



**WITH YOU  
SUCCESS TOGETHER**



# TC-20α *SERIES*

Drilling & Tapping Center



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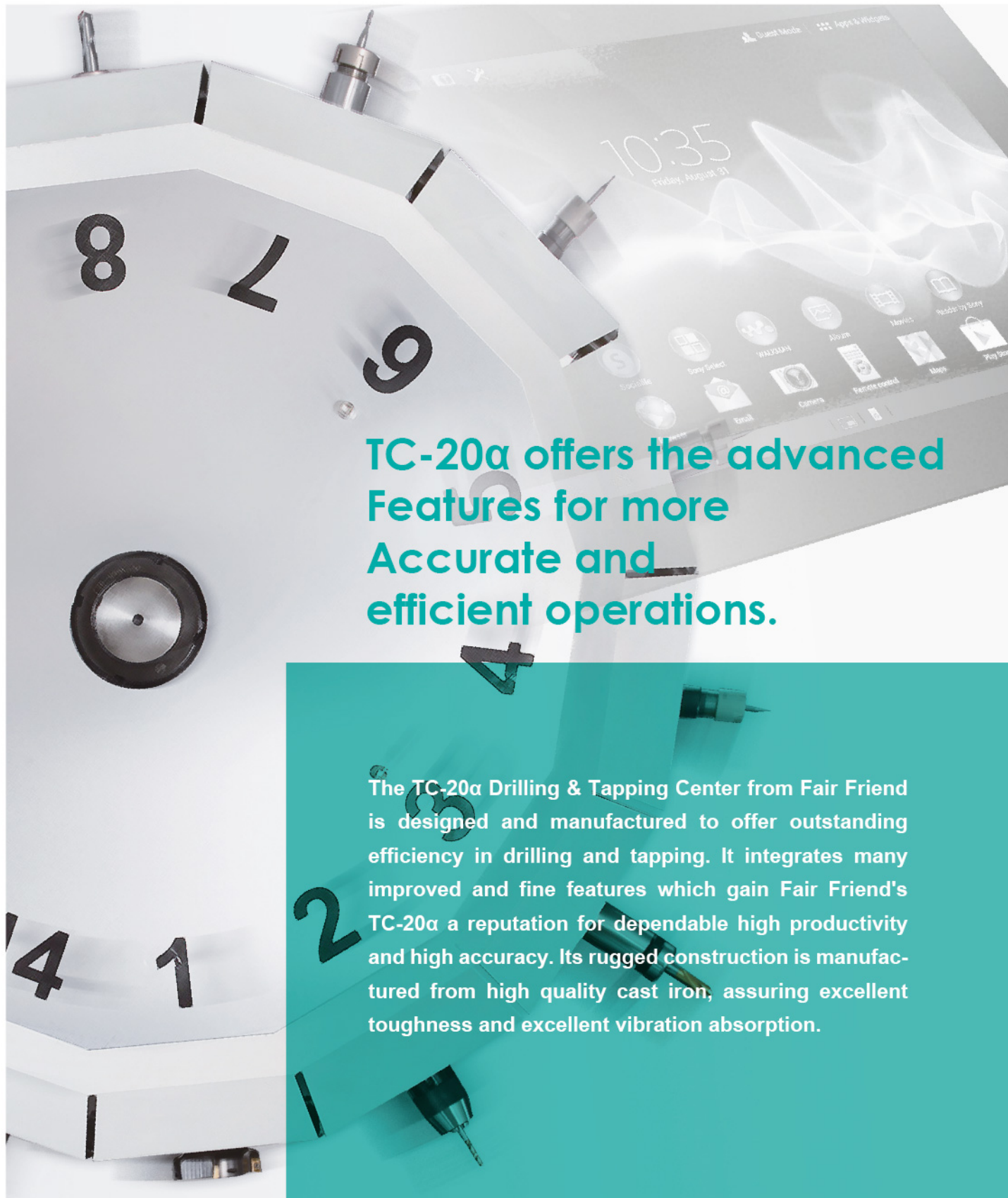


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**TC-20α offers the advanced Features for more Accurate and efficient operations.**

The TC-20α Drilling & Tapping Center from Fair Friend is designed and manufactured to offer outstanding efficiency in drilling and tapping. It integrates many improved and fine features which gain Fair Friend's TC-20α a reputation for dependable high productivity and high accuracy. Its rugged construction is manufactured from high quality cast iron, assuring excellent toughness and excellent vibration absorption.



