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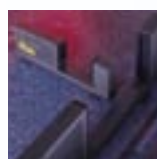
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Linear Gage



Mu-Checker



Laser Scan Micrometers

New Products



Linear Gage LGS



**Laser Scan Micrometer
LSM-500S**

Linear Gage / Display Unit Selection Guide

	KH Counter	EC Counter	EG Counter				EB Counter			EF Counter				EV Counter		
Representative Code No.		542-007	542-015	542-017	542-016	542-092	542-094	542-093	542-060	542-065	542-062	542-066	542-063	542-064	542-067	
Applicable gages																
0.00001mm Laser Hologage	●															
0.0001mm Laser Hologage			●						●		●					
0.0001mm LG/LGM			●						●		●					
0.0001mm LGK/LGB/LGF			●						●		●					
0.0005mm LGK/LGF			●			●			●		●		●			
0.0005mm LGF w/origin point mark				●			●			●		●			●	
0.001mm LGF w/origin point mark				●			●			●		●			●	
0.001mm LG/LGM			●			●			●		●		●			
0.001mm LGK/LGB/LGF			●			●			●		●		●			
0.005mm LGE			●			●			●		●		●			
0.01mm LGD/LGD-ML		●			●			●						●		
0.01mm LGS		●			●			●						●		
Functions																
Number of connectable gages	1	1	1	1	1	1	1	1	1	1	2	2	6	6	6	
Display	●	●	●	●	●	●	●	●	●	●	●	●	*1	*1	*1	
Zero set	●	●	●	●	●	●	●	●	●	●	●	●	*1	*1	*1	
Presetting	●	●	●	●	●	●	●	●	●	●	●	●	*1	*1	*1	
Direction switch	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
GO/NG indication		●	●	●	●	●	●	●	●	●	●	●	●	●	●	
GO/NG output		●	●	●	●	●	●	●	●	●	●	●	●	●	●	
5-stage tolerance display/output			●	●	●	●	●	●	●	●	●	●				
3-stage tolerance display/output		●	●	●	●	●	●	●	●	●	●	●	●	●	●	
mm/inch switch	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
ABS gage zero set		●			●			●						●	●	
ABS/INC gage changeover		●			●			●						●	●	
Peak hold			●	●	●	●	●	●	●	●	●	●	●	●	●	
Run out (TIR) measurement			●	●	●	●	●	●	●	●	●	●	●	●	●	
Double count	●								●	●	●	●				
Sum/difference calculation											●	●				
Lower digit blank-out		●	●	●	●				●	●	●	●				
External zero set		*2	*2	*2	*2	*2	*2	*2	●	●	●	●	●	●	●	
External preset		*3	●	●	●	●	●	●	●	●	●	●	●	●	●	
External hold		*3	●	●	●	●	●	●	●	●	●	●	●	●	●	
External tolerance set (when a PC is used)									●	●	●	●	●	●	●	
External tolerance memory switch (when I/O is used)			●	●	●	●	●	●					●	●	●	
External peak-hold cancel			●	●	●	●	●	●	●	●	●	●	●	●	●	
Inter-axial calculation function													●	●	●	
Output																
Power-supply voltage error		●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Overspeed error			●	●		●	●		●	●	●	●	●	●		
Overflow error		●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Gage error		●	●	●	●	●	●	●	●	●	●	●	●			
Tolerance setting error		●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Communication error									●	●	●	●	●	●	●	
Parallel BCD output			●	●	●								●	●	●	
Serial BCD output						●	●	●								
Simple analog output						●	●	●								
Tolerance judgment output		*3	●	●	●	●	●	●	●	●	●	●	●	●	●	
Limit output						●	●	●								
Segment output													●	●	●	
RS-232C output	●								*3 (6)	*3 (6)	*3 (12)	*3 (12)	● (60)	● (60)	● (60)	
Digimatic output		*5				●	●	●	*4	*4	*4	*4				
RS link (Maximum number of gages)									*3 (6)	*3 (6)	*3 (12)	*3 (12)	● (60)	● (60)	● (60)	

*1: When an optional D-EV is connected.

*4: Switchable between the RS-232C output.

*2: Enabled by setting "0" via external presetting.

*5: Switchable between the tolerance judgment output.

*3: Switchable between the Digimatic output.

Linear Gage LGK

SERIES 542 — with Slime Dimensions

Technical Data

Accuracy: Refer to the list of specifications (excluding quantizing error)
 Resolution: 1μm, 0.5μm or 0.1μm
 Length standard: Photoelectric linear encoder
 Max. response speed: 1500mm/s, 400mm/s (**542-158**)
 Contact point: ø3mm carbide
 Stem: ø8mm
 Bearing type: Stroke ball bearing
 Measuring force: Refer to the list of specifications
 Output signal: 90° phase difference, differential square wave (RS-422A equivalent)
 Signal pitch: 0.4μm (**542-158**), 2μm (**542-157**), 4μm (**542-156**)
 Dust/Water protection level: IP66

Optional Accessory

238772: Rubber boot (10mm)
902434: Extension cable (5m)
902433: Extension cable (10m)
902432: Extension cable (20m)
02ADE230: Air drive unit
02ADB680: Thrust stem set
02ADB682: Clamping nut
02ADB683: Wrench

FEATURES

- Compact design with a 12mm outside diameter
- Excellent structure of protection against dust and water splash (IP-66) in harsh shop-floor environments.
- Maximum permissible acceleration values for shock and impact, 11ms (IEC68-2-27)
- Output differential square wave signals for a wide range of applications.
- Employs linear stroke bearings on the spindle movement for durability
- Thrust Stem with a clamping nut is optional.
- Interchangeable contact points for dial indicators can be used. (See pages 200 and 201.)

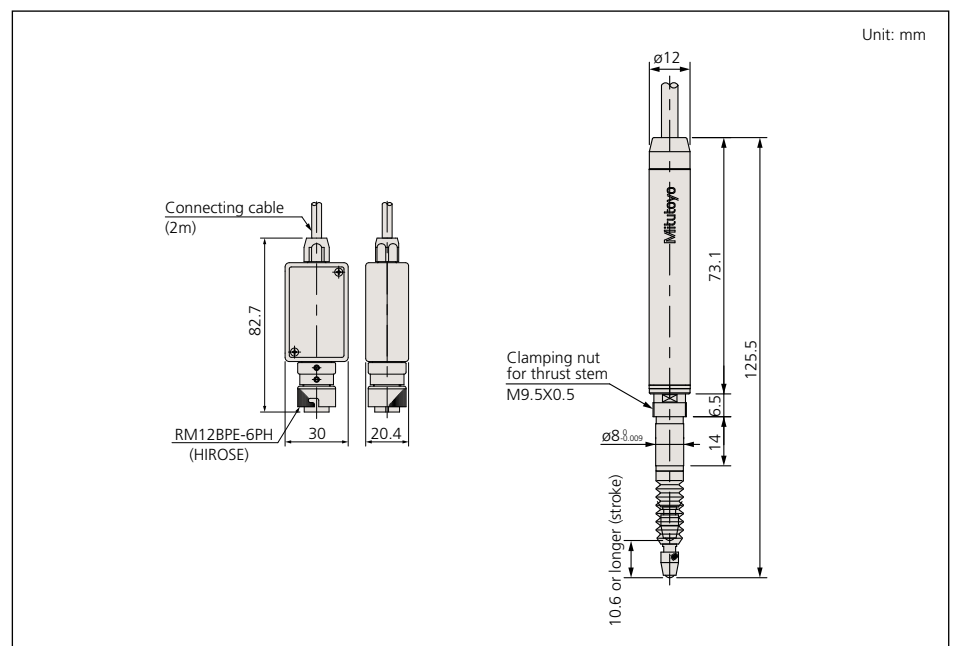


SPECIFICATIONS

Range	Order No.	Resolution	Accuracy*	Measuring force**	Stem dia.	Remarks
10mm (.4")	542-156	0.001mm	(1.5+L/50)μm	0.65N / 0.6N / 0.55N	8mm	—
10mm (.4")	542-157	0.0005mm	(1.5+L/50)μm	0.65N / 0.6N / 0.55N	8mm	—
10mm (.4")	542-158	0.0001mm	(0.8+L/50)μm	0.65N / 0.6N / 0.55N	8mm	—

*L = Measured length (mm) **Posture of gage: Upward / Horizontal / Downward

DIMENSION



Refer to the Linear Gage leaflet (E4174) for more details.

Linear Gage LGF

SERIES 542 — Economical Design

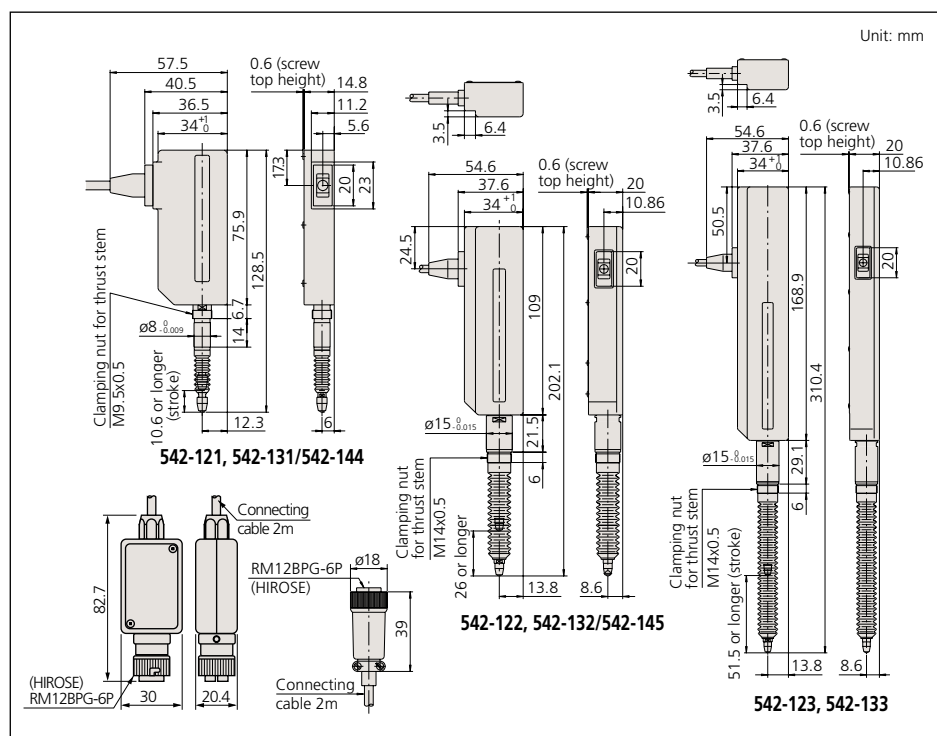


SPECIFICATIONS

Range	Order No.	Resolution	Accuracy*	Measuring force**	Stem dia.	Remarks
10mm (.4")	542-144	0.0001mm	(0.8+L/50)µm	1.2N / 1.1N / 1.0N	8mm	—
10mm (.4")	542-131	0.0005mm	(1.5+L/50)µm	1.2N / 1.1N / 1.0N	8mm	—
10mm (.4")	542-121	0.001mm	(1.5+L/50)µm	1.2N / 1.1N / 1.0N	8mm	—
25mm (1")	542-145	0.0001mm	(0.8+L/50)µm	4.6N / 4.3N / 4.0N	15mm	—
25mm (1")	542-132	0.0005mm	(1.5+L/50)µm	4.6N / 4.3N / 4.0N	15mm	—
25mm (1")	542-122	0.001mm	(1.5+L/50)µm	4.6N / 4.3N / 4.0N	15mm	—
50mm (2")	542-133	0.0005mm	(1.5+L/50)µm	5.7N / 5.3N / 4.9N	15mm	—
50mm (2")	542-123	0.001mm	(1.5+L/50)µm	5.7N / 5.3N / 4.9N	15mm	—

*L = Measured length (mm) **Posture of gage: Upward / Horizontal / Downward

DIMENSION



Technical Data

Accuracy: Refer to the list of specifications (excluding quantizing error)
 Resolution: 1µm, 0.5µm or 0.1µm
 Length standard: Photoelectric linear encoder
 Max. response speed: 1500mm/s, (400mm/s: **542-144, 542-145**)
 Contact point: ø3mm carbide
 Stem: ø8mm or ø15mm
 Bearing type: Stroke ball bearing
 Measuring force: Refer to the list of specifications
 Output signal: 90° phase difference, differential square wave (RS-422A equivalent)
 Signal pitch: 4µm (**542-121, 542-122, 542-123**), 2µm (**542-131, 542-132, 542-133**) or 0.4µm (**542-144, 542-145**)
 Dust/Water protection level: IP66

Optional Accessory

238772: Rubber boot (10mm)
962504: Rubber boot (25mm)
962505: Rubber boot (50mm)
902434: Extension cable (5m*)
902433: Extension cable (10m*)
902432: Extension cable (20m*)
02ADB680: Thrust stem set (for 10mm range models)
02ADB690: Thrust stem set (for 25, 50mm range models)
 *not available for **542-144** and **542-145**



Refer to the Linear Gage leaflet (E4174) for more details.

SERIES 542 — Economical Design with Origin Point Mark

Accuracy: Refer to the list of specifications
(excluding quantizing error)

Resolution: 1μm or 0.5μm

Length standard: Photoelectric linear encoder

Max. response speed: 1500mm/s

Contact point: ø3mm carbide

Stem: ø8mm or ø15mm

Bearing type: Stroke ball bearing

Measuring force: Refer to the list of specifications

Output signal: 90° phase difference, differential square
wave (RS-422A equivalent)

Signal pitch: 4μm **(542-124, 542-125, 542-126)** or
2μm **(542-134, 542-135, 542-136)**

Dust/Water protection level: IP66



*L = Measured length (mm) **Posture of gage: Upward / Horizontal / Downward

238772: Rubber boot (10mm)
962504: Rubber boot (25mm)
962505: Rubber boot (50mm)
02ADB680: Thrust stem set (for 10mm range models)
02ADB690: Thrust stem set (for 25, 50mm range models)

Unit: mm

542-124, 542-134

Clamping nut for thrust stem
M9.5x0.5

10.6 or longer (stroke)

61.5
40.5
36.5
34 $\frac{+0.1}{-0.1}$
14.6 $\frac{+0.1}{-0.1}$
12.3
75.9
128.5
173
0.6 (screw top height)
14.8
11.2
5.6
20
23
6

542-125, 542-135

Clamping nut for thrust stem
M14x0.5

26 or longer

54.6
37.6
34 $\frac{+0.1}{-0.1}$
24.5
109
202.1
21.5
6
13.8
8.6
0.6 (screw top height)
20
10.86
20

542-126, 542-136

Clamping nut for thrust stem
M14x0.5

51.5 or longer (stroke)

54.6
37.6
34 $\frac{+0.1}{-0.1}$
50.5
168.9
310.4
29.1
6
13.8
8.6
0.6 (screw top height)
20
10.86
20

Sleeve

ø16.7
34.0
ø6.2

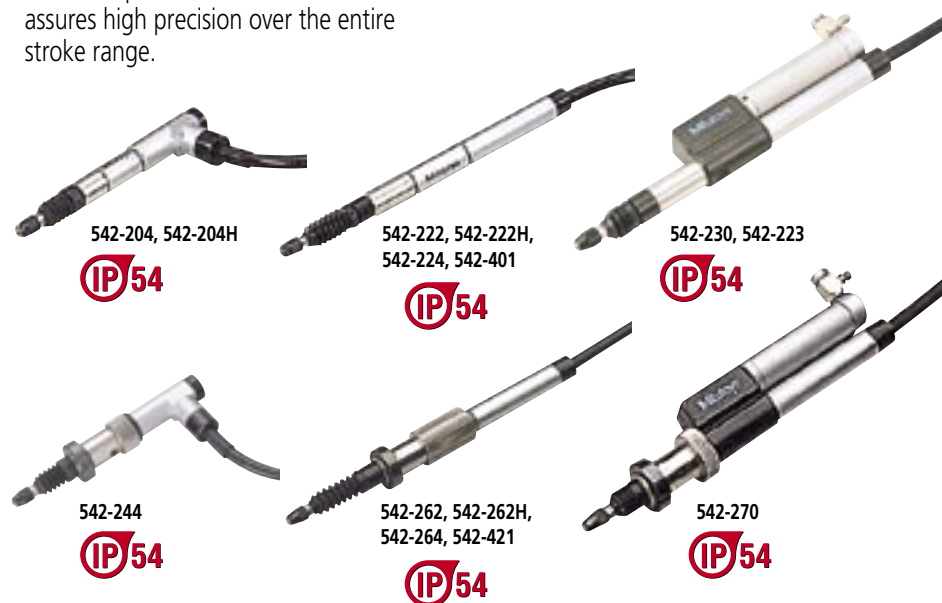


Linear Gage LGB

SERIES 542 — with Extra Slim Dimensions

FEATURES

- Extremely compact design. Available with an outside diameter as small as 8mm.
- The small photoelectric linear encoder assures high precision over the entire stroke range.
- The ball bearings used in the spindle unit ensure superb durability.



