



# HS-22 Series

## CNC Lathe



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# HS-22 Series



## ■ Space saving

HS-22 series have an excellent and compact machine structure that saves space for maximum utility of factory floor space.

## ■ Suitable for automatic production

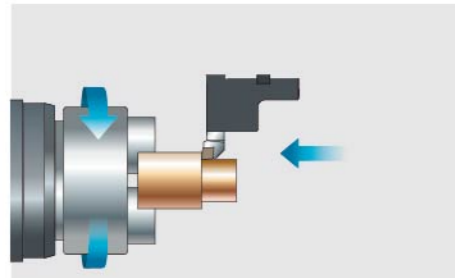
The loading /unloading system and part feeder of Tongtai proprietary design are available. Compact machine design makes the time of workpiece change shortened to 4.8 sec. It reduces drastically non-cutting time and improves productivity and investment profit.

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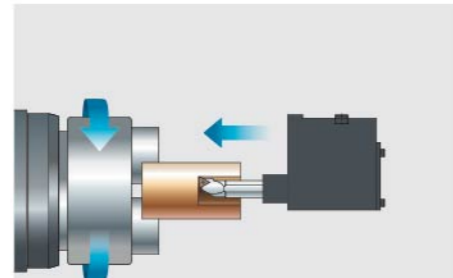
## Machining ability

Turning Material : S45C



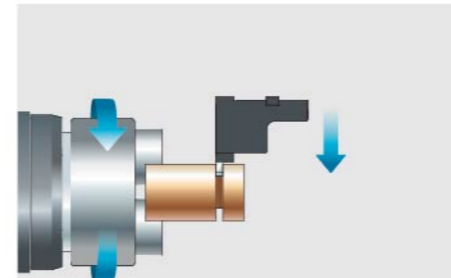
### O.D. turning

Material removal rate	165 cm <sup>3</sup> /min
Cutting depth	4 mm
Spindle speed	1364 rpm
Feedrate	0.3 mm/rev
Cutting speed	120 m/min



### I.D. turning

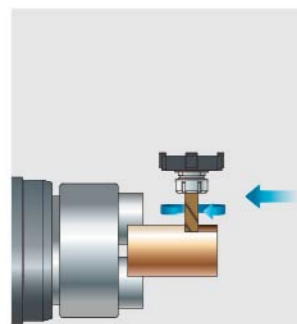
Material removal rate	130 cm <sup>3</sup> /min
Cutting depth	4 mm
Spindle speed	955 rpm
Feedrate	0.3 mm/rev
Cutting speed	120 m/min



### Grooving

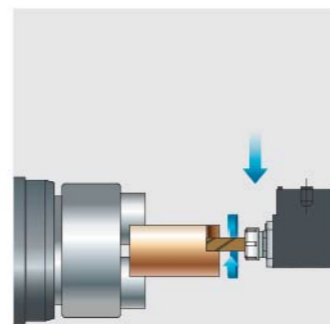
Cutting width	6 mm
Spindle speed	955 rpm
Feedrate	0.1 mm/rev
Cutting speed	120 m/min

Milling(Optional) Material : S45C



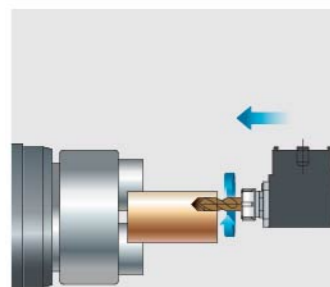
### End milling

Material removal rate	38 cm <sup>3</sup> /min
Tool	end mill Ø20 mm (4 teeth)
Spindle speed	500 rpm
Feedrate	0.1 mm/rev/tooth
Cutting feedrate	200 m/min
Cutting width	12 mm
Cutting depth	16 mm



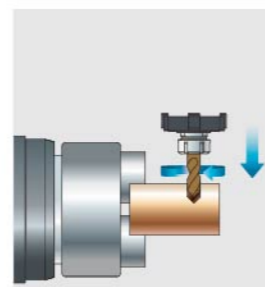
### End milling

Material removal rate	38 cm <sup>3</sup> /min
Tool	end mill Ø20 mm (4 teeth)
Spindle speed	500 rpm
Feedrate	0.1 mm/rev/tooth
Cutting feedrate	200 m/min
Cutting width	12 mm
Cutting depth	16 mm



### Drilling

Material removal rate	25 cm <sup>3</sup> /min
Tool	drill Ø20 (2 teeth)
Spindle speed	398 rpm
Feedrate	0.2 mm/rev
Cutting speed	25 m/min



### Drilling

Material removal rate	25 cm <sup>3</sup> /min
Tool	drill Ø20 (2 teeth)
Spindle speed	398 rpm
Feedrate	0.2 mm/rev
Cutting speed	25 m/min

※HS-22M testing data.

## Main structure

High rigidity box-way structure

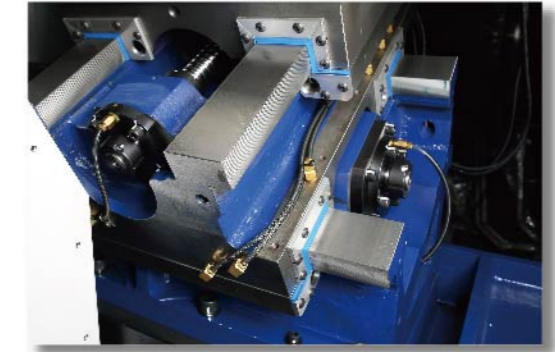
### Stroke

X/Z axis 155/220 mm

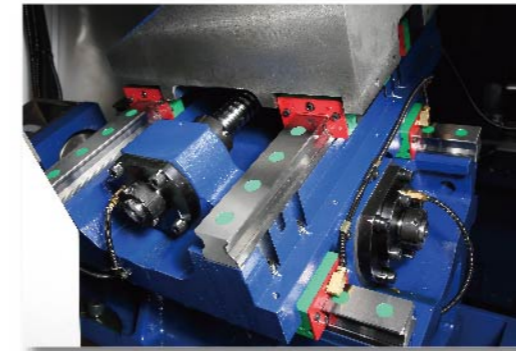
### Rapid traverse

X/Z axis 20 m/min (Box-way)

