

# NEW PRODUCT INFORMATION

## 攜帶式表面粗糙度儀 Surftest SJ-210

新Surftest® SJ-210

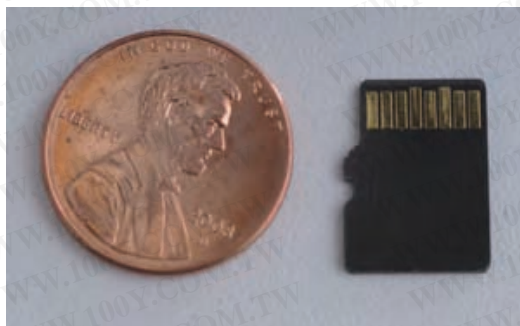
攜帶式表面粗糙度儀結合高精度和量測速度等眾多的創新，在表面檢驗中創建一個新的卓越領導特點。



## 最美麗的蛻變 SJ-210新誕生



- 2.4"彩色液晶顯示螢幕，包括背光照明和特大字體。
- 顯示方向可依左、右手操作習慣，改變為垂直或橫向讀取。
- 彩色公差判斷，評價曲線與所有數據皆可以16種語言顯示。
- 支援定時測量功能。
- 支援密碼鎖保護功能。



- 微型SD卡支援大容量可攜式數據儲存  
- 可儲存高達 10,000筆結果
- 記憶卡也支援螢幕資訊

- 可選擇腳踏開關取代觸控螢幕量測
- 多樣的輸出選擇，包括RS-232C與USB

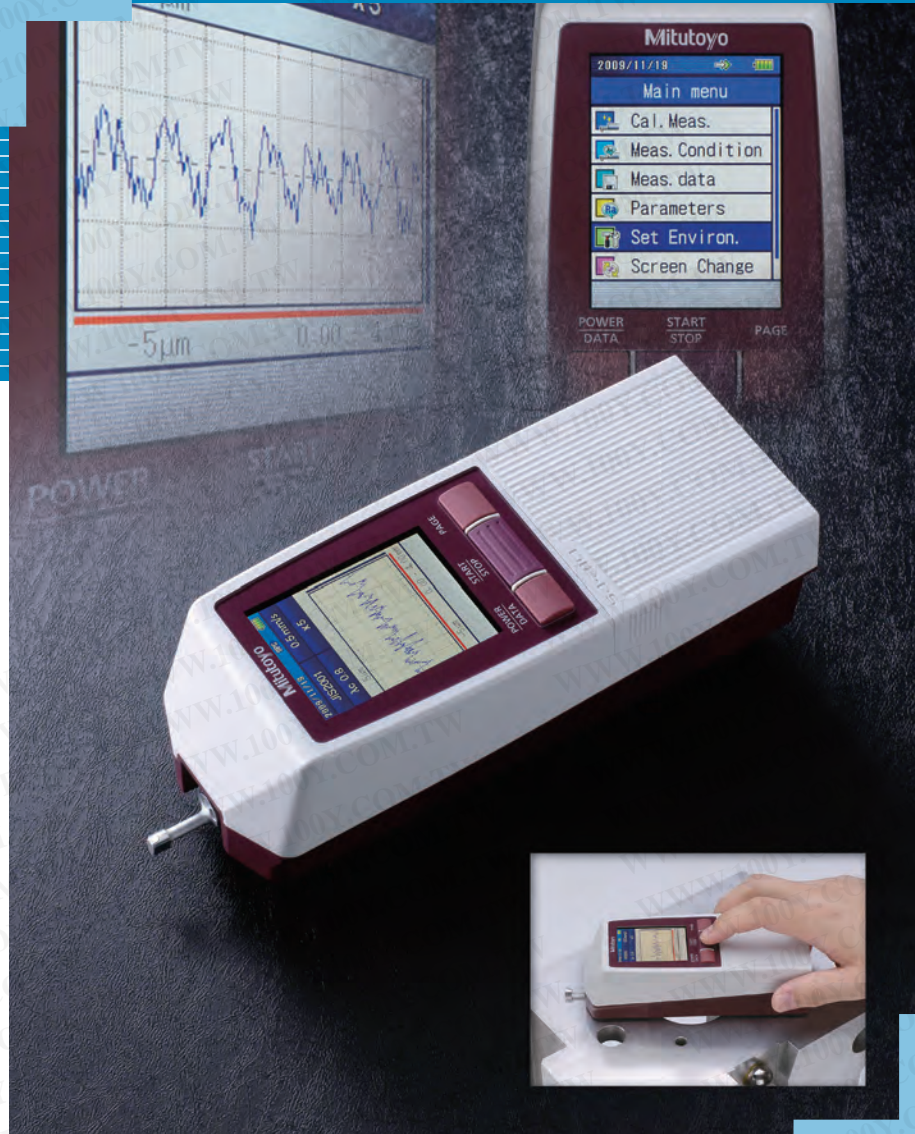
## 主要規格

型號		SJ-210
Order No.		0.75mN type 178-561-01A
量測範圍	X軸	17.5mm (5 inch*含前/後助足)
	Z軸	14200µin (-7900 µin~+6300 µin) [360 µm (-200 µm~+160 µm)]
追蹤速度	量測速度	.01, .02, .03 in/s (0.25, 0.5, 0.75 mm/s)
	回饋速度	.04 in/s (1 mm/s)
檢出器	測針尖端半徑	2 µm
	最小範圍/解析度	1000 µin / .08 µin (25 µm / 0.002 µm)
	量測曲線	輪廓曲線 (P), 粗糙曲線 (R), DF 曲線, R-Motif
顯示部	評價參數	Ra, Rq, Rz, Ry, Rv, Rt, R3z, Rsk, Rku, Rc, RPC, RSm, Rmax*1 Rz1max, S, HSC, RzJIS*2, Rppl, RΔa, RΔq, RΔr, Rmr, Rmr(c), Rc, Rk, Rpk, Rvk, Mr1, Mr2, A1, A2, Vo, Rpm, tp, Htp, R, Rx, AR
	GONG評斷	最大值 / 16% / 標準差
	樣本長度	.003, .01, .03, .1in (0.08, 0.25, 0.8, 2.5 mm)
	區間數	x1, x2, x3, x4, x5, x6, x7, x8, x9, x10, 任意長度
	濾波	2CR75 / PC75 / Gaussian
	顯示語言	16種語言 (含繁體中文)
	自動休眠功能	10-600 sec (自動休眠裝置當使用AC適配器時無效)
	輸入/輸出	USB, SPC, 印表機輸出, RS-232C, 腳踏開關, MicroSD
	LCD規格	2.4" 彩色 TFT, 背光 (320 x 240 pixels)
	粗糙度標準	JIS'82, JIS'94, JIS'01, ISO, ANSI, VDA
測量結果顯示	垂直, 水平 (可轉換), 曲線, 圖形, 數值	
內置電池 (鋰電)	充分充電約4小時 (約可測1,000次)	

※本DM僅供參考，詳細內容及規格依本公司正式公告之型錄為準

# Portable Surface Roughness Tester SURFTEST SJ-210 Series

Bulletin No. 2140



