

Optional Accessories

- Multifunctional display unit, **LSM-6200**:

Order No.	Display type	Remarks
544-071	Japanese mm/E	Japanese user's manual
544-071*	English mm/E	English user's manual
544-072*	English mm/in	English user's manual

* To denote your AC power cable add the following suffixes to the order No.: A for UL/CSA, D for CEE, DC for CCC, E for BS, F for SAA, K for KC, C and No suffix are required for PSE. *

- Panel-mount type display unit, **LSM-5200**:

Order No.	Remarks
544-046	Japanese user's manual
544-047	English user's manual

- Standard calibration gage set ($\phi 1.0, \phi 30.0$): **02AGD130**
- Adjustable workstage: **02AGD490**
- Air blower: **02AGD240**
- Workstage: **02AGD270**
- Extension signal cable (max. 25 m)

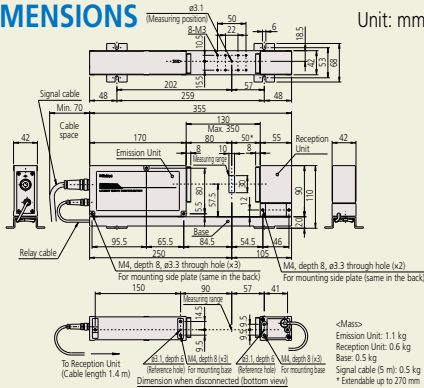
Order No.	Cable length
02AGN780A	5 m
02AGN780B	10 m
02AGN780C	15 m
02AGN780D	20 m

- Extension relay cable (max. 5 m)

02AGC150A	1 m
02AGC150B	3 m
02AGC150C	5 m

DIMENSIONS

Unit: mm



Optional Accessories

- Multifunctional display unit, **LSM-6200**:

Order No.	Display type	Remarks
544-071	Japanese mm/E	Japanese user's manual
544-071*	English mm/E	English user's manual
544-072*	English mm/in	English user's manual

* To denote your AC power cable add the following suffixes to the order No.: A for UL/CSA, D for CEE, DC for CCC, E for BS, F for SAA, K for KC, C and No suffix are required for PSE. *

- Panel-mount type display unit, **LSM-5200**:

Order No.	Remarks
544-046	Japanese user's manual
544-047	English user's manual

- Standard calibration gage set ($\phi 0.1, \phi 60.0$): **02AGD140**
- Adjustable workstage: **02AGD520**
- Air blower: **02AGD250**
- Extension signal cable (max. 25 m)

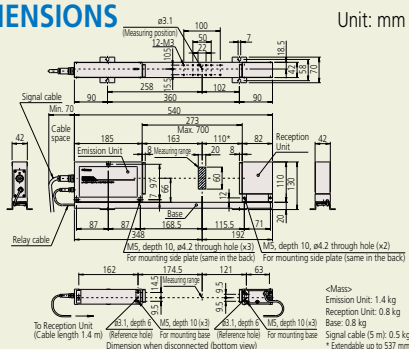
Order No.	Cable length
02AGN780A	5 m
02AGN780B	10 m
02AGN780C	15 m
02AGN780D	20 m

- Extension relay cable (max. 5 m)

02AGC150A	1 m
02AGC150B	3 m
02AGC150C	5 m

DIMENSIONS

Unit: mm



Laser Scan Micrometer

LSM-503S Measuring Unit SERIES 544 — 0.3 mm to 30 mm Measuring Unit

- Ensures $\pm 1.0 \mu\text{m}$ accuracy over the entire measuring range (0.3 to 30 mm).
- The industry's first narrow-range accuracy performance in this measuring range of $\pm(0.6+0.1\Delta D) \mu\text{m}$ is available for high-accuracy measurement.



