

Laser Scan Micrometers



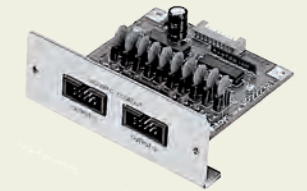
Display Units
Pages 443, 447



Measuring Units
Pages 444 to 446



Measuring and Display Unit Package
Pages 444 to 446



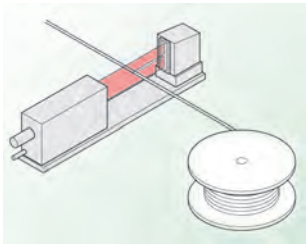
Benchtop Laser Scan Micrometer
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Accessories
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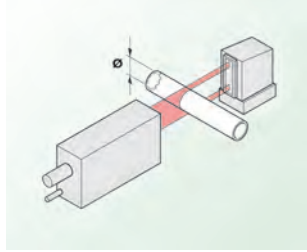
Laser Scan Micrometer

Series 544

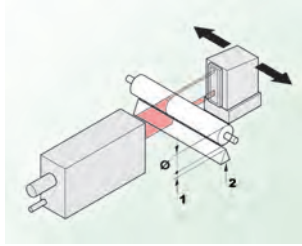
Application examples



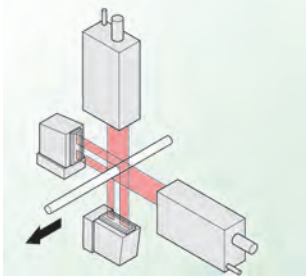
On-line measurement of glass fibre or fine wire diameters



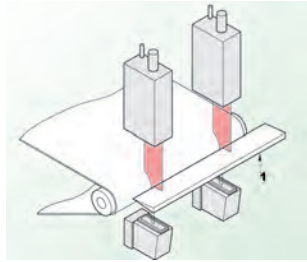
Measurement of outside diameters of cylindrical workpieces



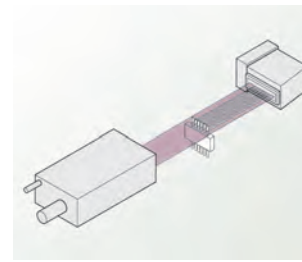
Measurement of outer diameter and roundness of cylinder
1 Roundness error
2 Reference edge



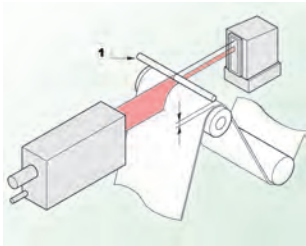
XY measurement of electric cables and fibres



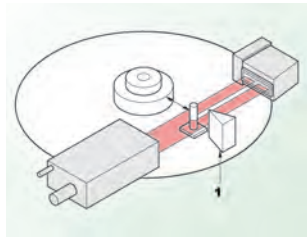
Measurement of unevenness of film and sheet
1 Reference edge



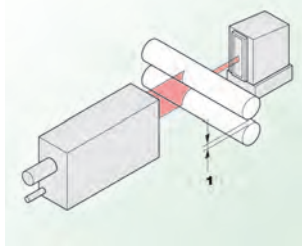
Measurement of spacing of IC chip leads
1 Reference edge



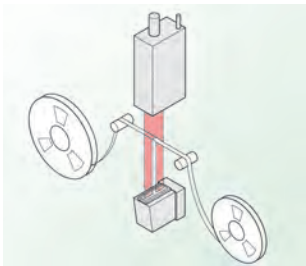
Measurement of film sheet thickness
1 Reference edge



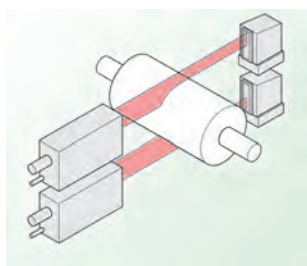
Measurement of laser disk and magnetic disk head movement
1 Reference edge



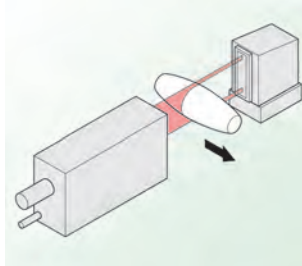
Measurement of gap between rollers
1 Gap



Measurement of tape width



Measurement of outer diameter of large rollers/cylinders



Measurement of workpiece form

Laser Scan Micrometer Measuring Unit and Display Unit Package

Series 544

LSM-902/6900

Ultra-high Accuracy Non-contact Measuring System

- Suitable for pin and plug gauge measurements.
- Wide measuring range of $\varnothing 0,1$ mm to $\varnothing 25$ mm.
- Provides ultra-high accuracy with a linearity of $\pm 0,5 \mu\text{m}$ over the entire measurement range and $\pm (0.3+0.1D) \mu\text{m}$ in the narrow range.
- Ultra-high repeatability of $\pm 0,05 \mu\text{m}$.



