

Surftest SJ-310

SERIES 178 – Portable Surface Roughness Tester

Technical Data

Detector	
Skid radius of curvature:	40 mm
Skid force:	Less than 400 mN
Type:	Differential inductance
External I/O:	USB, Digimatic output, RS-232C, external software interface
Data storage:	Memory card (option 12AAL069)

Evaluation Capability

Applicable standards:	JIS'82, JIS'94, JIS'01, ISO'97, ANSI, VDA
Digital filter:	2CR, PC75, Gaussian
Cutoff length:	lc: 0.08, 0.25, 0.8, 2.5, 8 mm ls: 2.5, 8 µm
Sampling length:	0.08, 0.25, 0.8, 2.5, 8 mm
Number of sampling lengths (x n):	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)*
Printer:	Thermal type
Printing width:	48 mm (paper width: 58 mm)
Recording magnification	
Vertical:	10X to 100,000X, auto
Horizontal:	1X to 1,000X, auto

* Only for transverse tracing drive unit type.

Functions

Customization:	Desired parameters can be selected for calculation and display
Statistical processing:	Maximum value, minimum value, mean value, standard deviation, pass rate, histogram of each parameter
GO/±NG judgement:	Maximum value rule, 16% rule, average value rule, standard deviation (1σ, 2σ, 3σ)
Storage	
Internal memory:	Setups (10 sets)
Memory card (option):	500 setups, 10,000 measured profiles, 500 display images, text file (setups / measured profile / assessed profile / bearing area curve / amplitude distribution curve), 500 statistical data, etc.
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 shutdown of backlight by ECO mode

Optional Accessories

Refer to pages L-05 to L-06.

- The handheld data processing unit and the 5.7-inch colour graphic LCD touch-panel provide 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.
- Complies with the following standards: JIS (JIS-B0601-2001, JIS-B0601-1994, JIS B0601-1982), VDA, ISO- 1997, and ANSI.
- The Measure-Start and other frequently used buttons are strengthened to resist wear and the detrimental effects of workshop contaminants.
- Equipped with a large-capacity battery allowing approximately 1500 measurements when fully charged.
- Includes convenient carrying case for protection in the field.
- A high-speed printer is built into the main unit. Either landscape or portfolio mode can be selected according to the application. Paper saving mode is supported.
- The display interface supports 16 languages, which can be freely switched.
- 10 setups can be saved in the measurement unit. An optional memory card can save setups and the measured profile.

MeasurLink ENABLED
Data Management Software by Mitutoyo



Surftest SJ-310

Specifications/Configuration

Model	SJ-310						
Code No. (inch/mm)	178-571-01E	178-571-02E	178-573-01E	178-573-02E	178-575-01E	178-575-02E	
Drive unit	Type	Standard		Retractable		Transverse tracing	
	Code No.	178-230-2		178-235		178-233-2	
Measuring range	17.5 mm					5.6 mm	
Measuring speed	0.25, 0.5, 0.75 mm/s (returning: 1 mm/s)						
Measuring method	Skidded						
Stylus tip	Angle	60°	90°	60°	90°	60°	
	Radius	2 µm	5 µm	2 µm	5 µm	2 µm	
Detector	Range	360 µm (-200 µm to +160 µm)					
	Measuring force	0.75 mN	4 mN	0.75 mN	4 mN	0.75 mN	
	Code No.	178-296	178-390	178-296	178-390	178-387	
Assessed profiles	P (primary profile), R (roughness profile), DIN4776, roughness motif, waviness motif						
Evaluation parameters	Ra, Ry, Rz, Rt, Rp, Rq, Rv, Rsk, Rku, Rc, RSm, S, R Pc, R3z, Rmr (c), Rpk, Rvk, Rδc, Rk, Mr1, Mr2, Lo, Rppi, R, AR, Rx, A1, A2, Vo, HSC, Rmr, SK, Ku, RΔa, RΔq, Rlr, λa, λq, Rpm, RzJIS (JIS'01), tp (ANSI), Htp (ANSI), Wte, Wx, W, AW, Rz1max (ISO), Rmax (VDA, ANSI, JIS'82), possible to customize						
Analysis graphs	Bearing area curve (BAC), amplitude distribution curve (ADC)						
Power supply	AC adapter and rechargeable battery						
Battery	Charge time	Max. 4 hours					
	Endurance	Approx. 1500 measurements (differs slightly due to usage and environmental conditions)					
Dimensions (WxDxH)	Display unit	275 x 109 x 198 mm					
	Drive unit	115 x 23 x 26 mm					
Mass	Display unit	Approx. 1.7 kg					
	Drive unit	0.2 kg					
Price							



