EH5 series

EH5 SERIES

Horizontal 5 axes Machining Centers

THE ULTIMATE MACHINING POWER

AWEA MECHANTRONIC CO.,LTD.

ISO 9001 ISO 14001 CE

Official distributor for Benelux

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A-EH5-EN-201808

THE ULTIMATE MACHINING POWER

AWEA MECHANTRONIC CO.,LTD.

5 AXES TECHNOLOGY

Comprehensive 5 Axes Machine Product Lines

Structural Features

- Vertical Type
- Horizontal Type
- Bridge Type
- Gantry Type

Rotary-axis Features

- High Performance Trunnion Tables
- ITALIAN Made Two Axes Head

High-quality finishes in aerospace and die / mold applications

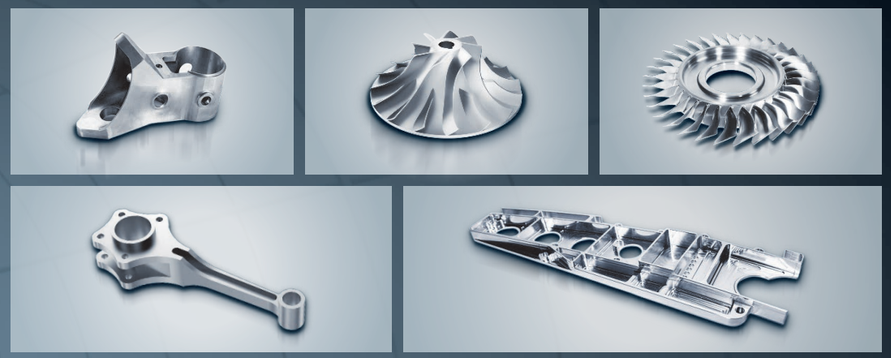
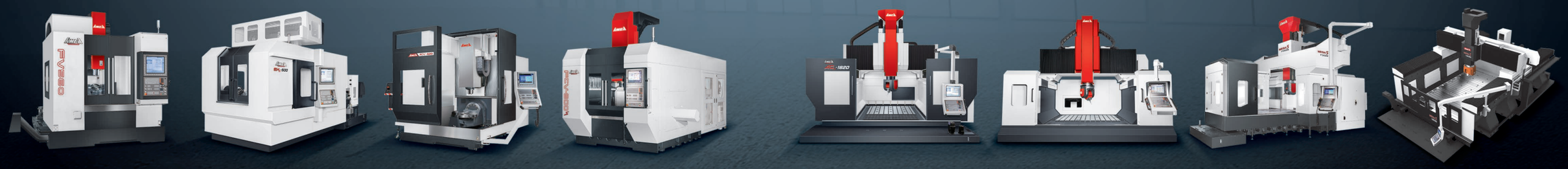


Table Size
Ø 210 mm

Table Size (X x Y)
10,000 x 4,800 mm



FV SERIES

High Performance Trunnion Table

A-axis : -42°~+120° *1
±100° *2

C-axis : ±360°

Table size : Ø 350 mm*1
Ø 210 mm*2

EH5 SERIES

High Performance Trunnion Table

A-axis : -120° ~ +42°

B-axis : ±360°

Table size : Ø 400 mm

FCV-620 SERIES

High Performance Trunnion Table

B-axis : -50° ~ +110°

C-axis : ±360°

Table size : Ø 650 mm

FCV-800S SERIES

High Speed Rotary Table

A-axis : -120° ~ +30°

C-axis : ±360°

Table size : Ø 850 mm

Turning speed : 800 rpm

*1 FV-960 *2 FV-560

AG5 SERIES

ITALIAN Made Two Axes Head

B-axis : ±100°

C-axis : ±240°

X / Y axes driven by high speed linear motors

RG5 SERIES

ITALIAN Made Two Axes Head

B-axis : ±100°

C-axis : ±240°

Advanced feed system with cooling technology

MEGA5 P SERIES

ITALIAN Made Two Axes Head

B-axis : ±100°

C-axis : ±240°

Bridge type structure

MEGA5 G SERIES

ITALIAN Made Two Axes Head

B-axis : ±100°

C-axis : ±240°

Gantry type structure

(Additional milling heads with different features and rotation angles are available on request.)

EH5 series | Horizontal 5 axes Machining Centers

Combining advanced 5 axes control technology a
horizontal machine development experience, EH5 s
axes simultaneous machining capability can overc
cutting tasks and realize unlimited possibilities.

Super rigid headstock structure

The unique headstock and saddle design maintains excellent
rigidity even with the Z-axis fully extended.

High performance A / B axes trunnion table

With a maximum cutting torque of 9,700 Nm and 0.001° B-axis
the EH5 series provides heavy cutting and high precision capal

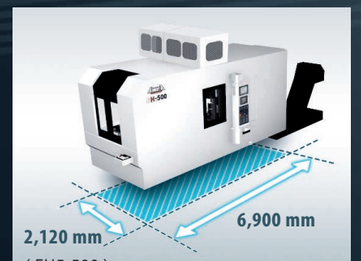
Work table variation

A variety of work tables is available for the EH series, offering
solution to precision mold making, mass production and any o

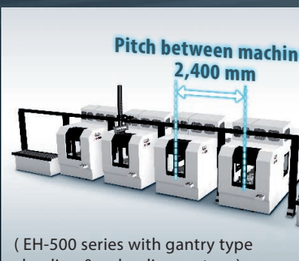
Models	EH-500			EH-500APC	EH
Rotary axis	—	A-axis	B-axis	B-axis	A
Table size	500 x 500	620 x 360	500 x 500	(500 x 500) x 2	620 x

Compact design

The compact, minimal footprint design effectively raises th
floor utilization and allows for the setup of an automated p
line even in the small workshops.



(EH5-500)



(EH-500 series with gantry type
loading & unloading system)

EH5 series | Super Rigid Structure

Finite element analysis

The Finite Element Analysis provides the optimal machine design to build a light-weight, yet super rigid machine structure.

One-piece casting structure

Using high grade MEEHANITE casting to produce the heavily ribbed, one-piece, thermally balanced machine bed and other structural components, the machine is built to endure years and years of rigorous milling.

Moving column structure design

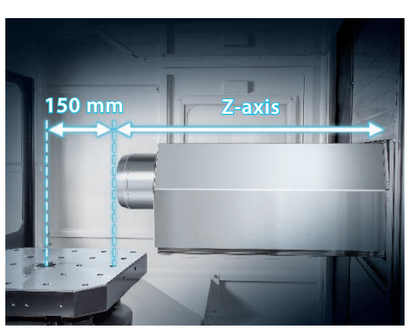
The highly rigid, yet light weight column structure provides efficient support for the headstock and ensures excellent dynamic performance of the X / Y / Z axes movements, thus effectively shortening cycle times.

