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TECHNOLOGY GROUP

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Find the *Mitutoyo SV-2000S2* at our website: *Click HERE*

Surface-, Form- and Contour Measurement

Surftest SV-2000/3000



Bulletin No. 1713

Surface Roughness Measuring System
Powerful and easy to use

Mitutoyo

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Surface Roughness Testing System

Surftest SV-2000/3000

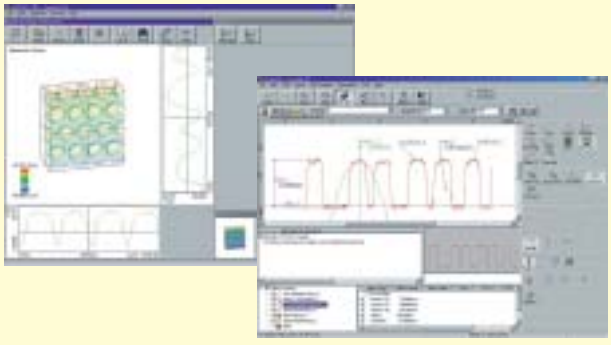
- **Mitutoyo's Surftest SV-2000/3000 Series provides high accuracy, high-level analysis and multi-functionality in 3D surface roughness analysis and finely detailed contour measurements, as well as conventional 2D surface roughness measurements.**
- **Optional accessories, such as the auto-leveling table and three-axis adjustment table, are available to enhance operability and to enable automatic measurement.**
- **SURFPAK®, a dedicated data-analysis software package, is installed as standard equipment. This gives data management a consistent format from the work site to the laboratory.**
- **TCON, the easy-to-use Touch-Panel Controller, makes high-level analysis affordable.**





Easy-to-use Surface Roughness and Contour Evaluation Software!

- Various data analyzing programs are available to satisfy a wide range of measuring needs: SURFPAK®-SV evaluates workpiece surface roughness two-dimensionally, while SURFPAK®-PRO does the same in three dimensions. FORMPAK®-SV evaluates surface contours.
- An ample selection of internationally recognized surface roughness parameters is provided.
- From a simple measurement to high-level data analysis, operations can be performed easily and speedily just by pointing and clicking.

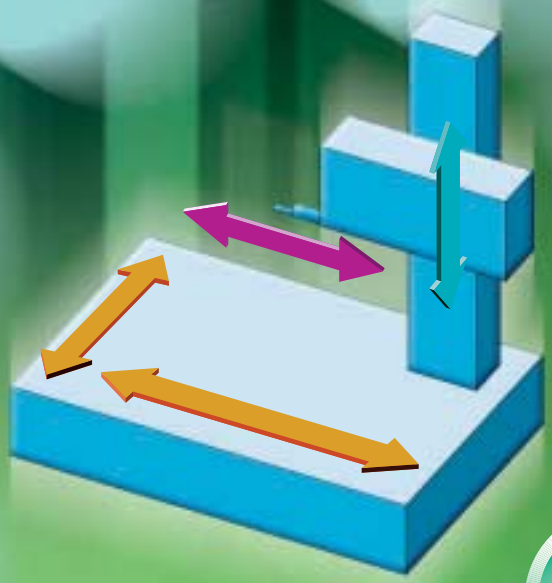




Convenient Report-Generation Function

- Surface roughness evaluation results can be output to a printer as an Evaluation Report.

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SV-3000M4
Traverse range: 100mm (4")
Vertical travel: 300mm (11.8")
Base size (WxD): 610x450mm (24"x17.7")

SV-2000S2
Traverse range: 50mm (2")
Vertical travel: 300mm (11.8")
Base size (WxD): 610x450mm (24"x17.7")

SV-2000N2
Traverse range: 50mm (2")
Vertical travel: —
Base size (WxD): —

SV-3000S4
Traverse range: 100mm (4")
Vertical travel: 300mm (11.8")
Base size (WxD): 610x450mm (24"x17.7")

SV-3000W8
Traverse range: 200mm (8")
Vertical travel: 500mm (19.7")
Base size (WxD): 1010x450mm (40"x17.7")

SV-3000H4
Traverse range: 100mm (4")
Vertical travel: 500mm (19.7")
Base size (WxD): 610x450mm (24"x17.7")

SV-3000H8
Traverse range: 200mm (8")
Vertical travel: 500mm (19.7")
Base size (WxD): 610x450mm (24"x17.7")

SV-3000W4
Traverse range: 100mm (4")
Vertical travel: 500mm (19.7")
Base size (WxD): 1010x450mm (40"x17.7")

SV-3000S8
Traverse range: 200mm (8")
Vertical travel: 300mm (11.8")
Base size (WxD): 610x450mm (24"x17.7")

Choose from a Variety of Models!

Select the model that best fits your needs — different base size, portable type, etc. Mitutoyo offers a full line of SV-2000/3000 Series surface measuring machines to choose from in accordance with the size of workpiece and evaluation method. Various optional accessories are also available.

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2D



Non-contact sensor unit can be attached to SV-3000 series (except SV-3000M4)
Order No. **178-067**
178-067C
178-067A
178-067D

Photo: ***SV-300S4*** with personal computer system



SV-3000S4
SV-3000H4
SV-3000W4



Photo: ***SV-2000N2*** with TCON

SV-2000N2

High Accuracy Mechanical Design

- Ceramic, well known for its superb anti-abrasive properties, is used as the X-axis drive unit guide. No lubrication of the guide is required.
- High-accuracy glass scales (X-axis resolution: 0.05μm, Y-axis resolution: 1μm) are built-in to the X- and Y-axes to insure high-accuracy positioning. The SV-3000 series demonstrate high-reliability, especially in the horizontal roughness parameters (S, Sm), that require highly accurate X-axis movement.
- Equipped with high-accuracy detector stylus.
- Equipped with several advanced functions: such as the 'straightness compensation' function, which improves the linear accuracy of the X-axis; the 'circular compensation' function for the vertical movement of the stylus; and the 'stylus-tip diameter compensation' function.
- The stylus and the skid can be replaced easily. Optional styli and skids are available for a wide variety of roughness measurement applications, such as measurement of small holes, deep holes, etc.
- An easy-to-operate Control Box is provided for the SV-2000S2, SV-3000S4/H4/W4/S8/H8/W8. The Control Box, independently of the main unit, allows positioning, measurement start/stop, retracting, and other operations to be performed remotely. The Drive Unit up/down position and the X-axis traverse can be fine-controlled manually.

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Photo: **SV-3000M4** with personal computer system

SV-3000M4



Photo: **SV-2000S2** with TCON

SV-2000S2

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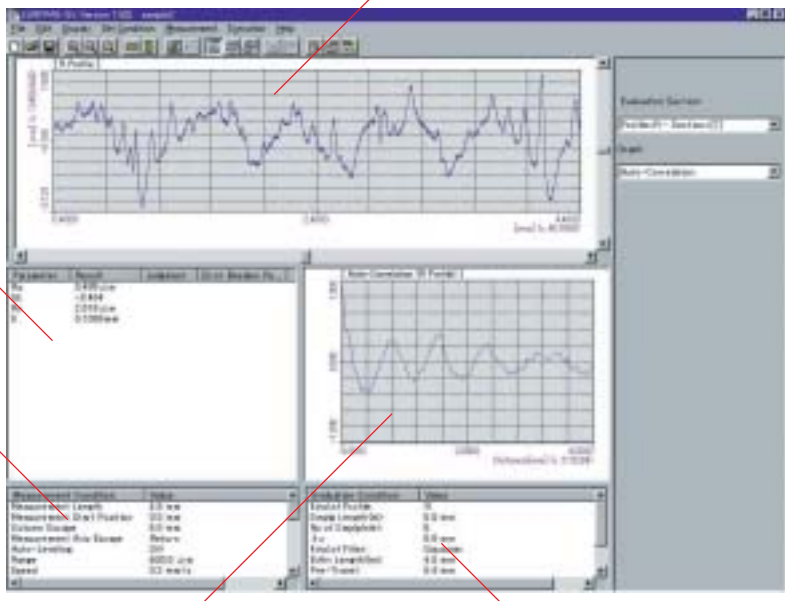


Surface roughness-analyzing program

SURFPAK®-SV

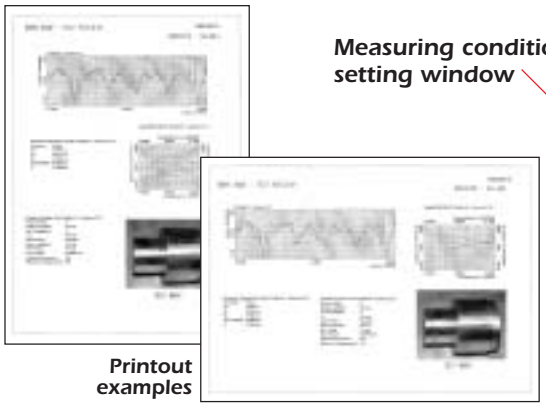
- **Enhanced with various control functions to support automatic measurement.**
- **Equipped with a variety of evaluation parameters conforming to most of the world standards and analysis functions.**
- **Allows the operator to perform a complicated measurement easily and speedily just by pointing and clicking.**

Assessed profile window:
The size of the assessed profile display can be freely changed.



Measurement result window:
Provides a great variety of parameters conforming to most of the international standards.

Measuring condition setting window



Printout examples

Analysis graph window:
Various analysis graphs can be created.

