

Accessories

Standard : ● Optional : ★

Item	Model	5A-65E	5A-65EF	5A-600T	5A-600TF	5A-800T	5A-800TF
1.Air blast through spindle_M53		●	●	●	●	●	●
2.Auto Power off		●	●	●	●	●	●
3.B,C-axis linear scale system_Heidenhain		●	●	●	●	●	●
4.DCM collision.		●	-	●	-	●	-
5.Full-enclosed splash guard		●	●	●	●	●	●
6.Foundation bolt, Concrete		●	●	●	●	●	●
7.Fluorescent lamp x1		●	●	●	●	●	●
8.Hartford Manual x1		●	●	●	●	●	●
9.Lubrication system		●	●	●	●	●	●
10.Operator Panel, Stand type		●	●	●	●	●	●
11.Spindle air curtain		●	●	●	●	●	●
12.Spindle oil cooler		●	●	●	●	●	●
13.Spray around spindle		●	●	●	●	●	●
14.Software option 1 : Plane Function		●	●	●	●	●	●
15.Software option 2 : TCPM		●	●	●	●	●	●
16.Table side air blast M50 control		●	●	●	●	●	●
17.Tool package		●	●	●	●	●	●
18.X,Y,Z-axis linear scale system_Heidenhain		★	★	★	★	★	★
19.Auto tool length measurement		★	★	★	★	★	★
20.Auto workpiece measurement		★	★	★	★	★	★
21 .Correction Ball(KKH250)		★	★	★	★	★	★
22.Coolant through spindle (20/25/40/75BAR)		★	★	★	★	★	★
23.Fluorescent lamp x2		★	★	★	★	★	★
24.Link type chip conveyor & portable chip bucket(1EA)		★	★	★	★	★	★
25.Oil mist coolant system		★	★	★	★	★	★
26.Spindle shaft with coolant system (Built-in 24,000rpm spindle)		★	★	★	★	★	★
27.Spindle coolant (HBO-1000)		★	★	★	★	★	★
28.Three axis ballscrew coolant system (Vary by model)		★	★	★	★	★	★
29.Tool 100pcs (for HSK-A63) for 5A-800T/5A-800TF		-	-	-	-	★	★
30.Tool 120pcs (for HSK-A63) for 5A-800T/5A-800TF		-	-	-	-	★	★
31.Tool 100pcs (for HSK-A100) for 5A-800T/5A-800TF		-	-	-	-	★	★
32.Tool 120pcs (for HSK-A100) for 5A-800T/5A-800TF		-	-	-	-	★	★
33.Kinematics comp		★	★	★	★	★	★

Standard & Optioanl Electrical Function

Standard

- Kinematics opt.(Auto length measurement, auto workpiece measurement and KKH-10 are necessary option for this function)
- DCM collision
- Software option 1: PLANE function
- Software option 2: TCPM

Optional

- Kinematics comp
- DXF converter
- AFC: Adaptive feed control
- CTC: Cross talk comp.
- PAC: Pos. adaptive control
- LAC: Load adaptive control

- MAC: Motion adaptive control
- ACC: Active chatter control
- AVD: Active vibration damping

Website



Facebook



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Hartford

Hartrol · Smartcenter · Robocell

We manufacture intelligent machines only

Hartford
EXCLUSIV
HartrolPlus APP

5-Axis Intelligent Machining Center

5A Series Smartcenter

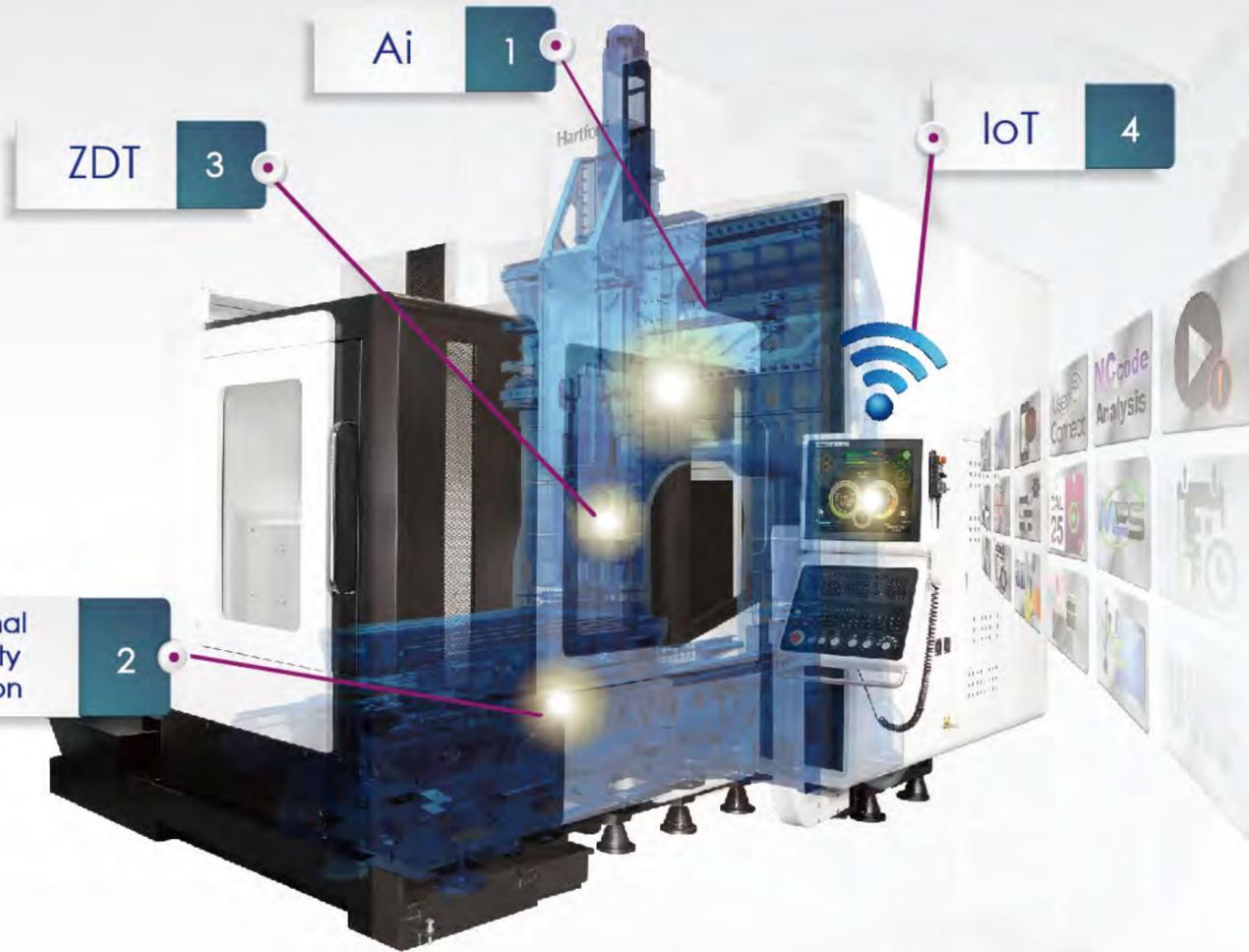
- 5-year warranty on guideways
- Thermal insulation solutions
- Built-in spindle shaft with cooling system
- 5-axis total error within 0.04mm



Imagine what future machines ought to be outlined.

