RG5 series

RG5 SERIES

Gantry Type High Speed 5 axes Machining Centers

AWEA MECHANTRONIC CO.,LTD.

ISO 9001 ISO 14001 CE

Official distributor for Benelux

THOLITEC

Jan Doustraat 37
1689 XK Zwaag (NH)
The Netherlands

Tel. +31(0)85 0022937
info@tholitec.nl
www.tholitec.nl

A-RG5-EN-201906

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

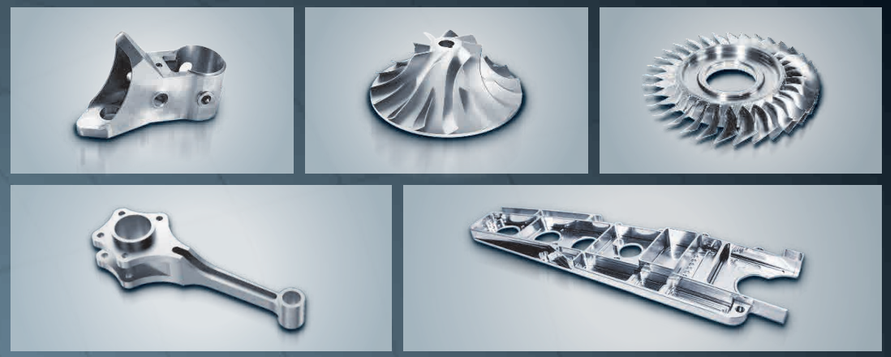


Table Size
Ø 210 mm

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

FV SERIES

High Performance Trunnion Table

A-axis : ±100° *1
-42°~+120° *2

C-axis : ±360°

Table size : Ø 210 mm*1
Ø 350 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-560 *2 FV-960

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 (Opt.)

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.)

RG5 series | Gantry Type
High Speed 5 Axes Machining Centers

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

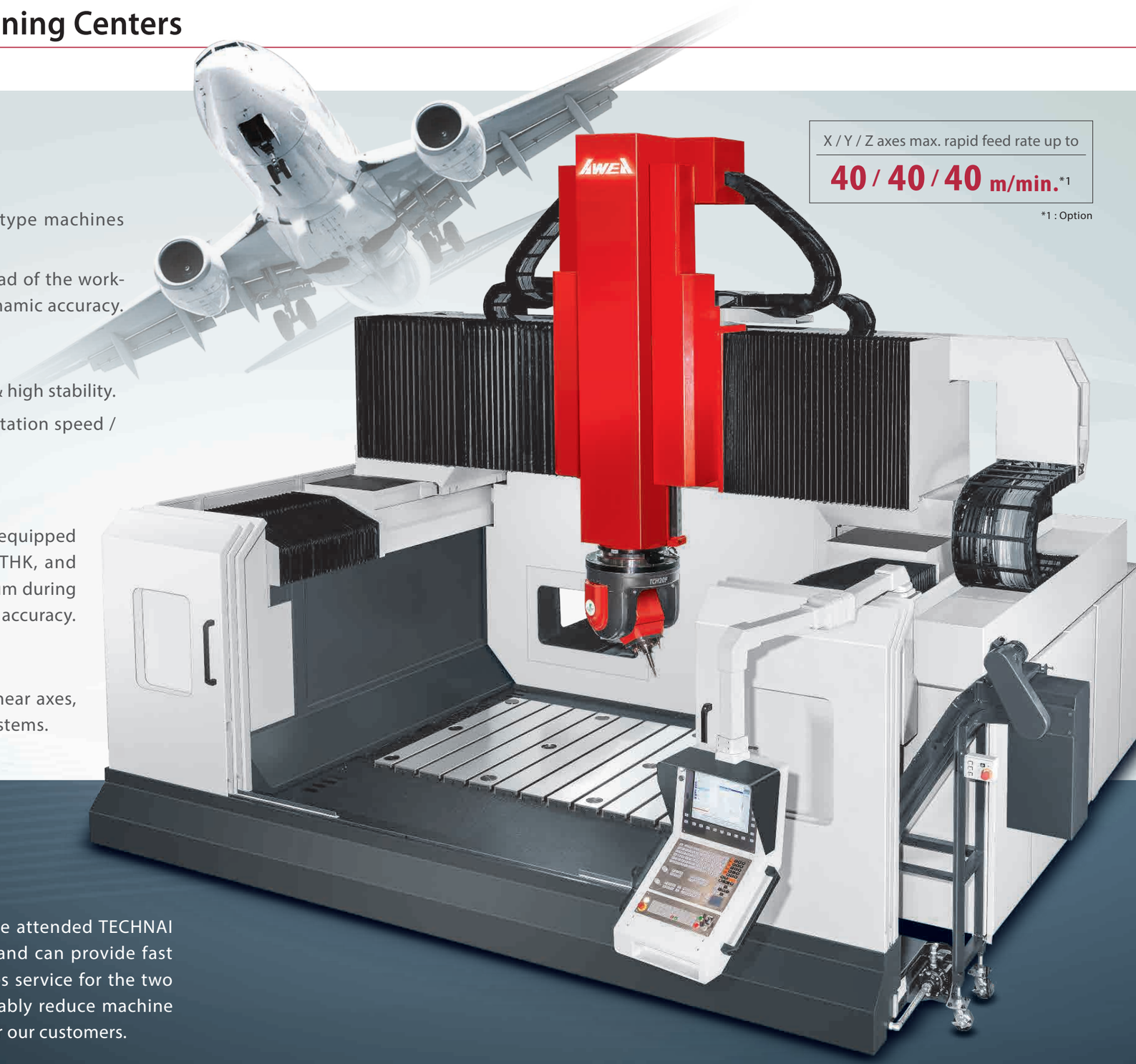
- Italian-made two axes head designed for high performance & high stability.
- A variety of milling heads are available optionally – high rotation speed / high torque / compact structure.

