUTE Digimatic data output and IP-66 protection class give you best-of-breed technology.



Metric

No.	Range [mm]	Measuring force *1	Stem Ø	Accuracy	Direction of counting	Mass [g]
575-303	0-12,7	2 N/1,8 N/1,6 N	8 mm	15 µm	positive	190
575-304	0-12,7	2 N/1,8 N/1,6 N	8 mm	15 µm	negative	190

*1 Spindle DOWN/Horizontal/UP



Specifications

Scale	Electrostatic capacitance-type ABSOLUTE linear encoder
Max. response speed	Unlimited (measuring by scanning cannot be performed)
Contact point	Ø3 mm carbide ball thread : M 2,5 x 0,45 mm
Cable length	2 m
Digital step	0,01 mm
Output signal	Digimatic
Environmental conditions	0 °C to 40 °C (20 % to 80 % rel. humidity, no condensation)
Bearing type	Slide bearing

Optional accessories

No.	Description
02ADF640	Digimatic cable extension adapter
936937	Digimatic cable (1 m)
965014	Digimatic cable (2 m)
903594	Pneumatic drive
011318	DMX-8/2 8 channel interface
011191	DMX-16 16 channel interface
011255	DMX-16C 16 channel interface with microprocessors
542-007D	EC-Counter Display
542-016	EG-Counter Display
542-093-2	EB-Counter Display
542-072D	EH-Counter Display
542-064	EV-Counter Display

Consumable spares

No.	Description
901312	Standard contact point
238774	Silicon rubber boot



02ADF640

Specifications

Throttle	Interior Ø 2,5 mm Exterior Ø 3,2 mm
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Optional accessories

No.	Description
903594	Pneumatic drive

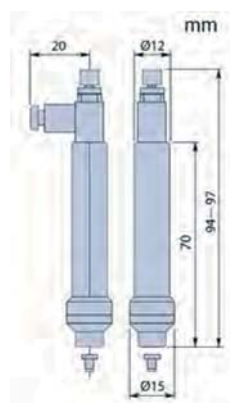


Refer to the Linear Gauge documentation for more details

Air Drive Unit

- Provides smooth lifting and lowering of the contact point of a gauge by pneumatic cylinder.
- The speed of lift can be regulated by the throttle on the remote cylinder.

No.	Range [mm]	Remarks	Suitable for gage model	Air supply [MPa]	Mass [g]
903594	10	Need air filter, regulator and lubricator	LGS	0,5	60



903594

Series 575

- Suitable for installation in machines, measuring devices and multi-position measurements.
- You can output data in Digimatic format, so you can document and determine measurement values via connected Digimatic data processing units and interface.

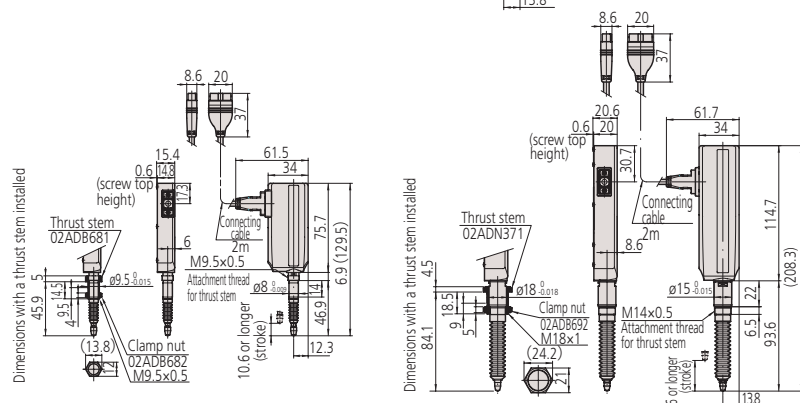
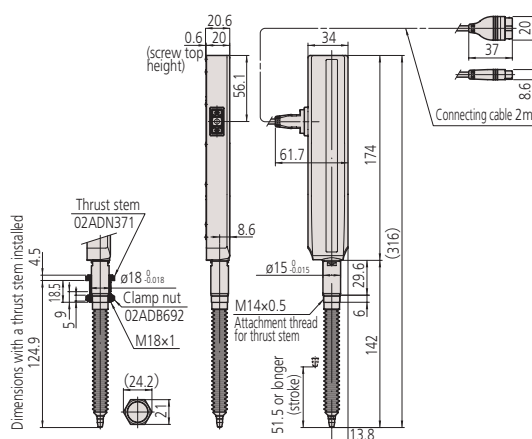


575-326

Metric

No.	Range [mm]	Measuring force *1	Stem Ø	Accuracy	Cable length [m]	Mass [g]
575-326	0-10	1,2 N/1,1 N/1 N	8 mm	20 µm	2	260
575-326-3	0-10	1,2 N/1,1 N/1 N	8 mm	20 µm	3	310
575-326-5	0-10	1,2 N/1,1 N/1 N	8 mm	20 µm	5	360
575-326-7	0-10	1,2 N/1,1 N/1 N	8 mm	20 µm	7	410
575-327	0-25	4,6 N/4,3 N/4 N	15 mm	20 µm	2	300
575-327-3	0-25	4,6 N/4,3 N/4 N	15 mm	20 µm	3	350
575-327-5	0-25	4,6 N/4,3 N/4 N	15 mm	20 µm	5	400
575-327-7	0-25	4,6 N/4,3 N/4 N	15 mm	20 µm	7	450
575-328	0-50	5,7 N/5,3 N/4,9 N	15 mm	30 µm	2	400
575-328-3	0-50	5,7 N/5,3 N/4,9 N	15 mm	30 µm	3	450
575-328-5	0-50	5,7 N/5,3 N/4,9 N	15 mm	30 µm	5	500
575-328-7	0-50	5,7 N/5,3 N/4,9 N	15 mm	30 µm	7	550

*1 Spindle DOWN/Horizontal/UP



Specifications

Scale	Electrostatic capacitance-type ABSOLUTE linear encoder
Max. response speed	Unlimited (measurement by scanning cannot be performed)
Contact point	Ø3 mm carbide ball, thread: M 2,5 x 0,45
Digital step	0,01 mm
Output signal	Digimatic
Environmental conditions	0 °C to 40 °C (20 % to 80 % rel. humidity, no condensation)
External input	Origin-setting signal
Bearing type	Linear ball bearing

Standard accessories

No.	Description
538610	Wrench for contact point (for 10 mm range models)
04GAA857	Wrench for contact point (for 25/50 mm range models)

Optional accessories

No.	Description
02ADF640	Digimatic cable extension adapter
936937	Digimatic cable (1 m)
965014	Digimatic cable (2 m)
02ADB680	Fixing set Ø 9,5 mm (for 10 mm model)
02ADN370	Fixing set Ø 18 mm (for 25/50 mm models)
02ADE230	10 mm pneumatic drive
02ADE250	25 mm pneumatic drive
02ADE270	50 mm pneumatic drive
011318	DMX-8/2 8 channel interface
011191	DMX-16 16 channel interface
011255	DMX-16C 16 channel interface with microprocessors
542-007D	EC-Counter Display
542-016	EG-Counter Display
542-093-2	EB-Counter Display
542-072D	EH-Counter Display
542-064	EV-Counter Display

Consumable spares

No.	Description
901312	Standard contact point
238772	10 mm rubber boot
962504	25 mm rubber boot
962505	50 mm rubber boot



02ADF640



Refer to the [Linear Gauge](#) documentation for more details

Specifications

Scale	Photoelectric linear encoder
Contact point	Ø3 mm carbide ball, thread: M 2,5 x 0,45
Cable length	2 m
Power supply	5 V (4,8 V to 5,2 V), 120 mA max.
Output signal	90° phase difference, differential square wave (RS-422A equivalent), minimum edge distance 1000 ns (5 µm type), 500 ns (1 µm type), 250 ns (0,5 µm type), 200 ns (0,1 µm type)
Environmental conditions	0 °C to 40 °C (20 % to 80 % rel. humidity, no condensation)
Bearing type	Linear ball bearing

Standard accessories

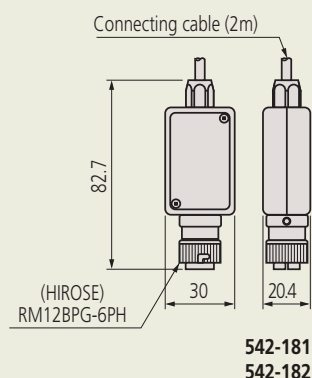
No.	Description
538610	Wrench for contact point (for 10 mm range models)
04GAA857	Wrench for contact point (for 25/50 mm range models)

Optional accessories

No.	Description
902432	Extension cable (20 m)
902433	Extension cable (10 m)
902434	Extension cable (5 m)
02ADB680	Fixing set Ø 9,5 mm (for 10 mm model)
02ADN370	Fixing set Ø 18 mm (for 25/50 mm models)
02ADE230	10 mm pneumatic drive
02ADE250	25 mm pneumatic drive
02ADE270	50 mm pneumatic drive
542-015	EG-Counter Display
542-092-2	EB-Counter Display
542-075D	EH-Counter Display
542-071D	EH-Counter Display
542-063	EV-Counter Display

Consumable spares

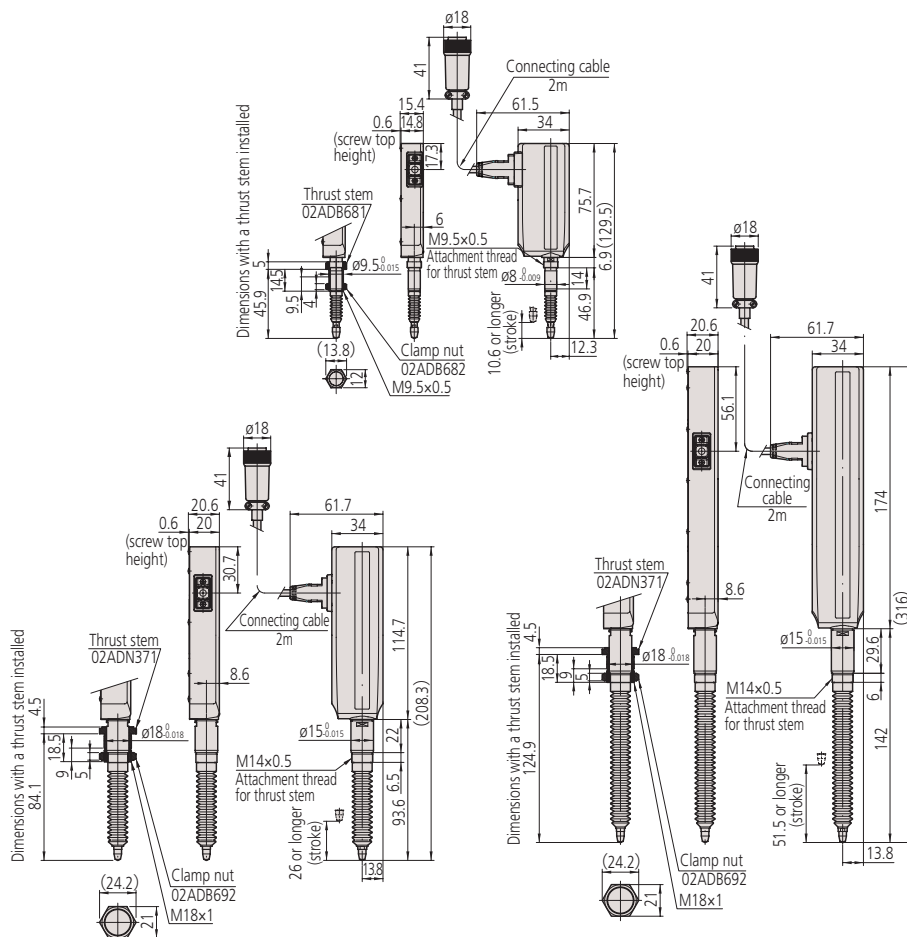
No.	Description
901312	Standard contact point
238772	10 mm rubber boot
962504	25 mm rubber boot
962505	50 mm rubber boot



542-161

No.	Range [mm]	Measuring force *1	Resolution [mm]	Stem Ø	Max. response speed	Accuracy	Signal pitch [µm]	Mass [g]
542-612	0-25	4,6/4,3/4 N	0,005	15 mm	1500 mm/s	(7,5 + L/50) µm/s	20	300
542-613	0-50	5,7/5,3/4,9 N	0,005	15 mm	1500 mm/s	(7,5 + L/50) µm/s	20	400
542-161	0-10	1,2/1,1/1 N	0,001	8 mm	1500 mm/s	(1,5 + L/50) µm/s	4	260
542-162	0-25	4,6/4,3/4 N	0,001	15 mm	1500 mm/s	(1,5 + L/50) µm/s	4	300
542-163	0-50	5,7/5,3/4,9 N	0,001	15 mm	1500 mm/s	(1,5 + L/50) µm/s	4	400
542-171	0-10	1,2/1,1/1 N	0,0005	8 mm	1500 mm/s	(1,5 + L/50) µm/s	2	260
542-172	0-25	4,6/4,3/4 N	0,0005	15 mm	1500 mm/s	(1,5 + L/50) µm/s	2	300
542-173	0-50	5,7/5,3/4,9 N	0,0005	15 mm	1500 mm/s	(1,5 + L/50) µm/s	2	400
542-181	0-10	1,2/1,1/1 N	0,0001	8 mm	400 mm/s	(0,8 + L/50) µm/s	0,4	310
542-182	0-25	4,6/4,3/4 N	0,0001	15 mm	400 mm/s	(0,8 + L/50) µm/s	0,4	350