What is Automation?

Hartford redefine the future

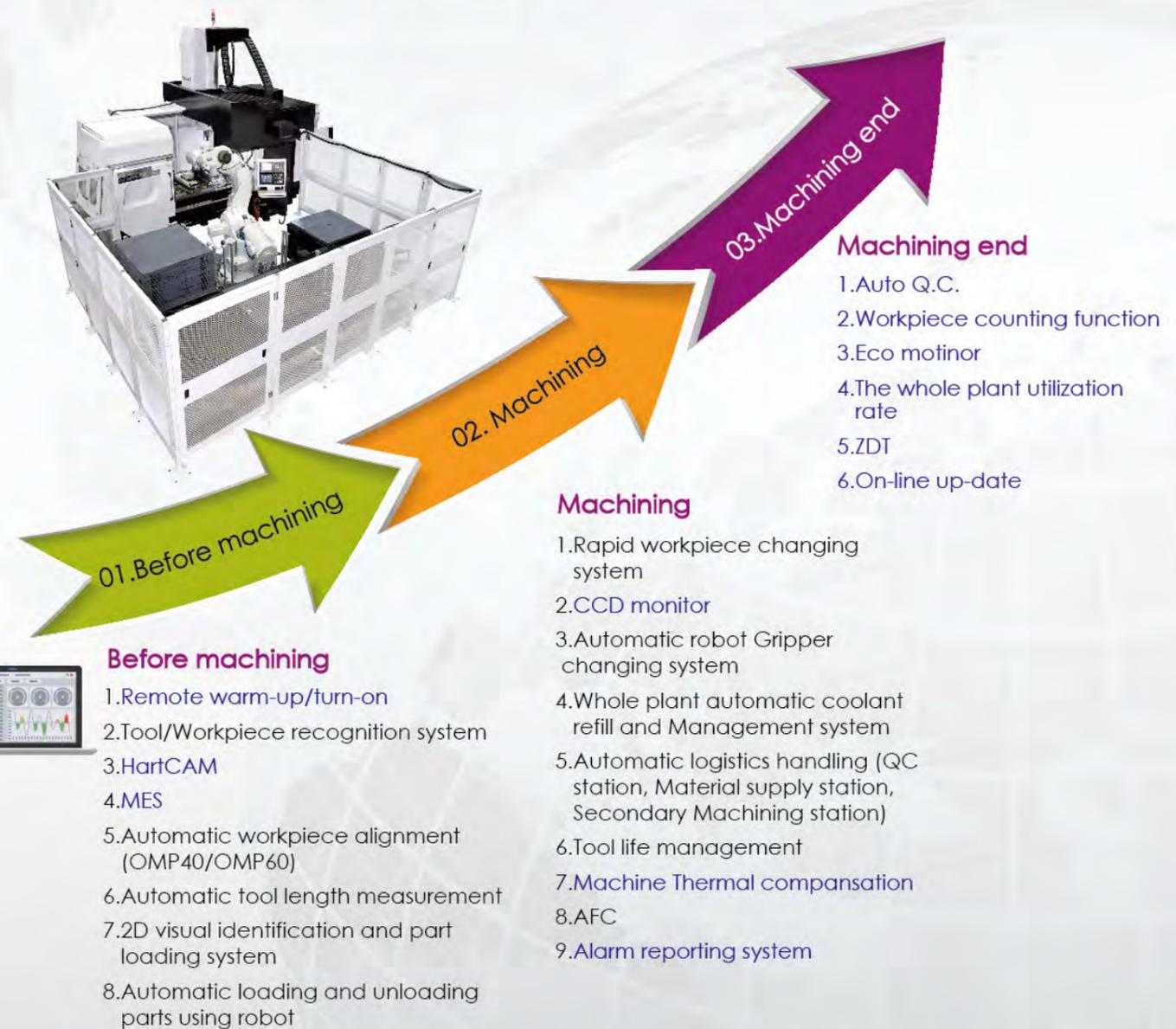


<p>Ai 1</p> <ul style="list-style-type: none"> + Remote Warm-up & Turn-on + Hartrol Plus Sync & Update + User Connect 	<p>Thermal stability solution 2</p> <ul style="list-style-type: none"> + Spindle Thermal Compensation + Casting Thermal Compensation + Thermal Symmetry / Thermal Balancing
<p>ZDT 3</p> <ul style="list-style-type: none"> + Diagnosis Report on Spindle Operation + Alarm Report System 	<p>IoT 4</p> <ul style="list-style-type: none"> + Facial Recognition System + AI Efficient Lubrication Management + Smart Efficient Chip Collection

The meaning of automation?

Reducing manpower, increasing productivity, maintaining product quality & consistent precise movements without fatigue these all factors can be called "automation". There is a vast scope for automation from fully automatic engine cylinder manufacturing lines to simple robotic loading and unloading operations, the process of automatic workpiece measurement during machining can also be part of automation, so entering the field of automation is not so far away.

When it comes to machining processes, following features we can recommend to help our customers to enter the field of automation

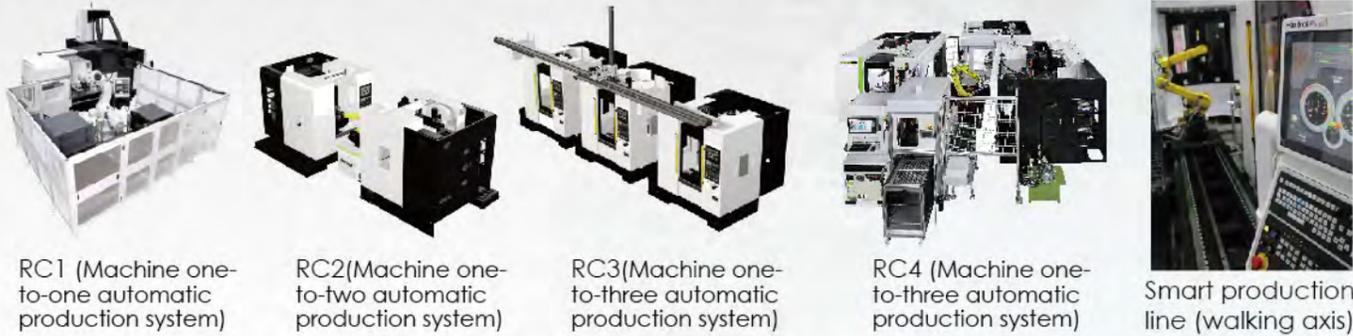


With more intelligent function equals to closer automation.

How to quickly implement automation?

Hartford Robot Production Cell

Hartford has the biggest automation solution team in Taiwan. We design and plan the project by ourself. To be professional, provide rapidly response and efficient are our points. In this modern age, labor shortage is always a big problem for many companies. Hartford provides you a set of stable and efficient automatic solution project to solve your problems.