Advanced cooling technology (Opt.)

- 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.



X / Y / Z axes max. rapid feed rate up to

40 / 40 / 40 m/min.[*1]

*1 : Option

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

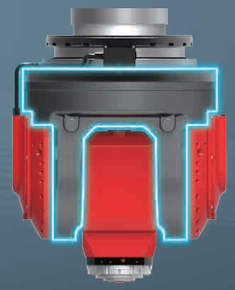
ITALIAN Made Two Axes Head

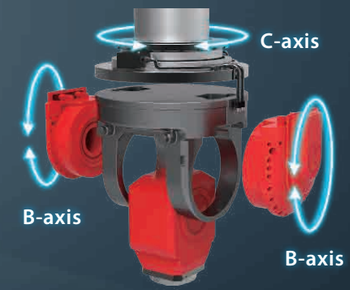
The rigid fork structure of the two axes head is made from GGG40 modular graphite cast iron and can easily sustain and disperse the complex cutting forces imposed on it during heavy cutting.

	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

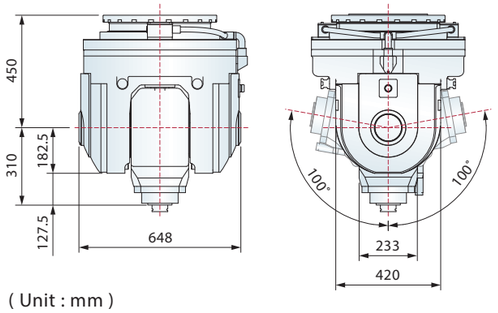
High torque direct drive motors

Modular spindle system

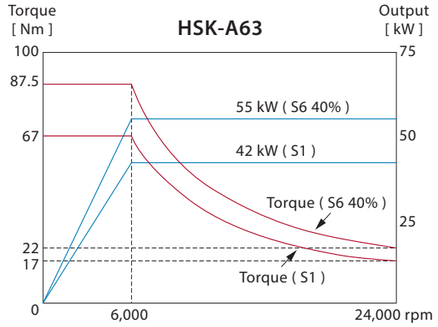
TCH-20F	Two Axes Head	Std.	24,000 rpm High Speed Built-in Spindle (HSK-A63)
TCH-20F-A	Two Axes Head	Opt.	124 Nm High Torque Built-in Spindle (HSK-A100)

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

TCH-20F

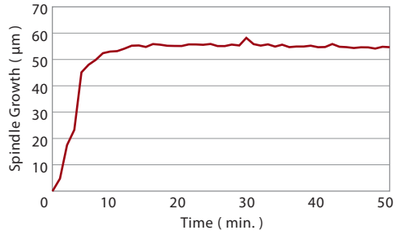


(Unit : mm)

