PORTABLE SURFACE ROUGHNESS TESTER
SURFTEST SJ-301

Excellent, Portable Surface Roughness Testing with Enhanced Capabilities
Battery-powered portability means better productivity 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 easily in various situations and setups.
Improved Product Lineup

A wide variety of system setups is possible with the detector + drive unit + display unit combination.

**Standard detector**

- Measuring force: 0.75mN
  Stylus profile: Tip radius: 2μm
- Measuring force: 4mN
  Stylus profile: Tip radius: 5μm

**Drive units**

- **Standard drive unit**
  For SJ-301
  - Popular standard drive unit
- **Transverse tracing drive unit**
  For SJ-301S
  - Best suited for measurement of narrow, shrouded workpiece features such as crankshaft bearings, etc.
- **Retractable drive unit**
  For SJ-301R
  - The detector is in the retracted position at rest so it is immune from damage when inserted into a feature whose profile cannot easily be seen, such as a blind hole, etc.

**Display unit**

- **Touch-panel operation unit with a built-in printer**
  **SJ-301 series display unit**
  - For SJ-201P/201S: Standard type
  - Common to SJ-301/301S/301R
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 shop-hardened 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 in the main unit.
- Five sets of measurement set-ups can be saved in the 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.
Evaluation parameters conform to internationally recognized surface roughness standards.

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

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

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

Result display screen shows the GO/NG judgment result.
### External view

<table>
<thead>
<tr>
<th>Drive unit type</th>
<th>Drive unit external view</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard drive unit</strong></td>
<td><img src="image1" alt="Standard drive unit" /></td>
</tr>
<tr>
<td><strong>Retractable drive unit</strong></td>
<td><img src="image2" alt="Retractable drive unit" /></td>
</tr>
<tr>
<td><strong>Transverse tracing drive unit</strong></td>
<td><img src="image3" alt="Transverse tracing drive unit" /></td>
</tr>
</tbody>
</table>

- **Display unit external view**

![Display unit external view](image4)
### Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>SJ-301</th>
<th>SJ-301R</th>
<th>SJ-301S</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-axis</td>
<td>178-954-4A (inch/mm)</td>
<td>178-955-4A (inch/mm)</td>
<td>178-999-2A (inch/mm)</td>
</tr>
<tr>
<td>2-axis</td>
<td>178-902-3A (inch/mm)</td>
<td>178-902-3A (inch/mm)</td>
<td>178-902-3A (inch/mm)</td>
</tr>
<tr>
<td>Measuring range X-axis</td>
<td>.5 inch (12.5mm)</td>
<td>1.22 inch (31.5mm)</td>
<td></td>
</tr>
<tr>
<td>Measuring range Y-axis</td>
<td>1378μinch (-7880μinch to +5900μinch) (350μm (-200μm to +150μm))</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Detector

- **Conical-taper angle**: 60° (Default)
- **Stylus tip radius**: 2μm
- **Measuring force**: 0.75mN
- **Stylus tip material**: Diamond
- **Skid radius of curvature**: 1.57 inch (40mm)
- **Skid force**: 400μN or less
- **Detector 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

- **Sampling length**: .003, .01, .03, .1, .3 inch (0.08, 0.25, 0.8, 2.5, 8mm)
- **Number of sampling lengths**: x1, x5, x10
- **Arbitrary length**: .01 to .49 inch (.01 inch interval) (0.3 – 12.5mm (.1mm increment))
- **Cutoff filter**: 1CR / 2CR / 1CR, 75 / 75 / Gaussian
- **Cutoff length x_c**: .003, .01, .03, .1, .3 inch (0.08, 0.25, 0.8, 2.5, 8mm)
- **Cutoff length x_s**: 100μinch, 320μinch, 1000μinch (2.5, 8, 25μm)

#### Printer

- **Built-in thermal printer**
- **Graphical printout**: Bearing are curve (BAC1 BAC2), Amplitude distribution curve (ADC)
- **Printing width**: 1.89" (48mm) (Paper width: 2.28" (58 mm))

#### Recording

- **Vertical magnification**: x1, x2, x5, x10, x20, x50, x100, x200, x500, x1000, AUTO
- **Horizontal magnification**: x1, x2, x5, x10, x20, x50, x100, x200, x500, x1000, AUTO

