OKK

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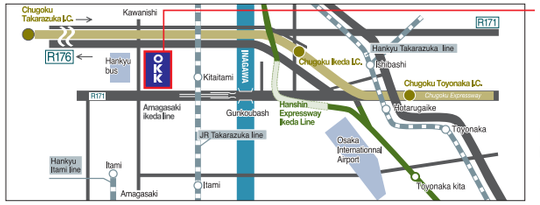
Access map



OKK Inagawa factory
8-10 Kitaitami, Itami, Hyogo Prefecture
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From Kansai International Airport : Please take a airport bus bound for Osaka (Itami) International Airport and take a taxi to OKK.

Technical Center

S-Plant

W-Plant

Technical center is for test cutting, demonstration and training.
S-plant is for machining and assembly of spindles and tables.
W-plant is for final assembly of large sized machining centers.
All are located at Inagawa, Itami city, Hyogo, Japan

INAGAWA PLANT:
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OKK A DIVERSIFIED MANUFACTURER OF MACHINE TOOLS

Specializes In:
Machining centers
Graphite cutting machining centers
Grinding centers
CNC Milling machines
Conventional milling machines
Total die and mold making systems
Flexible manufacturing cells and systems

Other Products Include:
Textile Machinery
Water Maters

NOTE :
OKK reserves the right to change the information contained in this brochure wihtout notice.
OKK is not responsible to make changes to previously sold machines or accessories.
The machines in the photographs of this brochure may include optional accessories.

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OKK

Vertical Machining Center

VM/R SERIES

VM43R
VM53R
VM76R

OKK New Enhanced Machining Center Series

VM/R SERIES

VERTICAL MACHINING CENTER

The REAL Machine

Enhanced models of OKK's best-selling machining center!!

OKK increased the rigidity of the main body and spindle to provide increased cutting performance.
The X, Y & Z axes utilize highly rigid and accurate box slide ways.
This enables the machining of all types of materials from aluminum to the difficult-to-cut materials like titanium.

VM43R

VM53R

VM76R

Machine picture includes optional accessories.

Evolving from the proven VM4 series, boasting 2500 deliveries.

Enhancing the rigidity of the main body and spindle that deliver exceptional heavy-duty machining capacity. Superb CNC operability with a 15inch color LCD screen* and PC style keyboard as standard.

*:Except the FAi controller.

Travel distance (X axis × Y axis × Z axis)
630×430×460mm (24.80"×16.93"×18.11")

Table size (X axis × Y axis)
800×420mm (31.50"×16.54")

Spindle rotating speed
6000min^{-1} (No.50)

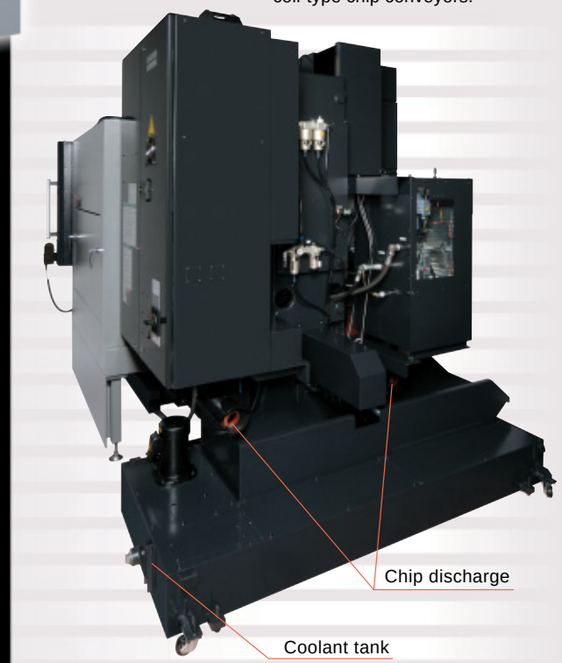
Spindle motor output (30-min / Continuous ratings)
7.5/5.5kW (No.40) (10/7HP)
11/7.5kW (No.50) (15/10HP)

Maximum tool diameter
ϕ110mm (No.40) (4.33")
ϕ160mm (No.50) (6.30")

Maximum tool length
350mm (13.78")

Maximum tool mass
10kg (22lbs) (No.40)
20kg (44lbs) (No.50)

Magazine Capacity
20tools



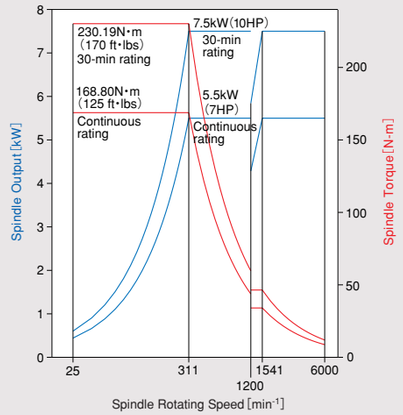
Chips are discharged from the machine rear side by the coil-type chip conveyors.

Variations of the spindle

No.40

6000-min^{-1} spindle (gear-driven)

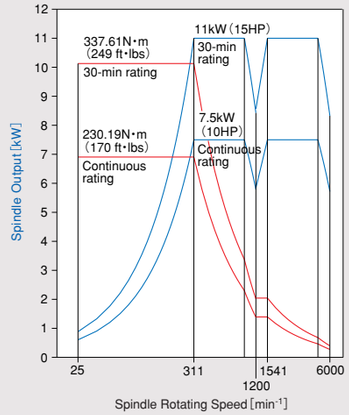
MITSUBISHI / FANUC



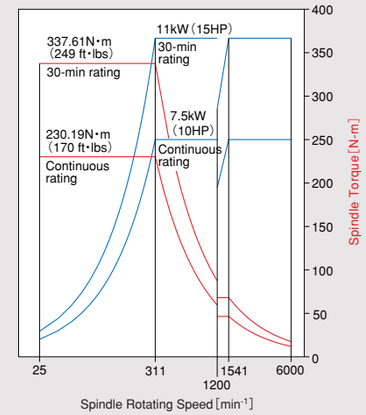
No.50

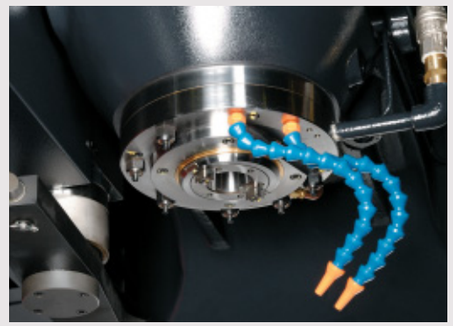
6000-min^{-1} spindle (gear-driven)

MITSUBISHI



FANUC

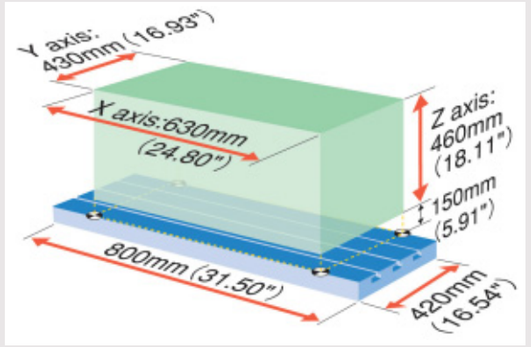


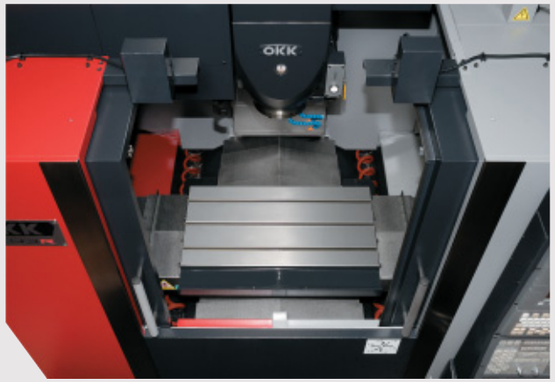


	Drive	Controller	Spindle rotating speed	Spindle moter (30-min/ Continuous rating)	Maximum spindle torque (30-min/ Continuous rating)
No.40	Gear drive	FANUC／MITSUBISHI	25～6000min^{-1}	7.5/5.5kW (10/7HP)	230/169N・m (170/125 ft・lbs)*
			25～8000min^{-1}	7.5/5.5kW (10/7HP)	192/141N・m (142/104 ft・lbs)
	MS drive	FANUC	100～14000min^{-1}	22/18.5kW (30/25HP)	166 (25%ED) /95N・m (122 (25%ED) /70 ft・lbs)
		MITSUBISHI		22/18.5kW (30/25HP)	166 (25%ED) /87N・m (122 (25%ED) /64 ft・lbs)
		FANUC／MITSUBISHI	200～20000min^{-1}	22/18.5kW (30/25HP)	117 (25%ED) /79N・m (86 (25%ED) /58 ft・lbs)
No.50	Gear drive	FANUC／MITSUBISHI	25～6000min^{-1}	11/7.5kW (15/10HP)	337/230N・m (249/170ft・lbs)*
				15/11kW (20/15HP)	460/337N・m (339/249ft・lbs)
			25～8000min^{-1}	11/7.5kW (15/10HP)	281/192N・m (207/142ft・lbs)
				15/11kW (20/15HP)	384/281N・m (283/207ft・lbs)

See Page 9 for the MS drive's torque diagram.
For details of the FAi spindle specification, request us separately.
*:Standard

Wide machining area





The doors have no top track, and, with the doors opened, there are no obstacles for smoothly loading and unloading workpieces with a crane.

The main body design delivers heavy and accurate machining in an ergonomic friendly design.

