

CNC-Sliding Head Lathes

M Series

Cincom M16/Cincom M32



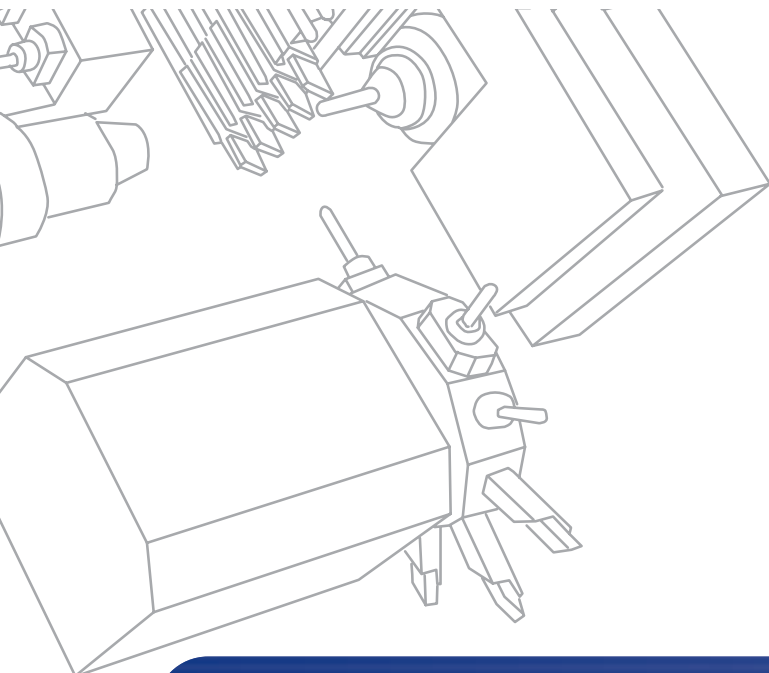
»**High End**« – our absolute top models for the highly flexible manufacture of complex parts.

## Highly Flexible Machining of Complex Parts in High Performance Cutting Applications

The third generation of Citizen's acclaimed M Series with maximum bar capacities of 16mm and 32mm machining diameter sets new standards for machining versatility, efficiency and ease of use.

The inclined-bed machine with digital AC drive technology has the capability of machining high-accuracy, complex or simple parts with minimum cycle times. The three tooling systems in combination with the Mitsubishi high-speed control allow extensive simultaneous machining operations. High-speed control functions using "Full Servo Technology" reduce machining time, operating costs and non-productive time, thus increasing productivity and output.

The state-of-the-art design of the M16-V/M32-V with Y axis in both gang tool holder and turret offer the user unique machining flexibility and superimposition options.



### Key features at a glance:

#### Versatile, flexible:

- Work envelopes (without re-chucking):  
Ø 16 x 200 mm and Ø 32 x 320 mm
- More than 40 tools may be used
- Three synchronously controlled tooling systems
- Machine-specific programming software
- Turret and gang tool holder both with Y axis (M16-V, M32-V)
- Gang tool holder with Y axis (M16-III, M32-III)

#### Precise, long life:

- Renowned accuracy and repeatability
- High machine rigidity and thermal stability
- Maximum precision and repeatability in continuous operation and during heavy-duty cutting processes.

#### Fast, time-saving:

- Short cycle times for both simple and complex parts
- Turret with 10 stations and 20 indexing positions
- All turret stations power driven
- Turret indexing via servo motors
- Simultaneous machining with three tools

## Contents



### Powerful, dynamic:

- Intelligent Digital AC drives
- Main spindle 7.5kW (M32) 2.2kW (M16)
- Sub-spindle 3.7kW (M32) 0.75kW (M16)

### User and service friendly

- Full Servo System, no hydraulic or pneumatic components
- Easy operator access
- Simple chip disposal in the inclined bed
- Easy access for maintenance
- Swivelling operating panel with 10.4" colour screen
- Automatic chuck force setting

### Easy to program:

- User friendly Mitsubishi control
- Comfortable interactive programming
- Online programming
- Powerful options and cutting data
- Easy axis movements via CNC handwheel

### Machine configuration

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### High-Speed CNC Control Mitsubishi Meldas 635 LCCH

