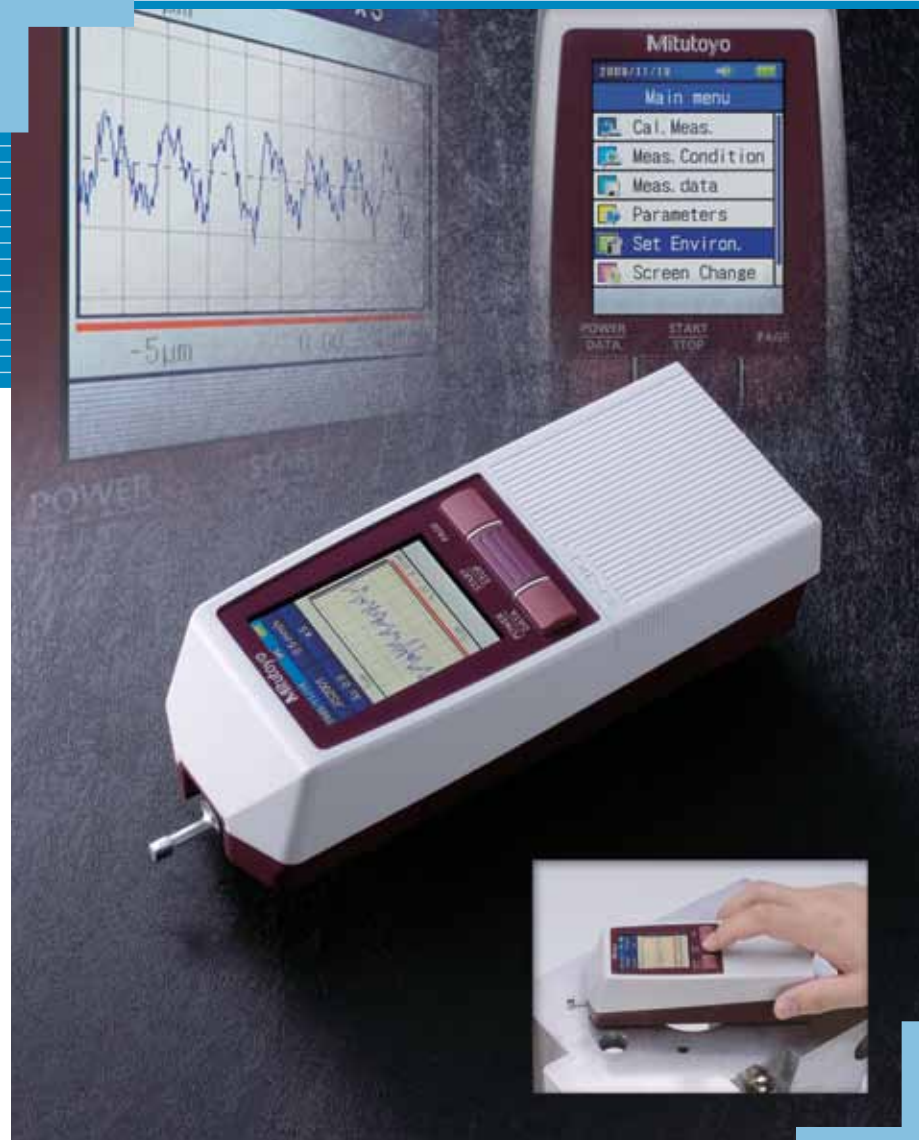


SURFTEST SJ-210

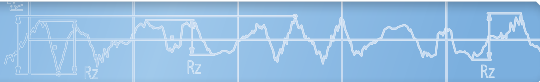


A small, lightweight, extremely easy-to-use surface roughness tester with colour LCD.

The SurfTest SJ-210 is a user-friendly surface roughness tester designed as a handheld tool that can be easily carried and used on site.



Easy to use



Colour-graphic LCD with backlight

The 2.4" colour screen provides excellent readability and an intuitive display for easy use of the extensive functionality, with the added convenience of a backlight for excellent visibility in poor light.

Simple key layout

The SurfTest SJ-210 is easily operated using the keys on the front of the unit and those under the sliding cover.

Highly functional



Advanced data storage capabilities

Up to 10 setups and one measured profile can be stored in the internal memory.

Optional memory card

An optional memory card can be used as an extended memory to store large numbers of measured profiles and setups.

Password protection

Access to each feature can be password-protected, which prevents unintended operation and enables settings to be protected.