Travel distance (X axis × Y axis × Z axis)
1050×530×510mm
(41.34"×20.87"×20.08")

Table size (X axis × Y axis)
1050×560mm
(41.34"×22.05")
OP : **1250×560mm**
(49.61"×22.05")

Spindle rotating speed
8000min^{-1} (No.40)
6000min^{-1} (No.50)

Spindle motor output
(30-min / Continuous ratings)
11/7.5kW (No.40)
(15/10HP)
15/11kW (No.50)
(20/15HP)

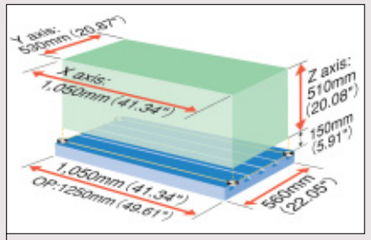
Maximum tool diameter
φ110mm (No.40)
(4.33")
φ200mm (No.50)
(7.87")

Maximum tool length
350mm (13.78")

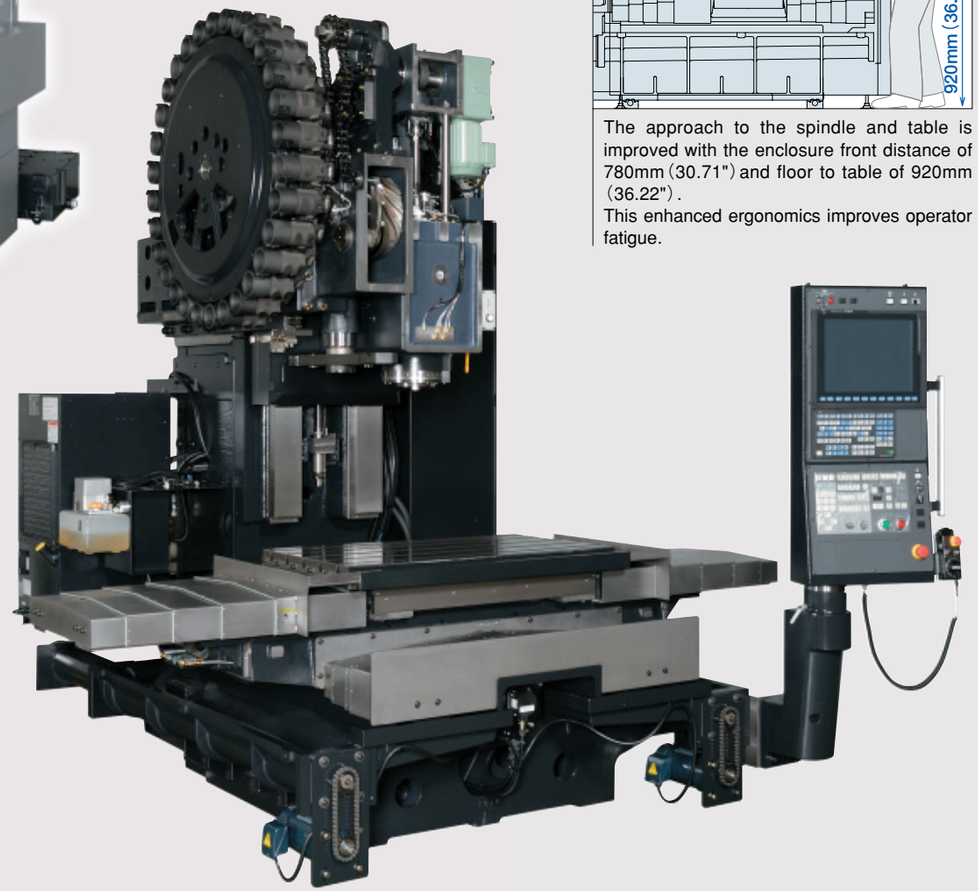
Maximum tool mass
10kg (22lbs) (No.40)
20kg (44lbs) (No.50)

Magazine Capacity
30 tools

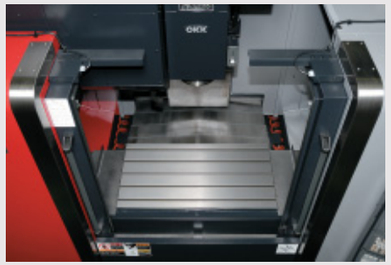
Wide machining area

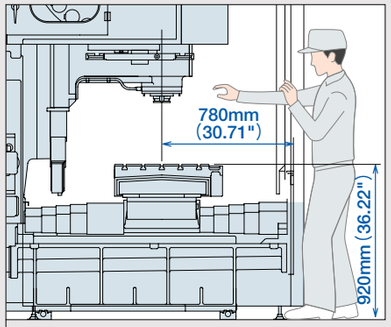


Strokes as large as 1050mm (41.34"), 530mm (20.87") and 510mm (20.08") for the X-, Y- and Z-axis respectively.
The long-table specification 1250mm (49.61") and 560mm (22.05") can be provided as an option allowing the accommodation of even longer workpieces.



Improved accessibility

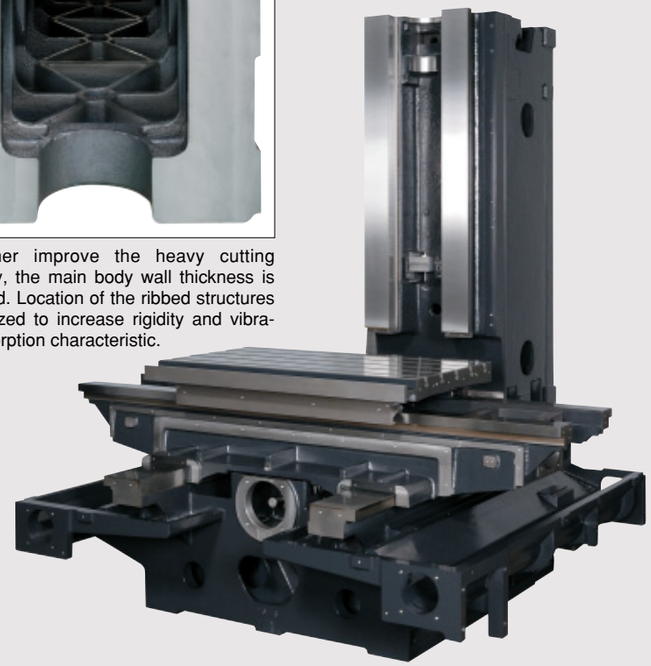


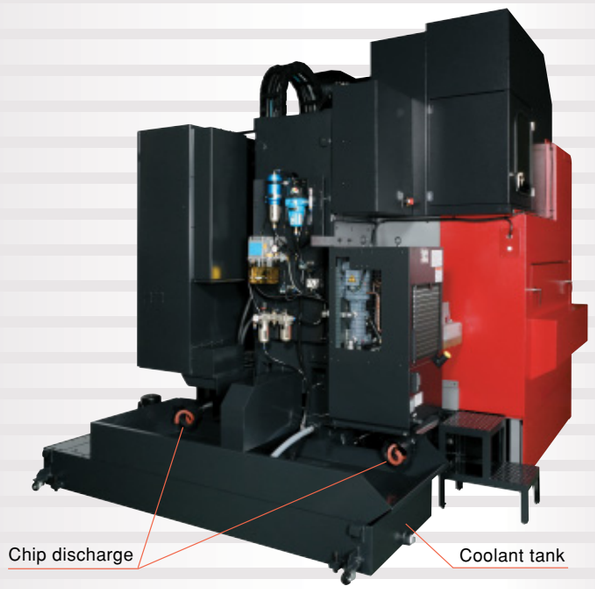


The approach to the spindle and table is improved with the enclosure front distance of 780mm (30.71") and floor to table of 920mm (36.22").
This enhanced ergonomics improves operator fatigue.

Increased main body rigidity

To further improve the heavy cutting capability, the main body wall thickness is increased. Location of the ribbed structures is optimized to increase rigidity and vibration absorption characteristic.





Top selling, highest quality machine in its class with 1500 delivered.

Travel distance (X axis × Y axis × Z axis)
1540×760×660mm
(60.63"×29.92"×25.98")

Table size (X axis × Y axis)
1550×760mm
(61.02"×29.92")

Spindle rotating speed
14000min^{-1} (No.40)
6000min^{-1} (No.50)

Spindle motor output
(30-min / Continuous ratings)
22/18.5kW (No.40)
(30/25HP)
15/11kW (No.50)
(20/15HP)

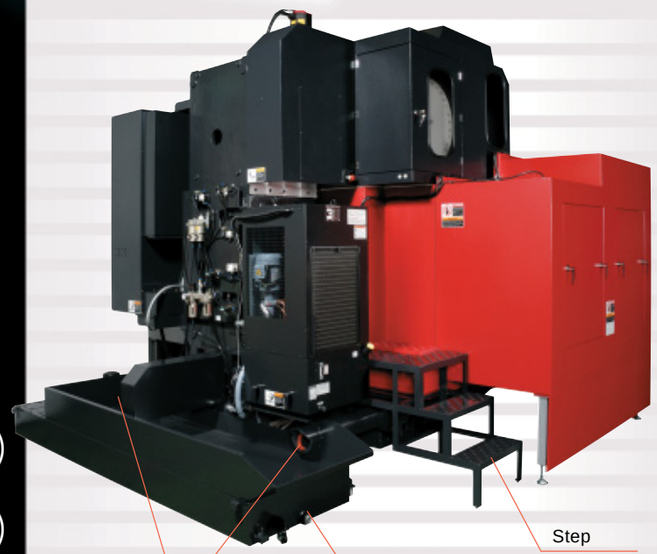
Maximum tool diameter
φ110mm (No.40)
(4.33")
φ200mm (No.50)
(7.87")

Maximum tool length
350mm
(13.78")

Maximum tool mass
10kg (No.40)
(22lbs)
20kg (No.50)
(44lbs)

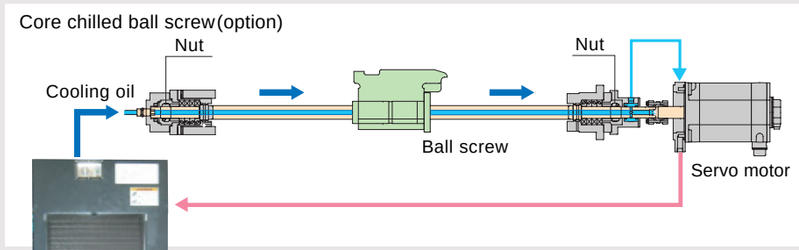
Magazine Capacity
30 tools

Machine picture includes optional accessories.

