Accessories	5A-350XL	5A-32E/EF	5A-65E/EF	5A-95Q/5X
Item				
1. Full-Enclosed Splash Guard	●	●	●	●
2. Spindle Oil (Water) Cooler	●	●	●	●
3. Vacuum Decompression Lubrication System	●	●	●	-
4. Fluorescent Lamp ×1	●	●	●	●
5. Fluorescent Lamp ×2	○	○	○	○
6. Foundation Bolt Set (For Concrete)	●	●	●	●
7. DCM Collision Monitoring (#40)	○	● / ○	● / ○	●
8. Software Option 1: Cylindrical & Tilted Plane Interpolation (#8)	●	●	●	●
9. Software Option 2: Advanced Contour Accuracy / TCPM (#9)	●	●	●	●
10. Spindle Speed 15,000 RPM	○	○	○	○
11. Three-Axis Hollow Ballscrew Oil-Cooling System	○	○	○	●
12. Chain-Type Chip Conveyor With 0.19 kW Tank & Portable Bucket (1 Unit)	○	○	○	●
13. Oil-Mist Coolant System	○	○	○	○
14. X/Y/Z-Axis Linear Scale System (Heidenhain)	○	● / ○	● / ○	○
15. Spindle Center Cooling Function	○	○	○	-
16. Oil-Water Separator	○	○	○	-
17. Oil-Mist Collector	○	○	○	○
18. ATC Magazine (24 / 30 / 40 / 60 Tools)	○	○	○	-
19. ATC Magazine (90 / 100 / 120 Tools)	-	-	-	○
20. Coolant Through Spindle (CTS Preparation, Without Pump)	○	○	○	○
21. Coolant Through Spindle — Simple Type, 20 Bar (Without Pump)	○	○	○	○
22. Coolant Through Spindle — Simple Type, 20 Bar (With Pump)	○	○	○	○
23. NC Rotary Table	○	○	○	-
24. Automatic Door System (Operator Door)	○	○	○	○
25. Automatic Workpiece Measuring System	○	○	○	○
26. Chip Flushing Device	○	○	○	○
27. Water / Air Gun	○	○	○	○
28. Air Conditioner For Electrical Cabinet	●	●	●	●
29. Spindle Thermal Compensation	○	○	○	○
30. NC4S (Serial A-4114-5060)	○	○	○	○
31. Calibration Ball (KKH250)	○	○	○	○
32. DXF Converter (#42) (Heidenhain)	○	○	○	○
33. Rotary Center Measurement Compensation #48 – CYCLE 451 (Heidenhain)	○	○	○	○
34. TNC Communication Software (Heidenhain)	○	○	○	○
35. Mode 4 (Heidenhain)	○	○	○	○
36. G68.2 (F / HP)	○	○	○	-
37. Rotary Center Automatic Measurement — RENISHAW AXISET (F / HP)	○	○	○	-
38. Tool Center Point Control (TCP) S677 (F)	○	○	○	-
39. Rotary Table Dynamic Fixture Offset S728 (F)	○	○	○	-
40. Electric Grease Lubrication System	○	○	○	●

Standard ● Optional ○

Hartford

5 Axis Vertical Machining Center

5A Series

- 5A-350XL
- 5A-32E/5A-32EF
- 5A-65E/5A-65EF
- 5A-95Q/5X

Hartford
Hartrol · Smartcenter · Robocell
Only High-Quality Intelligent Machines

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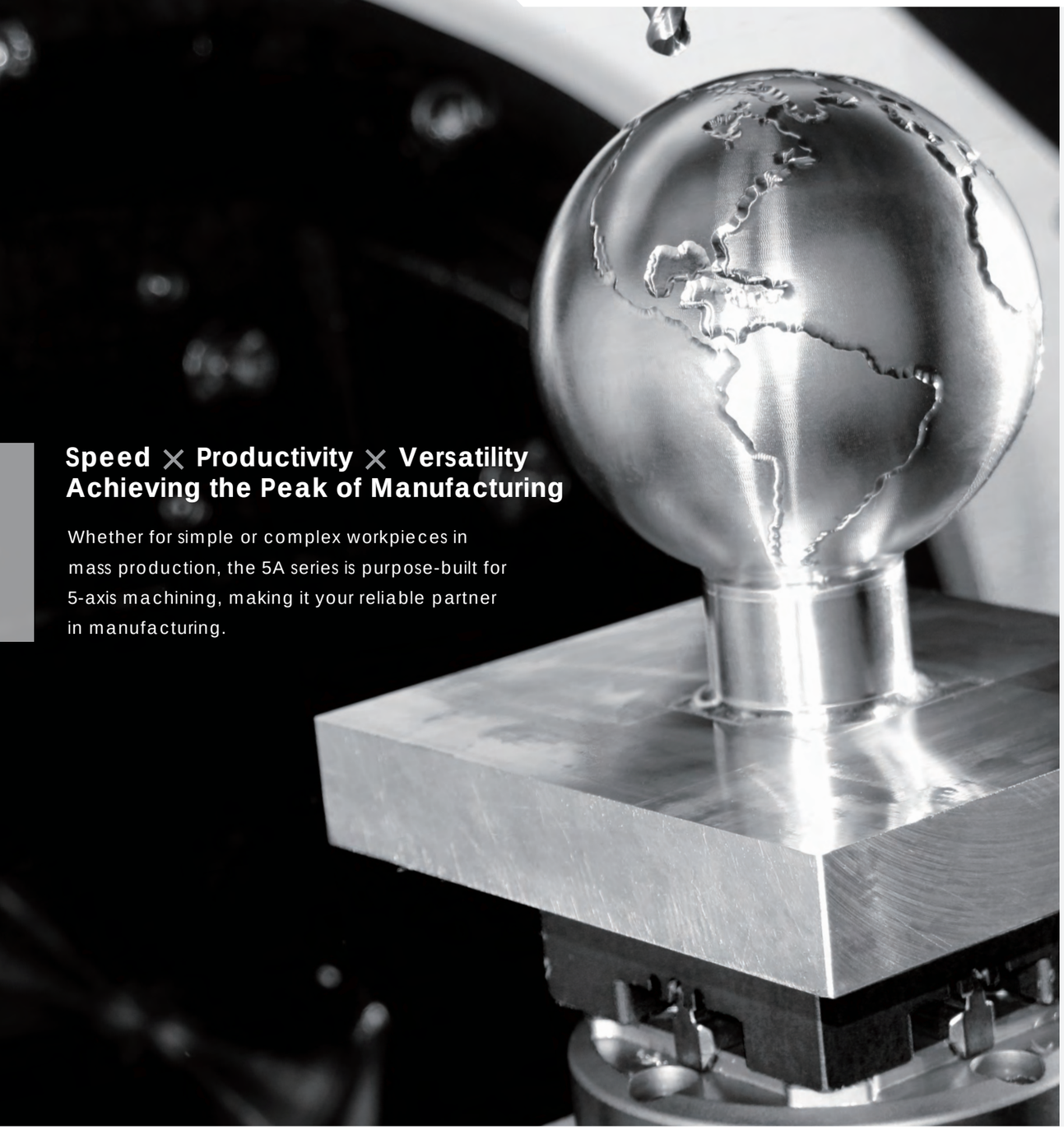
Facebook Website

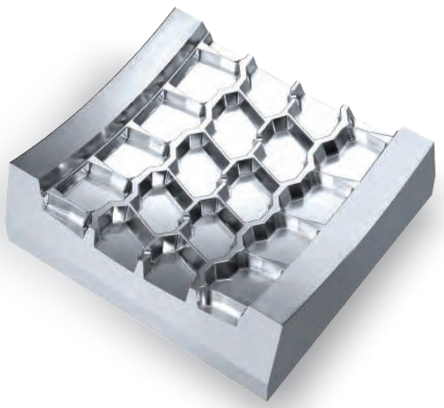
01 Workpiece Machining Applications



Speed × Productivity × Versatility
Achieving the Peak of Manufacturing

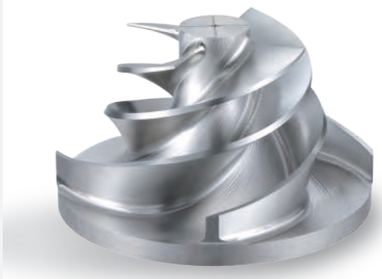
Whether for simple or complex workpieces in mass production, the 5A series is purpose-built for 5-axis machining, making it your reliable partner in manufacturing.

1



2

3



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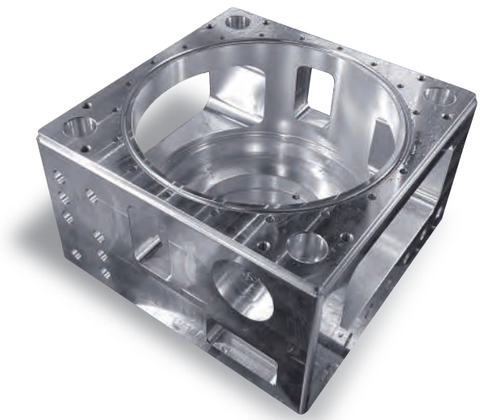


1 | 2
3 | 4

Mold
1 Tire mold

Medical
2 Orthodontic pliers

Aerospace
3 Turbine blade

Semiconductor
4 Vacuum chamber

02 Machine Structure Features

Optimized structural design ensures stability, deformation resistance, and long-term precision.

5A-350XL

Space-Efficient Machine Design

1.The compact full-enclosure design reduces the footprint by 20%.

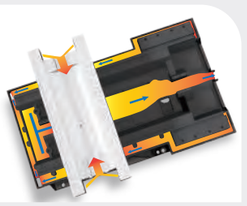
2.The modular CTS design saves space and facilitates maintenance and servicing.

Oil-Air Lubricated Spindle with a 2-Year Unlimited-Hour Warranty opt.

Optional spindle with **15,000 / 20,000** rpm, runout within **5** μm; high-efficiency cooling spindle design ensures stable operation over long periods; automatically activates energy-saving mode after idling for more than 15 minutes.

