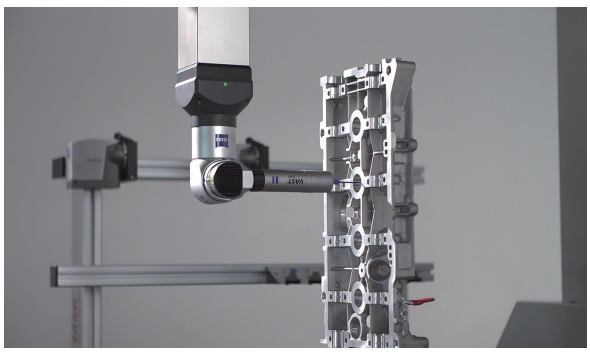
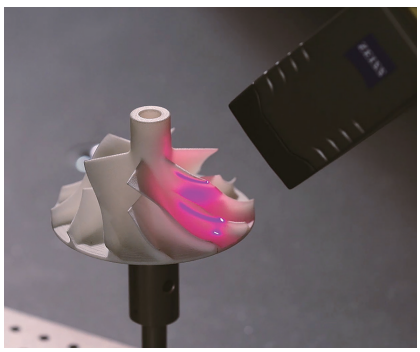
A global standard 3D coordinate measuring machine featuring high accuracy, high speed and high environmental resistance and supporting a variety of probe systems

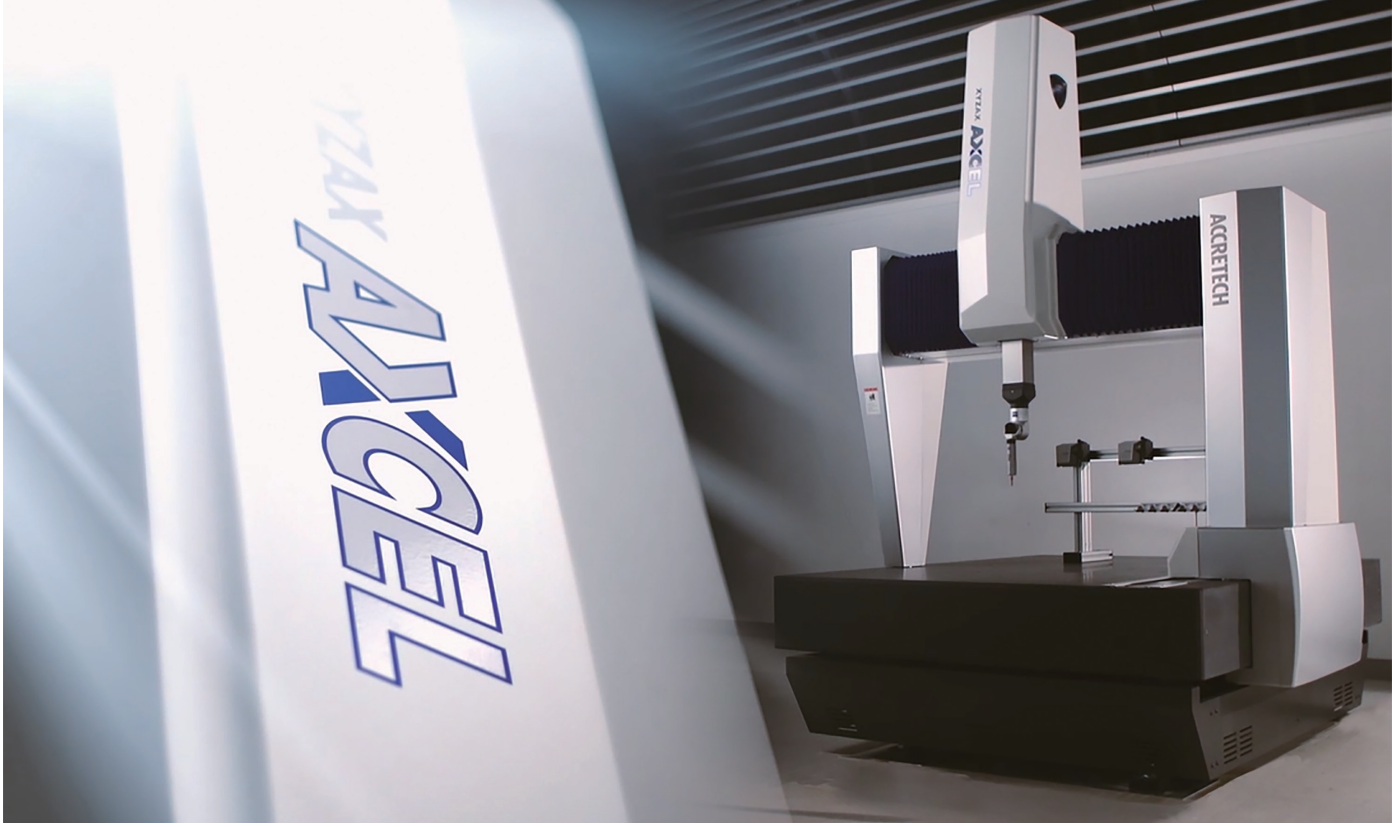
XYZAX AXCEL

In every industry, there are ever diversifying needs for measuring machines - high-accuracy measurement of parts manufactured with increasingly high accuracy, reduction in measurement time during the inspection, improvement in throughput, measurement of parts having complicated shapes, etc.
XYZAX AXCEL achieves higher accuracy, higher drive speed and a wider accuracy guarantee temperature range.
What's more, it allows various types of probe system to be selected as appropriate for the intended purpose, making it possible to deal with any kind of application.