### TC-20α

- This model is designed for light and tiny workpiece as well as for machining of diverse patterns with less quantity.
- Delicately, rigidly designed structure provide excellent accuracy at high speed running.
- Linear guides on 3 axes.
- 12,000/15,000 RPM provides additional efficiency in drilling operations.
- A choice of 14-tool turret-type ATC or 20-tool arm-type ATC to meet your machining requirements.



## Reinforced A-shape column bottom is combined with massive base for extra rigid support.

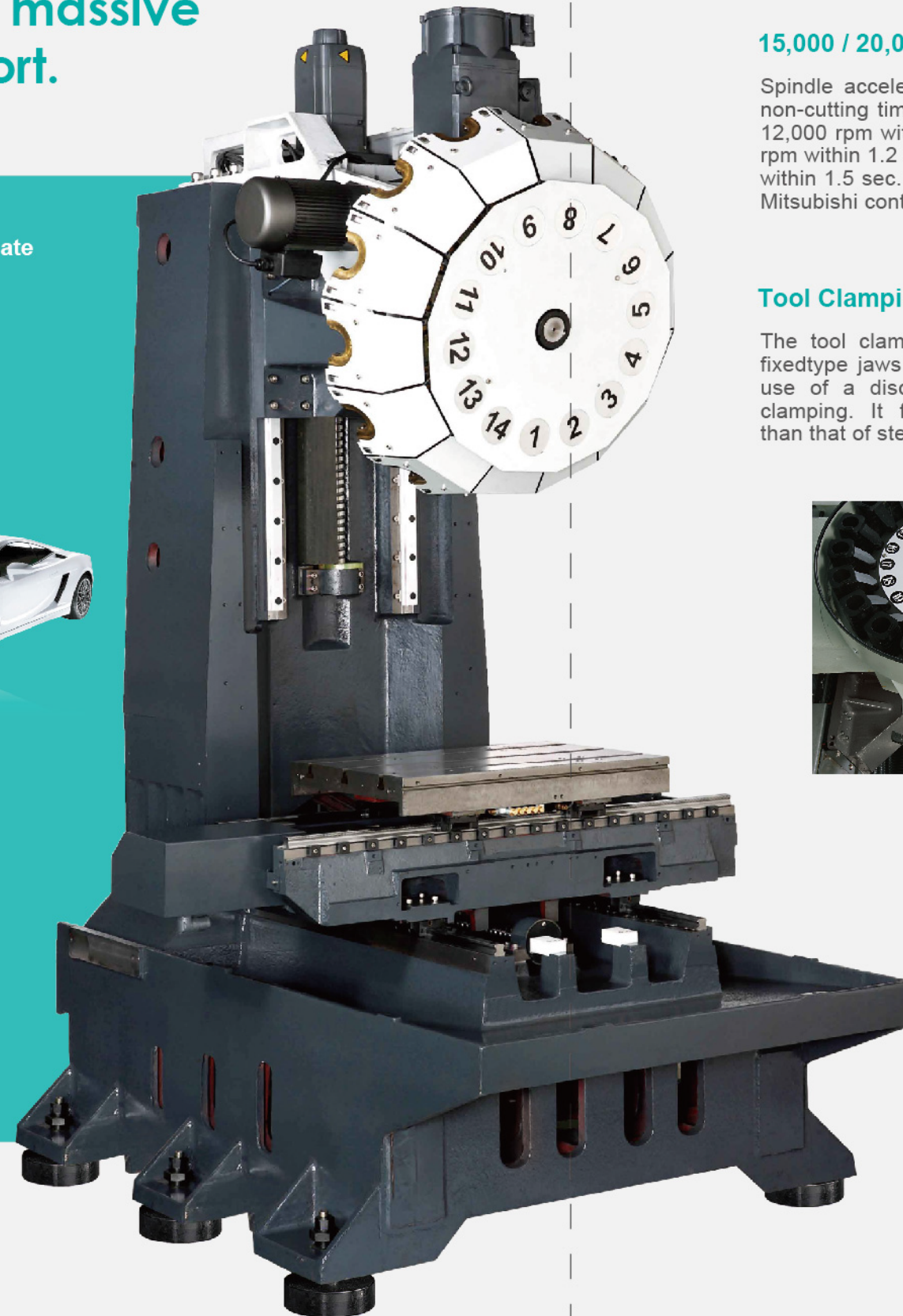
Optimized design on foot span and structure. Adequate stability and rigidity are realized with economically designed structure

