

## STRATO-APEX

PRECISION MEETS SPEED

COORDINATE  
MEASURING MACHINES



## STRATO-Apex: Simply more.

The challenges for measurement equipment are rising. Products are continuously improving – as a result the lifetime of products is increasing while their energy consumption is reduced. Additionally, the throughput of production is driven up. All these facts must be taken into account for your measuring equipment. With the STRATO-Apex CMM, Mitutoyo offers you the opportunity to match both: precision and velocity.

Because you need more!

### More precision.

The STRATO-Apex CMM is equipped with special glass scales originally designed for our high-end CMM series "LEGEX". These scales lead to a resolution of 20 nanometer – that's 0,00002 mm! The scales are made from Zeroglass which has the positive effect that its length is not changing with temperature. These scales lead to a basic accuracy of 0.9  $\mu\text{m}$  and enable you to reach even very small tolerances.



### More efficiency.

The new controller UC400 provides a high scanning speed of up to 100mm/s. Additionally, STRATO-Apex is ready for multi-sensor measurements: single points in touch-trigger mode, scanning, laser scanning with the new SurfaceMeasure line laser probe, vision system QV-P. Almost all kinds of measurement tasks can be handled with the STRATO-Apex – at high accuracy.

### More strength.

The STRATO-Apex contains special features to reach your quality goals. Besides a **thermal compensation unit** it provides an **active vibration damping system** to eliminate the environmental impacts of your measuring tasks – as standard!

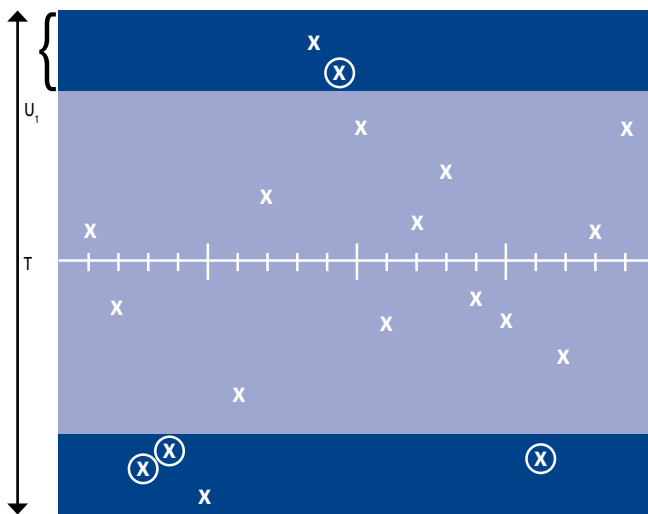


# STRATO-Apex

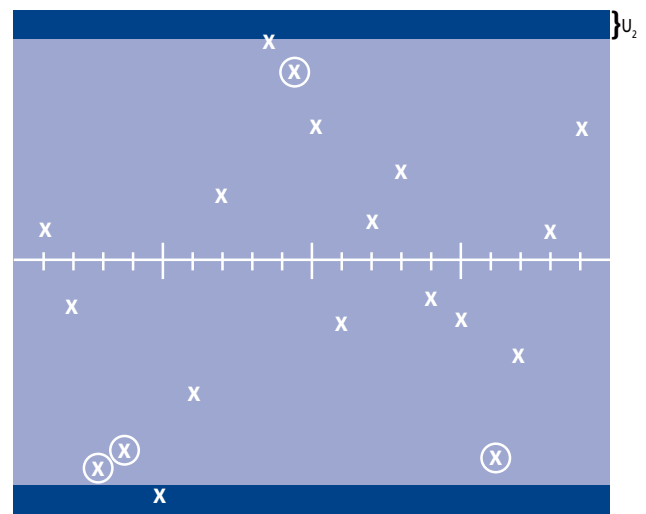
## More tolerance.

The high accuracy of the STRATO-Apex reduces the measurement uncertainty. This leads to more tolerance left for whom it belongs – your production!