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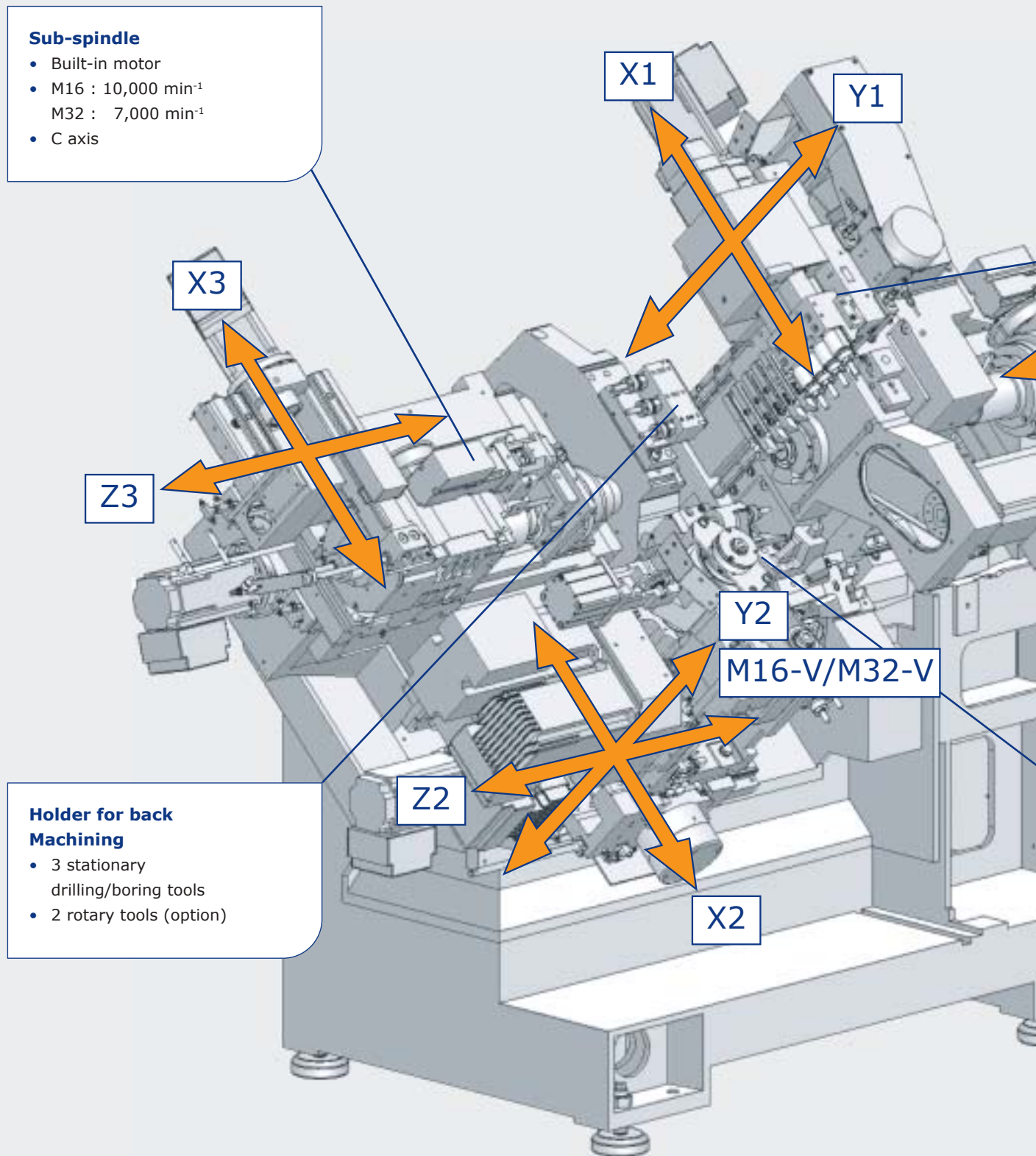
### Specification

Back flap

# M16-V/M32-V

## Sub-spindle

- Built-in motor
- M16 : 10,000 min<sup>-1</sup>
- M32 : 7,000 min<sup>-1</sup>
- C axis



## Holder for back Machining

- 3 stationary drilling/boring tools
- 2 rotary tools (option)

## The Tooling Systems

Three synchronously controlled tooling systems for the 'one-hit' machining of simple or complex parts in extremely short production times.

### Vertical holder

- 5 turning tools
- 4 rotary tools
- M16 : 8,000 min<sup>-1</sup>  
M32 : 5,000 min<sup>-1</sup>
- Synchronously driven guide bush

Z1

### Main spindle

- Built-in motor
- M16 : 10,000 min<sup>-1</sup>  
M32 : 8,000 min<sup>-1</sup>
- C axis

### Turret

- 10 stations, 20 indexing positions
- All stations power driven
- M16 : 6,500 min<sup>-1</sup>
- M32 : 5,000 min<sup>-1</sup>
- M16-V/M32-V with Y axis

### System 1

Vertical tool holder with 5 turning tools and 4 rotary tools for front machining



### System 2

The 10 station turret with 20 indexing positions carries multi-toolholders mountable for front and back machining. The turret may carry up to 40 tools. All stations are power driven.



### System 3

The triple drill holder for back machining is equipped with stationary tools. Optionally, 2 rotary tools may be used.



