

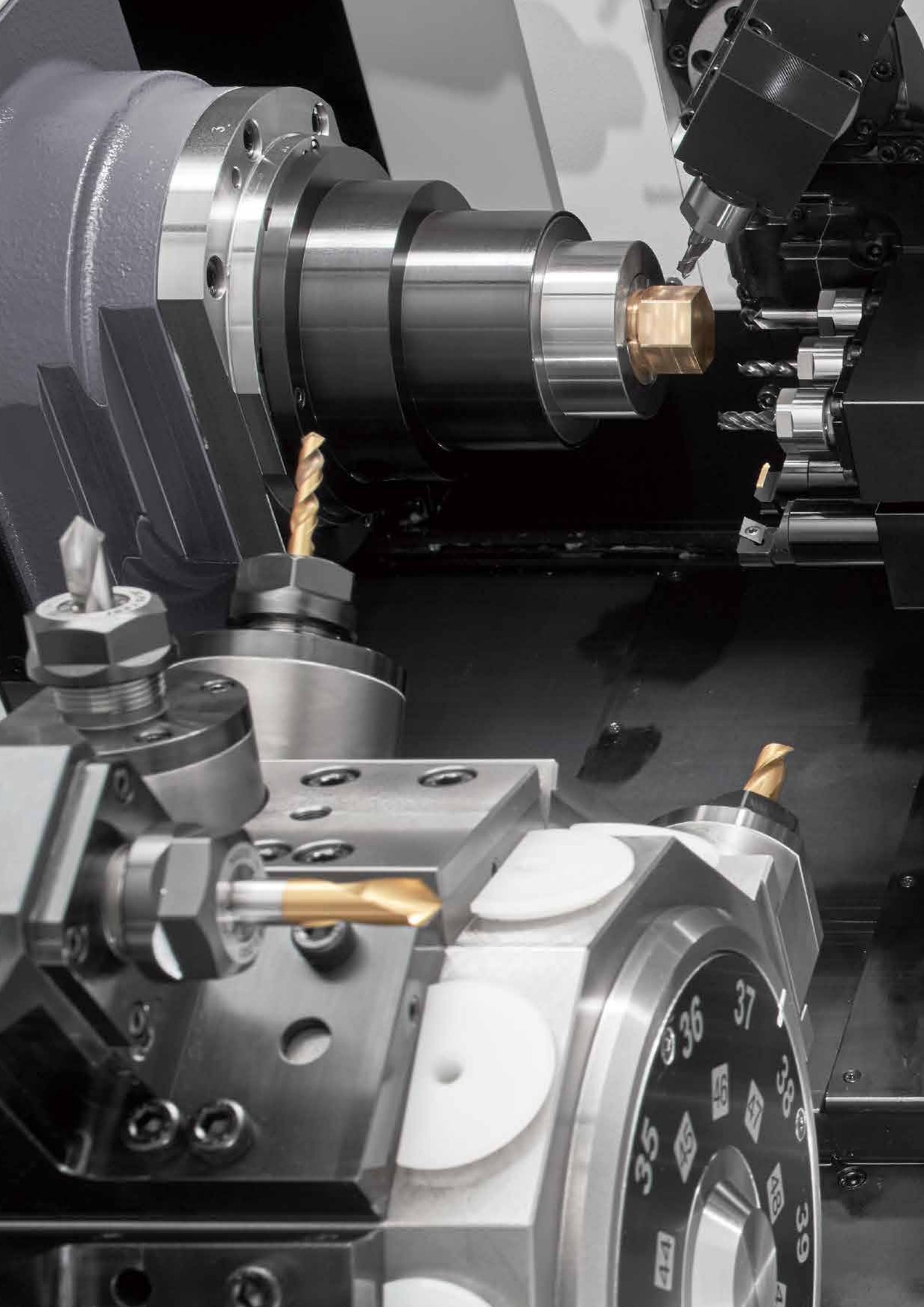
CITIZEN

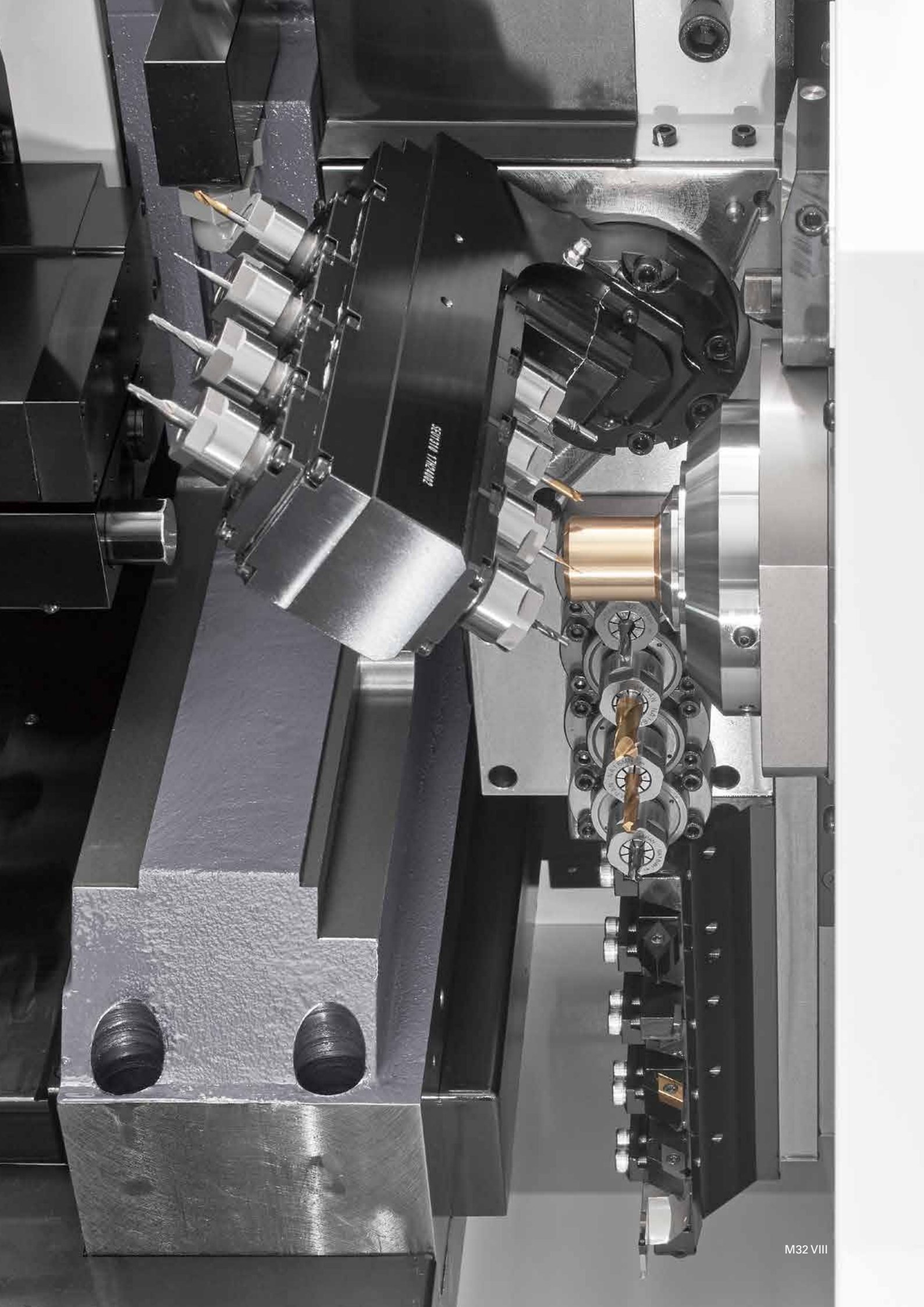
Cincom

M32

Sliding Headstock Type Automatic CNC Lathe







2009201 010103



Ultimate gang tool + turret configuration machine Revamped M32

While inheriting the basic configuration of “gang tool post + turret” , the new M32 has pursued the optimal balance of strength and weight through structural analysis, and greatly improves the rigidity that is the cornerstone of machining.

In addition, a single drive mechanism is introduced for rotary tools on the turret tool post, together with updated tooling. The rotary tool drive motor on each tool post has also been enhanced.

