

RG5
series

RG5 SERIES

Gantry Type High Speed 5 axes Machining Centers



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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

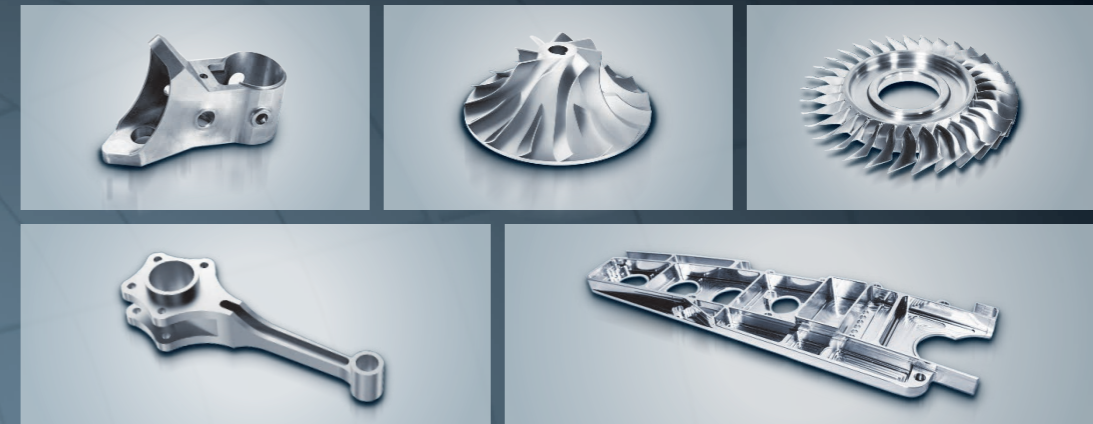
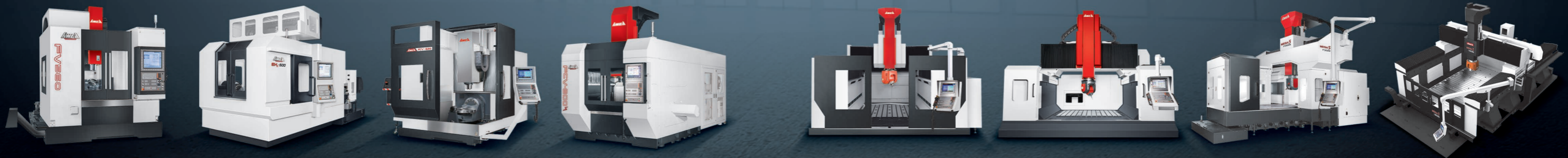


Table Size
Ø 210 mm

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



FV SERIES

High Performance Trunnion Table

A-axis : $\pm 100^\circ$ *1
-42°~+120° *2
C-axis : $\pm 360^\circ$
Table size : $\varnothing 210$ mm*1
 $\varnothing 350$ mm*2

*1 FV-560 *2 FV-960

EH5 SERIES

High Performance Trunnion Table

A-axis : -120° ~ +42°
B-axis : $\pm 360^\circ$
Table size : $\varnothing 400$ mm

FCV-620 SERIES

High Performance Trunnion Table

B-axis : -50° ~ +110°
C-axis : $\pm 360^\circ$
Table size : $\varnothing 650$ mm

FCV-800S SERIES

High Speed Rotary Table

A-axis : -120° ~ +30°
C-axis : $\pm 360^\circ$
Table size : $\varnothing 850$ mm
Turning speed : 800 rpm

AG5 SERIES

ITALIAN Made Two Axes Head

B-axis : $\pm 100^\circ$
C-axis : $\pm 240^\circ$
X / Y axes driven by high speed linear motors

RG5 SERIES

ITALIAN Made Two Axes Head

B-axis : $\pm 100^\circ$
C-axis : $\pm 240^\circ$
Advanced feed system with cooling technology

MEGA5 P SERIES

ITALIAN Made Two Axes Head

B-axis : $\pm 100^\circ$
C-axis : $\pm 240^\circ$
Bridge type structure

MEGA5 G SERIES

ITALIAN Made Two Axes Head

B-axis : $\pm 100^\circ$
C-axis : $\pm 240^\circ$
Gantry type structure

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

Gantry type rigid structure

- 40% less floor space required compared to other bridge type machines with similar travel ranges.
- All axial movements are executed by the cutting tool instead of the work-piece, causing less load on the axes and thus improving dynamic accuracy.

High performance B/C two axes head

- Italian-made two axes head designed for high performance & high stability.
- A variety of milling heads are available optionally – high rotation speed / high torque / compact structure.

Advanced cooling technology

- Milling head, spindle, and the X / Y axes drive systems are equipped with advanced cooling systems developed by TECHNAI, THK, and AWEA. These systems keep thermal deformation to a minimum during high speed or heavy cutting operations and thus assure high accuracy.

