

Formtracer SV-C3100 / SV-C4100

SERIES 525 — Surface Roughness / Contour Measuring System



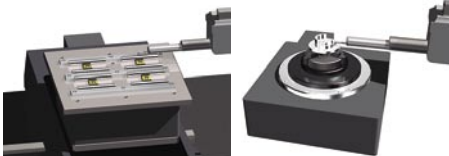
SV-C3100S4 with personal computer system and software

FEATURES

- Dramatically increased drive speed (X axis: 80 mm/s, Z2 axis column: 20mm/s) further reduces total measurement time.
- In order to maintain the traverse linearity specification for an extended period of time, Mitutoyo has adopted highly rigid ceramic guides that combine the characteristics of smallest secular change and remarkable resistance to abrasion.
- The drive unit (X-axis) and column (Z2-axis) are equipped with a high-accuracy linear encoders (ABS type on Z2-axis). This improves reproducibility of continuous automatic measurement of small holes in the vertical direction and repeated measurement of parts which are difficult to position.

Automatic Measurement

- With the support for a wide range of optional peripherals designed for use with the CNC models enables automatic measurement.



Using Y-axis Table

Using Rotary Table 01



Using Rotary Table 02

(See page 424 for more details.)

Surface Roughness Measurement



- Traverse linearity: $\pm(0.05+0.001L)\mu\text{m}^*$
Designed to handle workpieces calling for high accuracy.
*S4, H4, W4 types, L = Drive length (mm)
- Compliant with JIS '82/'94/'01, ISO, ANSI, DIN, VDA, and other international surface roughness standards.
- Equipped as standard with a high accuracy detector (0.75mN / 4mN measuring force) providing a resolution down to 0.0001 μm .

Contour Drive Measurement



- X axis accuracy: $\pm(0.8+0.01L)\mu\text{m}^*$
Z1-axis accuracy: $\pm(0.8+10.5H/25)\mu\text{m}^*$
Designed to handle workpieces calling for high accuracy.
* SV-C4100S4, H4, W4 types, L = Drive length, H = Measurement height (mm)
- The contour drive unit of SV-C4100 series is equipped with a Laser Hologage detector giving excellent narrow/wide range accuracy and resolution in the Z1-axis.

Technical Data: Common

Base size (W x H):	750 x 600mm or 1000 x 450mm
Base material:	Granite
Mass	
Main unit:	140kg (S4), 150kg (H4), 220kg (W4) 140kg (S8), 150kg (H8), 220kg (W8)
Controller Unit:	14kg
Remote Control Box:	0.9kg
Power supply:	100 - 240VAC $\pm 10\%$, 50/60Hz
Power consumption:	400W (main unit only)

Technical Data: Contour Measurement

X-axis	
Measuring range:	100mm or 200mm
Resolution:	0.05 μm
Measurement method:	Reflective-type linear encoder
Drive speed:	80mm/s and manual
Measuring speed:	0.02 - 5mm/s
Measuring direction:	Forward/backward
Traverse linearity:	0.8 μm / 100mm, 2 μm / 200mm <small>*with the X axis in horizontal orientation</small>
Linear displacement accuracy (at 20°C)	$\pm(1+0.01L)\mu\text{m}$ (SV-C3100S4, H4, W4) $\pm(0.8+0.01L)\mu\text{m}$ (SV-C4100S4, H4, W4) $\pm(1+0.02L)\mu\text{m}$ (SV-C3100S8, H8, W8) $\pm(0.8+0.02L)\mu\text{m}$ (SV-C4100S8, H8, W8) <small>* L = Drive length (mm)</small>
Inclining range:	$\pm 45^\circ$
Z2-axis (column)	
Vertical travel:	300mm or 500mm
Resolution:	1 μm
Measurement method:	ABSOLUTE linear encoder
Drive speed:	0 - 20mm/s and manual
Z1-axis (detector unit)	
Measuring range:	$\pm 25\text{mm}$
Resolution:	0.2 μm (SV-C3100), 0.05 μm (SV-C4100)
Measurement method:	Linear encoder (SV-C3100), laser hologage (SV-C4100)
Linear displacement accuracy (at 20°C)	$\pm(2+4H/100)\mu\text{m}$ (SV-C3100) $\pm(0.8+10.5H/25)\mu\text{m}$ (SV-C4100) <small>*H: Measurement height from the horizontal position (mm)</small>
Stylus up/down operation:	Arc movement
Face of stylus:	Upward/downward
Measuring force:	30mN
Traceable angle:	Ascent: 77°, descent: 87° <small>(using the standard stylus provided and depending on the surface roughness)</small>
Stylus tip	Radius: 25 μm , carbide tip