5.5/7.5 kW high-power spindle motors are adopted for both front and back spindles, realizing powerful machining and high acceleration/deceleration.

The gang tool post features a B-axis spindle(Type VIII) that supports contouring through 5-axis control.

The back tool post is equipped with an adjustable angle type spindle(Type VII/VIII) for more complex machining in combination with the Y axis. The degree of freedom in the allocation of machining processes is increased by enhanced back machining capability.

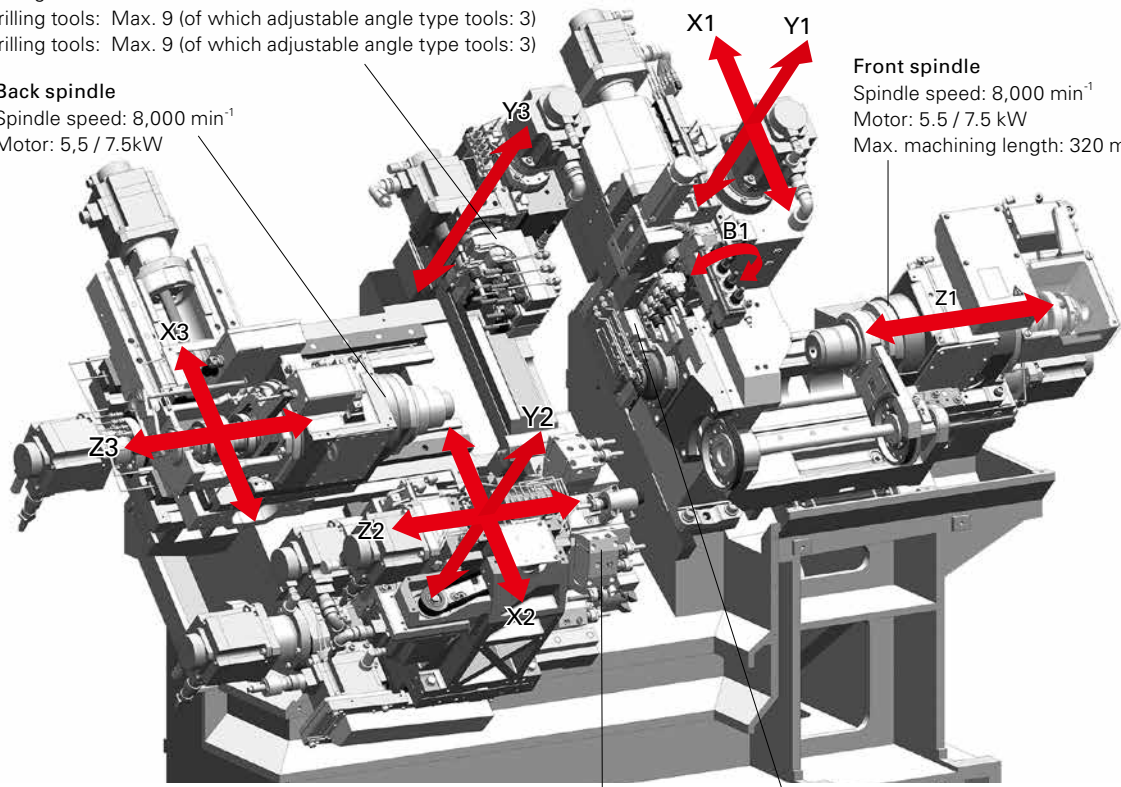
In addition, the 38-mm oversized specification option is supported, and it is possible to switch between guide bushing and guide bushing-less types.