With signal cable (5 m)
02AGN770A

SPECIFICATIONS

Order No.	544-535	544-536
Model	LSM-503S	
Applicable laser standards	JIS	IEC, FDA
User's Manual	Japanese version	English version
Measuring range	0.3 to 30 mm	
Resolution	0.02 to 100 μm (selectable)	
Repeatability*1	$\pm 0.11 \mu\text{m}$	
Linearity*2 (20 °C)	Whole range	$\pm 1.0 \mu\text{m}$
	Narrow range	$\pm(0.6+0.1\Delta D) \mu\text{m}^{*3}$
Positional error*4	$\pm 1.5 \mu\text{m}$	
Measuring region*5	10x30 mm (0.3 to 30 mm)	
Scanning rate	3200 scans/s	
Laser wavelength	650 nm (Visible)	
Laser scanning speed	226 m/s	
Operating environment	Temperature	0 to 40 °C
	Humidity	RH 35 to 85% (non-condensing)
Protection Level	IP64*6	

*1 Determined at the level of $\pm 2\sigma$ (σ : standard deviation) when measuring $\phi 30 \text{ mm}$ at the interval of 0.32 sec. (average 1024 times).

*2 Applies at the center of the measuring range when measuring outside diameters.

*3 ΔD =Difference in diameter between the master gage and workpiece (Unit: mm)

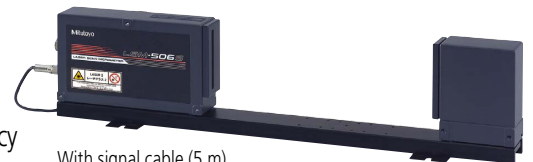
*4 An error in outside diameter measurement due to variation in workpiece position either in the optical axis direction or in the scanning direction.

*5 The area defined by [optical axis depth]x[scanning width].

*6 The protection level provided for the interior. If the workpiece or glass of the measuring unit window is soiled by water or dust, the unit may malfunction.

LSM-506S Measuring Unit SERIES 544 — 1 mm to 60 mm Measuring Unit

- Ensures $\pm 3 \mu\text{m}$ accuracy over the entire measuring range (1 to 60 mm).
- The industry's first narrow-range accuracy performance in this measuring range of $\pm(1.5+0.5\Delta D) \mu\text{m}$ is available for high-accuracy measurement.



With signal cable (5 m)
02AGN770A

SPECIFICATIONS

Order No.	544-537	544-538
Model	LSM-506S	
Applicable laser standards	JIS	IEC, FDA
User's Manual	Japanese version	English version
Measuring range	1 to 60 mm	
Resolution	0.05 to 100 μm (selectable)	
Repeatability*1	$\pm 0.36 \mu\text{m}$	
Linearity*2 (20 °C)	Whole range	$\pm 3 \mu\text{m}$
	Narrow range	$\pm(1.5+0.5\Delta D) \mu\text{m}^{*3}$
Positional error*4	$\pm 4 \mu\text{m}$	
Measuring region*5	20x60 mm (1 to 60 mm)	
Scanning rate	3200 scans/s	
Laser wavelength	650 nm (Visible)	
Laser scanning speed	452 m/s	
Operating environment	Temperature	0 to 40 °C
	Humidity	RH 35 to 85% (non-condensing)
Protection Level	IP64*6	

*1 Determined at the level of $\pm 2\sigma$ (σ : standard deviation) when measuring $\phi 60 \text{ mm}$ at the interval of 0.32 sec. (average 1024 times).

*2 Applies at the center of the measuring range when measuring outside diameters.

*3 ΔD =Difference in diameter between the master gage and workpiece (Unit: mm)

*4 An error in outside diameter measurement due to variation in workpiece position either in the optical axis direction or in the scanning direction.

*5 The area defined by [optical axis depth]x[scanning width].

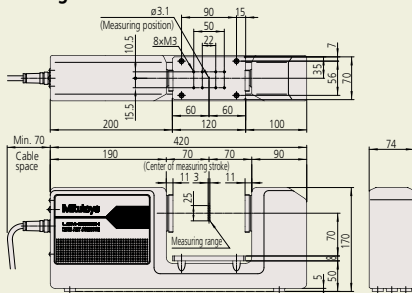
*6 The protection level provided for the interior. If the workpiece or glass of the measuring unit window is soiled by water or dust, the unit may malfunction.