60/60/60 m/min.

X / Y / Z axes rapid feed rate

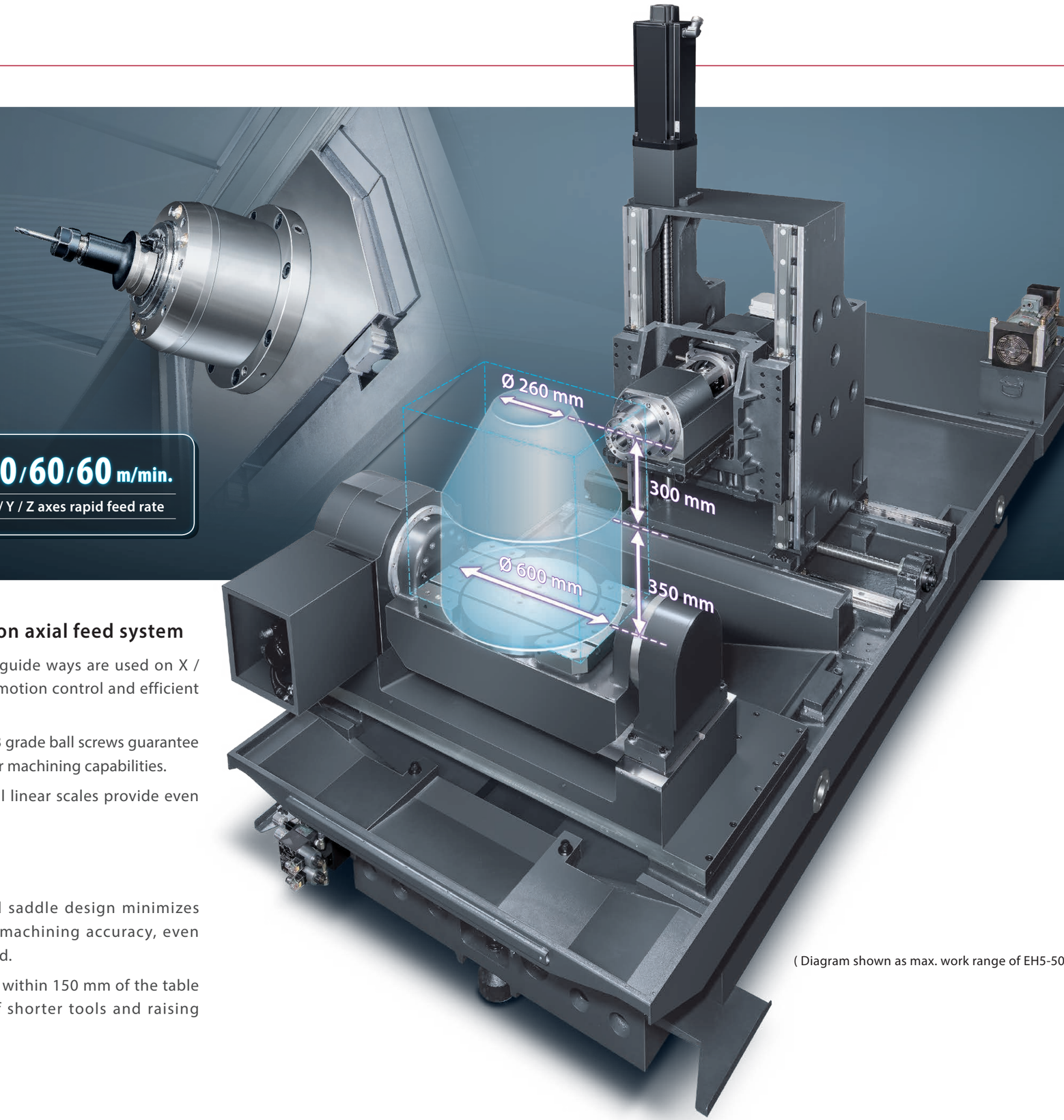
High speed, high precision axial feed system

- High speed, low friction linear guide ways are used on X / Y / Z axes to provide optimum motion control and efficient movements.
- Direct drive servo motors with C3 grade ball screws guarantee long term, high precision contour machining capabilities.
- Optional high resolution optical linear scales provide even higher precision.



High rigid headstock

- The optimized headstock and saddle design minimizes sagging to achieve excellent machining accuracy, even when the Z-axis is fully extended.
- The spindle nose can extend to within 150 mm of the table center, enabling the usage of shorter tools and raising cutting rigidity.



(Diagram shown as max. work range of EH5-500)

EH5 series | Diversified Work Table Modules

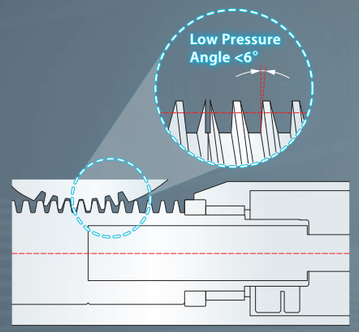
A / B axes trunnion table

- The Ø 400 mm B-axis embedded table design can be combined with a fixed table to increase the processing area for better machining flexibility.
- A / B axes with high resolution closed loop rotary encoders ensure ultimate positioning and repeatability accuracy.

Trunnion Table		EH5-500
Table size		620 x 360 mm
Table diameter (B-axis)		Ø 400 mm
Table load capacity	0°~ 45°	200 kg
	60°~ 90°	100 kg
Max. work-piece height		650 mm
Max. work-piece diameter		Ø 600 mm

High performance B-axis drive mechanism

- High rigidity two-piece worm gear design. The contact area is more than five times that of conventional designs, delivering twice the torque output with high precision, high transmission efficiency, and low wear.
- The fully circumferential hydraulic brake system effectively prevents disk deformation due to unbalanced torque, achieving high rigidity and heavy duty cutting performance.

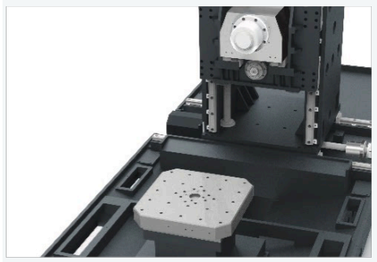


*1 The worm gear contact areas are designed with a low pressure angle, providing higher torque output.

