

AXILE®

G6 Series

G6 Standard
G6 Compact
G6 APC
G6 MT

Gantry type
5-Axis Vertical
Machining Center



BUFFALO MACHINERY CO., LTD.

56, Lane 318, Desheng Road, Daya District,
Taichung City 428-46, Taiwan
P.O. Box 320, Daya, Taichung City, Taiwan
Tel: +886-4-25 60 37 59 Fax: +886-4-25 60 37 69
E-mail: info@mail.buffalo.com.tw
www.buffalo-machinery.com
www.axilemachine.com



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> AXILE /'æksail/, stands for "agile"

Agility is the best word to define the identity of **AXILE**. Motor agility is the ability to move quickly and precisely, which is the essence of **high-speed machining**. Mental agility is the ability to think and understand quickly, to be

AXILE provides agile smart machining.

Highly sophisticated part manufacturers face the same problems everywhere: lower selling prices every day, higher costs and a shortage of specialized labour. AXILE propose highly productive machines based on **high-speed and 5-axis technologies at very competitive prices**.

The new AXILE line is built with **standard high-tech design and components** from world-class suppliers to **ensure the best quality and reliability**. AXILE patented **SMT technology** attains reaching high levels of accuracy and embraces **Industrie 4.0 technologies, reliability** is upgraded, maintenance costs minimized and downtime avoided.

AXILE products are proudly designed and manufactured at Buffalo's facilities, one of the leading technology manufacturers in **Taichung (Taiwan)**. Taichung is the world's biggest **cluster of machine tool builders**, thanks to abundant specialized workforce and a component supply chain far more efficient than in any other country. The rationalized range of 3X and 5X high-speed VMC's covers only the most requested sizes to reach economies of scale to maintain reasonable market prices.

AXILE is conceived to conquer the premium market of 3X and 5X high-speed vertical machining centers. Such markets will grow and AXILE will be the real Asian big player amongst its European competitors.

AXILE, motor and mental agility at a competitive price.



G6 Standard



G6 Compact



G6 APC

1 machine 3 different concepts

The new G6 was designed for today's production challenges at different level. AXILE developed 3 different concepts based in the same machine structure:

- **G6 Compact**
for the smaller subcontractors with reduced space availability.
- **G6 Standard**
with bigger tool magazine for more complex parts manufacturers
- **G6 APC**
for those who need longer production times through automation.
- **G6 MT**
with mill-turn multi-function machining for a higher integration of machining processes

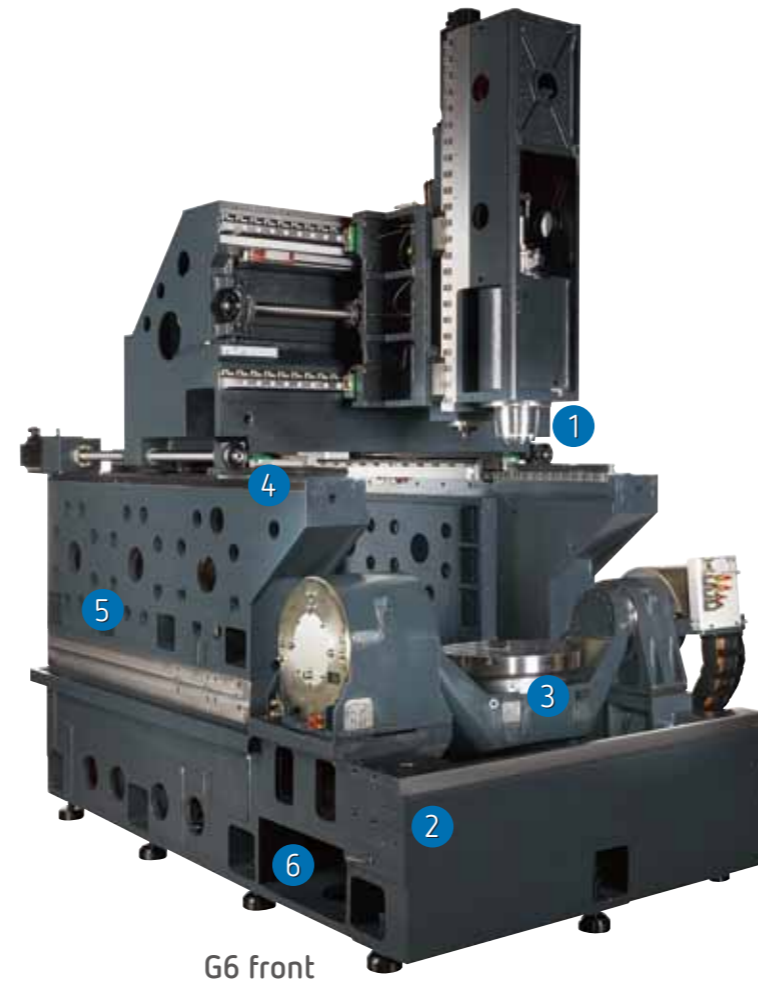
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Design concept

The structure

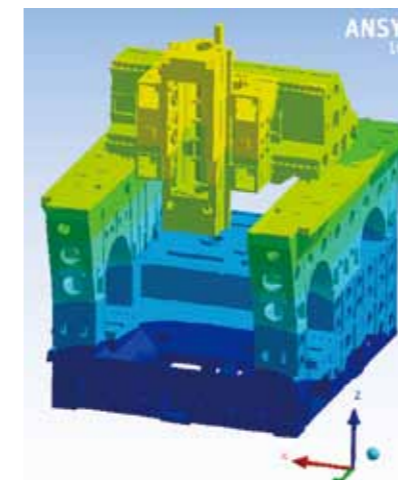
<p>1 Spindle moved by 3 linear axes</p>	<p>No rotary axis between the tool and the machine body, for better machining rigidity.</p>
<p>2 Perfect U-shape closed-gantry design</p>	<p>Same stability in all travels of X and Y axes Excellent accessibility to working area</p>
<p>3 Table moved by swivelling-rotary axes</p>	<p>Best accuracy with fixed relative position between 2 rotary axes.</p>
<p>4 Massive gantry sliding on 2 symmetric synchronized axes</p>	<p>Best servo response to any milling forces</p>
<p>5 All body made of high-quality casting</p>	<p>Optimal damping of machining vibrations Homogeneous thermal behaviour</p>
<p>6 Integrated chip disposal channel directly under the table</p>	<p>Quick evacuation of chips for high chip volume machining</p>
<p>7 Back gantry structure empty for added access to spindle and working area</p>	<p>This feature enables the use of the back space to locate the tool magazine (G6 compact) or the pallet changer (G6 apc)</p>



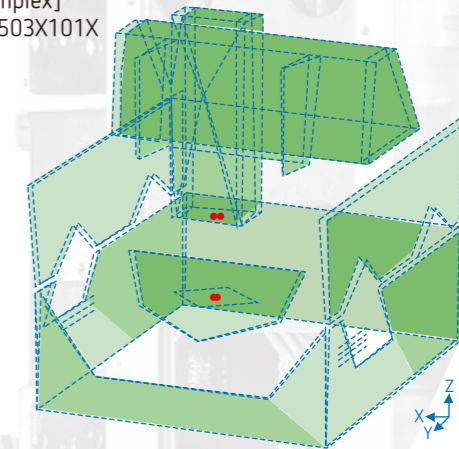
Gantry:
best dynamics, accuracy and ergonomics for 5X machines

