Mitutoyo

PORTABLE SURFACE ROUGHNESS TESTER

SURFTEST SJ-410 SERIES

Numerous options provide easier, smoother and more accurate measurements

FORM MEASUREMENT

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

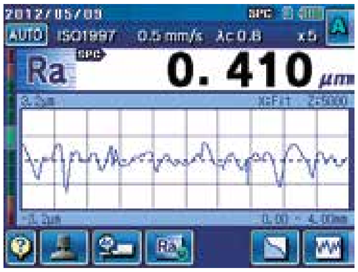
The color-graphic LCD with excellent visibility displays calculated results and assessed profiles even clearer. This is useful for checking results without printing them out.

Backlight provided

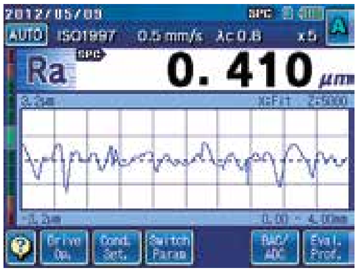
A backlight improves usability in dim testing environments.

Touch screen for easier operations

The screen display can be switched between icon display and text display.


2012/05/09
AUTO ISO1997 0.5 mm/s λc 0.8 x5
Ra 0.410 µm

Icon display

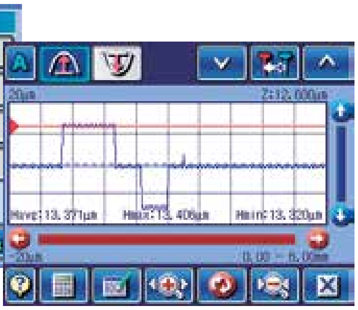

2012/05/09
AUTO ISO1997 0.5 mm/s λc 0.8 x5
Ra 0.410 µm

Text display

Easy to use and highly functional

This portable surface roughness tester is equipped with analysis functionality rivaling that of benchtop surface roughness testers.

Data compensation

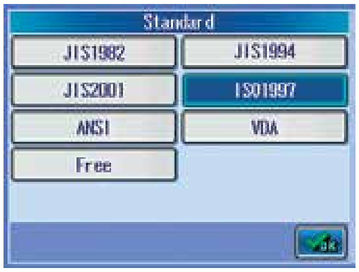

Mave: 13.371µm Hmax: 13.406µm Hmin: 13.320µm

Simple contour analysis function

Applicable standards

Complies with many industry standards

The Surftest SJ-410 complies with the following standards: JIS (JIS-B0601-2001, JIS-B0601-1994, JIS B0601-1982), VDA, ISO-1997, and ANSI.



Multilingual support

The display interface supports 16 languages.

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

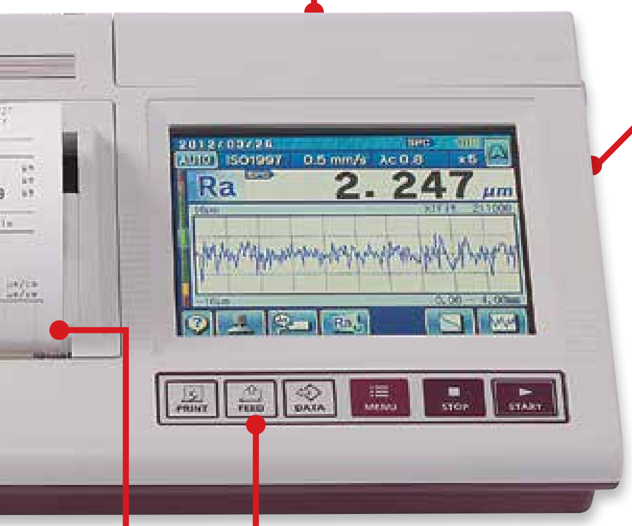
Straightness/ traverse length
0.3µm/25mm (**SJ-411**)
0.5µm/50mm (**SJ-412**)

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.



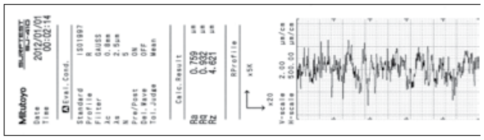
Key-sheet buttons

A sturdy key-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.



Data storage

Memory card (optional) is supported

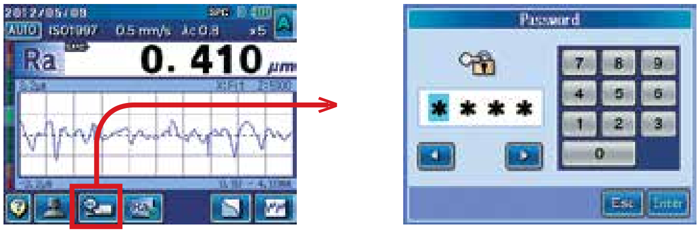
The measurement conditions and data can be stored in a memory card (optional) and recalled as required. This enables batch analysis and printout of data after on-site measurement.

- **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.



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.)