EH5-500	A-axis	B-axis
Rotary range	+120° ~ -42°	±360°
Min. table index	0.001°	
Repeatability	±4 arc-sec	±3 arc-sec

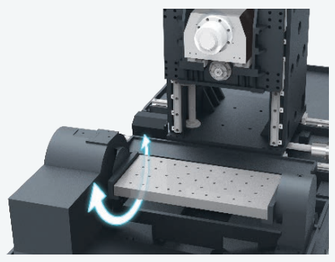
Fixed table

Model	EH-500
Table size (X x Y)	500 x 500 mm
Table load capacity	600 kg
Max. work-piece height	660 mm



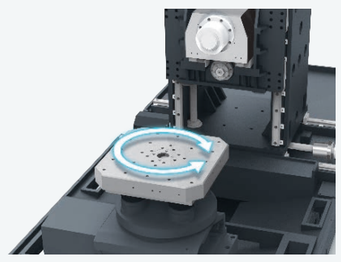
A-axis table

Model	EH-500
Table size (X x Y)	620 x 360 mm
Table load capacity	300 kg
Max. work-piece height	510 mm
A-axis swing range	0° ~ 90°
Table indexing (A-axis)	0.001°



B-axis table

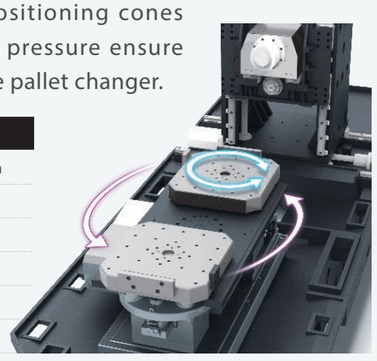
Model	EH-500
Table size (X x Y)	500 x 500 mm
Table load capacity	600 kg
Max. work-piece height	660 mm
Max. work-piece diameter	Ø 600 mm
B-axis rotary range	± 360°
Table indexing (B-axis)	0.001°

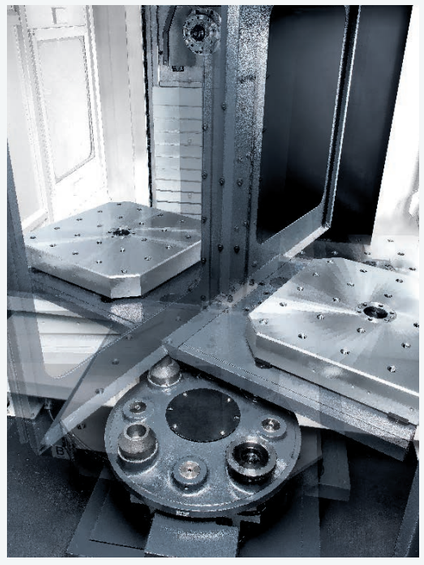


Automatic pallet change system

- The work table seat in the processing area is equipped with four hydraulic clamping mechanisms and tapered positioning cones that provide efficient clamping and accurate positioning for the table.
- Air blast cleaning of the positioning cones and monitoring the seal air pressure ensure reliability and durability of the pallet changer.

Model	EH-500APC
Table size (X x Y)	500 x 500 mm
Table load capacity	600 kg
Max. work-piece height	660 mm
Max. work-piece diameter	Ø 630 mm
B-axis rotary range	± 360°
Table indexing (B-axis)	0.001°

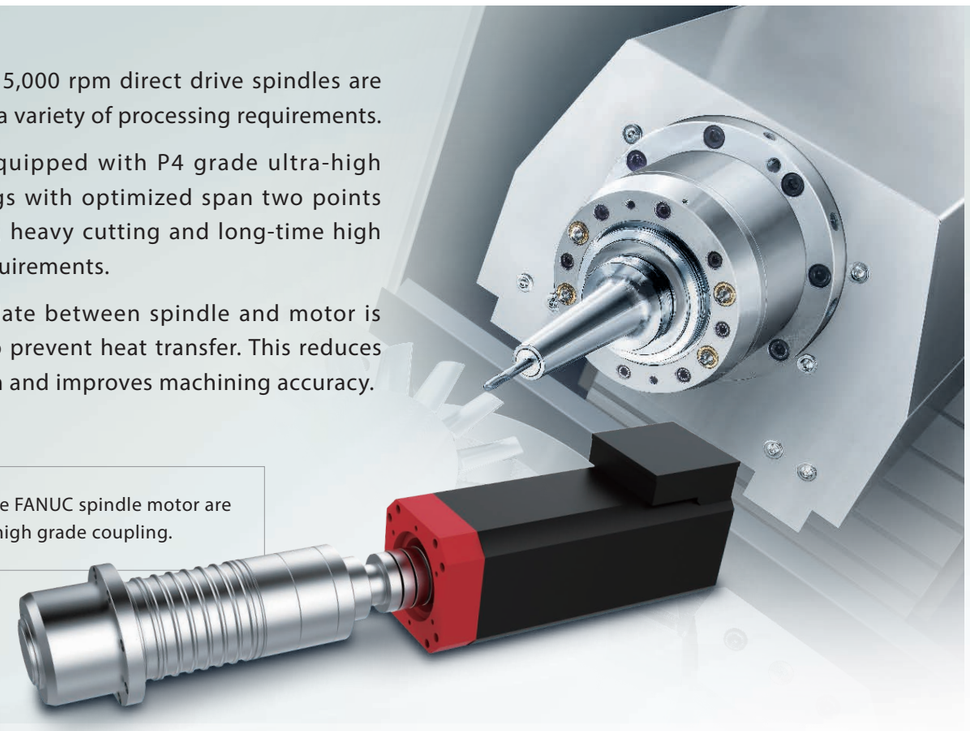




EH5 series | High Performance Spindle System

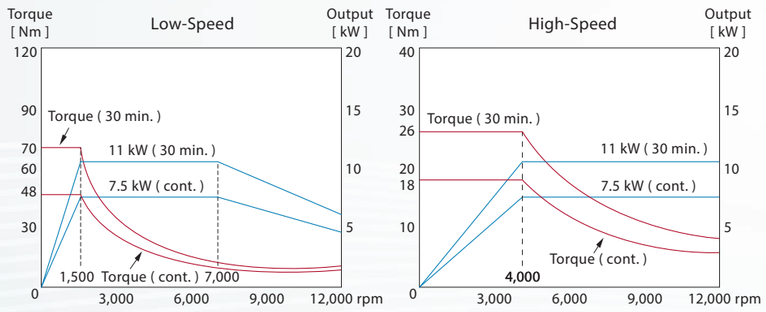
- 12,000 rpm and 15,000 rpm direct drive spindles are available to meet a variety of processing requirements.
- The spindle is equipped with P4 grade ultra-high precision bearings with optimized span two points support, fulfilling heavy cutting and long-time high speed cutting requirements.
- The connector plate between spindle and motor is actively cooled to prevent heat transfer. This reduces thermal distortion and improves machining accuracy.