Multilingual support

The display interface supports 16 languages, which can be freely switched.

Stylus alarm

An alarm warns when the cumulative measurement distance exceeds a preset limit, so that the stylus can be changed in good time before wear begins to adversely affect measurement.

Extensive analysis and display features



Complies with relevant industry standards

The SurfTest SJ-210 complies with the major VDA, ISO-1997, ANSI and Japanese standards applying to surface texture measurement.

Displays assessed profiles and graphical data

In addition to calculation results, the SurfTest SJ-210 can display sectional calculation results and assessed profiles, load curves, and amplitude distribution curves.



Mitutoyo

Surf

Colour-graphics display

Intuitive display that's clear, sharp, and legible.

Large, 2.4-inch LCD

The large screen provides excellent readability.

Backlight

The backlight improves visibility in poor lighting conditions.

Drive unit

The drive unit can be separated from the display unit by using the cable supplied, thus increasing flexibility in use. Separation and reattachment is simple.



There is a good choice of drive units and detectors available to suit almost any application.

Operation keys

- The keys on the front of the unit and under the sliding cover are clearly labelled for ease of use.
- The user-friendly screen layout and arrow keys provide intuitive operation.
- Displayed settings can be changed easily by using the left and right arrow keys.
- Infrequently used keys are hidden under the sliding cover to discourage unintended operation.

Battery

The battery charges in one quarter the time of previous Mitutoyo products.



Applicable standards

In addition to ISO, ANSI and VDA, the Surftest SJ-210 also complies with JIS standards.

Standard
JIS1982
JIS1994
JIS2001
ISO1997
ANSI
VDA

Multilingual support

The display interface supports 16 languages.

Select Language
日本語
English
Deutsch
Français
Italiano
Español

High-speed USB communication

Data can be transferred to and from a computer via the high-speed USB interface.



Memory card support

The memory-card slot enables large quantities of data to be conveniently stored.

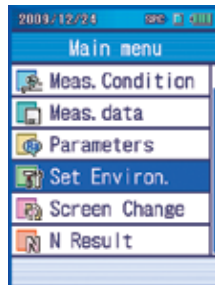


test SJ-210

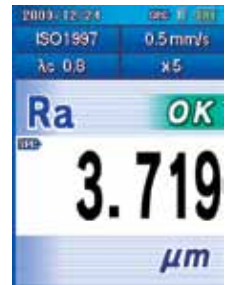
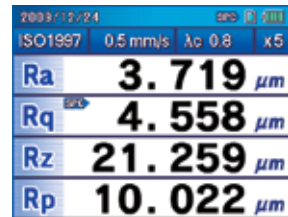
Many features in a compact form

Extensive display features that assist measurement

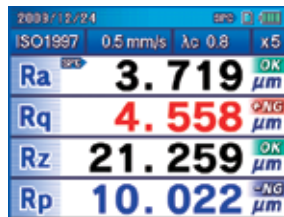
- The highly visible LCD with backlight ensures good screen visibility even in poor ambient lighting.



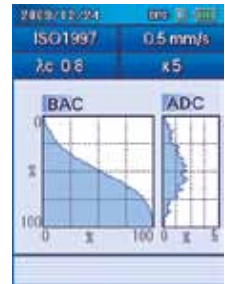
- The display mode can be freely switched between portrait and landscape.
- Calculation results are displayed in large characters.



- Pass/fail results are displayed in colour for easy assimilation.

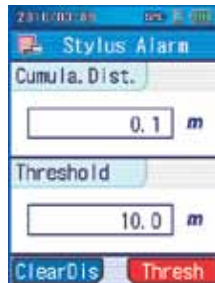


- Assessed profiles, load curves, and amplitude distribution curves can be displayed in addition to calculation results.
- Assessed profiles can also be zoomed up and down.



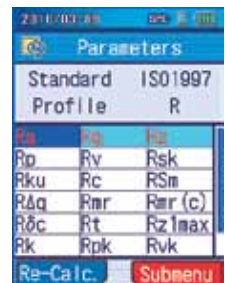
Stylus alarm function

- An alarm warns when the cumulative stylus travel exceeds a preset limit. This feature can be used to avoid problems caused by worn-out styli. Any value can be specified as the limiting distance.



Setting parameters and recalculating results

- The required parameters can be selected from the screen. The sub-menu also lets you specify detailed settings such as the tolerance. After completing measurement, the parameters can be changed and calculation can be executed again, using the new parameters*.