### Applications

- 3C Products
- Automotive Motorcycle Parts
- Mold Making
- Semiconductor

- TC20α is also suit for small part workpiece

Information	Clock
Machine	TC-20α
Material	AL6061
Condition	S11000 F1600
Size (L*W*D)	80*75*30 mm



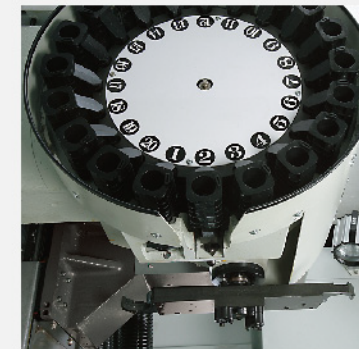
## Exceptional Spindle / Magazine

### 15,000 / 20,000 rpm Spindle (Optional)

Spindle acceleration dramatically reduces non-cutting time with the TC-20α reaching 12,000 rpm within 1 sec., reaching 15,000 rpm within 1.2 sec. and reaching 20,000 rpm within 1.5 sec. (20,000rpm spindle only for Mitsubishi control)

### Tool Clamping Mechanism

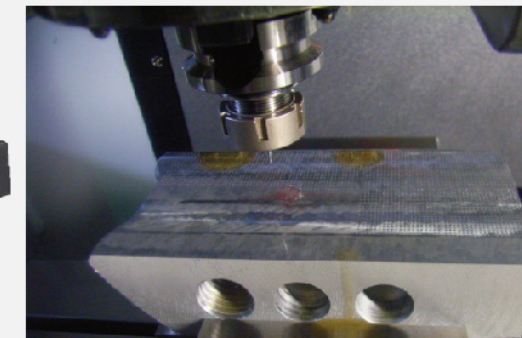
The tool clamping mechanism employs fixedtype jaws and is combined with the use of a disc spring for efficient tool clamping. It features higher efficiency than that of steel ball configurations.



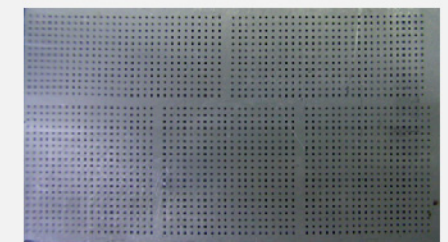
### Arm-Type ACT

- The arm-type magazine provides a loading capacity of 20 tools. Fast tool changing time is in only 1.7 second with tool clamping mechanism.
- The tool magazine accommodates 7/24 taper tool shank and features random bidirectional tool selection.

### Actual Test-Tiny Hole Drilling (ADC)



- The TC-20α features excellent rigidity and minimum vibration.

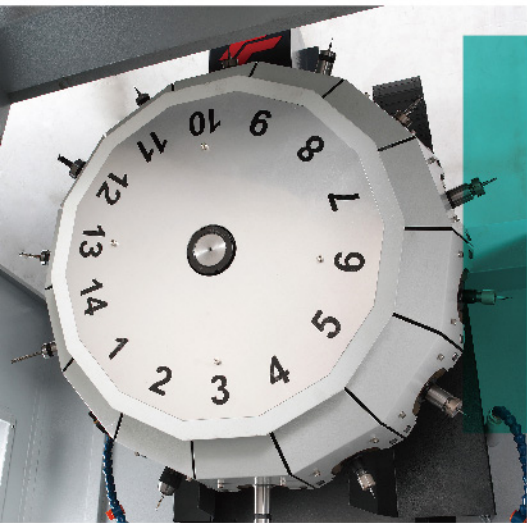


Test drilling of tiny hole of 0.75x5mm, up to 4,700 holes.

Material	Tool type	Spindle speed	Feed rate	Cutting depth	Number of holes
ADC	Ø0.75	16000rpm	640mm/min	5 mm	7777



## Machine Features



### Turret-type ATC

- Magazine for 14 tools.
- Tools of 7/24 taper are applicable; both clockwise and counter-clockwise rotation available for high efficiency tool selection.