Technical Data: Surface Roughness Measurement

X1-axis	
Measuring range:	100mm or 200mm
Resolution:	0.05 μm
Measurement method:	Linear encoder
Drive speed:	80mm/s
Traversing direction:	Backward
Traverse linearity:	(0.05+1.5L/1000) μm (S4, H4, W4 types) 0.5 μm /200mm (S8, H8, W8 types)
Z2-axis (column)	
Vertical travel:	300mm or 500mm
Resolution:	1 μm
Measurement method:	ABSOLUTE linear encoder
Drive speed:	0 - 20mm/s and manual
Detector	
Range / resolution:	800 μm / 0.01 μm , 80 μm / 0.001 μm , 8 μm / 0.0001 μm (up to 2400 μm with an optional stylus)
Detecting method:	Skidless / skid measurement
Measuring force:	4mN or 0.75mN (low force type)
Stylus tip:	Diamond, 90° / 5 μm R (60° / 2 μm R: low force type)
Skid radius of curvature:	40mm
Detecting method:	Differential inductance

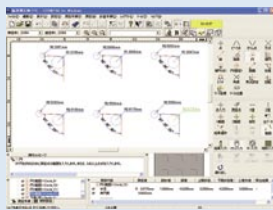


Mitutoyo Intelligent Computer Aided Technology

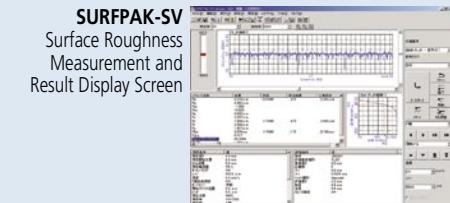
the standard in world
metrology software
FORM

Optional Software DUAL TRACEPAK

The type of measuring unit is automatically recognized so that when the surface roughness drive unit is mounted the surface roughness analysis program SURFPAK-SV starts automatically. Conversely, when the contour drive unit is mounted, the form analysis program FORMPAK-1000 is initiated. For offline analysis the program required can be selected for execution on the menu screen even when the Formtracer is turned off.



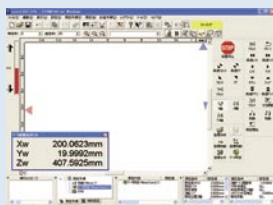
FORMPAK-1000
Contour Analysis Screen



SURFPAK-SV
Surface Roughness
Measurement and
Result Display Screen

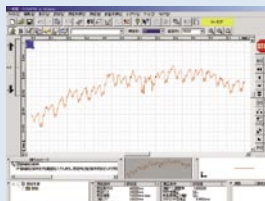
FORMTRACEPAK

Enables control of the optional motor-driven Y-axis table and rotary table for realizing efficient measurement automation. You can also perform contour evaluation that allows free analysis of level differences, angle, pitch, area and other characteristics based on surface roughness data. In addition, you can create an original inspection certificate by setting the print format to suit your particular requirements.



Contour Measurement
Screen

Surface Roughness
Measurement Screen



Refer to the Formtracer SV-C3100 / 4100 Series leaflet (E4304) for more details.

SPECIFICATIONS

Model No.	SV-C3100S4	SV-C3100S4	SV-C3100H4	SV-C3100H4	SV-C3100W4	SV-C3100W4
Order No. (mm)	525-421-1*	525-421-2*	525-422-1*	525-422-2*	525-423-1*	525-423-2*
Order No. (inch)	525-431-1*	525-431-2*	525-432-1*	525-432-2*	525-433-1*	525-433-2*

Model No.	SV-C4100S4	SV-C4100S4	SV-C4100H4	SV-C4100H4	SV-C4100W4	SV-C4100W4
Order No. (mm)	525-461-1*	525-461-2*	525-462-1*	525-462-2*	525-463-1*	525-463-2*
Order No. (inch)	525-471-1*	525-471-2*	525-472-1*	525-472-2*	525-473-1*	525-473-2*
X1-axis measuring range	100mm	100mm	100mm	100mm	100mm	100mm
Measuring force of detector	0.75mN	4mN	0.75mN	4mN	0.75mN	4mN
Vertical travel	300mm power column		500mm power column		500mm power column	
Granite base size (WxD)	610 x 450mm		610 x 450mm		1000 x 450mm	
Dimensions (main unit, WxDxH)	996 x 575 x 966mm		996 x 575 x 1176mm		1396 x 575 x 1176mm	
Mass (main unit)	140kg		150kg		220kg	