*May not be possible, depending on the setup.

Easy setting

- Displayed settings can be easily changed by pressing the left and right arrow keys under the sliding cover. For example, these keys can be used to switch the cut-off value (λ_c) and the number of sampling lengths (N) on the measurement screen.



Advanced features

- The multilingual display interface supports 16 languages, which can be freely switched.
- Access to functions can be password-protected.
- The battery is a quick charge, long life type.

Advanced data storage capabilities

- Interface options: RS-232C output, Digimatic output, printer output, and footswitch input.
- Up to 10 setups can be stored in the internal memory, and these are quickly retrievable as they are each associated with a specific workpiece.
- The memory card* slot enables practically unlimited expansion of the data memory capability.

*See page 9 for details of compatible memory cards.

Storage Capacity

Data type	Internal memory	Memory card (option)
Measured profiles	1	10,000
Calculation result	10	
Setups	10	



Detector/drive units

Battery-powered portability scores when making surface roughness measurements on the shop floor.

Measurements in any orientation can be performed, even upside down. Optional accessories*, such as a height gauge adapter, allow efficient measurement in almost any situation.

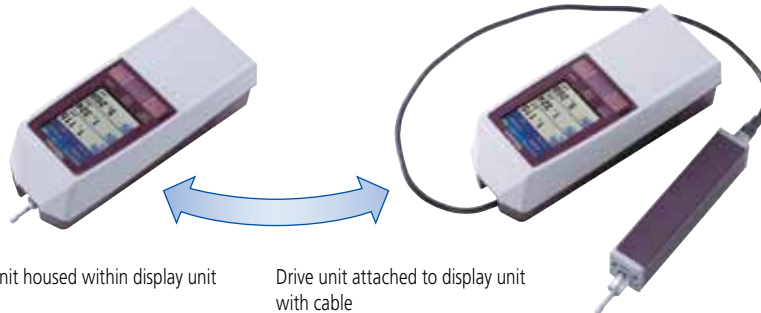
*See pages 8 to 10 for details of the optional accessories available.



The detector, drive unit and display combination means versatility.

Highly capable detectors and drive units

The drive unit can be separated from the display unit and reattached via the cable supplied very easily.



Drive unit housed within display unit

Drive unit attached to display unit with cable

Standard detector



One of two types may be selected:

1. Measuring force: 0.75 mN
Stylus profile: Tip radius 2 μm
Tip angle 60°
2. Measuring force: 4 mN
Stylus profile: Tip radius 5 μm
Tip angle 90°

Drive units

Standard drive unit

Popular standard drive unit.



Transverse tracing drive unit

Best suited for measurement of narrow, shrouded workpiece features such as crankshaft bearings, EDM parts, etc.



Retractable drive unit

The detector is in the retracted position at rest so it is immune from damage when inserted into a feature whose profile cannot be easily seen, such as a blind hole, etc.



Optional detectors

- A wide range of optional detectors* is available, including detectors for small holes, extra small holes, gear tooth surfaces, and deep grooves.

*See page 7 for details on the detectors.

Carrying case

- A convenient carrying case is supplied as standard for protecting the instrument in the field.