*1 Spindle DOWN/Horizontal/UP



Linear Gauge with Reference Point LGF-Z Series

Series 542

This is a very robust and economical linear gauge with a reference Point that offers you the following benefits:

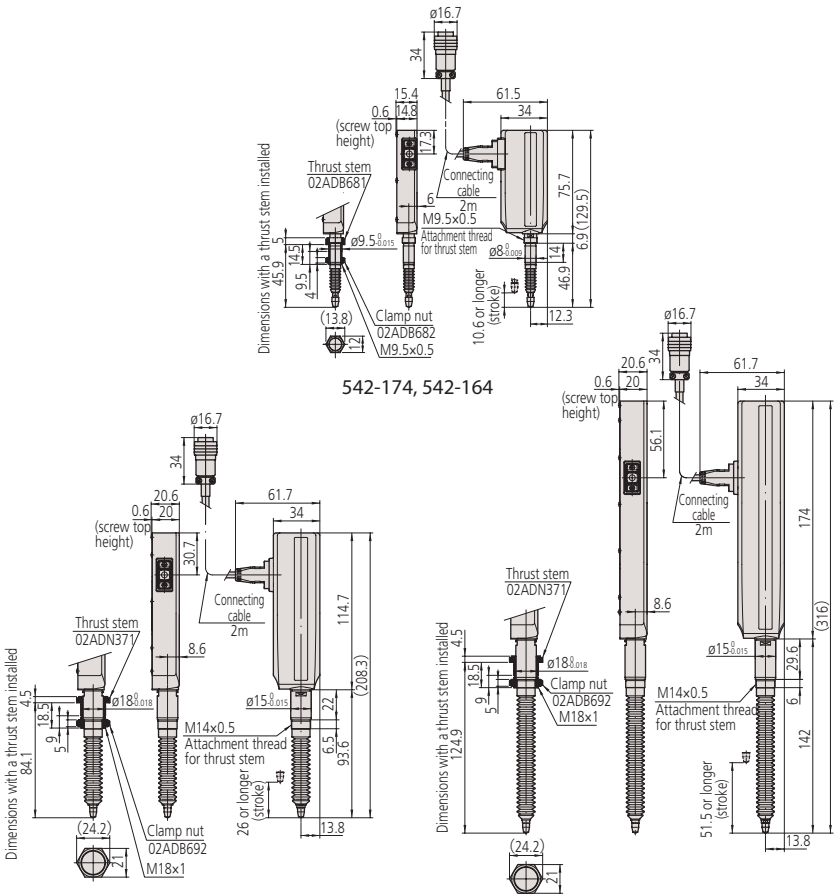
- The advanced construction of the plunger guidance assembly makes it very resistant to external shocks and vibration.
- Its differential square-wave signal output allows you to use it for a wide range of applications.
- It is very long lasting due to linear ball-bearings in the spindle unit.
- The origin point mark on its scale gives you a reference point.



542-164

No.	Range [mm]	Measuring force *1	Resolution [mm]	Stem Ø	Accuracy	Signal pitch [µm]	Mass [g]
542-174	0-10	1,2 N/1,1 N/1 N	0,0005	8 mm	(1,5 + L/50) µm	2	260
542-164	0-10	1,2 N/1,1 N/1 N	0,001	8 mm	(1,5 + L/50) µm	4	260
542-175	0-25	4,6 N/4,3 N/4 N	0,0005	15 mm	(1,5 + L/50) µm	2	300
542-165	0-25	4,6 N/4,3 N/4 N	0,001	15 mm	(1,5 + L/50) µm	4	300
542-176	0-50	5,7 N/5,3 N/4,9 N	0,0005	15 mm	(1,5 + L/50) µm	2	400
542-166	0-50	5,7 N/5,3 N/4,9 N	0,001	15 mm	(1,5 + L/50) µm	4	400

*1 Spindle DOWN/Horizontal/UP



542-175, 542-165

542-176, 542-166

Specifications

Scale	Photoelectric linear encoder
Max. response speed	1500 mm/s
Contact point	Ø3 mm carbide ball, thread: M 2,5 x 0,45
Cable length	2 m
Power supply	5 V (4,8 V to 5,2 V), 120 mA max.
Output signal	90° phase difference, differential square wave (RS-422A equivalent), minimum edge distance 200 ns (1 µm type), 250 ns (0,5 µm type)
Environmental conditions	0 °C to 40 °C (20 % to 80 % rel. humidity, no condensation)
Bearing type	Linear ball bearing
Scale reference point	3 mm from lowest rest point (10 mm type) 5 mm from lowest rest point (25,5 mm type)

Standard accessories

No.	Description
538610	Wrench for contact point (for 10 mm range models)
04GAA857	Wrench for contact point (for 25/50 mm range models)

Optional accessories

No.	Description
02ADF260	Extension cable (5 m)
02ADF280	Extension cable (10 m)
02ADF300	Extension cable (20 m)
02ADB680	Fixing set Ø 9,5 mm (for 10 mm model)
02ADN370	Fixing set Ø 18 mm (for 25/50 mm models)
02ADE230	10 mm pneumatic drive
02ADE250	25 mm pneumatic drive
02ADE270	50 mm pneumatic drive
542-017	EG-Counter Display
542-094-2	EB-Counter Display
542-073D	EH-Counter Display
542-067	EV-Counter Display

Consumable spares

No.	Description
901312	Standard contact point
238772	10 mm rubber boot
962504	25 mm rubber boot
962505	50 mm rubber boot



Refer to the Linear Gauge documentation for more details

Specifications

Scale	Photoelectric linear encoder
Stem Ø	8 mm
Contact point	Ø 3 mm carbide ball, thread: M 2,5 x 0,45
Cable length	2 m
Power supply	5 V (4,5 V to 5,2 V), 80 mA max.
Output signal	90° phase difference, differential square wave (RS-422A equivalent) minimum edge distance 200 ns (0,1 µm type), 200 ns (0,5 µm type), 400 ns (1 µm type)
Environmental conditions	0° C to 40° C (20% to 80% rel. humidity, no condensation)
Bearing type	Linear ball bearing

Standard accessories

No.	Description
538610	Wrench for contact point (for 10 mm range models)

Optional accessories

No.	Description
902434	Extension cable (5 m)
902433	Extension cable (10 m)
902432	Extension cable (20 m)
02ADE230	10 mm pneumatic drive
02ADB680	Fixing set Ø 9,5 mm (for 10 mm model)
542-015	EG-Counter Display
542-092-2	EB-Counter Display
542-075D	EH-Counter Display
542-071D	EH-Counter Display
542-063	EV-Counter Display

Consumable spares

No.	Description
901312	Standard contact point
238772	10 mm rubber boot



Refer to the Linear Gauge documentation for more details

Slim Head Linear Gauge LGK Series

Series 542

This is a slim type linear gauge that allows you to meet a variety of measurement needs.

The Linear Gauge SLIM HEAD LGK offers you the following benefits:

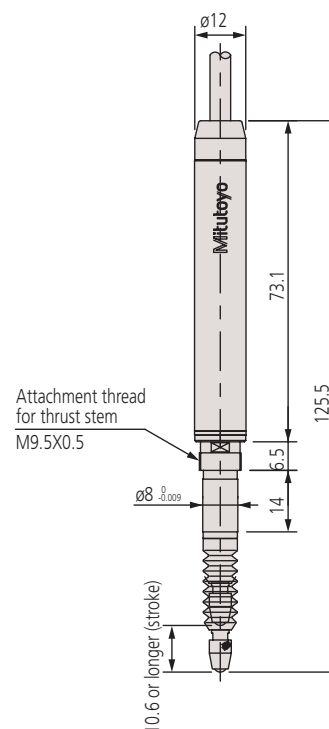
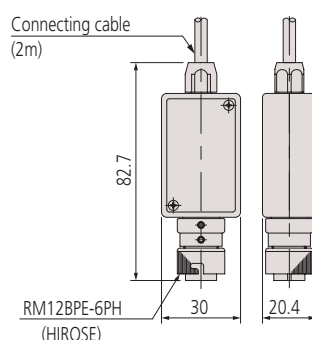
- Differential square-wave signal output enables to use it for a wide range of applications.
- You can install it even where space is restricted, thanks to its small size.
- Its photoelectric scale gives it high precision across the entire measuring range.
- It is very long lasting due to linear ball-bearings in the spindle unit.



542-156
542-157
542-158

No.	Range [mm]	Measuring force *1	Resolution [mm]	Accuracy	Signal pitch [µm]	Max. response speed	Mass [g]
542-156	0-10	0,8 N/0,75 N/0,7 N	0,001	(1,5 + L/50) µm	4	1500 mm/s	175
542-157	0-10	0,8 N/0,75 N/0,7 N	0,0005	(1,5 + L/50) µm	2	1500 mm/s	175
542-158	0-10	0,8 N/0,75 N/0,7 N	0,0001	(0,8 + L/50) µm	0,4	400 mm/s	175

*1 Spindle DOWN/Horizontal/UP



Slim Head Linear Gauge LGB Series

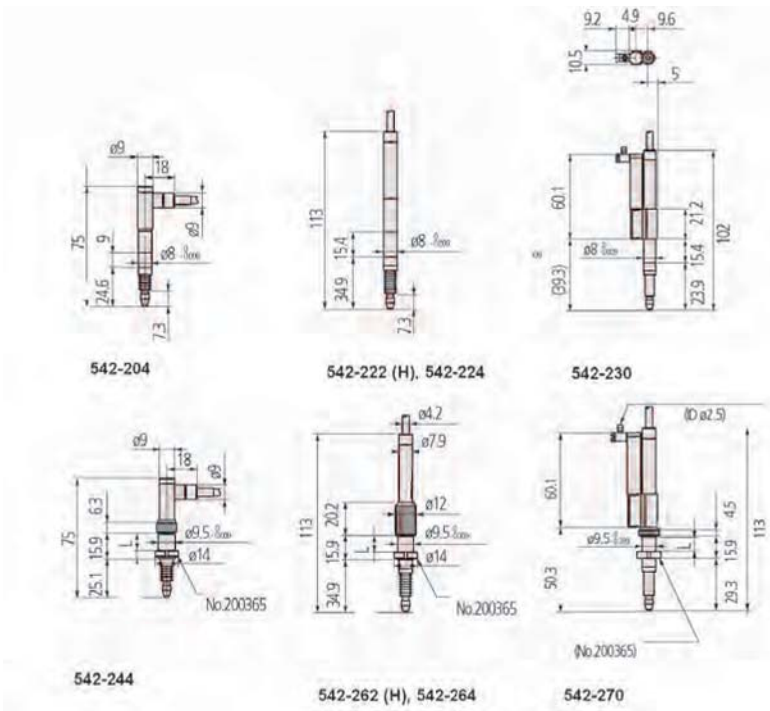
Series 542

- This is an extra slim linear gauge that offers you the following benefits:
- Its differential square-wave signal output allows you to use it for a wide range of applications.
 - It is very long lasting due to linear ball-bearings in the spindle unit.