Technical Data

Accuracy: Refer to the list of specifications (excluding quantizing error)
 Resolution: 1μm
 Length standard: Photoelectric linear encoder
 Max. response speed: 900mm/s
 Contact point: ø3mm carbide
 Stem: ø8mm or ø9.5mm
 Bearing type: Stroke ball bearing
 Measuring force: Refer to the list of specifications
 Output signal: 90° phase difference, differential square wave (RS-422A equivalent)
 (Sign-wave output: **542-401, 542-424**)
 Signal pitch: 4μm
 Dust/Water protection level: IP54

Optional Accessory

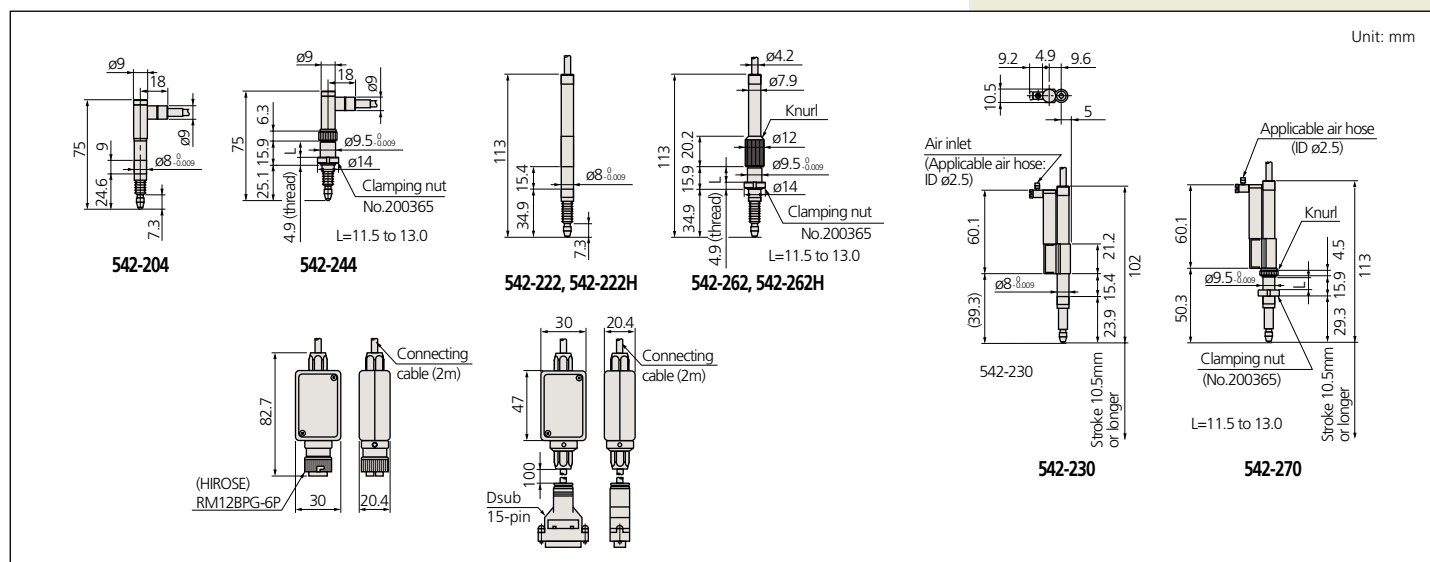
238773: Rubber boot for 5mm LGB (spare)
238772: Rubber boot for 10mm LGB (spare)
902434: Extension cable (5m)
902433: Extension cable (10m)
902432: Extension cable (20m)

SPECIFICATIONS

Range	Order No.	Resolution	Accuracy	Measuring force*	Stem dia.	Remarks
5mm (.2")	542-204	0.001mm	2μm	0.65N / 0.6N / 0.55N	8mm	—
5mm (.2")	542-204H	0.001mm	1μm	0.65N / 0.6N / 0.55N	8mm	—
10mm (.4")	542-222	0.001mm	2μm	0.8N / 0.75N / 0.7N	8mm	—
10mm (.4")	542-222H	0.001mm	1μm	0.8N / 0.75N / 0.7N	8mm	—
10mm (.4")	542-401	0.001mm	2μm	0.8N / 0.75N / 0.7N	8mm	Sine-wave output
10mm (.4")	542-224	0.001mm	2μm	0.6N / 0.55N / 0.5N	8mm	—
10mm (.4")	542-230	0.001mm	2μm	0.8N / 0.75N / 0.7N	8mm	w/ pneumatic cylinder
10mm (.4")	542-223	0.001mm	2μm	0.8N / 0.75N / 0.7N	8mm	w/ pneumatic cylinder
5mm (.2")	542-244	0.001mm	2μm	0.65N / 0.6N / 0.55N	9.5mm	Low measuring force
10mm (.4")	542-262	0.001mm	2μm	0.8N / 0.75N / 0.7N	9.5mm	—
10mm (.4")	542-262H	0.001mm	1μm	0.8N / 0.75N / 0.7N	9.5mm	—
10mm (.4")	542-421	0.001mm	2μm	0.8N / 0.75N / 0.7N	9.5mm	Sine-wave output
10mm (.4")	542-264	0.001mm	2μm	0.6N / 0.55N / 0.5N	9.5mm	Low measuring force
10mm (.4")	542-270	0.001mm	2μm	0.8N / 0.75N / 0.7N	9.5mm	w/ pneumatic cylinder

*Posture of gage: Upward / Horizontal / Downward

DIMENSION



Refer to the Linear Gage leaflet (E4174) for more details.

Linear Gage LGE

SERIES 542 — IP66 Water/Dust Protection

Technical Data

Accuracy: Refer to the list of specifications (excluding quantizing error)
 Resolution: 5μm
 Length standard: Photoelectric linear encoder
 Max. response speed: 1400mm/s
 Contact point: ø3mm carbide
 Stem: ø8mm or ø15mm
 Bearing type: Stroke ball bearing
 Measuring force: Refer to the list of specifications
 Output signal: 90° phase difference, differential square wave (RS-422A equivalent)
 Signal pitch: 20μm
 Dust/Water protection level: IP66 (IP54: 542-604)

Optional Accessory

238772: 10mm rubber boot (spare)
 962504: 25mm rubber boot (spare)
 962505: 50mm rubber boot (spare)
 02ADC730: ø9.5mm Thrust stem set (for 10mm LGE model)
 02ADC740: ø18mm Thrust stem set (for 25mm/50mm LGE model)

The LGE Series Linear Gages are compact electronic gage heads designed to fit into very tight spaces. Employing linear ball bearings, the LGE is also highly durable for long life.

FEATURES

- With a rubber boot for use in harsh environments.
- Optional thrust stem and tightening nut facilitate setup of the LGE linear gage in holes of a plate or fixture.

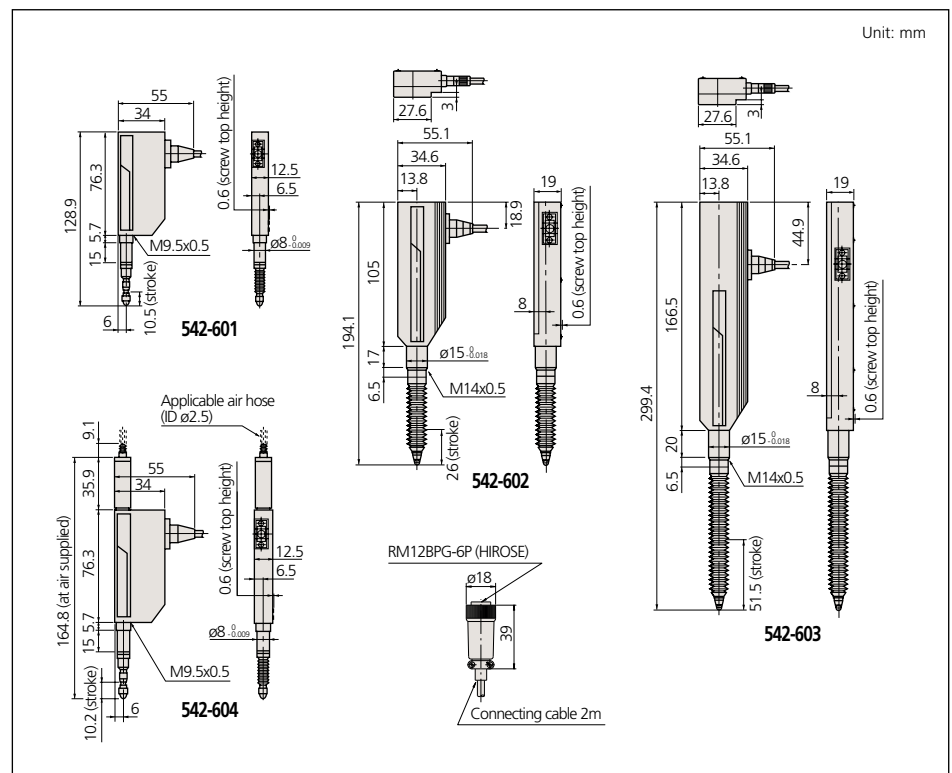


SPECIFICATIONS

Range	Order No.	Resolution	Accuracy	Measuring force*	Stem dia.	Remarks
10mm (.4")	542-601	0.005mm	20μm	1.2N / 1.1N / 1.0N	8mm	—
10mm (.4")	542-604	0.005mm	20μm	1.2N / 1.1N / 1.0N	8mm	w/ pneumatic cylinder
25mm (1")	542-602	0.005mm	20μm	4.6N / 4.3N / 4.0N	15mm	—
50mm (2")	542-603	0.005mm	30μm	5.7N / 5.3N / 4.9N	15mm	—

*Posture of gage: Upward / Horizontal / Downward

DIMENSION



Refer to the Linear Gage leaflet (E4174) for more details.

Linear Gage LGD / LGD-M

SERIES 542 — with ABSOLUTE Linear Encoder

The LGD is an ultra-compact ABS Linear Gage designed to fit into very tight spaces. It keeps track of its origin point once set.

FEATURES

- The use of an absolute scale* in the sensor makes it possible to maintain the origin setting even when the power is switched off.

- Special linear ball bearings are used for the spindle guide to ensure a long service life.
- Optional thrust stem and tightening nut facilitate setup of the LGD linear gage in holes of a plate or fixture.
- LGD-M employs the slide-bearing for higher cost-effectiveness.



SPECIFICATIONS

Metric LGD

Range	Order No.	Resolution	Accuracy	Measuring force*	Stem dia.	Remarks
10mm	575-321	0.01mm	20μm	1.2N / 1.1N / 1.0N	8mm	—
10mm	575-324	0.01mm	20μm	1.2N / 1.1N / 1.0N	8mm	w/ pneumatic cylinder
25mm	575-322	0.01mm	20μm	4.6N / 4.3N / 4.0N	15mm	—
50mm	575-323	0.01mm	30μm	5.7N / 5.3N / 4.9N	15mm	—

Inch LGD

Range	Order No.	Resolution	Accuracy	Measuring force*	Stem dia.	Remarks
.4"	575-331	.0005"	.001"	1.2N / 1.1N / 1.0N	8mm	—
.4"	575-334	.0005"	.001"	1.2N / 1.1N / 1.0N	8mm	w/ pneumatic cylinder
1"	575-332	.0005"	.001"	4.6N / 4.3N / 4.0N	15mm	—
2"	575-333	.0005"	.0012"	5.7N / 5.3N / 4.9N	15mm	—

Metric LGD-M

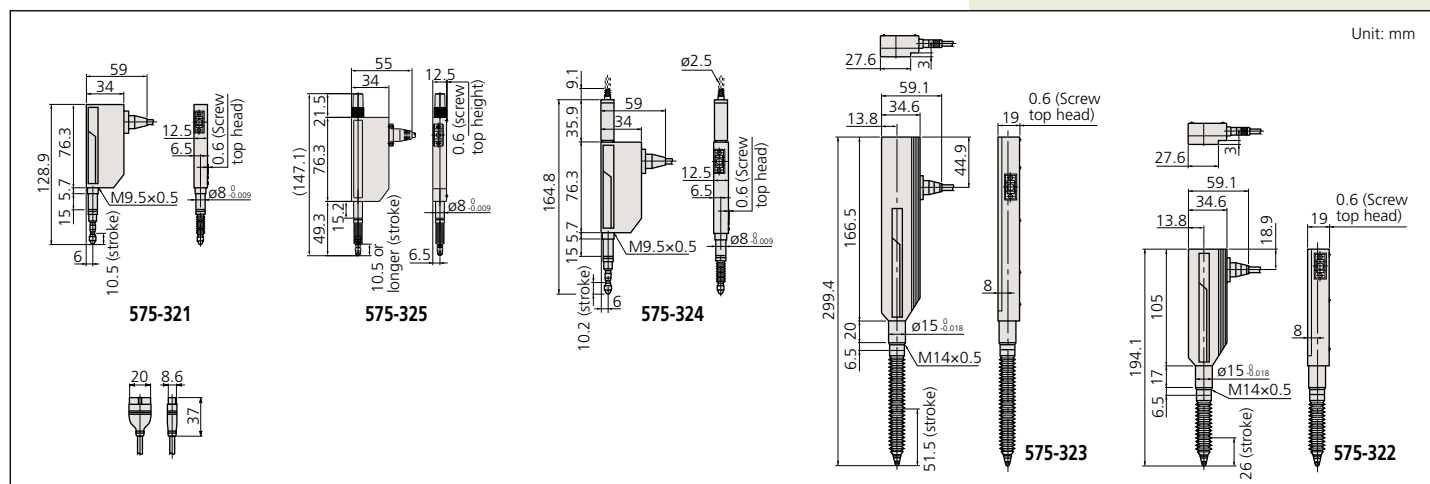
Range	Order No.	Resolution	Accuracy	Measuring force*	Stem dia.	Remarks
10mm	575-325	0.01mm	15μm	2.0N / 1.8N / 1.6N	8mm	Using slide-bearing

Inch LGD-M

Range	Order No.	Resolution	Accuracy	Measuring force*	Stem dia.	Remarks
.4"	575-335	.0005"	.0006"	2.0N / 1.8N / 1.6N	8mm	Using slide-bearing

*Posture of gage: Upward / Horizontal / Downward

DIMENSION



ABSOLUTE®
Absolute System Patented by MITUTOYO

(Refer to the page 9 for details.)

Technical Data

Accuracy: Refer to the list of specifications (excluding quantizing error)
 Resolution: 1μm or .0005"
 Length standard: Capacitance-type ABSOLUTE linear encoder
 Max. response speed: Unlimited
 Contact point: ø3mm carbide
 Stem: ø8mm or ø15mm
 Bearing type: Stroke ball bearing (Slide-bearing: 542-325, 542-335)
 Measuring force: Refer to the list of specifications
 Output signal: Digimatic output
 External input: Origin-setting signal (Absolute origin position can be changed externally.)
 Dust/Water protection level: IP66 (IP54: 542-324, 542-334)

Optional Accessory

238772: 10mm rubber boot (spare)
 962504: 25mm rubber boot (spare)
 962505: 50mm rubber boot (spare)
 02ADC730: ø9.5mm Thrust stem set (for 10mm model)
 02ADC740: ø18mm Thrust stem set (for 25mm/50mm model)
 965275*: Digimatic Power Supply Unit

* To denote your AC line voltage add the following suffixes to the order No. (e.g.: 965275A):
 A for UL/CSA, D for CEE, E for BS, F for SAA, DC for China, K for EK, No suffix is required for JIS/100V



Refer to the Linear Gage leaflet (E4174) for more details.



(Refer to the page 9 for details.)

Technical Data

Accuracy: Refer to the list of specifications
(excluding quantizing error)
Resolution: 0.01mm or .0005"
Length standard: Capacitance-type ABSOLUTE linear encoder
Max. response speed: Unlimited
Contact point: ø3mm carbide (ø3mm steel: **575-313**)
Stem: ø8mm or 3/8" DIA
Bearing type: Slide-bearing
Measuring force: Refer to the list of specifications
Output signal: Digimatic output
Dust/Water protection level: IP66

Optional Accessory

238774: Spare rubber boot
903594: Air Drive Unit (metric)
903598: Air Drive Unit (inch)
02ADF640: SPC cable extension adapter
02ADD950: Extension cable (0.5m)
936937: Extension cable (1m)
965014: Extension cable (2m)
——: EC Counter (See page 252.)

Linear Gage LGS

SERIES 542 — IP66 Water/Dust Proteciton with ABSOLUTE Linear Encoder

The LGS is compact Linear Gage designed to fit into tight spaces.



SPECIFICATIONS

Metric

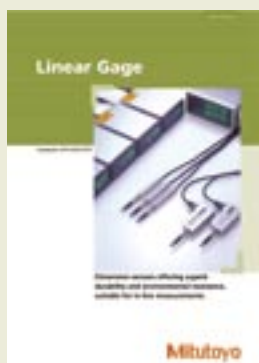
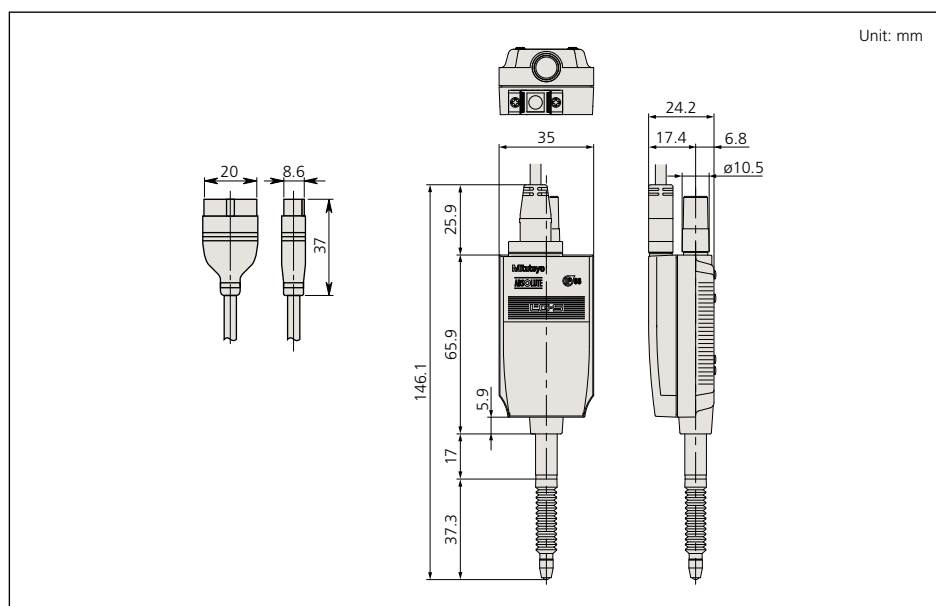
Range	Order No.	Resolution	Accuracy	Measuring force*	Stem dia.	Remarks
12.7mm	575-303	0.01mm	0.015mm	2.0N / 1.8N / 1.6N	8mm	—

Inch

Range	Order No.	Resolution	Accuracy	Measuring force*	Stem dia.	Remarks
.5"	575-313	.0005"	.0006"	2.0N / 1.8N / 1.6N	3/8 DIA	—

*Posture of gage: Upward / Horizontal / Downward

DIMENSION



Refer to the Linear Gage leaflet (E4174) for more details.

Laser Hologage

SERIES 542 — 0.0001mm Resolution Type

These are extra-high accuracy gaging heads provided with resolution up to 0.0001mm. The compact dimensions allow easy installation to very tight spaces. The Laser Hologage employs a unique holography scale as the length standard, ensuring excellent measuring accuracy and repeatability (See page 3 for explanation on hologram.). The dedicated display unit (EF Counter) is optional.

FEATURES

- A linear ball bearing in the spindle guide provides excellent durability for an extended service life.
- The 0.0001mm reading type LGB linear gage (542-246) comes with a clamping nut on the stem.



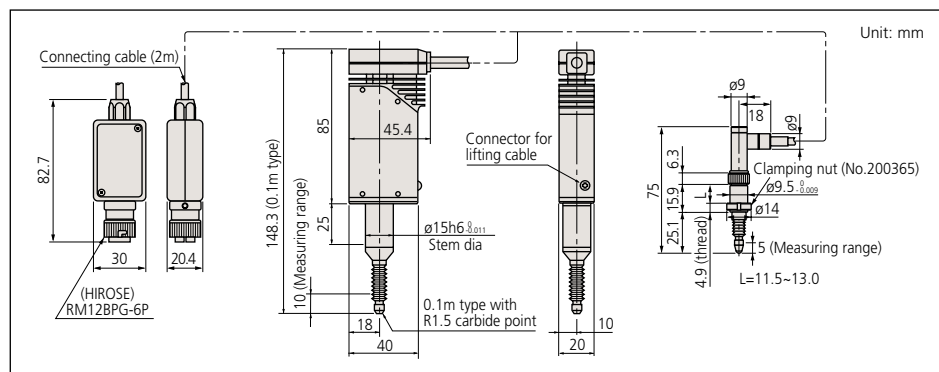
542-711-1

SPECIFICATIONS

Range	Order No.	Resolution	Accuracy	Measuring force*	Stem dia.	Remarks
10mm (.4")	542-711-1	0.1μm	0.2μm	0.55N / 0.45N / 0.35N	15mm	—
10mm (.4")	542-712-1	0.1μm	0.2μm	0.1N / — / —	15mm	Low measuring force

*Posture of gage: Upward / Horizontal / Downward

DIMENSION



Linear Gage LGB

SERIES 542 — 0.0001mm Resolution Type



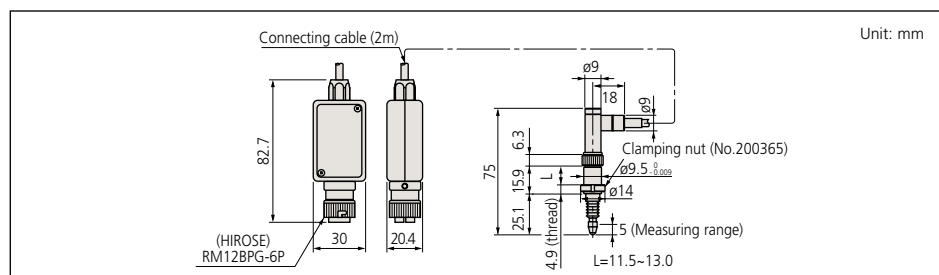
542-246

SPECIFICATIONS

Range	Order No.	Resolution	Accuracy	Measuring force*	Stem dia.	Remarks
5mm (.2")	542-246	0.1μm	0.8μm	0.65N / 0.60N / 0.55N	9.5mm	—

*Posture of gage: Upward / Horizontal / Downward

DIMENSION



Technical Data

Accuracy: Refer to the list of specifications (excluding quantizing error)
 Resolution: 0.1μm
 Length standard: Laser-hologram measurement sensor
 Max. response speed: 250mm/s
 Contact point: R1.5mm carbide
 Stem: ø15mm
 Bearing type: High precision linear ball bearing
 Measuring force: Refer to the list of specifications
 Output signal: 90° phase difference, differential square wave (RS-422A equivalent)
 Signal pitch: 0.25μm

Optional Accessory

238773: Rubber boot
 971751: Stem fixture for fixing to top surface
 971752: Stem fixture for fixing to bottom surface
 971753: Spindle lifting cable
 971750: Laser Hologage stand

Technical Data

Accuracy: Refer to the list of specifications (excluding quantizing error)
 Resolution: 0.1μm
 Length standard: Photoelectric linear encoder
 Max. response speed: 380mm/s
 Contact point: R1.5mm carbide
 Stem: ø9.5mm
 Bearing type: Linear ball bearing
 Measuring force: Refer to the list of specifications
 Output signal: 90° phase difference, differential square wave (RS-422A equivalent)
 Signal pitch: 0.4μm
 Dust/Water protection level: IP54

Optional Accessory

902434: Extension cable (5m)
 902433: Extension cable (10m)
 902432: Extension cable (20m)
 238773: Rubber boot



Refer to the Linear Gage leaflet (E4174) for more details.