Optional Accessories

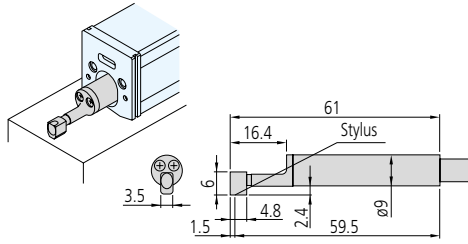
For Surftest SJ-210 and SJ-310

Detectors

Standard detectors

Code No.	Measuring force	Stylus profiles*	Applicable drive unit
178-296	0.75 mN	R2 $\mu\text{m}/60^\circ$	Standard or retractable
178-390	4 mN	R5 $\mu\text{m}/90^\circ$	
178-387	0.75 mN	R2 $\mu\text{m}/60^\circ$	Transverse
178-386	4 mN	R5 $\mu\text{m}/90^\circ$	
178-391	4 mN	R10 $\mu\text{m}/90^\circ$	Standard or retractable

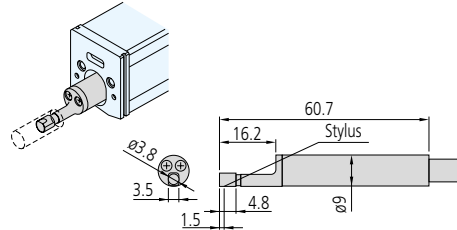
* Tip radius / tip angles



Small hole detectors

Code No.	Measuring force	Stylus profiles*	Min. measurable hole
178-383	0.75 mN	R2 $\mu\text{m}/60^\circ$	$\varnothing 4.5 \text{ mm}$
178-392	4 mN	R5 $\mu\text{m}/90^\circ$	

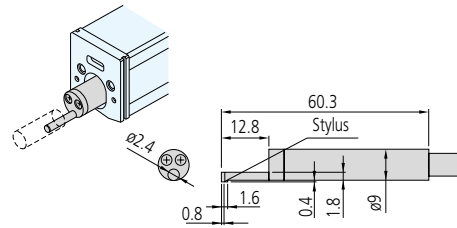
* Tip radius / tip angles



Extra small hole detectors

Code No.	Measuring force	Stylus profiles*	Min. measurable hole
178-384	0.75 mN	R2 $\mu\text{m}/60^\circ$	$\varnothing 2.8 \text{ mm}$
178-393	4 mN	R5 $\mu\text{m}/90^\circ$	

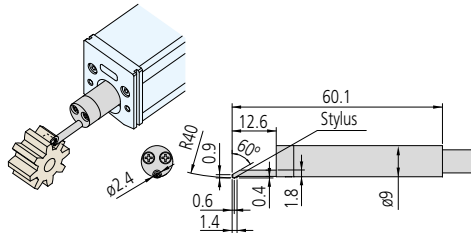
* Tip radius / tip angles



Gear-tooth surface detectors

Code No.	Measuring force	Stylus profiles*
178-388	0.75 mN	R2 $\mu\text{m}/60^\circ$
178-398	4 mN	R5 $\mu\text{m}/90^\circ$