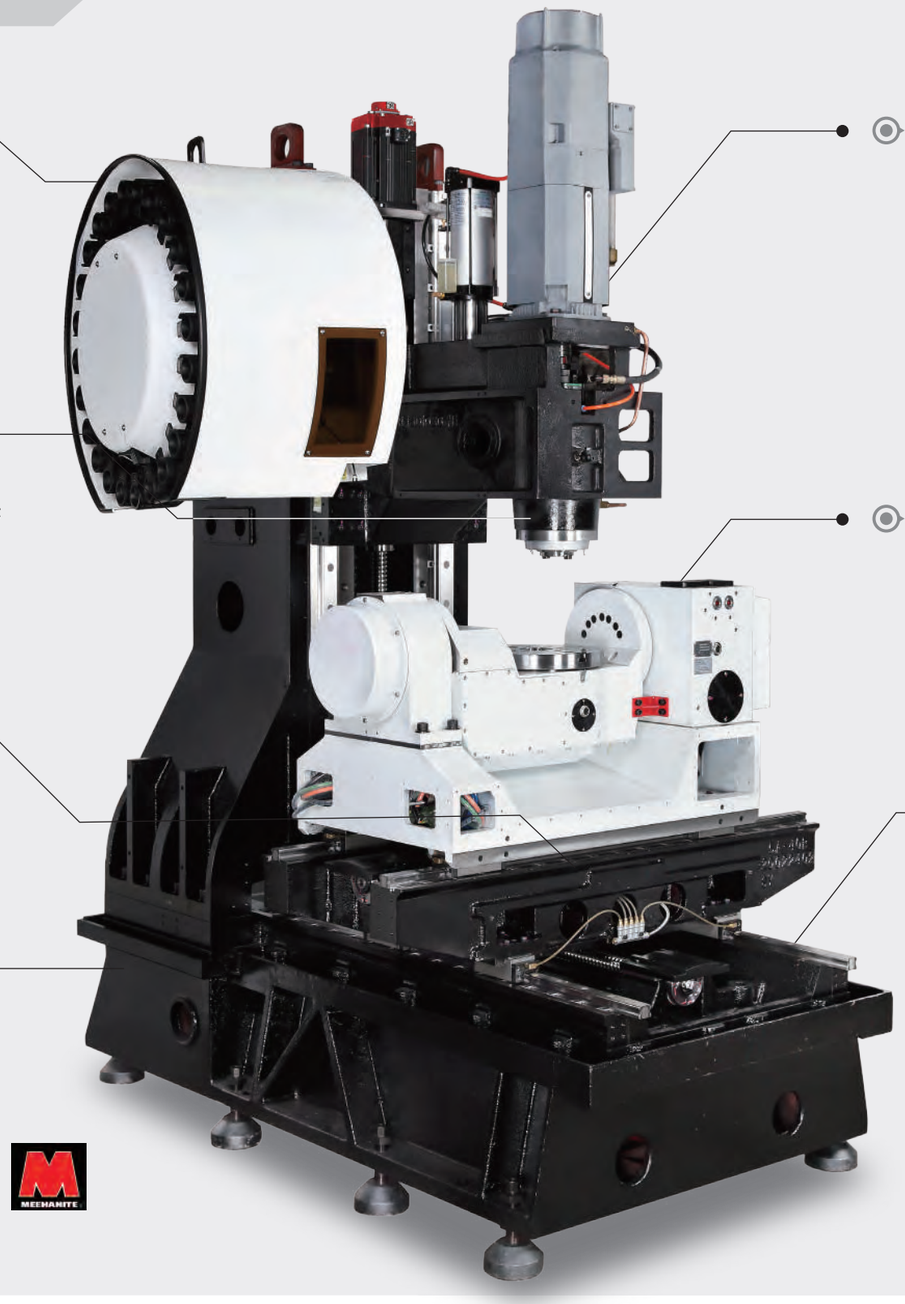
Eco-Friendly, Energy-Saving, Low-Carbon Grease Lubrication Design opt.

The feed axis uses low-amount grease lubrication to meet environmental rules, extend grease and cutting fluid life, reduce maintenance costs, avoid waste oil problems, and ensure stable operation and good product quality.



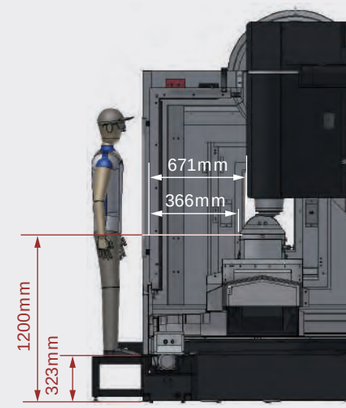
One-Piece Bed Design

The specially designed high-efficiency oil-water separator effectively prevents coolant deterioration and foul odors.



Easy for Operation

The ergonomic design makes loading and unloading more convenient for operators.

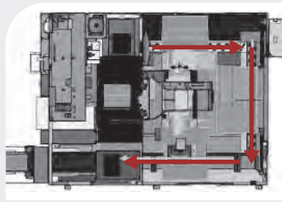


4.5-Axis Rotary Table

The integrated YRT bearing combined with a worm gear mechanism enhances load capacity, rigidity, and overall performance.

Optimized Chip Evacuation Design

The Y-axis right chip auger and X-axis front chip auger work with the chip conveyor and coolant filter system to efficiently remove chips, support stable long-term machining, and improve overall productivity.



Warranty on Guideways for All Models

Warranty coverage will not apply under following conditions :

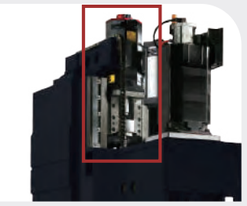
1.Improper operation(collision)

2.Lack of regular cleaningof accumulated debris causing damage to the linear rails &carriages.

02 Machine Structure Features

Single-arm design offers strong support and stable machining.

5A-65E

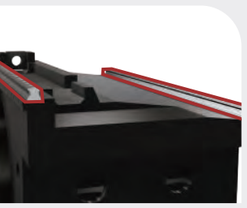


Z-axis Servo Motor Directly Coupled to the Ball Screw

During idle states, the Z-axis utilizes belt transmission; during operation, the servo motor directly drives the ball screw, completely eliminating backlash and preventing the servo lag commonly associated with conventional belt drives. This design significantly enhances machine efficiency and stability.

Oil-Air Lubricated Spindle with a 2-Year Unlimited-Hour Warranty opt.

Optional spindle with **15,000 / 20,000** rpm, runout within **5** μm; high-efficiency cooling spindle design ensures stable operation over long periods; automatically activates energy-saving mode after idling for more than 15 minutes.

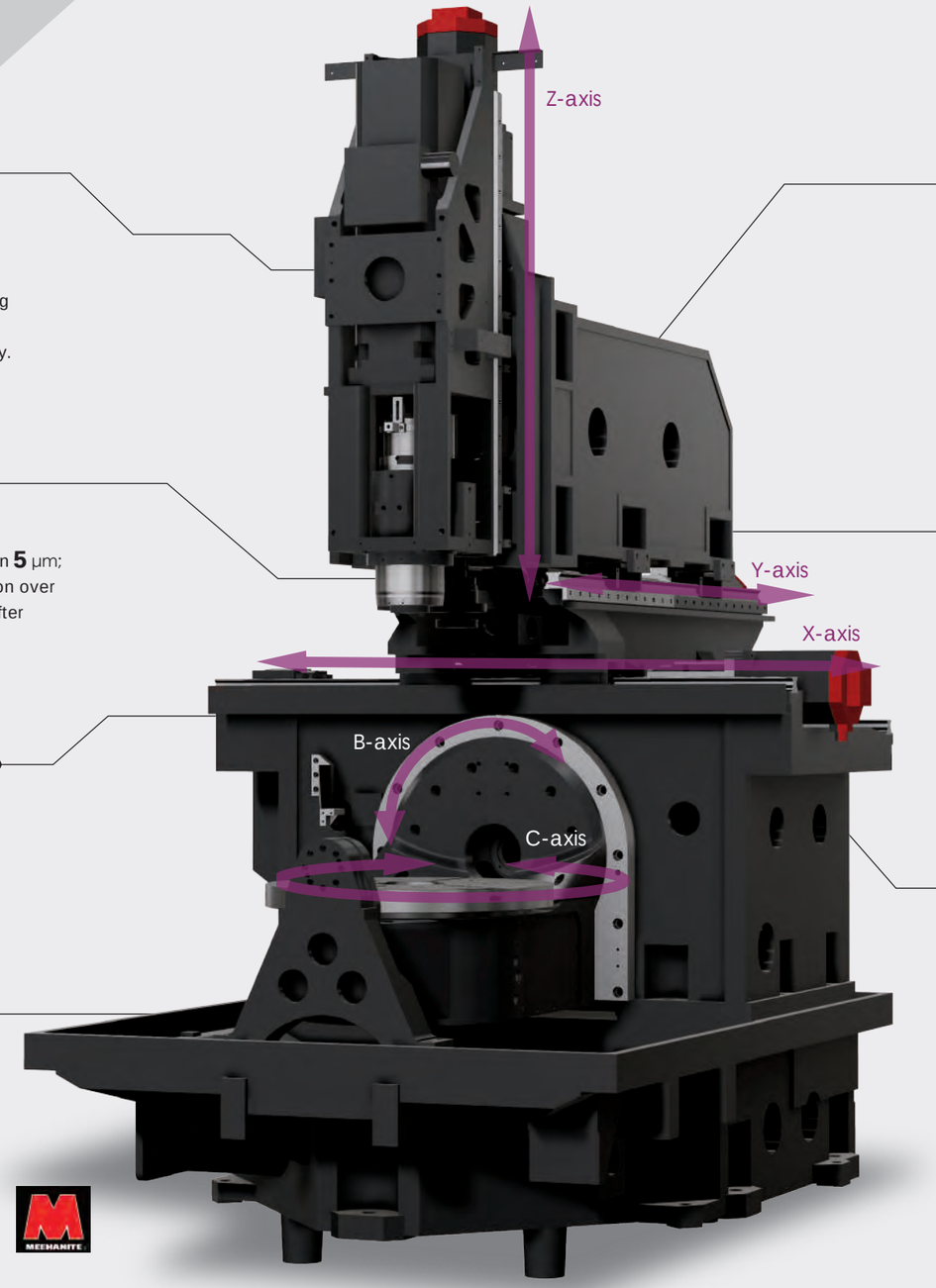


X-axis guide ways are set on stepped bed

The column features a stepped rail configuration and a high-rigidity structural design, providing strong support, effectively reducing structural deformation, and suppressing deflection during cutting. This enhances overall rigidity and machining stability.

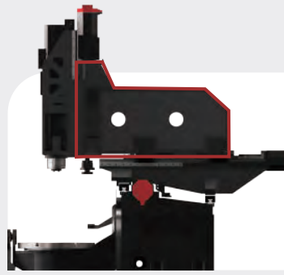
Eco-Friendly, Energy-Saving, Low-Carbon Grease Lubrication Design opt.

The feed axis uses low-amount grease lubrication to meet environmental rules, extend grease and cutting fluid life, reduce maintenance costs, avoid waste oil problems, and ensure stable operation and good product quality.



Full-Support Design on Y-axis

The Y-axis is fully supported throughout its entire travel, eliminating overhang and droop, ensuring stable accuracy and improved surface finish.

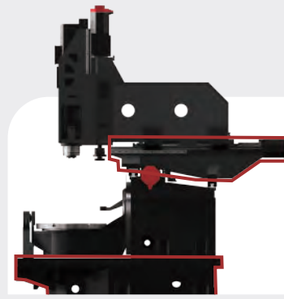


Overlap Design on 3-Axis

The workpiece remains stationary instead of moving with the three axes, ensuring stable loading on all axes, minimizing the impact on positioning accuracy, and achieving more consistent machining precision.

Enlarge Design on Base

The base feet and saddle adopt a forward overhang reinforced support structure, effectively enhancing dynamic cutting accuracy.