Back tool post

- Type V : Drilling tools: 5
- Type VII : Drilling tools: Max. 9 (of which adjustable angle type tools: 3)
- Type VIII : Drilling tools: Max. 9 (of which adjustable angle type tools: 3)

Back spindle

Spindle speed: 8,000 min⁻¹
 Motor: 5.5 / 7.5kW



Front spindle

Spindle speed: 8,000 min⁻¹
 Motor: 5.5 / 7.5 kW
 Max. machining length: 320 mm/1 chucking (GB)

Turret tool post

Number of stations: 10

Gang tool post

- Type V : Turning tools: 5
Cross drilling tools: 5 to 7
- Type VII : Turning tools: 5
Cross drilling tools: 5 to 7
- Type VIII : Turning tools: 5
Cross drilling tools: 8 (of which B-axis tools: 4)
Back face drilling tools: 4 (of which B-axis tools: 4)

Machine Configuration According to Model

	Type V	Type VII	Type VIII
B1 axis (rotary tools on the gang tool post)	---	---	○
Y3 axis (back tool post Y axis)	---	○	○
Rotary tools on the back tool post	---	○	○
Total number of tools	25 to 27+ α	23 to 31+ α	30 to 36+ α

LFV Function (Optional)



LFV (low-frequency vibration cutting) is a technology for performing machining while vibrating the X and Z servo axes in the cutting direction in synchrony with the rotation of the spindle. It reduces various problems caused by chips entangling with the product or tool, and is effective for small-diameter deep hole machining and the machining of difficult-to-cut materials.

	LFV mode 1	LFV mode 2	LFV mode 3
Operation	Multiple vibrations per spindle revolution	Multiple spindle revolutions per vibration	Vibration threading
Specification	The axes execute multiple vibrations during one spindle revolution, reliably breaking chips up into small pieces.	Machining is carried out while rotating the spindle multiple revolutions per vibration.	A vibrating behavior is applied in the direction of the cutting (notching) during threading with the timing of this vibration changing with each pass in relation to the rotary phase of the spindle to provide "air-cutting" during the machining and break up chips.
Application	Ideal for outer/inner diameter machining and groove machining	Ideal for micro-drilling, where peripheral speed is required	Optimal for threading of internal and external diameters
Waveform			

Model	Front side LFV	Back side LFV	LFV mode 1	LFV mode 2	LFV mode 3
V			✓	✓	✓
VII	X1, Z1	X3, Z3	✓	✓	✓
VIII			✓	✓	✓

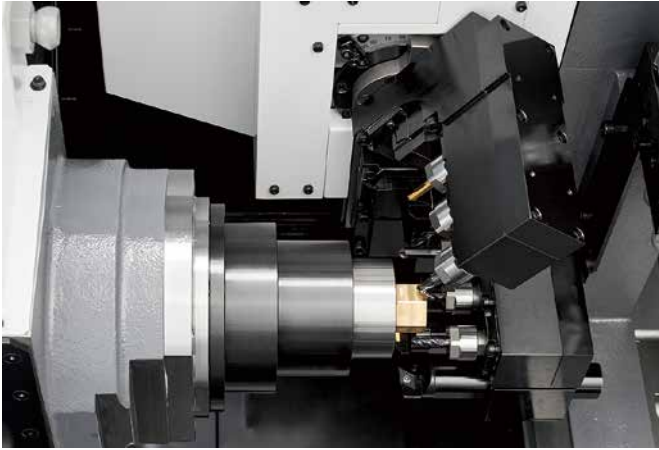
- Note 1 : LFV machining cannot be performed with the Y axis.
- Note 2 : LFV machining can be performed simultaneously on a maximum of 1 pair of axes.
- Note 3 : For LFV machining with rotary tools, the "LFV function" and "rotary tool feed per revolution" options are required
- Note 4 : LFV mode1/mode2 and LFV mode3 are optionally available. It is not possible to purchase LFV mode3 alone.

B-axis machining for more complex shapes, back face inclined machining

The gang tool post features a programmable B axis (back face 45°, front face 105°) (Type VII).

The back tool post features a 3-tool adjustable angle type spindle (Type VII/VIII).

Equipping a Y-axis on the back tool post and a B-axis on rotary tools on the gang tool post supports



3-tool angle adjusting type spindle

New turret adopting single drive

Employed for the first time with Cincom, a single drive mechanism whereby only the selected rotary tool rotates.