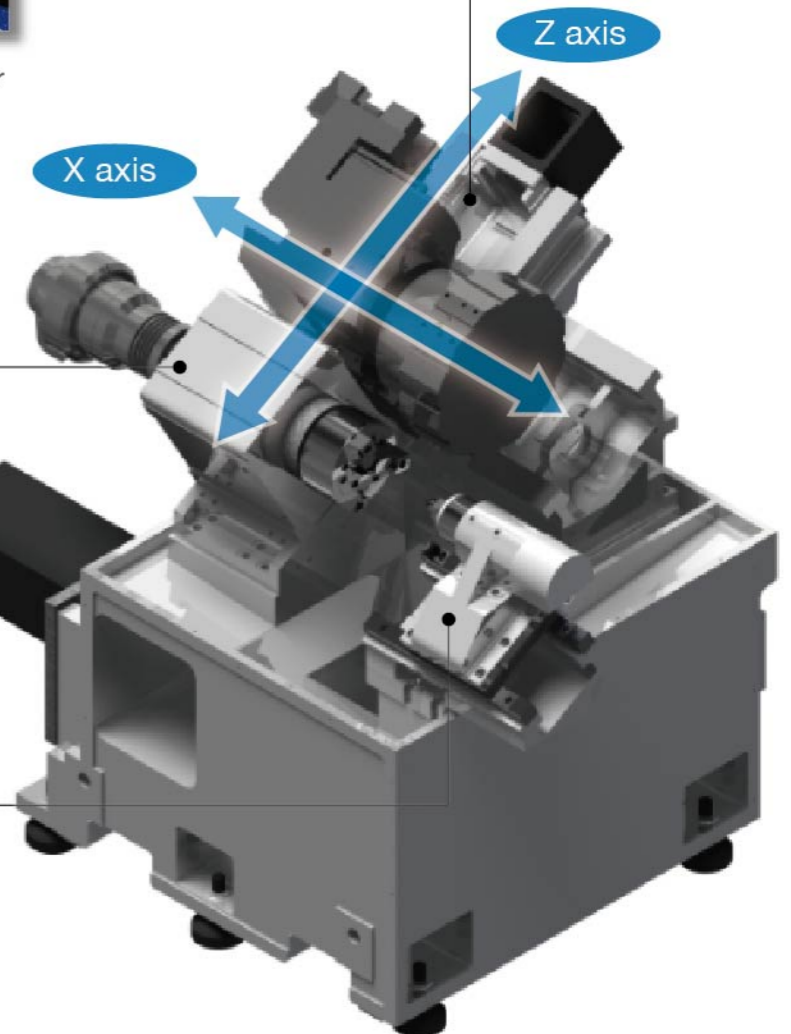
X/Z axis 24/30 m/min (Linear guide way)



Both X and Z axis are designed with box-way structure with proper heat treatment and grinding process, the high precision feeding units provide higher rigidity for heavy duty or intermittent cutting.



Linear guide way is available to get higher rapid traverse(30 m/min), decrease non-cutting time and improve productivity.



Through the precisely balance calibrating of spindle to ensure accuracy of high speed machining. The accelerating time of 0→5000 rpm is only 2.87 sec.

For higher slender ratio shaft, tail stock is available to offer stable support and avoid chatter.

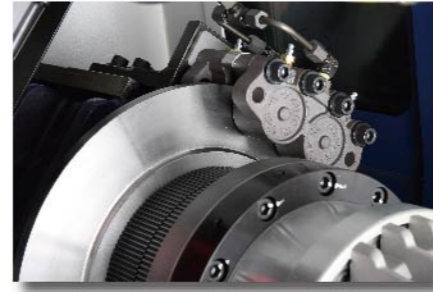
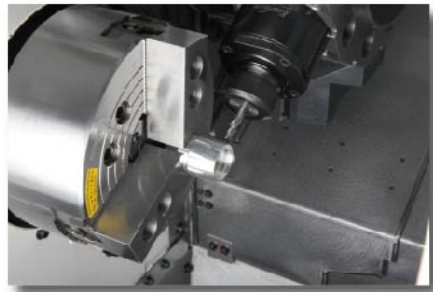
## Main structure

### Spindle

Diameter of spindle	Bar capacity	Spindle speed
Ø65 mm	Ø26 mm	6,000 rpm
Ø85 mm	Ø44 mm	4,800 rpm
Ø100 mm	Ø51 mm	4,500 rpm

Spindle motor **11/7.5 kW** (with Hydraulic turret)  
**15/11 kW** (with Power turret)

Torque output **85/60/45 Nm** (with Hydraulic turret)  
**109/80/60 Nm** (with Power turret)



With power turret, the position of CS axis is fed back by a rotary encoder. The minimum indexing increment of CS axis is available with 0.001 degree to satisfy various machining applications.

### Time of acceleration / deceleration

Testing data of Ø65 mm spindle with 6" chuck

Spindle speed (rpm)	0-1,000	0-2,000	0-3,000	0-4,000	0-5,000	0-6,000
Acceleration (sec)	0.25	0.51	1.01	1.83	2.87	4.14
Deceleration (sec)	0.3	0.53	0.96	1.67	2.5	3.3

### Turret

Hydraulic turret



Power turret

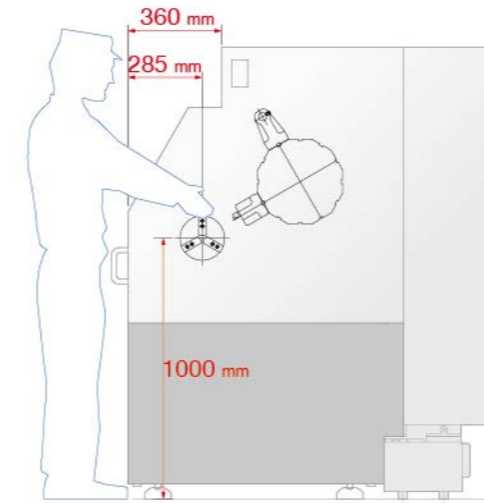


	Hydraulic turret	Power turret
Tool capacity	12/8(Opt.)	12
Indexing time(6-station)	0.45 sec	0.3 sec
Indexing time(1-station)	1.8 sec	1 sec
Max. speed of live tool	-	6000 rpm
Power of live tool	-	5.5/3.7 kW

## Operatoin · Peripheral accessories

### Accessibility

The access to spindles or turret is short and comfortable to operator.