Laser Hologage

SERIES 542 — 0.0001mm Resolution Type

Technical Data

Accuracy: Refer to the list of specifications (excluding quantizing error)
 Resolution: 0.01μm
 Length standard: Laser-hologram measurement sensor
 Max. response speed: 250mm/s
 Contact point: R5mm carbide
 Stem: ø15mm
 Bearing type: High precision linear ball bearing
 Measuring force: Refer to the list of specifications
 Output signal: 90° phase difference, two-phase sine wave
 Signal pitch: 0.25μm

Optional Accessory

09CAA335: Zero-set remote controller
971751: Stem fixture for fixing to top surface
971752: Stem fixture for fixing to bottom surface
971753: Spindle lifting cable
971750: Laser Hologage stand

The Mitutoyo Laser Hologage is a high-end digital gaging system that employs diffracted laser beam interference to make highly accurate and repeatable measurements. It features ultra-fine diffraction gratings which are holographically recorded on the scale. The Laser Hologage is suitable for measuring ultra-high precision parts, especially those in semiconductor and related industries (See page 3 for explanation on hologram.).

FEATURES

- Highly accurate measurement due to an ultra-high resolution of 0.0001mm (0.01μm), which is close to the performance of laser interferometers.
- Excellent measuring stability — the design is also highly resistant to unfavorable environmental conditions such as air movement and atmospheric pressure changes.
- High-precision linear ball bearings are used in the guide for extremely smooth movement and exceptional durability.
- A display unit is provided.



Gage head



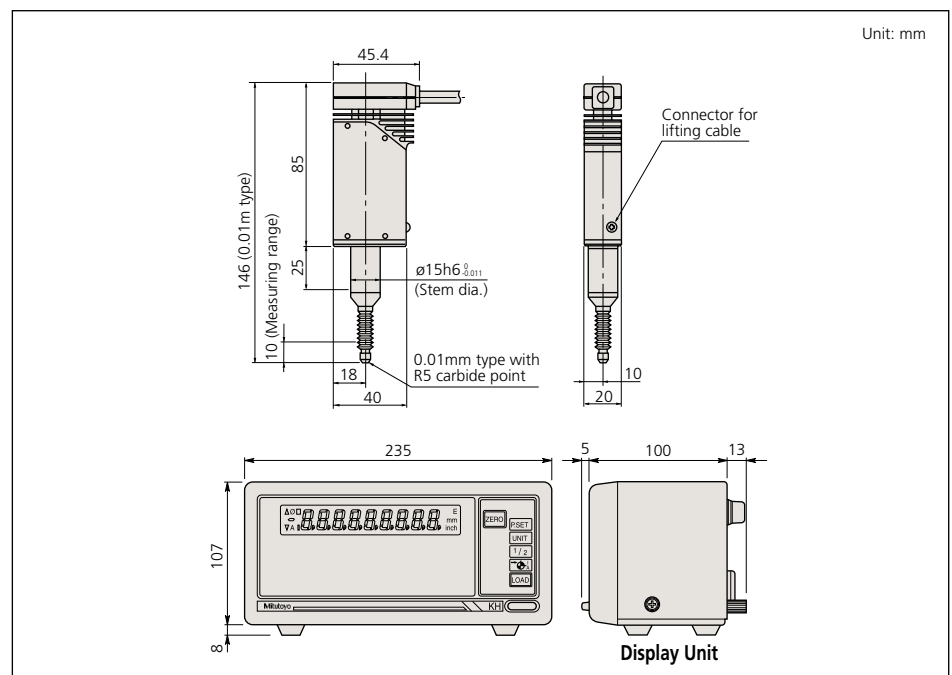
Display unit

SPECIFICATIONS

Range	Order No.	Resolution	Accuracy	Measuring force*	Stem dia.	Remarks
10mm (.4")	542-923	0.01μm / 1μinch	0.1μm	0.55N / 0.45N / 0.35N	15mm	—
10mm (.4")	542-924	0.01μm / 1μinch	0.1μm	0.1N / — / —	15mm	Low measuring force

*Posture of gage: Upward / Horizontal / Downward

DIMENSION



Refer to the Linear Gage leaflet (E4174) for more details.

Long Stroke Linear Gage

SERIES 542 — 100mm Stoke Type

FEATURES

- There are three types including the standard model, low measuring force model, and rubber boot model (order-to-make) available.
- The resolution of each model can be selected from 0.1μm and 1μm.



SPECIFICATIONS

Range	Order No.	Resolution	Accuracy*	Measuring force**	Stem dia.	Remarks
100mm (4")	542-312	0.1μm	(2+L/100)μm ≤ 2.5μm	8.0N / 6.5N / 5.0N	20mm	Standard
100mm (4")	542-316	0.1μm	(2+L/100)μm ≤ 2.5μm	3.0N / — / —	20mm	Low measuring force
100mm (4")	542-314	0.1μm	(2+L/100)μm ≤ 2.5μm	8.0N / 6.5N / 5.0N	20mm	w/ rubber boot
100mm (4")	542-332	1μm	(2.5+L/100)μm ≤ 3μm	8.0N / 6.5N / 5.0N	20mm	Standard
100mm (4")	542-336	1μm	(2.5+L/100)μm ≤ 3μm	3.0N / — / —	20mm	Low measuring force
100mm (4")	542-334	1μm	(2.5+L/100)μm ≤ 3μm	8.0N / 6.5N / 5.0N	20mm	w/ rubber boot

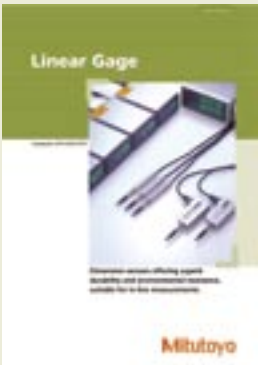
*L = Measured length (mm) **Posture of gage: Upward / Horizontal / Downward

Range	Order No.	Resolution	Accuracy*	Measuring force**	Stem dia.	Remarks
100mm (4")	542-313	0.1μm	(2+L/100)μm ≤ 2.5μm	3.0N / 6.5N / 9.5N	20mm	Motor-driven Type
100mm (4")	542-315	0.1μm	(2+L/100)μm ≤ 2.5μm	4.5N / — / 6.0N	20mm	Motor-driven Type
100mm (4")	542-333	1μm	(2.5+L/100)μm ≤ 3μm	3.0N / 6.5N / 9.5N	20mm	Motor-driven Type
100mm (4")	542-335	1μm	(2.5+L/100)μm ≤ 3μm	4.5N / — / 6.0N	20mm	Motor-driven Type

*L = Measured length (mm) **Posture of gage: Upward / Horizontal / Downward With rubber boot: 542-315, 542-335

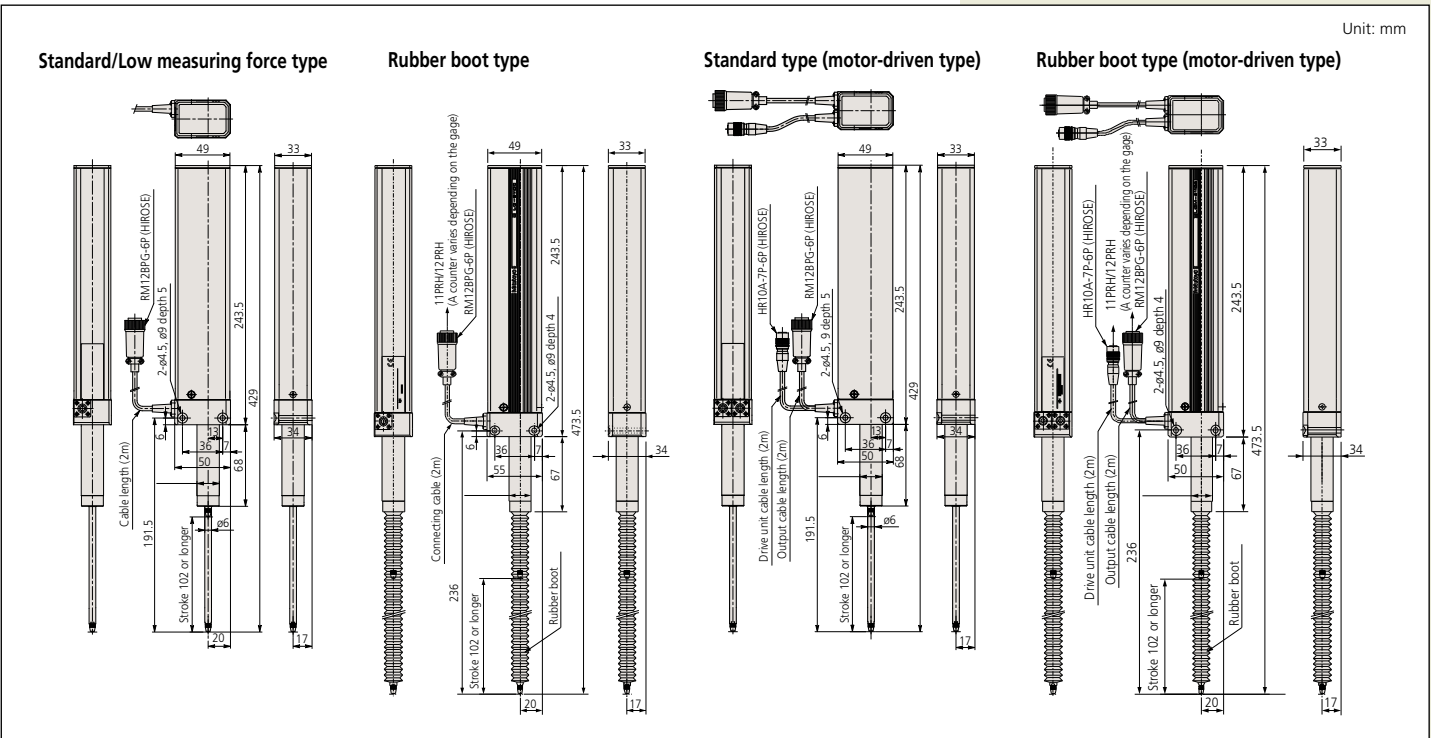
Technical Data

Accuracy: Refer to the list of specifications (excluding quantizing error)
Resolution: 1μm or 0.1μm
Length standard: Photoelectric linear encoder
Max. response speed: 400mm/s (800mm/s: motor-driven type)
Contact point: ø3mm carbide
Stem: ø8mm
Bearing type: Bearing guide
Measuring force: Refer to the list of specifications
Output signal: 90° phase difference, differential square wave (RS-422A equivalent)
Dust/Water protection level: IP54



Refer to the Linear Gage leaflet (E4174) for more details.

DIMENSION



EC Counter

SERIES 542 — Low-cost, Assembly Type Display Unit for LGD and LGS

Function

Preset, GO/±NG judgment

Output (selectable)

Tolerance judgment: -NG, OK, +NG (open-collector)

Data: Digimatic code

External control signal input

Preset, data hold

Power supply

Via AC adaptor

FEATURES

- Employed the DIN size (96X48mm) and mount-on-panel configuration, which greatly facilitates the incorporation into a system.
- Possible to produce either tolerance judgment output or Digimatic output.



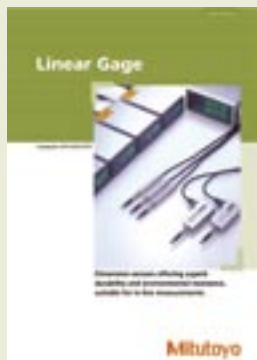
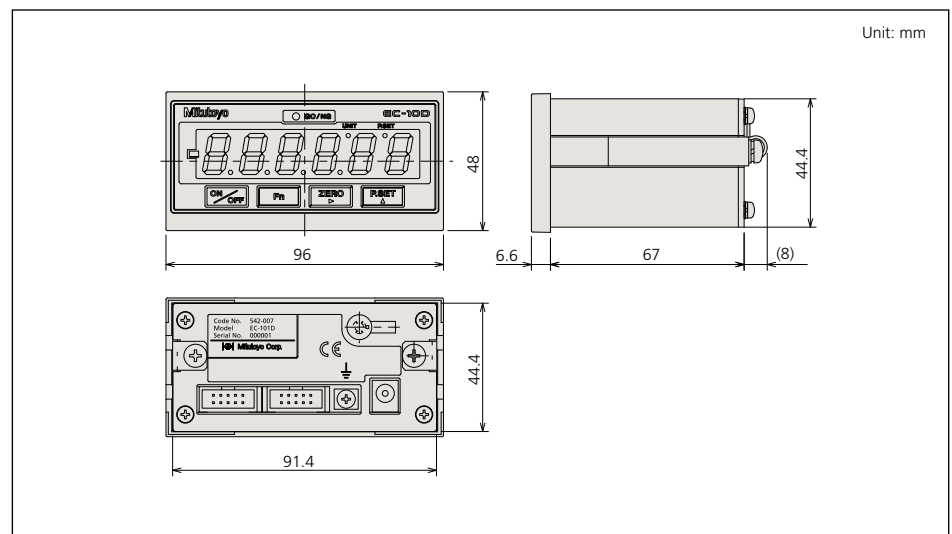
542-007



SPECIFICATIONS

Order No.	542-007
Applicable input	Digimatic code (SPC)
Applicable gage	LGD, LGD-L, LGD-ML, LGS
Number of gage input	1
Resolution	0.01mm, 0.001mm (Automatically set depending on the gage.)
Display	6-digit and a negative [-] sign LED (Amber, Green, Red)

DIMENSION



Refer to the Linear Gage leaflet (E4174) for more details.

EG Counter

SERIES 542 — Low-cost, Assembly Type Display Unit

FEATURES

- Possible to produce 3-step/5-step X 3 kinds of tolerance output and BCD output.
- The smoothing function can reduce the fluctuation of display digits.
- Employed the DIN size (96X48mm) and mount-on-panel configuration, which greatly facilitates the incorporation into a system.



542-015



542-016

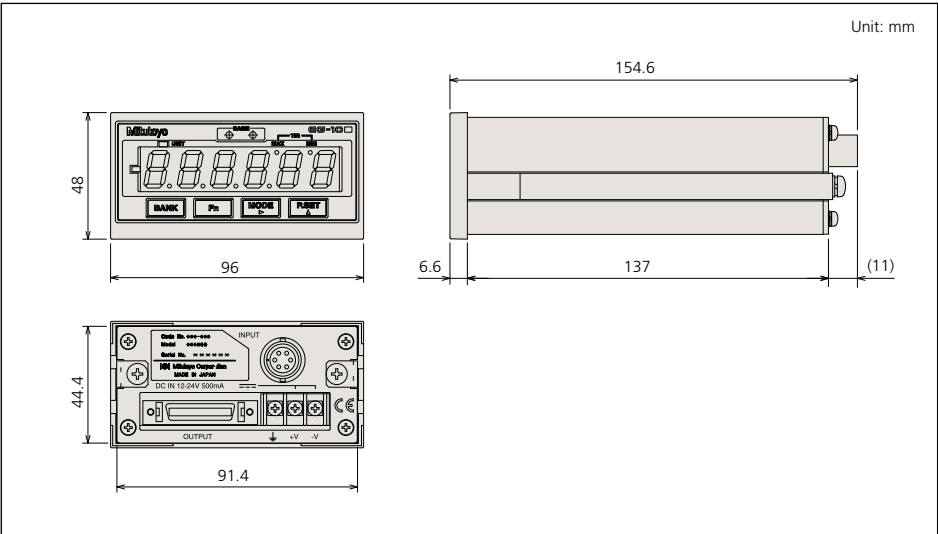


542-017

SPECIFICATIONS

Order No.	542-015	542-017	542-016
Applicable input	Differential square-wave	Differential square-wave w/origin point mark	Digimatic code (SPC)
Applicable gage	L GK, L GF, L GB, L GE, L GM, L GH (excluding with origin point and sign wave types)	L GF with origin point mark	L GD, L GS
Number of gage input	1		
Resolution (Depending on the linear gage type connected)	0.01mm, 0.005mm, 0.001mm, 0.0005mm, 0.0001mm		0.01mm, 0.001mm
Tolerance judgment display	LED display (3 steps: Amber, Green, Red/5 steps: Amber, Amber flash, Green, Red flash, Red)		

DIMENSION



Function

Preset, direction switch, tolerance judgment (3/5-step, 3 kinds). peak (max., min., runout) measurement, constant number, smoothing, error display/output, protection over keys

Output

Tolerance judgment: L1 to L5 (Switchover between open-collector output and BCD output by means of the parameter)

Control: NOM (normal signal) open-collector

BCD: 6-digit (positive/negative-true logic) open-collector (Switchover between tolerance judgment output by means of the parameter)

External control signal input

Preset, display hold, peak value clear, tolerance judgment BANK switch

Quantization error

±1 count

Maximum input frequency

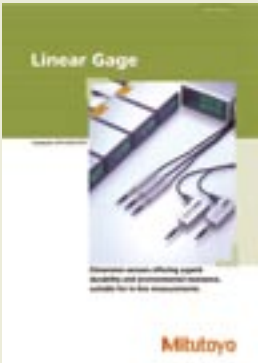
1.25MHz (The response speed depends on the gage being used.)

Power supply voltage

DC+12 to 24V

Power consumption

6W (500mA) or less (Secure power supply more than 1A for each unit.)



Refer to the Linear Gage leaflet (E4174) for more details.

EB Counter

SERIES 542 — Assembly Type Display Unit with Multiple Limit Setting

Function

Preset, tolerance judgment output (3/5-step X 7 kinds), limit value output (2 kinds independently for each of the 7 channels), peak (maximum, minimum, runout) measurement, diverse data output (serial BCD, simplified analog)

Output

Tolerance judgment: L1 to L5, open-collector

Control: Normal operation signal (NORMAL), open-collector

External control signal input

Preset, display hold, peak value clear, tolerance judgment BANK switch, open-collector or no-voltage contact signal (with/without contact point)

Interface

Serial BCD: Bit-serial format, open-collector

Analog output: 2.5V + Counting value X voltage resolution (25mV/2.5mV): Full-scale 0 to 5V

Digimatic input/output:

- Connecting to the external switch box (No. 02ADF180) makes it easy to enter tolerance limits and preset values. (Note) This can not be used when the gage is connected to a Mitutoyo DP-1VR Digimatic Mini-Processor
- Possible to connect with a Mitutoyo DP-1VR Digimatic Mini-Processor.
- Number of tolerance steps can be expanded by making a set of EB-D counters.

