

Portable Surface Roughness Tester SURFTEST SJ-301 Series

Catalog No.E4389-178

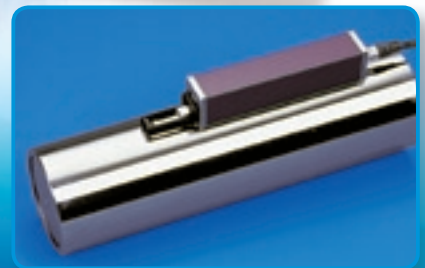
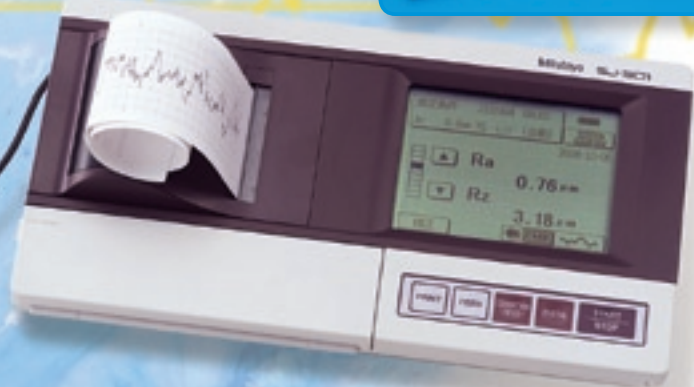


Mitutoyo

Unbeatable Portable Surface Roughness Tester

Battery-powered portability scores when making surface roughness measurements on the shop floor.

Capable of performing measurements in any orientation, including vertical and upside-down. Optional accessories, such as a height gage adapter, allow measurements to be performed efficiently in various situations and setups.



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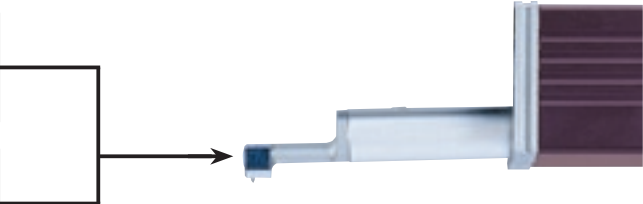


Enhanced Lineup

A wide variation in system setup is possible with the detector + drive unit + display unit combination.

Detectors*

- Measuring force: 0.75 mN
Stylus profile: Tip radius 2 μm, Tip angle 60°
- Measuring force: 4 mN
Stylus profile: Tip radius 5 μm, Tip angle 90°

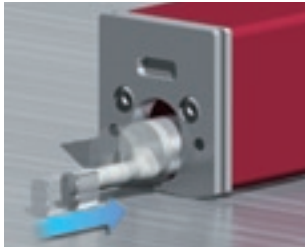


*One only supplied as standard. See specifications

Drive units

Standard drive unit

- Popular standard drive unit



Transverse tracing drive unit

- Best suited for measurement of narrow, shrouded workpiece features such as crankshaft, EDM parts, etc. (Patent Registered in Japan)



Retractable drive unit

- The detector is in the retracted position at rest so it is immune from damage when inserted into a feature whose profile cannot be easily seen, such as a blind hole, etc.



Display unit

Touch-panel operation unit with a built-in printer

SJ-301 series display unit

- Common to SJ-301/301S/301R



test SJ-301

Surftest SJ-301 Series

Unbeatable portable surface roughness tester created for ease-of-use and as a cost-effective solution to a wide variety of measuring needs



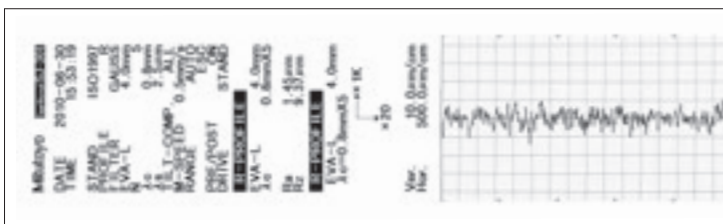
Simple operations performed with the large LCD touch-panel

- The Measure-Start button and others frequently used are hard wearing and resistant to workshop contaminants.



Equipped with a large capacity battery that, when fully charged, allows approximately 600 measurements to be made

- A convenient carrying case is supplied as standard for protecting the instrument in the field.

