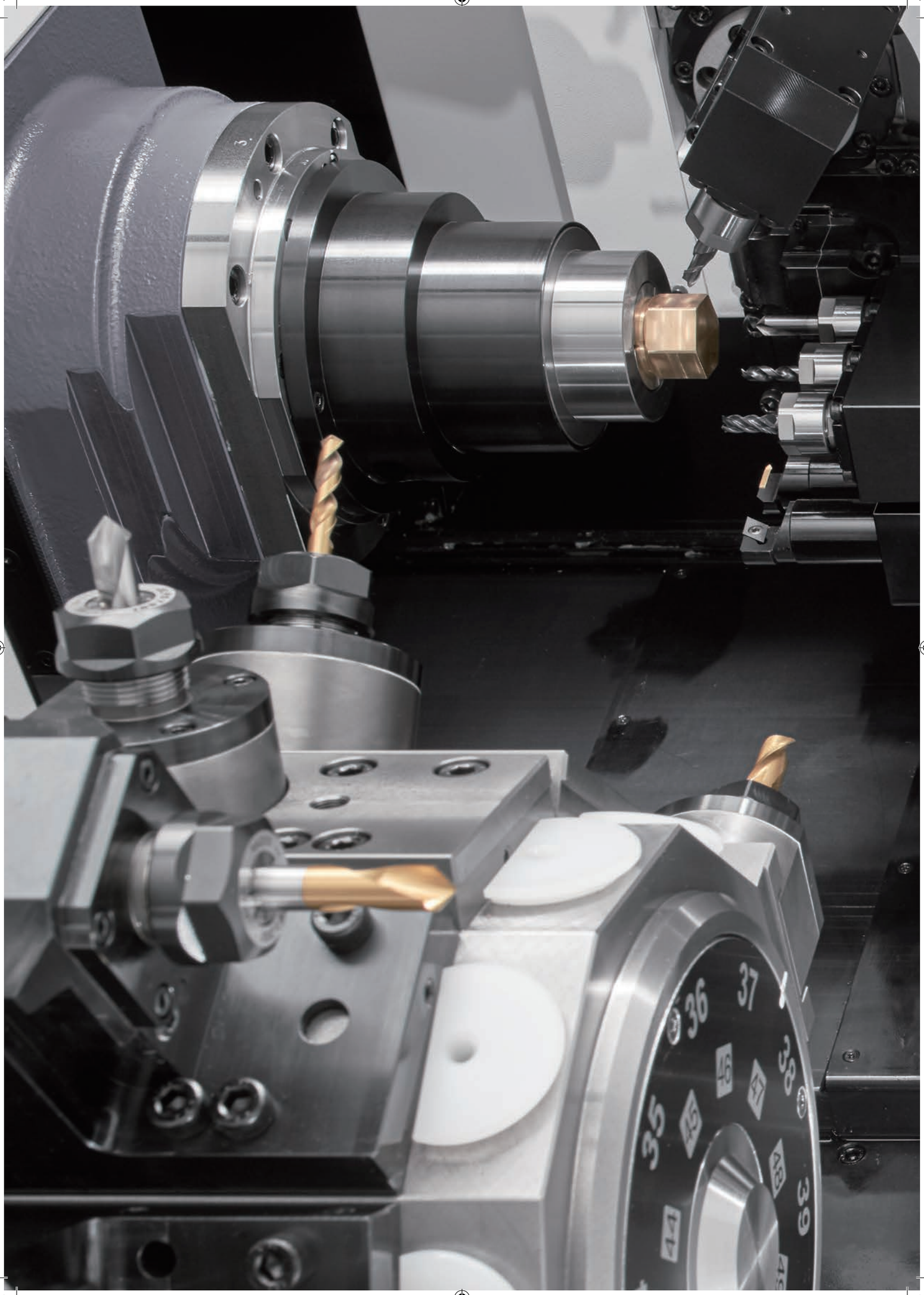
CITIZEN

Cincom

M32

Sliding Headstock Type CNC Automatic Lathe

LFV technology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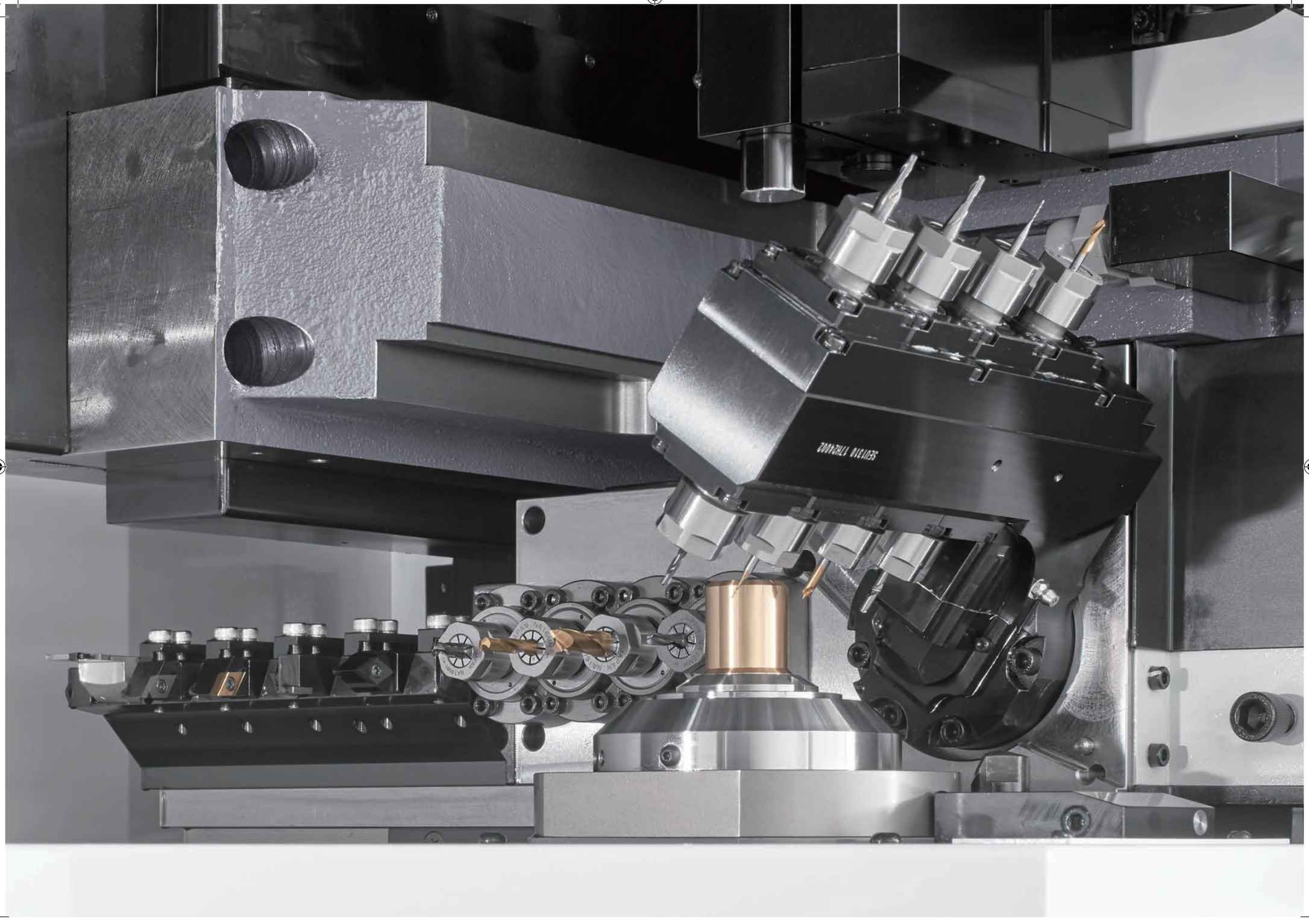


M32-VIII

Ultimate Gang + Turret: The M32 is Reborn

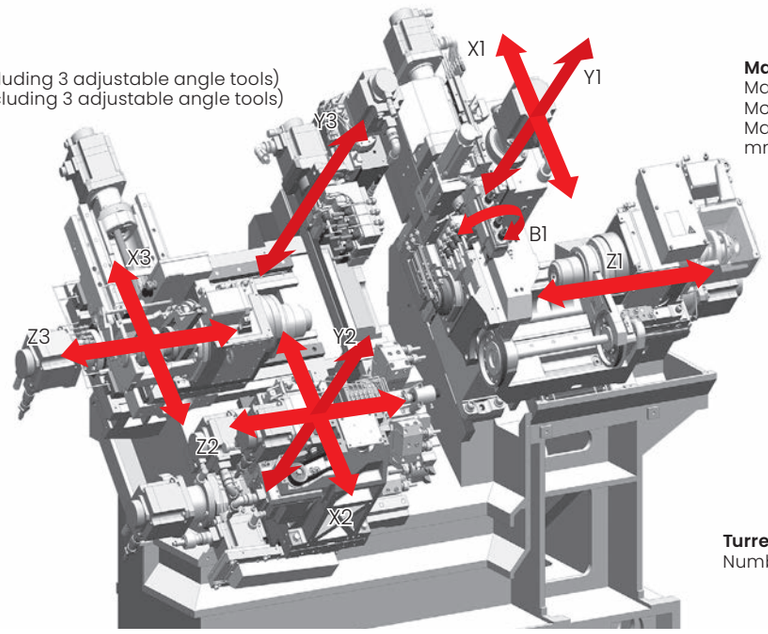
While inheriting the basic configuration of “gang tool post + turret”, the new M32 has pursued the optimal balance of strength and weight through structural analysis, and greatly improves the rigidity that is the cornerstone of machining.
In addition, a single drive mechanism is introduced for rotary 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, achieving 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 angular spindle (Type VII/VIII) for more complex machining in combination with the Y axis. Enhanced back machining capability is also increased due to the flexibilty of the machining process.
