



SURFCOM NEX

ENGLISH

Surface Texture and Contour Integrated Measuring Instrument

# SURFCOM NEX

Linear Technology

**Newly Developed Dual Sensor Technology**  
Highest-Accuracy Integrated Measuring Instrument  
In Its Class



Surface Texture and Contour Integrated Measuring Instrument

**SURFCOM  
NEX**

Linear Technology

*Integrated measuring instrument  
with the highest accuracy in its class*

*Newly developed dual sensor technology enables  
roughness and contour measurements at a time*

*Retrofit increases the value  
of an existing machine (Linear series)*

## 01 Newly Developed Dual Sensor Technology

World-  
first!!

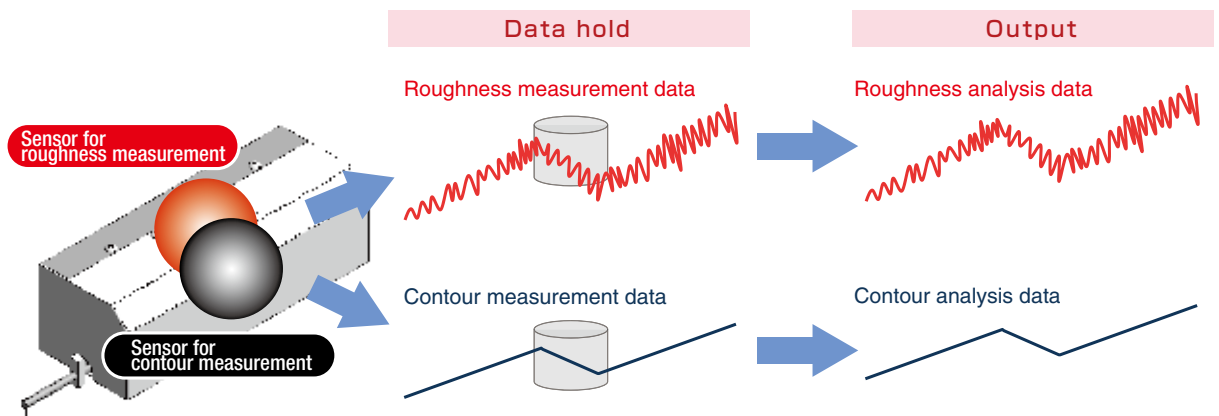
Patent  
pending

Single hybrid detector makes surface texture and  
contour measurements possible at a time!  
This saves operator's time to ex-  
change detectors and greatly  
improves work efficiency.



### ■ Principle of SURCOM NEX 100 Dual Sensor Technology

New hybrid detector mounts two sensors and acquires each roughness and contour signals at the same time.





## 02 Highest Accuracy in its Class

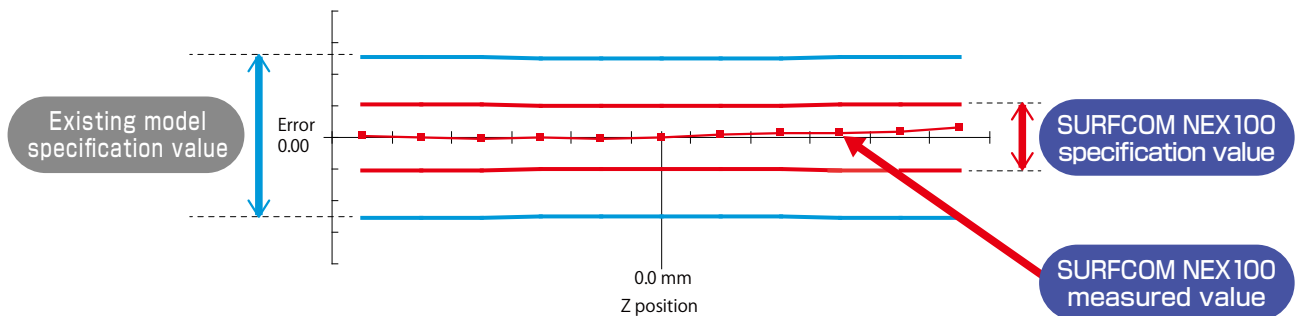
World No.1!!

Z-axis indication accuracy has been improved to  $\pm(1.0+|2H|/100) \mu\text{m}^{*1}$   
from  $\pm(2.5+|2H|/100) \mu\text{m}^{*2}$

Accuracy improved from 2.55  $\mu\text{m}$  to 1.05  $\mu\text{m}$  at 2.5 mm of full stroke.

\*1 SURFCOM NEX 100

\*2 Existing model



## 03 Larger Standard Granite Table

Standard granite table is 30 % larger than our existing machines. Depth is expanded to 133 mm.

Larger throat depth secures enough space for jigs. A large adjustment stand can be placed and a workpiece can be held stable.

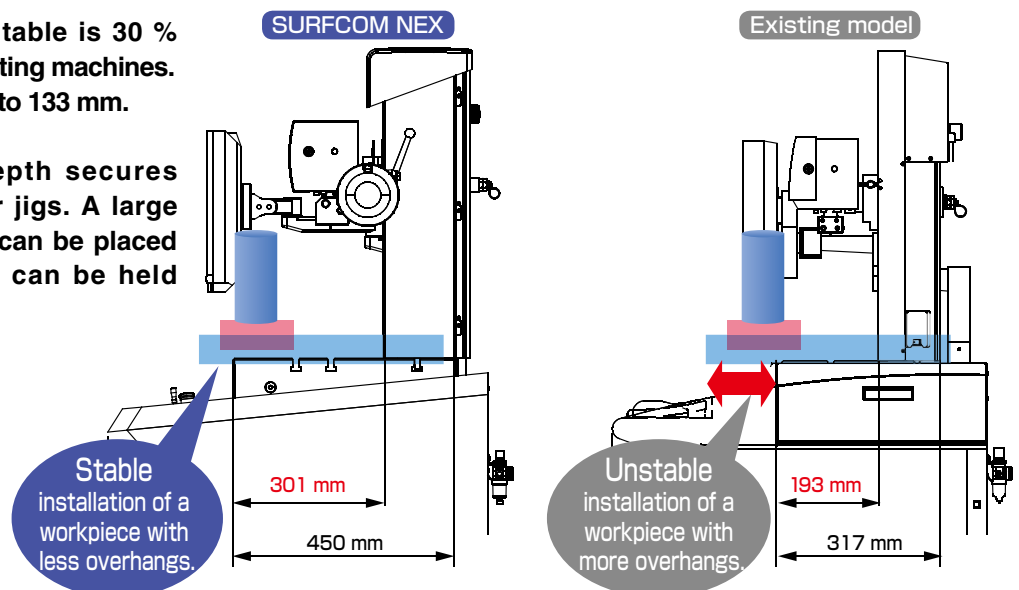



Image of the use of Y-axis CNC table (200 mm)


## 04 Calibration Wizard Function (Standard)

Wizard function enables even a beginner to conduct a calibration.

**Calibration with TIMS**




A screen shows all items at a time.




An operator may have a trouble where to start.

**Calibration with ACCTee**



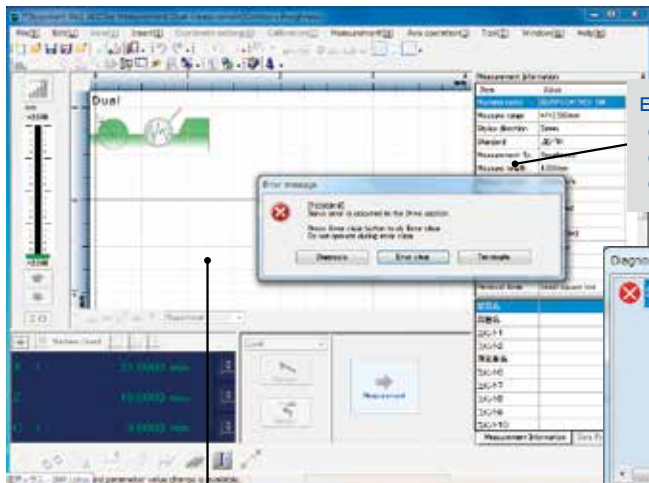
The wizard assists an operator to conduct complicated calibration procedures.



Easy operation for anyone!

## 05 Self-Diagnosis Function (Standard)

In preparation for an emergency, the self-diagnosis function is always in operation. Whenever there is a problem, a message indicating the location and nature of the problem such as a failure or error with the measurement instrument screen is displayed, enabling the operator to take appropriate action in to resolve the problem as soon as possible.



**Error examples:**

- Tracing driver servo error
- A detector touches a workpiece too much
- Tracing driver limit error

**Indication of:**

- an error status
- an error spot
- a guidance

**Diagnosis window:**

**Servo error (Driver)**

Guidance  
Servo error is occurred in the Driver section.  
Release the servo error pushing the release button.  
Please contact the nearest service center when this error is not removed.

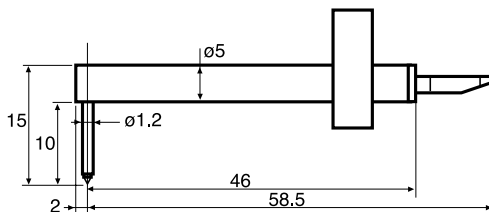
A display shows an operator a notice of an error status, an error spot and a countermeasure.



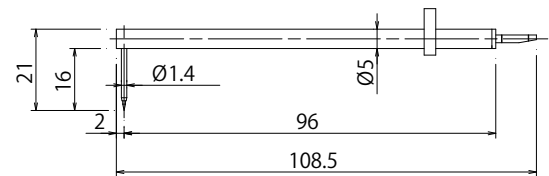
## 06 Styli for SURFCOM NEX 100

Two replaceable styli are standard accessories.

- Stylus for roughness and contour  
DM48507: 2  $\mu$ mR, LH=50, LV=-15.5, 0.75 mN



- Stylus for roughness and contour  
DM48775: 25 $\mu$ mR, LH=100, LV=-21.5, 4mN



※Note: Styli for S2000 can not be used to SURFCOM NEX 100.

## 07 Retrofit Increases the Value of an Existing Machine

Linear series machines can be retrofit by SURFCOM NEX.  
Expanded functionality enhances the operational efficiency.



Specialized machine for  
roughness measurement

Contour measurement  
also available  
Upgrade to integrated machine  
for roughness and  
contour measurement



Specialized machine for  
contour measurement

Roughness measurement  
also available  
Upgrade to integrated machine  
for roughness and  
contour measurement



Combined machine for  
roughness and  
contour measurement

Roughness and contour  
measurement available  
without detector exchange  
Upgrade to  
integrated machine

Dual sensor technology upgrades an existing machine as a high accuracy integrated machine for roughness and contour measurement without exchanging detectors.

