Surface roughness testers offer benchtop or portable operation and the choice of data analysis by PC or an easy-to-use dedicated processor.
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.

* Auto leveling table (optional)
  Automatically levels the surface to be tested for easy, strain-free setup.

**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, circle, 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.

---

**SJ-500**
Traverse: 1.97" (50mm)
Compact, high-performance type

**SV-2100M4**
Traverse: 3.94" (100mm)
Manual column type

**SV-2100S4/H4/W4**
Traverse: 3.94" (100mm)
Power column type

---

Mitutoyo
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, Simplified Chinese, Traditional Chinese, Czech, Polish, Hungarian, Turkish, Swedish, Dutch

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

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

Efficient positioning by joystick and adjustment knobs

Both a fast-traverse joystick (X-axis: .78"/s (20mm/s) for **SJ-500**, 1.98"/s (40mm/s) for **SV-2100**), Z-axis: .78"/s (20mm/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.

Navigation function aids leveling

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.

Powerful support for leveling adjustments

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

- Measurement
- Traverse

Example: **SV-2100S4** input screen
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:**
8µin/2" (0.2µm/50mm)
High-speed traverse at up to 0.78"/s (20mm/s) under joystick control
Smooth positioning using the vertical adjustment knob

**Drive unit inclination adjustment mechanism**

Digital Adjustment Tilting (DAT) function is supplied as standard for efficient leveling of workpieces: ±1.5°
DAT function: Patent pending (Japan, U.S., Germany)

**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.

**DAT function**

Powerful support for manual leveling!!

**On**
- Preparatory measurement
- Adjustment value display
- Adjust according to displayed value using leveling knob
- Actual measurement
- Reduction of setting time
- Accurate leveling
- Easy operation

**Off**
- Preparatory measurement
- Adjust using leveling knob
- Verification measurement
- Checking counter
- Repeat

**Mitutoyo**
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.

**High-speed traverse at up to 1.98"/s (40mm/s) (X-axis) under joystick control**

**Smooth positioning, using the Z-axis fine-adjustment knobs**

**Stable, high-accuracy measurement with a traverse straightness of 6µin/4" (0.15µm/100mm)**

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

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

3. **Base sizes and vertical travel range on column**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Vertical travel range</th>
<th>Vertical traverse method</th>
<th>Base size</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV-2100S4</td>
<td>13.8&quot; (350mm)</td>
<td>Power and manual</td>
<td>23.6&quot; x 17.72&quot; (600x450mm)</td>
</tr>
<tr>
<td>SV-2100H4</td>
<td>21.6&quot; (550mm)</td>
<td>Manual only</td>
<td>39.4&quot; x 17.72&quot; (1000x450mm)</td>
</tr>
<tr>
<td>SV-2100W4</td>
<td>21.6&quot; (550mm)</td>
<td>Power and manual</td>
<td>39.4&quot; x 17.72&quot; (1000x450mm)</td>
</tr>
<tr>
<td>SV-2100M4</td>
<td>13.8&quot; (350mm)</td>
<td>Manual only</td>
<td>23.6&quot; x 17.72&quot; (600x450mm)</td>
</tr>
</tbody>
</table>
Dedicated data processor

Data processing unit

- Data saving (internal memory)
- High-speed printing
- Expansion slot for external memory (CF card)
- Display supports 16 languages
- Key panel
- High-visibility 7.5” color LCD
- Touch panel with color icon display
- Joystick

Customizable menu screen

The menu customization function allows display of frequently used menu icons

One-touch display of various screens

Home screen

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.

Easy, icon-based input of setup conditions

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

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.

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.