### Minimized space and wide working area

An excellent and compact machine structure design saves space, facilitates the arrangement of production line. The wide door opening makes machine operation and maintenance convenient.



### Chip conveyor

According to different materials and chip size, Tongtai provide various chip conveyors for the best chip disposal.

Specification	Steel		Cast iron		Aluminum/ Non-ferrous metal		
	Long/Curl chips	Short chips	Powder chips	Short chips	Long/Curl chips	Short chips	Powder chips
Hinge type	O	X	X	X	O	X	X
Scraper type	X	O	O	O	X	O	O
Magnetic scraper type	X	O	O	O	X	X	X

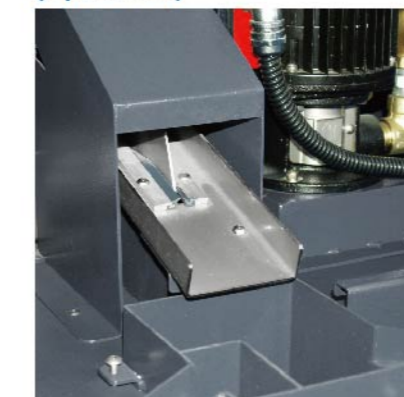
O : Suitable X : Non-suitable

Short chips: Chips shorter than 60 mm or ball type chips smaller than Ø40 mm.  
Curl long chips: Chips' length is longer than short ones.

### Manual tool presetter (optional)



### Disc type oil skimmer (optional)



### Oil mist collector (optional)



# Automation solution

## Solution 1. Side type robot Patent published in Taiwan M40216

- The time of workpies change is only 4.8 sec, it reduces drastically non-cutting time and improves productivity.
- Each axis is driven by servo motor with ball screw to get high rapid traverse.
- A variety of modularized part feeders are available.

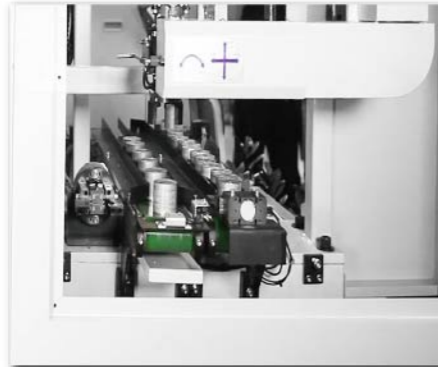
Workpiece diameter :  $\varnothing 35 - \varnothing 100$  mm  
 Max. Workpiece length : 60 mm  
 Max. Workpiece weight : 3 kg x 2  
 Rapid traverse of robot : 30 m/min



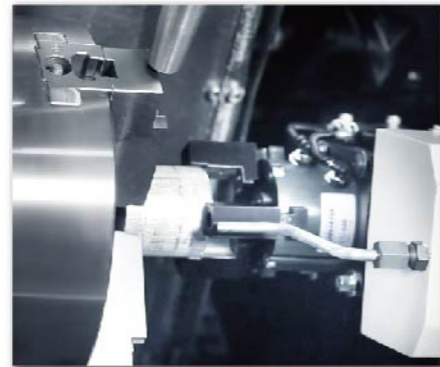
Workpiece turnover unit



Robotic arm unit



Workpiece change



©Chucked diameter of OP1 and OP2 must be the same.

## Solution 2. Joint type robot

- The time of workpies change is 7 sec.
- Simple structure makes easier installation operation, repair, and maintenance.
- A variety of modularized part feeders are available.

Workpiece diameter :  $\varnothing 35 - \varnothing 100$  mm  
 Max. Workpiece length : 60 mm  
 Max. Workpiece weight : 3 kg x 2  
 Rapid traverse of robot : 30 m/min



## Control system with dialog interface

- The alarm message will be shown when issues occur to assist trouble shooting.
- There is idiot-proofing function to avoid incorrect operation.
- The standard is 5.7" monochrome LCD, and 6.5" color TFT-LCD is also available.



## Modularized part feeder

Pallet stacking type (Solution 1.)



Conveyor type (Solution 1.)

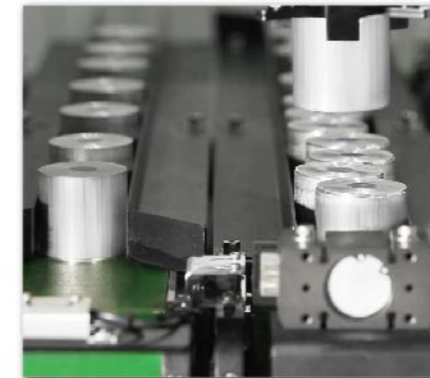
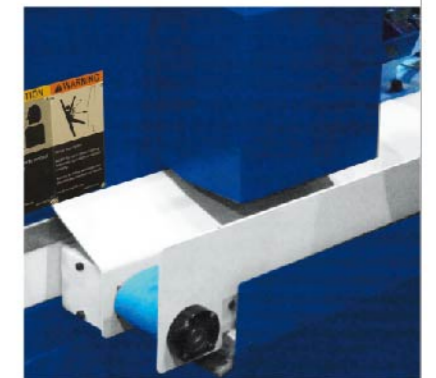
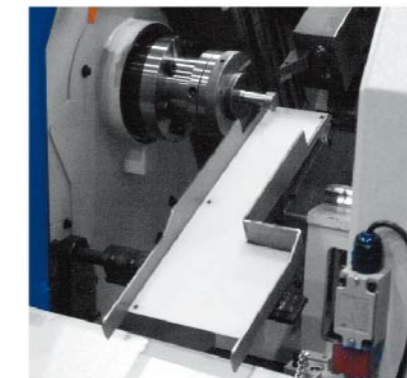


Plate type (Solution 1. & 2.) • Slant plate type (Solution 2.)