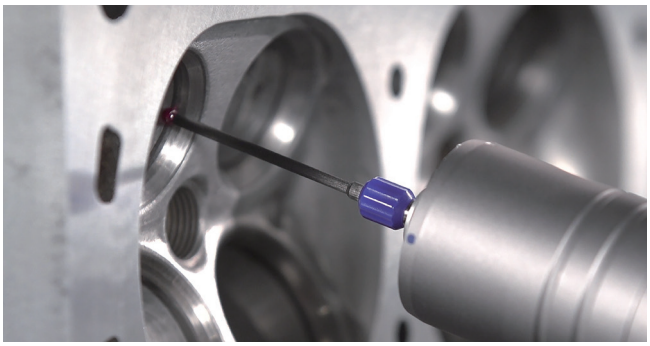
XYZAX AXCEL - a machine that we have positioned as a new global standard - meets the increasingly diverse needs.







Class highest level accuracy



Maximum permissible error of length measurement : E0, MPE (μm)

Up to the size of 10/15/8

1.8 + 3L / 1000

Featuring a newly developed highly rigid bridge and a new structure in which the Y-axis guide is supported by air pads from four directions (top, bottom, left and right), XYZAX AXCEL offers best-in-class accuracy.

Stunning speed realized by a newly developed driving mechanism

Drive speed 700 mm/sec max. → **Up 64% max. compared to our previous models**

Acceleration 2300 mm/sec² max. → **Up 35% max. compared to our previous models**

The driver of each axis uses a newly developed driving mechanism to enable high-speed and stable drive.
A change from the former belt-driven method to the newly developed drive system dramatically improves maneuverability.
This newly developed driving mechanism increases the drive speed by 64% and acceleration by 35% (compared to our previous models).
The new mechanism reduces the total time required for measurement, significantly increasing the measurement efficiency.

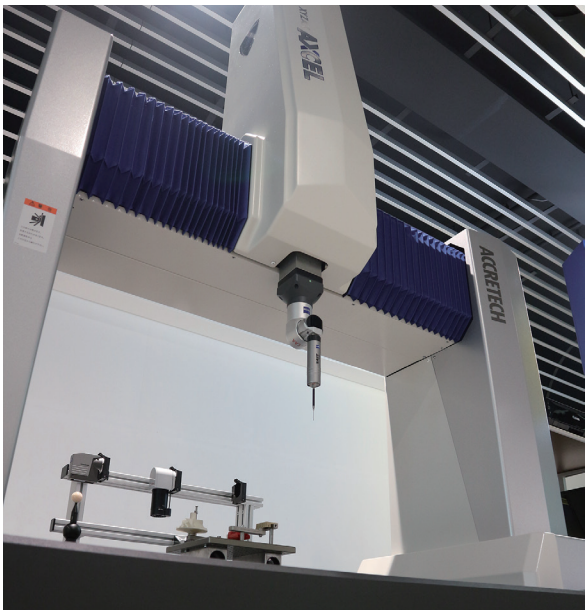
Wide temperature range for guarantee accuracy 15 to 30°C*

A newly designed cover is used that prevents the X-axis guide and Y-axis carriage from being affected directly by temperature changes. Furthermore, by adopting a structure designed to suppress the deformation of the stone worktable due to temperature changes, XYZAX AXCEL minimizes the impact of temperature changes. It supports a substantially wider accuracy guarantee temperature range of 15 - 30°C* while maintaining high accuracy.
This temperature range for guarantee accuracy helps you save the cost for temperature control in the measuring room.