- Standard calibration gage set (ø1.0, ø25.0) : **02AGD180**
- Workstage : **02AGD270**
- Adjustable workstage : **02AGD280**

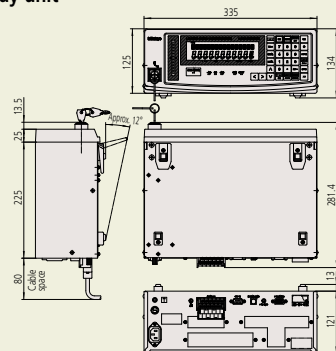
External Dimensions

Unit: mm

Measuring Unit



Display unit

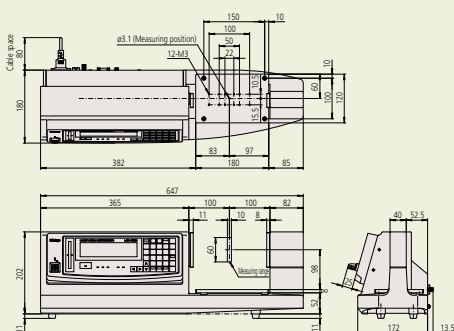


Optional Accessories

- Standard calibration gage set (ø1.0, ø60.0): **02AGD170**
- Adjustable workstage
 - Horizontal stroke 200 mm : **02AGD370**
 - Horizontal stroke 300 mm : **02AGD680**

DIMENSIONS

Unit: mm



LSM-6902H Measuring Unit and 6900 Display SERIES 544 — 0.1 mm to 25 mm High Accuracy

- Demonstrates the best repeatability available in the 25 mm class.
 - The ultra-precise scanning motor enables the highest measurement accuracy to be realized.
 - Thanks to excellent linearity, an accuracy of $\pm 0.5 \mu\text{m}$ over the entire measuring range and a higher accuracy of $\pm (0.3 + 0.1\Delta D) \mu\text{m}$ over a narrow range are guaranteed.
 - The optimal solution for measuring the outside diameter of pin gages or plug gages.
- 



SPECIFICATIONS

Set Order No.	544-497-1	544-498-1*6	544-499-1*6
Model	LSM-6902H		

Measuring unit

Type		mm	mm	inch/mm
Applicable standards		JIS	IEC, FDA	
Measuring range		0.1 to 25 mm (0.004 to 1.0 in)		
Resolution		0.01 to 10 μ m (selectable) (0.00001 to 0.0005 in)		
Repeatability*1	Whole range	$\pm 0.045 \mu$ m (± 0.0000018 in) ($\phi 25$ mm)		
	Narrow range	$\pm 0.03 \mu$ m (± 0.0000012 in) ($\phi 10$ mm)		
Linearity*2 (20 °C)	Whole range	$\pm 0.5 \mu$ m (± 0.000020 in)		
	Narrow range	$\pm (0.3+0.1\Delta D) \mu$ m $\pm (0.000012+0.01\Delta D)$ inch*5		
Positional error*3		$\pm 0.5 \mu$ m (± 0.000020 in)		
Measuring region*4		± 1.5 mm $\times$ 25 mm ($\pm 0.006 \times 1.0$ in)		
Scanning rate		3200 scans/s		
Laser wavelength		650 nm (Visible)		
Laser scanning speed		226 m/s		
Operating environment	Temperature	0 to 40 °C		
	Humidity	RH 35 to 85% (non-condensing)		

*1 $\pm 2\sigma$ values (σ being the standard deviation) for when $\varnothing 25$ mm and $\varnothing 10$ mm samples are measured for 1.28 seconds (2048 scans on average, 2 samples).

*2 The value at the center of the measuring range.

*3 An error in outside diameter measurement due to variation in workpiece position either in the optical axis direction or in the scanning direction.

*4 The region defined by [optical axis depth]×[scanning width].

*5 ΔD =Difference in diameter between the master gage and workpiece (Unit: mm).

*6 To denote your AC power cable add the following suffixes to the order No.: A for UL/CSA, D for CEE, DC for CCC, E for BS, F for SAA, K for KC, C and No suffix are required for PSE.

LSM-9506 Integrated Display/Measuring Unit SERIES 544 — 0.5 mm to 60 mm High Accuracy

- High accuracy of $\pm 2.5 \mu\text{m}$, integrated display unit with many functions equivalent to the multi-function display unit.
(Some functions may be unavailable.)