In addition, a 38mm oversized specification option is available, and it is possible to switch between guide bush and guide bushless operation.

Basic Structure

The image shows the type VIII

Rear tool post
Type V: 5 stations
Type VII: Max. of 9 stations (including 3 adjustable angle tools)
Type VIII: Max. of 9 stations (including 3 adjustable angle tools)

Opposed spindle
Main spindle speed: 8,000 min^{-1}
Motor: 5.5/7.5 kW



Main spindle
Main 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 turret stations: 10

Machine configuration by type

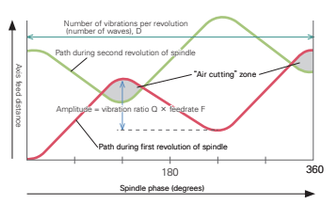
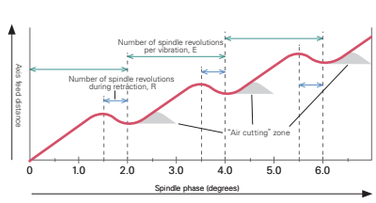
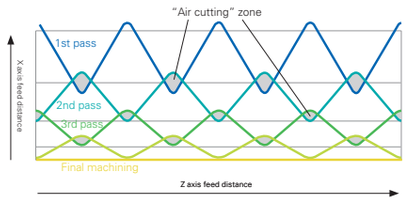
Type	V	VII	VIII
B axis (gang rotary tools)	–		●
Y3 axis (back tool post Y axis)	–	●	●
Driven tool capability on rear tool post	–	●	●
Total number of tools	25to36+ *α*	23to40+ *α*	30to36+ *α*

