Cincom

M32

Sliding Headstock Type CNC Automatic Lathe

The M32
The market leader re-defined

– more tools, – more functions, – more flexibility, – higher productivity, – same floor space, – more value

The M32 is renowned for its leading capability for 3 tool simultaneous machining in a compact floor space. The all round combination of flexible tooling, large tool capacity, and outstanding ease of use has made the M32 our success story in the new century.

The next generation M32 increases the 3 tool simultaneous machining abilities with a new Y3 axis on the back tool post which carries up to 9 tools (up to 6 driven). New advanced functions include a B axis on the gang tool post with 4 axis simultaneous containing control. There are 4 types of new M32: M32-III, -V, -VII and -VIII.

## Y axis on the back tool post
(types VII and VIII)

The back tool post can accommodate holders in 3 rows (two rows for rotary tools and one for fixed tools) and up to nine tools can be used. All 3 rows are under Y3 axis control. The specifications of the outer diameter milling spindle (GSC1110), 3-drilling spindle (GSE1510) and 3-sleeve holder (GDF1501) are common to those used on the gang tool post and they can
be used both on the gang tool post and the back tool post.
* The use of GSE1510 and GDF1501 on the gang tool post is applicable to types III, V and VII.

B axis with 3 rotary tools on the gang tool post (type VIII)

The B axis is the slant axis in reference to the Y1 axis. When drilling a slant hole on a conventional machine, an adjustable angle spindle on the turret was required, but now rotary tools incorporating a B axis can be used to change the angle by program command, enabling slanted holes at a number of angles. Contouring with simultaneous 4-axis control is also possible (the angle range is −10° to 95°).
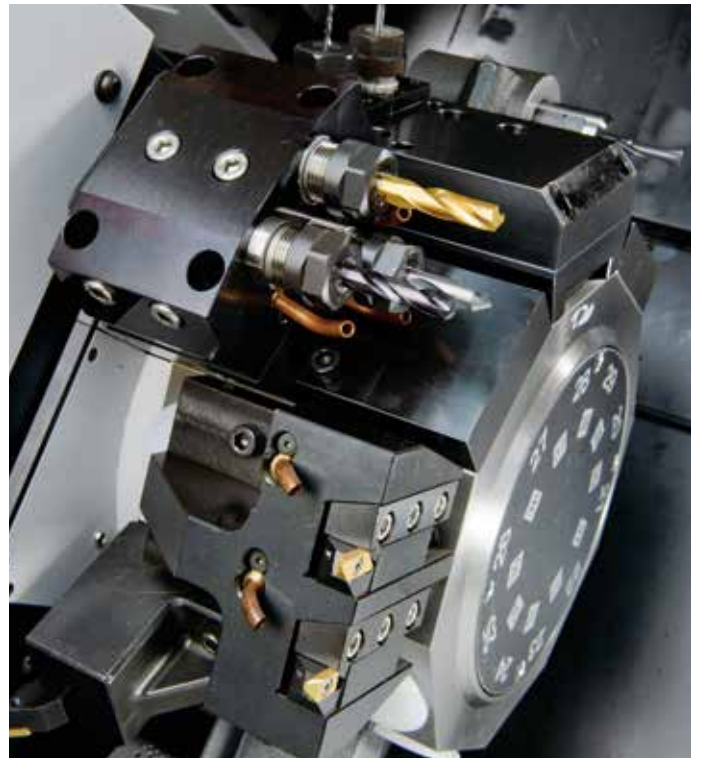
Improved turret capability

The turret geometry is carried over from the previous generation to deliver tool holder compatibility. An improved Z2 axis stroke allows simultaneous machining with opposed turning tools or rotary tools on the gang tool post thus enabling pinch/balanced turning and pinch/balanced cross drilling and milling. Turret indexing can take place in any position which reduces cycle time.