Warranty on Guideways for All Models

Warranty coverage will not apply under following conditions :

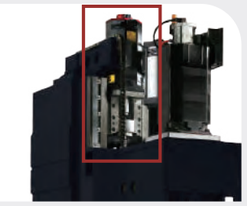
1.Improper operation(collision)

2.Lack of regular cleaningof accumulated debris causing damage to the linear rails &carriages.

02 Machine Structure Features

Innovative structure. Ultimate accuracy. Built for your 5-axis machining needs.

5A-95Q



Z-axis Servo Motor Directly Coupled to the Ball Screw

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Oil-Air Lubricated Spindle with a 2-Year Unlimited-Hour Warranty opt.

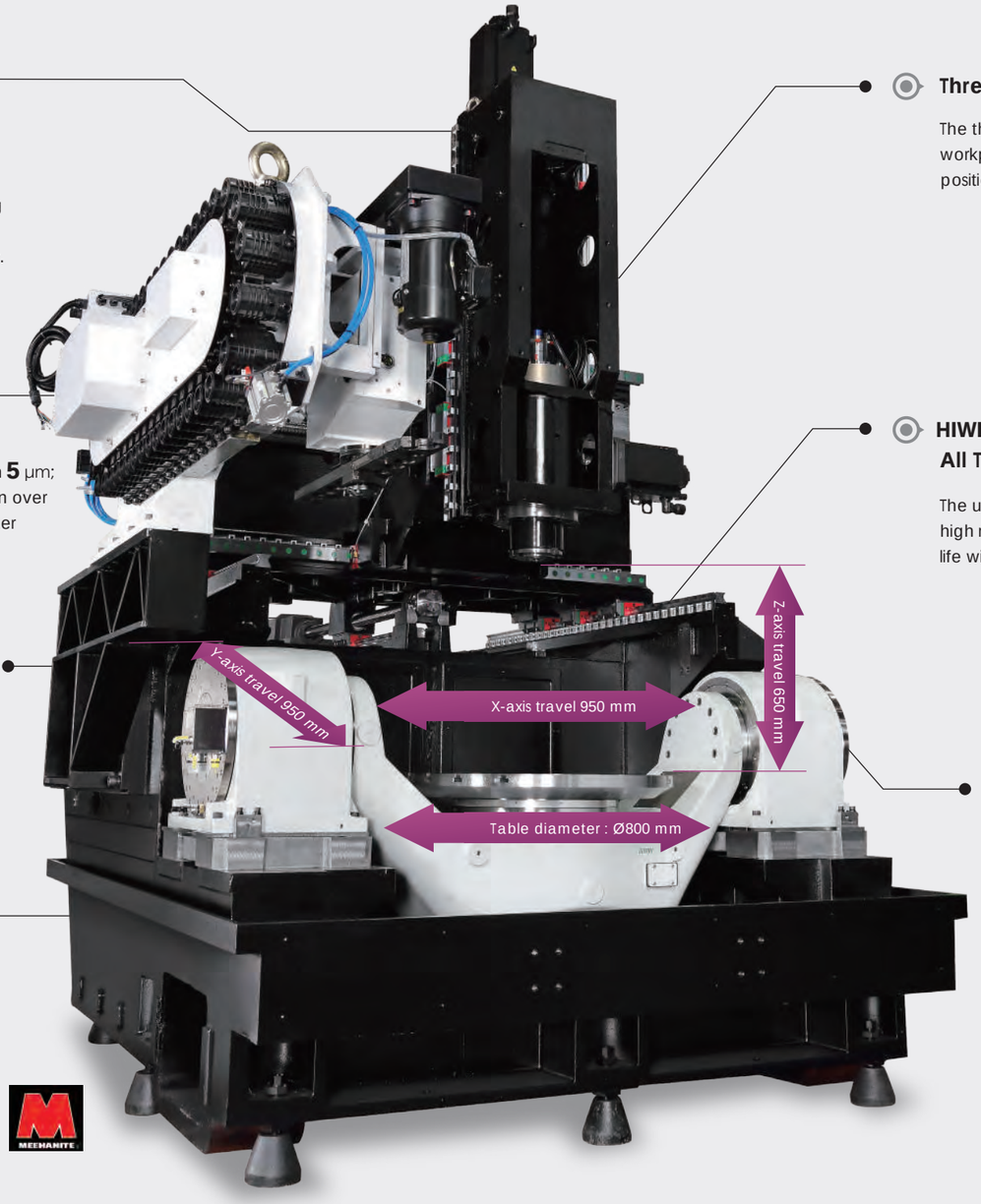
Optional spindle with **15,000 / 20,000** rpm, runout within **5** μm; high-efficiency cooling spindle design ensures stable operation over long periods; automatically activates energy-saving mode after idling for more than 15 minutes.

Automation Design

Preparation for automation interface design, upgraded to ultra-fast speed.

Eco-Friendly, Energy-Saving, Low-Carbon Grease Lubrication Design opt.

The feed axis uses low-amount grease lubrication to meet environmental rules, extend grease and cutting fluid life, reduce maintenance costs, avoid waste oil problems, and ensure stable operation and good product quality.



Three-Axis Overlapping Design

The three-axis load remains stable and is unaffected by workpiece weight, resulting in a 16% improvement in positioning accuracy and more consistent cutting precision.

HIWIN High-Rigidity Precision Linear Guides on All Three Axes

The unique guideway design provides exceptional precision, high rigidity, and heavy-load capacity, offering long service life with minimal maintenance requirements.

Design of A / C Axis

Equipped with a high-speed, high-precision, and high-rigidity DDM to ensure stable loading/unloading operations and consistent machining performance.

5 YEAR Warranty on Guideways for All Models

Warranty coverage will not apply under following conditions :

1.Improper operation(collision)

2.Lack of regular cleaningof accumulated debris causing damage to the linear rails &carriages.

03 Smart Factory / Intelligent Automation

One unit capable of connectingup to 10 or 20 machines

Smart i-Factory System with Superbox (Opt.)

Through i-Factory, all machinery and equipment in the factory can be connected, and the machine connections are no longer limited to Hartford. Machines from other manufacturers can also be connected for real-time visualization and management. The system is composed of five key components: real-time monitoring, production planning, alert notifications, data analysis, and remote connectivity, allowing you to move away from traditional management models and embrace a simpler and more convenient approach to factory management.

Tailored one-to-many automation planning

Intelligent Automated Production Line Unit (Opt.)

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.

Detailed specifications please contact our sales staff.

Hartrol Premium

Hartford Smartcenter APPS

1 Automation & Smart Factory

- Autopilot V2 Package
- Real-time Monitor Package
- Efficiency Improvement Package
- Smart Lubrication System
- Machine Play – Smartphone Remote Operation
- Wireless Network Function (Wi-Fi)

2 Monitoring & Energy Management

- Real-time Monitor Package (CCD Monitor / IP Camera)
- Energy Monitoring

3 Tool Protection & Machining Stability

- Tool Protection Suite (TPS)
- AFC – Automatic Feed Control
- Rigid Tapping Automatic Learning

4 CNC Control & Operation Enhancement

- Handwheel Simulation Mode
- HP Level R1–R10 Parameter Package

5 High-Speed / High-Accuracy Machining

- SSS High-speed High-accuracy Control
- High-speed High-accuracy Control III (G5P20000)
- High Speed Milling

24 HR

Online Update System

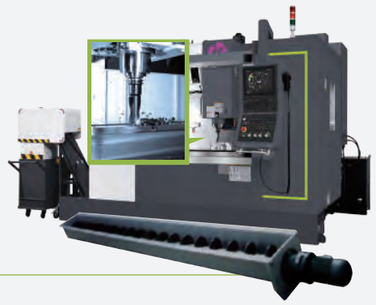
Keep your operating system in optimal condition and stay up to date with the latest features from Hartford.

Hartford ZDT

Early warning before machine failure helps reduce unexpected downtime, minimizing productivity loss and cost.

Chip Conveyor Opt.

Smart detection based on spindle current clears chips only when needed. The system runs on a 50% on/off cycle during cutting to save up to 50% motor power, and automatically reverses when chips build up to prevent overload and protect the conveyor.



Lubrication Opt.

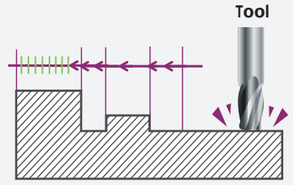
The system smartly delivers oil based on machine and cutting conditions, saving up to 50% oil and reducing costs while supporting eco-friendly operation.

Position Opt.

When performing workpiece measurement with Hartrol Premium and Fanuc 15” IPC, operators can simply enter values through the intuitive guided interface—no need to memorize complex measurement commands, making the process effortless.

AFC Opt.

Spindle load monitoring allows users to set tool-specific load limits, boosting efficiency by up to 21% in heavy operations like face and side milling.



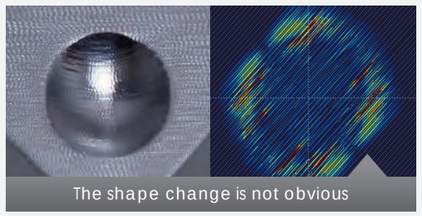
Eliminate interference and mechanical collision issues during the machining process

Digital Transformation (Opt.)

Digital Twin-NCVS software combines workpiece CAD, tools, and machine parameters to simulate the machining process in advance. It accurately reflects real conditions, going beyond traditional CAD/CAM by including machine data. The system verifies CNC parameter settings, analyzes part geometry and machine travel limits, and ensures alignment between programmed data and actual machine performance.. This helps prevent interference and collisions, ensuring safe, stable machining and better productivity.

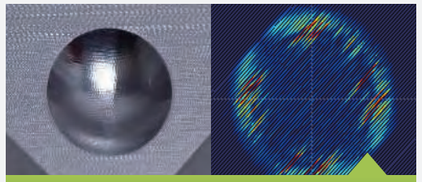
▪ Simulation vs. Actual Machining Results

OFF



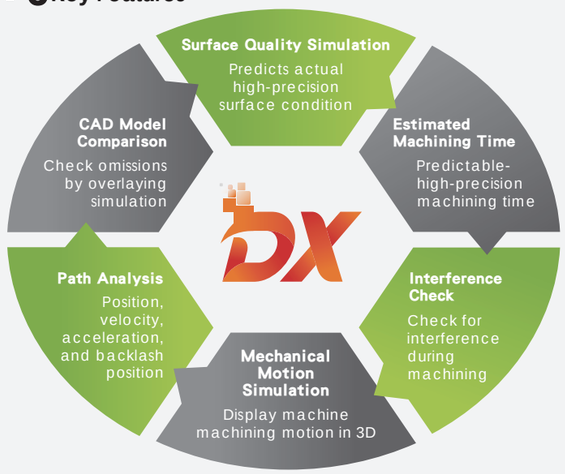
The shape change is not obvious

NO



The shape can be clearly identified

▪ 6 Key Features

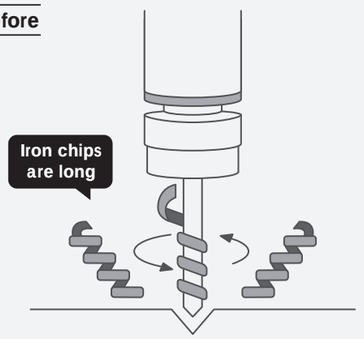


Solve the problem of chips wrapping around your cutting tool

Drilling Chip Breaker Feature (Opt.)