The spindle and the FANUC spindle motor are connected with a high grade coupling.



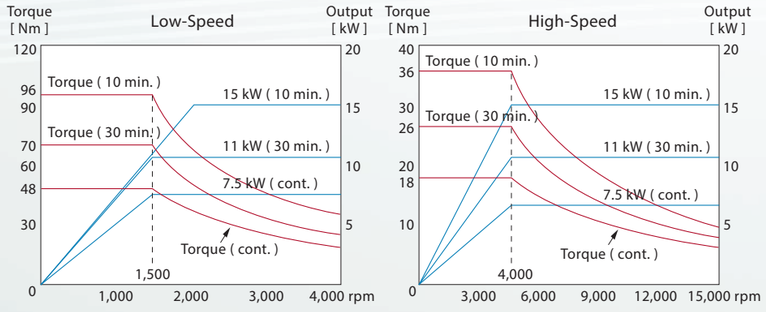
12,000 rpm Direct Drive Spindle

Spindle taper	BBT40
Spindle bearing diameter (front)	70 mm
Spindle speed	12,000 rpm
Spindle motor (cont. / 30 min.)	7.5 / 11 kW
Spindle torque	70 Nm



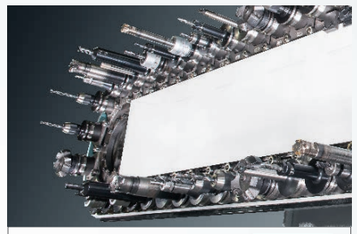
15,000 rpm Direct Drive Spindle

Spindle taper	BBT40
Spindle bearing diameter (front)	70 mm
Spindle speed	15,000 rpm
Spindle motor (cont. / 30 min. / 10 min.)	7.5 / 11 / 15 kW
Spindle torque	96 Nm

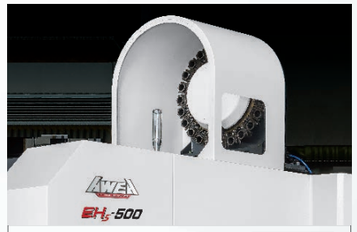


EH5 series | High Reliability Tool Change System

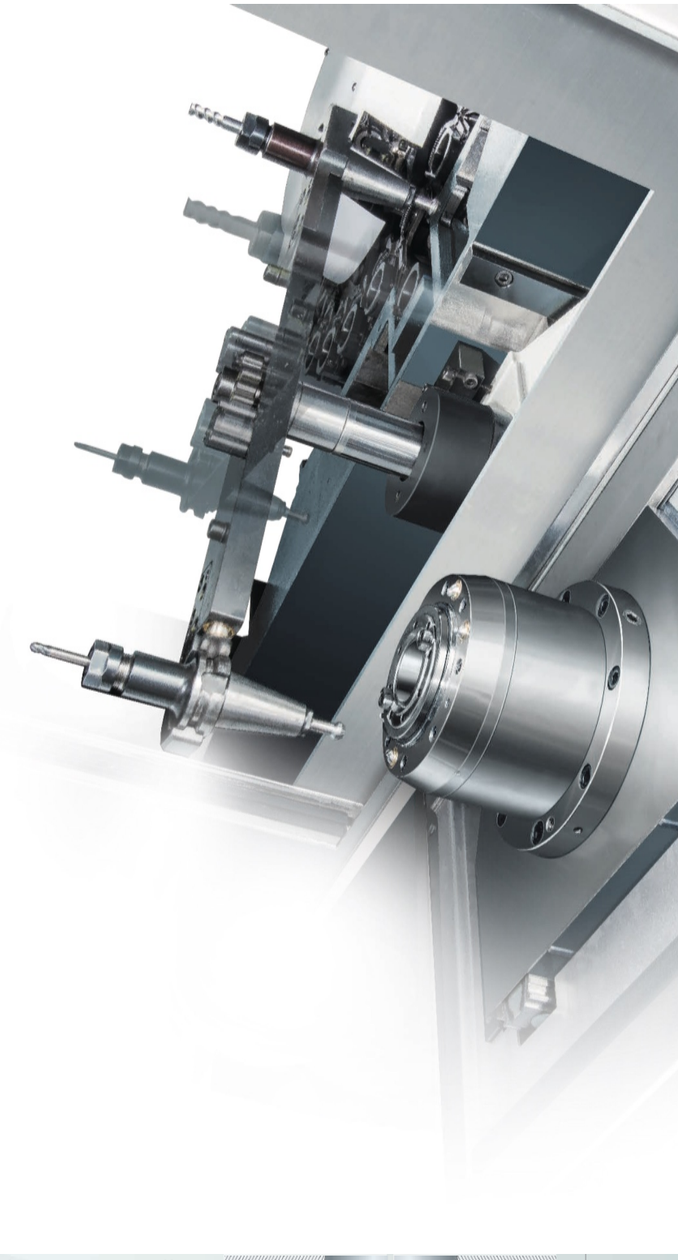
- The 24T disk type tool magazine combine type automatic tool changer shortens the time, thereby enhancing overall processing e
- Two way arbitrary tool selection (Std.): the automatically selects the shortest rotati rotate the tool to the exchange position, f tool exchange times.
- Pre-selecting a tool (moving it to the tool ex position prior to the actual tool exchange not interrupt the machining operation and c even more time.
- On request a 32T disk type magazine or a 50 type magazine are available.



Chain type 50T magazine Optional



Disk type 24T magazine Standard



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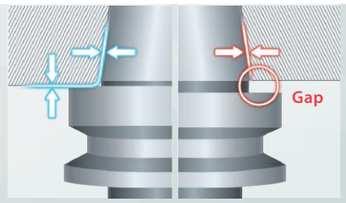
Dual contact spindle taper de

The EH5 series employs the advanced Dual Contact Spindle taper design, which not only avoids the taper run out but also enhances cutting rigidity. This is especially suitable for high speed machining. (Std.)

(BBT, BCV, BDV, etc. can be selected according to actual demands.)