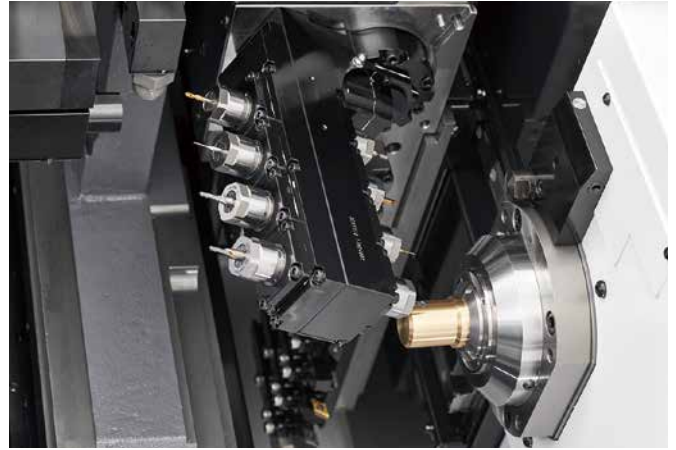
Elimination of wasted rotation of non-selected tools enables powerful machining with high accuracy while suppressing heat generation, vibration and loss of power.

It also extends the lives of gears and bearings, and reduces running costs.

Furthermore, the increased rigidity of the internal gears and bearings enables high-torque transmission, realizing installation of a motor with high torque of 2.2 kW/22 Nm, which is more than twice the torque of the existing M32, for driving rotary tools on the turret tool post.



complex machining while also broadening the range of machining with the back spindle, and increases the degree of freedom in the allocation of machining processes, which tended to be biased toward the front spindle. This helps increase productivity.

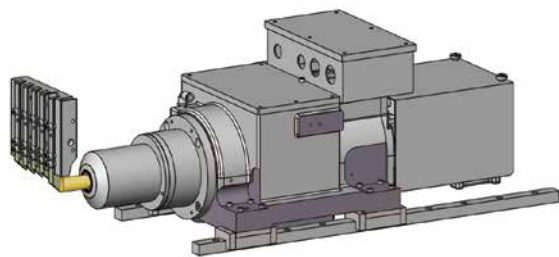


B axis: rotary tools on the gang tool post

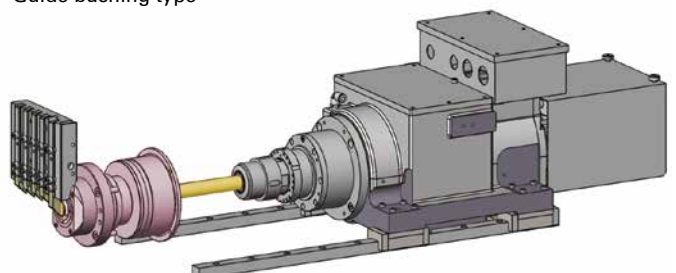
Switching between the guide bushing type and guide bushing-less type

When machining long thin workpieces, the machine is used as a guide bushing type. When using cold drawn material and when the aim is to leave short remnant bars, it is used as a guide bushing-less type.

Guide bushing-less type



Guide bushing type



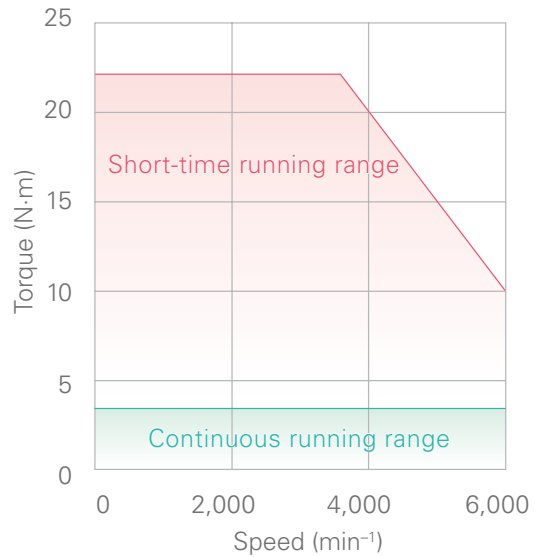
Double speed rotary tool



For rotary tools on the turret tool post, high-speed models of end face drilling spindles and cross-drilling spindles are available.

The maximum spindle speed has been increased to 12,000 min⁻¹, supporting machining with small-diameter tools.

Rotary tools on the turret tool post Torque diagram



Working efficiency improved



The door has been enlarged to 165% of the size on conventional machines, giving increased work



efficiency. By expanding the size of the window too, visibility when the door is closed is also improved.

Operation panel with new HMI (human machine interface)



The operation panel featuring the new HMI (human machine interface) is equipped with a 15-inch touch panel, improving machine operating convenience for the operator. In addition, the universal design concept is applied to the color scheme of the operation panel for the first time. It considers the fact that colors may appear different to different people and makes the information easy to see and understand for everyone.

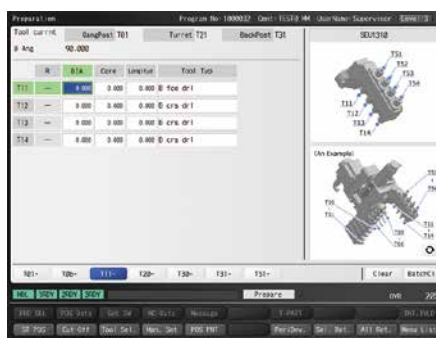


* Certification has been acquired from the Media Universal Design Association (MUD Association).