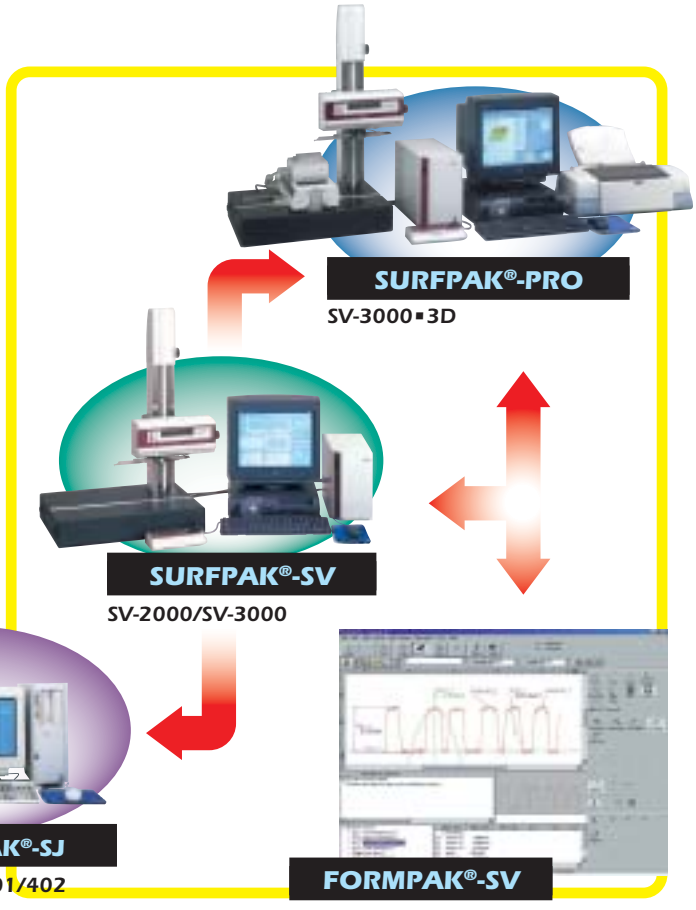
Evaluation conditions window:
For various recalculations of the measured data.

Report Generation Function

- The assessed profiles, calculation results, measuring conditions and comments can be freely formatted and printed out as reports.
- Cut and paste can be used not only on measurement data but also on image files (bit-map) to create unique reports with photos and company logos.
- Create one layout and use it repeatedly for other measurements.
- Reports can be printed on large-size paper or in color using the optional color printer.

SURFPAK® Series

- All the SURFPAK® Series surface roughness-analyzing programs have high operability and can exchange data with each other. SURFPAK®-SJ is the software for the portable model, SURFPAK®-SV is for use in the inspection room and SURFPAK®-PRO is designed for three-dimensional surface measuring machines. (Control method for the machine differs, depending on the model.)
- SURFPAK® Series software makes it easier to manage data from the manufacturing site to the laboratory because the same format can be used in surface roughness measurement as for storing and analyzing the measured data.
- Optionally, the FORMPAK®-SV program is available to evaluate surface contour.
- OS requirements:
Windows®95/Windows®98/Windows®NT4.0

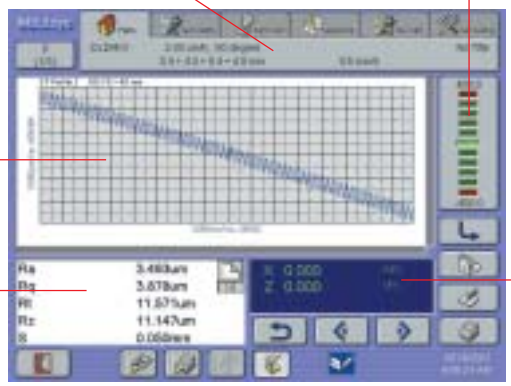


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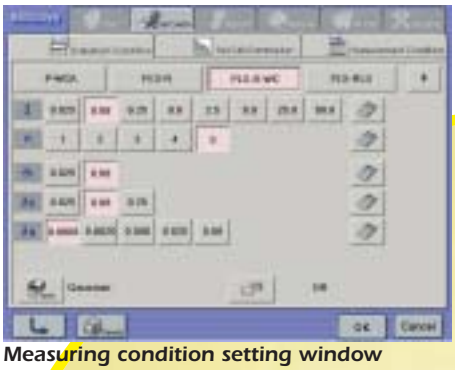


Touch-Panel Controller
TCON

- **Easy & speedy operation with touch-panel control**
- **12-inch color LCD**
- **Large sized and easy-to-understand icons allow high-level analysis as well as SURFPAK-SV functionality.**



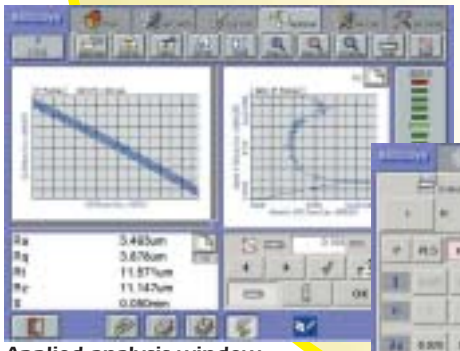
Main window


Measuring condition setting window


Configuration setting window


Calibration and control window




Applied analysis window


Recalculation window


Printout

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3D

Three-dimensional Surface Data Analysis



Non-contact sensor unit can be attached to SV-3000▪3D
Order No. **178-067**
178-067C
178-067A
178-067D



Note: The personal computer system and printer are optional.

SV-3000▪3D

- A multi-functional system provided with SURFPAK®-PRO, the software that measures, analyzes, and evaluates the roughness of workpiece surfaces three-dimensionally.
- From various graphics and three-dimensional surface roughness parameter analyses to volume and area measurements, a variety of surface contour evaluations can be performed freely. Selected topographic profiles can also be evaluated two-dimensionally.
- The three-dimensional auto-leveling table greatly reduces the workpiece set-up time.

SURFPAK®-PRO 3-D Analysis Functions

Three-dimensional evaluation parameters	Sa, Sq, Ssk, Sku, SΔq, Sλ, Sz, So, Sr, Sp, Sv, St, S3y, Spc, Svc, Spd, Svd, etc.
Filter functions	Moving average filter, Gaussian filter
Three-dimensional trend compensation	Plane compensation, sphere compensation, cylinder compensation, polyhedron compensation
Three-dimensional analysis functions	3-D topography display, topographic profile analysis, BAC, ADC analysis, spectrum analysis, probability distribution analysis, local peak distribution analysis, parameter distribution analysis, slope enhancement
Topographic profile sampling function	A desired cross-section can be analyzed two-dimensionally.

3-D Auto-leveling Table (equipped as standard)



The 3-D auto-leveling table, which adjusts the level of the measured surface of the workpiece automatically, is a standard accessory. This relieves the operator from the time-consuming manual adjustment that a conventional machine would require, thus greatly improving work efficiency.

Y-axis range	100mm (4")
Y-axis traverse linearity	0.2μm/100mm (8μinch/4")
Traverse speed	5mm/s (.2"/s) max.
Resolution	0.001mm (.00004")
Feeding accuracy	±(2+2L/100)μm, L= Traversing length (mm)
Leveling range	±2° (for each direction)
Max. workpiece weight	10kg (22 lbs.)

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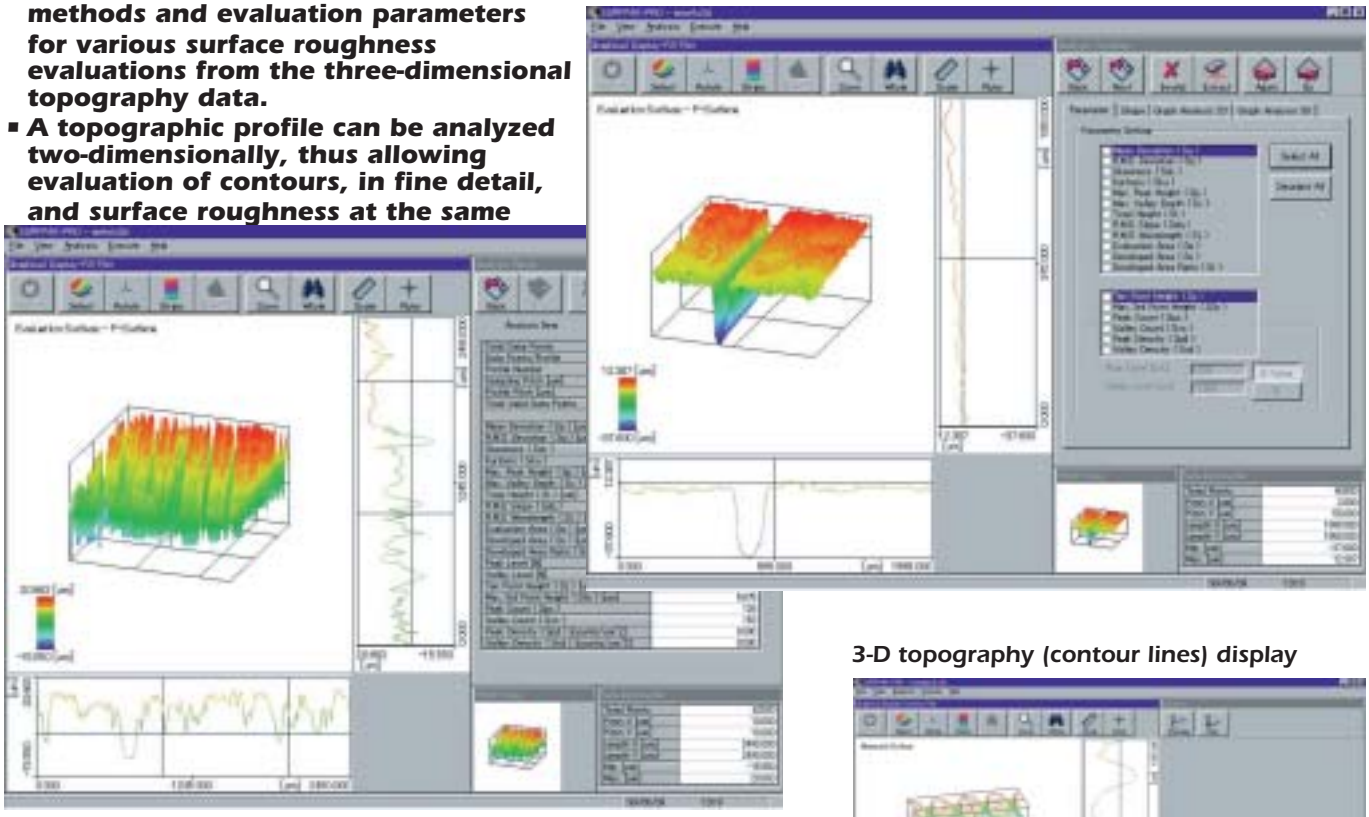