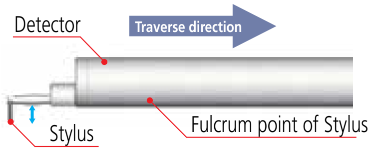
Enhanced measuring functions

Your choice of skidless or skidded measurement

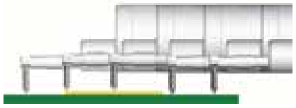
Patent registered in Japan, U.S.A.. Patent pending in Germany

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 roughnness, but range is limited to the stylus travel available. The SJ-410 series supports a variety of surface feature measurements simply by replacing the stylus.



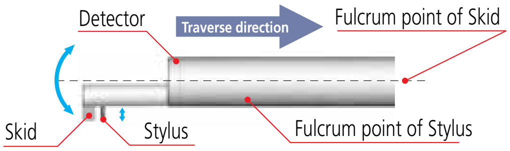
Measuring example of stepped features: Skidless



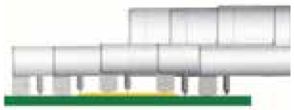
Measured profile

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.



Measuring example of stepped features: Skidded



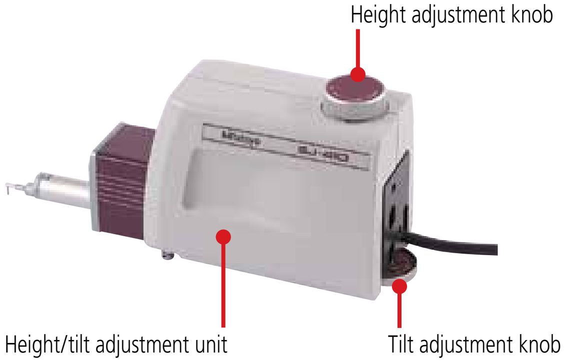
Measured profile

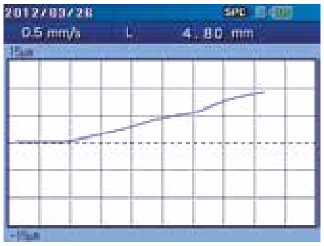
Powerful support for leveling

Patent registered in Japan, U.S.A.. Patent pending in Germany

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)



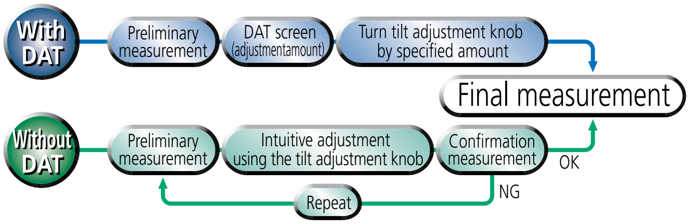


Preliminary measurement

Comp. Value 0.410 Rotation

Turn the tilt knob to make the positive compensation.

Amount of tilt adjustment

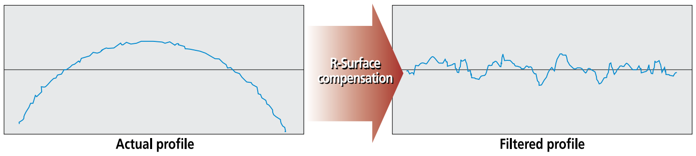


When the SJ-410 Series detector is mounted on the manual column stand*[1] for measurement, it can be combined with any of the optional products for easier leveling: leveling table*[1], 3-axis alignment table*[1] or tilt adjustment unit*[1].

*1: For details about optional products, see Pages 6-7.

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.

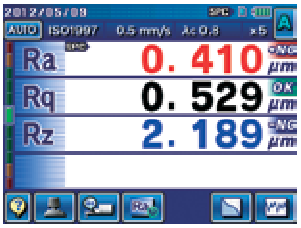


Recalculating

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

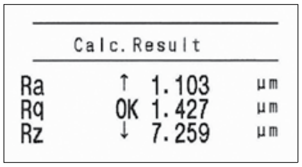
GO/NG judgement function

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.



2012/05/08
AUTO ISO1997 0.5 mm/s λc 0.8 x5

Ra 0.410 µm NG
Rq 0.529 µm OK
Rz 2.189 µm NG



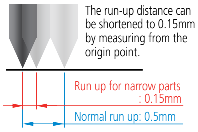
```
Calc.Result

Ra       ↑ 1.103   µm
Rq      OK 1.427   µm
Rz       ↓ 7.259   µm
```

The "OK" symbol means the measurement is within the limits set; "NG" means it is not, in which case an arrow points to either the upper or lower limit in the printout.

Narrow space measuring function Patent pending in Japan

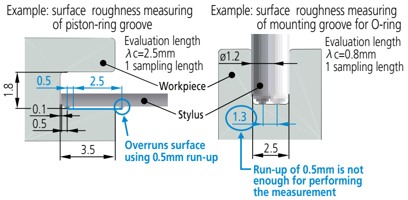
Surface roughness measurement requires a run-up distance before starting the measurement (or retrieving data). When the SJ-410 Series measures, its run-up distance is normally set to 0.5mm. This distance, however, can be shortened to 0.15mm using the narrow part measurement function (starting from the 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**



The run-up distance can be shortened to 0.15mm by measuring from the origin point.