Quantization error

±1 count

Maximum input frequency

1.25MHz (The response speed depends on the gage being used.)

The response speed depends on the gage being used. (542-093)

Power supply voltage

DC+12 to 24V

Power consumption

6W (500mA) or less (Secure power supply more than 1A for each unit.)

Optional Accessory

02ADB440: I/O output connector

02ADF180: 10-key unit

936937: SPC data ooutput cable (1m)

965014: SPC data ooutput cable (2m)

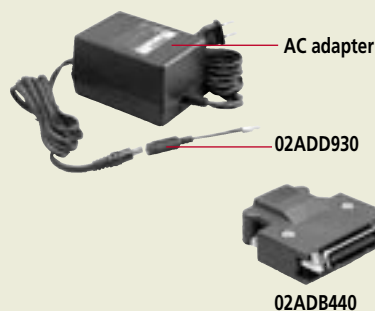
527428: AC adapter (100V)

527428A: AC adapter (120V)

527428CED: AC adapter (220V)

527428CEE: AC adapter (240V)

02ADD930: Terminal block connecting cable



FEATURES

- Possible to produce 3-step/5-step X 7 kinds of tolerance output and limit value output independently for each of 7 channels.
- Provided with serial BCD output capability, which makes the connection to a programmable controller or personal computer, etc. possible with the minimum cabling requirement.
- Possible to perform dynamic measurement with the simplified analog output.
- Employed the DIN size (96X48mm) and mount-on-panel configuration, which greatly facilitates the incorporation into a system.



542-092



542-093

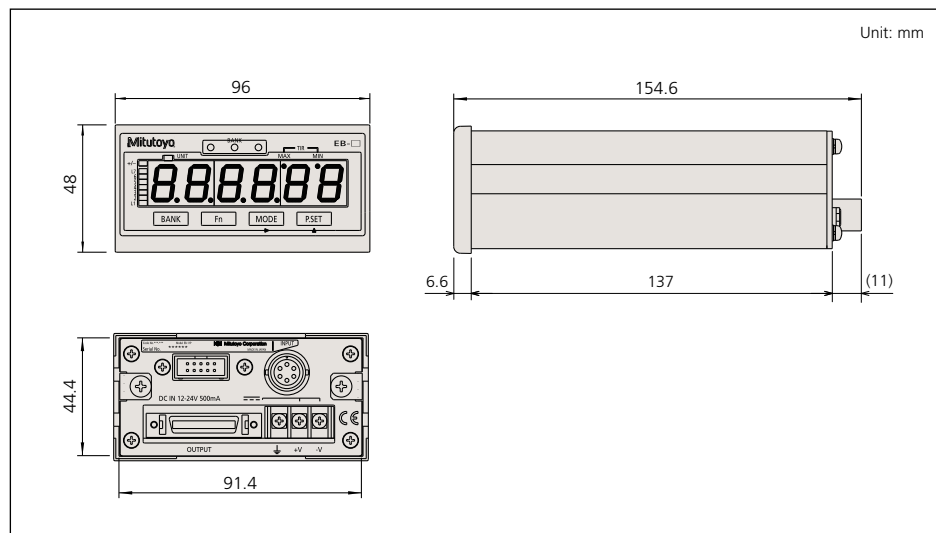


542-094

SPECIFICATIONS

Order No.	542-092	542-094	542-093
Applicable input	Differential square-wave	Differential square-wave w/origin point mark	Digimatic code (SPC)
Applicable gage	LGK, LGF, LGB, LGE	LGF with origin point mark	LGD, LGS
Number of gage input	1		
Resolution	0.01mm, 0.005mm, 0.001mm, 0.0005mm		0.01mm, 0.001mm
Tolerance judgment display	LED display (3 steps: Amber, Green, Red/5 steps: Amber, Amber flash, Green, Red flash, Red)		

DIMENSION



EF Counter

SERIES 542 — Multi-function Display Unit

FEATURES

- DIN compatible Panel-mounting type and DIN size (144 x 72mm). It can be easily incorporated into each system instrument.
- This counter can be used on a desktop by mounting it on the supplied stand leg.
- The standard RS-232C interface allows easy communication with an external PC.
- The RS Link function permits multiple EF counters (6 units maximum) to be connected with daisy chain and data to be input/output from one channel of the terminal RS-232C interface.
- The maximum value, minimum value, and TIR (runout) measurements are possible.
- The 2-gage input type can perform 2-axis display and make addition or subtraction calculations between 2 gages.



542-060



542-062



542-065

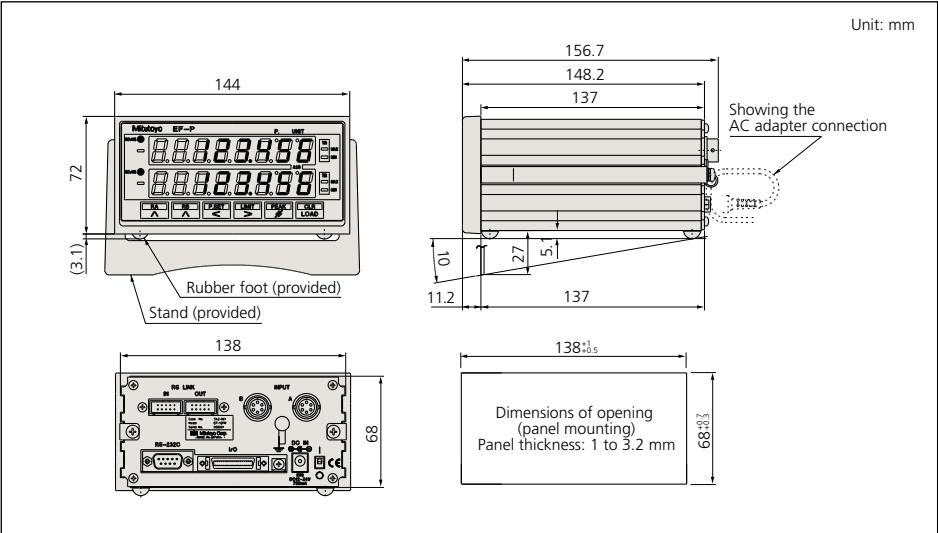


542-066

SPECIFICATIONS

Order No.	542-060	542-062	542-065	542-066
Applicable input	Differential square-wave			
Applicable gage	LGK, LGF (excluding with scale reference point), LGB (excluding sign wave type), LGE, LGH (excluding sign wave type)		LGF with scale reference point	
Number of gage input	1 (Single-display)	2 (Double-display)	1 (Single-display)	2 (Double-display)
Resolution (Depending on the linear gage type connected)	0.0001mm, 0.0005mm, 0.001mm, 0.005mm, 0.01mm, .000005", .00005", .0005"		0.0005mm, 0.001mm, 0.005mm, 0.01mm, .000005", .00005", .0005"	
Tolerance judgment display	LED display (3 steps: Amber, Green, Red/5 steps: Amber, Amber flash, Green, Red flash, Red)			

DIMENSION



Function

Zeroset, preset, limit setting (3 or 5-step), GO/±NG judgement, GO/±NG signal output, MAX/MIN/TIR (runout) measurement, counting direction switching, double reading, mm/inch switching, sum/difference calculation of 2 gages (542-062, 542-066 only), output mode selection

Output

I/O: Tolerance judgment output (3/5 stages), normal operation output RS-232C or Digimatic code (selectable): Various measurement data

External Control

I/O: Preset, Data hold and Error clear RS-232C: Displayed value output, MAX/MIN/TIR switching, Zero set, peak value clear, preset value input, tolerance value input and error clear

RS Link

Up to six EF counters may be connected via one RS-232C port.(daisy chain)

Error display/output

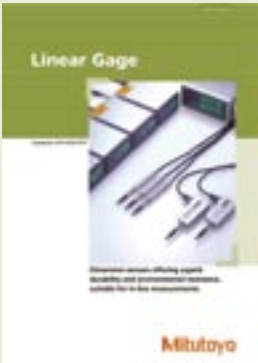
Power-supply voltage error, overspeed error, overflow error, gage error, communication error, and tolerance setting error

Maximum input frequency

1.25MHz (differential square-wave): Max counting Speed : 5MHz

Power supply

Via AC adaptor (12 - 24V DC, 700mA (max))



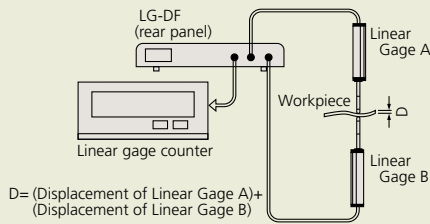
Refer to the Linear Gage leaflet (E4174) for more details.

Difference/Sum Unit

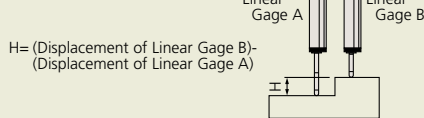
SERIES 542

CONNECTION EXAMPLE

Measurement of a curved plate thickness



Step measurement



Over-speed error output and the remedies

If either of the gages being connected A and B input connectors displaces as to exceed the rated moving speed, the counter will display over-speed error.

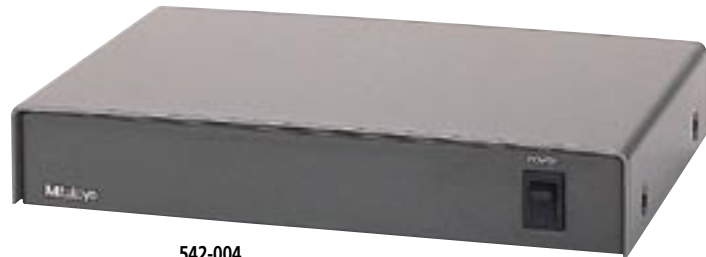
Technical Data

Response speed: 250mm/s (when 5/10μm linear gages are connected) 50mm/s (when 1μm linear gages are connected)
 Power supply: Via AC adaptor (DC9V, 500mA)
 Power consumption: 4.5W
 Dimensions: 236 (w) x 160 (D) x 44.2 (H) mm

FEATURES

- This unit serves to output a differential calculation result (A+B, A-B) or single value (A, B) of the counting values obtained from the linear gages that are connected to A and B input connectors, respectively.

* The minimum readings of the linear gages that are connected to A and B input connectors should be identical.

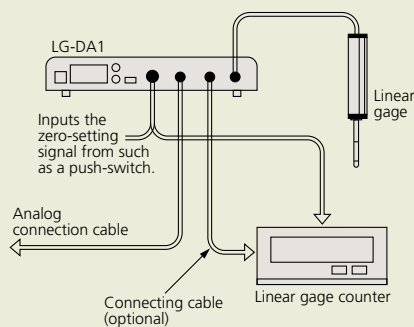


542-004

D/A Conversion Unit

SERIES 542

CONNECTION EXAMPLE



Technical Data

Power supply: Via AC adaptor (DC9V, 500mA)
 Dimensions: 236 (w) x 160 (D) x 44.2 (H) mm

Switching of D/A conversion range and resolution

When connected to a 0.001mm linear gage

Range	Resolution
±1mm	0.001mm
±2mm	0.002mm
±5mm	0.005mm
±10mm	0.01mm
±20mm	0.02mm
±50mm	0.05mm

When connected to a 0.005/0.01mm linear gage

Range	Resolution
±5mm	0.005mm
±10mm	0.01mm
±25mm	0.025mm
±50mm	0.05mm
±100mm	0.10mm
±250mm	0.25mm

FEATURES

- This unit consists of the pulse control circuit, counting circuit, and D/A conversion circuit to output the amount of linear gage displacement in the form of analog voltage.



542-003

EV Counter

SERIES 542 — For Multi-gage System

FEATURES

- Up to six gages can be connected to one unit.
- Able to connect up to 10 EV counters to one personal computer using the RS link function to facilitate the configuration of a multi-point measurement system comprising a maximum of 60 gages.
- A range of output modes to choose from; I/O output for tolerance judgment and segment output, BCD data output and RS-232 output are available.
- Peak-hold measurements are possible for maximum value, minimum value, runout (TIR), etc.
- Able to calculate a sum, average, maximum, minimum, maximum difference, etc., between gages connected to the same unit.



542-063



542-064



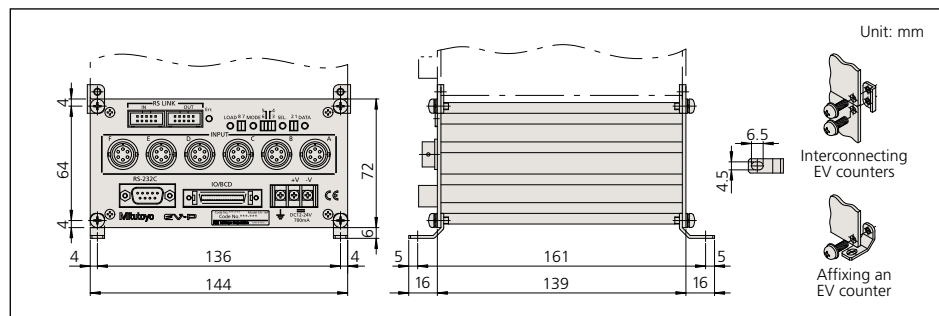
542-067

SPECIFICATIONS

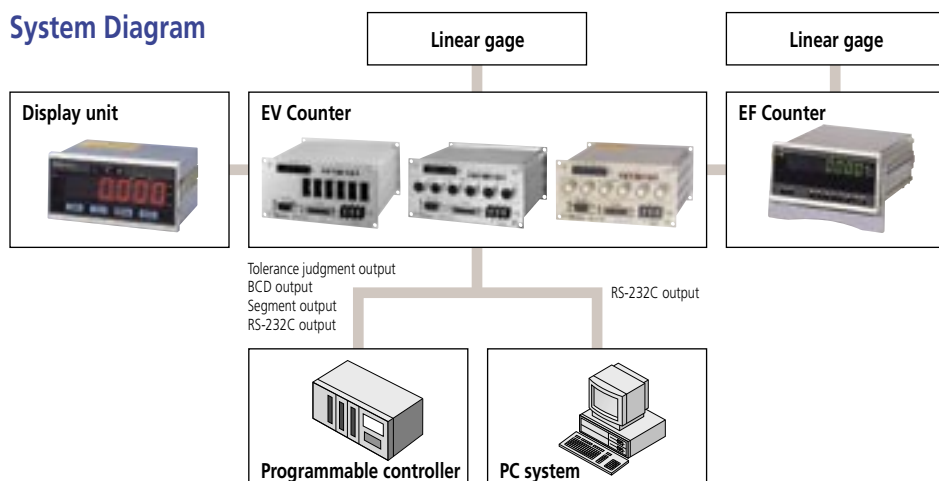
Order No.	542-063	542-067	542-064
Applicable input	Differential square-wave		Digimatic code (SPC)
Applicable gage	LGB (ex. 0.0001mm resolution), LGF, LGE, LG	LGF with origin point mark	LGD, LGD-M, LGS
Number of gage input	6		
Resolution (internal) - no display capability	0.0005mm, 0.001mm, 0.005mm, 0.01mm, .00005", .0005"		0.001mm*, 0.01mm, .00005"*, .0005"

*: Will not be indicated when combined with a LG gage.

DIMENSION



System Diagram



Function

GO/±NG judgment, GO/±NG signal output, MAX/MIN/TIR (runout) measurement, counting direction switching, mm/inch switching, calculation of sum, average, maximum, minimum and maximum difference between specified axes, and output-mode selection

Output

I/O: Normal operation output and GO/±NG signal (three steps), measurement data (BCD code), or 21-stage segment output (selectable) RS-232C: Various measurement data

External Control

I/O: Axis designation, preset, data hold, and error clear RS-232: Displayed value output command, MAX/MIN/TIR switching and peak value clear, zero set, preset value input, tolerance value input, error clear, and command to output calculated value between specified axes

RS Link

Up to 10 EV counters may be connected via a single RS-232 port. (daisy chain) EV and EF counters can be mixed (in which case a total of six counters can be connected).

Error display/output

Power-supply voltage error, overspeed error, overflow error, gage error, communication error, and tolerance setting error

Maximum input frequency

1.25MHz (differential square-wave): Max counting Speed : 5MHz

Power supply

Terminal block (M3 screws), DC +12 to +24V, 700mA (max.)

D-EV Display Unit

Technical Data

Number of connectable units: One display unit allows external display and setting for one EV counter.

Displayed digits: It uses a single sign plus six digits (EV counter operates on eight-digit data internally but displays only the last six digits).

LED display: Channel display (also for display of judgment result): 3 (three-color LED) Measurement mode display (current, maximum, minimum, runout): 2 Status display: 1 (two-color)

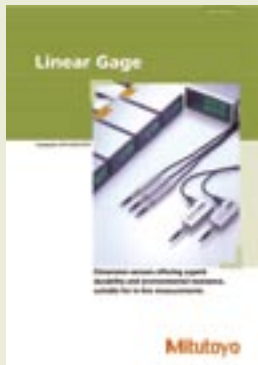
Operating switches: 4

Switches and their functions: Channel switching, measurement mode switching (current value, maximum value, minimum value and runout), parameter setting, preset, and tolerance setting

Input/output: RS Link connectors: 1 in and 1 out.

Error display: Overspeed, gage error and others.

Power supply: Terminal block (M3 screws), DC +12 to +24V, 200mA



Refer to the Linear Gage leaflet (E4174) for more details.

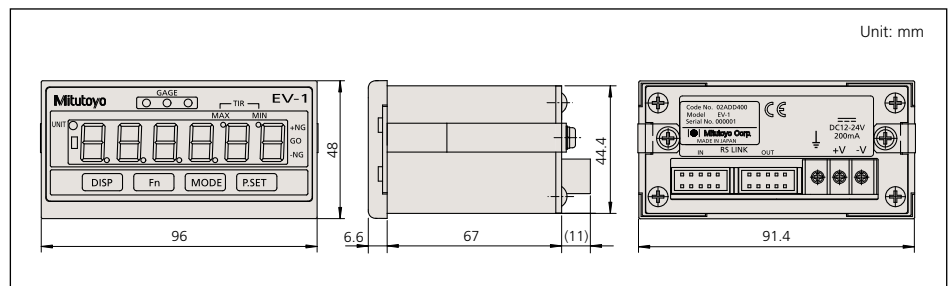
FEATURES

- Display unit for the EV counter.
- Using this display allows various settings for the EV counter without a personal computer or other equipment.
- Able to display each axis measurement value and GO/NG judgment result, total GO/NG judgment result for all axes, setting details, and errors.
- DIN compatible compact panel-mounting - cutout dimensions $45^{+0.8}_{-0.8} \times 92^{+0.8}_{-0.8}$
- The required power supply is DC +12 to +24V, 200mA at the terminal block.



02ADD400

DIMENSION



SENSORPAK

This software facilitates the loading of measurement data from a linear gage counter with the RS-232C interface into user's personal computer.