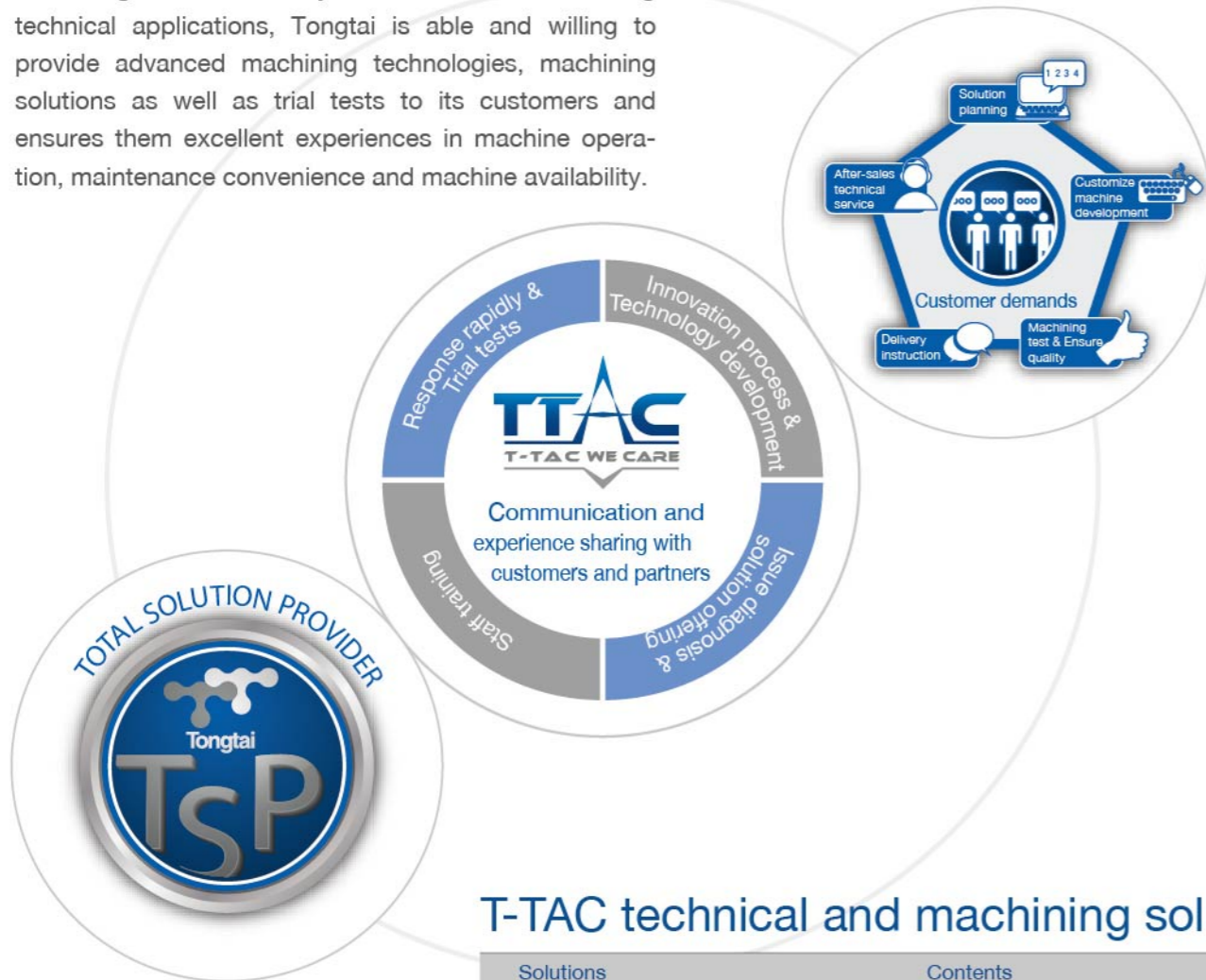
## Solution 3. Bar feeder type

- Bar feeder with part catcher are used in this type. The structure is simple and easy to operate, repair and maintenance.
- Part conveyor is also available in this type.



# Tongtai-Technical Application Center

The purpose of T-TAC is to take care of customer's machining solution actively. Based on the outstanding technical applications, Tongtai is able and willing to provide advanced machining technologies, machining solutions as well as trial tests to its customers and ensures them excellent experiences in machine operation, maintenance convenience and machine availability.