Typical applications



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.

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.

Ra 0.411 µm

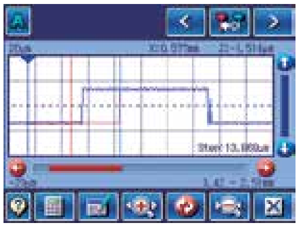
Pa 0.412 µm

Arbitrary sampling length setting

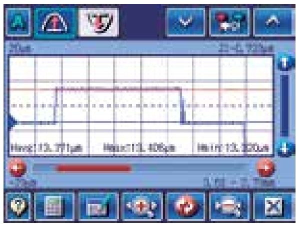
This function allows a sampling length to be arbitrarily set in 0.01mm increments (**SJ-411**: 0.1mm to 25mm, **SJ-412**: 0.1mm to 50mm). It also allows the **SJ-410** series to make both narrow and wide range measurements.

Simple contour analysis function

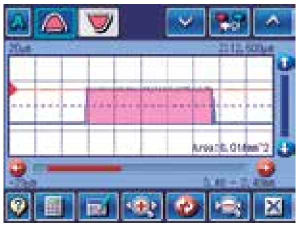
Point group data collected for surface roughness evaluation is used to perform simplified contour analysis (step, step height, area and coordinate variation). It assesses minute forms that cannot be assessed by a contour measurer.



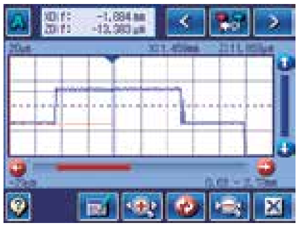
Step



Step volume



Dimensions



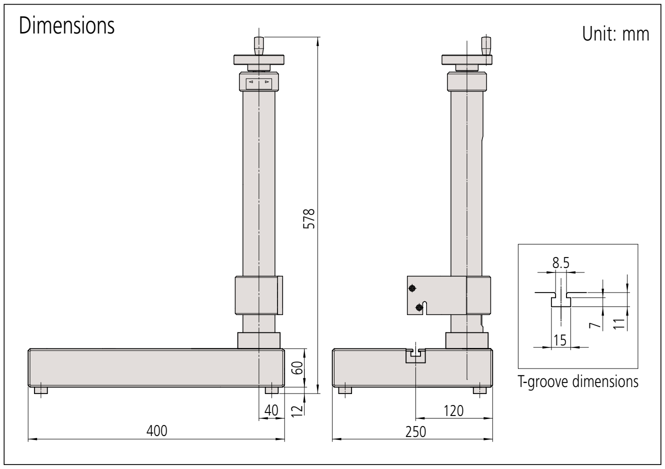
Coordinate difference

Optional Accessories

Simple column stand

Can be adjusted to match the height of the item to be measured.

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

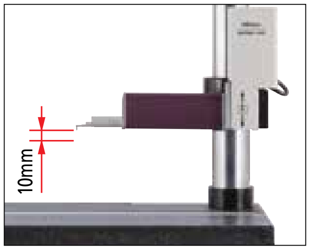


Options for simple column stand

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

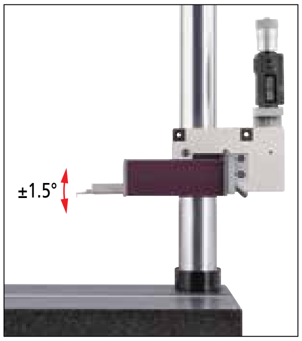
•Auto-set unit (178-010)*

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).

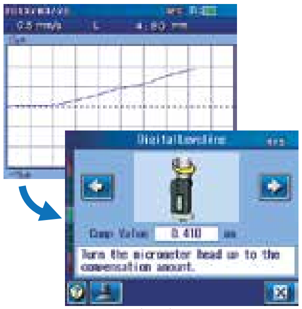


•Tilting adjustment unit (178-030)*

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.



Preliminary measurement

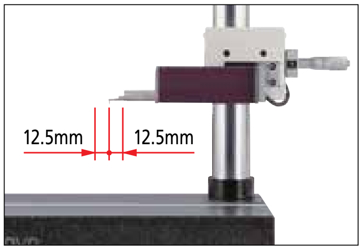


Turn the micrometer head up to the compensation amount.