#### 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 save 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**: 12.09"x6.50"x3.70" (307x165x94mm)
- **Drive unit**: 4.53"x.91"x1.02" (115x23x26mm)
- **Mass**: 2.65 lbs. (1.2kg)
- **Display unit**: 12.09"x6.50"x3.70" (307x165x94mm)
- **Drive unit**: 4.53"x.91"x1.02" (115x23x26mm)

#### LCD dimensions

- **Touch-panel type**: 12BAA686 3.94"x2.76" (100x70mm)

#### Standard accessories

- **Connecting cable**: 12BAA686 1270732 12AAA217 12AAA218 12AAA216 12AAA689 12AAA690 541106 270732 12BAA681
- **Roughness specimen (Ra3μm)**: 357651 12AAA217 12AAA218 12AAA216 12AAA689 12AAA690 541106 270732 12BAA681
- **Touch-panel protector sheet (10 sheets)**: No.270732 No.12AAA876 No.12AAA896 No.12AAA841

#### Optional accessories, consumables, and others for SJ-301

- **Printer paper (5 rolls)**
- **Durable printer paper (5 rolls)**
- **Touch-panel protector sheet (10 sheets)**
- **Memory card**: 1: Compact flash (CF) card on the market is also available.
Optional accessories

Drive unit, Display unit

<table>
<thead>
<tr>
<th>Drive unit</th>
<th>Display unit</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard drive unit</td>
<td></td>
<td>SJ-301</td>
</tr>
<tr>
<td>Order No. 178-230-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transverse tracing</td>
<td>Order No. 178-241-3A</td>
<td>SJ-301S</td>
</tr>
<tr>
<td>Order No. 178-234-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detector retracting type</td>
<td>Order No. 178-235</td>
<td>SJ-301R</td>
</tr>
</tbody>
</table>

Detector

Unit: Inch (Metric)

<table>
<thead>
<tr>
<th>Standard detector</th>
<th>Extra-small hole detector</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4mN type No. 178-390</td>
<td>Minimum measurable hole diameter: Ø .11&quot; (Ø 2.8mm)</td>
<td></td>
</tr>
<tr>
<td>0.75mN type No. 178-296</td>
<td>No. 178-393</td>
<td></td>
</tr>
<tr>
<td>(Stylus tip radius 2μm, 60°)</td>
<td>Minimum measurable hole diameter: Ø .11&quot; (Ø 2.8mm)</td>
<td></td>
</tr>
<tr>
<td>No. 178-395 (Stylus tip radius 2μm, 90°)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stylus tip radius 10μm type No. 178-391</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Small hole detector

<table>
<thead>
<tr>
<th>No. 178-392</th>
<th>Minimum measurable hole diameter: Ø .18&quot; (Ø 4.5mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 178-394</td>
<td>Maximum accessible groove depth: .31&quot; (8mm)</td>
</tr>
<tr>
<td>* Not available for the transverse tracing drive unit.</td>
<td></td>
</tr>
</tbody>
</table>

Deep groove detector

<table>
<thead>
<tr>
<th>No. 178-394</th>
<th>Maximum accessible groove depth: .31&quot; (8mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Not available for the transverse tracing drive unit.</td>
<td></td>
</tr>
</tbody>
</table>
**Optional accessories: Drive unit accessories**