### Standard CMM



### STRATO-Apex



The tolerance zone T is decreasing with measurement uncertainty U. Having a smaller uncertainty like the Strato-Apex, allows you to judge more products as "Go".

## With STRATO-Apex, Mitutoyo offers you:

- a higher acceptance of your results
- more trust in your products
- more confidence in your production
- less rework or parts identified as scrap
- to reach new markets with high-precision parts.

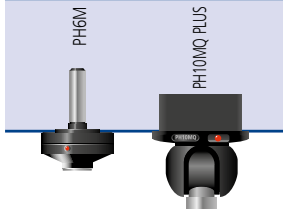


Vibration-damping unit with auto-levelling air springs

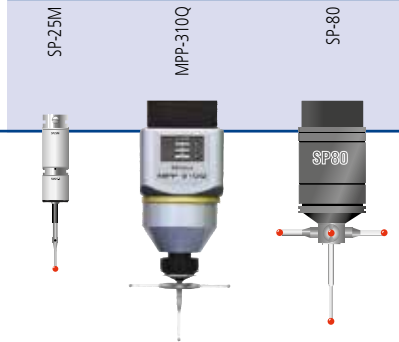


# Probe systems – for the right touch.

## Measuring probe holder heads



## Dynamic measuring probes systems



## Surface Roughness probe



## Optical measuring heads



## Probe change system

MRS-ACR3



**Mitutoyo aims to offer you the measurement system that fits best to your measurement task:**

- Tactile scanning probes like SP25M or SP80 for fast measurements at a high point density,
- Vision systems for fast 2.5D measurements
- Laser scanner for inspection and reverse engineering
- Automatic surface roughness measurement on the Coordinate Measuring Machines.
- Automatic changing racks for flexible multi-sensor measurements reducing the downtime to a minimum.



# Software

**MiCAT**

Mitutoyo Intelligent Computer Aided Technology

the standard in world metrology software

**CMM**

## MiCAT Planner – The next generation of CMM software

- › Fully automated part program generation
- › Based on your individual measurement strategy
- › Saves up to 95% programming time & costs
- › Boost Your Productivity!!



## MCOSMOS – The modular software for all kinds of measurement

Mitutoyo offers the following packages and options:

<b>MCOSMOS-1:</b>	The basic software package for prismatic workpieces. Easy programming of geometrical elements by joystick control or input of nominal values. Special features like clearance height or automatic element recognition help you to prevent collisions and to reduce the programming time.
<b>MCOSMOS-2:</b>	The CAD package for freeform surfaces and geometric elements. Why typing-in parameters when all features are already available in the CAD model? CAD based programming offers you the way to cut down the programming time once more. GD&T entities inside the CAD file helps you to measure all essential features.
<b>MCOSMOS-3:</b>	The full package. MCOSMOS-3 provides additional tools for measurement evaluation of contours in 2D or on the CAD model.
<b>MCOSMOS Offline:</b>	All three packages are available as an offline version. Programming in offline mode keeps the CMM free for real measurements. Since you only need the CAD file for programming, you don't even have to wait for the first part being produced. Many CAD interfaces like CATIA or PRO/E are available. That enables you to import your CAD models without any data getting lost. VIRTUAL MCOSMOS-2 can be ordered as multi-license package for 5 and 10 users.
<b>MeasurLink:</b>	SPC software with certified AQDEF interface. Allows you to collect data from different vendors and devices. Its database offers you to collect data worldwide, analyse your process and create individual reports.
<b>Gearpak:</b>	Turn your CMM into a gear measurement device! Extend your capabilities, measure gears, worm gears, helical gears. Just input the gear parameters - the rest will be done by Gearpak: measurement strategy, path generation, probe changes, and of course the measurement report of your gear.