## Fast and user friendly

**The M series machines are controlled by 12 axes (-III) or 13 axes (-V) The seven (eight) linear axes, C axis for main and sub-spindles, plus the five auxiliary axes are all controlled synchronously by the machine's CNC control Mitsubishi Meldas 635.**

Citizen's own control software, in combination with the high speed processing of the Mitsubishi CNC system, permits simultaneous front and back machining with up to 3 tools in cut.

The control is easy to use both for programmer and machine operator. The 'Windows' operator screen, with pictorial on screen prompts, guides the user step-by-step through operation sequences, ensuring that the time required for set-ups and changeovers is minimised.

High speed internal macros ensure fast processing and short part production times. Achieving short cycle times are supported by new functions – high speed cycle time check, high-speed threading and high-speed synchronous thread cutting.

A swivelling operating panel enables the operator to easily view the machining process and display screen at the same time.

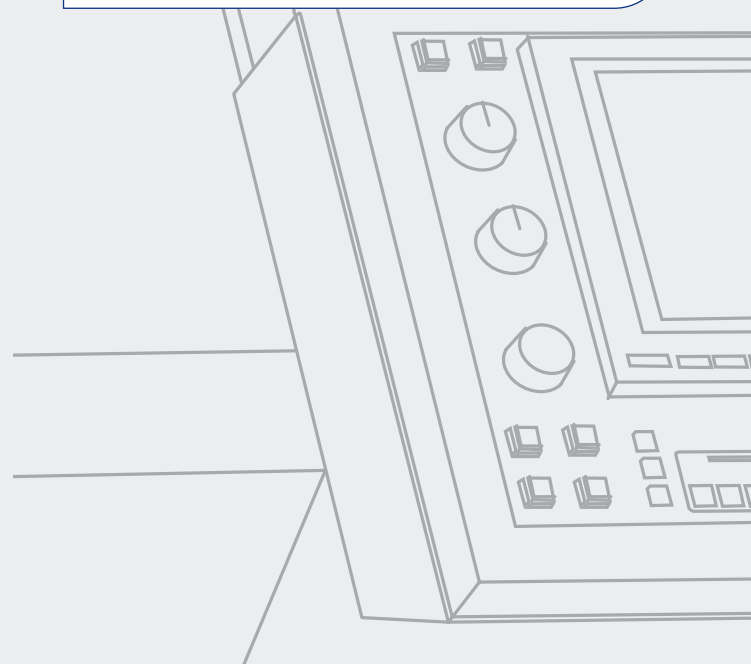
The electronic program check handwheel enables CNC beginners to quickly and safely operate the machine and prove-out new programs.

The PCMCIA card slot next to the monitor simplifies the reading in/out and storage of programs.



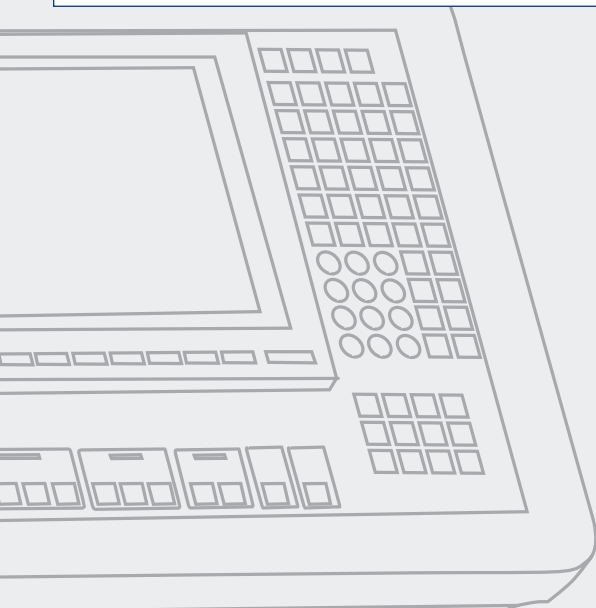
### Options (select)

- Polygon turning
- Thread whirling
- Gear milling
- Programming software
- Helical milling interpolation
- Tool life monitoring



### Features of the CNC control

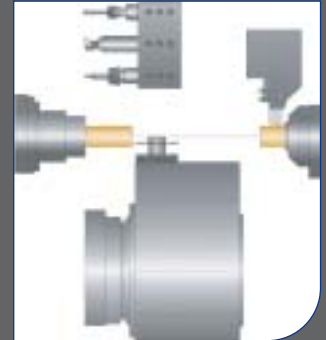
- Simultaneous or single machining
- Synchronous tapping at main and sub-spindles
- Manual axis movements using the electronic handwheel
- Tool offset 40 pairs
- Absolute measuring system (no reference point return required)
- Background edit function
- Threading cycle at main and sub-spindle
- Programming of 4 M functions in one block
- Program buffer for actual part program 64 kB (160m tape length)
- I/O interface for RS232C
- Self-diagnosis function
- Part counter display (max. 8 digits)
- Part production time control function
- Support function for program generation (processor, M & G code list/cutting data and coordinate calculation)
- Automatic power-off function
- Cut-off breakage monitoring
- Preparation function (automatic guide bush and collet adjustment, tool setting at the machine)



