Mitutoyo

Mitutoyo Quality

Roughness Measuring System
Surftest SJ-500/SV-2100

Form Measurement

Catalog No.E15006(6)

Easy operation, high-accuracy analysis of surface roughness and fine contours!

Dedicated data processor type

Surftest SJ-500/SV-2100

Improved operability

7.5" Color TFT LCD
The dedicated data processor has a high-visibility 7.5" color TFT LCD. Icon display and touch panel operation provide user-friendly display and easy operation.

Positioning by joystick and manual control knobs on the processor
Easy-to-operate joystick. Fine positioning of stylus required for small-hole measurements can be easily performed using the manual fine-adjustment knobs.

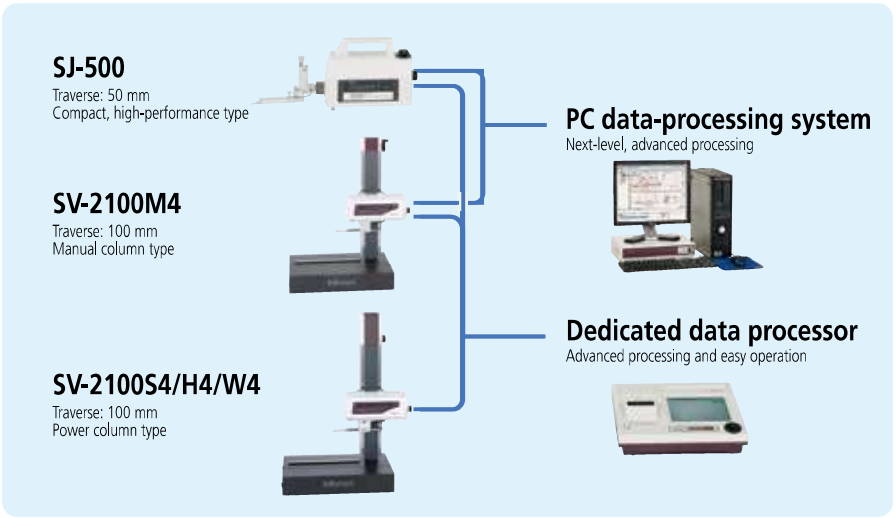
Multiple trace function
A machine can be programmed to take up to three traces, one after the other.

Various types of analysis

Capable of fine-contour analysis
Supports 43 types of analysis parameters, complying with surface roughness standards such as ISO 1997 and JIS 2001. Also capable of various fine-contour analysis.
* Contour analyses: Area, cirde, angle, coordinate difference, step, inclination

High-durability

Ceramic guideway
A ceramic guideway, inherently free from wear and deterioration with age, is employed to maintain the traversing straightness of the drive unit (X axis) indefinitely. Maintenance-free design, since anti-corrosion treatment is not required for ceramic.



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High-visibility color display panel

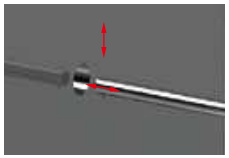
A high-visibility 7.5" color TFT LCD, color icon display and touch-operated panel provide user-friendly, easy operation.
Built-in thermal printer. Fine contour analysis provided as standard.

Supports 16 languages
Japanese, English, German, French, Italian, Spanish, Portuguese, Korean, Traditional Chinese, Simplified Chinese, Czech, Polish, Hungarian, Turkish, Swedish, Dutch

Efficient positioning by joystick and adjustment knobs

Both a fast-traverse joystick (X-axis: 20 mm/s for **SJ-500**, 40 mm/s for **SV-2100**, Z2-axis: 20 mm/s for **SV-2100S4/H4/W4**) and manual fine-adjustment knobs, essential for positioning in small hole measurement, are standard features.

〈Positioning in small hole measurement〉



Positioning in Y/Z-directions with column fine-adjustment knob (or detector elevation knob) and optional cross-travel table.

Positioning at the trace start point with X-axis fine-adjustment knob.

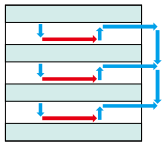
Multiple trace programming function

A machine can be programmed to take up to three consecutive traces by one-key operation, as shown in the figure below.

• SJ-500/SV-2100M4
Consecutive tracing in X-axis direction only

Measurement
Traverse

• SV-2100S4/H4/W4
X-axis tracing with programmed Z-axis shifts possible

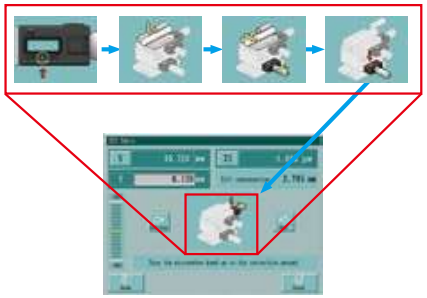


Example: **SV-2100S4** input screen

Navigation function aids leveling

Powerful support for leveling adjustments
When using an optional 3-axis adjustment table or leveling table, a navigation screen is available to help the operator level the surface to be tested.

