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# AXILE U6

Gantry type  
5-Axis Vertical  
Machining Center




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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 **smart** in other words.

## 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.



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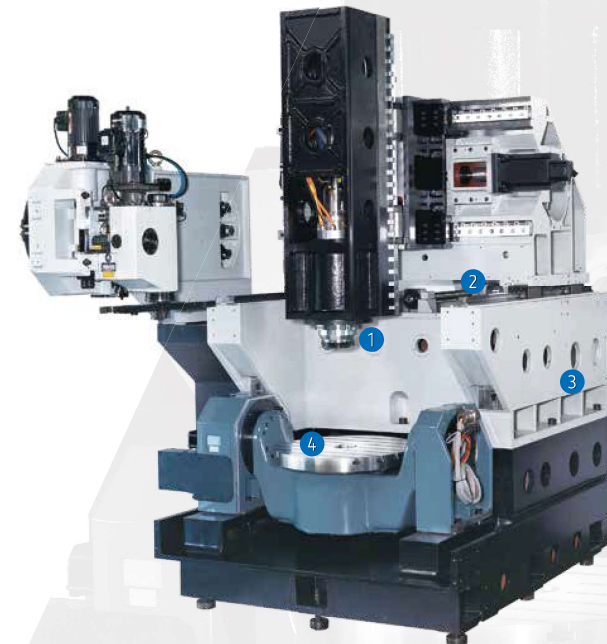
## Design concept

### U6 brings High-precision and High-speed 5-Axis Machining

AXILE U6 is designed for complex and multi surface contour machining. The series has working capacity ideal for medium-size workpiece and offers superior performance in all aspects of milling - consistency, accuracy, and power, therefore serving as a critical asset to all industries. The upgraded gantry type design presents compact structure with maximum working area reserved.



**Gantry:**  
best accuracy and rigidity  
for 5X machines,  
allowing high-speed cutting  
process in complex parts  
with various materials.



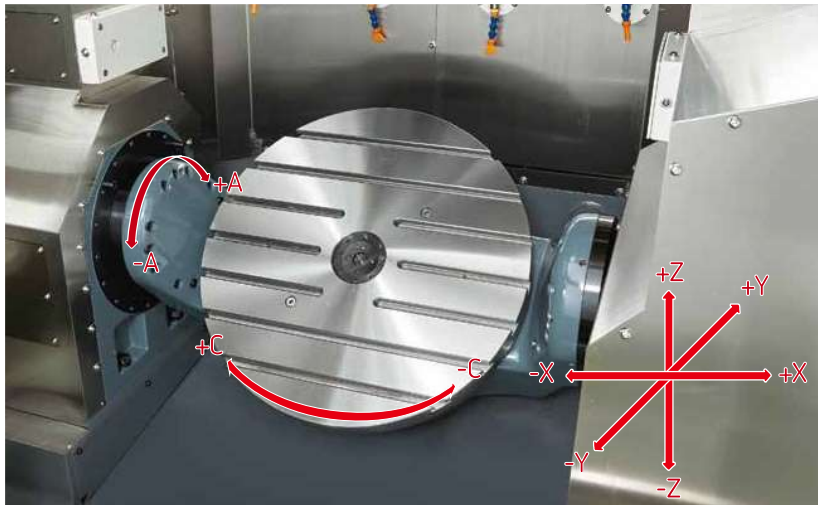
1  
Spindle moves in linear axis XYZ, ensuring better machining rigidity

2  
Gantry moves fully supported in all Y-axis travel, for the best accuracy

3  
All body made of high-quality Meehanite casting, providing optimal damping of machining vibrations and homogeneous thermal behavior

4  
Excellent accessibility to working area

# Table



C-axis with torque motor ensures maximum speed and lifetime accuracy

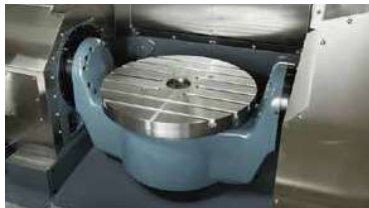
A-axis with worm gear for high-torque in tilting operations