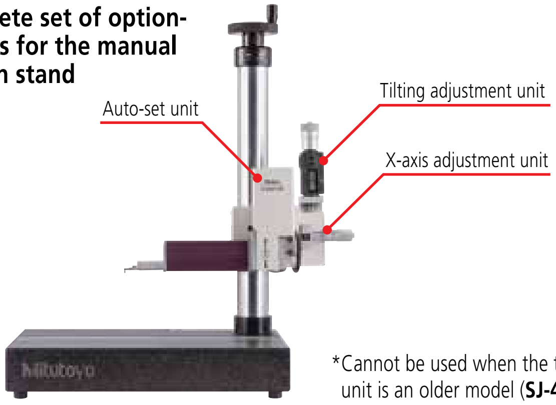
Tilt adjustment

•X-axis adjustment unit (178-020)*

This unit helps fine-tune the horizontal (X axis) direction.



Complete set of optional units for the manual column stand



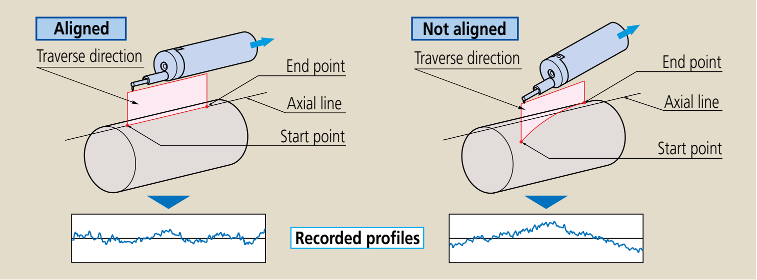
*Cannot be used when the tester's main unit is an older model (**SJ-401/402**).

3-axis Adjustment Table: 178-047

Patent registered in Japan, U.S.A.. Patent pending in Germany

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.

*V-block not included

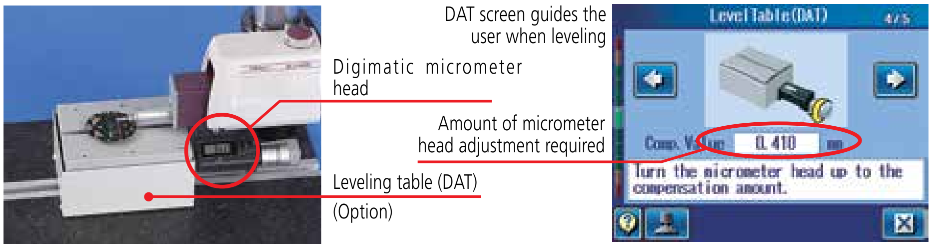


DAT Function for the optional leveling table

Patent registered in Japan, U.S.A.. Patent pending in Germany

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.

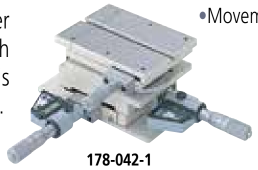
No.178-048
Inclination adjustment angle: ±1.5°
Table dimensions: 130×100mm
Maximum load: 15kg



Turn the micrometer head up to the compensation amount.

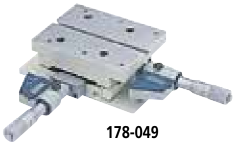
XY leveling tables

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**)



178-042-1

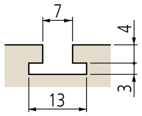
•Movement is in X- and Y-axes only.



178-049

Order No.	**178-042-1**(mm) **178-052-1**(inch) *with digital heads	**178-043-1**(mm) **178-053-1**(inch) *with analog heads	**178-049**(mm) **178-058**(inch/mm) *with digital heads
Table dimensions	130×100mm		
Maximum load	15kg		
Inclination adjustment angle	±1.5°		—
Swiveling angle	±3°		—
X/Y-axis travel range	±12.5mm	±12.5mm	±12.5mm
Resolution	0.001mm	0.01mm	0.001mm
Dimensions (WxDxH)	262×233×83mm	220×189×83mm	262×233×55mm
Mass	6.3kg	6kg	5kg

•T-groove dimensions

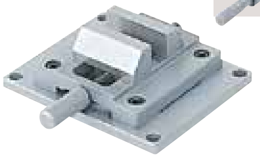


Unit: mm

Precision vise

•Fits on the stand.

Application



Order No.	178-019
Clamping method	Sliding jaws
Jaw opening	36mm
Jaw width	44mm
Jaw depth	16mm
Height	38mm

Cylinder attachment

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

No.12AAB358
Diameter: ø15~60mm

Configuration:
- Cylindrical measurement block
- Auxiliary block
- Clamp

*Drive unit not included.

Reference step specimen

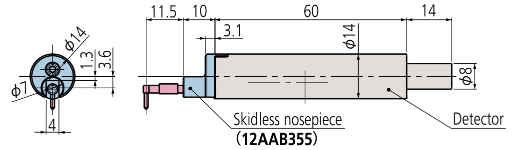
Used to calibrate detector sensitivity.

No.178-611
Step nominal values: 2μm/10μm

Optional Accessories: Detectors / Styli

Detectors

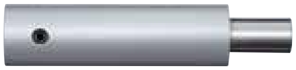
Unit: mm



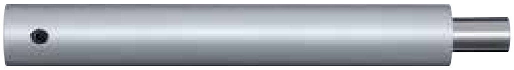
Order No.	Measuring force	
178-396-2	0.75mN	ISO-1997 and JIS-2001 compliant detectors
178-397-2	4mN	Detectors that comply with previous standards, for general use, etc.