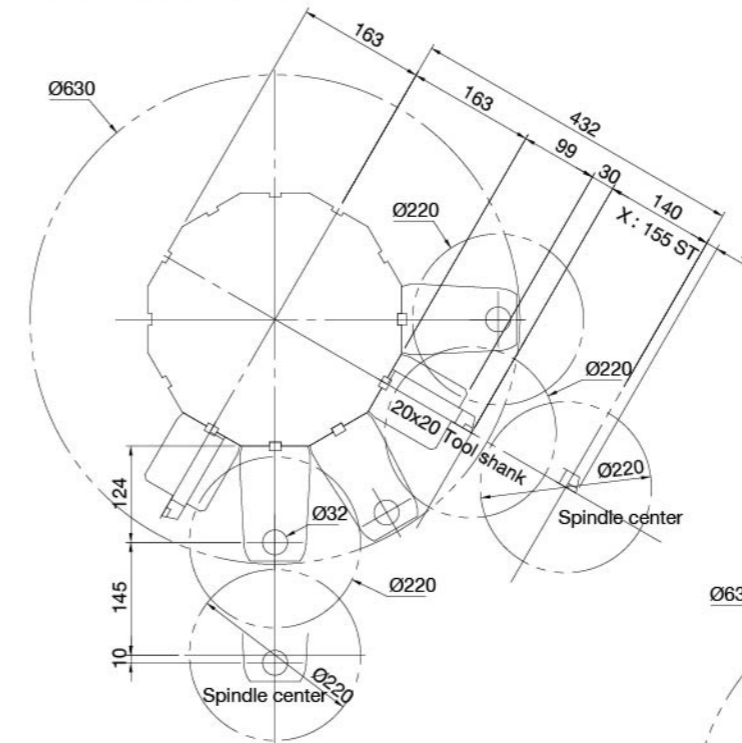


## T-TAC technical and machining solutions

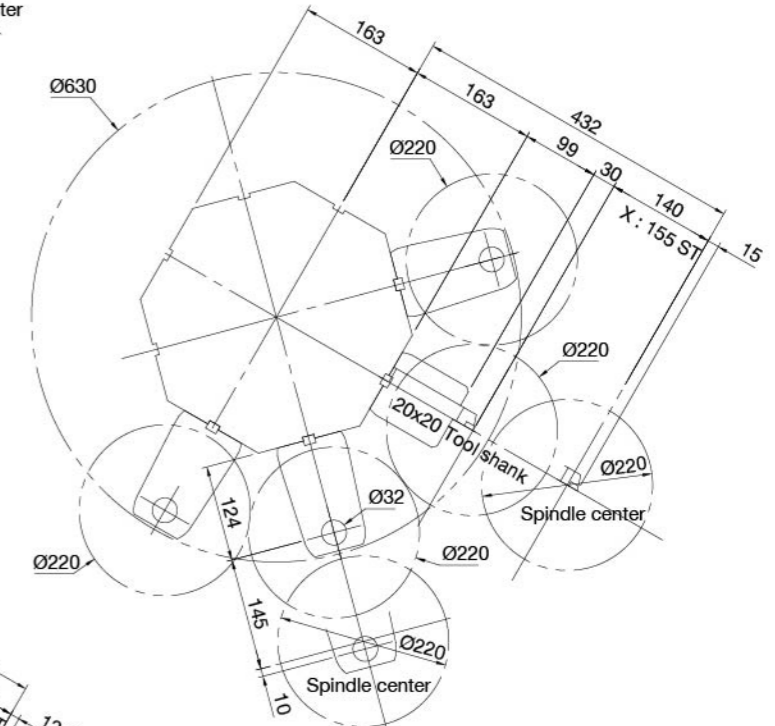
Solutions	Contents
<b>Product manufacture test</b>	Through the manufacturing progress and jig & fixture plans, Tongtai's skilled staff will manufacture the first piece for understanding the client's corresponding demands.
<b>Machining technologies</b>	By introducing innovative technologies and adding the extra functions, T-TAC is available to provide the brand-new solutions.
<b>Machine technology</b>	Our technical staff will test current problems, which clients have, in the same machine model for processing problem diagnosis and providing possible solutions. Furthermore, our skilled staff is able to provide the services at the client's factory.
<b>Training</b>	T-TAC is open to train current clients, potential customers, agents, teachers / students, and employees and to strengthen their abilities.
<b>Technology exhibits</b>	T-TAC is also an excellent platform to launch new products/technologies by cooperation with software/hardware suppliers. With presentation of highly reliable products/technologies, it's possible to provide higher efficiency and availability solutions than existing ones.