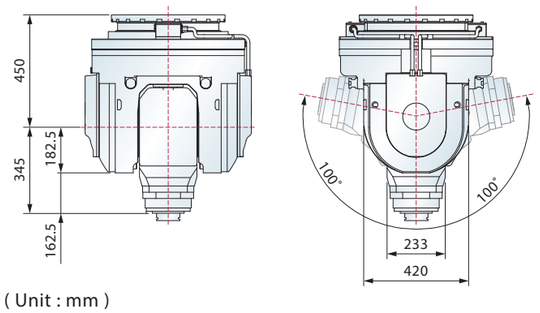


Thermal stability of the spindle

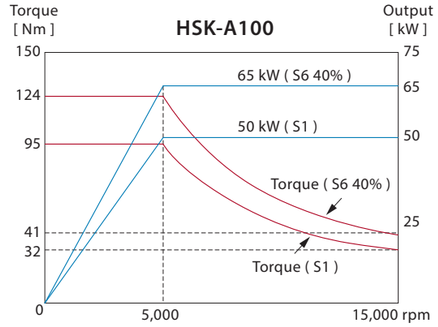
The spindle reaches thermal stability within 10 minutes from a cold start; afterwards thermal expansion is limited to less than 0.01 mm, even during long time machining.



TCH-20F-A



(Unit : mm)



RG5 series | Super Rigid Structure

Finite element analysis

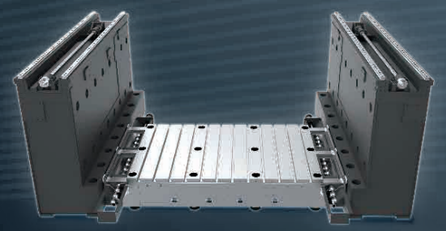
The Finite Element Analysis provides the optimal machine design to build a light-weight, yet super rigid machine structure.

Four guide ways on a U-shaped base

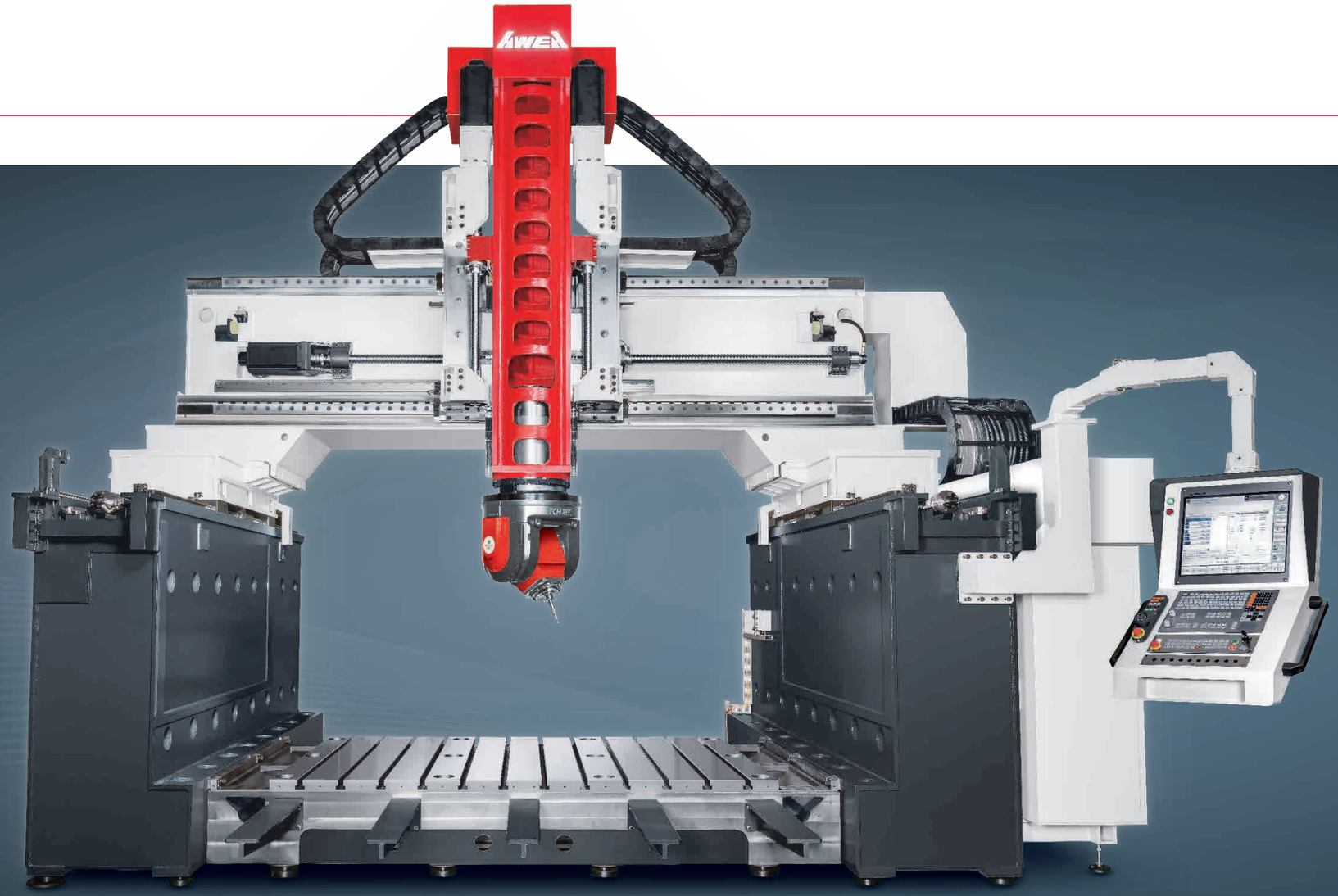
The rigid U-shaped base with dual linear guide ways on each side provides a solid basis for the cross beam.

