

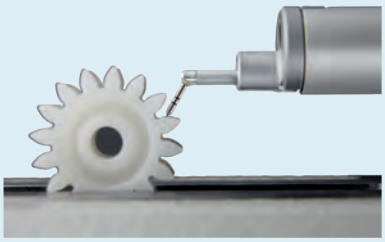
Surface Roughness Measuring Instruments
Surftest
Page 480



Contour Measuring Instruments
Contracer
Page 495



Surface Roughness & Contour Measuring Instruments
Formtracer
Page 499



Accessories Surftest, Contracer, Formtracer
Page 508



Form Measuring Instruments
Roundtest
Page 519

All products to be sold to commercial customers. Product illustrations are without obligation. Product descriptions, in particular any and all technical specifications, are only binding when explicitly agreed upon. For suggested retail prices, please refer to the separate price list.

Mitutoyo

Surftest SJ-210

Series 178 - Portable Surface Roughness Measuring Instrument

This is a portable measuring instrument that allows you to easily and accurately measure surface roughness.
The Surftest SJ-210 offers you the following benefits:

- It works independently of mains power, allowing you to make on-site measurements.
- The **6 cm** [2,4"] colour graphic, back-lit LCD gives you excellent readability.
- It performs roughness analyses conform to various international standards (EN ISO, VDA, ANSI, JIS) and customized settings.
- Different drivers expanding the range of applications.
- Calculation results, assessed profiles, bearing and amplitude curves can be displayed.
- Support of 21 languages.
- Operation by keys on the front and under the sliding cover.



SJ-210

Metric

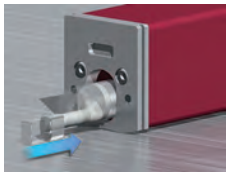
Switchable between 16 languages: Japanese, English, German, French, Italian, Spanish, Portuguese, Czech, Polish, Hungarian, Turkish, Swedish, Dutch, Korean, Traditional Chinese, Simplified Chinese

No.	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]	Description	Mass
178-560-01D	0,75	60°	2	SJ-210 model	500g
178-562-01D	0,75	60°	2	SJ-210R model	500g
178-564-01D	0,75	60°	2	SJ-210S model	500g

Metric

Switchable between 16 languages: Japanese, English, Russian, Slovenian, Rumanian, Bulgarian, Finnish, German, French, Italian, Spanish, Czech, Polish, Hungarian, Turkish, Swedish

No.	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]	Description	Mass
178-560-03D	0,75	60°	2	SJ-210 model	500g



Standard



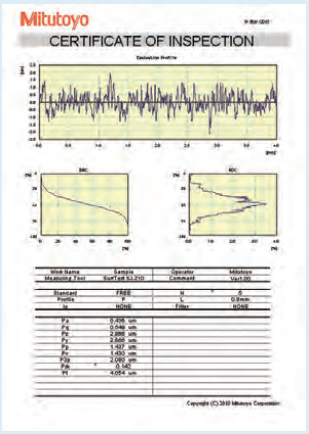
R-type



S-type

Specifications

Drive unit	
Measuring range	16 mm 4,8 mm [S-type]
Traverse	17,5 mm 5,6 mm [S-type]
Measuring speed	0,25 mm/s ; 0,5 mm/s; 0,75 mm/s
Detector	
Measuring method	Differential inductance
Range	360 µm
Stylus	Diamond Tip
Skid radius	40 mm
Display unit	
Profiles	Roughness Profile (R), R-Motif, DF-Profile and more
Roughness standard	EN ISO, VDA, JIS, ANSI and customize settings
Digital filter	Gauss, 2CR75, PC75
Cut-off length	λc : 0,08 mm; 0,25 mm; 0,8 mm; 2,5 mm λs : 2,5 µm; 8 µm
Tolerance	Coloured upper / lower limit
Interface	USB, Digimatic, RS-232C, Foot switch
Power supply	AC adapter or rechargeable battery



Software
USB COMMUNICATION TOOL
as a free download on www.mitutoyo.eu
registration required
(refer to page
Optional Software USB Communication Tool)

Refer to Surftest SJ-210 brochure

Scan QR Code with your mobile device and watch our product videos on YouTube

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Surftest SJ-210

Series 178 - Portable Surface Roughness Measuring Instrument

The SJ-210R – Retract System is a portable measuring instrument for surface roughness that includes a safety system.

– The detector starts in a safety position, not in contact with the workpiece surface. When measurement starts, the detector is lowered onto the workpiece while the drive unit moves in X measuring direction. During the return movement, the detector lifts up from the workpiece surface before returning to the start position. This is useful for avoiding stylus damage in applications where you cannot easily see the test surface.

SJ-210S (detailed information further on in this chapter)

– The SJ-210S model is a portable measuring instrument for surface roughness that has a transverse drive capability. This allows you to test shrouded surfaces in the transverse direction, such as crankshaft bearing surfaces, flanged features or deep grooves.



SJ-210

Additional Specifications

Optional accessories	Other optional and standard accessories are listed later in this section.

Optional accessories

No.	Description
178-029	Granite Stand, for SJ-210/SJ-310*
178-033	Measuring device-cylindrical workpieces
178-034	Measuring device as universal fixture
178-035	Measuring device for measuring inside Ø
12AAA221	Adapter for magnetic stand, for SJ-210/310*
178-230-2	Standard drive unit 17,5mm, for SJ-210/ SJ-310
178-235	R-type drive unit 17,5mm, for SJ-210/ SJ-310
178-233-2	S-type drive unit 5,6mm, for SJ-210/ SJ-310
936937	Digimatic Cable, Flat 10-Pin Type, 1 m
965014	Digimatic Cable, Flat 10-Pin Type, 2 m
02AZD790D	U-WAVE T Connection Cable D, Flat 10-Pin Type
06ADV380D	USB Input Tool Direct (Digimatic USB) cable, Flat 10-Pin Type, 2 m
12BAA303	Connecting cable for extension 1 m

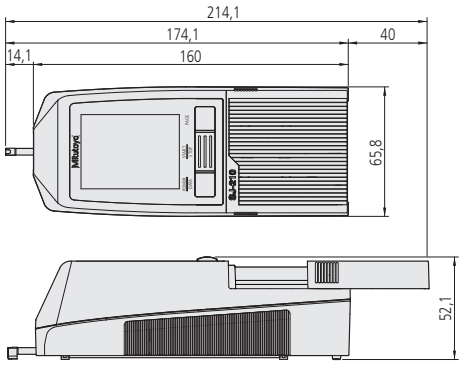
* 12AAA221 is needed for SJ-210 / SJ-310



Keyboard protective cover open



Back view



Dimensions



178-029 (displayed with SJ-210)

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Surftest SJ-310

Series 178 - Portable Surface Roughness Measuring Instrument

This is a portable measuring instrument that allows you to easily and accurately measure surface roughness.
The Surftest SJ-310 offers you the following benefits:

- Skid system with touch-screen functionality and built-in printer.
- It works independently of mains power, allowing you to make on-site measurements.
- Easy and intuitive menu navigation.
- The large **14,5cm** [5,7"] colour LCD gives you high visibility.
- It performs roughness analyses conform to various international standards (EN ISO, VDA, ANSI, JIS) and customized settings.
- You can store up to 10 different measuring conditions inside the SJ-310, and up to 500 with an optional SD card.
- Statistical analysis and coloured tolerance judgement.
- 2 different evaluation conditions within 1 measurement adjustable.
- You can separately password protect many functions.
- It comes with support for 16 languages.



SJ-310

Metric

No.	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]	Description	Mass
178-570-01D	0,75	60°	2	SJ-310 model	1,7 kg
178-572-01D	0,75	60°	2	SJ-310R model	
178-574-01D	0,75	60°	2	SJ-310S model	



Standard



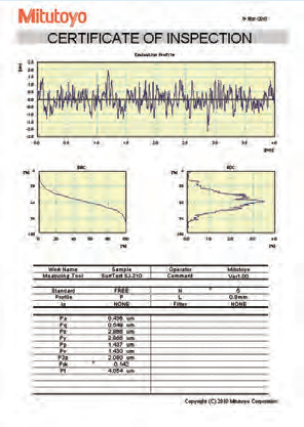
R-type



S-type

Specifications

Drive unit	
Measuring range	16 mm 4,8 mm [S-type]
Traverse	17,5 mm 5,6 mm [S-type]
Measuring speed	0,25 mm/s; 0,5 mm/s; 0,75 mm/s
Detector	
Measuring method	Differential inductance
Range	360 µm
Stylus	Diamond Tip
Skid radius	40 mm
Display unit	
Profiles	Roughness Profile (R), R-Motif, DF-Profile and more
Roughness standard	EN ISO, VDA, JIS, ANSI and customize settings
Digital filter	Gauss, 2CR75, PC75
Cut-off length	λc : 0,08 mm; 0,25 mm; 0,8 mm; 2,5 mm; 8 mm λs : 2,5 µm; 8 µm
Printer	Thermal Printer
Tolerance	Coloured upper / lower limit
Interface	USB, Digimatic, RS-232C, Foot switch
Power supply	AC adapter or rechargeable battery



Software
USB COMMUNICATION TOOL
as a free download on www.mitutoyo.eu
registration required
(refer to page
Optional Software USB Communication Tool)

Refer to Surftest SJ-310 brochure

Scan QR Code with your mobile device and watch our product videos on YouTube

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Surftest SJ-210 and SJ-310 - S-Type

Series 178 – Portable Transverse Measurement with S-Type Drive Unit

This is an S-Type drive unit for the Surftest SJ-210 and SJ-310 that provides portable transverse measurement.
It offers you the following benefits:

- It is compatible with the conventional drive units of the Surftest SJ-210 and SJ-310.
- You can simply connected it to the display unit.
- A typical application would be to position the S-Type unit on a crankshaft journal bearing, as shown in the photograph below. Once started the S-Type drive will track the stylus across the surface transversely to its own axis and reliably measure surface roughness in the direction of the crankshaft axis. Transverse tracking simplifies the measurement of surface roughness even in very confined situations, which has long been a problem with conventional instruments which allow only longitudinal measurement.

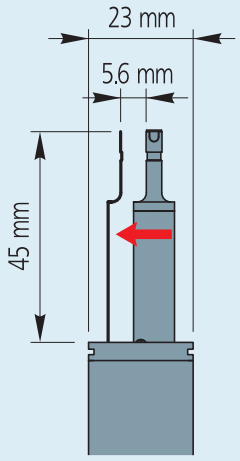
Specifications

Traverse	5,6 mm
Measuring speed	0,25 mm/s; 0,5 mm/s; 0,75 mm/s

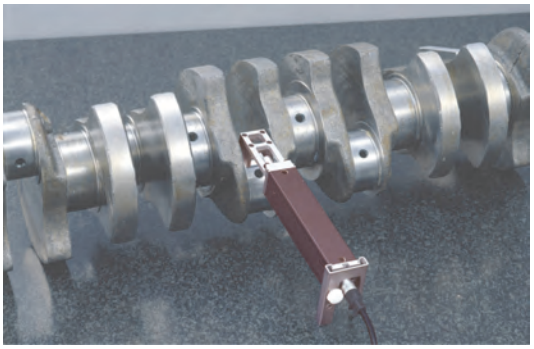
Optional accessories

No.	Description
178-029	Granite Stand, for SJ-210/SJ-310*
12AAA221	Adapter for magnetic stand, for SJ-210/310*
178-230-2	Standard drive unit 17,5mm, for SJ-210/ SJ-310
178-235	R-type drive unit 17,5mm, for SJ-210/ SJ-310
178-233-2	S-type drive unit 5,6mm, for SJ-210/ SJ-310

*12AAA221 is needed for SJ-210 / SJ-310



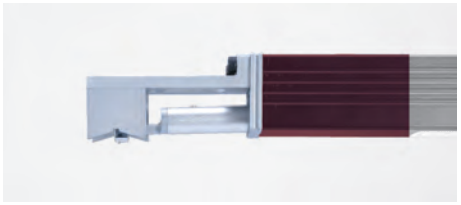
Linear movement of S-Type



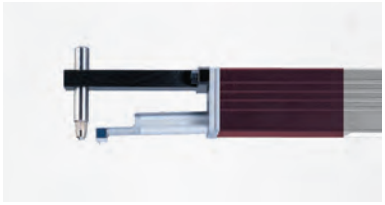


S - Type Drive Unit Set: [incl. 178-233-2 - 12AAE644 - 12AAE643]

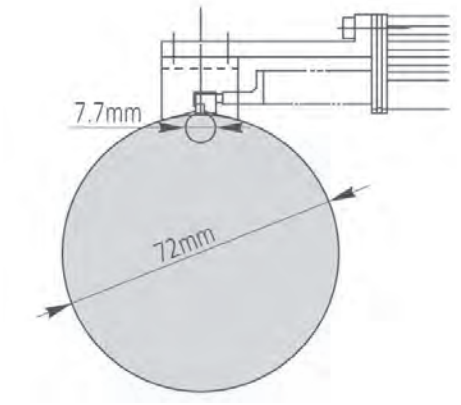
No.	Traverse	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]
178-234-2	5,6 mm	0,75	60°	2

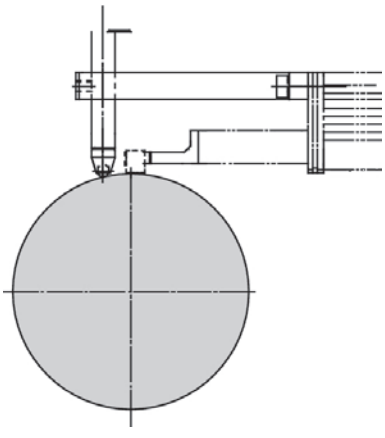


12AAE644
V-type adapter



12AAE643
Point - contact adapter





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Accessories for SJ-210 and SJ-310

Series 178 - Standard and Optional Accessories for Surftest SJ-210 / SJ-310

Model			Surftest SJ-210		Surftest SJ-210R		Surftest SJ-210S		Surftest SJ-310		Surftest SJ-310R		Surftest SJ-310S	
No.		Description	Std	Opt	Std	Opt	Std	Opt	Std	Opt	Std	Opt	Std	Opt
12AAA210		Extension rod length 50 mm		●		●				●		●		
12AAA216		Height adjustment feet		●		●			●					
12AAA217		Nosepiece (flat)		●		●			●		●			
12AAA218		Nosepiece (cylindrical)		●		●			●		●			
12AAA219		Adapter for vertical position		●		●				●		●		
12AAA221		Adapter for magnetic stand		●		●		●		●		●		●
12AAA222		Height gauge adapter		●		●		●		●		●		●
12AAD510		USB cable for SJ-310 / SJ-410								●		●		●
12AAE643		Point - contact adapter					●						●	
12AAE644		V-type adapter					●						●	
12AAJ088		Footswitch		●		●		●		●		●		●
12AAL066		Protective sheets for display (5 sheets)		●		●		●						
12AAL067		RS-232C cable for printer		●		●		●						
12AAL068D		USB cable for SJ-210		●		●		●						
12AAL069		Memory card		●		●		●		●		●		●
12AAN040		Protective film								●		●		●
12AAN046		Battery							●		●		●	
12BAA303		Connecting cable for extension 1 m	●		●		●			●		●		●
12BAG834		Touch pen							●		●		●	
12BAK700		Calibration table	●		●		●		●		●		●	
12BAK728		AC adapter 9V	●		●		●							
12BAL402		Touch Panel Protection							●		●		●	
357651		AC Adapter 12V							●		●		●	
178-029		Granite stand		●		●		●		●		●		●
178-230-2		Standard Drive unit 17,5 mm	●			●		●	●			●		●
178-233-2		S-Type drive unit 5,6 mm		●		●	●			●		●	●	
178-235		R-Type drive unit 17,5 mm		●	●			●		●	●			●
178-296		Standard detector 2 µm; 0,75 mN	●		●				●		●			
178-383		Detector for small holes Ø4,5 mm; 2 µm; 0,75 mN		●		●				●		●		
178-384		Detector for small holes Ø2,8mm		●		●				●		●		
178-385		Deep groove detector 2 µm; 0,75 mN		●		●				●		●		
178-386		Detector for S-drive 5 µm; 4 mN		●		●	●			●		●	●	
178-387		Detector for S-drive 2 µm; 0,75 mN		●		●	●			●		●	●	
178-388		Detector for gear tooth surface 2 µm; 0,75 mN		●		●				●		●		
178-390		Detector 5 µm; 4 mN		●		●				●		●		
178-391		Detector for soft materials 10 µm; 4 mN		●		●				●		●		
178-392		Detector for small holes Ø4,5 mm; 5 µm; 4 mN		●		●				●		●		
178-393		Detector for small holes Ø2,8 mm; 5 µm; 4 mN		●		●				●		●		
178-394		Deep groove detector 5 µm; 4 mN		●		●				●		●		
178-398		Detector for geartooth surface 5 µm; 4 mN; 90°		●		●				●		●		
178-421DDS		Printer set for SJ-210		●		●		●						
178-601		Roughness specimen Ra 3 µm	●		●			●	●			●		●
178-604		Roughness specimen Ra 0,4 µm /3 µm		●		●		●		●		●		●
178-605		Roughness specimen Ra 1 µm		●		●	●			●		●	●	
270732		Printer papers (5 rolls)		●		●		●	●			●		●

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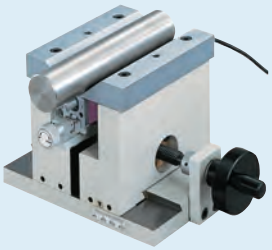
Accessories for SJ-210 and SJ-310

Optional accessories

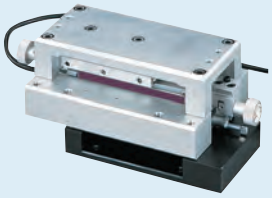
No.	Description
178-033	Measuring device-cylindrical workpieces
178-034	Measuring device as universal fixture
178-035	Measuring device for measuring inside Ø



178-029
(displayed with 12AAA221 + SJ-210)



178-033

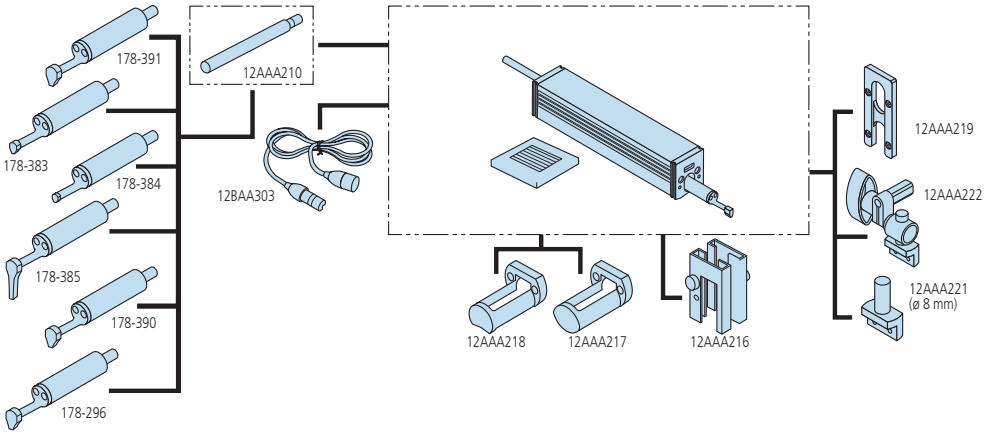


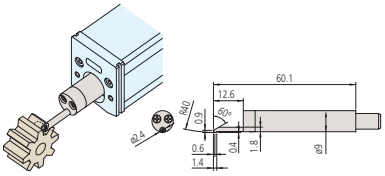
178-034



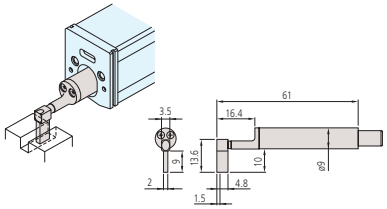
178-035

Series 178

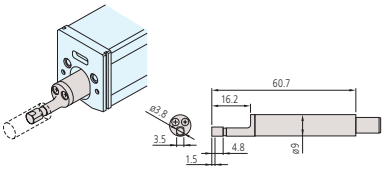




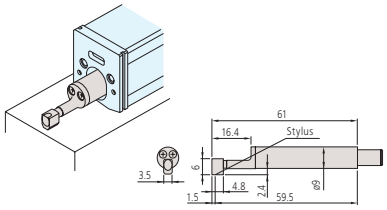
178-388/178-398



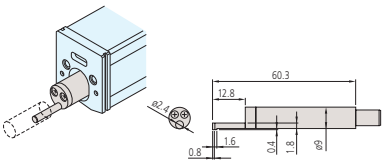
178-385/178-394



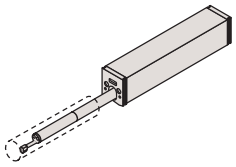
178-383/178-392



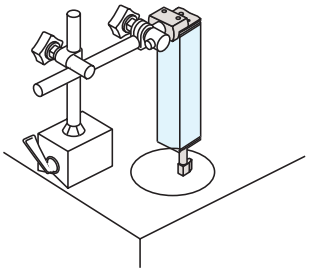
178-390/178-387
178-296/178-386



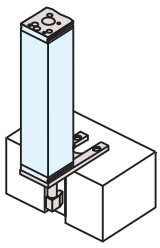
178-384/178-393



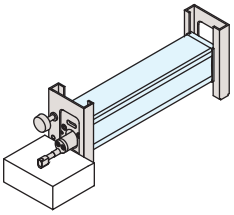
12AAA210



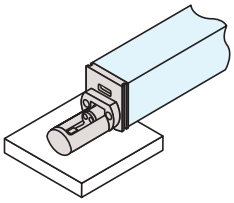
12AAA221



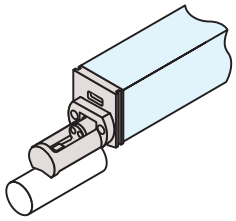
12AAA219



12AAA216



12AAA217



12AAA218

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Surftest SJ-410

Series 178 - Portable Surface Roughness Measuring Instrument

This is a portable measuring instrument that allows you to easily and accurately measure surface roughness.
The Surftest SJ-410 offers you the following benefits:

- Skidless system with touch-screen functionality and built-in printer.
- It works independently of mains power, allowing you to make on-site measurements.
- Easy and intuitive menu navigation.
- The large **14,5cm** [5,7"] colour LCD gives you high visibility.
- The skidless detector allows you to measure the primary profile (P), roughness profile (R), waviness profile (W) and more.
- Surface compensation of curved, radial and tilted surfaces.
- It performs roughness analyses conform to various international standards (EN ISO, VDA, ANSI, JIS) and customized settings.
- You can store up to 10 different measuring conditions inside the SJ-410, and up to 500 with an optional SD card.
- It allows two different evaluation conditions within one measurement adjustable.
- You can separately password protect many functions.
- It comes with support for 16 languages.
- Available options include an auto-set unit, X-axis fine adjustment and digital levelling unit.