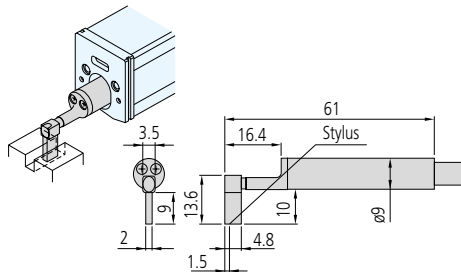
* Tip radius / tip angles



Deep groove detectors

Code No.	Measuring force	Stylus profiles*	Applicable drive unit
178-385	0.75 mN	R2 $\mu\text{m}/60^\circ$	Standard or retractable
178-394	4 mN	R5 $\mu\text{m}/90^\circ$	

* Tip radius / tip angles



Setting Attachments (for standard and retractable drive units only)

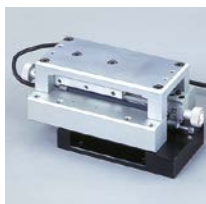
Improves measurement efficiency by allowing the setup of multiple workpieces of the same type and the positioning of hard-to-access features of a workpiece.

Code No.	Description
178-033	V-type for measuring in the cylinder axis direction
178-034	Magnetic slider type
178-035	Inside diameter type



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

- Adjustable range: $\varnothing 5 - \varnothing 150 \text{ mm}$



The magnet attached to the bottom surface of the frame allows hands-free measurements to be made.



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

- Applicable diameter: $\varnothing 75 - \varnothing 95 \text{ mm}$
- Accessible depth: 30 - 135 mm

SJ-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 (WxDxH: 93 x 125 x 70 mm) and can run on an internal battery.

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



178-421UK

Code No.	Description
178-421UK	SJ-Printer for SJ-210
270732	Printer paper (5 packs)



Example of the connection with SJ-210.

DP-1VA LOGGER

It is possible to process Digimatic data output from the Surftest SJ series with the DP-1VA LOGGER. This compact, hand-held device can provide printouts of measurement data and various statistical analysis results such as histograms, D-charts, and X-bar R control charts. With optional output cables, DP-1VA LOGGER is also capable of RS-232C output of measurement data to a PC (cable **09EAA084**) and GO/ \pm NG judgement output (cable **965516**).



264-505E

Code No.	Description
264-505E	DP-1VA LOGGER Digimatic Mini-Processor
936937	Connecting cable (1 m)
965014	Connecting cable (2 m)

Optional Software

SJ-Tools

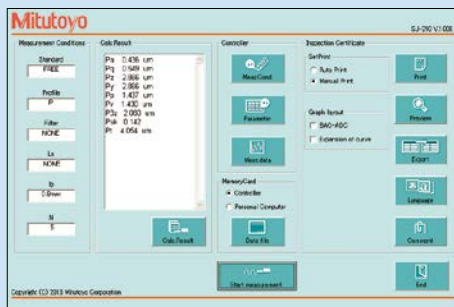
Output software based on Microsoft Excel* for controlling instruments and reproducing and storing measurement data. Complete with exclusive accessories.

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

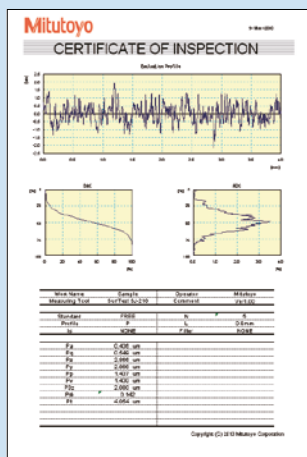
*Microsoft Excel is not included. To be supplied by the customer.

Cables required:

Code No.	Description
12AAL068	USB PC connecting cable (USB cable) for SJ-210
12AAD510	USB PC connecting cable (USB cable) for SJ-310
12AAL067	RS-232C cable for SJ-210
12AAA882D	RS-232C cable for SJ-310



SJ-Tools input mask for SurfTest SJ series.