No.	Range [mm]	Measuring force *1	Stem Ø	Accuracy	Remarks	Mass [g]
542-244	0-5	0,65 N/0,6 N/0,55 N	9,5 mm	2 µm	-	160
542-204	0-5	0,65 N/0,6 N/0,55 N	8 mm	2 µm	-	145
542-204H	0-5	0,8 N/0,75 N/0,7 N	8 mm	1 µm	-	145
542-222	0-10	0,8 N/0,75 N/0,7 N	8 mm	2 µm	-	150
542-222H	0-10	0,8 N/0,75 N/0,7 N	8 mm	1 µm	-	150
542-224	0-10	0,6 N/0,55 N/0,5 N	8 mm	2 µm	Low measuring force	165
542-230	0-10	0,8 N/0,75 N/0,7 N	8 mm	2 µm	w/pneumatic cylinder, 0,3 to 0,4 MPa	165
542-223	0-10	0,8 N/0,75 N/0,7 N	8 mm	2 µm	w/pneumatic cylinder, 0,3 to 0,4 MPa	165
542-262	0-10	0,8 N/0,75 N/0,7 N	9,5 mm	2 µm	-	170
542-262H	0-10	0,8 N/0,75 N/0,7 N	9,5 mm	1 µm	-	170
542-264	0-10	0,6 N/0,55 N/0,5 N	9,5 mm	2 µm	Low measuring force	170
542-270	0-10	0,8 N/0,75 N/0,7 N	9,5 mm	2 µm	w/pneumatic cylinder, 0,3 to 0,4 MPa	170

*1 Spindle DOWN/Horizontal/UP



Specifications

Scale	Photoelectric linear encoder
Max. response speed	900 mm/s
Contact point	Ø3 mm carbide ball, thread: M 2,5 x 0,45
Resolution	0,001 mm
Signal pitch	4 µm
Cable length	2 m
Power supply	5 V (4,5 V to 5,2 V), 80 mA max.
Output signal	90° phase difference, differential square wave (RS-422A equivalent)
Environmental conditions	0°C to 40°C (20% to 80% rel. humidity, no condensation)
Bearing type	Linear ball bearing

Standard accessories

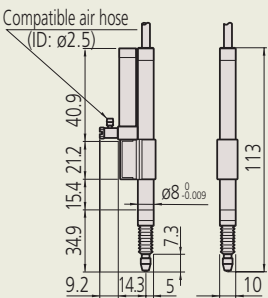
No.	Description
538610	Wrench for contact point (for 10 mm range models)

Optional accessories

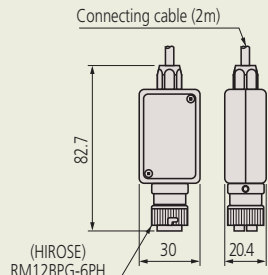
No.	Description
902434	Extension cable (5 m)
902433	Extension cable (10 m)
902432	Extension cable (20 m)
02ADE230	10 mm pneumatic drive
542-015	EG-Counter Display
542-092-2	EB-Counter Display
542-075D	EH-Counter Display
542-071D	EH-Counter Display
542-063	EV-Counter Display

Consumable spares

No.	Description
901312	Standard contact point
238773	5 mm rubber boot
238772	10 mm rubber boot



542-223



Connector for all Gauges

High Resolution Linear Gauge LGB Series



Specifications

Scale	Photoelectric linear encoder
Max. response speed	380 mm/s
Contact point	Ø3 mm carbide ball, thread: M 2,5 x 0,45
Resolution	0,1 µm
Cable length	2 m
Power supply	5 V (4,5 V to 5,2 V), 150 mA max.
Output signal	90° phase difference differential square wave (RS422 A equivalent)
Environmental conditions	0°C to 30°C (20% to 80% rel. humidity, no condensation)
Bearing type	Linear ball bearing

Standard accessories

No.	Description
538610	Wrench for contact point (for 10 mm range models)

Optional accessories

No.	Description
902434	Extension cable (5 m)
902433	Extension cable (10 m)
902432	Extension cable (20 m)
542-015	EG-Counter Display
542-092-2	EB-Counter Display
542-075D	EH-Counter Display
542-071D	EH-Counter Display
542-063	EV-Counter Display

Consumable spares

No.	Description
901312	Standard contact point
238773	5 mm rubber boot



Refer to the Linear Gauge documentation for more details

Series 542

The Linear Gauge LGB offers you the following benefits:

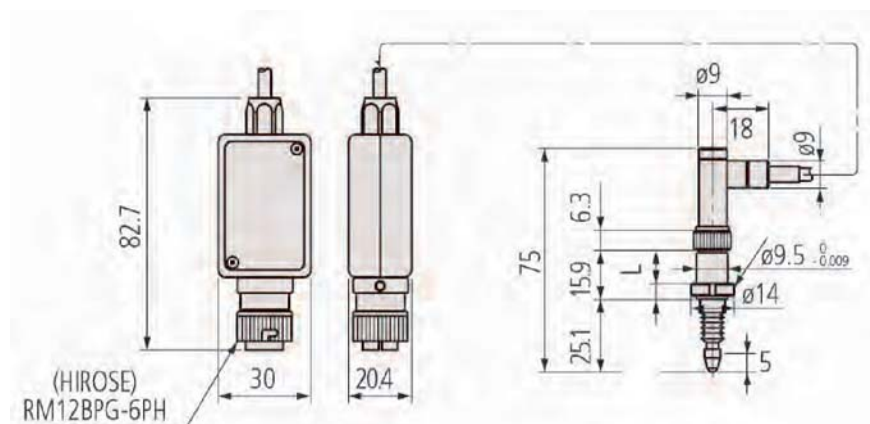
- It has an extra compact design, and its small photoelectric scale lets you measure at high precision across the entire range.
- Differential square-wave signal output allows you to use it for a wide range of applications.
- You can install it in machines and measuring devices.
- Very long life due to the linear ball-bearings in the spindle unit.



542-246

No.	Range [mm]	Measuring force *1	Stem Ø	Accuracy	Mass [g]
542-246	0-5	0,65 N/0,6 N/0,55 N	9,5 mm	0,8 µm	160

*1 Spindle DOWN/Horizontal/UP



Large Measuring Range Linear Gauge LG / LGM Series

Series 542

This linear gauge has a large measuring range 100 mm

- Your options include both manual and motorised versions.



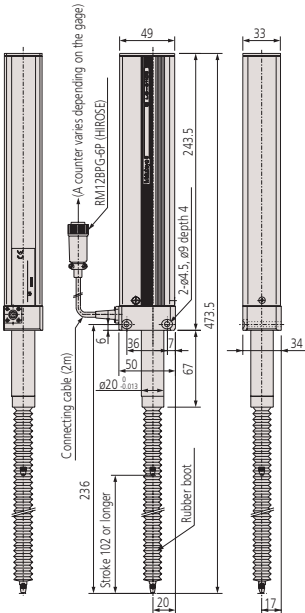
542-312



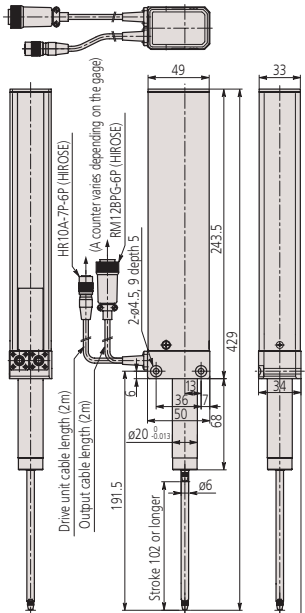
542-313D

No.	Range [mm]	Measuring force *1	Resolution [μm]	Accuracy	Remarks	Max. response speed	Mass [g]
542-312	0-100	8 N/6,5 N/5 N	0,1	(2 + L/100) μm ≤ 2,5 μm	Standard	400 mm/s	640
542-316	0-100	3 N/-/-	0,1	(2 + L/100) μm ≤ 2,5 μm	Low measuring force	400 mm/s	750
542-314	0-100	8 N/6,5 N/5 N	0,1	(2 + L/100) μm ≤ 2,5 μm	w/ rubber boot	400 mm/s	750
542-332	0-100	8 N/6,5 N/5 N	1	(2,5 + L/100) μm ≤ 3 μm	Standard	800 mm/s	750
542-336	0-100	3 N/-/-	1	(2,5 + L/100) μm ≤ 3 μm	Low measuring force	800 mm/s	750
542-334	0-100	8 N/ 6,5 N/5 N	1	(2,5 + L/100) μm ≤ 3 μm	w/ rubber boot	800 mm/s	750
542-313D	0-100	3 N/ 6,5 N/ 9,5 N	0,1	(2 + L/100) μm ≤ 2,5 μm	Motor-driven type	400 mm/s	1640
542-315D	0-100	4,5 N/-/6 N	0,1	(2 + L/100) μm ≤ 2,5 μm	Motor-driven type	400 mm/s	1640
542-333D	0-100	3 N/6,5 N/9,5 N	1	(2,5 + L/100) μm ≤ 3 μm	Motor-driven type	800 mm/s	940
542-335D	0-100	4,5 N/-/6 N	1	(2,5 + L/100) μm ≤ 3 μm	Motor-driven type	800 mm/s	1640

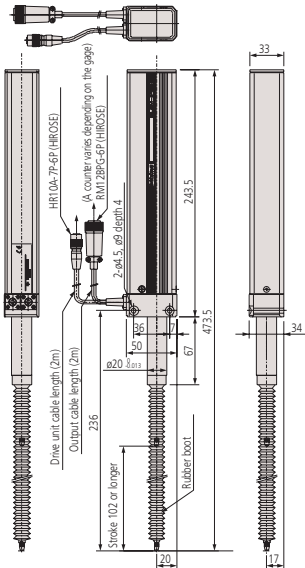
*1 Spindle DOWN/Horizontal/UP



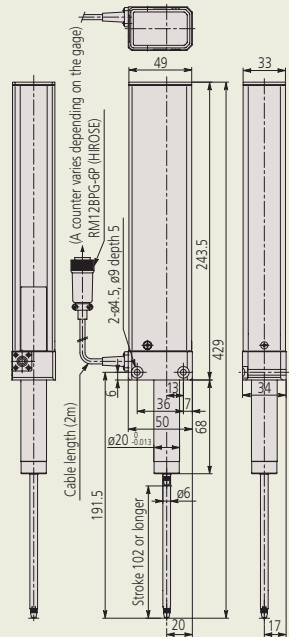
542-314, -334
Rubber boot model



542-313, -333
Standard model
(motor-driven type)



542-315, 335
Rubber boot model
(motor-driven type)



542-312, -316, -332, -336
Standard/Low measuring
force model

Specifications

Scale	Photoelectric linear encoder
Contact point	Ø 3 mm carbide ball, thread: M 2,5 x 0,45
Dimensions (WxDxH)	90 x 175 x 74 mm (control unit)
Cable length	2 m
Power supply	5 V (4,8 V to 5,2 V) (Control unit No. 542-313D: 230 V 50/60 Hz)
Output signal	90° phase difference, differential square wave (RS-422A equivalent)
Environmental conditions	0°C to 40°C (20% to 80% rel. humidity, no condensation)
Bearing type	Linear ball bearing

Optional accessories

No.	Description
542-015	EG-Counter Display
542-092-2	EB-Counter Display
542-075D	EH-Counter Display
542-071D	EH-Counter Display
542-063	EV-Counter Display

Consumable spares

No.	Description
901312	Standard contact point
02ADA004	Rubber boot

Rubber boot for IP66 type only



Control unit for
542-313D, 542-315D, 542-333D, 542-335D
(Standard accessory)

Laser Hologage LGH

Series 542

This is a highly precise dial gauge that uses optical interference so you can measure with unparalleled accuracy.

The Mitutoyo Laser Hologage offers you the following benefits:

- Through optical interference of laser light through a diffraction grating it gives you an extremely precise holographic scale with 0,0001mm resolution
- You can use the Laser Hologage for extremely precise measurements, as well as a transducer in ultra-precise positioning and control systems.



542-711-1

Specifications

Repeatability	0,02 µm
Retrace error	0,05 µm
Scale	Laser-hologram measurement sensor
Max. response speed	250 mm/s
Contact point	Ø 3 mm carbide ball, thread: M 2,5 x 0,45
Output signal	90° phase difference, differential square wave (RS-422A equivalent)
Signal pitch	0,25 µm
Bearing type	High precision linear ball bearing
Environmental conditions	10°C to 30°C (30% to 70% rel. humidity, no condensation)

Standard accessories

No.	Description
538610	Wrench for contact point (for 10 mm range models)

Optional accessories

No.	Description
971750	Stand for Laser Hologage LGH
971753	Spindle lifting cable
971751	Stem fixture for fixing to top surface
971752	Stem fixture for fixing to bottom surface
542-015	EG-Counter Display
542-075D	EH-Counter Display
542-071D	EH-Counter Display

No.	Range [mm]	Measuring force *1	Resolution [µm]	Stem Ø	Accuracy	Mass [g]
542-711-1	0-10	0,55 N/0,45 N/0,35 N	0,1	15 mm	0,2 µm	200
542-712-1	0-10	0,1 N/-/-	0,1	15 mm	0,2 µm	200

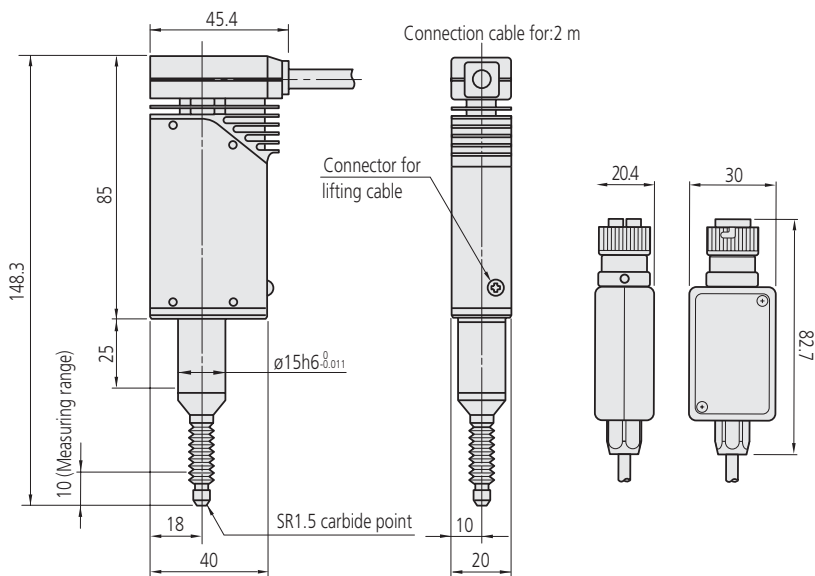
*1 Spindle DOWN/Horizontal/UP

Consumable spares

No.	Description
901312	Standard contact point



Refer to the Linear Gauge documentation for more details



Laser Hologage LGH

Series 542

This is a highly precise dial gauge that uses optical interference so you can measure with unparalleled accuracy.