Extension rods

- **12AAG202** Extension rod 50mm



- **12AAG203** Extension rod 100mm

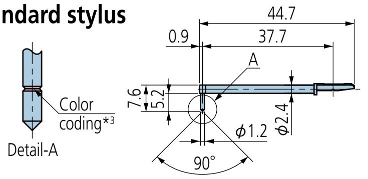


* No more than one extension rod can be connected.

Styli

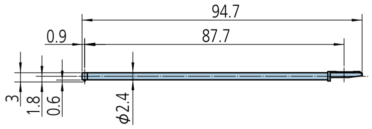
Unit: mm

Standard stylus



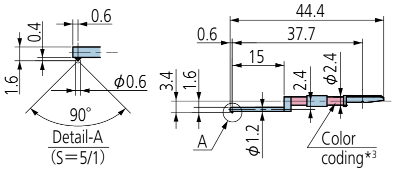
12AAE882 (1μm) *1
12AAE924 (1μm)
12AAC731 (2μm) *1
12AAB403 (5μm)
12AAB415 (10μm)
12AAE883 (250μm) *4
( ): Tip radius

Double-length for deep hole *2



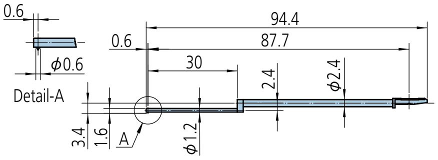
12AAE898 (2μm) *1
12AAE914 (5μm)
( ): Tip radius

For small hole



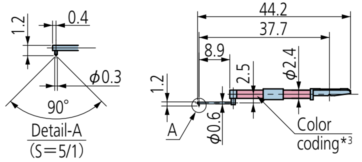
12AAC732 (2μm) *1
12AAB404 (5μm)
12AAB416 (10μm)
( ): Tip radius

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



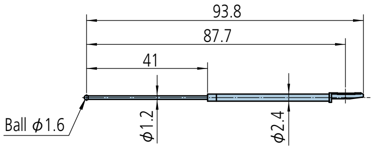
12AAE892 (2μm) *1
12AAE908 (5μm)
( ): Tip radius

For extra-small hole



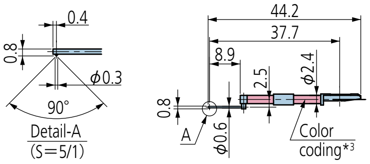
12AAC733 (2μm) *1
12AAB405 (5μm)
12AAB417 (10μm)
( ): Tip radius

For small hole *2 *4



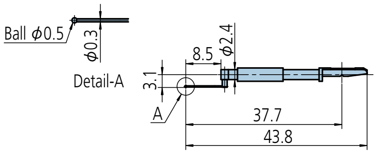
12AAE884 (ϕ1.6mm)
( ): Tip radius

For ultra-small hole



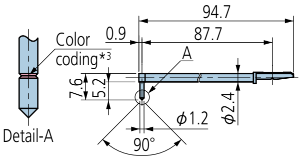
12AAC734 (2μm) *1
12AAB406 (5μm)
12AAB418 (10μm)
( ): Tip radius

For ultra-small hole *4

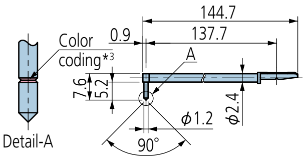


12AAJ662 (ϕ0.5mm)
( ): Tip radius

For deep hole (double-length and triple-length) *2

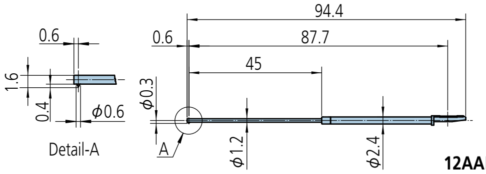


2X stylus
12AAC740 (2μm) *1
12AAB413 (5μm)
12AAB425 (10μm)
( ): Tip radius



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

For small slotted hole *2



12AAE938 (2μm) *1
12AAE940 (5μm)
( ): Tip radius

---

*1: Tip angle 60°

*2: For downward-facing measurement only.