# Tool interference

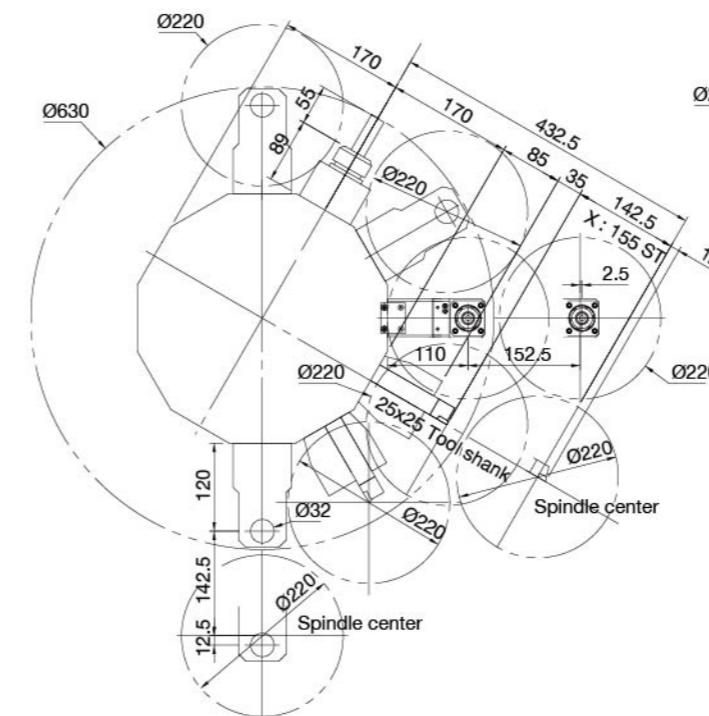
## 12V Hydraulic turret



## 8V Hydraulic turret

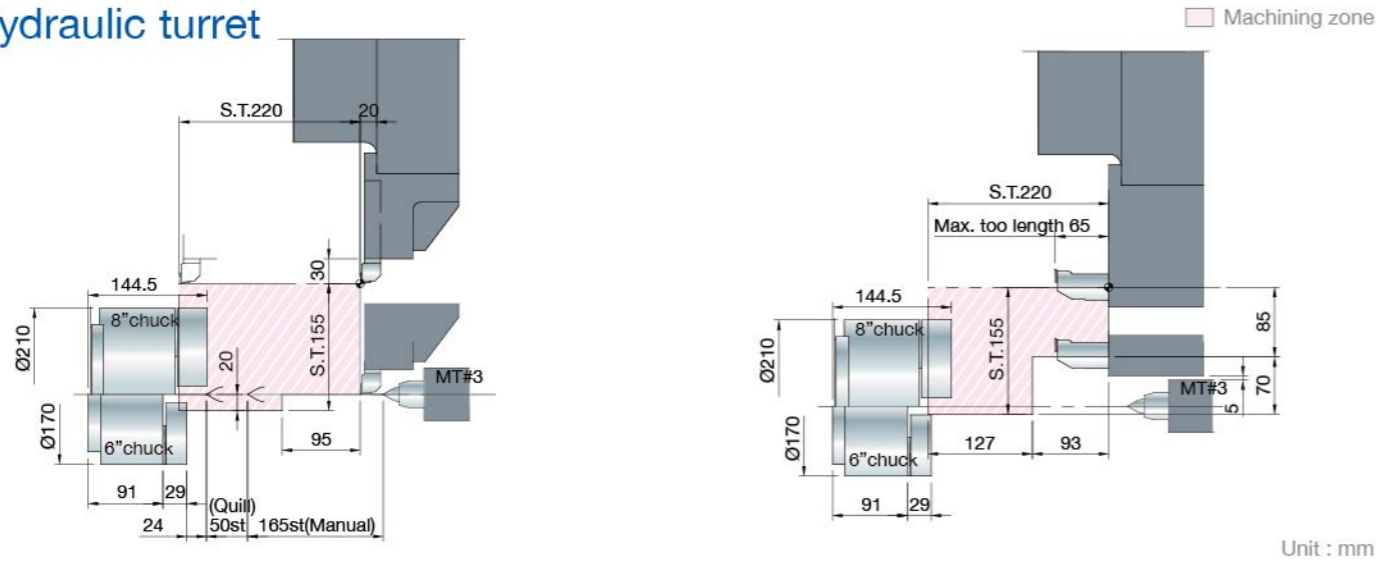


## 12V Power turret(VDI40)

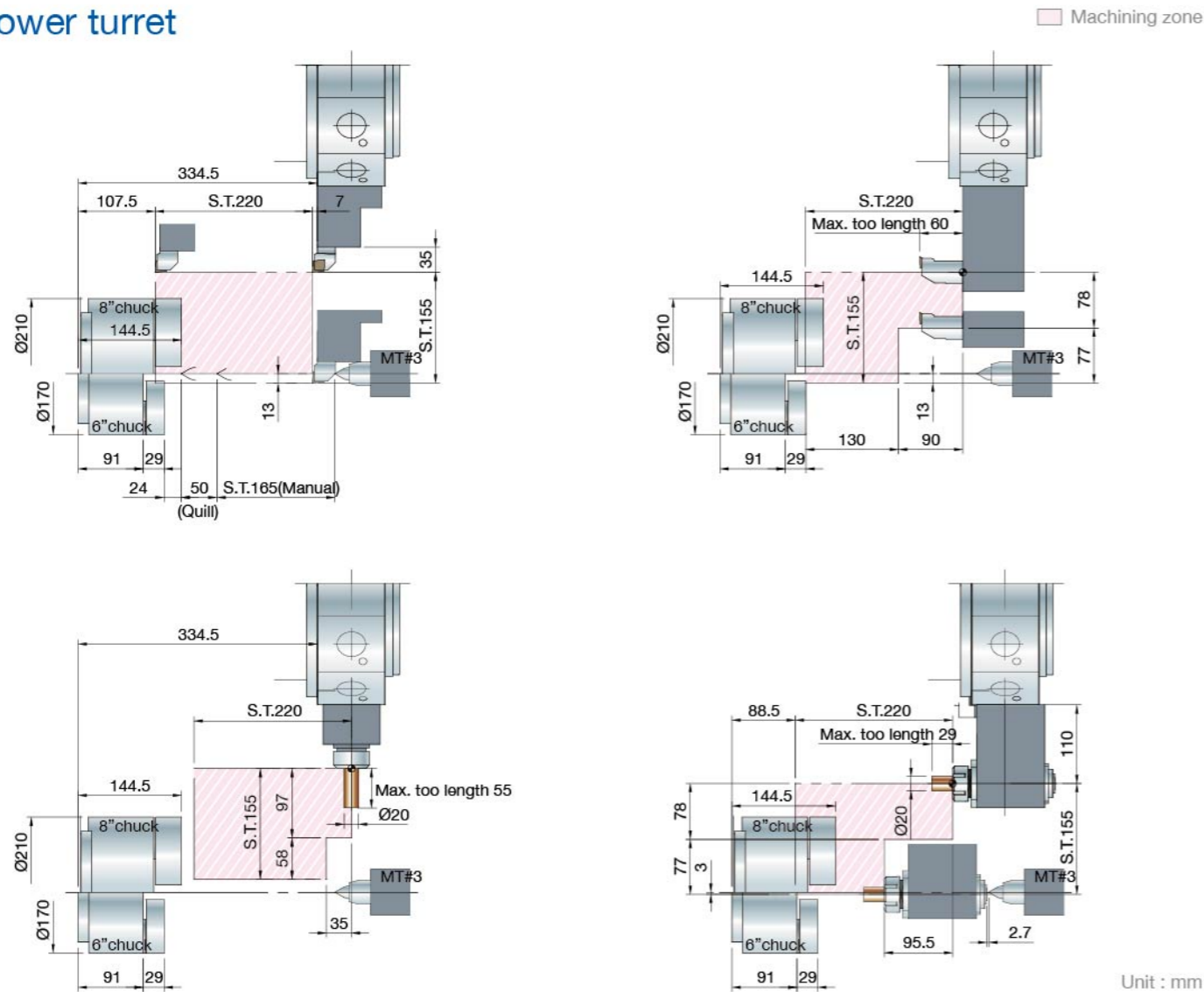


# Working area

## Hydraulic turret

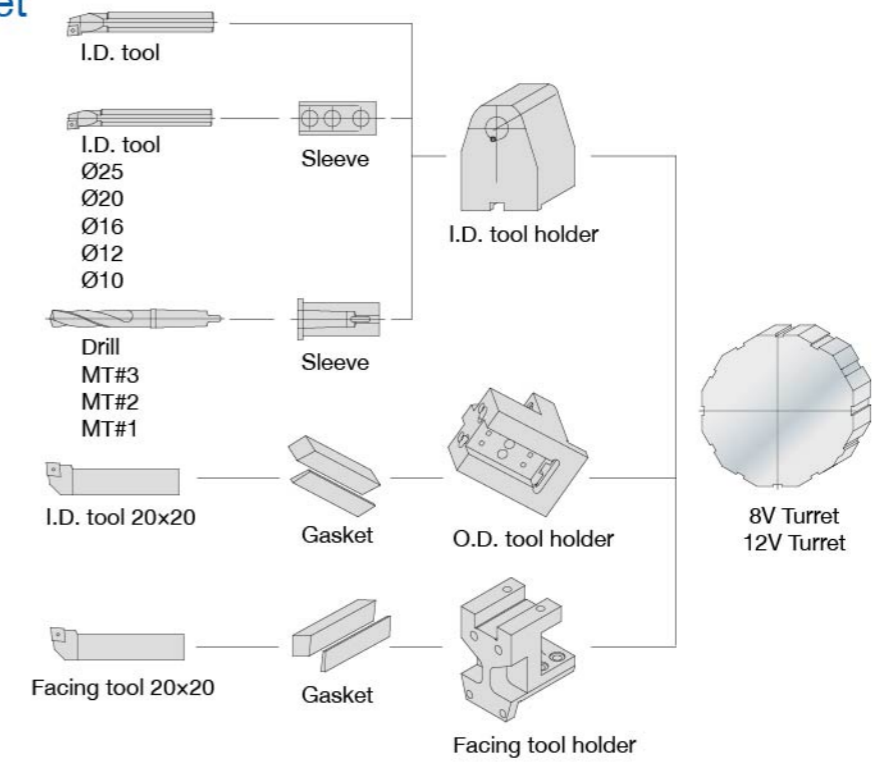