Surface roughness-analyzing program

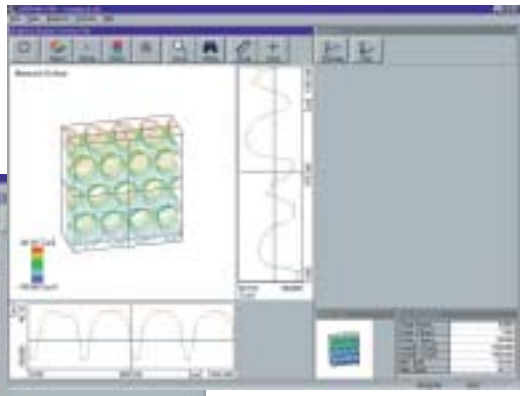
SURFPAK®-PRO

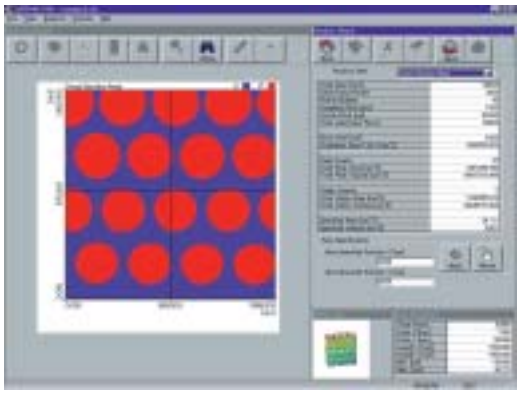
- **SURFPAK®-PRO provides a variety of graphics methods and evaluation parameters for various surface roughness evaluations from the three-dimensional topography data.**
- **A topographic profile can be analyzed two-dimensionally, thus allowing evaluation of contours, in fine detail, and surface roughness at the same**

Measurement result windows

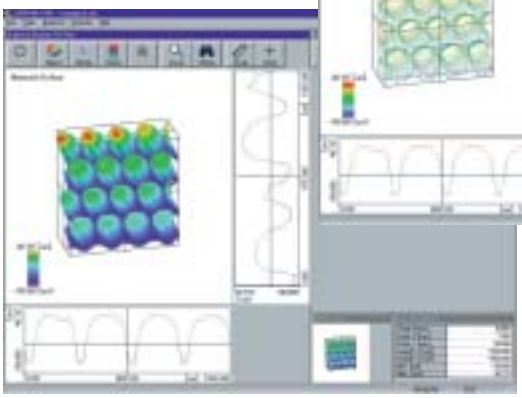


3-D topography (contour lines) display





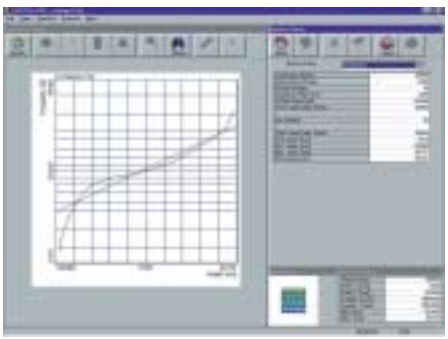
Cross-section analysis display



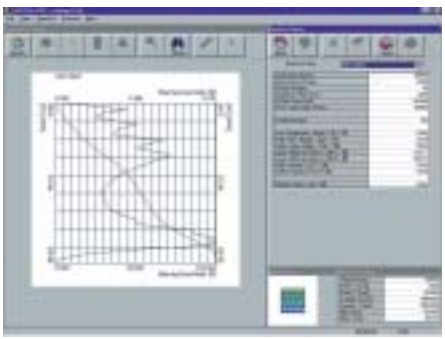
3-D topography display



Peak-height distribution chart



Probability distribution chart



BAC (Bearing area curve) &
ADC (Amplitude distribution chart)

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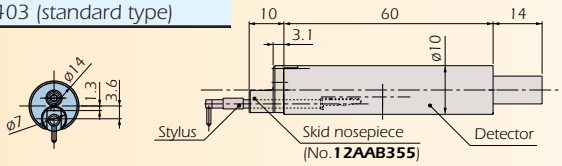
SURFTEST SV-2000/3000 Series
Measurement Applications


Using a small hole stylus


Using a deep groove stylus

Detector

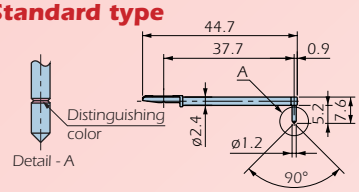
Order No.	Measuring force	Stylus
178-396-2	0.75mN	12AAC731(standard type)
178-397-2	4mN	12AAB403 (standard type)



Unit: mm

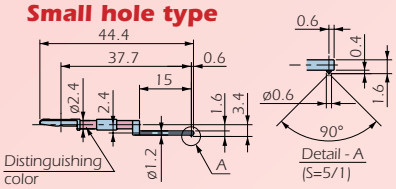
Stylus

Standard type



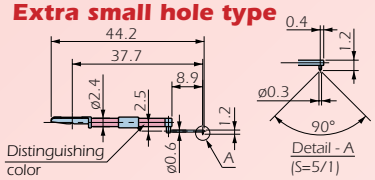
12AAC731 (2µm)*1
12AAB403 (5µm)
12AAB415 (10µm)
( ): Tip radius

Small hole type



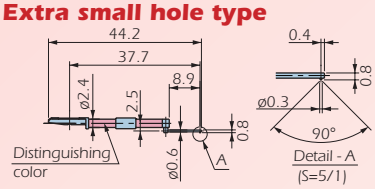
12AAC732 (2µm)*1
12AAB404 (5µm)
12AAB416 (10µm)
( ): Tip radius

Extra small hole type



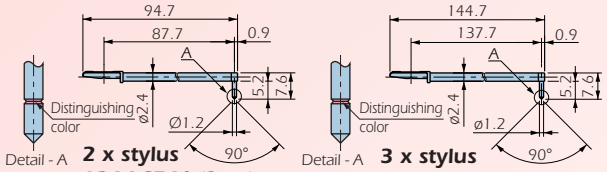
12AAC733 (2µm)*1
12AAB405 (5µm)
12AAB417 (10µm)
( ): Tip radius

Extra small hole type



12AAC734 (2µm)*1
12AAB406 (5µm)
12AAB418 (10µm)
( ): Tip radius

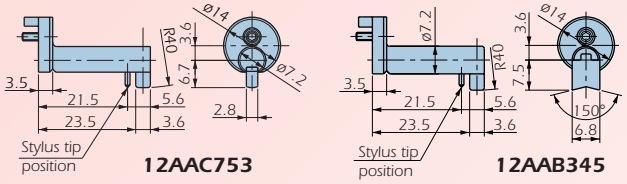
Deep hole type

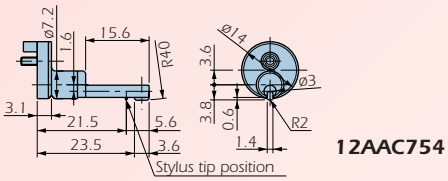


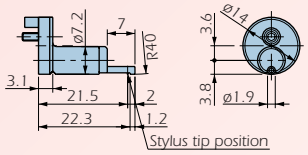
2 x stylus
12AAC740 (2µm)
12AAB413 (5µm)
12AAB425 (10µm)
( ): Tip radius

3 x stylus
12AAC741 (2µm)*1
12AAB414 (5µm)
12AAB426 (10µm)
( ): Tip radius

Applicable skid nosepiece







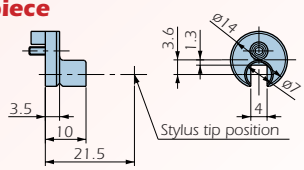
*1 Tip angle is 60°

Skidless nosepiece with stylus stopper

Used for measuring a workpiece having grooves the depth of which exceeds the measuring range of the detector. The stylus stopper prevents the stylus from falling into the grooves.