SPECIFICATIONS

Order No.		544-115* ⁵	544-116* ⁶
Model		LSM-9506	
Type		mm	inch/mm
Measuring range		0.5 to 60 mm	0.02 to 2.36 in/0.5 to 60 mm
Resolution		0.05 to 100 µm (selectable)	0.000002 to 0.005 in/0.00005 to 0.1 mm
Repeatability* ¹		±0.6 µm (±0.00003 in)	
Linearity* ² (20 °C)		±2.5 µm (±0.0001 in)	
Positional error* ³	Optical axis direction	±2.5 µm (±0.0001 in)	
	Scanning direction	± (2.0+L/10) µm L: Displacement between workpiece center and optical axis center	
Measuring region* ³		±5×60 mm (±0.2×2.36 in)	
Scanning rate		1600 scans/s	
Laser wavelength		650 nm (Visible)* ⁴	
Laser scanning speed		226 m/s (8900 in/s)	
Display unit		16-digit dot matrix (upper column) +7 segment 11-digit (lower column), guidance LEDs	
Standard interface		RS-232C, Digimatic code output unit (1-ch)	
Optional interface		No	
Power supply		AC100 V to 240 V±10%, 25 W, 50/60 Hz	
Operating environment		0 to 40 °C, RH 35 to 85% (non-condensing)	

*1 Determined at the level of $\pm 2\sigma$ (σ : standard deviation) when measuring $\phi 60$ mm in the interval of 0.32 sec. (average 512 times).

*2 Applies at the center of the measuring range when measuring outside diameters.

*3 An error in outside diameter measurement due to variation in workpiece position either in the optical axis direction or in the scanning direction.

*4 FDA Class II (**544-116-1A**)/IEC Class 2 (All models except **544-116-1A**) semiconductor laser for scanning (Maximum power: 1.0 mW)

*5 To denote your AC power cable add the following suffixes to the order No.: D for CEE, DC for CCC, E for BS, F for SAA, K for KC. C and No suffix are required for PSE.

*6 To denote your AC power cable add the following suffixes to the order No.: A for UL/CSA, D for CEE, DC for CCC, E for BS, K for KC and No suffix are required for PSE.

Laser Scan Micrometer

LSM-5200 Display Unit SERIES 544 — Panel-mount Type

- A compact controller which could be used for multi-unit system configurations.
- A panel-mount type display unit designed for the **LSM-S** Series.
- Analog I/O and RS-232C is standard.



SPECIFICATIONS

Order No.	544-047
Model	LSM-5200
Display	9-digit (upper) and 8-digit (lower) 7-segment
Segment	1 to 7 (1 to 3, transparent) or 1 to 255 edges* ¹
Averaging method	Arithmetic average: from 4 to 2048; Moving average: from 32 to 2048 (Arithmetic average is from 16 to 2048 when using LSM-500S .)
Judgment	Selecting from "target value±tolerance value" or "lower limit/upper limit".
Measurement mode	Standby, Single measurement, Continuous measurement
Statistical analysis	Calculation result is output via USB or RS-232C.
External dimensions	144 (W) x 72 (H) x 197.1 (D) mm
Power supply	24 V DC±10%, 1.3 A or more
Standard I/F	USB2.0, RS-232C, I/O analog
Operating temperature (humidity) ranges	0 to 40 °C, RH 35 to 85% (non-condensing)
Storage temperature (humidity) ranges	-20 to 70 °C, RH 35 to 85% (non-condensing)
Other functions	Measurement of odd fluted parts, simultaneous measurement, nominal setting, sample setting, selection of unnecessary digits, transparent object measurement* ² Automatic workpiece detection (dimension/position detected)* ¹ , abnormal data elimination, mastering, statistical processing (when using USB, RS-232C), output timer, automatic measurement in edge mode, presetting Note that every function is limited in its combination possibilities. See the user manual for details.
Mass	1.4 kg

*¹ The measuring range will be 0.1 mm to 2 mm in the 1 to 255 edge measurement mode or when activating the automatic workpiece detection with **544-531, 544-532**. Each function has its combination limit.

*² The measuring range is 50 μm to 2 mm when using **544-531, 544-532**. For smaller ranges, contact your local Mitutoyo sales office.