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)

LFV Function (Optional)

LFV technology 4-AXIS

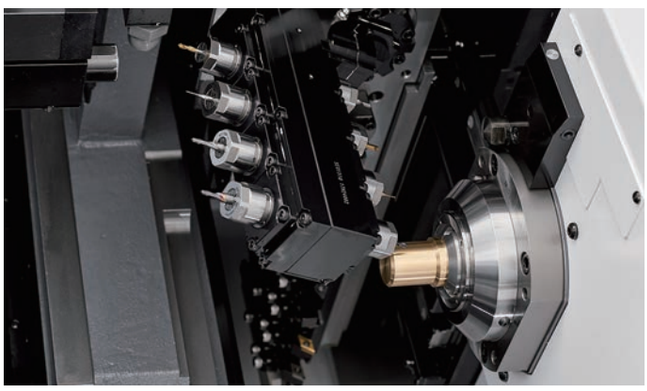
LFV (low-frequency vibration cutting) is a technology for performing machining whilst oscillating the X and Z servo axes in the cutting direction in synchronisation with the rotation of the spindle. It reduces all problems caused by swarf entangling with the component or tool, and is effective for small-diameter deep hole machining and the machining of difficult to chip 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			

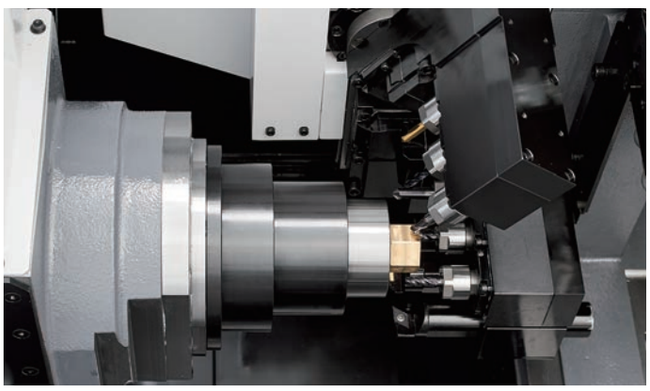
Model	Front side LFV	Back side LFV	LFV mode 1	LFV mode 2	LFV mode 3
V	X1, Z1	X3, Z3	✔	✔	✔
VII			✔	✔	✔
VIII			✔	✔	✔

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

The gang tool post features a fully programmable B axis (back face 45°, front face 105°)(Type VII).
The rear tool post has been equipped with a 3 tool adjustable angle spindle (type VII and VIII) to provide even more complex machining.
Equipped with a Y-axis on the rear tool post and a B-axis on the gang tool post enabling complex machining, whilst extending the range of machining operations on the back spindle. This creates a higher degree of flexibility in the allocation of machining processes, which tended to be biased toward the front spindle, increasing productivity.



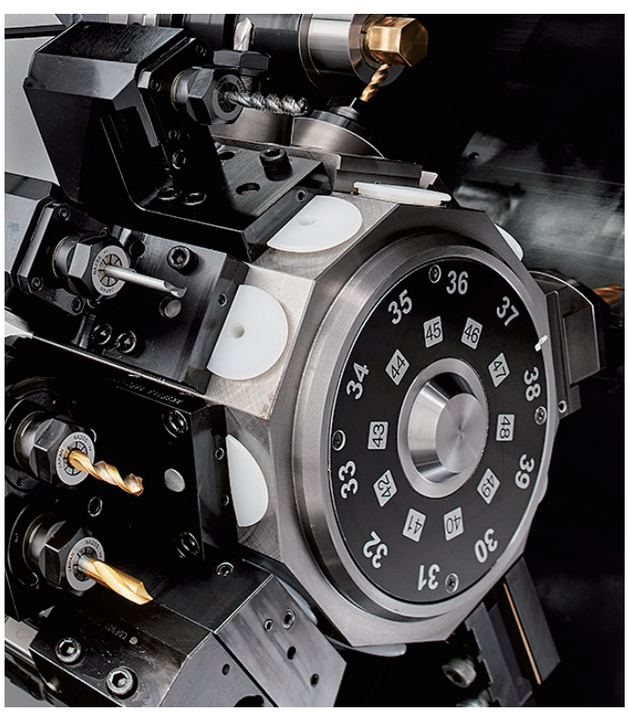
B axis: rotary tools on the gang tool post



3 tool adjustable angle spindle

New turret adopting single tool 'direct' drive

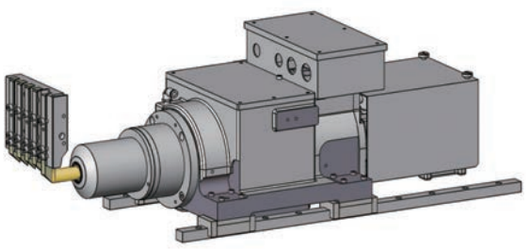
Utilised for the first time by Cincom, a single drive mechanism whereby only the selected rotary tool rotates.
Elimination of wasted rotation of non-selected tools enables powerful machining with high accuracy while suppressing heat generation, vibration and loss of power.
It also extends the lives of gears and bearings, and reduces running costs.
Furthermore, the increased rigidity of the internal gears and bearings enables high-torque transmission. An improved motor with high torque of 2.2 kW/22 Nm, (which is more than twice the torque of the previous M32 models), for driving rotary tools on the turret tool post.



