Mitutoyo

FORMTRACER SV-C3200/4500 SERIES

DUAL-PURPOSE MEASUREMENT AND POWERFUL

ANALYSIS OF SURFACE ROUGHNESS AND CONTOUR

FORM MEASUREMENT

Mitutoyo

Hybrid Measuring Instrument for Surface Roughness and Contour Measurement

SV-C4500S4

SV-C3200S4

Contour Measuring functions

Detector with new arm design

Expands measurement range while reducing workpiece interference. Mitutoyo's newly designed detector arm lowers workpiece interference while expanding the measurement range in the Z1 axis (detector).

• When using the SPH-71 one-sided cut stylus

• SV-C3100 / SV-C4100 (Conventional product)

50 mm
10 mm

• SV-C3200 / SV-C4500

60 mm
19 mm

Detector measurement range expanded by 10 mm
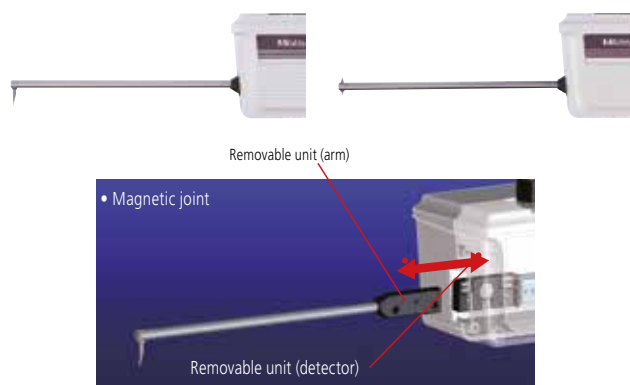
One-touch arm attachment   (Patent pending in Japan)

The arm mount uses a magnetic joint for quick and easy arm replacement. The mount also includes a safety mechanism.
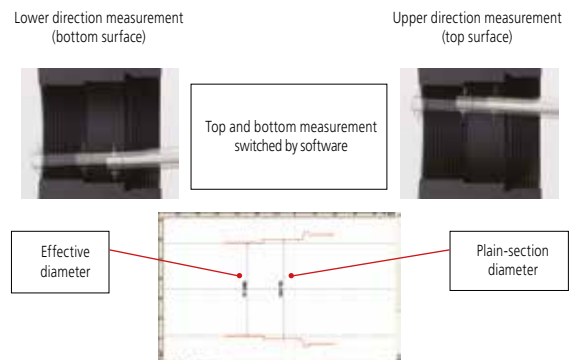
• **SV-C3200**   • **SV-C4500**

Removable unit (arm)

• Magnetic joint

Removable unit (detector)

New function specified for 4500 Series
Continuous top-bottom measurement function

Upper and lower surfaces can be measured continuously by using Mitutoyo's double-sided conical stylus. This continuous measurement data can be used to facilitate analysis of features that were difficult to measure before, such as the effective diameter of an internal screw-thread.

Lower direction measurement (bottom surface)

Upper direction measurement (top surface)

Top and bottom measurement switched by software

Effective diameter

Plain-section diameter

Continuous top-bottom measurement allows hassle-free one-step calibration   (Patent pending in Japan)

The one-step calibration kit supplied with the SV-C4500 Series has been upgraded to enable easy calibration of the double-sided conical stylus featuring a contact on both the top and the bottom. Fiddly work such as calibrating the Z1-axis gain, symmetry, and stylus radius can now be carried out in a single operation.

• Calibration kit for SV-C4500   • SV-C3200

Gauge blocks

Ball

Pin gauge
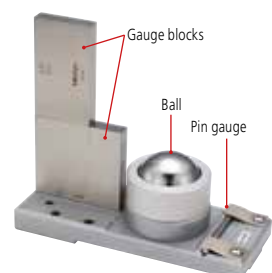
Surface Roughness measuring functions

Variable measuring force function

The measuring force can be varied in 5 steps by using the software provided **(FORMTRACEPAK)**, eliminating the need to adjust the measuring force by switching weights or through positional adjustment. The SV-C4500 Series can also maintain the specified measuring force even when tilted.

Supporting international standards

Compliant with EN ISO, VDA, JIS, ANSI and other international surface roughness standards.

Reduction of measuring time and operator's fatigue

In addition to high speed movement of main unit, reduction of setting time and operator's fatigue can be achieved by using auto-leveling table (option), which allows automatic leveling for a measuring face.

We offer a product lineup of surface roughness detectors with different measuring forces

Standard detectors can be selected (as listed below) to conform to the international standard recommendations.
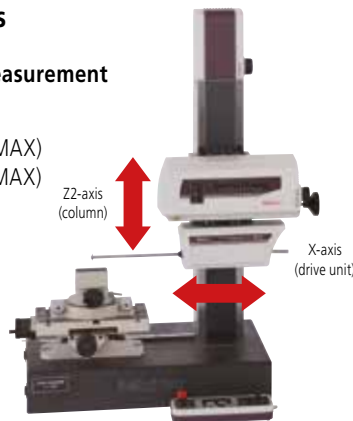0.75 mN (tip angle 60°; tip radius 2 μm)
4 mN (tip angle 90°; tip radius 5 μm)

Common specifications

Fast traverse improves measurement efficiency

X-axis (drive unit) : 80 mm/s (MAX)
Z2-axis (column)   : 30 mm/s (MAX)

The total measurement time can be shortened by speeding up the traverse movements.

Z2-axis (column)

X-axis (drive unit)

Remote-control unit enables safe, easy & fast measurement

The remote-control unit lets you move quickly from positioning to measurement. The unit also features an emergency stop switch and speed control knob for added safety while the machine is moving at high speeds.

Emergency stop switch

Drive speed control knob

New remote control box

Auto stop feature assures safety even during high-speed movement

The detector includes a safety mechanism (auto stop upon collision) to assure measurement safety even during high-speed movement. If the arm is removed or shifts during measurement, the safety mechanism is triggered and stops the machine.

