Portable Surface Roughness Tester
SURFTEST SJ-410 Series

Portable surface roughness tester evolution
Rich choice of options provide easier, smoother and more accurate measurements
Portable surface roughness tester evolves!
The large touch-screen, color-graphic LCD ensures both intuitive control and advanced operability

Enhanced power for making measurements on site

**Color-graphic LCD**
The color-graphic LCD with excellent visibility displays calculated results and assessed profiles even clearer. This is really useful for checking results without printing them out.

**Backlight provided**
A backlight improves usability in dim testing environments.

Touch screen for easier operations
The screen display can be switched between icon display and text display. Successfully realizes operability with utility and usability.

Easy to use and highly functional
This portable surface roughness tester is equipped with analysis functionality rivaling that of benchtop surface roughness testers.

Multilingual support
The display interface supports 16 languages.

Applicable standards
Complies with many industry standards

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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>Japanese</td>
<td>English</td>
<td>French</td>
<td>Polish</td>
<td>Turkish</td>
</tr>
</tbody>
</table>

High accuracy measuring
A wide range, high-resolution detector
Measuring range/ resolution
- 800µm/0.01µm
- 80µm/0.001µm
- 8µm/0.0001µm

High straightness drive unit
Straightness/ traverse length
- 0.3µm/25mm (SJ-411)
- 0.5µm/50mm (SJ-412)

Measuring range/ resolution
800µm/0.01µm
80µm/0.001µm
8µm/0.0001µm

High straightness drive unit
Straightness/ traverse length
0.3µm/25mm (SJ-411)
0.5µm/50mm (SJ-412)
Surftest SJ-410

Interfaces
A variety of interfaces supplied as standard
The external device interfaces that come as standard include USB, RS-232C, SPC output and footswitch I/F.

Data storage
Memory card (optional) is supported
The measurement conditions and data can be stored in a memory card (optional) and recalled as required. This enables batch analysis and printout of data after on-site measurement.

**Measurement condition**
- Internal memory: 10 sets
- Memory card: 500 sets

**Measurement result**
- Memory card: 1000 sets

Password protection
Access to functions can be restricted by a password
A pre-registered password can limit use of measurement conditions and other settings to the tester’s administrator.

Sheet buttons
Single button measurements
A sturdy sheet-button panel with superior durability in any environment is provided. For repeat measurement of the same work, simply pressing the start switch can complete measurement, analysis and printout.

Printer
High-speed printer prints out measurement results on site
A high-quality, high-speed thermal printer prints out measurement results. It can also print a BAC curve or an ADC curve as well as calculated results and assessed profiles. These results and profiles are printed out in landscape format, just as they appear on the color-graphic LCD.

Carrying case
The unit is easily transported in a dedicated carrying case which includes holders for the accessories as well as the tester itself. (Standard accessory.)
Enhanced measuring functions

Your choice of skidless or skidded measurement

**Skidless measurement**
Skidless measurement is where surface features are measured relative to the drive unit reference surface. This measures waviness and finely stepped features accurately, in addition to surface roughness, but range is limited to the stylus travel available. The SJ-400 series supports a variety of surface feature measurements simply by replacing the stylus.

**Skidded measurement**
In skidded measurements, surface features are measured with reference to a skid following close behind the stylus. This cannot measure waviness and stepped features exactly but the range of movement within which measurement can be made is greater because the skid tracks the workpiece surface contour.

Powerful support for leveling
The height/tilt adjustment unit comes as standard for leveling the drive unit prior to making skidless measurements and, supported by guidance from the unique D.A.T function, makes it easy to achieve highly accurate alignment.

- **Height/tilt adjustment unit (Standard accessory)**

When the SJ-410 Series detector is mounted on the manual column stand*1 for measurement, it can be combined with any of the optional products for easier leveling: leveling table*1, 3-axis alignment table*1 or tilt adjustment unit*1.