Example of 3-axis adjustable table



The user is guided through the leveling procedure to determine the amount of adjustment needed.

A portable tester also boasting high performance in desktop applications

Surftest SJ-500

High accuracy, high performance, user-friendly display and easy operation

Class-leading traverse straightness: 0.2 µm/50 mm

High-speed traverse at up to 20 mm/s under joystick control

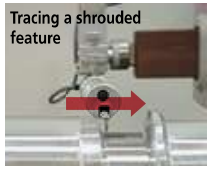
Smooth positioning using the vertical adjustment knob

Vertical adjustment knob

Essential for positioning the stylus close to the workpiece!

Support for testing problematic features

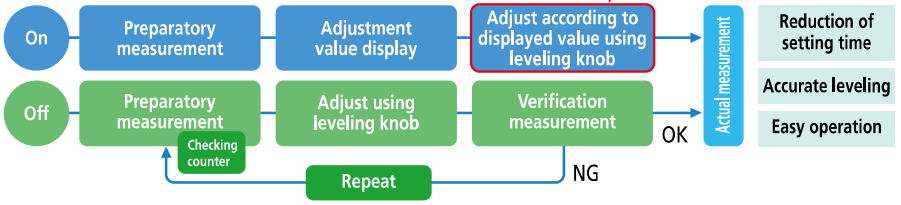
Supports measurement in the axial direction for shrouded features, such as found on crankshafts, by simply swiveling the detector through 90 degrees.



Drive unit inclination adjustment mechanism

Digital Adjustment Tilting (DAT) function is supplied as standard for efficient leveling of workpieces: ±1.5°

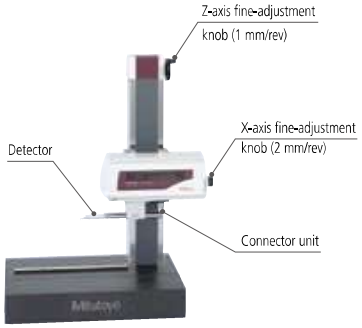
DAT function **Powerful support for manual leveling!!**



A desktop tester that's easy to use for portable applications

Surftest SV-2100

By setting the origin point at start-up, the Absolute scale system allows accurate positioning for repeated or multiple measurements.



SV-2100M4

SV-2100S4

High-speed traverse at up to 40 mm/s (X-axis) under joystick control Smooth positioning, using the Z-axis fine-adjustment knobs Stable, high-accuracy measurement with a traverse straightness of 0.15 µm/100 mm

1. Capable of a series of automatic measurements, plus auto leveling (optional) and stylus retraction. Accurate positioning for repeated or multiple measurements possible.

Measurement setup screen

2. **SV-2100S4/H4/W4** models are equipped with an emergency stop button.

3. Base sizes and vertical travel range on column

Model No.	Vertical travel range	Vertical traverse method	Base size
SV-2100S4	350 mm	Power and manual	600×450 mm
SV-2100H4	550 mm		
SV-2100W4			1000×450 mm
SV-2100M4	350 mm	Manual only	600×450 mm

Dedicated data processor

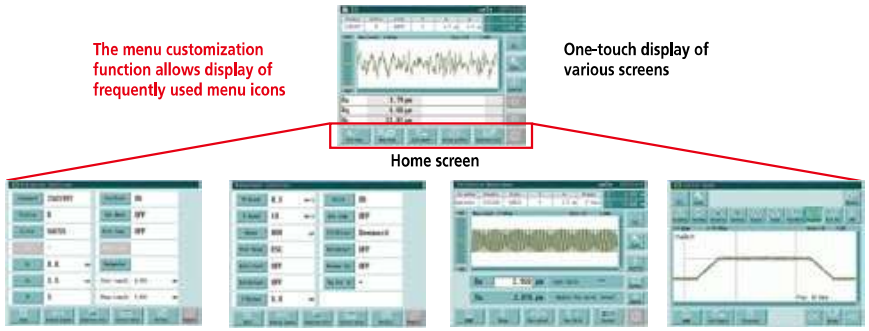
MiCAT
Mitutoyo Intelligent Computer Aided Technology
the standard in world metrology software
FORM

Data processing unit

Customizable menu screen

The menu customization function allows display of frequently used menu icons

One-touch display of various screens



Evaluation setup screen | Measurement setup screen | Calibration screen | Contour analysis screen

Statistical processing

Statistical data processing possible (up to 300 data samples)
Statistical processing items: MAX., MIN., average, standard deviation, histogram, probability of acceptance.

Statistical data input | Statistical results

Saving and recalling measurement setups

Up to 10 measurement setups can be saved to and recalled from internal memory.

One-touch recall of stored setups

Click the desired measurement setup file | Measurement screen opens

Analysis to international standards

Evaluates surface roughness using up to 43 parameters complying with international standards such as ISO 1997 and JIS 2001. Bearing Area Curve (BAC), Amplitude Distribution Curve (ADC), and power spectrum (wavelength display) are readily available in graph form.