Direction of collision that may cause the safety device to be triggered
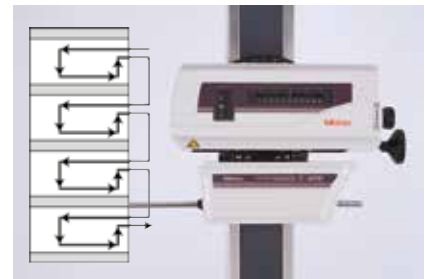• Detector for contour measuring

Removable unit

• Detector for surface roughness measuring

Remarkable ease of operation

Incorporation of an ABS scale in the Z2-axis eliminates the need for wearisome origin point resetting conventionally required for every step of repeated measurements over stepped or multiple sections.
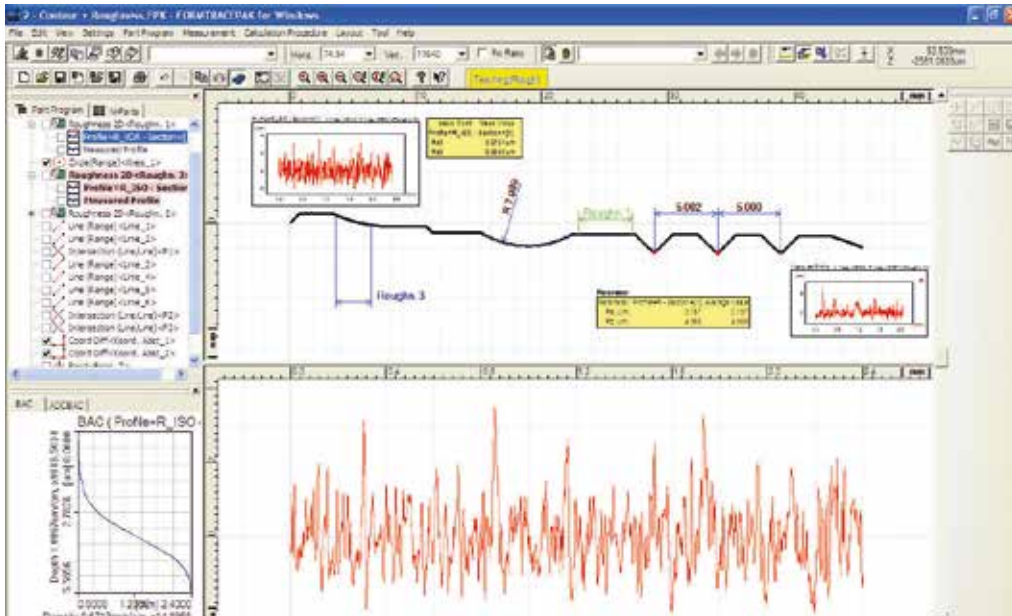
ABSOLUTE®

All detector and drive unit cables are housed inside the main unit to eliminate any risk of abrasion and guarantee trouble free, high-speed operation.

Contour Analysis Software: FORMTRACEPAK

Contour measuring

Contour analysis function

Upper and lower surfaces can be measured continuously by using Mitutoyo's double-sided conical stylus. This continuous measurement data can be used to facilitate analysis of features that were difficult to measure before, such as the effective diameter of an internal screw-thread.
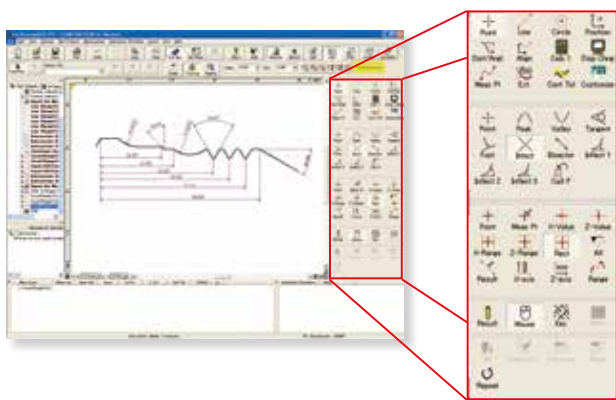

- **Contour-tolerancing function as a standard feature**
- **Design value generation function**
- **Data combination function**
- **Simple pitch calculation function**
- **Repeat function**

Surface Roughness measuring

Surface Roughness analysis function

FORMTRACEPAK can perform surface roughness analyses that conform to various standards such as EN ISO, VDA, JIS, ANSI. For comparing the measurement values with the tolerance limits, you can use the 16% rule or the maximum value rule. Furthermore, since FORMTRACEPAK comes with parameter calculation functions as well as a rich set of graphic analysis functions, it can be widely utilised for everything from routine quality control to R&D applications. It also includes many other functions, such as the function for eliminating (compensating) shapes, such as slopes and radial-surface, and a data deletion function.
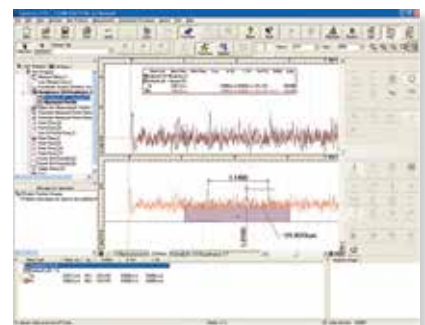

- **Contour analysis function**
- **Simple input using drawing symbols**
- **Reference length dialog box**
- **Data compensation function**
- **Radial-surface automatic measurement function**
- **Selection of analysis graphs**
- **Data connection settings**

Integrated layout

You can use simple operations to lay out graphics obtained from measurements as well as measurement results for surface roughness, contour, and roundness on a single page. Furthermore, since the program now allows you to specify a saved file and paste it, you can easily paste results from multiple files.