*1: For details about optional products, see P6-7.
More measuring functions than expected from a compact tester

Usually, a spherical or cylindrical surface (R-surface) cannot be evaluated, but, by removing the radius with a filter, R-surface data is processed as if taken from a flat surface.

Recalculating

Previously measured data can be recalculated for use in other evaluations by changing the current standard, assessed profile and roughness parameters.

GO/NG judgement function

An “OK/NG” judgment symbol is displayed when limits are set for the roughness parameter. In case of “NG,” the calculated result is highlighted. The calculated result can also be printed out.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Step volume</th>
<th>Coordinate difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step</td>
<td>Step volume</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coordinate difference</td>
</tr>
</tbody>
</table>

Assessing a single measurement result under two different evaluation conditions

A single measurement enables simultaneous analysis under two different evaluation conditions. A single measurement allows calculation of parameters and analysis of assessed profiles without the need for recalculation after saving data, contributing to higher work efficiency.

Arbitrary sampling length setting

This function allows a sampling length to be arbitrarily set in 0.01mm increments (SJ-411: 0.1mm to 25mm, SJ-412: 0.1mm to 50mm). It also allows the SJ-410 series to make both narrow and wide range measurements.

Simple contour analysis function

Point group data collected for surface roughness evaluation is used to perform simplified contour analysis (step, step height, area and coordinate variation). It assesses minute forms that cannot be assessed by a contour measurer.

Narrow space measuring function

Surface roughness measurement requires a run-up distance before starting the measurement (or retrieving data). When the SJ-410 Series measures, its run-up distance is normally set to 0.5mm. This distance, however, can be shortened to 0.15mm using the narrow part measurement function (starting from the origin point of the drive unit). The function extends the possibility of measurement of narrow locations such as grooves in piston ring / O-ring mounts.

- Narrow space measuring

  Typical applications

  | Example: surface roughness measuring of piston-ring groove |
  | Example: surface roughness measuring of mounting groove for O-ring |

  Overruns surface using 0.5mm run-up
  Run-up of 0.5mm is not enough for performing the measurement
  Example: surface roughness measuring of piston-ring groove

Real sampling

This function samples stylus displacement for a specified time without engaging detector traverse, which enables use as a simplified vibration meter or displacement gage incorporated in another system.
Optional Accessories

Simple column stand (for SJ-410 series)
Can be adjusted to match the height of the item to be measured.

Options for simple column stand (for SJ-410 series)
Three new optional units*1 are available to be attached to the simple column stand for SJ-410 series (No.178-039). You can choose the unit that suits your application. Or, you can also use the three units in any combination.*2 Using the optional units makes SJ-411/412 more convenient and easier to use to ensure accurate measurements.

• Auto-set unit*3 No.178-010
This unit enables the vertical (Z axis) direction to be positioned automatically (auto-set function).
A single button operation completes a series of operations from measurement, saving and auto-return (saving and auto-return can be switched on and off by operating the drive unit).

• Tilting adjustment unit*3 No.178-030
This unit is used for aligning the workpiece surface with the detector reference plane. It supports the DAT function to make the leveling of workpiece surfaces easier.

• X-axis adjustment unit*3 No.178-020
This unit helps fine-tune the horizontal (X axis) direction.

Vibration Isolator (Pump Type)
Vibration isolator for simple column stand for SJ-410 series (No.178-039).

No.178-093
Vibration isolator for simple column stand for SJ-410 series (No.178-039).

No.178-039
Vertical adjustment range: 250mm
Dimensions: 400×250×578mm
Mass: 20kg

Auto-set unit

Tilting adjustment unit

X-axis adjustment unit

Complete set of optional units for the manual column stand

*1: Cannot be used with any simple stands other than No. 178-039.
*2: When the units are used in combination, straightness for SJ-411/412 drive unit will be degraded about 0.2µm.
*3: Cannot be used when the tester’s main unit is an older model (SJ-401/402).
The tester includes X- and Y-axes micrometer heads. This makes axis alignment much easier because the tilt adjustment center is the same as the rotation center of the table. (Code No.178-042-1/178-043-1)

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.