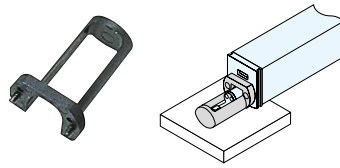


SJ-Tools output record from MS-Excel (This program can be downloaded for free from the Mitutoyo website www.mitutoyo.co.uk).

Attachments

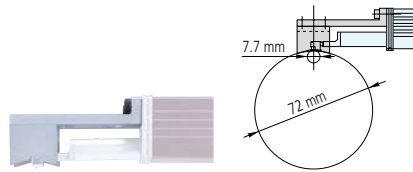
Nosepiece for flat surfaces

- SJ-310 standard accessory (not for transverse tracing type)



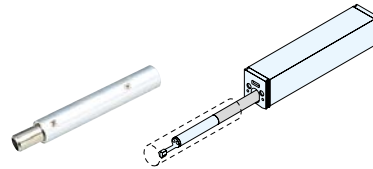
V-type adapter

- SJ-310 Transverse tracing type standard accessory



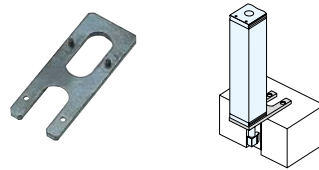
Extension rod (50 mm)

- Not available for the transverse tracing drive unit (Note: Only one rod can be used)

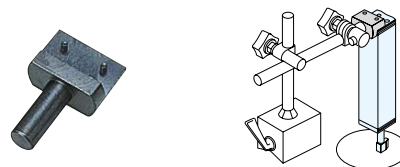


Vertical positioning adapter

- Not available for the transverse tracing drive unit

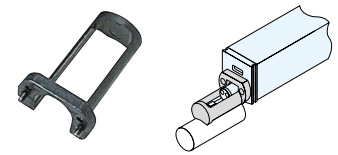


Magnetic stand adapter



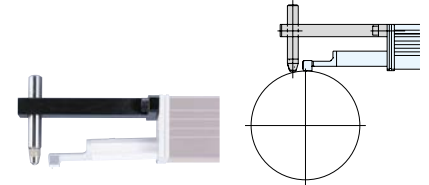
Nosepiece for cylindrical surfaces

- SJ-310 standard accessory (not for transverse tracing type)



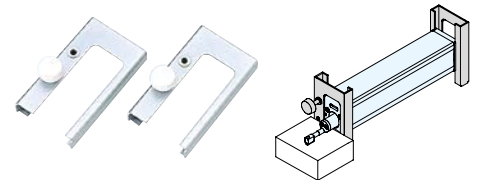
Point-contact adapter

- SJ-310 Transverse tracing type standard accessory

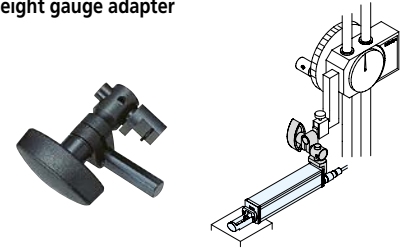


Support feet set

- SJ-301/301R standard accessory
- Not available for the detector end of the transverse tracing drive unit



Height gauge adapter



Extension cable (1 m)

- Only one cable can be used



Code No.	Description
12AAA210	Extension rod (50 mm)
12AAA216	Support feet set
12AAA217	Nosepiece for flat surfaces
12AAA218	Nosepiece for cylindrical surfaces
12AAA219	Vertical positioning adapter
12AAA220	Magnetic stand adapter (ø9.5 mm)

Code No.	Description
12AAA221	Magnetic stand adapter (ø8 mm)
12AAA222	Height gauge adapter (9 x 9 mm)
12AAA223	Height gauge adapter (1/4 x 1/2")
12AAE643	Point-contact adapter
12AAE644	V-type adapter
12BAA303	Extension cable (1 m)