Note: the optional ROUNDPAK roundness/cylindricity analysis program is required. (Ver. 7 or higher)
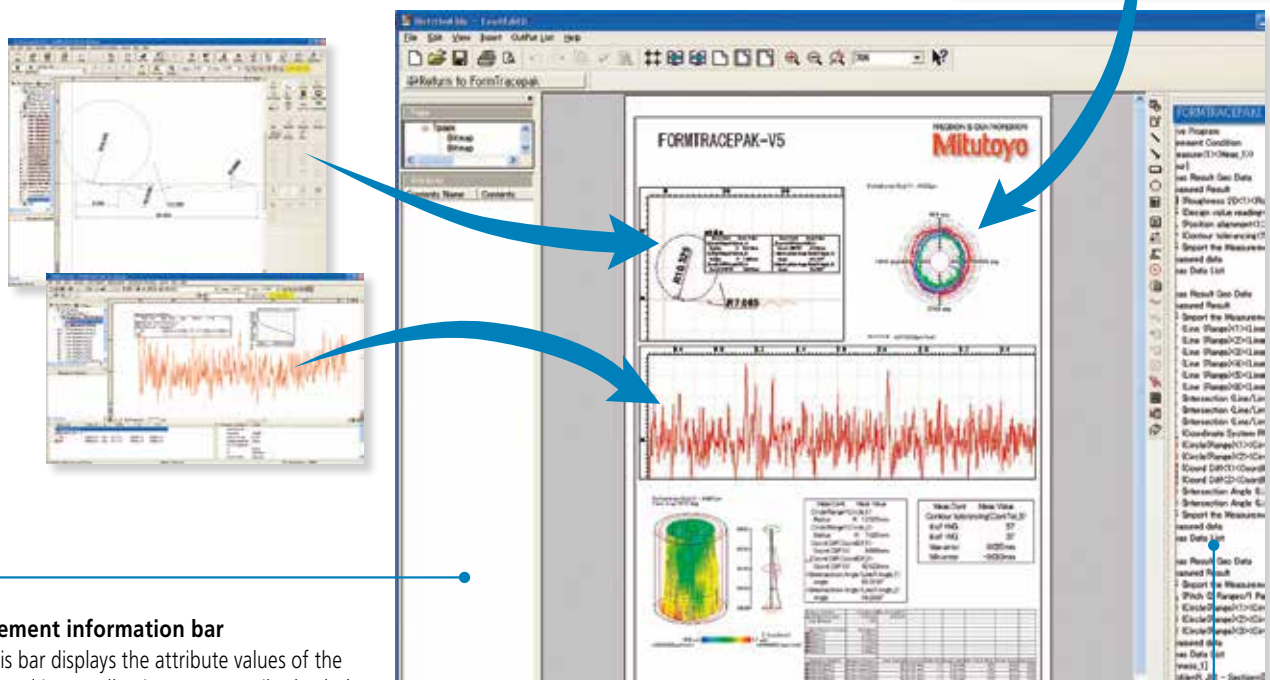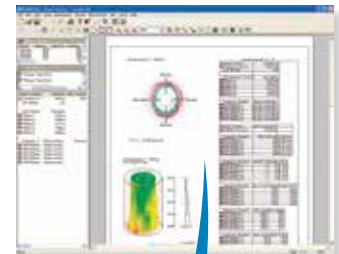
Element information bar
This bar displays the attribute values of the pasted items, allowing you to easily check the contents of the pasted measurement data files.

System layout printing
By simply selecting the items to be output, you can automatically lay out the page to be printed. Use this feature when you wish to simplify the printing task.

Element insertion bar
Using the mouse to drag and drop the analysis content displayed in the element insertion bar, you can paste it onto the layout. From the contour analysis result, you can also select the analysis result for a circle or line alone and paste it in position.

Saving the result as a web page
Since you can save the result in html or mhtml format, which can be displayed using Internet Explorer® or Microsoft® Word, you can check the result even on a PC in which no layout-editing program is installed.

Report creation function
You can freely assemble measurement results/conditions/graphics as well as comments/circles/lines/arrows, and print them out in a measurement result report. Furthermore, since you can paste bitmap files, you can also add a workpiece image or company logo to the layout. You can also save the created layout and use it again later for similar measurements.

Optional Accessories for Automatic Measurement

Y-axis table: 178-097

Enables efficient, automatic measurement of multiple aligned workpieces and multiple points on a single measurement surface.

Travel range	200 mm
Resolution	0.05 µm
Positioning accuracy	± 3 µm
Drive speed	Max. 80 mm/s
Maximum load	50 kg
Mass	28 kg

Rotary table θ1-axis table: 12AAD975*

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.
* θ1-axis mounting plate (12AAE630) is required when directly installing on the base of the SV-C3200/4500.
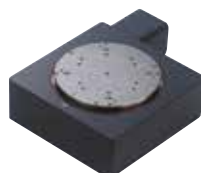
Displacement	360°
Resolution	0.004°
Maximum load	12 kg
Rotational speed	Max. 10°/s
Mass	7 kg

Rotary table θ2-axis unit: 178-078*

You can measure multiple points on a cylindrical workiece and automate front/rear-side measurement.
* θ2 -axis mounting plate (12AAE718) is required when directly installing on the base of the SV-C3200/4500.

Displacement	360°
Resolution	0.0072°
Maximum load (loading moment)	4 kg (343 N•cm or less)
Rotational speed	Max. 18°/s
Mass	5 kg

Centering chuck (ring operated): 211-032

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

Clamping range	Jaws normal	OD: ø 1 - ø 36 mm
	Jaws normal	ID: ø 16 - ø 69 mm
	Jaws reversed	OD: ø 25 - ø 79 mm
Dimensions		ø 118 x 41 mm
Mass		1.2 kg

Micro-chuck: 211-031

This chuck is suitable for clamping extra-small diameter workpieces (ø 1 mm or less), which cannot be retained with the centering chuck.

Clamping range	OD: ø 0.1 - ø 1.5 mm
Dimensions	ø 107 x 48.5 mm
Mass	0.6 kg

Auto-leveling table: 178-087

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.
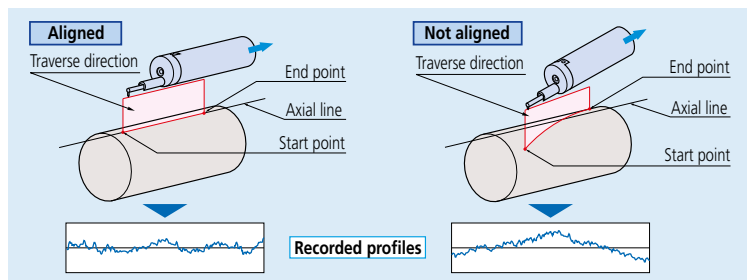
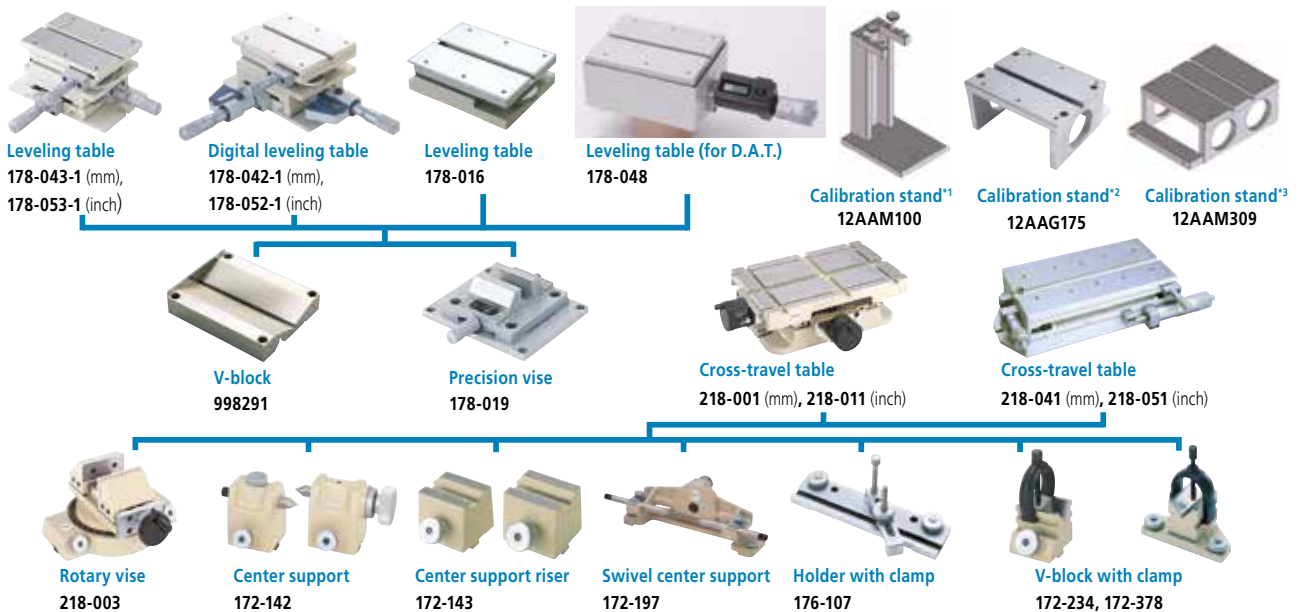|	
Inclination adjustment angle	± 2°
Maximum load	7 kg
Table dimensions	130 x 100 mm
Mass	3.5 kg
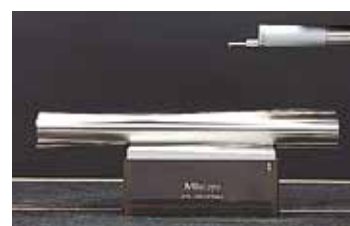
Optional Accessories