FEATURES

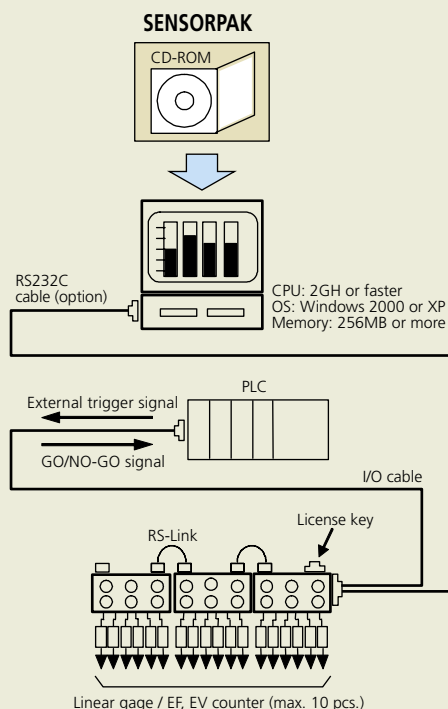
- Maximum 60 channels of measuring points can be processed.
- Possible to perform arithmetical calculation and maximum width calculation using the measurement data.
- Possible to export the measurement data into MS-Excel.
- Diverse graphic functions (numeric value display, meter display, bar-graph display, overall judgment display)
- Frequency of data loading: Max. 9999 times (60ch) to 60000 times (6CH)

MiCAT

Mitutoyo Intelligent Computer Aided Technology

the standard in world metrology software

SENSOR



Litematic and Litematic Head

SERIES 318 — High-resolution Measuring Unit

FEATURES

- The Litematic is designed for measuring easily-deformed workpieces and high-precision parts such as pin gages, thin-wall bearings, plastic parts, and springs.
- Extra-low measuring force of 0.01N (1gf).
- Super Litematic employs a unique Laser Holescale as the length standard, ensuring excellent measuring accuracy and repeatability.
- Ceramic anvil is free from corrosion and easy to maintain (Litematic).
- The measuring unit can be mounted onto fixtures or an optional stand to allow great flexibility of use (Litematic Head).
- With SPC output.



318-211
Litematic



318-217
Super Litematic



318-213
Litematic Head

SPECIFICATIONS

Range	Order No.*	Resolution	Accuracy (at 20°C±1°C)**	Remarks
0 - 50mm	318-217	0.01μm, 0.1μm, 1μm,	0.15μm (0.25μm: 35 - 50mm)	w/ ø26mm grooved ceramic anvil
0 - 50mm	318-211	.5pinch, 5pinch, 50pinch	(0.5+L/100)μm	w/ ø100mm grooved ceramic anvil
0 - 50mm	318-213	switchable	L=Measured length (mm)	Litematic Head

* To denote your AC line voltage add the following suffixes to the order No. (e.g.: 318-217A):

A for UL/CSA, D for CEE, E for SAA, F for China, K for EK, No suffix is required for JIS/100V

** 20°C±0.5°C: Super Litematic (318-217)



Technical Data

Accuracy: Refer to the list of specifications (excluding quantizing error)
 Resolution: Refer to the list of specifications
 Repeatability: $\sigma=0.05\mu\text{m}$ ($\sigma=0.02\mu\text{m}$: 318-217)
 Display unit: 8 digits and 14mm character height
 Stroke: 51.2mm (using standard contact point)
 Measuring force: 0.01N
 Spindle feed speed: 2mm/s, 4mm/s, 8mm/s
 (1mm/s, 2mm/s, 3mm/s, 5mm/s: 318-217)
 Length standard: Photoelectric linear encoder
 (Laser Holescale: 318-217)
 Contact point: ø3mm carbide ball (R5 carbide ball: 318-217)
 Power supply: 85 - 264V AC

Optional Accessory

936937: SPC cable (1mm)
 965014: SPC cable (2mm)
 957460: 300x250mm granite stand with bracket for Litematic Head
 101118: Contact point, Shell
 120066: Contact point, ø0.45mm needle (carbide)
 120065: Contact point, ø1.0mm needle (carbide)
 120064: Contact point, ø1.5mm needle (carbide)
 137257: Contact point, ø2.0mm needle (carbide)
 120059: Contact point, ø7.0mm spherical (carbide)
 120060: Contact point, ø10.5mm spherical (carbide)
 937179T: Foot switch
 264-504: Digimatic Mini-processor DP1-VR
 264-012: Input tool (for USB port)
 02ADM270: Sensorpak (data capture software w/ I/O cable)



Sensorpak



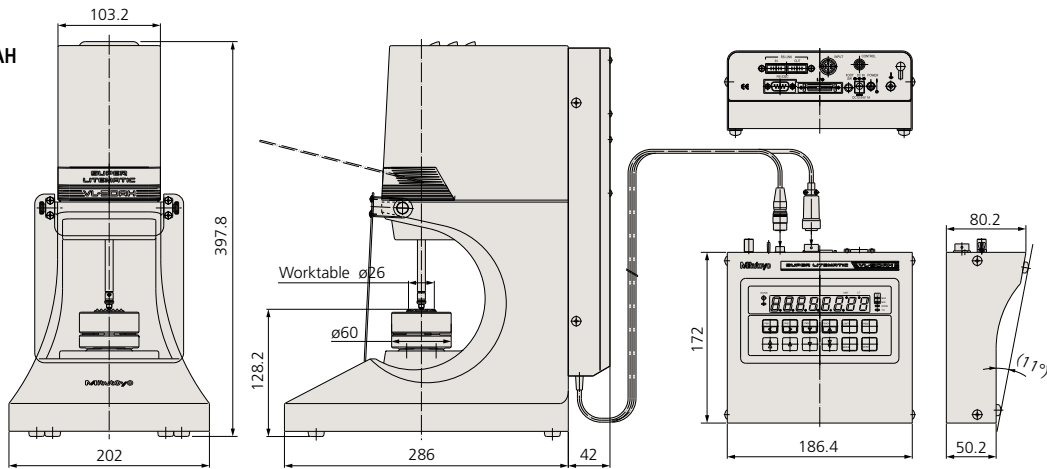
Application



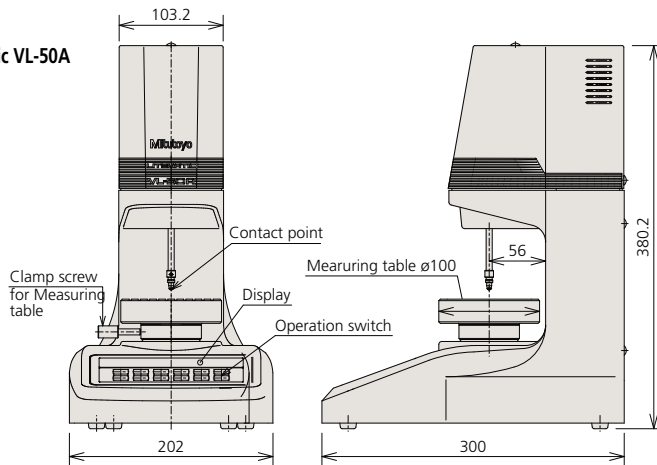
DIMENSION

Unit: mm

Litematic VL-50AH

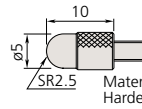


Litematic VL-50A

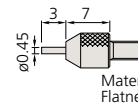


Interchangeable contact points

Unit: mm



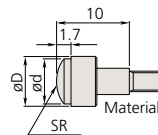
Material:
Hardened steel



Material: carbide
Flatness: 3μm

Order No.	Measuring force
101118	0.02N

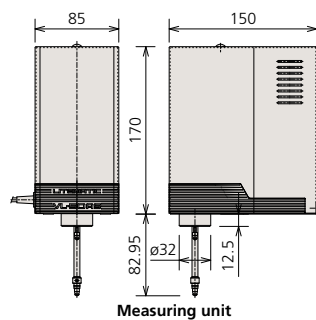
Order No.	Measuring force
120066	0.01N



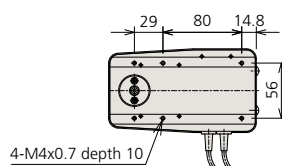
Material: carbide

Order No.	Measuring force	D	d	SR
120059	0.03N	ø7.5	ø6.5	7
120060	0.06N	ø10.5	ø9.5	10

Litematic Head VL-50AS

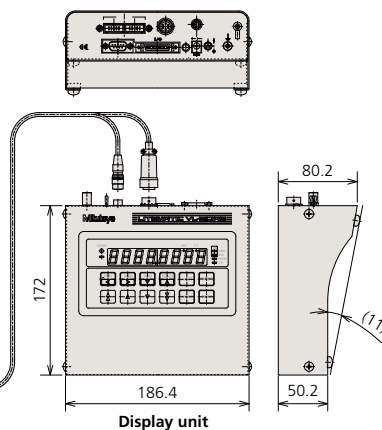


Measuring unit



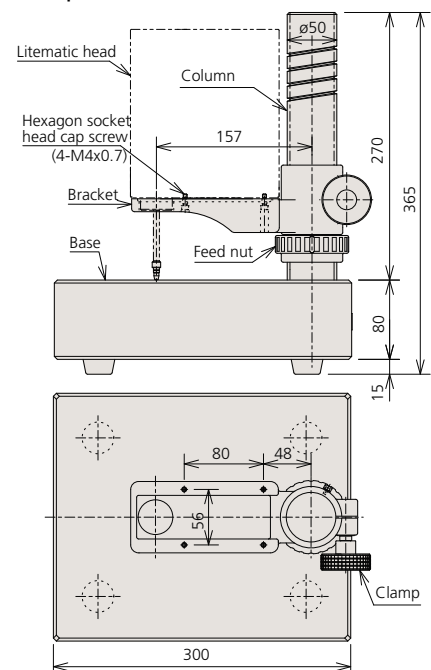
4-M4x0.7 depth 10

Connecting cable 2m



Display unit

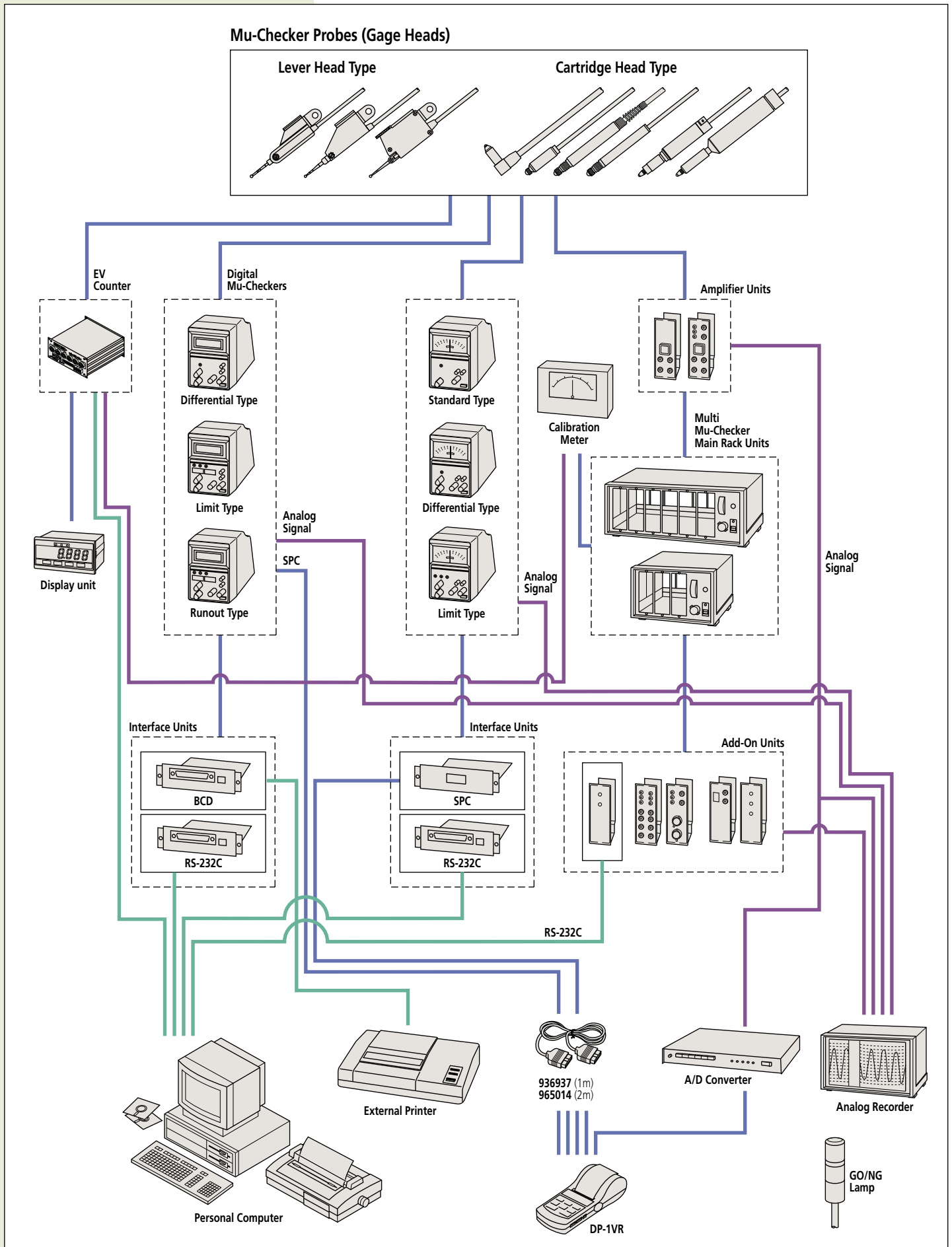
Optional stand for VL-50AS



Mu-Checker Probe Selection Guide

Type	Remarks	Effective range					
		±0.25mm	±0.5mm	±1.0mm	±1.5mm	±2.5mm	±5.0mm
Lever Head	Non-clutch Type						
		519-327					
	Clutch Type (with Direction Switch)						
		519-321					
	Low Measuring Force (Non-clutch Type)						
		519-322					
	High-Accuracy (Non-clutch Type)						
		519-326					
Cartridge Head	Slim Type (with Linear Ball Bearing)	     					
		519-346	519-161-1 519-347	519-163-1 (ø8mm) 519-348 (ø8mm) 519-349 (ø6mm)	519-335	519-341	519-338 519-336* <small>*Wide range type for Multi Mu-Checker only</small>
	Plain Type	 					
		519-331* *Low measuring force type					
		519-333					

Mu-Checker System Diagram



Lever Heads

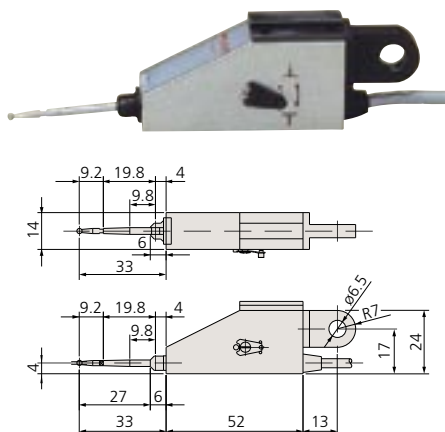
SERIES 519 — Lever Type Probe Head for Electric Micrometer

FEATURES

- A half-bridge circuit connection.
- Non-clutch type lever heads provide automatic reversal of measuring direction.
- **519-321** lever head is provided with a direction switch.
- The contact point of **519-326** lever head can be orientated at any direction.

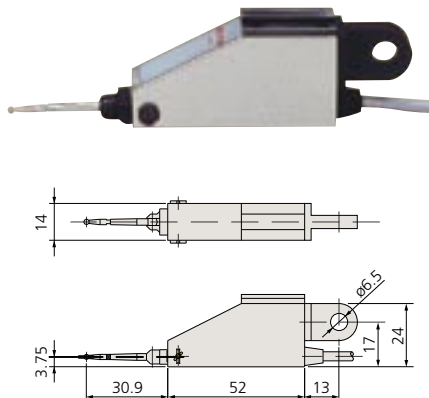
Switch type reversible direction

Order No.: 519-321



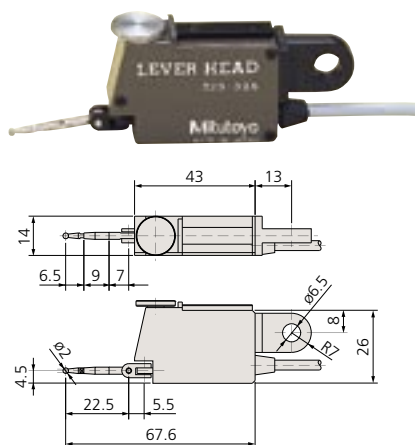
Low measuring force type

Order No.: 519-322



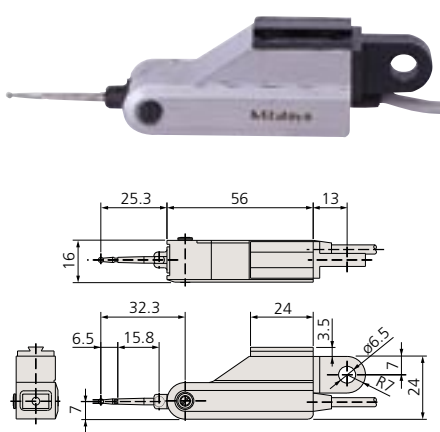
High-accuracy type

Order No.: 519-326



Non-clutch type reversible direction

Order No.: 519-327



Technical Data: 519-327

Effective range: $\pm 0.5\text{mm}$ (head stroke: $\pm 0.65\text{mm}$)
 Linearity: $\pm 0.5\%$
 Measuring force: 0.15N or less
 Contact point: $\varnothing 2\text{mm}$ carbide ball
102824 ($\varnothing 1\text{mm}$)*
102832 ($\varnothing 2\text{mm}$)
102825 ($\varnothing 2\text{mm}$, carbide)*
102826 ($\varnothing 3\text{mm}$)*
 *optional

Technical Data: 519-321

Effective range: $\pm 0.5\text{mm}$ (head stroke: $\pm 0.6\text{mm}$)
 Linearity: 0.5%
 Measuring force: 0.2N or less
 Contact point: $\varnothing 2\text{mm}$ carbide ball
520940 ($\varnothing 1\text{mm}$)
520939 ($\varnothing 2\text{mm}$)
520938 ($\varnothing 3\text{mm}$)

Technical Data: 519-322

Effective range: $\pm 0.5\text{mm}$ (head stroke: $\pm 0.6\text{mm}$)
 Linearity: 0.5%
 Measuring force: 0.02N or less
 Contact point: $\varnothing 2\text{mm}$ carbide ball
520940 ($\varnothing 1\text{mm}$)
520939 ($\varnothing 2\text{mm}$)
520938 ($\varnothing 3\text{mm}$)

Technical Data: 519-326

Effective range: $\pm 0.5\text{mm}$ (head stroke: $\pm 0.6\text{mm}$)
 Linearity: $\pm 0.3\%$
 Measuring force: 0.15N or less
 Contact point: $\varnothing 2\text{mm}$ carbide ball
102824 ($\varnothing 1\text{mm}$)*
102832 ($\varnothing 2\text{mm}$)
102826 ($\varnothing 3\text{mm}$)*
 *optional

Cartridge Heads

SERIES 519 — Cartridge Type Probe Head for Electric Micrometer

FEATURES

- A half-bridge circuit connection.
- The Slim Type Cartridge Head employs a linear ball bearing for excellent durability.