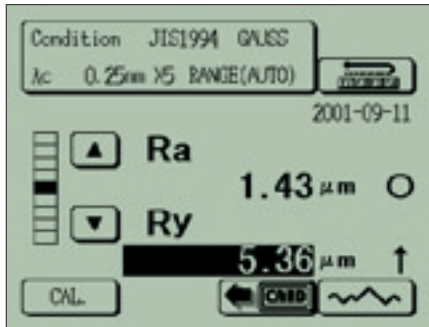


A high-resolution, high-speed printer is built into the main unit.

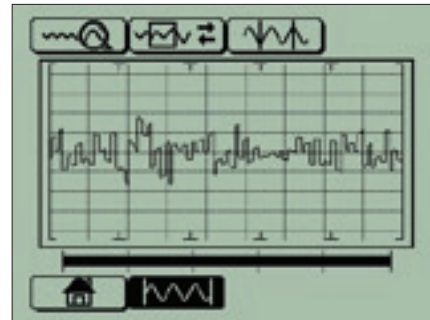
- Five sets of measurement set-ups can be saved in the measurement unit and the optional memory card (compact flash memory) allows saving of set-ups and measurements.
- Measurement data also can be saved in the memory card in CSV format and then loaded onto a personal computer for data handling with spreadsheet software.

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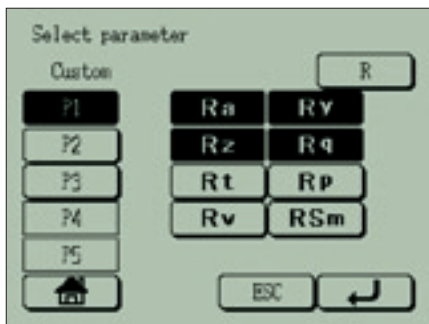
Result display screen can display the GO/NG judgment result.



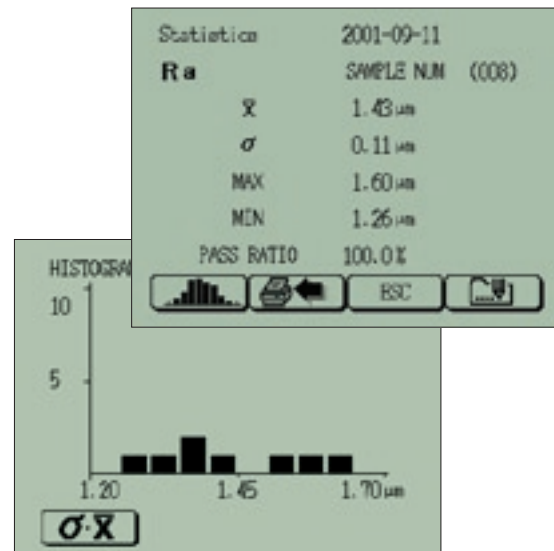
Recorded profile display capability allows surface texture measurements to be checked instantly, prior to print-out.



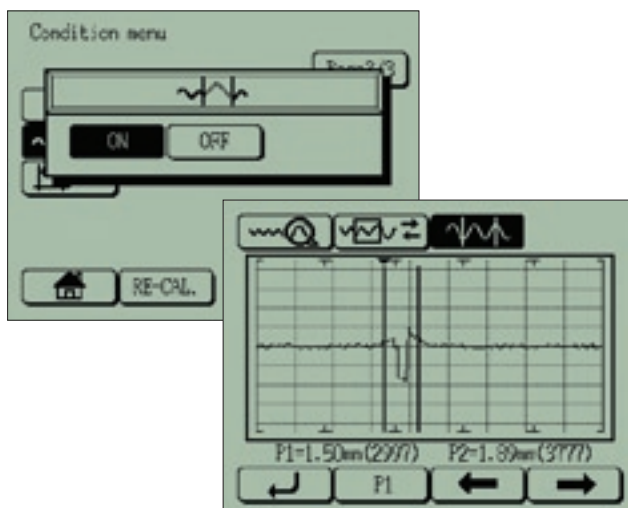
Evaluation parameters conform to internationally recognized surface roughness standards.



With a broad array of statistical processing functions, the instrument is ideally suited for histogram-based data management.



The data deletion function allows on-screen elimination of flaws that should be excluded from calculation prior to performing an evaluation.