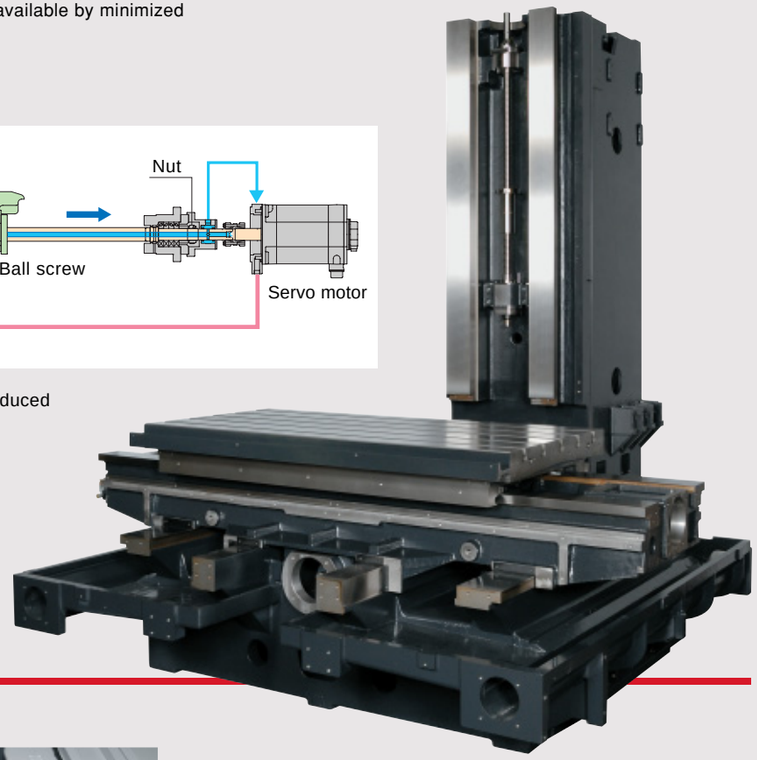


Core chilled ball screws for Die Mold Precision

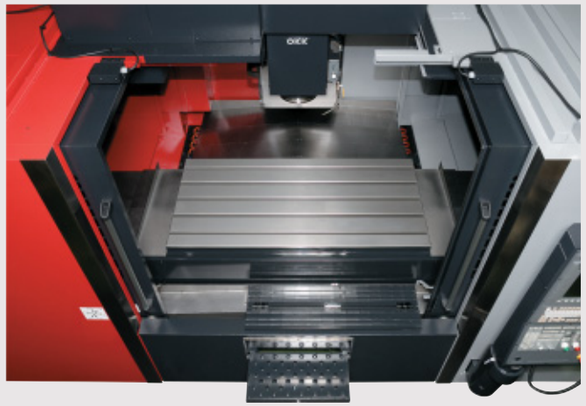
Highly rigid and accurate machine which incorporates a hollow cooling structure for ball screw cooling and double-anchoring-type support system. Further stabilized machining accuracy is available by minimized thermal displacement and lost motion.



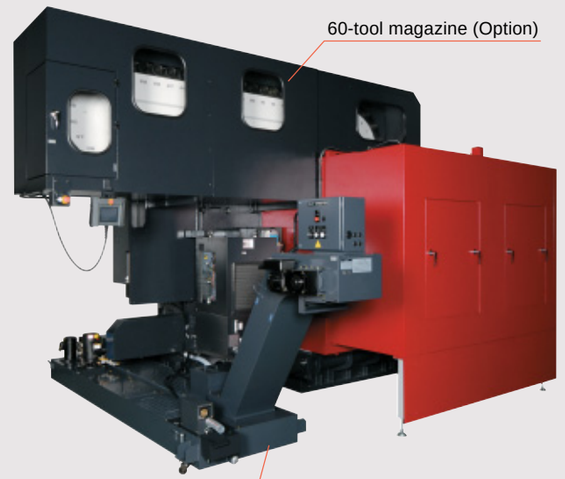
Thermal displace ment is reduced by circulation of cooling oil



Improvement in operability



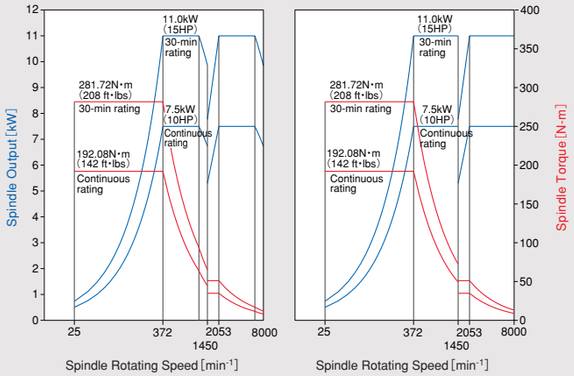
The folding first step and the wider second step inside the machine are standard to facilitate access to the spindle and table. The operators machine set-up approach is simplified.



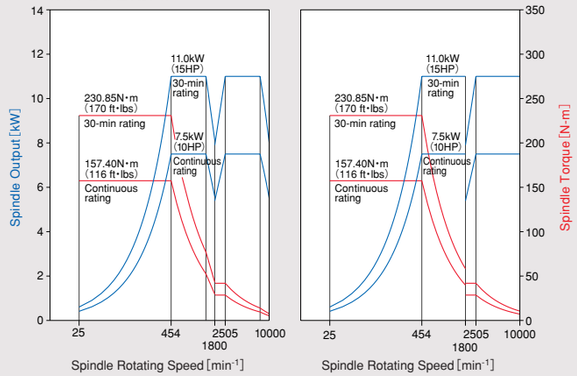
Several Spindle variations to meet your machining requirements.

No.40

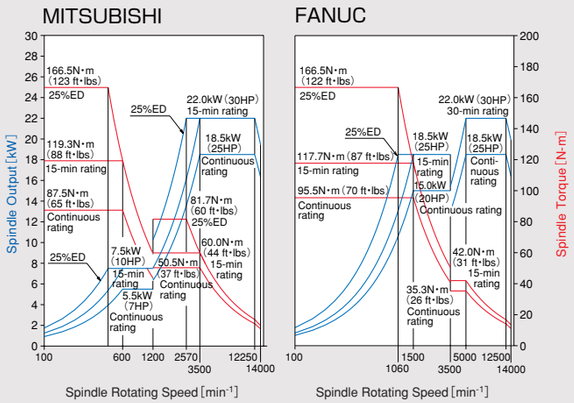
8000-min-1 spindle (gear-driven)



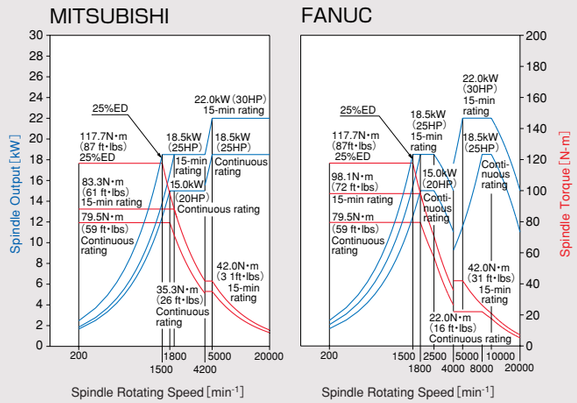
10000-min-1 spindle (gear-driven)



14000-min-1 spindle (MS-driven)



20000-min-1 spindle (MS-driven)



Maximum spindle torque 567N·m (418ft·lbs)

*Spindle motor 18.5/15kW (25/20HP)

Put large-size spindle bearing diameter to use

(VM53R No.50 Gear Head・VM76R No.50 Gear Head)

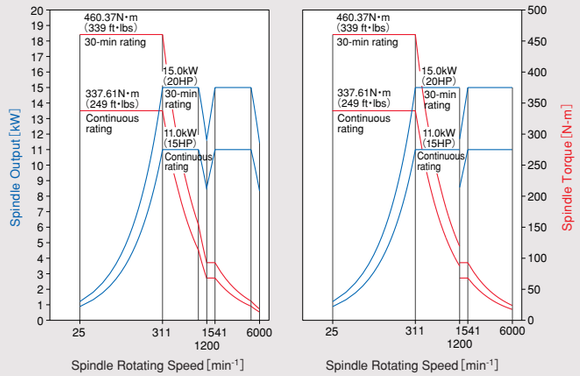
No.40

*1: Standard
*2: Standard for VM76R

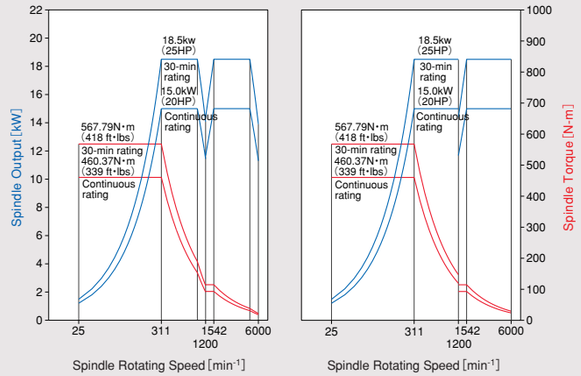
Type	Drive	Controller	Spindle rotating speed	Spindle motor 30-min/Continuous rating	Maximum spindle torque 30-min/Continuous rating
VM53R	Gear drive	FANUC／MITSUBISHI	25～ 8000min-1	11/7.5kW (15/10HP)	281/192N·m *1 (207/141 ft·lbs)
			25～10000-min-1	11/7.5kW (15/10HP)	230/157N·m (170/116 ft·lbs)
VM43R VM76R	MS drive	FANUC	100～14000min-1	22/18.5kW (30/25HP)	166 (25%ED) / 95N·m (122 / 70 ft·lbs) *2
		MITSUBISHI		22/18.5kW (30/25HP)	166 (25%ED) / 87N·m (122 / 64 ft·lbs) *2
		FANUC／MITSUBISHI	200～20000min-1	22/18.5kW (30/25HP)	117 (25%ED) / 79N·m (86 / 58 ft·lbs)

No.50

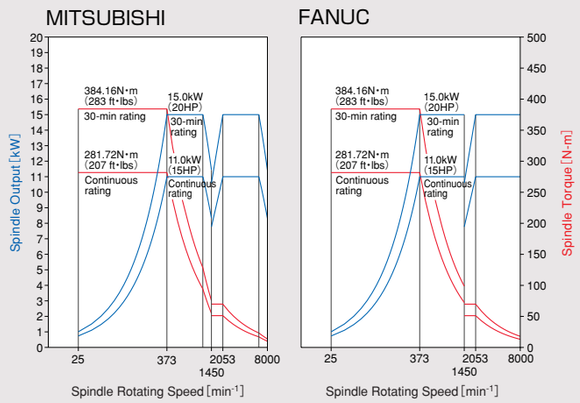
6000-min-1 spindle (gear-driven)