This is it! A small, lightweight, and extremely easy to use surface roughness measurement instrument that lets you view surface roughness waveforms right on the color LCD screen.

- Registered design in Japan, China, and the European Union.
- Design registration pending in the United States of America.

**Mitutoyo**

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



### Easy to use

#### 2.4-inch color graphic LCD with backlight

The color LCD provides excellent readability and an intuitive display that's easy to negotiate.

The LCD also includes a backlight for improved visibility in dark environments.

#### Simple key layout

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

### Highly functional

#### Advanced data storage capabilities

Up to 10 measurement conditions 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 quantities of measured profiles and conditions.

#### Password protection

Access to each feature can be password-protected, which prevents unintended operations and allows you to protect your settings.

#### Multilingual support

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

#### Stylus alarm (patent pending in Japan)

An alarm warns you when the cumulative measurement distance exceeds a preset limit.

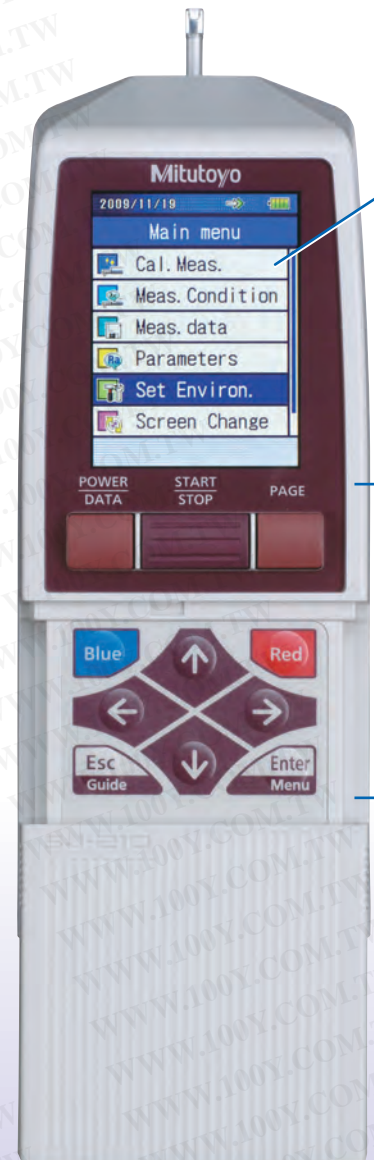
### Extensive analysis and display features

#### Complies with many industry standards

The SurfTest SJ-210 complies with the following standards: JIS (JIS-B0601-2001, JIS-B0601-1994, JIS B0601-1982), VDA, ISO-1997, and ANSI.