3-axis adjustment table: 178-047

This table helps make the alignment adjustments required when measuring cylindrical surfaces. The corrections for the pitch angle and the swivel angle are determined from a preliminary measurement and the Digimatic micrometers are adjusted accordingly. A flat-surfaced workpiece can also be leveled with this table.

Aligned
Traverse direction
End point
Axial line
Start point

Not aligned
Traverse direction
End point
Axial line
Start point

Recorded profiles

Table and fixture systems

Leveling table
178-043-1 (mm),
178-053-1 (inch)

Digital leveling table
178-042-1 (mm),
178-052-1 (inch)

Leveling table
178-016

Leveling table (for D.A.T.)
178-048

Calibration stand[1]
12AAM100

Calibration stand[2]
12AAG175

Calibration stand[3]
12AAM309

V-block
998291

Precision vise
178-019

Cross-travel table
218-001 (mm)**, 218-011** (inch)

Cross-travel table
218-041 (mm)**, 218-051** (inch)

Rotary vise
218-003

Center support
172-142

Center support riser
172-143

Swivel center support
172-197

Holder with clamp
176-107

V-block with clamp
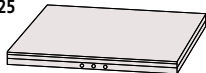**172-234, 172-378**

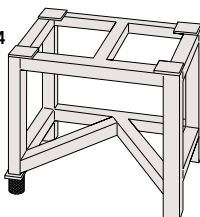### • Desktop type vibration isolators

Manually charged pneumatic type[4]
No. 178-023

Automatically charged pneumatic type[4]
No. 178-025

Stand for desktop type
External size (W × D × H): 640 × 470 × 660 mm
Mass: 25 kg
No. 178-024
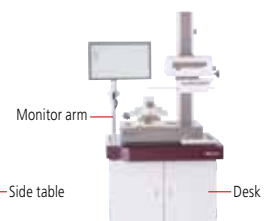
• Desk type vibration isolators

Desk type[4]
No. 12AAK110

Monitor arm[5]
No. 12AAK120

Side table[6]
No. 12AAL019

Monitor arm

Desk
Side table

Side table
Desk

Example combination: with side table but no monitor arm (tester and PC not included)

Example combination: with monitor arm but no side table[6] (tester and PC not included)

*1 Required for calibrating upward measurement of **SV-C3200** series.
*2 Required for calibrating in bulk by mounting straight arm/small-hole stylus arm without using cross-travel table and Y-axis table.
*3 Required for calibrating in bulk by mounting straight arm/eccentric arm/small-hole stylus arm without using cross-travel table and Y-axis table.
*4 For models with a product code that ends in **S4**, **S8**, **H4**, or **H8**. Please contact us directly if you require units for models with a product code that ends in W4, L4 or W8, L8 (large base models)
*5 Used together with vibration isolator **(No.12AAK110)**.
*6 User to provide a printer rack.

Optional Accessories: Detectors / Styli for Surface Roughness Measuring

Detectors

Unit: mm

11.5 10 60 14
φ14 1.3 3.6 3.1 φ14
φ7 φ8
4

Skidless nosepiece (**12AAB355**) Detector
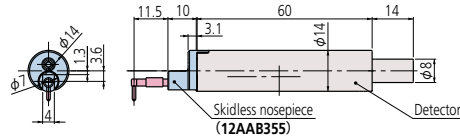
Order No.	Measuring force
178-396-2	0.75 mN
178-397-2	4 mN

Extension rods

• **12AAG202** Extension rod 50 mm

• **12AAG203** Extension rod 100 mm
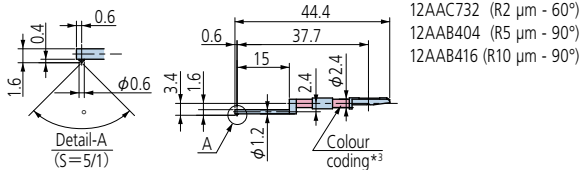

Styli

Unit: mm

Standard stylus

Colour coding*3
Detail-A
44.7 / 37.7 / 0.9 / 7.6 / 5.2 / A / φ2.4 / φ1.2
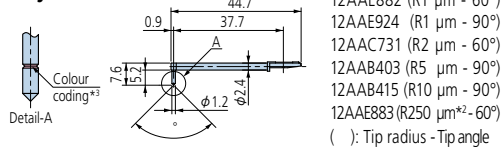
12AAE882 (R1 μm - 60°)
12AAE924 (R1 μm - 90°)
12AAC731 (R2 μm - 60°)
12AAB403 (R5 μm - 90°)
12AAB415 (R10 μm - 90°)
12AAE883 (R250 μm*2 - 60°)
( ): Tip radius - Tip angle