Modal analysis vs. Modal testing

1st mode (roll)_19.5Hz



View: 3D View [Complex]
SHP: Shape Table_503X101X
Freq: 19.5 (Hz)
Damp: 4.45%

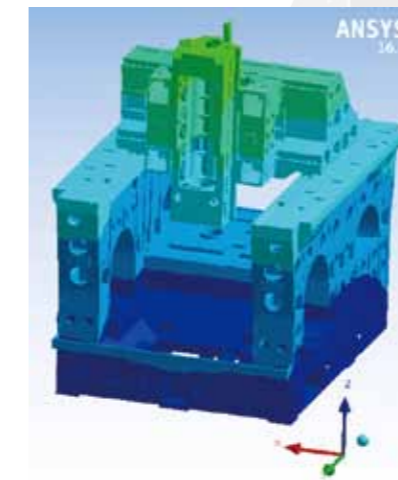


Modal Analysis

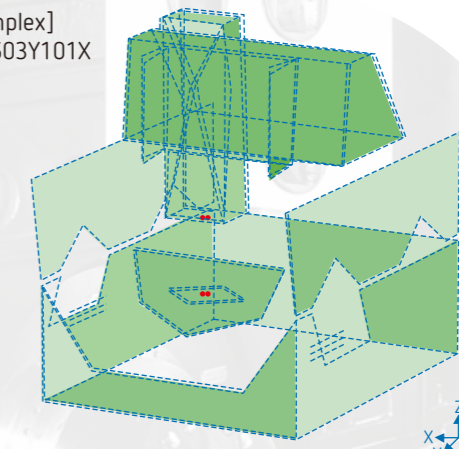
Modal Testing

Modal analysis vs. Modal testing

2nd mode (pitch)_22.6Hz



View: 3D View [Complex]
SHP: Shape Table_503Y101X
Freq: 22.6 (Hz)
Damp: 4.96%



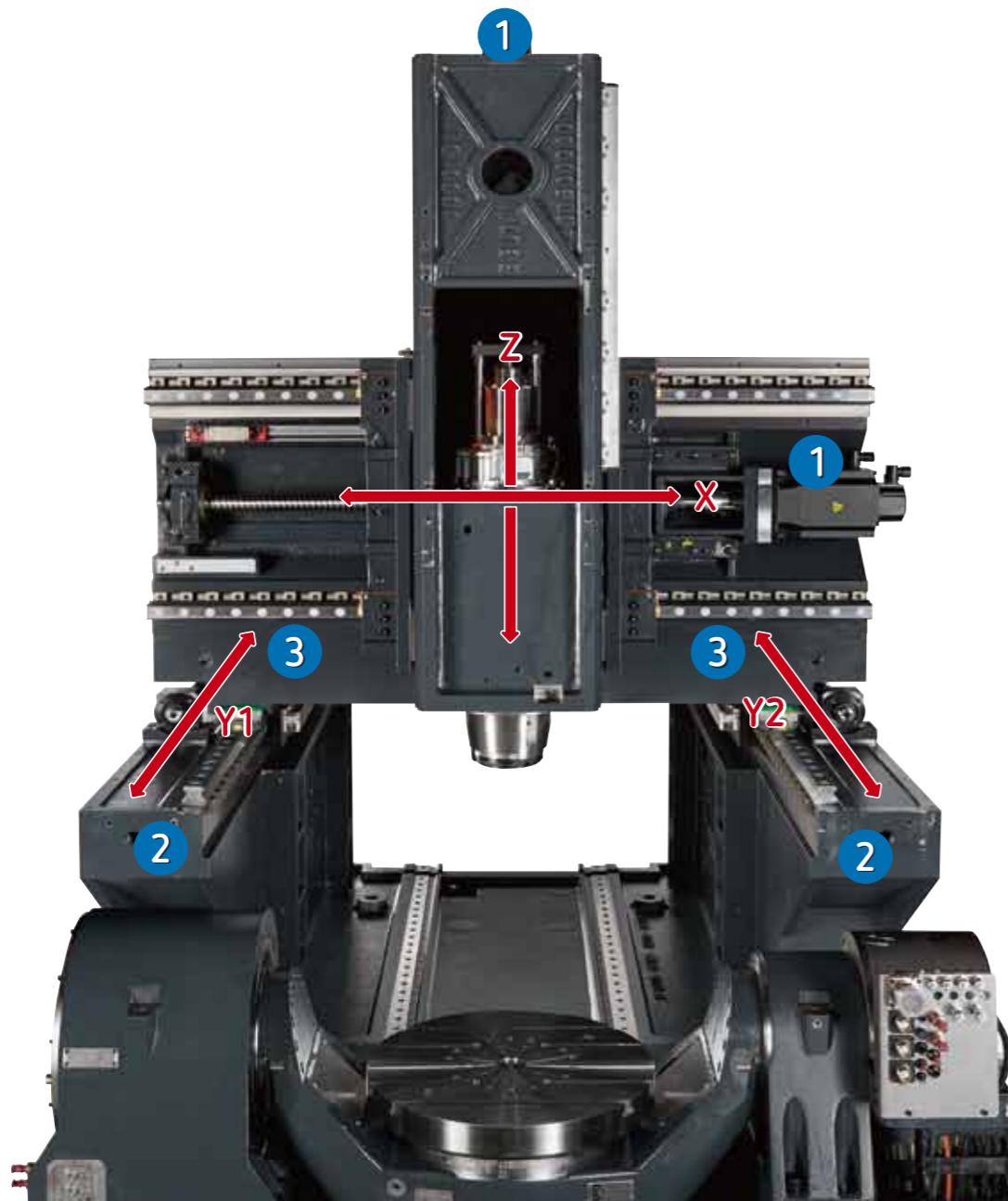
Modal Analysis

Modal Testing

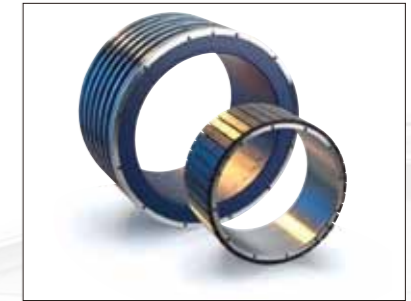
Agility

Linear axes

Direct driven servomotors (no belts/gears)	Best dynamic and minimal elasticity in the driving system 1
Double symmetric and synchronized axes (Y1, Y2)	Best dynamic for the gantry no matter the position of the machining force 2
Linear scales with 0,1 μm resolution in X, Y1, Y2 and Z axes	Ensures optimal synchronization in Y1 and Y2 axes, and best accuracy for ALL axes 3
Double roller type linear guideways	Best high-feed movement and vibration damping
Two pre-loaded double-nut ballscrews	Minimized backlash allowing high-feed movements



Swivelling-rotary axes



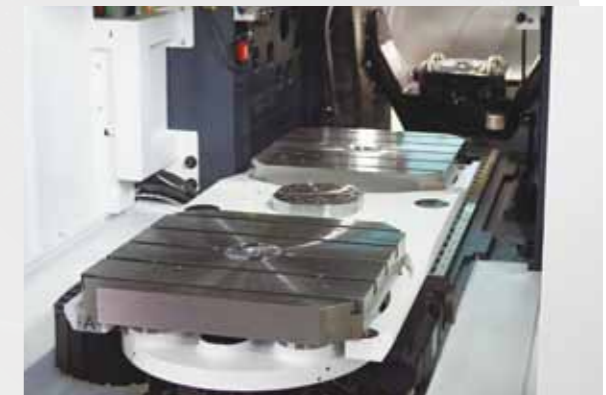
Integrated and ready-to-use hydraulic and pneumatic ports	Simplifying parts clamping process 1
Torque motor-driven rotary axis (C)	Highest dynamics 2
Torque motor-driven swivelling axis (A)	Highest accuracy
Brakes in rotary (C) and swivelling (A) axes	High-repeatability in 4+1x operation when using the brakes
High-resolution, direct absolute rotary measuring system	Zero-backlash and high accuracy 3



G6 Standard/ Compact table



G6 MT table



G6 APC table

> G6 Compact



The tool magazine moves between the gantry walls

Reducing the space requirement of the machine

Compact concept

for those companies where space requirement is a must and the maximum magazine capacity of 60 tools is not a limitation. Good choice for die & mold, aerospace and general sub-contractors with prototypes or very small batch production.



The tool management is then done at the back of the machine.



The working area becomes symmetric and simpler.



The access of the ATC ARM is done behind the working area

> G6 MT

Mill-turn for those looking for the maximum integration of metal-cutting processes in a single step, reducing complexity of the process and chance of error in the clamping.

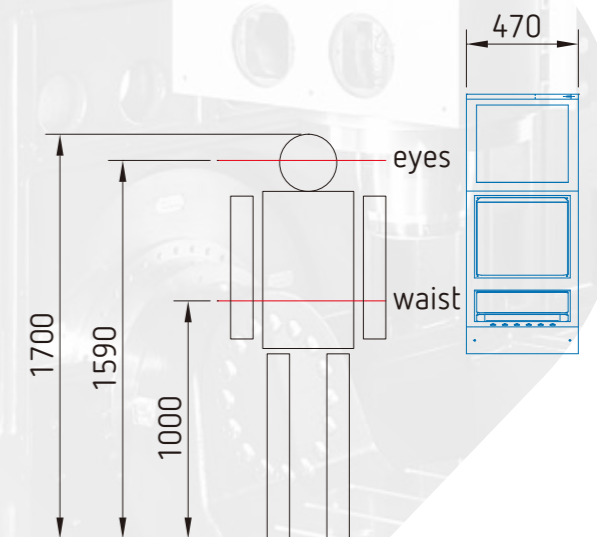


C-axis motor is cooled as in the milling version. Additionally the C-axis bearing is cooled in the inner and outer to ensure the long lasting accuracy and life.

Table diameter: 500 mm
Max turning speed: 1.500 rpm
Max table load:
Turning: 350 kg, Milling: 500 kg



Integrated balancing system that can be monitored from the additional screen located on top of the panel, with the help of a sensor located in the A-axis



> G6 APC

Integrated 2-pallet changer with a minimum space increase. Workpiece loading and unloading are done while machining, reducing down time and enlarging working time per day. The machine is prepared to integrate multi-pallet systems in case longer autonomy is required.



Back loading

The back shutter opens to access the two pallet carriage. In seconds, a new pallet with raw material is precisely located in the rotary-swivelling table, and ready to start working again.

Non-productive time is reduced, productivity increased and return on investment optimized.

Loading/unloading station at the back

The pallet rotates 4x90°, and the station has optional hydraulic and pneumatic feeding in case we need to use automatic clamping systems, commanded by the panel.