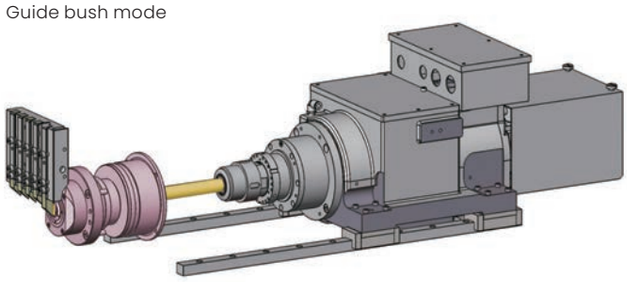
Switchable between guide bush and guide bushless operation

When machining long thin workpieces, the machine is used as a guide bush type. When producing less than two and half times diameter components, it can be used in guide bushless mode. The benefits are shorter bar remnants and ability to use bar stock with variable diameter tolerance.

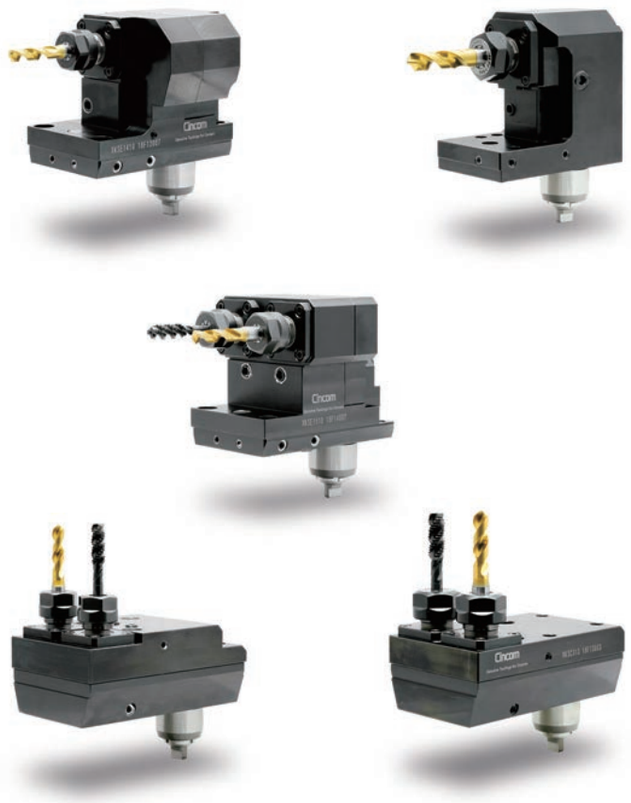
Guide bushless mode



Guide bush mode

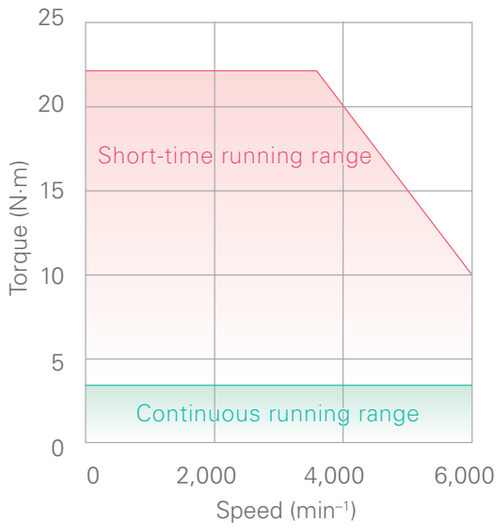


Double speed rotary tool



For rotary tools on the turret, 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

Operator access has been increased to 165% of the size of previous M model machines, giving increased space for more efficient tool setting. By also expanding the size of the window, visibility when the door is closed is improved.

Control panel with new HMI (human machine interface)

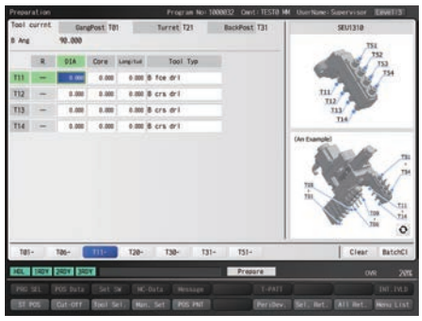
The control panel featuring the new HMI (human machine interface) is equipped with a 15-inch touch screen, improving machine operating convenience for the operator.
In addition, the universal design concept is applied to the colour scheme of the control panel for the first time. It considers the fact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

MUD Media Universal Design

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

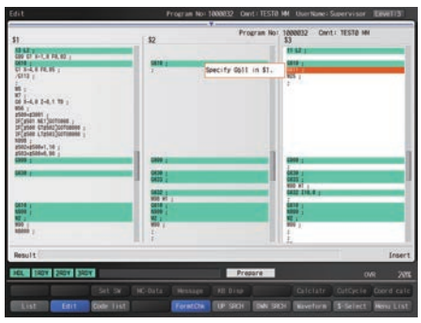
NC Functions

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



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

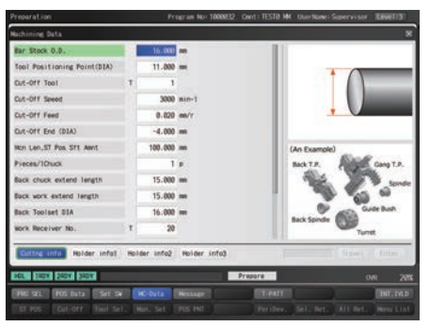
Turret tool post tool setting
On machine tool setting is possible for the turret tool post as well as for the gang tool post.