# STRATO-Apex 574



STRATO-Apex 574

## Specifications

Item		STRATO-Apex 574	
Measuring range	X	500 mm	
	Y	700 mm	
	Z	400 mm	
Guide method		Air bearings on all axes (static pressure air bearings)	
Drive speed	CNC mode	Drive speed: From 8 to 300 mm/s for each axis (maximum combined speed: 519 mm/s)	
		Measuring Speed 1 – 3 mm/s	
	J/S mode	Drive Speed 0 – 80 mm/s	
		Measuring Speed 0 – 3 mm/s	
Drive acceleration		Fine-positioning Speed 0.05 mm/s	
Measuring method		1,330 mm/s <sup>2</sup> for each axis (maximum combined acceleration: 2,310 mm/s <sup>2</sup> )	
Resolution		Linear encoder 0.00005 mm	
Work table	Material	Granite	
	Size (table surface)	676 × 1420 mm	
	Tapped inserts	M8 × 1.25 mm	
Workpiece	Maximum height	560 mm	
	Maximum mass	180 kg	
Machine mass (includes the vibration-damping platform and controller, but not workpiece)		1530 kg	
Power supply specifications (including the probe option interface)		Power supply voltage: AC100-120/200-240 V ± 10%; power supply capacity: 700 W (of which 170 W is used for the probe option interface)	
Air supply	Pressure	0.4 MPa	
	Consumption	60 L/min under normal conditions (air source: at least 120 L/min)	
Guaranteed accuracy temperature environment	Temperature range		18 – 22 °C
	Temperature change	Per hour	1.0 K
		Per 24 hours	2.0 K
	Temperature gradient	vertical/horizontal	1.0 K/m

\* While the appearance of the natural stone measuring table varies according to the source, the high stability for which this material is known can always be relied upon.

### Length measurement error unit: μm

Standard	Probe used	Max. permissible length measurement error
ISO 10360-2: 2009	SP25M	$E_{0, MPE} = 0.7 + 2.5L/1000$
		$E_{150, MPE} = 0.7 + 2.5L/1000$

### Repeatability unit: μm

Standard	Probe used	Repeatability range of $E_0$
ISO 10360-2: 2009	SP25M	$R_0, MPL = 0.7$

### Single stylus form error unit: μm

Standard	Probe used	Max. permissible single stylus form error
ISO 10360-5: 2010	SP25M	$P_{FTU, MPE} = 0.7$

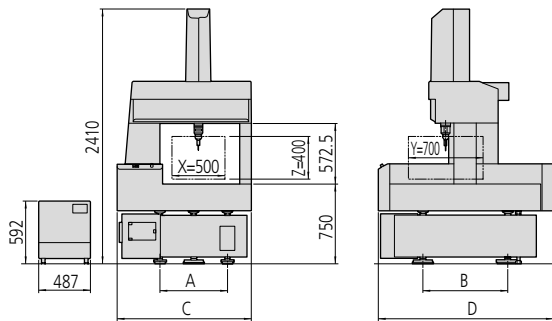
### Scanning probing error unit: μm

Standard	Probe used	Maximum permissible scanning probing error (Maximum permissible scanning test time) [sec]
ISO 10360-4: 2000	SP25M	$MPE_{THP} = 1.3$ ( $MPT_{THP} = 40$ )