Specifications

Specifications

Model No.	SJ-301		SJ-301R		SJ-301S		
Type of drive unit	Standard drive unit type		Retractable drive unit type		Transverse tracing drive unit type		
Type of detector	4mN type	0.75mN type	4mN type	0.75mN type	4mN type	0.75mN type	
Order No.	mm/inch	178-953-4	178-952-4	178-980-2	178-990-2	178-929-3	178-939-3
	mm*	178-953-4K	178-952-4K	178-980-2K	178-990-2K	178-929-3K	178-939-3K
	inch/mm	178-954-4	178-955-4	178-987-2	178-997-2	178-901-3	178-902-3
Measuring range	X-axis	12.5 mm (.5 inch)				5.6 mm (.22 inch)	
	Z-axis	350 μm (-200 μm ~ +150 μm) (13780 μinch (-7880 μinch to +5900 μinch))					
Drive unit	Measuring speed	0.25, 0.5mm/s (.01, .02inch/s)				0.25 mm/s (.01 inch/s)	
Detector	Conical-taper angle	90°	60°	90°	60°	90°	60°
	Stylus tip radius	5 μm	2 μm	5 μm	2 μm	5 μm	2 μm
	Measuring force	4 mN	0.75 mN	4 mN	0.75 mN	4 mN	0.75 mN
	Stylus tip material	Diamond					
	Skid radius of curvature	40 mm (1.57inch)					
	Skid force	Less than 400 mN					
	Detecting method	Differential inductance					
Applicable standards	JIS'82, JIS'94, JIS'01, ISO, ANSI, VDA						
Assessed profiles	Primary profile (P), Roughness profile (R), DIN4776, MOTIF-R, MOTIF-W						
Parameters	Ra, Ry, Rz, Rt, Rp, Rq, Rv, Sm, S, Pc, R3z, mr(c), Rpk, Rvk, δc, Rk, Mr1, Mr2, Lo, Ppi, R, AR, Rx, A1, A2, Vo, HSC, mr, SK, Ku, Δa, Δq, Wte, Wx, W, AW, Rz1max, Rmax (can be customized)						
Sampling length	0.08, 0.25, 0.8, 2.5, 8 mm (.003, .01, .03, .1, .3 inch)						
Number of sampling lengths	x1, x3, x5						
Arbitrary length	0.3 ~ 12.5 mm (0.1 mm increment) (.01 to .49 inch (.01 inch interval))				0.3 ~ 5.6 mm (0.1 mm increment)		
Cutoff filter	2CR / PC75 / Gaussian						
Cutoff wave lengths	λc	0.08, 0.25, 0.8, 2.5, 8 mm (.003, .01, .03, .1, .3 inch)					
	λs	2.5, 8, 25 μm (100 μinch, 320 μinch, 1000 μinch)					
Printer	Built-in thermal printer						
Graphical printout	Bearing area curve (BAC1 BAC2), Amplitude distribution curve (ADC)						
Printing width	48 mm (1.89") (Paper width: 58 mm (2.28"))						
Recording magnification	Vertical magnification	x10, x20, x50, x100, x200, x500, x1K, x2K, x5K, x10K, x20K, x50K, x100K, AUTO					
	Horizontal magnification	x1, x2, x5, x10, x20, x50, x100, x200, x500, x1K, AUTO					
Function	Customization	Desired parameters can be selected for calculation and display.					
	Statistical processing	Maximum value, minimum value, mean value, standard deviation, pass rate, frequency distribution chart of each parameter					
	GO/NG judgment	Upper/lower limits setting: 3 parameters, GO/NG judgment rule: mean value, 16% rule, maximum value rule					
	Measurement conditions saving	Maximum 5 sets					
	Data saving	Save/retrieval of measurement conditions (up to 20 sets), evaluation data, sampling data, and statistical data with a memory card (option).					
	Calibration	Auto-calibration with the entry of numerical value.					
Power saving function	If the auto-power-off function ON: Power turns off if not operated for 5 minutes						
External input/output	RS-232C I/F, SPC output						
Power supply	Two-way power supply: battery (rechargeable Ni-H battery) and AC adapter.						
Battery	Charging time	15 hours maximum					
	Recharge cycles	Approximately 600 times (slightly varies with the usage and environmental conditions)					
External dimensions (WxDxH)	Display unit	307x165x94 mm					
	Drive unit	115x23x26 mm					
Mass	Display unit	1.2 kg					
	Drive unit	0.2 kg					
LCD dimensions	100x70 mm, Touch-panel type						
Display language	Japanese, English, German, French, Italian, Spanish						
Standard accessories	12BAA686 Connecting cable 178-601 (mm) / 178-602 (inch/mm) Roughness specimen (Ra 3 μm) 357651 AC adapter 12AAA217 Flat surface nosepiece 12AAA218 Cylinder nosepiece 12AAA216 Supporting feet set 12BAA689 Touch-pen 12BAA690 Protector sheet 541106 Flat-blade screwdriver 270732 Printer paper (5 rolls) 12BAA781 Carrying case			12BAA686 Connecting cable 178-605 (mm) / 178-606 (inch/mm) Roughness specimen (Ra 1 μm) 357651 AC adapter 12AAE643 Point-contact adapter 12AAE644 V-type adapter 353134 Calibration stage 12BAA689 Touch-pen 12BAA690 Protector sheet 541106 Flat-blade screwdriver 270732 Printer paper (5 rolls) 12BAA781 Carrying case			