### Dual Flushing

- High volume flushing for longer tool lifetime.
- Flushing nozzles set at side for least interference with the 4th axis.



### Self-lube System

Automatic lubrication for extended machine lifetime.



### Pneumatic System

The pneumatic system is set externally for easy check and maintenance.



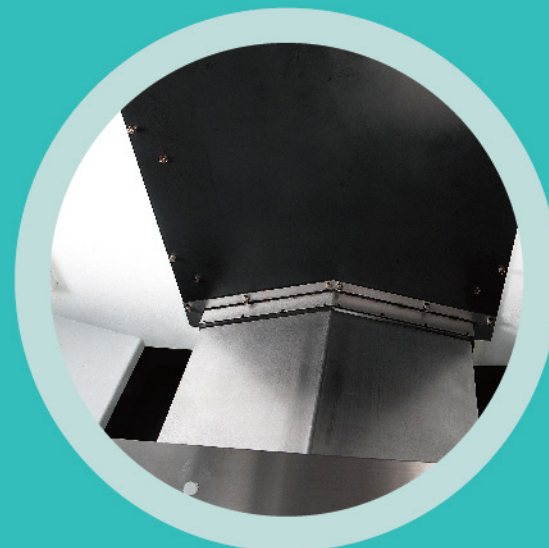
### Dust-Proof Electrical Cabinet

Rubber seals are mounted at the EC cabinet door for enclosure.



### Large Cooler Tank

The cooler tank capacity is 200L.



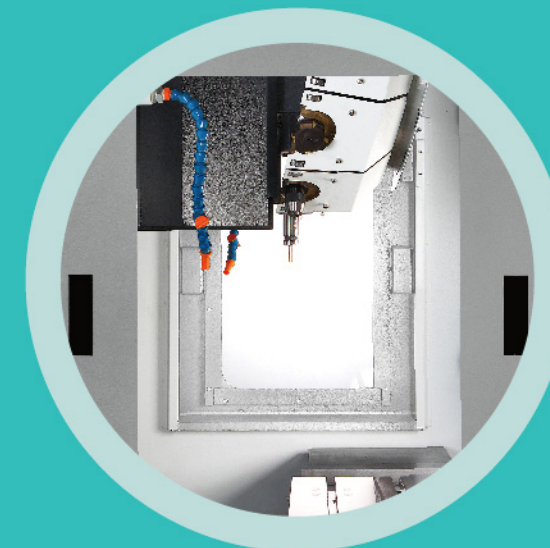
### Effective Protection

Single-piece axial cover on Z/Y axes feedrate and lifetime.



### Enhanced Coolant and Chip Discharge

2 titling discharge channels along with large cooler tank speeds up exhaust of coolant and chips.



### Enlarged Window

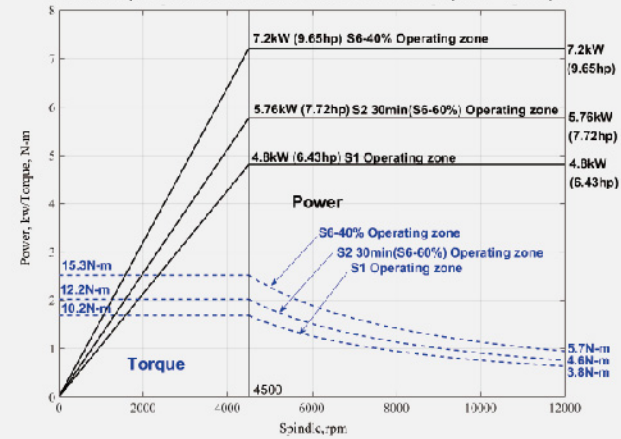
Easier maintenance on X axial servomotor, guideways and ball screw.