# Specifications

## Dimensions

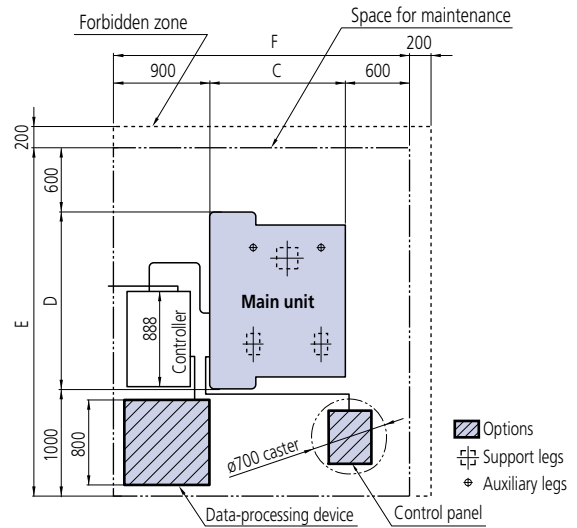
unit: mm



Item	STRATO-Apex 574
A	635
B	800
C	1270
D	1650
E	3250
F	2765

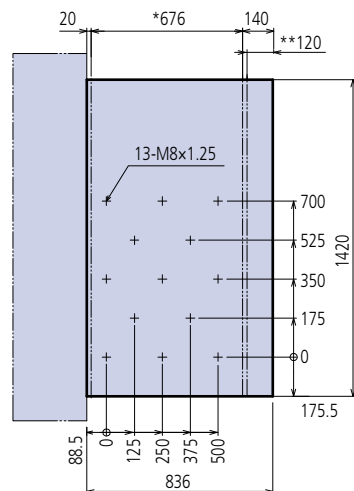
## Installation floor space

unit: mm



## Tapped insert positions in the table surface

unit: mm



STRATO-Apex 574

- \* Workpiece loading area
- \*\* Y-axis guiding surface

# STRATO-Apex 700/900 Series



STRATO-Apex 776



STRATO-Apex 9106

## Specifications

Item		STRATO-Apex 776	STRATO-Apex 7106	STRATO-Apex 9106	STRATO-Apex 9166
Measuring range	X	705 mm		905 mm	
	Y	705 mm	1005 mm		1605 mm
	Z	605 mm			
Guide method		Air bearings on all axes (static pressure air bearings)			
Drive speed	CNC mode	Drive speed: From 8 to 300 mm/s for each axis (maximum combined speed: 519 mm/s)			
		Measuring speed 1 – 3 mm/s			
	J/S mode	Drive speed 0 – 80 mm/s Measuring speed 0 – 3 mm/s Fine-positioning speed 0.05 mm/s			
Drive acceleration		1.500 mm/s <sup>2</sup> for each axis (maximum combined acceleration: 2.598 mm/s <sup>2</sup> )			
Measuring method		Linear encoder			
Resolution		0.00002 mm			
Work table	Material	Granite			
	Size (table surface)	880 x 1420 mm	880 x 1720 mm	1080 x 1720 mm	1080 x 2320 mm
	Tapped inserts	M8 x 1.25 mm			
Workpiece	Maximum height	770 mm			
	Maximum mass	500 kg	800 kg	800 kg	1200 kg
Machine mass (includes the vibration-damping platform and controller, but not workpiece)		1895 kg	2180 kg	2410 kg	3085 kg
Power supply specifications (including the probe option interface)		Power supply voltage: AC100-120/200-240 V ± 10%; power supply capacity: 700 VA (of which 170 VA is used for the optional probe interface)			
Air supply	Pressure	0.4 MPa			
	Consumption	60 L/min under normal conditions (air source: at least 120 L/min)			
Guaranteed accuracy temperature environment	Temperature range		19 – 21 °C		
	Temperature change	Per hour	1.0 K		
		Per 24 hours	2.0 K		
Temperature gradient	vertical/horizontal	1.0 K/m			

## Probing error

unit: μm

	Probe used	MPE <sub>p</sub>
ISO 10360-5: 2009	SP25M	0.9
	MPP-310Q	
	SP80	

## Indicating error

unit: μm

	Probe used	MPE <sub>i</sub>
ISO 10360-2: 2009	SP25M/MPP-310Q/SP80	0.9+0,25/100

## Scanning probing error

unit: μm

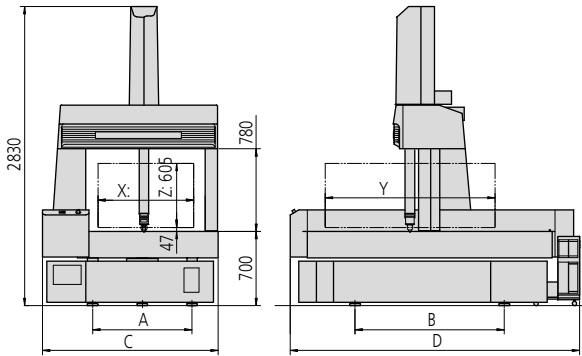
	Probe used	MPE <sub>THP</sub>
ISO 10360-4: 2009	SP25M/SP80	1.8 (MPT <sub>HP</sub> = 45 s)
	MPP-310Q	2.0 (MPT <sub>HP</sub> = 70 s)