#### 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.



平均線

Mitutoyo

Surf

### Color graphic LCD

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

### Large, 2.4-inch LCD

The large LCD provides excellent readability.

### Backlight

The backlight improves visibility in dark environments.

### Operation keys

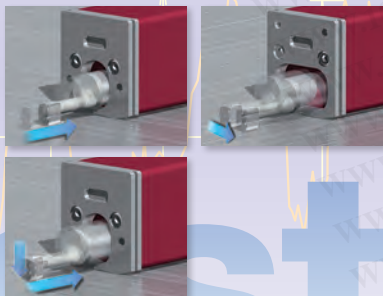
- The keys on the front of the unit and under the sliding cover are well-labeled and easy to use.
- The user-friendly screen layout and arrow keys provide intuitive operability.
- Displayed settings can be changed easily by using the left and right arrow keys. (Patent pending in Japan.)
- Infrequently used keys are hidden under the sliding cover to prevent unintended operations.

### Drive unit

The drive unit can be separated from the display unit by using a cable, allowing more flexible measurement. The driver can be separated and reattached in one simple step.

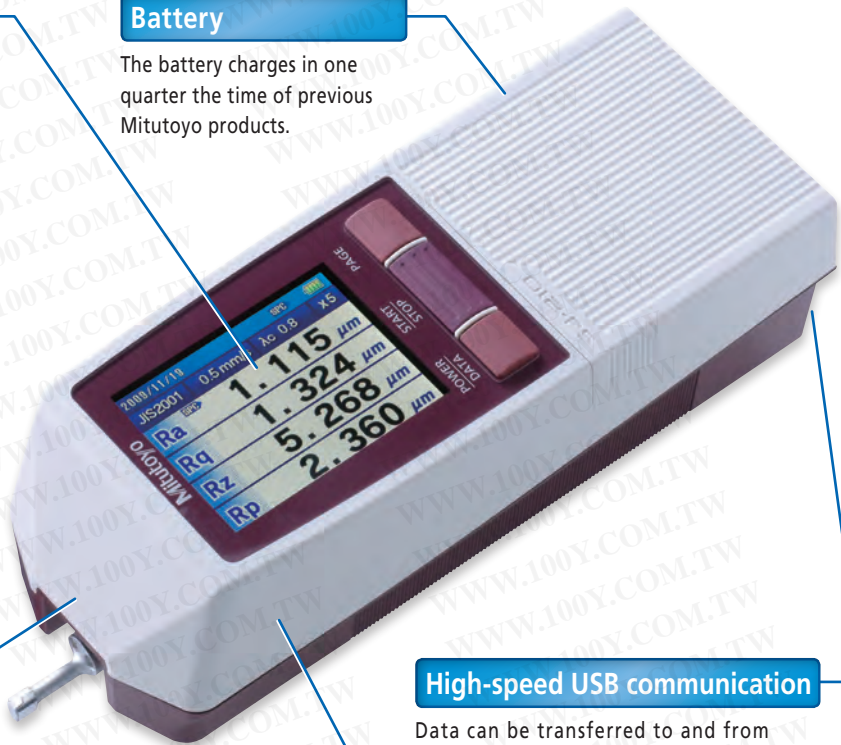


There are many different kinds of drive units and detectors available.



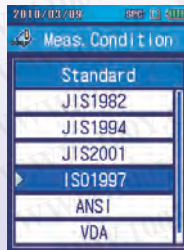
### Battery

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



### Applicable standards

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



### Multilingual support

The display interface supports 16 languages.



### 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 lets you store large amounts of data onto a memory card.



# test SJ-210



# Detector / Drive Units

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

Capable of performing measurements in any orientation, including vertical and upside-down. Optional accessories, such as a height gage adapter, allow measurements to be performed efficiently in various situations and setups.

\*Refer to pages 8 to 11 for details of the optional accessories available.



## A wide variation in system setup is possible with the detector + drive unit + display unit combination.

### Highly functional detectors and drive units

The driver can be separated from the display unit and reattached in one easy step.