※Note: Applicable software is only ACCTee after retrofit.

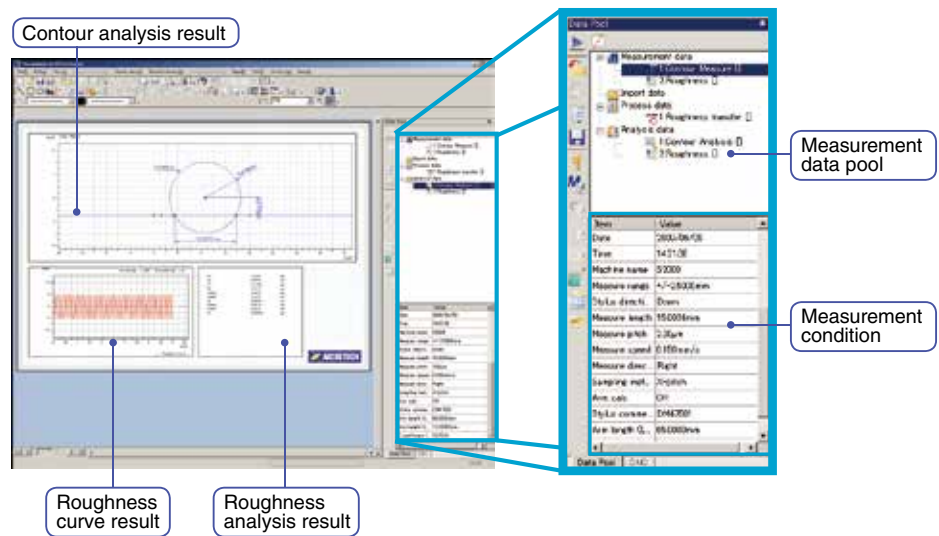


## Integrated Measurement and Analysis Software



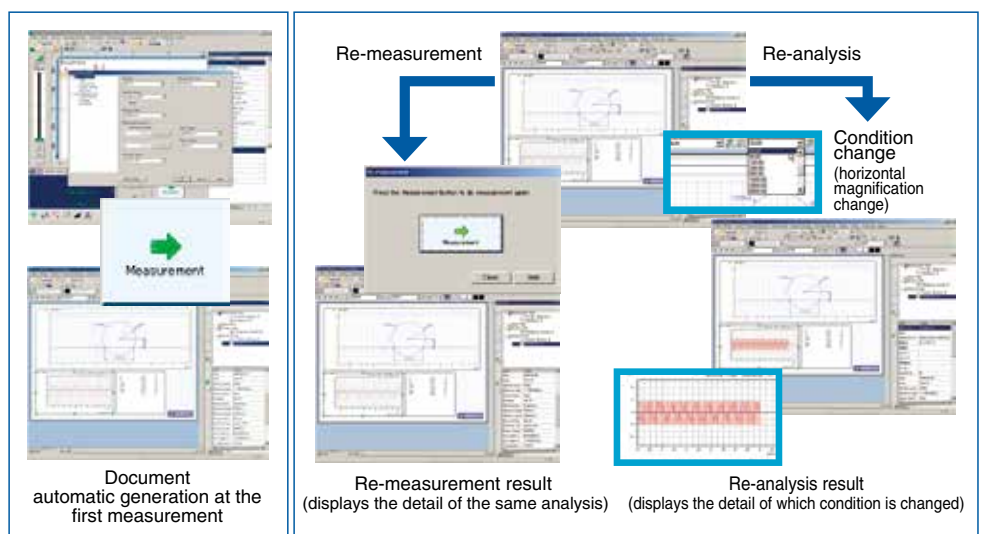
## Leading-edge Operability

ACCTee is equipped with a Windows style user interface that anyone can easily access. High operability is achieved with the user-friendly and intuitive icons that assist a series of operations from the measurement to the printing of analysis results.



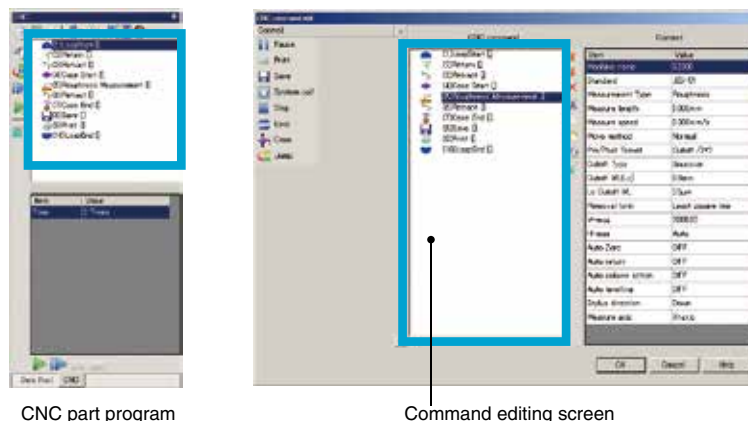
## Efficiency Improvement of Re-analysis and Re-measurement with Easy Operation

ACCTee contains all the information including the layout, measurement condition, analysis condition, measurement data, and part program in the document, so that the data edit, addition, re-analysis, and re-measurement of the analysis details can be executed freely. Since the switchover between windows is not necessary, it improves the operational efficiency by 40% or more compared with the conventional software. Besides executing re-analysis, when executing the same measurement and analysis of the previous times, the measurement result similar to the previous time can be acquired by selecting the measurement data of the data pool and clicking the re-measurement data.



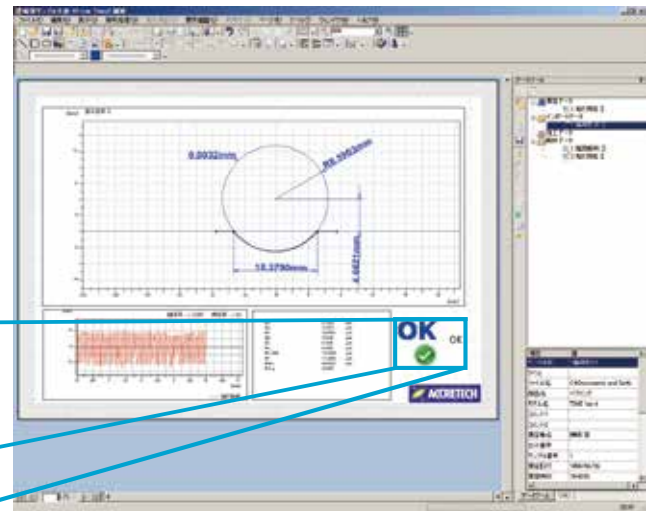
## CNC Function

This provides a highly efficient measurement work environment, as the series of tasks, from the measurement to the output of the test result, can be executed automatically. For the case and calculation error in the measurement result, such operations as "Jump", "Pause", "Stop" and "Continue" can be chosen. Because of the system call command, you can display any type of image files during CNC operation, and can check the part setup and stylus configuration with photos so that you can avoid accidental errors in advance.



## Document Comprehensive Judgment Display

ACCTee can provide judgment concerning the 16% rule and the design value for individual parameters. It can also display OK/NG in the graphic image for comprehensive judgment relating to the whole document. As a preset master page is registered, your logo and desired background will appear on all pages of the final inspection sheet output.

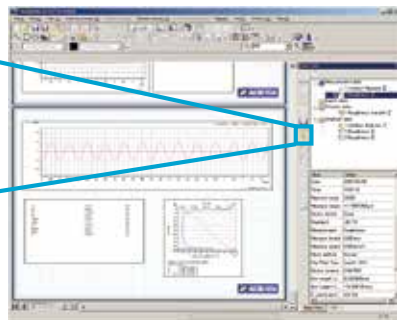


## Software Data Protection

The data measured by ACCTee can be protected by locking the data, eliminating the unintended data clear or data exchange, so that accidental data loss can be prevented.

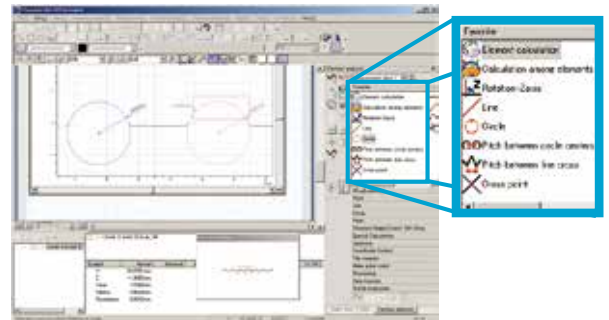


Data can be locked



## Favorite

Frequently used commands can be stored in "Favorite" and reorganized for easy use.



## Multi Languages Support

ACCTee can be used overseas and supports several languages including Japanese, Chinese, Korean, English, German, French, Italian, Spanish, Czech and Polish.



Language select screen

## Help System

Help is always available whenever ACCTee is on. ACCTee features an on-line manual system so that an appropriate help message can be displayed by clicking the soft help key.

Help can also be obtained by browsing the index or searching with keywords.