In deep-hole machining, the lack of effective chip-breaking can lead to issues like chips wrapping around the tool, scratching the workpiece, and making chips cleaning difficult. With Hartford's exclusive chips breaking for drilling function, chips are finely broken down, preventing them from wrapping around the tool. This ensures the workpiece remains intact, chips are easily cleaned, productivity is increased.

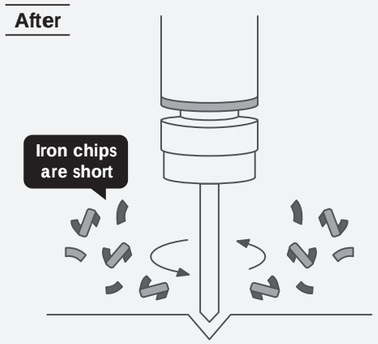
Before



▲ **Function Off**

Long iron chips cannot be effectively broken into manageable chips.

After



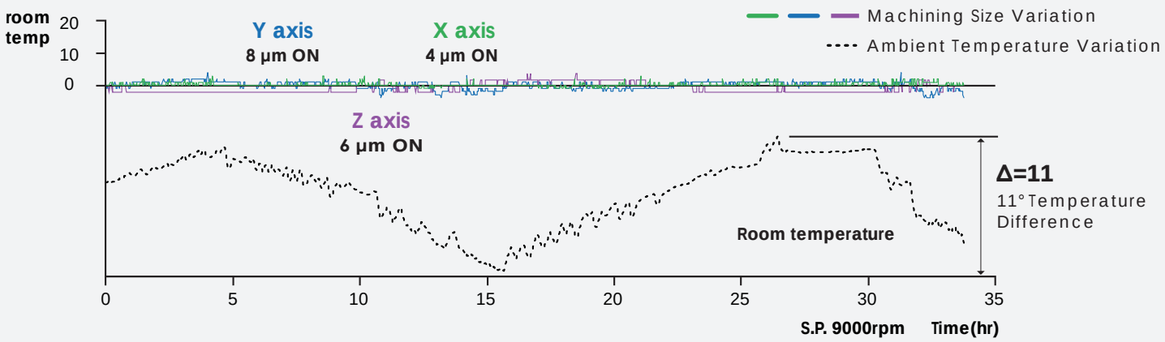
▲ **Function On**

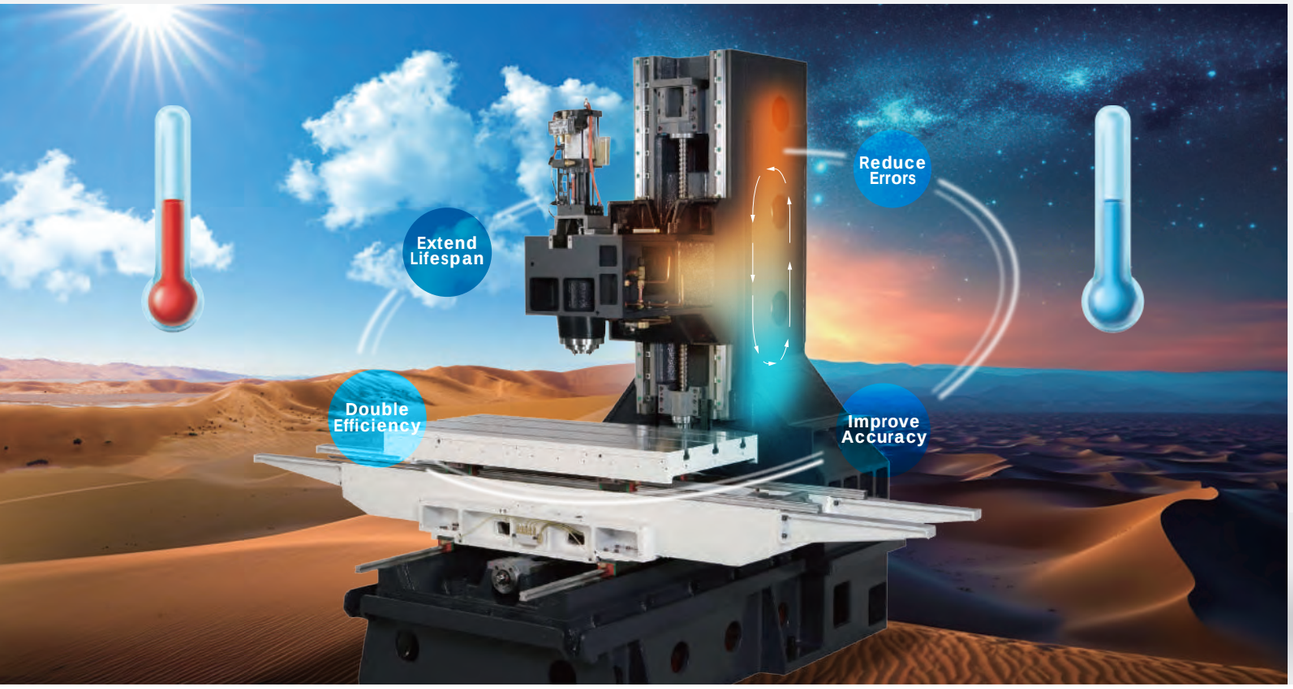
Effectively breaks long chips into short chips for improved chip control.

No More Thermal Drift –
Precision Machining, Zero Defects

Thermal Compensation System (Opt.)

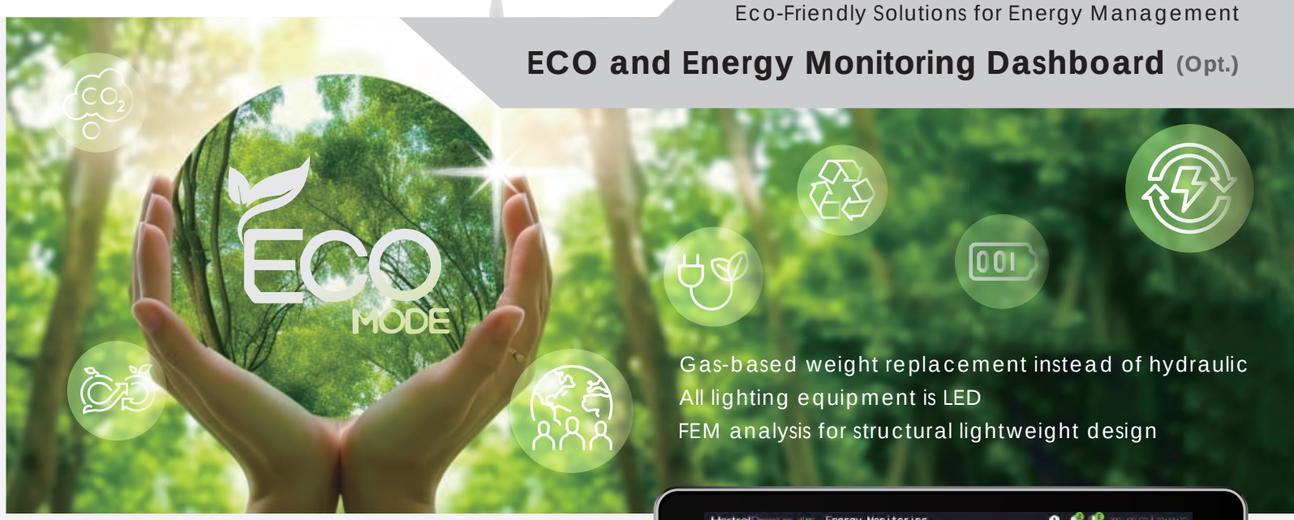
Exclusive whole-machine ambient temperature thermal displacement compensation function ensures that machining equipment does not cause workpiece deformation due to prolonged heat accumulation, thereby maintaining machining accuracy. Additionally, it effectively reduces the time required for temperature adaptation and thermal displacement modeling across different machine models and ambient temperature variations, significantly shortening delivery time.





Eco-Friendly Solutions for Energy Management

ECO and Energy Monitoring Dashboard (Opt.)



Gas-based weight replacement instead of hydraulic
All lighting equipment is LED
FEM analysis for structural lightweight design

Energy Monitoring Dashboard

Real-time monitoring of energy consumption for each electrical component of the machine, with the ability to query historical energy consumption data and generate reports.

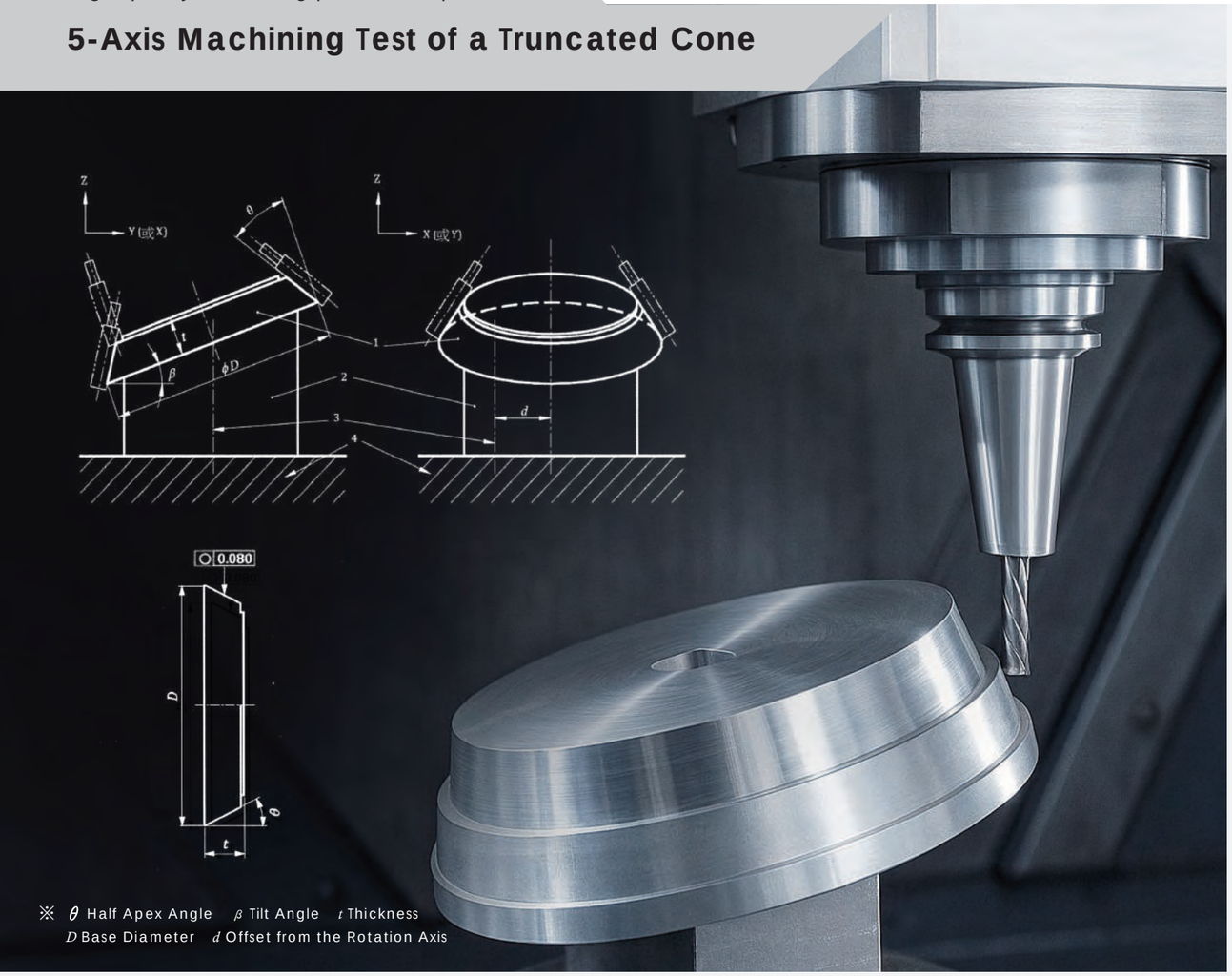
Eco Mode

Helps you control five peripheral devices, including the hydraulic motor, oil cooler, mist collector, work lights, and chip conveyor, to prevent unnecessary energy consumption when the machine is idle.