Choice of 4 models

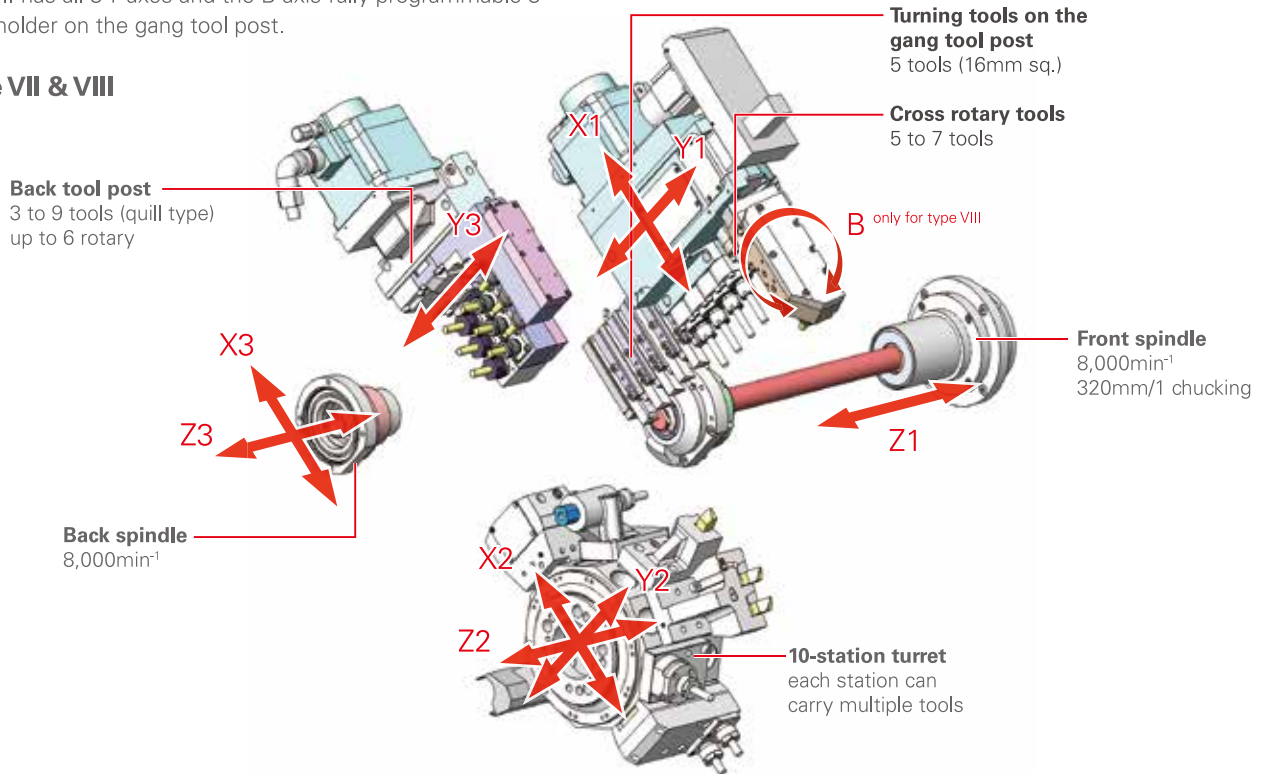## Selectable by 1, 2 or 3 Y axes and B axis

The new M32-III is the successor model to the original M32 with Y axis to the gang tool post now with the capability of an angle adjustable 3-rotary tool holder on the gang tool post. The M32-V additionally has Y2 axis to the turret and the M32-VII adds the new Y3 axis and the 9 position back tool post with 6 driven and 3 fixed tool positioning.