## DIRECT DRIVE SPINDLE - SPINDLE TORQUE DIAGRAM

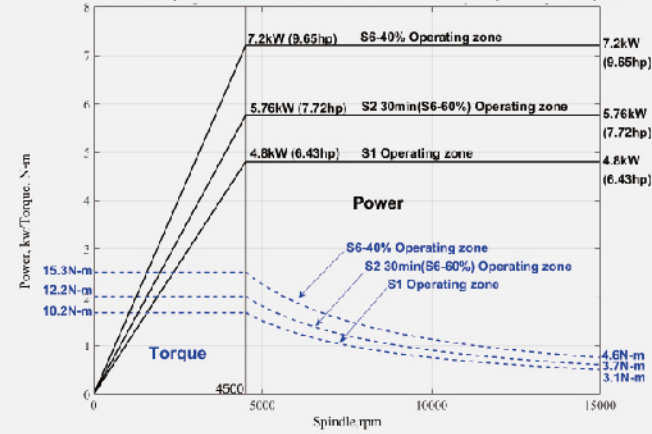
## ◆ Spindle Motor (D.D.S 12,000 rpm)

Power/Torque characteristic of SIEMENS 1PH8083 for spindle 12000rpm-

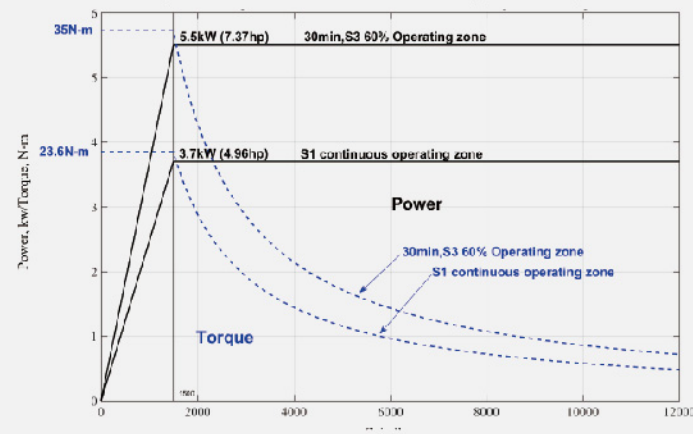


## ◆ Spindle Motor (D.D.S 15,000 rpm)

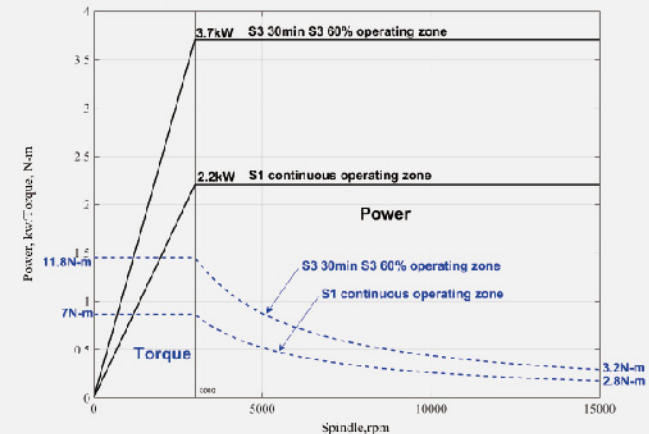
Power/Torque characteristic of SIEMENS 1PH8083 for spindle 15000rpm-



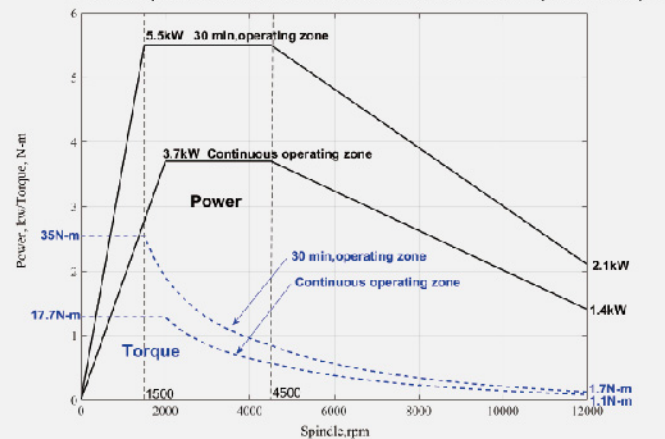
Power/Torque characteristic of FANUC A3/12000i for spindle 12000rpm-