Double-length for deep hole *1

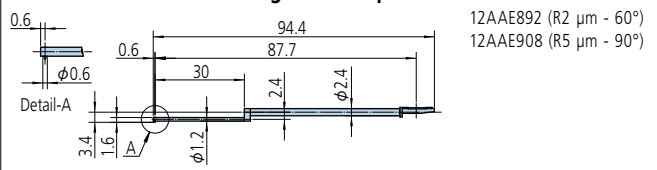94.7 / 87.7 / 0.9 / 3 / 1.8 / 0.6 / φ2.4
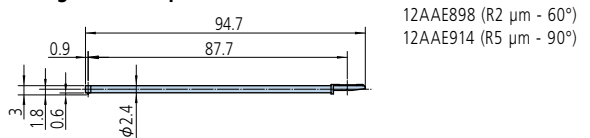
12AAE898 (R2 μm - 60°)
12AAE914 (R5 μm - 90°)

For small hole

0.6 / 0.4 / 1.6 / φ0.6
Detail-A (S=5/1)
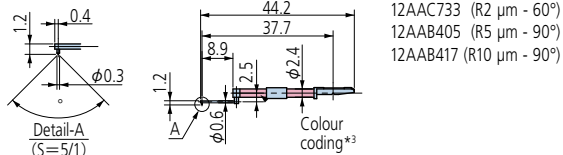44.4 / 37.7 / 15 / 0.6 / 3.4 / 1.6 / 2.4 / φ2.4 / A / φ1.2 / Colour coding*3

12AAC732 (R2 μm - 60°)
12AAB404 (R5 μm - 90°)
12AAB416 (R10 μm - 90°)

For small hole / Double-length for deep hole*1

0.6 / φ0.6 / Detail-A
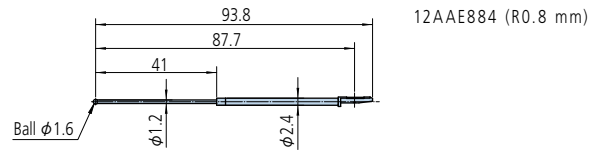94.4 / 87.7 / 30 / 0.6 / 2.4 / φ2.4 / 3.4 / 1.6 / A / φ1.2

12AAE892 (R2 μm - 60°)
12AAE908 (R5 μm - 90°)

For extra-small hole

1.2 / 0.4 / φ0.3
Detail-A (S=5/1)
44.2 / 37.7 / 8.9 / 1.2 / 2.5 / φ2.4 / A / φ0.6 / Colour coding*3

12AAC733 (R2 μm - 60°)
12AAB405 (R5 μm - 90°)
12AAB417 (R10 μm - 90°)

For small hole *1 *2

93.8 / 87.7 / 41 / Ball φ1.6 / φ1.2 / φ2.4

12AAE884 (R0.8 mm)

For ultra-small hole

0.8 / 0.4 / φ0.3
Detail-A (S=5/1)
44.2 / 37.7 / 8.9 / 0.8 / 2.5 / φ2.4 / A / φ0.6 / Colour coding*3
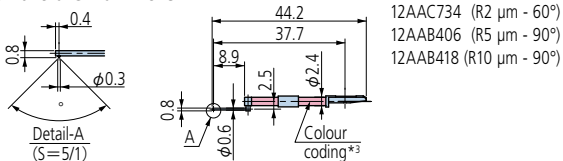
12AAC734 (R2 μm - 60°)
12AAB406 (R5 μm - 90°)
12AAB418 (R10 μm - 90°)

For ultra-small hole *2

Ball φ0.5 / 0.3 / φ2.4 / 8.5 / 3.1 / Detail-A / A / 37.7 / 43.8
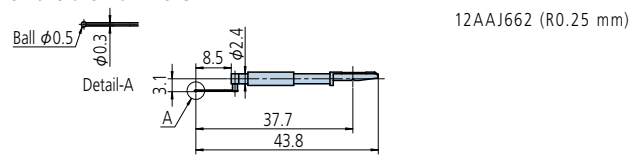
12AAJ662 (R0.25 mm)

For deep hole (double-length and triple-length) *1

Colour coding*3 / 0.9 / 94.7 / 87.7 / A / 7.6 / 5.2 / φ2.4 / φ1.2
Detail-A
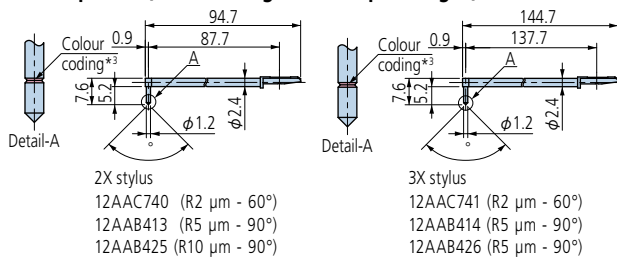
2X stylus
12AAC740 (R2 μm - 60°)
12AAB413 (R5 μm - 90°)
12AAB425 (R10 μm - 90°)

Colour coding*3 / 0.9 / 144.7 / 137.7 / A / 7.6 / 5.2 / φ2.4 / φ1.2
Detail-A

3X stylus
12AAC741 (R2 μm - 60°)
12AAB414 (R5 μm - 90°)
12AAB426 (R5 μm - 90°)

For small slotted hole *1

0.6 / 1.6 / 0.4 / φ0.6 / φ0.3
Detail-A
94.4 / 87.7 / 45 / 0.6 / A / φ1.2 / φ2.4
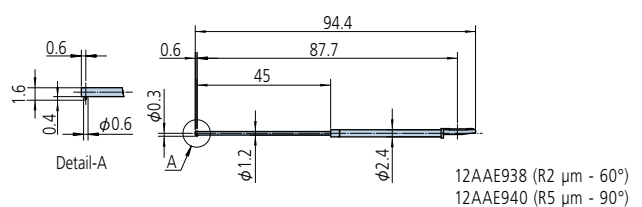
12AAE938 (R2 μm - 60°)
12AAE940 (R5 μm - 90°)

*1: For downward-facing measurement only.
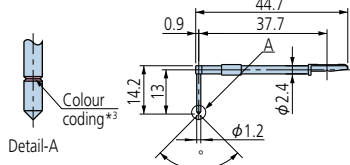*2: Used for calibration, a standard step gauge (No.178-611, option) is also required.