Skidless nosepiece

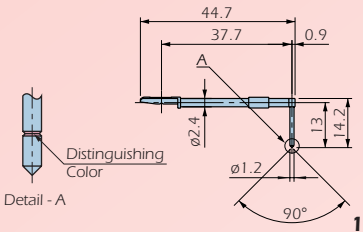


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Unit: mm

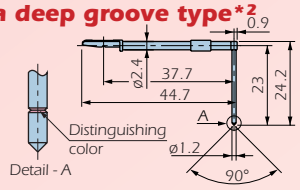
Stylus

Deep groove type*2



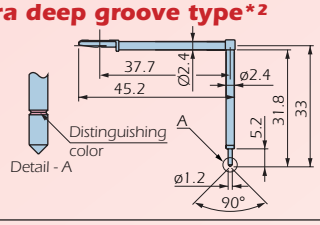
12AAC735 (2µm)*1
12AAB409 (5µm)
12AAB421 (10µm)
( ): Tip radius

Extra deep groove type*2



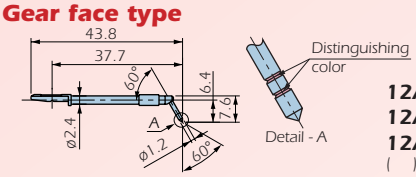
12AAC736 (2µm)*1
12AAB408 (5µm)
12AAB420 (10µm)
( ): Tip radius

Extra deep groove type*2



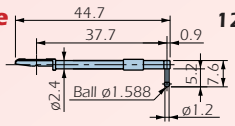
12AAC737 (2µm)*1
12AAB407 (5µm)
12AAB419 (10µm)
( ): Tip radius

Gear face type



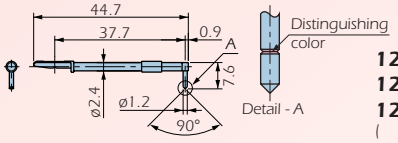
12AAB339 (2µm)*1
12AAB410 (5µm)
12AAB422 (10µm)
( ): Tip radius

WE-curve type



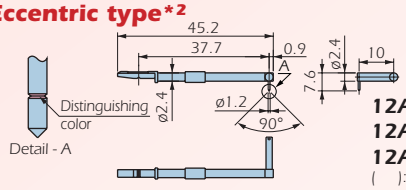
12AAB338 (0.8mm)

Knife edge type



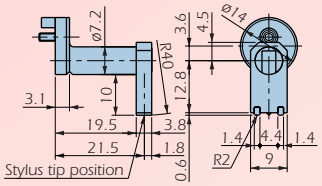
12AAC738 (2µm)*1
12AAB411 (5µm)
12AAB423 (10µm)
( ): Tip radius

Eccentric type*2

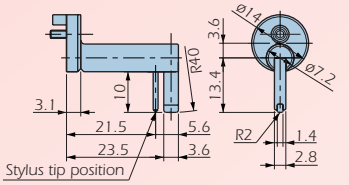


12AAC739 (2µm)*1
12AAB412 (5µm)
12AAB424 (10µm)
( ): Tip radius

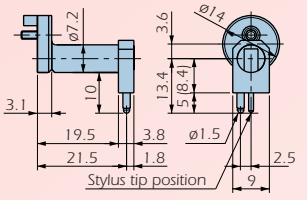
Applicable skid nosepiece



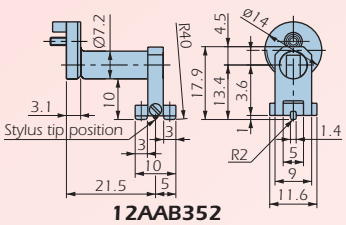
12AAB349



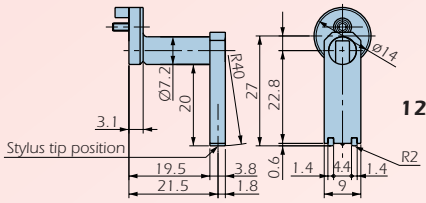
12AAC755



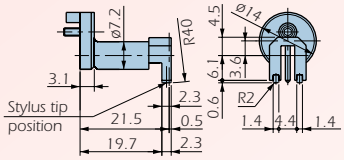
12AAB351



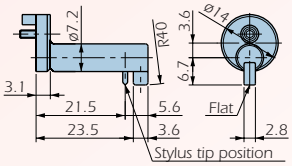
12AAB352



12AAB348



12AAB353



12AAC756

*1 Tip angle is 60° *2 The measuring force is not guaranteed when using this stylus.



Detector right angle adapter (SV-3000 series only)
- Useable with standard stylus, gear face stylus, WE-curve stylus

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OPTIONAL ACCESSORIES

Motor-driven accessories

Auto-leveling Table

- Leveling a workpiece for skidless measurement at high magnification requires skill and is time-consuming. Electrical correction for the inclination may involve errors depending on the method or the material of the workpiece, and on the radius of curvature of the stylus tip. The Auto-leveling Table solves these problems and allows exact workpiece leveling easily and quickly.



178-027



178-028

Order No.	178-027	178-028
Table top	130x100mm (5"x4")	280x250mm (11"x10")
Leveling range	±2°	
Max. table load	7kg (15.4 lbs.)	20kg (44 lbs.)
Dimensions (WxDxH)	135x105x57mm (5.31"x4.13"x2.24")	287x252x85mm (11.30"x9.92"x9.35")



Preliminary measurement



Measurement after auto-leveling

Traverse Table

- The Traverse Table is used for measuring workpieces whose dimensions exceed the traverse range of the Surftest Drive Unit. It moves the workpiece, and extends the tracing range up to 160mm (6.3").



178-044 (metric)
178-054 (inch/metric)

Order No.	178-044	178-054
Traverse range	160mm	6.3"
Table top	130x100mm	5"x4"
Leveling range	±1.5°	
Max. table load	10kg (22 lbs.)	
Linearity	0.5µm (19.6µin)	
Traverse speed	0.05mm/s, 0.5mm/s, 2mm/s (.002"/s, .02"/s, .08"/s) for measuring 0.5mm/s, 4mm/s (.02"/s, .16"/s) for positioning	
Dimensions (WxDxH)	535x185x117mm (21.16"x7.28"x4.61")	

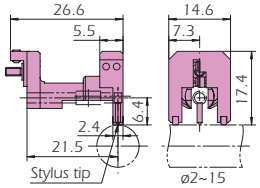
Rolling Unit

- The Rolling Unit is used for measuring cylindrical and spherical workpieces that the Surftest SV-2000/3000 Series cannot otherwise measure. It rotates the workpiece mounted on it to measure the surface using the Surftest. Special nosepieces are used for measurement.

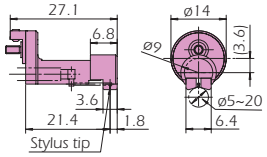


178-036

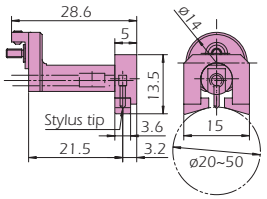
Nosepieces included



Cylinder (**12AAC871**)
Useable stylus: **12AAC731**
(not included) **12AAB403**
12AAB415



Sphere (**12AAC872**)
Useable stylus: **12AAB733**
(not included) **12AAB405**
12AAB417



Sphere (**12AAC873**)
Useable stylus: **12AAC731**
(not included) **12AAB403**
12AAB415

Order No. 178-036	
Nosepieces Cylinder(**12AAC871**)	Diameter: 2 to 50mm (.08" to 1.97") Width: 20 to 100mm (.79" to 3.94")
Sphere (**12AAC872**)	Diameter: 5 to 20mm (.20" to .79")
Sphere (**12AAC873**)	Diameter: 20 to 50mm (.79" to 1.97")
Max. workpiece load	2kg (4.4 lbs.)
Measuring speed	0.1, 0.5, 1mm/s (.004", .02", .04"/s)
Rolling speed	0.05mm/s to 2mm/s (.002"/s to .08"/s)
Cutoff value	λc, fl = 8mm (.3") or less
Dimensions (WxDxH)	160x52x53mm (6.3"x2.1"x2.1")

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Extension unit for SV-2000N2 and SV-3000M4

- The Extension Unit is required to connect up to two kinds of motor-driven options such as the Auto-leveling Table, Traverse Table or Rolling Unit with the Surftest SV-2000N2 and SV-3000M4.



998054□
□ Suffix: **A** for 120V, **D** for 220V, **E** for 240V or non for 100V

Add-on Unit for SV-2000N2/S2 and SV-3000M4

- The Add-on Unit is required to connect two or more kinds of motor-driven options, such as the Auto-leveling Table, Traverse Table or Rolling Unit with the Surftest SV-2000N2/S2 and SV-3000M4.

The Extension Unit (998054) is required for connecting to SV-2000N2/3000M4.