A large variety of optional accessories

Options supporting measurement including an auto leveling table, a 3-axis adjustment table, and a leveling table. Furthermore, these can be easily operated via a navigation function. (Supported accessories differ depending on the model.)

Fine-contour analysis

Various contour analyses (area, circle, angle, coordinate difference, step, inclination) are supplied as standard.

Select desired analysis icon and then specify the range.

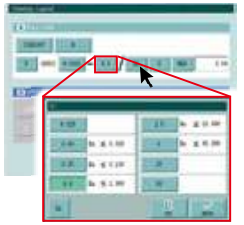
Easy, icon-based input of setup conditions

Note: Patent registered in Japan, U.S.A., China, Germany, U.K., and France.

Setups are aided by icons representing ISO/JIS roughness standard parameters with appropriate values selected from recommended lists.

Typical surface roughness symbol on drawing
Grinding
Ra 1.5
⊥ 0.0025-0.8/Rz8max 3.3

Typical result of icon-based setup
U"X"0.0025—0.8/Rz8max 3.3



Clicking a parameter icon displays the recommended cut-off value, etc.

Built-in thermal printer

Measurement data is printed by the high-definition, high-speed thermal printer.
In addition to calculation results and evaluation results, BAC, ADC and other curves can also be printed.

Simplified communication program for SURFTEST SJ-500/SV-2100

The Surftest **SJ-500/SV-2100** Series has a USB 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.

This program can be downloaded free of charge from the Mitutoyo website.
https://www.mitutoyo.co.jp

- OS: Windows XP-SP3, Windows Vista, Windows 7, Windows 8, Windows 10, Windows 11
- Spreadsheet software: Microsoft Excel 2000, Microsoft Excel 2002, Microsoft Excel 2003, Microsoft Excel 2007, Microsoft Excel 2010, Microsoft Excel 2013, Microsoft Excel 2016, Microsoft Excel 2021

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

The optional USB cable is also required.
USB cable for **SJ-500/SV-2100** Series **12AAH490**

PC data processing type

Surftest SJ-500P/SV-2100M4

A superior data processing tester with PC data analysis for higher efficiency.

Note 1: If a power column type with PC data-processing is required, consider the **FORMTRACER Avant S3000** Series (Refer to the Brochure <E15030> for specifications.)
Note 2: Printer is optional.

SJ-500P

SV-2100M4 with PC

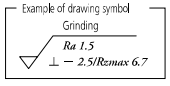
FORMTRACEPAK: Best-seller for surface roughness and contour analysis

• Surface Roughness analysis function

FORMTRACEPAK can perform surface roughness analyses that conform to various standards such as ISO, JIS, ANSI, and VDA. For comparing the measurement values with the tolerance limits, you can use the 16% rule or the maximum value rule.
Furthermore, since FORMTRACEPAK comes with parameter calculation functions as well as a rich set of graphic analysis functions, it can be widely utilized for everything from routine quality control to R&D applications. It also includes many other functions, such as the function for eliminating (compensating) shapes, such as slopes and R-surface, and a data deletion function.

• Simple input using drawing symbols

You can easily set up cumbersome measurement conditions by simply entering data according to the drawing symbols of the ISO/JIS roughness standard.

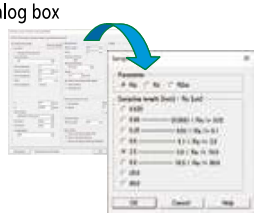


• Microscopic contour analysis function

This function can calculate steps and surface areas from the roughness data. Furthermore, as with the contour analysis function, a rich set of calculation commands that combine various elements, such as points, lines, and circles, to calculate angles, pitches, and distances are provided as standard features.

• Reference length dialog box

When setting up the reference length in a measurement condition, you can display the standard values defined by the ISO/JIS standards by selecting the applicable standard.

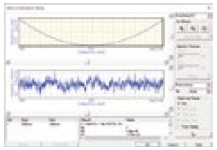


• Analysis condition modification with a preview function

You can easily modify various types of analysis conditions such as the standard to be used, curve type, and filter. Furthermore, before eliminating (compensating) shapes such as slopes, R-surfaces, and parabolas, the preview function allows you to check the impact on the spot.