Typical surface roughness symbol on drawing

Grinding

$Ra \leq 1.5$

$\pm 0.08-0.8/R_{z8max} \leq 3.3$

Clicking a parameter icon displays the recommended cut-off value, etc.
PC data processing type
Surftest SJ-500P

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

* If a power column type with PC data-processing is desired, consider the SV-3100 series

**SURFPAK-EZ: Easy-to-use task-focused software**

User-friendly graphical display and button layout allows intuitive operation. Simplified fine-contour analysis provided as standard, including step, area, angle, and circle calculation.
## Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>SJ-500</th>
<th>SV-2100M4</th>
<th>SV-2100S4</th>
<th>SV-2100H4</th>
<th>SV-2100W4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of data processing</strong></td>
<td>Dedicated data processor</td>
<td>PC system</td>
<td>PC system</td>
<td>PC system</td>
<td>PC system</td>
</tr>
<tr>
<td><strong>Model No.</strong></td>
<td>SJ-500</td>
<td>SV-2100M4</td>
<td>SV-2100S4</td>
<td>SV-2100H4</td>
<td>SV-2100W4</td>
</tr>
<tr>
<td><strong>Order No.</strong></td>
<td>178-533-01A</td>
<td>178-637-01A</td>
<td>178-681-01A</td>
<td>178-683-01A</td>
<td>178-685-01A</td>
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<tr>
<td><strong>Travel range (operation)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>X axis</td>
<td>2&quot; (50mm)</td>
<td>3.94&quot; (100mm) (power drive / manual)</td>
<td>2&quot; (50mm)</td>
<td></td>
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<tr>
<td>Z2 axis (column)</td>
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<tr>
<td><strong>Measuring range</strong></td>
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<tr>
<td>X axis</td>
<td>2&quot; (50mm)</td>
<td>3.94&quot; (100mm) (power drive / manual)</td>
<td>2&quot; (50mm)</td>
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<td></td>
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<tr>
<td>Z2 axis (column)</td>
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<tr>
<td><strong>Resolution</strong></td>
<td></td>
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</tr>
<tr>
<td>X axis</td>
<td>0.4µin / 3200µin range, 0.4µin / 3200µin range</td>
<td>1.97µin (0.05µm)</td>
<td></td>
<td></td>
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<tr>
<td>Z2 axis (column)</td>
<td></td>
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<tr>
<td><strong>Power drive speed</strong></td>
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<tr>
<td>X axis</td>
<td>0 - 0.78&quot;/s</td>
<td>0 - 20mm/s (via joystick)</td>
<td>0 - 20mm/s (via PC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z2 axis (column)</td>
<td></td>
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<tr>
<td><strong>Measuring speed</strong></td>
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<tr>
<td>X axis</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Z2 axis (column)</td>
<td></td>
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<tr>
<td><strong>Stylus up/down operation</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Detection</strong></td>
<td>Measuring force</td>
<td>0.75 mN or 4 mN</td>
<td>0.75 mN detector: 60°, R2µm or 4 mN detector: 90°, R5µm</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Applicable standards</strong></td>
<td>JIS'82 / JIS'94 / JIS'01 / ISO'97 / ANSI / VDA</td>
<td></td>
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</tr>
<tr>
<td><strong>Assessed profiles</strong></td>
<td>Dedicated data processor type: P (primary profile), R (roughness profile), WC, envelope residual profile, roughness motif, waviness motif</td>
