Surftest SJ-410

SERIES 178 — Portable Surface Roughness Tester

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

Free Communication Software
SJ-Tools

Output software based on Microsoft-Excel* for controlling the devices and reproducing and storing the measurement data.
*Microsoft-Excel is not included in the scope of supply.
Complete with exclusive accessories.

- Measurement device control
- Definition of measurement variables
- Graphic representation of the profile
- Storage of measurement results
- Documentation of measurement results

Optional cables (Required for software communication)
12AAD510: USB PC connecting cable (USB cable)
12AAA882: RS-232C connecting cable

Optional Accessories

178-611: Step gage (2µm, 10µm)
178-612: Step gage (2µm, 10µm, 79µin, 394µin)
178-610: Step gage (step: 1µm, 2µm, 5µm, 10µm)
12AAM556: Height/tilt adjustment unit for SJ-410
178-039: Manual column stand (granite base) (vertical travel: 250mm)
178-010: Auto-set unit for **178-039**
178-020: X axis adjustment unit for **178-039**
178-030: Tilting adjustment unit (Inclination adjustment unit) for **178-039**
12AAB358: Cylindrical surface adapter (workpiece dia.: 15 - 60mm)
178-016: Leveling table (tilting: ±1.5°, max. loading: 15kg)
178-048: Leveling table with D.A.T function (mm) (tilting: ±1.5°, max. loading: 15kg)
178-058: Leveling table with D.A.T function (inch) (tilting: ±1.5°, max. loading: 15kg)
178-043-1: XY leveling table (25 x 25mm) (tilting: ±1.5°, max. loading: 15kg, swiveling: ±3°)
178-053-1: XY leveling table (1″ x 1″) (tilting: ±1.5°, max. loading: 15kg, swiveling: ±3°)
178-042-1: Digital XY leveling table (25 x 25mm) (tilting: ±1.5°, max. loading: 15kg, swiveling: ±3°)
178-052-1: Digital XY leveling table (1″ x 1″) (tilting: ±1.5°, max. loading: 15kg, swiveling: ±3°)
178-049: Digital XY leveling table (25 x 25mm) (max. loading: 15kg)
178-059: Digimatic XY leveling table (1″ x 1″) (max. loading: 15kg)
178-019: Precision vise for XY leveling table (jaw opening: 36mm)
998291: Precision V-block for XY leveling table (workpiece dia.: 1 - 160mm)
12AAA841: Memory card (8GB)
965014: SPC cable (2m)
264-012-10: Input tool (USB type)
264-504-5A: DP-1VR
———: Detectors, Styli, and nosepieces (See pg. J-22/23.)

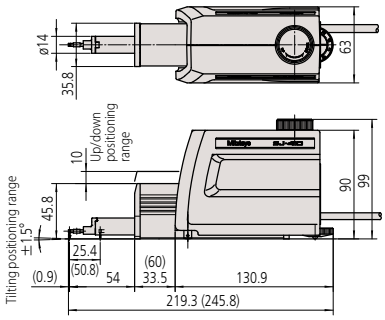
Consumables

12AAN040: LCD protective sheet (10 sheets/set)
12AAA876: Durable printer paper (25m, 5 rolls/set)
270732: Printer paper (5 pack)
12AAN046: Replacement battery
12AAJ088: Footswitch

DIMENSIONS

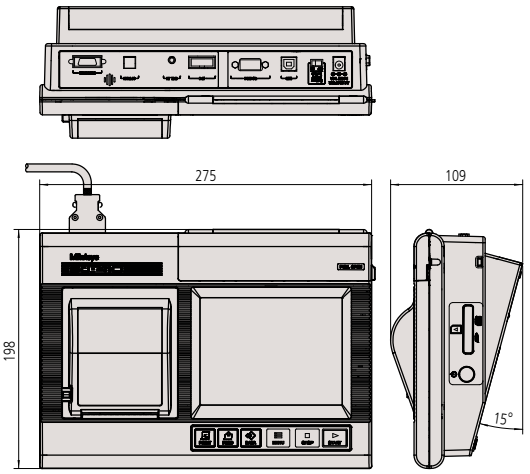
Unit: mm

Drive unit

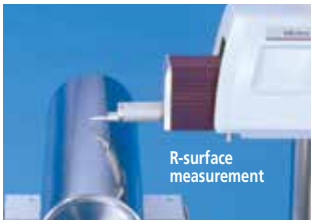


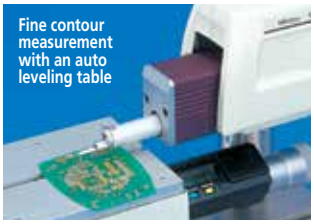
( ): Referring to dimensions when a 50mm drive is mounted to SJ-412.