## Power turret

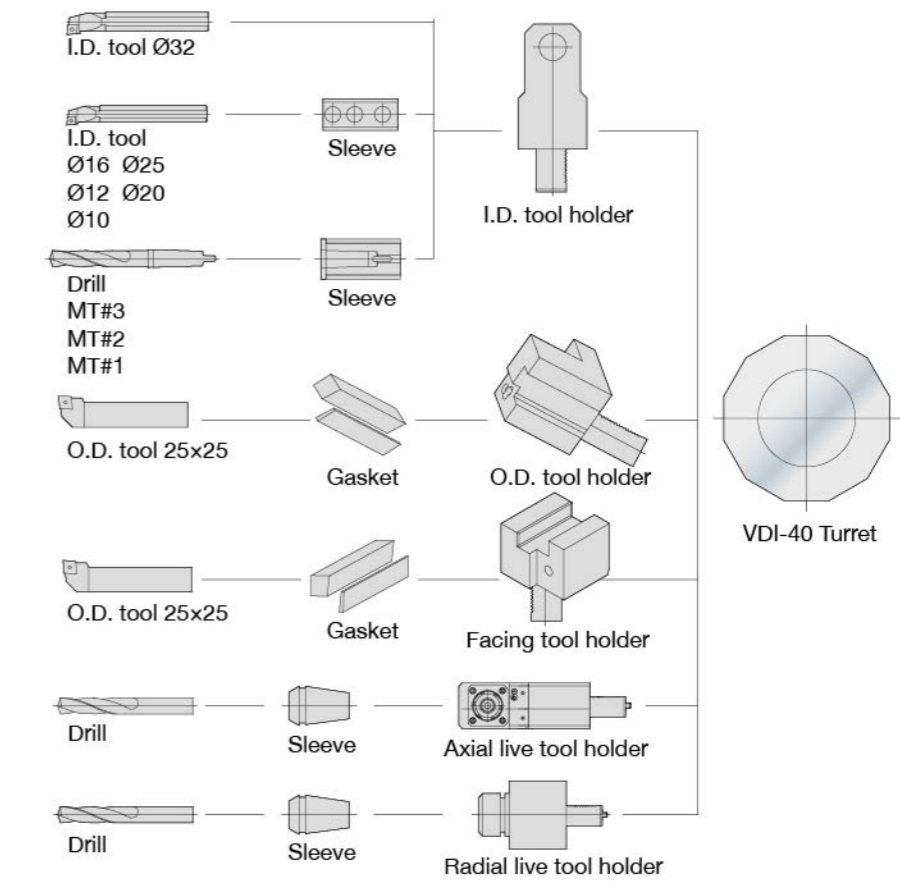


# Tool system

## Hydraulic turret



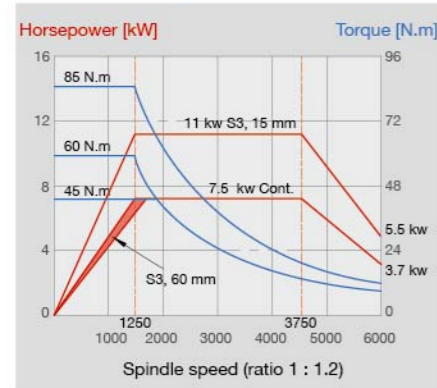
## Power turret



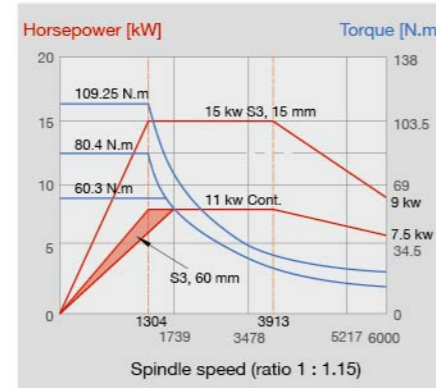
# Spindle output and torque chart · Standard/Optional accessories