The M32-VIII has all 3 Y axes and the B axis fully programmable 3 rotary tool holder on the gang tool post.
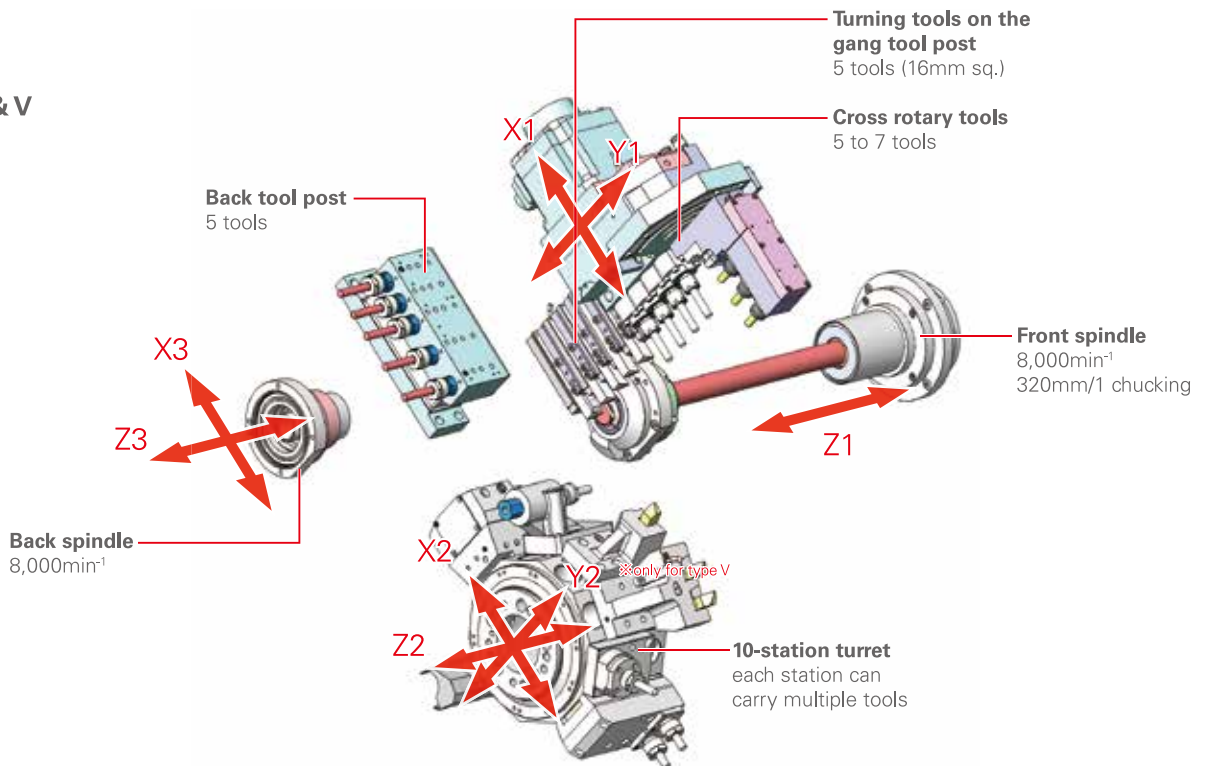
Machine configuration by M32 type

	III	V	VII	VIII
Y2 axis (turret Y axis)	N/A	Available	Available	Available
Y3 axis (back tool post Y axis)	N/A	N/A	Available	Available
B axis (rotary tools on the gang tool post)	N/A	N/A	N/A	Available

M32 type VII & VIII

Back tool post
3 to 9 tools (quill type)
up to 6 rotary

Back spindle
8,000min^{-1}

Turning tools on the gang tool post
5 tools (16mm sq.)

Cross rotary tools
5 to 7 tools

B only for type VIII

Front spindle
8,000min^{-1}
320mm/1 chucking

10-station turret
each station can
carry multiple tools

M32 type III & V

Back tool post
5 tools

Back spindle
8,000min^{-1}

Turning tools on the gang tool post
5 tools (16mm sq.)

Cross rotary tools
5 to 7 tools

Front spindle
8,000min^{-1}
320mm/1 chucking

※only for type V
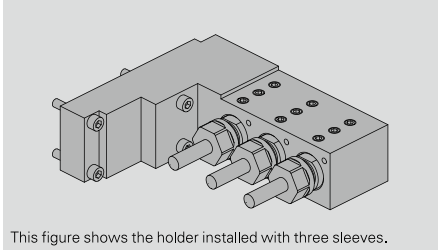
10-station turret
each station can
carry multiple tools

Tooling options for endless machining possibilities

Flexible multiple tooling combinations

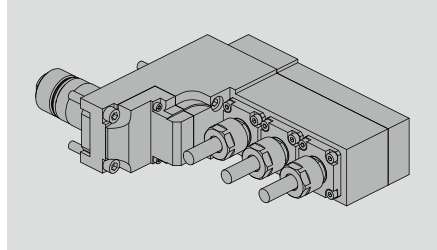This figure shows the holder installed with three sleeves.