*RDS type standard. PH type is optional

Elemental technologies to enable higher accuracy

Newly developed highly rigid bridge



Y direction

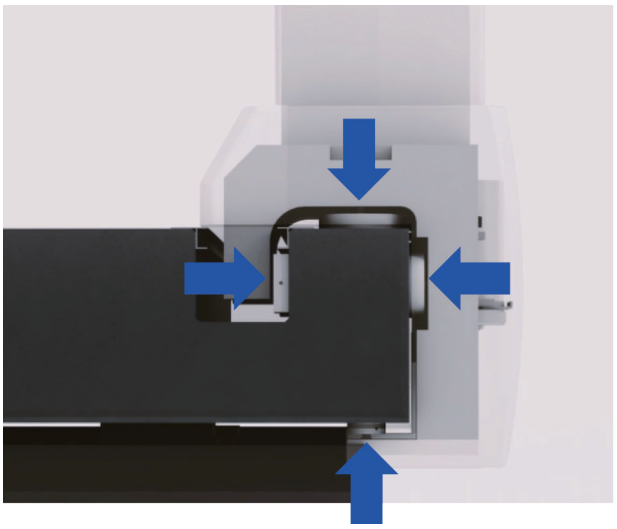
3.8 times as rigid as previous models

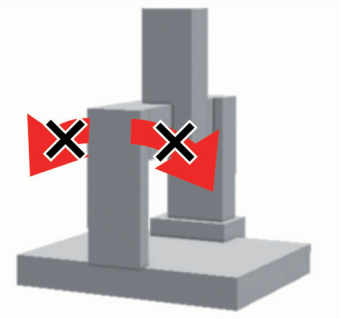
Torsion direction

1.5 times as rigid as previous models

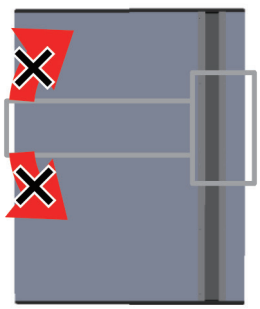
The rigidity of the bridge, an essential part of a 3D coordinate measuring machine, has a great impact on the accuracy of measurement.
XYZAX AXCEL uses a newly developed highly rigid bridge. With its X-axis guide structure entirely redesigned, this machine now provides substantially higher rigidity both in the Y direction and torsion direction.
This newly developed highly rigid bridge is the biggest factor in achieving high accuracy for XYZAX AXCEL.

Y-axis supported by air pads from four directions patented





Reduction in runout in the pitching direction

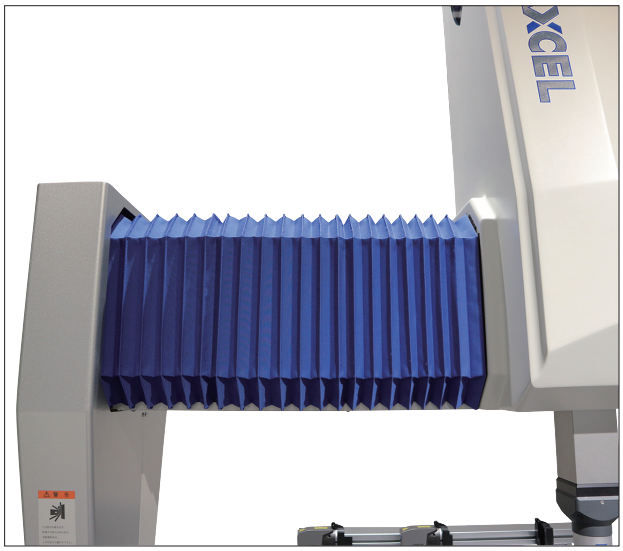


Reduction in runout in the yawing direction

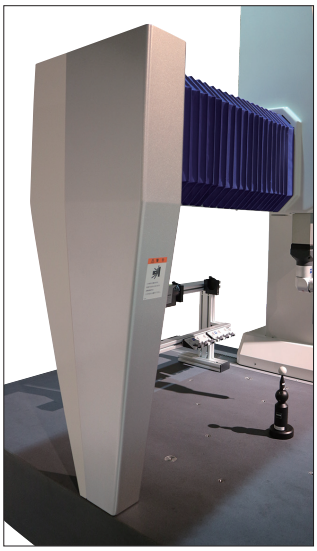
In addition to the highly rigid bridge, XYZAX AXCEL adopts a newly developed support structure in which the Y-axis guide is supported by air pads from four directions (top, bottom, left and right) (patented).
This structure reduces the runout that occurs in the pitching direction and yawing direction when the bridge is moved in the Y direction.
Reducing the vibration at the tip of the probe makes the machine even more accurate.

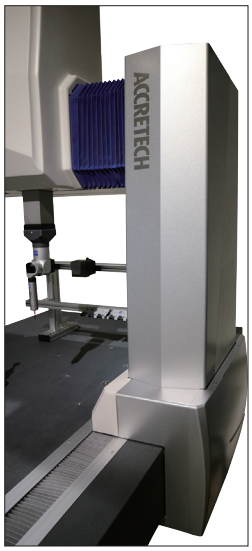
Elemental technologies to expand the temperature range for accuracy guarantee