DAT Function for the optional leveling table

The levelling table can be used to align the surface to be tested with the detector reference plane. The operator is guided through the procedure by screen prompts.

**XY leveling tables**

The tester includes X- and Y-axes micrometer heads. This makes axis alignment much easier because the tilt adjustment center is the same as the rotation center of the table. (Code No.178-042-1/178-043-1)

**Precision vise**

Fits on the stand.

**Cylinder attachment**

This block can be positioned on top of cylindrical objects to perform measurements.

**Reference step specimen**

Used to calibrate detector sensitivity.

No.178-611

Step nominal values: 2µm/10µm
Optional Accessories: Detectors / Styli

Detectors

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Measuring force</th>
<th>Detectors (previous standards, general use, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>178-396-2</td>
<td>0.75mN</td>
<td>'97ISO and '01JIS compliant detectors</td>
</tr>
<tr>
<td>178-397-2</td>
<td>4mN</td>
<td>Detectors that comply with previous standards, for general use, etc.</td>
</tr>
</tbody>
</table>

Extension rods

- **12AAG202** Extension rod 50mm
- **12AAG203** Extension rod 100mm

Styli

<table>
<thead>
<tr>
<th>Style</th>
<th>Unit: mm</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard stylus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For small hole</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For extra-small hole</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For ultra-small hole</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For deep hole (double-length and triple-length)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Detectors**

- **12AAE882** (1µm)*1
- **12AAE924** (1µm)*1
- **12AAC731** (2µm)*1
- **12AAB403** (5µm)*1
- **12AAB415** (10µm)*1
- **12AAE883** (250µm)*2

**For small hole**

- **12AAC732** (2µm)*1
- **12AAB404** (5µm)*1
- **12AAB416** (10µm)*1

**For extra-small hole**

- **12AAC733** (2µm)*1
- **12AAB405** (5µm)*1
- **12AAB417** (10µm)*1

**For ultra-small hole**

- **12AAC734** (2µm)*1
- **12AAB406** (5µm)*1
- **12AAB418** (10µm)*1

**For deep hole (double-length and triple-length)**

- **2X stylus**
  - **12AAC740** (2µm)*1
  - **12AAB413** (5µm)*1
  - **12AAB425** (10µm)*1
- **3X stylus**
  - **12AAC741** (2µm)*1
  - **12AAB414** (5µm)*1
  - **12AAB426** (10µm)*1

**Double-length for deep hole**

- **12AAE890** (2µm)*1
- **12AAE914** (5µm)*1

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

- **12AAE892** (2µm)*1
- **12AAE908** (5µm)*1

**For small hole**

- **12AAE884** (Φ1.8mm)*4

**For small slotted hole**

- **12AAE893** (2µm)*1
- **12AAE940** (5µm)*1

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*1: Tip angle 60°
*2: For downward-facing measurement only.
*3: Tip radius
*4: Used for calibration, a standard step gauge (No.178-611, option) is also required.
### Styli

#### For deep groove (10mm)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Diameter (mm)</th>
<th>Tip Radius (mm)</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12AAC735</td>
<td>1.2</td>
<td>37.7</td>
<td>44.7</td>
</tr>
<tr>
<td>12AAB409</td>
<td>5.5</td>
<td>0.9</td>
<td>44.7</td>
</tr>
<tr>
<td>12AAB421</td>
<td>10.0</td>
<td>0.9</td>
<td>44.7</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Diameter (mm)</th>
<th>Tip Radius (mm)</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12AAC736</td>
<td>1.2</td>
<td>37.7</td>
<td>44.7</td>
</tr>
<tr>
<td>12AAB408</td>
<td>5.5</td>
<td>0.9</td>
<td>44.7</td>
</tr>
<tr>
<td>12AAB420</td>
<td>10.0</td>
<td>0.9</td>
<td>44.7</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Diameter (mm)</th>
<th>Tip Radius (mm)</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12AAC737</td>
<td>1.2</td>
<td>37.7</td>
<td>44.7</td>
</tr>
<tr>
<td>12AAB407</td>
<td>5.5</td>
<td>0.9</td>
<td>44.7</td>
</tr>
<tr>
<td>12AAB419</td>
<td>10.0</td>
<td>0.9</td>
<td>44.7</td>
</tr>
</tbody>
</table>