GDF1501

3-tool sleeve holder

Up to three fixed drill sleeves can be carried.

The GDF1501 is mountable in one of the rotary tool positions of the gang tool post, U34B, of type III, V and VII models, or in back rotary tool drive device U152B of type VII and VIII machines.
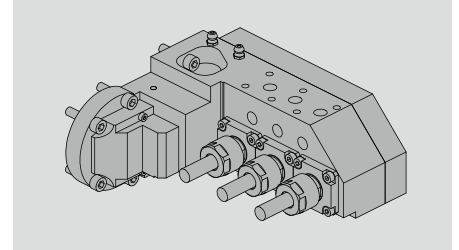Sleeve dia: 25.4 mm Dia.

GSE1510

3-tool drilling spindle

Used for drilling and end milling. Mountable in the 5th rotary position of the gang tool post, U34B, of type III, V and VII models, or in back rotary tool drive device U152B of type VII and VIII machines. When mounted in U34B, the angle can be manually adjusted between 0°and 90°.
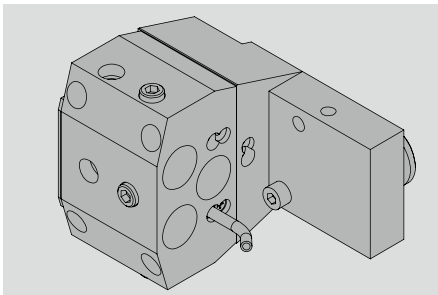Max. chuck dia: 10 mm Dia.
Chuck model: ER16

SEU810

3-tool drilling spindle

Used for face, cross or angle drilling/milling. Mountable in the 5th rotary position of the gang tool post, U33B, of type VIII models. The angle can be designated by B axis command -10° to +95°. Simultaneous 4 axis contouring is possible.
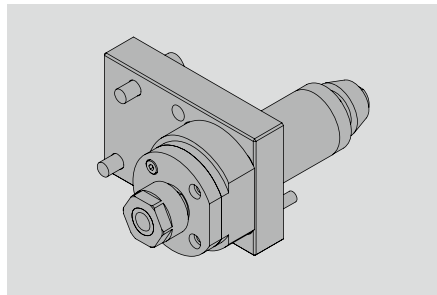Max. chuck dia: 10 mm Dia.
Chuck model: ER16

CDF901

Fixed type sleeve holder (Triple sleeve)

Up to three fixed drill sleeves can be mounted on one turret position. Including coolant nozzle.
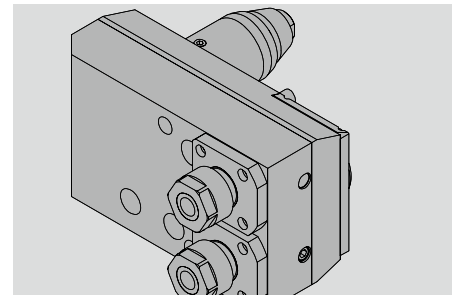Not usable on type III
Sleeve dia: 25.4 mm Dia.

KSC110

Cross drilling spindle

Turret mounted holder used for drilling and end milling in the cross machining direction. Suitable for pinch/balanced cross drilling in conjunction with rotary tools on gang tool post.
Max. chuck dia: 10 mm Dia.
Chuck model: ER16

KSC510

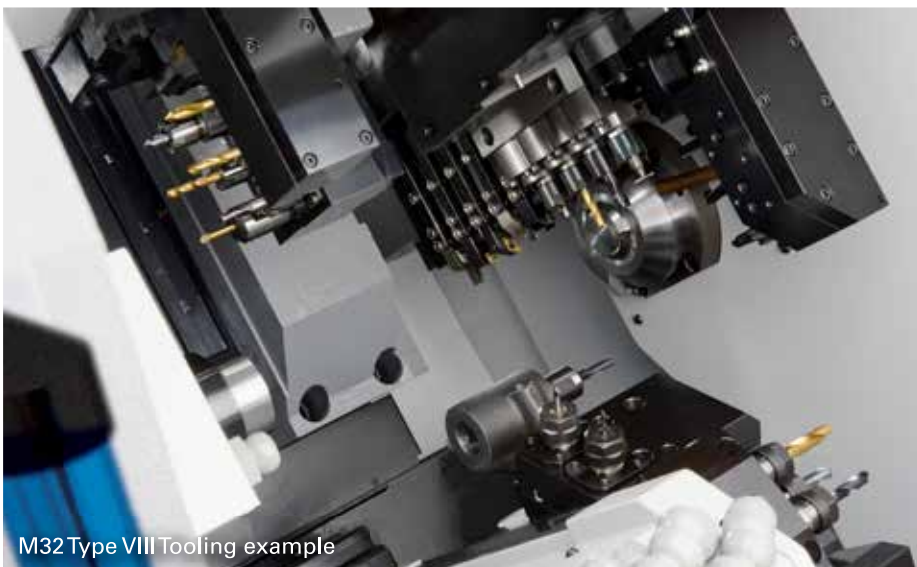Cross drilling spindle (Double)