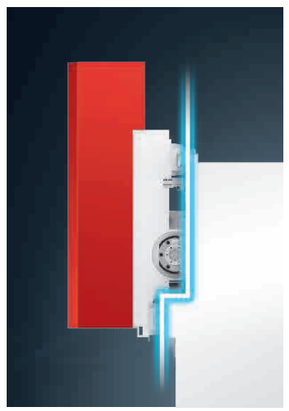
Heavy load fixed type work table

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 linear 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.

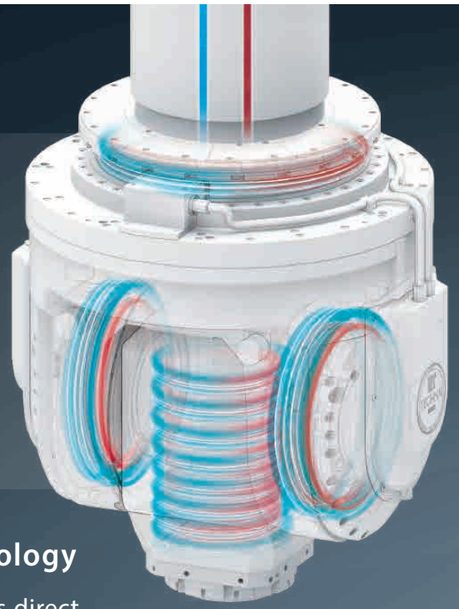
X / Y axes

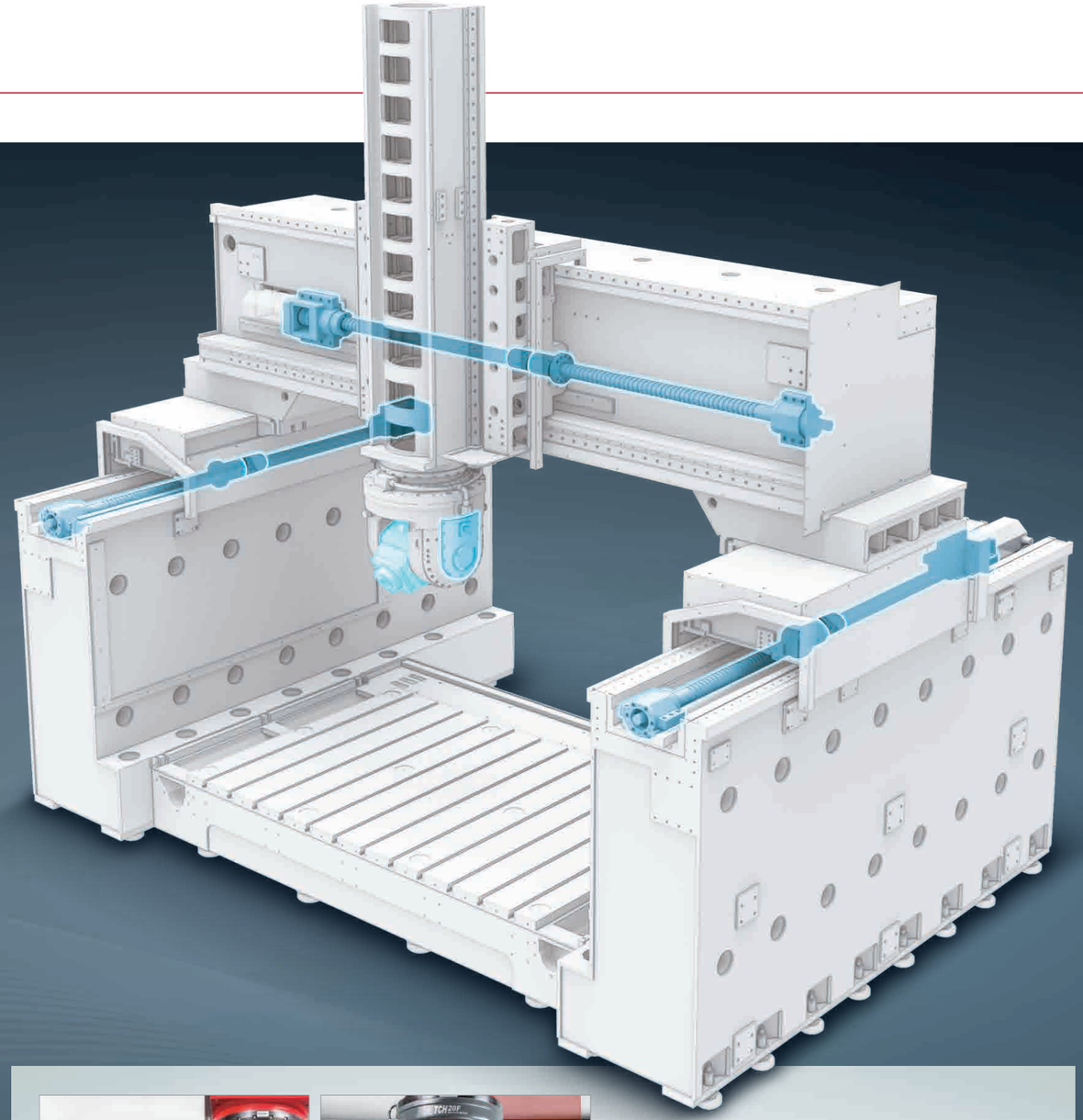
High performance drive system on all linear axes