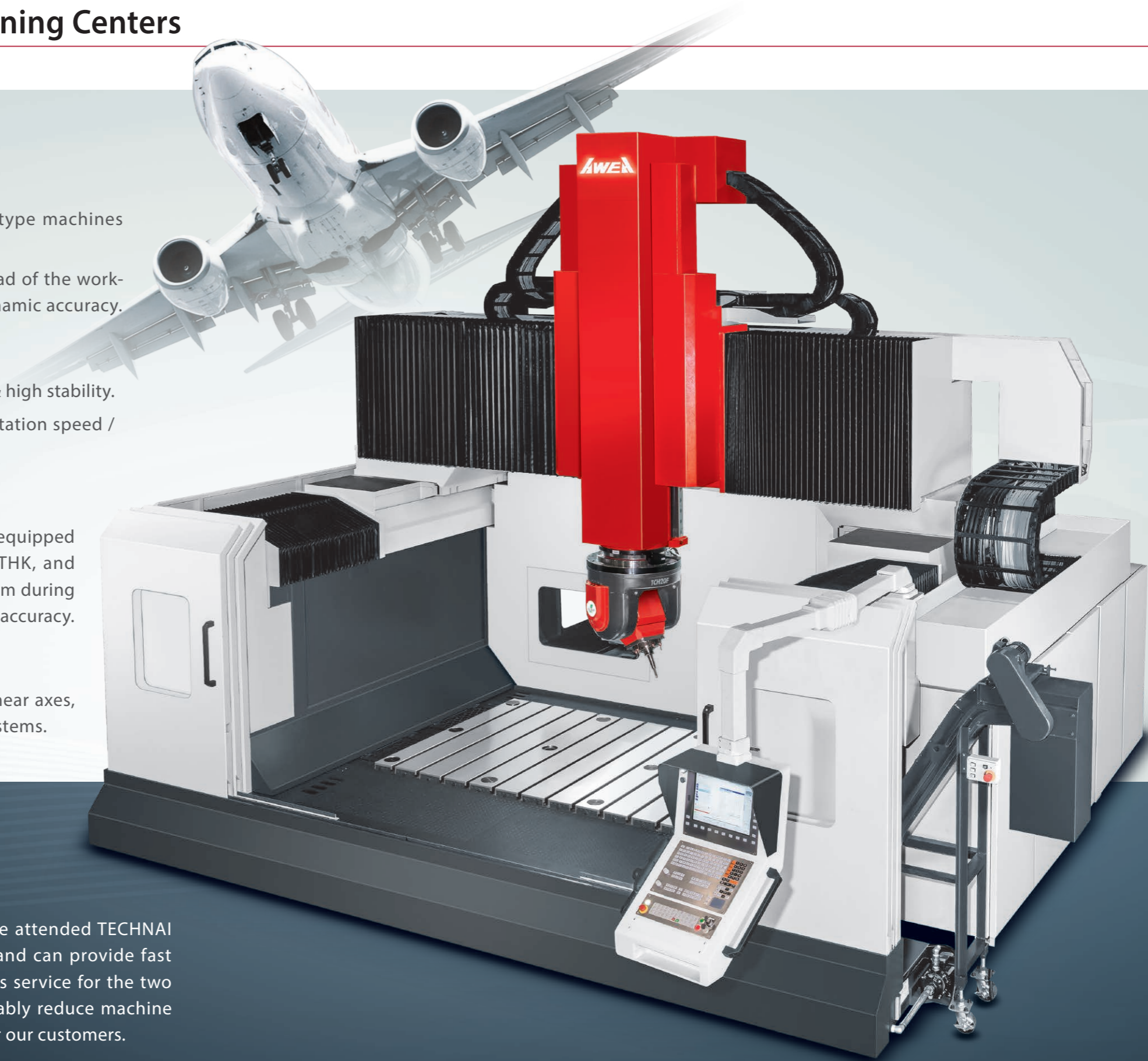
Superior machine dynamics

- Superior dynamic response with 0.3G acceleration on all linear axes, supported by rigid structural design and advanced drive systems.

Competent after-sales service



AWEA technicians have attended TECHNAI OEM training in Italy and can provide fast and efficient after-sales service for the two axes head to considerably reduce machine downtime and costs for our customers.





RG5 series

ITALIAN Made Two Axes Head

The rigid fork structure of the two axes head is made from GGG40 modular graphite cast iron and can easily sustain and disperse the complex cutting forces imposed on it during heavy cutting.

	B-axis	C-axis
Max. speed	50 rpm	50 rpm
Max. acceleration	30 rad/sec ²	30 rad/sec ²
Max. torque	1,400 Nm	1,300 Nm
Clamping torque	4,000 Nm	4,000 Nm
Position accuracy	± 3 arc.sec	± 3 arc.sec
Rotary angle	± 100°	± 240°

Advanced B, C axes structure

- Driven by three direct drive motors that provide high rotation speed, high torque and zero backlash.
- Equipped with cross roller bearings to sustain axial and radial loads from all directions.
- Disk type hydraulic clamping system featuring agile response and better heat dissipation to accommodate frequent clamping demands.
- High resolution absolute encoders ensure optimal machining accuracy.



The symmetric fork structure Compact design with low interference High torque direct drive motors

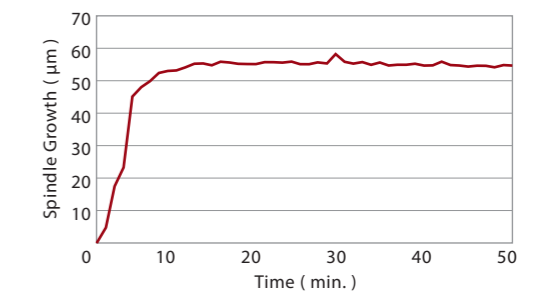
Modular spindle system

- TCH-20F** Two Axes Head Standard 24,000 rpm High Speed Built-in Spindle (HSK-A63)
- TCH-20F-A** Two Axes Head Optional 124 Nm High Torque Built-in Spindle (HSK-A100)