To denote your AC line voltage add the following suffixes (e.g. 178-953-4A). A for 120V, C for 110V (for Taiwan), D for 220V, E for 240V, DC for 220V (for China), 2K/3K/4K for 220V (for Korea)

*Specifications for Korea

Factory default unit

System of units	Factory default unit	Remarks
mm	mm	The unit is mm fixation.
mm/inch	mm	The unit can be switched to inch.
inch/mm	inch	The unit can be switched to mm.

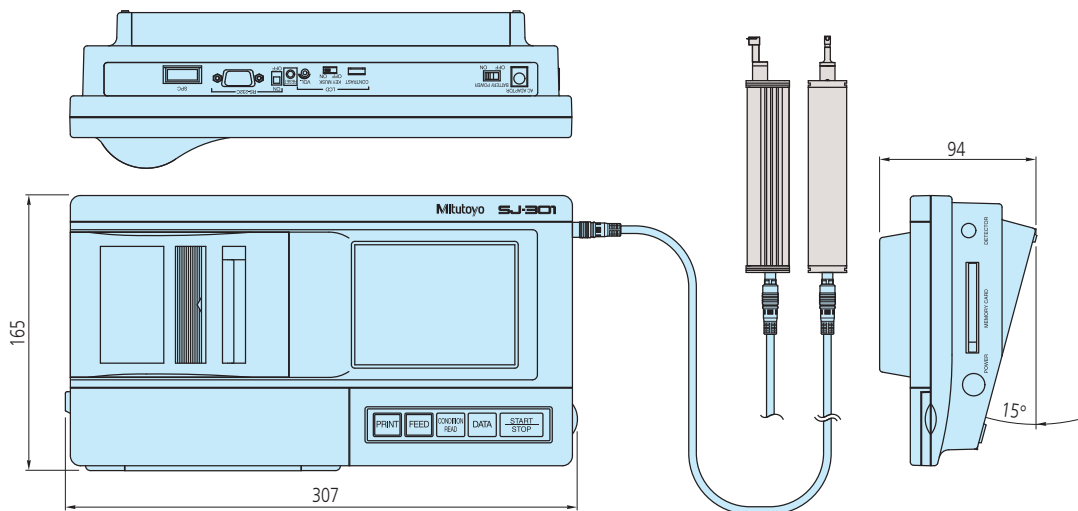
Dimensions: Display Unit and Drive Unit

Drive unit, Display unit

Unit: mm

Drive unit type	Drive unit external view
Standard drive unit	<p>Technical drawing of a standard drive unit. It includes a front view showing a circular connector, a top view showing a rectangular profile, and a side view showing the main body with dimensions: 23.0 mm height, 26.0 mm top width, 25.2 mm and 26.7 mm bottom width segments, and a total length of 115.0 mm.</p>
Retractable drive unit	<p>Technical drawing of a retractable drive unit. It includes a front view, a top view, and a side view. Dimensions include: 23.0 mm height, 26.0 mm top width, a 1 mm gap, a 2.0 mm offset, a 23.2 mm segment, a 26.7 mm bottom width, and a total length of 115.0 mm.</p>
Transverse tracing drive unit	<p>Technical drawing of a transverse tracing drive unit. It includes a front view with a 3.0 mm and 6.6 mm offset, a top view, and a side view. Dimensions include: 23.0 mm height, 26.0 mm top width, a 45.0 mm segment, a 46.5 mm bottom width, and a total length of 115.0 mm.</p>