[Storing drive unit in Display unit]

[Detaching drive unit from Display unit]

### Detector supplied as standard



Selectable from the following two items.

- Measuring force: 0.75mN  
Stylus profile: Tip radius 2µm  
Tip angle 60°
- Measuring force: 4mN  
Stylus profile: Tip radius 5µm  
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, EDM parts, etc.  
(Patent Registered in Japan)



#### 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 8 for details about the Detectors.

### Carrying case

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



# Specifications

Type of detector		Standard drive unit type		Retractable drive unit type	Transverse tracing drive unit type	
Model No.		SJ-210 (0.75mN type)	SJ-210 (4mN type)	SJ-210 (4mN type)	SJ-210 (4mN type)	
Order No.		inch/mm	<b>178-561-01A</b>	<b>178-563-02A</b>	<b>178-565-02A</b>	
Measuring range	X axis	.69" (17.5mm)			.22" (5.6mm)	
	Z axis (Detector)	14200 μm (-7900μm~+6300μm) / 360μm (-200μm ~ +160μm)				
Range / Resolution		14170μm / .8μm (360μm / 0.02μm), 4000μm / .2μm (100μm / 0.006μm), 1000μm / .08μm (25μm / 0.002μm)				
Measuring speed		Measuring: 0.01, 0.02, 0.03 in/s (0.25mm/s, 0.5mm/s, 0.75mm/s) Returning: 1mm/s				
Measuring force / Stylus tip		0.75mN type: 0.75mN / 2μmR 60°, 4mN type: 4mN / 5μmR 90°				
Skid force		Less than 400mN				
Applicable standards		JIS '82 / JIS '94 / JIS '01 / ISO '97 / ANSI / VDA				
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, Rpc, Rsm, Rmax, Rz1max, S, HSC, RzJIS, Rppi, RΔa, RΔq, Rlr, Rmr, Rmr(c), R $\bar{O}$ c, Rk, Rpk, Rvk, Mr1, Mr2, A1, A2, Vo, Rpm, tp, Htp, R, Rx, AR, Possible Customize				
Analysis graphs		Bearing area curve / Amplitude distribution curve				
Filters		Gaussian, 2CR75, PC75				
Cut off length	$\lambda c$	0.003, 0.01, 0.03, 0.1" (0.08, 0.25, 0.8, 2.5mm)				
	$\lambda s$	100, 300μm (2.5, 8μm) or none				
Sampling length		0.003, 0.01, 0.03, .1" (0.08, 0.25, 0.8, 2.5mm)				
Number of Sampling lengths (xn)		×1, ×2, ×3, ×4, ×5, ×6, ×7, ×8, ×9, ×10, Arbitrary 0.01~.63" (.0001" interval) [(0.3~16.0mm: 0.01mm interval)]			×1, ×2, ×3, ×4, ×5, ×6, ×7, ×8, ×9, ×10, Arbitrary .0118 ~ .22" (.0001" Interval) [(0.3 ~ 5.6mm: 0.01mm Interval)]	
LCD dimensions		1.45 x 1.93" (36.7x48.9 mm)				
Display languages		Japanese, English, German, French, Italian, Spanish, Portuguese, Korean, Traditional Chinese, Simplified Chinese, Czech, Polish, Hungarian, Turkish, Swedish, Dutch				
Calculation result display		Vertical display: 1 parameter / 3 parameter / trace to measurements Horizontal display: 1 parameter / 4 parameter / trace to measurements (Horizontal display is invertable)				
Printing function <sup>*1</sup> (Dedicated printer is required separately.)		Measurement conditions / 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				
Customization		Desired parameters can be selected for calculation and display				
GO/NG judgment <sup>*2</sup>		By max value / 16% / Standard deviation				
Storage of measurement condition		Save the conditions at power OFF				
Storage		Internal memory: Measurement condition (10sets), Measured profile (1set) Memory card (Option): 500 measurement conditions, 10000 measured profiles, 500 display images Text file (Measurement conditions / Measured profile / Assessed profile / Bearing area curve / Amplitude distribution curve)				
Calibration		Saves last inputted nominal value of specimen / Average calibration with multiple measurement (Max.5 times) is available				
Power-saving function		Auto-sleep off function (10-600sec) <sup>*3</sup>				
Power supply		Two-way power supply: battery (rechargeable Ni-MH battery) and AC adaptor *Charging time: about 4 hours (may vary due to ambient temperature) *Endurance: about 1000 measurements (differs slightly due to use conditions / environment)				
Size (WxDxH)	Display unit	2.05 x 2.6" x 6.3" (52.1x65.8x160mm)				
	Drive unit	4.5 x .9 x 1.02" (115x23x26mm)				
Mass		About 1.1lbs (500g) (Display unit + Drive unit + Standard detector)				
Standard accessories		<b>12BAA303</b> Connecting cable <sup>*4</sup> <b>178-602</b> Roughness specimen (Ra 3.00μm) <b>12BAK699</b> Carrying case <b>12BAK700</b> Calibration stage <b>12BAK820</b> Protective sheets for display AC Adapter Operation manual Quick reference manual Warranty			<b>12BAA303</b> Connecting cable <sup>*4</sup> <b>178-606</b> Roughness specimen (Ra 1.00μm) <b>12AAE643</b> Point-contact adapter <b>12AAE644</b> V-type adapter <b>12BAK699</b> Carrying case <b>12BAK700</b> Calibration stage <b>12BAK820</b> Protective sheets for display AC Adapter, Operation manual Quick reference manual, Warranty	