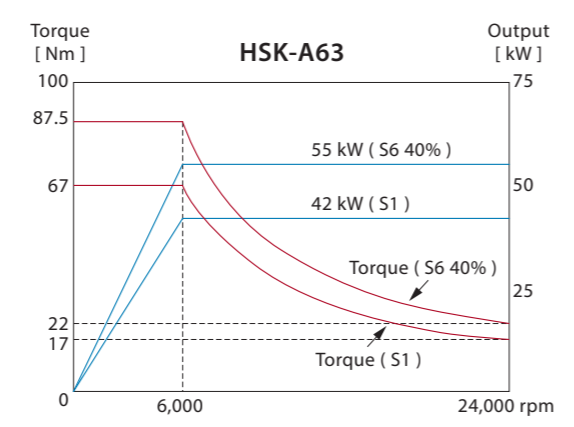
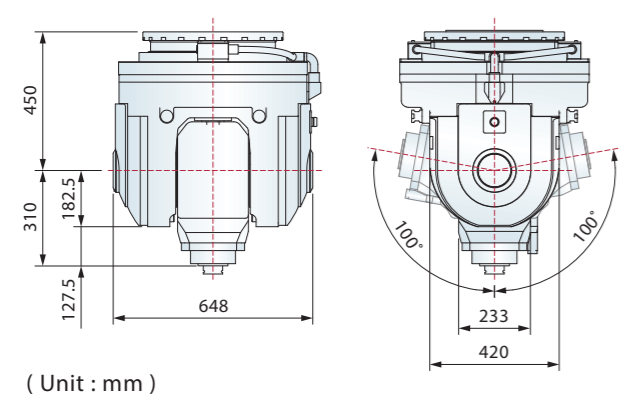
*1 : Optional compact two axes head TCH-L13 EVO, please see page 13.

Thermal stability of the spindle

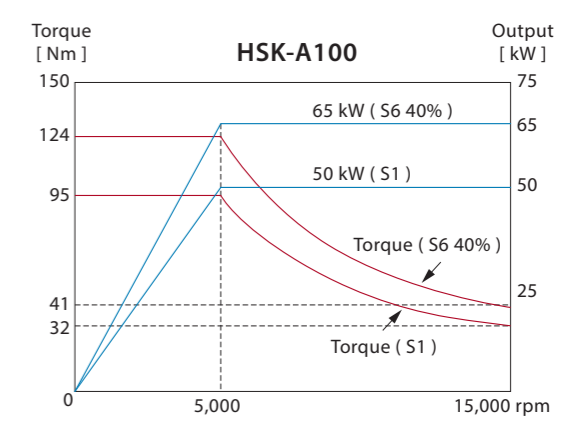
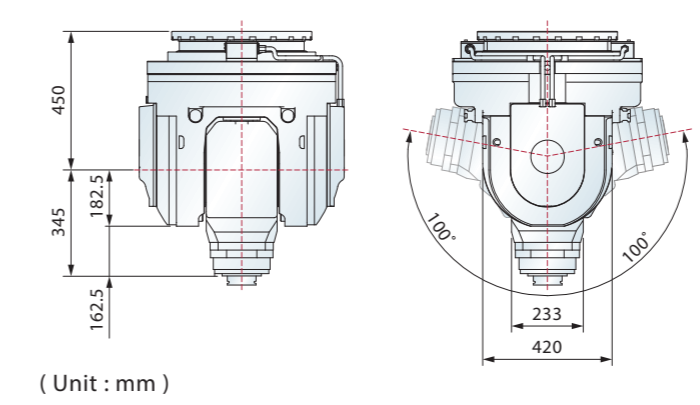
The spindle reaches thermal stability within 10 minutes from a cold start; afterwards thermal expansion is limited to less than 0.01 mm, even during long time machining.



TCH-20F



TCH-20F-A



RG5 series | Super Rigid Structure

Finite element analysis

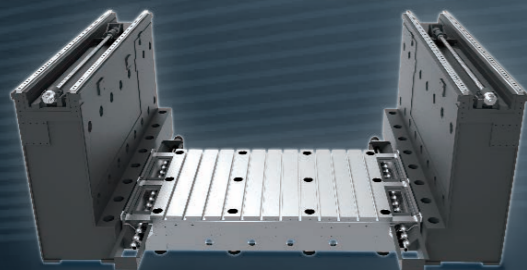
The Finite Element Analysis provides the optimal machine design to build a light-weight, yet super rigid machine structure.