*3:

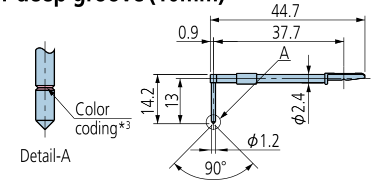
Tip radius	1μm	2μm	5μm	10μm	250μm
Color coding	White	Black	No color	Yellow	No notch or color

*4: Used for calibration, a standard step gauge (**No.178-611**, option) is also required

Styli

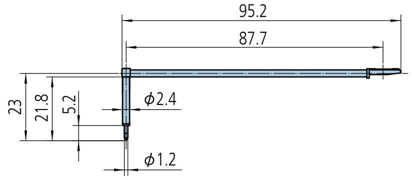
Unit: mm

For deep groove (10mm)



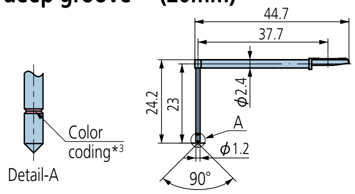
12AAC735 (2μm) *1
12AAB409 (5μm)
12AAB421 (10μm)
( ): Tip radius

For deep groove *2 (20mm)



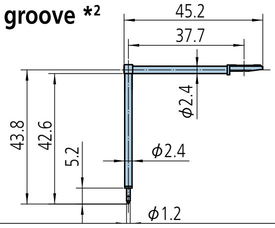
12AAE893 (2μm) *1
12AAE909 (5μm)
( ): Tip radius

For deep groove *2 (20mm)



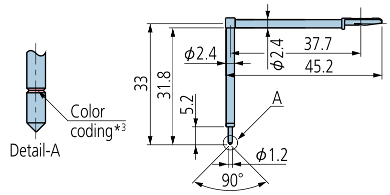
12AAC736 (2μm) *1
12AAB408 (5μm)
12AAB420 (10μm)
( ): Tip radius

For deep groove *2 (40mm)



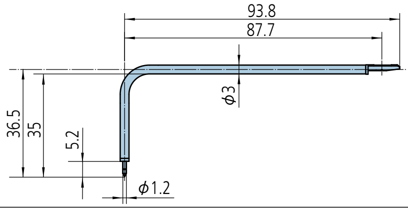
12AAE895 (2μm) *1
12AAE911 (5μm)
( ): Tip radius

For deep groove *2 (30mm)



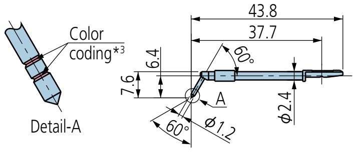
12AAC737 (2μm) *1
12AAB407 (5μm)
12AAB419 (10μm)
( ): Tip radius

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



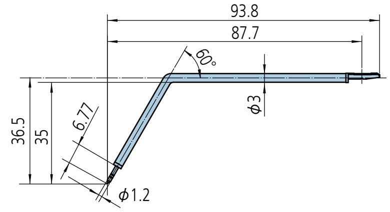
12AAE894 (2μm) *1
12AAE910 (5μm)
( ): Tip radius

For gear tooth



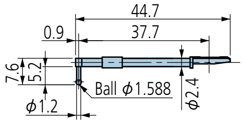
12AAB339 (2μm) *1
12AAB410 (5μm)
12AAB422 (10μm)
( ): Tip radius

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



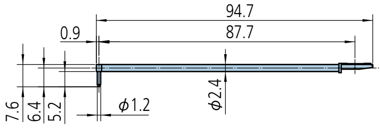
12AAE896 (2μm) *1
12AAE912 (5μm) *1
( ): Tip radius

For rolling circle waviness surface *4



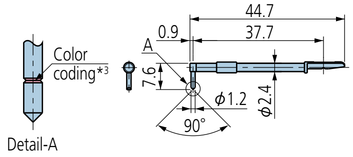
12AAB338 (ϕ1.588)
( ): Tip radius

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



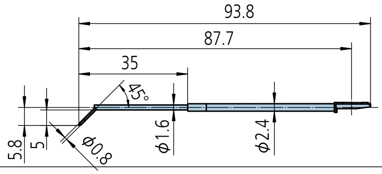
12AAE886 (250μm)
( ): Tip radius

For knife-edge *4



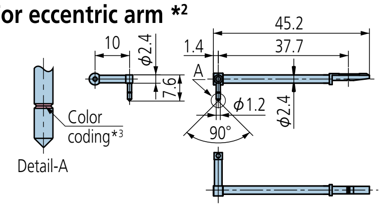
12AAC738 (2μm) *1
12AAB411 (5μm)
12AAB423 (10μm)
( ): Tip radius

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



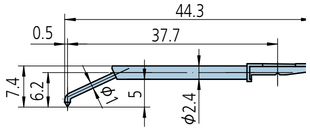
12AAE897 (2μm) *1
12AAE913 (5μm) *2
( ): Tip radius

For eccentric arm *2



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

For hole bottom



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

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*1: Tip angle 60°
*2: For downward-facing measurement only.
❊Customized special interchageable styli are available on request,
Please contact any Mitutoyo office for more information.

*3:

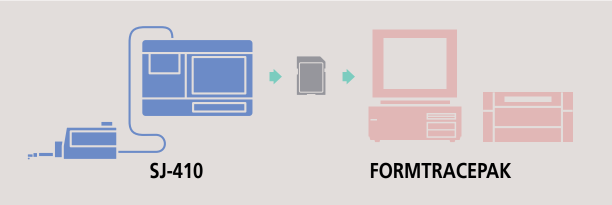
Tip radius	2μm	5μm	10μm
Color coding	Black	No color	Yellow

*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

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



Digimatic mini processor DP-1VR

By connecting this printer to the Surftest SJ-410's digimatic output, you can print calculation results, perform a variety of statistical analyses, draw a histogram or D chart, and also perform complicated operations for X-R control charts.