## Measuring Unit

Model				SURFCOM NEX							
				12	13	14	15	22	23	24	25
Measuring range	Z-axis (Detector: vertical direction)			5 mm / Standard arm, 10 mm / 2x arm							
	X-axis (Tracing driver: horizontal direction)			100 mm				200 mm			
Max. measuring height (Column up/down stroke)				250 mm	450 mm		650 mm	250 mm	450 mm		650 mm
Hybrid detector with dual sensor technology	Roughness	Sensing method		Differential inductance							
		Measuring range		0.05 mm to 5.0 mm							
		Resolution		1.0 nm to 100 nm							
	Contour	Sensing method		High-accuracy scale							
		Measuring range		5.0 mm							
		Indication accuracy (vertical)		± (1.0+ 2H /100) μm (H: Measuring height) (When LH=50 mm stylus is used)							
	Stylus	For Roughness and Contour	Model	DM48507 (LH=50 mm, Standard arm)							
			Measuring force	0.75 mN							
			Material	Diamond							
			Tip shape	2 μmR / 60 ° cone							
		For Contour	Model	DM48775 (LH=100 mm, 2x arm)							
			Measuring force	4.0 mN							
			Material	Cemented carbide							
			Tip shape	25 μmR / 24 ° cone							
		Replacement method		Replaceable							
	Common Function				Upper limit detection safety mechanism / retract function						
Tracing driver	X-axis	Sensing method		Linear scale							
		Straightness accuracy		(0.05+1.0 L/1000) μm 0.15 μm/100 mm							
		X-axis indication accuracy (horizontal)		± ( 1.0+1.0L/100 ) μm (L: Measuring length) (When LH=50mm stylus is used)							
		Resolution		0.016 μm							
		Speed	Moving speed	0.03 mm/s to 60 mm/s							
			Measuring speed	0.03 mm/s to 20 mm/s							
Tilt angle		± 10 ° (Optional tilting device)									
Measuring stand	Column	Speed	Moving speed	Max. 10 mm/s							
	Base	Material		Gabbro							
		Permissible loading weight		82 kg	72 kg	89 kg	79 kg	76 kg	66 kg	83 kg	73 kg
		Dimensions	Width	600 mm		1000 mm		600 mm		1000 mm	
			Depth	450 mm							

## Other

Power supply	Voltage (frequency)		Single-phase AC100 V to 240 V (50 Hz / 60 Hz)								
	Power consumption		Max. 670 VA								
Air supply (For anti-vibration table)	Supply pressure		0.45 MPa to 0.7 MPa								
	Working pressure		0.4 MPa								
	Air consumption		0.1 L/min (Max. 10 L/min)								
	Position of supply port		Back of main unit								
Dimensions and weight	Main unit	Air supply connecting port		Rc1/4 male screw (Outside diameter $\Phi 6 \text{ mm}$ one-touch pipe joint for tube)							
		Dimensions	Width	960	960	1360	1360	960	960	1360	1360
			Depth	762	762	840	840	762	762	840	840
			Height	1478	1678	1673	1893	1478	1678	1673	1893
		Weight		245	255	395	405	250	260	400	410
Ambient temperature	Temperature	Temperature of accuracy guarantee		20 °C $\pm$ 2 °C (Ratio of temperature change: $\pm 0.5^\circ\text{C}$ /within an hour, $0.1^\circ\text{C}$ /within one measuring time)							
		Temperature of operation guarantee		10 °C to 30 °C							
		Storage temperature		5 °C to 40 °C							
	Humidity	Humidity of operation guarantee		40 % to 80 % (without condensation)							
		Storage humidity		80 % or lower (without condensation)							

\* Power and air supply and a connecting hose are required before the delivery.

\* Contents of the specification may be changed without any notice due to product modifications.

## Standard Configuration and Accessories

- |  |   |
|--|---|
| 01) Set of measuring unit<br>Hybrid detector with dual sensor technology<br>Tracing driver<br>Measuring stand column<br>Measuring stand base<br>Anti-vibration table and bench (Standard for DX model, Option for SD model)<br>02) Set of data processor<br>Driver unit<br>PC<br>Keyboard<br>Mouse<br>Liquid crystal display<br>A4 color inkjet printer (Standard for DX model, Option for SD model)<br>03) Roughness and contour profile measurement and analysis integrated software; ACCTee | 04) Master ball calibration unit [ E-MC-S65A ]<br>05) Block gauge unit [ E-MG-S39A ]<br>06) Reference specimen [ E-MC-S24B ]<br>07) Stylus [ DM48507 ]<br>08) Stylus [ DM48775 ]<br>09) Oil clay<br>10) Set of hex wrenches<br>11) Flat-blade screwdriver<br>12) Lubrication oil<br>13) Accessory carrying case<br>14) Inspection certificate<br>15) Operation manual |
|--|---|



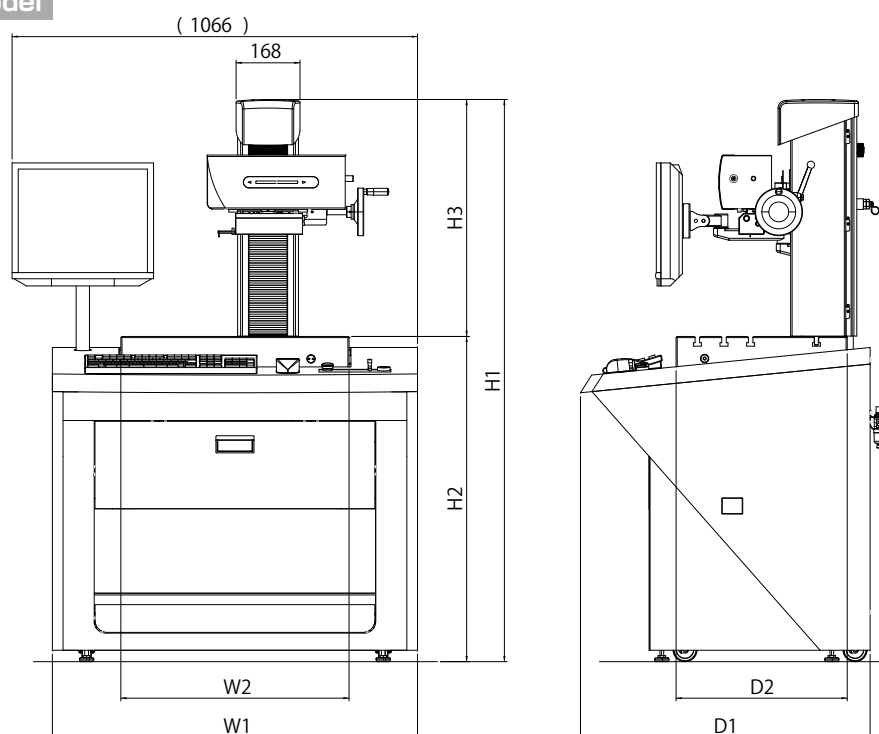
## External Dimensions and View

					Main unit dimentions					Measuring range (mm)		Base (mm)		Weight (kg)	
					Width	Depth	Height	Table height	Column height	X-axis (Tracing driver)	Z-axis (Column)	Width	Depth	Main unit weight ※1	Max. loading weight
Model	Code				W1	D1	H1	H2	H3	—	—	W2	D2	—	—
DX	12	K2	A B C	A	960	762	1478	855	623	100	250	600	450	245(275)	82
	13			B	960	762	1678	855	623	100	450	600	450	255(285)	72
SD	12	K2	D E F	A	600	638	1441	818	623	100	250	600	450	120(145) 242	82
	13			B	600	638	1641	818	623	100	450	600	450	130(155) 252	72

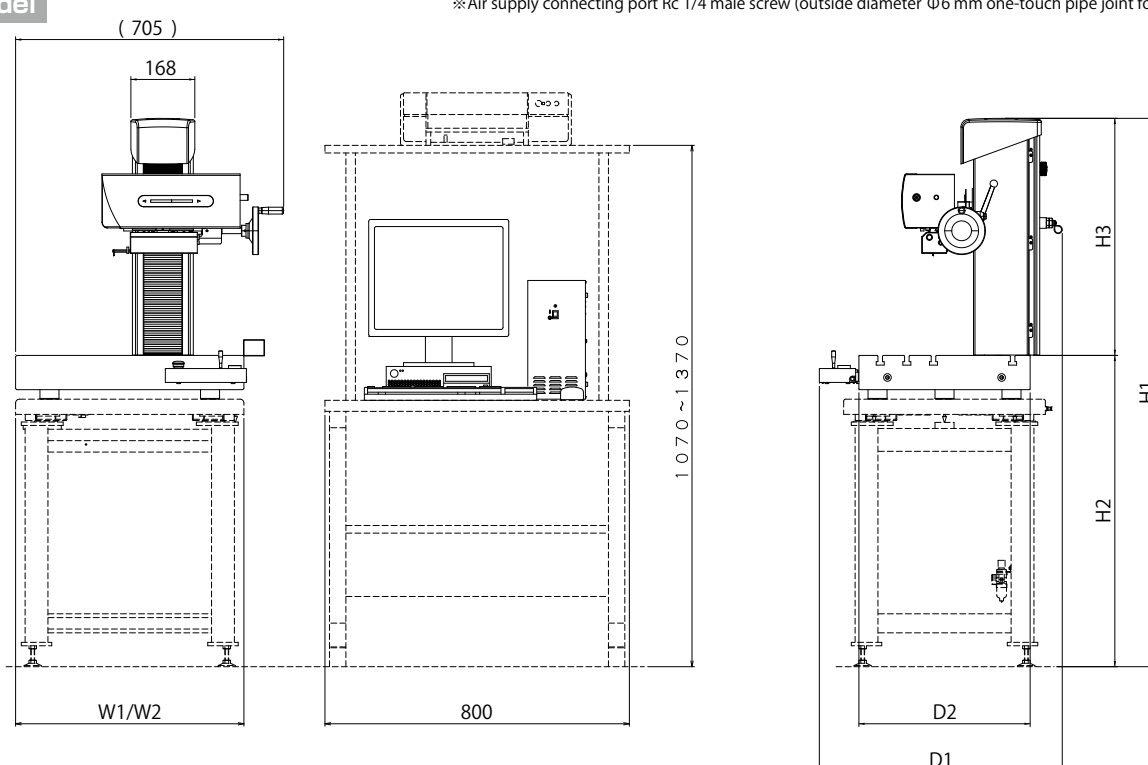
※1 Weights in parentheses include PC, driver unit, monitor and printer (DX model only).

Gross weights in lower lines include optional anti-vibration table, bench, rack and printer (SD model only).

### DX Model



### SD Model



※Tracing driver tilting device is optional.

※Air supply connecting port Rc 1/4 male screw (outside diameter  $\Phi 6$  mm one-touch pipe joint for tube)

※Tracing driver tilting device is optional.