Four guide ways on a U-shaped base

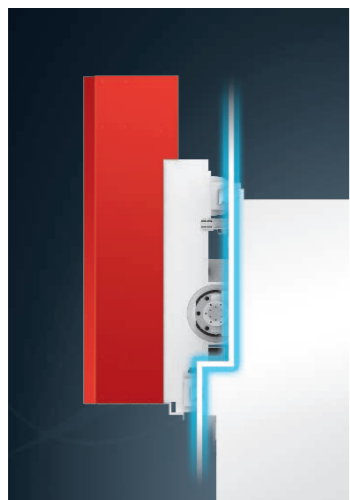
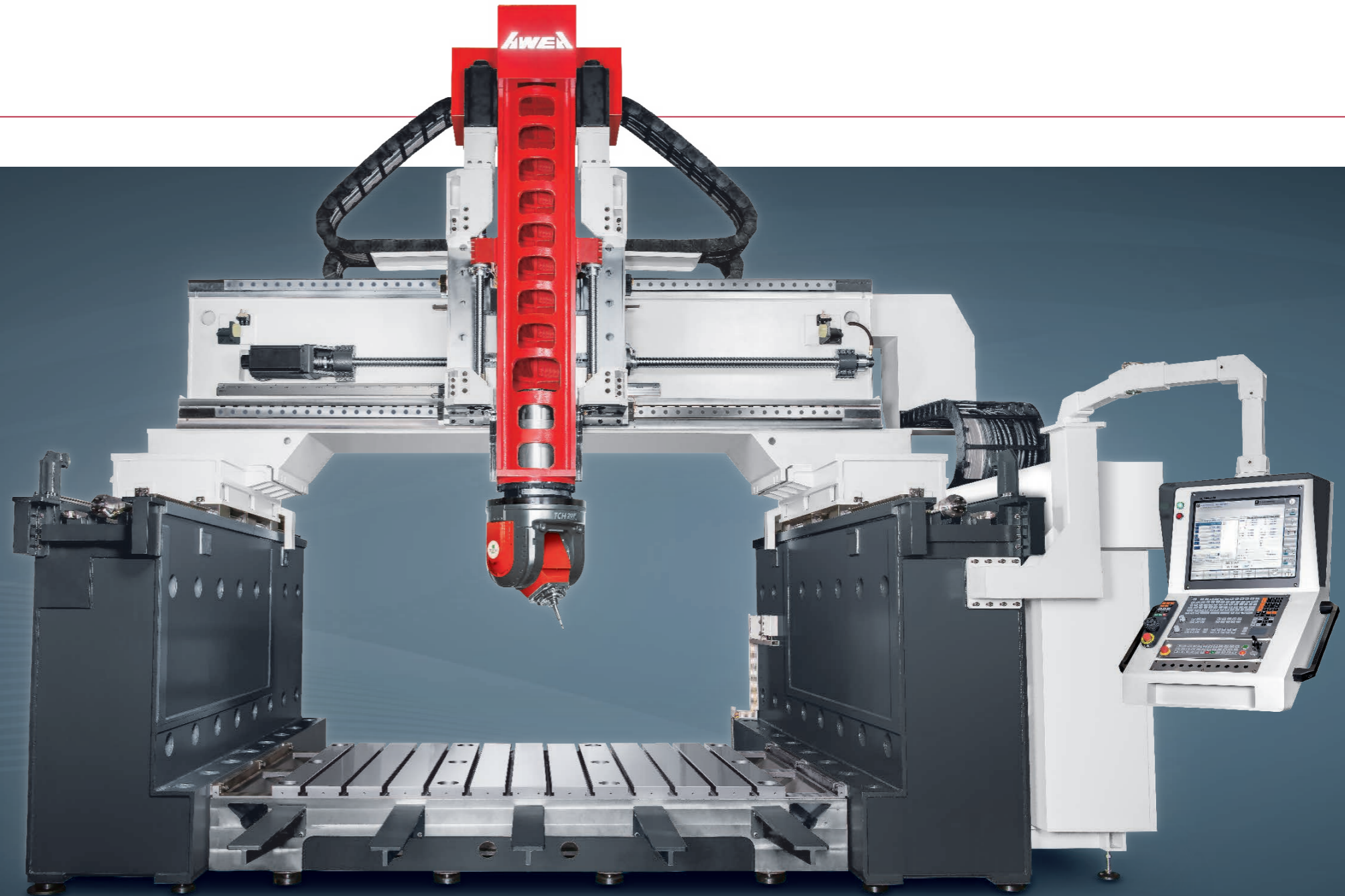
The rigid U-shaped base with dual linear guide ways on each side provides a solid basis for the cross beam.

Heavy load fixed type work table

The T-slots of the work table are finished at our factory after the machine set up and geometric accuracy adjustments have been completed to ensure perfect alignment.



Four guide ways on the U-shaped base



Y-axis sectional guide ways design

Y-axis sectional guide ways design

The Y-axis liner guide ways offset increases the structural rigidity and reduces the distance between spindle head and cross beam, thereby minimizing distortion and vibration issues, as well as enhancing overall cutting performance and accuracy.

High rigidity roller type linear guide ways

The super rigid roller type linear guide ways on the X, Y and Z axes provide heavy-duty cutting, fast movement and low friction capabilities.