SJ-410

Surftest SJ-411
Traverse : 25 mm
Traverse straightness : 0,3 µm / 25 mm

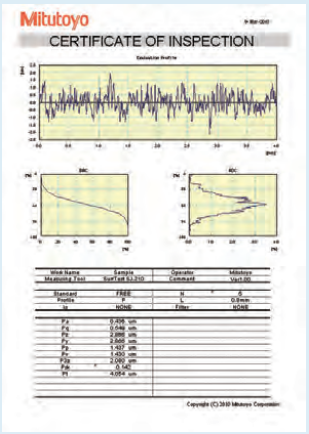
No.	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]
178-580-01D	0,75	60°	2
178-580-02D	4	90°	5

Surftest SJ-412
Traverse : 50 mm
Traverse straightness : 0,5 µm / 50 mm

No.	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]
178-582-01D	0,75	60°	2
178-582-02D	4	90°	5

Specifications

Drive unit	
Traverse	SJ-411: 25 mm SJ-412: 50 mm
Measuring speed	0,05 mm/s; 0,1 mm/s; 0,2 mm/s; 0,5 mm/s; 1 mm/s
Detector	
Measuring method	Skidless - Differential inductance
Range	800 µm; 80 µm; 8 µm (up to 2,4 mm with an optional stylus)
Positioning	±1,5° (tilting), 10 mm (up/down)
Display unit	
Profiles	Primary Profile (P), Roughness Profile (R), Waviness (W), MOTIF (R, W) and more
Standard	EN ISO, VDA, JIS, ANSI and customize settings
Analysis graphs	BAC, ADC
Digital filter	Gauss, 2CR75, PC75
Cut-off length	λc : 0,08 mm; 0,25 mm; 0,8 mm; 2,5 mm; 8 mm λs : 2,5 µm; 8 µm; 25 µm
Printer	Thermal Printer
Tolerance	Coloured upper / lower limit
Interface	USB, Digimatic, RS-232C, Foot switch
Power supply	AC adapter or rechargeable battery



Software
USB COMMUNICATION TOOL
as a free download on www.mitutoyo.eu
registration required
(refer to page
Optional Software USB Communication Tool)

Refer to Surftest SJ-410 brochure

Scan QR Code with your mobile device and watch our product videos on YouTube

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Surftest SJ-410

Series 178 - Portable Surface Roughness Measuring Instrument

Additional Specifications

Optional accessories	Other optional and standard accessories are listed later in different sections for accessories and styli.

Optional accessories

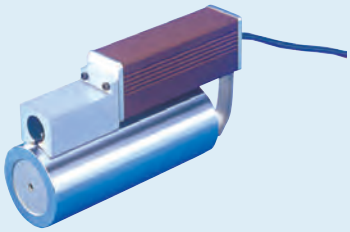
No.	Description
178-396-2	Detector, 0,75mN
178-397-2	Detector, 4mN
178-047	Three-axis adjustment table
178-048	Leveling table D.A.T
178-042-1	Digimatic XY leveling table, 25mmx25mm
178-043-1	XY leveling table, 25mmx25mm
178-605	Roughness specimen, Ra 1µm
178-610	Step gauge, (1, 2, 5, 10)µm
178-611	Step gauge, mm, (2, 10)µm
178-019	Precision Vice
12AAB358	Cylinder attachment Ø15-60mm
936937	Digimatic Cable, Flat 10-Pin Type, 1 m
965014	Digimatic Cable, Flat 10-Pin Type, 2 m
02AZD790D	U-WAVE T Connection Cable D, Flat 10-Pin Type
12AAD510	Signal cable (USB)
12AAL069	Memory card, for 178
Stands	
178-039	Granite stand, for SJ-410
178-093	Desktop vibration isolation stand

Consumable spares

No.	Description
12AAB355	Nosepiece skidless type
12BAG834	Touch pen
12BAL402	Touch Panel Protecting Sheet
12AAN046	Replacement battery, Replacement
270732	Printer paper, 5 rolls, for SJ-301



178-048
Leveling table D.A.T.



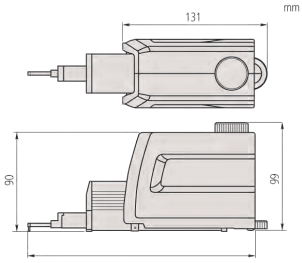
12AAB358
Cylinder attachment



Deep groove measurement



R-surface measurement



SJ-411: 207,5 mm / SJ-412: 234 mm
Drive unit



Optional:
- **Autoset unit 178-010**
- **X-axis adjustment 178-020**
- **Tilting adjustment unit 178-030**



Scope of delivery



178-039
(displayed with SJ-411)

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Mitutoyo

Surftest SJ-500

Series 178 - Surface Roughness Measuring Instrument

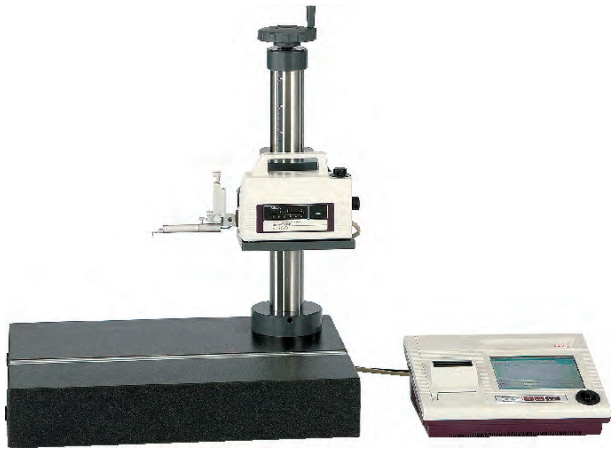
This is a measuring instrument that allows you to easily and accurately measure surface roughness. The Surftest SJ-500 offers you the following benefits:

- The skidless detector allows you to measure the primary profile (P), roughness profile (R), waviness profile (W) and more.
- User friendly control unit for high precision surface roughness measurement.
- The large **19cm** [7,5"] colour TFT LCD with touch-screen functionality gives you high visibility and ease of use.
- The display menu is easy to read and simple to operate.
- It performs roughness analyses conform to various international standards (EN ISO, VDA, ANSI, JIS) and customized settings.
- The built-in joystick on the control unit enables quick and easy positioning. The manual adjustment knob allows you to finely position a small stylus to measure the inside surface of small holes.
- The detector unit allows a 90° displacement of the stylus, which is ideal for crankshaft and narrow space measurement.
- You can use the instrument stand-alone or mounted on a stand.



SJ-500

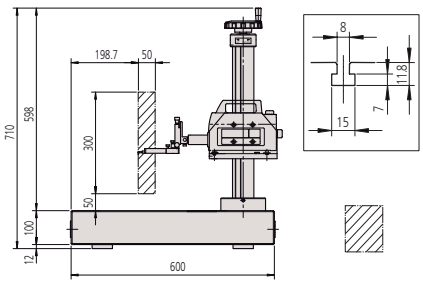
No.	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]
178-532-02D	4	90°	5
178-532-01D	0,75	60°	2



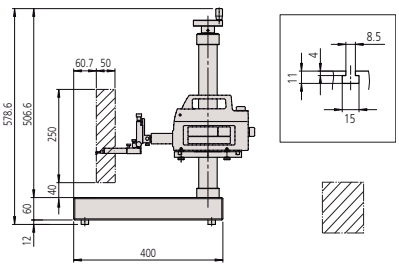
SJ-500 with optional manual column stand



Preview



178-085
600x450x710 mm



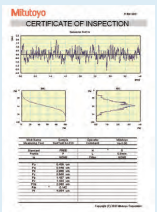
178-089
400x250x578 mm

Specifications

Drive unit	
Traverse	50 mm
Measuring speed	0,02 - 5 mm/s
Drive speed	0 - 20 mm/s or joystick operation
Traverse straightness	0,2 µm / 50 mm
Detector	
Measuring method	Skidless - Differential inductance
Range	800 µm; 80 µm; 8 µm (up to 2,4 mm with an optional stylus)
Positioning	±1,5° (tilting) 30 mm (up/down)
Display unit	
Profiles	Primary Profile (P), Roughness Profile (R), Waviness (W), MOTIF (R, W) and more
Standard	EN ISO, VDA, JIS, ANSI and customize setting
Analysis graphs	BAC, ADC
Digital filter	Gauss, 2CR75, PC75, RobustSpline
Cut-off length	λc : 0,025 mm; 0,08 mm; 0,25 mm; 0,8 mm; 2,5 mm; 8 mm; 25 mm λs : 0,25 µm; 0,8 µm; 2,5 µm; 8 µm; 25 µm; 80µm; 250µm; None λf : 0,08mm; 0,25mm; 0,8mm; 2,5mm; 8mm; 25mm; None
Printer	Thermal printer

Optional accessories

No.	Description
178-396-2	Detector, 0,75mN
178-397-2	Detector, 4mN
178-085	Granite stand for SJ-500
178-089	Column stand
178-047	Three-axis adjustment table
178-048	Leveling table D.A.T
178-042-1	Digimatic XY leveling table, 25mmx25mm
178-043-1	XY leveling table, 25mmx25mm
12AAG202	Extension rod, 50mm
12AAG203	Extension rod, 100mm
178-093	Desktop vibration isolation stand



Software
USB COMMUNICATION TOOL
as a free download on www.mitutoyo.eu
registration required
(refer to page
Optional Software USB Communication Tool)

Refer to SURFACE MEASUREMENT brochure

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Surftest SV-2100

Series 178 - Surface Roughness Measuring Instrument

This is a stationary measuring instrument that allows you to easily and accurately measure surface roughness.
The Surftest SV-2100 offers you the following benefits:

- It is mounted on a granite base with a manual or power column.
- The large **19cm** [7,5"] colour TFT LCD gives you high visibility and touch-screen functionality.
- It has a user friendly display unit for high precision surface roughness measurement.
- It performs roughness analyses conform to various international standards (EN ISO, VDA, ANSI, JIS) and customized settings.
- Designed for usage in workshop areas.



SV-2100S4



SV-2100M4

SV-2100H4 model
Vertical travel : 550 mm power column
Granite base size (WxD) : 600 x 450 mm

No.	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]
178-682-01D	0,75	60°	2
178-682-02D	4	90°	5

SV-2100M4 model
Vertical travel : 350 mm manual column
Granite base size (WxD) : 600 x 450 mm

No.	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]
178-636-01D	0,75	60°	2
178-636-02D	4	90°	5

SV-2100S4 model
Vertical travel : 350 mm power column
Granite base size (WxD) : 600 x 450 mm

No.	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]
178-680-01D	0,75	60°	2
178-680-02D	4	90°	5

SV-2100W4 model
Vertical travel : 550 mm power column
Granite base size (WxD) : 1000 x 450 mm

No.	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]
178-684-01D	0,75	60°	2
178-684-02D	4	90°	5

Specifications

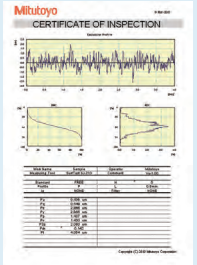
Drive unit	
Traverse	100 mm
Measuring speed	0,02 - 5 mm/s
Drive speed	X = 0-40 mm/s Z2 = 0-20 mm/s or joystick operation
Traverse straightness	0,15 µm / 100 mm
Detector	
Measuring method	Skidless - Differential inductance
Range	800 µm; 80 µm; 8 µm (up to 2,4 mm with an optional stylus)
Display unit	
Profiles	Primary Profile (P), Roughness Profile (R), Waviness (W), MOTIF (P, R, W) and more
Standard	EN ISO, VDA, JIS, ANSI and customize settings
Analysis graphs	BAC, ADC
Digital filter	Gauss, 2CR75, PC75, RobustSpline
Cut-off length	λc : 0,025 mm; 0,08 mm; 0,25 mm; 0,8 mm; 2,5 mm; 8 mm; 25 mm; 80 mm λs : 0,25 µm; 0,8 µm; 2,5 µm; 8 µm; 25 µm; 80 µm; 250 µm; none λf : 0,08 mm; 0,25 mm; 0,8 mm; 2,5 mm; 8 mm; 25 mm; 80 mm; none
Printer	Thermal printer

Optional accessories

No.	Description
12AAG202	Extension rod, 50mm
12AAG203	Extension rod, 100mm
218-001	Cross-travel table
218-003	Rotary Vice



Preview



Software
USB COMMUNICATION TOOL
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Surftest SJ-500P - SV-2100P

Series 178 - Surface Roughness Measuring Instruments with Software FORMTRACEPAK

These are surface roughness measuring instruments with software FORMTRACEPAK.
Software FORMTRACEPAK offers you the following benefits:

- It performs roughness analyses conform to various international standards (EN ISO, VDA, ANSI, JIS) and customized settings.
- It can be used for contour calculation within the measuring range.
- It offers total support for measurement system control, analysis and inspection report.
- All advantages of the SJ-500 and SV-2100 also apply to the P Type.

Surftest SJ-500P



No.	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]
178-530-01D	0,75	60°	2
178-530-02D	4	90°	5

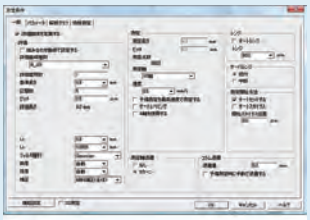
Surftest SV-2100M4P



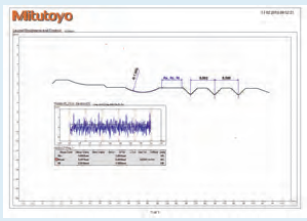
No.	Detector measuring force [mN]	Stylus Tip angle	Stylus Tip radius [µm]
178-634-01D	0,75	60°	2
178-634-02D	4	90°	5

Specifications

Drive unit	
Traverse	50 mm
Measuring speed	0,02 - 5 mm/s
Drive speed	0-20 mm/s
Traverse straightness	0,2 µm / 50 mm
Detector	
Measuring method	Skidless - Differential inductance
Range	800 µm; 80 µm; 8 µm (up to 2,4 mm with an optional stylus)
Positioning	±1,5° (tilting) 30 mm (up/down)
Software	**FORMTRACEPAK**



Measurement conditions



Formtracepak layout

Specifications

Drive unit	
Traverse	100 mm
Measuring speed	0,02 - 5 mm/s
Drive speed	X = 0-40 mm/s Z2 = 0-20 mm/s
Traverse straightness	0,15 µm / 100 mm
Detector	
Measuring method	Skidless - Differential inductance
Range	800 µm; 80 µm; 8 µm (up to 2,4 mm with an optional stylus)
Software	**FORMTRACEPAK**

Refer to SURFACE MEASUREMENT brochure

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Surftest SV-3200

Series 178 - Surface Roughness Measuring Instrument

This is a stationary surface roughness measuring instrument with FORMTRACEPAK software that allows you to take highly accurate measurements.
The Surftest SV-3200 offers you the following benefits:

- It performs roughness analyses conform to various international standards (EN ISO, VDA, ANSI, JIS) and customized settings.
- It also supports contour calculation features within the measuring range of the styli software.
- Part programing as well as motorised axes give you many features of a CNC instrument.
- You can choose from a huge number of styli that are easy to replace.
- Detector holders for downward/upward measurement and crank position available as optional
- Optional accessories like DAT unit and 3D/Y-axis table have been added to product line.

Specifications

Traverse	100 mm / 200 mm
Range	800 µm; 80 µm; 8 µm (up to 2,4 mm with an optional stylus)
Drive speed	X = 0 - 80 mm/s Z2 = 0 - 30 mm/s
Standard	EN ISO, VDA, JIS, ANSI and customize setting
Measuring speed	0,02 - 20 mm/s
Inclining range	±45°
Profiles	Primary Profile (P), Roughness Profile (R), Waviness (W), MOTIF (P, R, W) and more
Software	**FORMTRACEPAK** – Enables control of all axes and rotary table for realizing efficient measurement automation. – Perform contour evaluation that allows free analysis of level differences, angles, pitch, area and other characteristics as well as surface roughness evaluation. – Able to create an original inspection certificate by setting the print format to suit particular requirements.



Detector holder S-3000C



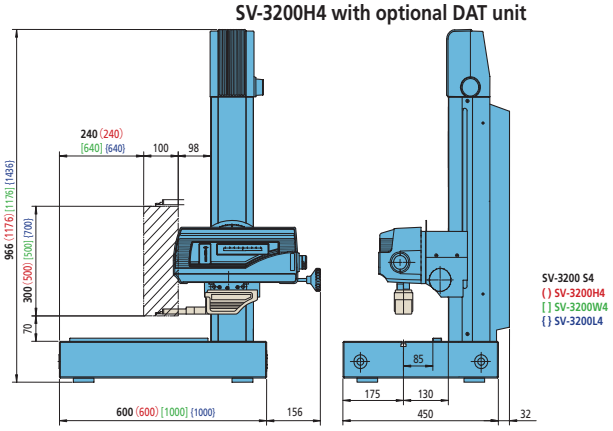
Detector holder S-3000CR



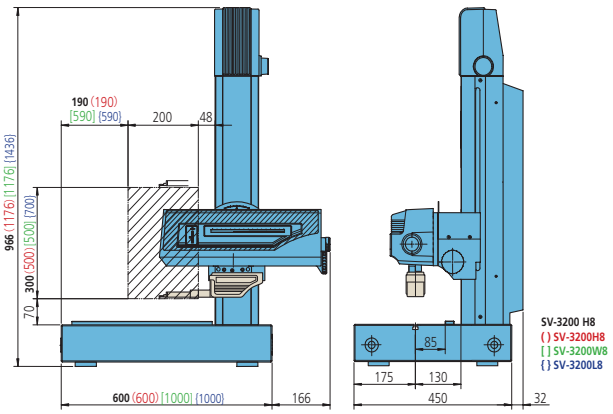
Detector holder S-3000MR



SV-3200H4 with optional DAT unit



SV-3200S4 - SV-3200H4 - SV-3200W4 - SV-3200L4



SV-3200S8 - SV-3200H8 - SV-3200W8 - SV-3200L8

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Mitutoyo

Surftest SV-3200

X-axis measuring range : 100 mm

X-axis Traverse straightness : (0,05+0,001L) µm, L = Measurement length (mm)

Model	SV-3200S4	SV-3200S4.	SV-3200H4	SV-3200H4.
No.	**178-434-11D**	**178-434-12D**	**178-435-11D**	**178-435-12D**
Detector measuring force [mN]	0,75	4	0,75	4
Stylus Tip angle	60°	90°	60°	90°
Stylus Tip radius [µm]	2	5	2	5
Vertical travel [mm]	300	300	500	500
Granite base size (WxD) [mm]	600 x 450	600 x 450	600 x 450	600 x 450

Model	SV-3200W4.	SV-3200W4	SV-3200L4	SV-3200L4.
No.	**178-436-11D**	**178-436-12D**	**178-474-11D**	**178-474-12D**
Detector measuring force [mN]	0,75	4	0,75	4
Stylus Tip angle	60°	90°	60°	90°
Stylus Tip radius [µm]	2	5	2	5
Vertical travel [mm]	500	500	700	700
Granite base size (WxD) [mm]	1000 x 450	1000 x 450	1000 x 450	1000 x 450

X-axis measuring range : 200 mm

X-axis Traverse straightness : (0,1+0,002L) µm, L=Measurement length (mm)

Model	SV-3200S8	SV-3200S8.	SV-3200H8	SV-3200H8.
No.	**178-437-11D**	**178-437-12D**	**178-438-11D**	**178-438-12D**
Detector measuring force [mN]	0,75	4	0,75	4
Stylus Tip angle	60°	90°	60°	90°
Stylus Tip radius [µm]	2	5	2	5
Vertical travel [mm]	300	300	500	500
Granite base size (WxD) [mm]	600 x 450	600 x 450	600 x 450	600 x 450

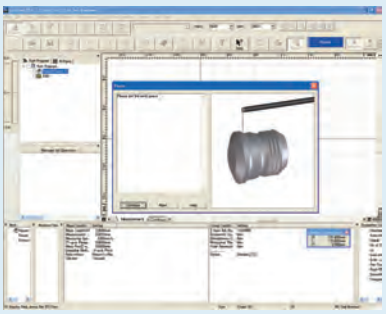
Model	SV-3200W8	SV-3200W8.	SV-3200L8	SV-3200L8.
No.	**178-439-11D**	**178-439-12D**	**178-475-11D**	**178-475-12D**
Detector measuring force [mN]	0,75	4	0,75	4
Stylus Tip angle	60°	90°	60°	90°
Stylus Tip radius [µm]	2	5	2	5
Vertical travel [mm]	500	500	700	700
Granite base size (WxD) [mm]	1000 x 450	1000 x 450	1000 x 450	1000 x 450

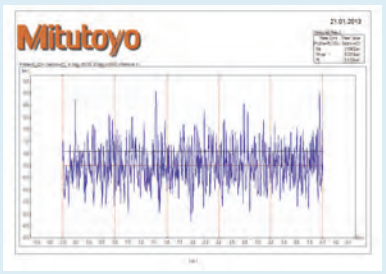


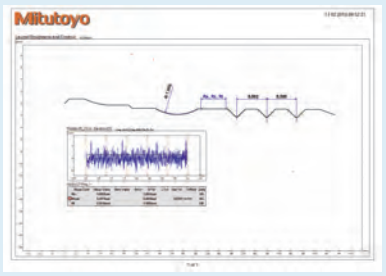
SV-3200 with 178-096 and 178-077

Optional accessories

No.	Description
178-097	Y-axis table
12AAD975	Rotary table, Theta-1
178-078	Rotary table, Theta2 axis
178-023	Manual vibration isolator
178-024	Stand for vibration isolator
178-025	Dynamic vibration isolator
218-001	Cross-travel table
218-003	Rotary Vice
12AAG202	Extension rod, 50mm
12AAG203	Extension rod, 100mm
178-611	Step gauge, mm, (2, 10)µm
178-087	Automatic leveling table, SV-series, CV-series, CS-3200
178-396-2	Detector, 0,75mN
178-397-2	Detector, 4mN
178-074	Detector holder S-3000C
178-075	Detector holder S-3000CR
178-076	Detector holder S-3000MR
178-040	D.A.T unit
178-096	3 D/Y-axis table
12AAR859	Detector stand
178-077	3D leveling table, (for SV-3200 only with 178-096)







FORMTRACEPAK

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Surftest Extreme SV-3000CNC

Series 178 – CNC Surface Roughness Measuring Instrument

These is a fully CNC surface roughness measuring instrument with powerful software FORMTRACEPAK.
The Surftest Extreme SV-3000CNC offers you the following benefits:

- It is perfectly made for increased throughput of multiple profile and workpiece measurement tasks.
- Each axis has a drive speed of up to 200 mm/s.
- You can take continuous measurement over horizontal and inclined surfaces by power-tilting the drive unit.
- Within the measuring range of the styli software FORMTRACEPAK supports contour calculation features
- 3D topography measurement as option available
- Inclined plane measurement is possible through 2-axis simultaneous control in the X and Y directions.
- The detector unit incorporates an anti-collision safety device, causing it to automatically stop if its main body collides with a workpiece or jig.