※Air supply connecting port Rc 1/4 male screw (outside diameter  $\Phi 6$  mm one-touch pipe joint for tube)


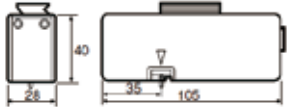

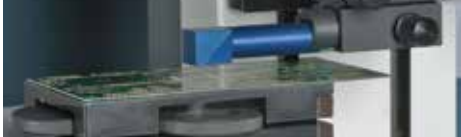
## Replaceable styli for Hybrid Detector with Dual Sensor Technology [E-DT-CR14A]

Name	Model	External view	Specifications	Remarks
General purpose	DM48505		2 $\mu$ mR, 60° conical diamond, 0.75 mN LH= 50 LV= -14.35	<ul style="list-style-type: none"> <li>Standard length</li> <li>For roughness and contour measurement</li> </ul>
General purpose highly rigid stylus	DM48507		2 $\mu$ mR, 60° conical diamond, 0.75 mN LH= 50 LV= -15.5	<ul style="list-style-type: none"> <li>Standard length</li> <li>Standard accessory for SURFCOM NEX 100</li> <li>For roughness and contour measurement</li> </ul>
Highly rigid stylus for contours	DM48775		25 $\mu$ mR, 24° conical carbide, 0.40 mN LH= 100 LV= -21.5	<ul style="list-style-type: none"> <li>2x length</li> <li>Standard accessory for SURFCOM NEX 100</li> <li>For contour measurement only</li> </ul>
	DM48508		500 $\mu$ mR, ruby ball, 0.75 mN LH= 100 LV= -21.5	<ul style="list-style-type: none"> <li>2x length</li> <li>For contour measurement only</li> </ul>
	DM48509		500 $\mu$ mR, ruby ball, 3.2 mN LH= 125 LV= -25.5	<ul style="list-style-type: none"> <li>2.5x length</li> <li>For contour measurement only</li> </ul>
Right angle stylus	DM48511		2 $\mu$ mR, 60° conical diamond, 0.75 mN LH= 50 LV= -14.5	<ul style="list-style-type: none"> <li>Standard length</li> <li>Offset: 13.5 mm</li> <li>For roughness and contour measurement</li> </ul>
Small hole stylus	DM48513		2 $\mu$ mR, 60° conical diamond, 0.75 mN LH= 50 LV= -5.025	<ul style="list-style-type: none"> <li>Standard length</li> <li>Probe height: 2.0 mm</li> <li>For roughness and fine contour measurement</li> </ul>
Extra small hole stylus	DM48514		2 $\mu$ mR, 60° conical diamond, 0.75 mN LH=50 LV= -4.625	<ul style="list-style-type: none"> <li>Standard length</li> <li>Probe height: 1.0 mm</li> <li>For roughness and fine contour measurement</li> </ul>
Deep hole stylus	DM48515		2 $\mu$ mR, 60° conical diamond, 0.75 mN LH= 50 LV= -30.5	<ul style="list-style-type: none"> <li>Standard length</li> <li>Probe height: 25.0 mm</li> <li>For roughness and fine contour measurement</li> </ul>
Fine contours stylus	DM48588		5 $\mu$ mR, 30° conical diamond, 0.75 mN LH= 50 LV= -14.35	<ul style="list-style-type: none"> <li>Standard length</li> <li>For roughness and fine contour measurement</li> </ul>



Standard Inventory Parts

**Detectors** Retrofit to hybrid detector with dual sensor technology enables the use of same detectors for existing linear series.


### Pickup for roughness measurement

	Option	SURFCOM NEX
For general purpose : E-DT-SS01A : E-DT-SS08A 		Applicable
For high magnification : E-DT-SH01A 		Applicable
Thin pickups : DM42020 Pickup holder for thin pickups : E-DH-S60A 		Applicable
For non-contact measurement : E-DT-SL12B 		Applicable

### Detector for contour measurement

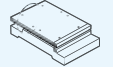
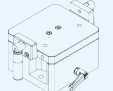
	Option	SURFCOM NEX
High-accuracy contour detector for C1710DX/SD, C1910DX/SD series : E-DT-CH10A/B 	Set of detector change box ① • Detector change box (1pc.) • BOX-AMP cables (3 pc.) • Detector-Box cable (1 pc.)	Applicable
High-accuracy contour detector for C2700DX/SD, S2900DX/SD series : E-DT-CH08A/B 	Set of detector change box ② • Detector change box (1pc.) • BOX-AMP cables (3 pc.) • Detector-Box cable (1 pc.)	Applicable

### Detector for integrated measuring instrument

	Option	SURFCOM NEX
Hybrid detector for S2000DX/SD series : E-DT-CR06A 		Not applicable ※Detector for S2000 to be taken over

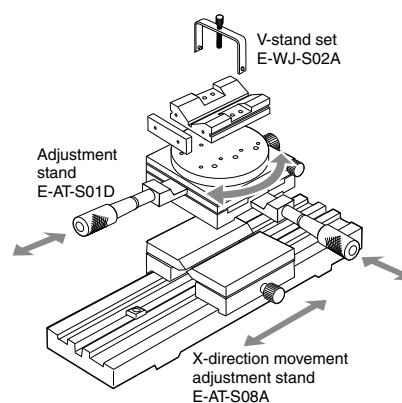
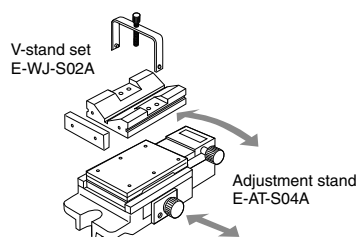
In case your machine is linear series with a detector for standard series, contact your nearest Tokyo Seimitsu.

## Adjustment Devices

Name	Model	External view	Orthogonal Axis Adjustment (mm)			Swivel Adjustment (rad)		Tilt Adjustment (rad)		Table Size (mm)	Allowable Load (kg) (net wt.)	Remarks
			X	Y	Z	Fine	Coarse	Fine	Coarse			
Adjustment stand	E-AT-S01D		50	50	—	8	360	—	—	Φ150	20 (7)	Min. reading value: 10 μm
Leveling adjustment stand	E-AT-S02A		—	—	—	—	—	±1.5	—	80×110	15 (3)	—
Adjustment stand	E-AT-S04A		—	±8	—	±3	—	—	—	80×125	15 (8)	—
X-direction movement adjustment stand	E-AT-S08A		400	—	—	—	—	—	—	150×150	20 (25)	—
3D fine adjustment device	E-AT-S10A		55	55	28	—	—	—	—	75×40	1 (3.4)	Straightness: 0.03 mm
1-axis ultra precision fine adjustment stand	E-AT-S11B		—	50	—	—	—	—	—	125×150	20 (4.9)	Straightness: 3.0 μm Min. reading value: 10.0 μm
Swivel fine rotation stand	E-AT-S12A		—	—	—	±5	360	—	—	Φ90	3 (0.58)	Min. reading value: 5'
1-axis precision fine adjustment stand	E-AT-S13B		—	10 (Coarse: 10 μm Fine: 0.5 μm)	—	—	—	—	—	60×60	10 (0.7)	Straightness: 3.0 μm Min. reading value: 0.5 μm
Tilting stand	E-AT-S64B		—	—	—	—	—	±20	—	60×120	10 (1)	Min. reading value: 5'
Universal stand	E-WJ-S03A		—	—	—	—	360	—	±90	Φ110	3 (2.5)	X/Y-direction adjustment
Column rotation spacer	E-CS-S129A		—	—	H: 100	—	360	—	—	—	—	Inserted between table and column
Column spacer	E-CS-S128A		—	—	H: 100	—	—	—	—	—	—	Inserted between table and column
Tracing driver spacer	E-CS-S33A		—	L: 70	—	—	—	—	—	—	—	Inserted between column and tracing driver
Tracing driver tilting device	E-CA-S85A E-CA-S92A		—	—	—	—	—	—	±15	—	—	For contour measurements E-CA-S85A: For tracing driver 100 mm  E-CA-S92A: For tracing driver 200 mm

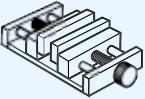
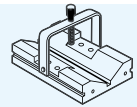
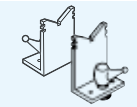
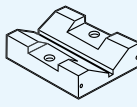
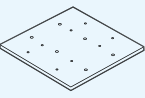
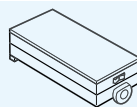
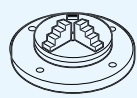

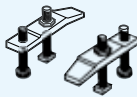
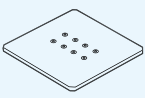
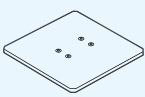
Sample Adjustment Stand /Holder Configurations

Standard Inventory Parts



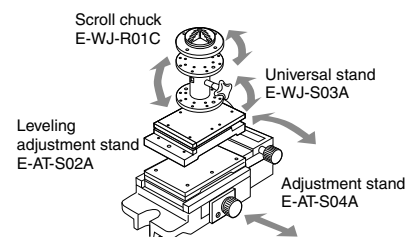
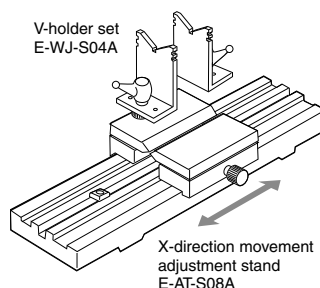
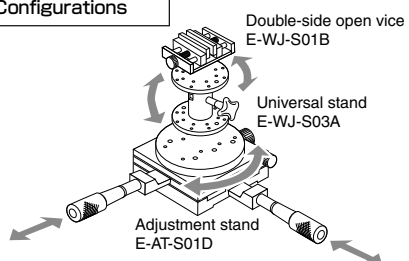


## Holders

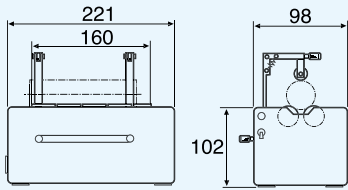
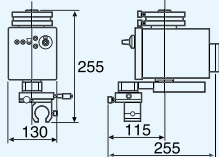