Model No.	SV-C3100S8	SV-C3100S8	SV-C3100H8	SV-C3100H8	SV-C3100W8	SV-C3100W8
Order No. (mm)	525-426-1*	525-426-2*	525-427-1*	525-427-2*	525-428-1*	525-428-2*
Order No. (inch)	525-436-1*	525-436-2*	525-437-1*	525-437-2*	525-438-1*	525-438-2*

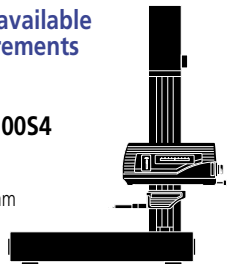
Model No.	SV-C3100S8	SV-C3100S8	SV-C3100H8	SV-C3100H8	SV-C3100W8	SV-C3100W8
Order No. (mm)	525-466-1*	525-466-2*	525-467-1*	525-467-2*	525-468-1*	525-468-2*
Order No. (inch)	525-476-1*	525-476-2*	525-477-1*	525-477-2*	525-478-1*	525-478-2*
X1-axis measuring range	200mm	200mm	200mm	200mm	200mm	200mm
Measuring force of detector	0.75mN	4mN	0.75mN	4mN	0.75mN	4mN
Vertical travel	300mm power column		500mm power column		500mm power column	
Granite base size (WxD)	610 x 450mm		610 x 450mm		1000 x 450mm	
Dimensions (main unit, WxDxH)	1005 x 575 x 966mm		1005 x 575 x 1176mm		1408 x 575 x 1176mm	
Mass (main unit)	140kg		150kg		220kg	

* To denote your AC line voltage add the following suffixes to the order No. (e.g. **525-426-1A**):
A for UL/CSA, **D** for CEE, **E** for BS, **DC** for China, **K** for EK, **No suffix** is required for JIS/100V

A variety of models available for measuring requirements

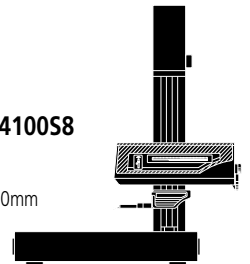
SV-C3100S4 / SV-C4100S4

Traverse range: 100mm
Vertical travel: 300mm
Base size (W x D): 600 x 450mm
Base material: Granite



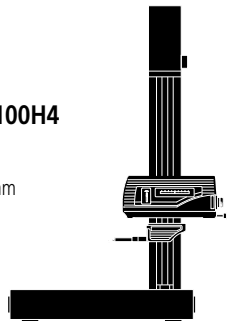
SV-C3100S8 / SV-C4100S8

Traverse range: 200mm
Vertical travel: 300mm
Base size (W x D): 600 x 450mm
Base material: Granite



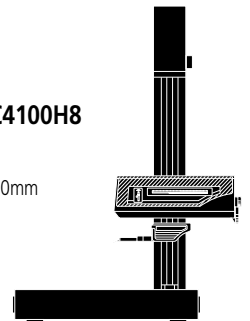
SV-C3100H4 / SV-C4100H4

Traverse range: 100mm
Vertical travel: 500mm
Base size (W x D): 600 x 450mm
Base material: Granite



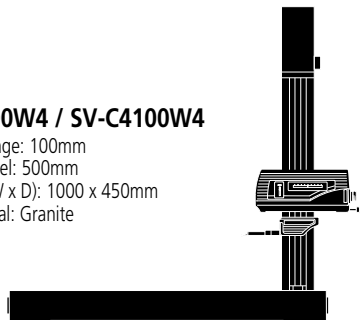
SV-C3100H8 / SV-C4100H8

Traverse range: 200mm
Vertical travel: 500mm
Base size (W x D): 600 x 450mm
Base material: Granite



SV-C3100W4 / SV-C4100W4

Traverse range: 100mm
Vertical travel: 500mm
Base size (W x D): 1000 x 450mm
Base material: Granite



SV-C3100W8 / SV-C4100W8

Traverse range: 200mm
Vertical travel: 500mm
Base size (W x D): 1000 x 450mm
Base material: Granite