Note 1: Cannot be connected to **544-495, 544-496**.

Note 2: Previous models such as **544-451** cannot be connected.

Note 3: For USB communication with a PC, a dedicated device driver is required. For details, contact your local Mitutoyo sales office.

LSM-6200 Display Unit SERIES 544 — Multi-function Type

- 2-axis display unit enables 2 items be displayed simultaneously.
- Statistical operation is supported.
- Capable of statistical analysis such as: average, maximum value, minimum value, range (max. to min.).
- Segment measurement (7 points) or edge measurement (1 to 255 edges) can be selected.
- A function to eliminate abnormal values is standard.
- 100 tolerance values, preset values, or settings can be stored.



SPECIFICATIONS

Order No.	544-071	544-072
Model	LSM-6200	
Type	mm	inch/mm
Display	16-digit dot matrix (upper) and 11-digit 7-segment (lower)	
Segment	1 to 7 (1 to 3, transparent) or 1 to 255 edges* ¹	
Averaging times	Arithmetic average: per 2 to 2048/Moving average: per 32 to 2048 (Arithmetic average is per 16 to 2048 when using 544-531, 544-532)	
Judgment	Selection from "target value+tolerance", "lower tolerance + upper tolerance", or "7 classes multi-limit tolerance zone".	
Measurement mode	Standby, Single measurement, Continuous measurement	
Statistical analysis	Maximum, Minimum, Average, Dispersion, σ (S.D)	
Size	335 (W) x 134 (H) x 250 (D) mm	
Power supply	100 to 240 V AC ±10%, 45 W, 50/60 Hz	
Standard I/F	RS-232C, Analog I/O	
Optional I/F	Digimatic code output unit (2-ch), 2nd I/O analog I/F, BCD I/F	
Operating environment	0 to +40 °C, RH 35 to 85% (non-condensing)	
Other functions	Nominal setting, sample setting, selection of unnecessary digits, transparent object measurement* ² , measurement of odd fluted parts, automatic measurement in edge mode, output timer, abnormal data elimination, SHL change, group judgment, simultaneous measurement, statistical processing, mastering, buzzer function, automatic workpiece detection (dimension/position)* ¹ , zero-set/offset, dual measurement (optional)	

*¹ The measuring range will be 0.1 mm to 2 mm in the 1 to 255 edge measurement mode or when activating automatic workpiece detection with **544-531, 544-532**. Each function has its combination limit.

*² The measuring range is 50 μm to 2 mm when using **544-531, 544-532**. For smaller ranges, contact your local Mitutoyo sales office.

Note 1: To denote your AC power cable add the following suffixes to the order No.: A for UL/CSA, D for CEE, DC for CCC, E for BS, F for SAA, K for KC, C and No suffix are required for PSE.

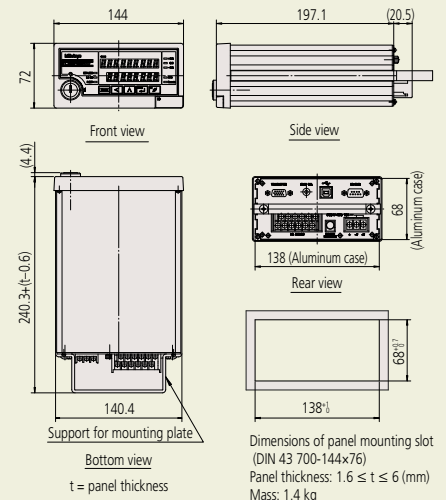
Note 2: Cannot be connected to **544-495, 544-496**.

Note 3: Previous models such as **544-451** cannot be connected.