RC1 (Machine one-to-one automatic production system)

RC2(Machine one-to-two automatic production system)

RC3(Machine one-to-three automatic production system)

RC4 (Machine one-to-three automatic production system)

Smart production line (walking axis)

Easy to get started

Hartford Robocell provides you a professional robot training and rich automation experience, to let you quickly learn and easily operate your automation systems

Quality control monitoring

Automation systems have to pass all the strict Quality Control tests at every stage like design, assembly, testing, final inspection and shipment, complete quality control processes for all the products.

Professional analysis

Robocell Machining optimization service, to let you be on the top by using professional machining methods



Complete service

- Single window process
- Professional team
- Instant solution
- Quick service



Superior Value in Mould Making

A perfect demonstration for machining accuracy and ability.

Hartford 5A series is specially designed for simple and complex parts in small lot production, which require high precision 5-axis machining.



1. Tire (for 5-axis controller)



2. Bullet blade(for 5-axis controller)



3. Hollow fan(for 5-axis controller)



Generator Blades



Turbine Blade

- Work piece Size:ø160 cylinder
- Special features : Flake machining B,C axes machining.

Tool	Rpm	Feed rate	Machining Time
D8R4mm Aluminum Ball End Mill	10000	3000	02:58:56
D4R2mm Aluminum Ball End Mill	12000	2000	25:26:15
D4R1mm Aluminum Ball End Mill	12000	1000	02:08:38
Total time			36:33:49

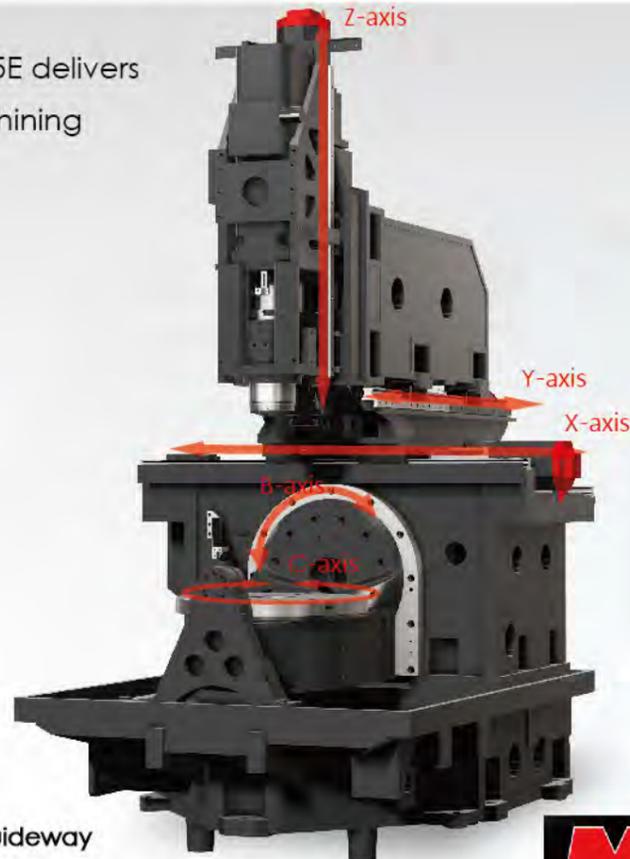
- Work piece Size:ø450 cylinder
- Special features : 5 axes blade module application,5 axes machining with Table-Table type.

Tool	Rpm	Feed rate	Machining Time
D80 Rough Mill	2200	6000	03:28:35
D10R5mm Aluminum Ball End Mill	8000	3000	101:45:58
D10R5mm Aluminum Ball End Mill	10000	3000	01:55:32
D10R5mm Aluminum Ball End Mill	10000	3000	01:22:54
Total time			108:32:59

High rigidity structure design on 5A-65E

5A-600T(F)/5A-800T(F) , Latest Advances In Structure Design

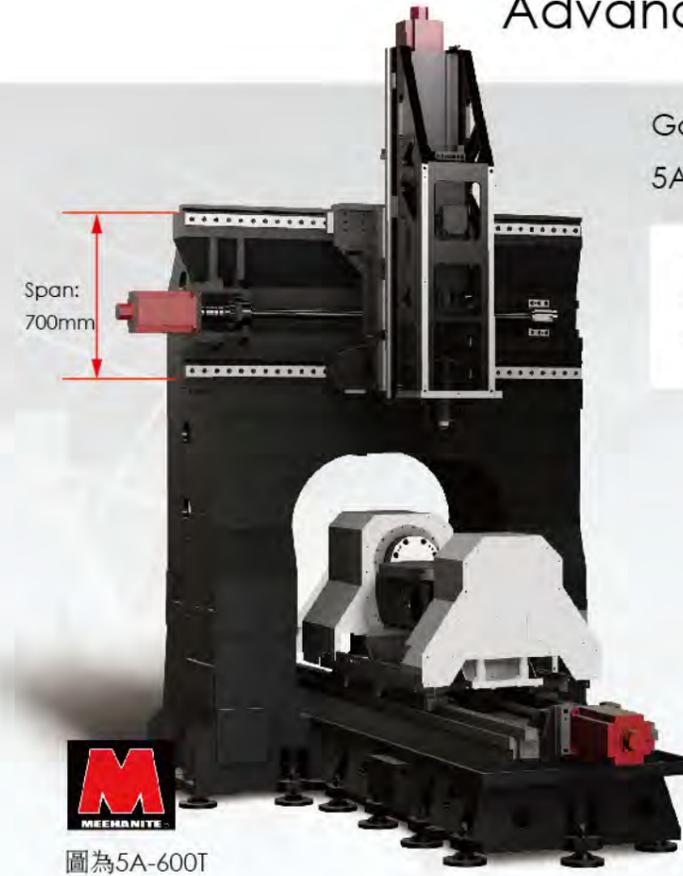
The single arm structure design of 5A-65E delivers higher rigidity, support and better machining capability.



Full range of linear guideway five-year warranty:

Warranty coverage will not apply under following conditions

- 1.Improper operation (collision)
- 2.Lack of regular cleaning of accumulated debris causing damage to the linear rails & carriages.



圖為5A-600T

Gantry type construction delivers higher stability for 5A-600T(F) and 5A-800T(F).

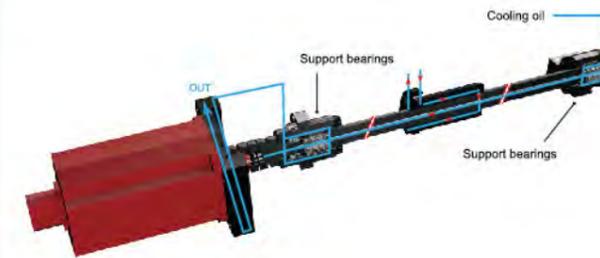
Great span on Y-axis linear guideway

- Machine structural rigidity is increased.
- Average rigidity increased by **64%** on the three axes.



Bearing housing stop pin

- Bearing housing with stop pin design.
- Increases machine transmission rigidity.
- Axis rigidity is increased by **14%**



Thermal growth control on 3-axis (opt.)

- The parts in 3-axis feeds, such as the motor base, ballscrews, nuts and bearings are completely cooled.
- Removes thermal deformation while ensuring the positioning accuracy of the machine.
- Machine dynamic rigidity is increased.
- Axis accuracy increased by **15%**
- Features may vary by models, please check with sales window.