The Mitutoyo Laser Hologage offers you the following benefits:

- Through optical interference of laser light through a diffraction grating it gives you an extremely precise holographic scale with 0,01 µm resolution.
- The measuring head is very compact, enabling you to build it into various systems far less expensively than conventional laser technology.
- You can use the Laser Hologage for measuring extremely precise parts, as well as a transducer in ultra-precise positioning and control systems.



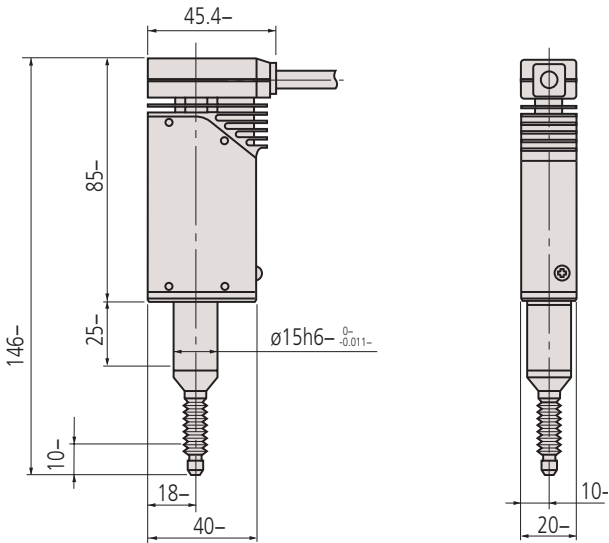
542-925D



Laser Hologage supplied with Display Unit
(2 axis counter)

No.	Range [mm]	Measuring force *1	Resolution [µm]	Stem Ø	Accuracy	Remarks	Mass [g]
542-925D	0-10	0,55 N/0,45 N/0,35 N	0,01	15 mm	0,1 µm	Supplied with Display Unit 542-074D	900
542-926D	0-10	0,1 N/-/-	0,01	15 mm	0,1 µm	Supplied with Display Unit 542-074D	900

*1 Spindle DOWN/Horizontal/UP



Functions	Series 542
Digimatic data output	●
ON/OFF	●
Functions for Display unit	
ZERO SET	●
PRESET	●
Counting direction switchable	●
Error display/output	●
MAX/MIN difference measurement	●
mm / inch switching	●
RS-232C Output	●
USB Output for SENSORPAK	●
Analogue output	●
Error output	●
Extern tolerance set (when a PC is used)	●

Specifications

Repeatability	0,02 µm
Retrace error	0,05 µm
Scale	Laser-hologram measurement sensor
Max. response speed	250 mm/s
Contact point radius	R=5 mm carbide
Bearing type	High precision linear ball bearing
Environmental conditions	10°C to 30°C (30% to 70% rel. humidity, no condensation)

Standard accessories

No.	Description
538610	Wrench for contact point (for 10 mm range models)
542-074D	EH-Counter with double display (2-phase sine wave type)

Optional accessories

No.	Description
971750	Stand for Laser Hologage LGH
971753	Spindle lifting cable
971751	Stem fixture for fixing to top surface
971752	Stem fixture for fixing to bottom surface

Consumable spares

No.	Description
901312	Standard contact point

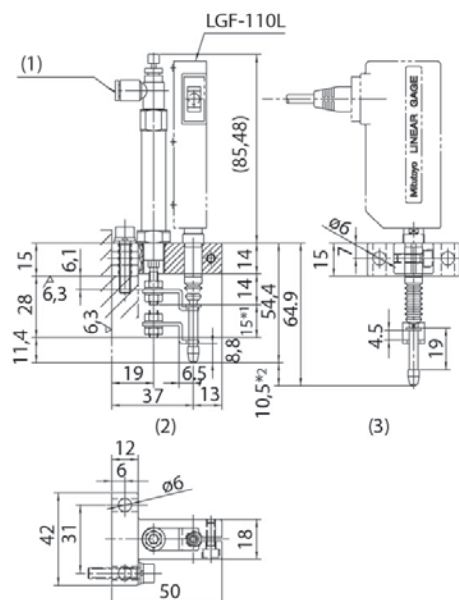


Refer to the Linear Gauge documentation for more details



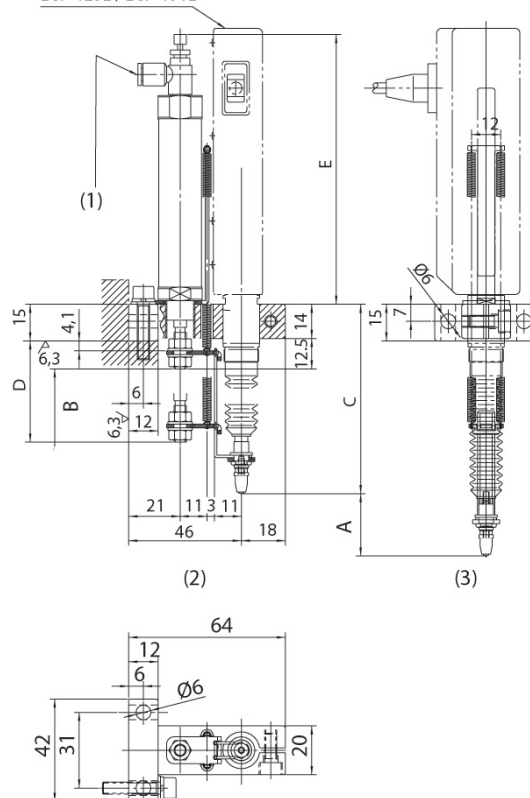
Refer to the Linear Gauge documentation for more details

Air Drive Unit for Linear Gauges



For Linear Gauge with 10 mm range

LGF-125L / LGF-150L



For Linear Gauge with 25 mm and 50 mm range

1. Speed controller
2. At air supply off
3. At air supply on

No.	Range [mm]	Remarks	Air supply [MPa]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
02ADE230	0-10	Need air filter, regulator and lubricator	0,2 to 0,4					
02ADE250	0-25	Need air filter, regulator and lubricator	0,2 to 0,4	25,5	30	77,6	41,5	110,5
02ADE270	0-50	Need air filter, regulator and lubricator	0,2 to 0,4	51	50	95,9	66,5	159,5

EC Counter for Linear Gauges

Series 542

This Digimatic display can be connected to any device with Digimatic output, including micrometers, indicators, calipers and LGS/LGD Linear Gauge.

It offers you the following benefits:

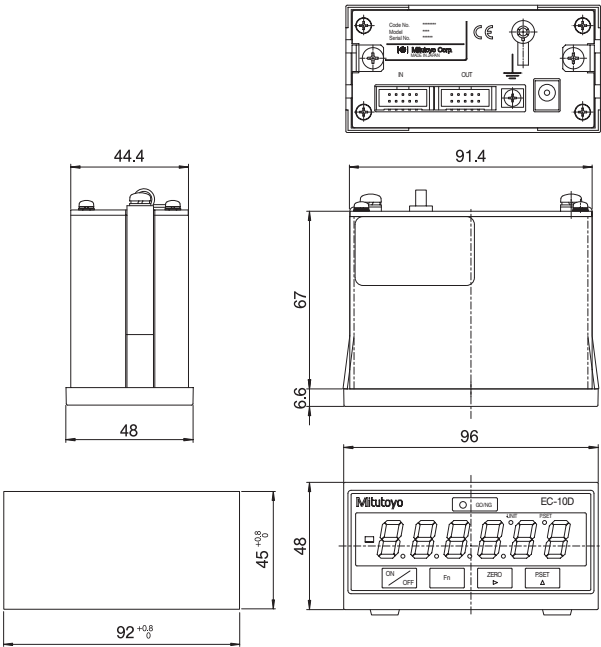
- It has a data output and tolerance evaluation function.



542-007



No.	Resolution [mm]	Input signal type	Applicable gauge	Gauge inputs
542-007D	0,001/0,01 (automatic setting by gauge)	Digimatic code	Digimatic Indicator Digimatic Scale Units Linear Gauge LGS/LGD	1



542-007

Functions	Series 542
Digimatic data output	●
ON/OFF	●
External PRESET/ZERO	●
ZERO SET	●
PRESET	●
ABS/INC	●
Counting direction switchable	●
3-stage tolerance display/output	●
Error display/output	●
Display with a definable factor	●
External HOLD	●
mm / inch switching	●

Specifications

Power supply	+ 9 - 12 V DC 400 mA or AC adapter
Display	Green LED display, 6 digits plus sign
Tolerance judgement display	LED display (3 steps: Amber, Green, Red)

Standard accessories

No.	Description
06AEG302D	AC Adapter 9V, 500mA

Optional accessories

No.	Description
C162-155	I/O cable (2 m)
936937	Digimatic cable (1 m)
965014	Digimatic cable (2 m)
06ADV380D	USB Input Tool Direct cable (2 m)
02AZD790D	Connecting cable U-Wave



Refer to the Linear Gauge documentation for more details

EG Counter for Linear Gauges

Series 542

This is a compact counter with a control panel that offers you the following benefits:

- Its I/O control function enables tolerance judgement evaluation (3 or 5 steps) or parallel BCD output function.



542-015



542-017



542-016



Series 542			
	542-015	542-017	542-016
Functions			
External PRESET/ZERO	●	●	●
ZERO SET	●	●	●
PRESET	●	●	●
5-stage tolerance display/output	●	●	●
Counting direction switchable	●	●	●
ABS/INC	●	●	●
BCD output	●	●	●
3-stage tolerance display/output	●	●	●
Error display/output	●	●	●
Display with a definable factor	●	●	●
MAX / MIN / Difference measurement	●	●	●
mm / inch switching	●	●	●
External peak-hold cancel	●	●	●

Specifications

Power supply	Terminal block (M3 screws) 12 to 24 V DC, 6W or less (500 mA max.) external supply, AC-adaptor is not standard accessory
Display	Green LED display 6 digits plus sign
Tolerance judgement display	LED display (3 steps : Amber, Green, Red/5 steps : Amber, Amber flashing, Green, Red flashing, Red)

Optional accessories

No.	Description
02ADB440	BCD-I/O-Data connector
02ADN460	AC adapter
02ZAA020	AC cable
02ADD930	Three-wire cable for power supply via AC adapter
02ADF180	External tolerance/preset setting box



02ADB440

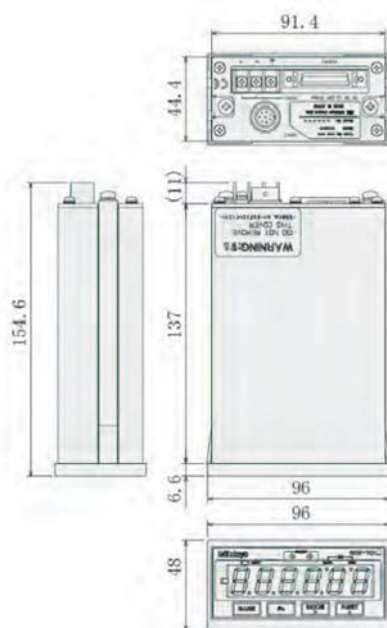


02ADD930, 02ADN460, 02ZAA020



Refer to the Linear Gauge documentation for more details

No.	Resolution [mm]	Max. input frequency	Input signal type	Applicable gauge	Gauge inputs	Mass [g]
542-015	0,0001/0,0005/ 0,001/0,005/0,01	1,25 MHz (2-phase square wave), response speed depends on gauge specification	Differential square-wave	LGF, LGK, LGB, LG, LGM, LGH (excluding LGF-Z with reference point, LGH with 0,01 µm resolution)	1	400
542-017	0,0001/0,0005/ 0,001/0,005/0,01	1,25 MHz (2-phase square wave), response speed depends on gauge specification	Differential square-wave with reference point	LGF-Z with reference point	1	400
542-016	0,001/0,01 (automatic setting by gauge)	-	Digimatic code	Digimatic Indicator Digimatic Scale Units Linear Gauge LGS/LGD	1	400



EB Counter for Linear Gauges

Series 542

- Its I/O control function enables tolerance judgement evaluation (3 or 5 steps) or serial BCD output function.
- Dynamic measurement possible with simplified analogue output.