X-axis guide cover* / Y-axis carriage cover



X-axis guide cover





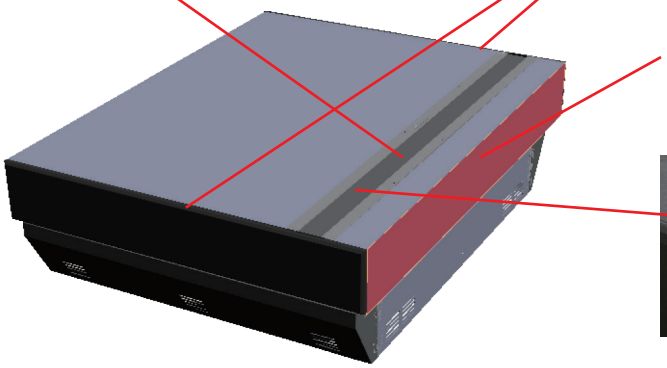
Y-axis carriage cover

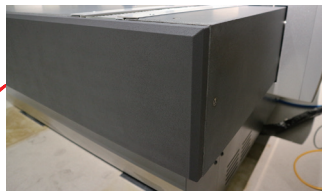
New developed covers are adopted for the X-axis guide and Y-axis carriage.
Protecting the guide and carriage with covers reduces the impact of temperature changes, which enables to expanding the temperature range for guarantee accuracy of XYZAX AXCEL.
The X-axis guide cover also prevents contaminants from attaching to the X-axis guide.

*Standard feature for the RDS type. For the PH type, the cover is a standard feature for 10/10/6 and larger sizes and an option for other sizes.

Worktable structure to suppress the impact of temperature changes patented

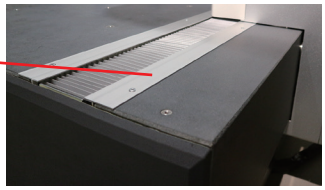
Y-axis groove structure that prevents heat generated by the motor or other parts from entering the measurement area of the worktable





Special insulating material that reduces heat coming in and out of the front and rear of the worktable to suppress the generation of a temperature gradient

Uncovered Y-axis guide to dissipate heat



Y-axis shutter structure that suppresses the inflow of ambient air as well as prevents contaminants from attaching to the scale inside

Since the stone worktable is low in thermal conductivity, heat is not readily transferred to the inside. If the ambient temperature changes, a temperature gradient persists for a long time until the temperature inside the worktable becomes uniform.
Such a temperature gradient deforms the worktable, which causes a decrease in straightness of the worktable surface, resulting in lower measurement accuracy.
XYZAX AXCEL solves these problems by adopting a Y-axis groove structure, installing insulating material at the front and rear ends of the worktable and introducing an uncovered Y-axis guide structure designed to dissipate heat.

Features and options for enhanced performance

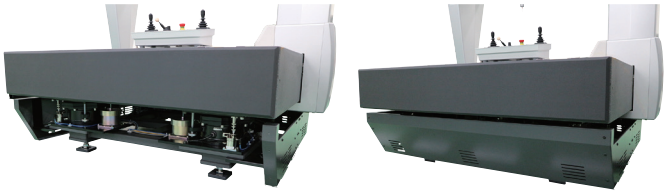
Air Saver function (standard feature) effective for power saving and running cost cutting

XYZAX AXCEL features the Air Saver function that automatically stops the supply of compressed air when the machine is idling, as automobiles stop idling. This reduces the unnecessary consumption of air, contributing to power saving and running cost cutting.

Air anti-vibration unit to reduce the transmission of vibration from the floor (standard feature for Z800 and larger sizes*)

An air anti-vibration unit can be mounted in XYZAX AXCEL. It reduces the transmission of vibration from the floor and suppresses its impact.
Since mounting the air anti-vibration unit does not change the dimensions of the machine, you can use it without worrying about the installation space.

*Option for Z600 and smaller sizes. A base cover is attached for mounting the air anti-vibration table.

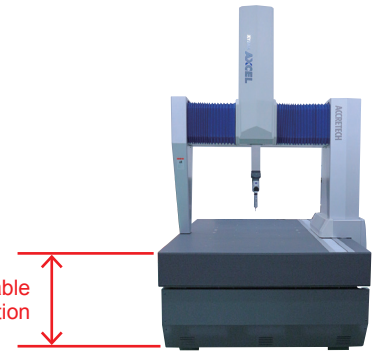


Anti-vibration unit (left) and base cover attached to the anti-vibration unit (right)

The special stand specification to which the height from a floor to the surface of the table is changed (option*)

Although the height from a floor to the surface of the table of XYZAX AXCEL is 600 mm (Z600 size) or 630 mm (Z800 and Z1000 size), it is enable to change the height as the special stand specification (example: 800 mm specification with which it might be easy to operate even while standing up).

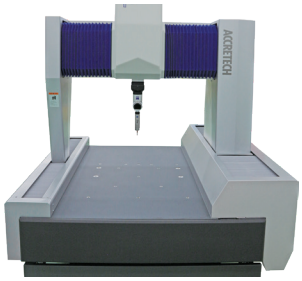
*This option is a factory option.