Before compensation ⇨

After compensation ⇨



Specifications

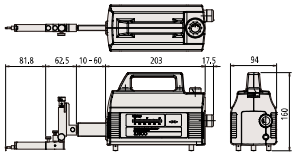
Type of data processing		Dedicated data processor					PC system	
Model No.		SJ-500	SV-2100M4	SV-2100S4	SV-2100H4	SV-2100W4	SJ-500P	SV-2100M4
Order No.*	with 0.75 mN detector mm	178-532-01	178-636-01	178-680-01	178-682-01	178-684-01	178-534-11	178-638-11
	with 0.75 mN detector inch/mm	178-533-01	178-637-01	178-681-01	178-683-01	178-685-01	178-534-13	178-638-13
	with 4 mN detector mm	178-532-02	178-636-02	178-680-02	178-682-02	178-684-02	—	—
	with 4 mN detector inch/mm	178-533-02	178-637-02	178-681-02	178-683-02	178-685-02	—	—
Measuring range	X axis	50 mm (2 in)	100 mm (4 in)				50 mm (2 in)	100 mm (4 in)
	Z axis (detector)	800 µm, 80 µm, 8 µm (32000 µin, 3200 µin, 320 µin)						
Detector	Detection method	Differential inductance						
	Resolution	0.01 µm (800 µm range), 0.001 µm (80 µm range), 0.0001 µm (8 µm range) (0.4 µin <32000 µin range>, 0.04 µin <3200 µin range>, 0.004 µin <320 µin range>)						
	Stylus tip shape (Angle/Radius) Measuring force	60°/2 µm, 0.75 mN 90°/5 µm, 4 mN						
Drive unit (X axis)	Measuring speed	0.02 - 5 mm/s						
	Drive speed	0 - 20 mm/s or manual	0 - 40 mm/s or manual				0 - 20 mm/s or manual	0 - 40 mm/s or manual
	Straightness	0.2 µm/50 mm*1	0.15 µm/100 mm				0.2 µm/50 mm*1	0.15 µm/100 mm
	Resolution	0.05 µm (1.97 µin)						
Drive unit (Z2 axis)	Travel	—	350 mm (H4, W4: 550 mm)				—	350 mm
	Drive speed	—*2	Manual	0 - 20 mm/s or manual			—*2	Manual
	Resolution	—		1 µm (39.4 µin)			—	
Applicable standards		JIS1982/JIS1994/JIS2001/ISO1997/ANSI/VDA						
Parameter		Pa, Pq, Pz, Pp, Pv, Pt, Psk, Pku, Pc, PSm, PΔq, Pmr, Pmr(c), PδC, Rk, Rpk, Rvk, Mr1, Mr2, A1, A2, Rmax, Rz, Pmax, PzJIS Ra, Rq, Rz, Rp, Rv, Rt, Rsk, Rku, Rc, RSm, RΔq, Rmr, Rmr(c), RδC, Ry, R3z, RPc, Pc, Sm, S, HSC, Rmax, RzJIS, Rppi, RΔa, RλaRλq, Rlo, Rlr, tp, Htp, Vo Wa, Wq, Wz, Wp, Wv, Wt, Wsk, Wku, Wc, WSm, WΔq, Wmr, Wmr(c), WδC, Wy, W3z, WPc, Wmax, WΔa, WλaWλq, Wlo, Wlr R, Rx, AR, W, Wx, AW, Wte					Pa, Pq, Psk, Pku, Pp, Pv, Pz, Pt, Pc, PSm, PΔq, Pmr(c), Pmr, PδC, Ppq, Pvq, Pmq, PPc, PzJIS, PPI, Ra, Rq, Rsk, Rku, Rp, Rv, Rz, Rt, Rc, RSm, RΔq, Rmr(c), Rmr, RδC, Rpq, Rvq, Rmq, Rmax, RzJIS, Wa, Wq, Wsk, Wku, Wp, Wv, Wz, Wt, Wc, WSm, WΔq, Wmr(c), Wmr, WδC, Wst, Rk, Rpk, Rvk, Mr1, Mr2, A1, A2, Rx, AR, R, Wx, AW, W, Wte, Ry, RyDIN, RzDIN, R3y, R3z, S, HSC, Lo, lr, Δa, λa, λq, Vo, Htp, NR, NCRX, CPM, SR, SAR, NW, SW, SAW
Filtered profile		Primary profile, Roughness profile, Waviness profile, DF profile, Roughness motif profile, Waviness motif profile					Primary profile, Roughness profile, Waviness profile, Filtered waviness profile, Band waviness profile, Rolling circle waviness profile, Rolling circle center line waviness profile, envelope residual profile, DIN4776 profile, Roughness motif profile, Waviness motif profile	
Analysis graph		ADC, BAC, power spectrum graph					ADC, BAC Graph, power spectrum graph, auto-correlation graph, Walsh power spectrum graph, Walsh auto-correlation graph, local peak distribution graph, slope distribution graph, parameter distribution graph	
Data compensation functions		Inclination (Entire, Arbitrary), Circular compensation, Elliptical compensation, Parabolic compensation, Hyperbolic compensation, Conic compensation, Stylus circular-arc compensation					Inclination (Entire/start/end/Arbitrary), R-surface correction, Elliptical compensation, Parabolic compensation, Hyperbolic compensation, Conic compensation, Polynomial correction	
Filter		Gaussian, 2CR75, PC75, Robust-Spline					Gaussian, 2CR75, 2CR50, 2CRPC75, 2CRPC50, Robust-Spline, Robust-Gaussian	
Cutoff value		λs: 0.25/0.8/2.5/8/25/80/250 µm/None λc: 0.025/0.08/0.25/0.8/2.5/8/25/80 mm*3 λf: 0.08/0.25/0.8/2.5/8/25/80 mm/None					λs: 0.8/2.5/8/25/80/250/800 µm/Arbitrary λc: 0.025/0.08/0.25/0.8/2.5/8/25/80mm/Arbitrary λf: 0.08/0.25/0.8/2.5/8.0/25/80/250mm/Arbitrary	
Sampling length		0.025/0.08/0.25/0.8/2.5/8/25/80 mm*3					0.025/0.08/0.25/0.8/2.5/8/25mm/Arbitrary	
Number of intervals		1 - 20					- 700 (max.)	
Arbitrary length		0.02 - 50 mm (0.01 mm interval)	0.02 - 100 mm (0.01 mm interval)				0.025 - 50 mm (0.001 mm interval)	0.025 - 100 mm (0.001 mm interval)
Display language		16 languages (Japanese, English, German, French, Italian, Spanish, Portuguese, Korean, Chinese (traditional/simplified), Czech, Polish, Hungarian,Turkish, Swedish, Dutch)					18 languages (Japanese, English, German, French, Italian, Spanish, Portuguese, Korean, Chinese (traditional/simplified), Czech, Polish, Hungarian,Turkish, Swedish, Dutch, Russian, Thai)	
External dimensions (W×D×H)	Main unit	425×94×160 mm	716×450×863 mm	S4: 766×450×966 mm H4: 766×450×1166 mm W4: 1166×450×1176 mm			425×94×160 mm	716×450×863 mm
	Display unit	330×270×124 mm					—*4	—*4
	Electronic unit	—		372×245×71.8 mm			—	—
	PC I/F unit	—					350×263×86 mm	
Mass	Main unit	2.7 kg	140 kg	S4: 140 kg H4: 150 kg W4: 220 kg			2.7 kg	140 kg
	Display unit	4.0 kg					—*4	—*4
	Electronic unit	—		3.0 kg			—	—
	PC I/F unit	—					3.8 kg	