542-092-2



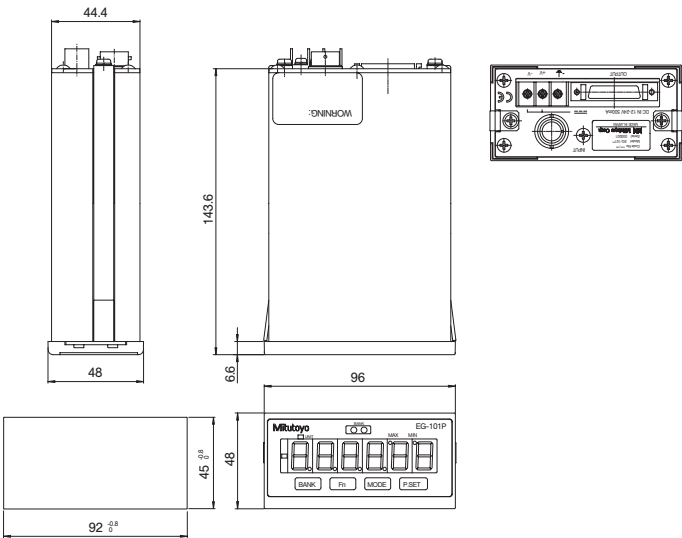
542-094-2



542-093-2



No.	Resolution [mm]	Max. input frequency	Input signal type	Applicable gauge	Gauge inputs	Mass [g]
542-092-2	0,0001/0,0005/ 0,001/0,005/0,01	1,25 MHz (2-phase square wave), response speed depends on gauge specification	Differential square-wave	LGF, LGK, LGB, LG, LGM, LGH (excluding LGF-Z with reference point, LGH with 0,01 µm resolution)	1	400
542-094-2	0,0001/0,0005/ 0,001/0,005/0,01	1,25 MHz (2-phase square wave), response speed depends on gauge specification	Differential square-wave with reference point	LGF-Z with reference point	1	400
542-093-2	0,001/0,01 (automatic setting by gauge)	-	Digimatic code	Digimatic Indicator Digimatic Scale Units Linear Gauge LGS/LGD	1	400



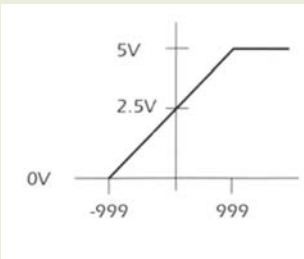
	542-092-2	542-094-2	542-093-2
Functions			
Digimatic data output	●	●	●
External PRESET/ZERO	●	●	●
ZERO SET	●	●	●
PRESET	●	●	●
5-stage tolerance display/output	●	●	●
Counting direction switchable	●	●	●
ABS/INC			●
BCD output	●	●	●
3-stage tolerance display/output	●	●	●
Error display/output	●	●	●
External HOLD	●	●	●
MAX / MIN / Difference measurement	●	●	●
mm / inch switching	●	●	●
RS link		●	●
Output I/O	●	●	●
Analogue output	●	●	●

Specifications

Power supply	Terminal block (M3 screws) 12 to 24 V DC, 6W or less (500 mA max.) external supply, AC-adaptor is not standard accessory
Display	Green LED display, 6 digit plus sign
Tolerance judgement display	LED display (3 steps : Amber, Green, Red/5 steps : Amber, Amber flashing, Green, Red flashing, Red)

Optional accessories

No.	Description
02ADB440	BCD-I/O-Data connector
02ADN460	AC adapter
02ZAA020	AC cable
02ADD930	Three-wire cable for power supply via AC adapter
02ADF180	External tolerance/preset setting box
936937	Digimatic cable (1 m)
965014	Digimatic cable (2 m)
06ADV380D	USB Input Tool Direct cable (2 m)
02AZD790D	Connecting cable U-Wave



Specifications :

- Output voltage: 2.5 V + counting value x voltage resolution (25mV/2.5 mV)
- Full scale : 0 to 5 V
- Response speed: 10 Hz (update time 5 MS)
- Accuracy : ± 5 % (0 to 5 V) ± 0.5 % (2.5 V ± 200 mV, after Offset adjustment)
- The accuracy is indicated with respect to full scale 5 V
- Load resistance: 300 kΩ or more

EH Counter for Linear Gauges

Series 542

Multi-functional Counter

- The standard RS-232C and USB interfaces allows easy communication with an external PC (the USB can only be used with SENSORPAK).
- The built-in networking function allows you to easily create a multi-point measuring system (RS link, max. 10 Counter).
- The 2-gauge input type can calculate additions and subtractions between two gauges.



542-075D



542-071D, 542-073D, 542-072D



542-075D



542-071D



542-073D



542-072D

Series 542				
	542-071D	542-073D	542-072D	542-075D
Functions				
Digimatic data output	●	●	●	●
ON/OFF	●	●	●	●
External PRESET/ZERO	●	●	●	●
ZERO SET	●	●	●	●
PRESET	●	●	●	●
Sum/difference of two probes	●	●	●	●
Calculation of sum	●	●	●	●
5-stage tolerance display/output	●	●	●	●
ABS/INC	●	●	●	●
Counting direction switchable	●	●	●	●
BCD output	●	●	●	●
3-stage tolerance display/output	●	●	●	●
Error display/output	●	●	●	●
Display with a definable factor	●	●	●	●
External HOLD	●	●	●	●
MAX / MIN / Difference measurement	●	●	●	●
mm / inch switching	●	●	●	●
External peak-hold cancel	●	●	●	●
Lower digit blank-out	●	●	●	●
RS link	●	●	●	●
RS-232C Output	●	●	●	●
I/O Output	●	●	●	●
USB Output for SENSORPAK	●	●	●	●
Analogue output	●	●	●	●
Extern tolerance set (when a PC is used)	●	●	●	●

Specifications

Power supply	Via AC Adapter (12-24 V DC, 700 mA)
Display	Green LED display, 8 digit plus sign
Tolerance judgement display	LED display (3 steps : Amber, Green, Red/5 steps : Amber, Amber flashing, Green, Red flashing, Red)

Standard accessories

No.	Description
02ADN460	AC adapter
02ZAA020	AC cable

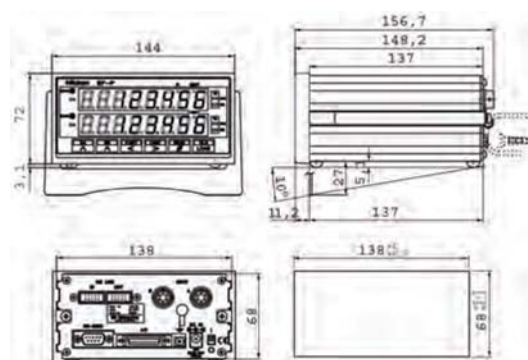
Optional accessories

No.	Description
02ADB440	BCD-I/O-Data connector
936937	Digimatic cable (1 m)
965014	Digimatic cable (2 m)
06ADV380D	USB Input Tool Direct cable (2 m)
02AZD790D	Connecting cable U-Wave
12AAA807D	RS-232C cable (2m)



02ADB440

No.	Resolution [mm]	Max. input frequency	Input signal type	Applicable gauge	Gauge inputs	Mass [g]
542-075D	0,0001/0,001/0,01	2,5 MHz (2-phase square wave), response speed depends on gauge specification	Differential square-wave	LGF, LGK, LGB, LG, LGM, LGH (excluding LGF-Z with reference point, LGH with 0,01 µm resolution)	1	760
542-071D	0,0001/0,001/0,01	2,5 MHz (2-phase square wave), response speed depends on gauge specification	Differential square-wave	LGF, LGK, LGB, LG, LGM, LGH (excluding LGF-Z with reference point, LGH with 0,01 µm resolution)	2	800
542-073D	0,0001/0,001/0,01	2,5 MHz (2-phase square wave), response speed depends on gauge specification	Differential square-wave with reference point	LGF-Z with reference point	2	800
542-072D	0,001/0,01 (automatic setting by gauge)	-	Digimatic code	Digimatic Indicator Digimatic Scale Units Linear Gauge LGS/LGD	2	800



EV Counter for Linear Gauges

Series 542

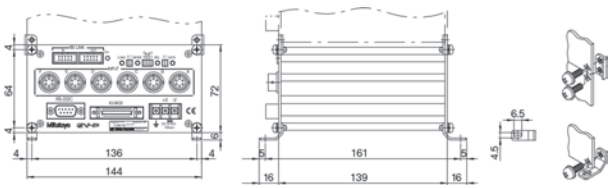
- You can connect up to six gauges, and by using the RS Link function, you can connect up to 10 EV Counters to one PC.
- Multi-point measuring systems with a maximum of 60 gauges can be configured.
- You can select several different output modes, including I/O output for tolerance judgement and Segment output, BCD data output and RS-232C output.



542-063

542-067

542-064

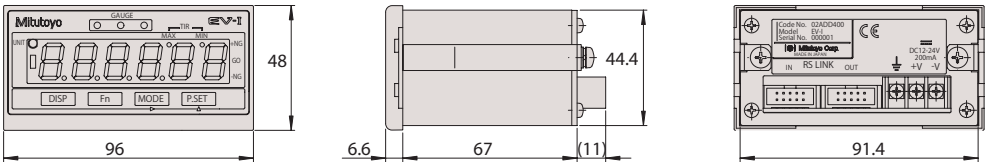


542-063

No.	Resolution [mm]	Max. input frequency	Input signal type	Applicable gauge	Gauge inputs	Mass [g]
542-063	0,0005/0,001/0,005/0,01 (no display)	1,25 MHz (2-phase square wave), response speed depends on gauge specification. Max.counting speed: 5MHz	Differential square-wave	LGF, LGK, LGB, LG, LGM, LGH (excluding LGF-Z with reference point, LGH with 0,01 µm resolution)	6	910
542-067	0,0005/0,001/0,005/0,01 (no display)	1,25 MHz (2-phase square wave), response speed depends on gauge specification. Max.counting speed: 5MHz	Differential square wave with reference point	LGF-Z with reference point	6	910
542-064	0,001/0,01 (automatic setting by gauge)	-	Digimatic code	Digimatic Indicator Digimatic Scale Units Linear Gauge LGS/LGD	6	830

Specifications for 02ADD400

No.	Description
02ADD400	Allows external display and setting for one EV Counter LED display: channel display (also for judgement result display): 3 (3-color LED) measurement mode display (current data, max. value, min. value, range): 2 Functions: channel switching, measurement mode switching (current value, max. value, min. value, range), parameter setting, preset, and tolerance setting Input/output: RS Link connector: 1 each for IN, OUT Error display: overspeed and others



	Series 542		
	542-063	542-067	542-064
Functions			
Digimatic data output	●	●	●
External PRESET/ZERO	●	●	●
ZERO SET	●	●	●
PRESET	●	●	●
ABS/INC	●	●	●
Counting direction switchable	●	●	●
Calculation function	●	●	●
3-stage tolerance display/output	●	●	●
Error display/output	●	●	●
External HOLD	●	●	●
MAX / MIN / Difference measurement	●	●	●
mm / inch switching	●	●	●
RS link	●	●	●
RS-232C Output	●	●	●

Specifications

Power supply	Terminal connector (M3 screws), 12 to 24V, (700 mA max. for EV-Counter) (200 mA max. for D-EV Display unit), AC-adapter is not standard accessory
Display	D-EV Unit: red LED display, 6 digit plus sign 8 digit internal to EV-Counter
Tolerance judgement display	LED display (3 steps: Amber, Green, Red)

Optional accessories

No.	Description
02ADD400	D-EV Display Unit
02ADB440	BCD-I/O-Data connector
02ADN460	AC adapter
02ZAA020	AC cable
02ADD930	Three-wire cable for power supply via AC adapter
02ADD950	Digimatic cable (0,5 m)
936937	Digimatic cable (1 m)
965014	Digimatic cable (2 m)
06ADV380D	USB Input Tool Direct cable (2 m)
12AAA807D	RS-232C cable (2m)



02ADD400



02ADB440



02ADD930, 02ADN460, 02ZAA020

Display Unit Mu-Checker

Series 519

- The Analogue Mu-Checker can output digital data via an optional interface unit.



519-501D



519-503D



519-511D

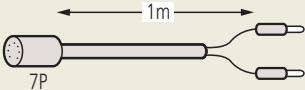
No.	Linearity [%]	Response speed	Instant zero-setting effective zone	Channels	Calculation function	Mass [kg]
519-501D	± 1%/FS (Added to a head's measuring error)	approx. 0,3s	± 15%/FS	1		2,4
519-503D	± 1%/FS (Added to a head's measuring error)	approx. 0,3s	± 15%/FS	2	±A; ±B; ±A ±B	2,4
519-511D	± 3 digit ± 1 (added to a head measuring error)	approx. 0,3s	± 0,68 mm	2	±A; ±B; ±A ±B	2,6

FS=Full Screen

Series 519			
	519-501D	519-503D	519-511D
Functions			
ZERO SET			
Calculation function			
Digimatic Output			

Specifications	
Dimensions (WxDxH)	134 x 183 x 208 mm
Output Gain	± 1V/FS Linearity: ±0,1%/FS (Excepts a head's measuring error)
Power supply	AC Adapter 230V 50/60Hz

Optional accessories	
No.	Description
934795	Analogue Output Cable
529035	Analog Limit signal output connector (7-pin)
934386	Extension cable for head (5 m)
936937	Digimatic cable (1 m)
965014	Digimatic cable (2 m)



529035

LITEMATIC VL-50

Motorized low force, high precision gauges

Series 318

This is a high-accuracy motorised measuring machine with safe and easy operation. The LITEMATIC VL-50 offers you the following benefits:

- It has a measuring force of **0,01 N** (1 gf) and a resolution of 0,01 µm.
- Its constant and low measuring force makes it especially suitable for measuring soft materials such as rubber, plastic, film thicknesses or sensitive form parts.
- The motor driven plunger gives you a range of approach and retraction speeds for safe and easy operation.