### Drive unit, Display unit

<table>
<thead>
<tr>
<th>Accessory</th>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nosepiece for flat surfaces</td>
<td>12AAA217</td>
<td>* SJ-301 standard accessories * Not available for the transverse tracing drive unit.</td>
</tr>
<tr>
<td>Nosepiece for cylindrical surfaces</td>
<td>12AAA218</td>
<td>* SJ-301 standard accessories * Not available for the transverse tracing drive unit.</td>
</tr>
<tr>
<td>V-type adapter</td>
<td>12AAE644</td>
<td>* SJ-301S standard accessories * Dedicated to the transverse tracing drive unit.</td>
</tr>
<tr>
<td>Extension rod 1.97&quot; (50mm)</td>
<td>12AAA210</td>
<td>(Note: Extension is possible with only a single rod.) * Not available for the transverse tracing drive unit.</td>
</tr>
<tr>
<td>Support feet set</td>
<td>12AAA216</td>
<td>* SJ-301 standard accessory * Not attachable to the detector side of the transverse tracing drive unit.</td>
</tr>
<tr>
<td>Magnetic stand adapter</td>
<td>12AAA220 (ø375&quot;)</td>
<td>No. 12AAA220 (ø8mm)</td>
</tr>
<tr>
<td>Height gage adapter</td>
<td>12AAA233 (1/4&quot; x 1/2&quot;)</td>
<td>No. 12AAA222 (9mm x 9mm)</td>
</tr>
<tr>
<td>Vertical positioning adapter</td>
<td>12AAA219</td>
<td>* Not available for the transverse tracing drive unit.</td>
</tr>
<tr>
<td>Extension cable 39.40&quot; (1m)</td>
<td>12BAA303</td>
<td>(Note: Extension is possible with only a single cable.).</td>
</tr>
<tr>
<td>Point-contact adapter</td>
<td>12AAE643</td>
<td>* SJ-301S standard accessories * Dedicated to the transverse tracing drive unit.</td>
</tr>
<tr>
<td>Nosepiece for cylindrical surfaces</td>
<td>12AAA218</td>
<td>* SJ-301 standard accessories * Not available for the transverse tracing drive unit.</td>
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<td>12AAA220 (ø375&quot;)</td>
<td>No. 12AAA220 (ø8mm)</td>
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<tr>
<td>Height gage adapter</td>
<td>12AAA233 (1/4&quot; x 1/2&quot;)</td>
<td>No. 12AAA222 (9mm x 9mm)</td>
</tr>
</tbody>
</table>
Optional Accessories: Setting attachments

Setting attachments

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.

<table>
<thead>
<tr>
<th>Setting attachment: V type for measuring in the cylinder axis direction</th>
<th>Setting attachment: Magnetic slide type</th>
<th>Setting attachment: Inside diameter type</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 178-033</td>
<td>No. 178-034</td>
<td>No. 178-035</td>
</tr>
<tr>
<td>The V-width is adjustable to the cylinder diameter facilitating axial measurement of a wide range of cylinder diameters.</td>
<td>The magnet attached to the frame bottom surface allows hands-free measurement on the wall.</td>
<td>Greatly facilitates measurement of internal wall surfaces of, for example, a cylinder block.</td>
</tr>
<tr>
<td>Adjustable range: ø2.0”<del>ø5.91” (ø5</del>ø150mm)</td>
<td>Cable length 39.40” (1m): No. 936937</td>
<td>Applicable diameter: ø2.95”<del>ø3.74” (ø75</del>ø95mm)</td>
</tr>
<tr>
<td></td>
<td>Cable length 78.80” (2m): No. 965014</td>
<td>Accessible depth: 1.18”<del>5.31” (30</del>135mm)</td>
</tr>
</tbody>
</table>

Optional Accessories: Printer

DP-1VR

Powerful data management capabilities make it possible to process the Digimatic data output from the Surftest SJ series for measurement data printout, various statistical analyses for plotting a histogram and D-chart, and calculation of X-R control charts. Also, it is equipped with the RS-232C GO/NG judgment output for connection to a personal computer.

- Digimatic mini-processor DP-1VR
  No. 264-504-5A*

* A Digimatic Connecting Cable is required to use DP-1VR

- Digimatic connecting cable
  Cable length 39.40” (1m): No. 936937
  Cable length 78.80” (2m): No. 965014
Optional Software: SURFPAK-SJ

Surface roughness analysis program SURFPAK-SJ

An upgraded data analysis system can be built by connecting the Surftest SJ series to a personal computer.

- Capable of diversified analyses of surface textures, including calculations of varieties of parameters and graphical data analyses.
- Equipped with a flexible report generating function that allows freely laying out the recorded profiles and the calculation results in the report.

An RS-232C cable is also required.
- SJ-301 series RS-232C cable *1 No.12AAA882

*1: Equivalent to RS-232C straight cable with D-sub 9-pin female connector.

Assessed profile window:
The size of the assessed profile display can be easily changed.

Measurement result window:
 Provides a great variety of parameters conforming to most of the world’s standards.

Measuring condition setting window

Evaluation conditions window:
For various recalculations of the measured data.

Analysis graph window:
Various analysis graphs can be created.

Operation window

Measuring conditions setting window

Machine operation icons for SJ-301/401
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