X-axis guide ways are set on stepped bed

- This makes better support for machine.
- Machine rigidity is much better.
- Deformation is not an issue for machine



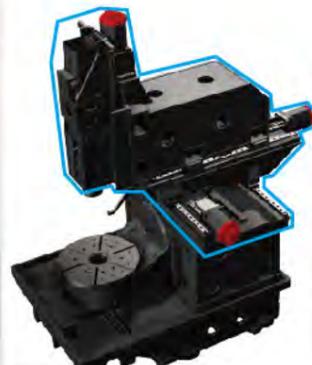
Full-support design on Y-axis

- Weight sagging problem is improved.
- Machining accuracy is enhanced.



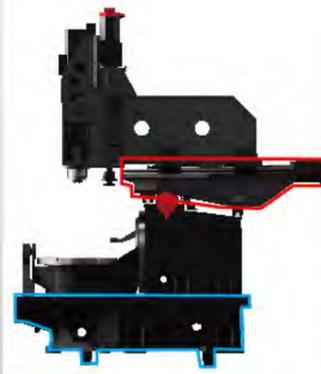
Overlap design on 3-axis

- Workpiece does not move with 3-axis.
- The impact on 3-axis positioning accuracy is minimized.
- Cutting accuracy is better



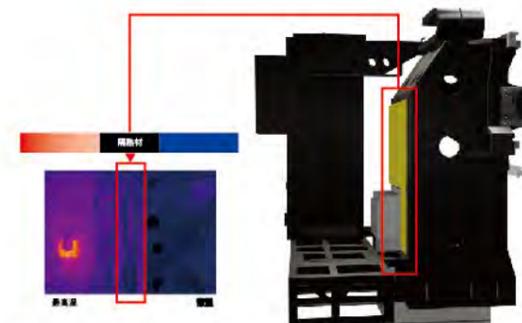
Enlarge design on base

- Movement cutting accuracy is improved.
- Delivers higher support for machine.



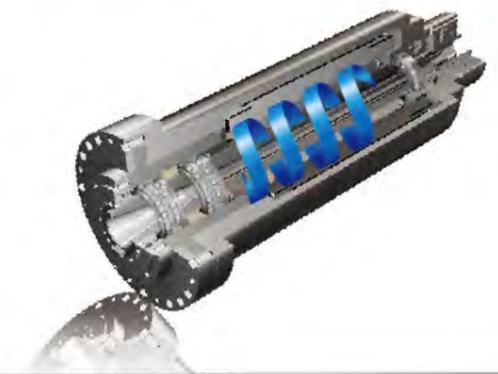
Thermal symmetry and heat isolation

- Heat isolating material is added between machine crossbeam and cabinet.
- Ensures machine accuracy.
- Thermal deformation problem can be prevented.
- Crossbeam thermal growth is reduced by **13%**



Built-in 24,000 spindle shaft with cooling system

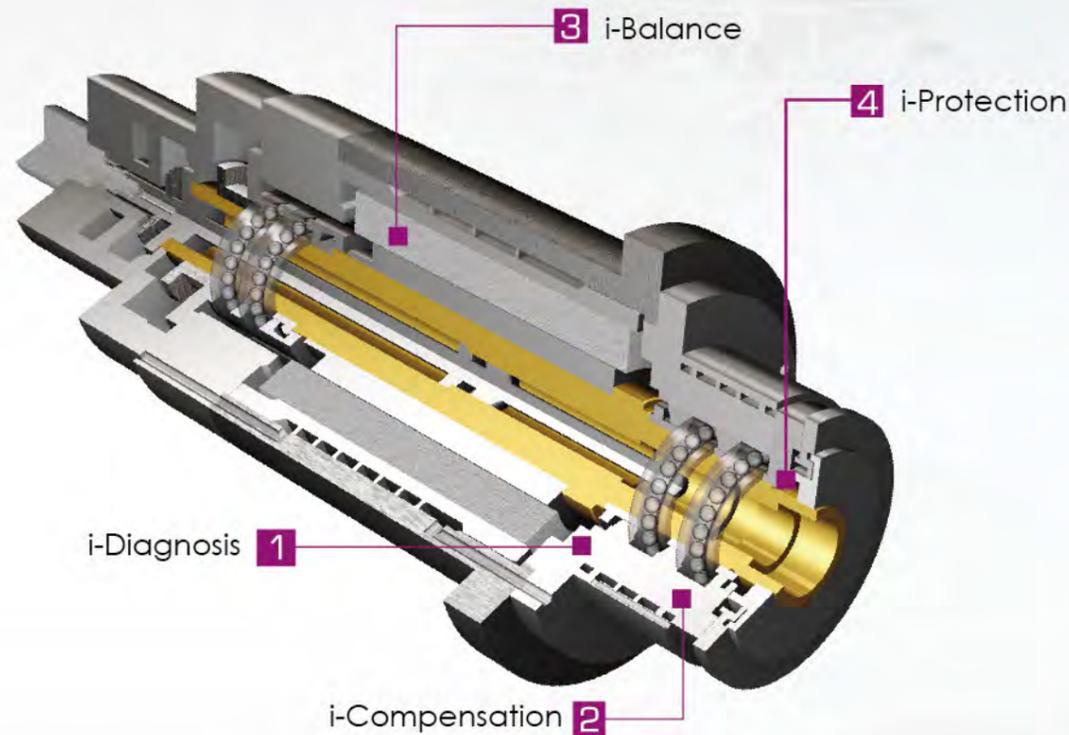
- It's small size, light, low noise and low vibration,available for all controllers.
- Intelligent spindle is optional.
- Spindle thermal deformation is decreased by **50%**



Spindles Manufactured by Hartford Offer Quality Assurance

The self-designed and made built-in type 24,000rpm spindle guarantee the best quality for you and provide you instant solutions when you need.

The spindle is available to integrate various smart functions such as i-Diagnosis, i-Compensation, i-Balance and i-Protection which provide safety protection of the spindle, increase the spindle accuracy and reduce down time.

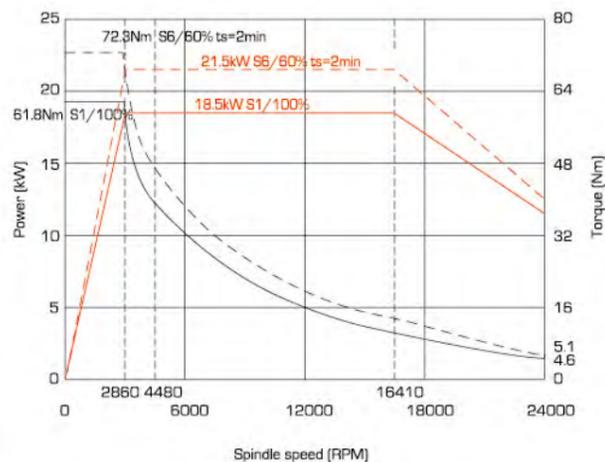


NCG-2005 5-axis Accuracy Testing

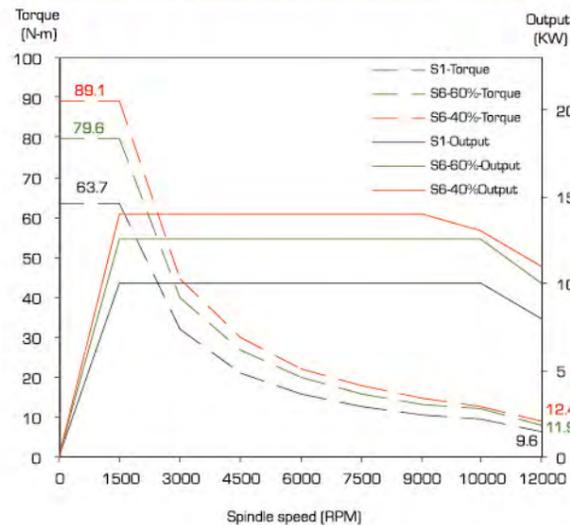
- Workpiece name: NCG2005
- Workpiece material: Necuron 1007
- Workpiece size: Ø75x105x50 mm
- Workpiece fixed angle: 0° & 30°
- Cycle time: 12 min
- Tool: 6 mm end mill