## Spindle output and torque chart

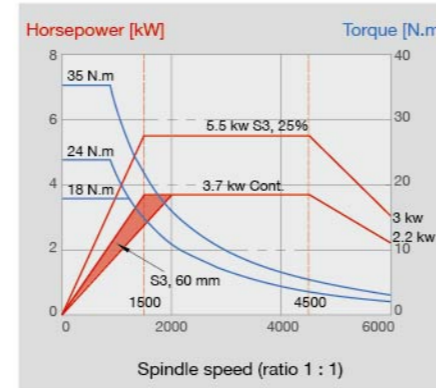
■ HS-22 Hydraulic turret



■ HS-22M Power turret



■ HS-22M Live tool motor



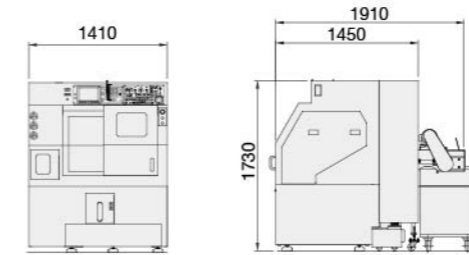
## Standard/Optional accessories

Item	Specification	Standard	Optional
Chuck	3 Jaws through hole chuck	●	
	Collet type through hole chuck		○
Turret	12V hydraulic turret	●	
	8V hydraulic turret		○
	Power turret		○
Spec. of live tool holder	BMT-65		○
	VDI-40		○
Chip conveyor	Hinge type	●	
	Scraper type		○
	Magnetic scraper type		○
Coolant & air blow	Coolant through spindle		○
	Air blow through spindle		○
	Coolant on spindle side		○
	Air blow on spindle side		○
Automation equipment	Bar feeder		○
	Part catcher		○
	Part conveyor		○
	Automatic door		○
Tool holder(Hyd. turret)	Face turning tool holder	2	
	I.D. tool holder	4	
	O.D. tool holder	4	
	Gasket	12	
	Sleeve of I.D. tool Ø8, Ø10, Ø12, Ø16, Ø20, Ø25	one each size	
	Sleeve of drilling tool MT1, MT2, MT3"	one each size	
Others	Oil skimmer		○
	Oil mist collector		○
	Air conditioner for electrical cabinet		○
	Manual tool presetter		○
	Air gun		○
	Coolant gun		○

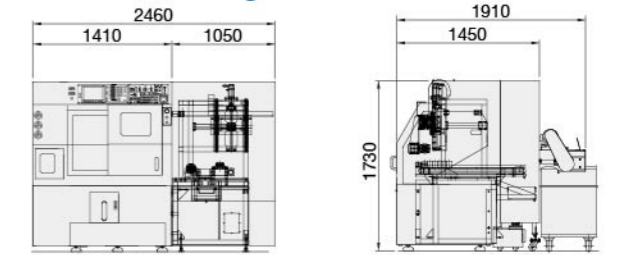
# Machine dimensions · Specification

## Machine dimensions

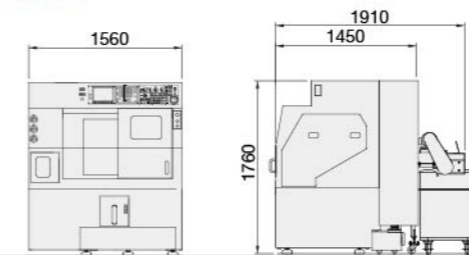
■ HS-22



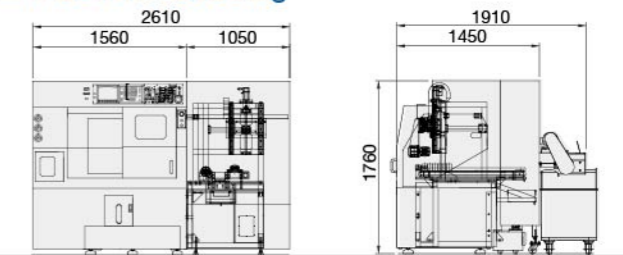
■ HS-22+Loading



■ HS-22M



■ HS-22M+Loading



Unit : mm

## Specification

Item	Specification	Unit	HS-22	HS-22M
Turning capacity	Max. swing diameter	mm	Ø220	
	Max. turning diameter	mm	Ø220	
	Max. turning length	mm	200	
Spindle	Spindle nose		A2-5[A2-6/A2-6]	
	Spindle speed	rpm	6000[4800/4500]	
	Chuck size	inch	6"(Opt. 8")	
	Through-spindle hole diameter	mm	Ø35[Ø56/Ø62]	
	Bar capacity	mm	Ø26[Ø44/Ø51]	
	Spindle bearing diameter	mm	Ø65[Ø85/Ø100]	
Turret	Tool capacity	pc	12(Opt. 8)	-
	O.D. tool	mm	20x20	-
	I.D. tool	mm	Ø32	-
Power turret	Tool capacity	pc	-	12(VDI-40)
	Motor	kw	-	5.5/3.7
	O.D. tool	mm	-	25x25
	I.D. tool	mm	-	Ø32
Stroke	Max. speed	rpm	-	6000
	X/Z axis stroke	mm	155/220	
Feed	X/Z axis rapid traverse	m/min	20/20	
	Cutting feedrate	mm/rev	0.01-500	
	Tailstock/Hydraulic stroke	mm	165(manual)/50	
Tailstock (opt.)	Tailstock taper		MT#3	
	Quill diameter	mm	Ø90	
	Driving system		manual	
	X/Y axis rapid traverse	m/min	30	
Robotic arm (opt.)	Servo motor	kw	0.5	
	Gripper Capacity	kg	3	
	Loading/Unloading time	sec	4.8	
Hydraulic unit	Hydraulic tank capacity	L	30	
	Hydraulic motor	kw	1.5	
Coolant unit	Coolant tank capacity	L	65	
	Coolant motor	kw	0.37	
Motor	Spindle motor (50% ED)	kw	11/7.5	15/11
	X/Z axis servo motor	kw	1.8/1.8	
Controller			FANUC Oi-T	
Machine size	LxWxH	mm	1410x1450x1730	1560x1450x1760
	Weight	kg	2350	2400

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