Specifications

Model (Type of detector)	Standard drive unit type		Retractable drive unit type		Transverse tracing drive unit type				
	SJ-210 0.75 mN type	SJ-210 4 mN type	SJ-210 0.75 mN type	SJ-210 4 mN type	SJ-210 0.75 mN type	SJ-210 4 mN type			
Order No.	inch/mm		178-561-01	178-561-02	178-563-01	178-563-02	178-565-01	178-565-02	
Measuring range	X axis	17.5 mm				5.6 mm			
	Z axis (detector)	Range	360 µm (-200 µm to +160 µm)						
		Range/resolution	360 µm/0.02 µm, 100 µm/0.006 µm, 25 µm/0.002 µm						
Measuring speed			Measuring: 0.25 mm/s, 0.5 mm/s, 0.75 mm/s		Returning: 1 mm/s				
Measuring force/stylus tip			0.75 mN type: 0.75 mN/2 µm R 60°, 4 mN type: 4 mN/5 µm R 90°						
Skid force			Less than 400 mN						
Applicable standards			ISO '97/ANSI/VDA/JIS '82/JIS '94/JIS '01						
Assessed profiles			Primary profile/roughness profile/DF profile/roughness profile-Motif						
Evaluation parameters			Ra, Rc, Ry, Rz, Rq, Rt, Rmax, Rp, Rv, R3z, Rsk, Rku, Rc, Rpc, Rsm, Rz1max, S, HSC, RzJIS, Rppi, RΔa, RΔq, Rlr, Rmr, Rmr(c), Rδc, Rk, Rpk, Rvk, Mr1, Mr2, A1, A2, Vo, Rpm, tp, Htp, R, Rx, AR, custom						
Analysis graphs			Bearing area curve/amplitude distribution curve						
Filters			Gaussian, 2CR75, PC75						
Cut-off length	λ_c		0.08, 0.25, 0.8, 2.5 mm						
	λ_s		2.5, 8 µm						
Sampling length			0.08, 0.25, 0.8, 2.5 mm						
Number of sampling lengths (xn)			x1, x2, x3, x4, x5, x6, x7, x8, x9, x10, arbitrary length (0.3 to 16.0 mm: 0.01 mm interval)			x1, x2, x3, x4, x5, x6, x7, x8, x9, x10, arbitrary length (0.3 to 5.6 mm: 0.01 mm interval)			
LCD dimensions			36.7 x 48.9 mm						
Display languages			English, Chinese (simplified or traditional), Czech, Dutch, German, French, Hungarian, Italian, Japanese, Korean, Polish, Portuguese, Spanish, Swedish, Turkish						
Calculation result display	Vertical		1 parameter/3 parameter/trace to measurements						
	Horizontal		1 parameter/4 parameter/trace to measurements (horizontal display is invertable)						
Printing function *1 (A separate dedicated printer is required)			Setups/calculation results/calculation results for each sampling length/assessed profile/ bearing area curve/amplitude distribution curve/environment setting information						
External I/O			USB I/F, digimatic output, printer output, RS-232C I/F, foot SW I/F						
Functions	Customization		Desired parameters can be selected for calculation and display						
	GO/NG judgement*2		By maximum value/16%/standard deviation						
	Storage of setup		Save the conditions at power OFF						
	Internal memory		Setups (10 sets), measured profile (1 set)						
Storage		Memory card (optional accessory)		500 setups, 10000 measured profiles, 500 display images, text file (setups/measured profile/assessed profile/bearing area curve/amplitude distribution curve)					
Calibration		Auto-calibration with the entry of numerical value/average calibration with multiple measurement (maximum 5)							
Power-saving			Auto-sleep function (10-600 sec)*3						
Power supply			Two-way power supply: battery (rechargeable Ni-MH battery) and AC adapter Note 1: charging time approximately 4 hours (may vary due to ambient temperature) Note 2: endurance approximately 1000 measurements (depends slightly on usage/environment)						
Size (W x D x H)	Display unit		52.1 x 65.8 x 160 mm						
	Drive unit		115 x 23 x 26 mm						
Mass			Approximately 500 g (display unit + drive unit + standard detector)						
Standard accessories			12BAA303 Connecting cable**4 12BAK699 Carrying case 12BAK700 Calibration stage 178-601 Roughness specimen Protective sheets for display, AC adapter, operation manual, quick reference manual, warranty			12BAA303 Connecting cable**4 12AAE643 Point-contact adapter 12AAE644 V-type adapter 12BAK699 Carrying case 12BAK700 Calibration stage 178-605 Roughness specimen Protective sheets for display, AC adapter, operation manual quick reference manual, warranty			

*1: Order the SJ-210 printer (178-421, optional accessory) separately. See page 9 for details on printer.

*2: Standard deviation only can be selected in ANSI. 16% rule cannot be selected in VDA.