- Dimensional accuracy:** Marginal lines (1 mm) in X, Y-axis are consistent.
- Workpiece surface check:** Accurate right angle between X & Y plane.
- N/C Thermal elongation check:** Connection wall thickness down to 10 µm is not broken.
- Axis accuracy check:** In hole cutting, tool feeds in right and left direction are symmetrical.
- Angle accuracy deviation of rotating axes:** High angle accuracy of B/C axes is easily recognized by surface finish and spacing symmetry.
- Contour accuracy check:** By the high accuracy of contour.
- Tool center point check:** Tool center point in 5-axis (X,Y,Z,B,C) positions accurately.

Built-in type Spindle 24,000RPM



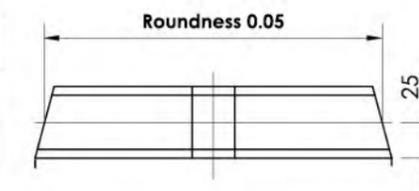
HEIDENHAIN GAN200U*12000RPM



NAS-979 Inspection Cutting report

	Tolerance	Test results
Inclination angle	$\angle 15^\circ (\pm 1^\circ/20'')$	15.0007°
Roundness	0.05	0.008

Unit: mm

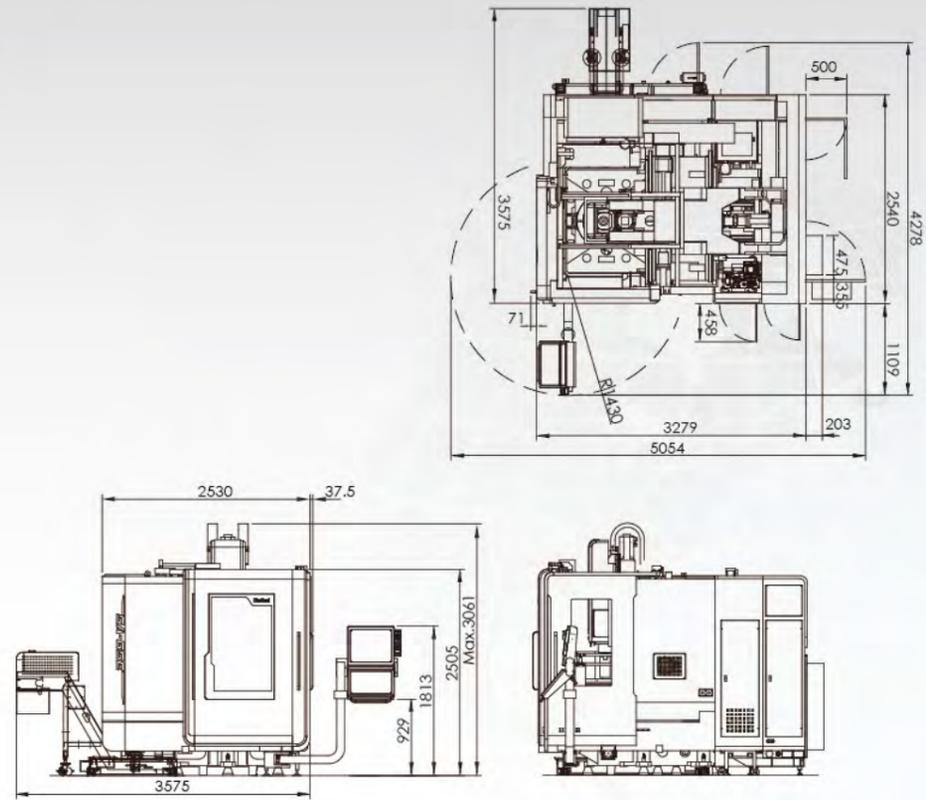


All the test results featured in this catalogue were produced under strict testing condition in a special zed testing environment. Under different testing conditions and less than ideal testing environments. That the test results may vary from those shown in this catalogue.