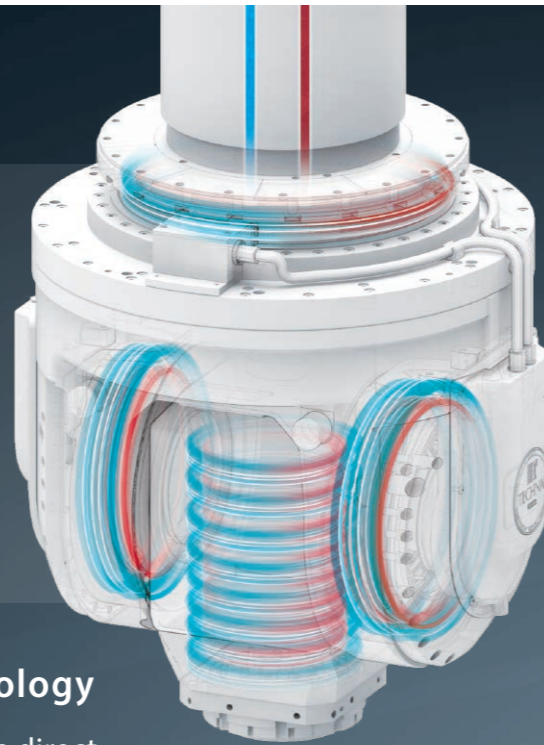


X / Y axes

High performance drive system on all linear axes

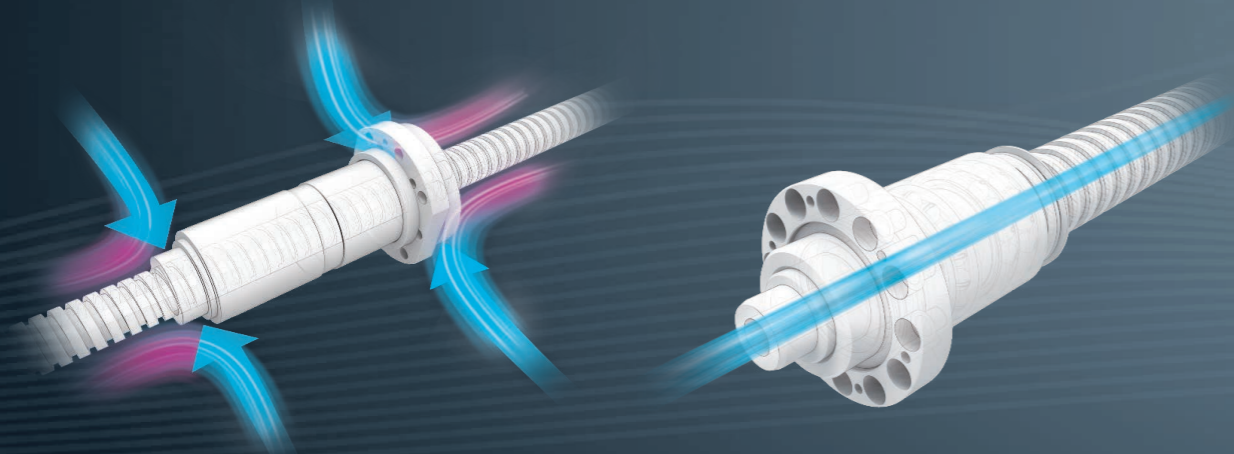
- Direct-drive servo motors on all linear axes deliver ample thrust and dynamic responses.
- The X-axis is equipped with one linear scale on each column to ensure utmost accuracy and perfectly parallel movements.
- The Z-axis is driven by dual ball screws and servo motors without a hydraulic counterweight system for superior dynamic response.

The advanced cooling system combines the best technologies from TECHNAI, THK and AWEA, to efficiently remove heat generated by high speed axial movements, thus assuring high accuracy in high speed milling.



TECHNAI two axes head cooling technology

Optimal cooling of the spindle and the B & C axes direct drive motors is achieved by spiral coolant circulation.