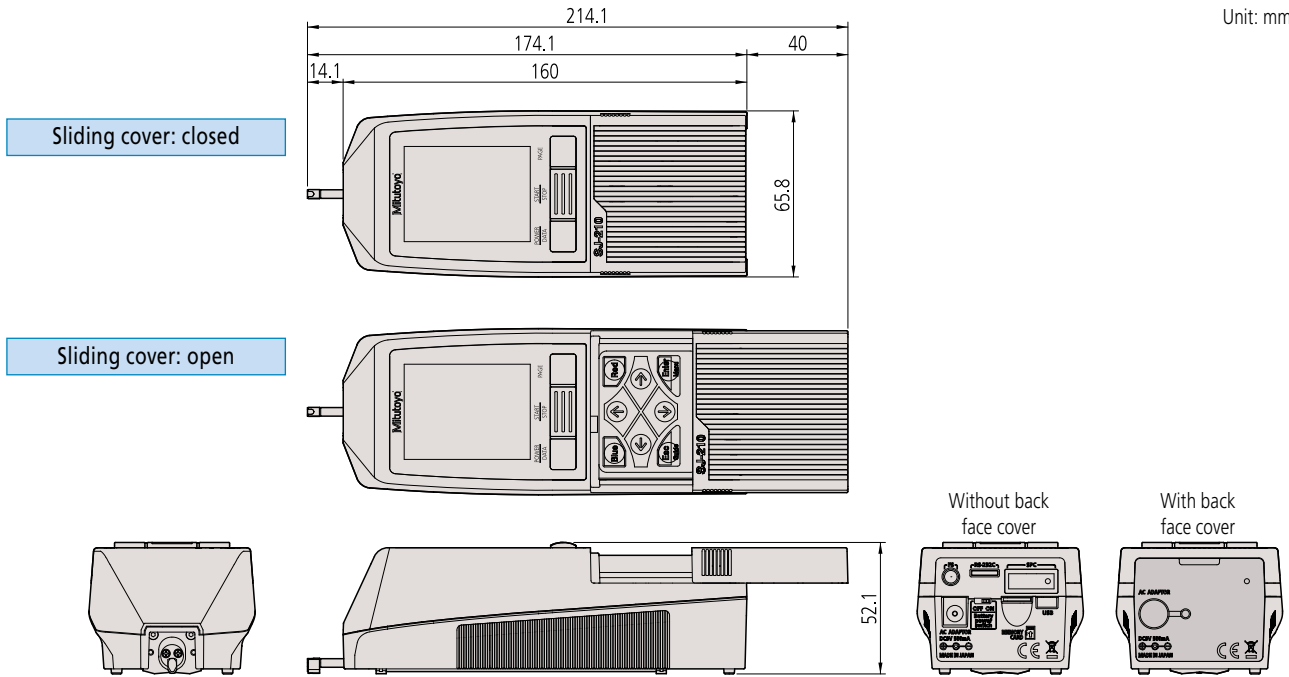
*3: Auto-sleep function is inoperative when the AC adaptor is used.

*4: For connecting the calculation display unit and drive unit.

Dimensions: display unit and drive unit

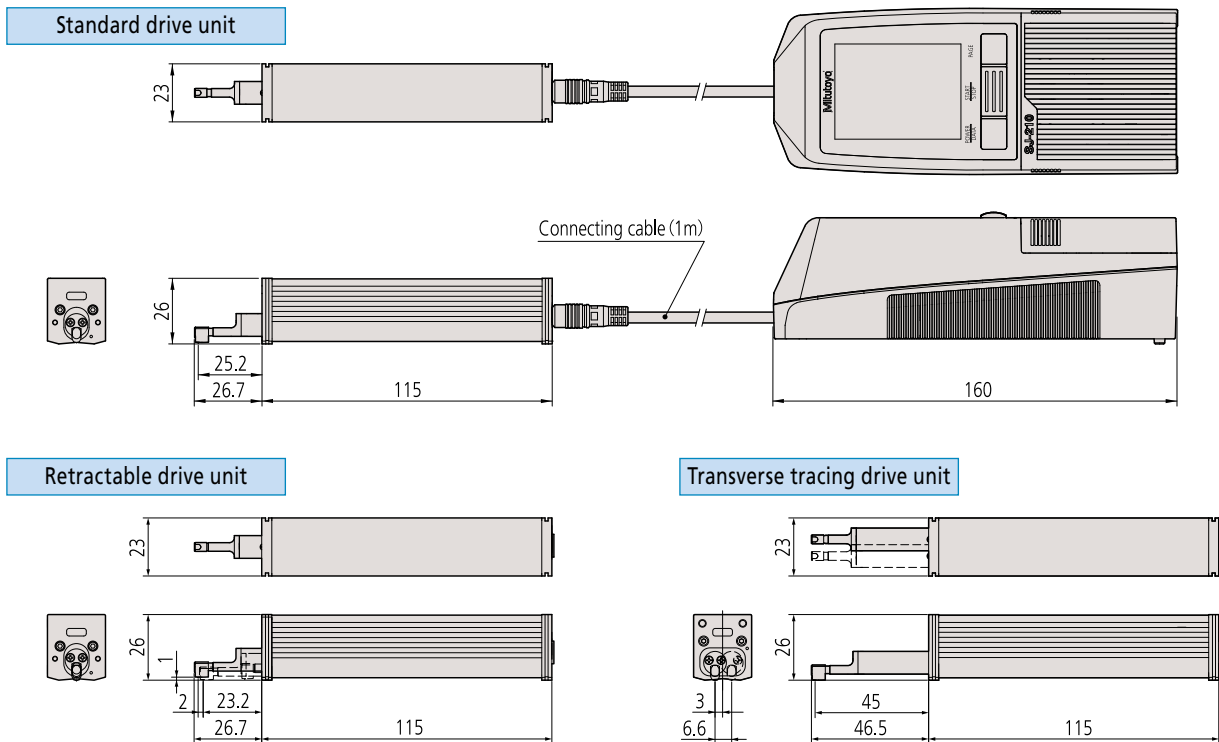
Drive unit housed inside display unit (standard detector installed in drive unit)