NC Functions



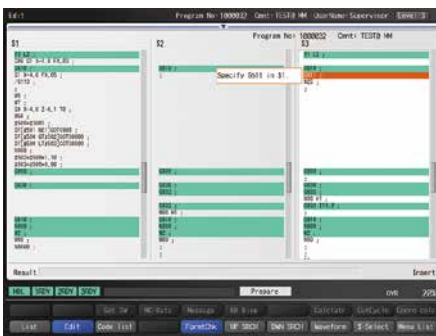
In response to the selection of an item, the corresponding illustration is displayed on the screen so that the operator can easily recognize the meaning of the selected item. (The screen shown above displays the machining data.)



Tool selection screen
The selected tool moves to the waiting point.



Code list
The function displays the list of G and M codes including explanations of the arguments to support programming.



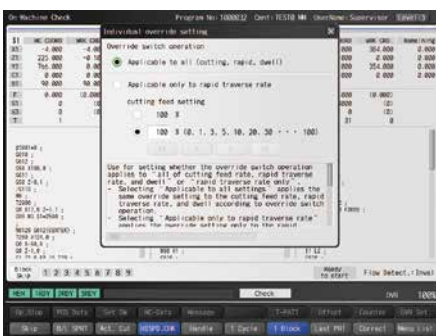
Format check
On the Edit screen, the customer can check whether there are any syntax errors in the program before running it.



High-speed program check
Programs can be checked at high speed without operating the machine (machine lock status).



On-machine program check
This runs the machining program at high speed without operating the machine and detects program errors. It also allows you to measure the approximate cycle time.



Rapid feed override
It is also possible to control only the rapid feed rate in accordance with the setting of the override dial while fixing the override for the cutting feed rate.



Turret tool post tool setting
In-machine tool setting is possible for the turret tool post as well as for the gang tool post.



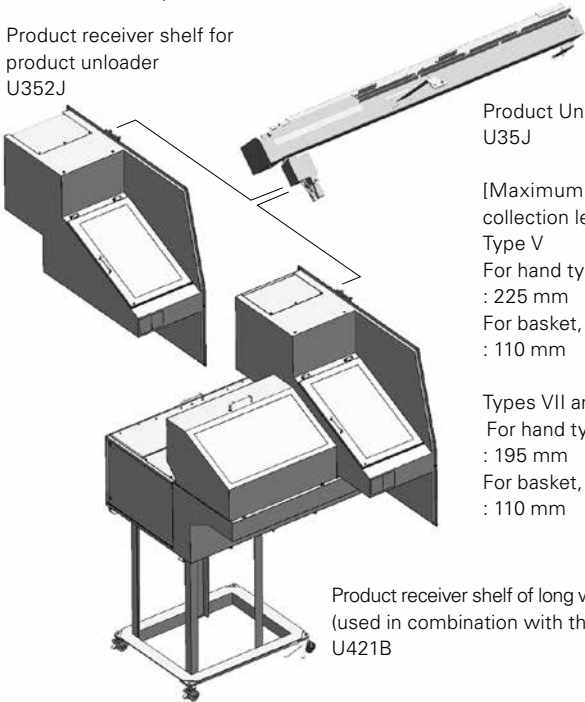
Machine operating status screen
This screen classifies the operating status as five items - automatic operation time, alarm stop time, setup time, non-operation time, and power OFF time - and displays graphs for each of these items or in a time series.

Options

Product Unloader

Installing the product unloader eliminates the time for collection by the turret, shortening cycle times. The product receiver shelf for product unloader is a shelf for receiving unloaded products. Using the product receiver shelf of long workpiece device makes it possible to combine product unloading with a function for ejecting long workpieces from the rear of the back spindle.

Product receiver shelf for product unloader
U352J



Product Unloader
U35J

[Maximum product collection length]
Type V
For hand type
: 225 mm
For basket, U351J
: 110 mm

Types VII and VIII
For hand type
: 195 mm
For basket, U351J
: 110 mm

Product receiver shelf of long workpiece device
(used in combination with the product unloader)
U421B

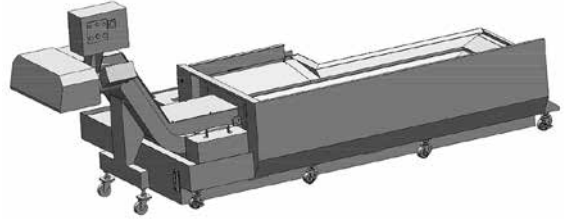
High-pressure coolant device

This contributes to effective chip removal and the improvement of machining accuracy / tool life.



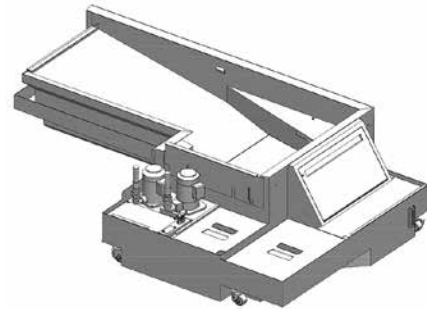
Chip conveyor

The chip conveyor is used in combination with the U12R extended coolant tank unit.



Extended coolant tank

With a coolant capacity of 295 L, this is used in combination with the chip conveyor/high-pressure coolant unit.



Workpiece conveyor switchbox

This allows manual operation (selection of continuous running or intermittent running) close to the workpiece ejection port.