Covers for both Y axis guides (option*)

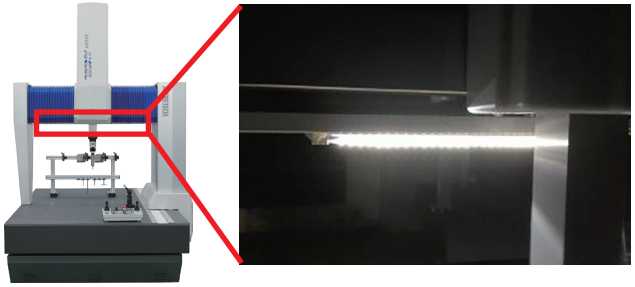
Covering both the right and left Y axis guides can protect the guide surfaces, preventing dust adhesion and occurrence of scratches caused by contact with workpieces and jigs. This option is effective when using XYZAX AXCEL outside the measurement room, such as inside the workshop, as it enhances the environmental resistance of the machine, combined with the wide range of accuracy guarantee temperature.

*This option is a factory option.



LED light function (option)

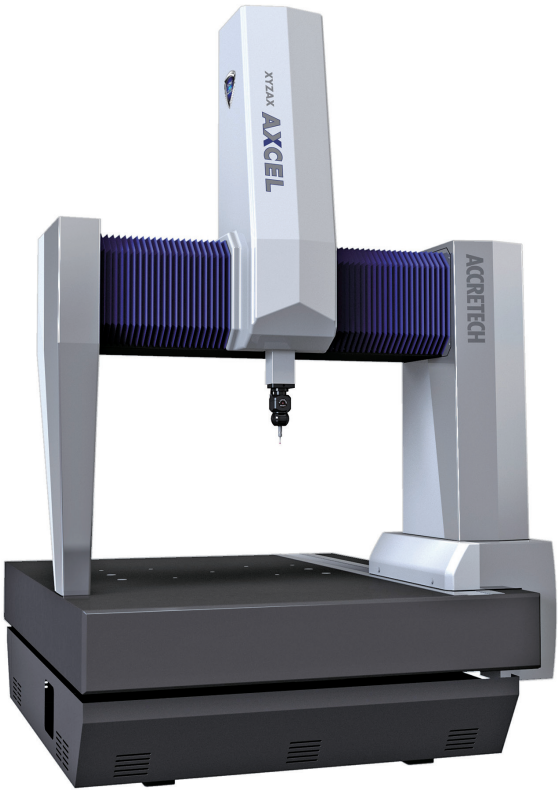
An LED light to illuminate the worktable can be mounted as an option below the X-axis guide. The light brightly illuminates the area around your hands and minute parts of the workpiece, leading to enhanced operability.



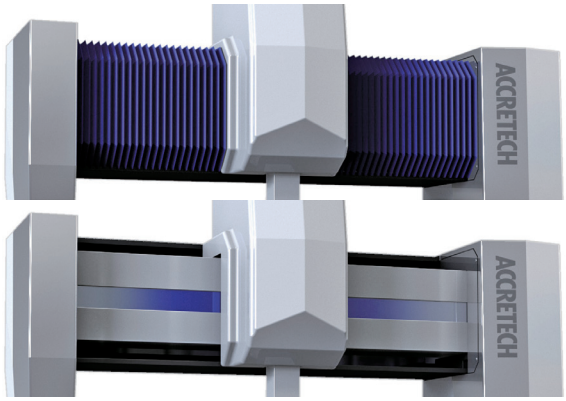
XYZAX AXCEL PH

With the point measurement models of the AXCEL series, you can select from among various specifications based on your specific needs.

Without the X-axis guide cover and with the base cover



With the X-axis guide cover and base cover



With the guide cover (top) /
Without the guide cover (bottom)

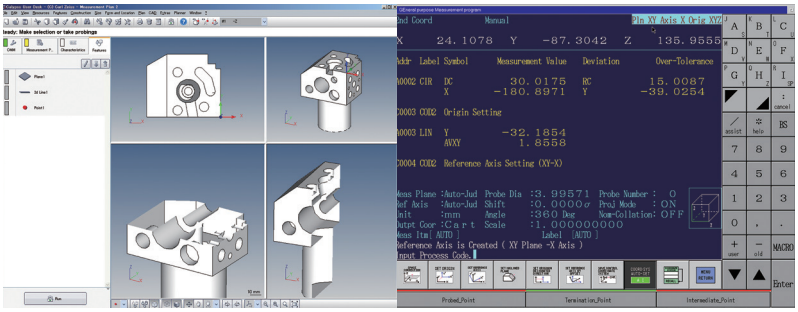
Temperature range for guaranteed accuracy / X-axis guide cover

As the temperature range for guaranteed accuracy for XYZAX AXCEL PH, you can choose between 16 - 26°C (standard) and 15 - 30°C (option) (for all sizes).
If you select 16 - 26°C as the temperature range for guaranteed accuracy for 9/15/6 or smaller size, you can choose not to use the X-axis guide cover.
You can select specifications according to the installation environment of the measuring machine and your budget.

With the base cover (top) /
Without the base cover (bottom)

Base cover

You can also select whether or not to use the base cover intended to cover the lower part of the machine (when the size of machine is Z600 or smaller and the optional air anti-vibration unit is not used).
Not using the base cover is effective when you want to keep the initial cost as low as possible.