LSM-6900 display unit



LSM-902 measuring unit

Metric

No.	Range	Resolution (selectable)
544-495D	0,1-25 mm	0,01-10 μm / 0.0000001-0.0005"

Inch/Metric

No.	Range	Resolution (selectable)	Remarks
544-496E	0,1-25 mm / 0.004-1"	0,01-10 μm / 0.0000001-0.0005"	UK only
544-496D*	0,1-25 mm / 0.004-1"	0,01-10 μm / 0.0000001-0.0005"	

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

Specifications

Linearity at 20°C *1	Entire range : $\pm 0,5 \mu\text{m}$ Narrow range : $\pm (0.3+0.1D) \mu\text{m}$
Repeatability ($\pm 2 \sigma$)	$\pm 0,05 \mu\text{m}$ / 2.0 μinch
Accuracy *2	$\pm 0,5 \mu\text{m}$
Measuring region	3 x 25 mm / 0.12 x 0.98"
Laser wavelength	650 nm, Visible
Scanning rate	800 scans/s
Scanning speed	56m/s
Applicable laser standards	IEC
Main display	16-digit fluorescent tube
Interface units	RS-232C, Analog I/O, Footswitch equipped
Power supply	100 - 240VAC, 40 VA, 50/60Hz

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

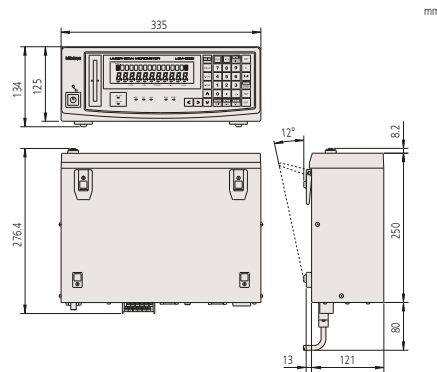
D = Difference in diameter between the master gauge and workpiece

Optional accessories

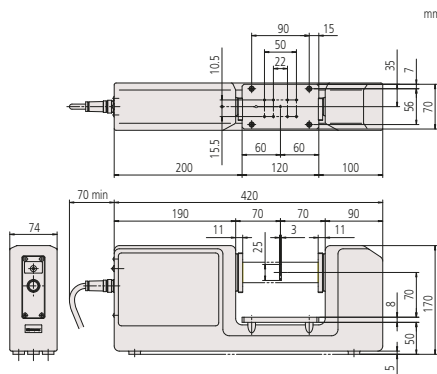
No.	Description
02AGD180	Calibration gauge set ($\varnothing 1-25$ mm)
02AGD270	Workstage
02AGD280	Adjustable workstage



LSM brochure on request



LSM-6900 display unit



LSM-902 measuring unit

Laser Scan Micrometer Measuring Unit

Series 544

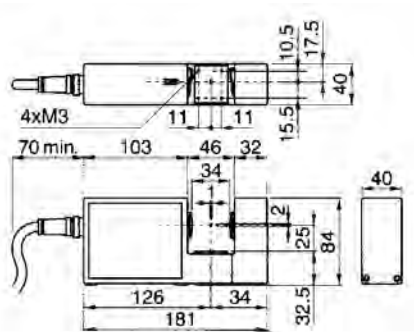
LSM-500S

High Accuracy Non-contact Measuring System

- Permits Measurements starting from \varnothing 5 μ m.
- Provides ultra-high accuracy with a linearity of $\pm 0,3 \mu$ m over the entire measurement range (5 μ m up to 2 mm).
- Ultra-high repeatability of $\pm 0,03 \mu$ m.