*1 When using the simplified stand (optional): 0.4 µm/50 mm
When using the manual column stand (optional): 0.3 µm/50 mm
*2 The simplified stand or manual column stand is available as an optional accessory. (Refer to page 11 for details.)
*3 80 mm only for the **SV-2100** Series.
*4 Varies depending on the PC system.

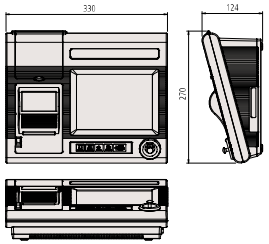
External Dimensions

Unit: mm

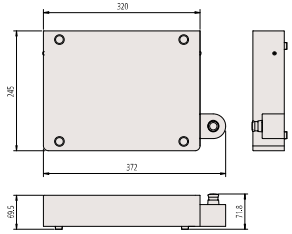
SJ-500



Dedicated data processor

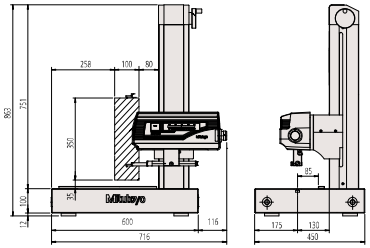


Electronic unit

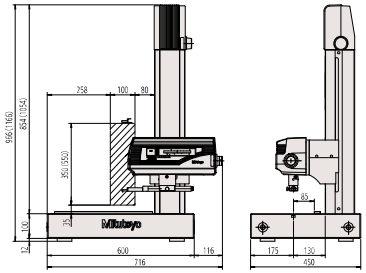


Only for **SV-2100S4/H4/W4**

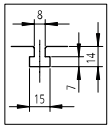
SV-2100M4



SV-2100S4 / SV-2100H4



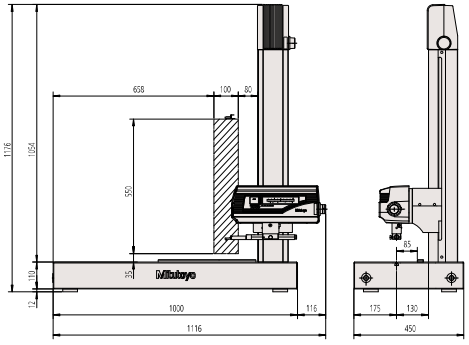
( ): **SV-2100H4**



T-groove dimensions
(common to **SV-2100** Series)

Measuring range

SV-2100W4



Optional Accessories

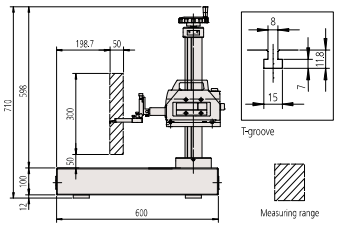
Manual column stand: 178-085 (for SJ-500)

Suitable for desktop use in inspection rooms, etc.

178-085 Except for measuring unit
Vertical adjustment range: 300 mm
Dimension (W×D×H): 600×450×710 mm
Mass: 110 kg

Dimensions of **SJ-500** with manual column stand

Unit: mm



Note: While the appearance of the natural stone stand varies according to the source, the high stability for which this material is known can always be relied upon.