Mitutoyo

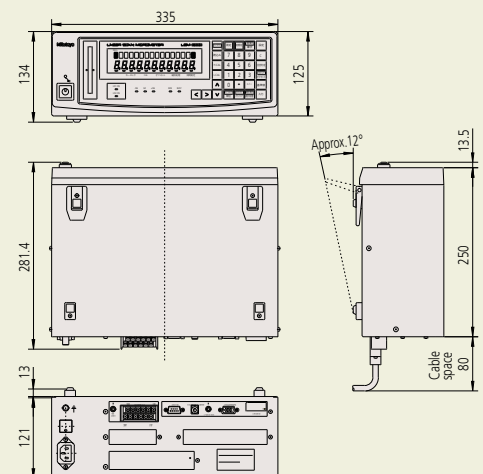
DIMENSIONS

Unit: mm



DIMENSIONS

Unit: mm



Optional Accessories SERIES 544 — Laser Scan Micrometer (Measuring Unit)

Standard calibration gage set

- Standard gage set suitable for calibration of Laser Scan Micrometers.
- Nominal gage diameters (1 to 160 mm) are as given in Specifications.



SPECIFICATIONS

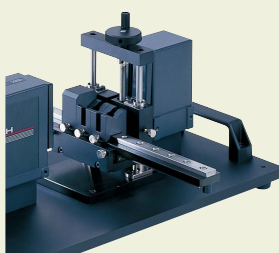
For calibrating models		LSM-6902H	LSM-500S	LSM-501S	LSM-503S	LSM-506S	LSM-512S	LSM-516S	LSM-9506
Set No.		02AGD180	02AGD110	02AGD120	02AGD130	02AGD140	02AGD150	02AGM300	02AGD170
Configuration (Order No.)	Stand	02AGD181	02AGD111	02AGD121	02AGD131	02AGD141	02AGD151	02AGM320	02AGD171
	Gages	ø1: 02AGD920 ø25: 02AGD963	ø0.1: 958200 ø2: 958202	ø0.1: 958200 ø10: 229317	ø1: 02AGD920 ø30: 02AGD961	ø1: 02AGD920 ø60: 02AGD962	ø20: 229730 ø120: 234072	ø20: 229730 ø160: 02AGM303	ø1: 02AGD920 ø60: 02AGD962
	Carrying case	02AGD190	958203	958203	02AGD980	02AGD980	02AGD990	02AGM310	02AGD970

Workstage

- Easy set-up and height adjustment enables high-precision measurement.

SPECIFICATIONS

Model	LSM-501S LSM-503S LSM-6902H
Order No.	02AGD270

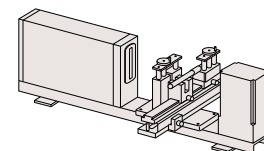
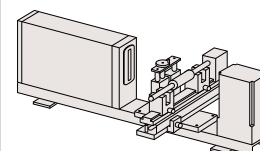


Adjustable workstage

- Vertical/horizontal slide mechanism enables easy measurement of various workpiece diameters.
- Suitable for quality control of high-precision shafts, rollers, pin gages and similar.

Measurement Examples

- Roller of copying machine
- Pin gage or plug gage



Basic configuration

Basic set	Order No.	Model	Standard Accessories	Measuring range (mm)	Horizontal stroke (mm)	Vertical stroke (mm)
1) Main unit 2) V-block 3) Stop	02AGD280	LSM-6902H	V-block (02AGD420), 2 pcs. Stopper (02AGD430), 1 pc.	0.1 - 25	130	47
	02AGD400	LSM-501S		0.05 - 10	130	32
	02AGD490	LSM-503S		0.3 - 30	200	35
	02AGD520	LSM-506S*	V-block A (02AGD550), 2 pcs.	1 - 60	300	45
	02AGD370	LSM-9506*	V-block B (02AGD560), 1 pc.	0.5 - 60	200	45
	02AGD680		V-block C (02AGD570), 1 pc.	0.5 - 60	300	45

* The stop is not included in the basic set for these models.

Note: Optional part for the adjustable workstage, such as center support, adjustable V-block (up/down) etc., are available.

Guide pulley

- Used for supporting measurement of outside diameter of fine wirelike materials such as magnetic wire or fiber.

SPECIFICATIONS

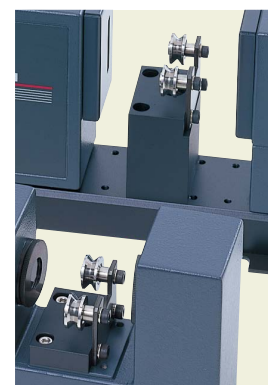
Model	LSM-500S	LSM-501S
Order No.	02AGD200	02AGD210

Note 1: Each measurement range is as follows:

LSM-500S: ø5 µm to ø1.6 mm

LSM-501S: ø50 µm to ø2 mm

Note 2: For calibration, the calibration gage set for LSM-500S (02AGD110) is required.