- 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.

RG5 series | Advanced Cooling Technology

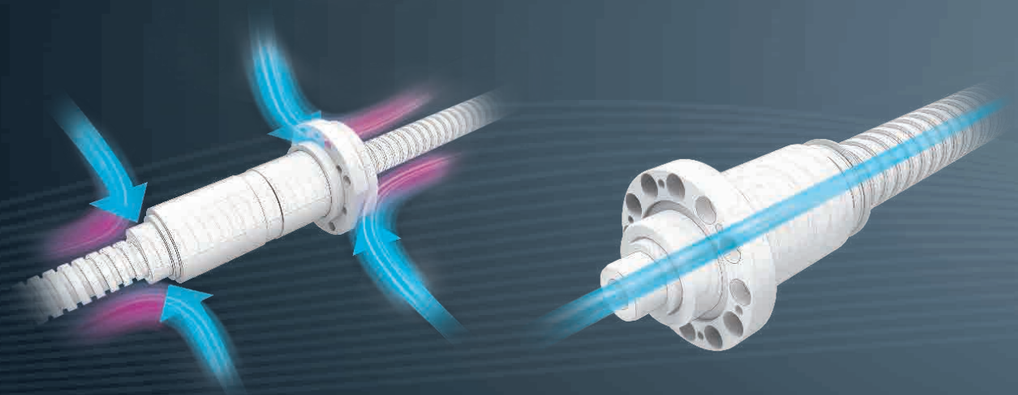
The advanced cooling system combines the best technologies from TECHNAI, THK and AWEA, to efficiently remove heat generated by high speed axial movements, thus assuring high accuracy in high speed milling.