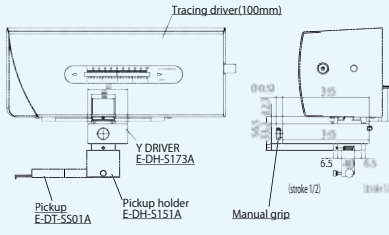

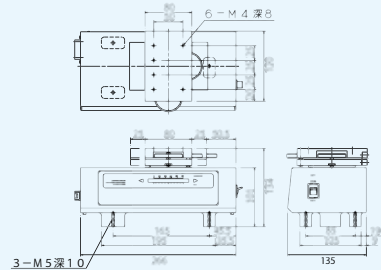
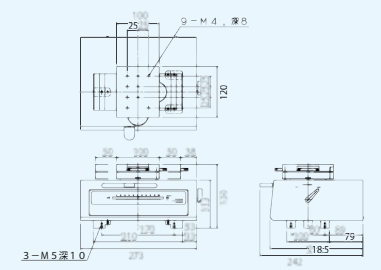
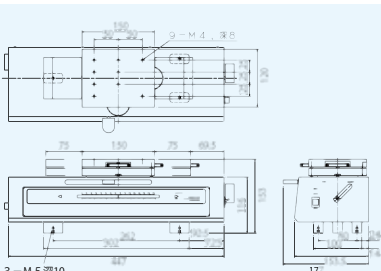
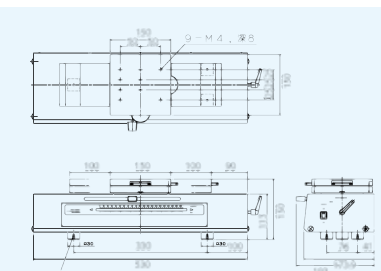
Name	Model	External view	V Holder (mm)	Chucking (mm)	Vice (mm)	Clamp (mm)	Flat Surface (mm)	Allowable Load (kg) (net wt.)	Remarks
Double-side open vice	E-WJ-S01B		—	—	OD: 38 to 105 ID: 59	—	—	5 (0.8)	Consult us when combining with the tilt stand.
V-stand set	E-WJ-S02A		Φ1 to 150	—	—	—	—	(1.5)	Provided with workpiece clamber
V-stand holder set	E-WJ-S04A		Φ12 to 150	—	—	—	—	(3)	Two pieces set for T-groove clamp.
Compact stand	E-WJ-S05A		Φ4 to 10	—	—	—	—	(0.4)	—
Load plate	E-WJ-S06A		—	—	—	—	150×150 angle plate	(1)	—
Static electricity holding plate	E-WJ-S11A		—	—	—	—	80×130 angle plate	(1.3)	Holding strength: 0.2 kg Ideal for paper, aluminum, and film
Scroll chuck	E-WJ-R01C		—	OD: Φ2 to 75 ID: Φ56 ~ 91	—	—	—	(1)	—
Iris chuck	E-WJ-R10A		—	OD: Φ5 to 110	—	—	—	(3)	Manufactured after receipt of order
	E-WJ-R378A			OD: Φ5 to 150				(5)	
Clamp set	JC-3		—	—	—	Height 40 to 60	—	—	—
Ceramic load plate	E-WJ-S252A		—	—	—	—	300×300 angle plate	(5.3)	Manufactured after receipt of order
Ceramic load plate	E-WJ-S234A		—	—	—	—	500×500 angle plate	(15)	Manufactured after receipt of order

 Standard Inventory Parts

## Sample Adjustment Stand /Holder Configurations



## Tracing driver


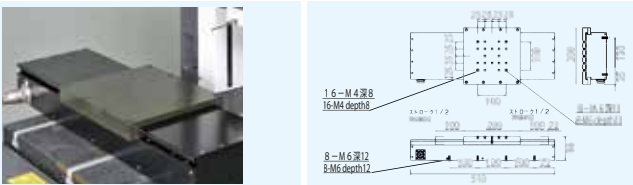
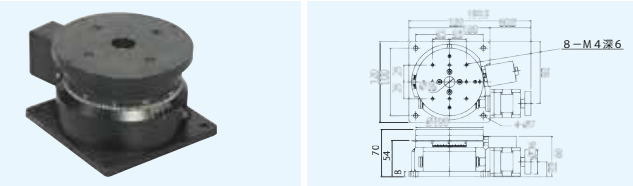
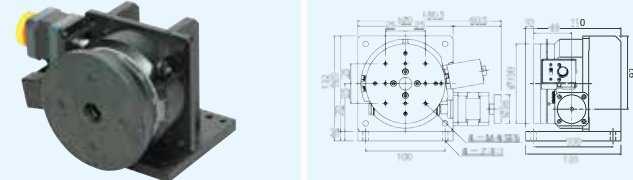
Name	Model	Specifications		External view		
Outer periphery roughness tracing driver	E-RM-S85B	Measuring OD / length	Φ12 mm to Φ20 mm 30 mm to 150 mm			
			Φ20 mm to Φ150 mm 30 mm to 250 mm			
		Peripheral velocity	0.3, 0.6, 1.5 mm/s			
		Max. loading weight	5 kg			
		Weight	Approx. 7 kg			
Round surface roughness tracing driver	E-RM-S84A	Measuring radius	0.25 mm to 40 mm			
		Rotation accuracy	± 0.25 μm (180° arbitrary)			
		Peripheral velocity	0.3mm/s (stepless)			
		Weight	Approx. 15 kg			
Y-axis fixed pitch tracing driver for 3D roughness measurement (Detector movement type)	E-DH-S173A	Drive range	13 mm			
		Min. feed pitch	0.001 mm			
		Number of feed line	2 to 4001 lines			
		Straightness accuracy	1 μm			
		Table surface dimensions	—			
		Max. loading weight	—			
Y-axis fixed pitch tracing driver for 3D roughness measurement (Workpiece movement type)	E-YM-S06A	Drive range	50 mm			
		Min. feed pitch	0.001 mm			
		Number of feed line	2 to 4001 lines			
		Straightness accuracy	0.05 + 3L/1000 μm			
		Table surface dimensions	80 × 120 mm			
		Max. loading weight	5 kg			
	E-YM-S12A	Drive range	100 mm			
		Min. feed pitch	0.001 mm			
		Number of feed line	2 to 4001 lines			
		Straightness accuracy	0.05 + 3L/1000 μm			
		Table surface dimensions	100 × 120 mm			
		Max. loading weight	10 kg			
	E-YM-S07A	Drive range	150 mm			
		Min. feed pitch	0.001 mm			
		Number of feed line	2 to 4001 lines			
		Straightness accuracy	0.05 + 3L/1000 μm			
		Table surface dimensions	120 × 150 mm			
		Max. loading weight	5 kg			
	E-YM-S08A	Drive range	200 mm			
		Min. feed pitch	0.001 mm			
		Number of feed line	2 to 4001 lines			
		Straightness accuracy	0.05 + 3L/1000 μm			
		Table surface dimensions	150 × 150 mm			
		Max. loading weight	10 kg			

## CNC Table

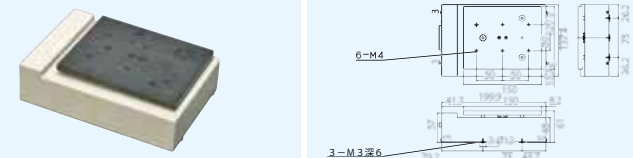
The standard measuring system can be automated by adding a CNC table unit.

CNC table is controlled, and fully automatic measurements can be performed from the ACCTee integrated measuring software.



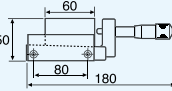
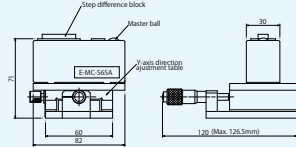
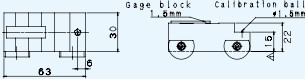

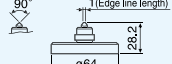
The Y-axis and  $\theta$ -axis CNC table can be rearranged as needed in order to configure the system to suit the workpiece.

Name	Model	Specifications	External view	
Y-axis CNC table (100mm)	E-AT-S105A	Travel	100 mm	
		Max. travel speed	50 mm/s	
		Positioning accuracy	20 $\mu$ m	
		Max. load	30 kg	
		Weight	Approx. 19 kg	
Y-axis CNC table (200mm)	E-AT-S106A	Travel	200 mm	
		Max. travel speed	50 mm/s	
		Positioning accuracy	20 $\mu$ m	
		Max. load	30 kg	
		Weight	Approx. 22 kg	
$\theta$ -axis CNC table (horizontal)	E-AT-S107A	Travel	360 °	
		Max. travel speed	20 °/s	
		Positioning accuracy	0.03 °	
		Max. load	15 kg	
		Weight	Approx. 2.5 kg	
$\theta$ -axis CNC table (vertical)	E-AT-S108A	Travel	360 °	
		Max. travel speed	20 °/s	
		Positioning accuracy	0.03 °	
		Max. load	5 kg	
		Weight	Approx. 3.2 kg	

## Automatic Adjustment Stand

2-axes auto leveling table	E-AT-S62A	Leveling range	$\pm 2^\circ$	
		Max. load	5 kg	
		Weight	4 kg	

## Calibrators

Name	Model	External view	Specifications	Remarks
Reference specimen	E-MC-S24B		Calibration surface : Approx. 3.1 $\mu$ m Ra Stylus check surface: Approx. 0.4 $\mu$ m Ra Actual measured value denoted.	<ul style="list-style-type: none"> <li>For sensitivity calibration and for stylus check</li> <li>Standard accessory for SURFCOM NEX</li> </ul>
Level difference reference specimen	E-MC-S57A		Large range : Approx. 20.0 $\mu$ m Small range : Approx. 2.0 $\mu$ m Actual measured value denoted.	<ul style="list-style-type: none"> <li>For sensitivity calibration and stylus check</li> </ul>
Magnification calibrator	E-MC-50B		Narrow range accuracy : 0 to 10 $\mu$ m $\pm 0.1 \mu$ m Wide range accuracy : 0 to 400 $\mu$ m $\pm 1.0 \mu$ m	<ul style="list-style-type: none"> <li>For magnification calibration</li> </ul>
Master ball calibration unit	E-MC-S65A		Master ball : Radius $\Phi 6.35$ mm : Sphericity 0.13 $\mu$ m Level difference block : Step value 4 mm, 8 mm Y-axis direction adjustment table : Max. stroke 13 mm	<ul style="list-style-type: none"> <li>For measurements with stylus pointing downwards</li> <li>With block gauge unit [ E-MG-S39A ]</li> <li>Standard accessory for SURFCOM NEX</li> </ul>
Small hole stylus Master ball calibration unit	E-MC-S59C		Reference sphere: $\Phi 1.5$ mm Block gauge: 1.5 mm	<ul style="list-style-type: none"> <li>For measurements with stylus pointing downwards</li> <li>With block gauge unit</li> </ul>
Pitch gage	E-MG-S02A		Pin diameter: 7.9 mm Pitch: 15 mm	<ul style="list-style-type: none"> <li>Dimensions: 144 mm (W) x 38 mm (D) x 49 mm (H)</li> </ul>
Stylus check master	E-MG-S24A		Tip radius: 0.1 $\mu$ m or less. Material: Knife edge diamond	—