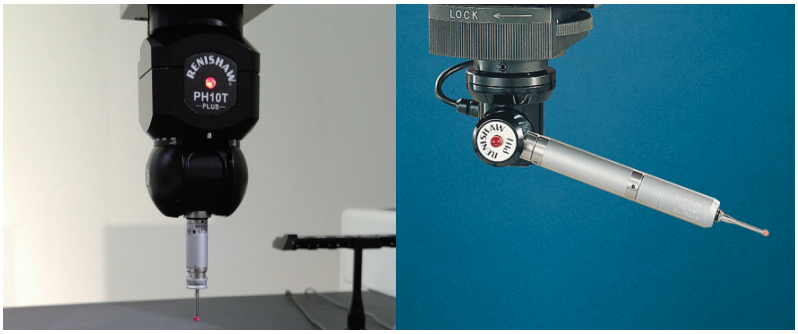


CALYPSO screen example

XYANA2000 screen example

Measurement and analysis software

There are two types of measurement and analysis software that you can select to use for XYZAX AXCEL PH. “CALYPSO” lets you import CAD models and conduct measurement and analysis graphically. “XYANA2000” is simple-to-operate software that you can use just like vernier calipers.

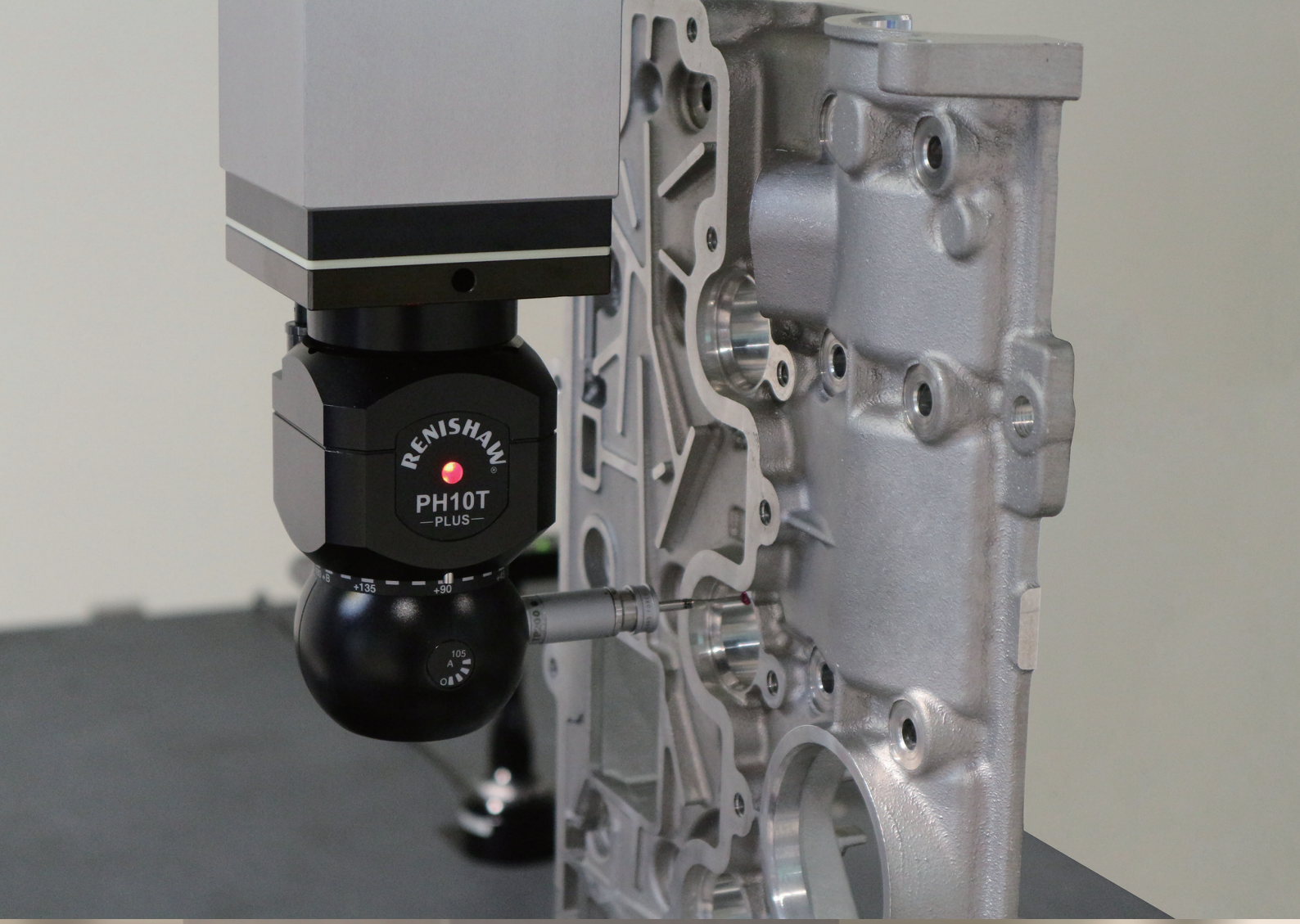


PH10T PLUS + TP200

PH1 + TP2

Probe composition

The probe composition of XYZAX AXCEL PH can be selected according to whether the measurement position is to be changed automatically or manually, as well as your specific needs such as the use of modules that differ in the stylus length, measurement force, etc.
(For details, see the next page.)