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.

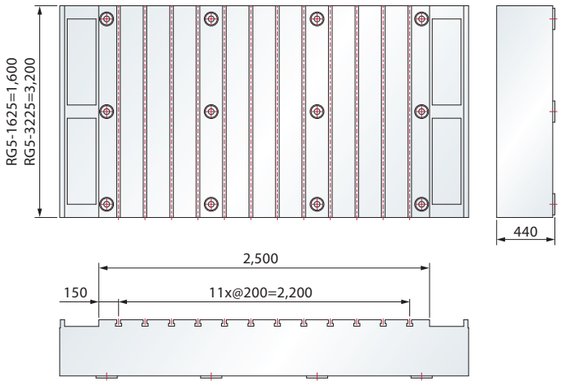
Strict quality control

1 Geometric accuracy check
(granite square gauge 1 m x 1 m)

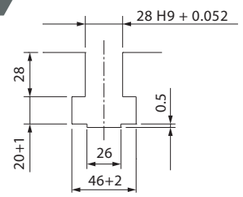
2 3D accuracy check
(B : ±90° / C : ±180°)

(Unit : mm)

Table Dimensions

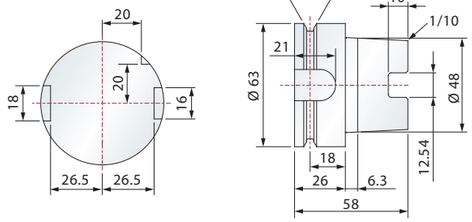


T-slot Dimensions

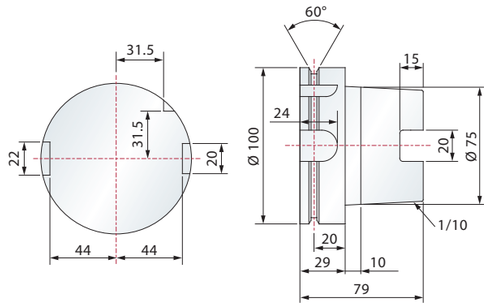


Tool Shank Dimensions

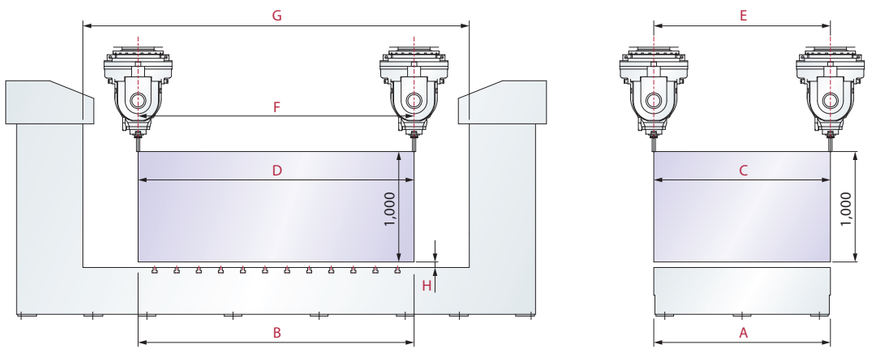
HSK-A63



HSK-A100



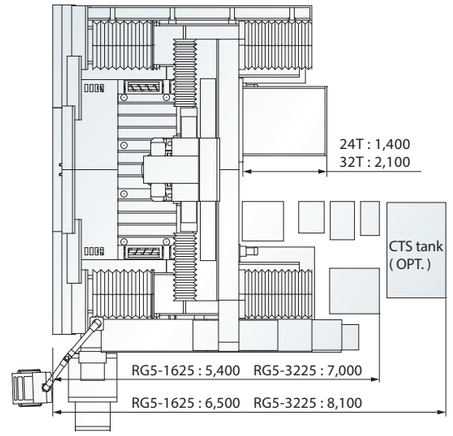
Work Range Vertical

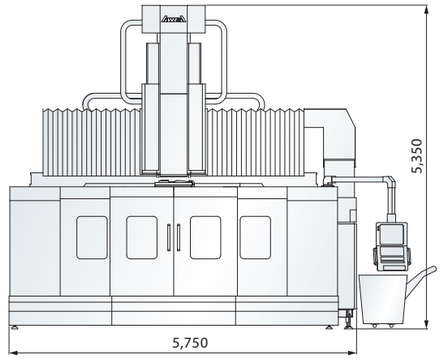


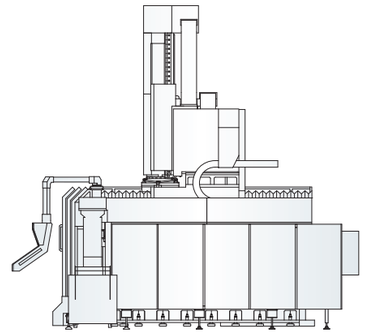
Models	Two Axes Head	A	B	C	D	E	F	G	H
RG5-1625	TCH-20F	1,600	2,500	1,600	2,500	1,600	2,500	3,500	50
	TCH-20F-A								15
RG5-3225	TCH-20F	3,200	2,500	3,200	2,500	3,200	2,500	3,500	50
	TCH-20F-A								15

* Tool length 150 mm

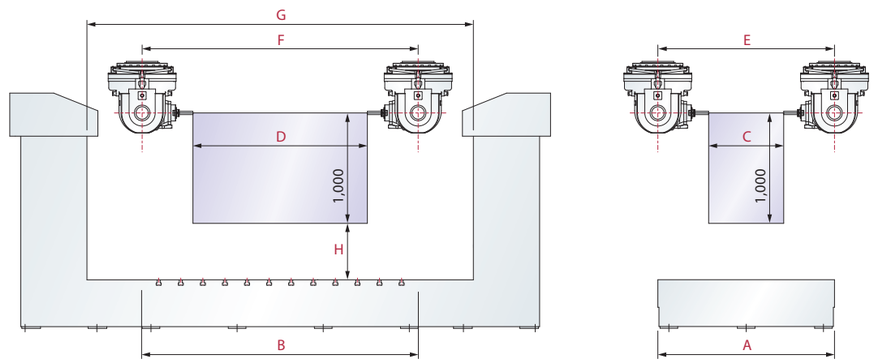
Machine Dimensions





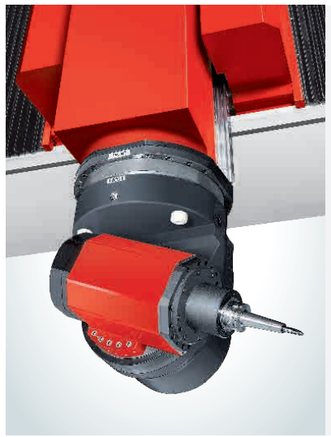