## Peripherals

Name	Model	External view	Specifications	Remarks
Bench for desktop anti-vibration table	E-VS-S218A		—	<ul style="list-style-type: none"> <li>• Dimensions: 510 (W) x 430 (D) x 643 (H) mm</li> <li>• Weight: 23 kg</li> <li>• For E-VS-S213A</li> </ul>
Desktop anti-vibration table	E-VS-S213A		Anti-vibration method: Diaphragm air spring Natural frequency: 2.5 Hz to 3.5 Hz Load weight: 200 kg	<ul style="list-style-type: none"> <li>• Dimensions: 600 (W) x 530 (D) x 60 (H) mm</li> <li>• Air supply: 350 kPa to 700 kPa</li> <li>• Weight: 27 kg</li> <li>• Requires nylon tube with <math>\phi 6</math> mm outside and <math>\phi 4</math> mm inside diameter for quick joint connecting aperture.</li> </ul>
Desktop large anti-vibration table	E-VS-S45A		Anti-vibration method: Diaphragm air spring Natural frequency: 4 Hz Load weight: 300 kg	<ul style="list-style-type: none"> <li>• Dimensions: 1000 (W) x 750 (D) x 143 (H) mm</li> <li>• Air supply: Pump</li> <li>• Weight: 80 kg</li> </ul>
Anti-vibration table	E-VS-R16A	 Dimensions in parentheses are for the E-VS-S21B	Anti-vibration method: Diaphragm air spring Natural frequency: V: 2 Hz; H: 2.2 Hz Load weight: 250 kg	<ul style="list-style-type: none"> <li>• Dimensions: 980 (W) x 780 (D) x 700 (H) mm</li> <li>• Air supply: 350 kPa to 700 kPa</li> <li>• Weight: 170 kg</li> </ul>
	E-VS-S21B		Anti-vibration method: Diaphragm air spring Natural frequency: V: 1.6 Hz; H: 2 Hz Load weight: 550 kg	<ul style="list-style-type: none"> <li>• Dimensions: 1100 (W) x 850 (D) x 700 (H) mm</li> <li>• Air supply: 350 kPa to 700 kPa</li> <li>• Weight: 340 kg</li> </ul>
System rack	E-DK-S24A		—	<ul style="list-style-type: none"> <li>• Dimensions: 800 (W) x 800 (D) x 1070 (H) mm</li> <li>• Weight: 44.5 kg</li> </ul>
	E-DK-S25A		—	<ul style="list-style-type: none"> <li>• Dimensions: 1200 (W) x 800 (D) x 1070 (H) mm</li> </ul>
Side desk	E-DK-S10A		—	<ul style="list-style-type: none"> <li>• Dimensions: 400 (W) x 700 (D) x 700 (H) mm</li> </ul>
High magnification dust cover	E-CV-S02A		—	<ul style="list-style-type: none"> <li>• Used with desktop anti-vibration table / stand for roughness measuring</li> <li>• Dimensions: 750 (W) x 614 (D) x 810 (H) mm</li> <li>• Weight: 8 kg</li> <li>• For SURFCOM NEX SD type</li> </ul>
	E-CV-S03A		—	<ul style="list-style-type: none"> <li>• Used with desktop anti-vibration table / stand for contour profile measurement</li> <li>• Dimensions: 1000 (W) x 629 (D) x 810 (H) mm</li> <li>• Weight: 13 kg</li> <li>• For SURFCOM NEX SD type</li> </ul>
Dust cover	E-CV-S25A		—	<ul style="list-style-type: none"> <li>• Used with E-VS-S21A anti-vibration table</li> <li>• Dimensions: 1070 (W) x 750 (D) x 1050 (H) mm</li> <li>• Weight: 20 kg</li> </ul>
Measuring position verification unit	E-MA-S81A		Magnification: $\times 20$ Focal distance: 60 mm	<ul style="list-style-type: none"> <li>• Stand type</li> </ul>
Light	E-MA-S84A		—	<ul style="list-style-type: none"> <li>• Stand type</li> </ul>
Power transformer box	E-TF-R25A		Input: 90 V to 240 V Output: 100 V Capacity: 2.1 kVA	<ul style="list-style-type: none"> <li>• Specify the input voltage.</li> <li>• Dimensions: 300 (W) x 350 (D) x 296 (H) mm</li> <li>• Weight: 45 kg</li> </ul>





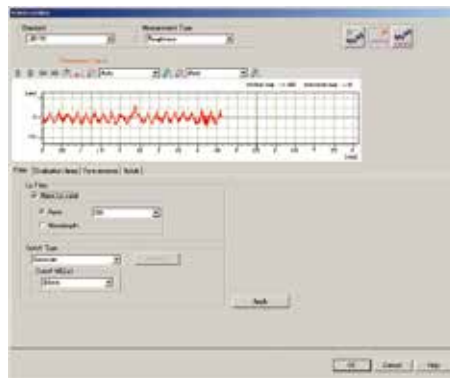
## Integrated Measurement and Analysis Software



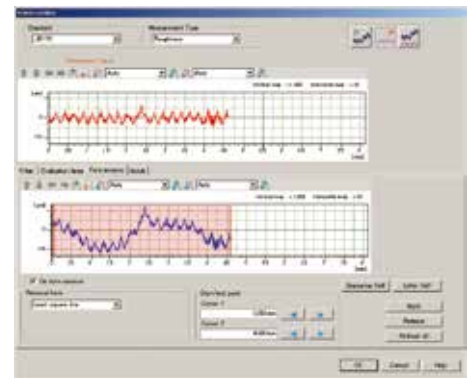
ALL in the Document!

**ACCTee****Surface Texture Measurement and Analysis System***Versatile measurement and analysis functions**Various guidance functions for beginners***Change Analysis Conditions with Preview Function**

With ACCTee, you can set and change the roughness parameter calculation standard, cutoff filter, notch level, deletion length and other conditions. The range of the waveform data used for the roughness parameter calculation can be set to any value. The preview function also allows you to optimum form remove (tilt correction) can also be selected. The specified area and conditions can be cleared and changed quickly and easily.



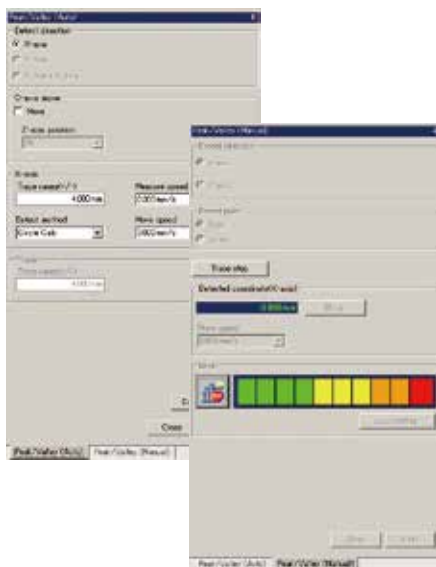
Analysis condition display



Preview display of changed analysis condition

**Roughness Peak and Valley Detection Function**

ACCTee detects the maximum point (minimum point) and automatically shifts the stylus to the maximum point (minimum point) as the peak and valley function traces the cylindrical profile, convex, concave, and spherical profile using the stylus. In manual operation, the position is reported by an alarm.

**Roughness Curve Trace Function**

As the profile traced by the roughness stylus is displayed, the measurement area can be set on the screen.

**Level Difference Parameter**

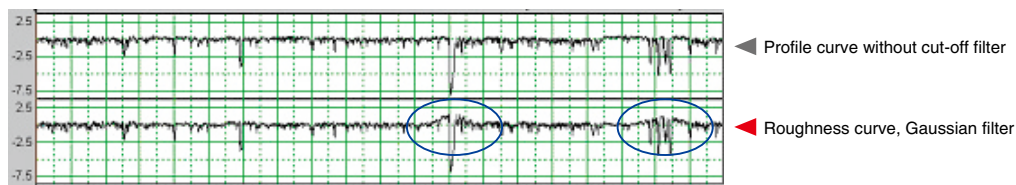
Level differences can be measured on the concave and convex profile. The measurement, average height, maximum height, minimum height, and area can be calculated from the data.

**Wear-out Analysis for Roughness Curve Data**

The degree of wear can be calculated by overlapping and displaying two roughness curves and calculating the differences between the data.

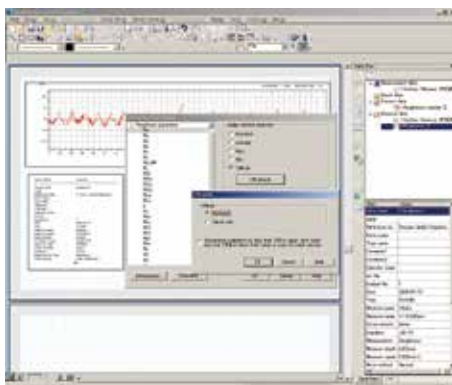
## Robust Spline Filter

Various filters are available for roughness measurement and analysis, including robust spline filter. The robust spline filter dissolves distortion caused by the phase-compensated type filter with distinguished peak and valley on roughness waviness.



## Automatic Pass/Fail Judgment under 16% Rule (JIS2001 Standard)

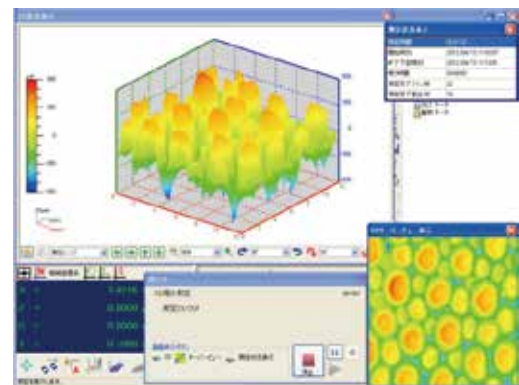
In the ACCTEe analysis process, the 16% rule and the max rule are standardized for the tolerance criteria of the roughness evaluation parameters. With the 16% rule, if the measurement value for the multiple standard length that exceeds the tolerance is below 16%, it is assumed to pass. With the Max rule, all multiple standard length measurement values must not exceed the allowable tolerance.



## 3D Roughness Measurement and Analysis

Functions support 3D roughness analysis. (Optional expanded hardware required) It is possible to obtain up to 4000 scanning lines and 80 million data.

3D analysis can be performed with versatile visual displays.

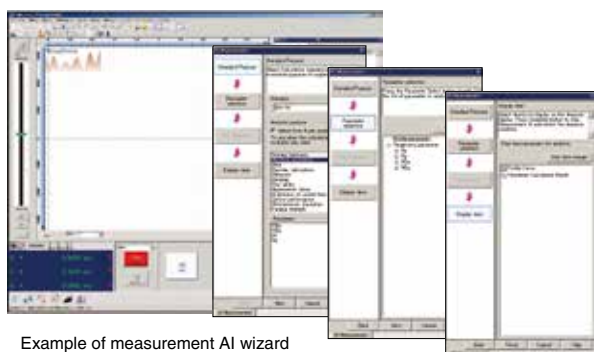


## Surface Texture Measurement and Analysis System

### Versatile wizard functions support operators

#### Measurement AI Wizard

For the measurement AI function of the ACCTee, the parameters and analysis condition appropriate for the roughness standard and evaluation purpose can be specified. In addition, the optimum measurement condition can be specified by executing trial measurement. The analysis item for the measurement data selected on the document can be displayed by selecting the display items at the end.