<td>PC system type: P (primary profile), R (roughness profile), WC, WCA, WE, WE, DIN4776 profile, E (envelope residual profile), roughness motif, waviness motif</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation parameters</strong></td>
<td>Dedicated data processor type: Ra, Rc, Ry, Rz, Rq, Rp, Rsk, Sm, S, Pc, mcr (c), oc, mr, tp, Htp, Lo, lr, Ppi, HSC, λa, λq, Ku, Sk, Rpk, Rvk, Rk, Mr1, Mr2, A1, A2, Vo, ha, λq, R, AR, AX, AW, AX, Wte, Wte</td>
<td>PC system type: Ra, Rc, Ry, Rz, Rq, Rp, Rsk, Sm, S, Pc, mcr (c), oc, mr, tp, Htp, Lo, lr, Ppi, HSC, λa, λq, Ku, Sk, Rpk, Rvk, Rk, Mr1, Mr2, A1, A2, Vo, ha, λq, R, AR, AX, AW, AX, Wte, Wte</td>
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<td></td>
</tr>
<tr>
<td><strong>Analysis graphs</strong></td>
<td>Dedicated data processor type: ADC, BAC, peak spectrum graph</td>
<td>PC system type: ADC, BAC Graph, power spectrum graph, auto-correlation graph, Walsh power spectrum graph, Walsh auto-correlation graph, slope distribution graph, local peak distribution graph, parameter distribution graph</td>
<td></td>
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</tr>
<tr>
<td><strong>Curved surface compensation</strong></td>
<td>Dedicated data processor type: Parabolic compensation, Hyperbolic compensation, Elliptical compensation, Circular compensation, Conic compensation, Inclination (Entire, Arbitrary), Polynomial compensation</td>
<td>PC system type: Parabolic compensation, Hyperbolic compensation, Elliptical compensation, Circular compensation, Conic compensation, Inclination (Entire, Arbitrary), Polynomial compensation</td>
<td></td>
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</tr>
<tr>
<td><strong>Contour analysis</strong></td>
<td>Dedicated data processor type: Aarea, Circle, Angle, Coordinate difference, Step, Inclination</td>
<td>PC system type (SURFPAK-E2): Aarea, Circle, Angle, Coordinate difference, Step, Inclination</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Filters</strong></td>
<td>Dedicated data processor type: 2CR-75%, 2CRPC-75%, Gaussian, Robust-spline</td>
<td>PC system type: 2CR-75%, 2CR-50%, 2CRPC-75%, 2CRPC-50%, Gaussian, Rubust-spline</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Base size (width x depth)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main unit</td>
<td>16.7&quot; x 17.7&quot; x 34&quot; (425x494x160mm)</td>
<td>28.2&quot; x 17.7&quot; x 34&quot; (716x450x160mm)</td>
<td>30.16&quot; x 17.7&quot; x 34&quot; (766x450x160mm)</td>
<td>30.16&quot; x 17.7&quot; x 45.9&quot; (766x450x160mm)</td>
<td>45.9&quot; x 17.7&quot; x 46.3&quot; (1166x450x1176mm)</td>
</tr>
<tr>
<td>Display unit</td>
<td>12.9&quot; x 10.63&quot; x 4.38 (330x270x124mm)</td>
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<tr>
<td><strong>Base material</strong></td>
<td>Granite</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>External dimensions (W x D x H)</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main unit</td>
<td>38.4&quot; x 17.7&quot; x 34&quot; (980x450x160mm)</td>
<td>30.16&quot; x 17.7&quot; x 45.9&quot; (766x450x160mm)</td>
<td>45.9&quot; x 17.7&quot; x 46.3&quot; (1166x450x1176mm)</td>
<td>16.7&quot; x 23.8x8&quot; (425x94x160mm)</td>
<td>16.7&quot; x 10.4&quot; x 3.4&quot; (350x263x86mm)</td>
</tr>
<tr>
<td><strong>Mass</strong></td>
<td>5.9 lbs (2.7kg)</td>
<td>308.6 lbs (140kg)</td>
<td>308.6 lbs (140kg)</td>
<td>330.7 lbs (150kg)</td>
<td>485 lbs (220kg)</td>
</tr>
<tr>
<td><strong>Display unit</strong></td>
<td>8.8 lbs (4.0kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electronic unit</strong></td>
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</tr>
</tbody>
</table>
Dimensions