Specifications

Range	800 µm; 80 µm; 8 µm (up to 2,4 mm with an optional stylus)
Traverse	X = 200 mm Y = 200mm
Measuring speed	0,02 - 2 mm/s
Standard	EN ISO, VDA, JIS, ANSI and customize setting
Drive speed	CNC mode: max. 200 mm/s Joystick mode: 0 - 60 mm/s
Traverse straightness	0,5 µm / 200 mm
Inclining range	-45° (CCW) to +10° (CW)
Profiles	Primary Profile (P), Roughness Profile (R), Waviness (W), MOTIF (P, R, W) and more
Software	**FORMTRACEPAK** – Allows control of all axis, optional motor-driven Y-axis table and rotary table for efficient automated measurement. – Surface roughness analysis and contour evaluation can be performed using analysis of level differences, angle, pitch, area and contour tolerancing as standard. – An inspection certificate can be created by setting the print format as required.

Additional Specifications

Optional accessories	Other optional and standard accessories are listed later in different sections for accessories and styli.

Optional accessories

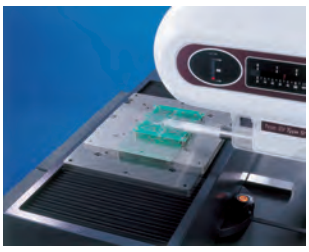
No.	Description
12AAD975	Rotary table, Theta-1
178-078	Rotary table, Theta2 axis
178-037	2D auto-leveling table
178-077	3D leveling table, (for SV-3200 only with 178-096)
12AAE032	Special anti-vibration table
12AAE449	Cabin for H-type used with CNC series, for Z2=500mm

Refer to SURFACE MEASUREMENT brochure



SV-3000CNC

Model	SV-3000CNC-S	SV-3000CNC-H	SV-3000CNC-S.	SV-3000CNC-H.
No.	**178-522-2**	**178-542-2**	**178-524-2**	**178-544-2**
Z2-axis range [mm]	300	500	300	500
Y-axis table unit	-	-	Installed	Installed
α-axis unit	Installed	Installed	Installed	Installed



Automatic measurement

All products to be sold to commercial customers. Product illustrations are without obligation. Product descriptions, in particular any and all technical specifications, are only binding when explicitly agreed upon. For suggested retail prices, please refer to the separate price list.

Mitutoyo

Surftest Extreme SV-M3000CNC

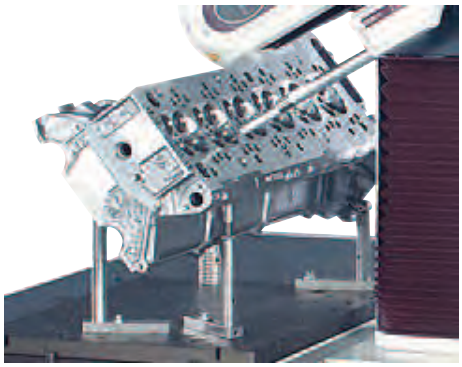
Series 178 - CNC Surface Roughness Measuring Instrument

This is a top performance CNC surface roughness measuring instrument with powerful software FORMTRACEPAK.
The Surftest Extreme SV-M3000CNC offers you the following benefits:

- You can measure large and heavy workpieces such as engine blocks and crankshafts.
- It has an 800mm moving column configuration to largely eliminate workpiece size restrictions.
- Each axis has a drive speed of up to 200 mm/s.
- When combined with the optional detector swivelling unit, continuous measurement over the bottom, top and side surface of a workpiece is possible.
- The huge load table has a self-contained structure ensuring that you can easily accommodate various size workpieces, standard and custom jigs, and auto-feed devices.



No.	Model	Detector hold type (Essential option)
178-549-2	178-071	Standard
	178-072	Long type
	178-073	Rotary type



Typical measurement task

Specifications

Range	800 µm; 80 µm; 8 µm (up to 2,4 mm with an optional stylus)
Traverse	X = 200 mm Y = 800 mm Z2 = 500 mm
Measuring speed	0,02 - 2 mm/s
Standard	EN ISO, VDA, JIS, ANSI and customize setting
Drive speed	CNC mode: max. 200 mm/s Joystick mode: 0 - 50 mm/s
Traverse straightness	X = 0,5 µm / 200 mm (standard) X = 0,7 µm / 200 mm (long-type detector) X = 0,5 µm / 200 mm (rotary-type detector) Y = 0,5 µm / 50 mm; 2 µm / 800 mm (standard) Y = 0,7 µm / 50 mm; 3 µm / 800 mm (long-type detector) Y = 0,7 µm / 50 mm; 3 µm / 800 mm (rotary-type detector)
Inclining range	-45° (CCW) to +10° (CW)
Profiles	Primary Profile (P), Roughness Profile (R), Waviness (W), MOTIF (P, R, W) and more
Loading weight	300 kg
Software	**FORMTRACEPAK** • Enables control of all axes for realizing efficient measurement automation. • Perform contour evaluation that allows free analysis of level differences, angles, pitch, area and other characteristics as well as surface roughness evaluation. • Able to create an original inspection certificate by setting the print format to suit particular requirements.

Additional Specifications

Optional accessories	Other optional and standard accessories are listed later in different sections for accessories and styli.

Refer to SURFACE MEASUREMENT brochure

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Contracer CV-2100

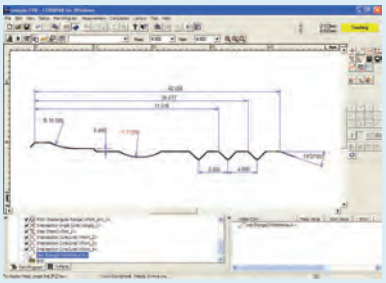
Series 218 - Contour Measuring Instruments

This contour measuring instrument is designed to support "easy to use" and "speedy" measurements.

The Contracer CV-2100N4 and CV-2100M4 offer you the following benefits:
- Extensive contour measurement quick and easy.
- Quick movement in Z2 because of an easy to use quick grip. [M4 type]
- Auto execution and multi point measurement with the new stylus up-and down function.
- X-axis drive up to 20mm/s by jog shuttle.
- Easy part programming as well as single measurement with software FORMTRACEPAK.
- Automatic evaluation, best fit of contours, CAD comparison and many more features as standard.
- CV-2100 M4 mounted with quick grip stand on a granite base.
- CV-2100 N4 can be mounted on an optional granite base with a manual column.
- Centralized front control panel

Specifications

Measuring range	Z1 = 50mm X = 100mm
Measuring speed	0,02 - 5 mm/s
Drive speed	X = 0 - 20 mm/s
Accuracy	X = (2,5 + 0,02L) µm [L: drive length (mm)] Z1 = (2,5 + I0,1HI) µm [H: Measurement height from the horizontal position (mm)]
Traverse straightness	2,5 µm / 100 mm
Column type	M4: 350 mm
Software	**FORMTRACEPAK** – Allows control of measuring conditions for efficient automated measurement. – Contour evaluation can be performed using analysis of level differences, angle, pitch, area and contour tolerancing as standard. – An inspection certificate can be created by setting the print format as required.



FORMTRACEPAK

Refer to CV-2100 brochure

Scan QR Code with your mobile device and watch our product videos on YouTube



CV-2100M4



CV-2100N4

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Contracer CV-2100

Series 218 - Contour Measuring Instruments

Specifications and accessories

Model	CV-2100N4	CV-2100M4
No.	**218-613D**	**218-633D**
Z2-axis range [mm]	-	350
Z1-axis range [mm]	50	50
Z2-axis column type	Optional: Manual	Manual: Quick up-and-down motion, fine feed
X1-axis range [mm]	100	100



CV-2100 Stylus up-and-down function



CV-2100M4 with column and quick grip



Easy and quick movement in Z2

Additional Specifications

Optional accessories	Other optional and standard accessories are listed later in different sections for accessories and styli.

Optional accessories

No.	Description
218-001	Cross-travel table
218-003	Rotary Vice
178-023	Manual vibration isolator
178-024	Stand for vibration isolator
218-042	Column Stand, for CV-2100N4



Optional column stand 218-042

All products to be sold to commercial customers. Product illustrations are without obligation. Product descriptions, in particular any and all technical specifications, are only binding when explicitly agreed upon. For suggested retail prices, please refer to the separate price list.

Contracer CV-3200 and CV-4500

Series 218 - Contour Measuring Instruments

These are high accuracy semi-automatic contour measuring instruments equipped with powerful software FORMTRACEPAK.

The Contracer CV-3200 offers you the following benefits:

- Huge measuring range of Z=60 mm comes as standard.
- Easy exchange of magnetic stylus arm gives you excellent flexibility.
- The CV-3200 provides excellent accuracy and resolution in Z1-axis measurement.
- Its high positioning speed reduces the total measurement time.
- It has a fully automatic calibration routine.

The Contracer CV-4500 offers you the following benefits:

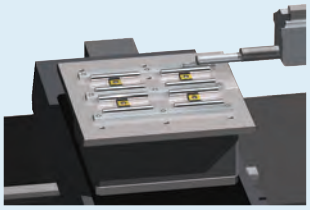
- It has a dual stylus system for upward/downward measurement at double sided contours.
- Variable measuring force is controlled by software FORMTRACEPAK.
- Easy exchange of magnetic stylus arm gives you excellent flexibility.
- The CV-4500 provides the highest accuracy and resolution possible.
- The motorised axes have a high positioning speed.
- The dual stylus system has a fully automatic calibration routine.

Specifications

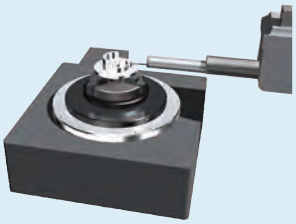
Traverse	Z2 = 300 mm / 500 mm / 700 mm
Measuring range	Z1 = 60 mm X = 100 mm / 200 mm
Measuring speed	0,02 - 20 mm/s
Drive speed	X = 0 - 80 mm/s Z2 = 0 - 30 mm/s
Accuracy	X = (0,8+0,01L) µm (S4, H4, W4, L4 model) X = (0,8+0,02L) µm (S8, H8, W8, L8 model) [L : Drive length (mm)] **CV-3200 :** Z1 = (1,4+I2HI/100) µm **CV-4500 :** Z1 = (0,8+I2HI/100) µm [H : Measurement height from the horizontal position (mm)]
Inclining range	±45°
Measuring force	**CV-3200 :** 30 mN **CV-4500 :** 10, 20, 30, 40, 50 mN (software controlled)
Software	**FORMTRACEPAK**

Additional Specifications

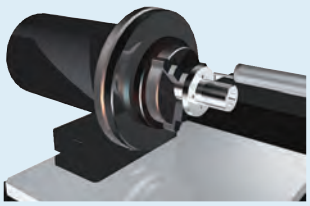
Optional accessories	Other optional and standard accessories are listed later in different sections for accessories and styli.



Optional Y-axis - 178-097



Optional Rotary Table θ1 - 12AAD975



Optional Rotary Table θ2 - 178-078

Refer to CONTOUR MEASUREMENT brochure



Contracer CV-3200
(CV-4500 equipped with dual stylus system)



Drive unit CV-3200



Drive unit CV-4500

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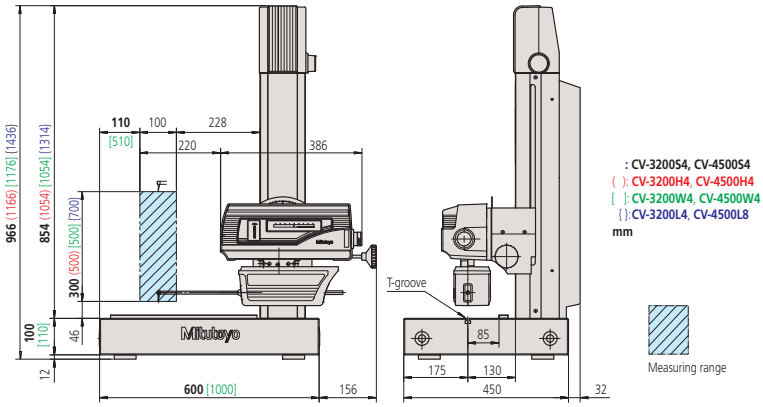
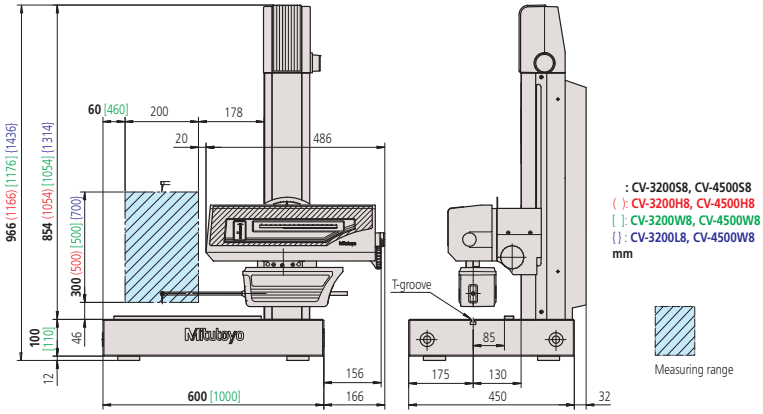
Contracer CV-3200 and CV-4500

Series 218 - Contour Measuring Instruments

Dimensions and specifications





CV-3200

Model	CV-3200S4	CV-3200H4	CV-3200W4	CV-3200L4
No.	**218-481-10D**	**218-482-10D**	**218-483-10D**	**218-484-10D**
X1-axis range [mm]	100	100	100	100
Vertical travel [mm]	300	500	500	700
Granite base size (WxD) [mm]	600x450	600x450	1000x450	1000x450

Model	CV-3200S8	CV-3200H8	CV-3200W8	CV-3200L8
No.	**218-486-10D**	**218-487-10D**	**218-488-10D**	**218-489-10D**
X1-axis range [mm]	200	200	200	200
Vertical travel [mm]	300	500	500	700
Granite base size (WxD) [mm]	600x450	600x450	1000x450	1000x450

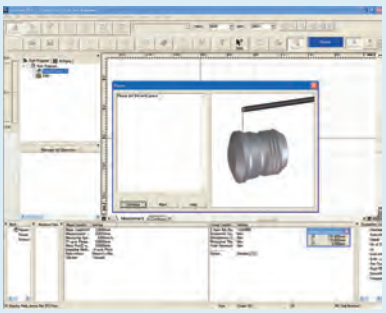
CV-4500

Model	CV-4500S4	CV-4500H4	CV-4500W4	CV-4500L4
No.	**218-441-10D**	**218-442-10D**	**218-443-10D**	**218-444-10D**
X1-axis range [mm]	100	100	100	100
Vertical travel [mm]	300	500	500	700
Granite base size (WxD) [mm]	600x450	600x450	1000x450	1000x450

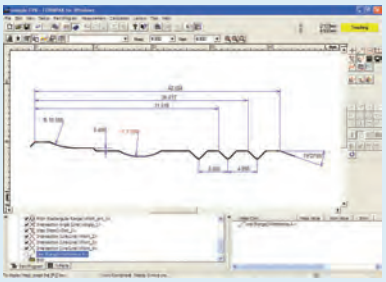
Model	CV-4500S8	CV-4500H8	CV-4500W8	CV-4500L8
No.	**218-446-10D**	**218-447-10D**	**218-448-10D**	**218-449-10D**
X1-axis range [mm]	200	200	200	200
Vertical travel [mm]	300	500	500	700
Granite base size (WxD) [mm]	600x450	600x450	1000x450	1000x450

Specifications

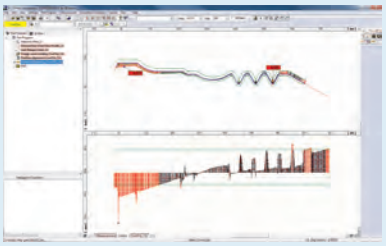
Software	**FORMTRACEPAK** – Allows control of all axis, optional motor-driven Y-axis table and rotary table for efficient automated measurement. – Contour evaluation can be performed using analysis of level differences, angle, pitch, area and contour tolerancing as standard. – An inspection certificate can be created by setting the print format as required.



Measurement control screen



Contour analysis screen



Contour comparison

FORMTRACEPAK

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Formtracer SV-C3200 and SV-C4500

Series 525 - Surface and Contour Measuring System

These are high accuracy semi-automatic contour and roughness measuring instruments equipped with powerful software FORMTRACEPAK.

The Formtracer SV-C3200 offers you the following benefits:

- It is as powerful as two separate, specialised instruments.
- It economically combines roughness & contour measurement into a single device.
- You have access to a huge contour measuring range of Z=60mm as standard, and a roughness measurement range of 800µm as standard.
- Easy exchange of the magnetic contour stylus arm gives you excellent flexibility.
- The SV-C3200 provides you with excellent accuracy and resolution in Z1-axis measurement.

The Formtracer SV-C4500 offers you the following benefits:

- It economically combines roughness & dual stylus upward/downward contour measurement into a single device.
- You have access to a huge contour measuring range of Z=60mm as standard, and a roughness measurement range of 800µm as standard.
- Its variable measuring force is controlled by software FORMTRACEPAK.
- Easy exchange of the magnetic contour stylus arm gives you excellent flexibility.
- The SV-C4500 provides you with high accuracy and resolution.

Specifications

Traverse	Z2 = 300 mm / 500 mm / 700 mm
Measuring range	X = 100 mm / 200 mm **Contour:** Z1 = 60 mm **Roughness:** Z1 = 800 µm; 80 µm; 8 µm (up to 2,4 mm with an optional stylus)
Measuring speed	0,02 - 20 mm/s
Drive speed	X = 0 - 80 mm/s Z2 = 0 - 30 mm/s
Accuracy	X = (0,8+0,01L) µm (S4, H4, W4, L4 model) X = (0,8+0,02L) µm (S8, H8, W8, L8 model) [L : Drive length (mm)] **SV-C3200 :** Z1 = (1,4+I2HI/100) µm **SV-C4500 :** Z1 = (0,8+I2HI/100) µm [H : Measurement height from the horizontal position (mm)]
Inclining range	±45°
Measuring force	**SV-C3200 Contour :** 30 mN **SV-C4500 Contour :** 10, 20, 30, 40, 50 mN software controlled **Roughness :** 0,75 mN / 4mN (dependent on model)
Software	**FORMTRACEPAK**

Additional Specifications

Optional accessories	Other optional and standard accessories are listed later in different sections for accessories and styli.



Refer to Formtracer SV-C3200 / 4500 brochure



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Formtracer SV-C3200



Surface Roughness drive unit

[Surface Roughness Measurement : Complies with EN ISO, VDA, JIS, ANSI and other international surface roughness standards.]



Contour drive unit SV-C3200



Contour drive unit SV-C4500

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Formtracer SV-C3200 and SV-C4500

Series 525 - Surface and Contour Measuring System

Metric

SV-C3200

No.	Model	Detector 0,75 mN	Detector 4 mN	X-axis 100 mm	X-axis 200 mm	Z2-axis 300 mm	Z2-axis 500 mm	Z2-axis 700 mm	Granite size (WxD) [mm]
525-481-11D	SV-C3200S4	●		●		●			600 x 450
525-481-12D	"		●	●		●			600 x 450
525-482-11D	SV-C3200H4	●		●			●		600 x 450
525-482-12D	"		●	●			●		600 x 450
525-483-11D	SV-C3200W4	●		●			●		1000 x 450
525-483-12D	"		●	●			●		1000 x 450
525-484-11D	SV-C3200L4	●		●				●	1000 x 450
525-484-12D	"		●	●				●	1000 x 450
525-486-11D	SV-C3200S8	●			●	●			600 x 450
525-486-12D	"		●		●	●			600 x 450
525-487-11D	SV-C3200H8	●			●		●		600 x 450
525-487-12D	"		●		●		●		600 x 450
525-488-11D	SV-C3200W8	●			●		●		1000 x 450
525-488-12D	"		●		●		●		1000 x 450
525-489-11D	SV-C3200L8	●			●			●	1000 x 450
525-489-12D	"		●		●			●	1000 x 450

Metric

SV-C4500

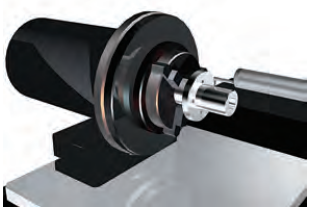
No.	Model	Detector 0,75 mN	Detector 4 mN	X-axis 100 mm	X-axis 200 mm	Z2-axis 300 mm	Z2-axis 500 mm	Z2-axis 700 mm	Granite size (WxD) [mm]
525-441-11D	SV-C4500S4	●		●		●			600 x 450
525-441-12D	"		●	●		●			600 x 450
525-442-11D	SV-C4500H4	●		●			●		600 x 450
525-442-12D	"		●	●			●		600 x 450
525-443-11D	SV-C4500W4	●		●			●		1000 x 450
525-443-12D	"		●	●			●		1000 x 450
525-444-11D	SV-C4500L4	●		●				●	1000 x 450
525-444-12D	"		●	●				●	1000 x 450
525-446-11D	SV-C4500S8	●			●	●			600 x 450
525-446-12D	"		●		●	●			600 x 450
525-447-11D	SV-C4500H8	●			●		●		600 x 450
525-447-12D	"		●		●		●		600 x 450
525-448-11D	SV-C4500W8	●			●		●		1000 x 450
525-448-12D	"		●		●		●		1000 x 450
525-449-11D	SV-C4500L8	●			●			●	1000 x 450
525-449-12D	"		●		●			●	1000 x 450



Using Y-axis table



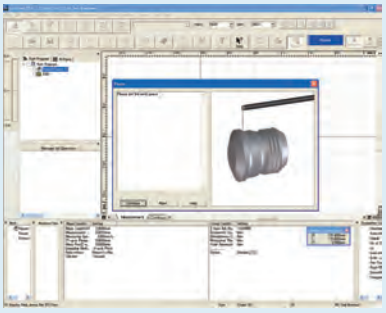
Using rotary table θ1



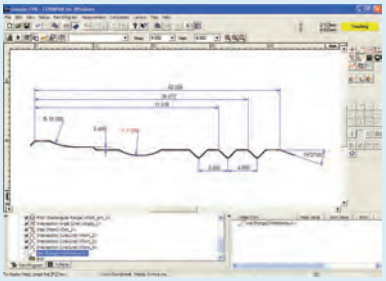
Using rotary Table θ2

Specifications

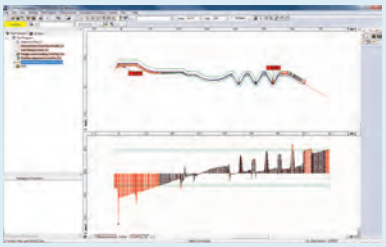
Software	**FORMTRACEPAK** – Allows control of all axis, optional motor-driven Y-axis table and rotary table for efficient automated measurement. – Contour evaluation can be performed using analysis of level differences, angle, pitch, area and contour tolerancing as standard. – An inspection certificate can be created by setting the print format as required.