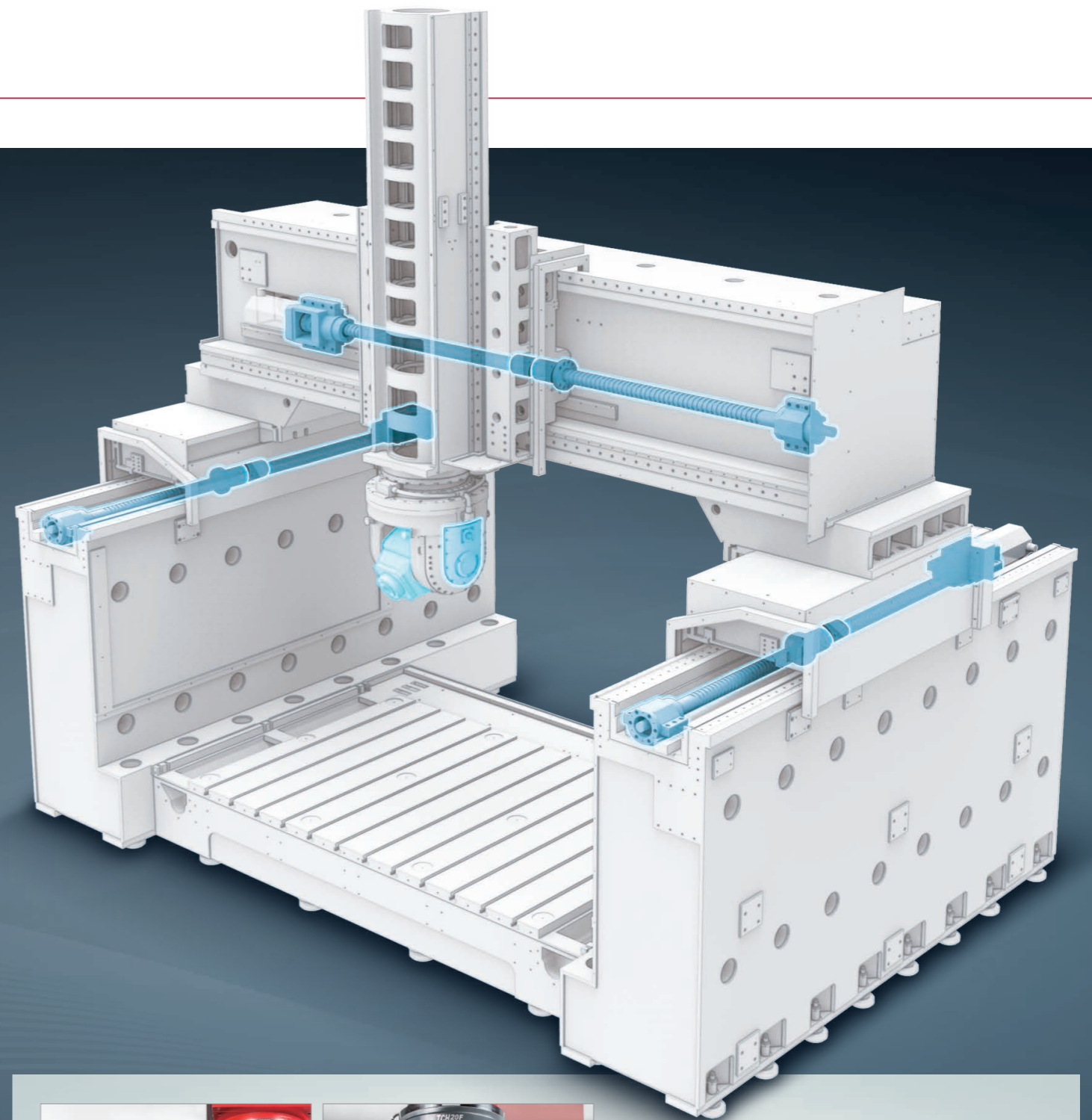
THK nut cooling technology

Dual side air inlets assure thorough cooling of the nut during high speed rotation. (Opt.)^{*1}

AWEA hollow ball screw cooling technology

Specially designed coolant circulation through the hollow ball screw of the X / Y axes stabilizes not only the ball screw's temperature, but also the nut's and bearing blocks, thereby ensuring high accuracy during long time machining. (Opt.)^{*1}

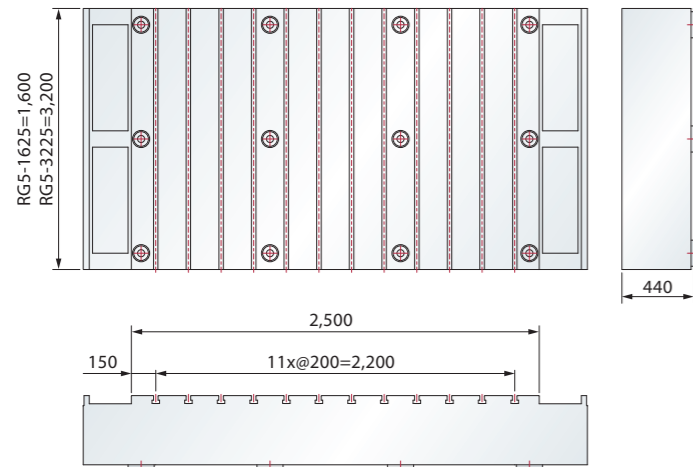
^{*1} The technology applied may vary among models.



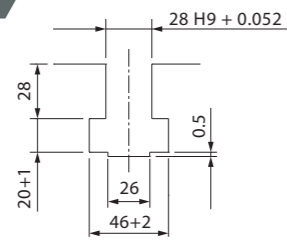
Strict quality control

- 1 Geometric accuracy check (granite square gauge 1 m x 1 m)
- 2 3D accuracy check (B : ±90° / C : ±180°)