**Minimum part production times through simultaneous machining with two spindles and 3 tools.**

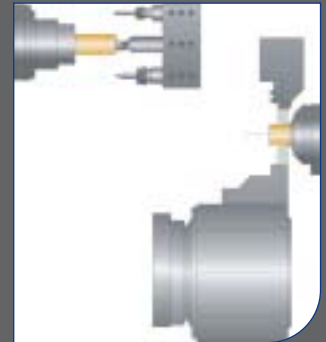
#### **Simultaneous machining with two tools.**

Turning at the main spindle, slotting at the sub-spindle.



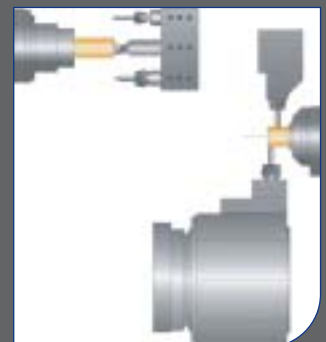
#### **Simultaneous machining with three tools.**

Turning with vertical holder and turret at the main spindle, drilling at the sub-spindle.



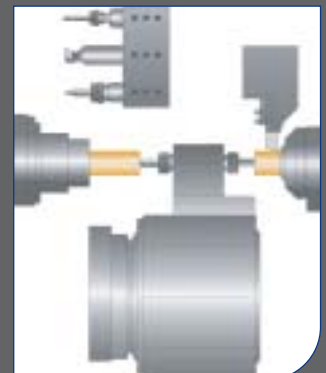
#### **Simultaneous machining with three tools.**

Milling with vertical holder and turret at the main spindle, drilling at the sub-spindle.



#### **Simultaneous machining with three tools.**

Turning and drilling at the main spindle, drilling at the sub-spindle.

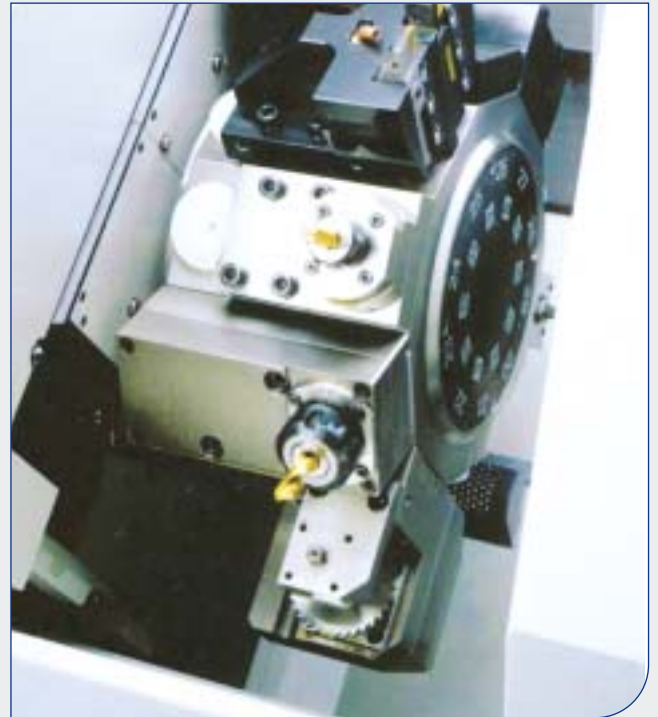


## Positioning with lightning speed and high accuracy

Each of the 10 turret stations has an intermediate indexing position for carrying multiple toolholders and 2 mounting positions for front turning or back turning. Multiple tools carrying both front and back working tools are possible. In addition, the second Y axis of the M16-Y and M32 -Y models further enhances machining flexibility. Multiple toolholders include twin turning, drilling, milling holders & triple drilling holder.

The type -V models allow easy centre-height adjustment and increase further the capability for off-centre milling & drilling.

Coolant galleries through both turret and designated toolholders facilitate the use of high pressure coolant to improve life, improve swarf management and increase unattended operation.