Example of measurement AI wizard

#### Pickup Calibration Wizard

Sensitivity calibration is executed by selecting any of the following three options: depth specimen; magnification calibration unit; and reference specimen.

Next, the calibration condition is specified (inputting reference value), the installation method for the calibration unit and the measurement start position are confirmed, then calibration is executed.



Example of pickup calibration wizard

#### Calibration Alarm and Historical Management

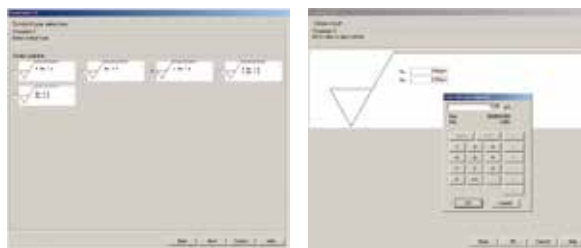
ACCTee can accept any time as the time of calibration. In addition to the probe replacement time, a calibration alert based on measurement frequencies or lapsed days is displayed, helping maintain accurate and stable measurement by ensuring periodical calibration.

#### Stylus Tip Check Wizard

ACCTee can use a depth specimen or reference specimen for the stylus tip check. The tip of the stylus is subject to increasing wear so a regular check is necessary to maintain accurate measurement. With the wizard's guidance, anyone can easily check the stylus tip.

#### Parameter Figure and Symbol Input Wizard

The same symbols used in the design diagram can be input into the design values of the analysis condition and parameter pass/fail judgment.



Example of parameter figure and symbols wizard

Surface Texture Measurement and Analysis Program			
Standard		Complies with JIS2001, JIS1994, JIS1982, ISO1997, ISO1984, DIN1990, ASME2002/1995, CNOMO	
Parameter		Ra, Rq, Ry, Rp, Rv, Rc, Rz, Rmax, Rt, Rz.J, R3z, Sm, S, RΔ a, RΔ q, R λ a, R λ q, TILT A, Ir, Pc, Rsk, Rku, Rk, Rpk, Rvk, Mr1, Mr2, VO, K, tp, Rmr, Rmr2, Rσ c, AVH, Hmax, Hmin, AREA, NCRX, R, Rx, AR, NR, CPM, SR, SAR	
Parameter judgment		The judgment result can be displayed by standard, average value, maximum value, minimum value, and 16 % rule	
Evaluation curve		Profile curve, roughness curve, filtered waviness curve, filtered center line waviness curve, rolling circle waviness curve, rolling circle center line waviness curve, ISO13565-1(DIN4776) roughness curve, roughness motif curve, waviness motif curve, envelope waviness curve	
Surface characteristic display		Bearing area curve, power spectrum curve, amplitude distribution function, ISO13565-2 Bearing area curve, ISO13565-3 Bearing area curve, peak height distribution graph/list, auto correlation graph (option), wear-out amount analysis (two arbitrary curves), overlapping analysis (ten curves max.)	
Form remove (tilt correction)		Least square straight line correction, n-dimension polynomial (n=2 to 9) correction, both ends correction, least square circle correction, least square oval correction, spline correction, robust (spline) correction (arbitrary or first or latter half of the setting range can be specified for all the options)	
Filter	Type		Gaussian phase compensation filter, phase uncompensation type 2RC filters, phase compensation 2RC filters, spline filter, robust (spline) filter
	Cutoff wavelength		0.008, 0.025, 0.08, 0.25, 0.8, 2.5, 8, 25, 50 mm (9 levels), arbitrary (in the range of 0.001 mm to 51 mm)
	λ s filter	Cutoff ratio	1/30, 1/100, 1/300, 1/1000, arbitrary (from 1/10)
		Cutoff wavelength	0.08, 0.25, 0.8, 2.5, 8, 25, 80 μ m (7 levels), arbitrary (in the range of 0.05 μ m to 0.08 μ m)
Stylus calibration		Can be selected from step reference specimen (JIS standard), magnification calibration unit, and reference specimen. Maximum 20 units of stylus calibration information can be registered (deadline for the calibration time can be specified)	
Number of data points		300,000 points max.	
Magnification display	Vertical	Automatic, arbitrary value (unit: 0.01), upper/lower limit value 50, 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k, 200k, 500k, 1000k, 2000k, 5000k, 10000k times	
	Horizontal	Automatic, arbitrary value (unit: 0.01), upper/lower limit value 50, 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k, 200k, 500k, 1000k times	



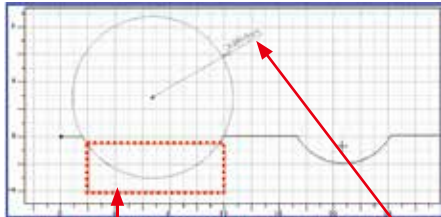


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**ACCTree****Contour Profile Measurement and Analysis system****Calculation Result Preview Function** **Patent pending**

Calculation results can be displayed before output. As a calculation range is changed, a result can be previewed timely. Try & Error analysis is available as many times as necessary while viewing calculation results, which enhances operational efficiency.

Execute element analysis



① Set analysis area

② Temporary dimension line is displayed

Preview is displayed

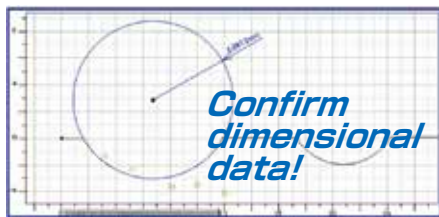


③ Execute re-calculation after changing the area

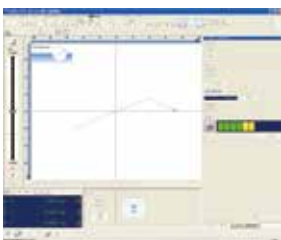
④ Re-calculation result is displayed

**Try & Error**

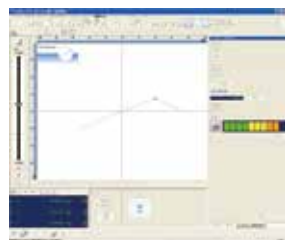
Try &amp; Error analysis is available as many times as necessary

**Confirm dimensional data!****Peak and Valley Function**

There are two modes in this function: Auto mode, in which the minimum point is automatically detected; and Manual mode, in which you turn the knob of the adjustment platform or the tracing driver and changes in color and sound alert you when the level mark on the screen.



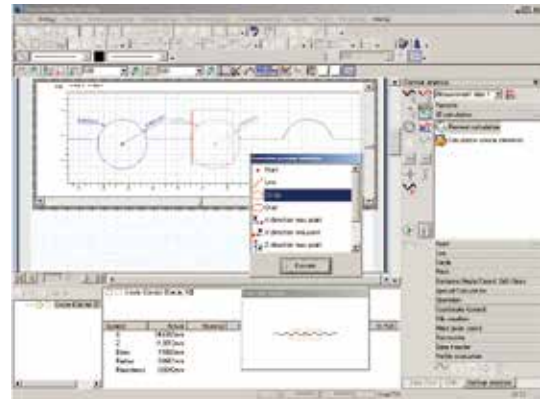
Manual mode detection start



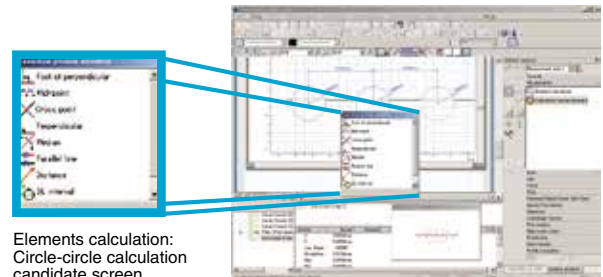
Manual mode maximum point detection

**AI Function (automatic element judgment)** **Patented**

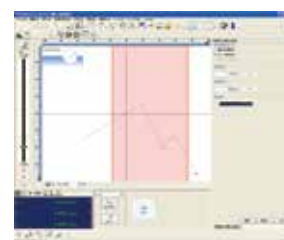
The points, straight lines, and circles of the basic elements are automatically extracted by turning on the AI function and by selecting the specified area of the measurement data. This eliminates the specification of the menu and icon in each case, which significantly reduce the operation procedure.

**Element Calculation with Icon Guidance**

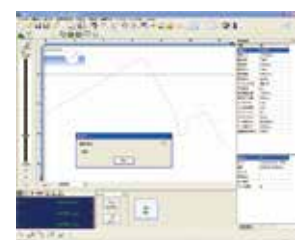
When making a new calculation from any of the multiple elements already created, all possible choices are displayed. Multiple inter element calculations can also be selected to suit your requirements.

Elements calculation:  
Circle-circle calculation  
candidate screen**Work Trace Function**

As this function displays a manually traced profile, it is ideal for determining the measurement limit point when measuring to the edges of a wall or valley with reference to the trace start or end points. It is also useful in situations where a visual check is difficult, such as the inside of a hole. As the start point and the end point can be specified in the profile traced on the screen, the measurement will never fail. The screen changes to show the real-time status of the profile being measured when measurement starts.



Work trace measurement area setting



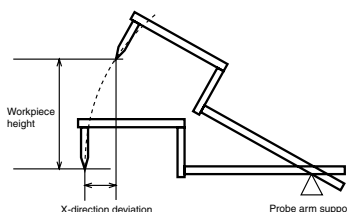
Real-time display

## Contour Profile Measurement and Analysis system

### Master Ball Calibration Function **Patented**

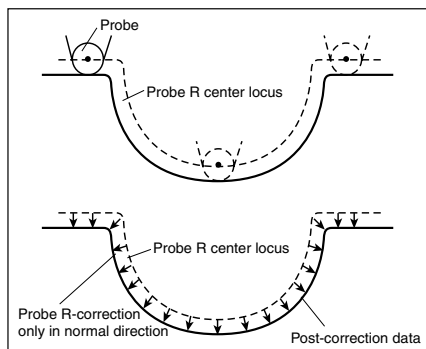
#### Circle correction calculation

Since the probe moves in a circular motion vertically around the support on the contour measuring instrument's probe arm, X-axis data also has errors because the probe tip position also moves in the X-axis direction. These error elements must be corrected in order to achieve high measuring accuracy. The ACCRETECH contour measuring system performs calibration using a master ball calibration unit which enables simple circle error as well as tip R error calibration.