Work Range Horizontal



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



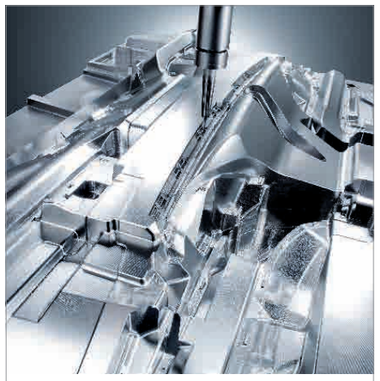
TCH-L13 EVO compact two axes head Opt.

	B-axis	C-axis
Max. speed	50 rpm	
Max. acceleration	10 ~ 15 rad/sec^2	
Max. torque	312 Nm	442 Nm
Clamping torque	1,500 Nm	
Position accuracy	± 10 arc.sec	
Rotary angle	± 105°	± 250°

Spindle	
Spindle motor (S1 / S6 40%)	27 / 33 kW
Spindle torque (S1 / S6 40%)	40 / 56 Nm
Spindle speed	24,000 rpm
Spindle taper	HSK-A63

Std. HEIDENHAIN TNC 640
5 axes controller

Opt. GERMAN made
two axes head (KESSLER)



Opt. 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	3,000	
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 rapids feed rate		m/min.	24 / 40 (Opt.)	20 / 40 (Opt.)
Y-axis rapids feed rate		m/min.	24 / 40 (Opt.)	
Z-axis rapids feed rate		m/min.	24 / 40 (Opt.)	
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

Specications are subject to change without notice.