No.264-504 -5A

SJ-410 → DP-1VR Connecting cable
1m: **No.936937**
2m: **No.965014**

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.

U-WAVE-R
(Connects to the PC)
No.02AZD810D

U-WAVE-T *
(Connects to the SJ-410)
No.02AZD880D

*Requires the optional Surftest SJ-410 connection cable.
No.02AZD790D

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.com/about/contacting-mac/surftest-simple-communication-program/

CLICK HERE

Required environment*

- **OS:** Windows XP-SP3
  Windows Vista
  Windows 7
  Windows 8 (32/64bit)
- **Spreadsheet software:** Microsoft Excel 2002
  Microsoft Excel 2003
  Microsoft Excel 2007
  Microsoft Excel 2010/13

*Windows OS and Microsoft Excel are products of Microsoft Corporation.
*PC OS must be 32-Bits

The optional USB cable is also required.

- USB cable for SJ-410 series **No.12AAD510**

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.

USB-ITN-D
No.06ADV380D

USB keyboard signal conversion type*
IT-012U
No.264-012-10

*Requires the optional Surftest SJ-410 connection cable.
1m: **No.936937**
2m: **No.965014**

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**

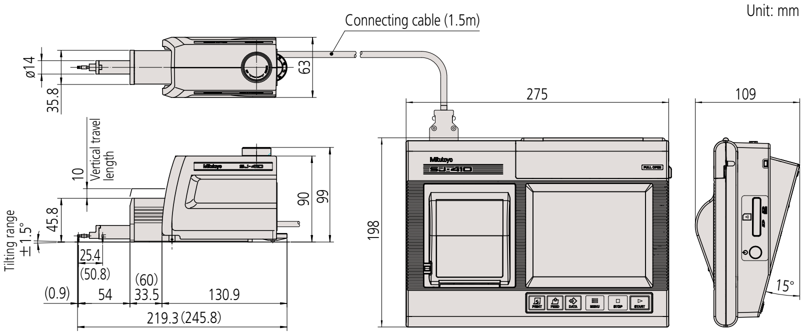
*micro SD card (with a conversion adapter to SD card)