# Specifications

## Dimensions

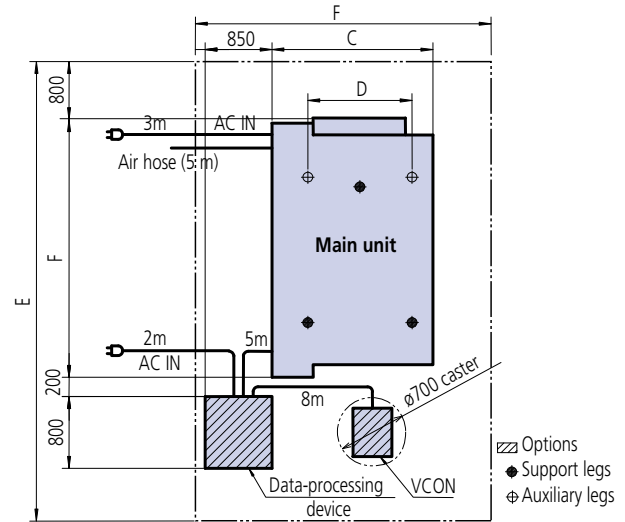
unit: mm



Item	STRATO-Apex 776	STRATO-Apex 7106	STRATO-Apex 9106	STRATO-Apex 9166
A	740			940
B	700		1000	1410
C	1460			1660
D	1860		2160	2760
E	4060		4360	4960
F		3210		3410

## Installation floor space

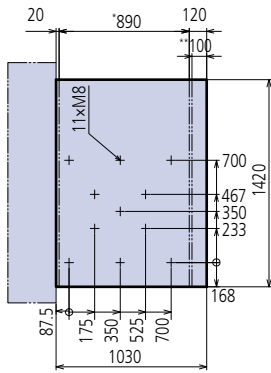
unit: mm



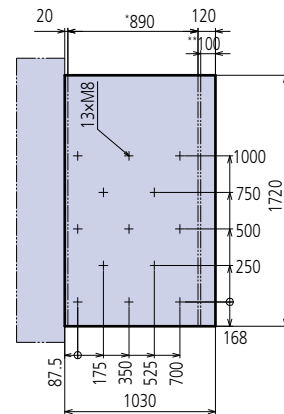
## Tapped insert positions in the table surface