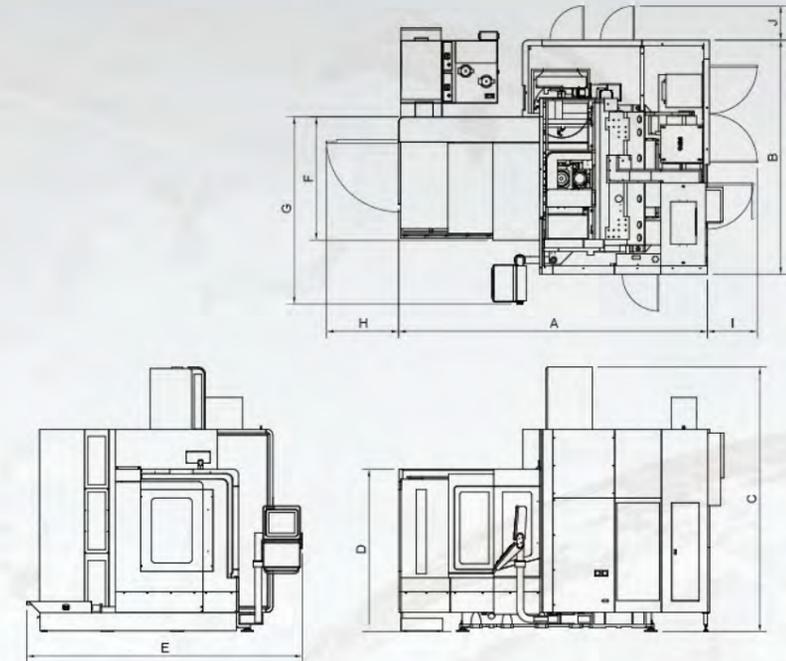


Machine Dimension

5A-65E

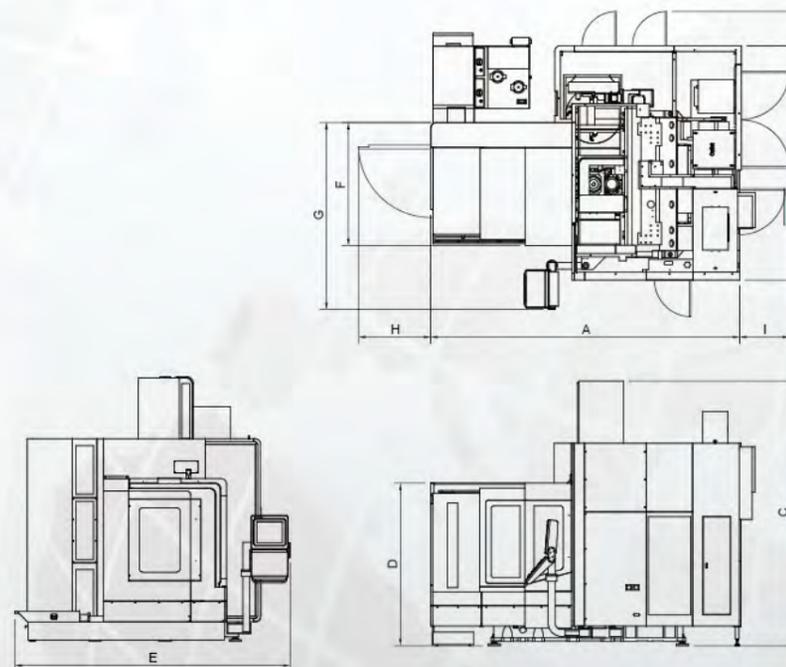
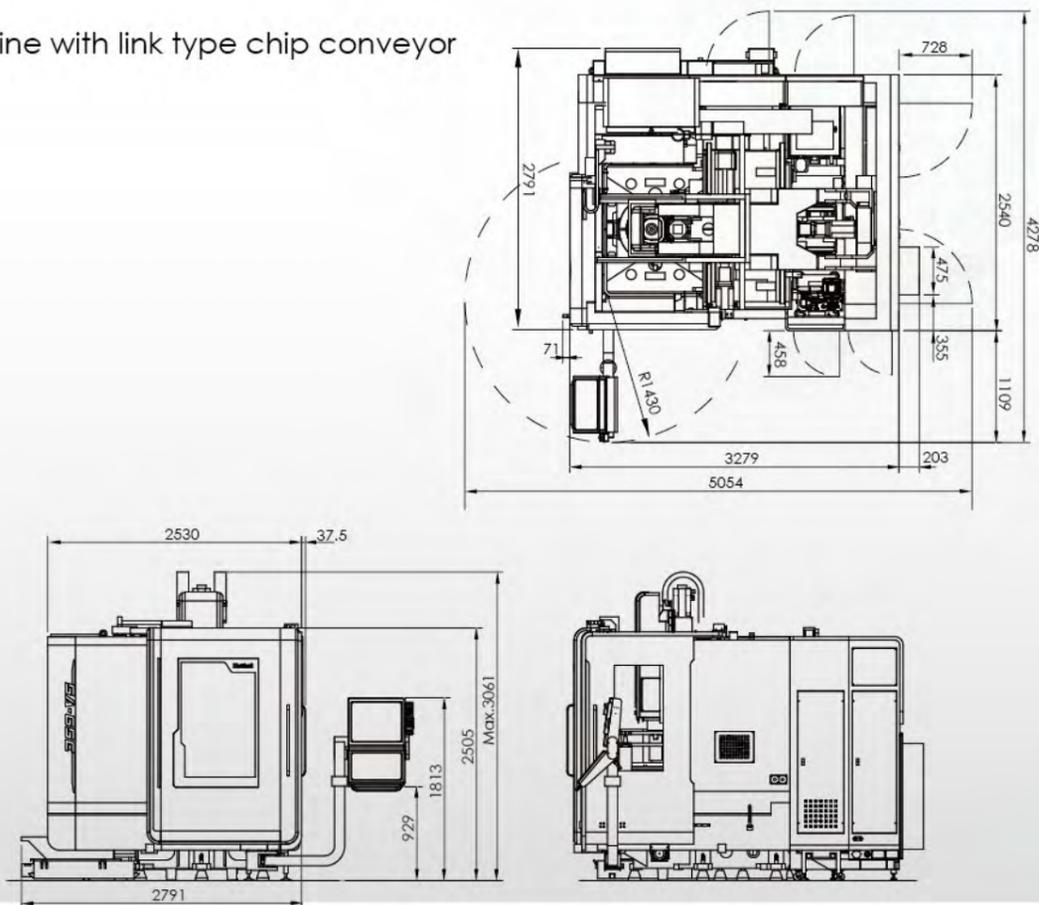


5A-600T(F)/800T(F)