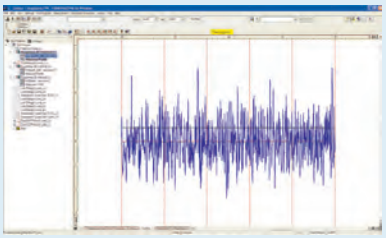
Measurement control screen



Contour analysis screen



Contour comparison



Roughness analysis

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Formtracer CS-3200

Series 525 - Surface and Contour Measuring System

This provides all-in-one surface roughness and contour measurement within one drive unit.
The Formtracer CS-3200 offers you the following benefits:

- You can carry out simultaneous analysis of roughness and contour with one measurement.
- It performs roughness analyses conform to various international standards (EN ISO, VDA, ANSI, JIS) and customized settings..
- It gives you the best measuring condition with a vibration stand as standard.
- The high drive speed reduces the total measurement time.
- The detector unit can be extended to avoid interference between the drive unit and workpiece.

Specifications

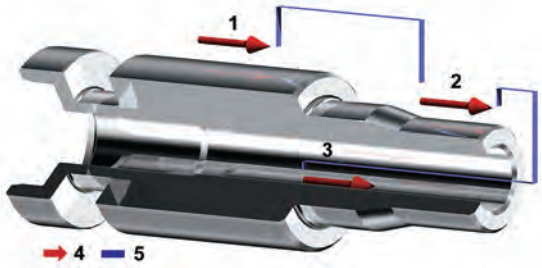
Traverse	Z2 = 300 mm
Measuring range	X = 100 mm Z1 = 5 mm (up to 10 mm with an optional stylus)
Measuring speed	Roughness measurement: 0,02 / 0,05 / 0,1 / 0,2 mm/s Contour measurement: 0,02 / 0,05 / 0,1 / 0,2 / 0,5 / 1 / 2 mm/s
Drive speed	X = 0 - 80 mm/s Z2 = 0 - 20 mm/s
Accuracy	X = (0,8+0,01L) µm [L : Drive length (mm)] Z1 = (1,5+l2Hl/100) µm H : Measurement height from the horizontal position (mm)
Inclining range	±45°
Traverse straightness	X = 0,2 µm / 100 mm
Software	**FORMTRACEPAK** – Allows control of all axis, optional motor-driven Y-axis table and rotary table for efficient automated measurement. – Surface roughness analysis and contour evaluation can be performed using analysis of level differences, angle, pitch, area and contour tolerancing as standard. – An inspection certificate can be created by setting the print format as required.

Refer to Formtracer CS-3200 brochure

Scan QR Code with your mobile device and watch our product videos on YouTube



CS-3200S4
(with optional Y-axis 178-097)



1: Outside diameter
2: Outside diameter
3: Inside diameter
4: Measurement element
5: Positioning element

Continuous measurement example:

The drive unit (X-axis) and column (Z2-axis) are equipped with high-accuracy linear scales (ABS type) enabling fully automatic measurement combining vertical and horizontal movement. This improves reproducibility of continuous automatic measurement of small holes in the vertical direction and repeated measurements of parts which are difficult to position

All products to be sold to commercial customers. Product illustrations are without obligation. Product descriptions, in particular any and all technical specifications, are only binding when explicitly agreed upon. For suggested retail prices, please refer to the separate price list.

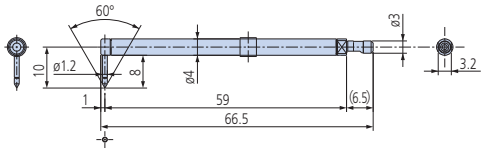
Mitutoyo

Formtracer CS-3200

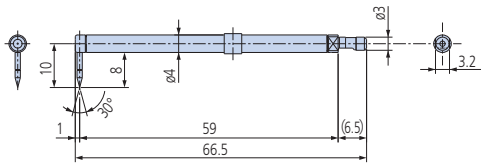
Series 525 - Surface and Contour Measuring System

Specifications and Styli

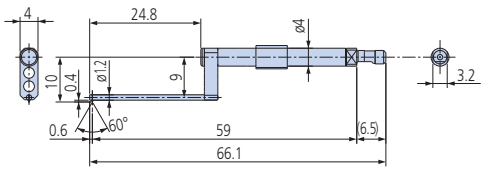
Model	CS-3200S4
No.	**525-401D**
Z2-axis range [mm]	300
X1-axis range [mm]	100



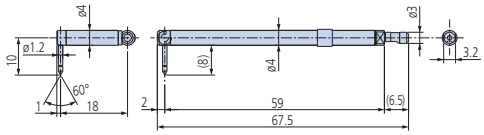
12AAD554
Standard stylus
Radius of tip curvature = 2 µm
Tip Material: Diamond



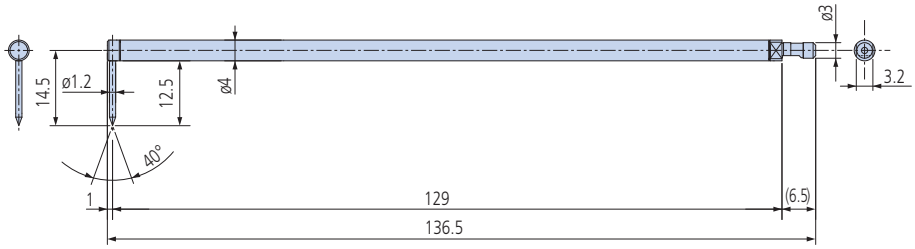
12AAD552
Cone stylus
Radius of tip curvature = 25 µm
Tip Material: Sapphire



12AAD556
Small hole stylus
Radius of tip curvature = 2 µm
Tip Material: Diamond

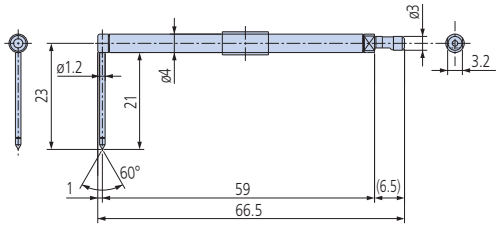


12AAD558
Eccentric type stylus
Radius of tip curvature = 2 µm
Tip Material: Diamond



12AAD562
2x-long stylus*1
Radius of tip curvature = 5 µm
Tip Material: Diamond

***1: Measuring force is 4mN and the Z1 measuring and resolution is double that of the standard stylus.**

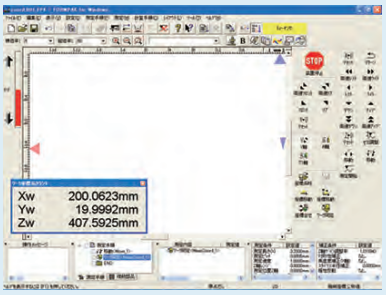


12AAD560
Deep groove stylus
Radius of tip curvature = 2 µm
Tip Material: Diamond



Additional Specifications

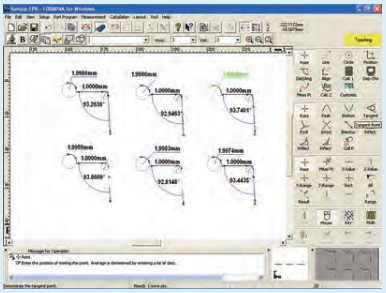
Optional accessories	Other optional and standard accessories are listed later in different sections for accessories and styli.



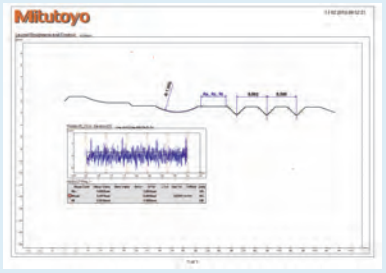
Measuring instrument control



Contour analysis screen



Contour analysis screen



Contour and roughness layout

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Formtracer Extreme SV-C4500CNC

Series 525 - Surface and Contour Measuring Instrument

High accurate fully CNC surface and contour measuring instrument.
The Formtracer Extreme SV-C4500CNC offers you the following benefits:

- Powerful as two separate, fully CNC instruments.
- Measurement of long distances in Z2-axis for models without α- axis.
- Each axis has a drive speed up to 200mm/s.
- Dual stylus system for upward and downward contour measurement at doubled sided contours.
- It´s variable contour measuring force is controlled by software FORMTRACEPAK.
- The contour drive unit is equipped with an arc encoder detector giving excellent accuracy and resolution in Z1-axis.
- Perfectly made for increased throughput of multiple profile and workpiece measurement tasks.
- The detector unit incorporates an anti-collision safety device, causing it to stop automatically if its main body collides with a workpiece or jig.

Specifications

Traverse	Z2= 300 mm / 500 mm
Measuring range	X= 200 mm Y= 200 mm **Contour:** Z1= 60 mm Z2= 300 / 500 mm **Roughness:** Z1= 800 µm; 80 µm; 8 µm (up to 2,4 mm with an optional stylus)
Measuring speed	0,02 - 2 mm/s
Drive speed	CNC mode: max. 200 mm/s Joystick mode: 0-50 mm/s
Accuracy	X= (0,8 +4L/200) µm [L: Drive length (mm)] Z1= (0,8 + I2HI/100) µm [H: Measurement height from the horizontal position (mm)] Model without α-axis: Z2= (1,5 + 10HI1000) µm
Inclining range	-45° (CCW) to +10° (CW)
Measuring force	0,75 mN
Software	**FORMTRACEPAK** – Allows control of all axis, motor-driven Y-axis table and rotary table for efficient automated measurement. – Contour evaluation can be performed using analysis of level differences, angle, pitch, area and contour tolerancing as standard. – An inspection certificate can be created by setting the print format as required.

Refer to CONTOUR AND SURFACE MEASUREMENT brochure



SV-C4500CNC equipped with two powerful exchangeable drive units



Surface Roughness drive unit



Contour drive unit

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Formtracer Extreme SV-C4500CNC

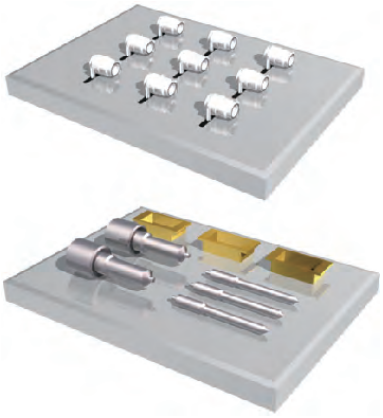
Series 525 - Surface and Contour Measuring Instrument

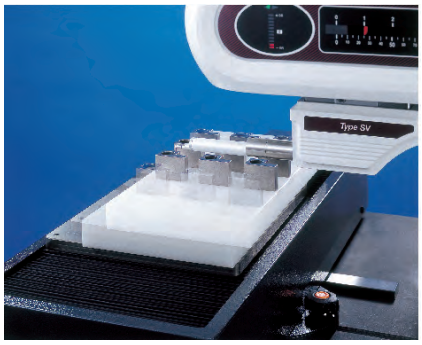
SV-C4500CNC-H

No.	Z2-axis range [mm]	Y-axis table unit	α-axis unit
525-681-1D	500	-	-
525-682-1D	500	-	Installed
525-683-1D	500	Installed	-
525-684-1D	500	Installed	Installed

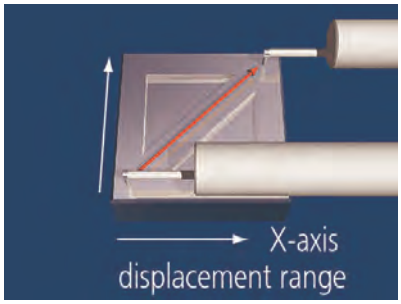
SV-C4500CNC-S

No.	Z2-axis range [mm]	Y-axis table unit	α-axis unit
525-661-1D	300	-	-
525-662-1D	300	-	Installed
525-663-1D	300	Installed	-
525-664-1D	500	Installed	Installed

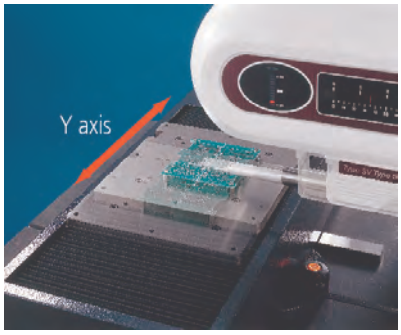




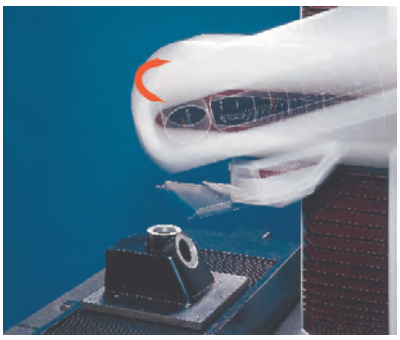
Multiple measurements



Through 2-axis simultaneous control in the X and Y directions



Y-axis



α-axis

Specifications

Optional accessories	Other optional and standard accessories are listed later in different sections for accessories and styli.

Optional accessories

No.	Description
178-397-2	Detector, 4mN
12AAD975	Rotary table, Theta-1
178-078	Rotary table, Theta2 axis
178-037	2D auto-leveling table
178-077	3D leveling table, (for SV-3200 only with 178-096)
12AAE449	Cabin for H-type used with CNC series, for Z2=500mm
12AAE287	Cabin for S-type used with CNC series, For Z2=300mm

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Formtracer Extreme SV-C4500CNC HYBRID Type 1

Series 525 - Surface and Contour Measuring Instrument

This measuring system is equipped with a surface roughness detector, a contour detector and a confocal chromatic point sensor (CPS) employing axial chromatic aberration. It performs non-contact contour and roughness measurement on parts with steeply inclined surfaces and soft materials.

- Powerful as three separate fully CNC instruments
- High accurate fully CNC surface and contour measuring instrument
- Non-contact and contact measurement combined in one instrument
- Two machine types with different CPS sensors available, depending on measuring range and resolution
- Drive speed of up to 200mm/s in all axes
- Vibration isolator as standard

Specifications

Traverse	Z2 = 500 mm
Measuring range	X= 200 mm Y= 200 mm **Contour:** Z1= 60 mm Z2= 300 / 500 mm **Roughness:** Z1= 800 µm; 80 µm; 8 µm (up to 2,4 mm with an optional stylus)
Measuring speed	0,02 - 2 mm/s
Accuracy	X= (0,8 +4L/200) µm [L: Drive length (mm)] Z1= (0,8 + I2HI/100) µm [H: Measurement height from the horizontal position (mm)] Model without α-axis: Z2= (1,5 + 10HI1000) µm
Software	**FORMTRACEPAK** – Allows control of all axis, motor-driven Y-axis table and rotary table for efficient automated measurement. – Contour evaluation can be performed using analysis of level differences, angle, pitch, area and contour tolerancing as standard. – An inspection certificate can be created by setting the print format as required.





Surface Roughness drive unit



Contour drive unit



CPS sensor drive unit

No.	Model	Roughness	Contour	Non-contact
525-686-1D	Type 1A	0,75 mN	Dual contour stylus	CPS2525
525-687-1D	Type 1B	0,75 mN	Dual contour stylus	CPS0517

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Formtracer Extreme CS-5000CNC and CS-H5000CNC

Series 525 - CNC Surface and Contour Measuring Instruments

This is the highest-accuracy stylus type CNC surface roughness and contour measuring instrument. The Formtracer Extreme CS-5000CNC / CS-H5000CNC offers you the following benefits:

- It meets the highest demands of accuracy and repeatability.
- You can carry out simultaneous analysis of roughness and contour within one measurement.
- It includes a cabin and a vibration stand as standard to avoid external influences.
- A Mitutoyo Laser Holoscale is incorporated in the X1- and Z1-axes so you can achieve high resolution of X1-axis : 6,25 nm and Z1-axis : 0,8 nm/1,6 nm.
- The X1 and Z2-axis have maximum drive speeds of 40mm/s and 200mm/s respectively.



CS-H5000CNC





Specifications

Traverse	Z2 = 300 mm / 500 mm
Measuring range	X = 200mm Z1 = 12 mm [standard lenght stylus] Z1 = 24 mm [double lenght stylus]
Measuring speed	Roughness measurement: 0,02 - 0,2 mm/s Contour measurement: 0,02 - 2 mm/s
Drive speed	CNC mode: max. 200 mm/s Joystick mode 0 - 50 mm/s
Accuracy	**CS-5000CNC:** X = (0,3+0,002L) µm Z1 = (0,3+I0,02HI) µm **CS-H5000CNC:** X = (0,16+0,001L) µm Z1 = (0,07+I0,02HI) µm [L : Drive length (mm)] [H : Measurement height from the horizontal position (mm)]
Traverse straightness	**CS-5000CNC:** X = (0,1+0,0015L) µm [standard stylus] X = (0,2+0,0015L) µm [double length stylus] **CS-H5000CNC:** X = (0,05+0,0003L) µm [standard stylus] X = (0,1+0,0015L) µm [double length stylus]
Measuring force	4 mN (with standard stylus) 0,75 mN (with 2X-long stylus)
Resolution	X = 0,00625 µm Z1 = 0,0008 µm [standard stylus] Z1 = 0,0016 µm [double length stylus]
Software	**FORMTRACEPAK**

Refer to CONTOUR AND SURFACE MEASUREMENT brochure

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Formtracer Extreme CS-5000CNC and CS-H5000CNC

Series 525 - CNC Surface and Contour Measuring Instruments

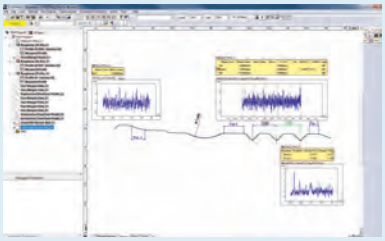
Specifications and Styli

Specifications

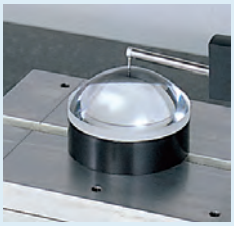
Software

FORMTRACEPAK

- Allows control of all axis, optional motor-driven Y-axis table and rotary table for efficient automated measurement.
- Contour evaluation can be performed using analysis of level differences, angle, pitch, area and contour tolerancing as standard.
- An inspection certificate can be created by setting the print format as required.



Contour and roughness analysis



Optional:
Aspherical lens analysis program ASLPAK

CS-5000CNCH

Model	CS5000CNCH	CS-5000CNCH + α-axis unit	CS-5000CNCH + Y-axis table unit	CS-5000CNCH + Y-axis table unit +α-axis unit
No.	**525-746D**	**525-747D**	**525-748D**	**525-749D**
Z2-axis range [mm]	500	500	500	500
Y-axis table unit	-	-	Installed	Installed
α-axis unit	-	Installed	-	Installed

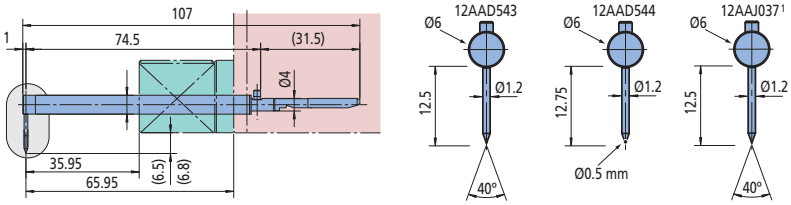
CS-5000CNCS

Model	CS-5000CNCS	CS-5000CNCS + α-axis unit	CS-5000CNCS + Y-axis table unit	CS-5000CNCS + Y-axis table unit + α-axis unit
No.	**525-726D**	**525-727D**	**525-728D**	**525-729D**
Z2-axis range [mm]	300	300	300	300
Y-axis table unit	-	-	Installed	Installed
α-axis unit	-	Installed	-	Installed

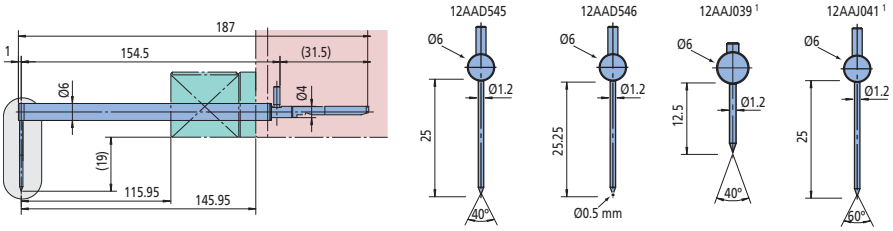
CS-H5000CNCS

Model	CS-H5000CNCS	CS-H5000CNCS + Y-axis table unit
No.	**525-776D**	**525-777D**
Z2-axis range [mm]	300	300
Y-axis table unit	-	Installed
α-axis unit	-	-

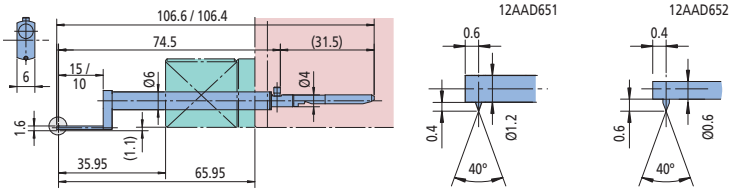
Standard



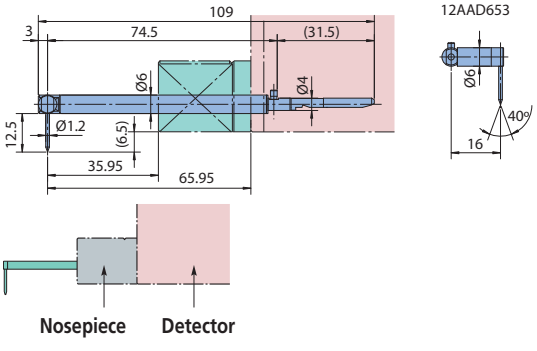
Double length



For small holes



Eccentric



1 = additional for CS-H5000CNC

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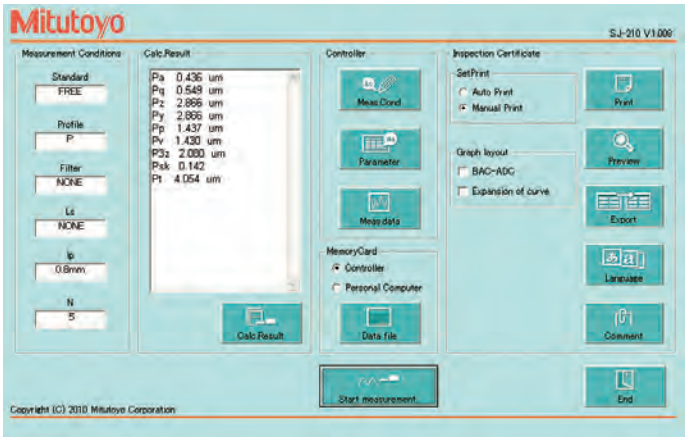
Mitutoyo

Optional Software USB Communication Tool

Series 178 - Control Software for SJ series, SV-2100

This is a control software for Surftest SJ-210 / SJ-310 / SJ-410 / SJ-500 and SV-2100 which offers you the following benefits:

- It is available as a free download on www.mitutoyo.eu (registration is required).
- Output software is based on Microsoft® Excel® for controlling the devices, reproducing and storing measurement data.
- Measurement device control.
- It provides definition of measurement variables.
- Graphic representation of the profile.
- Storage of measurement records.
- Documentation of measurements result.
- A USB connecting cable is necessary.