ACCRETECH TOKYO SEIMITSU

Motorized indexing probe head

PH10T PLUS

PH10T PLUS is a motorized indexing probe head whose horizontal surface rotation angle is ±180° and whose vertical surface rotation angle is 0 to ±105°. It allows positioning at a pitch of 7.5° in both directions.
When a CNC measurement plan is executed, the probe automatically rotates at a specified angle to conduct measurement.
You can attach one of two types of probe. TP200 supports a long stylus with low measuring force, and TP20 allows you to select various modules according to the intended application.
For both TP200 and TP20, you can use the optional stylus changer rack that enables automatic stylus change.

Modules that can be selected according to the application

	Modules	Max. stylus length (mm)	Measuring force (N)	Sense directions
TP200	SF (standard) For stylus with tip diameter ＞Φ1	100 (at use of GF stylus)	XY : 0.02, Z : 0.07 (at use of 50 mm stylus)	±X, ±Y, ±Z
	LF (option) For stylus with tip diameter ＜Φ1	50 (at use of GF stylus)		
	EO (option) Extended + Z overtravel	100 (at use of GF stylus)		
TP20	SF (standard)	50 (at use of GF stylus)	XY : 0.055, Z : 0.65 (at use of 10 mm stylus)	±X, ±Y, Z
	LF (option)	30	XY : 0.08, Z : 0.75 (at use of 10 mm stylus)	
	MF (option)	60	XY : 0.1, Z : 1.9 (at use of 25 mm stylus)	
	EF (option)	60	XY : 0.1, Z : 3.2 (at use of 50 mm stylus)	
	6W (option)	30	XY : 0.14, Z : 1.6 (at use of 10 mm stylus)	±X, ±Y, ±Z
	EM1 STD (option) With 50 mm extension	50 (at use of GF stylus)	XY : 0.08, Z : 0.75 (at use of 10 mm stylus)	±X, ±Y, Z
	EM2 STD (option) With 75 mm extension			

Manual positioning probe head

PH1+TP2

PH1 is a manual positioning probe head that allows positioning at the horizontal surface rotation angle of 360° (15° pitch) and vertical surface rotation angle of ±115°.
Its measurement position can be changed easily using the accompanying wrench.
Use PH1 with the TP2 probe attached to it.