• Display unit external view

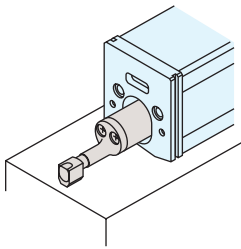


Dimensions: Detectors

Detectors

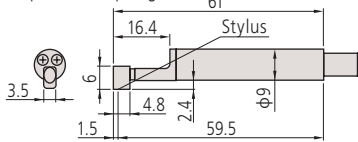
Unit: mm

Standard detectors

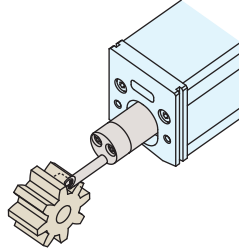


Order No.	Measuring force	Stylus profiles*	Remarks
178-296	0.75mN	2 μmR/60°	Dedicated to the standard/retractable drive unit
178-390	4 mN	5 μmR/90°	
178-387	0.75mN	2 μmR/60°	Dedicated to the transverse tracing drive unit
178-386	4 mN	5 μmR/90°	
178-391	4 mN	10 μmR/90°	Dedicated to the standard/retractable drive unit

*Tip radius / Tip angle

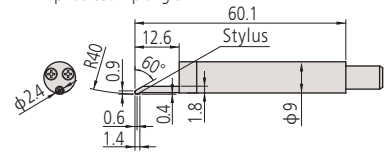


Gear-tooth surface detectors

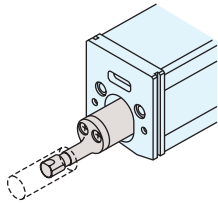


Order No.	Measuring force	Stylus profiles*	Remarks
178-388	0.75mN	2 μmR/60°	
178-398	4 mN	5 μmR/60°	

*Tip radius / Tip angle

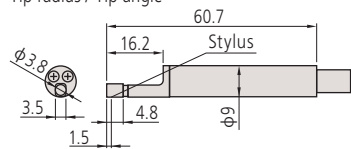


Small hole detectors

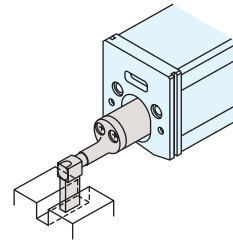


Order No.	Measuring force	Stylus profiles*	Remarks
178-383	0.75mN	2 μmR/60°	Minimum measurable hole diameter: ø4.5mm
178-392	4 mN	5 μmR/90°	

*Tip radius / Tip angle

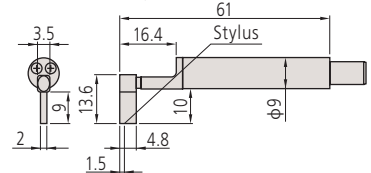


Deep groove detectors

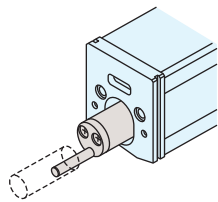


Order No.	Measuring force	Stylus profiles*	Remarks
178-385	0.75mN	2 μmR/60°	Not available for the transverse tracing drive unit
178-394	4 mN	5 μmR/90°	

*Tip radius / Tip angle

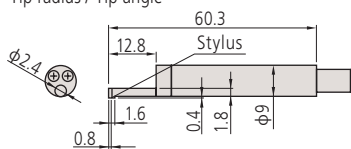


Extra small hole detectors



Order No.	Measuring force	Stylus profiles*	Remarks
178-384	0.75mN	2 μmR/60°	Minimum measurable hole diameter: ø2.8mm
178-393	4 mN	5 μmR/90°	

*Tip radius / Tip angle



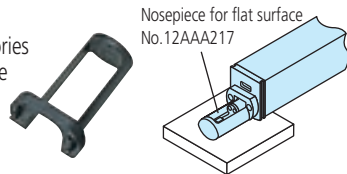
Dimensions: Display Unit and Drive Unit

Drive unit, Display unit

Nosepiece for flat surfaces

No.12AAA217

- SJ-301/301R standard accessories
- Not available for the transverse tracing drive unit.