Table Dimensions

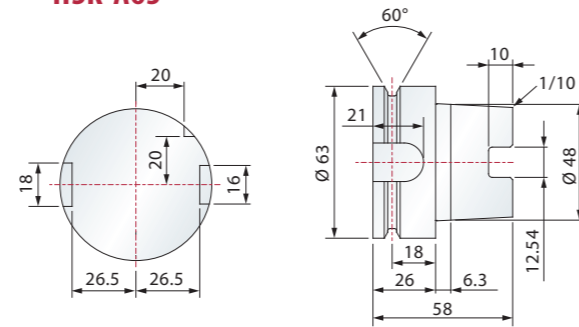


T-slot Dimensions

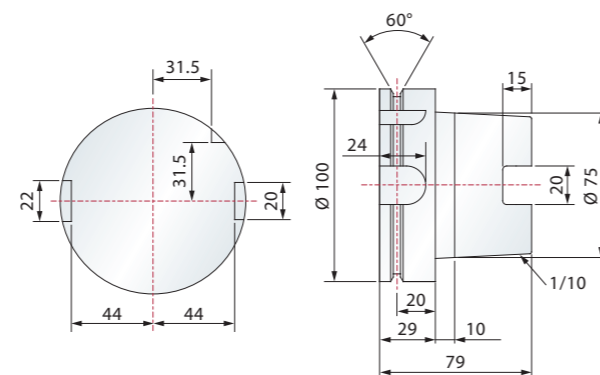


Tool Shank Dimensions

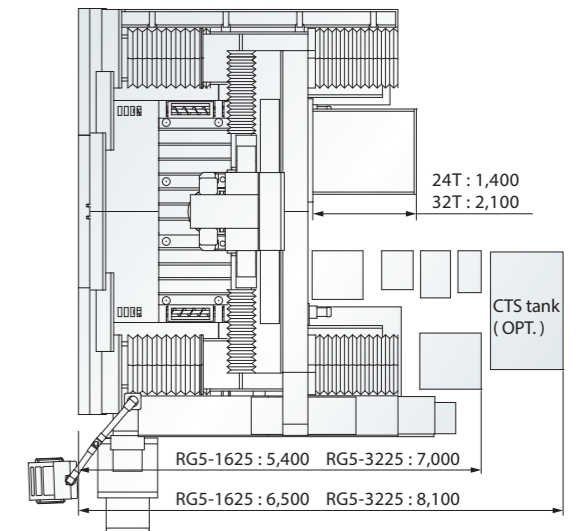
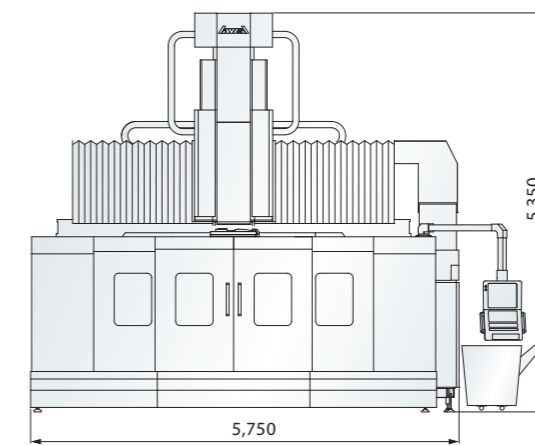
HSK-A63



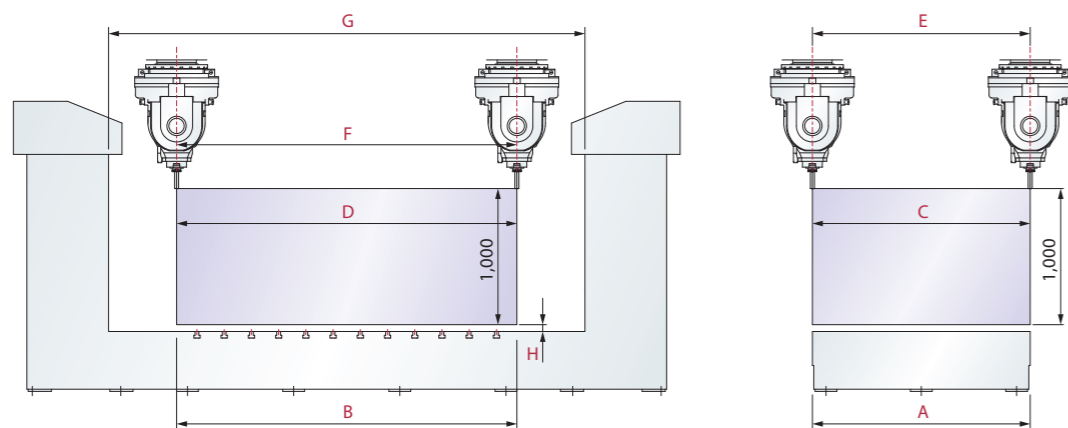
HSK-A100



Machine Dimensions



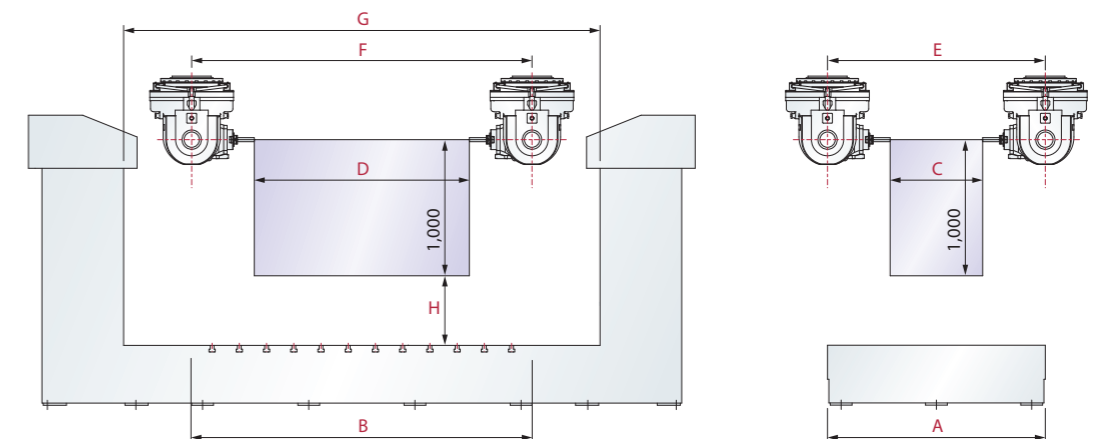
Work Range Vertical



Models	Two Axes Head	A	B	C	D	E	F	G	H
RG5-1625	TCH-20F	1,600	2,500	1,600	2,500	1,600	2,500	3,500	50
	TCH-20F-A								15
RG5-3225	TCH-20F	3,200	2,500	3,200	2,500	3,200	2,500	3,500	50
	TCH-20F-A								15

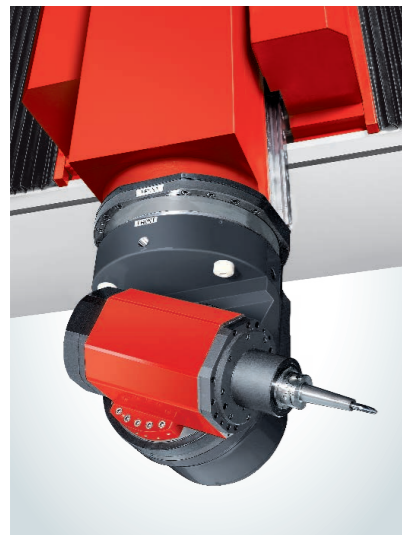
* Tool length 150 mm

Work Range Horizontal



Models	Two Axes Head	A	B	C	D	E	F	G	H
RG5-1625	TCH-20F	1,600	2,500	680	1,580	1,600	2,500	3,500	510
	TCH-20F-A			610	1,510				
RG5-3225	TCH-20F	3,200	2,500	2,280	1,580	3,200	2,500	3,500	510
	TCH-20F-A			2,210	1,510				