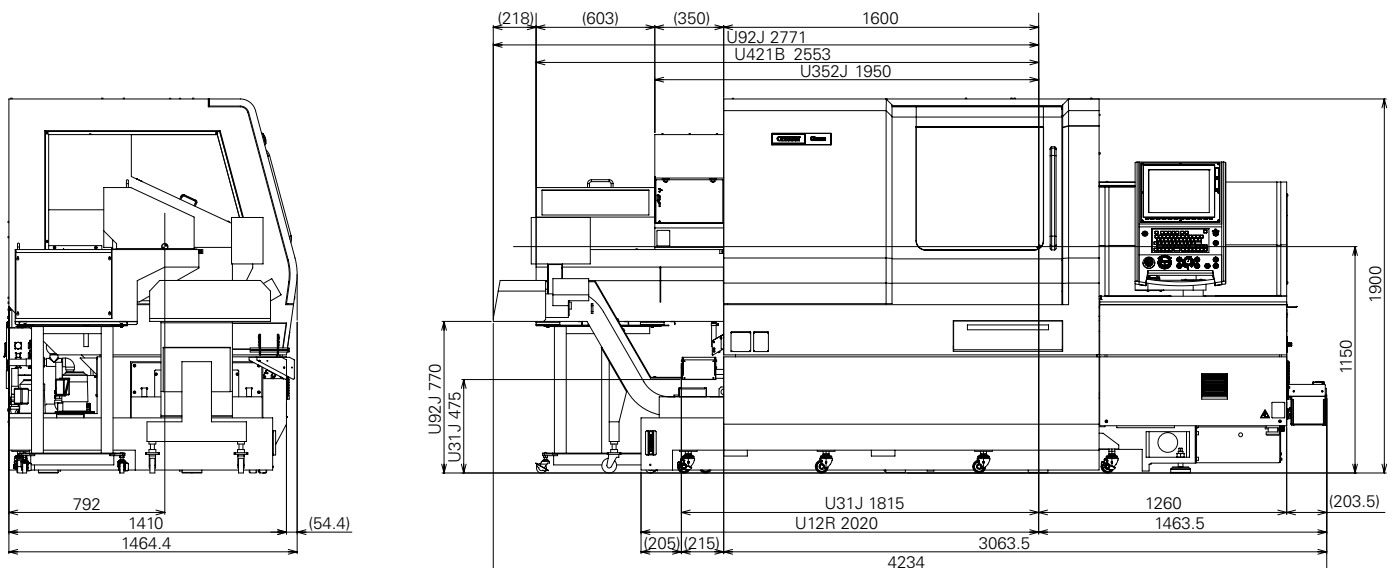


Workpiece conveyor

A workpiece conveyor can be equipped to facilitate the efficient mass production of workpieces. The cover over the unloading route can be opened easily, giving good maintainability too.

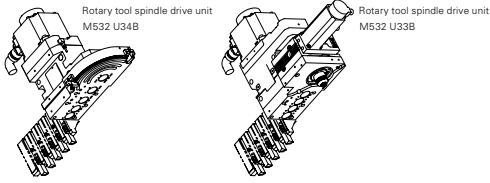
In addition, periodic cleaning of the chip collector basket, which was required on the existing machine, is no longer necessary due to the improvement of the structure.