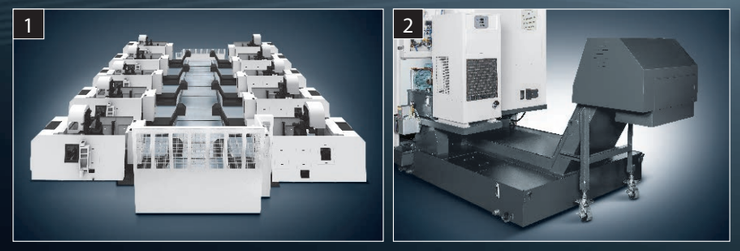


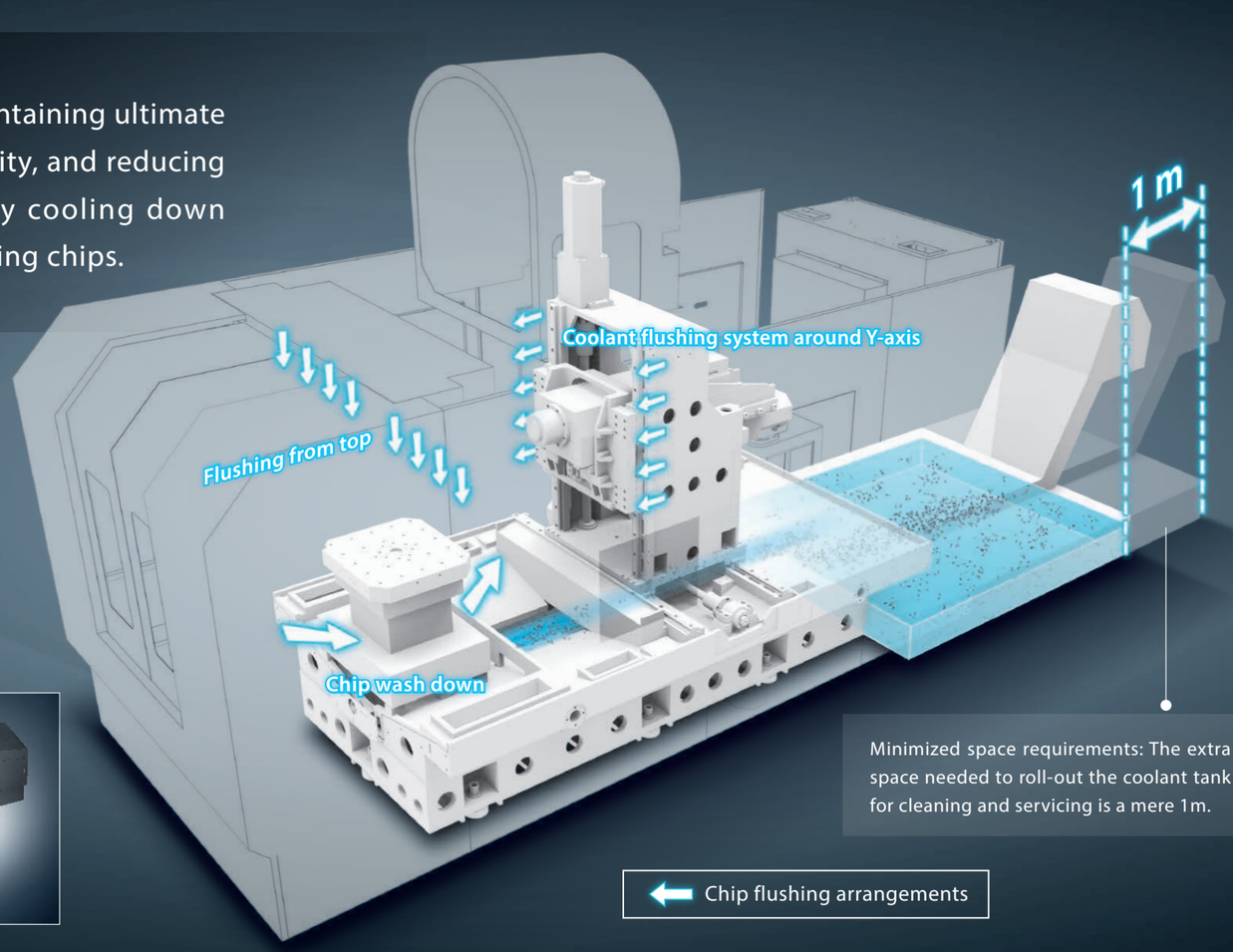
EH5 series | Chip Removal System

The advanced chip flushing system assists in maintaining ultimate accuracy, achieving long term machining reliability, and reducing downtime for manual chip removal by rapidly cooling down work-piece and tool while simultaneously removing chips.

1 The rear-exit coolant tank and chip conveyor design can easily be integrated with a centralized chip removal system, suitable for automated production line arrangements.

2 Large coolant tank with 685 L capacity and a large surface area for best cooling results. The roll-out design makes maintenance faster and easier.

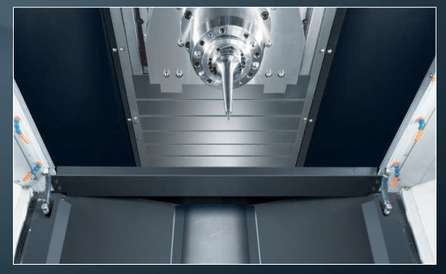




Minimized space requirements: The extra space needed to roll-out the coolant tank for cleaning and servicing is a mere 1m.

Chip flushing arrangements

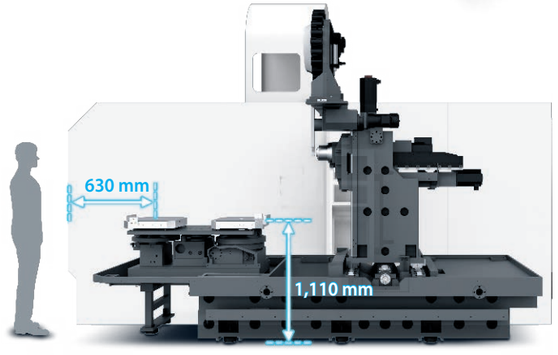
The nozzles of the chip flush system can be adjusted to reach any position inside the machine, avoiding chip pile up and providing the best cooling effect at the same time.



The central chip channel is covered by stainless steel; the smooth surface greatly reduces the probability of a chip pile up inside the machine.

Optimum operability

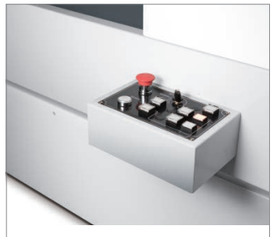
- Ergonomics were taken into account while designing the machine to make work-piece setup fast, convenient, and safe.
- All models are designed with large doors and overhead clearance to allow for work-piece loading and unloading by crane or robot arm, which reduces the operator's workload.



(EH-500APC)

Swiveling operator panel and large impact resistant windows.