### Tools for Y Axis



#### For M32-V

##### Triple drilling holder CDF901

- Tool diameter 25.4 mm
- with through-the-tool coolant supply



##### Holder for two rotary tools KSC510

- Collet type ER 16



##### Twin drilling holder CTF1116

- Tool dimensions 16 x 16 x 90 mm
- with through-the-tool coolant supply

#### For M16-V

##### Triple drilling holder VTF701

- Tool diameter 19,05 mm
- with through-the-tool coolant supply

##### Holder for two rotary tools MSC407

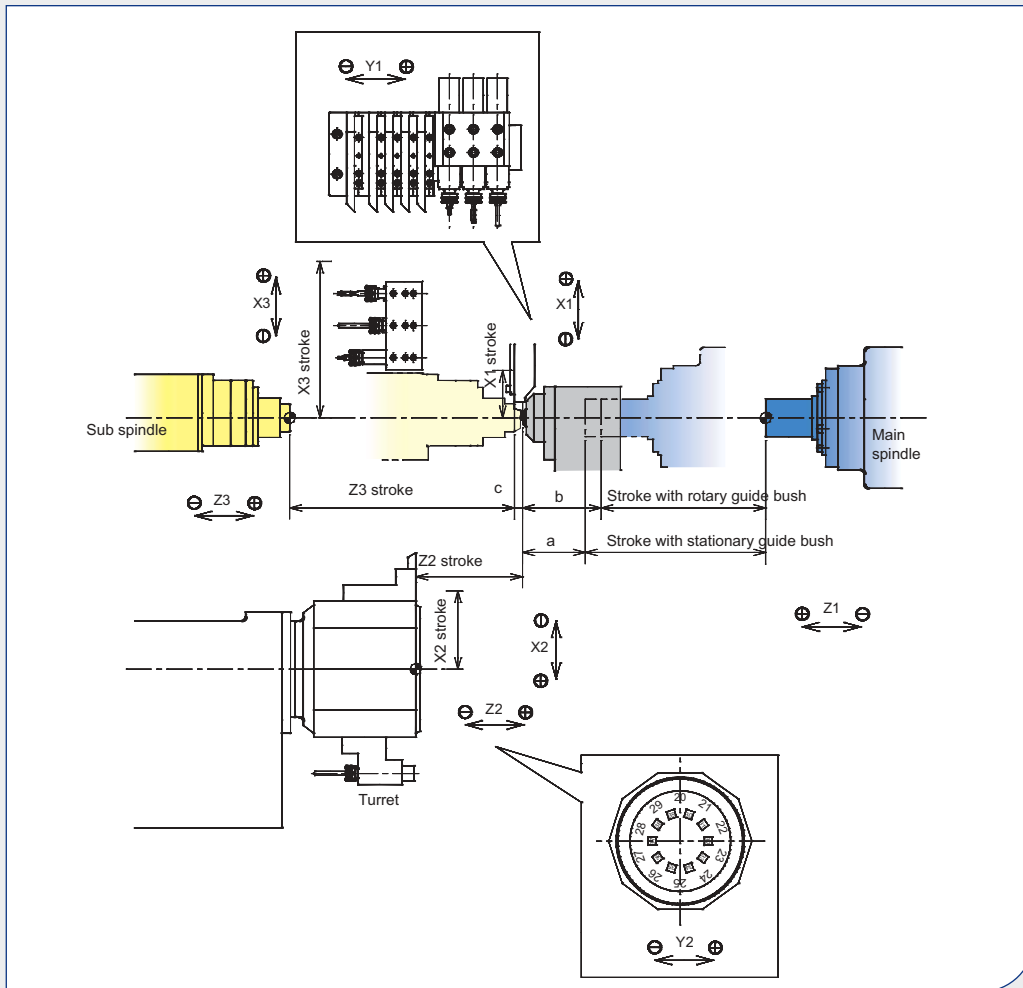
- Collet type ER 11
- 10 mm offset from guide bush