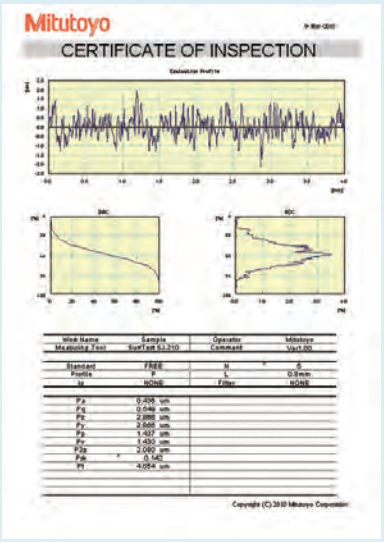
Input mask for Surftest SJ series



Output record from Microsoft® Excel® in 18 languages as standard.

Optional accessories

No.	Description
12AAL068D	USB cable for SJ-210
12AAD510	Signal cable (USB)
12AAH490	USB Cable for SJ-500 / SV-2100



Output record from Microsoft® Excel®

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Optional Styli
for Surftest and Formtracer SV-C series



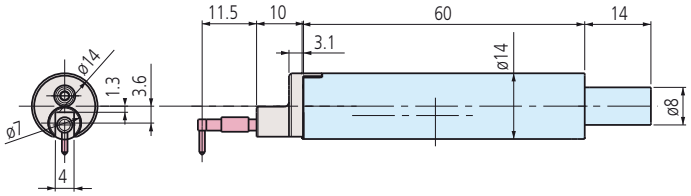
12AAG202 Extension rod 50mm



12AAG203 Extension rod 100mm

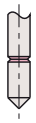
Detectors

mm

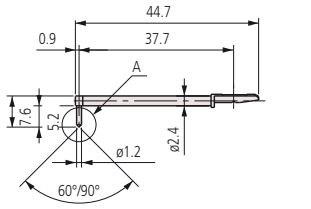


Order No	Measuring force		Inclusive stylus
178-396-2	0,75mN	R2µm, 60°	12AAC731
178-397-2	4mN	R5µm, 90°	12AAB403

No.	Radius	Angle [°]
12AAE882	1 µm	60°
12AAE924	1 µm	90°
12AAC731	2 µm	60°
12AAB403	5 µm	90°
12AAB415	10 µm	90°
12AAE883	250 µm	60°



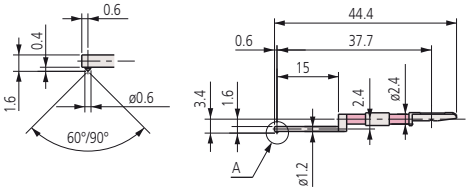
mm



Standard

No.	Radius	Angle [°]
12AAC732	2 µm	60°
12AAB404	5 µm	90°
12AAB416	10 µm	90°

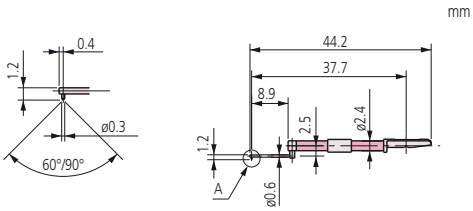
mm



For small hole

No.	Radius	Angle [°]
12AAC733	2 µm	60°
12AAB405	5 µm	90°
12AAB417	10 µm	90°

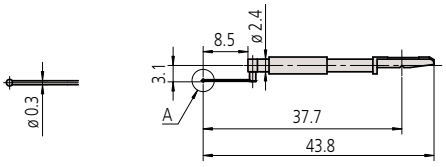
mm



For extra-small hole

No.	Radius	Angle [°]
12AAJ662	250 µm	-

mm



For ultra-small hole

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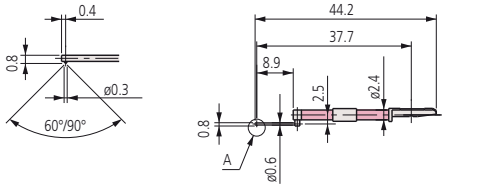
Mitutoyo

Optional Styli
for Surftest and Formtracer SV-C series

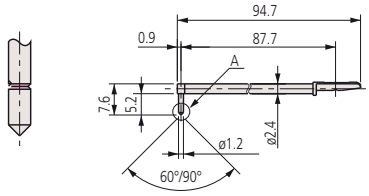
mm



No.	Radius	Angle [°]
12AAC734	2 µm	60°
12AAB406	5 µm	90°
12AAB418	10 µm	90°

For ultra-small hole

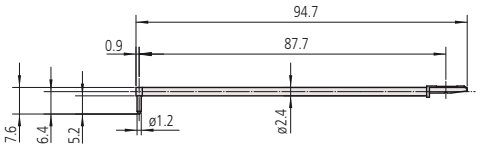
mm



No.	Radius	Angle [°]
12AAC740	2 µm	60°
12AAB413	5 µm	90°
12AAB425	10 µm	90°

For deep hole [double-length]

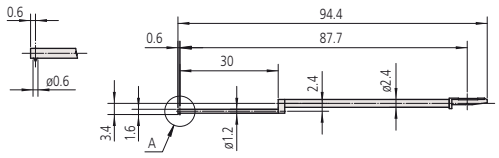
mm



No.	Radius	Angle [°]
12AAE886	250 µm	60°

For rolling circle waviness [double-length]

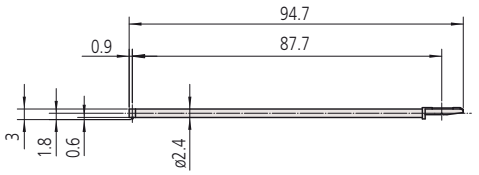
mm



No.	Radius	Angle [°]
12AAE892	2 µm	60°
12AAE908	5 µm	90°

For small deep hole [double-length]

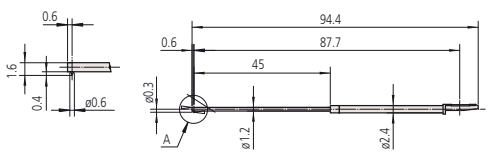
mm



No.	Radius	Angle [°]
12AAE898	2 µm	60°
12AAE914	5 µm	90°

For deep hole [double-length]

mm



No.	Radius	Angle [°]
12AAE938	2 µm	60°
12AAE940	5 µm	90°

For small slotted hole [double-length]

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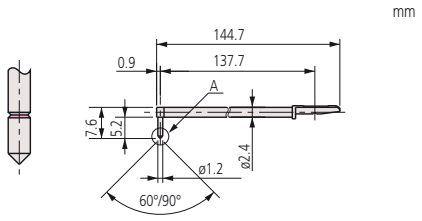
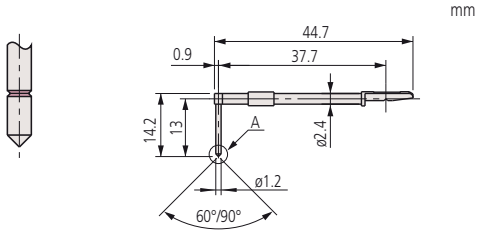
Optional Styli
for Surftest and Formtracer SV-C series

No.	Radius	Angle [°]
12AAC741	2 µm	60°
12AAB414	5 µm	90°
12AAB426	10 µm	90°



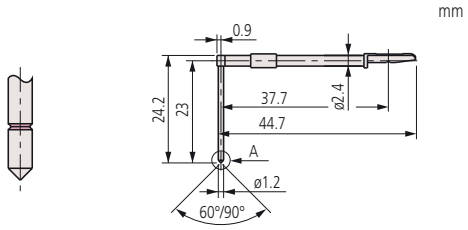
For deep hole [triple-length]

No.	Radius	Angle [°]
12AAC735	2 µm	60°
12AAB409	5 µm	90°
12AAB421	10 µm	90°



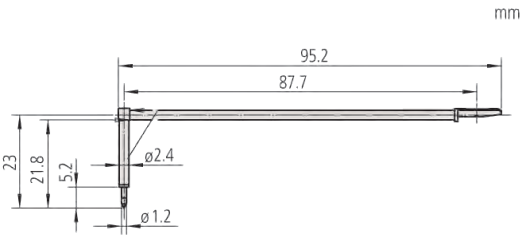
For deep groove 10 mm

No.	Radius	Angle [°]
12AAC736	2 µm	60°
12AAB408	5 µm	90°
12AAB420	10 µm	90°



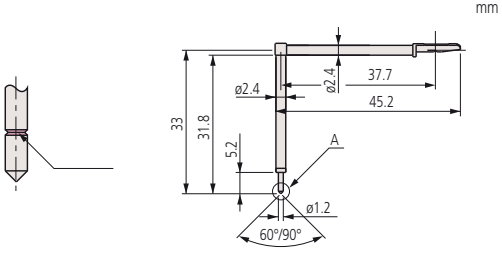
For deep groove 20 mm

No.	Radius	Angle [°]
12AAE893	2 µm	60°
12AAE909	5 µm	90°



For deep groove 20 mm [double-length]

No.	Radius	Angle [°]
12AAC737	2 µm	60°
12AAB407	5 µm	90°
12AAB419	10 µm	90°



For deep groove 30 mm

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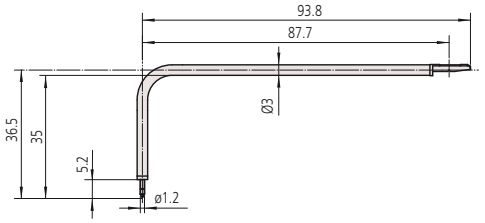
Optional Styli
for Surftest and Formtracer SV-C series

mm

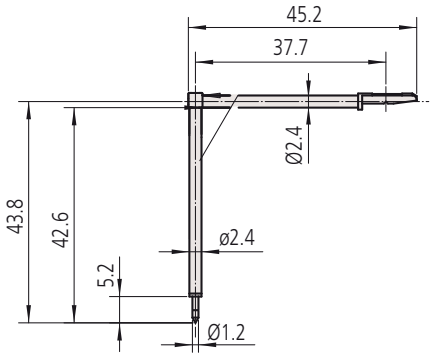
No.	Radius	Angle [°]
12AAE894	2 µm	60°
12AAE910	5 µm	90°



For deep groove 30 mm [double-length]

mm

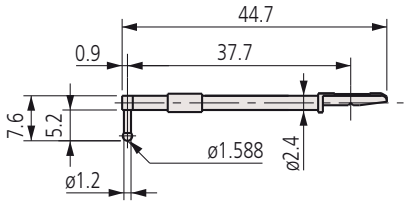
No.	Radius	Angle [°]
12AAE895	2 µm	60°
12AAE911	5 µm	90°



For deep groove 40 mm

mm

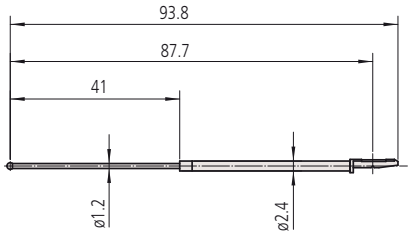
No.	Radius
12AAB338	0,8 mm



For rolling circle waviness surface roughness (Roughness specimen 178-611 required)

mm

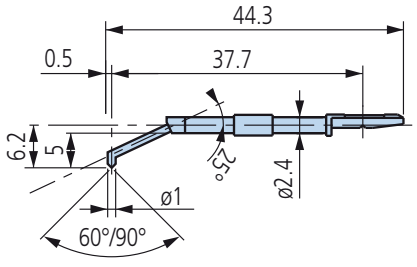
No.	Radius
12AAE884	0,8 mm



For rolling circle waviness surface roughness [double-length] (178-611 required)

mm

No.	Radius	Angle [°]
12AAE899	2 µm	60°
12AAE915	5 µm	90°



For hole bottom

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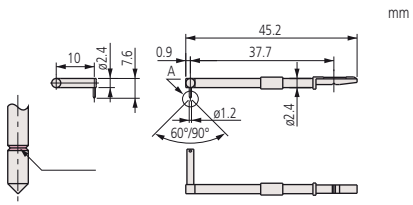
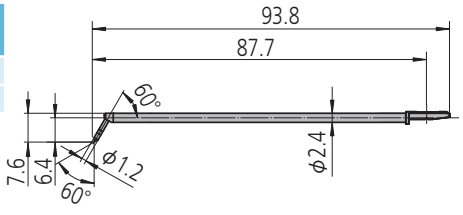
Optional Styli
for Surftest and Formtracer SV-C series

No.	Radius	Angle [°]
12AAC739	2 µm	60°
12AAB412	5 µm	90°
12AAB424	10 µm	90°



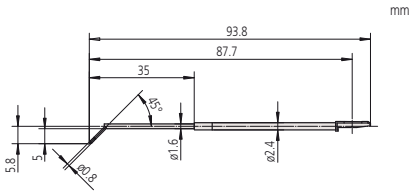
For eccentric arm

No.	Radius	Angle [°]
12AAM601	2 µm	60°
12AAM603	5 µm	60°



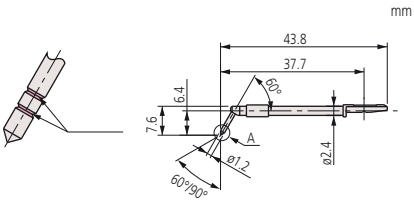
For corner hole [double-length]

No.	Radius	Angle [°]
12AAE897	2 µm	60°
12AAE913	5 µm	90°



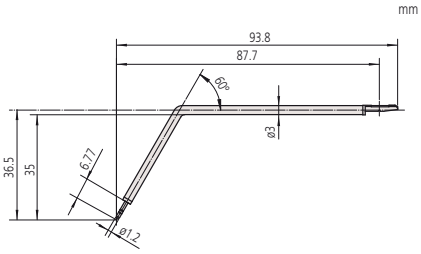
For corner hole [double-length]

No.	Radius	Angle [°]
12AAB339	2 µm	60°
12AAB410	5 µm	90°
12AAB422	10 µm	90°



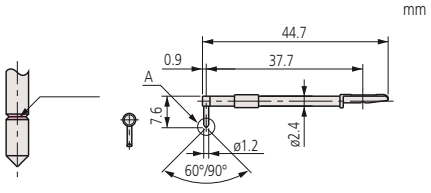
For gear tooth

No.	Radius	Angle [°]
12AAE896	2 µm	60°
12AAE912	5 µm	90°



For gear tooth [double-length]

No.	Radius	Angle [°]
12AAC738	2 µm	60°
12AAB411	5 µm	90°
12AAB423	10 µm	90°



For knife-edge

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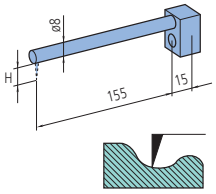
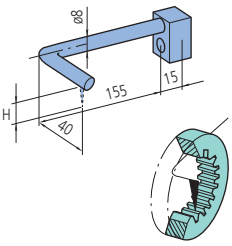
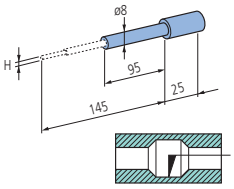
Optional Styli and Arms for Contracer and Formtracer SV-C Series



Arm Straight type
CV-2100



Arm Eccentric type
CV-2100



Arm for small-hole stylus
CV-2100

Applicable arms for CV-2100

No.	Arm	Arm No.	Compatible stylus height (H) [mm]
935110	Small hole	AB-11	0,4 / 1 / 2,5
935111	Straight type	AB-51	6
935112	Straight type	AB-61	12
935113	Straight type	AB-71	20
935114	Straight type	AB-81	30
935115	Straight type	AB-91	42
935116	Eccentric type	AB-52	6
935117	Eccentric type	AB-62	12
935118	Eccentric type	AB-72	20
935119	Eccentric type	AB-82	30
935120	Eccentric type	AB-92	42

Applicable Arms for CV-3200 / CV-4500 / SV-C3200 / SV-C4500 / SV-C4500CNC

No.	Arm	Arm No.	Compatible stylus height (H) [mm]
12AAQ762	Eccentric Arm	AB-37	SPH-5*, 6*, 7*, 8*, 9*
12AAM101	Straight type	AB-31	SPH-5*, 6*, 7*, 8*, 9*
12AAM103	Small hole	AB-33	SPH-41, SPH-42, SPH-43

Applicable Styli for CV-2100

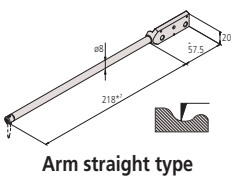
No.	Stylus	Stylus No.	Stylus height (H) [mm]
932693	Small hole, carbide-tipped one-sided cut	SP-11	0,4
932694	Small hole, carbide-tipped one-sided cut	SP-12	1
932695	Small hole, carbide-tipped one-sided cut	SP-13	2,5
12AAE873	Small hole, carbide-tipped cone	SP-31	0,4
12AAE874	Small hole, carbide-tipped cone	SP-32	1
12AAE875	Small hole, carbide-tipped cone	SP-33	2,5

Applicable Styli for CV-3200 / CV-4500 / SV-C3200 / SV-C4500 / SV-C4500CNC

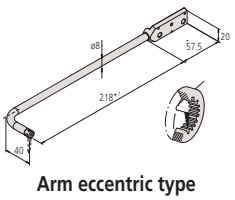
No.	Stylus	Stylus No.	Stylus height (H) [mm]
12AAM104	Small hole, carbide tipped one sided cut	SPH-41	2
12AAM105	Small hole, carbide tipped one sided cut	SPH-42	4
12AAM106	Small hole, carbide tipped one sided cut	SPH-43	6,5

Arm and stylus set

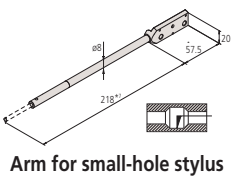
No.	Applicable models	Included arms	Included styli	Included arm stylus
12AAR587	CV-3200, CV-4500, SV-C3200, SV-C4500, SV-C4500CNC	AB-33, AB-37	SPH-41, -43, -51, -72, -76	
12AAR588	CV-4500, SV-C4500, SV-C4500CNC	AB-33, AB-37	SPH-41, -43, -51, -72, -76, SPHW-66, -76	SPHW-32



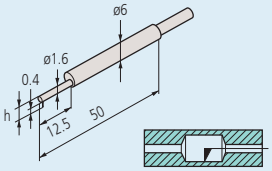
Arm straight type
CV-3200/CV-4500
SV-C3200/SV-C4500
SV-C4500CNC



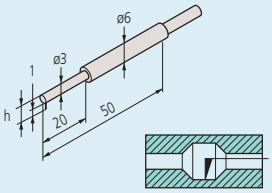
Arm eccentric type
CV-3200/CV-4500
SV-C3200/SV-C4500
SV-C4500CNC



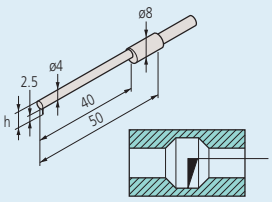
Arm for small-hole stylus
CV-3200/CV4500
SV-C3200/SV-C4500
SV-C4500CNC



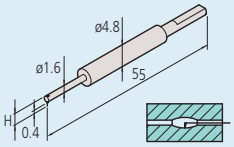
Small hole: 932693 / 12AAE873
Tip shape: Single bevel / Cone
Tip angle: 20° / 30°
Tip radius: 25 µm / 25 µm
Tip material: Carbide / Carbide



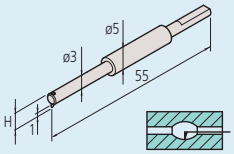
Small hole: 932694 / 12AAE874
Tip shape: Single bevel / Cone
Tip angle: 20° / 30°
Tip radius: 25 µm / 25 µm
Tip material: Carbide / Carbide



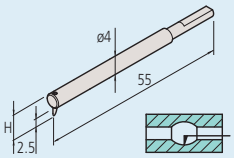
Small hole: 932695 / 12AAE875
Tip shape: Single bevel / Cone
Tip angle: 20° / 30°
Tip radius: 25 µm / 25 µm
Tip material: Carbide / Carbide



Small hole: 12AAM104
Tip shape: One-sided cut
Tip angle: 20°
Tip radius: 25 µm
Tip material: Carbide