#### For gear tooth

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Diameter (mm)</th>
<th>Tip Radius (mm)</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12AAB339</td>
<td>1.2</td>
<td>37.7</td>
<td>44.7</td>
</tr>
<tr>
<td>12AAB410</td>
<td>5.5</td>
<td>0.9</td>
<td>44.7</td>
</tr>
<tr>
<td>12AAB422</td>
<td>10.0</td>
<td>0.9</td>
<td>44.7</td>
</tr>
</tbody>
</table>

#### For rolling circle waviness surface *4

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Diameter (mm)</th>
<th>Tip Radius (mm)</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12AAB338</td>
<td>1.2</td>
<td>37.7</td>
<td>44.7</td>
</tr>
</tbody>
</table>

#### For knife-edge *4

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Diameter (mm)</th>
<th>Tip Radius (mm)</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12AAC738</td>
<td>1.2</td>
<td>37.7</td>
<td>44.7</td>
</tr>
</tbody>
</table>

#### For eccentric arm *2

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Diameter (mm)</th>
<th>Tip Radius (mm)</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12AAC739</td>
<td>1.2</td>
<td>37.7</td>
<td>44.7</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Diameter (mm)</th>
<th>Tip Radius (mm)</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12AAB338</td>
<td>1.2</td>
<td>37.7</td>
<td>44.7</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Diameter (mm)</th>
<th>Tip Radius (mm)</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12AAC738</td>
<td>1.2</td>
<td>37.7</td>
<td>44.7</td>
</tr>
</tbody>
</table>

#### For hole bottom

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Diameter (mm)</th>
<th>Tip Radius (mm)</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>12AAB339</td>
<td>1.2</td>
<td>37.7</td>
<td>44.7</td>
</tr>
</tbody>
</table>

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*1: Tip angle 60°
*2: For downward-facing measurement only.
*3: Customized special interchangeable styli are available on request. Please contact your Mitutoyo office for more information.
*4: Used for calibration, a standard step gauge (No. 178-611, option) is also required.
Optional Accessories: For External Output

**Contour / Roughness analysis software**
FORMTRACEPAK-AP

More advanced analysis can be performed by loading SJ-410 series measurement data to software program FORMTRACEPAK-AP via a memory card (option) for processing back at base.

**Simplified communication program for SURFTEST SJ series**
The Surftest SJ-410 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.
http://www.mitutoyo.co.jp

**Required environment***

- OS: Windows XP-SP3
- Windows Vista
- Windows 7
- Windows 8
- Spreadsheet software:
  - Microsoft Excel 2002
  - Microsoft Excel 2003
  - Microsoft Excel 2007
  - Microsoft Excel 2010
  - Microsoft Excel 2013

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

**Measurement Data Wireless Communication System U-WAVE**

This unit allows you to remotely load Surftest SJ-410 calculation results (SPC output) into commercial spreadsheet software on a PC. You can essentially use a one-touch operation to enter the calculation results (values) into the cells in the spreadsheet software.

**Calculation results input unit** INPUT TOOL

This unit allows you to load Surftest SJ-410 calculation results (SPC output) into commercial spreadsheet software on a PC via a USB connector. You can essentially use a one-touch operation to enter the calculation results (values) into the cells in the spreadsheet software.