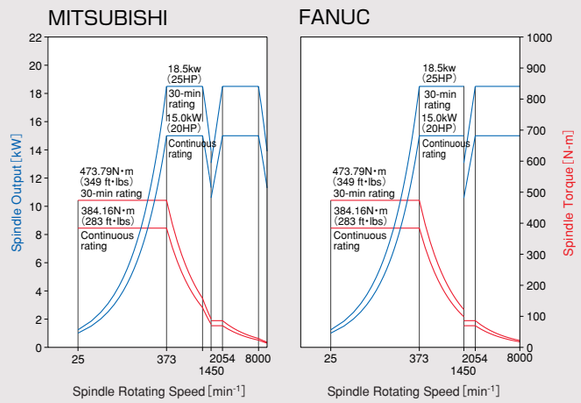
6000-min-1 high-power spindle (gear-driven)



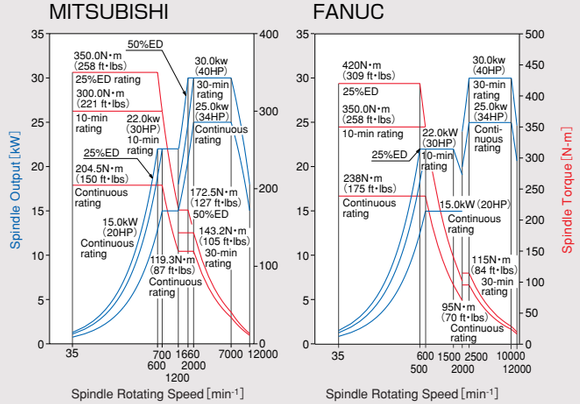
8000-min-1 spindle (gear-driven)



8000-min-1 high-power spindle (gear-driven)



12000-min-1 spindle (MS-driven)

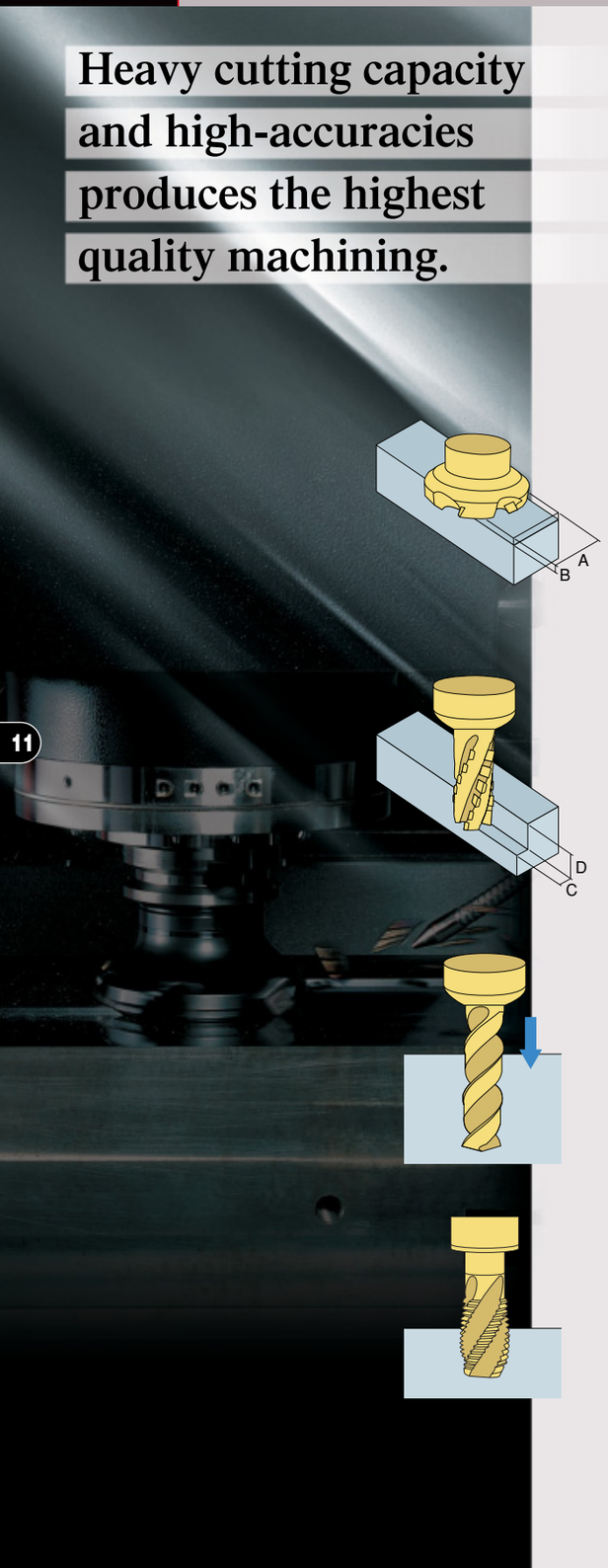


No.50

※: Standard

Type	Drive	Controller	Spindle rotating speed	Spindle motor 30-min/Continuous rating	Maximum spindle torque 30-min/Continuousrating
VM53R VM76R	Gear drive	FANUC／MITSUBISHI	25～ 6000min-1	15/11kW (20/15HP)	460/337N·m ※ (339/249 ft·lbs)
				18.5/15kW (25/20HP)	567/460N·m (418/339 ft·lbs)
			25～ 8000min-1	15/11kW (20/15HP)	384/281N·m (283/207 ft·lbs)
				18.5/15kW (25/20HP)	473/384N·m (349/283 ft·lbs)
	MS drive	FANUC	35～ 12000min-1	30/25kW (40/34HP)	420(25%ED)/238N·m (309(25%ED)/175 ft·lbs)
		MITSUBISHI		30/25kW (40/34HP)	350(25%ED)/205N·m (258(25%ED)/150 ft·lbs)

Heavy cutting capacity and high-accuracies produces the highest quality machining.



Highest level heavy-duty cutting capability

Cutting data Workpiece material : S45C

VM43R : No.40 8000min^{-1} 7.5/5.5kW (10/7HP)
VM53R : No.50 6000min^{-1} 15/11kW (20/15HP)
VM76R : No.50 8000min^{-1} 18.5/15kW (25/20HP)

		VM43R	VM53R	VM76R
Type of machining		Face milling		
		ϕ100 (3.94") ×6T	ϕ125 (4.92") ×6T	ϕ125 (4.92") ×6T
Spindle rotating speed	min^{-1}	478	500	500
Width of cut (A)	mm	75 (2.95")	100 (3.94")	100 (3.94")
Depth of cut (B)	mm	5 (0.197")	6 (0.236")	6 (0.236")
Feed rate	mm/min	480 (18.90ipm)	900 (35.43ipm)	900 (35.43ipm)
Cutting rate	cm^3/min	180 (11in^3/min)	540 (32.4in^3/min)	540 (32.4in^3/min)
Spindle motor load	%	133	133	124

		VM43R	VM53R	VM76R
Type of machining		Side milling		
		ϕ32 (1.26") ×6T [Roughing endmill]	ϕ50 (1.97") ×4T [Chip type]	ϕ80 (3.15") ×5T [Chip type]
Spindle rotating speed	min^{-1}	250	500	600
Width of cut (C)	mm	16 (0.63")	5 (0.197")	15 (0.59")
Depth of cut (D)	mm	32 (1.26")	80 (3.15")	53 (2.09")
Feed rate	mm/min	240 (9.45ipm)	500 (19.69ipm)	500 (19.69ipm)
Cutting rate	cm^3/min	123 (7.5in^3/min)	200 (12in^3/min)	398 (24.3in^3/min)
Spindle motor load	%	104	65	118

		VM43R	VM53R	VM76R
Type of machining		Drill milling		
		ϕ32 (1.26") [Drill]	ϕ63 (2.48") [Chip type]	ϕ50 (1.97") [Chip type]
Spindle rotating speed	min^{-1}	230	760	650
Feed rate	mm/min	70 (2.76ipm)	91 (3.58ipm)	80 (3.15ipm)
Feed	mm/rev	0.30 (0.012in/rev)	0.12 (0.005in/rev)	0.12 (0.005in/rev)
Cutting rate	cm^3/min	56 (3.4in^3/min)	283.5 (17.3in^3/min)	157 (9.6in^3/min)
Spindle motor load	%	76	100	52

		VM43R	VM53R	VM76R
Type of machining		Tap milling		
		M36×P4	M48×P5	M48×P5
Spindle rotating speed	min^{-1}	62	47	47
Feed rate	mm/min	248 (9.76 ipm)	235 (9.25 ipm)	235 (9.25 ipm)
Spindle motor load	%	114	65	72

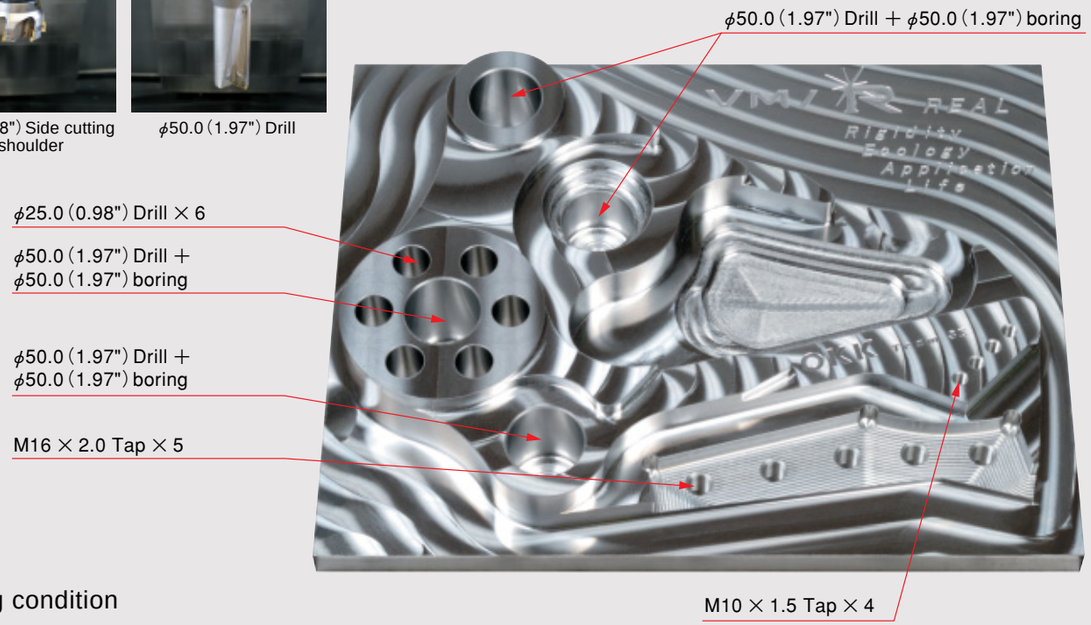
Values shown here are for reference to provide an indication of cutting capability.