05 Cutting Accuracy

High-quality machining precision inspection

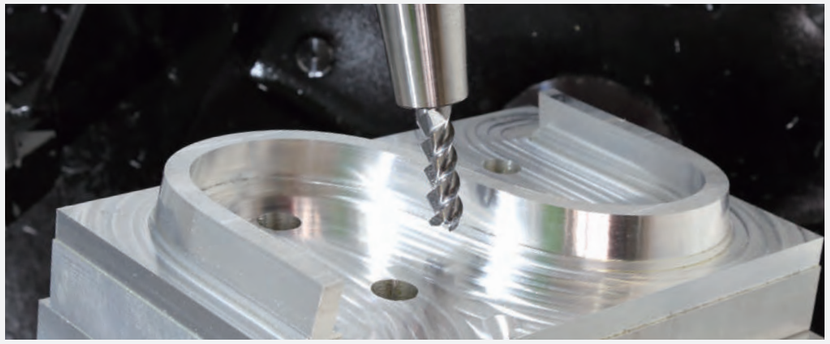
5-Axis Machining Test of a Truncated Cone



■ 5-Axis Precision Inspection : CNC - 15077-7 M3

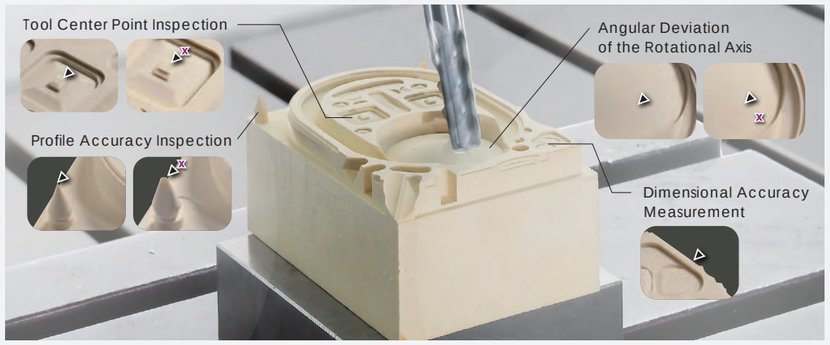
Workpiece Material	Aluminum	Roundness	0.080mm
Workpiece Dimensions	80x20mm	Feed Rate (F)	1000
Cutting Tool	Ø12mm End Mill	Spindle Speed (S)	6000
Angular Error	θ ISO : 15 ° Max. : 15° 1' 20'' / Min. : 14° 58'40''	Sampling Points	≥12 point (Uniform Dispersion)

■ Five-Axis Accuracy Inspection : S-CUT



Item	Test Item	Standard Value	Inspection Data
1	Multi-faces simultaneous (Finish/smooth)	RA3.2 Rmax12.5	RA2.0 Rmax12.5
2	Contour Accuracy	±0.1mm	0.085mm
3	Thickness accuracy of 5-axis simultaneous	±0.1mm	0.063mm
4	Direction Change Discrepancy	No Discrepancy	No Discrepancy

■ Five-Axis Accuracy Inspection : NCG2005



Workpiece Material	Necuron 1007
Workpiece Dimensions	75x105x50 mm
Workpiece Fixing Angle	0 ° & 30 °
Machining Time	12 min
Tool	Ø6 mm End Mill

Note :
This is the actual cutting inspection data of the machine. Due to differences in assembly and environmental conditions for each machine, the cutting accuracy will be based on the actual machine shipped.

06 Spindle Torque Diagrams

主軸型式

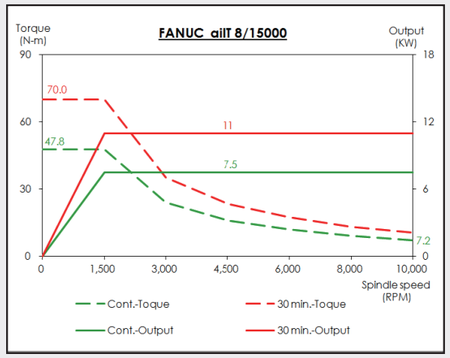
- #40 DDS 10000 /12000/15000 rpm (BT/BBT/HSK-A63)
- #40 DDS 20000 rpm (HSK-A63)
- #40 Built-in 24000 rpm (HSK-A63) N/A – 5A-350XL

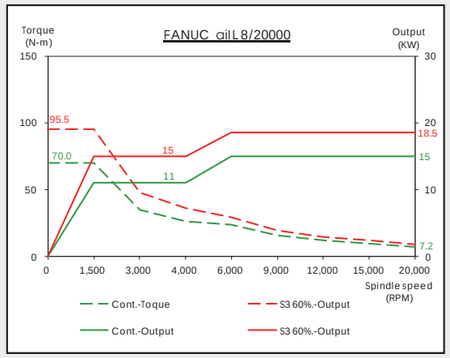
BBT for optional

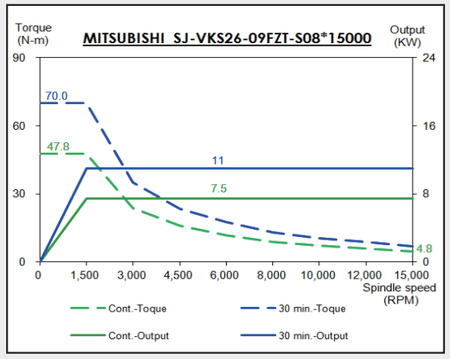
- Dual contact between the taper and theflange
- Improves the rigidity, accuracy, speed and performance. Radial deflection, vibration and deviationare significantly reduced