Nosepiece for cylindrical surfaces

No.12AAA218

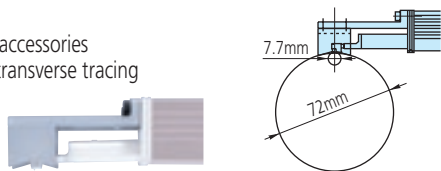
- SJ-301/301R standard accessories
- Not available for the transverse tracing drive unit.



V-type adapter

No.12AAE644

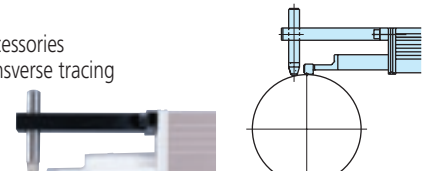
- SJ-301S standard accessories
- Dedicated to the transverse tracing drive unit.



Point-contact adapter

No.12AAE643

- SJ-301S standard accessories
- Dedicated to the transverse tracing drive unit.

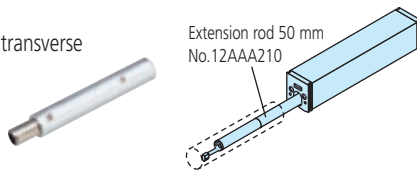


Extension rod (50 mm)

(Note: Extension is possible with only a single rod.)

No.12AAA210

- Not available for the transverse tracing drive unit.



Extension cable (1 m)

(Note: Extension is possible with only a single cable.)

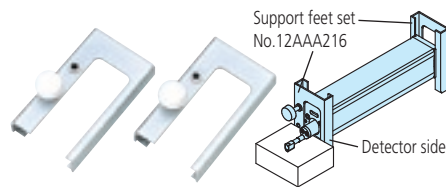
No.12BAA303

- For connecting between calculation display unit and drive unit.

Support feet set

No.12AAA216

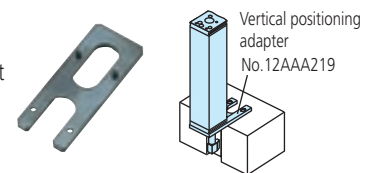
- SJ-301 standard accessory
- Not attachable to the detector side of the transverse tracing drive unit.



Vertical positioning adapter

No.12AAA219

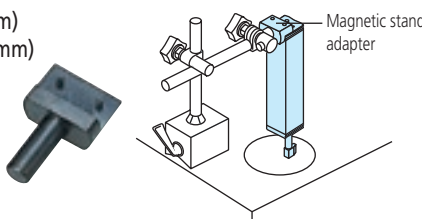
- Not available for the transverse tracing drive unit



Magnetic stand adapter

No.12AAA221(ø8mm)

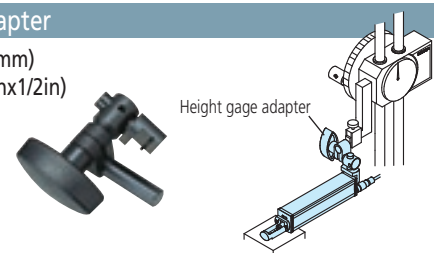
No.12AAA220(ø9.5mm)



Height gage adapter

No.12AAA222(9x9mm)

No.12AAA233(1/4inx1/2in)



Setting attachments

(Note: Not available for the transverse tracing drive unit)

Enhances measurement efficiency by facilitating the measurement setup of multiple workpieces of the same type and of the hard-to-access sections of a workpiece.

V type for measuring cylinders in the axial direction

No.178-033

The V-width is adjustable to the cylinder diameter facilitating axial measurement of a wide range of cylinder diameters.

- Adjustable range: ø 5 ~ 150 mm



Magnetic slider type

No.178-034

The magnet attached to the frame bottom surface allows taking hands-free measurement on a wall.



Inside diameter type

No.178-035

Greatly facilitates measurement of internal wall surfaces of, for example, a cylinder block.