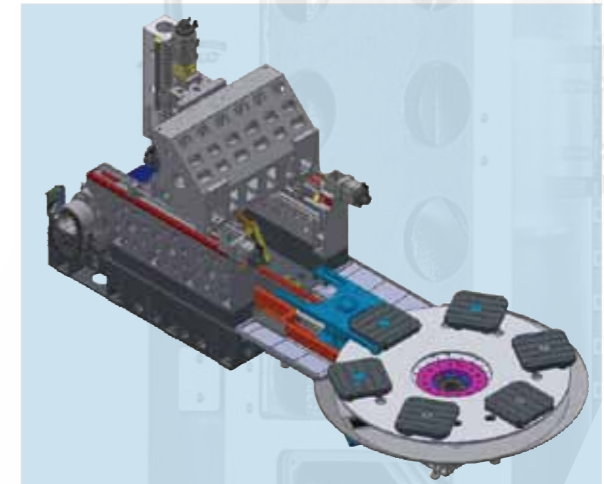
The operator access to the finished part from the back which is spacious and highly ergonomic.



G6 APC increase autonomy and flexibility

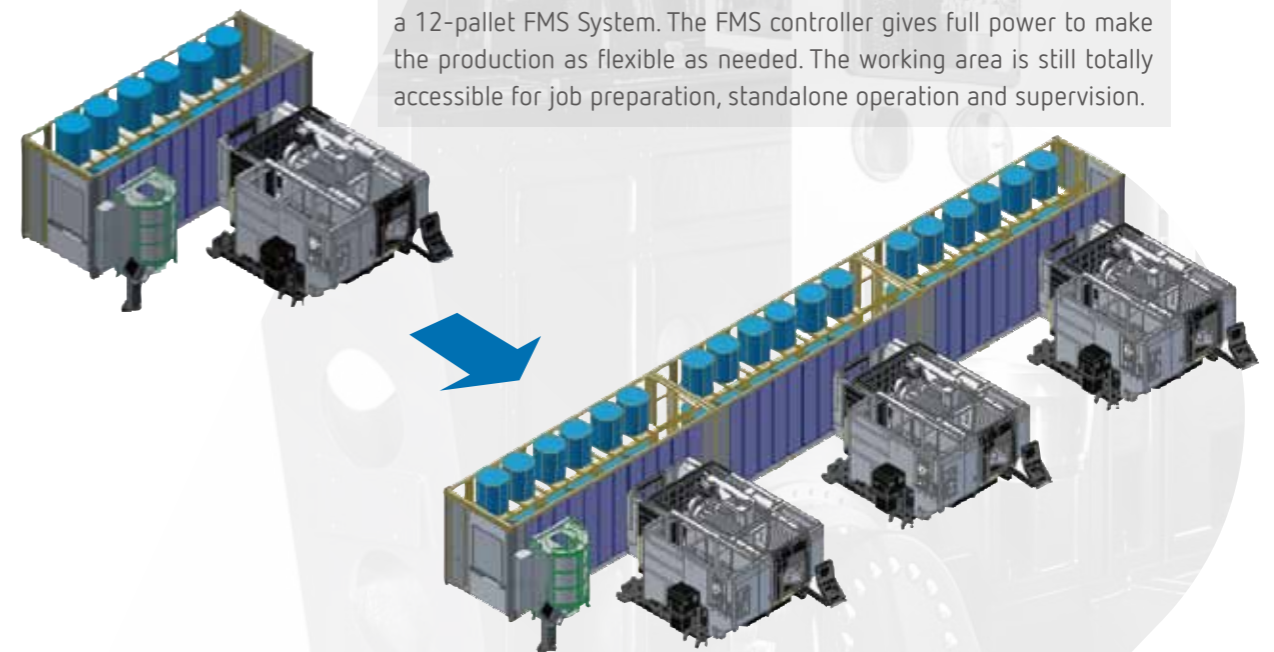
G6 APC6

The 6-pallet pool extends the autonomy of the G6 APC. The system can be integrated at the machine commissioning or later, when the autonomy requirement grows. The loading and unloading is done through the APC6 system side.



G6 APC + FMS

For higher autonomy requirements, the machine can be integrated in a 12-pallet FMS System. The FMS controller gives full power to make the production as flexible as needed. The working area is still totally accessible for job preparation, standalone operation and supervision.



Expandable

The FMS System is expandable to 24 or 36 tools, 1 to 3 machines and 2 loading stations.

Smart Machining Technology™

High-speed and 5-axis technologies pursue lower manufacturing costs for complex products, but they also represent some serious challenges for accuracy and reliability. This is why Buffalo dedicated almost a decade to research the necessary knowledge to dominate such technologies. We call them SMT™.

Low productivity due to wrong F value selection **MRRO**

MRRO How to achieve the best productivity and performance and to optimize the metal removal rate with excellent machining quality?

- OPTIMIZATION PRODUCTION Fully utilize machine capability
- EXTREMELY FAST PROCESSING TIME Maximization of metal removal rate
- HIGH TOOL DURABILITY & PERFECT SURFACE ROUGHNESS Stable cutting force and chatter-free machining

The Maximum Efficiency in Metal Removal Rate and Processing Time

Configuration	Spindle speed (G/min)	Maximum feed rate (mm/min)	Surface Roughness (µm)	Metal Removal Rate (cm³/min)
MRRO OFF	44	197	0.548	133.6
MRRO ON	42	170	0.491	152.8
Comparison	-6.45%	-13.7%	-10.4%	14.3%

Overall performance improved

Prolong Tool Life Under Spindle Overload

Configuration	Spindle speed (G/min)	Maximum feed rate (mm/min)	Surface Roughness (µm)	Metal Removal Rate (cm³/min)
MRRO OFF	110	79	1.412	337.6
MRRO ON	95	85	0.943	270.7
Comparison	-13.6%	+7.5%	-61.5%	-19.8%

Surface Roughness improved **61.5%**
Spindle load decrease **13.6%**

Spindle thermal growth at high-speed **TPC**

TPC How to prevent the inaccuracy caused by temperature rise of spindle and motor under high speed motion?

- HIGH ACCURACY Directly measuring expansion
- REAL-TIME COMPENSATION Electrical type sensor
- BETTER SURFACE FINISH 5-6 times accuracy improved

DISPLACEMENT METER → AMPLIFIER → MPU → CNC

ACCURACY IMPROVED 5~6 TIMES!

Spindle vibration reduces lifetime **SVS**

SVS How to real-time monitor the spindle vibration to remain the machining accuracy under long time operation?

- HIGH FINISH QUALITY Spindle Life Time
- LONGER LIFE TIME Wear reduction on spindle bearings and tools
- EASY FOR MAINTENANCE Abnormal vibration data recording

VIBRATION SENSOR → AMPLIFIER → MPU → CNC

THREE LEVELS FOR SPINDLE VIBRATION MONITORING

LEVEL 1 shows the warning message to notify operator
LEVEL 2 shows the error message and reduces spindle speed and feed rate
LEVEL 3 machine shut down immediately to prevent crash

Angular deformation in machine body causing linear errors **AAC**

AAC How to prevent the inaccuracy caused by temperature rise of machine body under long time operation?

- AXIAL THERMO MONITORING Integration of temperature sensors and thermal error model
- HIGH PRECISION Thermal induced positioning error compensation

temperature sensors → MULTIPLEXER / AMPLIFIER → MPU → CNC

THERMAL ERROR BEFORE AND AFTER COMPENSATION

With thermal compensation system, the thermal error can be reduced from 20µm to 3µm.

AXILE Reliability Technology™ ART™

ART solution enhances machines to integrate in the smart factory system to ensure the 24/7 automatic operation without unexpected downtime.

MP ART formulates the application to real-time monitoring of the machine status with data collection and analysis to organize the production schedule proficiency.

Calculate and analyze the utilization rate of each machine and displaying the rate of utilization at any time.

- In cooperation with the third party's task scheduling system to further maximize the productivity and improve the machine utilization rate.
- Facilitate managers to easily identify the production status.

Manufacturing Process

EM ART monitors the machine energy consumption and usage condition to optimize the energy efficiency.

- Monitor the machine power consumption and track the power usage condition.
- In cooperate with the off-peak electricity rate or contract of control electricity, etc. to moderate the electricity cost.