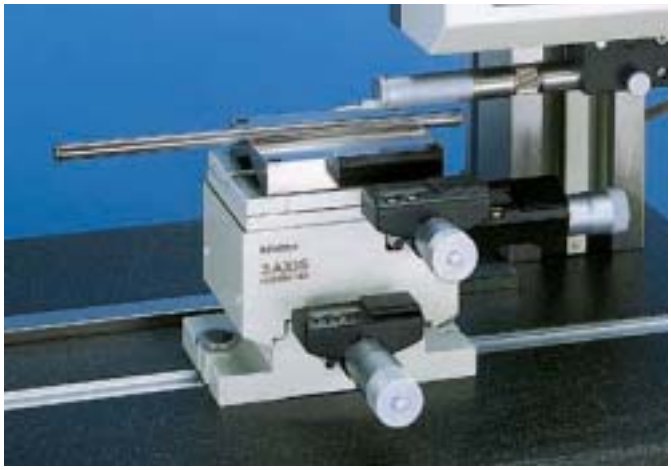
998055

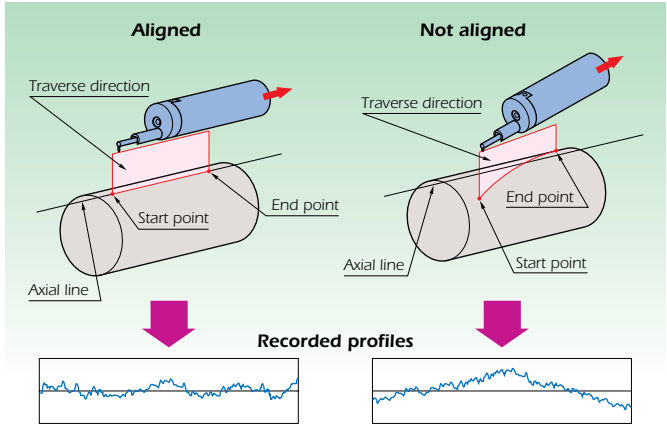
3-axis Adjustment Table

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.



178-047
3-axis Adjustment Table





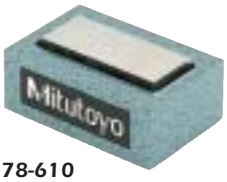
Order No.	178-047
Table top	130x100mm (5"x4")
Table loading	15kg (33 lbs.) maximum
Workpiece diameter	1mm to 160mm (.04" to 6.3")
Leveling range	±1.5°
Swivel range	±2°
Y-axis adjustment	±12.5mm (±.5")
Height	152.5mm (6")
Mass	9kg (19.8 lbs.)
Remarks	V-block (**998291**) is provided.

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OPTIONAL ACCESSORIES

Step gage

Metric 4-step gage
- Step: 1µm, 2µm, 5µm, 10µm



178-610

Step gage
- Steps: 2µm (79µinch), 10µm (394µinch)



178-611 (mm)
178-612 (inch/mm)
for SV-2000N2/52000S2/3000M4

Vise

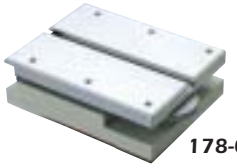
Precision vise
- Max. workpiece size: 36mm (1.42")
- Can be mounted on a leveling table.



178-019

Leveling tables

Leveling table
- Table top: 130x100mm (5"x4")
- Leveling range: ±1.5°
- Height: 40mm (1.57")



178-016

Workbenches

Adjustable workbench
- Dimensions (WxDxH): 1000x500x660mm (40"x20"x26")



218-007

Auxiliary desk
- Dimensions (WxDxH): 400x500x660mm (16"x20"x26")



218-008

Adjustable workbench
- Dimensions (WxDxH): 1200x750x670mm (48"x30"x27")



166-215

Auxiliary desk
- Dimensions (WxDxH): 550x500x700mm (22"x20"x28")



218-010

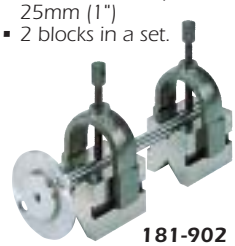
V-block

V-block
- Workpiece diameter: 1mm to 160mm (.04" to 6.3")
- Can be mounted on a leveling table.



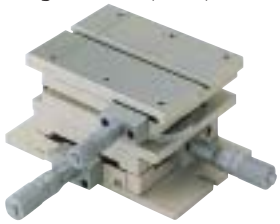
998291

V-block with clamp
- Maximum workpiece diameter: 25mm (1")
- 2 blocks in a set.



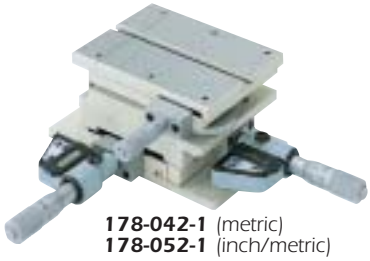
181-902 (metric)
181-901 (inch)

XY leveling table with swivel
- Table top: 130x100mm (5"x4")
- Leveling range: ±1.5°
- XY travel: ±12.5mm (.5")
- Height: 83mm (3.27")



178-043-1 (metric)
178-053-1 (inch)

Digimatic XY leveling table with swivel
- Table top: 130x100mm (5"x4")
- Leveling range: ±1.5°
- XY travel: ±12.5mm (.5")
- Height: 83mm (3.27")



178-042-1 (metric)
178-052-1 (inch/metric)

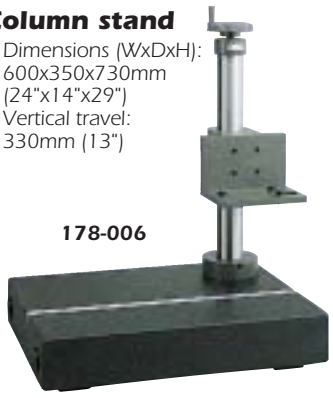
Accessories for SV-2000N2

Cylinder attachment
- Diameter: 50 to 625mm (2" to 25")



997843

Column stand
- Dimensions (WxDxH): 600x350x730mm (24"x14"x29")
- Vertical travel: 330mm (13")



178-006

Column stand
- Dimensions (WxDxH): 370x200x540mm (15"x8"x21")
- Vertical travel: 200mm (7.8")



178-008

Vibration isolator
- Dimensions (WxDxH): 750x550x59mm (40"x20"x2.3")
- Stand is optional (**178-024**).



178-023

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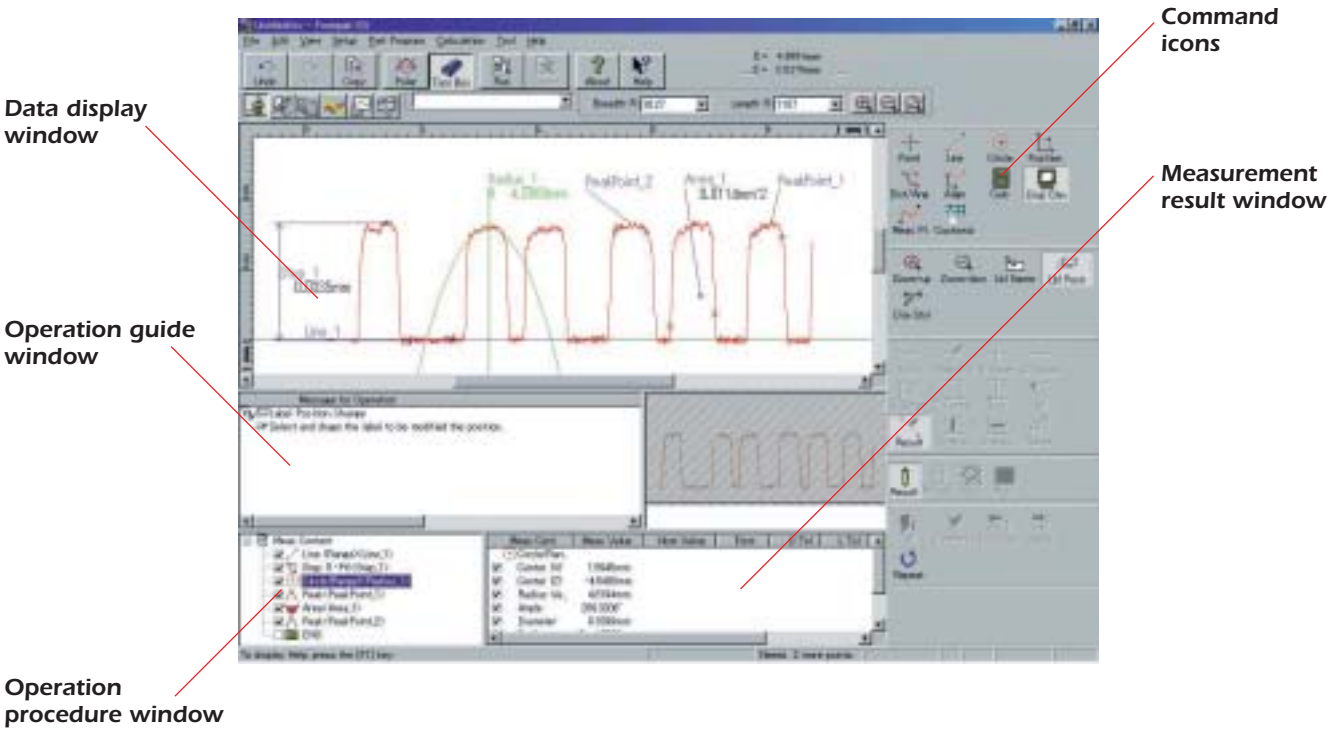


Optional software

Fine contour analyzing software

FORMPAK®-SV

- **Evaluates contours on the workpiece surface that cannot be measured by surface roughness parameters.**
- **Performs various analyses/evaluations including contour evaluation of step, pitch and area calculations.**



Various Contour Evaluation Commands

- By combining contour elements such as point, line, circle, and coordinates, various evaluations can be performed, including the length measurement of step and pitch, the area calculation, etc.