*3:

Tip radius	1 μm	2 μm	5 μm	10 μm	250 μm
Colour coding	White	Black	No colour	Yellow	No notch or colour

Styli

Unit: mm

For deep groove (10 mm)

Colour coding*[3]
Detail-A

44.7
37.7
0.9
14.2
13
φ2.4
φ1.2
A

12AAC735 (R2 µm - 60°)
12AAB409 (R5 µm - 90°)
12AAB421 (R10 µm - 90°)

For deep groove*[1] (20 mm)

95.2
87.7
23
21.8
5.2
φ2.4
φ1.2
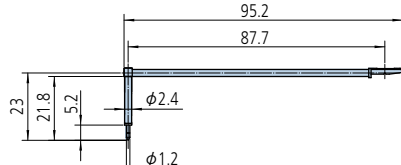
12AAE893 (R2 µm - 60°)
12AAE909 (R5 µm - 90°)

For deep groove*[1] (20 mm)

Colour coding*[3]
Detail-A

44.7
37.7
24.2
23
φ2.4
φ1.2
A
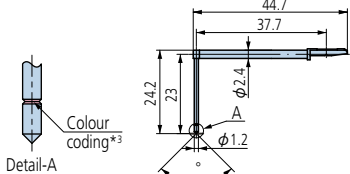
12AAC736 (R2 µm - 60°)
12AAB408 (R5 µm - 90°)
12AAB420 (R10 µm - 90°)

For deep groove*[1] (40 mm)

45.2
37.7
43.8
42.6
5.2
φ2.4
φ2.4
φ1.2
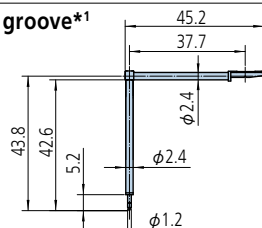
12AAE895 (R2 µm - 60°)
12AAE911 (R5 µm - 90°)

For deep groove*[1] (30 mm)

Colour coding*[3]
Detail-A

φ2.4
37.7
45.2
33
31.8
5.2
φ1.2
A
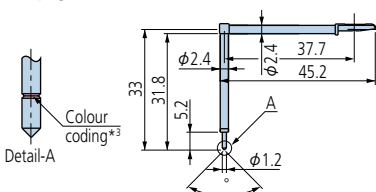
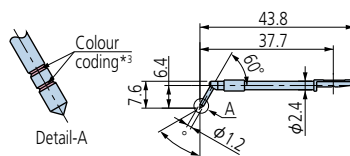12AAC737 (R2 µm - 60°)
12AAB407 (R5 µm - 90°)
12AAB419 (R10 µm - 90°)

For deep groove (30 mm) / double-length for deep hole*[1]

93.8
87.7
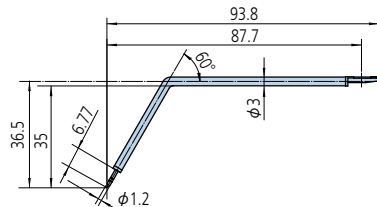36.5
35
5.2
φ3
φ1.2
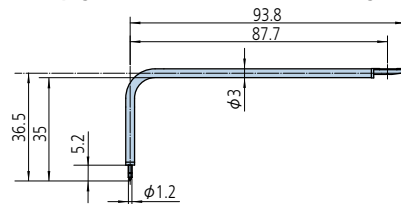
12AAE894 (R2 µm - 60°)
12AAE910 (R5 µm - 90°)

For gear tooth

Colour coding*[3]
Detail-A

43.8
37.7
6.4
7.6
60°
φ2.4
φ1.2
A

12AAB339 (R2 µm - 60°)
12AAB410 (R5 µm - 90°)
12AAB422 (R10 µm - 90°)

For gear tooth / double-length for deep hole*[1]

93.8
87.7
36.5
35
60°
6.77
φ3
φ1.2

12AAE896 (R2 µm - 60°)
12AAE912 (R5 µm - 60°)

For rolling circle waviness surface*[2]

44.7
37.7
0.9
7.6
5.2
Ball φ1.588
φ2.4
φ1.2
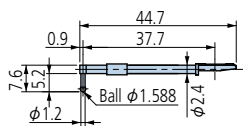
12AAB338 (ø 1.588 mm)

For rolling circle waviness / double-length for deep hole*[1] *[2]

94.7
87.7
0.9
7.6
6.4
5.2
φ2.4
φ1.2
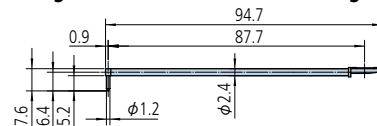
12AAE886 (R250 µm - 60°)

For knife-edge*[2]

Colour coding*[3]
Detail-A

44.7
37.7
0.9
7.6
φ1.2
φ2.4
A
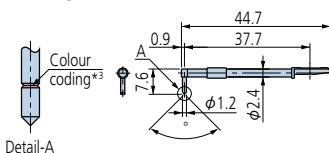
12AAC738 (R2 µm - 60°)
12AAB411 (R5 µm - 90°)
12AAB423 (R10 µm - 90°)

For corner hole / double-length for deep hole*[1]

93.8
87.7
35
45°
5.8
5
φ0.8
φ1.6
φ2.4
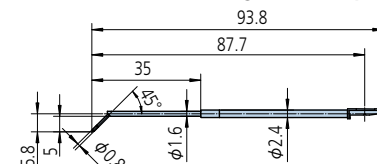
12AAM601 (R2 µm - 60°)
12AAM603 (R5 µm - 60°)

For eccentric arm*[1]

Colour coding*[3]
Detail-A

45.2
37.7
10
φ2.4
1.4
7.6
φ1.2
φ2.4
A
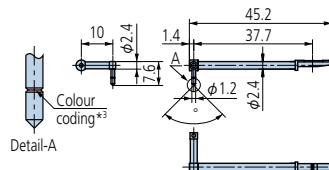
12AAC739 (R2 µm - 60°)
12AAB412 (R5 µm - 90°)
12AAB424 (R10 µm - 90°)

For hole bottom

44.3
37.7
0.5
7.4
6.2
5
φ1
φ2.4
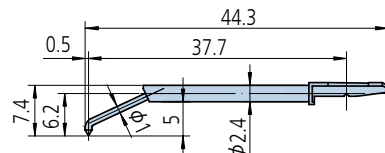
12AAE899 (R2 µm - 60°)
12AAE915 (R5 µm - 90°)

*1: For downward-facing measurement only. Customized special interchangeable styli are available on request, please contact any Mitutoyo office for more information.
*2: Used for calibration, a standard step gauge (No.178-611, option) is also required.