The cutting that only OKK can realize!

ϕ63.0 (2.48") Side cutting for shoulder

ϕ50.0 (1.97") Drill

- Machning model : VM53R
- Sample of workpiece : Construction machine cutting parts
- Material : S50C
- Total machning time : 7 hours 30 minutes
- Work size : 500 (19.69") ×400mm (15.75")



Cutting condition

Face milling rough processing [ϕ125 (4.9") × 6t / face milling]

Spindle rotating speed (min^{-1})	Cutting speed (m/min)	Cutting Feed (mm/min)	Feed rate / Chip (mm/tooth)	Depth (mm)	Width (mm)	
500	195 (7.68 ipm)	900 (35.43 ipm)	0.3 (0.012")	5.0 (0.20")	100.0 (3.94")	▶ Steady heavy-duty cutting (Chip discharge rate : 450 cc/min)

Contour rough processing [ϕ63.0 (2.48") × 6t / side cutting for shoulder]

Spindle rotating speed (min^{-1})	Cutting speed (m/min)	Cutting Feed (mm/min)	Feed rate / Chip (mm/tooth)	Depth (mm)	Width (mm)	
900	180 (7.09 ipm)	720 (28.35 ipm)	0.13 (0.005")	3.0 (0.12")	25.0 (0.98") −63.0 (2.48")	▶ Use of the MQL system (oil mist) extends the life of the insert. (Exchange of insert: once per about 3 hours)

Contour finish processing [ϕ25.0 (0.98") × 2t / insert cutter]

Spindle rotating speed (min^{-1})	Cutting speed (m/min)	Cutting Feed (mm/min)	Feed rate / Chip (mm/tooth)	Depth (mm)	Width (mm)	
2000	160 (6.30 ipm)	800 (31.50 ipm)	0.2 (0.008")	5.0 (0.19")	10.0 (0.39") −25.0 (0.98")	▶ Enables both the pocket roughing and the high-quality side face finishing.

Hole drilling [ϕ50.0 (1.98") drill / ϕ25.0 (0.98") drill]

	Spindle rotating speed (min^{-1})	Cutting speed (m/min)	Cutting Feed (mm/min)	Feed rate / Chip (mm/tooth)	Depth (mm)	Width (mm)	
ϕ50.0 (1.97") DR	650	100 (3.94 ipm)	78 (3.07ipm)	0.12 (0.005")	80.0 (3.15")	50.0 (1.97")	▶ Highly-efficient normal-hole drilling cycle (G81) using the high-pressure coolant supplied internally through the spindle.
ϕ25.0 (0.98") DR	1800	140 (5.51 ipm)	215 (8.46ipm)	0.12 (0.005")	70.0 (2.76")	25.0 (0.98")	

Other used tools
- ϕ15.0 (0.59") Endmill
- ϕ12.0 (0.47") Endmill
- ϕ14.0 (0.55") Drill
- ϕ12.0 (0.47") Drill
- ϕ 8.5 (0.33") Drill
- ϕ20.0 (0.79") Chamfering tool
- ϕ10.0 (0.39") Chamfering tool
- M16×2.0 Tap
- M10×1.5 Tap
- ϕ50.0 (1.97") Boring

Highly reliable structure realizes the high-accuracy and high-quality machining

Soft Scale Ⅲ

Three functions for improving and retaining accuracy

1 Variable backlash compensation Ⅱ
Backlash changes with speed/position. It minimizes the backlash by compensating it according to the slideway's characteristics (Patent No.4750496).

2 Ball screw elongation compensation
Reduces any error generated by repeated feeding and positioning.

3 Spindle's thermal displacement compensation
It compensates the thermal displacement generated by rotation of the spindle.

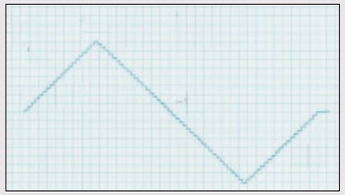
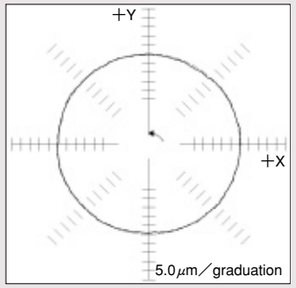


Diagram of the 1-μm step-feed measurement

Circularity measurement

VM43R : 2.3μm
VM53R : 2.4μm
VM76R : 2.9μm



Circularity measurement sample

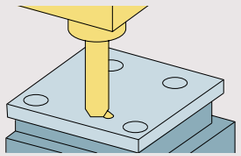
＊The above data show the actual values. The results may vary with the conditions.

Accuracy

■ Positioning accuracy (mm) (OKK tolerance)

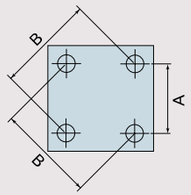
Item	VM43R	VM53R	VM76R
Positioning accuracy	X/Y/Z : ±0.0025 (±0.00010") full stroke	X/Y/Z : ±0.003 (±0.00012") full stroke	X:±0.005 (0.00020") full stroke Y/Z:±0.003 (0.00012") full stroke
Repeated positioning accuracy	X/Y/Z : ±0.0015 (±0.00006") full stroke	X/Y/Z : ±0.002 (±0.00008") full stroke	X/Y/Z : ±0.002 (±0.00008") full stroke

■ Positioning Machining Accuracy



(mm)

	VM43R	VM53R VM76R
A	150 (5.91")	200 (7.87")
B	212.132 (8.35")	282.843 (11.14")



Example record (mm)

Item	VM43R	VM53R	VM76R
Axial direction	−0.004 (−0.00016")	0.004 (0.00016")	−0.003 (−0.00012")
Diagonal direction	−0.004 (−0.00016")	0.002 (0.00008")	−0.001 (0.00004")
Difference in diameter	0.004 (0.00016")	0.003 (0.00012")	0.002 (0.00008")

Notes
1. The data shown above is an example and is based on short-time machining. The values may vary in during continuous machining.
2. The data shown above as an example were obtained under OKK's in-house cutting test conditions. The values may vary with different cutting tools and fixtures.
3. The above accuracy data are laboratory data obtained by installing the machine according to the OKK's foundation drawing and carrying out the inspection based on OKK's inspection standard in an environment with controlled temperature.

ATC [Automatic Tool Changer]

Consistent tool change operation and superior durability are ensured by use of OKK's original proven cam-controlled high-speed synchronized tool changer (OKK patent).

■ The variable-speed ATC function is included in the standard specification.

When tools such as heavy tools and large-diameter tools are registered for use during machining, this function allows a reduced ATC turning speed automatically to exchange those tools smoothly and safely.

Photo is VM76R

Photo is VM76R

Photo is VM53R

Maximum tool diameter
VM43R
φ110mm (No.40) (4.33")
φ160mm (No.50) (6.30")
VM53R
φ110mm (No.40) (4.33")
φ200mm (No.50) (7.87")
Option : φ270mm (No.50) (10.63")
VM76R
φ110mm (No.40) (4.33")
φ200mm (No.50) (7.87")
Option : φ270mm (No.50) (10.63")

Maximum tool length
350mm (13.78")

Maximum tool mass
10kg (No.40) (22lbs)
20kg (No.50) (44.1lbs)

Maximum tool moment
9.8N·m (No.40) (7.23ft·lbs)
29.4N·m (No.50) (21.68ft·lbs)

Tool exchange time (tool-to-tool)
2.0sec
1.5sec (VM43R No.40)

Ergonomics and environmental friendliness in this machine.

Environmental measures

■ECO sleep function (Standard)

If the machine remains idle longer than the specified time period, the machine's present mode is switched to a power-saving mode to reduce wasteful consumption of power, air and so on. When the power-saving mode is active, the equipment such as servos and chip conveyors are turned off. It is cancelled automatically when the setup operation is completed i.e. when the doors are closed.

■LED lamps (Standard)

The machine incorporates LED lamps due to their low heat generation and power consumption savings.

Photo is VM76R

Improvement in operability

■15-inch operation panel

N730

F31i-A

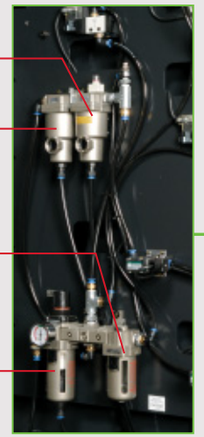
◎The 15-inch color LCD screen increases legibility of the information on the screen and improves operability.
◎Construction of the operation panel is simple and ergonomic. Its keyboard adopts the QWERTY key arrangement similar to PCs.
◎The display incorporates OKK's original screens for setup support and operation.

*Not avalable NC control : FAi

Maintenance

■Easy to maintain

In order to improve the operating efficiency, routinely inspected air- and oil-related equipments are collectively located respectively.



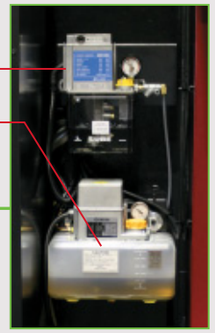


Photo is VM76R.

Thorough chip processing measures

■Coil-type chip conveyor (Standard)

Standard machine has two sets of rear discharge coil-type chip conveyors.
(1 set for each of right and left)
The coil-type chip conveyors are capable of removing a large amount of chips from the machine promptly.