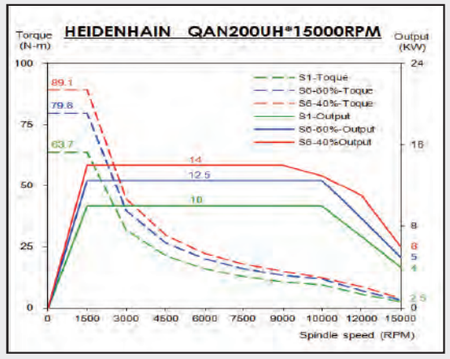
Spindle Torque Diagrams

■ #40_Direct-drive

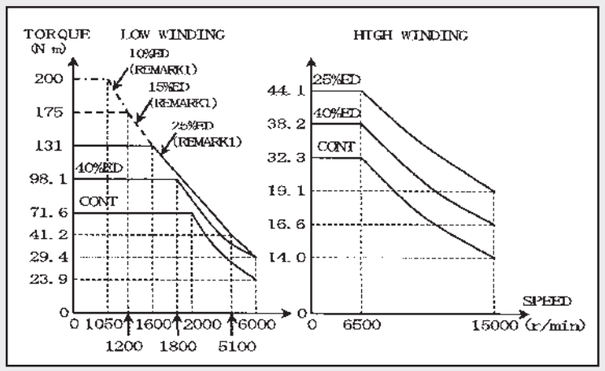




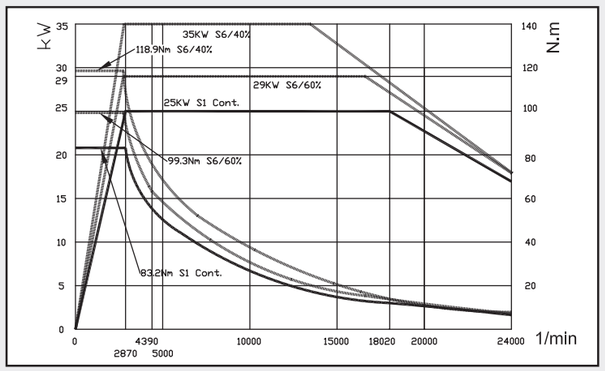




■ #40_Direct-drive



*Applicable Models_5A-40R,5A-65E/EF

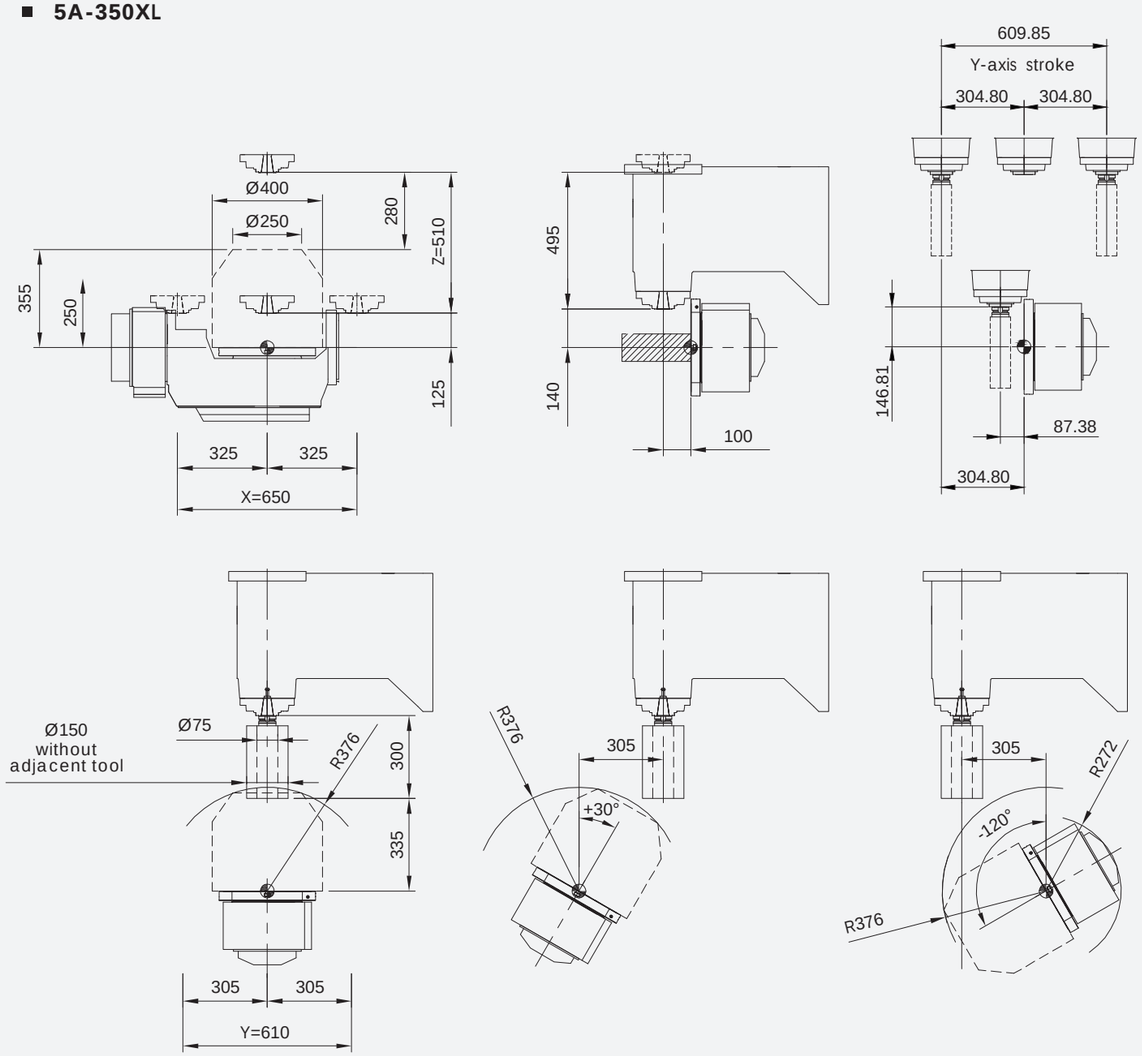


*Applicable Models_5A-95Q/5X

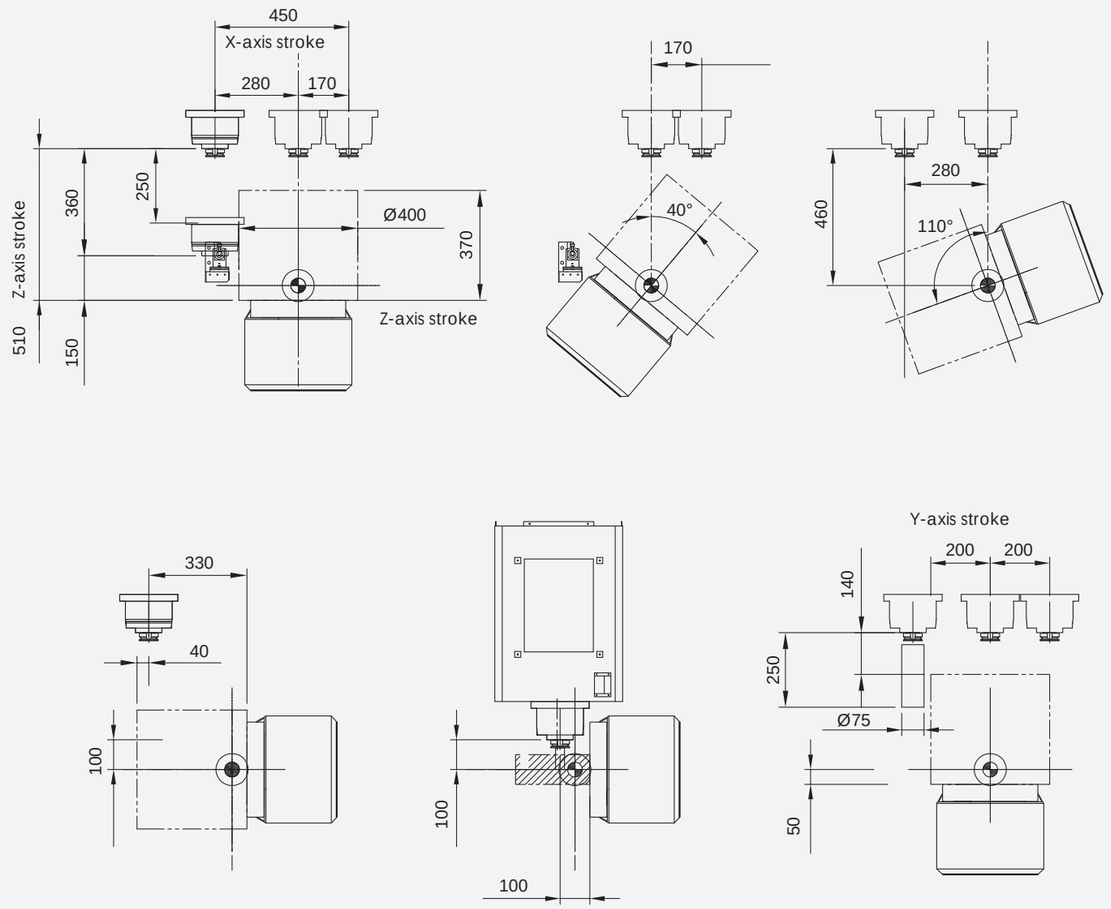
All the results featured in this calogue were produced under shich testing condilion in a special zed testing enviroment.
Under dfferent festing conditions and in less than ideal tesing environments. That the rest results vary fom those shown in this catalogue.