*3 Tip radius	2 µm	5 µm	10 µm
Colour coding	Black	No colour	Yellow

Mitutoyo

Arms / Styli
for Contour Measuring

Arms

| Description	Arm no.	Parts no.	Applicable stylus no.
Straight arm	**AB-31**[*1]	12AAM101	**SPH-5x, 6x, 7x, 8x, 9x, SPHW[*2]-56,66,76**
Eccentric arm	AB-37	12AAQ762	**SPH-5x, 6x, 7x, 8x, 9x, SPHW[*2]-56,66,76**
Small-hole arm	AB-33	12AAM103	**SPH-41, 42, 43**

*1 Standard accessory
*2 Stylus for SV-C4500 series
*3 One-sided cut stylus SPH-71 (standard accessory) mounting

• Straight arm **AB-31**

• Eccentric arm **AB-37**

• Small-hole arm **AB-33**
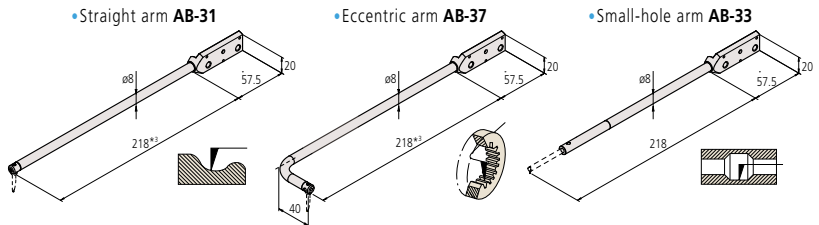
Styli

Stylus name	Stylus no.	Parts no.	Application arm no.	H (mm)
Double-sided conical stylus *1	SPHW-56	12AAM095 *2	AB-31, AB-37	20
	SPHW-66	12AAM096	AB-31, AB-37	32
	SPHW-76	12AAM097	AB-31, AB-37	48
One-sided cut stylus	SPH-51	354882	AB-31, AB-37	6
	SPH-61	354883	AB-31, AB-37	12
	SPH-71	354884 *2*3	AB-31, AB-37	20
	SPH-81	354885	AB-31, AB-37	30
	SPH-91	354886	AB-31, AB-37	42
Intersecting cut stylus	SPH-52	354887	AB-31, AB-37	6
	SPH-62	354888	AB-31, AB-37	12
	SPH-72	354889	AB-31, AB-37	20
	SPH-82	354890	AB-31, AB-37	30
	SPH-92	354891	AB-31, AB-37	42
Cone stylus Tip angle 30° Sapphire tipped	SPH-53	354892	AB-31, AB-37	6
	SPH-63	354893	AB-31, AB-37	12
	SPH-73	354894	AB-31, AB-37	20
	SPH-83	354895	AB-31, AB-37	30
	SPH-93	354896	AB-31, AB-37	42
Cone stylus Tip angle 30° Carbide-tipped	SPH-56	12AAA566	AB-31, AB-37	6
	SPH-66	12AAA567	AB-31, AB-37	12
	SPH-76	12AAA568	AB-31, AB-37	20
	SPH-86	12AAA569	AB-31, AB-37	30
	SPH-96	12AAA570	AB-31, AB-37	42
Cone stylus Tip angle 20° Carbide-tipped	SPH-57	12AAE865	AB-31, AB-37	6
	SPH-67	12AAE866	AB-31, AB-37	12
	SPH-77	12AAE867	AB-31, AB-37	20
	SPH-87	12AAE868	AB-31, AB-37	30
	SPH-97	12AAE869	AB-31, AB-37	42
Cone stylus tip angle 50° Diamond tipped	SPH-79	355129	AB-31, AB-37	20
Knife edge stylus	SPH-54	354897	AB-31, AB-37	6
	SPH-64	354898	AB-31, AB-37	12
	SPH-74	354899	AB-31, AB-37	20
	SPH-84	354900	AB-31, AB-37	30
	SPH-94	354901	AB-31, AB-37	42
Ball stylus	SPH-55	354902	AB-31, AB-37	6
	SPH-65	354903	AB-31, AB-37	12
	SPH-75	354904	AB-31, AB-37	20
	SPH-85	354905	AB-31, AB-37	30
	SPH-95	354906	AB-31, AB-37	42
Small hole stylus*4	SPH-41	12AAM104	AB-33	2
	SPH-42	12AAM105	AB-33	4
	SPH-43	12AAM106	AB-33	6.5

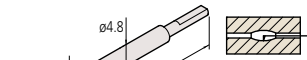**Double-sided conical stylus**
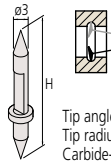
Tip angle: 30°
Tip radius: 25 μm
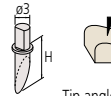Carbide-tipped
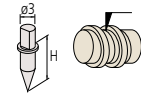
Cone stylus

Tip angle: 30° (**SPH-79**: 50°)
Tip radius: 25 μm
Sapphire, Carbide-tipped
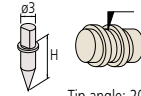(SPH-79:Diamond tipped)

Small hole stylus SPH-41

Tip shape: One-sided cut
Tip angle: 20°
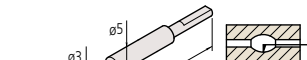Tip radius: 25 μm
Carbide-tipped

One-sided cut stylus

Tip angle: 12°
Tip radius: 25 μm
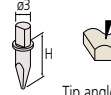Carbide-tipped

Cone stylus

Tip angle: 20°
Tip radius: 25 μm
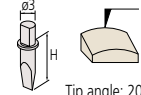Carbide-tipped

Small hole stylus SPH-42

Tip shape: One-sided cut
Tip angle: 20°
Tip radius: 25 μm
Carbide-tipped

Intersecting cut stylus

Tip angle: 20°
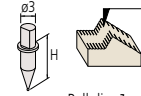Tip radius: 25 μm
Carbide-tipped

Knife edge stylus

Tip angle: 20°
Edge width: 3 mm
Tip radius: 25 μm
Carbide-tipped

Small hole stylus SPH-43

Tip shape:One-sided cut
Tip angle: 20°
Tip radius: 25 μm
Carbide-tipped

Ball stylus

Ball dia: 1 mm
Carbide-tipped

*1 Stylus for SV-C4500 series
*2 Standard accessory of SV-C4500 series
*3 Standard accessory of SV-C3200 series
*4 Styli SPH-21, 22, and 23 for SV-C3100/4100 series are not available.