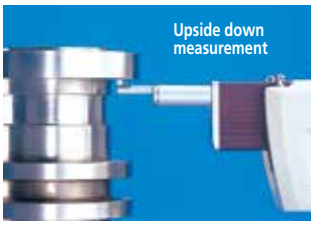
Display unit

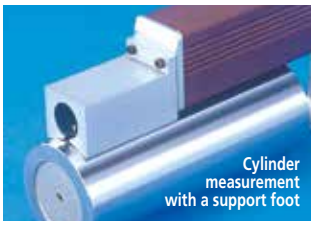


MEASUREMENT APPLICATIONS









Carrying case is a standard accessory.

Manual column stand **178-039**

With optional accessories.
178-010: Auto-set unit
178-020: X-axis adjustment unit
178-030: Tilting adjustment unit

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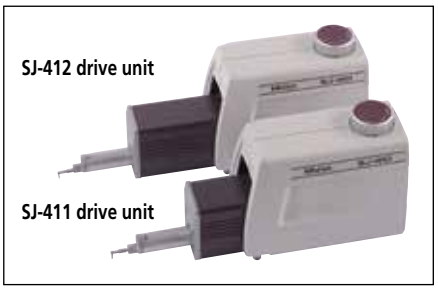
FEATURES

- Both skidded and skidless measurement are possible with this series. Equipped with 46 roughness parameters that conform to the latest ISO, DIN, ANSI, and JIS standards.
- A wide-range, high-resolution detector and a drive unit provide superior high-accuracy measurement in its class.

Detector
Measuring range: 800µm
Resolution: 0.000125µm (at 8µm range)
Drive unit
Straightness/traverse length
SJ-411: 0.3µm/25mm
SJ-412: 0.5µm/50mm



- A skidless detector and a curved surface compensation function provide efficient evaluation of cylinder surface roughness.
- Ultra-fine steps, straightness and waviness can be measured by using the skidless measurement function.
- The handheld data processing unit and the 5.7-inch color graphic LCD touch-panel provides superior readability and operability. The LCD also includes a backlight for improved visibility in dark environments.
- The excellent user interface provides intuitive and easy-to-understand operability.
- Measured data can be output to a PC with optional RS-232C or USB cable.
- Digital filter function for non-distorted roughness profiles.
- Go/no-go judgment function.
- Auto-calibration function.
- The display interface supports 16 languages, which can be freely switched.
- Simplified contour analysis function supports the four types of measurement: step, level change, area and coordinate difference.
- Access to each feature can be password-protected, which prevents unintended operations and allows you to protect your settings.
- The optional attachments for mounting on a column stand significantly increase the operability.

Skidless measurement

Surftest SJ-411

SPECIFICATIONS

Model No.		SJ-411	SJ-411	SJ-412	SJ-412
Order No. (inch/mm)		**178-581-01A**	**178-581-02A**	**178-583-01A**	**178-583-02A**
Detector measuring force		0.75mN	4mN	0.75mN	4mN
Evaluation range		25mm	25mm	50mm	50mm
Stylus tip	Tip angle	60°	90°	60°	90°
	Tip radius	2µm	5µm	2µm	5µm

Technical Data: X axis (drive unit)