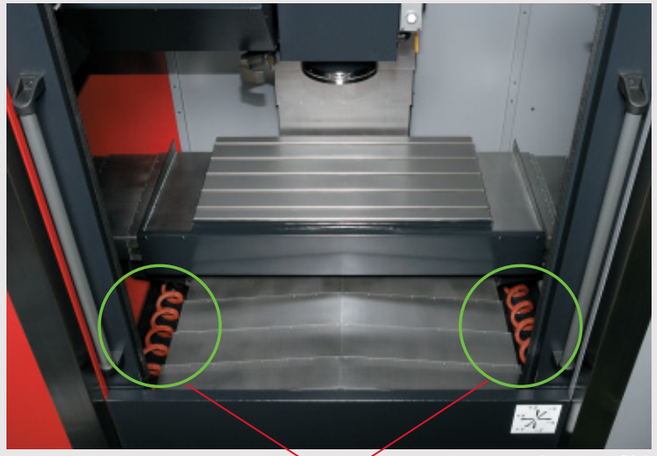


Photo is VM53R.

Lift-up chip conveyor (Option)

Photo is Hinged type.
Chip bucket is another option.
There are fixed type and swivel type.

■Lift-up chip conveyor (Option)

Suitable lift-up chip conveyor according to type of chips

◎ : Most suitable; ○ : Usable; △ : Conditionally usable; × : Not usable; − : Not applicable

Type of chip conveyor				Hinged type		Scraper typ		Magnet scraper type		Scraper type with drum filter		Magnet scraper type with drum filter	
Use or not use of coolant oil				Use	Not use	Use	Not use	Use	Not use	Use	Not use	Use	Not use
Type of chips	Magnetizable chips	Steel	Short curl	◎	◎	○	○	◎	◎	○	-	◎	-
			Spiral	◎	◎	△*2	△*2	△*2	△*2	×	-	×	-
			Long	◎	◎	×	×	×	×	×	-	×	-
			Needle shape	×	△*1	×	○	○*3	○	○	-	◎	-
			Powder or small lump	×	△*1	×	○	○*3	○	○	-	◎	-
		Cast iron	Needle shape	×	△*1	×	○	○*3	○	○	-	◎	-
			Powder or small lump	×	△*1	×	○	○*3	○	△*3	-	◎	-
	Non-magnetizable chips	Aluminum	Short curl	×	◎	△*4	○	-	-	◎	-	◎	-
			Spiral	○	◎	○	○	-	-	△*5	-	△*5	-
			Long	○	◎	○	○	-	-	△*5	-	△*5	-
			Needle shape	×	△*1	×	○	-	-	◎	-	◎	-
			Powder or small lump	×	△*1	×	○	-	-	◎	-	◎	-

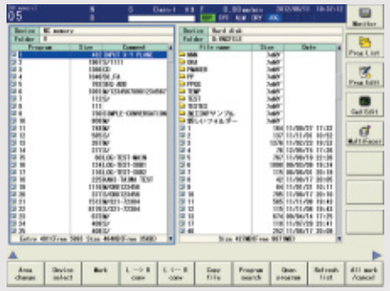
*1: Minute chips can enter the conveyor casing through a gap between hinged plates. Therefore, cleaning inside the conveyor frequently is needed.
*2: Long chips can easily be caught by a scraper. Therefore, measures for shortening the chips such as the step feed and removing the caught chips are needed.
*3: If the coolant flow rate is large, chips can flow out of the conveyor casing and cause clogging of filters. Therefore, combined use of a magnet plate is recommended.
*4: If the coolant flow rate is large, chips can flow out of the conveyor casing and cause clogging of filters. Therefore, cleaning filters frequently is needed.
*5: Long chips can easily be caught by a scraper. Therefore, removing them regularly is needed. Drum filters are damaged if they are not removed.

OKK's Dedicated Control Functions

Programming Support Function

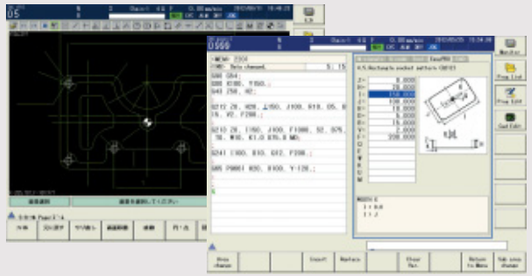
■Program Editor

It enables editing of the programs in the NC memory, data server (or hard disc) and memory card. It also enables managing the programs i.e. copying, deleting, changing the program name, etc.



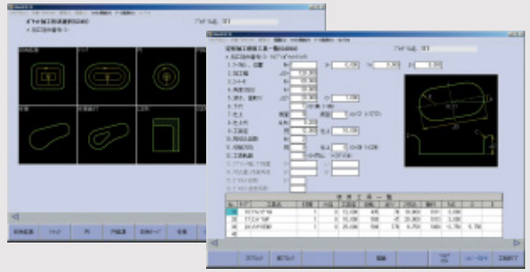
■EasyPRO (Programming Support Function)

You can display the interactive guide screen and, while referring to the displayed guide charts and description, you can input the programs such as the macro programs for machining and measuring.
The incorporated easy-to-operate CAD functions can be used for the input of coordinates, contour machining, etc.



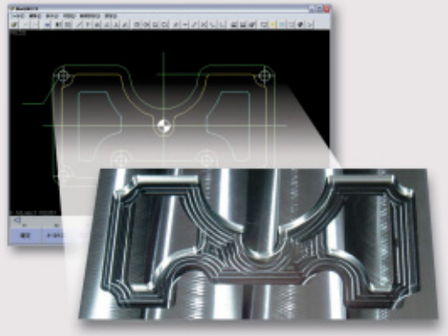
■WinGMC7X (Option for N730)

It is a friendly interactive automatic NC programming function.It contains various menus such as the hole drilling, contouring and pocketing.
As the machining conditions and machining movements are determined automatically, you can make machining programs easily even if you are not familiar with the NC programs.



●Option H

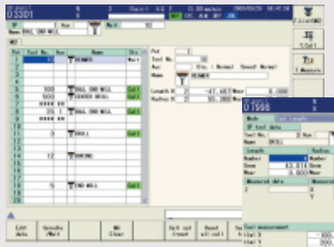
It enables machining the pocket with multiple islands. As it contains the easy-to-operate CAD functions, you can use them to read out the CAD data and draw figures for machining complicated shapes.



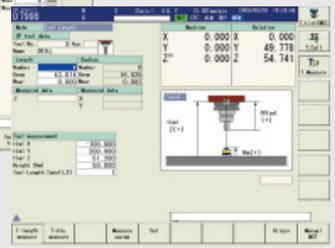
Setup Support Function

■Tool Support

You can manage each tool's various information such as the tool name, schematic and offset number comprehensively through a single screen. It contains the functions that are convenient for the setup operation. For example the tool measurement is also available by just switching the menu.



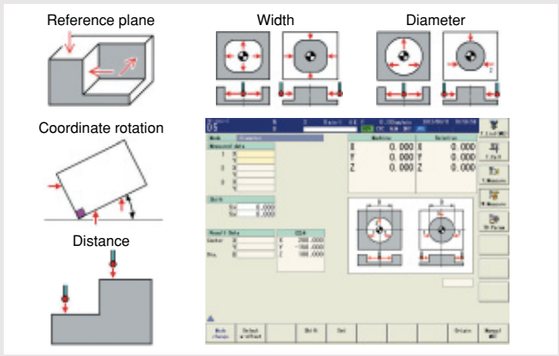
▼Tool length compensation amount measurement screen



▲Tool setup screen

■T0 Softwaer (Option)

This screen enables the simple manual measurement using the touch sensor (option: T1-A or T1-B).
You can move the sensor to the desired measuring point by handle mode then the machine starts the automatic measurement after the sensor contacts the workpiece. You can set the results of the measurement as the data for the desired workpiece coordinate system and tool offset number through the single key operation.



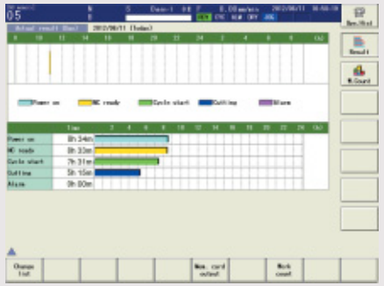
Maintenance Functions

■Help Guidance

It displays detailed information regarding the machine alarms and the method to recover when a problem occurs on the machine. It also displays a list of G-codes and description of the M signals.

■Work Manager (Option)

It enables managing the number of machined workpieces and controlling the operation rate easily. You can output and write the data to the memory card for management of the machine's operational statuses.



Technologies for Reduced Setup and Unmanned Operation

■Soft AC (Option)

The soft AC function applies the feed rate override control automatically so that the value of the spindle load meter does not change significantly. This helps to prevent damages of tools caused by overload and improve cutting efficiency.

●Adaptive control function
Feed override control range:10 to 200%. (Changeable with parameters)
Alarms are output at the lower limit override value.

●Air-cut reduction function
Feed rates during non-cutting operation can be increased up to 200%. (Changeable with parameters)

●Tool failure monitoring function
Specifications similar to the soft CCM.

●Continuous unmanned processing at the time of tool failure
Combined operation with the automatic restart function (Another option) is possible.

■Soft CCM (Option)

The Soft CCM monitors the spindle load meter, and stops operation when the meter value exceeds the preset value (set by M signal or set for each of the T numbers through setting screen) and generation of abnormal tool load is determined which is convenient for unmanned operation at night.

High-efficiency Control Technologies

■Hyper HQ Control (Option)

High-speed processing is enabled by improved capability of processing fine line segment toolpaths.