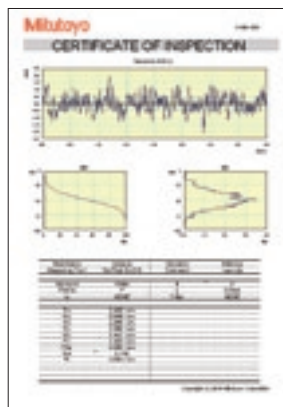
- Applicable diameter: ø 75 ~ ø 95 mm
- Accessible depth: 30 ~ 135 mm



Optional Accessories: For External Output

Simplified communication program for SURFTEST SJ series

The SurfTest SJ-301 series has an RS-232C interface, enabling data to be transferred to a spreadsheet or other software. We also provide a program that lets you create inspection record tables using a Microsoft Excel* macro.



Required environment*:

- OS: Windows 2000 SP4
- OS: Windows XP
- OS: Windows Vista
- OS: Windows 7
- Spreadsheet software: Microsoft Excel 2000
- Spreadsheet software: Microsoft Excel 2002
- Spreadsheet software: Microsoft Excel 2003
- Spreadsheet software: Microsoft Excel 2007

*Windows OS and Microsoft Excel are products of Microsoft Corporation.

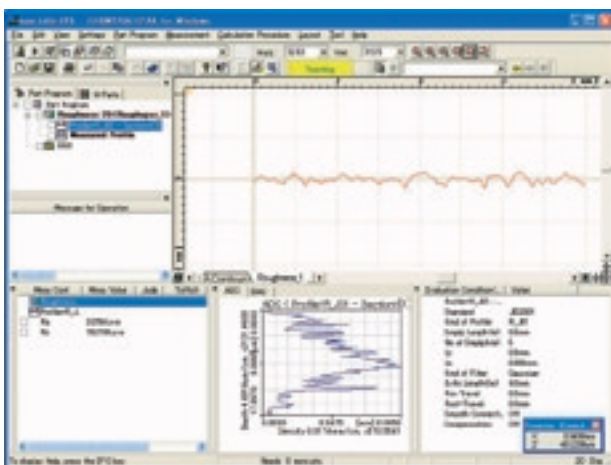
The optional RS-232C cable is also required.

- RS-232C cable for SJ-301 series
No.12AAA882

This program can be downloaded for free from the Mitutoyo website.
<http://www.mitutoyo.co.jp>

Contour / Roughness analysis software FORMTRACEPAK

More advanced analysis can be performed by loading SJ-301 series measurement data to software program FORMTRACEPAK via a memory card (option) for office processing.



Optional Accessories: For External Equipment

Digimatic mini processor DP-1VR

By connecting this printer to the Surfctest SJ-210's digimatic output, you can print calculation results, perform a variety of statistical analyses, draw a histogram or D chart, and also perform complicated operations for X-R control charts.



No.264-504

To denote your AC line voltage add the following suffixes (e.g.264-504-5A).

5A for 120V, 5D for 230V, 5E for 230V (for UK), 5DC for 220V (for China), 5K for 220V (for Korea), 5F for 230V (for Oceania)

SJ-210 → DP-1VR Connecting cable

1m: **No.936937**

2m: **No.965014**

Input Tool: Calculation results input unit

Surfctest SJ-210 calculation results can be loaded directly into commercial spreadsheet software via this unit simply by connecting it to the USB connector on a computer or a PS/2 type keyboard connector. (See Catalog No.E4250-264, E4391 for details.)



For USB keyboards

IT-012U **No.264-012-10**

USB-ITN-D **No.06ADV380D**

For PS/2 keyboards

IT-005D **No.264-005**

Optional accessories, consumables, and others for SJ-301

- Printer paper (5 rolls) **No.270732**
- Durable printer paper (5 rolls) **No.12AAA876**
- Touch-panel protector sheet (10 sheets) **No.12AAA896**
- Memory card (128MB) *1 **No.12AAA841**

*1: Compact flash (CF) card on the market is also available.



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- Coordinate Measuring Machines
- Vision Measuring Systems
- Form Measurement
- Optical Measuring
- Sensor Systems
- Test Equipment and Seismometers
- Digital Scale and DRO Systems
- Small Tool Instruments and Data Management

Note: All information regarding our products, and in particular the illustrations, drawings, dimensional and performance data contained in this pamphlet, as well as other technical data are to be regarded as approximate average values. We therefore reserve the right to make changes to the corresponding designs, dimensions and weights. The stated standards, similar technical regulations, descriptions and illustrations of the products were valid at the time of printing. Only quotations submitted by ourselves may be regarded as definitive.
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