Small hole: 12AAM105
Tip shape: One-sided cut
Tip angle: 20°
Tip radius: 25 µm
Tip material: Carbide



Small hole: 12AAM106
Tip shape: One-sided cut
Tip angle: 20°
Tip radius: 25 µm
Tip material: Carbide

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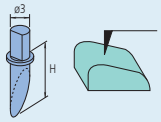
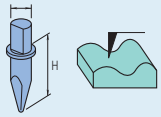
Optional Styli and Arms for Contracer and Formtracer SV-C Series

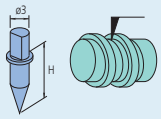
Styli



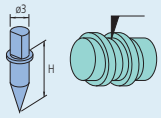
Single bevel
Tip angle: 12°
Tip radius: 25 µm
Tip material: Carbide



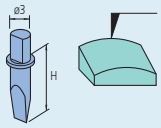
Cross ground
Tip angle: 20°
Tip radius: 25 µm
Tip material: Carbide



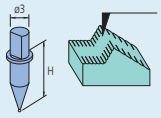
Cone
Tip angle: 30°/50°
Tip radius: 25 µm
Tip material: Carbide/Sapphire/Diamond
(355129: 50°, Diamond)



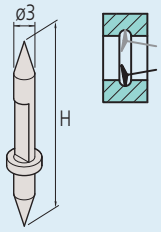
Cone
Tip angle: 20°
Tip radius: 25 µm
Tip material: Carbide



Knife edge
Tip angle: 20°
Edge width: 3 mm
Tip radius: 25 µm
Tip material: Carbide



Ball
Ball: ø1 mm
Tip material: Carbide



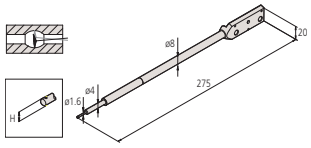
Both sides conical stylus
Tip angle: 30°
Tip radius: 25 µm
Tip material: Carbide

Applicable Styli for
CV-2100 / CV-3200/ CV-4500 / SV-C3200 / SV-C4500 / SV-C4500CNC

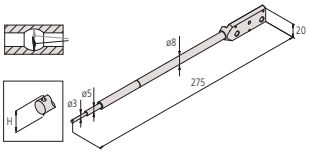
No.	Stylus	Stylus No.	Stylus height (H) [mm]
354882	Single bevel, carbide tipped	SPH-51	6
354883	Single bevel, carbide tipped	SPH-61	12
354884	Single bevel, carbide tipped	SPH-71	20
354885	Single bevel, carbide tipped	SPH-81	30
354886	Single bevel, carbide tipped	SPH-91	42
354887	Cross ground, carbide tipped	SPH-52	6
354888	Cross ground, carbide tipped	SPH-62	12
354889	Cross ground, carbide tipped	SPH-72	20
354890	Cross ground, carbide tipped	SPH-82	30
354891	Cross ground, carbide tipped	SPH-92	42
12AAE865	Cone, carbide-tipped angle 20°	SPH-57	6
12AAE866	Cone, carbide-tipped angle 20°	SPH-67	12
12AAE867	Cone, carbide-tipped angle 20°	SPH-77	20
12AAE868	Cone, carbide-tipped angle 20°	SPH-87	30
12AAE869	Cone, carbide-tipped angle 20°	SPH-97	42
354892	Cone, sapphire-tipped angle 30°	SPH-53	6
354893	Cone, sapphire-tipped angle 30°	SPH-63	12
354894	Cone, sapphire-tipped angle 30°	SPH-73	20
355129	Cone, diamond-tipped angle 50°	SPH-79	20
354895	Cone, sapphire-tipped angle 30°	SPH-83	30
354896	Cone, sapphire-tipped angle 30°	SPH-93	42
12AAA566	Cone, carbide-tipped angle 30°	SPH-56	6
12AAA567	Cone, carbide-tipped angle 30°	SPH-66	12
12AAA568	Cone, carbide-tipped angle 30°	SPH-76	20
12AAA569	Cone, carbide-tipped angle 30°	SPH-86	30
12AAA570	Cone, carbide-tipped angle 30°	SPH-96	42
354897	Knife edge, carbide tipped	SPH-54	6
354898	Knife edge, carbide tipped	SPH-64	12
354899	Knife edge, carbide tipped	SPH-74	20
354900	Knife edge, carbide tipped	SPH-84	30
354901	Knife edge, carbide tipped	SPH-94	42
354902	Ball, carbide tipped	SPH-55	6
354903	Ball, carbide tipped	SPH-65	12
354904	Ball, carbide tipped	SPH-75	20
354905	Ball, carbide tipped	SPH-85	30
354906	Ball, carbide tipped	SPH-95	42

Applicable Styli for only CV-4500 /SV-C4500 / SV-C4500CNC

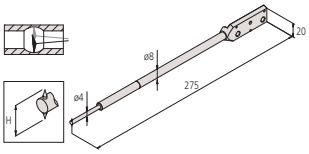
No.	Stylus	Stylus No.	Stylus height (H) [mm]
12AAM095	Both sides conical stylus	SPHW-56	20
12AAM096	Both sides conical stylus	SPHW-66	32
12AAM097	Both sides conical stylus	SPHW-76	48
12AAM108	Both sides small hole arm stylus	SPHW-31	2,4
12AAM109	Both sides small hole arm stylus	SPHW-32	5
12AAM110	Both sides small hole arm stylus	SPHW-33	9



SPHW-31



SPHW-32



SPHW-33

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Mitutoyo

Optional Accessories for Surftest, Contracer and Formtracer

For SV series, SV-C series, CV series, CS series and CNC Models

Automatic-leveling table : 178-087 (for SV, CV, SV-C, CS)
Automatic-leveling table : 178-037 (for CNC Models)
This is a stage that performs fully automatic leveling as measurement starts, freeing the user from this troublesome operation. Fully automatic leveling can be done quickly by anyone. In addition, the operation is easy and reliable.

No.	Inclination adjustment angle	Maximum load [kg]	Effective table dimensions [mm]
178-087	± 2°	7	130 x 112
178-037	± 2°	7	130 x 112



178-087



Using 178-087

Micro-chuck
This chuck is suitable for clamping extra-small diameter workpieces (ø1,5 mm or less), which cannot be retained with the centering chuck.

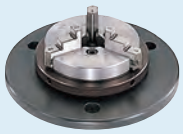
No.	Dimensions [mm]	Retention range [mm]
211-031	ø118 x 48,5	OD: Ø 0 - Ø 1,5



211-031

Quick chuck
This chuck is useful when measuring small workpieces. You can easily clamp them with its knurled ring.

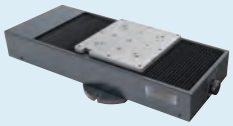
No.	Dimensions [mm]	Retention range [mm]
211-032	ø118 x 41	Inner latch : OD ø1 - ø36 Inner latch : ID ø16 - ø69 outer latch : OD ø25 - ø79



211-032

Y-axis table
for SV-3200, SV-C, CS and CV models (not CNC models)
Enables efficient, automatic measurement of multiple aligned workpieces and multiple points on a single measurement surface. It allows semi-automatic measurement with a semi-automatic with non CNC models by using these items.

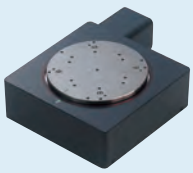
No.	Travel range [mm]	Resolution	Positioning accuracy [µm]	Maximum load [kg]	Drive speed
178-097	200	0,05	±3	50	Max. 80 mm/s



178-097

θ1-axis:*1
For efficient measurement in the axial / transverse directions. When measuring a cylindrical workpiece, automatic alignment can be performed in combination with the Y-axis table.
*1 = **12AAE630** mounting plate is required when directly installing on the base of the machine.

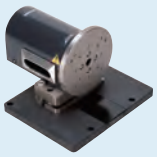
No.	Resolution	Rotational speed	Displacement	Maximum load [kg]
12AAD975	0,004°	Max. 10°/s	360°	12



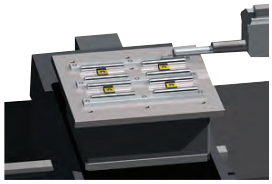
12AAD975

θ2-axis:*1
For efficent measurement of multiple points on a cylindrical workpiece and automate front/rear-side measurement.
*1 = **12AAE718** mounting plate is required when directly installing on the base of the machine.
*1 = **12AAE705** attachment plate is required when installing on θ1-axis table.
*1 = **12AAE707** mounting plate is required when directly installing on Y-axis table with automatic leveling table.

No.	Resolution	Rotational speed	Displacement	Maximum load [kg]
178-078	0,0072°	Max. 18°/s	360°	4



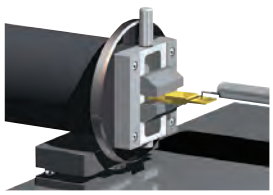
178-078



178-097
using Y-axis



12AAD975
using θ1-axis



178-078
using θ2-axis

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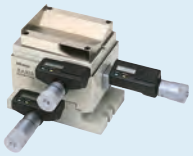
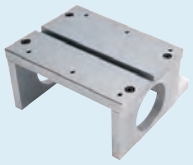
Optional Accessories for Surftest, Contracer and Formtracer



178-047

3 - Axis Adjustment Table

No.	Description
178-047	This table helps to 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.



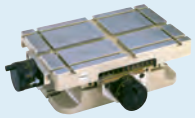
12AAG175

Calibration Stand

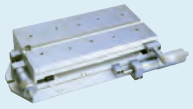
No.	Description
12AAG175	For mounting a roughness specimen or step gauge during calibration

Cross-travel Table

No.	Table top [mm]	XY travel [mm]
218-001	280 x 180	100 x 50
218-041	280 x 152	50 x 25



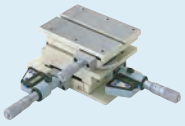
218-001



218-041

Digital Leveling Table

No.	Leveling range	Table top [mm]	XY travel [mm]
178-042-1	±1,5°	130 x 100	± 12,5



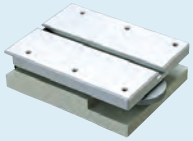
178-042-1

Leveling Table

No.	Leveling range	Table top [mm]	XY travel [mm]
178-043-1	±1,5°	130 x 100	± 12,5
178-016	±1,5°	130 x 100	40



178-043-1



178-016

Precision Vise

No.	Description
178-019	Max. workpiece size : 36 mm Can be mounted on a leveling table

Rotary Vise

No.	Description
218-003	Two-slide jaw type Max. workpiece size : ø60 mm Minimum reading : 1°



178-019

V-Block

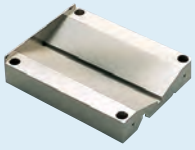
No.	Description
998291	Workpiece diameter : 1 mm to 160 mm Can be mounted on a leveling table



218-003

Vibration Isolator

No.	Packing size	Description
178-119	1000 x 1340 x 880 mm	For SV-2100/3200 series (wide base) For CV-3200/4500 series (wide base) For SV-C3200/4500 series (wide base)
178-115	600 x 1050 x 260 mm	Desktop type For SV-2100/3200 series (wide base) CV-3200/4500 series (wide base) SV-C3200/4500 (wide base)



998291

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eco-fix Fixtures Form

eco-fix Kit Form S

Adapter plate Ø150mm usable with:

- Roundtest RA-10
- Roundtest RA-120
- Roundtest RA-120P
- Roundtest RA-1600
- THETA 1 for CV, SV, SV-C and CS types



No.
K551133

eco-fix Kit Form L

Adapter plate Ø200mm usable with:

- Roundtest RA-2200
- Roundtest RA-H5200
- Roundtest RA-2200CNC
- Roundtest RA-H5200CNC
- THETA 1 for CV, SV, SV-C and CS types



No.
K551134

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Roundtest RA-10

Series 211 - Form Measuring Instrument

This is a compact and affordable form measuring instrument.
The Roundtest RA-10 offers you the following benefits:

- It combines outstanding cost and performance with full measurement capabilities.
- The machine has a compact body with integrated electronics and printer, making it ideal for installation in space-restricted locations.
- You can easily view measurement results and recorded profiles on the large coloured LCD panel display.
- Despite being a low-priced model, the turntable with air bearings gives you rotational accuracy as high as (0,04+0,0006H)µm, assuring a precision that compares well with that of higher priced models.
- The control panel has large keys and an intuitive layout for easy operation.
- One-key calling function.
- One-key zero-set function.
- Support of 16 languages.
- It complies with EN ISO standard like 12181-1, 12181-2, 12781-1 and 12781-2.
- USB Communication Program – Microsoft® Excel ® based – to import results and create, save and print out inspection certificates on PC.

Specifications

Range	±1000 µm
Turntable	
Rotational accuracy	**Radial:** (0,04+0,0006H)µm H: Measuring height from turntable surface (mm) **Axial:** (0,04+0,0006X)µm X: Radial distance from center (mm)
Max. probing Ø	100 mm
Max. workpiece Ø	320 mm
Max. turntable loading [kg]	10 kg
Vertical column	
Max. probing height	152 mm
Display unit	
Data analysis items	Roundness, Coaxiality, Concentricity, Flatness, Runout radial
Printer	Built-in thermal line printer

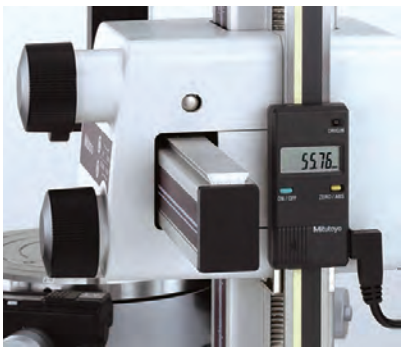


Software
USB Communication Program
as a free download on www.mitutoyo.eu
(registration required)

Refer to FORM MEASUREMENT brochure



RA-10 with optional collet



Z-axis scale unit



X-axis stop

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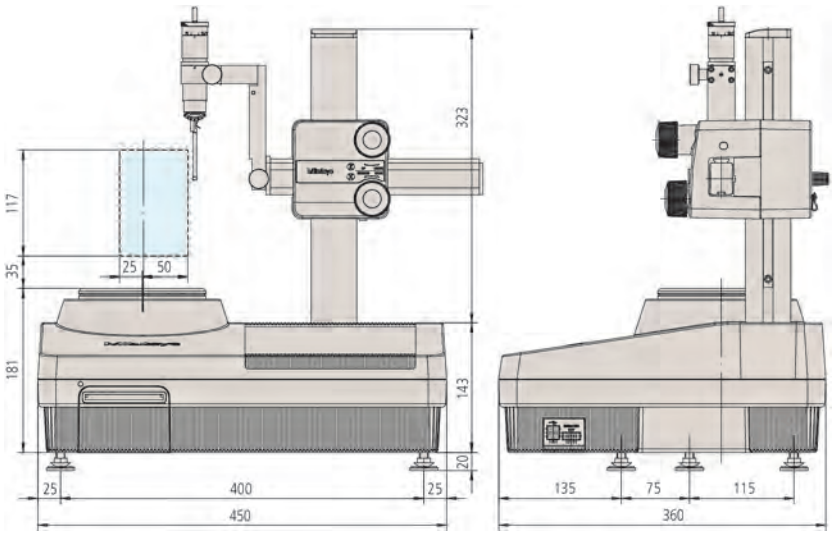
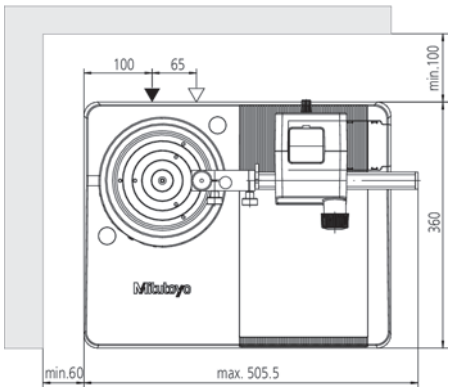
Roundtest RA-10

Series 211 - Form Measuring Instrument

Dimensions and accessories







211-031



211-032



211-051



211-052



211-053



211-054



211-055



12AAH425

No.	Model	Max. workpiece ø [mm]	Max. probing Ø [mm]	Max. turntable loading [kg]
211-541D	RA-10	320	100	10

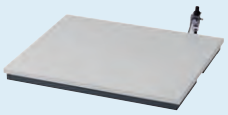
Optional accessories

No.	Description
12AAH402	Collet (Ø 0,5-1,0mm)*
12AAH403	Collet (Ø 1,0-1,5mm)*
12AAH404	Collet (Ø1,5-2,0mm)*
12AAH405	Collet (Ø 2,0-2,5mm)*
12AAH406	Collet (Ø2,5-3,0mm)*
12AAH407	Collet (Ø3,0-3,5mm)*
12AAH408	Collet (Ø3,5-4,0mm)*
12AAH409	Collet (Ø4,5-5,0mm)*
12AAH410	Collet (Ø5,0-6,0mm)*
12AAH411	Collet (Ø6,0-7,0mm)*
12AAH412	Collet (Ø 7,0-8,0mm)*
12AAH413	Collet (Ø8,0-9,0mm)*
12AAH414	Collet (Ø 9,0-10,0mm)*
211-013	Vibration damping stand
211-016	Reference hemisphere
211-031	Micro-chuck OD:1-1,5mm
211-032	Quick chuck OD:1-79, ID: 16-79 mm
211-045	Magnification checking gauge
211-051	Collet chuck holder (OD: 0,5-10mm)*
211-052	Quick chuck
211-053	V-block A (Screw clamp)
211-054	V-block B (spring clamp)
12AAH420	Spacer for reference hemisphere
12AAH425	Alignment table with D.A.T (mm)
12AAH427	Alignment table with mechanical heads
12AAH318	Z-axis scale unit
12AAH320	X-axis stop
356038	Stage for a low height workpiece
997090	Gauge block set for calibration

* Individual collet for collet chuck holder should be ordered separately.

Consumable spares

No.	Description
12AAH181	Printer paper (10 rolls)



211-013

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Roundtest RA-120 and RA-120P

Series 211 - Form Measuring Instrument

These are compact, affordable and simple-to-use instruments for measuring roundform geometry. The Roundtest RA-120 and RA-120P offer you the following benefits:
– The turntable accuracy of (0,04+0,0006H)µm provides high level form analysis.

RA-120
– The RA-120 has a compact body with integrated electronics and printer, making it ideal for installation in space-restricted locations.
– You can easily view measurement results and recorded profiles on the large coloured LCD panel display.
– One-key operations.
– Support of 16 languages.
– It complies with EN ISO standard like 12181-1, 12181-2, 12781-1 and 12781-2
– USB Communication Program – Microsoft® Excel ® based – to import results and create, save and print out inspection certificates on PC.

RA-120P
– The RA-120P is a PC based model with all operations controlled via powerful ROUNDPAK software.
– Software ROUNDPAK gives you excellent possibilities for single measurement and part programming.

Specifications

Turntable	
Rotational accuracy	**Radial:** (0,04+0,0006H)µm H: Measuring height from turntable surface (mm) **Axial:** (0,04+0,0006X)µm X: Radial distance from center (mm)
Max. probing Ø	280 mm 380 mm in reverse position
Max. workpiece Ø	440 mm
Max. turntable loading [kg]	25 kg
Centering range	±3 mm
Leveling range	±1°
Vertical column	
Vertical travel [mm]	280 mm
Max. probing height	280 mm above turntable surface 480 mm in reverse position
Max. probing depth	100 mm (minimum ID: 30 mm)
Display unit	
Data analysis items	Roundness, Coaxiality, Flatness, Runout (radial), Runout (axial), Thickness deviation, Parallelism, Perpendicularity
Printer	Built-in thermal line printer (RA-120)
Software	**ROUNDPAK** (only RA-120P)



Software
USB Communication Program
as a free download on www.mitutoyo.eu
(registration required)
(only RA-120)

Refer to ROUNDTEST RA-120 brochure

Scan QR Code with your mobile device to watch the product lines video on YouTube



RA-120



RA-120P

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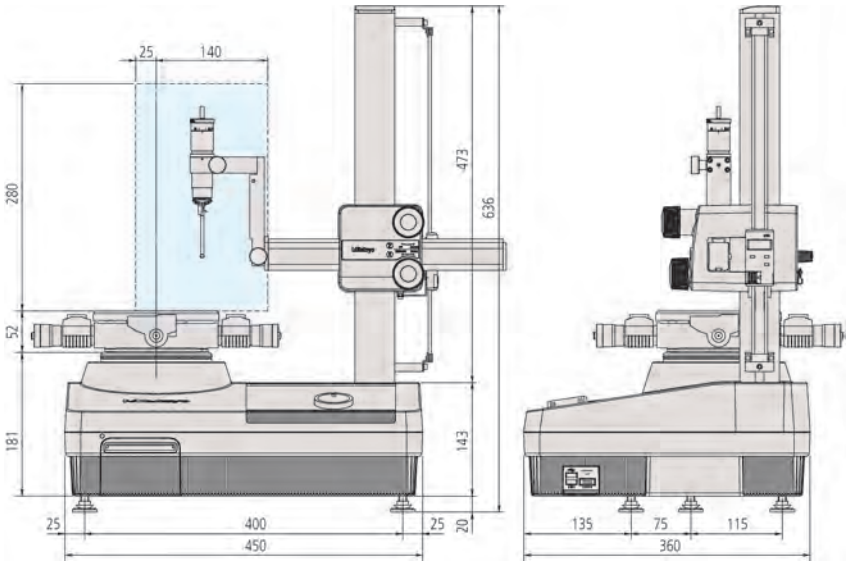
Roundtest RA-120 and RA-120P

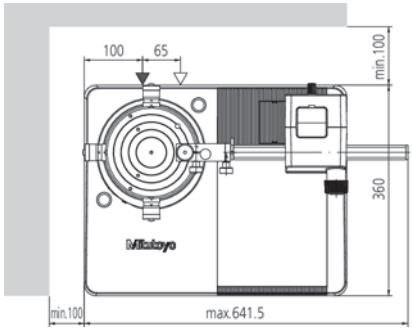
Series 211 - Form Measuring Instrument

This is a compact roundness tester with D.A.T. (Digital Adjustment Table) function.
The Roundtest RA-120 and RA-120P give you the following benefits:

– The turntable displays centering and leveling adjustments digitally, making this challenging task easy enough for even an untrained operator to perform, through these four simple steps:

1. Preliminary measurement of two cross sections on the workpiece.
2. The centering and leveling adjustment values are displayed.
3. The digital micrometer heads on the rotary table are adjusted to match the values displayed.
4. Centering and leveling is complete. [Centering range : ±3 mm - Leveling range : ±1°]





No.	Model	Max. workpiece ø [mm]	Max. probing Ø [mm]	Max. turntable loading [kg]
211-542D	RA-120 with D.A.T. function	440	280	25
211-544D	RA-120 with mechanical turntable	440	280	25
211-545D	RA-120P with D.A.T. function	440	280	25
211-547D	RA-120P with mechanical turntable	440	280	25

Additional Specifications

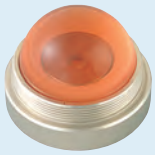
Optional accessories	Other optional and standard accessories are listed later in this section for accessories and styli.