Turret mounted holder used for drilling and end milling in the cross machining direction. Suitable for pinch/balanced cross drilling in conjunction with rotary tools on gang tool post.
Not usable on type III
Max. chuck dia: 10 mm Dia.
Chuck model: ER16

M32 Type VIII Tooling example

Making operation easier for you

You can add the product unloader device and chip conveyor

Latest high speed CNC unit
Start-up time, screen switching and processing times are considerably shorter. 'Cincom Control' is adopted to further reduce cycle times.

Operation panel
The pivoting operation panel enables easy operation whilst simultaneously viewing the machining process.
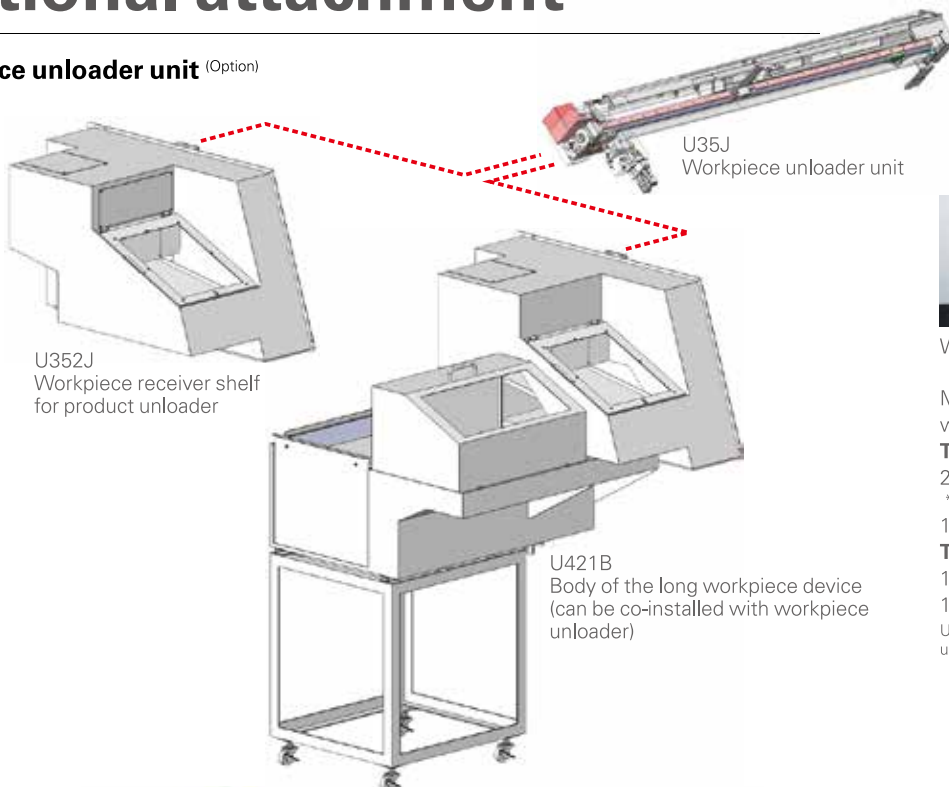
Product collection
The workpiece is ejected from the back spindle into the product chute or optional workpiece conveyor for collection. See below for optional fully programmable workpiece unloader unit which offers the advantage of controlled removal of the workpiece from the back spindle.
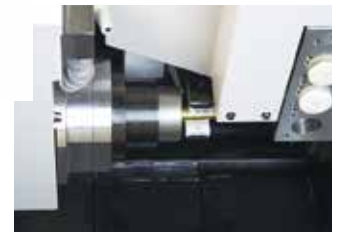
Optional attachment