Energy Management

RM The data collected through the multiple sensors located in machine components enables a predictive maintenance and MTBF

Reliability Maintenance

- ### Benefits to the production
- Transparency on machine production status
 - Increasing machine utilization and accessibility
 - Machine performance optimization
 - Abnormal condition notice for faster reaction

- ### Benefits to the maintenance and service
- Error message delivery prior to broken
 - Lower warranty expenses and service efficiency enhancement
 - Reducing inventory of spare parts
 - Equipment is always ready to work, no adjustment time or downtime



Real-time analyzed data and easy access platform

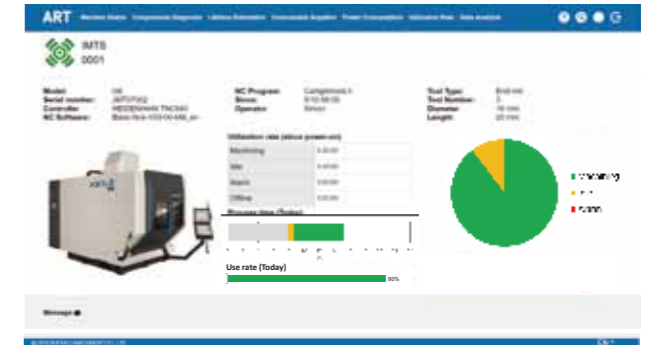
Reliability Maintenance (RM)



Energy Management (EM)



Manufacturing Process (MP)



Data Analysis



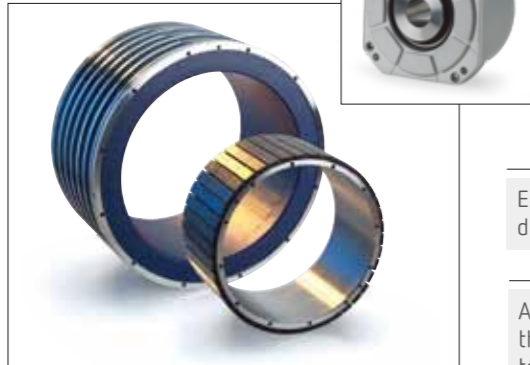
Accuracy

“The **Cornerstone** of 5-Axis machining”

Linear axes accuracy

Ballscrew's thermal growth

0.1µm resolution absolute linear scales in ALL axes



Rotary axes accuracy

Elasticity and backlash of driving system

Direct-driven torque motors with no backlash

Angular error is multiplied by the distance from rotary axis to machining point

+/- 5" accuracy absolute rotary scale feedback



Thermal stability

Heat generated by spindle and torque motors

Spindle and torque motors are cooled with a water chiller close-circuit and a cooling unit



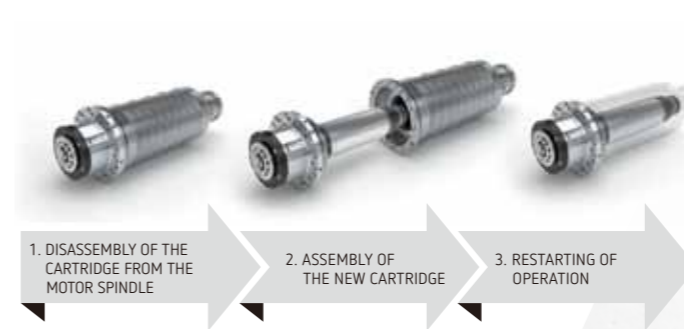
Linear-rotary axes relative positioning

The swivelling-rotary table might shift its relative position to the 3 linear axes by many reasons generating an increasing error in the part

CNC embedded compensating functions like Kinematics (Heidenhain), Kinematic chain (Siemens) and Tilted working plane indexing (Fanuc)

Spindle

High-performance built-in spindle selection



Bearing preload dynamically adaptable to the operation speed

At low speed, bearing pre-load increases to enhance rough cutting. At high speed, bearing pre-load decreases, to enlarge spindle life.

Hydraulic clamping available

For turning operations

Detachable cartridge

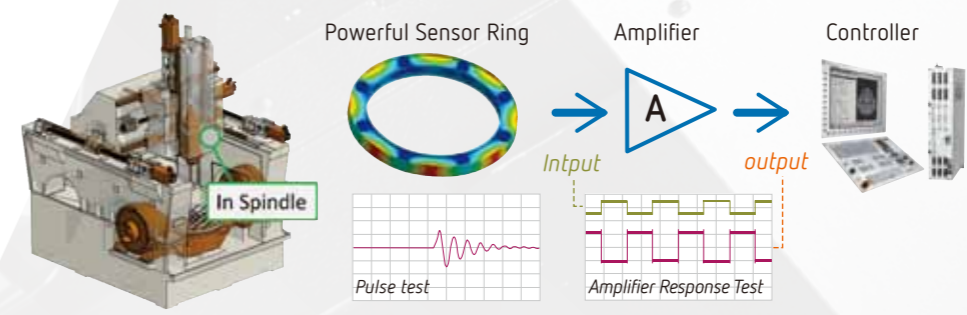
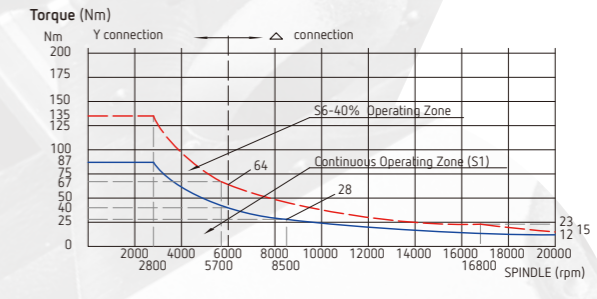
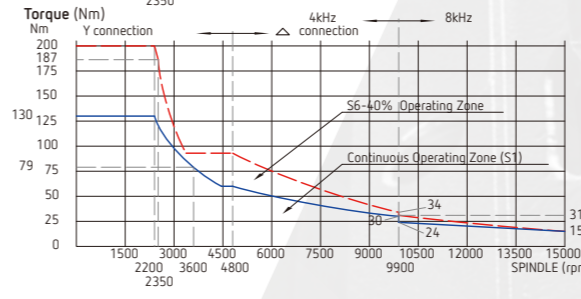
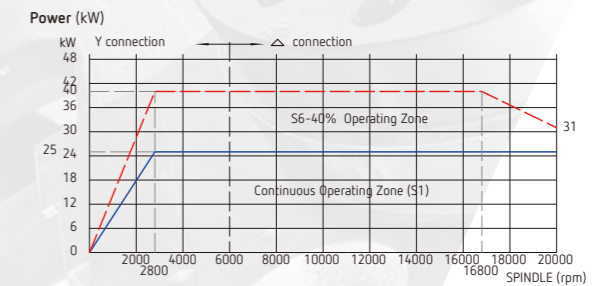
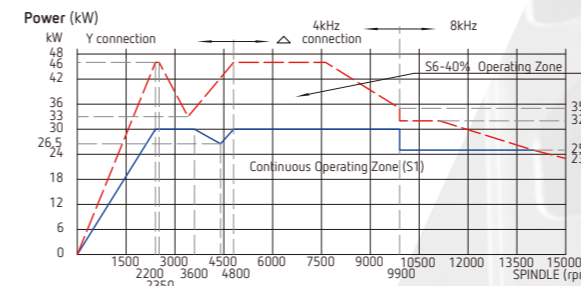
Reducing downtime and cost due to spindle breakdown

- > 15.000 rpm
- > HSK A63
- > 30/46 kW S1/S6-40%

- > Double coil asynchronous motor
- > 130/200 Nm S1/S6-40%

- > 20.000 rpm
- > HSK A63
- > 25/40 kW S1/S6-40%

- > Double coil asynchronous motor
- > 87/135 Nm S1/S6-40%



ART™ supported

Notification of repair before spindle damage, reducing waiting time for 90% downtime. Expected shutdowns takes only 1 days to replace or repair the spindle

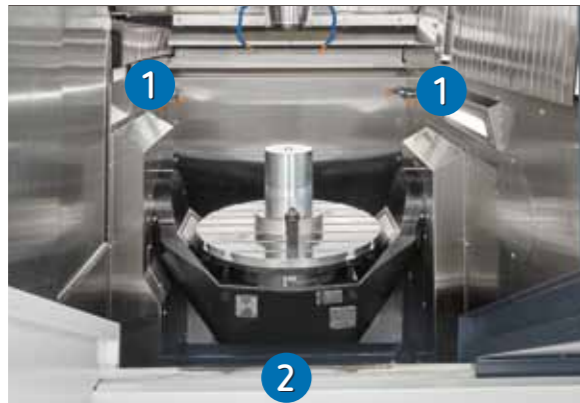
Embedded sensor ring

Effectively detecting bearing abnormalities

Chip management

Flushing chips away

G6 Standard



G6 Compact

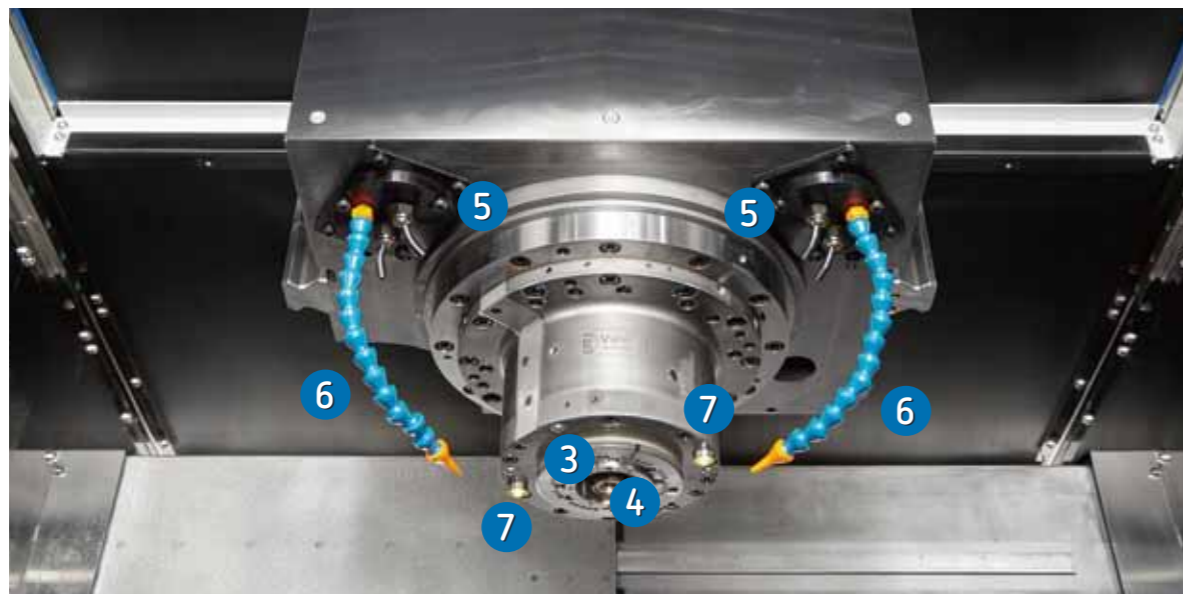


High-quality stainless steel work area Long-lasting clean operation

Sharp walls and no-corner design Easier to flush away chips by shower

2xLed lights spindle nose For optimal illumination of the tool cutting

- 1 Chip wash down
- 2 Chip conveyor
- 3 4x coolant at spindle nose
- 4 Coolant through spindle
- 5 Air flushing
- 6 Coolant flushing
- 7 2x led lights