Data Processing Function

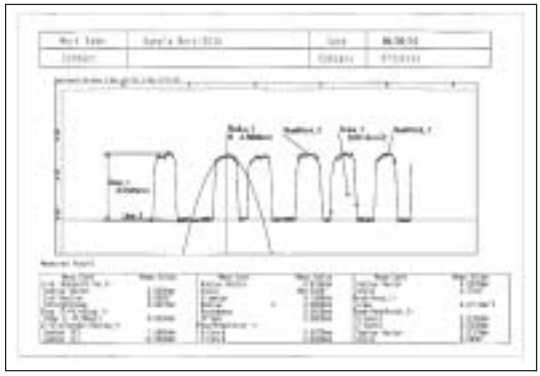
- Allows assessed profile filtration, deletion of data, data cut-off, and combination of data from multiple measurements.

Data Compensation Function

- Circular error compensation function: Compensates circular movement error of the stylus to reduce distortion, thus obtaining the most accurate contour data possible.
- Stylus-tip diameter compensation: Offsets the measured data for the stylus-tip diameter.

Report Generation Function

- Just like the SURFPAK® Series software, FORMPAK®-SV allows measurement results to be freely laid out and printed out as report. This program also supports the optional color printer.



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Surftest SV-2000/3000 Series data analysis capabilities

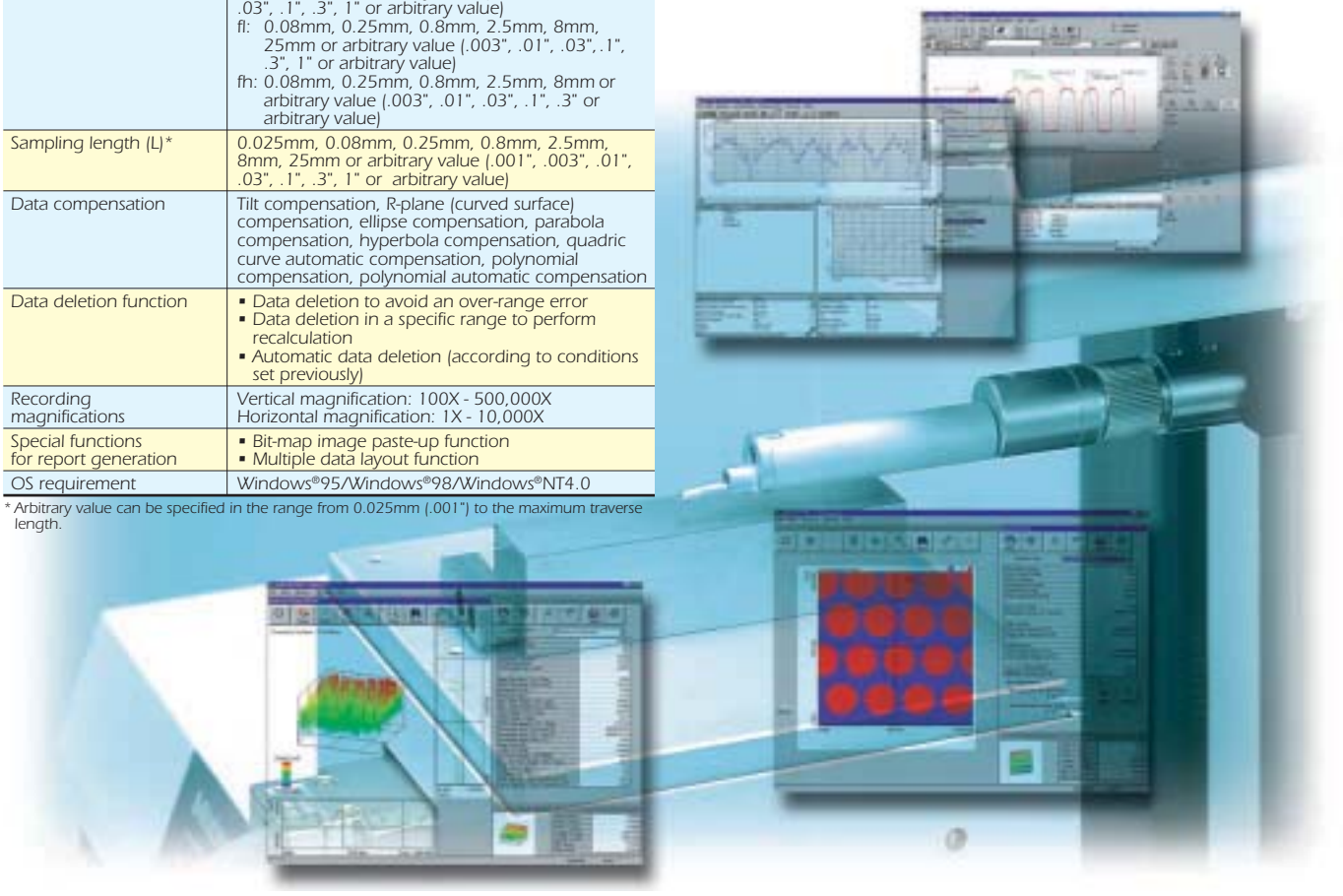
SURFPAK®-SV

International standards supported		ISO 4287: 1997, ANSI/ASME B46.1-1995, to be JIS B0601 1994
Assessed profiles		P (primary profile), R (roughness profile), WC, WCA, WE, WEA, DIN4776 profile, E (envelope residual profile), R-motif (roughness motif), W-motif (waviness motif)
Evaluation parameters	P, R, WC, WCA, WE, WEA, DIN 4776, E	Ra, Rq, Rz, Rz (JIS), Ry, Ry (DIN), Rc, Rp, Rpmax, Rpi, Rv, Rvmax, Rvi, Rt, Rti, R3z, R3zi, R3y, S, Pc (Ppi), Sm, HSC, mr, δc, plateau ratio, mrd, Rk, Rpk, Rvk, Mr1, Mr2, Δa, Δq, λa, λq, Sk, Ku, Lo, Lr, A1, A2
	R-motif	Rx, R, AR, SR, SAR, NR, NCRX, CPM
	W-motif	Wte, Wx, W, AW, SW, SAW, NW
Analysis graphs		ADC, BAC1, BAC2, power spectrum chart, auto-correlation chart, Walsh power spectrum chart, Walsh auto-correlation chart, slope distribution chart, local peak distribution chart, parameter distribution chart
Digital filter		2CR-75%, 2CR-50%, 2CR-75% (phase corrected), 2CR-50% (phase corrected), Gaussian-50% (phase corrected)
Cutoff length*		λc: 0.025mm, 0.08mm, 0.25mm, 0.8mm, 2.5mm, 8mm, 25mm or arbitrary value (.001", .003", .01", .03", .1", .3", 1" or arbitrary value) fl: 0.08mm, 0.25mm, 0.8mm, 2.5mm, 8mm, 25mm or arbitrary value (.003", .01", .03",.1", .3", 1" or arbitrary value) fh: 0.08mm, 0.25mm, 0.8mm, 2.5mm, 8mm or arbitrary value (.003", .01", .03", .1", .3" or arbitrary value)
Sampling length (L)*		0.025mm, 0.08mm, 0.25mm, 0.8mm, 2.5mm, 8mm, 25mm or arbitrary value (.001", .003", .01", .03", .1", .3", 1" or arbitrary value)
Data compensation		Tilt compensation, R-plane (curved surface) compensation, ellipse compensation, parabola compensation, hyperbola compensation, quadric curve automatic compensation, polynomial compensation, polynomial automatic compensation
Data deletion function		▪ Data deletion to avoid an over-range error ▪ Data deletion in a specific range to perform recalculation ▪ Automatic data deletion (according to conditions set previously)
Recording magnifications		Vertical magnification: 100X - 500,000X Horizontal magnification: 1X - 10,000X
Special functions for report generation		▪ Bit-map image paste-up function ▪ Multiple data layout function
OS requirement		Windows®95/Windows®98/Windows®NT4.0

* Arbitrary value can be specified in the range from 0.025mm (.001") to the maximum traverse length.