〈N730VW capability of processing fine line segments〉

Type	Fine line segment data processing speed (m/min)	Instruction method
Without Hyper HQ control	16.8 (0.66 ipm)	
Hyper HQ control mode Ⅰ	33.6 (1.32 ipm)	ON : G5P1 OFF : G5P0
Hyper HQ control mode Ⅱ	168 (6.61 ipm)	ON : G5P2 OFF : G5P0

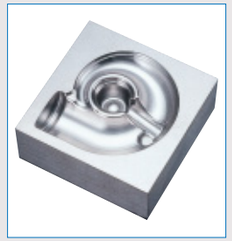
〈F31i-A capability of processing fine line segments〉

Type	Fine line segment data processing speed (m/min)	Instruction method
Without Hyper HQ control	15.0 (0.59 ipm)	
Hyper HQ control A mode	30.0 (1.18 ipm)	ON : G5.1Q1 OFF : G5.1Q0
Hyper HQ control B mode	150 (5.91 ipm)	ON : G5.1Q1 OFF : G5.1Q0

The above values show (theoretical) maximum speeds for processing 1-mm-segment blocks construction a straight line. Actual processing speeds depend on the machine and NC data.

■HQ Tuner (Option)

The HQ tuner provides the programmer a 10-step adjustment of parameters for hyper HQ control in accordance with processing conditions.
It adjusts the hyper HQ control in accordance with the current process.
For example, during roughing routines the programmer can place a higher priority on speed and in finishing routines a higher priority on dimensional accuracy at corners and circular arcs.



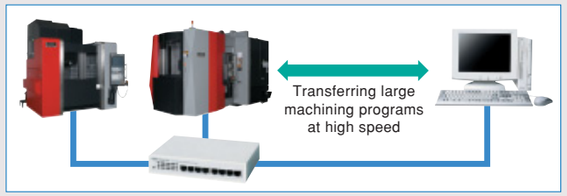
Network Function

■ Data Server (Option for F31i-A)

Large machining programs can be transferred to the data server through the network connected to the host computer at high speed.
The transferred machining programs are executed as the main program or the sub program called up with the M198.

■ Hard Disc Operation (N730 Standard Function)

Large machining programs can be transferred to the hard disc installed in the machine through the network connected to the host computer at high speed.
The transferred machining programs are executed as the main program or the sub program.



Machine Main Body's Main Specification

Machine Body's Specification

Item	Unit	Specification	
		No.40	No.50
		Gear-drive spindle	
		6000min-1	6000min-1
Travel on X axis (Table right / left)	mm	630 (24.80")	
Travel on Y axis (Saddle back / forth)	mm	430 (16.93")	
Travel on Z axis (Spindle head up / down)	mm	460 (18.11")	
Distance from table top surface to spindle nose	mm	150 (5.91") ~610 (24.02")	
Distance from column front to spindle center	mm	445 (17.52")	
Table work surface area (X-axis direction × Y-axis direction)	mm	800 (31.50") ×420 (16.54")	
Max. workpiece weight loadable on table	kg	500 (1102 lbs)	
Table work surface configuration (T-slot nominal dimension × spacing × number of T slots)	mm	18 (0.71") ×125 (4.92") ×3	
Distance from floor to table work surface	mm	900 (35.43")	
Spindle rotating speed	min-1	25~6000	25~6000
Number of spindle rotating speeds		2 steps	
Spindle nose (nominal number)		7/24-tapered No.40	7/24-tapered No.50
Spindle bearing bore diameter	mm	ϕ70 (2.76")	ϕ85 (3.35")
Rapid traverse rate	m/min	X/Y:30 (1181 ipm) Z:20 (787 ipm)	
Cutting feed rate	mm/min	1~20000 (0.04 to 787 ipm) ※1	
Jog feed rate	mm/min	2000 (78.7 ipm)	
Type of Tool shank		JIS B 6339 BT40	JIS B 6339 BT50
Type of Pull stud		MAS403 P40T-1	OKK only 90°
Number of stored tools	tools	20	
Max. tool diameter (with tools in adjacent pots)	mm	ϕ82 (3.23")	ϕ110 (4.33")
Max. tool diameter (with no tools in adjacent pots)	mm	ϕ110 (4.33")	ϕ160 (6.30")
Max. tool length (from gauge line)	mm	350 (13.78") [300 (11.81") ※2]	
Max. tool mass [moment]	kg [N・m]	10 (22 lbs) [9.8 (7.2ft・lbs)]	20 (44.1 lbs) [29.4 (21.7ft・lbs)]
Tool selection method		Memory random method	
Tool exchange time (tool-to-tool)	sec	1.5 (Speed is changeable for heavy tools)	2.0 (Speed is changeable for heavy tools)
Tool exchange time (cut-to-cut)	sec	5.5 (13.5 ※2)	5.9 (12.9 ※2)
Spindle motor (30-min/continuous rating) MITSUBISHI	kW	7.5 (10HP)/5.5 (7HP)	11 (15HP)/7.5 (10HP)
Spindle motor (30-min/continuous rating) FANUC	kW	7.5 (10HP)/5.5 (7HP)	11 (15HP)/7.5 (10HP)
Feed motors MITSUBISHI	kW	X / Y:2.0 (2.7HP) Z:3.5 (4.7HP)	
Feed motors FANUC	kW	X / Y:3.0 (4HP) Z:4.0 (5.4HP)	
Coolant pump motor	kW	0.4 (0.5HP)	
Slideway lubrication pump motor	kW	0.017 (0.022HP)	
Spindle head cooling pump motor (oil cooler)	kW	0.75 (1HP)	
Motor for ATC	kW	0.4 (0.54HP)	0.75 (1HP)
Motor for tool magazine	kW	0.2 (0.27HP)	0.4 (0.54HP)
Motor for coil-type chip conveyor	kW	0.2 (0.27HP) ×2	
Power supply ※3 MITSUBISHI	kVA	27	31
Power supply ※3 FANUC	kVA	27	28
Supply voltage・Supply frequency	V・Hz	200V±10% 50/60Hz±1Hz 220V±10% 60Hz±1Hz	
Compressed air supply pressure ※4	MPa	0.4~0.6 (58~87 psi)	
Compressed air supply flow rate ※3,※4	L/min (ANR)	160 more (42 gpm more)	
Coolant tank capacity ※3	L	250 (66 gal)	
Spindle cooling oil tank capacity (oil cooler)	L	50 (13.2 gal)	
Spindle bearing lubrication oil tank capacity	L	6.0 (1.6 gal)	
Machine height (from floor surface)	mm	2626 (103.39")	2683 (105.63")
Required floor space under operation (width×depth)	mm	1980 (77.95") X2655 (104.53")	2090 (82.28") X2655 (104.53")
Machine weight	kg	5500 (12100 lbs)	5700 (12600 lbs)
Operation environment temperature	℃	5~40	
Operation environment humidity	%	10~90 (No dew)	
Controller		N730, F31i-A or FAi	

※1 : Available with the HQ or Hyper HQ control
※2 : ATC-shutter specification
※3 : The value for the standard specification It may vary with added options.
※4 : Purity of the supplied air should be equivalent to Class 3.5.4 specified in ISO 8573-1 / JIS B8392-1 or higher.

Standard Accessories

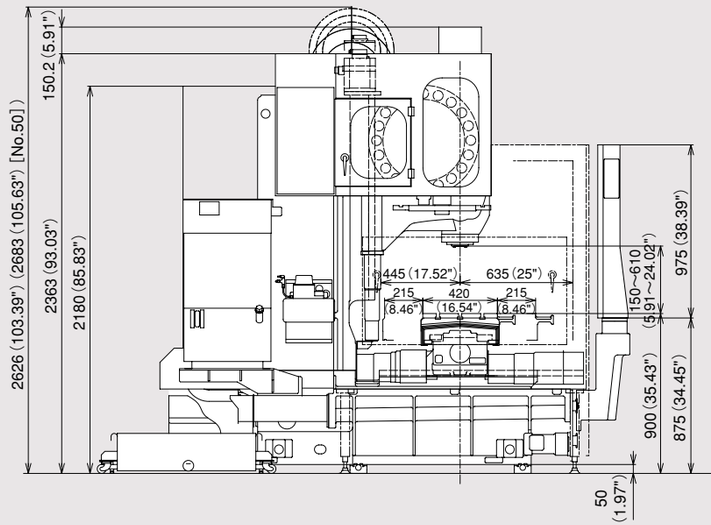
Name	Qty	Remark
Illuminating lamp	1 set	LED lamp
Coolant unit (Separate coolant tank)	1 set	Tank capacity:250L (66gal)
Entire machine cover (Splash Guard)	1 set	Including front door and maintenance cover electromagnetic lock
Magazine safety cover	1 set	Including electromagnetic lock
Sliding surface protection steel sliding cover for X/Y/Z axes	1 set	
Spindle head cooling oil temperature controller	1 set	
Rear discharge coil-type chip conveyor	2 sets	1 set for each of right and left
Leveling block	1 set	
Parts for machine transfer	1 set	
Automatic power-off unit (with M02 or M30)	1 set	
Electric spare parts (fuses)	1 set	
Instruction manual (Specification, Maintenance manual, Foundation & Installation manual)	1 set	
Electrical instruction manuals (Operation manual, Hardware diagram)	1 set	