07 Cutting Range and Interference

■ 5A-350XL

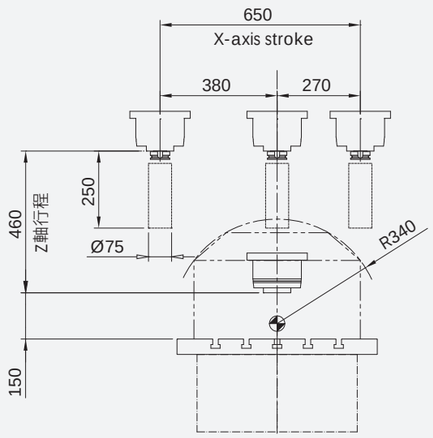


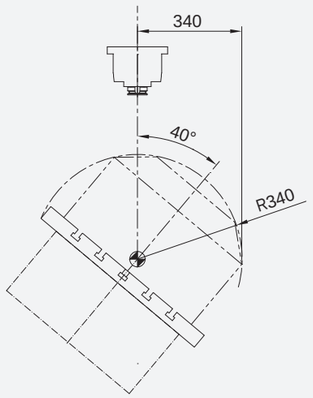
■ 5A-32E/EF

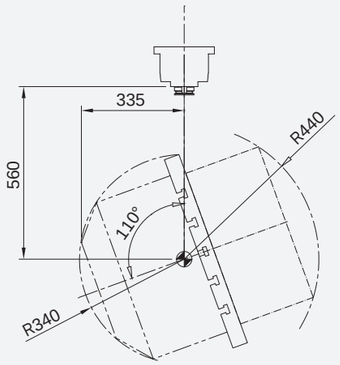


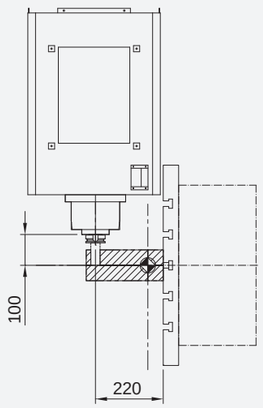
07 Cutting Range and Interference

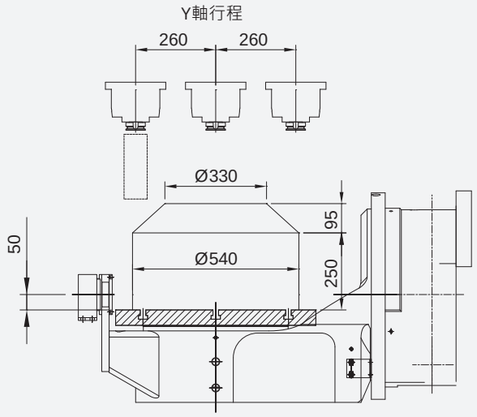
■ 5A-65E / EF

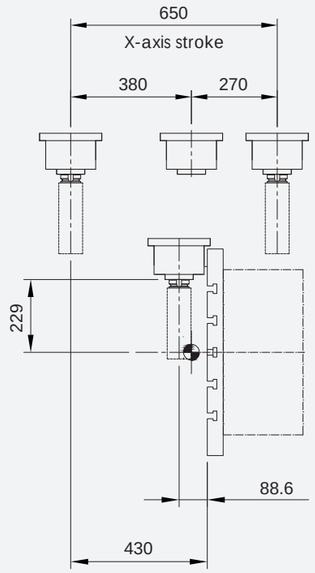




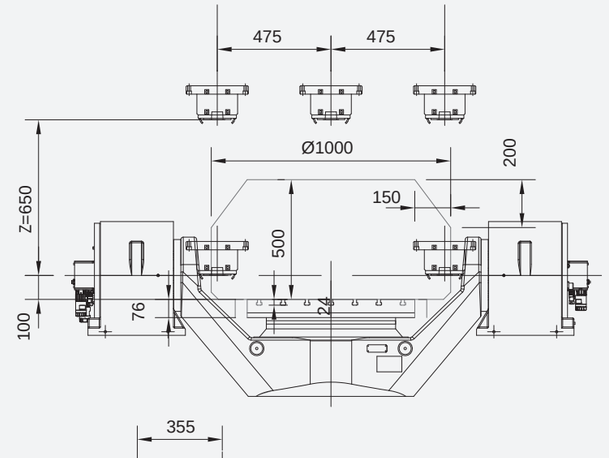


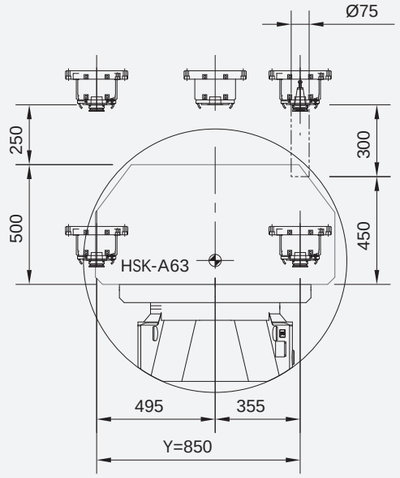


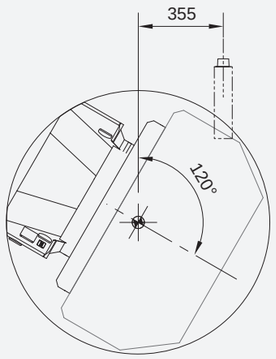


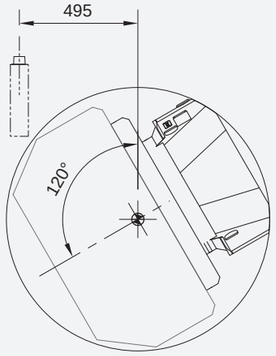


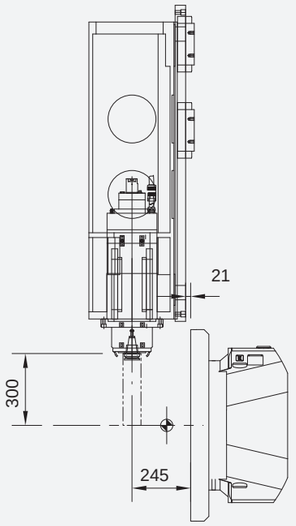
■ 5A-95Q /5X

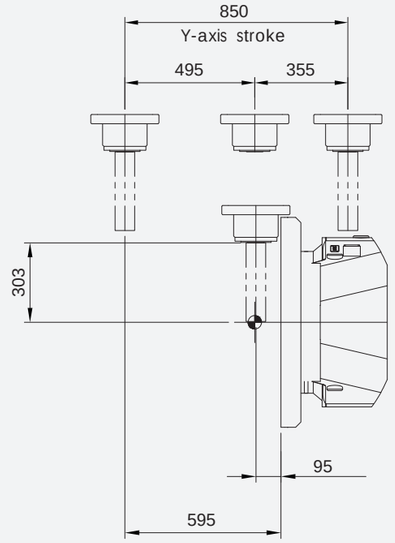




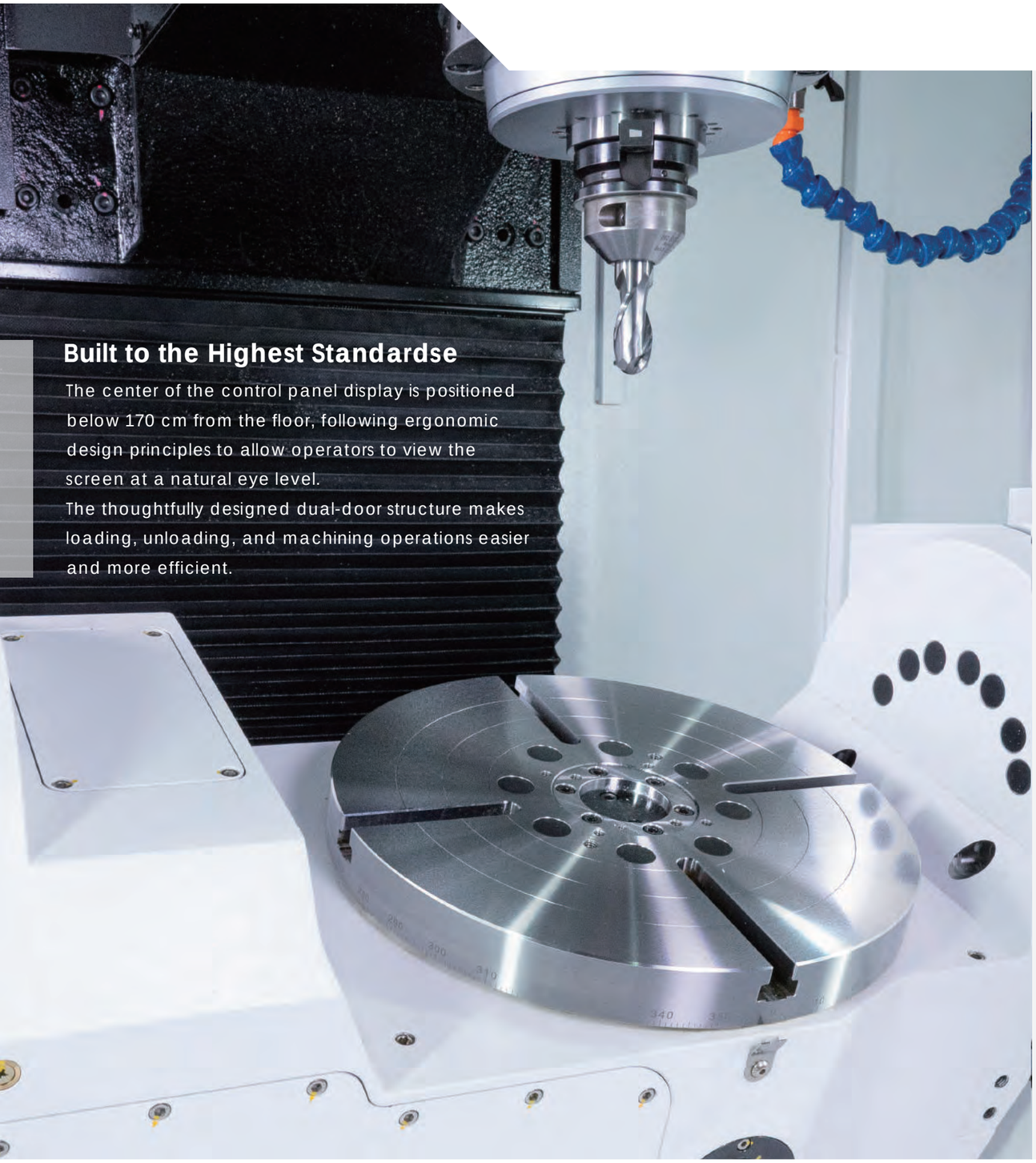








08 Machine Dimension

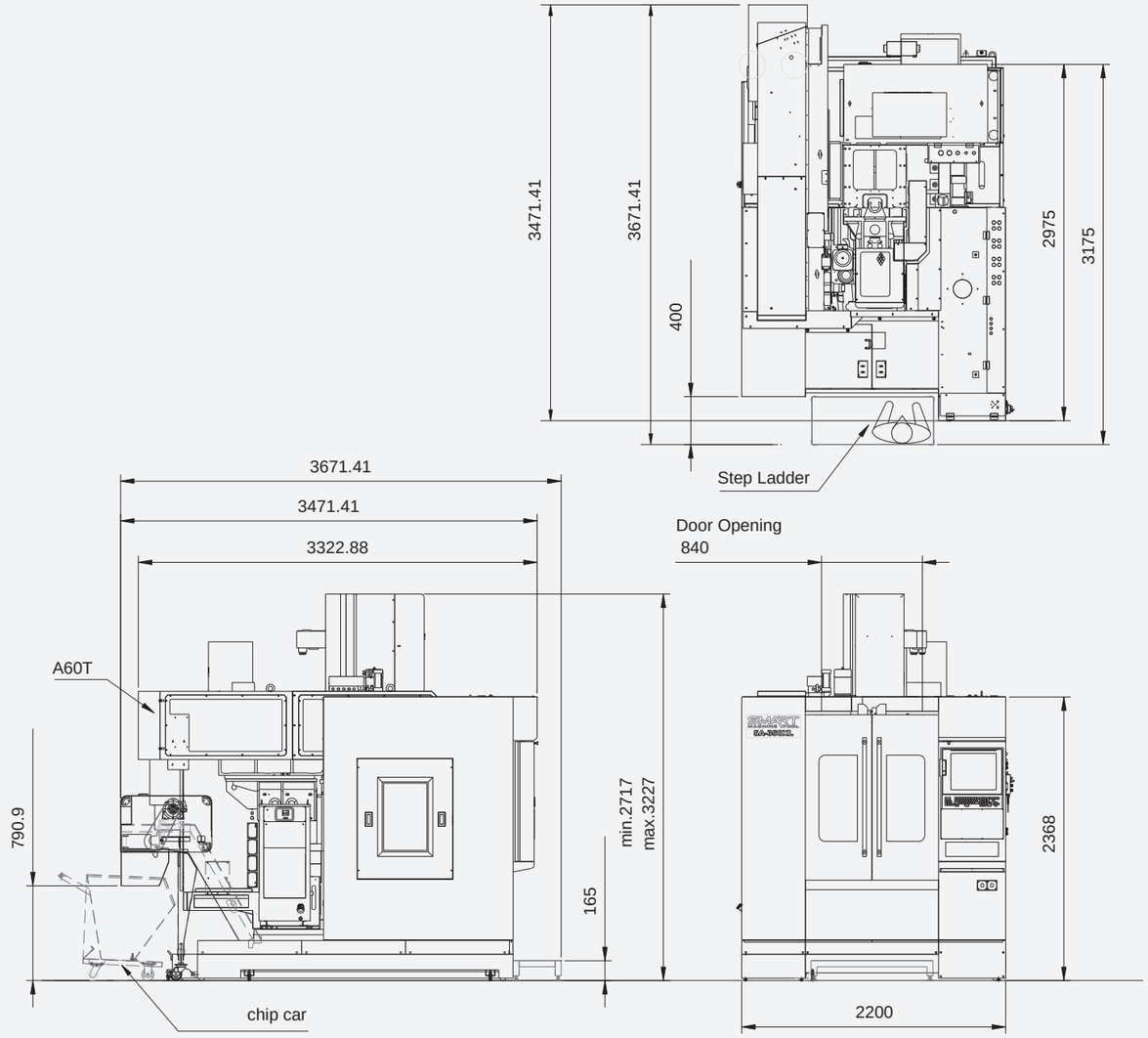


Built to the Highest Standardse

The center of the control panel display is positioned below 170 cm from the floor, following ergonomic design principles to allow operators to view the screen at a natural eye level.

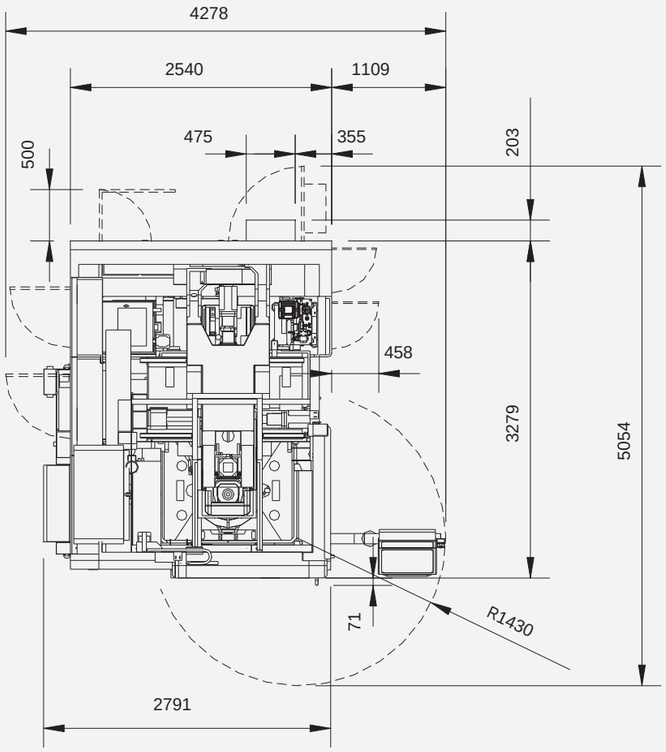
The thoughtfully designed dual-door structure makes loading, unloading, and machining operations easier and more efficient.