Easily accessible pneumatic control unit.

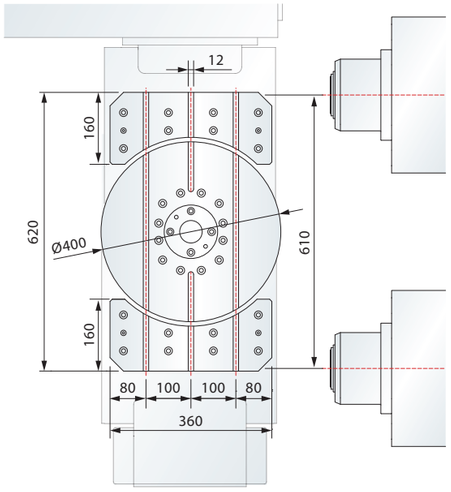


Independent work table exchange operation panel. (EH-500APC only)

Military grade electrical connectors.

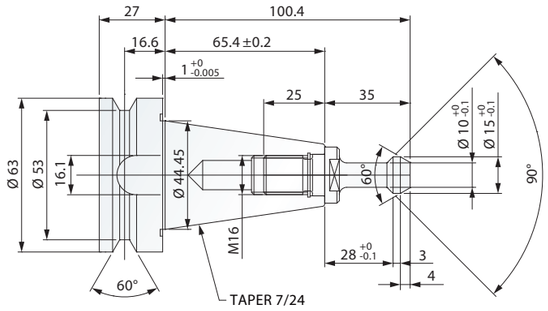
(Unit : mm)