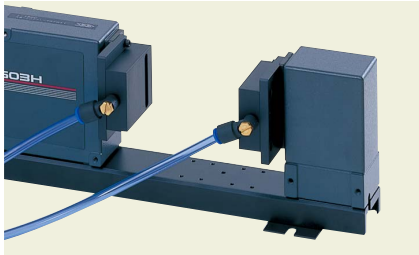


Laser Scan Micrometer

Optional Accessories
SERIES 544 — Laser Scan Micrometer (Measuring Unit)

Air shield

- Air blows from the air outlet installed on the laser section to clear dust adhering to the laser window.



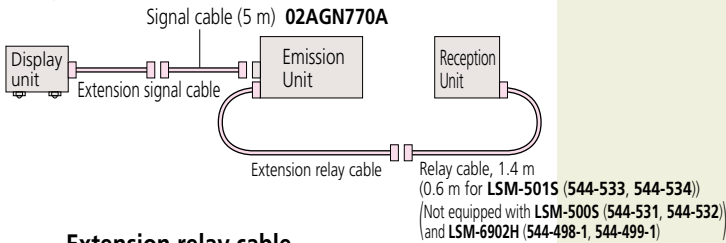
SPECIFICATIONS

Air supply unit	Air shield	Applicable models
957608	02AGD220	LSM-500S (544-531, 544-532)
	02AGD230	LSM-501S (544-533, 544-534)
	02AGD240	LSM-503S (544-535, 544-536)
	02AGD250	LSM-506S (544-537, 544-538)
	02AGD260	LSM-512S (544-539, 544-540)

Note: Air shield is supplied with 5 m air tube (Outside Diameter: 6 mm).

Extension signal cable / Extension relay cable

- Extension signal cables are necessary when the measuring unit and display unit are separated in operation; Extension relay cables are necessary when the optical section is separated in operation.



SPECIFICATIONS

Extension signal cable

Order No.	Cable length
02AGN780A	5 m
02AGN780B	10 m
02AGN780C	15 m
02AGN780D	20 m

Note 1: For 544-531, 544-532, 544-533, 544-534, the overall length of the signal cable and the extension signal cable is 20 m at a maximum.

Note 2: For 544-535, 544-536, 544-537, 544-538, 544-539, 544-540, 544-541, 544-542 the overall length of the signal cable and the extension signal cable is 30 m at a maximum.

Note 3: The length of the relay extension cable is 5 m at a maximum.

Note 4: The maximum extension length of the signal cable and relay cable is 32 m in total.

Note 5: Cannot be used with 544-498-1 and 544-499-1.

Extension relay cable

Order No.	Cable length
02AGC150A	1 m
02AGC150B	3 m
02AGC150C	5 m

Optional Accessories
SERIES 544 — Laser Scan Micrometer (Display Unit)

Foot switch

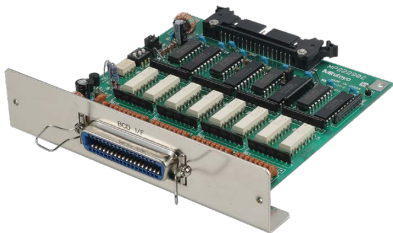
- For LSM-6200 (544-071, 544-072), LSM-6902H (544-498-1, 544-499-1) and LSM-9506 (544-115, 544-116).



Optional Accessories
Interface for LSM6200, 6902H

BCD Interface

- Outputs measurement data in BCD output (7-digit) or HEX output.
- Data logic can be switched.
- Isolated I/O circuitry
- Available for LSM-6200 (544-071, 544-072) and LSM-6902H (544-498-1, 544-499-1).