Ergonomics

Accessibility to work area

Large front door opening Comfortable access to work area for workpiece preparation and supervision

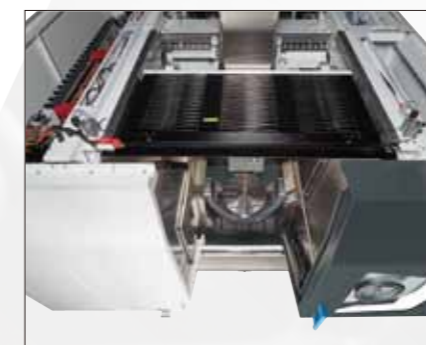
Short distance from operator to table Ergonomic loading and unloading of small parts

Automatic roof to open ceiling working area Easy loading and unloading of heavy and bulky workpieces by over-head crane



Automatic roof for overhead crane loading and unloading

Roof closed



Automatic sliding of roof



➤ Tool management

Easier tooling management and maintenance

Matrix rack magazine for bigger capacities up to 320 tools

Perfect solution for multi-pallet automation with bigger number of different parts and need for sister tools to reach a practical unmanned operation

- Specification of 320 tool is on request

“Travel arm type magazine with **up to 120 tools** capacity”

- Specification of 320 tool is on request

1 level (60 tools) or 2 level (120 tools) magazine are selectable within the same machine layout

Unmanned operation with automation, sister tools and complex parts can be machined with no worries on tool magazine capacity

Vertical tool magazine and arm-type automatic tool change

Next tool preparation is executed during automatic machining operation for time saving.

Tool change is fast and non-cutting time is reduced

Tools are accessible from the front-left side of the machine and stored in vertically

Tools can be easily changed during automatic operation in the same area for machining supervision, CNC panel and workpiece loading and unloading.

Smart tool: interface panel is used to select the tool. When finished, the system checks whether all tool holders are in the right position

Avoid human failures when automatically change tool to spindle, protecting spindle and reducing down-time



➤ Control unit

A controller for every user

Heidenhain TNC 640

- Kinematics
- Dynamic Collision Monitoring
- Tool Center Point Management
- Tilted the Working Plane

Siemens 840D sl

- Kinematic chain
- Collision Avoidance
- 5-axis transformation with tool orientation
- Swivel the Coordinate System

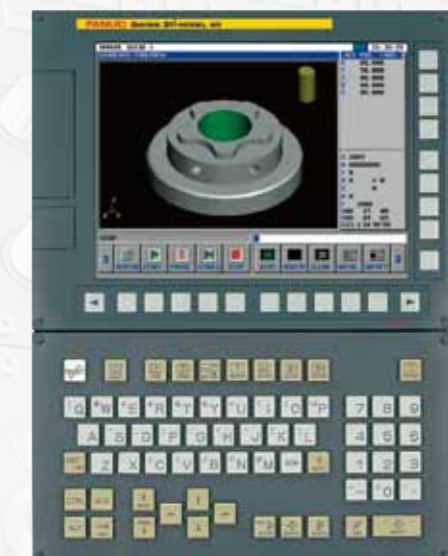
Fanuc 31iMB5

- 3D Interference Check
- High Speed Smooth TCP
- Tilted Working Plane indexing

Heidenhain TNC 640



Fanuc 31iMB5



Siemens 840D sl



Standard & optional equipment

Standard details of a premium machine



G6 standard

Optional design and organization of electrical connectors and cables

Easier maintenance

High-speed and twisting stress cycles



G6 APC

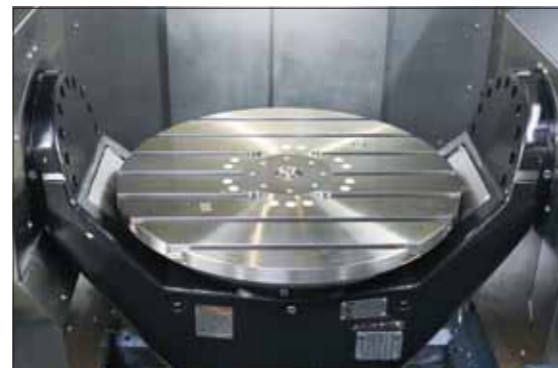
All necessary consumables are located together in the side of the machine

Easier maintenance routine for operator



Chain-type chip conveyor with chip bucket, oil skimmer and built-in 20 bar through spindle coolant pump are standard equipments.

They can be positioned either side of the machine for layout customization.



Integrated and ready-to-use 3 hydraulic and 1 pneumatic ports. Clamping and unclamping functions by softkeys in the control panel and/or by M-function.

Optional

- Integrated and ready-to-use 8x hydraulic (80 bar) or pneumatic (6 bar) ports
- 4x vacuum port

Simplifies 5X workpiece clamping.

Customize the machine to your needs



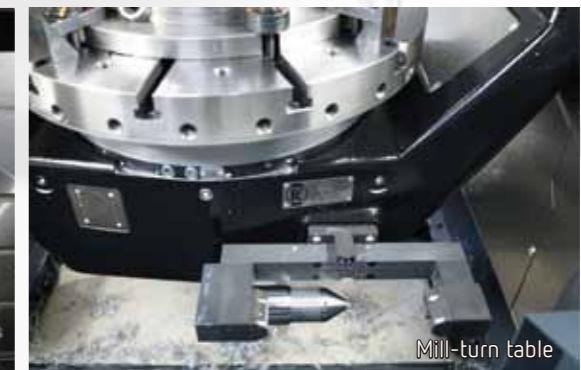
Automatic workpiece measurement (with probe, receiver and reference ball)

Automatic compensation of the linear-rotary axis relative positioning: Kinematics (Heidenhain), Kinematic chain (Siemens) and Tilted working plane indexing (Fanuc)

For accurate workpiece positioning or in-process measuring of some machining features.



Standard table



Mill-turn table

U-type embedded in the table (for highest accuracy). Laser tool measurement. This option is used for:

Turning tool are measured in an additional touch probe, in different angle positions

For accurate tool measurement in length, radius and shape

For in-process tool measurement at working conditions (spindle running at thermal stable conditions)



Separate type cooling unit including:

- > Cartridge filter
- > Paper filter
- > Through spindle 20 bar centrifugal pump or
- > Through spindle 70 bar screw type pump with stepless programmable pressure
- > Oil skimmer
- > Coolant chiller