##### Twin drilling holder VTF1510

- Tool dimensions 10 x 10 x 60 mm
- with through-the-tool coolant supply

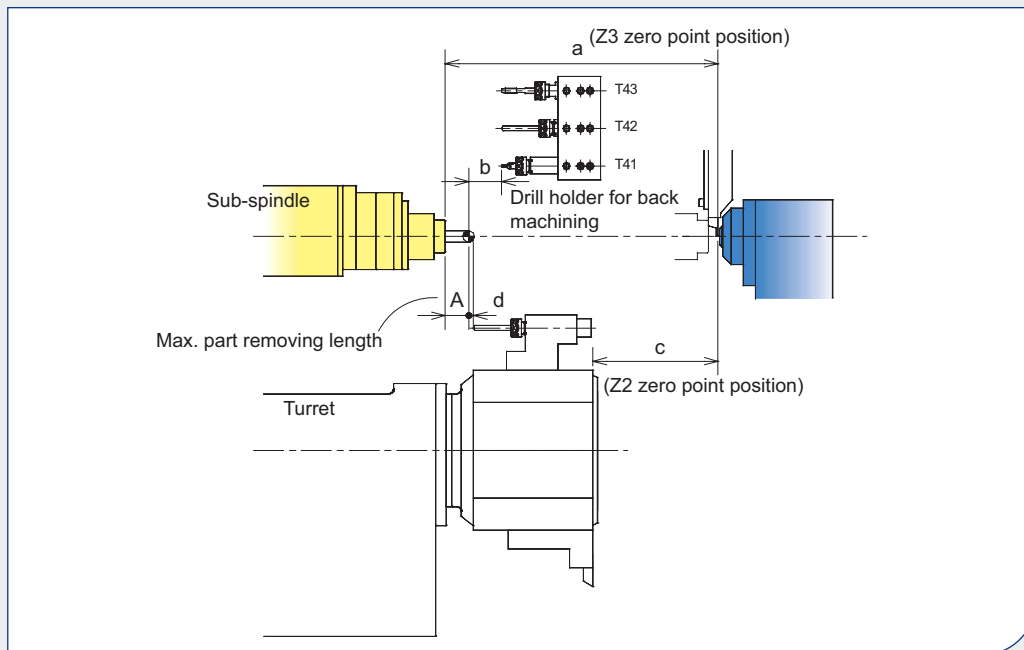


## Tool Layout and Strokes



Strokes (mm)	Cincom M16	Cincom M32
X1 stroke	60.5	108.0
Z1 stroke	205.0	325.0
Y1 stroke	208.0	275.0
X2 stroke	97.5	Type III: 135.5 Type V: 120.5
Z2 stroke	133.0	202.0
Y2 stroke	32.0	45.0
X3 stroke	195.0	235.0
Z3 stroke	280.0	410.0
a	88.0	135.0
b	98.0	135.0
c	10.0	10.0

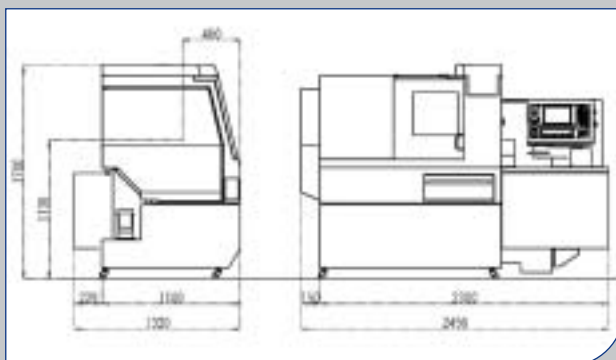
## Tool Layout and Strokes



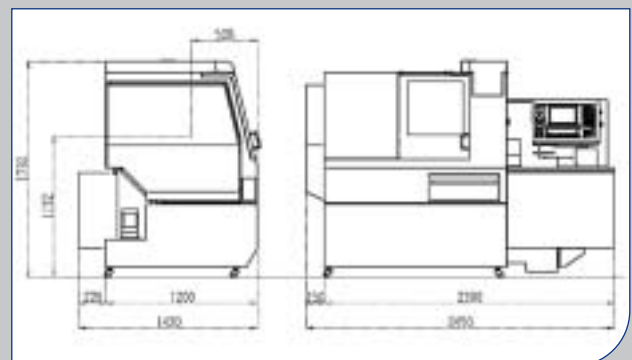
Strokes (mm)	Cincom M16	Cincom M32
A max. machining length	25.0	65.0
a	290.0	420.0
b	35.0 (25.0)	80.0 (70.0)
c	133.0	202.0

## Machine installation diagram M16-III/M16-V

M16-III

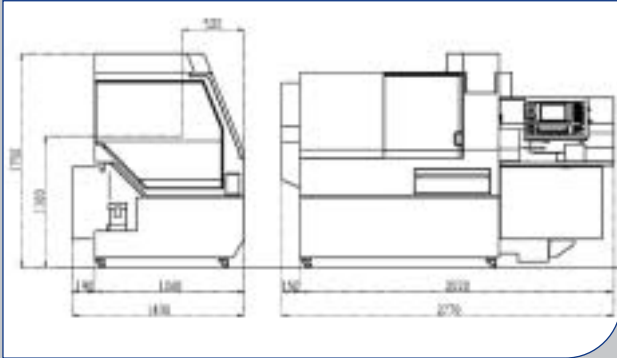


M16-V

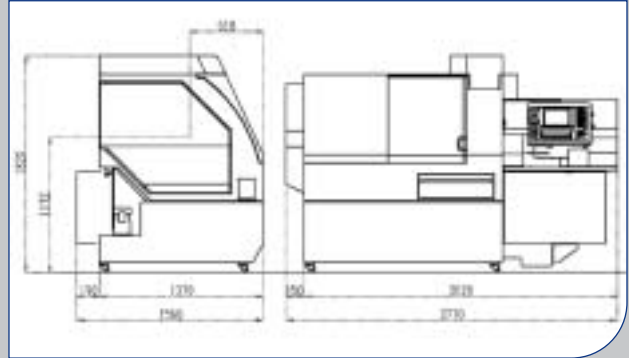


## Machine installation diagram M32-III/M32-V

M32-III



M32-V



## Optional Accessories



### Part unloading system U35J

Unloading time is reduced. The system unloads the finished part from the sub-spindle using a gripper. All turret stations available for carrying tools.