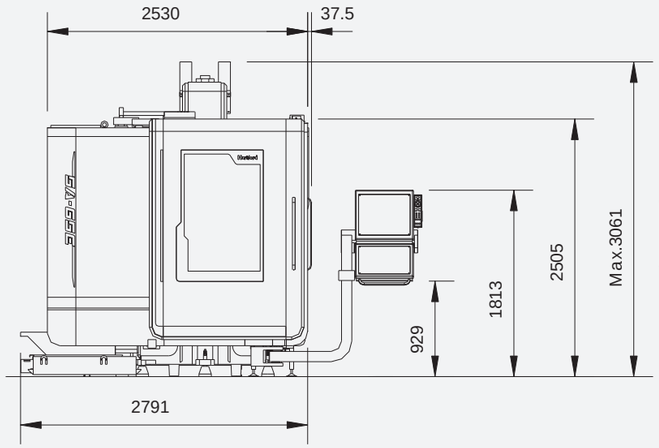
■ **5A-350XL**

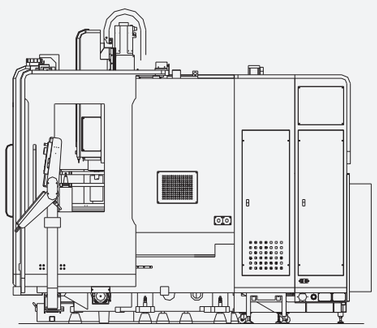


08 Machine Dimension

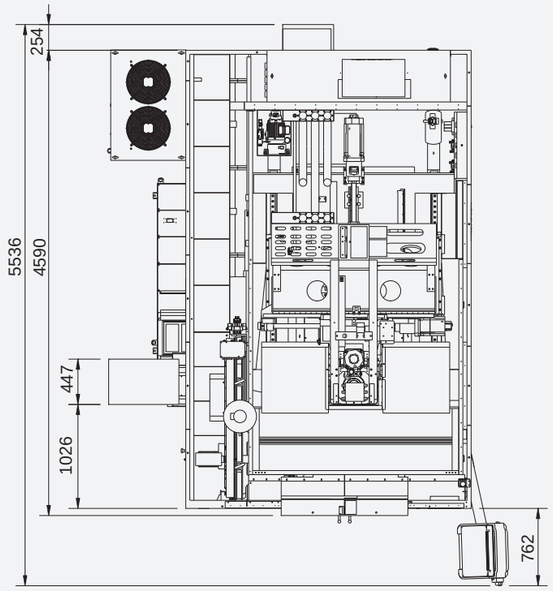
■ 5A-65E / EF

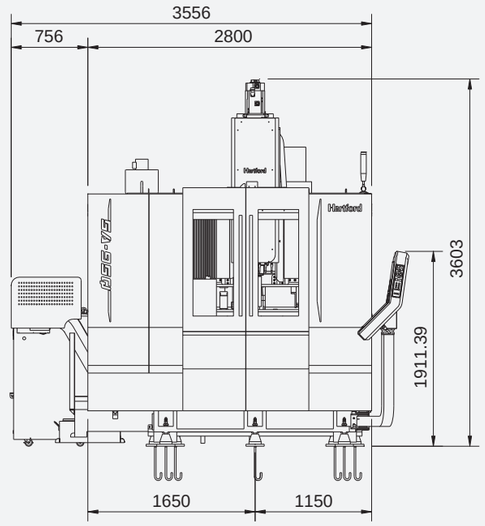


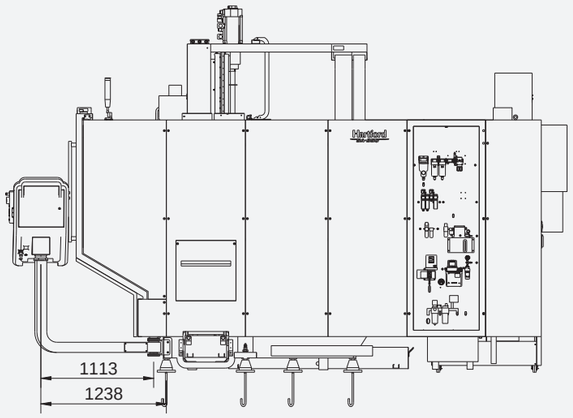




■ 5A-95Q / 5X







09 Machine Specifications

		Unit	5A-350XL	5A-32E	5A-32EF	5A-65E	5A-65EF	5A-95Q	5A-95Q / 5X
Table	Working Surface	mm	Ø350	Ø320	Ø320	Ø650	Ø650	Ø800	Ø800
	T-slot Width × Pitch (Number)	mm	12 x 90°(4)	14 x 45°(8)	14 x 45°(8)	18 x 60°(6)	18 x 60°(6)	14 x 100°(7)	14 x 100°(7)
	Max. Load (Average)	kg	200	H200 / V150	H200 / V150	500	500	850	850
Travel	X-axis Travel	mm	650	450	450	650	650	950	950
	Y-axis Travel	mm	610	400	400	520	520	850	850
	Z-axis Travel	mm	510	360	360	460	460	650	650
	A-axis Travel	deg	+30° ~ -120°	-	-	-	-	±120°	±120°
	B-axis Travel	deg	-	+110° ~ -40°	+110° ~ -40°	+110° ~ -40°	+110° ~ -40°	-	-
	C-axis Travel	deg	±360°	360°	360°	360°	360°	360°	360°
	Distance from Spindle End to Table	mm	125~635	150~510	150~510	150~610	150~610	100~750	100~750
Spindle	Spindle Nose Taper	rpm	#40	#40	#40	#40	#40	#40	#40
	Spindle Speed (DDS)	rpm	10000 / 12000 / 15000 / 20000	10000 / 12000 / 15000 / 20000	10000 / 12000 / 15000 / 20000	12000 / 15000 / 20000	12000 / 15000 / 20000	12000 / 15000	12000 / 15000
	Spindle Speed (Built-in)	rpm	15000 / 20000	15000 / 20000 / 24000	15000 / 20000 / 24000	15000 / 20000 / 24000	15000 / 20000 / 24000	15000 / 24000	15000 / 24000
Feed	Cutting Feedrate (X / Y / Z)	m/min	20 / 20 / 20	20 /20 / 20	20 /20 / 20	20 /20 / 20	20 / 20 / 20	20 / 20 / 20	20 / 20 / 20
	Rapid Traverse Rate (X / Y / Z)	m/min	36 / 36 / 36	36 / 36 / 36	36 / 36 / 36	36 / 36 / 36	36 / 36 / 36	36 / 36 / 36	36 / 36 / 36
	Rapid Feed Rate (B / C)	m/min	25 / 25	25 / 25	25 / 25	25 / 25	25 / 25	-	-
	Rapid Feed Rate (A / C)	m/min	-	-	-	-	-	30/50 ; 60/100 (Heidenhain)	60/100
ATC	Tool Capacity	pcs	40 / 60	60 / 120	60 / 120	A : 24 (30 / 40 / 60)	A : 24 (30 / 40 / 60)	A : 40 (60 / 80 / 120)	A : 40 (60 / 80 / 120)
	Max. Tool Weight	kg	7	7	7	7	7	7	7
	Max. Tool Size (Dia. × Length)	mm	75 x 300L	75 x 250L	75 x 250L	75 x 250L	75 x 250L	75 x 300L (D10 / D15K / B15K) : 60 x 300L (B24K)	75 x 300L (D10 / D15K / B15K) : 60 x 300L (B24K)
	Tool Shank		BT40 (BBT40 / CAT40 / DIN69871)	BT40 (BBT / CAT / DIN / HSK-A63)	BT40 (BBT / CAT / DIN / HSK-A63)	BT40 (BBT / CAT / DIN / HSK-A63)	BT40 (BBT / CAT / DIN / HSK-A63)	BT40 (BBT / CAT / DIN / HSK-A63)	BT40 (BBT / CAT / DIN / HSK-A63)
	Pull Stud Bolt		MAS-P40T-1 (CAT40 / DIN69872)	P40T-1 (CAT-40 / DIN69872)	P40T-1 (CAT-40 / DIN69872)	P40T-1 (CAT-40 / DIN69872)	P40T-1 (CAT-40 / DIN69872)	P40T-1 (CAT-40 / DIN69872)	P40T-1 (CAT-40 / DIN69872)
Motor	Spindle Drive Motor (Continuous / 30 min)	kW	7.5 / 11 opt. 15 / 18.5	7.5 / 9.8 opt. 10 / 12.5 (S6-40%)	7.5 / 9.8 opt. 10 / 12.5 (S6-40%)	7.5 / 9.8 opt. 10 / 12.5 (S6-40%)	7.5 / 11 opt.15 / 18.5 ; 7.5 / 9.8 opt.10 / 12.5 (S6-40%,Heidenhain)	7.5 / 11 opt. 15 / 18.5 opt. 22 / 26 10 / 12.5 opt. 25 / 35 (S6-40%,Heidenhain)	7.5 / 11 opt. 15 / 18.5 opt. 22 / 26 10 / 12.5 opt. 25 / 35 (S6-40%,Heidenhain)
Positioning Accuracy	Positioning Accuracy (JIS B6330), without linear scale	mm	±0.006	±0.006	±0.006	±0.006	±0.006	±0.006	±0.006
	Repeatability (JIS B6330), without linear scale	mm	±0.002	±0.002	±0.002	±0.002	±0.002	±0.002	±0.002
	Positioning Accuracy (JIS B6330), with linear scale	mm	±0.005	±0.005	±0.005	±0.005	±0.005	±0.006	±0.006
	Repeatability (JIS B6330), with linear scale	mm	±0.002	±0.002	±0.002	±0.002	±0.002	±0.002	±0.002
	Positioning Accuracy (VDI 3441, repeat 5 time)	mm	0.01	0.008	0.008	0.008	0.008	0.012	0.012
	Repeatability (VDI 3441, repeat 5 time)	mm	0.006	0.006	0.006	0.006	0.006	0.01	0.01
Other	Required Air Pressure	kg/cm^2	6.5	6.5	6.5	6.5	6.5	6.5	6.5
	Electric Power Requirement	KVA	30~45	22~55	22~55	22~55	22~55	55~85	55~85
	Machine Weight	kg	7000	7000	7000	9000	9000	16000	16000
	Floor Space	mm	4114 x 4086	*	*	5060 x 5000	5060 x 5000	6340 x 6485	6340 x 6485
	Machine Dimensions (L × W × H)	mm	3322 x 2200 x 3227	*	*	3482 x 2540 x 3061	3482 x 2540 x 3061	4844 x 2800 x 3603	4844 x 2800 x 3603

Model Description : FOUR (4+1 Axis CNC Control Capability)

Note : 1. Factory laser accuracy is based on JIS standards. For VDI 3441 compliance, please specify separately.
2. Product specifications and accessories are subject to change without notice.
3. * Please contact our sales representative.