unit: mm

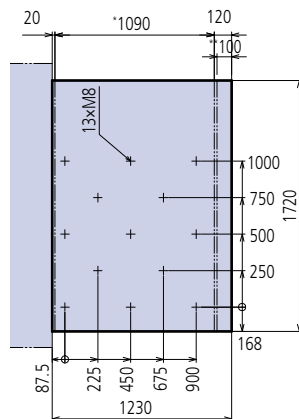
STRATO-Apex 776



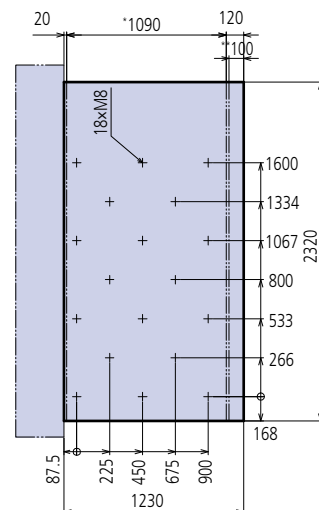
STRATO-Apex 7106



STRATO-Apex 9106



STRATO-Apex 9166



# STRATO-Apex 1600 Series



STRATO-Apex 163016

## Specifications

Item		STRATO-Apex 162012	STRATO-Apex 162016	STRATO-Apex 163012	STRATO-Apex 163016
Measuring range	X	1600 mm			
	Y	2000 mm		3000 mm	
	Z	1200 mm	1600 mm	1200 mm	1600 mm
Guide method		Air bearings on all axes (static pressure air bearings)			
Drive speed	CNC mode	Drive speed: From 8 to 350 mm/s for each axis (maximum combined speed: 606 mm/s)			
		Measuring Speed 1 – 3 mm/s			
	J/S mode	Drive Speed 0 – 80 mm/s			
		Measuring Speed 0 – 3 mm/s			
Drive acceleration		780 mm/s <sup>2</sup> for each axis (maximum combined acceleration: 1,350 mm/s <sup>2</sup> )			
Measuring method		Linear encoder			
Resolution		0.00005 mm			
Work table	Material	Granite			
	Size (table surface)	1850 x 3280 mm		1850 x 4280 mm	
	Tapped inserts	M8 x 1.25			
Workpiece	Maximum height	1350 mm	1750 mm	1350 mm	1750 mm
	Maximum mass	3500 kg		4000 kg	
Machine mass (includes the vibration-damping platform and controller, but not workpiece)		11150 kg	11200 kg	15300 kg	15350 kg
Power supply specifications (including the probe option interface)		Power supply voltage: AC100-120/200-240 V ± 10%; power supply capacity: 1500 W (of which 170 W is used for the probe option interface)			
Air supply	Pressure	0.4 MPa			
	Consumption	100 L/min under normal conditions (air source: at least 250 L/min)			
Guaranteed accuracy temperature environment	Temperature range		18 – 22 °C		
	Temperature change	Per hour	1.0 K		
		Per 24 hours	2.0 K		
Temperature gradient		vertical/horizontal	1.0 K/m		

\* While the appearance of the natural stone measuring table varies according to the source, the high stability for which this material is known can always be relied upon.

## STRATO-Apex162012/163012

### Length measurement error unit: μm

Standard	Probe used	Max. permissible length measurement error
ISO 10360-2: 2009	SP25M/SP80/MPP-310Q	$E_{0, MPE} = 2.5 + 4.0L/1000$
		$E_{150, MPE} = 2.5 + 4.0L/1000$

### Repeatability unit: μm

Standard	Probe used	Repeatability range of $E_0$
ISO 10360-2: 2009	SP25M/SP80/MPP-310Q	$R_{0, MPL} = 2.5$

### Single stylus form error unit: μm

Standard	Probe used	Max. permissible single stylus form error
ISO 10360-5: 2010	SP25M/SP80/MPP-310Q	$P_{FTL, MPE} = 2.3$

### Scanning probing error unit: μm

Standard	Probe used	Maximum permissible scanning probing error (Maximum permissible scanning test time) [sec]
ISO 10360-4: 2000	SP25M/SP80/MPP-310Q	$MPE_{THP} = 2.5$ (MPT <sub>THP</sub> = 60)

# Specifications

## STRATO-Apex162016/163016

**Length measurement error** unit:  $\mu\text{m}$

Standard	Probe used	Max. permissible length measurement error
ISO 10360-2: 2009	SP25M/SP80/ MPP-310Q	$E_0, MPE=3.0+4.0L/1000$
		$E_{150}, MPE=3.0+4.0L/1000$

**Repeatability** unit:  $\mu\text{m}$

Standard	Probe used	Repeatability range of $E_0$
ISO 10360-2: 2009	SP25M/SP80/MPP-310Q	$R_0, MPE=2.5$