Unit: mm



Drive unit not housed inside display unit (standard detector installed in drive unit)

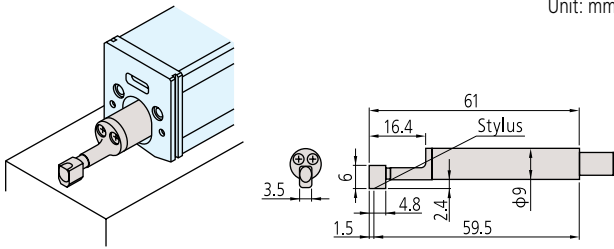
Unit: mm



Dimensions: detectors

Standard detectors

Unit: mm

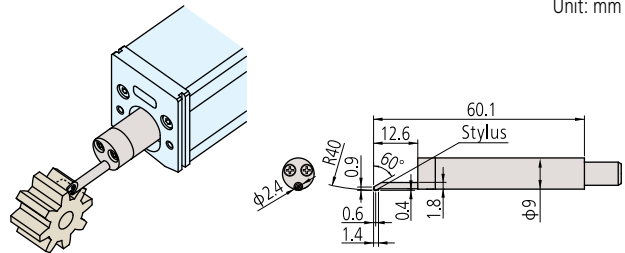


Order No.	Measuring force	Stylus profiles*	Remarks
178-296	0.75 mN	2 μm R/60°	Dedicated to the standard/retractable drive units
178-390	4 mN	5 μm R/90°	
178-387	0.75 mN	2 μm R/60°	Dedicated to the transverse tracing drive unit
178-386	4 mN	5 μm R/90°	
178-391	4 mN	10 μm R/90°	Dedicated to the standard/retractable drive units

*Tip radius/angle

Gear-tooth surface detectors

Unit: mm

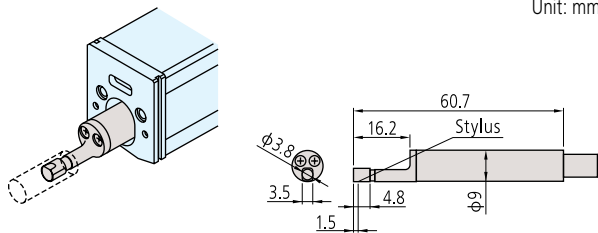


Order No.	Measuring force	Stylus profiles*
178-388	0.75 mN	2 μm R/60°
178-398	4 mN	5 μm R/90°

*Tip radius/angle

Small hole detectors

Unit: mm

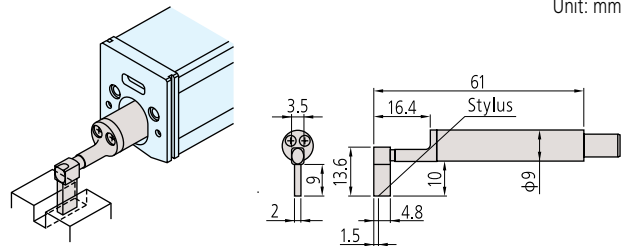


Order No.	Measuring force	Stylus profiles*	Remarks
178-383	0.75 mN	2 μm R/60°	Minimum measurable hole: ϕ 4.5 mm
178-392	4 mN	5 μm R/90°	