Machine dimensions

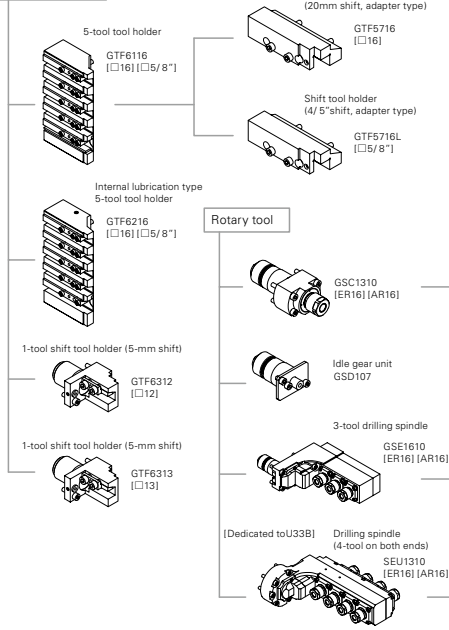


Tooling system

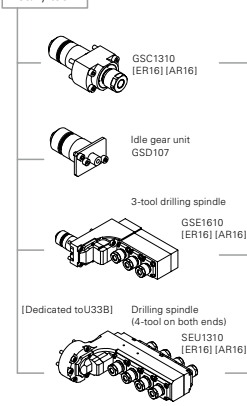
for Gang tools



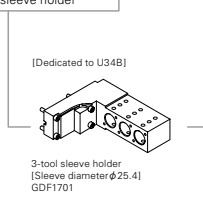
Tool holder



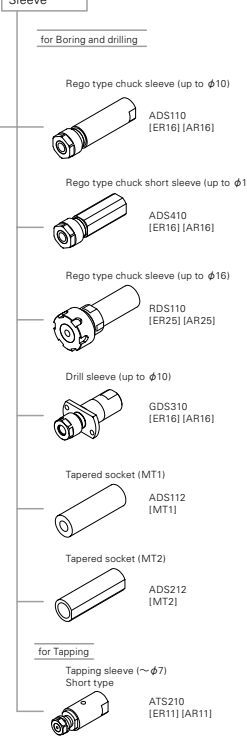
Rotary tool



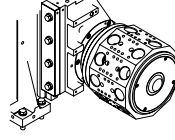
sleeve holder



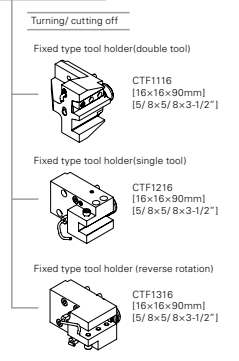
Sleeve



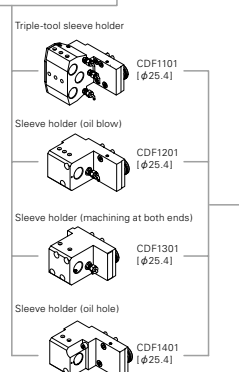
for Turret tool post



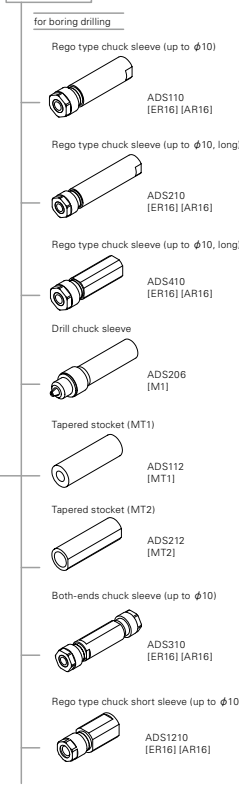
Tool holder



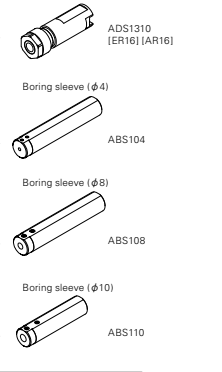
Sleeve holder



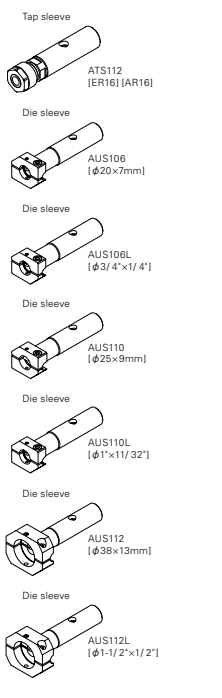
sleeve



Rego type chuck sleeve (up to $\phi 10$, oil hole)



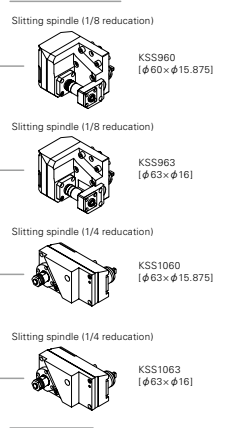
for Tapping and die machining



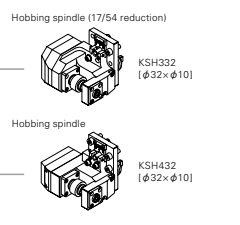
End face drilling spindle (double-speed spindle)