\*1: Order the SJ-210 printer (No.178-421A, optional accessory) separately.  
See page 10 for details about the SJ-210 printer.

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

\*3: Auto-sleep function is invalid when AC adaptor is used.

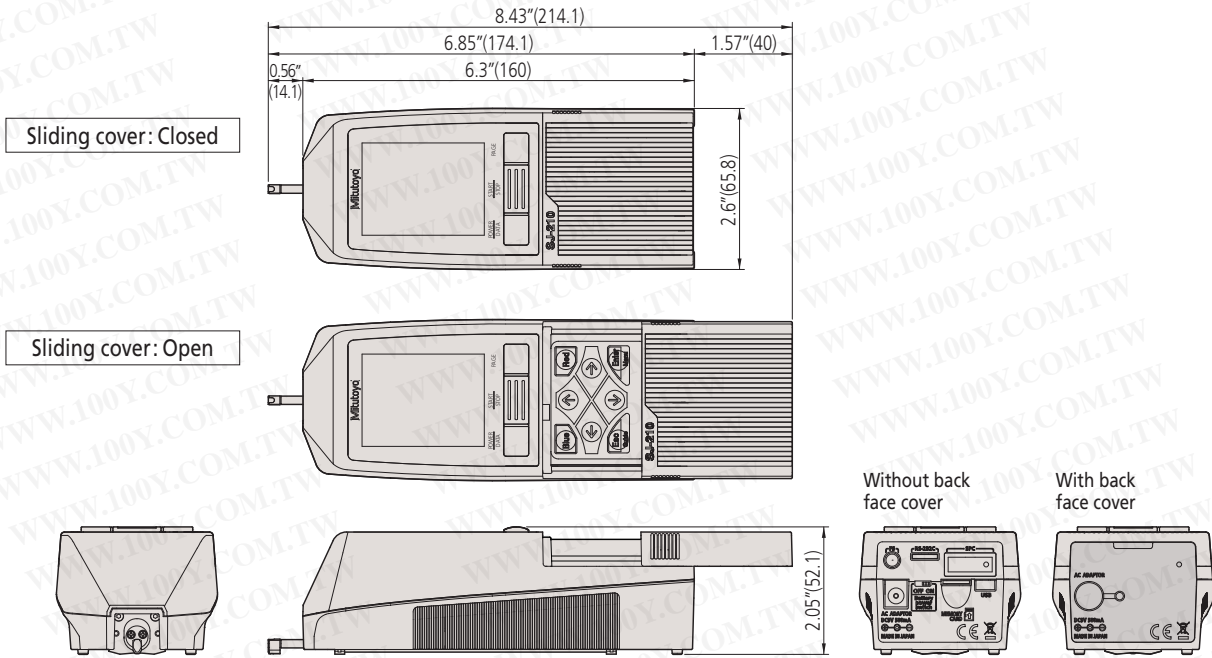
\*4: For connecting the calculation display unit and drive unit.