**Optional accessories, consumables, and others for SJ-410**

- Printer paper (5 rolls) No.270732
- Durable printer paper (5 rolls) No.12AAA876
- Touch-screen protector sheet (10 sheets) No.12AAN040
- Memory card (2GB) * No.12AAL069
- Connecting cable (for RS-232C) No.12AAA882

* micro SD card (with a conversion adapter to SD card)
<table>
<thead>
<tr>
<th>Specifications</th>
<th>SJ-411</th>
<th>SJ-412</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model No.</strong></td>
<td>SJ-411</td>
<td>SJ-412</td>
</tr>
<tr>
<td><strong>Order No.</strong></td>
<td>mm</td>
<td>inch/mm</td>
</tr>
<tr>
<td>178-580-01</td>
<td>178-580-02</td>
<td>178-582-01</td>
</tr>
<tr>
<td><strong>Measuring range</strong></td>
<td>X axis: 25mm (1inch), 50mm (2inch)</td>
<td>X axis: 25mm (1inch), 50mm (2inch)</td>
</tr>
<tr>
<td></td>
<td>Z1 axis (detector unit): 800µm, 80µm, 8µm</td>
<td>Z1 axis (detector unit): 800µm, 80µm, 8µm</td>
</tr>
<tr>
<td></td>
<td><em>Up to 2,400µm with an optional stylus</em></td>
<td><em>Up to 2,400µm with an optional stylus</em></td>
</tr>
<tr>
<td><strong>Detector</strong></td>
<td>Measuring principle: Differential inductance</td>
<td>Measuring principle: Differential inductance</td>
</tr>
<tr>
<td></td>
<td>Resolution: 0.01µm (800µm range) / 0.001µm (80µm range) / 0.0001µm (8µm range)</td>
<td>Resolution: 0.01µm (800µm range) / 0.001µm (80µm range) / 0.0001µm (8µm range)</td>
</tr>
<tr>
<td></td>
<td>Stylus tip: 60°/2µm (80µinch) 90°/5µm (200µinch) 60°/2µm (80µinch) 90°/5µm (200µinch)</td>
<td>Stylus tip: 60°/2µm (80µinch) 90°/5µm (200µinch) 60°/2µm (80µinch) 90°/5µm (200µinch)</td>
</tr>
<tr>
<td></td>
<td>Measuring force: 0.75mN 4mN 0.75mN 4mN</td>
<td>Measuring force: 0.75mN 4mN 0.75mN 4mN</td>
</tr>
<tr>
<td><strong>Drive unit: X-axis</strong></td>
<td>Measuring speed: 0.05, 0.1, 0.2, 0.5, 1mm/s (0.002, 0.004, 0.02, 0.04 inch/s)</td>
<td>Measuring speed: 0.05, 0.1, 0.2, 0.5, 1mm/s (0.002, 0.004, 0.02, 0.04 inch/s)</td>
</tr>
<tr>
<td></td>
<td>Drive speed: 0.5, 1, 2, 5mm/s (0.02, 0.04, 0.08, 0.2 inch/s)</td>
<td>Drive speed: 0.5, 1, 2, 5mm/s (0.02, 0.04, 0.08, 0.2 inch/s)</td>
</tr>
<tr>
<td><strong>Height-tilt adjustment unit</strong></td>
<td>Height adjustment: 10mm (0.39inch)</td>
<td>Height adjustment: 10mm (0.39inch)</td>
</tr>
<tr>
<td></td>
<td>Tilt adjustment: ±1.5°</td>
<td>Tilt adjustment: ±1.5°</td>
</tr>
<tr>
<td><strong>Parameters</strong></td>
<td>Ra, Rq, Rz, Ry, Rp, Rv, Rt, R3z, Rsk, Rku, Rc, RPc, RSm, Rmax<em>1, Rz1max</em>2, S, HSC, RzJIS*3, Rppi, R</td>
<td>Ra, Rq, Rz, Ry, Rp, Rv, Rt, R3z, Rsk, Rku, Rc, RPc, RSm, Rmax<em>1, Rz1max</em>2, S, HSC, RzJIS*3, Rppi, R</td>
</tr>
<tr>
<td><strong>Measured profiles</strong></td>
<td>Measured profiles: Primary, Roughness, DF, Filtered waviness curve, R-Motif, W-Motif</td>
<td>Measured profiles: Primary, Roughness, DF, Filtered waviness curve, R-Motif, W-Motif</td>
</tr>
<tr>
<td><strong>Graph analysis</strong></td>
<td>Graph analysis: BAC and ADC curves</td>
<td>Graph analysis: BAC and ADC curves</td>
</tr>
<tr>
<td><strong>Filter</strong></td>
<td>Filter: 2CR, PC75, Gaussian filter</td>
<td>Filter: 2CR, PC75, Gaussian filter</td>
</tr>
<tr>
<td><strong>Cut-off length</strong></td>
<td>Ac: 0.08, 0.25, 0.8, 2.5, 8.0mm</td>
<td>Ac: 0.08, 0.25, 0.8, 2.5, 8.0mm</td>
</tr>
<tr>
<td></td>
<td>Xs: 2.5, 5.0, 10mm (100, 500, 1000µinch)</td>
<td>Xs: 2.5, 5.0, 10mm (100, 500, 1000µinch)</td>
</tr>
<tr>
<td><strong>Sample length</strong></td>
<td>Sample length: 0.18, 0.25, 0.8, 2.5, 8.0, 25.0mm</td>
<td>Sample length: 0.18, 0.25, 0.8, 2.5, 8.0, 25.0mm</td>
</tr>
<tr>
<td><strong>Number of sampling lengths</strong></td>
<td>Number of sampling lengths: x1, x2, x3, x4, x5, x6, x7, x8, x9, x10, x11, x12, x13, x14, x15, x16, x17, x18, x19, x20</td>
<td>Number of sampling lengths: x1, x2, x3, x4, x5, x6, x7, x8, x9, x10, x11, x12, x13, x14, x15, x16, x17, x18, x19, x20</td>
</tr>
<tr>
<td><strong>Arbitrary length</strong></td>
<td>Arbitrary length: 0.1~25mm</td>
<td>Arbitrary length: 0.1~25mm</td>
</tr>
</tbody>
</table>