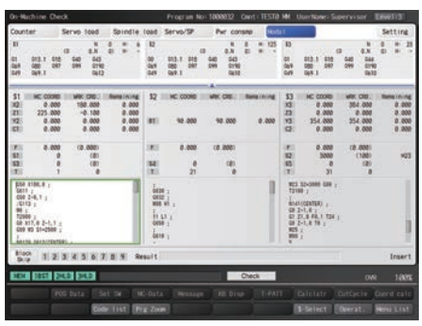
Format check
On the Edit screen, the operator can check whether there are any syntax errors in the program before running it.

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

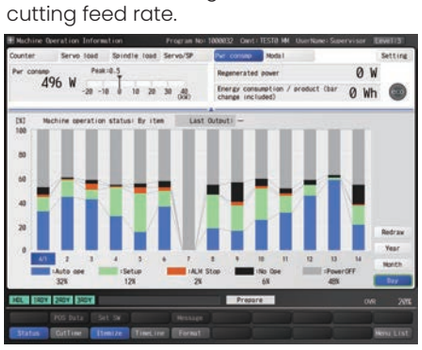
Rapid feed override
It is also possible to control only the rapid feed rate in accordance with the setting of the dial while fixing the override for the cutting feed rate.



Machining data screen
In response to the selection of an item, the corresponding illustration is displayed on the screen so that the operator can easily recognise the meaning of the selected item.



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.

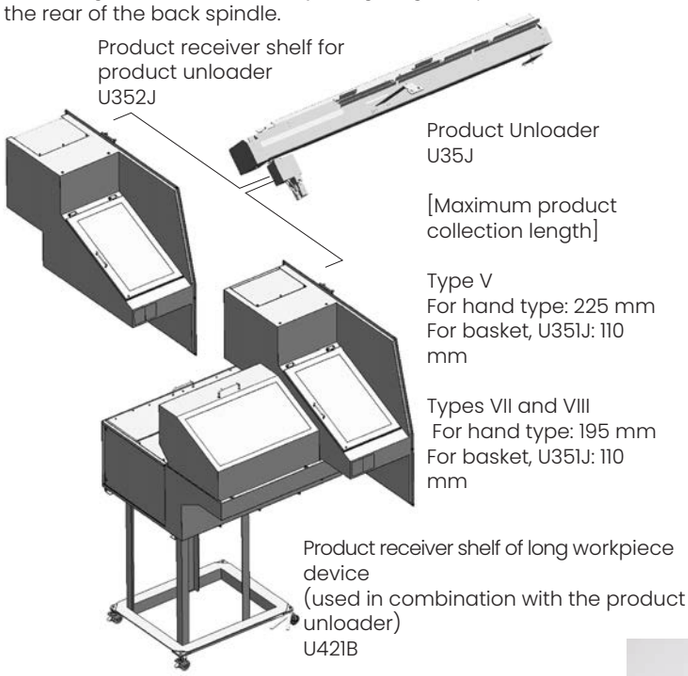


Machine operating status screen
This screen classifies the operating status as five items - automatic operation time, alarm stop time, setup time, non-operation time, and power OFF time - and displays graphs for each of these items or in a time series.

Options

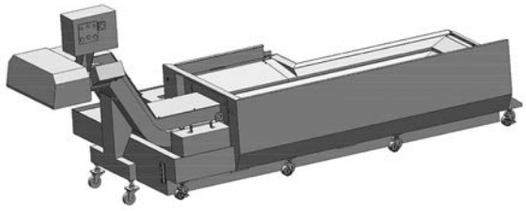
Product Unloader

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.



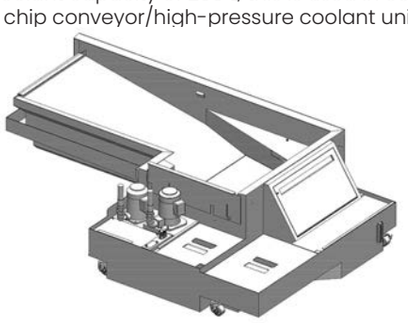
Chip conveyor

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.