High-repeatability in 4+1x operation

Allow best accuracy with maximum table load

Endure excellent rigidity for roughing operations

## Table option



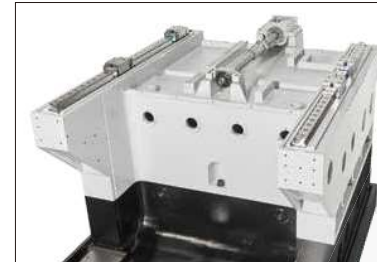
Ø600 mm



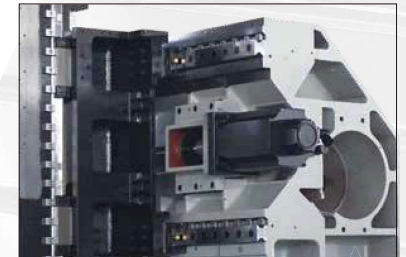
Ø500 x 420 mm

# Accuracy

## Driving system



Direct driven servomotors (no belts/gears) endure best dynamic and minimal elasticity in the driving system



Roller type, high rigidity, linear guideways for the best high-feed movement and vibration damping

Pre-loaded double-nut ballscrews minimize backlash and allow high-feed movements (36 m/min)

## Linear axes

0.1µm resolution absolute linear scales in XYZ axes to compensate the ballscrew thermal growth and ensure the best 3X accuracy



## Thermal stability

The heat generated by the spindle motor, the spindle cartridge, and the C-axis torque motor is dissipated by a main cooler

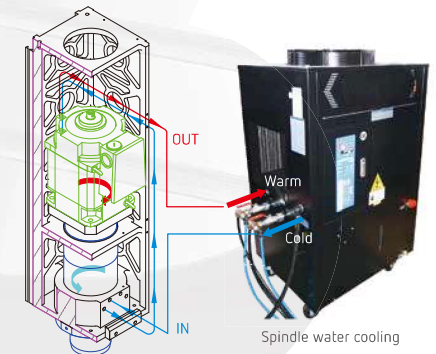
## Rotary axes

±5" accuracy absolute rotary scale feedback for the best rotary axes accuracy



## Linear-rotary axes relative positioning

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

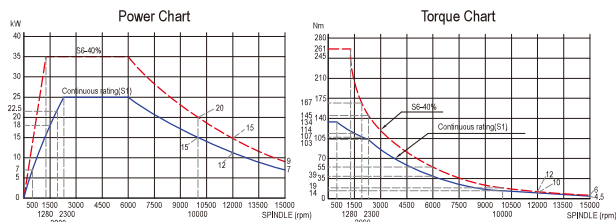


Thermal reduction Design

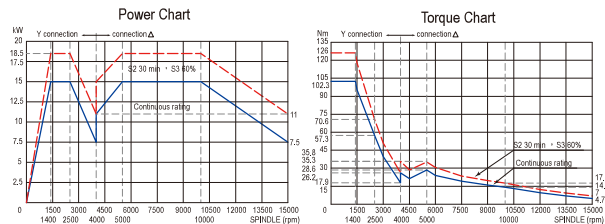
## Spindle

### High-torque in-line spindle (#40)

- HEIDENHAIN  
or SIEMENS control
- > Double winding motor
  - > Water-cooled
  - > 15.000 rpm max speed
  - > 261 Nm at S6(40%)
  - > 35 kW at 1280 rpm

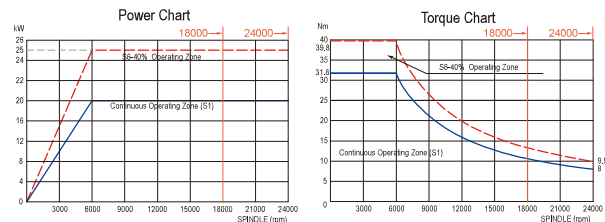


- FANUC control
- > Double winding motor
  - > Air-cooled
  - > 15.000 rpm max speed
  - > 126 Nm at S3 (60%)
  - > 18.5 kW at 1400 rpm



### High-speed built-in spindle (HSK-A63)

- 18000 rpm  
24000 rpm
- > Single winding motor
  - > Water-cooled
  - > 40 Nm at S6(40%)
  - > 25 kW at 6000 rpm



## Chip management

### Standard equipment

- > Chain-type chip conveyor with chip bucket.
- > Oil skimmer.
- > Built-in 20 bar through spindle coolant pump.