LSM-500S



Inch/Metric

No.	Range	Resolution (selectable)
544-532	0,005-2 mm / 0.0002-0.08"	0,00001-0,01 mm / 0.000001-0.0005"

Series 544

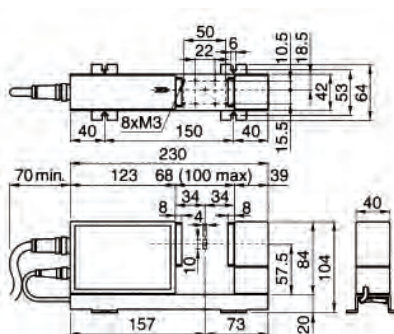
LSM-501S

High Accuracy Non-contact measuring system

- Provides ultra-high accuracy with a linearity of $\pm 0,5 \mu$ m over the entire measurement range ((0,05 mm to 10 mm) and $\pm(0.3+0.1D) \mu$ m in the narrow range).
- Ultra-High repeatability of $\pm 0,04 \mu$ m.



LSM-501S



Inch/Metric

No.	Range	Resolution (selectable)
544-534	0,05-10 mm / 0.002-0.4"	0,00001-0,01 mm / 0.000001-0.0005"



LSM brochure on request



Specifications

Linearity at 20°C *1	$\pm 0,3 \mu$ m
Repeatability ($\pm 2 \sigma$)	$\pm 0,03 \mu$ m
Accuracy *2	$\pm 0,4 \mu$ m
Measuring region	1 x 2 mm
Laser wavelength	650 nm, Visible
Scanning rate	3200 scans/s
Scanning speed	76m/s
Applicable laser standards	IEC, FDA (544-532)

Optional accessories

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



Specifications

Linearity at 20°C *1	Entire range : $\pm 0,5 \mu$ m Narrow range : $\pm(0.3+0.1D) \mu$ m
Repeatability ($\pm 2 \sigma$)	$\pm 0,04 \mu$ m
Accuracy *2	$\pm 0,5 \mu$ m
Measuring region	2 x 10 mm (\varnothing 0,05-0,1 mm) 4 x 10 mm (\varnothing 0,1-10 mm)
Laser wavelength	650 nm, Visible
Scanning rate	3200 scans/s
Scanning speed	113 m/s / 4450"/s
Applicable laser standards	IEC, FDA (544-534)

Optional accessories

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

02AGD440 and 02AGD450 : use with an adjustable workstage

*1 At the centre of the measuring region

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

D = Difference in diameter between the mastergauge and workpiece

Laser Scan Micrometer Measuring Unit



Specifications

Linearity at 20°C *1	Entire range : ±1,0 µm Narrow range : ±(0.6+0.1D) µm
Repeatability (±2 σ)	±0,11 µm
Accuracy *2	±1,5 µm
Measuring region	10 x 30 mm
Laser wavelength	650 nm, Visible
Scanning rate	3200 scans/s
Scanning speed	226 m/s
Applicable laser standards	IEC, FDA (544-536)

Optional accessories

No.	Description
02AGC150A	Extension relay cable 1 m
02AGC150B	Extension relay cable 3 m
02AGC150C	Extension relay cable 5 m
02AGD130	Calibration gauge set (ø1-30 mm)
02AGD240	Air shield
02AGD440	Centre support
02AGD450	Adjustable V-block
02AGD490	Adjustable workstage
02AGN780A	Extension signal cable 5 m
02AGN780B	Extension signal cable 10 m
02AGN780C	Extension signal cable 15 m
02AGN780D	Extension signal cable 20 m
957608	Air cleaner for air shield

02AGD440 and 02AGD450 : use with an adjustable workstage

Specifications

Linearity at 20°C *1	Entire Range : ±3 µm Narrow range : ±(1.5+0.5D) µm
Repeatability (±2 σ)	±0,36 µm
Accuracy *2	±4 µm
Measuring region	20 x 60 mm
Laser wavelength	650 nm, Visible
Scanning rate	3200 scans/s
Scanning speed	452 m/s
Applicable laser standards	IEC, FDA (544-538)

Optional accessories

No.	Description
02AGC150A	Extension relay cable 1 m
02AGC150B	Extension relay cable 3 m
02AGC150C	Extension relay cable 5 m
02AGD140	Calibration gauge set (ø1-60 mm)
02AGD250	Air shield
02AGD520	Adjustable workstage
02AGD580	Centre support
02AGD590	Adjustable V-block
02AGN780A	Extension signal cable 5 m
02AGN780B	Extension signal cable 10 m
02AGN780C	Extension signal cable 15 m
02AGN780D	Extension signal cable 20 m
957608	Air cleaner for air shield