Technical Data: 519-331, 519-332

Effective range: $\pm 0.5\text{mm}$ (head stroke: $\pm 0.65\text{mm}$)
 Linearity: 0.5%
 Measuring force: 0.25N or less
 Stem diameter: 8mm
 Contact point*: R1.5, M2.5 x 5 (#4-48UNF: 519-332)

Technical Data: 519-333

Effective range: $\pm 1.0\text{mm}$ (head stroke: $\pm 1.2\text{mm}$)
 Linearity: 0.5%
 Measuring force: 1N or less
 Stem diameter: 8mm
 Contact point*: R1.5, M2.5 x 5

Technical Data: 519-335

Effective range: $\pm 1.5\text{mm}$ (head stroke: $\pm 4.0\text{mm}$)
 Linearity: $\pm 0.3\%$
 Measuring force: $0.6\text{N} \pm 0.15\text{N}$
 Stem diameter: 8mm
 Contact point*: R1.5, M2.5 x 5

Technical Data: 519-338

Effective range: $\pm 5\text{mm}$ (head stroke: $\pm 5.5\text{mm}$)
 Linearity: $\pm 0.5\%$
 Measuring force: 1.05N or less
 Stem diameter: 8mm
 Contact point*: R1.5, M2.5 x 5

Technical Data: 519-341

Effective range: $\pm 2.5\text{mm}$ (head stroke: $\pm 3.0\text{mm}$)
 Linearity: $\pm 0.5\%$
 Measuring force: 0.9N or less
 Stem diameter: 8mm
 Contact point*: R1.5, M2.5 x 5

Technical Data: 519-346

Effective range: $\pm 0.25\text{mm}$ (head stroke: 0.6mm)
 Linearity: 0.3%
 Measuring force: 0.65N or less
 Stem diameter: 8mm
 Contact point*: R1.5, M2.5 x 5

Technical Data: 519-347

Effective range: $\pm 0.5\text{mm}$ (head stroke: 1.5mm)
 Linearity: 0.3%
 Measuring force: 0.6N or less
 Stem diameter: 8mm
 Contact point*: R1.5, M2.5 x 5

Technical Data: 519-348

Effective range: $\pm 1.0\text{mm}$ (head stroke: 2.5mm)
 Linearity: 0.3%
 Measuring force: 0.7N or less
 Stem diameter: 8mm
 Contact point*: R1.5, M2.5 x 5

Technical Data: 519-349

Effective range: $\pm 1.0\text{mm}$ (head stroke: 2.5mm)
 Linearity: 0.3%
 Measuring force: 0.7N or less
 Stem diameter: 6mm
 Contact point*: R1.5, M2.5 x 5

Technical Data: 519-161-1

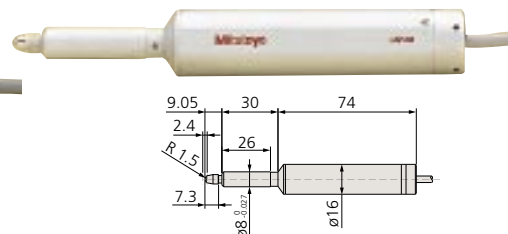
Effective range: $\pm 0.5\text{mm}$ (head stroke: 1.25mm)
 Linearity: $\pm 0.3\%$
 Measuring force: $0.13\text{N} \pm 0.04\text{N}$
 Stem diameter: 8mm
 Contact point*: R1.5, M2.5 x 5

Technical Data: 519-163-1

Effective range: $\pm 1.0\text{mm}$ (head stroke: 2.6mm)
 Linearity: $\pm 0.4\%$
 Measuring force: $0.15\text{N} \pm 0.045\text{N}$
 Stem diameter: 8mm
 Contact point*: R1.5, M2.5 x 5

*Compatible with contact points of dial indicator (see page XXX.)

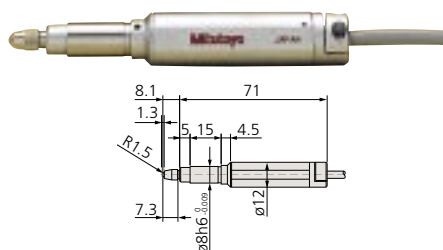
Order No.: 519-333



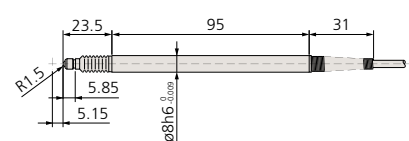
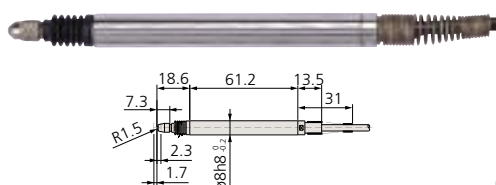
Order No.: 519-338



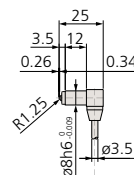
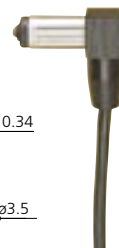
Order No.: 519-331, 519-332



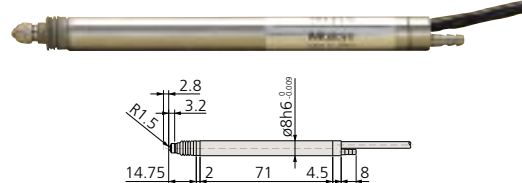
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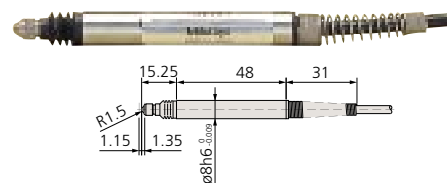
Order No.: 519-346



Order No.: 519-341



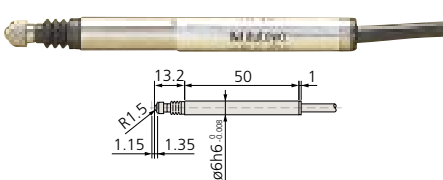
Order No.: 519-348



Order No.: 519-347



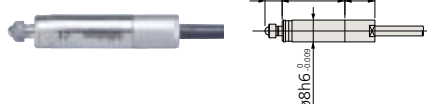
Order No.: 519-349



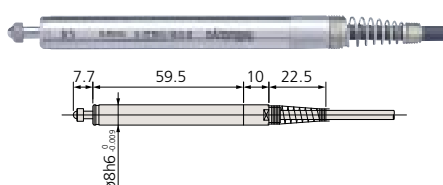
Optional Accessory

- 625029: Right angle adapter (applicable head: 519-338, 519-348)
 685014: Spindle lifting unit (applicable head: 519-335, 519-348)

Order No.: 519-161-1



Order No.: 519-163-1



Analog Mu-Checker

SERIES 519 — Standard, Differential and Limit Type Electric Micrometer

FEATURES

- The Analog Mu-Checker can output digital data via an optional interface unit.
- Analog Mu-Checkers are available in three types for diverse measuring requirements.



Standard type analog Mu-Checker

Order No.*: 519-401 (Metric)
519-402 (Inch/Metric)

Probe channels: 1ch



Differential type analog Mu-Checker

Order No.*: 519-403 (Metric)
519-404 (Inch/Metric)

Probe channels: 2ch (A, B)
Display mode: A, B, A + B, A - B, B - A, - (A + B)



Limit type analog Mu-Checker

Order No.*: 519-405 (Metric)
519-406 (Inch/Metric)

Probe channels: 2ch (A, B)
Display mode: A, B, A + B, A - B, B - A, - (A + B)

* To denote your AC line voltage add the following suffixes to the order No. (e.g.: **519-401A**):
A for UL/CSA, **D** for CEE, **E** for BS, **F** for SAA, **DC** for China, **K** for EK, **No suffix** is required for JIS/100V

Functions

	Standard type	Differential type	Limit type
Zero-set	✓	✓	✓
-/+ switching	✓	✓	✓
GO/±NG judgment	—	—	✓
GO/±NG output	—	—	✓
2-probe measurement	—	✓	✓
SPC output	▲*	▲*	▲*
RS-232C output	▲	▲	▲
Analog output	✓	✓	✓

✓: Available, ▲: Optional, ▲*: Optional (Metric model only)

Technical Data

Range: $\pm 5 / 0.1 \mu\text{m}$, $\pm 15 / 0.5 \mu\text{m}$, $\pm 50 / 1 \mu\text{m}$,
graduation $\pm 150 / 5 \mu\text{m}$, $\pm 500 / 10 \mu\text{m}$, $\pm 1500 / 50 \mu\text{m}$
($\pm 0.0015 / .000005''$, $\pm 0.005 / .00001''$,
 $\pm 0.015 / .00005''$, $\pm 0.05 / .0001''$, $\pm 0.15 / .0005''$, $\pm 0.5 / .001''$) (): Inch/Metric models
Signal output: $\pm 1\text{V DC}$ / full scale
Power supply: Via AC adapter

Optional Accessory

965690A: RS-232C interface unit



965691A: SPC output unit for metric models



271214: Vertical stand
Used for supporting the analog Mu-Checker in vertical position.



934795: Analog output cable (1m)



529035: Analog limit signal output connector (7-pin)

Digital Mu-Checker

SERIES 519 — Differential, Limit and Runout Type Electric Micrometer

Technical Data

Range/: $\pm 200 / 0.1 \mu\text{m}$, $\pm 2000 / 1 \mu\text{m}$,
graduation ($\pm 0.008 / .000005''$, $\pm .08 / .00005''$)
(): Inch/Metric models
Signal output: $\pm 1\text{V DC}$ / full scale
Power supply: Via AC adapter

Optional Accessory

965838B: RS-232C interface unit



965839A: BCD output unit



936937: SPC cable (1m)

271214: Vertical stand
Used for supporting the analog Mu-Checker in vertical position.



934795: Analog output cable (1m)



529035: Analog limit signal output connector (7-pin)

FEATURES

- The Digital Mu-Checker offers easy-to-read digital displays and SPC data output to a wide variety of Mitutoyo Digimatic Mini-Processors.
- Digital Mu-Checkers are available in three types for diverse measuring requirements.



Differential type digital Mu-Checker

Order No.*: 519-411 (Metric)
519-412 (Inch/Metric)

Probe channels: 2ch (A, B)

Display mode: A, B, A + B, A - B, B - A, - (A + B)



Limit type digital Mu-Checker

Order No.*: 519-413 (Metric)
519-414 (Inch/Metric)

Probe channels: 2ch (A, B)

Display mode: A, B, A + B, A - B, B - A, - (A + B)



Runout digital Mu-Checker

Order No.*: 519-417 (Metric)
519-418 (Inch/Metric)

Probe channels: 1ch

* To denote your AC line voltage add the following suffixes to the order No. (e.g.: **519-401A**):
A for UL/CSA, **D** for CEE, **E** for BS, **F** for SAA, **DC** for China, **K** for EK, **No suffix** is required for JIS/100V

Functions

	Differential type	Limit type	Runout type
Zero-set	✓	✓	✓
-/+ switching	✓	✓	✓
Max, Min, Runout	—	—	✓
GO/±NG judgment	—	✓	✓
GO/±NG output	—	✓	—
2-probe measurement	—	✓	✓
SPC output	✓	✓	✓
BCD output	▲	▲	▲
RS-232C output	▲	▲	▲
Analog output	✓	✓	✓

✓: Available, ▲: Optional

Multi Mu-Checker

SERIES 519 — Module Type Electric Micrometer

FEATURES

- The Multi Mu-Checker Main Rack Unit incorporates a power unit and analog indicator. It is available with 3 slots or 6 slots for different applications.
- Optional Calibration Meter (**519-030**) is available for accurate and easy-to-read measurement.
- By selecting the appropriate add-on units that include Amplifier Unit for Mu-Checker probes, the Multi Mu-Checker System offers diverse measuring applications with minimum investment.



519-352 (6-slot model)



System sample



519-030: Calibration meter

SPECIFICATIONS

Number of slots	Order No.*
3 slots	519-351
6 slots	519-352

* To denote your AC line voltage add the following suffixes to the order No. (e.g.: **519-351A**):
A for UL/CSA, **D** for CEE, **E** for BS, **F** for SAA, **DC** for China, **K** for EK, **No suffix** is required for JIS/100V

Function Capabilities of Optional Add-On Units

	519-361 Amplifier unit	519-363 Amplifier unit with GO/NG	519-374 Differential unit	519-371 Analog memory unit	519-372 Classification unit	519-373 Total judgment unit	519-360 RS-232C interface unit
Probe input	✓	✓	—	—	—	—	—
Range/graduation setting	✓	✓	—	—	—	—	—
-/+ switching	✓	✓	—	—	—	—	—
Difference/sum (2-probe)	✓	✓	—	—	—	—	—
GO/±NG judgment	—	✓	✓	✓	✓	—	—
GO/±NG output	—	✓	✓	✓	✓	—	—
Classification of tolerance	—	—	—	—	✓	—	—
Total GO/±NG judgment	—	—	—	—	—	✓	—
Max, Min, Runout, Mean	—	—	—	—	—	—	—
Difference/sum (2-unit)	—	—	—	—	—	—	—
Analog output	✓	✓	✓	✓	—	—	—
SPC output	▲	▲	▲	▲	—	—	—
RS-232C output	—	—	—	—	—	—	✓

✓: Available, ▲: Optional

Technical Data

Accuracy of indication: ±2.5%
Analog output: ±1V DC / full scale for optional calibration meter
Power supply: 100 - 240V AC

Optional Accessory

- 519-030:** Calibration meter
625200: Bus line connector
937929: Blind panel set for a blank slot

Multi Mu-Checker Add-On Units

Optional Accessory for Amplifier Unit

625030:	Range Plug, $\pm 5\mu\text{m}$ (Graduation: $0.1\mu\text{m}$)
625031:	Range Plug, $\pm 15\mu\text{m}$ (Graduation: $0.5\mu\text{m}$)
625032:	Range Plug, $\pm 50\mu\text{m}$ (Graduation: $1\mu\text{m}$)
625033:	Range Plug, $\pm 150\mu\text{m}$ (Graduation: $5\mu\text{m}$)
625035:	Range Plug, $\pm 1500\mu\text{m}$ (Graduation: $50\mu\text{m}$)
625036:	Range Plug, $\pm 2500\mu\text{m}$
625037:	Range Plug, $\pm 5000\mu\text{m}$ (Graduation: $100\mu\text{m}$)
625040:	Range Plug, $\pm .00015''$ (Graduation: $.000005''$)
625041:	Range Plug, $\pm .0005''$ (Graduation: $.00001''$)
625042:	Range Plug, $\pm .0015''$ (Graduation: $.00005''$)
625043:	Range Plug, $\pm .005''$ (Graduation: $.0001''$)
625044:	Range Plug, $\pm .015''$ (Graduation: $.0005''$)
625045:	Range Plug, $\pm .05''$ (Graduation: $.001''$)
529035:	Analog output connector
625200:	Bus line connector

Optional Accessory for Differential Unit

529035:	Analog output connector
625200:	Bus line connector

Optional Accessory for Analog Memory Unit

529035:	Analog output connector (OUT1)
625201:	Analog output connector (OUT2)
625202:	External control connector
625200:	Bus line connector

Optional Accessory for Classification Unit

625203:	BCD output connector
625200:	Bus line connector
625202:	External control connector

Optional Accessory for Total Judgment Unit

625204:	GO/ \pm NG output connector
625202:	External control connector
625200:	Bus line connector

Optional Accessory for RS-232C Unit

965000:	Main Rack Unit connecting cable (BUS IN)
625200:	Bus line connector



Amplifier Unit

Order No.: 519-361

519-363 (w/ GO/ \pm NG LED)

Probe channels: 2ch (A, B)
 Range: $\pm 500\mu\text{m}$ (By Range Plug 625034 provided)
 Graduation: $10\mu\text{m}$ (on Calibration Meter)
 Display mode: A, B, A + B, A - B, B - A, - (A + B)
 GO/ \pm NG judgment: By LED (**519-363**)
 Analog output: $\pm 1\text{V DC}$ / \pm fullscale
 GO/ \pm NG output: Open collector (**519-363**)



Differential Unit

Order No.: 519-374

Calculation: Difference/sum between Add-On Units
 Probe channels: 2ch (A, B)
 GO/ \pm NG judgment: By LED
 Analog output: $\pm 1\text{V DC}$ / \pm fullscale
 GO/ \pm NG output: Open collector



Analog Memory Unit

Order No.: 519-371

Measurement: Maximum, Minimum, Runout, Mean
 GO/ \pm NG judgment: By LED
 Analog output: $\pm 1\text{V DC}$ / \pm fullscale
 GO/ \pm NG output: Open collector



Classification Unit

Order No.: 519-372

Classification display: Digital (0 - 9)
 Limit setting range: 10% - 100% fullscale
 Data output: BCD (0-9 classification)
 GO/ \pm NG output: TTL



Total Judgment Unit

Order No.: 519-373

GO/ \pm NG judgment: By LED
 GO/ \pm NG output: Relay circuit



RS-232C Interface Unit

Order No.: 519-360

Analog input channels: 11
 Applicable range: $\pm 50\mu\text{m}$ and more
 Analog input: $\pm 1\text{V DC}$ / \pm fullscale
 Sampling speed: 12 times/s

A/D Conversion Unit

SERIES 519 — For SPC Data Output

FEATURES

- The A/D Conversion Unit converts analog signals from the Mu-Checker into digital signals and outputs SPC data.
- When connected with a Digimatic Mini-Processor (DP-1VR), the A/D Conversion Unit is powered by the processor.



Rear panel

Order No.: 519-391 (Metric)
519-392 (Inch/Metric)

* To denote your AC line voltage add the following suffixes to the order No. (e.g.: **519-351A**):
A for UL/CSA, **D** for CEE, **E** for BS, **F** for SAA, **DC** for China, **K** for EK, **No suffix** is required for JIS/100V

Technical Data

Range/resolution: $\pm 5 / 0.01 \mu\text{m}$, $\pm 15 / 0.01 \mu\text{m}$, $\pm 50 / 0.1 \mu\text{m}$,
 $\pm 150 / 0.5 \mu\text{m}$, $\pm 500 / 1 \mu\text{m}$, $\pm 1500 / 1 \mu\text{m}$
($\pm 0.00015 / .00001''$, $\pm 0.0005 / .00001''$,
 $\pm 0.0015 / .0001''$, $\pm 0.005 / .0001''$, $\pm 0.015 / .001''$, $\pm 0.05 / .001''$) (): Inch/Metric models

Analog input channel: 1ch
Signal input: $\pm 1\text{V DC}$ / full scale
Sampling time: 7.5times/s
Data output: SPC
Power supply: Via AC adapter

Optional Accessory

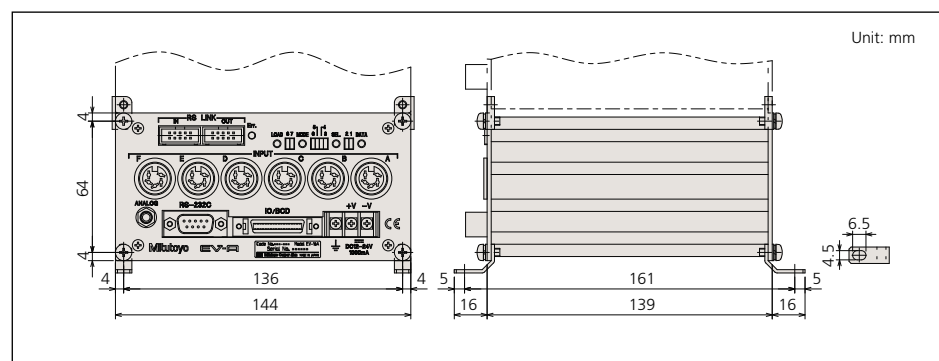
526688: AC adapter (100V AC)
526688A: AC adapter (120V AC)
526688D: AC adapter (220V AC)
526688E: AC adapter (240/220V AC)

EV Counter

SERIES 542 — with 6ch Analog Input for Multi-gage System



DIMENSION





Laser Scan Micrometer Selection Guide

MEASURING UNITS

Appearance	Model	Laser Classification	Measuring range	Resolution (Selectable)
	LSM-902*	Visible (650nm), IEC Class 2/ FDA Class II	0.1 - 25mm (.0002" - .08")	0.01μm - 10μm (.000001" - .0005")
	LSM-500S	Visible (650nm), IEC Class 2/ FDA Class II	0.005 - 2mm (.0002" - .08")	0.01μm - 10μm (.000001" - .0005")
	LSM-501S	Visible (650nm), IEC Class 2/ FDA Class II	0.05 - 10mm (.002" - .4") FDA Class II	0.01μm - 10μm (.000001" - .0005")
	LSM-503S	Visible (650nm), IEC Class 2/ FDA Class II	0.3 - 30mm (.012" - 1.18")	0.02μm - 100μm (.000001" - .005")
	LSM-506S	Visible (650nm), IEC Class 2/ FDA Class II	1 - 60mm (.04" - 2.36")	0.05μm - 100μm (.000002" - .005")
	LSM-512S	Visible (650nm), IEC Class 2/ FDA Class II	1 - 120mm (.04" - 4.72")	0.1μm - 100μm (.000005" - .005")
	LSM-516S	Visible (650nm), IEC Class 2/ FDA Class II	1 - 160mm (.04" - 6.30")	0.1μm - 100μm (.000005" - .005")
 With display unit	LSM-9506N Measuring unit - display unit one-piece structure for bench- top use only	Visible (650nm), IEC Class 2/ FDA Class II	0.5 - 60mm (.02" - 2.36")	0.05μm - 100μm (.000002" - .005")

DISPLAY UNITS

Appearance	Model	Type	Application	Interface units equipped
	LSM-6200 LSM-6900*	Multi-function type	Bench-top use	<ul style="list-style-type: none"> • RS-232C • I/O • Analog output
	LSM-5100** (order-to-made)	Compact type (Low cost)	Assembly/ bench-top use (DIN size)	<ul style="list-style-type: none"> • RS-232C • I/O • Analog output

*LSM-902 and LSM-6900 are factory-set package.