SJ-500

Dedicated data processor

Electronic unit

Only for SV-2100S4 / H4 / W4

SV-2100M4

SV-2100S4 / SV-2100H4

SV-2100W4

Dimensions

Unit: mm

Measuring range

T-groove dimensions (common to all types)
Optional Accessories

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

Suitable for desktop use in inspection rooms and such.

No.178-085 * Except measuring unit
Vertical adjustment range: 11.8” (300mm)
Dimension (W × D × H): 23.6” x 17.7” x 28”
(600 x 450 x 710mm)
Weight: 242 lbs (110kg)

Dimensions of SJ-500 with manual column stand
Unit: mm

DAT leveling table: 178-048

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


This is a stage that performs fully automatic leveling as measurement starts, freeing the user from this tedious operation. Fully automatic leveling can be done quickly by anyone. In addition, the operation is easy and reliable.

<table>
<thead>
<tr>
<th>Inclination adjustment angle</th>
<th>±2°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum load</td>
<td>15.4 lbs (7kg)</td>
</tr>
<tr>
<td>Table dimensions</td>
<td>5.12” x 3.94” (130 x 100mm)</td>
</tr>
<tr>
<td>Mass</td>
<td>7.7 lbs (3.5kg)</td>
</tr>
</tbody>
</table>

Leveling table: 178-043-1 (with analog heads) 178-042-1 (with digital heads)

Inclination adjustment angle ±1.5°
Maximum load 33 lbs (15kg)
Swiveling angle ±3°
X/Y-axis travel range ±0.49” (+12.5mm)
Resolution 0.01mm 0.001mm
Dimensions 8.66” x 7.4” x 3.27” (220 x 189 x 83mm)
10.3” x 9.17” x 3.27” (262 x 233 x 83mm)
Mass 13.2 lbs (6kg) 13.9 lbs (6.3kg)

Quick chuck: 211-032

This chuck is useful when measuring small workpieces. The knurled ring makes clamping very easy.

Micro-chuck: 211-031

This chuck is suitable for clamping extra-small diameter workpieces (ø1mm or less), which cannot be clamped with the centering chuck.

Quick chuck:

<table>
<thead>
<tr>
<th>Retention range</th>
<th>Inner latch</th>
<th>OD: ø 0.039” - 1.42” (1-36mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner latch</td>
<td>ID: ø 0.55” - 2.76” (14-ø70mm)</td>
<td></td>
</tr>
<tr>
<td>Outer latch</td>
<td>OD: ø 0.039 - 2.95” (1-ø75mm)</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>ø 4.64 x 1.61” (118 x 41mm)</td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>2.65 lbs (1.2kg)</td>
<td></td>
</tr>
</tbody>
</table>

Micro-chuck:

<table>
<thead>
<tr>
<th>Clamping range</th>
<th>OD: ø 0.06” (0-1.5mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>ø 4.64” – 1.91” (118 x 48.5mm)</td>
</tr>
<tr>
<td>Mass</td>
<td>1.32 lbs (0.6kg)</td>
</tr>
</tbody>
</table>
Optional Accessories

3-axis adjustment table: 178-047

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.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclination adjustment</td>
<td>±1.5°</td>
</tr>
<tr>
<td>Swiveling angle</td>
<td>±2°</td>
</tr>
<tr>
<td>Y-axis range</td>
<td>0.49&quot; ±(12.5mm)</td>
</tr>
<tr>
<td>Resolution of heads</td>
<td>0.001mm</td>
</tr>
<tr>
<td>Table dimensions</td>
<td>5.12&quot; x 3.94&quot;(130x100mm)</td>
</tr>
<tr>
<td>Maximum load</td>
<td>33 lbs (15kg)</td>
</tr>
</tbody>
</table>

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

- 178-083: Leveling table (with digital heads)
- 178-081: Leveling table (with analog heads)
- 178-042-1: Leveling table
- 178-041-1: Leveling table
- 12AAA876: Printer paper (5 rolls)
- 12AAA481: Memory card
- 12AAJ112: SPC cable
- 12AAJ111: RS-232C cable
- 12AAA841: Memory card
- 12AAG203: Extension rod 3.94" (100mm)
- 12AAG202: Extension rod 1.97" (50mm)

*1: 70mm 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.
*3: PC for managing the analysis result externally output from the dedicated data processor.
Optional Accessories

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

- **Roughness specimen (standard accessory): 178-601**
  - Display: Ra = about 3 µm
  - Material: Ni (TiN surface coating)

- **Reference step specimen: 178-611 (mm), 178-612 (inch)**
  - Nominal value of step: 2µm 10µm, 79µin 394µin

- **Roughness specimen: 178-604**
  - For checking stylus tip
  - Display: Ra = about 3 µm, about 0.4 µm

*1: 2.76” (70mm) 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: 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.
## Optional Styli