Measuring range: 1"(25mm) (SJ-411), 2"(50mm) (SJ-412)
Measuring speed: .002, .004, .008, .02, .04"/s (0.05, 0.1, 0.5, 1.0mm/s)
Return speed: .02, .04, .08"/s (0.5, 1.0, 2.0mm/s)
Traversing direction: Backward
Traverse linearity: 12 µin / 1"(0.3µm/25mm) (SJ-411), 20 µin / 2"(0.5µm/50mm) (SJ-412)
Positioning: ±1.5° (tilting), 10mm (up/down)
Detector Range / resolution: 800µm / 0.0125µm, 80µm / 0.00125µm, 8µm / 0.000125µm (up to 2400µm with an optional stylus)
Measurement method: Skidless / skidded
Measuring force: 0.75mN (4mN)
Stylus tip: Diamond, 60° / 2µmR (90° / 5µmR)
Skid radius of curvature: 40mm
Type: Differential inductance
Power supply: Via AC adapter / rechargeable battery
Battery life: Max. app. 1000 measurements (w/o printing)
Recharge time: 4 hours Data output Via USB interface / RS-232C interface / SPC output
Storage:Internal memory: Measurement condition (10 sets)
Memory card (Option): 500 measurement conditions, 10,000 measured profiles, 500 display images, Text file (Measurement conditions / Measured profile / Assessed profile / Bearing area curve / Amplitude distribution curve), 500 statistical data, etc.
Dimensions (W x D x H)
Display unit: 10.8x4.3x7.8"(275x109 x198mm)
Height-tilt adjustment unit: 5.16x2.48x3.9"(131x63x99mm)
Drive unit: 5.04x1.41x1.83"(128x36x47mm)(SJ-411), 6.1x1.41x1.83"(155x36x47mm) (SJ-412)
Mass Control unit: Approx. 3.75lb (1.7kg)
Height-tilt adjustment unit: Approx. .9lb (0.4kg)
Drive unit: 1.3lb(0.6kg) (SJ-411), 1.5lb(0.7kg)(SJ-412)

Evaluation Capability

Applicable standards: JIS'82, JIS'94, JIS'01, ISO'97, ANSI, VDA, Free
Assessed profiles: P (primary profile), R (roughness profile), DF (DF profile), W (filtered waviness profile), roughness motif, waviness motif
Evaluation parameters: Ra, Rq, Rz, Ry, Rp, Rv, Rt, R3z, Rsk, Rku, Rc, RPc, RSm, Rmax(VDA, ANSI), Rz1max(ISO'97), S, HSC, RzJIS(JIS'01), Rppi, RΔa, RΔq, Rlr, Rmr, Rmr(c), Rδc, Rk, Rpk, Rvk, Mr1, Mr2, A1, A2, Vo, λq, Lo, Rpm, tp(ANSI), Htp(ANSI), R, Rx, AR, W, AW, Wx, Wte
Analysis graphs: Bearing Area Curve (BAC), Amplitude Distribution Curve (ADC)
Digital filter: 2CR, PC75, Gaussian
Cutoff length: λc: .003, .01, .03, .1, .3" (0.08, 0.25, 0.8, 2.5, 8mm)
λs: 100, 320, 1000µin (2.5, 8, 25µm)(Availability of switching depends of the selected standard.)
Sampling length: 0.08, 0.25, 0.8, 2.5, 8, 25*mm; or arbitrary length in range 0.1 to 25mm (0.1 to 50mm: SJ-412) in 0.01mm increments
Number of sampling lengths: 1, 2, 3, ~20 (limited by traverse range)
Printer: Thermal type
Printing width: 48mm (paper width: 58mm)
Recording magnification
Vertical magnification: 10X to 100,000X, Auto
Horizontal magnification: 1X to 1,000X, Auto
Function
Customize: Selection of display/evaluation parameter
Data compensation: R-surface, Tilt compensation
Ruler function: Step, level change, area and coordinate difference
D.A.T. function: Helps to level workpiece prior to skidless measurement displacement detection mode enables the stylus displacement to be input while the drive unit is stopped.
Statistical processing: Max. value, Min. value, Mean value, Standard deviation (s), Pass ratio, Histogram
GO/NG judgement: Maximum value rule, 16% rule, average value rule, standard deviation (1σ, 2σ, 3σ)
Calibration: Auto-calibration with the entry of numerical value /average calibration with multiple measurement (Max.12 times) is available.
Power saving function: Auto-sleep-function, Auto light-off of Backlight by ECO mode.

* Only for SJ-412