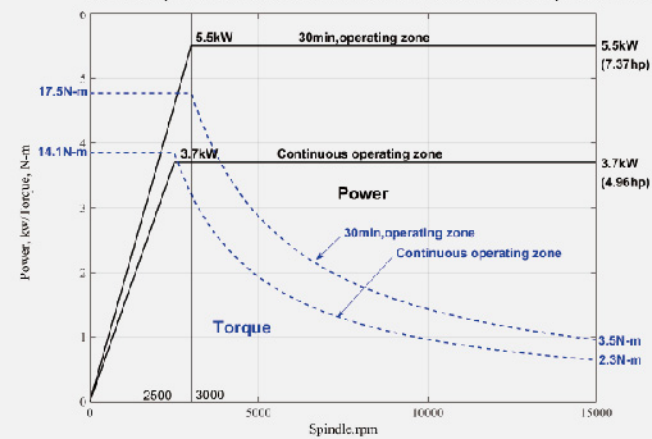
Power/Torque characteristic of FANUC a2/15000i for spindle 15000rpm-a2/15000i



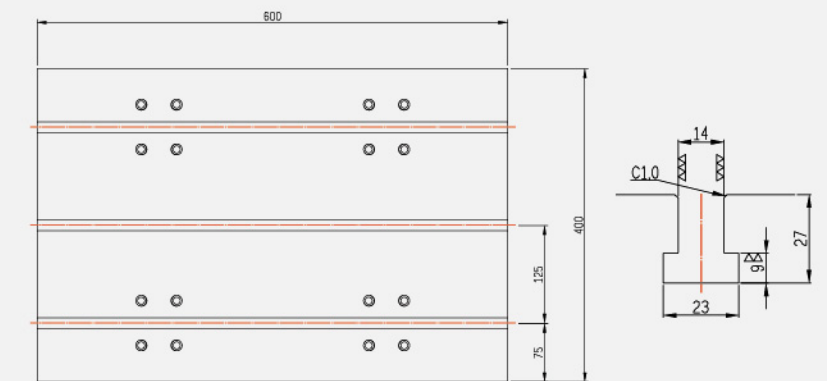
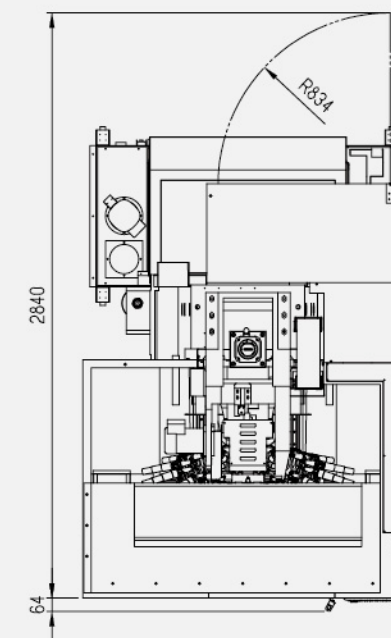
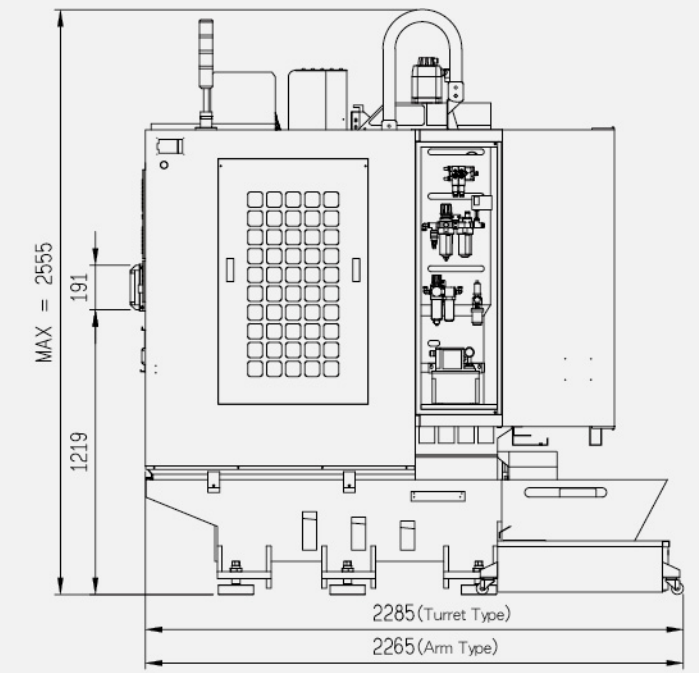
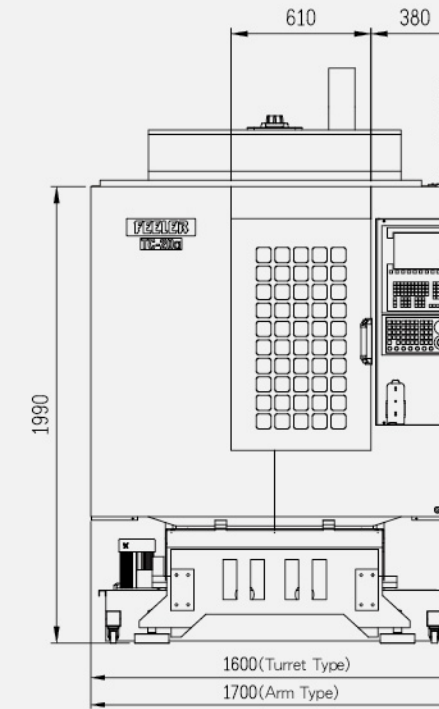
Power/Torque characteristic of MITSUBISHI SJ-DJ5.5/12000 for spindle 12000rpm-