### Detectors
- Detector (0.75mN): 178-396-2
- Detector (4mN): 178-397-2

### Extension rods
- Extension rods (12AAG202: 1.97” (50mm), 12AAG203: 3.94” (100mm)

### Styli

#### Standard stylus
- Color coding: Detail-A

#### Double-length for deep hole
- Tip radius
- Tip angle: 60° **Tip angle: 90°

#### For small hole
- 12AAE882 (1µm)*
- 12AAE924 (4µm)**
- 12AAE731 (2µm)*
- 12AAE843 (5µm)**
- 12AAE415 (10µm)**
- 12AAE883 (250µm)

#### For very small hole
- 12AAE733 (2µm)*
- 12AAE405 (5µm)**
- 12AAE417 (10µm)**

#### For extra small hole
- 12AAE734 (2µm)*
- 12AAE406 (5µm)**
- 12AAE418 (10µm)**

#### For deep hole (double-length and triple-length)
- 2X stylus
- 12AAC740 (2µm)*
- 12AA8413 (5µm)**
- 12AAA425 (10µm)**
- 3X stylus
- 12AAC741 (2µm)*
- 12AA8414 (5µm)**
- 12AAA426 (10µm)**

#### For small slotted hole
- Tip radius
- Tip angle: 60° **Tip angle: 90°

### Extension rods
- 2X stylus
- 12AAC740 (2µm)*
- 12AA8413 (5µm)**
- 12AAA425 (10µm)**
- 3X stylus
- 12AAC741 (2µm)*
- 12AA8414 (5µm)**
- 12AAA426 (10µm)**

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### Styli

**For deep groove (10mm)**

- **12AAC735** (2µm)*
- **12AAB409** (5µm)**
- **12AAB421** (10µm)**
  - Tip radius
  - Tip angle: 60°
  - Tip angle: 90°

**For deep groove (20mm)/Double-length for deep hole**

- **12AAE893** (2µm)*
- **12AAE909** (5µm)**
- **12AAE911** (10µm)**
  - Tip radius
  - Tip angle: 60°
  - Tip angle: 90°

**For deep groove (20mm)**

- **12AAC736** (2µm)*
- **12AAB408** (5µm)**
- **12AAB420** (10µm)**
  - Tip radius
  - Tip angle: 60°
  - Tip angle: 90°

**For deep groove (30mm)**

- **12AAC737** (2µm)*
- **12AAB407** (5µm)**
- **12AAB419** (10µm)**
  - Tip radius
  - Tip angle: 60°
  - Tip angle: 90°

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

- **12AAE894** (2µm)*
- **12AAE910** (5µm)**
- **12AAE912** (10µm)**
  - Tip radius
  - Tip angle: 60°
  - Tip angle: 90°

**For gear tooth**

- **12AAB737** (2µm)*
- **12AAB410** (5µm)**
- **12AAB422** (10µm)**
  - Tip radius
  - Tip angle: 60°
  - Tip angle: 90°

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

- **12AAE895** (2µm)*
- **12AAE915** (5µm)**
  - Tip radius
  - Tip angle: 60°
  - Tip angle: 90°

**For rolling circle waviness surface**

- **12AAB338** (Ø1.588)
  - Tip radius

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

- **12AAE886** (250µm)
  - Tip radius

**For knife-edge detector**

- **12AAC738** (2µm)*
- **12AAB411** (5µm)**
- **12AAB423** (10µm)**
  - Tip radius
  - Tip angle: 60°
  - Tip angle: 90°

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

- **12AAE897** (2µm)*
  - Tip radius
  - Tip angle: 60°
  - Tip angle: 90°

**For eccentric arm**

- **12AAC739** (2µm)*
- **12AAB412** (5µm)**
- **12AAB424** (10µm)**
  - Tip radius
  - Tip angle: 60°
  - Tip angle: 90°

**For bottom surface**

- **12AAE899** (2µm)*
- **12AAE915** (5µm)**
  - Tip radius
  - Tip angle: 60°
  - Tip angle: 90°
Small Tool Instruments and Data Management

Test Equipment and Seismometers

Digital Scale and DRO Systems

Coordinate Measuring Machines

Sensor Systems

Optical Measuring

Form Measurement

Vision Measuring Systems

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