Optional accessories

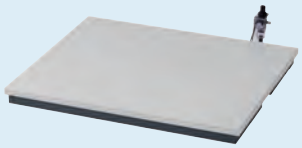
No.	Description
211-013	Vibration damping stand
211-014	Three jaw chuck OD:2-78, ID:25-68 mm
211-016	Reference hemisphere
211-031	Micro-chuck OD:1-1,5mm
211-032	Quick chuck OD:1-79, ID: 16-79 mm
211-045	Magnification checking gauge
211-061	Collect chuck OD:0,5-10mm
12AAH320	X-axis stop
356038	Stage for a low height workpiece
997090	Gauge block set for calibration

Consumable spares

No.	Description
12AAH181	Printer paper (10 rolls)



211-016



211-013



Z-axis scale unit (optional)



X-axis stop

Scan QR Code with your mobile device and watch our product videos on YouTube

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Roundtest RA-1600

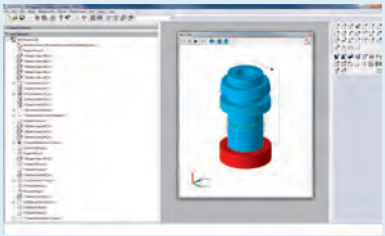
Series 211 - Form Measuring System

This is a PC-compliant form measuring system which allows you to measure roundform geometry like cylindricity.
The Roundtest RA-1600 offers the following benefits:

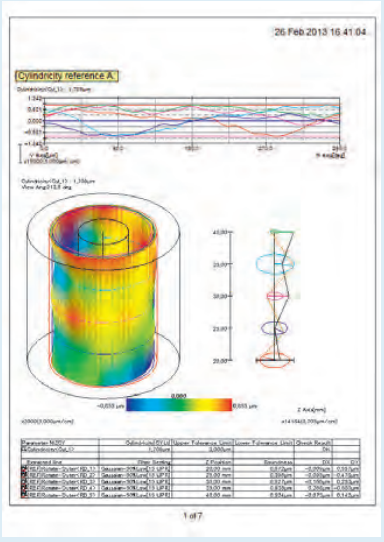
- It is equipped with a high accurate turntable accuracy of (0,02+0,0006H)µm.
- You can carry out simple & accurate centering and leveling of the workpiece with D.A.T. (Digital Adjustment Table).
- The user friendly software, ROUNDPAK, gives you easy drag and drop usage.
- ROUNDPAK also has easy-to-use part programming and single measurement functions.
- A remote control box is including allowing you easy operation.
- There is also an auto follow function for easy and quick pre-centering of the workpiece.

Specifications

Turntable	
Rotational accuracy	**Radial:** (0,02+0,0006H)µm H: Measuring height from turntable surface (mm) **Axial:** (0,02+0,0006X)µm X: Radial distance from center (mm)
Rotational speed	4, 6, 10 rpm
Max. probing Ø	280 mm
Max. workpiece Ø	560 mm
Max. turntable loading [kg]	25 kg
Centering range	±3 mm
Leveling range	±1°
Vertical column	
Max. probing height	300 mm above turntable surface
Max. probing depth	91 mm (minimum ID : ø32 mm) 50 mm (minimum ID : ø7 mm)
Straightness	0,2 µm / 100 mm 0,3 µm / 300 mm
Parallelism with turntable axis	1,5 µm / 300 mm
Software	**ROUNDPAK**



Measuring screen

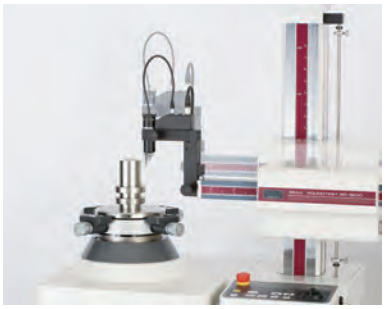


Result screen

ROUNDPAK
Simple to operate even with a full set of parameters and analysis functions.

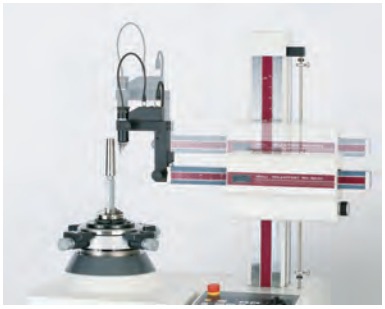


RA-1600 (+desktop vibration isolator)



Spiral Measurement/Analysis (RA-1600)

Provided with a spiral measurement function that combines turntable rotation and rectilinear motion allowing cylindricity, coaxiality and other form characteristics to be measured in continuous data stream mode.



Measurement through X - axis tracking

Measurement while tracing is possible through a built-in linear scale in the X - axis.

All products to be sold to commercial customers. Product illustrations are without obligation. Product descriptions, in particular any and all technical specifications, are only binding when explicitly agreed upon. For suggested retail prices, please refer to the separate price list.

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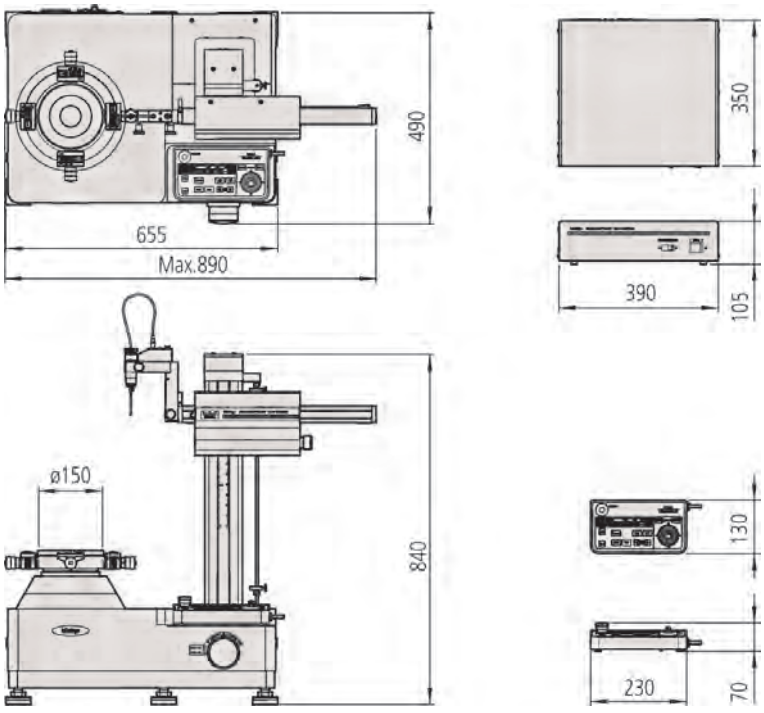
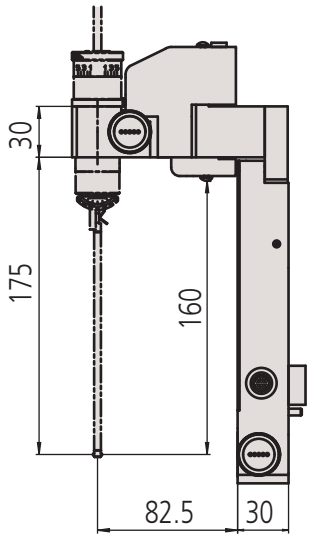
Roundtest RA-1600

Series 211 - Roundness Measuring System



Dimensions

No.	Model	Max. workpiece ø [mm]	Max. probing Ø [mm]	Max. turntable loading [kg]
211-723D	RA-1600	560	280	25



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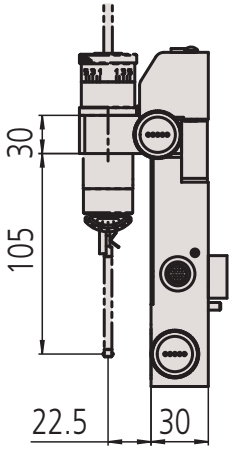

12AAF204

Additional Specifications

Optional accessories	Other optional and standard accessories are listed later in this section for accessories and styli.

Optional accessories

No.	Description
211-014	Three jaw chuck OD:2-78, ID:25-68 mm
211-031	Micro-chuck OD:1-1,5mm
211-032	Quick chuck OD:1-79, ID: 16-79 mm
211-045	Magnification checking gauge
211-061	Collect chuck OD:0,5-10mm
12AAL019	Side table
12AAL090	Sliding detector holder
12AAF203	Double length detector holder
12AAF204	Large diameter detector holder
12AAK110	Vibration isolator
12AAK120	Monitor arm
356038	Stage for a low height workpiece
997090	Gauge block set for calibration

Refer to ROUNDTEST RA-1600 brochure

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Roundtest RA-2200

Series 211 - Form Measuring Instrument

This is a highly accurate form measuring system which allows you to measure roundform geometry like cylindricity.
The Roundtest RA-2200 offers the following benefits:

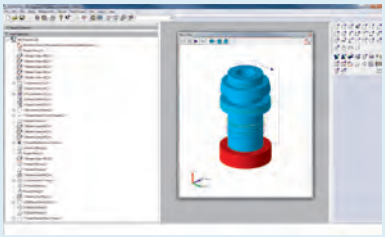
- It has fully motorised axes movement.
- Its extremely high turntable accuracy of (0,02+0,00035H)µm gives you excellent form analysis.
- The user friendly software, ROUNDPAK, gives you easy drag and drop usage and a wide range of parameters.
- ROUNDPAK also has easy-to-use part programming and single measurement functions.
- A huge number of styli provides you with maximum flexibility.
- There is an auto follow function for easy and quick pre-centering of the workpiece.

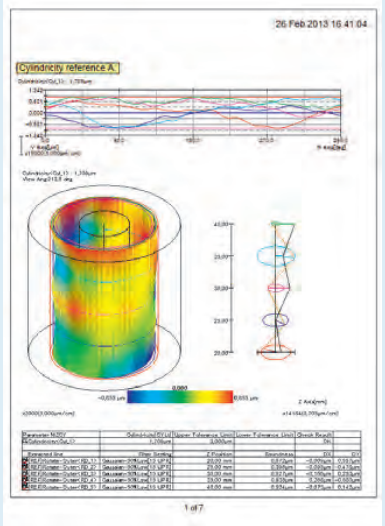
There is a wide variety of models available to suit any application.
RA-2200DS/DH: These models have a navigation function supplied as standard, to quickly and simply guides you through the centering and leveling task. The models are equipped with the D.A.T. (Digital Adjustment Table).

RA-2200AS/AH: The models have an automatic centering and leveling turntable supplied as standard , freeing you from the centering and leveling task. The models are equipped with the A.A.T. (Automatic Adjustment Table).

Specifications

Turntable	
Rotational accuracy	**Radial:** (0,02+0,00035H)µm H: Measuring height from turntable surface (mm) **Axial:** (0,02+0,00035X)µm X: Radial distance from center (mm)
Rotational speed	2, 4, 6, 10 rpm
Max. probing Ø	300 mm
Max. workpiece Ø	580 mm
Max. turntable loading [kg]	30 kg
Leveling range	±1°
Centering range	**DS / DH:** ±5 mm **AS / AH:** ±3 mm
Vertical column	
Max. probing height	**AS / DS :** 300 mm **AH / DH:** 500 mm above turntable surface
Max. probing depth	85 mm (minimum ID : ø32 mm) 50 mm (minimum ID : ø7 mm)
Straightness	**AS / DS :** 0,1 µm / 100 mm **AS / DS :** 0,15µm / 300 mm **AH / DH:** 0,25 µm / 500 mm
Parallelism with rotation center	**AS / DS :** 0,7 µm / 300 mm **AH / DH:** 1,2µm / 500 mm
Horizontal axis	
Straightness	0,7 µm / 150 mm
Perpendicularity to rotation center	1 µm / 150mm
Software	**ROUNDPAK** FORMTRACEPAK-AP (optional for roughness detection unit)

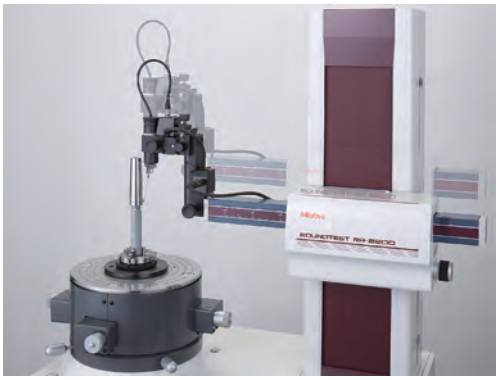




ROUNDPAK
Simple to operate even with a full set of parameters and analysis functions.



RA-2200AS



Automatic measurement

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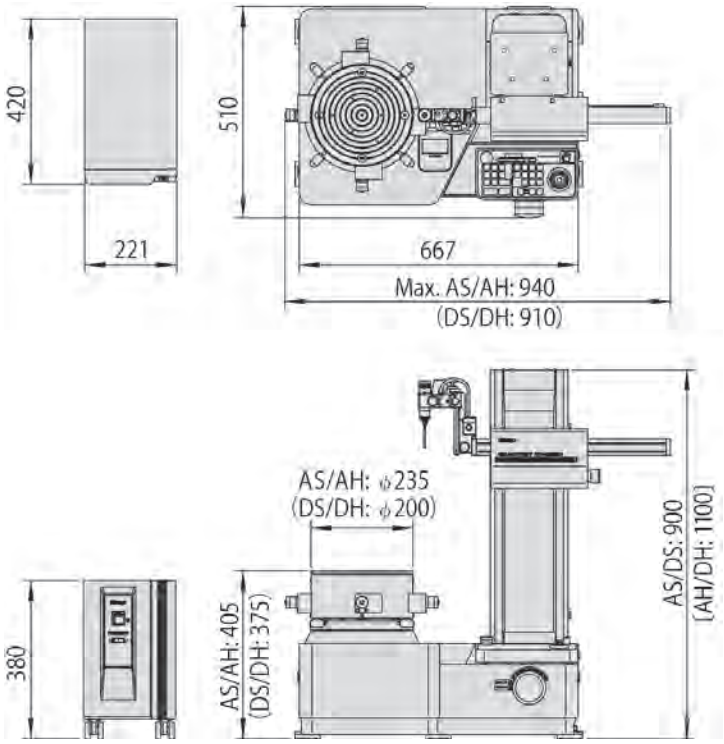
Roundtest RA-2200

Series 211 - Roundness/Cylindricity Measuring System

Accessories and dimensions



No.	Model	Centering/leveling adjustment 1*	Vertical travel [mm]	Max. workpiece ø [mm]	Max. probing Ø [mm]	Max. turntable loading [kg]
211-511D	RA-2200AS	AAT	300	580	300	30
211-512D	RA-2200AH	AAT	500	580	300	30
211-513D	RA-2200DS	DAT	300	580	300	30
211-515D	RA-2200DH	DAT	500	580	300	30

1* AAT : Automatic Adjustment Table
DAT : Digital Adjustment Table

Additional Specifications

Optional accessories	Other optional and standard accessories are listed later in this section for accessories and styli.

Optional accessories

No.	Description
211-014	Three jaw chuck OD:2-78, ID:25-68 mm
211-031	Micro-chuck OD:1-1,5mm
211-032	Quick chuck OD:1-79, ID: 16-79 mm
211-045	Magnification checking gauge
12AAL019	Side table
12AAF203	Double length detector holder
12AAF204	Large diameter detector holder
12AAK110	Vibration isolator
12AAK120	Monitor arm
356038	Stage for a low height workpiece
12AAF353	Roughness detection unit
178-396-2	Detector, 0,75mN

Refer to ROUNDTEST RA-2200 brochure

All products to be sold to commercial customers. Product illustrations are without obligation. Product descriptions, in particular any and all technical specifications, are only binding when explicitly agreed upon. For suggested retail prices, please refer to the separate price list.

Roundtest RA-H5200

Series 211 - High-precision Form Measuring Instrument

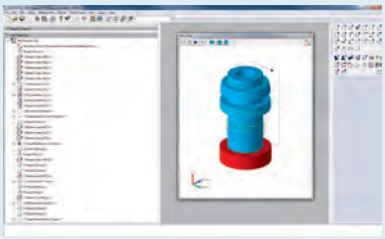
This is a highly accurate, precision form measuring system developed to give you the highest accuracy as well as high flexibility and analytical capability.
The Roundtest RA-H5200 offers the following benefits:

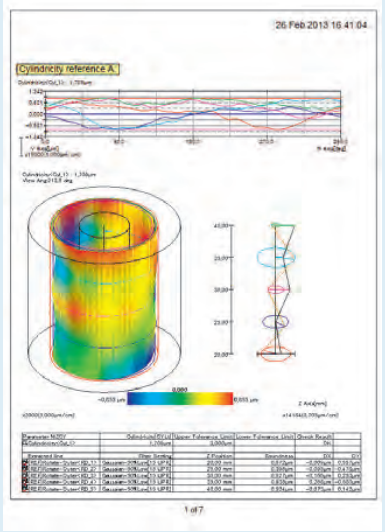
- Its integrated vibration isolator helps you to measure within the best conditions.
- It has a high measuring range and loading mass.
- The user friendly software, ROUNDPAK, gives you easy drag and drop usage and a wide range of parameters.
- ROUNDPAK also has easy-to-use part programming and single measurement functions.
- A.A.T. (Automatic Adjustment Table) gives you fully automatic centering and leveling.
- There is an auto follow function for easy and quick pre-centering of the workpiece.

Specifications

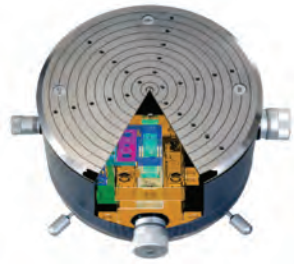
Turntable	
Rotational accuracy	**Radial:** (0,02+0,00035H)µm H: Measuring height from turntable surface (mm) **Axial:** (0,02+0,00035X)µm X: Radial distance from center (mm)
Rotational speed	2, 4, 6, 10 rpm
Max. probing Ø	400 mm
Max. workpiece Ø	680 mm
Max. turntable loading [kg]	65 kg 80 kg without auto centering
Centering range	±5 mm
Leveling range	±1°
Vertical column	
Max. probing height	**AS :** 350 mm **AH:** 550 mm above turntable surface
Max. probing depth	85 mm (minimum ID : ø32 mm) 50 mm (minimum ID : ø7 mm)
Straightness	**AS / AH :** 0,05 µm / 100 mm **AS :** 0,14µm / 350 mm **AH :** 0,2 µm / 550 mm
Parallelism with rotation center	**AS :** 0,2 µm / 350 mm **AH :** 0,32µm / 550 mm
Horizontal axis	
Straightness	0,4 µm / 200 mm
Perpendicularity to rotation center	0,5 µm / 200 mm
Software	**ROUNDPAK** FORMTRACEPAK-AP (optional for roughness detection unit)



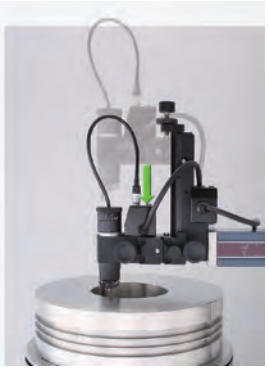




ROUNDPAK
Simple to operate even with a full set of parameters and analysis functions.



Highly accurate, automatic centering/leveling turntable
The performance of this turntable has been achieved through exceptional manufacturing accuracy of the critical components, in addition to a high-accuracy air-bearing that provides superior rigidity. The resulting rotational accuracy, the heart of a Roundtest measuring system, is world-class at 0.02+0.00035H µm.



Sliding detector-unit holder provided as a standard feature
The detector-unit holder is equipped with a sliding mechanism, enabling one-touch measurement of a workpiece with a deep hole having a thick wall, which has been difficult with the conventional standard arm. Sliding distance : 112 mm.

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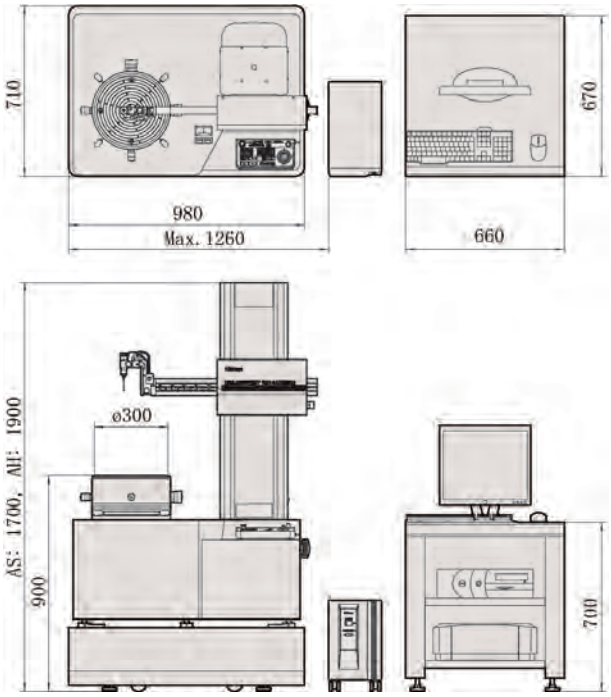
Mitutoyo

Roundtest RA-H5200

Series 211

Dimensions and accessories

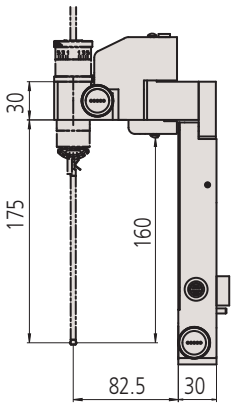


Dimensions

No.	Model	Centering/leveling adjustment 1*	Vertical travel [mm]	Max. workpiece ø [mm]	Max. probing Ø [mm]	Max. turntable loading [kg]
211-531D	RA-H5200AS	AAT	350	680	400	65
211-532D	RA-H5200AH	AAT	550	680	400	65

1* AAT : Automatic Adjustment Table

mm



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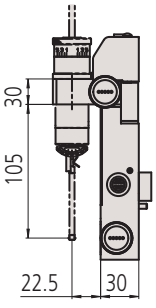

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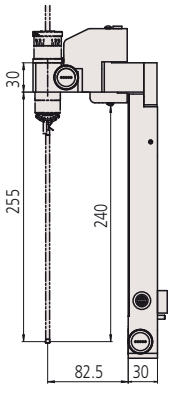


12AAF205

Additional Specifications

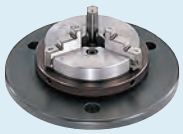
Optional accessories	Other optional and standard accessories are listed later in this section for accessories and styli.