Workpiece unloader unit (Option)

U35J
Workpiece unloader unit

U352J
Workpiece receiver shelf
for product unloader

U421B
Body of the long workpiece device
(can be co-installed with workpiece
unloader)

Workpiece collection with hand

Maximum workpiece collection length
when using U35J
Type III and V
225mm (with hand)
 *Up to 315 mm possible with the knock-out device removed
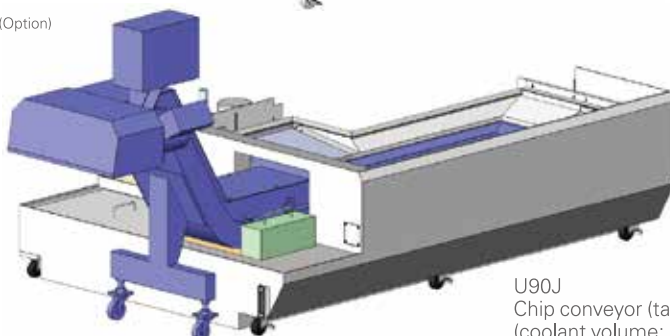110mm (with basket U351J)
Types VII and VIII
195mm (with hand)
110mm (with basket U351J)
U35J longitudinal motion is programmable; hand clamp /
unclamp by M code.
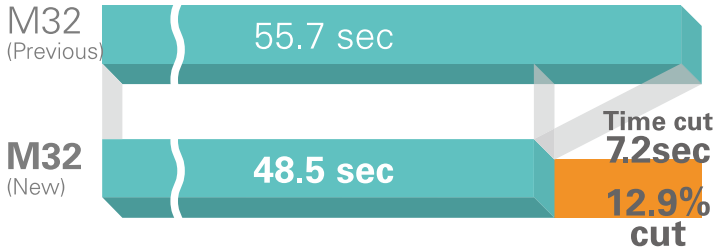
Chip conveyor (Option)

U90J
Chip conveyor (tank-integrated type)
(coolant volume: 270L)

Environmentally friendly products

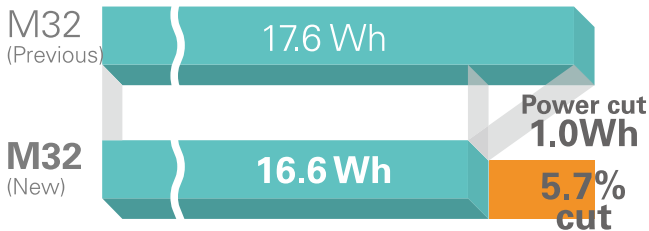## Reducing not only cycle time but also power consumption

Cycle time and Power consumption
Comparison with previous model

Cycle Time

M32
(Previous)

55.7 sec

M32
(New)

48.5 sec

Time cut
7.2sec
12.9%
cut

Average power consumption per component

M32
(Previous)

17.6 Wh

M32
(New)