Coolant shower, coolant & air spindle nozzle are built for a better chip management



## Tool management

### Tool accessibility



Tools are accessible from the left side of the machine if 48 or 60 tool magazine is chosen



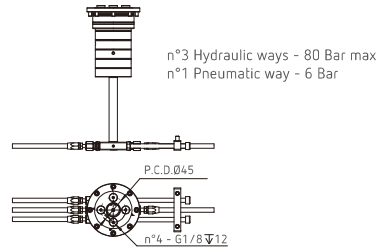
Tools can be easily changed during automatic operation, to avoid idle times between up cutting time

# ➤ Premium equipment

## Standard

Integrated preparation for 3xhydraulic (80bar) and 1xpneumatic (6 bar) ports. Clamping and unclamping functions by softkeys in the control panel and/or by M-function.

Simplifies 5X workpiece clamping.

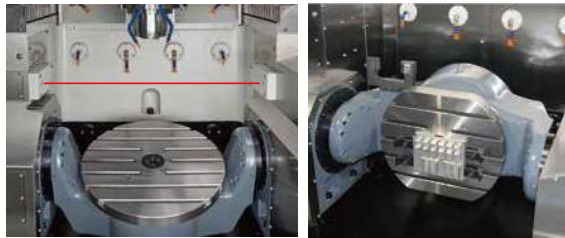


## Optional equipment

Separate type cooling unit including:

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

Recommended for high aluminum or cast iron material cutting



Separate type laser tool setter

Table-mounted laser tool setter

Laser tool measurement installed for highest accuracy.

- > Non-contact laser tool setter with separated transmission and receiver units
- > Table-mounted laser tool setter

Accurate tool measurement in length, radius and shape

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

Mechanical tool setter removable. Used for:

- > Accurate tool measurement in length, radius and shape
- > The tool setter is placed when tool setting and removed to avoid interferences during machining



# ➤ Ergonomy & Maintenance

## Overhead roof type

Easy loading and unloading of heavy and bulky workpieces by over-head crane



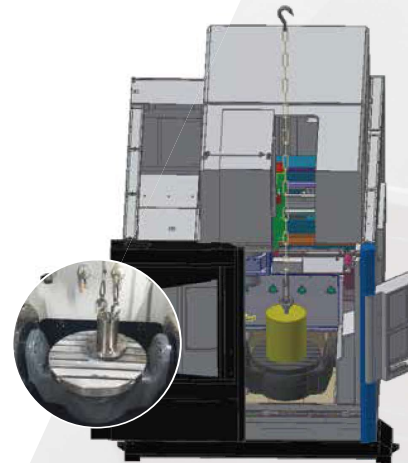
## Automatic roof type

Convenient to open ceiling working area automatically



## Large front door opening

Comfortable access to work area for workpiece preparation and supervision



All consumables are located in the same area for easier maintenance activities. Electrical cabinet comes std with air conditioning system.



## Controller versions & Panel

### 5X



#### Heidenhain TNC 640

- Controller with Standard:
- > Kinematics Opt
  - > Tool center point management
  - > Tilted working plane
  - > Dynamic Collision Monitoring: DCM

Perfect for 5X operation



#### Siemens 840D sl Controller

- with Standard:
- > Kinematics chain
  - > 5X transformation with tool orientation
  - > Swivel the coordinate system
  - > Collision avoidance

Perfect for 5X operation

### 4+1 or 3+2 X



#### Siemens 828D Controller

- with Standard:
- > Kinematics chain
  - > 5X transformation with tool orientation
  - > Swivel the coordinate system

Cost-effective for 4+1X operation



#### Fanuc OiM Controller

- with Standard:
- > Manual Guide i
  - > Tilted working plane indexing

Cost-effective for 4+1X operation

## Flexible controller selection



Pending panel Best economy for long-lasting CNC operations at the machine



Swivelling panel Best for space requirement

## Dimensions & Interference

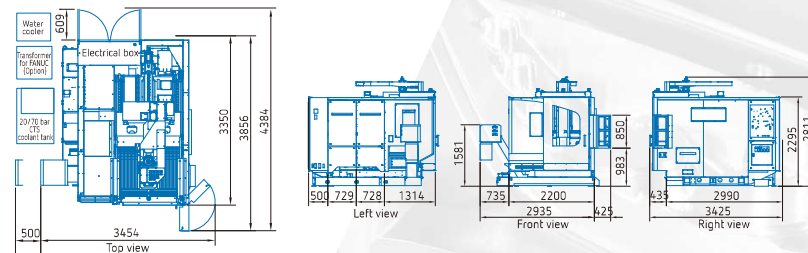
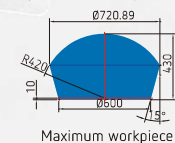