02AGD580 and 02AGD590 : use with an adjustable workstage

*1 At the centre of the measuring region

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

D = Difference in diameter between the mastergauge and workpiece

Series 544

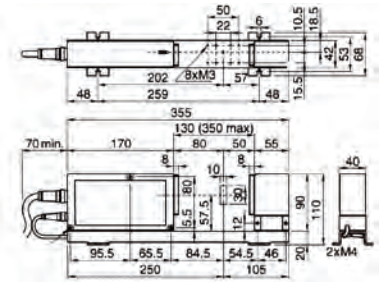
LSM-503S

High Accuracy Non-contact measuring system

- General-purpose type with a measurement range of 0,3 mm to 30 mm.
- Provides high accuracy with a linearity of ±1,0 µm over the entire measurement range (and ±(0.6+0.1D) µm in the narrow range.
- Excellent repeatability of ±0,1 µm.



LSM-503S



Inch/Metric

No.	Range	Resolution (selectable)
544-536	0,3-30 mm / 0.012-1.18"	0,00002-0,1 mm / 0.000001-0.005"

Series 544

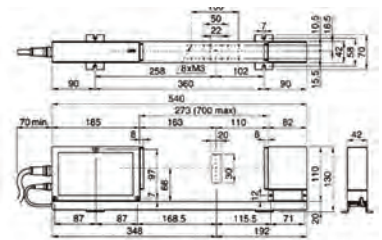
LSM-506S

High Accuracy Non-contact Measuring System

- General-purpose type with a measurement range of 1mm to 60 mm.
- Provides high accuracy with a linearity of ±3 µm over the entire measurement range and ±(1.5+0.5D) µm in the narrow range.
- Excellent repeatability of ±0,36 µm.



LSM-506S



Inch/Metric

No.	Range	Resolution (selectable)
544-538	1-60 mm / 0.04-2.36"	0,00005-0,1 mm / 0.000002-0.005"



LSM brochure on request

Laser Scan Micrometer Measuring Unit

Series 544

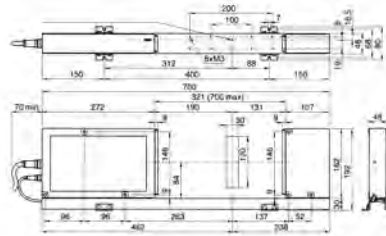
LSM-512S

High Accuracy Non-contact measuring system

- General-purpose type with a wide measurement range of 1 mm to 120 mm.
- Provides high accuracy with a linearity of $\pm 6 \mu\text{m}$ over the entire measurement range and $\pm(4.0+0.5D) \mu\text{m}$ in the narrow range.
- Excellent repeatability of $\pm 0,8 \mu\text{m}$.



LSM-512S



Inch/Metric

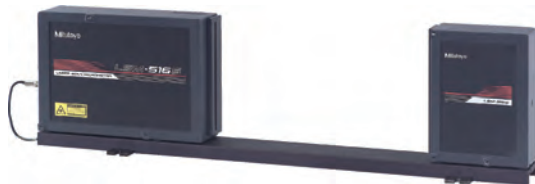
No.	Range	Resolution (selectable)
544-540	1-120 mm / 0.04-4.72"	0,0001-0,1 mm / 0.000005-0.005"

Series 544

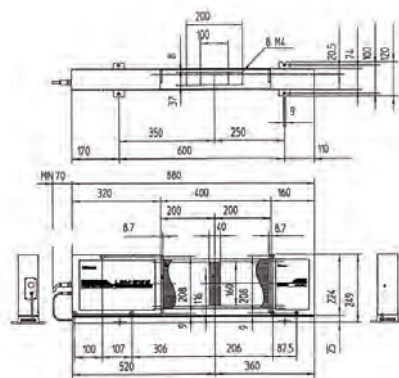
LSM-516S

High Accuracy Non-contact measuring system

- General-purpose type with a wide measurement range of 1 mm to 160 mm.
- Provides high accuracy with a linearity of $\pm 7 \mu\text{m}$ over the entire measurement range and $\pm(4.0+2D) \mu\text{m}$ in the narrow range.
- Excellent repeatability of $\pm 1,4 \mu\text{m}$.