# Dimension Display Unit and Drive Unit

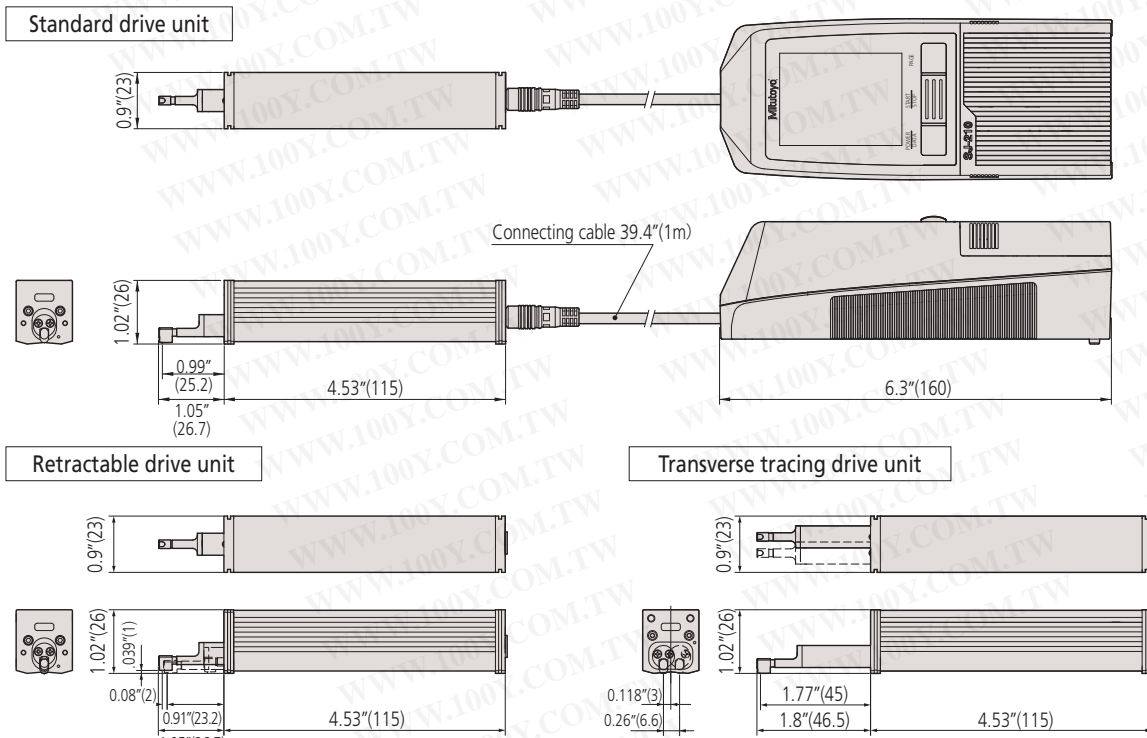
## Display unit, Drive unit

Unit: inch(mm)

- Drive unit stored inside display unit (Standard detector installed in drive unit)



- Drive unit not stored inside display unit (Standard detector installed in drive unit)

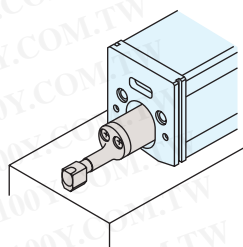


# Dimensions Detectors and Drive units

## Detectors

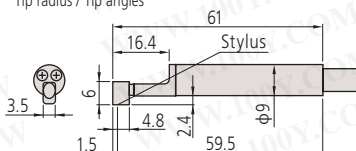
Unit: inch(mm)

### Standard detectors

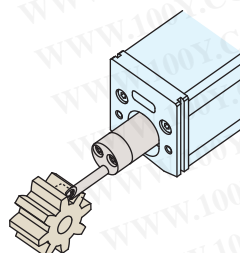


Order No.	Measuring force	Stylus profiles*	Remarks column
178-296	0.75mN	2µmR/60°	Dedicated to the standard/retractable drive unit
178-390	4 mN	5µmR/90°	
178-387	0.75mN	2µmR/60°	Dedicated to the transverse tracing drive unit
178-386	4 mN	5µmR/90°	
178-395	0.75mN	2µmR/90°	Dedicated to the standard/retractable drive unit
178-391	4 mN	10µmR/90°	

\*Tip radius / Tip angles

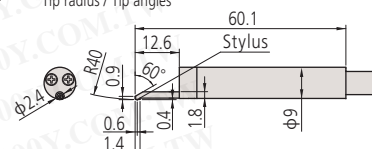


### Gear-tooth surface detectors

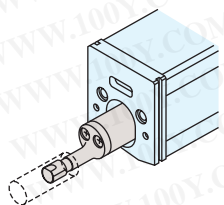


Order No.	Measuring force	Stylus profiles*
178-388	0.75mN	2µmR/60°
178-398	4 mN	5µmR/90°

\*Tip radius / Tip angles

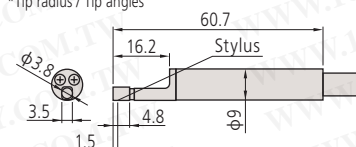


### Small hole detectors

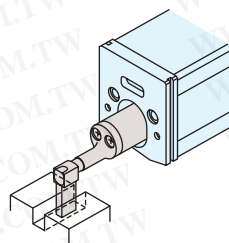


Order No.	Measuring force	Stylus profiles*	Remarks column
178-383	0.75mN	2µmR/60°	Minimum measurable hole diameter: 4.5mm
178-392	4 mN	5µmR/90°	