**When connecting with the LSM-500S series, the scanning speed becomes 1600 scans/sec.

LSM-902 / 6900

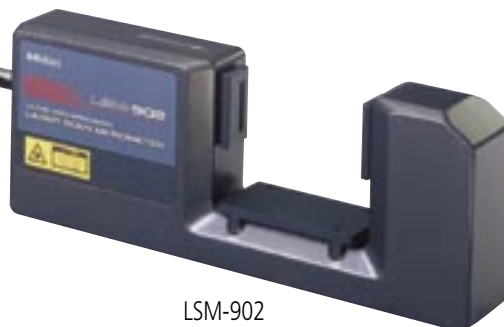
SERIES 544 — Ultra-high Accuracy Non-contact Measuring System

FEATURES

- Suitable for pin and plug gage measurements.
- Wide measuring range of $\varnothing 0.1\text{mm}$ to $\varnothing 25\text{mm}$.
- Provides ultra-high accuracy with a linearity of $\pm 0.5\mu\text{m}$ over the entire measurement 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

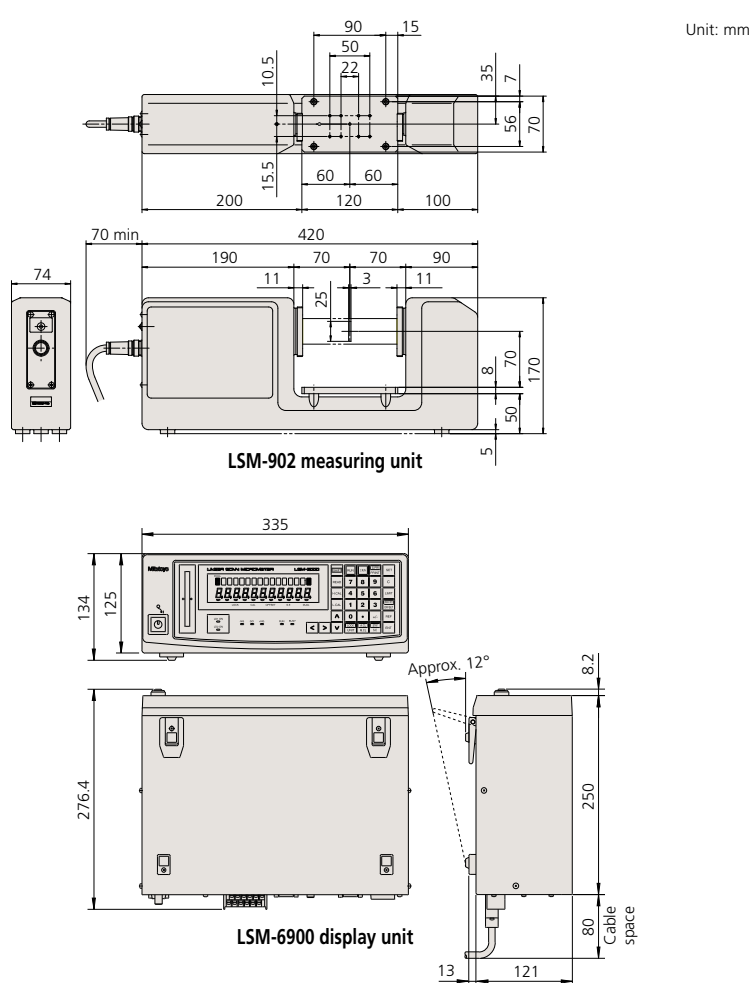


LSM-902
measuring unit

Order No.*: **544-495** (Metric)
544-496 (Inch/Metric)

* To denote your AC line voltage add the following suffixes to the order No. (e.g.: **544-495A**):
A for UL/CSA, **D** for CEE, **E** for BS, **F** for SAA, **DC** for China, **K** for EK, **No suffix** is required for JIS/100V

DIMENSION



Technical Data

Range: 0.1 - 25mm
 Resolution: 0.00001 - 0.01mm selectable
 (.000001" - .0005") (): Inch/Metric models
 Linearity at 20°C*: Entire range: $\pm 0.5\mu\text{m}$
 Narrow range: $\pm (0.3 + 0.1\Delta D)\mu\text{m}$
 Repeatability ($\pm 2\sigma$): $\pm 0.5\mu\text{m}$
 Workpiece positional error: $\pm 0.5\mu\text{m}$
 Measuring region: 3 x 25mm
 Laser wavelength: 650nm, Visible
 Number of scans: 800scans/s
 Laser scanning speed: 56m/s
 Acceptable standard of laser: IEC (FDA: **544-495A**, **544-496A**)
 Main display: 16-digit fluorescent tube
 Interface units equipped: RS-232C, Analog I/O, Foot switch
 Power supply: 100 - 240V AC $\pm 10\%$, 40VA, 50/60Hz
 * At the center of the measuring region.
 ΔD = Difference in diameter between the mastergage and workpiece

Function of Display Unit

Zero-setting, Presetting, GO/NG judgment, Multi-limit judgment, Offset value setting, Sample measurement, Statistical calculation, Group judgment, Data output, Workpiece position display, mm/inch switching, Dual-gage calibration, Transparent object measurement, Dual-unit measurement (optional), Automatic measurement, Abnormal data eliminating

Optional Accessory

- 02AGD180:** Calibration gage set for LSM-902/6900
- 02AGD270:** Workstage
- 02AGD280:** Adjustable workstage
- 02AGD600A:** Thermal printer (w/100V AC adapter)
- 02AGD600B:** Thermal printer (w/120V AC adapter)
- 02AGD600C:** Thermal printer (w/130V AC adapter)



Refer to the Laser Scan Micrometer leaflet (E4156) for more details.

LSM-9506

SERIES 544 — Bench Top Type Non-contact Measuring System

FEATURES

- With a design that integrates the display section and measuring section into one unit, it is best suited for bench-top measurement in an inspection room.
- A statistical calculation function is provided.
- Standard RS-232C interface and SPC output interface are provided as standard.

Technical Data

Range: 0.5 - 60mm
 Resolution: 0.0005mm (.00002")
 (): Inch/Metric models
 Linearity at 20°C*: $\pm 2.5\mu\text{m}$
 Repeatability ($\pm 2\sigma$): $\pm 0.6\mu\text{m}$
 Workpiece positional error: $\pm 2.5\mu\text{m}$
 Measuring region: 10 x 60mm
 Laser wavelength: 650nm, Visible
 Number of scans: 1600scans/s
 Laser scanning speed: 226m/s
 Acceptable standard of laser: IEC (FDA: **544-115A**, **544-116A**)
 Main display: 16-digit fluorescent tube
 Interface units equipped: RS-232C, SPC, Foot switch
 Power supply: 100 - 240V AC $\pm 10\%$, 40VA, 50/60Hz
 * At the center of the measuring region.

Function

Zero-setting, Presetting, GO/NG judgment, Multi-limit judgment, Offset value setting, Sample measurement, Statistical calculation, Group judgment, Data output, Workpiece position display, mm/inch switching, Dual-gage calibration, Transparent object measurement, Automatic measurement, Abnormal data eliminating

Optional Accessory

02AGD170: Calibration gage set for LSM-9506
02AGD600A: Thermal printer (w/100V AC adapter)
02AGD600B: Thermal printer (w/120V AC adapter)
02AGD600C: Thermal printer (w/130V AC adapter)

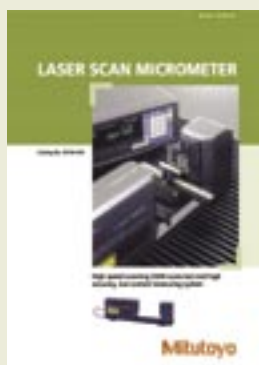
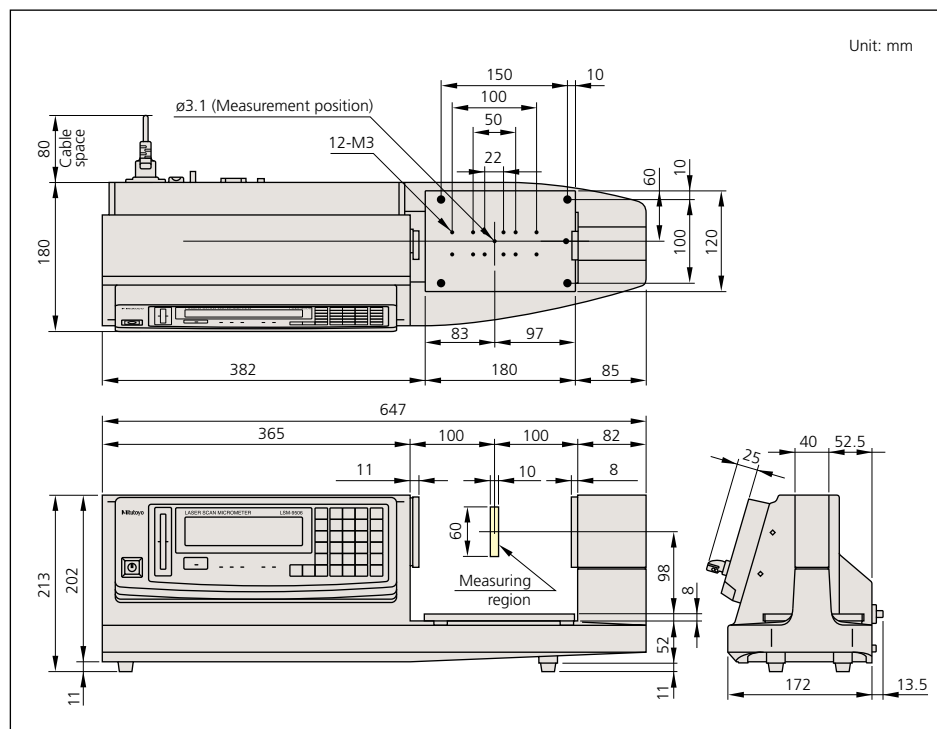


LSM-9506

Order No.*: **544-115** (Metric)
544-116 (Inch/Metric)

* To denote your AC line voltage add the following suffixes to the order No. (e.g.: **544-495A**):
A for UL/CSA, **D** for CEE, **E** for BS, **F** for SAA, **DC** for China, **K** for EK, **No suffix** is required for JIS/100V

DIMENSION



Refer to the Laser Scan Micrometer leaflet (E4156) for more details.

LSM-500S, LSM-501S, LSM-503S

SERIES 544 — High Accuracy Non-contact Measuring System

FEATURES: LSM-500S

- Permits measurements starting from $\varnothing 5\mu\text{m}$.
- Provides ultra-high accuracy with a linearity of $\pm 0.3\mu\text{m}$ over the entire measurement range (5 μm to 2mm).
- Ultra-high repeatability of $\pm 0.03\mu\text{m}$



Order No.: 544-531 (FDA)
544-532 (IEC)

FEATURES: LSM-501S

- Provides ultra-high accuracy with a linearity of $\pm 0.5\mu\text{m}$ over the entire measurement range (0.05mm to 10mm) and $\pm (0.3 + 0.1\Delta D)\mu\text{m}$ in the narrow range.
- Ultra-high repeatability of $\pm 0.04\mu\text{m}$



Order No.: 544-533 (FDA)
544-534 (IEC)

FEATURES: LSM-503S

- General-purpose type with a measurement range of 0.3mm to 30mm.
- Provides high accuracy with a linearity of $\pm 1.0\mu\text{m}$ over the entire measurement range and $\pm (0.6 + 0.1\Delta D)\mu\text{m}$ in the narrow range.
- Excellent repeatability of $\pm 0.1\mu\text{m}$



Order No.: 544-535 (FDA)
544-536 (IEC)

Technical Data of LSM-500S

Range: 0.005 - 2mm
Resolution: 0.00001 - 0.01mm selectable
(.000001" - .0005") (): Inch/Metric models
Linearity at 20°C*: $\pm 0.3\mu\text{m}$
Repeatability ($\pm 2\sigma$): $\pm 0.03\mu\text{m}$
Workpiece positional error: $\pm 0.4\mu\text{m}$
Measuring region: 1x2mm
Laser wavelength: 650nm, Visible
Number of scans: 3200scans/s
Laser scanning speed: 76m/s
Acceptable standard of laser: IEC or FDA
* At the center of the measuring region.

Technical Data of LSM-501S

Range: 0.05 - 10mm
Resolution: 0.00001 - 0.01mm selectable
(.000001" - .0005") (): Inch/Metric models
Linearity at 20°C*: Entire range: $\pm 0.5\mu\text{m}$
Narrow range: $\pm (0.3 + 0.1\Delta D)\mu\text{m}$
Repeatability ($\pm 2\sigma$): $\pm 0.04\mu\text{m}$
Workpiece positional error: $\pm 0.5\mu\text{m}$
Measuring region: 2x10mm ($\varnothing 0.05 - \varnothing 0.1\text{mm}$)
4x10mm ($\varnothing 0.1 - \varnothing 10\text{mm}$)
Laser wavelength: 650nm, Visible
Number of scans: 3200scans/s
Laser scanning speed: 113m/s
Acceptable standard of laser: IEC or FDA
* At the center of the measuring region.
 ΔD =Difference in diameter between the mastergauge and workpiece

Technical Data of LSM-503S

Range: 0.3 - 30mm
Resolution: 0.00002 - 0.1mm selectable
(.000001" - .005") (): Inch/Metric models
Linearity at 20°C*: Entire range: $\pm 1.0\mu\text{m}$
Narrow range: $\pm (0.6 + 0.1\Delta D)\mu\text{m}$
Repeatability ($\pm 2\sigma$): $\pm 0.1\mu\text{m}$
Workpiece positional error: $\pm 1.5\mu\text{m}$
Measuring region: 10x30mm
Laser wavelength: 650nm, Visible
Number of scans: 3200scans/s
Laser scanning speed: 226m/s
Acceptable standard of laser: IEC or FDA
* At the center of the measuring region.
 ΔD =Difference in diameter between the mastergauge and workpiece

Optional Accessory for LSM-500S

- 02AGD110:** Calibration gage set (ø0.1mm, ø2.0mm)
- 02AGD200:** Wire guiding pulley
- 02AGD220:** Air blow cover
- 957608:** Air cleaner for air blow cover
- 02AGC780A:** Extension signal cable 5m
- 02AGC780B:** Extension signal cable 10m
- 02AGC780C:** Extension signal cable 15m

Optional Accessory for LSM-501S

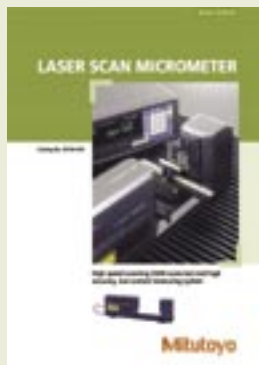
- 02AGD120:** Calibration gage set (ø0.1mm, ø10mm)
- 02AGD210:** Wire guiding pulley
- 02AGD400:** Adjustable workstage
- 02AGD440:** Center support*
- 02AGD450:** Adjustable V-block*
- 02AGD230:** Air blow cover
- 957608:** Air cleaner for air blow cover
- 02AGC150A:** Extension relay cable 1m
- 02AGC780A:** Extension signal cable 5m
- 02AGC780B:** Extension signal cable 10m
- 02AGC780C:** Extension signal cable 15m

*Use with an adjustable workstage.

Optional Accessory for LSM-503S

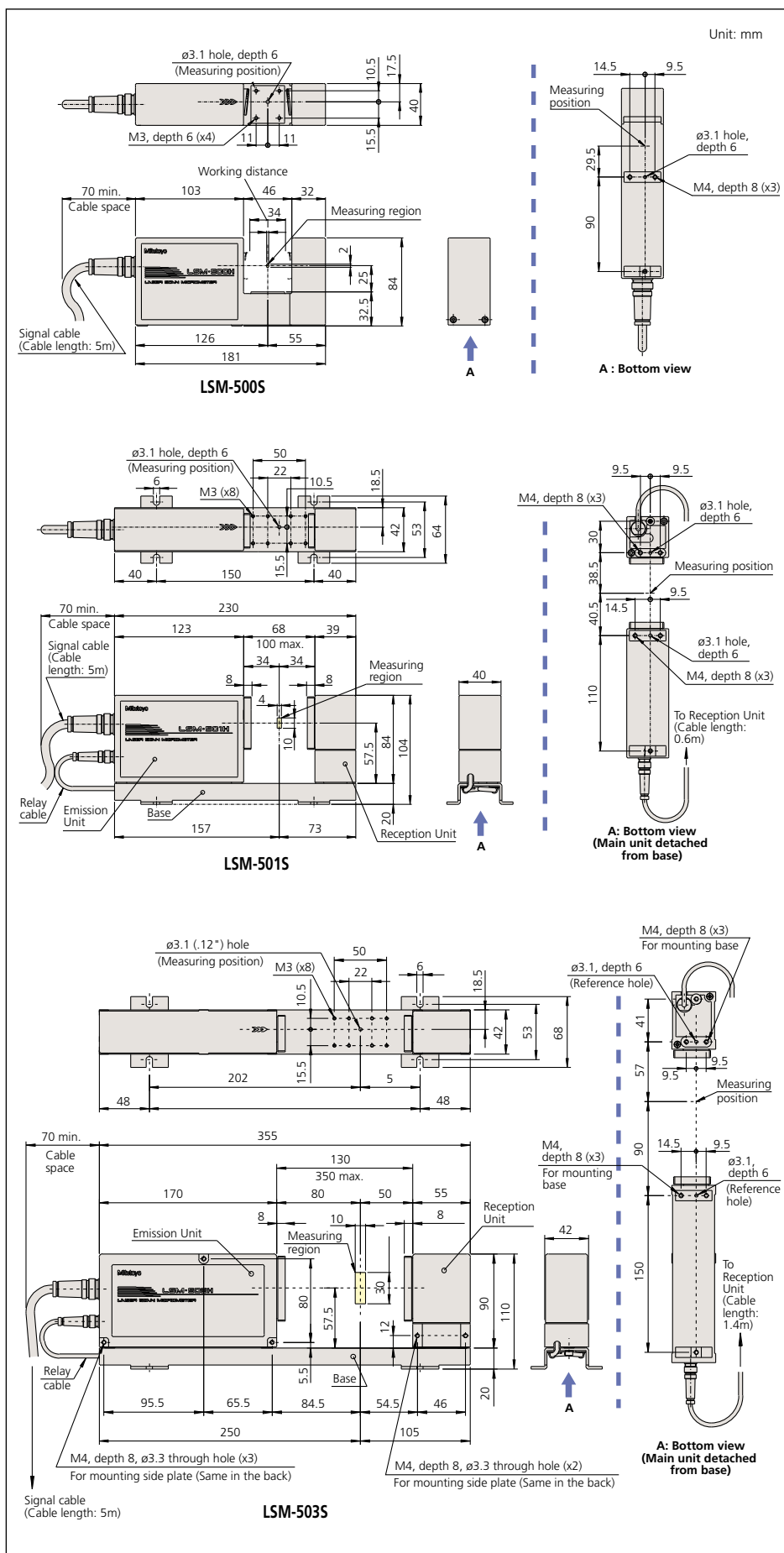
- 002AGD130:** Calibration gage set (ø1mm, ø30mm)
- 02AGD490:** Adjustable workstage
- 02AGD440:** Center support*
- 02AGD450:** Adjustable V-block*
- 02AGD240:** Air blow cover
- 957608:** Air cleaner for air blow cover
- 02AGC150A:** Extension relay cable 1m
- 02AGC150B:** Extension relay cable 3m
- 02AGC150C:** Extension relay cable 5m
- 02AGC780A:** Extension signal cable 5m
- 02AGC780B:** Extension signal cable 10m
- 02AGC780C:** Extension signal cable 15m
- 02AGC780D:** Extension signal cable 20m

*Use with an adjustable workstage.