Optional accessories

No.	Description
211-014	Three jaw chuck OD:2-78, ID:25-68 mm
211-031	Micro-chuck OD:1-1,5mm
211-032	Quick chuck OD:1-79, ID: 16-79 mm
211-045	Magnification checking gauge
12AAL019	Side table
12AAF203	Double length detector holder
12AAF204	Large diameter detector holder
12AAF205	Triple length holder for exta-deep holes
12AAF353	Roughness detection unit
178-396-2	Detector, 0,75mN



211-014



211-032



211-031



211-045

Refer to ROUNDTEST RA-H5200 brochure

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Roundtest Extreme RA-2200CNC

Series 211 - High-precision Form Measuring Instrument

This is a fully automatic CNC form measuring instrument that gives highly accurate results.
The Roundtest Extreme RA-2200CNC offers you the following benefits:

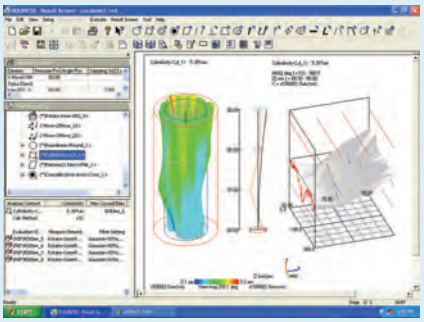
- It has a CNC controlled measuring system with orientation steps of 1°.
- The extremely high turntable accuracy of (0,02+0,00035H)µm gives you highly accurate form analysis.
- The user friendly software, ROUNDPAK, gives you easy drag and drop usage and a wide range of parameters.
- ROUNDPAK also has easy-to-use part programming and single measurement functions.
- An automatic centering and leveling turntable A.A.T. (Automatic Adjustment Table) is supplied as standard, freeing you from the centering and leveling task.

Specifications

Turntable	
Rotational accuracy	**Radial:** (0,02+0,00035H)µm H: Measuring height from turntable surface (mm) **Axial:** (0,02+0,00035X)µm X: Radial distance from center (mm)
Rotational speed	2, 4, 6, 10 rpm
Max. probing Ø	256 mm
Max. workpiece Ø	580 mm
Max. turntable loading [kg]	30 kg
Centering range	±3 mm
Leveling range	±1°
Vertical column	
Max. probing height	**AS :** 300 mm **AH:** 500 mm above turntable surface
Max. probing depth	104 mm (minimum ID : ø32 mm) 26 mm (minimum ID : ø12,7 mm)
Straightness	**AS / AH :** 0,1 µm / 100 mm **AS :** 0,15 µm / 300 mm **AH :** 0,25 µm / 500 mm
Parallelism with rotation center	**AS :** 0,7 µm / 300 mm **AH :** 1,2 µm / 500 mm
Horizontal axis	
Straightness	0,7 µm / 150 mm
Perpendicularity to rotation center	1 µm / 150 mm
Software	**ROUNDPAK** FORMTRACEPAK-AP (optional for roughness detection unit)

Optional accessories

No.	Description
12AAL019	Side table
12AAK110	Vibration isolator
12AAK120	Monitor arm
12AAG419	Roughness detection unit CNC, 0,75mN

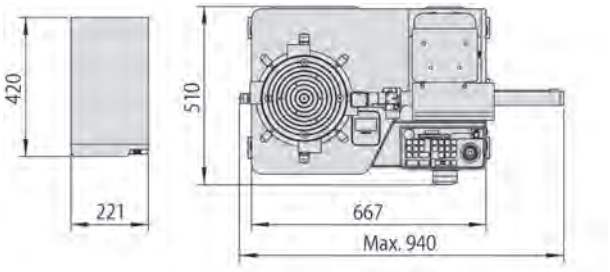


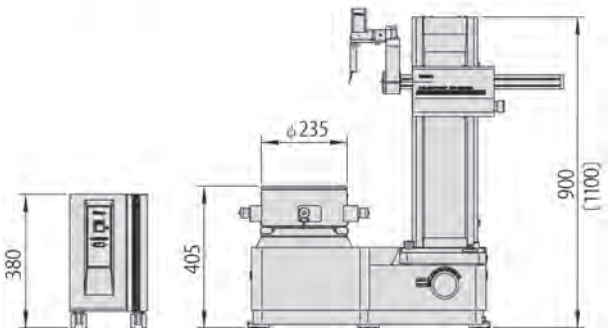
ROUNDPAK
Simple to operate even with a full set of parameters and analysis functions.

Refer to ROUNDTEST RA-2200 brochure



RA-2200 CNC
+ optional vibration isolator [12AAK110]
and side table [12AAL019]





No.	Model	Centering/leveling adjustment 1*	Vertical travel [mm]	Max. work-piece ø [mm]	Max. probing Ø [mm]	Max. turntable loading [kg]
211-517D	RA-2200CNC AS	AAT	300	580	256	30
211-518D	RA-2200CNC AH	AAT	500	580	256	30

1* AAT : Automatic Adjustment Table

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Mitutoyo

Roundtest Extreme RA-H5200CNC

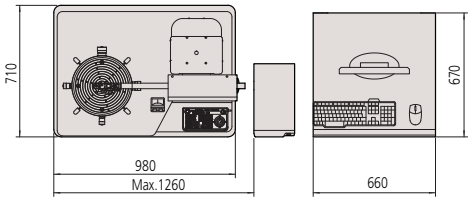
Series 211 - High-precision Roundness/Cylindricity Measuring System

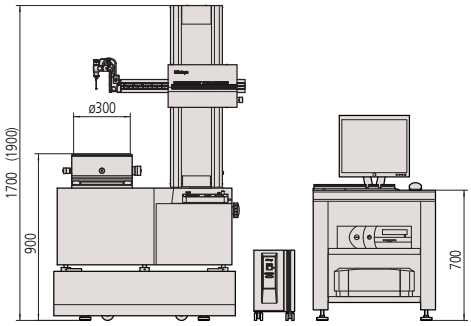
This is a CNC form measuring instrument that combines high accuracy with automatic CNC measurements.
The Roundtest Extreme RA-H5200CNC offers you the following benefits:

- An integrated vibration isolator helps you to measure within best conditions.
- It will greatly improve your productivity and efficiency.
- You can take highly accurate, fast and operator-free measurements.
- The user friendly software, ROUNDPAK, gives you easy drag and drop usage and a wide range of parameters.
- ROUNDPAK also has easy-to-use part programming and single measurement functions.
- An automatic centering and leveling turntable A.A.T. (Automatic Adjustment Table) is supplied as standard, freeing you from the centering and leveling task.



RA-H5200CNC + side table [12AAL019]





Dimensions

No.	Centering/leveling adjustment 1*	Model	Vertical travel [mm]	Max. work-piece ø [mm]	Max. probing Ø [mm]	Max. turntable loading [kg]
211-533D	AAT	RA-H5200CNC AS	350	680	356	65
211-534D	AAT	RA-H5200CNC AH	550	680	356	65

1* AAT : Automatic Adjustment Table

Specifications

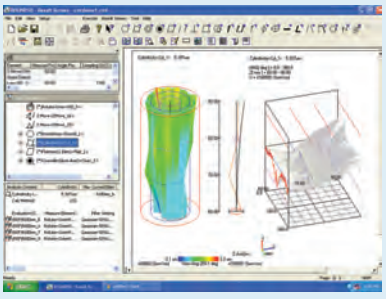
Turntable	
Rotational accuracy	**Radial:** (0,02+0,00035H)µm H: Measuring height from turntable surface (mm) **Axial:** (0,02+0,00035X)µm X: Radial distance from center (mm)
Rotational speed	2, 4, 6, 10 rpm Auto centering: 20 rpm
Max. probing Ø	356 mm
Max. workpiece Ø	680 mm
Max. turntable loading [kg]	65 kg 80 kg without auto centering
Centering range	±5 mm
Leveling range	±1°
Vertical column	
Max. probing height	**AS :** 350 mm **AH:** 550 mm above turntable surface
Max. probing depth	104 mm (minimum ID : ø32 mm) 26 mm (minimum ID : ø12,7 mm)
Parallelism with rotation center	**AS :** 0,2 µm / 350 mm **AH :** 0,32 µm / 550 mm
Horizontal axis	
Straightness	0,4 µm / 200 mm
Perpendicularity to rotation center	0,5 µm / 200 mm
Software	**ROUNDPAK** FORMTRACEPAK-AP (optional for roughness detection unit)

Additional Specifications

Optional accessories	Other optional and standard accessories are listed later in this section for accessories and styli.

Optional accessories

No.	Description
12AAL019	Side table
12AAG419	Roughness detection unit CNC, 0,75mN



ROUNDPAK
Simple to operate even with a full set of parameters

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Roundtest Extreme RA-6000CNC

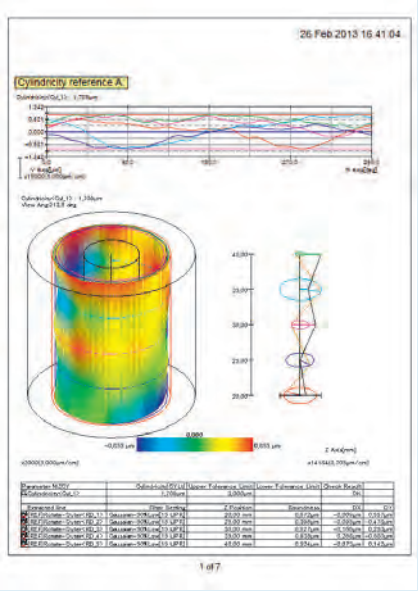
Series 211 – Large size Form Measuring Instrument

This is a fully automatic CNC form measuring instrument for heavy and accurate workpieces. The Roundtest Extreme RA-6000CNCbears the following benefits:

- Huge measuring range of 1050mm in height for long workpieces
- Wide probing range enables measurements of form parameters of huge-diameter workpieces
- Maximum loading capacity of 350kg for heavy and big size workpieces
- Highly-accurate measurements of large workpieces
- Fully automatic measurement provides fast and accurate processing
- ROUNDPAK software also comprises easy-to use part programing and single measurement functions
- A highly accurate automatic centering and leveling turntable A.A.T. (Automatic Adjustment Table) is supplied as standard, rendering manual centering and leveling redundant

Specifications

Turntable	
Rotational accuracy	**Radial:** (0,05+0,0006H)µm H: Measuring height from turntable surface (mm) **Axial:** (0,05+0,0006X)µm X: Radial distance from center (mm)
Rotational speed	2, 4, 6 rpm
Max. turntable loading [kg]	350 kg
Centering range	±5 mm
Leveling range	±1°
Vertical column	
Max. probing height	1050 mm



ROUNDPAK
Simple to operate even with a full set of parameters and analysis functions



RA-6000CNC

No.	Model	Centering/leveling adjustment 1*	Max. turntable loading [kg]	Vertical travel [mm]	Max. workpiece ø [mm]	Max. probing Ø [mm]
211-591D	RA-6000CNC	AAT	350	1050	900	880

1* AAT : Automatic Adjustment Table

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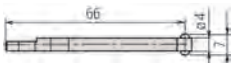
Optional Styli for Roundtest

Interchangeable styli for RA-10, RA-120, RA-120P, RA-1600, RA-2200, RA-H5200



12AAL021 - Standard
ø 1,6 mm tungsten carbide



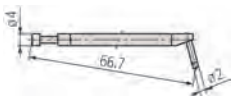
12AAL022 - Notch
ø 3 mm tungsten carbide



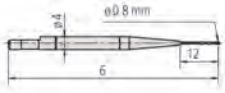
12AAL023 - Deep groove
R 0,25 mm sapphire



12AAL024 - Corner
R 0,25 mm sapphire



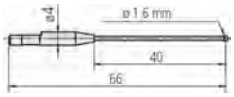
12AAL025 - Cutter mark
R 15 mm tungsten carbide



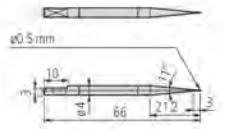
12AAL026 - Small hole
ø 0,8 mm tungsten carbide



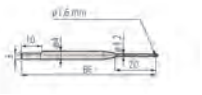
12AAL027- Small hole
ø 1 mm tungsten carbide



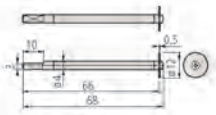
12AAL028 - Small hole
ø 1,6 mm tungsten carbide



12AAL029- Extra small hole
ø 0,5 mm tungsten carbide



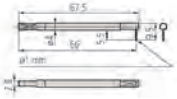
12AAL030- ø 1,6 mm ball
ø 1,6 mm tungsten carbide



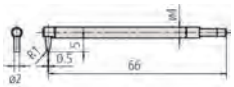
12AAL031- Disc
ø 12 mm



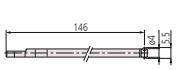
12AAL032- Crank
ø 0,5 mm tungsten carbide



12AAL033- Crank
ø 1 mm tungsten carbide



12AAL034- Flat surface
Tungsten carbide



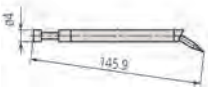
12AAL035- 2X-long standard
ø 1,6 mm tungsten carbide



12AAL036- 2X-long notch
ø 3 mm tungsten carbide



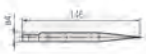
12AAL037- 2X-long deep groove
R 0,25 mm sapphire



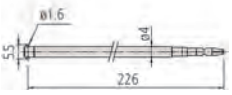
12AAL038- 2X-long corner
R 0,25 mm sapphire



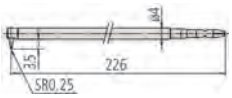
12AAL039- 2X-long type cutter mark
R 15 mm tungsten carbide



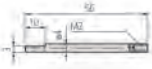
12AAL040- 2X-long small hole
ø 1 mm tungsten carbide



12AAL041- 3X-long standard
ø 1,6 mm tungsten carbide



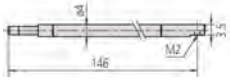
12AAL042- 3X-long deep groove
R 0,25 mm sapphire



12AAL043- Stylus shank
for mounting M2 - CMM stylus



12AAL044- Stylus shank groove
for mounting M2 - CMM stylus



12AAL045- Stylus shank 2X groove
for mounting M2 - CMM stylus

Standard accessories

No.	Description
12AAL021	Standard stylus

Optional accessories

No.	Description
12AAL022	Stylus for notches, Ø3 mm, tungsten carbide
12AAL023	Stylus for deep groove, R 0,25 mm, Sapphire
12AAL024	Stylus for corner, R 0,25 mm, Sapphire
12AAL025	Stylus for cutter marks, R 15 mm, tungsten carbide
12AAL026	Stylus for small holes, Ø0,8 mm, tungsten carbide
12AAL027	Stylus for small holes, Ø1 mm, tungsten carbide
12AAL028	Stylus for small holes, Ø1,6 mm, tungsten carbide
12AAL029	Stylus for extra small hole, Ø0,5 mm, tungsten carbide
12AAL030	Stylus ball type, Ø1,6 mm, tungsten carbide
12AAL031	Stylus disc type, Ø12 mm
12AAL032	Stylus for cranks, Ø0,5 mm, tungsten carbide
12AAL033	Stylus for cranks, Ø1 mm, tungsten carbide
12AAL034	Stylus for flat surface, tungsten carbide
12AAL035	Stylus 2X-long standard type, Ø1,6 mm, tungsten carbide*1
12AAL036	Stylus 2X-long type for notches, Ø3 mm, tungsten carbide*1
12AAL037	Stylus 2X-long type for deep grooves, R 0,25 mm, Sapphire*1
12AAL038	Stylus 2X-long type for corners, R 0,25 mm, Sapphire*1
12AAL039	Stylus 2X-long type for cutter marks, R 15 mm, tungsten carbide*1
12AAL040	Stylus 2X-long type for small hole, Ø1 mm, tungsten carbide*1
12AAL041	Stylus 3X-long standard type, Ø1,6 mm, tungsten carbide*2
12AAL042	Stylus 3X-long type for deep grooves, R 0,25 mm, Sapphire*2
12AAL043	Stylus shank, for mounting M2-CMM stylus
12AAL044	Stylus shank for grooves, for mounting M2-CMM stylus
12AAL045	Stylus shank 2X-long type for grooves, for mounting M2-CMM stylus*1

*1 Not available for RA-10, RA-120, RA-120P
*2 Measuring is only possible in the vertical direction



Notches



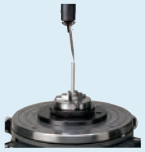
Flat surface



Cutter marks



Corner



Small hole

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Optional Styli for Roundtest

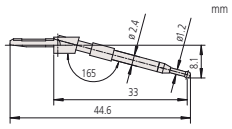
Standard accessories

No.	Description
12AAE301	Stylus standard type for CNC, Ø1,6 mm, tungsten carbide
12AAE302	Stylus for flat surfaces for CNC, Ø1,6 mm, tungsten carbide

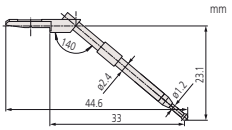
Optional accessories

No.	Description
12AAE303	Ball stylus for CNC, Ø1,6 mm, tungsten carbide
12AAE304	Ball stylus for CNC, Ø0,8 mm, tungsten carbide
12AAE305	Ball stylus for CNC, Ø0,5 mm, tungsten carbide
12AAE306	Stylus for deep holes, Ø1,6 mm, tungsten carbide
12AAE307	Stylus for deep holes, Ø1,6 mm, tungsten carbide
12AAE308	Stylus for deep grooves, Ø1,6 mm, tungsten carbide
12AAE309	Stylus for notches, Ø3,0 mm, tungsten carbide
12AAE310	Stylus for grooves, Ø1,6 mm, tungsten carbide

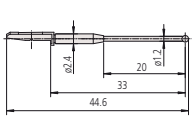
Interchangeable styli for RA-2200CNC, RA-H5200CNC, RA-6000CNC



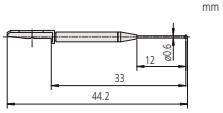
12AAE301 - Standard
ø 1,6 mm tungsten carbide



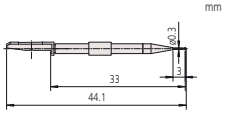
12AAE302 - Flat surface
ø 1,6 mm tungsten carbide



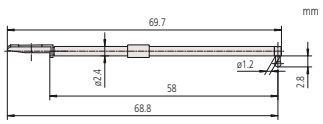
12AAE303 - ø 1,6 mm ball
ø 1,6 mm tungsten carbide



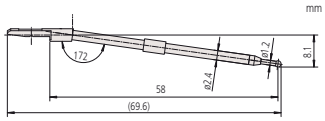
12AAE304 - ø 0,8 mm ball
ø 0,8 mm tungsten carbide



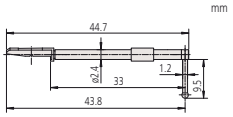
12AAE305 - ø 0,5 mm ball
ø 0,5 mm tungsten carbide



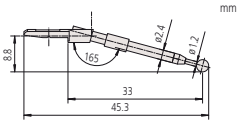
12AAE306 - Deep hole
ø 1,6 mm tungsten carbide



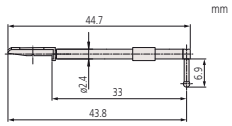
12AAE307 - Deep hole
ø 1,6 mm tungsten carbide



12AAE308 - Deep groove
ø 1,6 mm tungsten carbide



12AAE309 - Notch
ø 3 mm tungsten carbide



12AAE310 - Groove
ø 1,6 mm tungsten carbide

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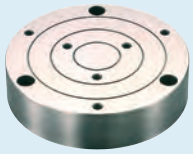
Optional Accessories for Roundtest

Optional accessories for Roundtest and Roundtest Extreme

Auxiliary stage for a low-height workpiece

No.	Description
356038	Used for measuring a workpiece whose diameter is 40 mm or less and whose height is 20 mm or less

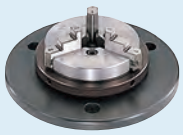


356038

Chuck - Quick chuck

This Chuck is useful when measuring small workpieces. You can easily clamp them with its knurled ring.

No.	Holding capacity [mm]	External dimensions [mm]
211-032.	Internal jaw: ID = ø 16 - 69 External jaw: OD = ø 1 - 79	ø118 x 41
211-031.	Internal jaw: ø 0,1 - 1,5	ø 107 x 48,5



211-032



211-031

Chuck - Three jaw chuck (key operated)

No.	Holding capacity [mm]	External dimensions [mm]
211-014	Internal jaw: ID = ø 25 - 68 Internal jaw: OD = ø 2 - 35 External jaw: OD = ø 35 - 78	ø157 x 70,6



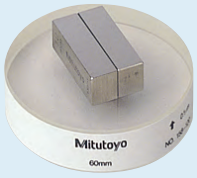
211-014

Cylindric square

No.	Cylindricity [µm]	Roundness [µm]	Perpendicularity [µm]	Straightness [µm]
350850	2	0,5	3	1



350850



997090

Gauge block set for calibration

No.	Description
997090	Standard accessory for RA-2200,RA-2200CNC Standard accessory for RA-H5200 and RA-H5200CNC

Magnification checking gauge

No.	Max. calibration range [µm]	Graduation [µm]
211-045	400	0,2



211-045

Origin point gauge

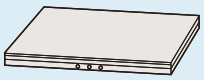
No.	Description
998382	Standard accessory for RA-1600, RA-2200 and RA-H5200



998382

Vibrator isolator and accessories

No.	Vibration isolation method	External dimensions [mm]	Description
178-025	Air suspension Diaphragm isolation system	(WxDxH) 750x550x59	For RA-2200 and RA-2200CNC
178-024			Stand for RA-2200 and RA-2200CNC
12AAL019		660 x 670 x 700	Side table
12AAK110		830 x 800 x 700	Vibration isolator
12AAK120			Monitor arm



178-025



12AAK110 + 12AAK120



12AAK110 + 12AAL019

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