Functions	Series 318
ZERO/ABS	●
Data output	●
PRESET	●
Counting direction switchable	●
mm / inch switching	●
Key lock	●
Tolerance input (3 or 5 levels)	●
Motorised plunger movement	●
Mode : max-min (TIR) reading	●
Max. value/Hold	●

Specifications

Measuring range (inside)	0-50 mm
Data output	Digimatic RS-232C INTERFACE I/O

Optional accessories

No.	Description
937179T	Footswitch
02ADB440	BCD-I/O-Data connector
936937	Digimatic cable (1 m)
965014	Digimatic cable (2 m)
12AAA807D	RS-232C cable (2m)
06ADV380D	USB Input Tool Direct cable (2 m)
02AZD790D	Connecting cable U-Wave

Consumable spares

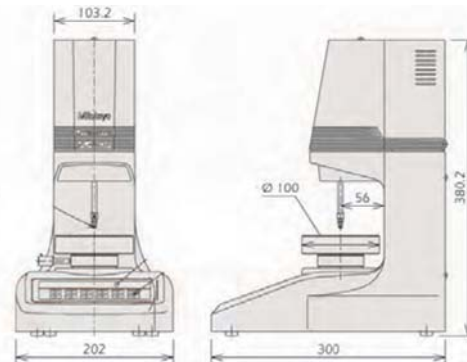
No.	Description
901312	Standard contact point



Refer to the LITEMATIC documentation for more details



318-22xD



318-22xD



318-217D

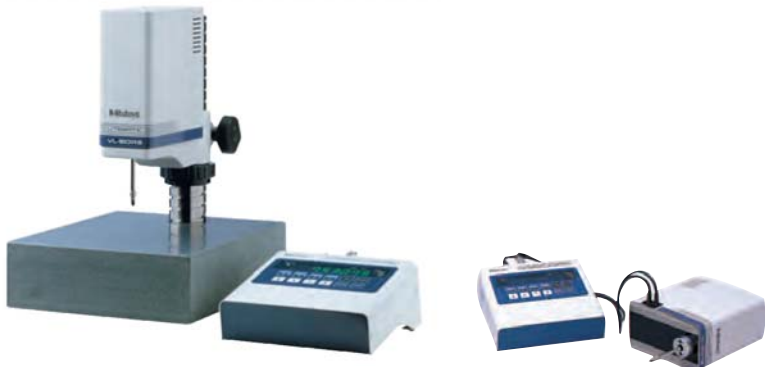
No.	Measuring force [N]	Accuracy	Type
318-217D	0,01 N (1 gf)	$(0,1 + 0,5L/100) \mu\text{m}$ L = Measurement height	VL-50 AH
318-221D	0,01 N (1 gf)	$(0,5 + L/100) \mu\text{m}$ L = Measurement height	VL-50 B
318-222D	0,15 N (15 gf)	$(0,5 + L/100) \mu\text{m}$ L = Measurement height	VL-50-15-B
318-223D	1 N (102 gf)	$(0,5 + L/100) \mu\text{m}$ L = Measurement height	VL-50-100-B

LITEMATIC VL-50

Motorized low force, high precision gauges

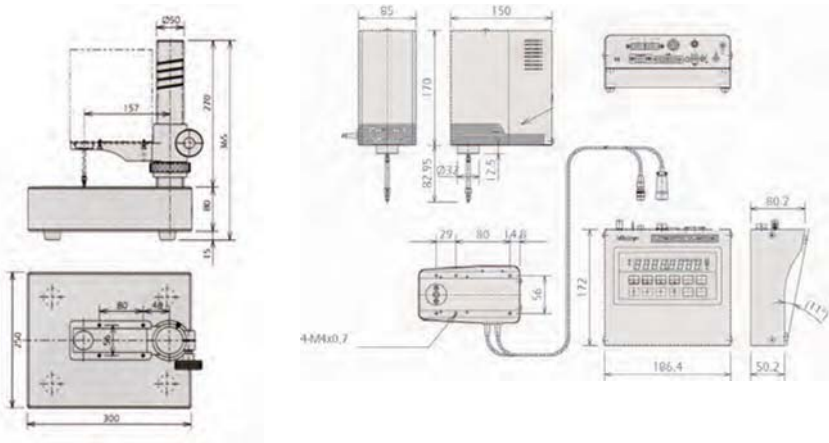
Series 318

- This is a high-accuracy gauge head with a separate controller.
- The LITEMATIC VL-50 offers you the following benefits:
- It has a measuring force of **0,01 N** (1 gf) and a resolution of 0,01 µm.
 - Its constant and low measuring force makes it especially suitable for measuring soft materials such as rubber, plastic, film thicknesses or sensitive form parts.
 - The motor driven plunger gives you a range of approach and retraction speeds for safe and easy operation.
 - The head is supplied with a separate controller so you can mount it in a measurement fixture, or on the optional comparator stand.



318-22xD (957460 is optional)

318-22xD



957460 Comparator stand

No.	Measuring force [N]	Accuracy	Type
318-226D	0,01 N (1 gf)	(0,5 + L/100)µm L = Measurement height	VL-50S-B
318-227D	0,15 N (15 gf)	(0,5 + L/100)µm L = Measurement height	VL-50S-15-B
318-228D	1 N (102 gf)	(0,5 + L/100)µm L = Measurement height	VL-50S-100-B

Functions	Series 318
ZERO/ABS	●
Data output	●
PRESET	●
Counting direction switchable	●
mm / inch switching	●
Key lock	●
Tolerance input (3 or 5 levels)	●
Motorised plunger movement	●
Mode : max-min (TIR) reading	●
Max. value/Hold	●

Specifications

Measuring range (inside)	0-50 mm
Data output	DIGIMATIC RS 232C INTERFACE I/O

Optional accessories

No.	Description
957460	Comparator stand for LITEMATIC VL-50S
937179T	Footswitch
02ADB440	BCD-I/O-Data connector
936937	Digimatic cable (1 m)
965014	Digimatic cable (2 m)
12AAA807D	RS-232C cable (2m)
06ADV380D	USB Input Tool Direct cable (2 m)
02AZD790D	Connecting cable U-Wave

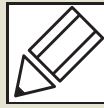
Consumable spares

No.	Description
901312	Standard contact point



Refer to the LITEMATIC documentation for more details

Quick Guide to Precision Measuring Instruments

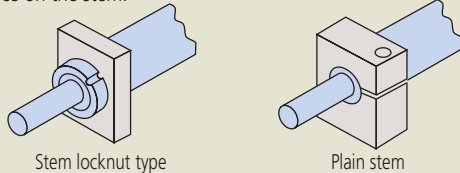


Linear Gages

Head

■ Plain Stem and Stem with Clamp Nut

The stem used to mount a linear gage head is classified as a "plain type" or "clamp nut type" as illustrated below. The clamp nut stem allows fast and secure clamping of the linear gage head. The plain stem has the advantage of wider application and slight positional adjustment in the axial direction on final installation, although it does require a split-fixture clamping arrangement or adhesive fixing. However, take care so as not to exert excessive force on the stem.



■ Measuring Force

This is the force exerted on a workpiece during measurement by the contact point of a linear gage head, at its stroke end, expressed in newtons.

■ Comparative Measurement

A measurement method where a workpiece dimension is found by measuring the difference in size between the workpiece and a master gage representing the nominal workpiece dimension.

■ Ingress Protection Code

IP54 protection code

Type	Level	Description
Protects the human body and protects against foreign objects	5: Dust protected	Protection against harmful dust
Protects against exposure to water	4: Splash-proof type	Water splashing against the enclosure from any direction shall have no harmful effect.

IP66 protection code

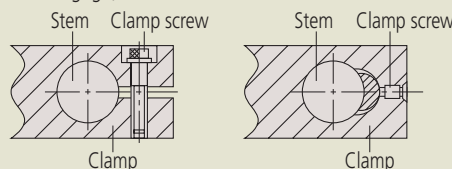
Type	Level	Description
Protection against contact with the human body and foreign objects	6: Dust tight	Protection from dust ingress Complete protection against contact
Protects against exposure to water	6: Water-resistant type	Water jets directed against the enclosure from any direction shall have no harmful effects.

■ Precautions in Mounting a Gage Head

- Insert the stem of the gage into the mounting clamp of a measuring unit or a stand and tighten the clamp screw.
- Notice that excessively tightening the stem can cause problems with spindle operation.
- Never use a mounting method in which the stem is clamped by direct contact with a screw.
- Never mount a linear gage by any part other than the stem.
- Mount the gage head so that it is in line with the intended direction of measurement. Mounting the head at an angle to this direction will cause an error in measurement.
- Exercise care so as not to exert a force on the gage through the cable.

■ Precautions in Mounting a Laser Hologage

To fix the Laser Hologage, insert the stem into the dedicated stand or fixture.



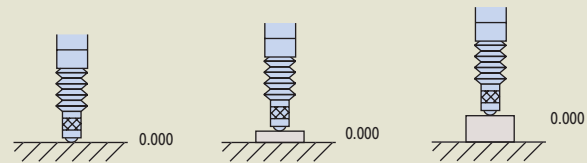
Recommended hole diameter on the fixing side: 15mm +0.034/-0.014

- Machine the clamping hole so that its axis is parallel with the measuring direction. Mounting the gage at an angle will cause a measuring error.
- When fixing the Laser Hologage, do not clamp the stem too tightly. Over-tightening the stem may impair the sliding ability of the spindle.
- If measurement is performed while moving the Laser Hologage, mount it so that the cable will not be strained and no undue force will be exerted on the gage head.

Display Unit

■ Zero-setting

A display value can be set to 0 (zero) at any position of the spindle.



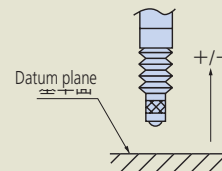
■ Presetting

Any numeric value can be set on the display unit for starting the count from this value.



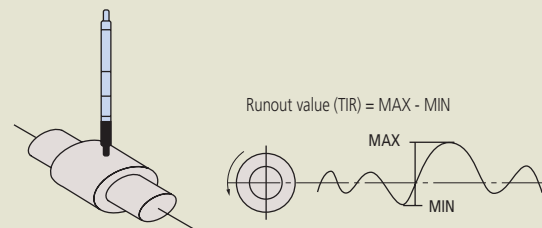
■ Direction changeover

The measuring direction of the gage spindle can be set to either plus (+) or minus (-) of count.



■ MAX, MIN, TIR Settings

The display unit can hold the maximum (MAX) and minimum (MIN) values, and MAX - MIN value during measurement.



■ Tolerance Setting

Tolerance limits can be set in various display units for automatically indicating if a measurement falls within those limits.

■ Open Collector Output

An external load, such as a relay or a logic circuit, can be driven from the collector output of an internal transistor which is itself controlled by a Tolerance Judgement result, etc.

■ Relay output

Contact signal that outputs the open/closed status.

■ Digimatic Code

A communication protocol for connecting the output of measuring tools with various Mitutoyo data processing units. This allows output connection to a Digimatic Mini Processor DP-1VR for performing various statistical calculations and creating histograms, etc.

■ BCD Output

A system for outputting data in binary-coded decimal notation.

■ RS-232C Output

A serial communication interface in which data can be transmitted bi-directionally under the EIA Standards. For the transmission procedure, refer to the specifications of each measuring instrument.

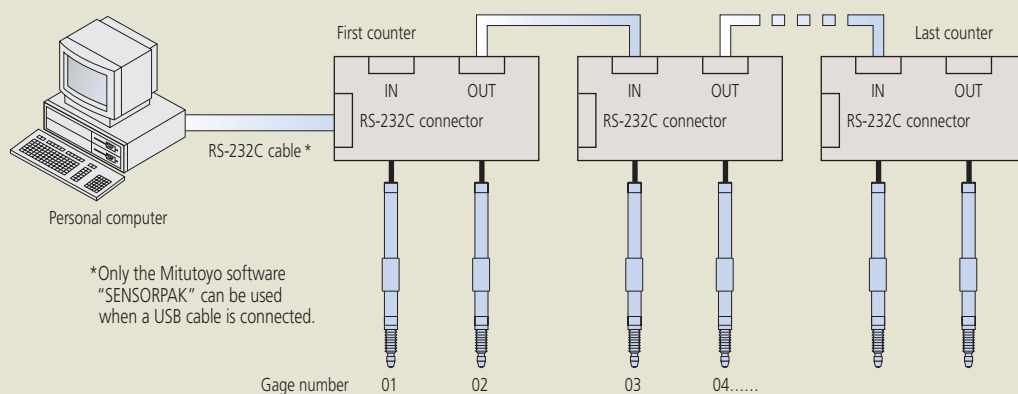
RS Link Function Multi-point measurement can be performed by connecting multiple EH or EV counters with RS Link cables.

■ RS Link for EH Counter

It is possible to connect a maximum of 10 counter units and handle up to 20 channels of multi-point measurement at a time.

For this connection use a dedicated RS Link cable **No.02ADD950** (0.5m), **No.936937** (1m) or **No.965014** (2m).

(The total length of RS Link cables permitted for the entire system is up to 10m.)