16.6 Wh

Power cut
1.0Wh
5.7%
cut

Citizen has developed a new control system for high-speed, smooth axis motion. "Cincom Control" reduces not only cycle time but also power consumption. Consideration has been given to saving energy and resources by adopting control methods that reduce power consumption, such as the idling stop function, and by optimizing consumption of oil/air for lubrication.
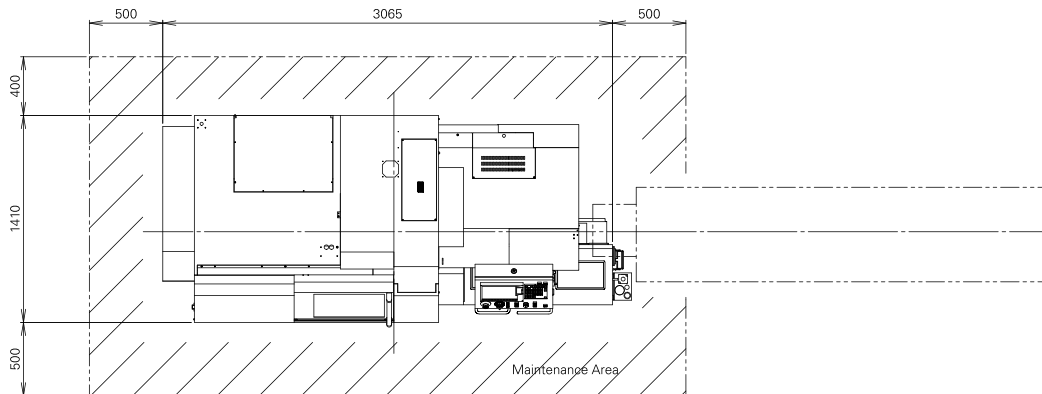Consideration has also been given to the environment by using materials that are easy to recycle, increasing the percentage of recyclable materials used, and eliminating hazardous substances in conformity with the RoHS Directive.
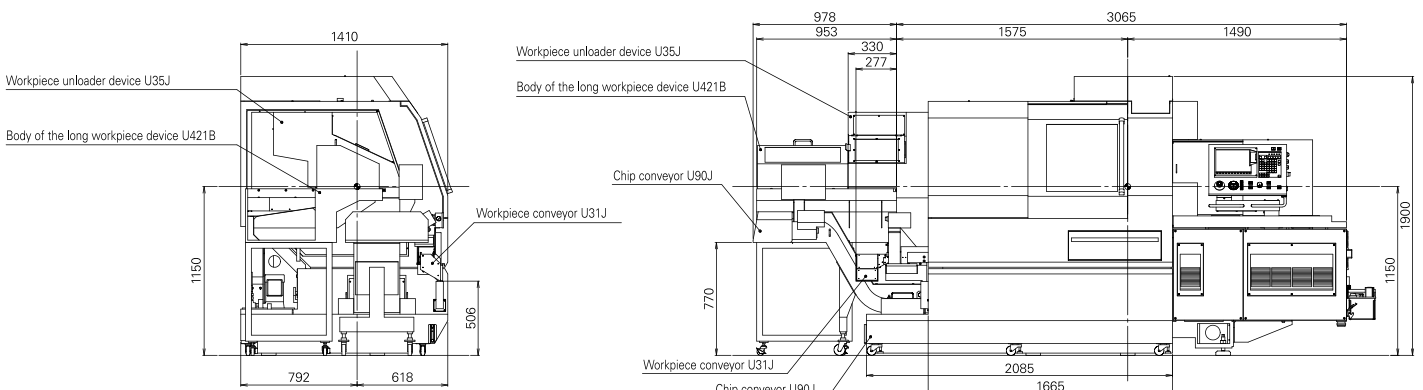
Machine Layout

M32 Machine Layout with options

Maintenance Area

M32 Machine Layout

Workpiece unloader device U35J
Body of the long workpiece device U421B
Workpiece conveyor U31J
Chip conveyor U90J