LSM-516S



Inch/Metric

No.	Range	Resolution (selectable)
544-542	1-160 mm / 0.04-6.3"	0,0001-0,1 mm / 0.000005-0.005"



Specifications

Linearity at 20°C *1	Entire range : $\pm 6 \mu\text{m}$ Narrow range : $\pm(4.0+0.5D) \mu\text{m}$ $\pm 0,8 \mu\text{m}$
Repeatability ($\pm 2 \sigma$)	$\pm 0,8 \mu\text{m}$
Accuracy *2	$\pm 8 \mu\text{m}$
Measuring region	30 x 120 mm
Laser wavelength	650 nm, Visible
Scanning rate	3200 scans/s
Scanning speed	904 m/s
Applicable laser standards	IEC, FDA (544-540)

Optional accessories

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



Specifications

Linearity at 20°C *1	Entire range : $\pm 7 \mu\text{m}$ Narrow range : $\pm(4.0+2D) \mu\text{m}$ $\pm 1,4 \mu\text{m}$
Repeatability ($\pm 2 \sigma$)	$\pm 1,4 \mu\text{m}$
Accuracy *2	$\pm 8 \mu\text{m}$
Measuring region	40 x 160 mm
Laser wavelength	650 nm, Visible
Scanning rate	3200 scans/s
Scanning speed	1206 m/s
Applicable laser standards	IEC, FDA (544-534)

Optional accessories

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

*1 At the centre of the measuring region

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

D = Difference in diameter between the mastergauge and workpiece



LSM brochure on request

Laser Scan Micrometer

Series 544

LSM-9506

Bench Top Type Non-contact Measuring System

- Measurement system and display integrated into a single unit for easy bench-top inspection.
- A statistical calculation function is provided.
- Includes standard RS-232C interface and data output interface.



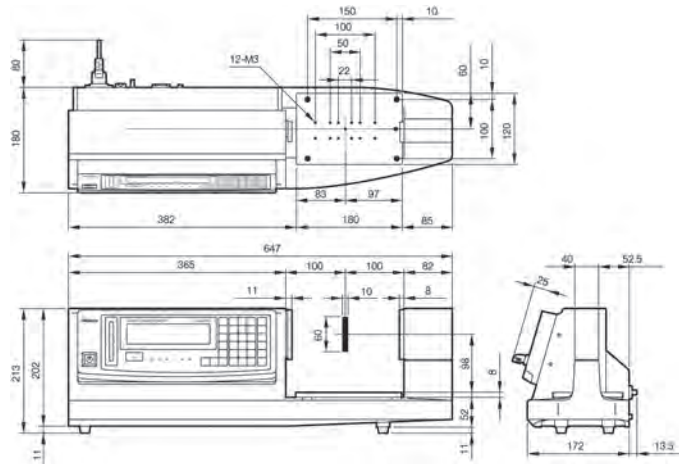
LSM-9506

Metric

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

Inch/Metric

No.	Range	Resolution (selectable)	Remarks
544-116E*	0,5-60 mm / 0.02-2.36"	0,00005-0,1 mm / 0.000002-0.005"	UK only
544-116D*	0,5-60 mm / 0.02-2.36"	0,00005-0,1 mm / 0.000002-0.005"	



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

Specifications

Linearity at 20°C *1	±2,5 µm
Repeatability (±2 σ)	±0,6 µm / 24 µinch
Accuracy *2	±2,5 µm
Measuring region	10 x 60 mm
Laser wavelength	650 nm, Visible
Scanning rate	1600 scans/s
Scanning speed	226 m/s
Applicable laser standards	IEC
Main display	16-digit fluorescent tube
Interface units equipped	RS-232C, Digimatic, Foot Switch
Power supply	100-240VAC, 40VA, 50/60Hz

*1 At the centre of the measuring region

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



LSM brochure on request

Laser Scan Micrometer Display Unit

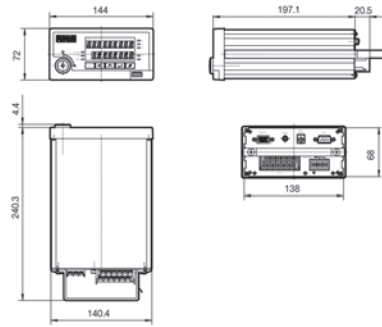
Series 544

LSM-5200 Display Unit

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



LSM-5200 display unit



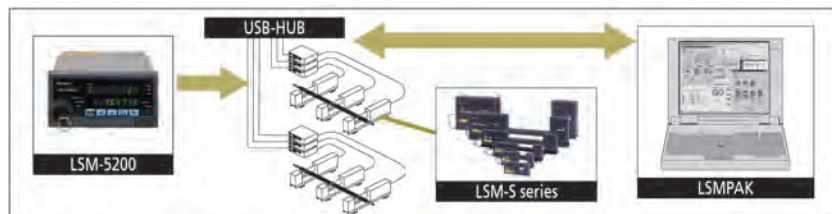
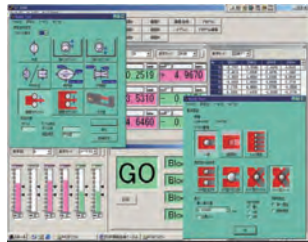
No.