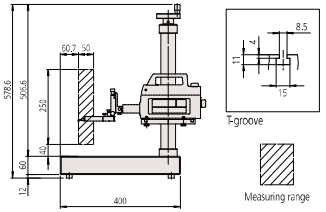
Simple column stand: 178-089 (for SJ-500)

A portable simple column stand.

178-089 Except for measuring unit
Vertical adjustment range: 250 mm
Dimension (W×D×H): 400×250×578.6 mm
Mass: 20 kg

Dimension of **SJ-500** with simple column stand

Unit: mm



Note: While the appearance of the natural stone stand varies according to the source, the high stability for which this material is known can always be relied upon.

DAT leveling table: 178-196

This table can be used by itself or in conjunction with other leveling tables.

Inclination adjustment angle	±1.5°
Maximum load	15 kg
Table dimensions	130×100 mm

XY leveling tables 178-183/178-185

178-183

178-185

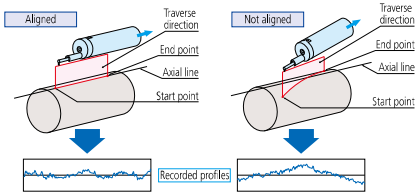
Order No.	**178-183** (mm) **178-184** (in) *with analog heads	**178-185** (mm) **178-186** (in) *with digital heads
Table dimensions	130×100 mm	
Maximum load	15 kg	
Inclination adjustment angle	±1.5°	
Swiveling angle	±3°	
X/Y-axis travel range	±12.5 mm	
Resolution	0.01 mm	0.001 mm
Dimensions (W×D×H)	220×189×83 mm	262×233×83 mm
Mass	6 kg	6.3 kg

Optional Accessories

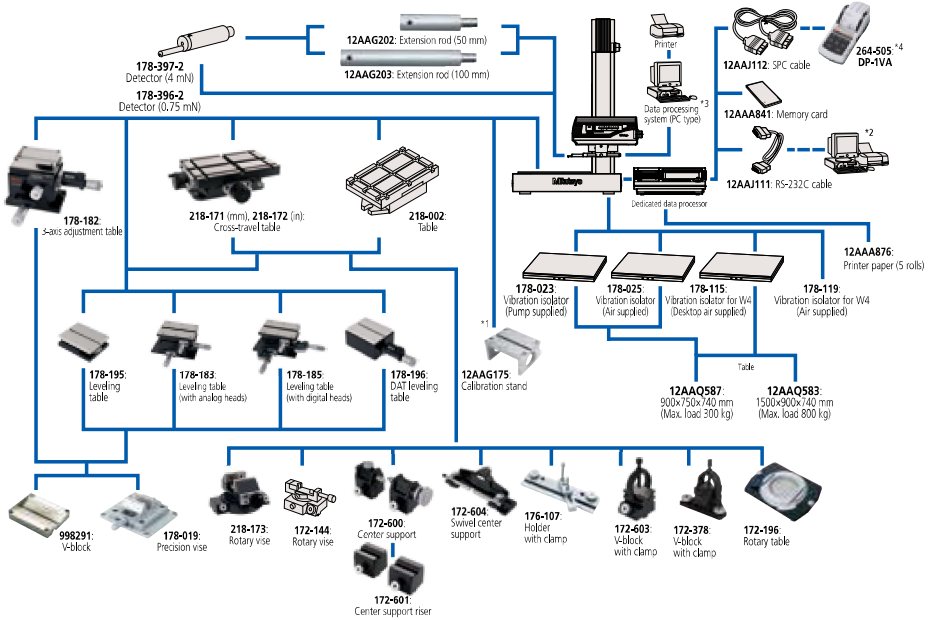
3-axis adjustment table: 178-182

This table helps make the alignment adjustments required when measuring cylindrical surfaces. The corrections for the pitch angle and the swivel angle are determined from a preliminary measurement and the Digimatic micrometers are adjusted accordingly. A flat-surfaced workpiece can also be leveled with this table.

Inclination adjustment angle	±1.5°
Swiveling angle	±2°
Y-axis range	±12.5 mm
Resolution of heads	0.001 mm
Table dimensions	130×100 mm
Maximum load	15 kg



System configuration including optional accessories (for SV-2100M4/S4/H4/W4)



*1 70 mm stage to be mounted onto the base required for calibration of roughness specimen.
Not required when using cross-travel table, plain stage, cross-travel stage, or 3-axis adjustment table.
*2 PC for managing the analysis result externally output from the dedicated data processor.
*3 Only **SV-2100M4** can be connected.
*4 Since print of unit does not support 'µm', use **DP-1VA** without print set of unit.