Table Dimensions

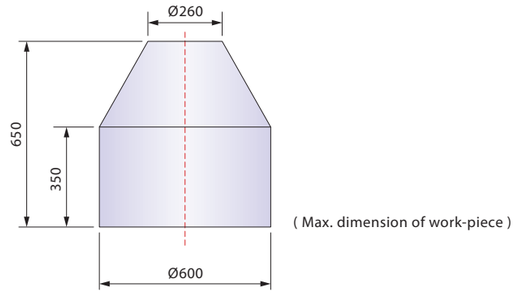


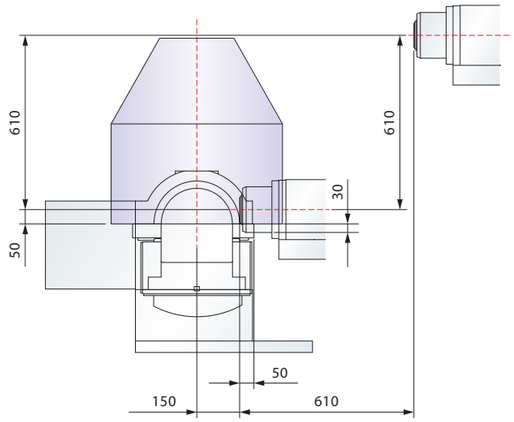
Tool Shank Dimensions

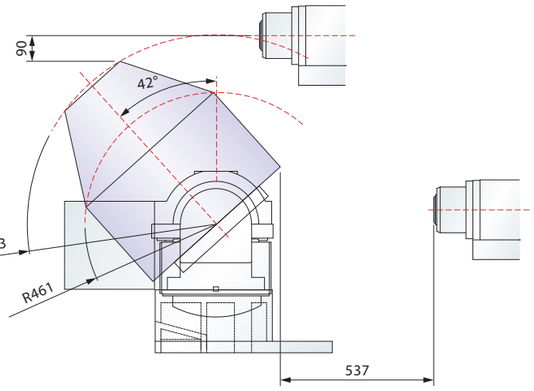
BBT40



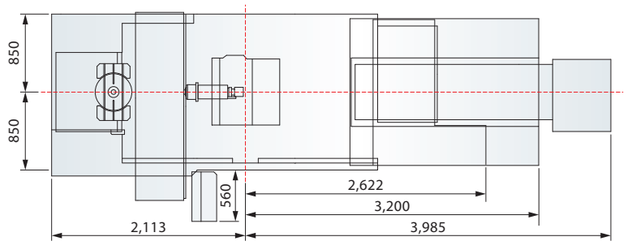
Work Range

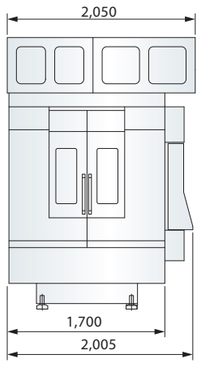


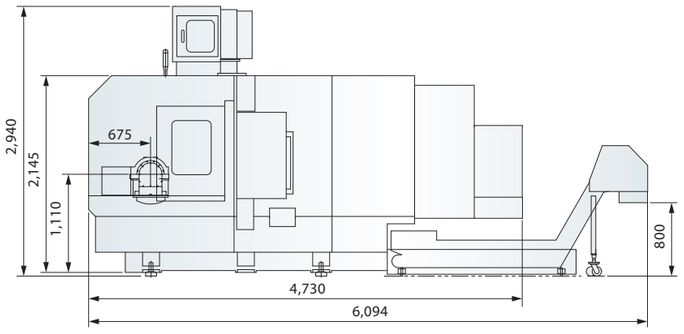


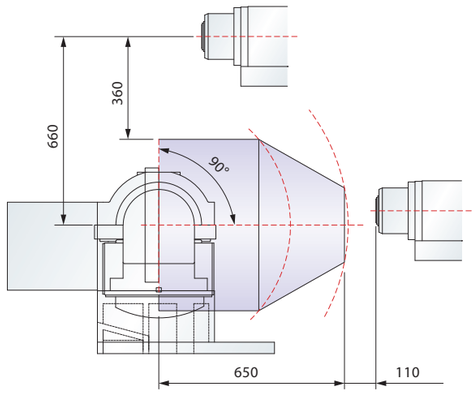


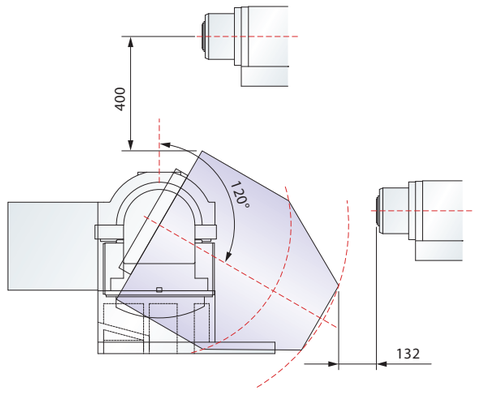
Machine Dimensions





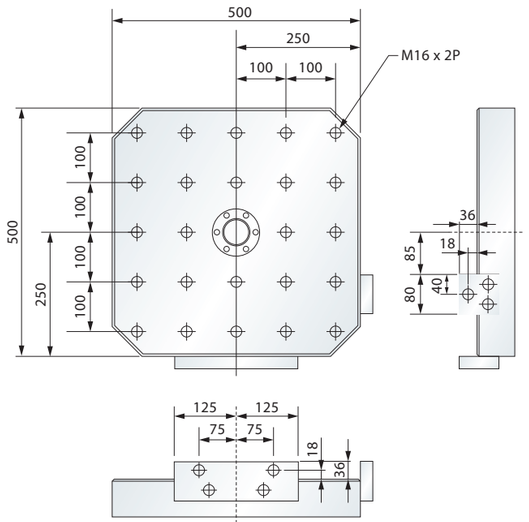






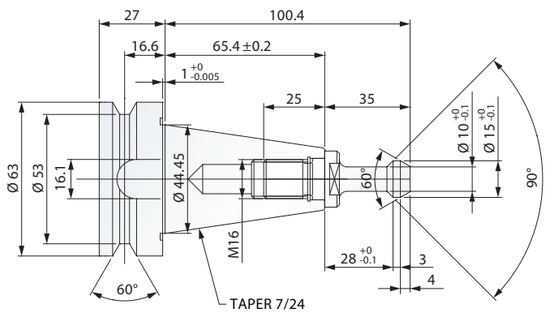
(Unit : mm)