544-047

Series 544

LSMPAK

- This software can import measurement data from multiple LSM-5200 Display Units to a personal computer, allowing a variety of measuring systems to be constructed.
- Capable of processing a maximum of 10 channels of measurement-point data (USB-HUB connection).
- Capable of composite calculation between Measuring Units (multiple channels), statistical calculation, and calculation results output as a file.



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

No.

02AGP690A

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

Specifications

Main display	9-digit LED
Interface units equipped	USB2.0, RS-232C, Analog I/O, Foot Switch
Power supply	+24VDC ±10%, 1A

Specifications

Operating Environment	<ul style="list-style-type: none"> • Connection interface: USB2.0 • PC : DOS/V(IBM) compatible machine • CPU : 2GHz or more (recommended) • OS/software : Windows XP, Excel 2000 XP Japanese version • Memory : 256MB or more (recommended) • Applicable display unit : LSM-5200
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Other Functions	Rich choice of functions (e.g. counter, graphs, calculation results)
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LSM brochure on request

Laser Scan Micrometer Display Unit

Series 544

LSM-6200 Display Unit

Standard Display Unit for Laser Scan Micrometer

- Setup values can be continuously monitored with this dual-display design. Simultaneous display of two measurement values also possible.
- Either the segment measurement (7 segments max.) or edge measurement (1 to 255 edges) can be selected.
- Includes RS-232C and I/O and analog interface capabilities.
- Includes statistical calculation and abnormal data eliminating functions.

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

Specifications

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



LSM brochure on request



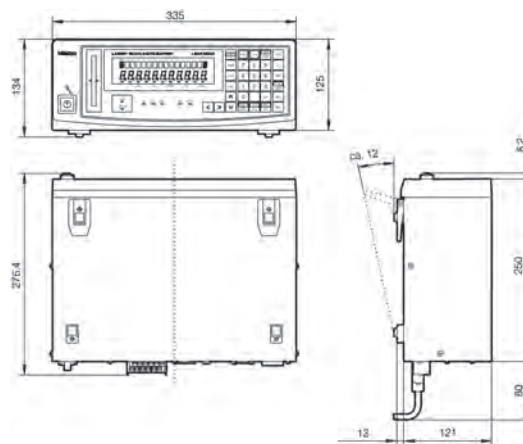
LSM-6200 display unit

Metric

No.
544-071D

Inch/Metric

No.	Remarks
544-072D*	
544-072E	UK only



Laser Scan Micrometer Optional Accessories

Series 544 - Accessories

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

Laser Scan Micrometer Optional Accessories

Series 544 - Accessories

	No.	Description	Application
 <p>Digimatic (SPC) code-out unit</p>	02AGC840	Digimatic (SPC) code-out unit	LSM-6200/6900
	02AGC880	2nd I/O & analog interface	LSM-6200/6900
	02AGC910	BCD interface unit	LSM-6200/6900
 <p>GP-IB interface unit</p>	02AGC940	GP-IB interface unit	LSM-6200/6900
 <p>Extension relay cable</p>	02AGC150A	Extension relay cable 1 m	All LSM models (1)
	02AGC150B	Extension relay cable 3 m	All LSM models (1)
	02AGC150C*	Extension relay cable 5 m	All LSM models (1)
	02AGC330A	Output signal cable 5 m	All LSM models (1)
	02AGC330B	Output signal cable 10 m	All LSM models (1)
	 <p>Extension signal cable</p>	02AGN780A	Extension signal cable 5 m
02AGN780B*		Extension signal cable 10 m	All LSM models (2)
02AGN780C*		Extension signal cable 15 m	All LSM models (2)
02AGN780D		Extension signal cable 20 m	All LSM models (2)
02AGN780E		Extension signal cable 30 m	All LSM models (2)
 <p>Dual-type add-on unit</p>		02AGP150	Dual-type add-on unit

(1) Except for LSM-500S/902

(2) Except for LSM-902