**Single stylus form error** unit:  $\mu\text{m}$

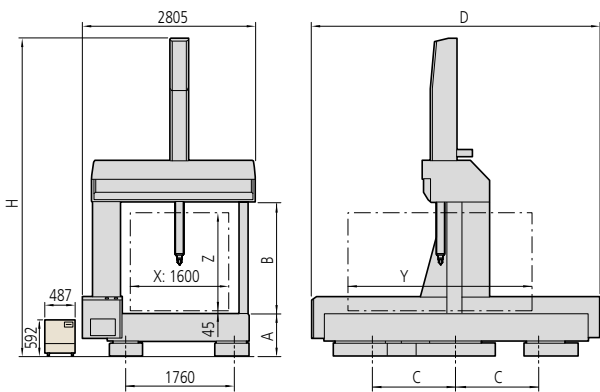
Standard	Probe used	Max. permissible single stylus form error
ISO 10360-5: 2010	SP25M/SP80/ MPP-310Q	$P_{FTU}, MPE=2.8$

**Scanning probing error** unit:  $\mu\text{m}$

Standard	Probe used	Maximum permissible scanning probing error (Maximum permissible scanning test time) [sec]
ISO 10360-4: 2000	SP25M/SP80/ MPP-310Q	$MPE_{THP}=3.0$ ( $MPT_{THP}=60$ )

## Dimensions

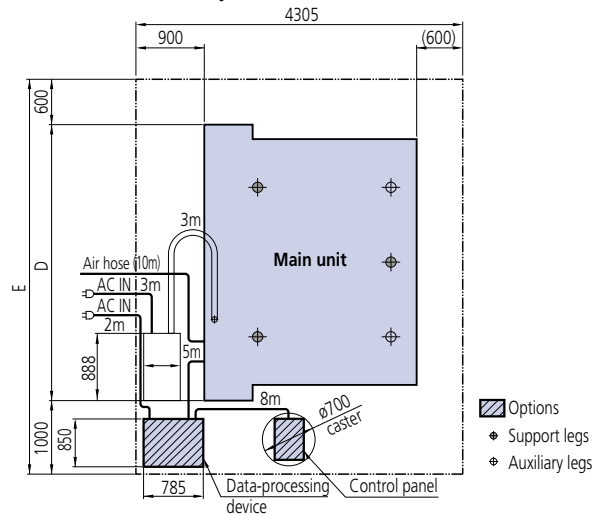
unit: mm



Item	STRATO-Apex 162012	STRATO-Apex 162016	STRATO-Apex 163012	STRATO-Apex 163016
A	650		700	
B	1415	1815	1415	1815
C	1000		1350	
D	3685		4685	
E	5285		6285	
H	4340	5140	4390	5190

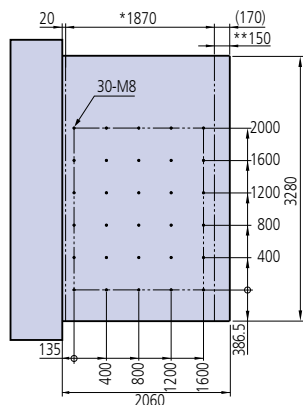
## Installation floor space

unit: mm

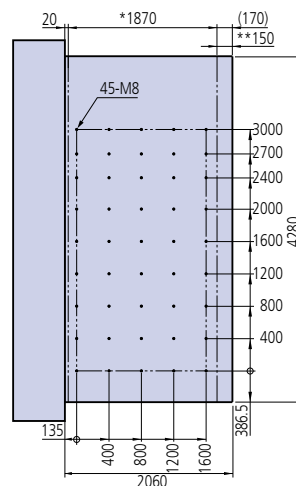


## Tapped insert positions in the table surface

unit: mm



STRATO-Apex 162012/162016



STRATO-Apex 163012/163016

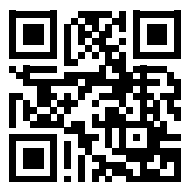
\* Workpiece loading area  
\*\* Y-axis guiding surface



**Whatever your challenges are,  
Mitutoyo supports you from start to finish.**

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

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



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and our product catalogue**

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