*Tip radius/angle

Deep groove detectors

Unit: mm

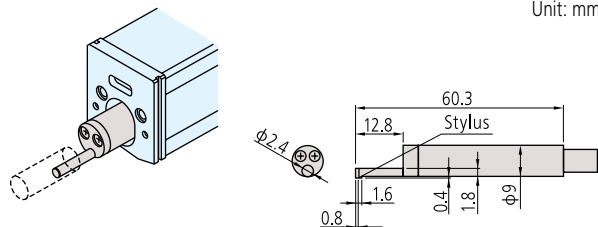


Order No.	Measuring force	Stylus profiles*	Remarks
178-385	0.75 mN	2 μm R/60°	Not available for the transverse tracing drive unit
178-394	4 mN	5 μm R/90°	

*Tip radius/angle

Extra small hole detectors

Unit: mm



Order No.	Measuring force	Stylus profiles*	Remarks
178-384	0.75 mN	2 μm R/60°	Minimum measurable hole: ϕ 2.8 mm
178-393	4 mN	5 μm R/90°	

*Tip radius/angle

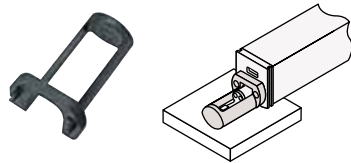


Optional accessories: drive unit

Nosepiece for flat surfaces

12AAA217

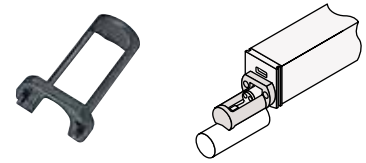
Not usable with the transverse tracing drive unit.



Nosepiece for cylindrical surfaces

12AAA218

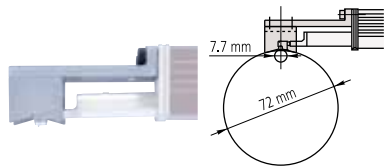
Not usable with the transverse tracing drive unit.



V-type adapter

12AAE644

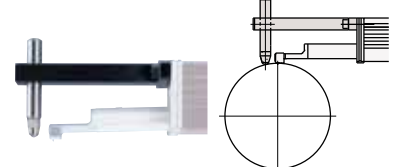
A transverse tracing drive unit standard accessory. Dedicated to the transverse tracing drive unit.



Point-contact adapter

12AAE643

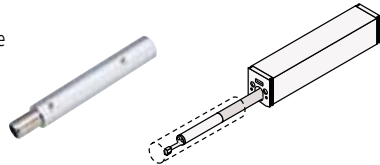
A transverse tracing drive unit standard accessory. Dedicated to the transverse tracing drive unit.



Extension rod (50 mm)

12AAA210

Not usable with the transverse tracing drive unit. Only one rod may be used at any one time.



Extension cable (1 m)

12BAA303

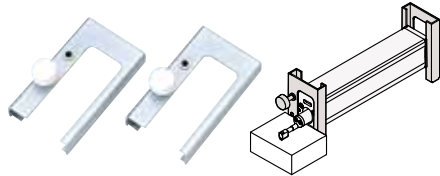
For connecting between calculation display unit and drive unit. Only one cable may be used at any one time.



Support feet set

12AAA216

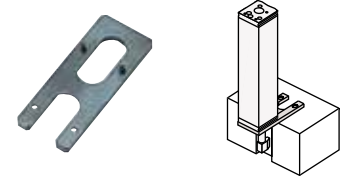
Not usable with the transverse tracing drive unit.



Vertical positioning adapter

12AAA219

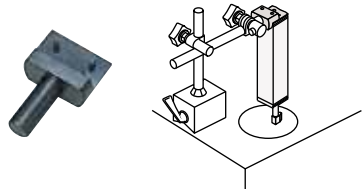
Not usable with the transverse tracing drive unit.



Magnetic stand adapter

12AAA221 (ø8 mm)

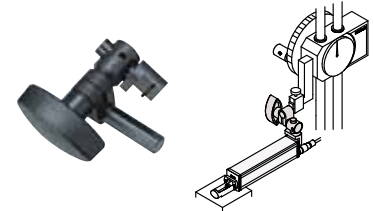
12AAA220 (ø9.5 mm)



Nosepiece for cylindrical surfaces

12AAA222 (9 x 9 mm)

12AAA233 (1/4" x 1/2")



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. (Not available for the transverse tracing drive unit.)

V type

178-033

The V-width is adjustable to the cylinder diameter facilitating axial measurement of a wide range of cylinder diameters. Adjustable range: ø5-150 mm



Magnetic slider type

178-034

The magnetic frame allows taking hands-free measurement on an inclined surface of a magnetizable workpiece.