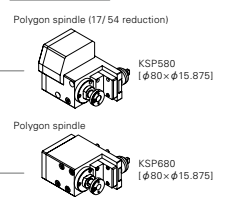
Slitting spindle



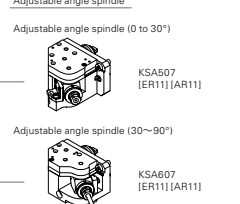
Hobbing spindle



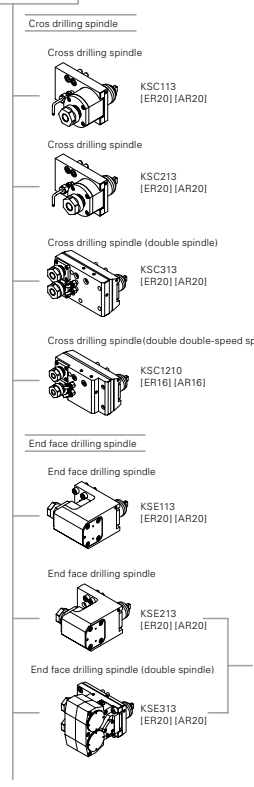
Rotary tool



Adjustable angle spindle



Rotary tool



Machine Specification

Item	M32		
	V	VII	VIII
	M32 - 5M5	M32 - 5M7	M32 - 5M8
Max. machining diameter (D)	32 mm dia. (38 mm ^{ØP})		
Max. machining length (L)	320 mm/1 chucking		
Max. front drilling diameter	12 mm dia.		
Max. tapping diameter for the front spindle	M12 (Cutting tap)		
Main spindle speed	Max. 8,000 min ⁻¹		
Max. chuck diameter for the back spindle	32 mm dia. (38 mm ^{ØP})		
Max. drilling diameter for the back spindle	12 mm dia.		
Max. tapping diameter for the back spindle	M12 (Cutting tap)		
Max. length of the back spindle workpiece	145 mm (Standard recovery unit)		
Back spindle speed	Max. 8,000 min ⁻¹		
Gang rotary tools			
Max. drilling diameter	8 mm dia.		
Max. tapping diameter	M8 (Cutting tap)		
Main spindle speed	Max. 9,000 min ⁻¹		
Turret rotary tools			
Max. drilling diameter	12 mm dia.		
Max. tapping diameter	M12 (Cutting tap)		
Main spindle speed	Max. 6,000 min ⁻¹		
Back rotary tools			
Max. drilling diameter	8 mm dia.		
Max. tapping diameter	M6 (Cutting tap)		
Main spindle speed	Max. 6,000 min ⁻¹		
Number of tools	25 to 27 + α	23 to 31 + α	30 to 36 + α
Turning tools	5		
Cross drills	5 to 7		8 (including 4 B-axis drills)
Gang tool post backside drills	Max. 4		4 (including 4 B-axis drills)
Number of turret stations	10		
Back tool post drills	5	Max. 9	
Tool size			
Turning tool	□ 16 mm		
Sleeve diameter	25.4 mm dia.		
Chuck and bushing			
Main spindle collet chuck	FC081-M (FC251-M: 38-mm dia. Opt.)		
Back spindle collet chuck	FC081-M-K (FC251-M-K: 38-mm dia. Opt.)		
Guide bushings	FG531-M and WFG531-M (FG581-M: 38-mm dia. Opt.)		
Rapid feed rate			
X1, Y1, Z1, Z2, X3, Z3	32 m / min		
Y3	—	32 m / min	
X2	18 m / min		
Y2	12 m / min		
B1	-		50 min ⁻¹
Motors			
Front spindle drive	5.5 / 7.5 kW		
Back spindle drive	5.5 / 7.5 kW		
Gang rotary tool drive	2.2 kW		
Turret rotary tool drive	2.2 kW		
Back rotary tool drive	1.0 kW		
Pneumatic unit: Required pressure and required flowrate	0.5 MPa at 110 NL/min. (When stationary)		
Machine main unit dimensions	(W) 2,860 × (D) 1,465 × (H) 1,900 mm		
Weight	4,250 kg	4,300 kg	
Power supply voltage	AC200V ± 10%		
Rated power consumption	24 kVA		25 kVA
Full-load current	79 A		
Main breaker capacity	100 A		

Main standard accessories

Main spindle chucking unit	Back spindle chucking unit
Gang rotary tool driving unit	Back rotary tool driving unit *Types VII, VIII
Rotary guide bushing unit	Rotary guide bushing drive unit
Coolant unit (with level detector)	Concentrated lubricating oil supply unit (with level detector)
Air-driven knock-out device for back machining	Air-driven workpiece separator
Machine relocation detector	Spindle cooling unit
Door lock	Machine internal lighting
Automatic fire extinguishing unit	

Special accessories

Knock-out jig for through-hole workpiece	Motordriven knock-out device for back machining
Cut-off tool breakage detector	Long workpiece unit
Product unloader	Workpiece conveyor
Chip conveyor	Medium-pressure coolant unit
High-pressure coolant unit	Coolant flow rate detector
3-color signal tower	M32 special tool

Standard NC functions

CINCOM SYSTEM M830W (Mitsubishi Electric) *Types V, VI	CINCOM SYSTEM M850W (Mitsubishi Electric) *Type VII
15-inch XGA touch panel	USB slot
Program storage capacity: 160 m (Approx. 64 KB)	Tool offset pairs: 99
Product counter indication (up to 8 digits)	User-opened disk capacity of 10 MB
Preparing operation functions	Operating time display function
Machine operation information display	Spindle C-axis function
B-axis control function *Type VIII	Back machining program skip function
Interference check function	Impact detection function
Spindle speed change detector	Constant peripheral speed control function
Automatic power-off function	Spindle 1° indexing function
On-machine program check function	Nose radius compensation
Eco display	Chamfering/Corner R function
Multiplete repetitive cycle for turning	

Special NC functions

Variable lead thread cutting	Arc threading function
3D chamfering function	Geometric command function
Spindle synchronized function	Milling interpolation function
Back spindle 1° indexing function	Back spindle C-axis function
Back spindle chasing function	Canned cycle for drilling
Synchronized tapping phase adjustment function	Synchronized tapping function
High-speed synchronized tapping function	Differential speed rotary tool function
Optional block skip (9 sets)	Tool life management I
Tool life management II	Program storage capacity: 4800 m (1,920 KB)
User-opened disk capacity of 100 MB	External memory program driving
Submicron commands	User macros
Inclined helical interpolation function	Inclined helical interpolation function
Hob function	Polygon function
Inch command	Sub inch command
Network I/O function	RS232C connector
LFV model, 2	LFV mode3
Rotary tool feed per revolution	

Environmental Information

Basic Information	Energy usage	Supply voltage	AC200 V
		Electrical power requirement	V, VII : 24 kVA , VIII : 25 kVA
Environmental Performance Information	Power consumption	Required pneumatic pressure	0.5 MPa
		Standby power	0.779 kW
		Power consumption with model workpiece ^{*1}	0.0217 kWh/cycle
		Power consumption value above converted to a CO2 value ^{*2}	10.3 g /cycle
	Air consumption	Required air flow rate	65 NL/min (Power ON), 110 NL/min (Normal), 175 NL/min (With air blow)
Approach to Environmental Issues	Lubricating oil consumption	At power ON	5.5 cc / 30min
	Noise level	Value measured based on JIS	72 dB
	Recycling	Indication of the material names of plastic parts	Detailed in the part list ^{*3}
Environmental management		We pursue Green Procurement, whereby we make our purchases while prioritizing goods and services that show consideration for the environment.	

*1 : This is the power consumption in program operation (when not cutting) for one of our standard test pieces, shown for the purpose of comparing the environmental performance with that of existing models.

*2 : This is the value converted in accordance with the CHUBU Electric Power CO2 emissions coefficient for 2017 as published by the Ministry of the Environment.

*3 : If polyvinyl chloride (PVC) and fluorine resin are not processed correctly, they can generate harmful gases. When recycling these materials, commission a contractor that is capable of processing them appropriately.

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CITIZEN

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