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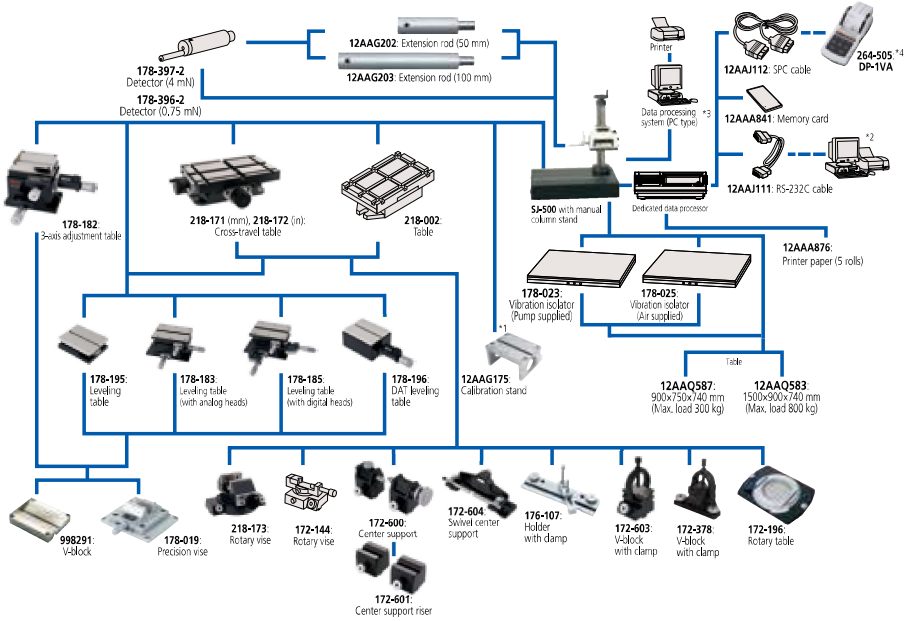
Optional Accessories

System configuration including optional accessories (for SJ-500 with optional manual column stand)



*1 70 mm stage to be mounted onto the base required for calibration of roughness specimen.
Not required when using cross-travel table, plain stage, cross-travel stage, or 3-axis adjustment table.
*2 PC for managing the analysis result externally output from the dedicated data processor.
*3 Only **SJ-500P** can be connected. Use a USB cable when connecting the **SJ-500P** main unit and a PC. A USB cable is a standard accessory of the **SJ-500P**.
*4 Since print of unit does not support 'µm', use **DP-1VA** without print set of unit.

Roughness specimen (standard accessory): 178-601

Display	Ra=about 3 µm
Material	Ni (Cr surface coating)

Roughness specimen: 178-604

Display	Ra=about 3 µm, about 0.4 µm

Note: Ra=Approx. 0.4 µm should only be used for stylus tip checking.

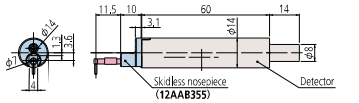
Reference step specimen: 178-611 (mm), 178-612 (in)

For sensitivity calibration of detector

Nominal value of step	2 µm (79 µin), 10 µm (394 µin)

Optional Detectors, Extensions and Styli

Detectors



Order No.	Measuring force	
178-396-2	0.75 mN	'97ISO and '01JIS compliant detectors
178-397-2	4 mN	Detectors that comply with previous standards, for general use, etc.

Extension rods

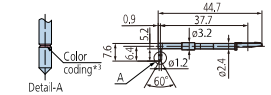
- **12AAG202** Extension rod 50 mm

- **12AAG203** Extension rod 100 mm

Note: No more than one extension rod can be connected.

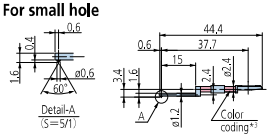
Styli

Standard stylus



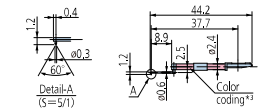
12AAE882 (1 µm)
12AAE924 (1 µm)*1
12AAC731 (2 µm)
12AAB403 (5 µm)*1
12AAB415 (10 µm)*1
12AAE883 (250 µm)*4
( ): Tip radius

For small hole



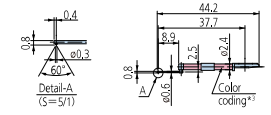
12AAC732 (2 µm)
12AAB404 (5 µm)*1
12AAB416 (10 µm)*1
( ): Tip radius

For extra-small hole



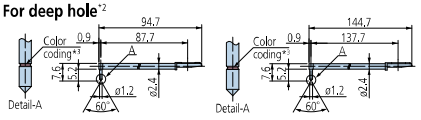
12AAC733 (2 µm)
12AAB405 (5 µm)*1
12AAB417 (10 µm)*1
( ): Tip radius

For extra-minute hole



12AAC734 (2 µm)
12AAB406 (5 µm)*1
12AAB418 (10 µm)*1
( ): Tip radius

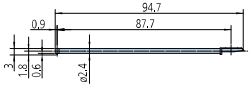
For deep hole*2



2X stylus
12AAC740 (2 µm)
12AAB413 (5 µm)*1
12AAB425 (10 µm)*1
( ): Tip radius

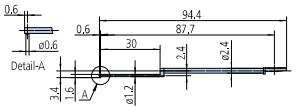
3X stylus
12AAC741 (2 µm)
12AAB414 (5 µm)*1
12AAB426 (10 µm)*1
( ): Tip radius

Double-length for deep hole*2



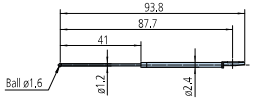
12AAE898 (2 µm)
12AAE914 (5 µm)*1
( ): Tip radius