Table Ø600mm / Table Ø500x420mm



Maximum workpiece

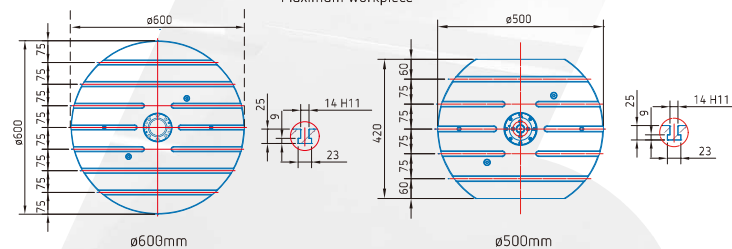
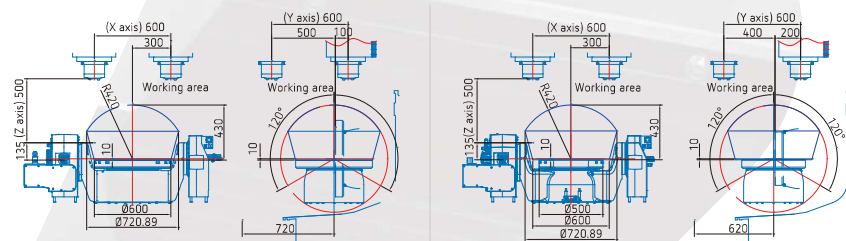


Table Ø600mm

Table Ø500x420mm



# > Technical data

## HIGH DYNAMIC TABLE

Rotary table top diameter	mm	Ø600	Ø500 x 420
Tilting axis A	degree	±120	
Rotary axis C	degree	360	
T-slots ( number x width x pitch )	mm	7 x 14 x 75	5 x 14 x 75
Max. table load	kg	600	

## LINEAR TRAVEL

X axis	mm	600
Y axis	mm	600
Z axis	mm	500

## IN-LINE SPINDLE

Spindle taper		ISO40
Spindle speed	rpm	15000
Motor output	kW	25/35
Motor torque	Nm	134/261
Spindle nose to rotary table clamping surface	mm	135 ~ 635

## BUILT-IN SPINDLE

Spindle taper		HSK-A63
Spindle speed	rpm	18000 (std.) / 24000 (opt.)
Motor output	kW	20/25
Motor torque	Nm	32/40
Spindle nose to rotary table	mm	175 ~ 675

## TOOL MAGAZINE

ATC type		Carousel type	Chain type
Magazine capacity		24 (std.)	32/48/60 (opt.)
Tool shank		HSK A63 / BT / DIN / CAT40	
Max. tool length	mm	300	
Max. tool diameter	mm	78	
Max. tool diameter with adjacent station empty	mm	120	
Max. tool weight	kg	7	
Max. loading weight	kg	120	160/240/300
Tool changing time(T-T)	sec	1.51 (50 Hz)	1.94 (50 Hz)
		1.25 (60 Hz)	1.64 (60 Hz)

## FEED RATE

X/Y/Z axes rapid feed	m/min	36/36/36
A axis max. speed	rpm	16.6
C axis max. speed	rpm	90

## ACCURACY

Positioning accuracy	mm	0.005
Repeatability	mm	±0.0025

## MACHINE DATA

Length	mm	3015
Width	mm	5050
Height	mm	3000
Floor space	mm	4000 x 4500
Weight	kg	9000

\*Specification are subject to change without notice.

Description	U6 4+1	U6
Linear scales in X,Y and Z axis	○	●
Rotary scales in A and C axis	○	●
DCM: Dynamic Collision Monitoring	NA	●
Kinematics	○	○
Preparation for 3xHydraulic + 1xPneumatic port	●	●
20 bar coolant through spindle	●	●
Chip conveyor and oil skimmer	●	●
Separate type tank with paper filter	○	○
Oil Mist Collector	○	○
Overhead roof	○	○
Automatic roof	NA	○
Laser tool measurement integrated in table	○	○
Mechanical detachable tool setter	○	NA
20/70 bar CTS with separate tank and paper filter	○	○
TSC: Thermal Spindle Compensation	●	●

● Standard accessories

○ Optional accessories

NA: No available