High-pressure coolant device

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

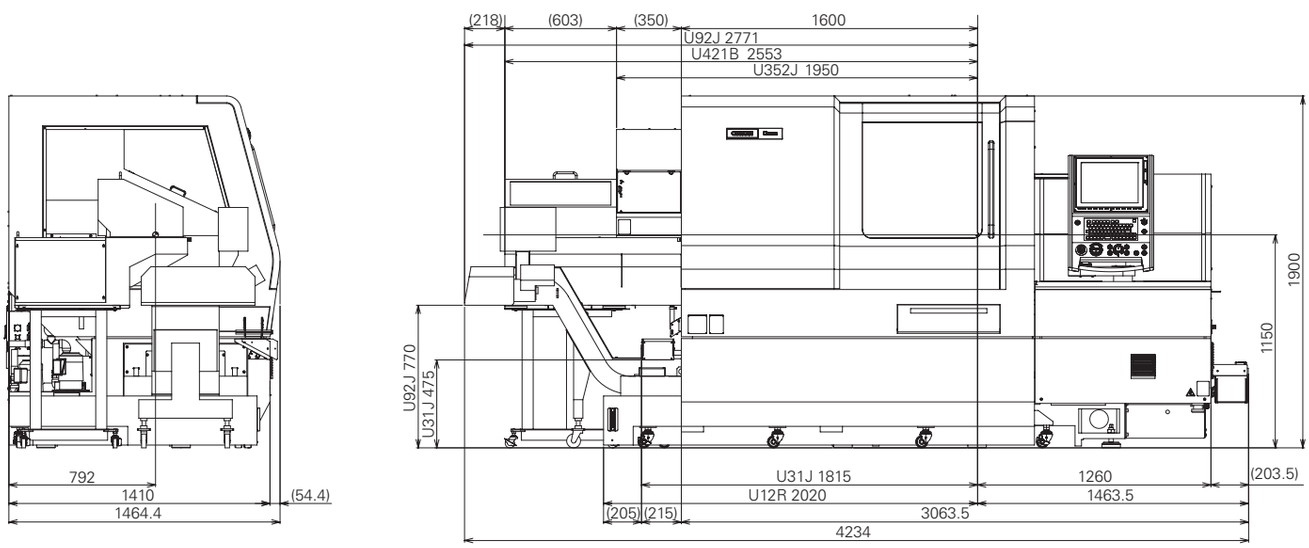
Workpiece conveyor switchbox

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

Workpiece conveyor

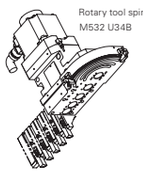
A workpiece conveyor can be equipped to facilitate the efficient mass production of workpieces. The cover over the unloading route can be opened easily, giving good maintainability too.
In addition, periodic cleaning of the chip collector basket, which was required on the existing machine, is no longer necessary due to the improvement of the structure.

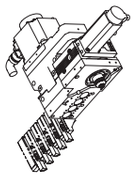
Machine dimensions



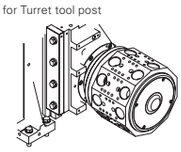
Tooling system

for Gang tools

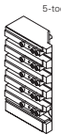

Rotary tool spindle drive unit
M532 U34B

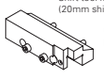

Rotary tool spindle drive unit
M532 U33B

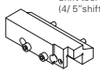
for Turret tool post



Tool holder


5-tool tool holder
GTF6116
[□16] [□5/8"]


Shift tool holder
(20mm shift, adapter type)
GTF5716
[□16]


Shift tool holder
(4/5"shift, adapter type)
GTF5716L
[□5/8"]


Internal lubrication type
5-tool tool holder
GTF6216
[□16] [□5/8"]

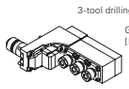

1-tool shift tool holder (5-mm shift)
GTF6312
[□12]


1-tool shift tool holder (5-mm shift)
GTF6313
[□13]

Rotary tool

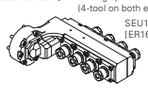

GSC1310
[ER16] [AR16]


Idle gear unit
GSD107


3-tool drilling spindle
GSE1610
[ER16] [AR16]

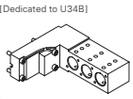
Short nut
DNU110
[ER16] [AR16]

[Dedicated toU33B]


Drilling spindle
(4-tool on both ends)
SEU1310
[ER16] [AR16]

sleeve holder

[Dedicated to U34B]


3-tool sleeve holder
[Sleeve diameterϕ25.4]
GDF1701

Sleeve

for Boring and drilling


Rego type chuck sleeve (up to ϕ10)
ADS110
[ER16] [AR16]


Rego type chuck short sleeve (up to ϕ10)
ADS410
[ER16] [AR16]


Rego type chuck sleeve (up to ϕ16)
RDS110
[ER25] [AR25]


Drill sleeve (up to ϕ10)
GDS310
[ER16] [AR16]


Tapered socket (MT1)
ADS112
[MT1]

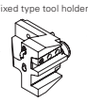

Tapered socket (MT2)
ADS212
[MT2]

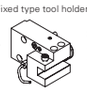
for Tapping


Tapping sleeve (～ϕ7)
Short type
ATS210
[ER11] [AR11]

Tool holder

Turning/ cutting off


Fixed type tool holder(double tool)
CTF1116
[16×16×90mm]
[5/8×5/8×3-1/2"]


Fixed type tool holder(single tool)
CTF1216
[16×16×90mm]
[5/8×5/8×3-1/2"]


Fixed type tool holder (reverse rotation)
CTF1316
[16×16×90mm]
[5/8×5/8×3-1/2"]

Sleeve holder


Triple-tool sleeve holder
CDF1101
[ϕ25.4]


Sleeve holder (oil blow)
CDF1201
[ϕ25.4]


Sleeve holder (machining at both ends)
CDF1301
[ϕ25.4]


Sleeve holder (oil hole)
CDF1401
[ϕ25.4]

sleeve

for boring drilling


Rego type chuck sleeve (up to ϕ10)
ADS110
[ER16] [AR16]


Rego type chuck sleeve (up to ϕ10, long)
ADS210
[ER16] [AR16]


Rego type chuck sleeve (up to ϕ10, long)
ADS410
[ER16] [AR16]


Drill chuck sleeve
ADS206
[M1]


Tapered stocket (MT1)
ADS112
[MT1]

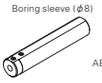

Tapered stocket (MT2)
ADS212
[MT2]


Both-ends chuck sleeve (up to ϕ10)
ADS310
[ER16] [AR16]


Rego type chuck short sleeve (up to ϕ10, oil hole)
ADS1210
[ER16] [AR16]


Rego type chuck sleeve (up to ϕ10, oil hole)
ADS1310
[ER16] [AR16]


Boring sleeve (ϕ4)
ABS104


Boring sleeve (ϕ8)
ABS108


Boring sleeve (ϕ10)
ABS110

for Tapping and die machining


Tap sleeve
ATS112
[ER16] [AR16]


Die sleeve
AUS106
[ϕ20×7mm]


Die sleeve
AUS106L
[ϕ3/4"×1/4"]


Die sleeve
AUS110
[ϕ25×9mm]


Die sleeve
AUS110L
[ϕ1"×11/32"]


Die sleeve
AUS112
[ϕ38×13mm]


Die sleeve
AUS112L
[ϕ1-1/2"×1/2"]

Rotary tool

Cros drilling spindle


Cross drilling spindle
KSC113
[ER20] [AR20]


Cross drilling spindle
KSC213
[ER20] [AR20]