Refer to the Laser Scan Micrometer leaflet (E4156) for more details.

DIMENSION



LSM-506S, LSM-512S, LSM-516S

SERIES 544 — High Accuracy Non-contact Measuring System

FEATURES: LSM-506S

- General-purpose type with a measurement range of 1mm to 60mm.
- Provides high accuracy with a linearity of $\pm 3\mu\text{m}$ over the entire measurement range and $\pm(1.5+0.5\Delta D)\mu\text{m}$ in the narrow range.
- Excellent repeatability of $\pm 0.36\mu\text{m}$



Order No.: 544-537 (FDA)
544-538 (IEC)

FEATURES: LSM-512S

- General-purpose type with a wide measurement range of 1mm to 120mm.
- Provides high accuracy with a linearity of $\pm 6\mu\text{m}$ over the entire measurement range and $\pm(4.0+0.5\Delta D)\mu\text{m}$ in the narrow range.
- Excellent repeatability of $\pm 0.8\mu\text{m}$



Order No.: 544-539 (FDA)
544-540 (IEC)

FEATURES: LSM-516S

- General-purpose type with a wide measurement range of 1mm to 160mm.
- Provides high accuracy with a linearity of $\pm 7\mu\text{m}$ over the entire measurement range and $\pm(4.0+2.0\Delta D)\mu\text{m}$ in the narrow range.
- Excellent repeatability of $\pm 1.4\mu\text{m}$



Order No.: 544-541 (FDA)
544-542 (IEC)

Technical Data of LSM-506S

Range: 1 - 60mm
Resolution: 0.00005 - 0.1mm selectable
(.000002" - .005") (): Inch/Metric models
Linearity at 20°C*: Entire range: $\pm 3\mu\text{m}$
Narrow range: $\pm(1.5+0.5\Delta D)\mu\text{m}$
Repeatability ($\pm 2\sigma$): $\pm 0.36\mu\text{m}$
Workpiece positional error: $\pm 4\mu\text{m}$
Measuring region: 20 x 60mm
Laser wavelength: 650nm, Visible
Number of scans: 3200scans/s
Laser scanning speed: 452m/s
Acceptable standard of laser: IEC or FDA
* At the center of the measuring region.
 ΔD =Difference in diameter between the mastergauge and workpiece

Technical Data of LSM-512S

Range: 1 - 120mm
Resolution: 0.0001 - 0.1mm selectable
(.000005" - .005") (): Inch/Metric models
Linearity at 20°C*: Entire range: $\pm 6\mu\text{m}$
Narrow range: $\pm(4.0+0.5\Delta D)\mu\text{m}$
Repeatability ($\pm 2\sigma$): $\pm 0.8\mu\text{m}$
Workpiece positional error: $\pm 8\mu\text{m}$
Measuring region: 30 x 120mm
Laser wavelength: 650nm, Visible
Number of scans: 3200scans/s
Laser scanning speed: 904m/s
Acceptable standard of laser: IEC or FDA
* At the center of the measuring region.
 ΔD =Difference in diameter between the mastergauge and workpiece

Technical Data of LSM-516S

Range: 1 - 160mm
Resolution: 0.0001 - 0.1mm selectable
(.000005" - .005") (): Inch/Metric models
Linearity at 20°C*: Entire range: $\pm 7\mu\text{m}$
Narrow range: $\pm(4.0+2.0\Delta D)\mu\text{m}$
Repeatability ($\pm 2\sigma$): $\pm 1.4\mu\text{m}$
Workpiece positional error: $\pm 8\mu\text{m}$
Measuring region: 40 x 160mm
Laser wavelength: 650nm, Visible
Number of scans: 3200scans/s
Laser scanning speed: 603m/s
Acceptable standard of laser: IEC or FDA
* At the center of the measuring region.
 ΔD =Difference in diameter between the mastergauge and workpiece

Optional Accessory for LSM-506S

- 02AGD140:** Calibration gage set ($\phi 1\text{mm}$, $\phi 60\text{mm}$)
- 02AGD520:** Adjustable workstage
- 02AGD580:** Center support*
- 02AGD590:** Adjustable V-block*
- 02AGD250:** Air blow cover
- 957608:** Air cleaner for air blow cover
- 02AGC150A:** Extension relay cable 1m
- 02AGC150B:** Extension relay cable 3m
- 02AGC150C:** Extension relay cable 5m
- 02AGC780A:** Extension signal cable 5m
- 02AGC780B:** Extension signal cable 10m
- 02AGC780C:** Extension signal cable 15m
- 02AGC780D:** Extension signal cable 20m

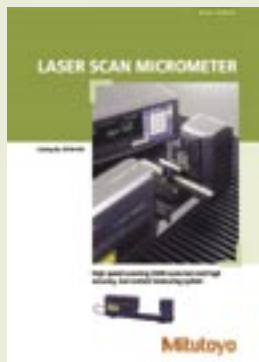
*Use with an adjustable workstage.

Optional Accessory for LSM-512S

- 02AGD150:** Calibration gage set ($\phi 20\text{mm}$, $\phi 120\text{mm}$)
- 02AGD260:** Air blow cover
- 957608:** Air cleaner for air blow cover
- 02AGC150A:** Extension relay cable 1m
- 02AGC150B:** Extension relay cable 3m
- 02AGC150C:** Extension relay cable 5m
- 02AGC780A:** Extension signal cable 5m
- 02AGC780B:** Extension signal cable 10m
- 02AGC780C:** Extension signal cable 15m
- 02AGC780D:** Extension signal cable 20m

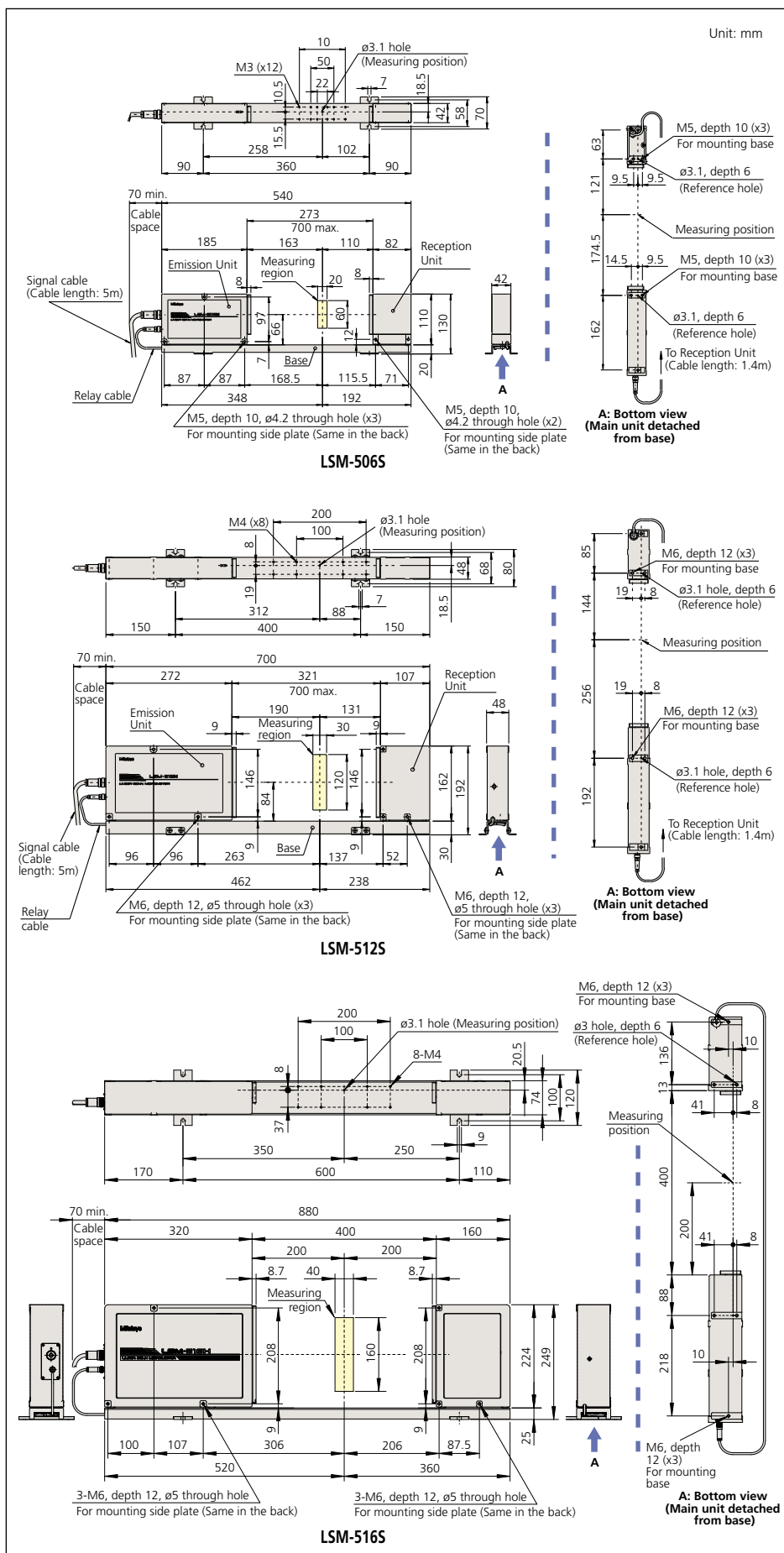
Optional Accessory for LSM-516S

- 002AGM300:** Calibration gage set ($\phi 20\text{mm}$, $\phi 160\text{mm}$)
- 02AGC150A:** Extension relay cable 1m
- 02AGC150B:** Extension relay cable 3m
- 02AGC150C:** Extension relay cable 5m
- 02AGC780A:** Extension signal cable 5m
- 02AGC780B:** Extension signal cable 10m
- 02AGC780C:** Extension signal cable 15m
- 02AGC780D:** Extension signal cable 20m



Refer to the Laser Scan Micrometer leaflet (E4156) for more details.

DIMENSION



LSM-5100 Display Unit

SERIES 544 — Compact Display Unit for Laser Scan Micrometer

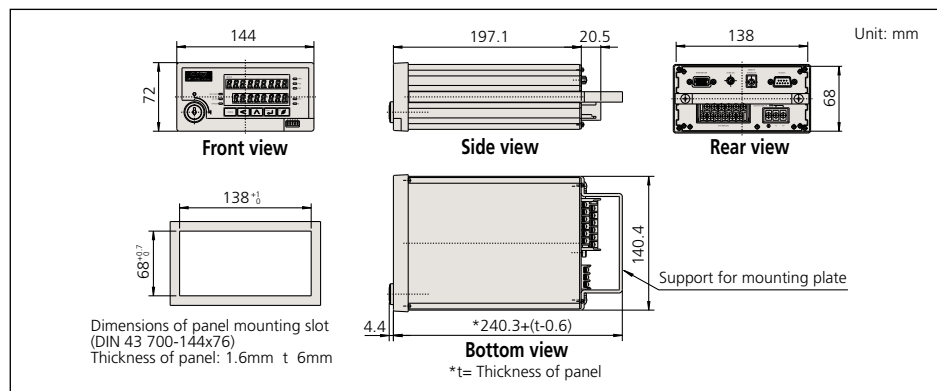
FEATURES

- Panel-mount type (with dimensions conforming to DIN standards) allows easy system integration.
- Capable of calculating mean, maximum, minimum, and range (maximum - minimum).
- Either the segment measurement (7 segments max.) or edge measurement (1 to 255 edges) can be selected.
- The RS-232C interface and the I/O and analog interface are provided as standard.
- The arithmetical average or moving average can be selected.
- GO/±NG judgment function.



Order No.: **544-039** (Metric)
544-040 (Inch/Metric)

DIMENSION



Technical Data

Main display: 9-digit LED
Interface units equipped: RS-232C, Analog I/O, Foot switch
Power supply: +24V DC±10%, 1A

Function of Display Unit

Zero-setting, presetting, GO/±NG judgment, Offset value setting, Sample measurement, Statistical calculation, Data output, Workpiece position display, mm/inch switching, Dual-gage calibration, Transparent object measurement, Automatic measurement, Abnormal data eliminating

LSM-6200 Display Unit

SERIES 544 — Standard Display Unit for Laser Scan Micrometer

FEATURES

- With a dual-display design setup values can be continuously monitored. Also, two measurement value items can be displayed on the sub-display with the simultaneous measurement function.
- Either the segment measurement (7 segments max.) or edge measurement (1 to 255 edges) can be selected.
- The RS-232C interface and the I/O and analog interface are provided as standard.
- A statistical calculation function and abnormal data eliminating function are provided.



Order No.: **544-071** (Metric)
544-072 (Inch/Metric)

* To denote your AC line voltage add the following suffixes to the order No. (e.g.: **544-495A**):
A for UL/CSA, **D** for CEE, **E** for BS, **F** for SAA, **DC** for China, **K** for EK, **No suffix** is required for JIS/100V

Technical Data

Main display: 16-digit fluorescent tube
Interface units equipped: RS-232C, Analog I/O, Foot switch
Power supply: 100 - 240V AC±10%, 40VA, 50/60Hz

Function of Display Unit

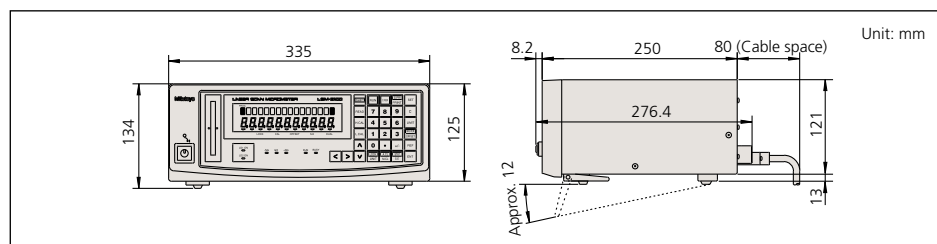
Zero-setting, Presetting, GO/±NG judgment, Multi-limit judgment, Offset value setting, Sample measurement, Statistical calculation, Group judgment, Data output, Workpiece position display, mm/inch switching, Dual-gage calibration, Transparent object measurement, Dual-unit measurement (optional), Automatic measurement, Abnormal data eliminating

QUICKTOOL



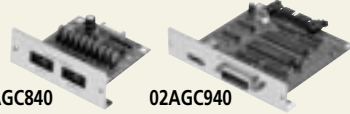



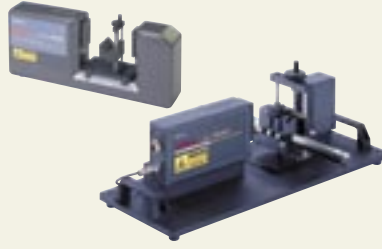
QUICKTOOL is a free software that makes the troublesome key operation of LSM-6200 setting simple and easy. Please contact your Mitutoyo office.



DIMENSION



Optional Accessories for LSM

Appearance	Order No.	Description	Application
	02AGD110 02AGD120 02AGD180 02AGD130 02AGD140 02AGD150 02AGM300 02AGD170	Calibration gage set Calibration gage set Calibration gage set Calibration gage set Calibration gage set Calibration gage set Calibration gage set Calibration gage set	LSM-500S LSM-501S LSM-902 LSM-503S LSM-506S LSM-512S LSM-516S LSM-9506
	02AGP150	Dual-type add-on unit	LSM-6200
	02AGC840 02AGC880 02AGC910 02AGC940	Digimatic (SPC) codeout unit 2nd I/O & analog interface unit BCD interface unit GP-IB interface unit	LSM-6200/6900 LSM-6200/6900 LSM-6200/6900 LSM-6200/6900
	02AGC780A 02AGC780B 02AGC780C 02AGC780D	Extension signal cable (5m) Extension signal cable (10m) Extension signal cable (15m) Extension signal cable (20m)	Any model of LSM* Any model of LSM* Any model of LSM* Any model of LSM*
	02AGC150A 02AGC150B 02AGC150C	Extension relay cable (1m) Extension relay cable (3m) Extension relay cable (5m)	Any model of LSM** Any model of LSM** Any model of LSM**
	936937	SPC cable (1m)	LSM-6200/6900/9506
	937179T	Footswitch	LSM-6200/6900/9506
	02AGD270 02AGD400 02AGD280 02AGD490 02AGD520 02AGD370 02AGD680 02AGD440 02AGD580 02AGD450 02AGD590	Work stage Adjustable workstage Adjustable workstage Adjustable workstage Adjustable workstage Adjustable workstage Adjustable workstage Adjustable workstage Center support Adjustable V-block Adjustable V-block	LSM-501S/503S/902 LSM-501S LSM-902 LSM-503S LSM-506S LSM-9506 LSM-9506 LSM-501S/503S/902 LSM-506S/9506 LSM-501S/503S/902 LSM-506S/9506
	02AGD200 02AGD210	Wire guiding pulley Wire guiding pulley	LSM-500S LSM-501S
	02AGD220 02AGD230 02AGD240 02AGD250 02AGD260 957608	Air blow cover Air blow cover Air blow cover Air blow cover Air blow cover Air cleaner	LSM-500S LSM-501S LSM-503S LSM-506S LSM-512S Any model of LSM
	02AGD600A 02AGD600B 02AGD600C	Thermal printer (100V AC) Thermal printer (120V AC) Thermal printer (130V AC)	Any model of LSM Any model of LSM Any model of LSM

* Except for LSM-902
** Except LSM-500S/902

Laser Indicator

SERIES 548 — Non-contact Displacement Measuring System

FEATURES

- Scanning is non-directional due to the pinhole focal point detection method employed.
- Focusing speed is improved with the software servo.
- Automatic intensity compensation allows workpieces with high dispersion surfaces, such as ceramics, to be measured.
- A built-in high-intensity blue LED guide light is used so that the position of the measuring point can be checked visually.



Order No. 548-205
(LI-H1001U)



Order No. 548-206
(LI-H1015U)



Order No. 548-023 (Display Unit)

Technical Data

Resolution:	0.01μm
Measuring range:	1mm (±500μm)
Working distance:	1.0mm (548-205), 15.5mm (548-206)
Linearity:	1.5μm
Focusing method:	Pinhole method
Laser beam diameter:	Approx. ø2.0μm
Laser wavelength:	780nm
Display:	Touch-panel type 6-inch LCD (black and white)
Power supply:	100 - 240V AC, 50/60Hz, 350W

DIMENSION