\*Tip radius / Tip angles

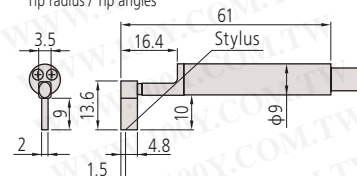


### Deep groove detectors

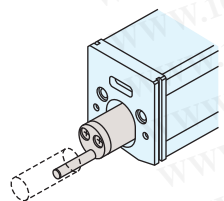


Order No.	Measuring force	Stylus profiles*	Remarks column
178-385	0.75mN	2µmR/60°	Not available for the transverse tracing drive unit
178-394	4 mN	5µmR/90°	

\*Tip radius / Tip angles

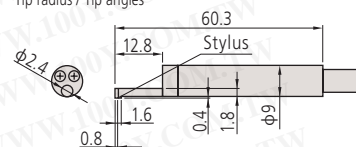


### Extra small hole detectors



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

\*Tip radius / Tip angles



### Drive units

Order No.	
178-230-2	Standard drive unit
178-233-2	S-Drive unit
178-234-2	S-Drive unit set (includes point-contact adapter)
178-235	R-Drive unit



# Optional Accessories For Drive Unit

## Drive unit accessories

### Nosepiece for flat surface

No.12AAA217

\*Not available for the transverse tracing drive unit.



### Nosepiece for cylindrical surface

No.12AAA218

\*Not available for the transverse tracing drive unit.

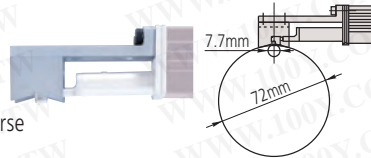


### V-type adapter

No.12AAE644

\*Transverse tracing drive unit type standard accessories.

\*Dedicated to the transverse tracing drive unit.

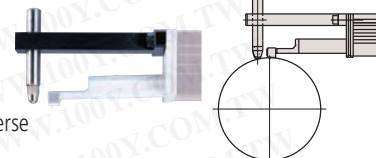


### Point-contact adapter

No.12AAE643

\*Transverse tracing drive unit type standard accessories.

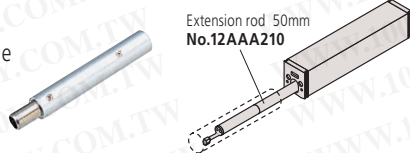
\*Dedicated to the transverse tracing drive unit.



### Extension rod (50mm) (Note: Extension is possible with only a single rod.)

No.12AAA210

\*Not available for the transverse tracing drive unit.



### Extension cable (1m) (Note: Extension is possible with only a single cable.)

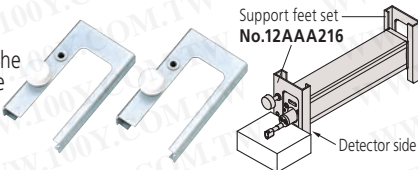
No.12BAA303

\*For connecting between calculation display unit and drive unit.

### Support feet set

No.12AAA216

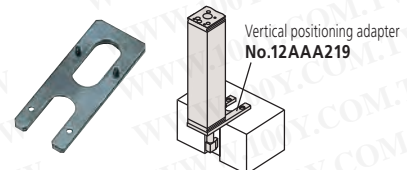
\*Not attachable to the detector side of the transverse tracing drive unit.



### Vertical positioning adapter

No.12AAA219

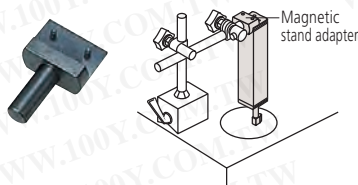
\*Not available for the transverse tracing drive unit.



### Magnetic stand adapter

No.12AAA221 (ø8mm)

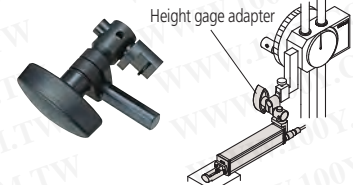
No.12AAA220 (ø9.5mm)



### Height gage adapter

No.12AAA222 (9×9mm)

No.12AAA233 (1/4in×1/2in)



## Setting attachments

\* Not available for the transverse tracing drive unit

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.

### Setting attachment: V type for measuring in the cylinder axis direction

No.178-033

The V-width is adjustable to the cylinder diameter facilitating axial measurement of a wide range of cylinder diameters.