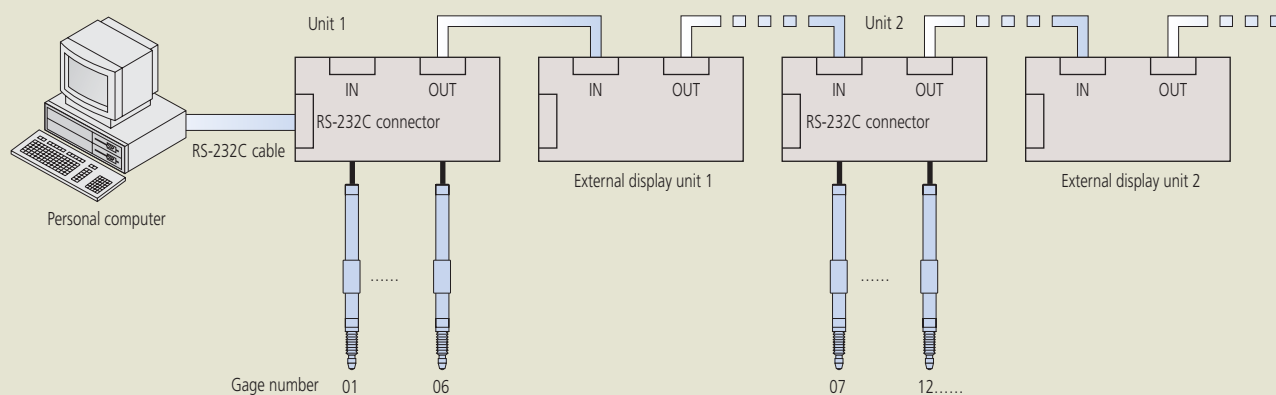
■ RS Link for EV Counter

It is possible to connect a maximum of 10* counter units and handle up to 60 channels of multi-point measurement at a time.

For this connection use a dedicated RS Link cable **No.02ADD950** (0.5m), **No.936937** (1m) or **No.965014** (2m).

(The total length of RS Link cables permitted for the entire system is up to 10m.)

* The maximum number of counter units that can be connected is limited to 6 (six) if an EH counter is included in the chain.





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Laser Scan Micrometer Measuring Unit and Display Unit Package

Series 544

The LSM-902/6900 is a high accuracy, non-contact measuring system that uses a high speed scanning laser beam to accurately measure workpieces. It is ideal for measuring items that are difficult or impossible to measure with conventional instruments, such as elastic parts or soft parts that might deform under pressure.

The LSM-902/6900 offers you the following benefits:

- Suitable for pin and plug gauge measurements.
- It has a wide measuring range of 0,1 mm to 25 mm.
- Provides ultra-high accuracy with a linearity of $\pm 0,5 \mu\text{m}$ over the entire measuring range and $\pm (0,3+0,1\Delta D) \mu\text{m}$ in the narrow range.
- Ultra-high repeatability of $\pm 0,05 \mu\text{m}$.



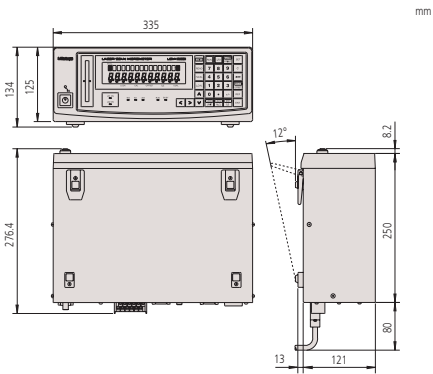
LSM-6900 display unit



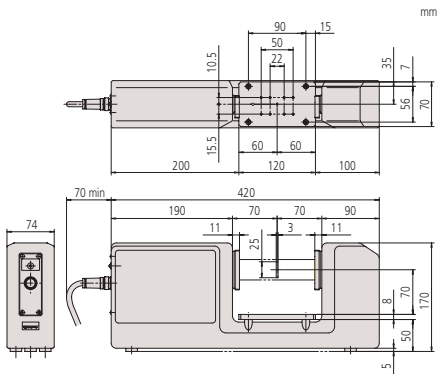
LSM-902 measuring unit

Metric

No.	Range [mm]	Resolution (selectable)
544-495D	0,1-25	0,01-10 μm



LSM-6900 display unit



LSM-902 measuring unit

Functions	Series 544
GO/ \pm NG judgement	●
OFFSET	●
Multi-limit judgement	●
Sample Measurement	●
Statistical calculation	●
Data output	●
ZERO SET	●
PRESET	●
Group judgement	●
Workpiece position display	●
Dual-gauge calibration	●
Transparent object measurement	●
Automatic measurement	●
Abnormal data elimination	●
Dual-unit measurement (optional)	●

Specifications

Linearity at 20°C *1	Entire range : $\pm 0,5 \mu\text{m}$ Narrow range : $\pm (0,3+0,1\Delta D) \mu\text{m}$
Positional error *2	$\pm 0,5 \mu\text{m}$
Repeatability ($\pm 2\sigma$)	$\pm 0,05 \mu\text{m}$
Measuring region	3 x 25 mm
Laser wavelength	650 nm, Visible
Scanning rate	800 scans/s
Scanning speed	56m/s
Applicable laser standards	IEC
Main display	16-digit fluorescent tube
Interface units equipped	RS-232C, Analogue I/O, Footswitch
Power supply	100 - 240VAC, 40 VA, 50/60Hz

Optional accessories

No.	Description
02AGD180	Calibration gauge set ($\phi 1-25$)
02AGD270	Workstage
02AGD280	Adjustable workstage

*1 At the centre of the measuring region
*2 Potential measurement error due to variation in workpiece position within the measuring region
 ΔD = Difference in diameter between the mastergauge and workpiece



Refer to the LSM brochure

Laser Scan Micrometer Measuring Unit

Series 544

LSM-500S

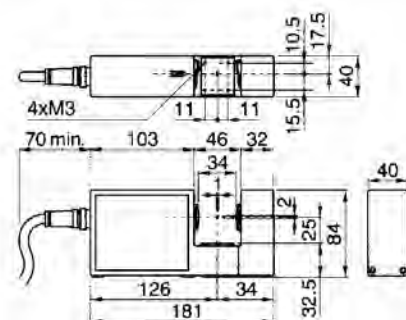


High Accuracy Non-contact Measuring System

- Measuring range starting from $\varnothing 5 \mu\text{m}$.
- Provides ultra-high accuracy with a linearity of $\pm 0,3 \mu\text{m}$ over the entire measuring range (5 μm up to 2 mm).
- Ultra-high repeatability of $\pm 0,03 \mu\text{m}$.
- High scanning rate of 3200 scans/s



LSM-500S



Metric

No.	Range [mm]	Resolution (selectable)
544-532	0,005-2	0,00001-0,01 mm

Series 544

LSM-501S

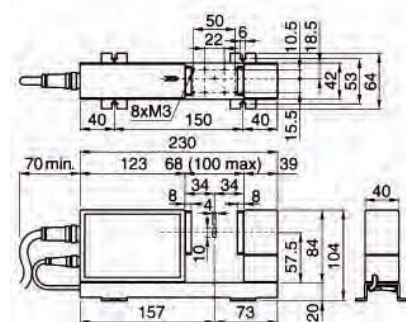


High Accuracy Non-contact measuring system

- Provides ultra-high accuracy with a linearity of $\pm 0,5 \mu\text{m}$ over the entire measuring range (0,05 mm to 10 mm) and $\pm (0,3+0,1\Delta D) \mu\text{m}$ in the narrow range.
- Ultra-High repeatability of $\pm 0,04 \mu\text{m}$.
- High scanning rate of 3200 scans/s



LSM-501S



Metric

No.	Range [mm]	Resolution (selectable)
544-534	0,05-10	0,00001-0,01 mm

Specifications

Linearity at 20°C *1	$\pm 0,3 \mu\text{m}$
Positional error *2	$\pm 0,4 \mu\text{m}$
Repeatability ($\pm 2\sigma$)	$\pm 0,03 \mu\text{m}$
Measuring region	1 x 2 mm
Laser wavelength	650 nm, Visible
Scanning rate	3200 scans/s
Scanning speed	76m/s
Applicable laser standards	IEC, FDA

Optional accessories

No.	Description
02AGD110	Calibration gauge set ($\varnothing 0,1-2$)
02AGD200	Wire guiding pulley
02AGD220	Air shield
957608	Air cleaner for air shield
02AGN780A	Extension signal cable 5 m
02AGN780B	Extension signal cable 10 m
02AGN780C	Extension signal cable 15 m

Specifications

Linearity at 20°C *1	Entire range : $\pm 0,5 \mu\text{m}$ Narrow range : $\pm (0,3+0,1\Delta D) \mu\text{m}$
Positional error *2	$\pm 0,5 \mu\text{m}$
Repeatability ($\pm 2\sigma$)	$\pm 0,04 \mu\text{m}$
Measuring region	2 x 10 mm ($\varnothing 0,05-0,1$ mm) 4 x 10 mm ($\varnothing 0,1-10$ mm)
Laser wavelength	650 nm, Visible
Scanning rate	3200 scans/s
Scanning speed	113 m/s
Applicable laser standards	IEC, FDA

Optional accessories

No.	Description
02AGD120	Calibration gauge set ($\varnothing 0,1-10$)
02AGD210	Wire guiding pulley
02AGD400	Adjustable workstage
02AGD440	Centre support
02AGD450	Adjustable V-block
02AGD230	Air shield
957608	Air cleaner for air shield
02AGC150A	Extension relay cable 1 m
02AGN780A	Extension signal cable 5 m
02AGN780B	Extension signal cable 10 m
02AGN780C	Extension signal cable 15 m

02AGD440 and 02AGD450 : use with an adjustable workstage

*1 At the centre of the measuring region

*2 Potential measurement error due to variation in workpiece position within the measuring region

ΔD = Difference in diameter between the mastergauge and workpiece



Refer to the LSM brochure

Laser Scan Micrometer Measuring Unit

Series 544

LSM-512S

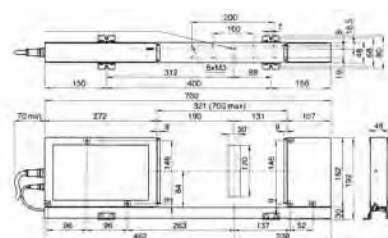


High Accuracy Non-contact measuring system

- General-purpose type with a wide measuring range of 1 mm to 120 mm.
- Provides high accuracy with a linearity of $\pm 6 \mu\text{m}$ over the entire measuring range and $\pm(4+0,5\Delta D) \mu\text{m}$ in the narrow range.
- Excellent repeatability of $\pm 0,8 \mu\text{m}$.
- High scanning rate of 3200 scans/s



LSM-512S



Metric

No.	Range [mm]	Resolution (selectable)
544-540	1-120	0,0001-0,1 mm

Series 544

LSM-516S

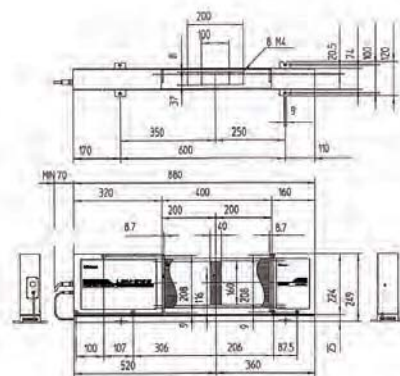


High Accuracy Non-contact measuring system

- General-purpose type with a wide measuring range of 1 mm to 160 mm.
- Provides high accuracy with a linearity of $\pm 7 \mu\text{m}$ over the entire measuring range and $\pm(4+2\Delta D) \mu\text{m}$ in the narrow range.
- Excellent repeatability of $\pm 1,4 \mu\text{m}$.
- High scanning rate of 3200 scans/s



LSM-516S



Metric

No.	Range [mm]	Resolution (selectable)
544-542	1-160	0,0001-0,1 mm

Specifications

Linearity at 20°C *1	Entire range : $\pm 6 \mu\text{m}$ Narrow range : $\pm(4+0,5\Delta D) \mu\text{m}$
Positional error *2	$\pm 8 \mu\text{m}$
Repeatability ($\pm 2\sigma$)	$\pm 0,8 \mu\text{m}$
Measuring region	30 x 120 mm
Laser wavelength	650 nm, Visible
Scanning rate	3200 scans/s
Scanning speed	904 m/s
Applicable laser standards	IEC, FDA

Optional accessories

No.	Description
02AGD150	Calibration gauge set (ø20-120)
02AGD260	Air shield
957608	Air cleaner for air shield
02AGC150A	Extension relay cable 1 m
02AGC150B	Extension relay cable 3 m
02AGC150C	Extension relay cable 5 m
02AGN780A	Extension signal cable 5 m
02AGN780B	Extension signal cable 10 m
02AGN780C	Extension signal cable 15 m
02AGN780D	Extension signal cable 20 m

Specifications

Linearity at 20°C *1	Entire range : $\pm 7 \mu\text{m}$ Narrow range : $\pm(4+2\Delta D) \mu\text{m}$
Positional error *2	$\pm 8 \mu\text{m}$
Repeatability ($\pm 2\sigma$)	$\pm 1,4 \mu\text{m}$
Measuring region	40 x 160 mm
Laser wavelength	650 nm, Visible
Scanning rate	3200 scans/s
Scanning speed	1206 m/s
Applicable laser standards	IEC, FDA

Optional accessories

No.	Description
02AGM300	Calibration gauge set (ø 20-160)
02AGC150A	Extension relay cable 1 m
02AGC150B	Extension relay cable 3 m
02AGC150C	Extension relay cable 5 m
02AGN780A	Extension signal cable 5 m
02AGN780B	Extension signal cable 10 m
02AGN780C	Extension signal cable 15 m
02AGN780D	Extension signal cable 20 m

*1 At the centre of the measuring region

*2 Potential measurement error due to variation in workpiece position within the measuring region

ΔD = Difference in diameter between the mastergauge and workpiece



Refer to the LSM brochure

Laser Scan Micrometer

Series 544

The LSM-9506 is a bench-top, non-contact measuring system that uses a high speed scanning laser beam to accurately measure workpieces. It is ideal for measuring items that are difficult or impossible to measure with conventional instruments, such as elastic parts or soft parts that might deform under pressure.