Recommended for high aluminum or cast iron material cutting

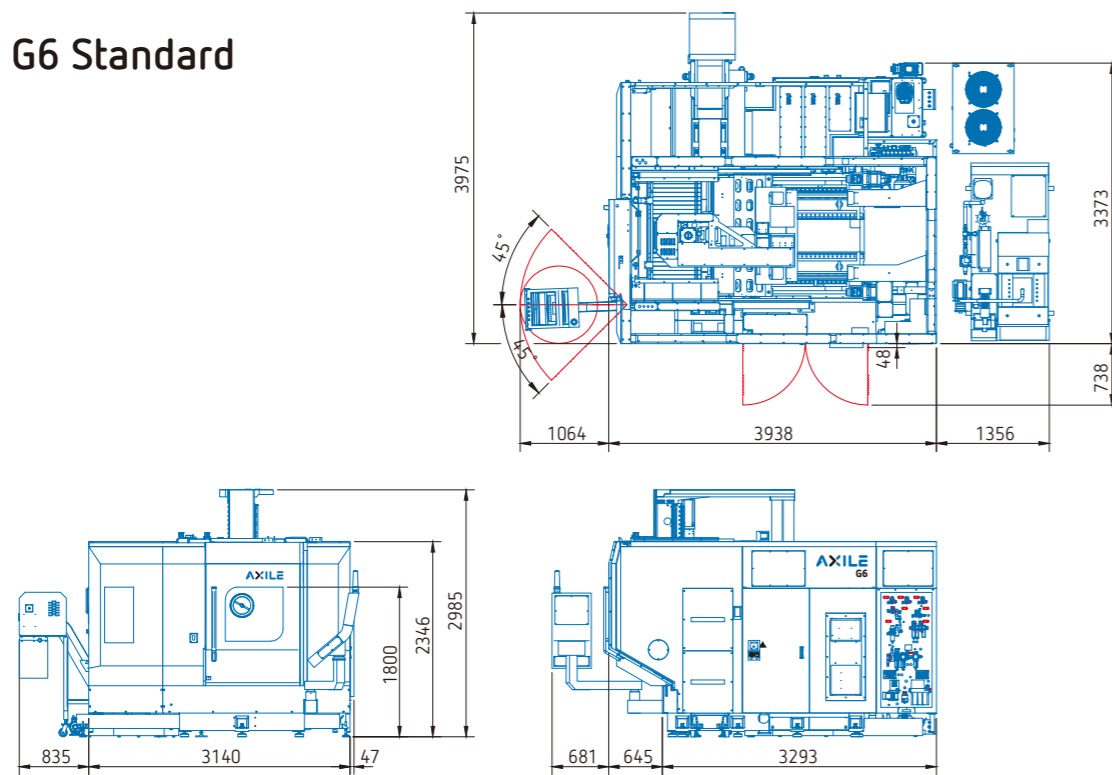


Spin window

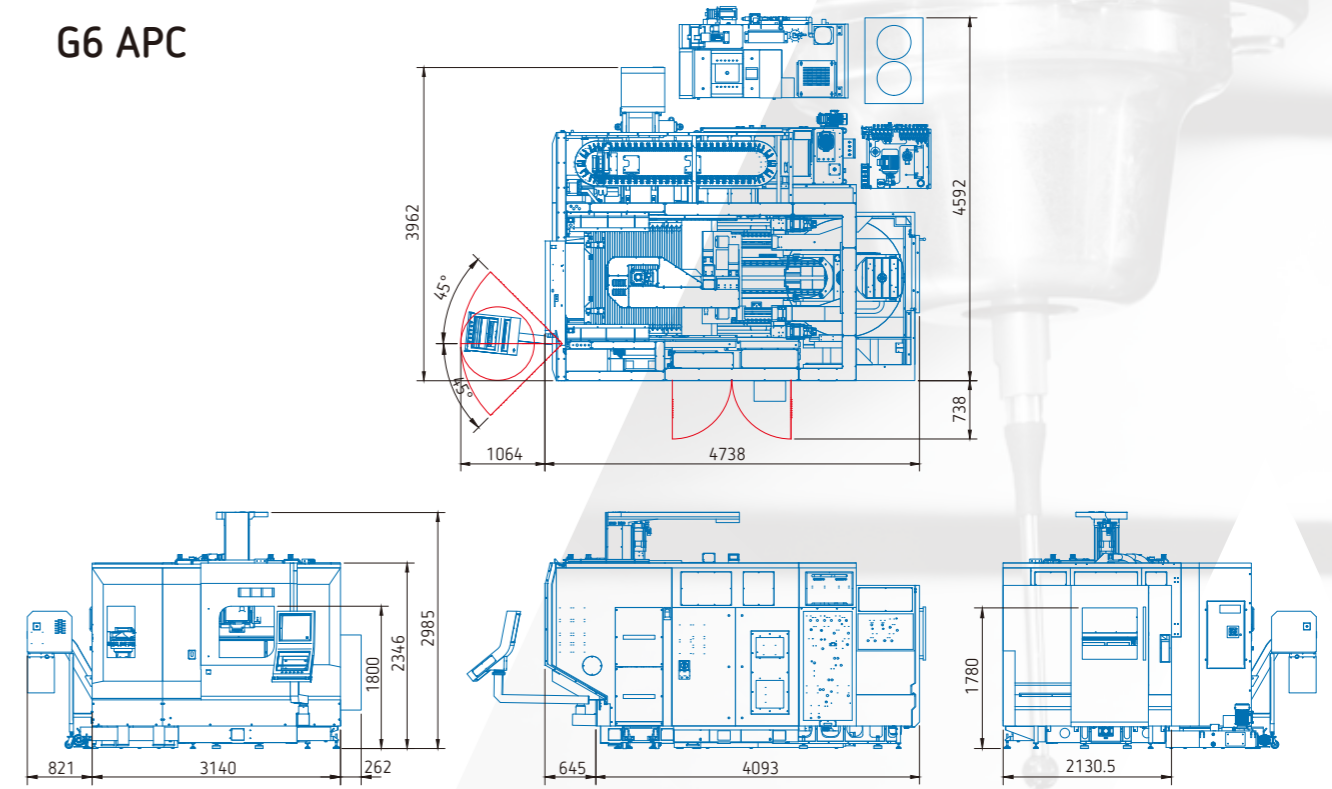
For easier view of working area when huge amount of coolant and chips are produced