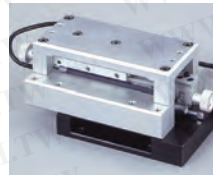
- Adjustable range: ø 5 ~ 150mm



### Setting attachment: Magnetic slider type

No.178-034

The magnet attached to the frame bottom surface allows taking hands-free measurement on the wall.



### Setting attachment: Inside diameter type

No.178-035

Greatly facilitates measurement of internal wall surfaces, for example, a cylinder block.

- Applicable diameter: ø 75 ~ ø 95mm
- Accessible depth: 30 ~ 135 mm



# Optional Accessories For External Equipment

## Printer for SJ-210

Assessed profiles and calculation results and curves can be printed out by connecting the SJ-210-dedicated printer, which is palm sized 3.7 x 4.9 x 2.7" (WxDxH: 93x125x70mm) and can run on an internal battery.

- Power supply can be selected. (AC adapter or battery pack)
- Printable items: Measurement conditions, calculation results, assessed profile, bearing area curve (BAC), amplitude distribution curve (ADC), and environment settings.



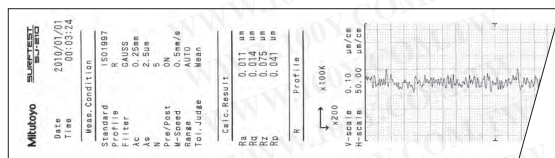
178-421A

Unit configuration:

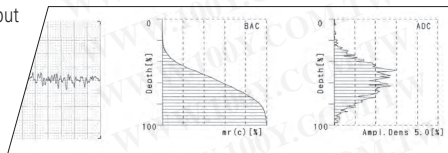
- ① Printer main unit
- ② Printer connecting cable
- ③ Printing paper 6-pack
- ④ Battery pack 1 piece
- ⑤ Exclusive use AC adaptor (with AC power cord) 1 piece



Example of the connection with SJ-210



Example of the output by the printer



Printer for SJ-210 supplies:  
Printing paper (5-pack) No. 12AAA876

## Digimatic mini processor DP-1VR

By connecting this printer to the Surfptest SJ-210'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.



264-504-5A

SJ-210 → DP-1VR Connecting cable  
1m: No. 936937 Digimatic SPC cable  
2m: No. 965014 Digimatic SPC cable

## Memory card

A memory card for saving 500 measurement conditions, 10,000 measured profiles, 500 display images, text file (measurement conditions, measured profiles, assessed profiles, BAC, ADC)



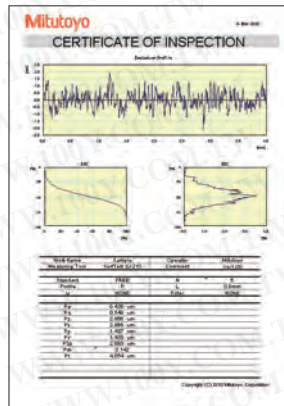
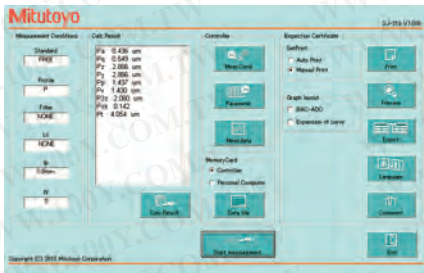
\*Not all memory cards can be recognized. Please use the memory card recommended by Mitutoyo.

No. 12AAL069

# Optional Accessories For External Output

## Simplified communication program for SURFTEST SJ series

The SurfTest SJ-210 has a USB interface, enabling data to be transferred to spreadsheet or other software. We also provide a program that lets you create inspection record tables using a Microsoft Excel\* macro.



Required environment\*:

- OS Windows 2000 SP4
- OS Windows XP
- OS Windows Vista
- OS Windows 7 (32/64 bit)
- Spreadsheet software: Microsoft Excel 2000
- Spreadsheet software: Microsoft Excel 2002
- Spreadsheet software: Microsoft Excel 2007

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

The optional USB cable is also required.

- USB cable for SJ-210 series (2m)

No. 12AAL068

This program can be downloaded for free from the Mitutoyo website.  
<http://www.mitutoyo.com>

## Footswitch

A footswitch is used to trigger measurement. This tool is very useful in cases where you need to measure the same workpiece multiple times using jigs and other fixtures.



No. 12AAJ088

## Input Tool: Calculation results input unit

SurfTest SJ-210 calculation results can be loaded directly into commercial spreadsheet software via this unit simply by connecting it to the USB connector on a computer or a PS/2 type keyboard connector. (See Catalog No. E4250-264 for details.)



USB keyboard signal conversion model

IT-012U No. 264-012-10

PS/2 keyboard signal conversion model

IT-005D No. 264-005



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