### Drilling holder with rotary tools for back machining U151B

Collet type ER 16. Two stations for rotary tools and one station for one stationary tool.



### Long part option

For workpieces longer than 125mm (M16) or 145mm (M32). The unit guides the long part through the sub-spindle discharging it to the left side of the machine.



### Chip conveyor

Automatic discharge of the chips towards the left machine side.

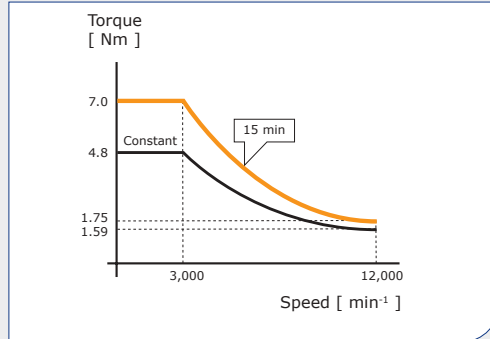
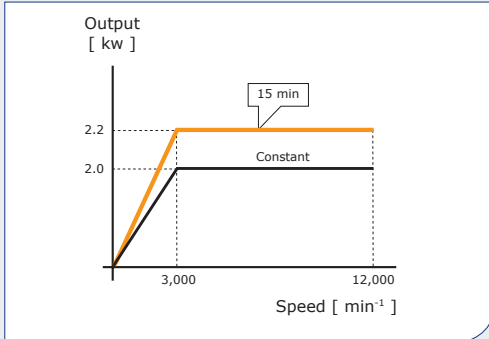


### Coolant supply through the turret U701R

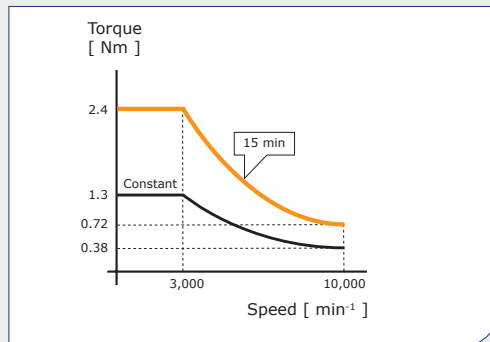
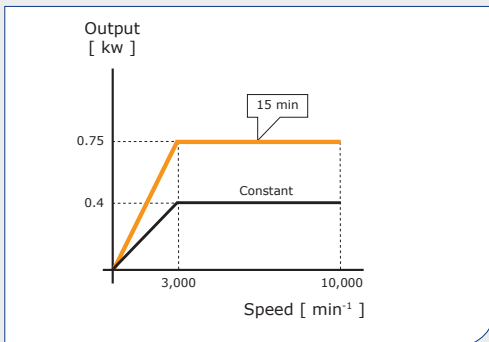
The coolant may selectively be directed to defined turret stations. High-pressure coolant supply through the turret is also possible. Special tool holders are available for this purpose.

# Power and Torque Diagrams

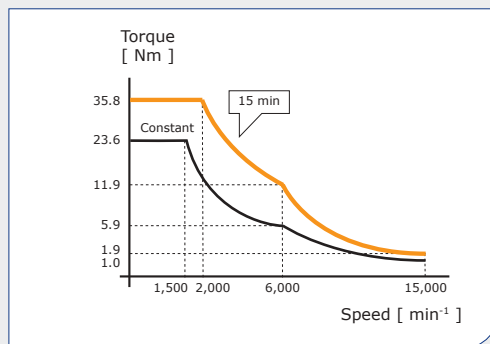
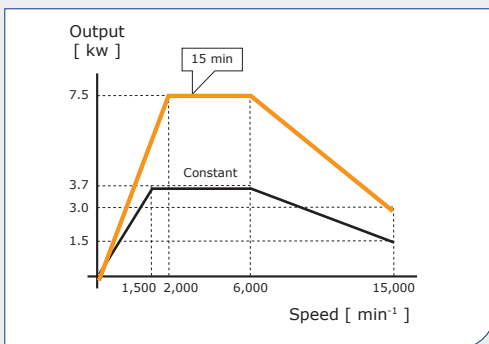
## M16 Main spindle