Specifications

Model No.		SJ-411		SJ-412	
	inch/mm	**178-581-01A**	**178-581-02A**	**178-583-01A**	**178-583-02A**
Measuring range	X axis	25mm (1inch)		50mm (2inch)	
	Z1 axis (detector unit)	800μm, 80μm, 8μm *Up to 2,400μm with an optional stylus			
Detector	Measuring principle	Differential inductance			
	Resolution	0.01μm (800μm range) / 0.001μm (80μm range) / 0.0001μm (8μm range) 0.4μinch (32000μinch) / 0.04μinch (3200μinch) / 0.004μinch (320μinch)			
	Stylus tip	60°/2μm (80μinch)	90°/5μm (200μinch)	60°/2μm (80μinch)	90°/5μm (200μinch)
	Measuring force	0.75mN	4mN	0.75mN	4mN
	Radius of skid curvature	R40 mm (R1.57")			
	Measuring method	Skidded measurement / skidless measurement			
Drive unit: X-axis	Measuring speed	0.05, 0.1, 0.2, 0.5, 1.0mm/s (0.002, 0.004, 0.02, 0.04 inch/s)			
	Drive speed	0.5, 1, 2, 5mm/s (0.02, 0.04, 0.08, 0.2 inch/s)			
	Straightness	0.3μm / 25mm (12μinch/ 1inch)		0.5μm / 50mm (20μinch/ 2inch)	
Height-tilt adjustment unit	Height adjustment	10mm (0.39inch)			
	Tilt adjustment	±1.5°			
Standards		JIS1982 / JIS1994 / JIS2001 / ISO1997 / ANSI / VDA			
Parameters		Ra, Rq, Rz, Ry, Rp, Rv, Rt, R3z, Rsk, Rku, Rc, RPc, RSm, Rmax*[1], Rz1max*[2], S, HSC, RzJIS*[3], Rppi, RΔa, RΔq, Rlr, Rmr, Rmr(c), Rσc, Rk, Rpk, Rvk, Mr1, Mr2, A1, A2, Vo, λa, λq, Lo, Rpm, tp*[4], Htp*[4], R, Rx, AR, W, AW, Wx, Wte, Possible Customize			
Measured profiles		Primary, Roughness, DF, Filtered waviness curve, R-Motif, W-Motif			
Graph analysis		BAC and ADC curves			
Data compensation		Parabola/ Hyperbola/ Ellipse/ Circle/ Conic/ Tilting, Compensation off			
Filter		2CR, PC75, Gaussian filter			
Cut-off length	λc	0.08, 0.25, 0.8, 2.5, 8.0mm			
	λs *[5]	2.5, 8.0, 25mm (100, 320, 1000μinch)			
Sample length		0.08, 0.25, 0.8, 2.5, 8.0, 25.0mm			
Number of sampling lengths		×1, ×2, ×3, ×4, ×5, ×6, ×7, ×8, ×9, ×10, ×11, ×12, ×13, ×14, ×15, ×16, ×17, ×18, ×19, ×20			
Arbitrary length		0.1~25mm		0.1~50mm	
Functions	Customization	Desired parameters can be selected for calculation and display			
	Simple contour analysis function	Step, Step volume, Dimensions, Coordinate difference			
	DAT function	Helps to adjust leveling during skidless measurement			
	Real sampling function	Samples stylus displacement for a specified time without engaging detector traverse.			
	Statistical processing	Static measurement (max. 3 parameters) is possible. Static processing for MAX, MIN, AVERAGE, standard deviation, histogram and pass rate is possible			
	GO/ NG judgement*[6]	Max rule / 16% rule / Average rule / Standard deviation (1σ, 2σ, 3σ)			
	Storage functions	10 measuring conditions can be stored in internal memory			
	Printing function	Measurement conditions / Calculation results / GO / NG judgement result / Calculation results for each sampling length / Measurement curve / BAC / ADC / Environmental setting information			
	Display languages	Japanese, English, German, French, Italian, Spanish, Portuguese, Korean, Traditional Chinese, Simplified Chinese, Czech, Polish, Hungarian Turkish, Swedish, Dutch			
	Storage	Internal memory: Measurement condition (10 sets) Memory card (option): 500 measurement condition, 10000 measuring data, 10000 text data, 500 statistic data, 1 backup of machine setting, the last ten traces (Trace 10)			
	External I/O	USB I/F, Digimatic output, RS-232C I/F, External SW I/F			
Power supply	Battery	Two-way power supply: battery (rechargeable Ni-MH battery) and AC adapter *Charging time: about 4 hours (may vary due to ambient temperature) *Endurance: about 1500 measurements (differs slightly due to use conditions / environment)			
	Power consumption	50W			
Size (W×D×H)	Display unit	275×198×109mm (10.83×4.29×7.80inch)			
	Height adjustment unit	130.9×63×99mm (5.16×2.48×3.90 inch)			
	Drive unit	128×35.8×46.6mm (5.04×1.41×1.83 inch)		154.5×35.8×46.6mm (6.08×1.41×1.83inch)	
Mass	Display unit	1.7kg			
	Height adjustment unit	0.4kg			
	Drive unit	0.6kg		0.64kg	
Standard accessories		Detector*[7], Stylus*[8], Roughness specimen **270732** Printing paper **12BAL402** Touch-screen protection sheet **12BAG834** Touch pen **12AAN041** Carrying case AC adapter, Philips screwdriver, Strap for stylus pen, Operation manual, Quick reference manual, Warranty			

*1: Only for VDA/ANSI/JIS'82 standards.
*2: Only for JIS'97 standard.
*3: Only for JIS'01 standard.
*4: Only for ANSI standard.
*5: λs 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.178-396-2** or **No.178-397-2** is supplied as a standard accessory depending on the Order No. of the main unit for SJ-410 Series.
*8: The standard stylus (**No.12AAC731** or **No.12AAB403**), which is compatible with the detector supplied, is a standard accessory.

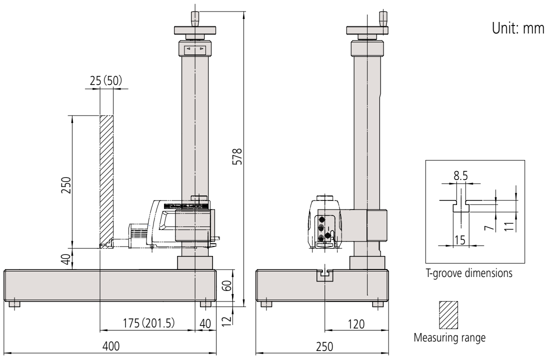
Unit: mm



*The dimensions in parentheses indicate those for **SJ-412**

E

For details see page 6.



*The dimensions in parentheses indicate those for **SJ-412**

Coordinate Measuring Machines

Vision Measuring Systems

Form Measurement

Optical Measuring

Sensor Systems

Test Equipment and Seismometers

Digital Scale and DRO Systems

Small Tool Instruments and Data Management

**Whatever your challenges are,
Mitutoyo supports you from start to finish.**

Mitutoyo is not only a manufacturer of top-quality measuring products but one that also offers qualified support for the lifetime of the equipment, backed by comprehensive services that ensure your staff can make the very best use of the investment.

Apart from the basics of calibration and repair, Mitutoyo offers product and metrology training, as well as IT support for the sophisticated software used in modern measuring technology. We can also design, build, test and deliver measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.