機型	A	B	C	D	E	F	G	H	I	J
5A-600T	4475	3380	3820	2345	3990	1680	2705	1045	720	495
5A-600TF										

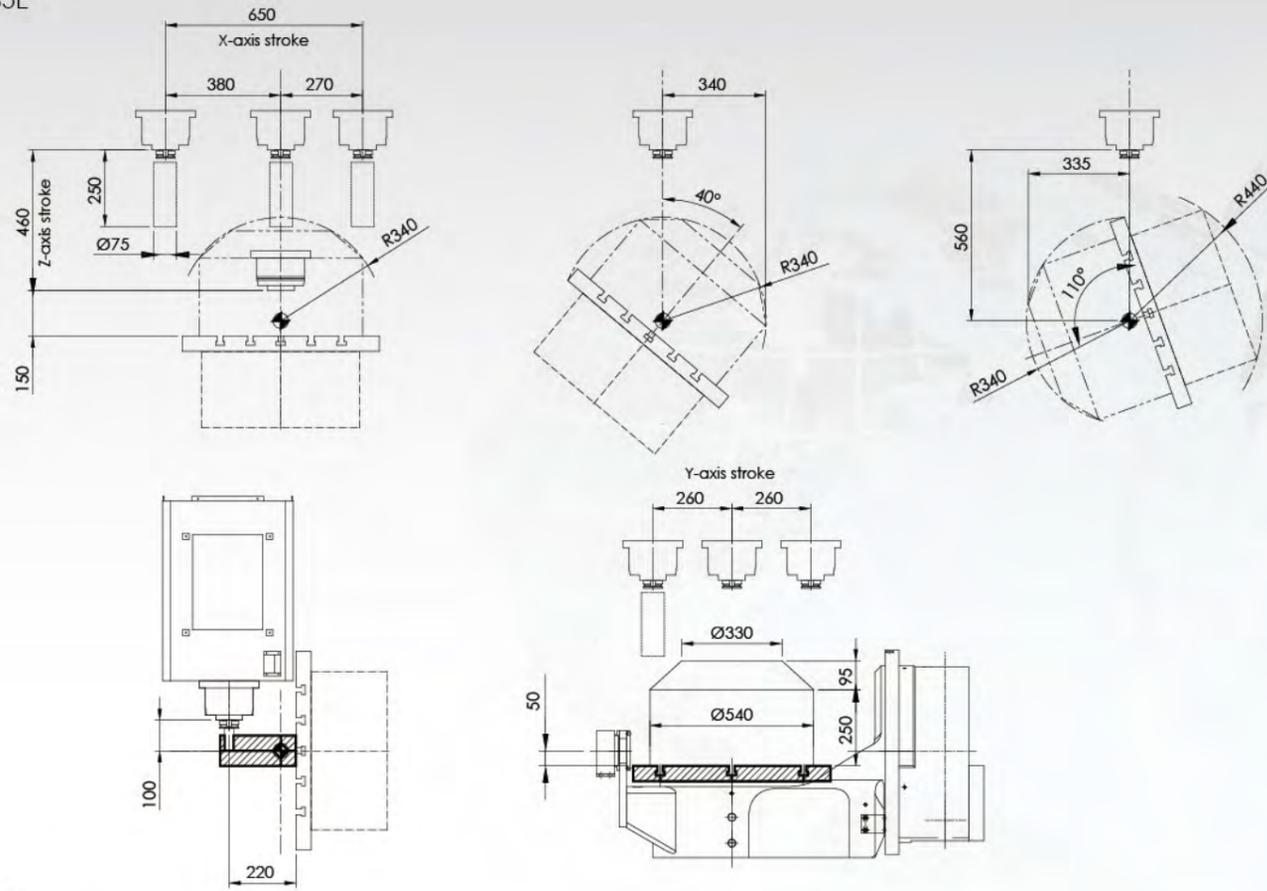
Machine with link type chip conveyor



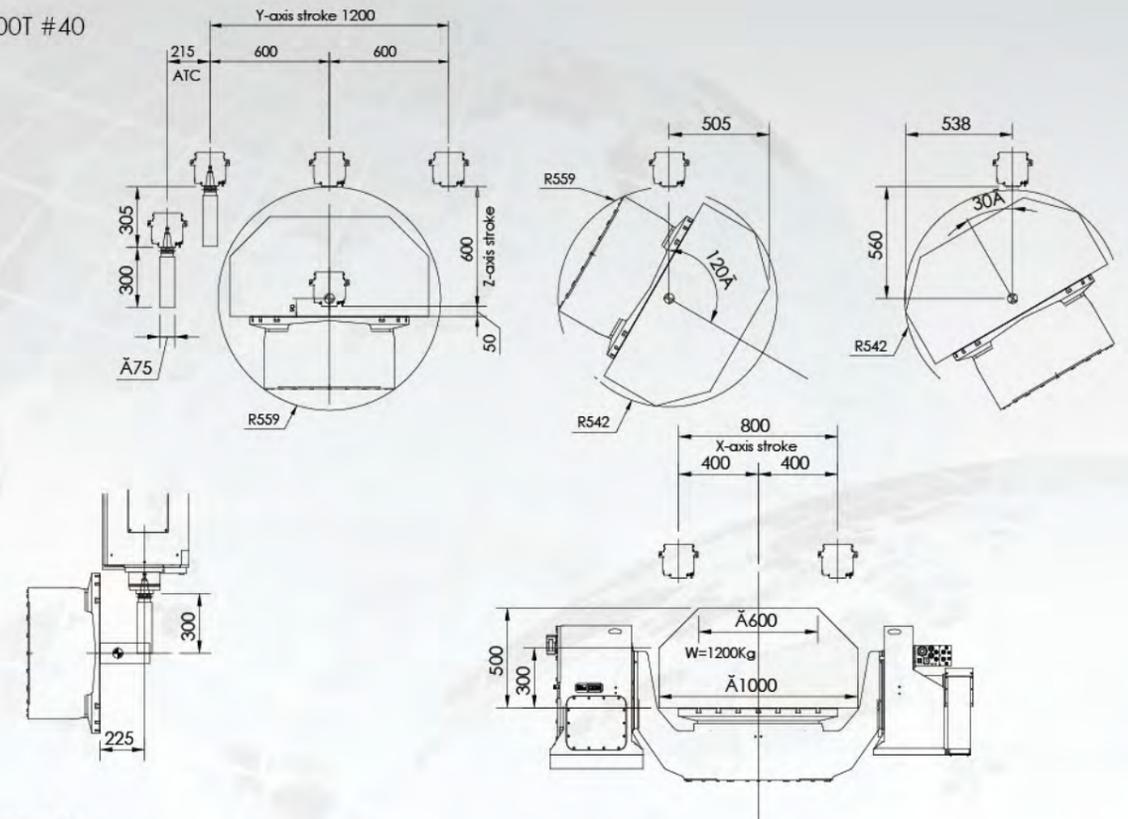
機型	A	B	C	D	E	F	G	H	I	J
5A-800T	5340	3710	4060	2575	4320	2000	3035	1120	975	940
5A-800TF										