SPECIFICATIONS

Order No.	02AGC910
Standard Accessories	Connector (DDK) 57-30360 (214188)

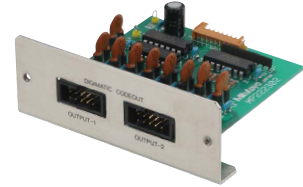
Optional Accessories SERIES 544 — Laser Scan Micrometer (Display Unit)

Digimatic code output unit

- 2-channel Digimatic code output
- In simultaneous measurement, measurement data are output as follows:
Program No. 0 to No. 4 in OUTPUT-1
Program No. 5 to No. 9 in OUTPUT-2
(10 programs operated)
- 10 pin MIL type connector.
- Output cable is not supplied.
Connecting cable (optional) 1 m (936937)
- Available for **LSM-6200 (544-071, 544-072)** and **LSM-6902H (544-498-1, 544-499-1)**.

Note 1: Output is 6 digits of measurement data.

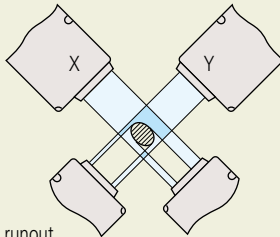
Note 2: Displaying 6th and 7th digit after the decimal point is not supported.



SPECIFICATIONS

Order No.	02AGC840
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XY Measurement



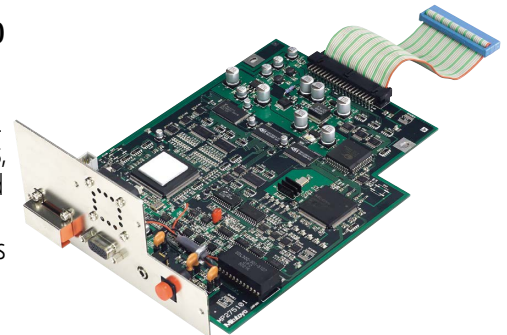
(X-Y): runout
(X+Y)/2: average
Note: XY requires 10 mm-interval.

Dual connection unit

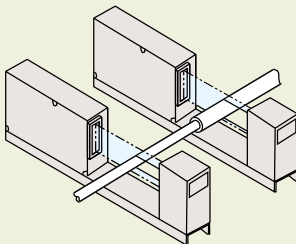
- Enables second unit connection to **LSM-6200 (544-071, 544-072)**. (both units must be the same model)
- Note: Cannot be used for **LSM-6902H (544-498-1, 544-499-1)**.
- Depending on the layout of the two measuring units, large-diameter measurement, XY measurement, and parallel measurement are possible.
- Both of the measuring units and display units can be simultaneously operated.

SPECIFICATIONS

Order No.	02AGP150
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Parallel Measurement

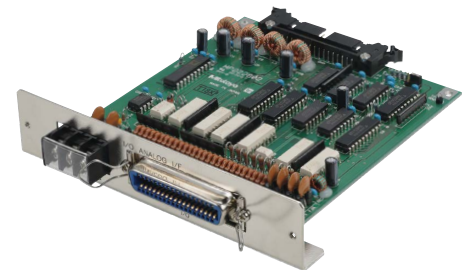


2nd I/O analog I/F

- I/O, analog output.
- Simultaneous measurement is supported by two pairs of GO/NG judgment outputs.
- Available for **LSM-6200 (544-071, 544-072)** and **LSM-6902H (544-498-1, 544-499-1)**.

SPECIFICATIONS

Order No.	02AGC880
Standard Accessories	Connector (DDK) 57-30360 (214188)



Cable for BCD and 2nd I/O simultaneous mount

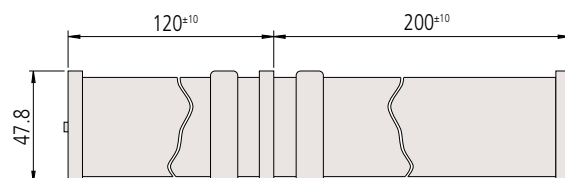
- Both BCD (02AGC910) and 2nd I/O analog I/F (02AGC880) can be mounted on **LSM-6200 (544-071, 544-072)** and **LSM-6902H (544-498-1, 544-499-1)** using this cable.

Note: If using this cable, the dual connection unit (02AGP150) cannot be used.

SPECIFICATIONS

Order No.	02AGE060
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DIMENSIONS



Unit: mm