Table Dimensions

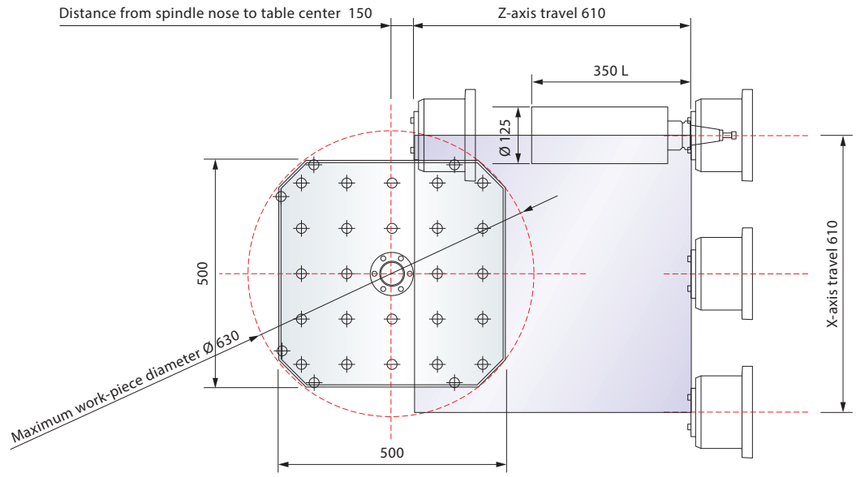


Tool Shank Dimensions

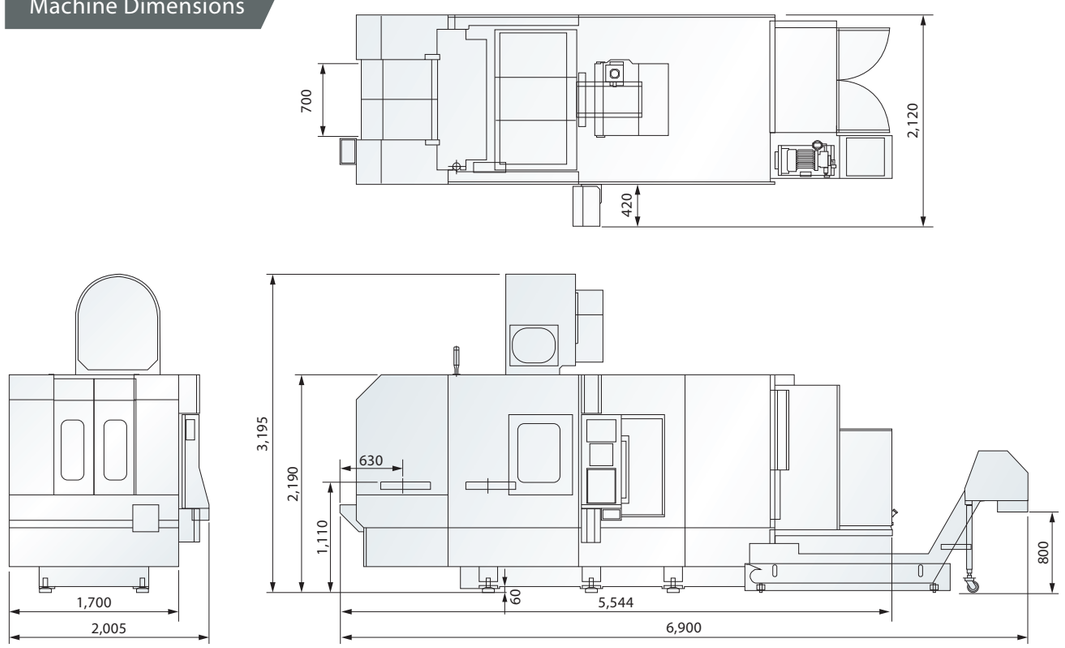
BBT40

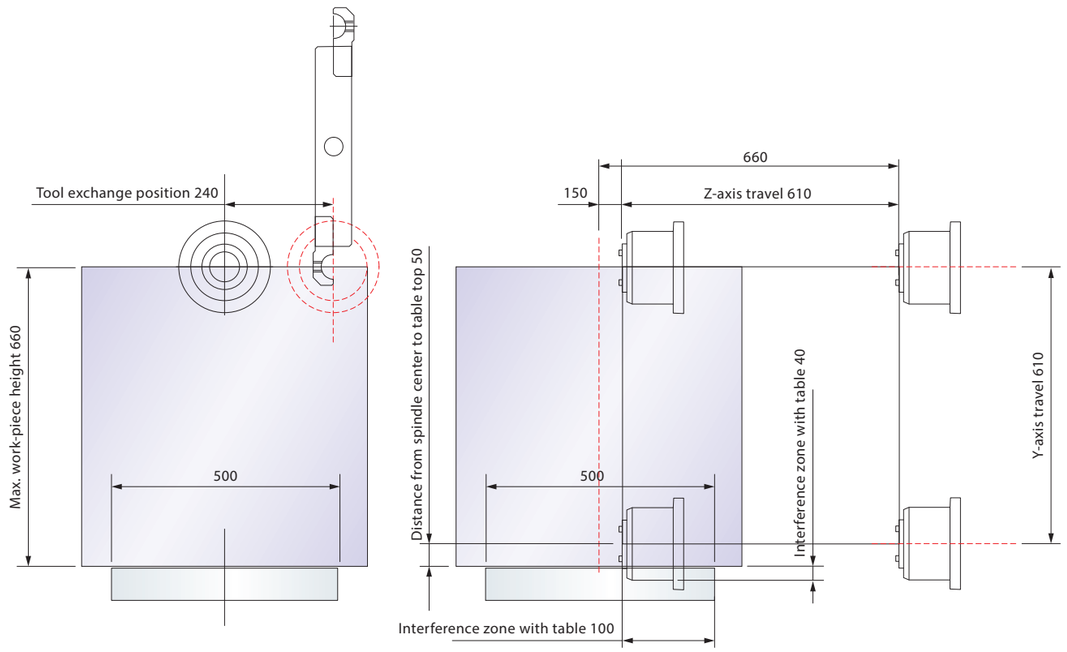


Work Range



Machine Dimensions



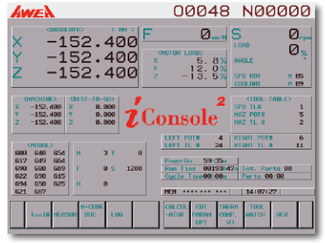


i Console Optional

AWEA's self-developed i Console intelligent software enhancement system provides you with a user-friendly interface, real-time machine status information and diagnosis functions. It not only effectively reduces complex working processes but also enables intelligent machining abilities.

(For 10.4" LCD only)

Main screen



- Instant messaging system
- Tool list
- Work-piece measurement
- M code
- Calculator

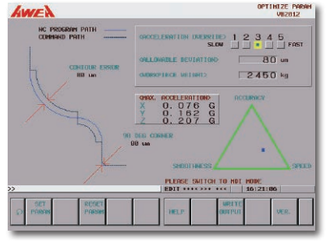
OPT.

- CNC parameter optimization
- Spindle thermal compensation
- Adoptive feed control (AFC)

Trouble shooting

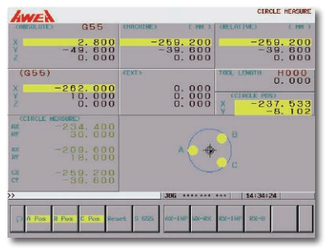
When an alarm appears, the program will display the cause for the alarm and a suitable troubleshooting procedure. Users can easily troubleshoot minor problems to avoid down time.

CNC optimized parameter



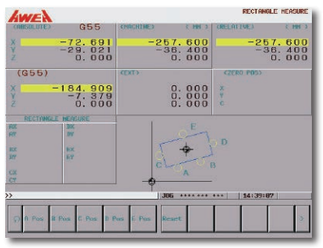
From rough cutting to fine machining, users can select different work modes, define the allowable tolerances and enter the weight of the work-piece. Based on this input the i Console program will modify machining parameters to reduce machining time.

Circular work-piece measurement



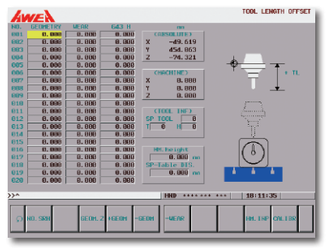
By measuring the A, B, C three points coordinates the circular work-piece's center point can be correctly calculated.

Rectangular work-piece measurement



By measuring the A, B, C, D, and E five points coordinates, the rectangular work-piece's center point and slant angle can be calculated. Then the center point coordinate can be entered in the work-piece coordinate system.(G54 – G59)

Tool length offset



After manually measuring the tool length, the controller will automatically calculate the tool tip position and enter the data into the tool length offset table.

		EH-500	EH5-500
SPECIFICATIONS			
X / Y / Z axes travel	mm	610 / 610 / 610	610 / 610 / 610
Distance from spindle center to table top	mm	50 ~ 660	50 ~ 660
Distance from spindle nose to table center	mm	150 ~ 760	150 ~ 760
WORK TABLE			
Table size	mm	Various options, please refer to pages 7 ~ 8 for details.	620 x 360 (Ø 400)
Table load capacity	kg		0° ~ 45° : 200 45° ~ 90° : 100
Max. work-piece diameter / height	mm		Ø 600 / 650
Table indexing (B-axis)			0.001°
Rotary angle			A-axis : -120° ~ +42° B-axis : ±360°
SPINDLE			
Spindle motor (cont. / 30 min.)	kW	7.5 / 11	
Spindle speed	rpm	Direct Drive 12,000 / 15,000 (Opt.)	
Spindle taper		BBT40	
FEED RATE			
X / Y / Z axes rapid feed rate	m/min.	60 / 60 / 60	
Cutting rapid feed rate	m/min.	1 ~ 15	
TOOL MAGAZINE			
Tool magazine capacity	T	24	
Max. tool diameter / adj. pocket empty	mm	Ø 85 / Ø 125	
Max. tool length	mm	350	
Max. tool weight	kg	8	
ACCURACY			
Positioning accuracy (VDI 3441)	mm	P ≤ 0.010 / Full Travel	
Repeatability (VDI 3441)	mm	Ps ≤ 0.015	
GENERAL			
Pneumatic pressure requirement	kg/cm²	5 ~ 7	
Control system		FANUC O*i*-MF	HEIDENHAIN TNC 640
Machine dimension (L x W x H)	mm	6,900 x 2,120 x 3,195*1	6,900 x 2,120 x 3,195
Machine weight	kg	11,000*1	11,000

*1 Depending on the work table specifications, please contact AWEA for details.

Specifications are subject to change without notice.

Standard Accessories

- Spindle cooling system
- Spindle air curtain
- Coolant nozzle around spindle
- Rotary encoders on A & B axes
- Flushing from top and chip wash down
- Disk type 24T magazine
- Coolant system with pump and tank
- Caterpillar type chip conveyor and bucket
- Roof enclosure splash guard
- Heat exchanger for electric cabinet
- Air gun and water gun
- Disk type oil skimmer
- RS-232 interface and Ethernet port
- Tool box and foundation bolts
- Operation and maintenance manual

Optional Accessories

- Coolant through spindle (CTS)
- Compensation system for spindle thermal extension
- Anti-drop system for sudden power outage
- X / Y / Z axes optical linear scale
- Chain type 32T / 50T tool magazine
- Automatic door at preparation side
- Air conditioner for electrical cabinet
- Automatic tool length measurement system
- Work-piece probe