Cutting Range and Interference

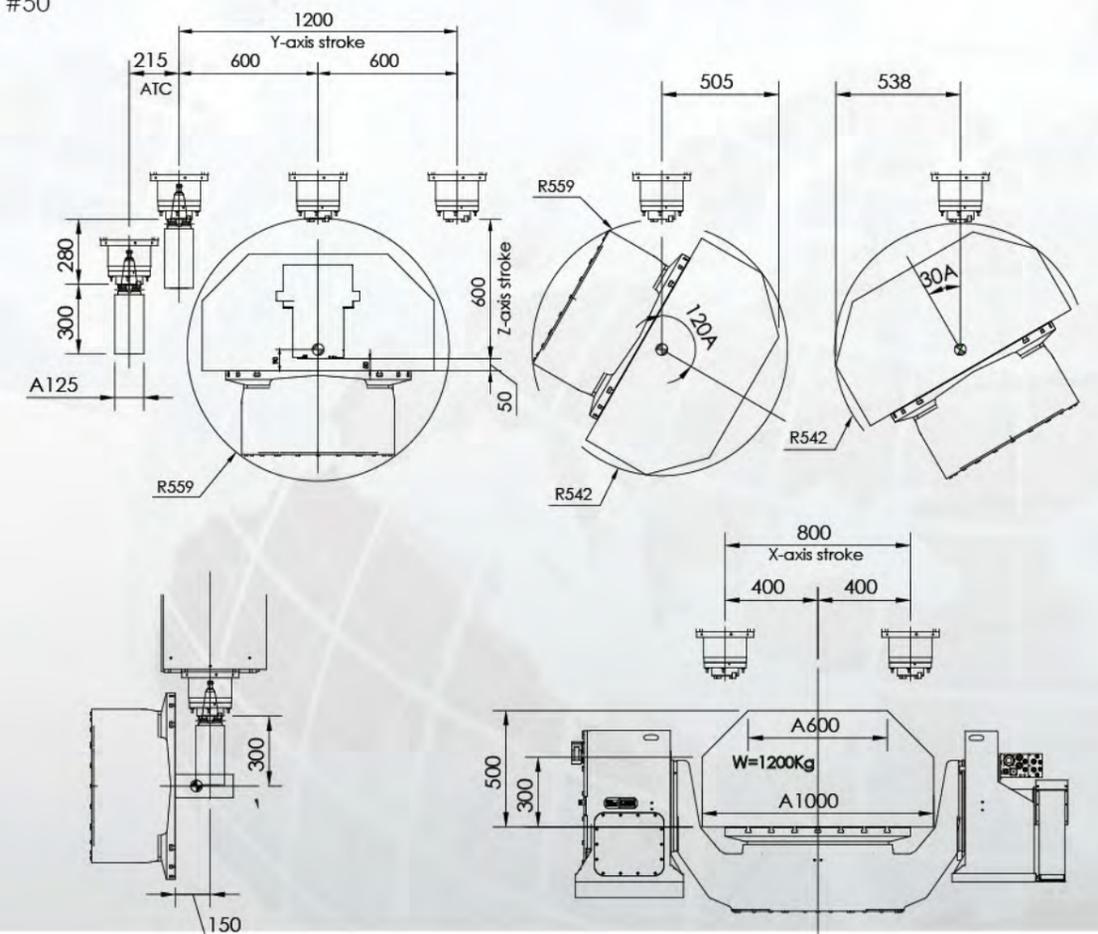
5A-65E



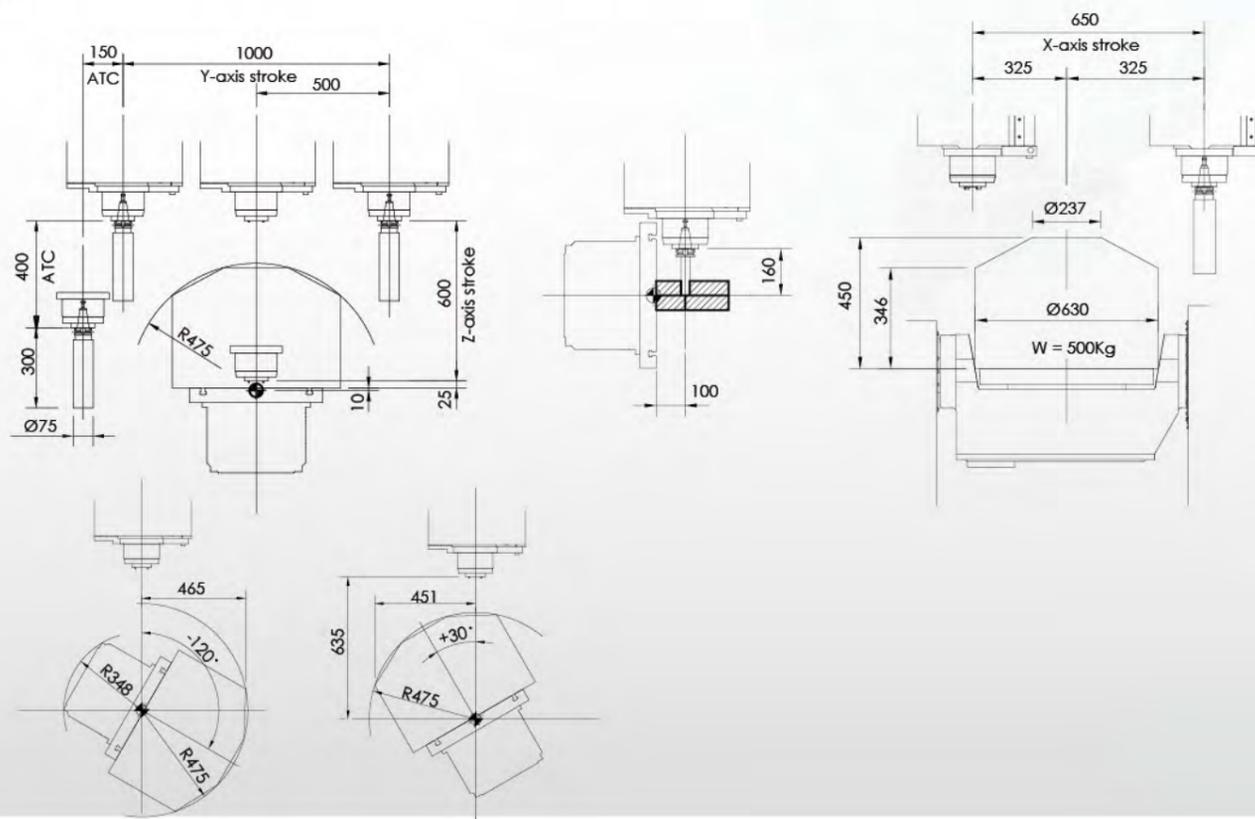
5A-800T #40



5A-800T #50



5A-600T



Specification

Model	5A-65E	5A-65EF	5A-600T	5A-600TF (Hartrul Plus 1/Fanuc:4+1(31IMB))	5A-800T	5A-800TF (Hartrul Plus 1/Fanuc:4+1(31IMB))
Table Unit						
Working Surface	mm	mm	mm	mm	mm	mm
T-slot (Size x Number x Pitch)	mm	mm	mm	mm	mm	mm
Max Table Load	kg	kg	kg	kg	kg	kg
Travel						
Longitudinal Travel (X-axis)	mm	mm	mm	mm	mm	mm
Gross Travel (Y-axis)	mm	mm	mm	mm	mm	mm
Vertical Travel (Z-axis)	mm	mm	mm	mm	mm	mm
Tilting travel (A-axis)	mm	mm	mm	mm	mm	mm
Corss travel (B-axis)	mm	mm	mm	mm	mm	mm
Vertical travel (C-axis)	mm	mm	mm	mm	mm	mm
Distance From Spindle End to Table Center	mm	mm	mm	mm	mm	mm
Spindle						
Spindle Nose Tape						
Spindle Speed (DDS)	rpm	rpm	rpm	rpm	rpm	rpm
Spindle Speed (Built-in)	rpm	rpm	rpm	rpm	rpm	rpm
Feed						
Cutting Feedrate (X/Y/Z Axes)	m/min	m/min	m/min	m/min	m/min	m/min
Cutting Feedrate (A/B/C Axes)	rpm	rpm	rpm	rpm	rpm	rpm
Rapid Traverse (X/Y/Z Axes)	m/min	m/min	m/min	m/min	m/min	m/min
Rapid Traverse (A/B/C Axes)	m/min	m/min	m/min	m/min	m/min	m/min
ATC						
Tool Storage Capacity	pcs	pcs	pcs	pcs	pcs	pcs
Max. Tool Weight	kg	kg	kg	kg	kg	kg
Max. Tool Size (Diameter x Length)	mm	mm	mm	mm	mm	mm
Tool Shank						
Pull Stud Bolt						
Motor						
Spindle Drive Motor(30min)						
X/Y/Z axis drive motor						
A/C axis drive motor						
B/C axis drive motor						
Positioning Accuracy						
3 axes laser positioning accuracy (JIS B6338)						
Positioning accuracy/Full travel	mm	mm	mm	mm	mm	mm
Repetitive positioning accuracy	mm	mm	mm	mm	mm	mm
3 axes laser positioning accuracy (VDI 3441)/Repeated 5 times						
Positioning accuracy	mm	mm	mm	mm	mm	mm
Repetitive positioning accuracy	mm	mm	mm	mm	mm	mm
Accuracy						
Positioning (with angle encoder)						
Repeatability (with angle encoder)						
Other						
Required Air Pressure	kg/cm ²	kg/cm ²	kg/cm ²	kg/cm ²	kg/cm ²	kg/cm ²
Electric Power Consumption	KVA	KVA	KVA	KVA	KVA	KVA
Floor Space(Full Guarding)	mm	mm	mm	mm	mm	mm
Net Weight	kg	kg	kg	kg	kg	kg
Coolant capacity(Standard)	L	L	L	L	L	L