Inside diameter type

178-035

Greatly facilitates measurement of internal wall surfaces of, for example, a cylinder block. Applicable dia.: 75-95 mm Accessible depth: 30-135 mm



Optional accessories: external equipment

Digimatic mini processor DP-1VR

264-504

This processor can be used to 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.



SJ-210 to DP-1VR connecting cables:

936937 (1 m)

965014 (2 m)

Memory card

12AAL069

A memory card* for saving up to 500 setups, 1000 measured profiles, 500 display images, text files (setups, measured profiles, assessed profiles, BAC, ADC).



Not all memory cards are recognized. Please use the memory card recommended by Mitutoyo.

Printer

178-421

This palm-sized printer (WxDxH: 93x125x70 mm) can run on an internal battery to print assessed profiles, calculation results and curves.

- Powered by AC adapter or battery pack.
- Printable items: Setups, calculation results, assessed profiles, bearing area curves (BAC), amplitude distribution curves (ADC), and environment settings.

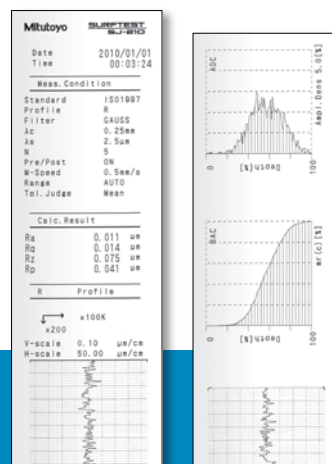


Unit configuration:

- Printer main unit
- Printer connecting cable
- Printing paper 6-pack
- Battery pack
- Exclusive use AC adapter



Examples of printer output



Printer paper (5-pack):
12AAA876

Optional accessories: external output

Simplified communication program for SURFTEST SJ series

The Surfptest SJ-210 is equipped with a USB interface, enabling data to be transferred to spreadsheet or other software. A program that enables inspection record tables to be created using a Microsoft Excel* macro is also provided.

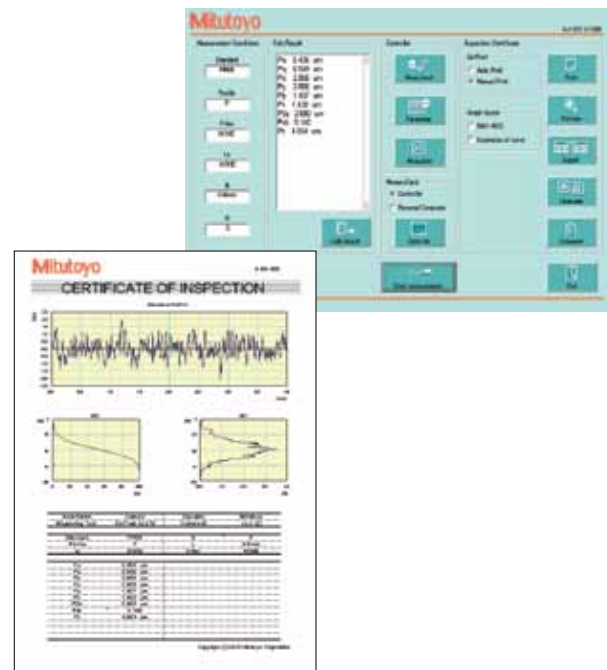
Required environment*

- OS:
 - Windows 2000 SP4
 - Windows XP
 - Windows Vista
 - Windows 7
- Spreadsheet software:
 - Microsoft Excel 2000
 - Microsoft Excel 2002
 - Microsoft Excel 2007

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

USB cable:
12AAL068 (2 m)

This program can be downloaded FREE of charge from
www.mitutoyo.co.uk



Footswitch

12AAJ088

A footswitch can be used to trigger measurement. This tool is very useful in cases where the same type of workpiece is measured multiple times, often using a fixture for alignment.



Input tool

USB keyboard signal conversion model:

IT-012U (264-012-10)

PS/2 keyboard signal conversion model:

IT-005D (264-005)

Calculation results can be loaded directly into commercial spreadsheet software via this unit simply by connecting it from the SJ-210 to the USB connector on a computer or a PS/2 type keyboard connector.



Protective sheet for the display

12AAL066

Protective sheet for the colour LCD (5-pack).

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	=====

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