Power/Torque characteristic of MITSUBISHI SJ-DL5.5/20000 for spindle 15000rpm-



## MACHINE LAYOUT/WORKING TABLE DIMENSIONS





## MACHINE SPECIFICATIONS

	Unit	TC-20α Turret Type/Arm Type
<b>TRAVEL</b>		
X axis travel	mm	510
Y axis travel	mm	400
Z axis travel	mm	300 / 400
Spindle nose to table surface	mm	174~474 / 174~574
Table surface to floor	mm	845
<b>TABLE</b>		
Table dimension	mm	600x400
Max.loading weight	kg	250
T-slots(WxNO.xP)	WxNO.xP	14x13x125
<b>SPINDLE</b>		
Spindle speed	rpm	12,000
Spindle nose		7/24Taper No.30
Spindle motor	kw	3.7 / 5.5
<b>FEEDRATE</b>		
Rapid traverse X axis	m/min	48
Rapid traverse Y axis	m/min	48
Rapid traverse Z axis	m/min	48
<b>AUTOMATIC TOOL CHANGER</b>		
No.of tools	T	14 / 20
Pull stud		P-30T(45°)
Max.tool weight/total tool	kg	3/25
Max.tool length	mm	200
Max.tool diameter	mm	Ø 80
Tool changing time (tool to tool)	sec	1.8
<b>OTHERS</b>		
Floor space	mm	1,600x2,285 / 1,700x2,285
Machine weight	kg	2,400
Max.machine height	mm	2,555
Power capacity	KVA	15
Air source	Bar	6~8

\*Specifications are subject to change without prior notice.

## MACHINE ACCESSORIES

	TC-20α Turret Type/Arm Type
3-Axis Pre-tensioned Ball Screw	●
3-Color Signal Light	●
Automatic Lubrication System	●
Coolant Nozzles	●
Dust-Proof Electrical Cabinet	●
Enclosed Splash Guard	●
Ethernet Interface	●
Front Door Inter Lock	●
Heat Exchanger	●
Outside Air Blast	●
Rear Side Chip Flushing System	●
Rigid Tapping	●
RS232	●
Spindle Air Sealing	●
Spindle Coolant Nozzle	●
Spindle Oil Cooler	●
Spindle Speed DDS 12000rpm	●
Spindle Taper BT30	●
Work Light	●
14T - Turret Type ATC	●
20T - Arm Type ATC	○
4th Axis Interface	○
Air Condition	○
Air Gun	○
Auto Tool Length Measurement	○
Auto Workpiece Measurement	○
Automatic Power Off	○
C.T.S with filter system(top roof must included)	○
Chip Conveyor-Left/Right Side Discharge & Chip Bucket	○
Chip Flushing System	○
Column Raiser 150mm	○
Coolant Gun	○
CTS Interface	○
Linear Scale	○
Oil Skimmer	○
Screw type Chip Conveyor-Left/Right Side Discharge & Chip Bucket	○
Spindle air blast	○
Spindle Speed 15000/20000 rpm(DDS)	○
Top Roof	○

●:Standard ○: Optional