Cross drilling spindle (double spindle)
KSC313
[ER20] [AR20]


Cross drilling spindle(double double-speed spindle)
KSC1210
[ER16] [AR16]

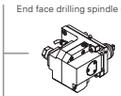
End face drilling spindle


End face drilling spindle
KSE113
[ER20] [AR20]


End face drilling spindle
KSE213
[ER20] [AR20]

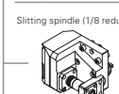

End face drilling spindle (double spindle)
KSE313
[ER20] [AR20]

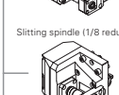
Short nut
DNU113
[ER20] [AR20]


End face drilling spindle (double-speed spindle)
KSE1410
[ER16] [AR16]


End face drilling spindle (double double-speed spindle)
KSE1510
[ER16] [AR16]

Slitting spindle


Slitting spindle (1/8 reducation)
KSS960
[ϕ60×ϕ15.875]


Slitting spindle (1/8 reducation)
KSS963
[ϕ63×ϕ16]


Slitting spindle (1/4 reducation)
KSS1060
[ϕ63×ϕ15.875]

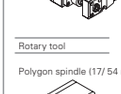

Slitting spindle (1/4 reducation)
KSS1063
[ϕ63×ϕ16]

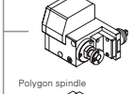
Hobbing spindle


Hobbing spindle (17/54 reduction)
KSH332
[ϕ32×ϕ10]

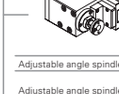

Hobbing spindle
KSH432
[ϕ32×ϕ10]

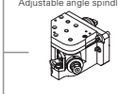
Rotary tool


Polygon spindle (17/54 reduction)
KSP580
[ϕ80×ϕ15.875]

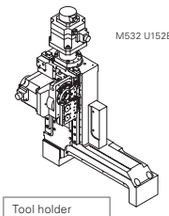

Polygon spindle
KSP680
[ϕ80×ϕ15.875]

Adjustable angle spindle


Adjustable angle spindle (0 to 30°)
KSA507
[ER11] [AR11]

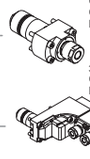

Adjustable angle spindle (30～90°)
KSA607
[ER11] [AR11]

for Back tool post



M532 U152B

Rotary tool



Outer diameter milling spindle
GSC1310
[ER16] [AR16]

3-tool drilling spindle
GSE1610
[ER16] [AR16]

Short nut
DNU110
[ER16] [AR16]

Tool holder

1-tool shift tool holder (5-mm shift)

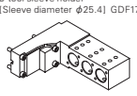
GTF6312
[□12]

1-tool shift tool holder (5-mm shift)

GTF6313
[□13]

Sleeve holder

[Dedicated toU152B]
3-tool sleeve holder
[Sleeve diameter ϕ25.4] GDF1701



Sleeve

for Boring and drilling

Rego type chuck sleeve (up toϕ10)

ADS110
[ER16] [AR16]

Rego type chuck sleeve (up toϕ10, long)

ADS210
[ER16] [AR16]

Rego type chuck short sleeve (up toϕ10)

ADS410
[ER16] [AR16]

Rego type chuck sleeve (up toϕ16)

RDS116
[ER25] [AR25]

Drill sleeve (up toϕ10)

GDS310
[ER16] [AR16]

Tapered socket (MT1)

ADS112
[MT1]

Tapered socket (MT2)

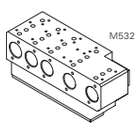
ADS212
[MT2]

for Tapping

Tapping sleeve (up toϕ7)
Short type

ATS210
[ER11] [AR11]

for Back tool post



M532 U150B

Sleeve

for Boring and drilling

Rego type chuck sleeve (up to ϕ10)

ADS110
[ER16] [AR16]

Rego type chuck sleeve (up to ϕ10, long)

ADS210
[ER16] [AR16]

Rego type chuck short sleeve (up to ϕ10)

ADS410
[ER16] [AR16]

Drill chuck sleeve

ADS206
[MT1]

Tapered socket (MT1)

ADS112
[MT1]

Tapered socket (MT2)

ADS212
[MT2]

Rego type chuck short sleeve
(up to ϕ10, oil hole)

ADS1210
[ER16] [AR16]

Rego type chuck sleeve
(up to ϕ10, oil hole)

ADS1310
[ER16] [AR16]

Rego type chuck sleeve (uo to ϕ16)

RDS116
[ER25] [AR25]

Drill sleeve (uo to ϕ10)

GDS310
[ER16] [AR16]

Boring sleeve (ϕ4)

ABS104

Boring sleeve (ϕ8)

ABS108

Boring sleeve (ϕ10)

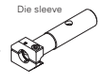
ABS110

for tapping and die machining

Tap sleeve

ATS112
[ER16] [AR16]

Die sleeve

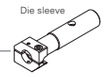


AUS106
[ϕ20×7mm]

Die sleeve

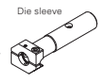
AUS106L
[ϕ3/4"×1/4"]

Die sleeve



AUS106L
[ϕ25×9mm]

Die sleeve

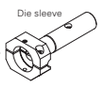


AUS110L
[ϕ1"×11/32"]