SURFPAK®-PRO (3-D Data Analysis Program for SV-3000▪3D)

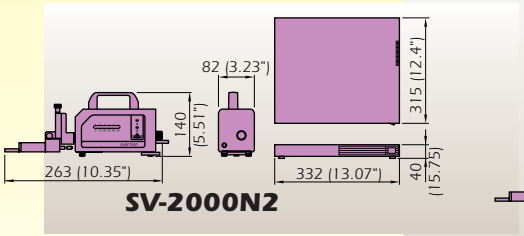
Three-dimensional evaluation parameters	Sa, Sq, Ssk, Sku, SΔq, Sλ, Sz, So, Sr, Sp, Sv, St, S3y, Spc, Svc, Spd, Svd, etc.
Three-dimensional filter function	Moving average filter, Gaussian filter
Three-dimensional trend compensation functions	Plane compensation, sphere compensation, cylinder compensation, polyhedron compensation
Three-dimensional analysis functions	3-D topography display, topographic profile analysis, BAC, ADC, power spectrum chart, probability distribution chart, local peak distribution chart, parameter distribution chart, slope enhancement
Topographic profile sampling function	A desired cross-section which is included in a three-dimensional topography data can be analyzed two-dimensionally.
Two-dimensional data analysis capabilities	Include the same evaluation parameters, analysis graphs, and functions as SURFPAK®-SV



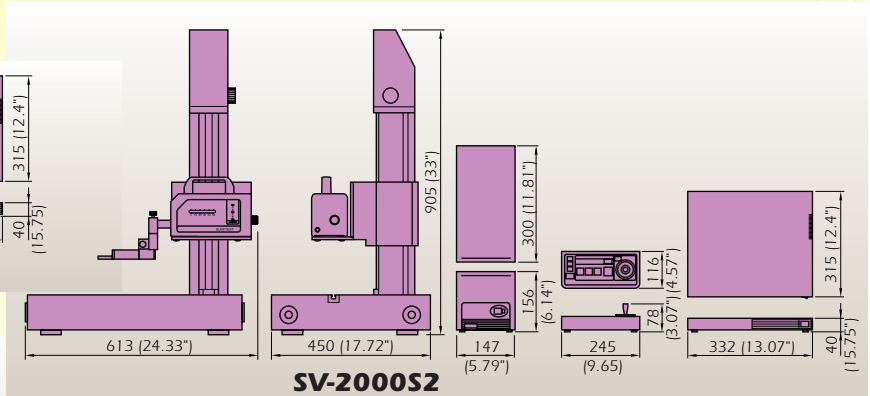
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Dimensions

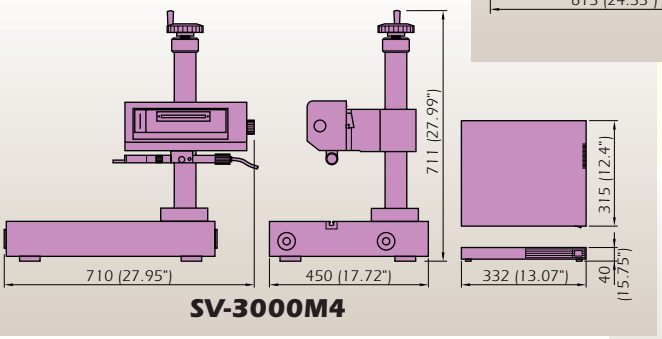
Unit: mm (inch)



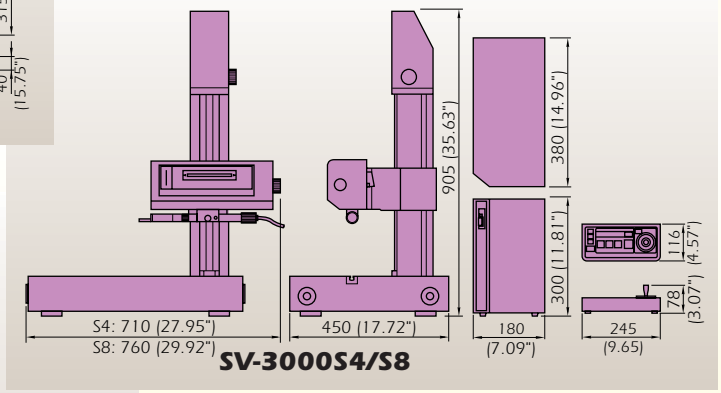
SV-2000N2



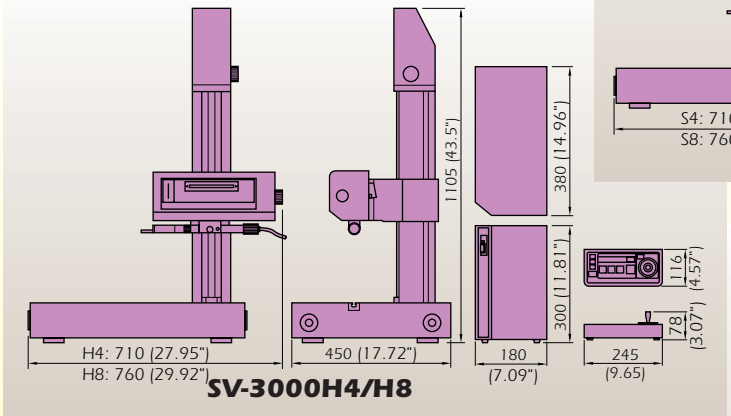
SV-2000S2



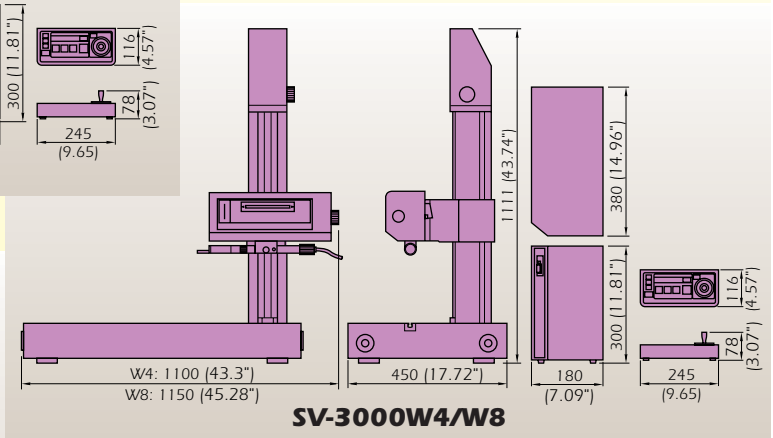
SV-3000M4



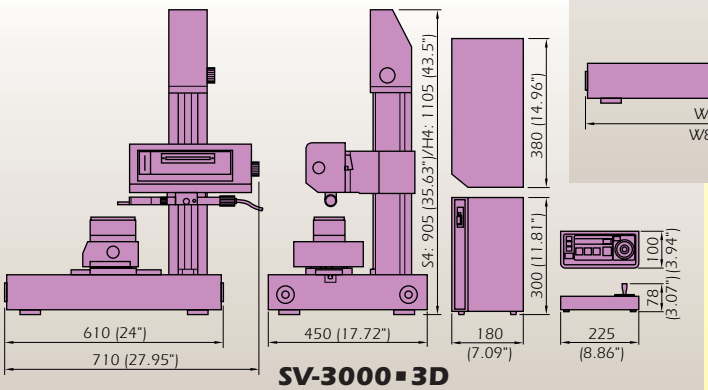
SV-3000S4/S8



SV-3000H4/H8



SV-3000W4/W8



SV-3000▪3D

Note: An adjustable connector (**998047**) is required when using the Drive Unit separated from the power column.

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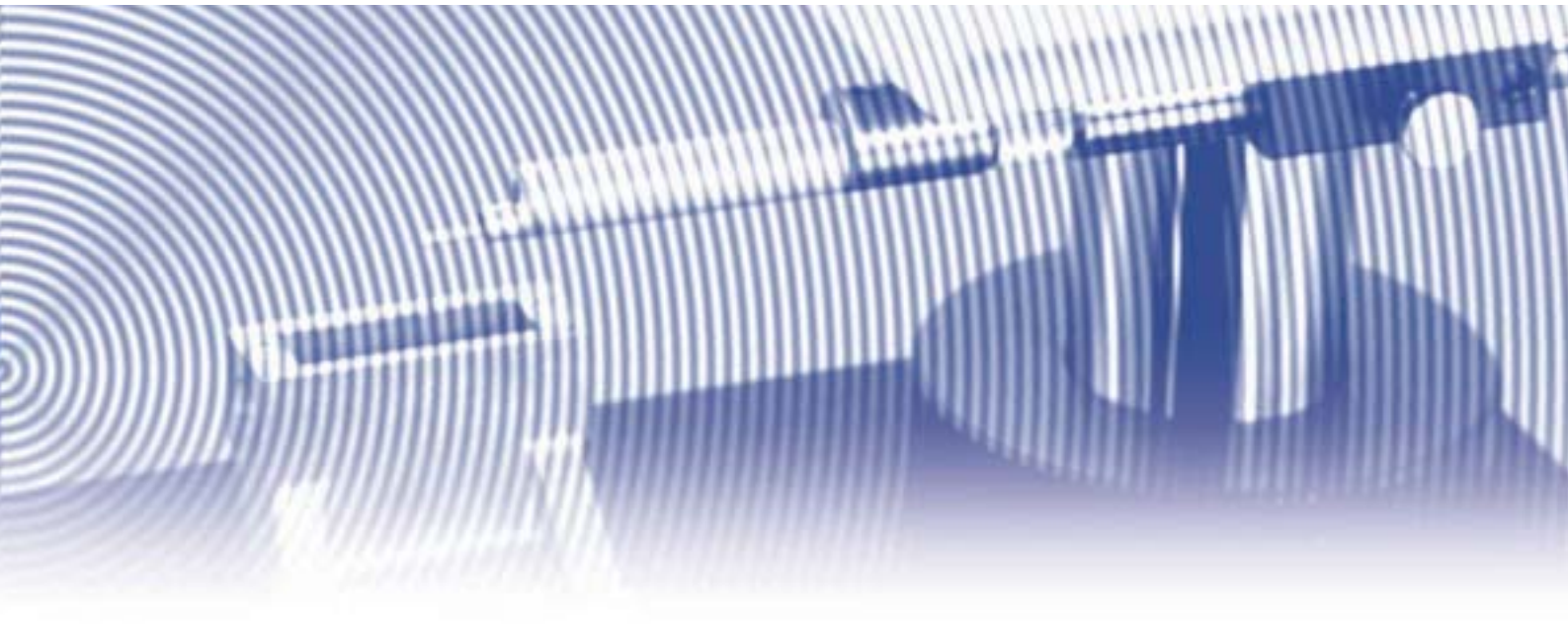
Surface Roughness Testing System
Surftest SV-2000/3000