Layout and workspace

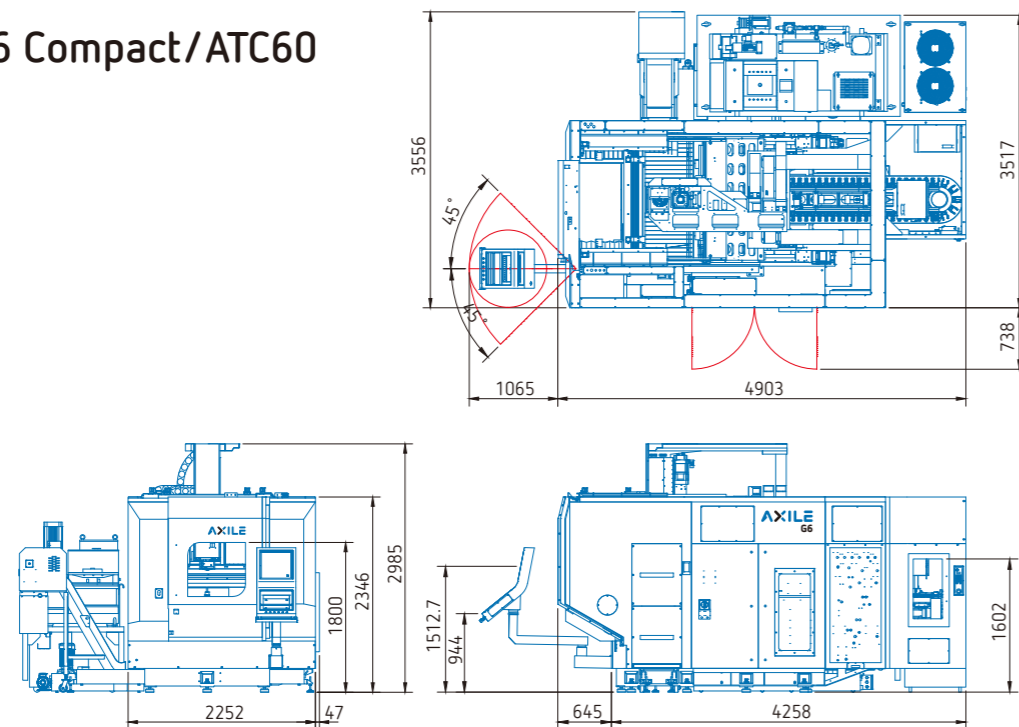
G6 Standard



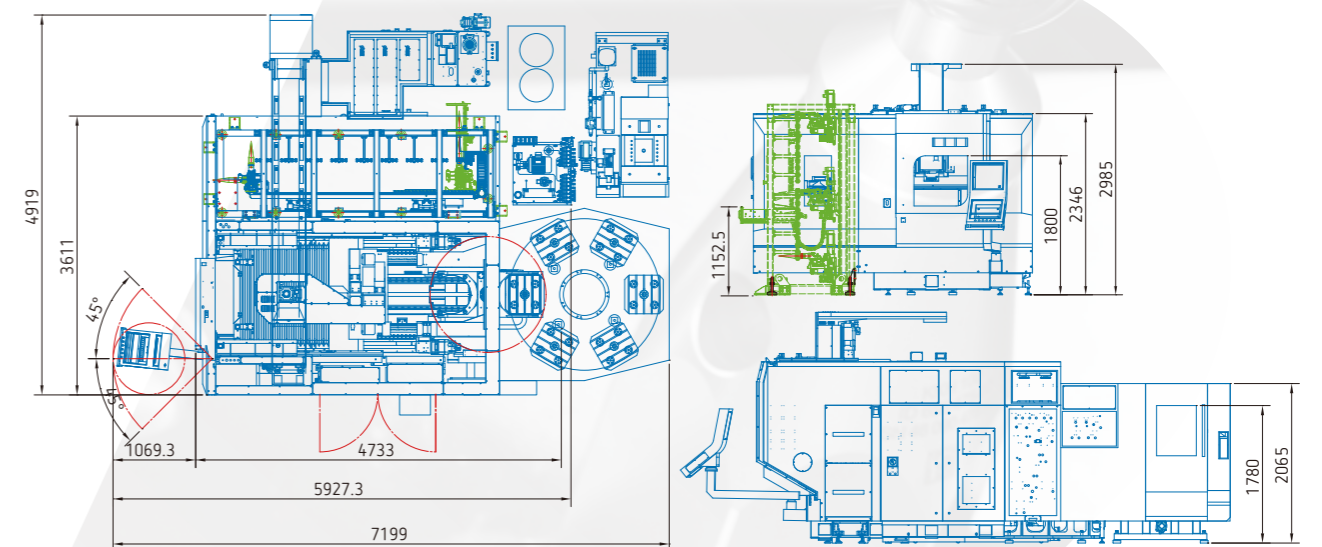
G6 APC



G6 Compact/ATC60

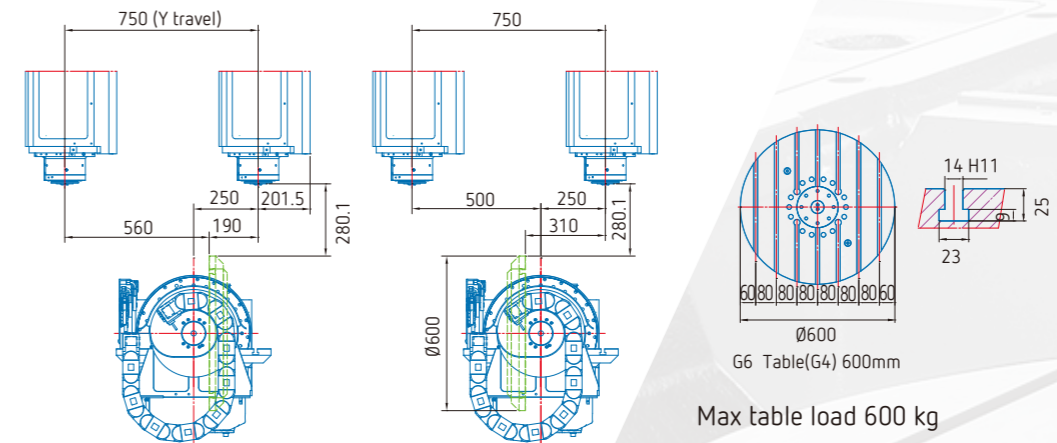
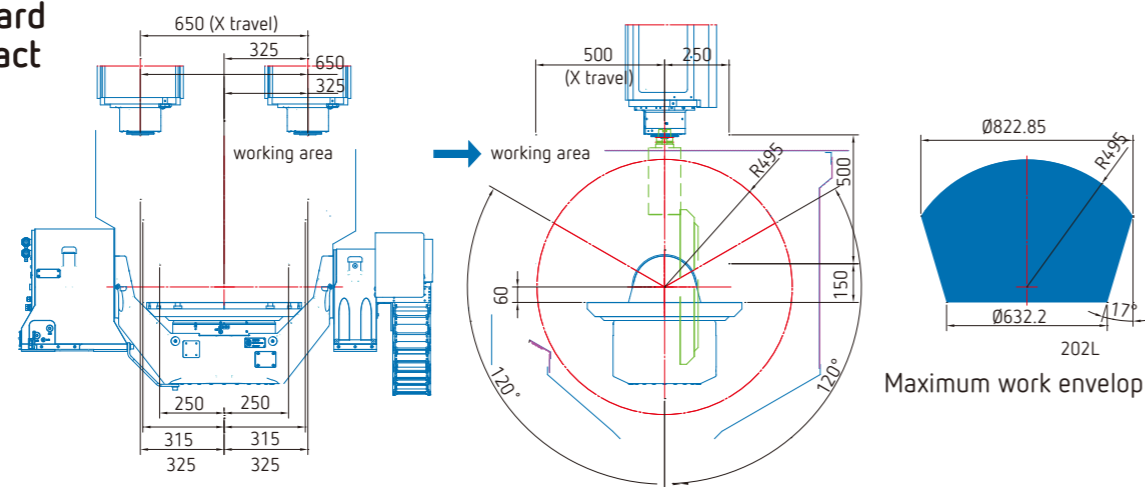


G6 APC6 with ATC320 (rack)

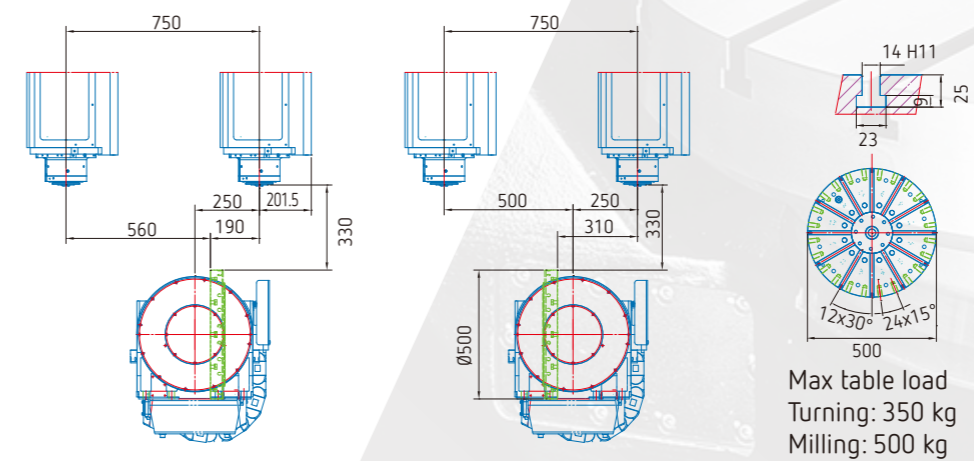
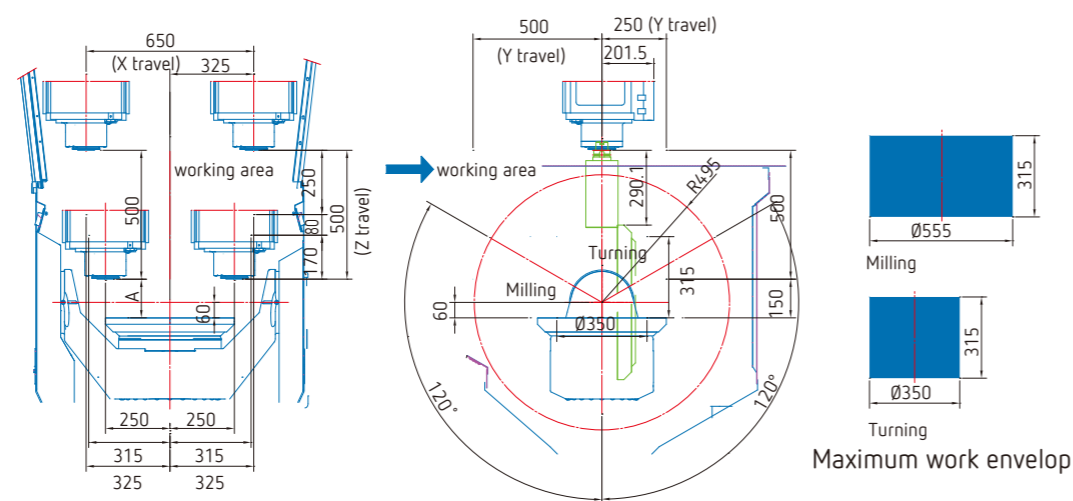


Interference

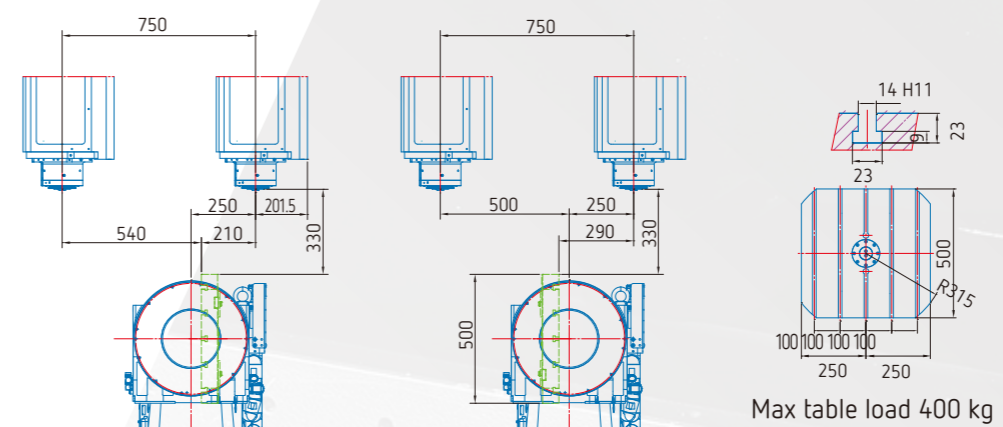
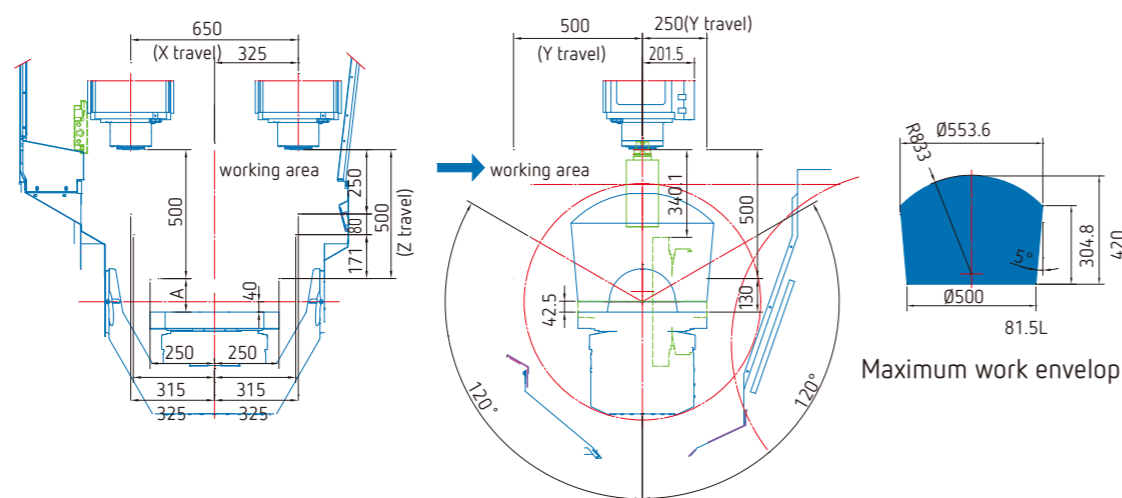
G6 Standard G6 Compact