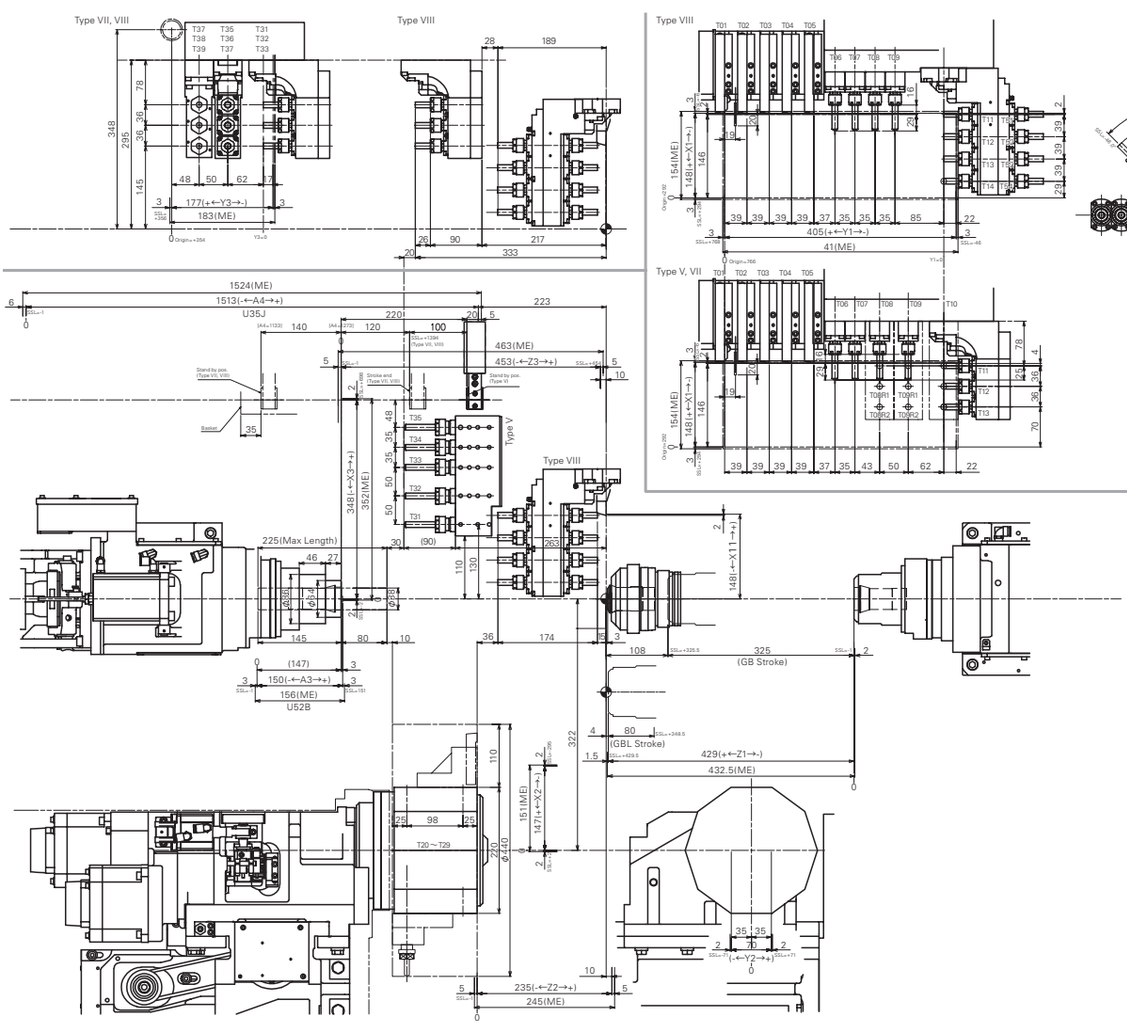
Die sleeve

AUS112
[ϕ38×13mm]

Die sleeve



AUS112L
[ϕ1-1/2"×1/2"]



Machine Specification

Item	M32-5M5	M32 - 5M7	M32 - 5M8
Max. machining diameter (D)	32 mm dia. (38 mm[OP])		
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	Max8,000 min^{-1}		
Max. chuck diameter for the back spindle	32 mm dia. (38 mm[OP])		
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	FC08H-M (FC25H-M: 38-mm dia. Opt.)		
Back spindle collet chuck	FC08H-M-K (FC25H-M-K: 38-mm dia. Opt.)		
Guide bushings	FG53H-M and WFG53H-M (FG58H-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 VI, VII
Rotary guide bushing unit	Knock-out jig for through-hole workpiece
Coolant unit (with level detector)	Lubricating oil supply unit (with level detector)
Motor knock-out device for back machining	Motor-driven workpiece separator
Machine relocation detector	Spindle cooling unit
Door lock	Machine internal lighting
Cut-off tool breakage detector	Coolant flow rate detector
Product unloader	3-colour signal tower

Special accessories	
Chip conveyor	Long workpiece unit
High-pressure coolant unit	Workpiece conveyor
Medium-pressure coolant unit	M32 special tool

Standard NC functions	
CINCOM SYSTEM M830W (Mitsubishi Electric) *Types V, VII	CINCOM SYSTEM M850W (Mitsubishi Electric) *Type VIII
15-inch XGA touch panel	USB slot
Program storage capacity: 160m (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	B-axis control function *Type VIII
Back machining program skip function	Obstruction check
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	Canned cycle for composite turning
Geometric command function	Spindle C-axis function
Spindle synchronised function	Back spindle 1° indexing function
Milling interpolation function	Back spindle chasing function
Back spindle C-axis function	Canned cycle for drilling
Synchronised tapping function	User macros
RS232C connector	

Optional NC functions	
Variable lead thread cutting	Arc threading function
Differential speed rotary tool function	3D chamfering function
Tool life management I	Synchronised tapping phase adjustment function
Program storage capacity: 4800 m (1,920 KB)	High-speed synchronised tapping function
External memory program driving	Optional block skip (9 sets)
Inclined helical interpolation function	Tool life management II
Polygon function	User-opened disk capacity of 100 MB
Helical interpolation function	Submicron commands
Hob function	Inch command
Sub inch command	Network I/O function

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