Specifications

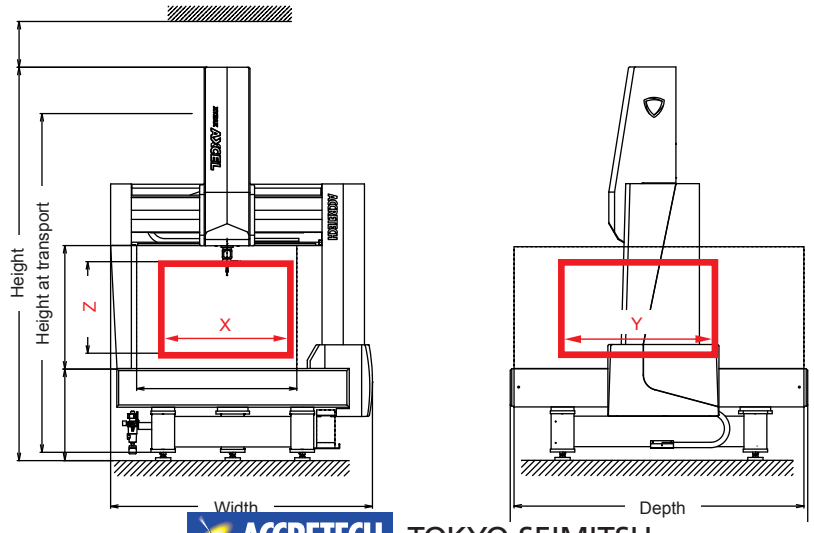
Model					XYZAX AXCEL PH										
					7/5/5	7/7/5	9/6/6	9/10/6	9/15/6	10/10/6	10/12/6	10/15/6	10/10/8	10/12/8	10/15/8
Measuring Range		X-axis		(mm)	650		850			1000			1000		
		Y-axis		(mm)	500	700	600	1000	1500	1000	1200	1500	1000	1200	1500
		Z-axis		(mm)	480		600						800		
Measuring length scale					Linear scale										
Minimum display value				(µm)	0.01										
Measurement accuracy*1	PH10T PLUS +TP200	Maximum permissible error of length measurement: $E_{0,MPE}$ $E_{150,MPE}$	Temperature condition A	(µm)	1.8 + 3L/1000 2.3 + 3L/1000										
			Temperature condition C	(µm)	1.8 + 4L/1000 2.3 + 4L/1000										
			Temperature condition E*2	(µm)	1.8 + 5L/1000 2.3 + 5L/1000										
		Maximum permissible of the repeatability range: $R_{0,MPL}$		(µm)	1.5								1.8		
		Maximum permissible scanning probing error: $P_{FTU,MPE}$		(µm)	2.0								2.4		
Guidance system for each axis					Air bearings										
Table		Material			Gabbro										
		Usable width (X)		(mm)	950		1050			1200			1270		
		Usable depth (Y)		(mm)	1400	1600	1500	1900	2400	1900	2100	2400	2000	2200	2500
		Height from floor		(mm)	600		600						630		
		Flatness			JIS Class 1										
		Clamping screw for workpiece			M10 threaded hole										
Workpiece		Max. height		(mm)	670		790						1000		
		Max. weight		(kg)	600	800	800	1000	1500	1000	1200	1500	1000	1200	1500
Drive speed		Max. acceleration/deceleration		(mm/s^2)	2300										
		Valiable speed range		(mm/s)	Auto measurement mode 0.01 - 700 (Stepless control)										
				(mm/s)	Joystick and manual mode (Automatic measurement) 0 - 120 (Stepless control)										
		Measuring speed		(mm/s)	Joystick and manual mode (Automatic measurement) 0 - 5										
Accuracy guarantee environmental temperature conditions		Environmental temperature	Temperature condition A	(°C)	18 - 22										
			Temperature condition C	(°C)	16 - 26										
			Temperature condition E*2	(°C)	15 - 30										
		Temperature changes	Temperature condition A	(°C/hour)	1.0										
				(°C/day)	2.0										
			Temperature condition C	(°C/hour)	1.0										
				(°C/day)	2.0										
			Temperature condition E*2	(°C/hour)	2.0										
				(°C/day)	5.0										
		Temperature gradient	Temperature condition A	(°C/m)	1.0										
			Temperature condition C	(°C/m)	1.0										
			Temperature condition E*2	(°C/m)	1.0										
Air supply		Supply pressure / Working pressure		(MPa)	0.49 - 0.69 / 0.39										
		Consumption		(NL/min)	55								85		
Power supply		Voltage		(V/%)	AC100/110/115/120/125/220/230/240 ±10 (adjusted in factory shipping) (grounding required)										
		Power consumption		(W)	1210		1210			1350			1500		
External dimensions and mass		External dimensions	Width	(mm)	1462		1716			1866			1930		
			Depth	(mm)	1450	1650	1550	1950	2450	1950	2150	2450	2050	2250	2550
			Height	(mm)	2339		2578						3015		
		Body mass		(kg)	1610	1800	2100	2550	3150	2850	3100	3450	3800	4100	4600
		Machine height at transport*3		(mm)	1940		2080						2200		

*1 The measuring accuracy is based on the following evaluation methods and use of standard stylus.
<Evaluation methods>
$E_{0,MPE}$, $E_{150,MPE}$ and $R_{0,MPL}$ … JIS B 7440-2: 2013 (ISO 10360-2: 2009)
$P_{FTU,MPE}$ … JIS B7440-5: 2013 (ISO 10360-5: 2010)
<Standard stylus>
$E_{0,MPE}$, $E_{150,MPE}$, $R_{0,MPL}$ and $P_{FTU,MPE}$ … Tip diameter: Φ4, Length: 20 mm

*2 Adapting to temperature condition E is optional.

*3 Be sure to check the height of passageways, and, in particular, the height of doors and other openings to be used when the ma chine is delivered.The height of openings needs to be thespecified each machine height at transport plus about 200 mm to allow for the dollies used to move the machines.

External View



XYZAX AXCEL PH		
12/15/10	12/20/10	12/25/10
1200		
1500	2000	2500
1000		
Linear scale		
0.01		
2.4 + 3L/1000 2.9 + 3L/1000		
2.4 + 4L/1000 2.9 + 4L/1000		
2.4 + 5L/1000 2.9 + 5L/1000		
2.4		
3.0		
Air bearings		
Gabbro		
1470		
2500	3100	3600
630		
JIS Class 1		
M10 threaded hole		
1200		
1500		1000
2300		
Auto measurement mode 0.01 - 700 (Stepless control)		
Joystick and manual mode (Automatic measurement) 0 - 120 (Stepless control)		
Joystick and manual mode (Automatic measurement) 0 - 5		
18 - 22		
16 - 26		
15 - 30		
1.0		
2.0		
1.0		
2.0		
2.0		
5.0		
1.0		
1.0		
1.0		
0.49 - 0.69 / 0.39		
90		
AC100/110/115/120/125/220/230/240 ±10 (adjusted in factory shipping) (grounding required)		
1500		
2180		
2550	3150	3650
3415		
5200	6300	7600
2600		

XYZAX AXCEL PH probe composition