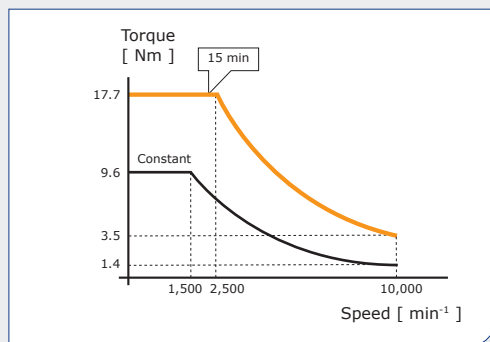
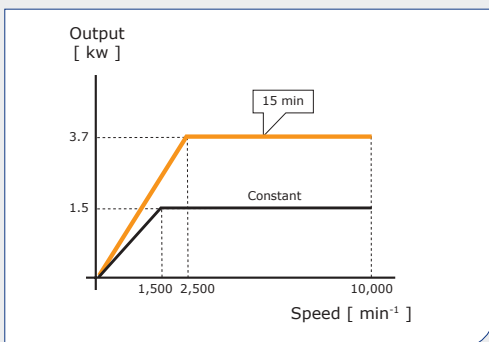
## M16 Sub-spindle



## M32 Main spindle



## M32 Sub-spindle

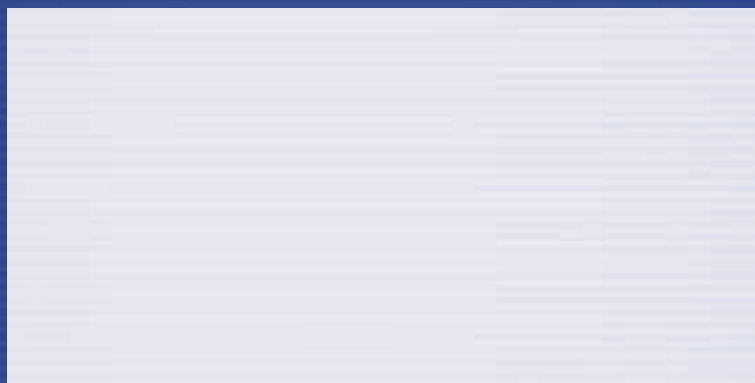


## Specifications Cincom M Series

	Cincom M16-III	Cincom M16-V	Cincom M32-III	Cincom M32-V
<b>Main spindle</b>				
Max. machining diameter [mm]	16	16	32	32
Max. turning length without re-chucking [mm]	200	200	320	320
Through-hole diameter [mm]	20	20	36	36
Speed - main spindle [min <sup>-1</sup> ]	10,000	10,000	8,000	8,000
Indexing - main spindle	C axis	C axis	C axis	C axis
Main spindle drive [kW]	2.2	2.2	7.5	7.5
<b>Sub-spindle</b>				
Max. machining diameter [mm]	16	16	32	32
Speed - sub-spindle [min <sup>-1</sup> ]	10,000	10,000	7,000	7,000
Indexing - sub-spindle	C axis	C axis	C axis	C axis
Sub-spindle drive [kW]	0.75	0.75	3.7	3.7
<b>No. of rotary tools at vertical tool holder</b>				
Speed of rotary tools [min <sup>-1</sup> ]	8,000	8,000	5,000	5,000
Drive power [kW]	0.75	0.75	1.0	1.0
Number	4	4	4	4
Stations	10	10	10	10
<b>No. of rotary tools at turret</b>				
Speed of rotary tools [min <sup>-1</sup> ]	6,500	6,500	5,000	5,000
Drive power [kW]	0.75	0.75	1.5	1.5
<b>Tools</b>				
Turning tool dimensions	10 x 10 x 120	10 x 10 x 120	16 x 16 x 130	16 x 16 x 130
Number	5	5	5	5
Drill holder for back machining	3 (2 rotary)**	3 (2 rotary)**	3 (2 rotary)**	3 (2 rotary)**
Collet sleeve dia.	19.05	19.05	25.4	25.4
<b>Collet type / Guide Bush type</b>				
Collets (main spindle/sub-spindle)	F20	F20	F37	F37
Drill collets	ER 11	ER 11	ER 16/20	ER 16/20
Guide bush (Neukomm)	61,002	61,002	28,001	28,001
Rapid feed rate - all axes [m/min]	20	20	20	20
<b>Machine dimensions</b>				
Dimensions (without bar feeder) L/W/H [mm]	2,450 x 1,320 x 1,700	2,450 x 1,420 x 1,730	2,770 x 1,300 x 1,790	2,800 x 1,430 x 1,820
Centre height [mm]	1,100	1,132	1,100	1,132
Weight [kg]	2,710	2,900	2,900	3,100

\*\*Option

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