Machine Specification

Item	Type III (M32-4M3)	Type V (M32-4M5)	Type VII (M32-4M7)	Type VIII (M32-4M8)
	M32			
Max. machining diameter (D)	32mm dia. (35mm^{OP})			
Max. machining length (L)	320mm/1 chucking			
Max. front drilling diameter	12mm dia.			
Max. front tapping diameter (tap, die)	M10			
Spindle through-hole diameter	36mm dia.			
Main spindle speed	8,000min^{-1}			
Max. drilling diameter for the gang rotary tool	8mm dia.			
Max. tapping diameter for the gang rotary tool	M6			
Spindle speed of the gang rotary tool	6,000min^{-1} (Rating 4,500min^{-1})			
Max. drilling diameter for the turret rotary tool	10mm dia.			
Max. tapping diameter for the turret rotary tool	M8			
Spindle speed of the turret rotary tool	6,000min^{-1}			
Max. drilling diameter for the back spindle	10mm dia.			
Max. tapping diameter for the back spindle	M10			
Back spindle speed	8,000min^{-1}			
Max. drilling diameter for the back tool post rotary tool	—		8mm dia.	
Max. tapping diameter for the back tool post rotary tool	(Option)		M6	
Spindle speed of the back tool post rotary tool	—		6,000min^{-1}	
Max. chuck diameter of the back spindle	32mm dia.			
Max. protrusion length of the back spindle workpiece	65mm			
Max. protrusion length	145mm			
Number of tools to be mounted	25+a		29+a	31+a
Gang tool post	5			
Gang rotary tool	5			4
Gang B axis rotary tool	0			3
Number of turret station	10			
Back tool post	5		9	
Tool size				
Tool (gang tool post)	16mm sq.			
Sleeve	25.4mm dia.			
Chuck and bushing				
Main spindle collet chuck	FC081-M			
Back spindle collet chuck	FC081-M-K			
Guide bushing	FG531-M			
Rapid feed rate				
All axes (except X2 & Y2)	32m/min			
X2 axis	18m/min			
Y2 axis	—	8m/min		
Y3 axis	—		32m/min	
Motors				
Spindle drive	3.7/7.5kW			
Back spindle drive	2.2/3.7kW			
Gang tool post rotary tool drive	1.0kW			
Turret rotary tool drive	0.75/1.5kW			
Back tool post rotary tool drive	—		1.0kW	
Coolant oil	0.4kW			
Lubricating oil	0.003kW			
Center height	1150mm			
Rated power consumption	14.5kVA			
Full-load current	53A			
Main braker capacity	75A			
Weight	3450kg	3500kg	3550kg	

Standard accessories

Main spindle chucking unit	Air-driven knock-out device for back machining
Rotary guide bushing unit	Workpiece separator
Back spindle chucking unit	Machine relocation detector
Gang rotary tool driving unit	Door lock
Coolant unit (with level detector)	Lighting
Lubricating oil supply unit (with level detector)	

Special accessories

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

Standard NC functions

NC unit dedicated to the M32 (M730LPC-4VS)	Automatic power-off function
10.4 inch color liquid crystal display (LCD)	On-machine program check function
Program storage capacity : 40m (Approx.16KB)	Nose radius compensation
Tool offset pairs : 40	Chamfering, corner R
Product counter indication (up to 8 digits)	Format check function
Operating time display function	Alarm block display function
Spindle speed change detector	Eco display
Constant surface speed control function	Machine operation information display
Spindle C-axis function	

Special NC functions

Variable lead thread cutting	Program storage capacity : 1200m (Approx.480KB)
Arc threading function	Tool offset pairs : 80
Geometric function	Tool life management I
Spindle synchronized function	Tool life management II
Milling interpolation	External memory program driving
Back spindle 1°indexing function	Network I/O function
Back spindle C-axis function	Submicron commands
Back spindle chasing function	User macros
Canned cycle drilling	Helical interpolation function
Rigid tapping function	Inclined helical interpolation function
High speed Rigid tapping function	Hob function
Rigid tapping phase adjustment function	Polygon function
Differential speed rotary tool function	Inch command
Optional block skip (9 sets)	Sub inch command
Back machining program skip function	3D camfering function

Environmental Information

Basic Information	Energy usage	Power supply voltage	AC200V
		Electrical power requirement	14.5kVA
		Required pneumatic pressure	0.5MPa
Environmental Performance Information	Power consumption	Standby power *1	0.524kW
		Power consumption with model workpiece *2	0.017kWh/cycle
		Power consumption value above converted to a CO_2 value *3	8.1g/cycle
	Air consumption	Required air flow rate	90Nl/min(max. 240 NL/min., during air blow)
	Lubricant consumption	At power ON	5.5cc/30min
	Noise level	Value measured based on JIS	80dB
Approach to Environmental Issues	Environmental load reduction	RoHS Directive / REACH regulations	Compliant
	Recycling	Indication of the material names of plastic parts	Covered in the instruction manual *4
	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 standby power in the idle stop mode (a function that turns servomotor excitation off when it is not necessary, for example during program editing).
*2: 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.
*3: This is the value converted in accordance with the CHUBU Electric Power CO_2 emissions coefficient for 2009 as published by the Ministry of the Environment.
*4: If polyvinyl chloride (PVC) and fluoric resin are not processed correctly they can generate harmful gases. When recycling these materials, commission a contractor that is capable of processing them appropriately.