* Tool length 150 mm



TCH-L13 EVO compact two axes head Optional

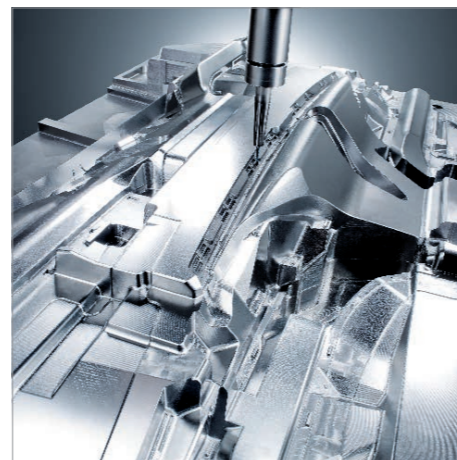
	B-axis	C-axis	Spindle	
Max. speed	50 rpm		Spindle motor (S1 / S6 40%)	27 / 33 kW
Max. acceleration	10 ~ 15 rad/sec ²		Spindle torque (S1 / S6 40%)	40 / 56 Nm
Max. torque	312 Nm	442 Nm	Spindle speed	24,000 rpm
Clamping torque	1,500 Nm		Spindle taper	HSK-A63
Position accuracy	± 10 arc.sec			
Rotary angle	± 105°	± 250°		



Standard HEIDENHAIN TNC 640 5 axes controller



Optional GERMAN made two axes head (KESSLER)



Optional RG series basic model X / Y / Z 3 axes machining

Standard Accessories

- Spindle cooling system
- Dual direct drive servo motors on Z-axis
- ATC with 24 tools magazine
- X / Y / Z axes with optical linear scales
- Centralized automatic lubrication system
- Spindle oil-air lubricant collecting device
- Hydraulic system
- Pneumatic system (excluding external air supply and hose)
- Coolant system with pump and tank
- Full splash guard w/o roof
- Twin screw type chip auger
- Caterpillar type chip conveyor and bucket
- Foundation bolt kit
- Electric cabinet with air conditioner
- Swing type control panel
- Foot switch for tool release
- Status signal lamp
- Automatic power-off system
- MPG
- Tool box

Optional Accessories

- Spindle : TCH-20F-A 15,000 rpm (HSK-A100)
TCH-L13 EVO 24,000 rpm (HSK-A63)
- 20 / 40 bar coolant through spindle
- Automatic tool length measurement
- Automatic work piece measurement
- 32 tools magazine / No tool magazine
- Full splash guard with roof
- Oil skimmer
- 19" LCD
- SIEMENS CNC controller

		RG5-1625	RG5-3225	
SPECIFICATIONS				
X-axis travel	mm	1,600	3,200	
Y-axis travel	mm	2,500		
Z-axis travel	mm	1,000		
Dist. between columns (with water eliminator)	mm	3,500 (3,300)		
Dist. from spindle nose to table top (B-axis = 0°)	mm	200 ~ 1,200		
Dist. from 90° spindle center line to table (B-axis = 90°)	mm	510 ~ 1,510		
TABLE				
Table size (X x Y)	mm	1,600 x 2,500	3,200 x 2,500	
T-slot (width x pitch)	mm	28 x 200		
Table load capacity	kg/m ²	2,500		
SPINDLE (TCH-20F TWO AXES HEAD)				
Spindle taper		HSK-A63		
Spindle motor (S1 / S6 40%)	kW	42 / 55		
Spindle speed	rpm	Built-in 24,000		
FEED RATE				
X-axis rapid feed rate	m/min.	24	20	
Y-axis rapid feed rate	m/min.	24		
Z-axis rapid feed rate	m/min.	24		
Cutting feed rate	m/min.	1 ~ 20		
TOOL MAGAZINE				
Tool magazine capacity	T	24		
Max. tool length	mm	400		
Max. tool weight	kg	8		
Max. tool diameter / adj. pocket empty	mm	Ø100 / Ø180		
ACCURACY				
Positioning accuracy (JIS B 6338)	mm	± 0.010 / Full Travel		
Positioning accuracy (VDI 3441)	X-axis	mm	P = 0.016 / Full Travel	P = 0.025 / Full Travel
	Y-axis	mm	P = 0.020 / Full Travel	P = 0.020 / Full Travel
	Z-axis	mm	P = 0.016 / Full Travel	P = 0.016 / Full Travel
Repeatability (JIS B 6338)	mm	± 0.003 / Full Travel		
Repeatability (VDI 3441)	X-axis	mm	Ps = 0.012	Ps = 0.018
	Y-axis	mm	Ps = 0.015	Ps = 0.015
	Z-axis	mm	Ps = 0.012	Ps = 0.012
GENERAL				
Coolant tank capacity	liter	700		
Lubrication oil tank capacity	liter	6		
Hydraulic tank capacity	liter	60		
Pneumatic pressure requirement	kg/cm ²	5 ~ 8 (5)		
Machine weight	kg	35,000	45,000	
Max. work-piece dimension L x W x H (Tool length 150 mm)	mm	1,600 x 2,500 x 1,000	3,200 x 2,500 x 1,000	

Specifications are subject to change without notice.