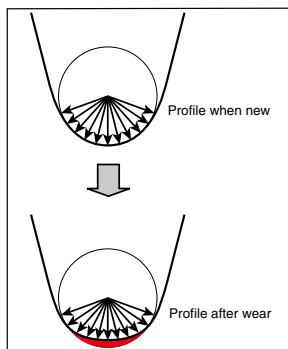


#### Tip R-correction

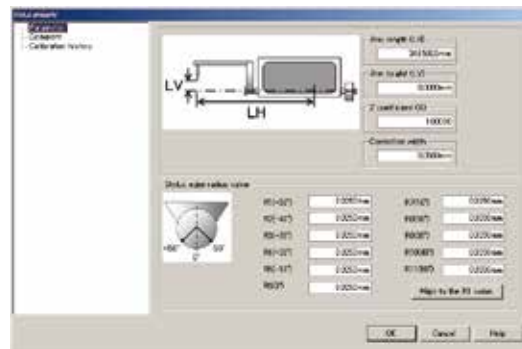
Although the contour measuring instrument's probe tip is R-shaped, tip R-correction is an indispensable factor for high measuring accuracy. Measurements are taken from the center of probe tip R and correction is performed by offsetting in the normal direction at 11 dividing points on the tip (Figure a). Though there is no problem with fixed quantity correction when probe tip R is near maximal generalized roundness zero, large errors occur in the correction amount due to tip R processing tolerance error or wear after long term use (Figure b). In order to make it possible to quickly detect errors, ACCRETECH calculates tip R for every 10° and generates correction values. More than simple R-correction, an original algorithm monitors the status of the probe tip. The operator is alerted by an error indicator whenever the correction value is outside preset limits.



(Figure a)



(Figure b)



Master ball correction screen

### Stylus Calibration Wizard

Stylus calibration is performed by the master ball calibration unit. During masterball measurement and level difference measurement, tip R correction and arc error correction can be executed automatically or manually. The wizard takes you through all necessary steps in the following order: calibration condition (inputting reference value) setting, placement of the calibration unit, confirmation of measurement start point, and execution of calibration.



### Calibration Alert

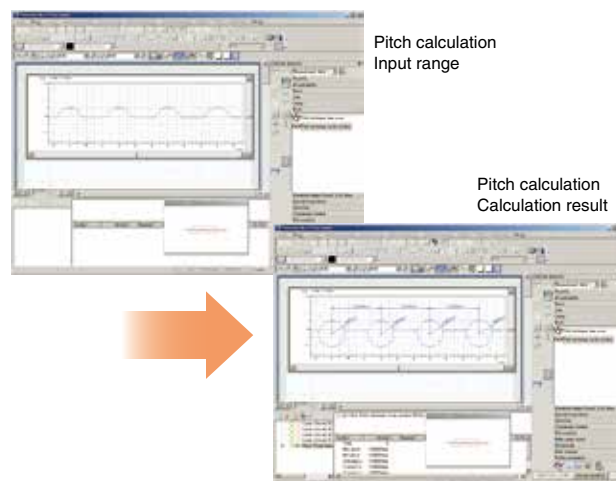
Calibration can be specified at any time. In addition to the stylus replacement time, a calibration alert based on measurement frequencies or elapsed time is displayed periodically, ensuring accurate, stable measurement on a continuous basis.

### Calculation Point Manual Input

When analyzing the same profile repeatedly, it is possible to switch from manual operation to targeted analysis during CNC execution by setting the condition for recalculation, enabling detailed analysis.

### Pitch Calculation Function

For the same multiple profiles composed of circles and straight lines, the pitch between line intersections or the pitch between circle centers can be automatically output just by specifying the arc with the mouse. Analysis efficiency can be improved by using the dimension line auto output function at the same time.

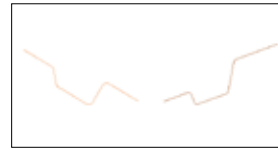


## Profile Synthesis Function

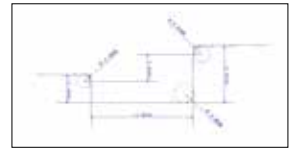
Even for a workpiece that requires measurement for multiple times because of the limitation of the stylus angle, the analysis can be made by combining the data into one using the profile synthesis function.



Profile



Analysis



Measurement

## Edge Detection Measurement Patent pending

You can set the instrument to detect edges during measurement and automatically complete measurement. This is useful when you want to measure the far end of the edge.

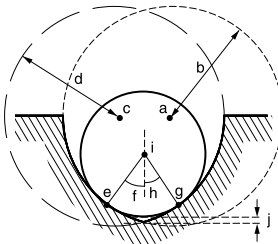
## Import External Data

CAD IGES/DXF data and Calypso Curve measurement data\* are read and evaluated with contour analysis.

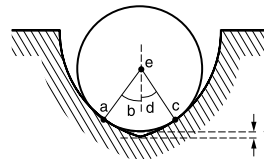
\* Nominal value data output by Calypso optional Form data ASCII input/output program.

## Ball Screw Calculation Function (Option)

Two calculation methods are supported: approximation for a round ball screw groove part, and a method that calculates the groove profile as-is. A lead angle projection function makes it possible to analyze and project data measured in the edge direction in groove and line directions.



Ball Circle Calculation



Ball Screw Probe Calculation

## Best Fit Function (Option)

Best fit function calculates points that are symmetrical to the curve, providing measured data for a non-spherical surface and shifting the origin so these points are the vertices. The origin shift can be configured so X and Z rotation are performed independently, or in combination.

## Non-spherical Surface Nominal Value Generation Function (Option)

This function generates non-spherical surface nominal values using a non-spherical surface calculation formula. After inputting the conic constant, circle radius, number of expression terms, non-spherical surface coefficient value, and other parameters as calculation expression variables, the software generates nominal value point data for a non-spherical surface profile.

Contour Profile Measurement and Analysis Program		
AI function		Automatic distinction of point, straight line, circle
		Automatic distinction of the combination executable of calculation between two elements (point-point, point-straight line, point-circle, point-oval, straight line-straight line, straight line-circle, straight line-oval, circle-circle, circle-oval, oval-oval)
Arithmetic processing	Point	Point, maximum point, foot of perpendicular, mid-point, intersection, contact point, point on straight line, point on circle, inflection point
	Straight line	Straight, perpendicular, median, contact, parallel, bisector, virtual
	Circle	Circle, partial circle, contact circle, virtual circle, oval
	Pitch	Pitch between line cross, pitch between circle centers
	Distance	Distance, path
	Angle	Intersection angle, complementary angle, supplementary angle
	Coordinate	X coordinate difference, Z coordinate difference, angular difference, radius vector difference
	Step difference	Average step, max. step, min. step
	Area	Area
	Arithmetic	Addition, subtraction, multiplication, division, power operation, surplus, absolute value, square root
	Statistics	Average, max. value, min. value, standard deviation, total sum
	Special calculation	Over-pin calculation
Coordinate control		Origin setting, parallel move, rotary move, each axis setting
Measurement support function		Re-measurement function, AI function, wizard functions, self-diagnosis function, CNC function, peak and valley function, work trace function, dimension line display function, profile synthesis function, collation function with form and nominal value, coordinate system automatic setting function
Calculation support function		Infinite cursor, cursor form vertical/horizontal switch, one point micro motion, setting of error band
Data file input and output		Input of point sequence, text, CSV, IGES, DXF data and Calypso data
Stylus calibration		Automatic and manual calibration by master ball calibration unit. Maximum 20 units of stylus calibration information can be registered (deadline for the calibration time can be specified)
Measure pitch		0.01 $\mu\text{m}$ to 1000 $\mu\text{m}$
Number of data points		300,000 points max.
Magnification display	Vertical	Arbitrary value (unit: 0.01), automatic and 0.01 to 10,000,000 times
	Horizontal	Arbitrary value (unit: 0.01), automatic and 0.01 to 10,000,000 times

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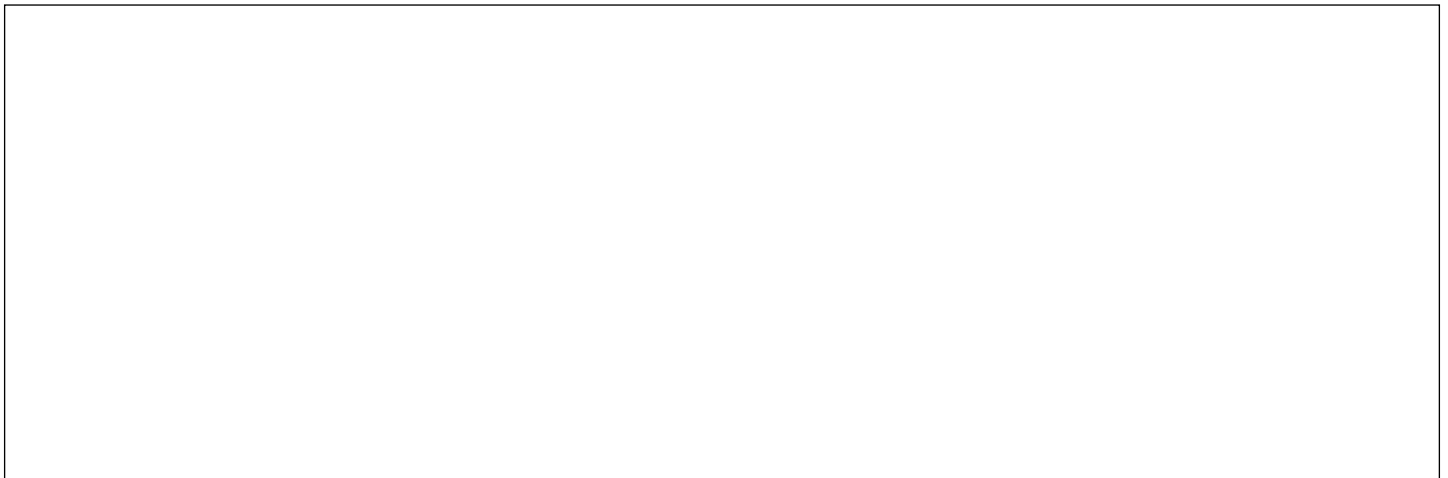
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