G6 MT



G6 APC



> Technical data

Common data for G6

LINEAR AXES		
X travel (carriage left and right)	mm	650
Y travel (gantry back and forth)	mm	750
Z travel (headstock up and down)	mm	500
Max feedrate X/Y/Z	m/min	36/36/36
Guideways type		Roller
Guideways size X/Y/Z	mm	45/45/45
Distance between X/Y guides	mm	500/1110
Ballscrew diameter/pitch	mm	40/12
X axis motor power/torque	kW/Nm	5/17.7
Y axis motor power/torque (x2)	kW/Nm	5.7/21.6(x2)
Z axis motor power/torque	kW/Nm	6/26.1
ROTARY AXES		
A range (swivelling)	deg	+/-120
C (rotary)	deg	360
SPINDLE(std)		
Spindle speed	rpm	20000
Spindle taper		HSK-A63 (milling) HSK-T63 (turning)
Transmission	rpm	Built-in
Motor type		Asynchronous
Bearing typefront/rear		Angular ball
Bearing cooling and lubrication		Oil/Air
Power S1/S6-40%	kW	25/40
Torque S1/S6-40%	Nm	87/135
SPINDLE(opt)		
Spindle speed	rpm	15000
Spindle taper		HSK-A63 (milling) HSK-T63 (turning)
Transmission	rpm	Built-in
Motor type		Asynchronous
Bearing typefront/rear		Angular ball
Bearing cooling and lubrication		Oil/Air
Power S1/S6-40%	kW	30/46
Torque S1/S6-40%	Nm	130/200
ACCURACY (VDI/DGQ 3441)		
Positioning	mm	0.005
Repeatability	mm	±0.0025
EXTERNAL COOLANT SUPPLY		
External nozzels coolant supply (number) pressure	bar	(4x)3
External nozzels air supply (number) pressure	bar	(2x)6
Tank capacity	l	1500
SPINDLE THROUGH COOLANT SUPPLY (STANDARD)		
High pressure pump	bar	20
Filter type		Cartridge
SPINDLE THROUGH COOLANT SUPPLY WITH SEPARATE TANK(OPTIONAL)		
High pressure pump	bar	70
High pressure pump with stepless programable pressure	bar	0-70 stepless
Filter type		Cartridge and paper band
Additional		Coolant chiller and oil skimmer
CONTROL UNIT		
Heidenhain		TNC 640
Siemens		840D sl
Fanuc		31iMB5

Specific data for G6 Standard / G6 Compact

WORKPIECE AND TABLE		
Table size (diameter)	mm	600
Maxium table load	kg	600
T-slot (w/pitch/no)	mm	14x80x7
Number and hydraulic ports		3
Working pressure of hydraulic ports	bar	80
Number and pneumatic ports		1
Working pressure of pneumatic ports	bar	6
SPINDLE		
Spindle taper		ISO40/HSK-A63
Spindle nose to rotary table clamping surface		150-650
ROTARY AXES		
Maximum swivelling (A) speed	rpm	80
Maximum rotary (C) speed	rpm	200
Driving system in swivelling (A) axis		Torque motor
Driving system in rotary (C) axis		Torque motor
Power & torque of swivelling (A) axis	kW/Nm	9.8/1040
Power & torque of rotary (C) axis	kW/Nm	8.4/401
Brake type of swivelling (A) axis		Hydraulic clamping
Braking torque of swivelling (A) axis	Nm	3200
Brake type of rotary (C) axis		Hydraulic clamping
Braking torque of rotary (C) axis	Nm	2000
TOOL CHANGER		
Change type		Arm
Magazine type		DVCA402
Carousel driving system		Servomotor
Magazine positions		STD: 60(std), 120(60x2)(opt) Compact: 48(opt), 60(std)
Tool shank type		HSK-A63
Maximum tool length	mm	300
Maximum tool diameter / tool diameter with adjacent pot empty	mm	Ø75/Ø125
Maximum tool weight	kg	8
Max. loading weight	kg	480/768/960
MEASURING FEEDBACK		
Linear axes type		Linear scale
Linear axes resolution	µm	0.1
Rotary axes type		Rotary scale
Rotary axes accuracy		±5"
SUPPLIES		
Installed power	kVA	60
DIMENSION		
Length (w & w/o conveyor)		STD : 3150/3990 COMPACT : 2250/3560
Width	mm	STD : 3940 COMPACT (48T/60T) : 4600/4900
Height	mm	2970
Weight	kg	12000
Floor Space	mm	3150x3940



Technical data

Specific data for G6 APC

WORKPIECE AND TABLE		
Table size (diameter)	mm	500x500
Maxium table load	kg	400
T-slot (w/pitch/no)	mm	14x100x5
Threaded hole	mm	M12x100
Number and hydraulic ports		3
Working pressure of hydraulic ports	bar	80
Number and pneumatic ports		1
Working pressure of pneumatic ports	bar	6
SPINDLE		
Spindle taper		ISO40/HSK-A63
Spindle nose to rotary table clamping surface		130-630
ROTARY AXES		
Maximum swivelling (A) speed	rpm	100
Maximum rotary (C) speed	rpm	200
Driving system in swivelling (A) axis		Dual torque motor
Driving system in rotary (C) axis		Torque motor
Power & torque of swivelling (A) axis	kW/Nm	9.8/1040 (per torque motor)
Power & torque of rotary (C) axis	kW/Nm	8.4/401
Brake type of swivelling (A) axis		Hydraulic clamping
Braking torque of swivelling (A) axis	Nm	3200
Brake type of rotary (C) axis		Hydraulic clamping
Braking torque of rotary (C) axis	Nm	2000
TOOL CHANGER		
Change type		Arm
Magazine type		DVCA402
Carousel driving system		Servomotor
Magazine positions		60(std), 120(60x2)(opt)
Tool shank type		HSK-A63
Maximum tool length	mm	300
Maximum tool diameter / tool diameter with adjacent pot empty	mm	Ø75/Ø125
Maximum tool weight	kg	8
Max. loading weight	kg	480/960
MEASURING FEEDBACK		
Linear axes type		Linear scale
Linear axes resolution	µm	0.1
Rotary axes type		Rotary scale
Rotary axes accuracy		±5"
APC system		
APC type		ACW500
APC quantity		one to one
Exchange time	sec	<60
SUPPLIES		
Installed power	kVA	60
DIMENSION		
Length (w & w/o conveyor)	mm	3150/3990
Width	mm	4750
Height	mm	2970
Weight	kg	16000
Floor Space	mm	3150x4750

Specific data for G6 MT

WORKPIECE AND TABLE		
Table size (diameter)	mm	Ø500
Maxium table load	kg	350(Turning) 500(Milling)
T-slot (w/pitch/no)	mm	14x30x12
SPINDLE		
Spindle taper		ISO40/HSK-T63
Spindle nose to rotary table clamping surface		150-650
ROTARY AXES		
Maximum swivelling (A) speed	rpm	15(Turning) 100(Milling)
Maximum rotary (C) speed	rpm	1000(Turning) 100(Milling)
Driving system in swivelling (A) axis		Torque motor
Driving system in rotary (C) axis		Torque motor
Power & torque of swivelling (A) axis	kW/Nm	9.8/1040
Power & torque of rotary (C) axis	kW/Nm	38/450
Brake type of swivelling (A) axis		Hydraulic clamping
Braking torque of swivelling (A) axis	Nm	3200
Brake type of rotary (C) axis		Hydraulic clamping
Braking torque of rotary (C) axis	Nm	2000
TOOL CHANGER		
Change type		Arm
Magazine type		DVCA402
Carousel driving system		Servomotor
Magazine positions		60(std), 120(60x2)(opt)
Tool shank type		HSK-T63
Maximum tool length	mm	300
Maximum tool diameter / tool diameter with adjacent pot empty	mm	Ø75/Ø125
Maximum tool weight	kg	8
Max. loading weight	kg	480/960
MEASURING FEEDBACK		
Linear axes type		Linear scale
Linear axes resolution	µm	0.1
Rotary axes type		Rotary scale
Rotary axes accuracy		±5"
SUPPLIES		
Installed power	kVA	60
DIMENSION		
Length (w & w/o conveyor)	mm	3150/3990
Width	mm	3940
Height	mm	2970
Weight	kg	12000
Floor Space	mm	3560x4900