Arm stylus (comprising an arm and stylus)

Arm stylus name	Stylus no.	Parts no.	H (mm)
Double-sided small hole arm stylus*5 (Cone 30°)	SPHW-31	12AAM108	2.4
	SPHW-32	12AAM109	5
	SPHW-33	12AAM110	9

*5 Arm stylus for SV-C4500 series

Arm stylus name	Stylus no.	Parts no.	H (mm)
Double-sided small hole arm stylus*5 (Cone 30°)	SPHW-21	12AAT469	2.4
	SPHW-22	12AAT470	5

*5 Arm stylus for SV-C4500 series

Double-sided small hole arm stylus SPHW-31
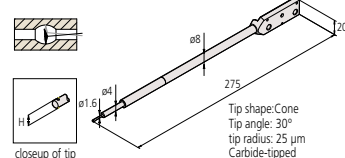
closeup of tip

Tip shape:Cone
Tip angle: 30°
tip radius: 25 μm
Carbide-tipped

Double-sided small hole arm stylus SPHW-32
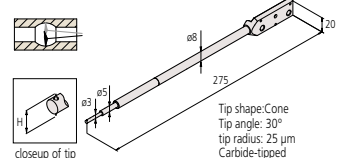
closeup of tip

Tip shape:Cone
Tip angle: 30°
tip radius: 25 μm
Carbide-tipped

Double-sided small hole arm stylus SPHW-33

closeup of tip

Tip shape:Cone
Tip angle: 30°
tip radius: 25 μm
Carbide-tipped

Dimensions

TYPE S4/H4/W4/L4

TYPE S8/H8/W8/L8

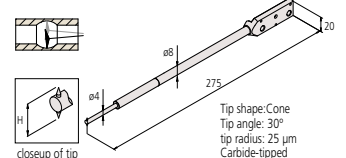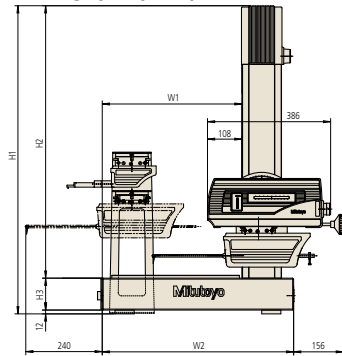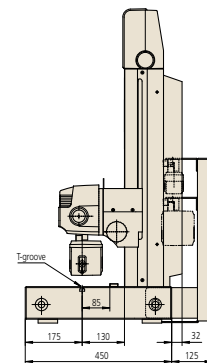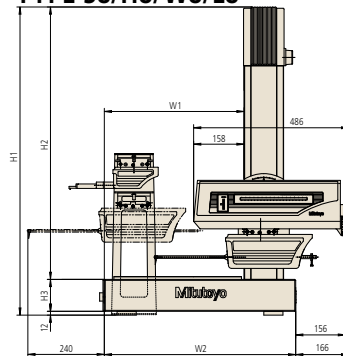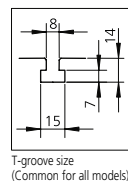Unit: mm

T-groove size
(Common for all models)

X-axis (drive unit)	Models		H1	H2	H3	W1	W2
Measuring range	3200 Series	4500 Series	mm	mm	mm	mm	mm
100 mm	SV-C3200S4	SV-C4500S4	966	854	100	438	600
	SV-C3200H4	SV-C4500H4	1166	1054	100	438	600
	SV-C3200W4	SV-C4500W4	1176	1054	110	838	1000
	SV-C3200L4	SV-C4500L4	1436	1314	110	825	1000
200 mm	SV-C3200S8	SV-C4500S8	966	854	100	438	600
	SV-C3200H8	SV-C4500H8	1166	1054	100	438	600
	SV-C3200W8	SV-C4500W8	1176	1054	110	838	1000
	SV-C3200L8	SV-C4500L8	1436	1314	110	825	1000

Specifications

Model	SV-C3200S4	SV-C3200H4	SV-C3200W4	SV-C3200L4	SV-C3200S8	SV-C3200H8	SV-C3200W8	SV-C3200L8
	SV-C4500S4	SV-C4500H4	SV-C4500W4	SV-C4500L4	SV-C4500S8	SV-C4500H8	SV-C4500W8	SV-C4500L8

Specifications for surface roughness measurement

Measuring range	X-axis (drive unit)	100 mm				200 mm			
	Z1-axis (detector unit)	800 µm / 80 µm / 8 µm							
Straightness		(0.05 ± 0.001L) µm L = drive length mm				0.5 µm / 200 mm			
Resolution Z1-axis (detector unit)		0.01 µm (800 µm), 0.001 µm (80 µm), 0.0001 µm (8 µm)							
Measuring force		0.75 mN or 4 mN							
Stylus tip		60°, 2 µmR (measuring force: 0.75 mN) or 90°, 5 µmR (measuring force: 4 mN)							
Conformable standards		JIS1982/JIS1994/JIS2001/ISO1997/ANSI/VDA							
Assessed profiles		Primary profile, roughness profile, envelope residual curve, filtered waviness curve, band pass waviness curve, waviness curve, rolling circle waviness curve, roughness motif, waviness motif, DIN4776 curve							
Graphs		Amplitude distribution graphs, BAC1, BAC2, power spectrum curve, auto correlation curve inclination angle distribution curve, peak point height distribution curve, parameter distribution curve							
Data compensation		Tilt compensation, R-surface compensation, ellipse compensation, parabola compensation, hyperbolic compensation, polynomial compensation, conic automatic compensation, polynomial automatic compensation							
Filters		Gaussian filter, 2CRPC75, 2CRPC50, 2CR75, 2CR50, robust spline filter							

Specifications for contour measurement

Measuring range	X-axis (drive unit)	100 mm				200 mm			
	Z1-axis (detector unit)	60 mm (± 30 mm in horizontal situation)							
Straightness (when the X-axis is horizontal)		0.8 µm / 100 mm				2 µm / 200 mm			
Accuracy	X-axis (drive unit)	± (0.8 ± 0.01L) µm L = drive length mm				± (0.8 ± 0.02L) µm L = drive length mm			
	Z1-axis (detector unit)	SV-C3200 series ± [1.4+2H/100]µm, SV-C4500 series ± (0.8+ |2H|/100) µm H = measurement height from the horizontal position (mm)							
Resolution	X-axis (drive unit)	0.05 µm							
	Z1-axis (detector unit)	SV-C3200 series 0.04 µm, SV-C4500 series 0.02 µm							
	Z2-axis (column)	1 µm							
Measuring force		SV-C3200 series 30 mN, SV-C4500 series 10, 20, 30, 40, 50 mN (setting measuring force in FORMTRACEPAK)							
Measuring face direction		SV-C3200 series both upward and downward, SV-C4500 series both upward and downward (direction switch from FORMTRACEPAK)							

Common specifications

Z2-axis (column) travel range		300 mm	500 mm	700 mm	300 mm	500 mm	700 mm
X-axis inclination angle		± 45°					
Drive speed	X-axis	0-80 mm/s and manual operation					
	Z2-axis (column)	0-30 mm/s and manual operation					
Measuring speed		0.02-5 mm/s					

Coordinate Measuring Machines	Vision Measuring Systems	Form Measurement	Optical Measuring
Sensor Systems	Test Equipment and Seismometers	Digital Scale and DRO Systems	Small Tool Instruments and Data Management

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Mitutoyo supports you from start to finish.**

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

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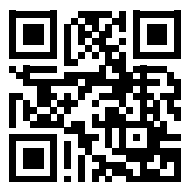
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