### Power supply

- **Battery**: Two-way power supply: battery (rechargeable Ni-MH battery) and AC adapter.
- **Power consumption**: 50W
- **Size (WxDxH)**
  - Display unit: 275x198x109mm (10.83x4.29x7.80inch)
  - Height adjustment unit: 150x95x59mm (5.90x3.74x2.32inch)
  - Drive unit: 128x35.8x46.6mm (5.04x1.41x1.83inch)
  - Mass: 1.7 kg
- **External I/O**: USB IF, Digticam IF, RS-232C IF, External SW I/F
- **Memory**: 1000 memory condition, 10000 measuring data, 500 statistic data, 1 backup of machine setting, the last ten traces (Trace 10)

### Standard accessories

- **Detector**, **Stylus**: 178-601 270732 12BAL402
- **Roughness specimen (Rα3µm)**: 12BAG834 12AAN041
- **Printing paper**: 12BAG834 12AAN041
- **Touch-screen protection sheet**: 12BAL402

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*1: Only for VDA/ANSI/ISO 82 standards.
*2: Only for JIS 97 standard.
*3: Only for JIS 01 standard.
*4: Only for ANSI standard.
*5: Any may not be switchable depending on standard selected.
*6: Standard deviation only can be selected in ANSI 16% rule cannot be selected in VDA.
*7: Either No.178-396 or No.178-397 is supplied as a standard accessory depending on the Order No. of the main unit for SJ-410 Series.
*8: The stylus tip is compatible with the detector supplied, is a standard accessory.
To denote your AC line voltage add the following suffixes (e.g. 178-570-01A).
A for 120V, C for 100V, D for 230V, E for 230V (for UK), DC for 220V (for China), K for 220V (for Korea)
Dimensions

Connecting cable (1.5m)

Unit: mm

Tilting range

*The dimensions in parentheses indicate those for SJ-412

Example of mounting on simple column stand. (Code No. 178-039)*

*For details see page 6.

Unit: mm

T-groove dimensions

Measuring range

*The dimensions in parentheses indicate those for SJ-412