For small hole/Double-length for deep hole*2



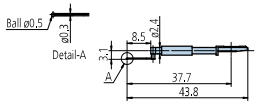
12AAE892 (2 µm)
12AAE908 (5 µm)*1
( ): Tip radius

For small hole*2*4



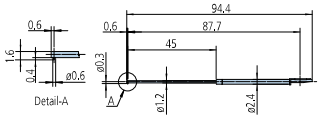
12AAE884 (ϕ1.6 mm)

For ultra-small hole*4



12AAJ662 (ϕ0.5 mm)

For small slotted hole*2



12AAE938 (2 µm)
12AAE940 (5 µm)*1

*1 Tip angle 90°
*2 For downward-facing measurement only.

*3

Tip radius	1 µm	2 µm	5 µm	10 µm	250 µm
Color coding	White	Black	No color	Yellow	No notch or color

*4 Used for calibration, a "Reference step specimen" (**178-611** or **178-612**, optional) is also required

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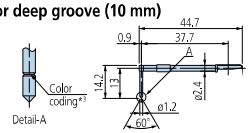
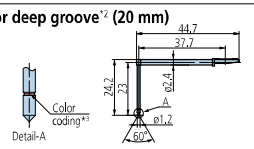
Styli

For deep groove (10 mm)



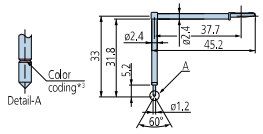
12AAC735 (2 µm)
12AAB409 (5 µm)*1
12AAB421 (10 µm)*1
( ): Tip radius

For deep groove*2 **(20 mm)**



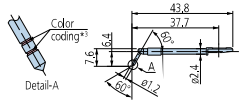
12AAC736 (2 µm)
12AAB408 (5 µm)*1
12AAB420 (10 µm)*1
( ): Tip radius

For deep groove*2 **(30 mm)**



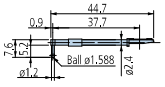
12AAC737 (2 µm)
12AAB407 (5 µm)*1
12AAB419 (10 µm)*1
( ): Tip radius

For gear tooth



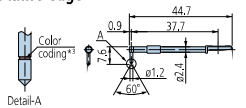
12AAB339 (2 µm)
12AAB410 (5 µm)
12AAB422 (10 µm)
( ): Tip radius

For rolling circle waviness surface*4



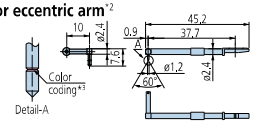
12AAB338 (ϕ1.588)

For knife-edge



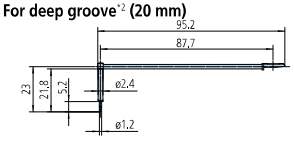
12AAC738 (2 µm)
12AAB411 (5 µm)*1
12AAB423 (10 µm)*1
( ): Tip radius

For eccentric arm*2



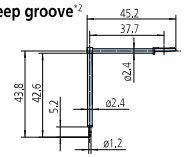
12AAC739 (2 µm)
12AAB412 (5 µm)*1
12AAB424 (10 µm)*1
( ): Tip radius

For deep groove*2 **(20 mm)**



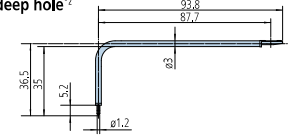
12AAE893 (2 µm)
12AAE909 (5 µm)*1
( ): Tip radius

For deep groove*2



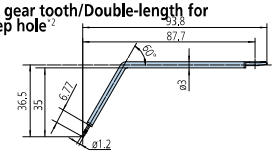
12AAE895 (2 µm)
12AAE911 (5 µm)*1
( ): Tip radius

For deep groove (30 mm)/Double-length for deep hole*2



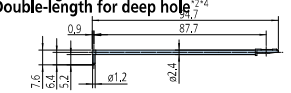
12AAE894 (2 µm)
12AAE910 (5 µm)*1
( ): Tip radius

For gear tooth/Double-length for deep hole*2



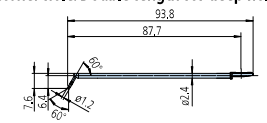
12AAE896 (2 µm)
12AAE912 (5 µm)
( ): Tip radius

For rolling circle waviness/ Double-length for deep hole*2*4



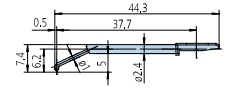
12AAE886 (250 µm)

For corner hole/Double-length for deep hole*2



12AAM601 (2 µm)
12AAM603 (5 µm)
( ): Tip radius

For hole bottom



12AAE899 (2 µm)
12AAE915 (5 µm)*1
( ): Tip radius

*1 Tip angle 90°
*2 For downward-facing measurement only.
Note: Customized special interchangeable styli are available on request, Please contact any Mitutoyo office for more information.

*3

Tip radius	2 µm	5 µm	10 µm
Color coding	Black	No color	Yellow

*4 Used for calibration, a "Reference step specimen" (**178-611** or **178-612**, optional) is also required