The LSM-9506 offers you the following benefits:

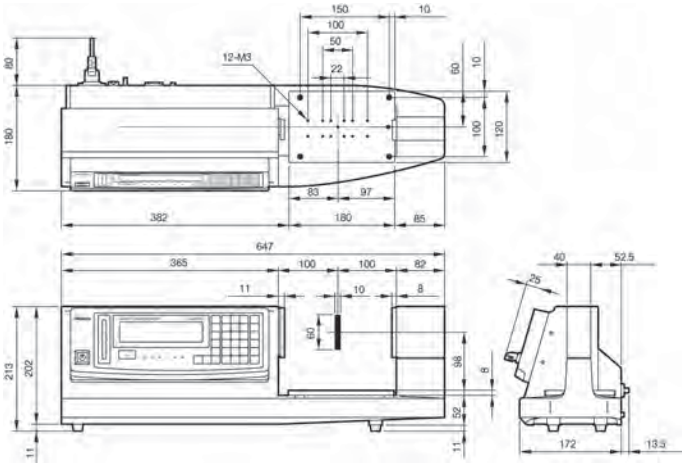
- Its measurement system has an integrated display, allowing easy bench-top inspection.
- A statistical calculation function is also provided.
- Includes standard RS-232C serial port and data output interface.



LSM-9506

Metric

No.	Range [mm]	Resolution (selectable)
544-115D	0,5-60	0,00005-0,1 mm



Functions	Series 544
GO/±NG judgement	●
OFFSET	●
Multi-limit judgement	●
Sample Measurement	●
Statistical calculation	●
Data output	●
ZERO SET	●
PRESET	●
Group judgement	●
Workpiece position display	●
Dual-gauge calibration	●
Transparent object measurement	●
Automatic measurement	●
Abnormal data elimination	●

Specifications

Linearity at 20°C *1	±2,5 µm
Positional error *2	±2,5 µm
Repeatability (±2σ)	±0,6 µm
Measuring region	10 x 60 mm
Laser wavelength	650 nm, Visible
Scanning rate	1600 scans/s
Scanning speed	226 m/s
Applicable laser standards	IEC
Main display	16-digit fluorescent tube
Interface units equipped	RS-232C, Digimatic, Foot Switch
Power supply	100-240VAC, 40VA, 50/60Hz



Refer to the LSM brochure

*1 At the centre of the measuring region
*2 Potential measurement error due to variation in workpiece position within the measuring region

Laser Scan Micrometer Display Unit

Series 544

The LSM-5200 Display Unit is a versatile display unit dedicated to Laser Scan Micrometers. This dual-display design allows setup values to be continuously monitored with. You can also get simultaneous readout of two measurement values, and segment measurement and edge measurement are both supported. Statistical calculation and abnormal-data elimination functions are provided as well.

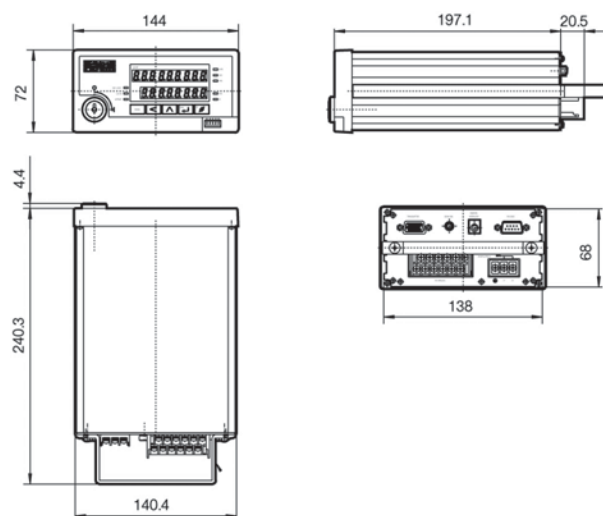
The LSM-5200 Display Unit offers you the following benefits:

- Panel-mount type (with dimensions conforming to DIN 43700) making system integration easy.
- Capable of calculating mean, maximum, and range (maximum to minimum).
- You can select either segment measurement (7 segments max) or edge measurement (1 to 255 edges).
- USB, RS-232C, I/O and analogue interfaces are provided as standard.
- The arithmetical average or moving average can also be selected.
- GO/±NG judgement function.



LSM-5200 display unit

No.
544-047



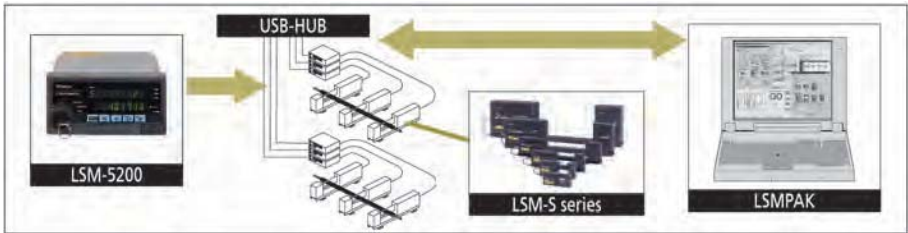
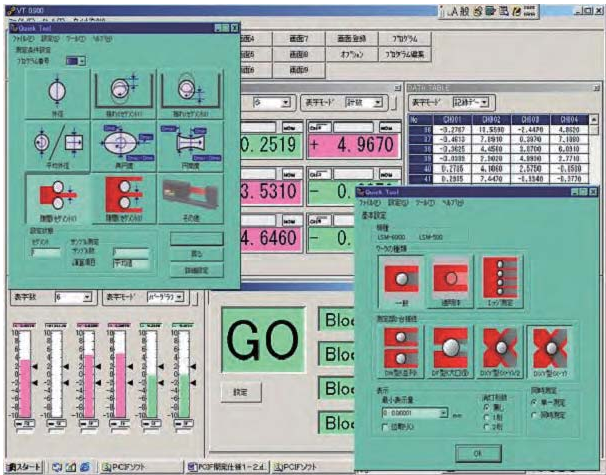
Laser Scan Micrometer Display Unit

Series 544

LSMPAK is Laser Scan Micrometer data software that enables and administers multi- point measurements.

LSMPAK offers you the following benefits:

- You can use it to import measurement data from multiple LSM-5200 Display Units to a personal computer, allowing a variety of measuring systems to be constructed.
- Capable of processing measurement-point data of max 10 channels (USB-HUB connection).
- Capable of composite calculation between measuring units (multiple channels), and it outputs statistical calculation and calculation results as a file.



System Diagram (Example of concurrent multi-point measurement of printer rollers)

No.
02NGA002

Specifications

Operating Environment	<ul style="list-style-type: none">• Connection interface: USB2• CPU : 2GHz or more (recommended)• OS/software : Windows® XP, Windows® 7 (32bit)• Microsoft® Excel® 2000 or higher• Memory : 256MB or more (recommended)• Applicable display unit : LSM-5200
Other Functions	Rich choice of functions (e.g. counter, graphs, calculation results)



Refer to the LSM brochure

Laser Scan Micrometer Display Unit

Series 544

The LSM-6200 Display Unit is a versatile display unit dedicated to Laser Scan Micrometers. This dual-display design allows setup values to be continuously monitored with. You can also get simultaneous readout of two measurement values, and segment measurement and edge measurement are both supported. Statistical calculation and abnormal-data elimination functions are provided as well.

The LSM-5200 Display Unit offers you the following benefits:

- With this dual-display design, you can continuously monitor setup values, and also simultaneously display two measurement values.
- You can select either the segment measurement (7 segments max) or edge measurement (1 to 255 edges).
- Includes RS-232C and I/O and analogue interface capabilities.
- Includes statistical calculation and abnormal data eliminating functions.

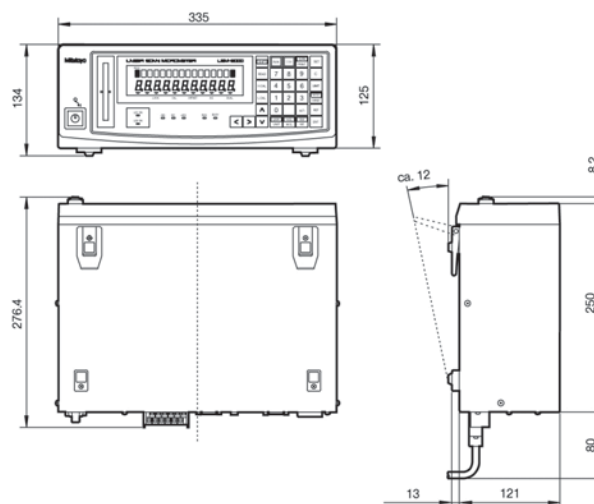


LSM-6200 display unit

Metric

No.

544-071D



02agp150 - Dual-type add-on unit

Functions	Series 544
GO/±NG judgement	●
OFFSET	●
Multi-limit judgement	●
Sample Measurement	●
Statistical calculation	●
Data output	●
ZERO SET	●
PRESET	●
Group judgement	●
Workpiece position display	●
Dual-gauge calibration	●
Transparent object measurement	●
Automatic measurement	●
Abnormal data elimination	●
Dual-unit measurement (optional)	●

Specifications

Applicable laser standards	IEC, FDA (544-534), JIS (544-533)
Main display	16-digit fluorescent tube
Interface units equipped	RS-232C, Analogue I/O, Foot Switch
Power supply	100-240V AC, 40 VA, 50/60Hz



Refer to the LSM brochure

Laser Scan Micrometer Optional Accessories

Series 544 - Accessories



Refer to the LSM brochure





	No.	Application	Description
	02AGD110	LSM-500S	Calibration gauge set (ø0,1-2 mm)
	02AGD120	LSM-501S	Calibration gauge set (ø0,1-10 mm)
	02AGD130	LSM-503S	Calibration gauge set (ø1-30 mm)
	02AGD140	LSM-506S	Calibration gauge set (ø1-60 mm)
	02AGD150	LSM-512S	Calibration gauge set (ø20-120 mm)
	02AGD170	LSM-9506	Calibration gauge set (ø1-60 mm)
	02AGD180	LSM-902	Calibration gauge set (ø1-25 mm)
	02AGM300	LSM-516S	Calibration gage set (ø 20-160 mm)
	02AGD200	LSM-500S	Wire guiding pulley
	02AGD210	LSM-501S	Wire guiding pulley
	02AGD220	LSM-500S	Air shield
	02AGD230	LSM-501S	Air shield
	02AGD240	LSM-503S	Air shield
	02AGD250	LSM-506S	Air shield
	02AGD260	LSM-512S	Air shield
	957608	All LSM models	Air cleaner for air shield
	02AGD270	LSM-501S/503S/902	Workstage
	02AGD280	LSM-902	Adjustable workstage
	02AGD370	LSM-9506	Adjustable workstage
	02AGD400	LSM-501S	Adjustable workstage
	02AGD490	LSM-503S	Adjustable workstage
	02AGD520	LSM-506S	Adjustable workstage
	02AGD680	LSM-9506	Adjustable workstage
	02AGD440	LSM-501S/503S/902	Centre support
	02AGD580	LSM-506S/9506	Centre support
	02AGD450	LSM-501S/503S/902	Adjustable V-block
	02AGD590	LSM-506S/9506	Adjustable V-block
	937179T.		Footswitch



Refer to the LSM brochure

Laser Scan Micrometer Optional Accessories

Series 544 - Accessories

	No.	Application	Description
 Digimatic (SPC) code-out unit	02AGC840	LSM-6200/6900	Digimatic (SPC) code-out unit
	02AGC880	LSM-6200/6900	2nd I/O & analog interface
	02AGC910	LSM-6200/6900	BCD interface unit
 Extension relay cable	02AGC150A	All LSM models ⁽¹⁾	Extension relay cable 1 m
	02AGC150B	All LSM models ⁽¹⁾	Extension relay cable 3 m
	02AGC150C	All LSM models ⁽¹⁾	Extension relay cable 5 m
	02AGC330A	All LSM models ⁽¹⁾	Output signal cable 5 m
	02AGC330B	All LSM models ⁽¹⁾	Output signal cable 10 m
 Extension signal cable	02AGN780A	All LSM models ⁽²⁾	Extension signal cable 5 m
	02AGN780B	All LSM models ⁽²⁾	Extension signal cable 10 m
	02AGN780C	All LSM models ⁽²⁾	Extension signal cable 15 m
	02AGN780D	All LSM models ⁽²⁾	Extension signal cable 20 m
	02AGN780E	All LSM models ⁽²⁾	Extension signal cable 30 m
 Dual-type add-on unit	02AGP150	LSM-6200	Dual-type add-on unit

⁽¹⁾ Except for LSM-500S/902

⁽²⁾ Except for LSM-902