Specifications

Model No.		SV-2000N2		SV-2000S2		SV-3000M4		SV-3000S4		SV-3000H4	
Type		mm	inch/mm	mm	inch/mm	mm	inch/mm	mm	inch/mm	mm	inch/mm
Order No. (Each order number suffix denotes the AC power cable type equipped.) Measuring force of detector: **0.75mN**	100V AC	**178-660**	—	**178-661**	—	**178-662**	—	**178-663**	**178-673**	**178-664**	**178-674**
	110V AC	**178-660C**	—	**178-661C**	—	**178-662C**	—	**178-663C**	—	**178-664C**	—
	120V AC	**178-660A**	**178-670A**	**178-661A**	**178-671A**	**178-662A**	**178-672A**	**178-663A**	**178-673A**	**178-664A**	**178-674A**
	220V AC	**178-660D**	**178-670D**	**178-661D**	**178-671D**	**178-662D**	**178-672D**	**178-663D**	**178-673D**	**178-664D**	**178-674D**
	240V AC	**178-660E**	**178-670E**	**178-661E**	**178-671E**	**178-662E**	**178-672E**	**178-663E**	**178-673E**	**178-664E**	**178-674E**
Order No. (Each order number suffix denotes the AC power cable type equipped.) Measuring force of detector: **4mN**	100V AC	**178-640**	—	**178-641**	—	**178-642**	—	**178-643**	**178-653**	**178-644**	**178-654**
	110V AC	**178-640C**	—	**178-641C**	—	**178-642C**	—	**178-643C**	—	**178-644C**	—
	120V AC	**178-640A**	**178-650A**	**178-641A**	**178-651A**	**178-642A**	**178-652A**	**178-643A**	**178-653A**	**178-644A**	**178-654A**
	220V AC	**178-640D**	**178-650D**	**178-641D**	**178-651D**	**178-642D**	**178-652D**	**178-643D**	**178-653D**	**178-644D**	**178-654D**
	240V AC	**178-640E**	**178-650E**	**178-641E**	**178-651E**	**178-642E**	**178-652E**	**178-643E**	**178-653E**	**178-644E**	**178-654E**
Traverse range		50mm (2")				100mm (4")					
Linearity of traverse		0.3µm/50mm (12µinch/2")				0.3µm/100mm (12µinch/4")		0.05+1.5L/1000µm [(2+1.5L)µinch] L=Measuring length			
Vertical travel		—		300mm (11.8") Power column (or manual)		300mm (11.8") Manual column		300mm (11.8") Power column		500mm (19.7") Power column	
Base	Size (WxD)	—		610x450mm (24"x17.7")		610x450mm (24"x17.7")		610x450mm (24"x17.7")			
Stylus speed	Measuring	0.1mm/s (.004"/s), 0.2mm/s (.008"/s), 0.5mm/s(.02"/s), 1mm/s (.04"/s), 2mm/s (.08"/s)		0.02mm/s (.0008"/s), 0.05mm/s (.002"/s), 0.1mm/s (.004"/s), 0.2mm/s (.008"/s), 0.5mm/s (.02"/s), 1mm/s (.04"/s), 2mm/s (.08"/s)		0.05mm/s (.002"/s), 0.1mm/s (.004"/s), 0.2mm/s (.008"/s), 0.5mm/s (.02"/s), 1mm/s (.04"/s), 2mm/s (.08"/s)					
	Positioning	0.5mm/s (.02"/s), 2mm/s (.08"/s), Manual feed available		Can be adjusted with joystick 0.1mm/s to 5mm/s (.004"/s to .2"/s), Manual feed available		0.5mm/s (.02"/s), 2mm/s (.08"/s), Manual feed available					
Measuring range											
Standard detector (**178-396-2**) (**178-397-2**)	Detecting method										
	Stylus										
	Skid										
Data analysis software										**SURFPAK®-SV** (CD-ROM provided)	
Operating temperature											
Power supply											
Dimensions (WxDxH) of main unit		263x82x140mm (10.35"x3.2"x5.5")		618x450x905mm (24.33"x17.72"x33")		760x450x711mm (29.92"x17.72"x27.99")		710x450x905mm (27.95"x17.72"x36.63")		710x450x1105mm (27.95"x17.72"x43.5")	
Mass of main unit		2.8kg (6.16 lbs.)		130kg (286 lbs.)		140kg (308 lbs.)		140kg (308 lbs.)		150kg (330 lbs.)	
Standard accessories		Standard detector (**178-396-2** (Measuring force: 0.75mN), **178-397-2** (Measuring force: 4mN)), standard nosepiece (**12AAC753**), roughness specimen (**178-601** (mm) or **178-602** (inch/mm)), machine cover (**355130**)*, carrying bolts**, lubricant**, key wrenches, screwdriver, AC adapter, power cord, User's manual									

* Not included with SV-2000N2
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SV-3000W4		SV-3000S8		SV-3000H8		SV-3000W8		SV-3000S4▪3D		SV-3000H4▪3D	
mm	inch/mm	mm	inch/mm	mm	inch/mm	mm	inch/mm	mm	inch/mm	mm	inch/mm
178-665	**178-675**	**178-666**	**178-676**	**178-667**	**178-677**	**178-668**	**178-678**	**178-721**	**178-731**	**178-723**	**178-733**
178-665C	—	**178-666C**	—	**178-667C**	—	**178-668C**	—	**178-721C**	—	**178-723C**	—
178-665A	**178-675A**	**178-666A**	**178-676A**	**178-667A**	**178-677A**	**178-668A**	**178-678A**	**178-721A**	**178-731A**	**178-723A**	**178-733A**
178-665D	**178-675D**	**178-666D**	**178-676D**	**178-667D**	**178-677D**	**178-668D**	**178-678D**	**178-721D**	**178-731D**	**178-723D**	**178-733D**
178-665E	**178-675E**	**178-666E**	**178-676E**	**178-667E**	**178-677E**	**178-668E**	**178-678E**	**178-721E**	**178-731E**	**178-723E**	**178-733E**
178-645	**178-655**	**178-646**	**178-656**	**178-647**	**178-657**	**178-648**	**178-658**	**178-722**	**178-732**	**178-724**	**178-734**
178-645C	—	**178-646C**	—	**178-647C**	—	**178-648C**	—	**178-722C**	—	**178-724C**	—
178-645A	**178-655A**	**178-646A**	**178-656A**	**178-647A**	**178-657A**	**178-648A**	**178-658A**	**178-722A**	**178-732A**	**178-724A**	**178-734A**
178-645D	**178-655D**	**178-646D**	**178-656D**	**178-647D**	**178-657D**	**178-648D**	**178-658D**	**178-722D**	**178-732D**	**178-724D**	**178-734D**
178-645E	**178-655E**	**178-646E**	**178-656E**	**178-647E**	**178-657E**	**178-648E**	**178-658E**	**178-722E**	**178-732E**	**178-724E**	**178-734E**
200mm (8")								100mm (4")			
0.5µm/200mm (20µinch/8")								0.05+1.5L/1000µm [(2+1.5L)µinch] L=Measuring length			
300mm (11.8") Power column				500mm (19.7") Power column				125mm (4.9") Power column			
1010x450mm (39.8"x17.7")		610x450mm (24"x17.7")				1010x450mm (39.8"x17.7")		610x450mm (24"x17.7")			
0.02mm/s (.0008"/s), 0.05mm/s (.002"/s), 0.1mm/s (.004"/s), 0.2mm/s (.008"/s), 0.5mm/s (.02"/s), 1mm/s (.04"/s), 2mm/s (.08"/s)											
Can be adjusted with joystick 0.1mm/s to 5mm/s (.004"/s to .2"/s), Manual feed available											
800µm [Resolution: 0.01µm] (32000µinch [Resolution: .4µinch]) 80µm [Resolution: 0.001µm] (3200µinch [Resolution: .04µinch]) 8µm [Resolution: 0.0001µm] (320µinch [Resolution: .004µinch])											
Differential inductance method											
Measuring force 0.75mN: Diamond, 60° cone, Tip radius: 2µm (79µinch) Measuring force 4mN: Diamond, 90° cone, Tip radius: 5µm (200µinch)											
Carbide, Radius of curvature: 40mm (1.6")											
								SURFPAK®-PRO (CD-ROM provided)			
15°C to 25°C											
100V AC - 240V AC, 50/60Hz											
1100x450x1111mm (43.3"x17.72"x43.74")		760x450x905mm (29.92"x17.72"x35.63")		760x450x1105mm (29.92"x17.72"x43.5")		1150x450x1111mm (45.28"x17.72"x43.74")		710x450x905mm (27.95"x17.72"x35.6")		710x450x1105mm (27.95"x17.72"x43.5")	
155kg (341 lbs.)		145kg (319 lbs.)		155kg (341 lbs.)		160kg (352 lbs.)		140kg (308 lbs.)		150kg (330 lbs.)	
Standard detector (**178-396-2** (Measuring force: 0.75mN), **178-397-2** (Measuring force: 4mN)), standard nosepiece (**12AAC753**), roughness specimen (**178-601** (mm) or **178-602** (inch/mm)), machine cover (**355130** for SV-3000S4/S8) or **355270** for SV-3000H4/W4/H8/W8), key wrenches, screwdrivers, carrying bolts, lubricant, power cord, User's manual											

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