Special Accessories

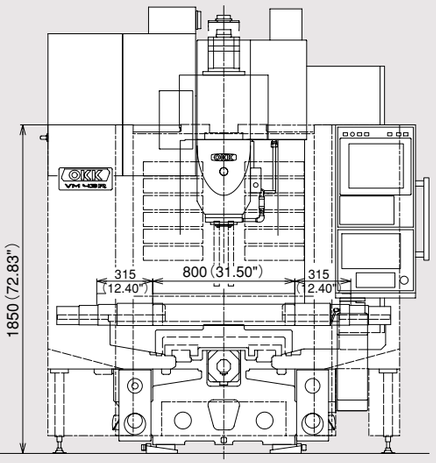
Item	Specification
Compatibility with Dual-contact tool	BT Type (with Magazine tool holder remove device)
Spindle motor	8000min-1 (7.5/5.5kW (10/7HP)) (No.40 Gear-drive spindle) 14000min-1 (22/18.5kW (30/25HP)) (No.40 MS spindle) 20000min-1 (22/18.5kW (30/25HP)) (No.40 MS spindle) 6000min-1 (15/11kW (20/15HP)) (No.50 Gear-drive spindle) 8000min-1 (11/7.5kW (15/10HP)、15/11kW (20/15HP)) (No.50 Gear-drive spindle)
Number of stored tools	30 tools (Drum type) (No.40 only)
Pallet changer	Direct turn type APC
Column-UP	200mm (7.87")
Chip discharge equipment	Chip flow coolant / without coil conveyor
Coolant pump motor	Rank up 1.1kW (1.5HP)
Oil skimmer	Belt type
Splash guard	Front door automatically open / close
Ceiling cover	Ceiling cover / ATC shutter
Addition of lighting system	LED light / Additional light (MG side)
Signal lamp (tower type / rotary type)	Two-lamp type / Three-lamp type (With buzzer / Without buzzer)
Linear scale feed back	XYZ-axis / XY-axis
Spindle through coolant	2MPa (290psi) coolant / 7MPa (1015psi) coolant / with air / Complete preparation for coolant through spindle with rotary joint
Coolant cooler	Separately installed type / High-pressure unit integrated type (High-pressure unit is required separately)
Air blow nozzle	
Compatibility with oil-mist blow	
Minimal quantity	
Swirl stopper block	For high-spindle / For angle attachment
Compatibility with oil-hole holder	
Workpiece flushing equipment	Shower gun type
Mist collector	1.5kW (2HP) installed separately / Compatibility with supplied device
Lift-up chip conveyor	Hinged type / Scraper type / Magnet scraper type / Scraper type with drum filter / Magnet scraper type with drum filter
Chip bucket	Fixed type / Swing type
Special operation panel	Pendant-type/console type
Manual pulse generator 3-axis	Stand type / Handy type
Foundation parts	Bond anchoring method
Bond for foundation work	1kg (2.2 lbs)
Machine coating color	Color specified by customer
Standard tool set	Including a tool box
NC rotary table	
Touch sensor system T0	Workpiece measurement Tool length / diameter measurement
Touch sensor system T1 (Workpiece measurement)	Workpiece measurement
Touch sensor system T1 (Tool measurement)	Tool length measurement / Tool break detection

Main Dimensions

Side View



Front View



Floor Space

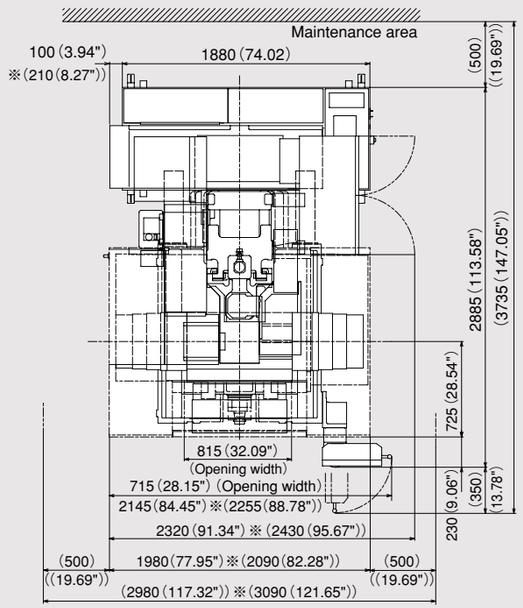
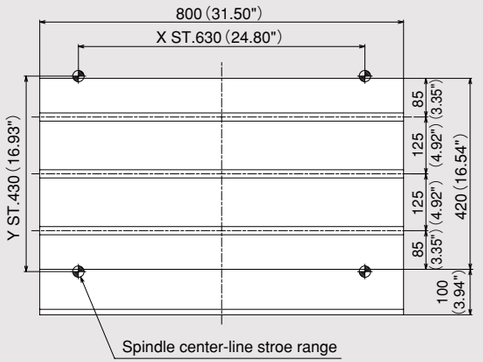
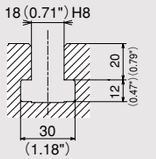


Table Dimensions



T-slot dimention



Note: The asterisked dimension varies with the machine specification.
※ : No.50

Machine Main Body's Main Specification

Machine Body's Specification

Item	Unit	Specification	
		No.40	No.50
		Gear-drive spindle	
		8000min-1	6000min-1
Travel on X axis (Table right / left)	mm	1050 (41.34")	
Travel on Y axis (Saddle back / forth)	mm	530 (20.87")	
Travel on Z axis (Spindle head up / down)	mm	510 (20.08")	
Distance from table top surface to spindle nose	mm	150 (5.91")～660 (25.98")	
Distance from column front to spindle center	mm	564 (22.20")	
Table work surface area (X-axis direction × Y-axis direction)	mm	1050 (41.34")×560 (22.05")	
Max. workpiece weight loadable on table	kg	800 (1764 lbs)	
Table work surface configuration (T-slot nominal dimension × spacing × number of T slots)	mm	18 (0.71")×110 (4.33")×5	
Distance from floor to table work surface	mm	920 (36.22")	
Spindle rotating speed	min-1	25～8000	25～6000
Number of spindle rotating speeds		2 steps	
Spindle nose (nominal number)		7/24-tapered No.40	7/24-tapered No.50
Spindle bearing bore diameter	mm	φ70 (2.76")	φ100 (3.94")
Rapid traverse rate	m/min	X/Y:30 (1181 ipm) Z:20 (787 ipm)	
Cutting feed rate	mm/min	1～20000 (0.04 to 787 ipm) ※1	
Jog feed rate	mm/min	2000 (78.7 ipm)	
Type of Tool shank		JIS B 6339 BT40	JIS B 6339 BT50
Type of Pull stud		MAS403 P40T-1	OKK only 90°
Number of stored tools	tools	30	
Max. tool diameter (with tools in adjacent pots)	mm	φ80 (3.15")	φ103 (4.06")
Max. tool diameter (with no tools in adjacent pots)	mm	φ110 (4.33")	φ200 (7.87")
Max. tool length (from gauge line)	mm	350 (13.78")	
Max. tool mass [moment]	kg [N・m]	10 (22 lbs) [9.8 (7.2ft・lbs)]	20 (44.1 lbs) [29.4 (21.7ft・lbs)]
Tool selection method		Memory random method	
Tool exchange time (tool-to-tool)	sec	2.0 (Speed is changeable for heavy tools)	
Tool exchange time (cut-to-cut)	sec	5.5 (13.5 ※2)	5.9 (13.9 ※2)
Spindle motor (30-min/continuous rating) MITSUBISHI	kW	11 (15HP) / 7.5 (10HP)	15 (20HP) / 11 (15HP)
Spindle motor (30-min/continuous rating) FANUC	kW	11 (15HP) / 7.5 (10HP)	15 (20HP) / 11 (15HP)
Feed motors MITSUBISHI	kW	X / Y:2.0 (2.7HP) Z:3.5 (4.7HP)	
Feed motors FANUC	kW	X / Y:3.0 (4HP) Z:4.0 (5.4HP)	
Coolant pump motor	kW	0.4 (0.5HP)	
Slideway lubrication pump motor	kW	0.017 (0.022HP)	
Spindle head cooling pump motor (oil cooler)	kW	0.75 (1HP)	
Spindle head cooling pump motor (oil air lubrication)	kW	—	0.018 (0.024HP)
Motor for ATC	kW	0.4 (0.54HP)	0.75 (1HP)
Motor for tool magazine	kW	0.2 (0.27HP)	0.4 (0.54HP)
Motor for coil-type chip conveyor	kW	0.2 (0.27HP)×2	
Power supply ※3 MITSUBISHI	kVA	32	37
Power supply ※3 FANUC	kVA	30	35
Supply voltage・Supply frequency	V・Hz	200V±10% 50/60Hz±1Hz 220V±10% 60Hz±1Hz	
Compressed air supply pressure ※4	MPa	0.4～0.6 (58～87 psi)	
Compressed air supply flow rate ※3,※4	L/min (ANR)	160 more (42 gpm more)	400 more (106 gpm more)
Coolant tank capacity	L	280 (74 gal)	
Spindle cooling oil tank capacity (oil cooler)	L	50 (13.2 gal)	
Spindle bearing lubrication oil tank capacity	L	—	2.0 (0.5 gal)
Slideway lubrication oil tank capacity	L	6.0 (1.6 gal)	
Machine height (from floor surface)	mm	2744 (108.03")	2815 (110.83")
Required floor space under operation (width×depth)	mm	2780 (109.45") × 2980 (117.32")	
Machine weight	kg	7800 (17200 lbs)	8000 (17600 lbs)
Operation environment temperature	℃	5～40	
Operation environment humidity	%	10～90 (No dew)	
Controller		N730, F31i-A or FAi	

※1：Available with the HQ or Hyper HQ control
※2：ATC-shutter specification
※3：The value for the standard specification It may vary with added options.
※4：Purity of the supplied air should be equivalent to Class 3.5.4 specified in ISO 8573-1 / JIS B8392-1 or higher.

Standard Accessories

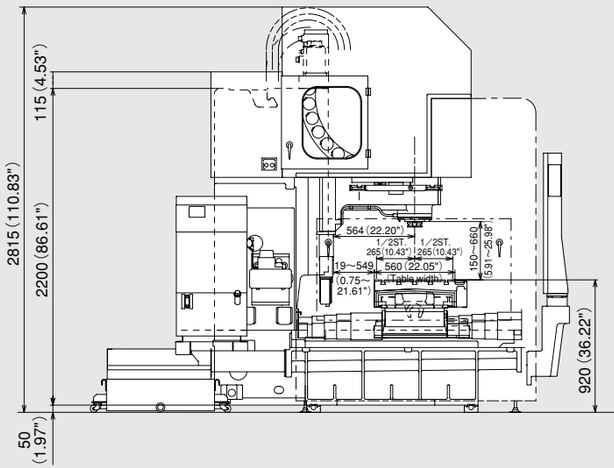
Name	Qty	Remark
Illuminating lamp	1 set	LED lamp
Coolant unit (Separate coolant tank)	1 set	Tank capacity:280L (74 gal)
Entire machine cover (Splash Guard)	1 set	Including front door and maintenance cover electromagnetic lock
Magazine safety cover	1 set	Including electromagnetic lock
Sliding surface protection steel sliding cover for X/Y/Z axes	1 set	
Spindle head cooling oil temperature controller	1 set	
Rear discharge coil-type chip conveyor	2 sets	1 set for each of right and left
Leveling block	1 set	
Parts for machine transfer	1 set	
Automatic power-off unit (with M02 or M30)	1 set	
Electric spare parts (fuses)	1 set	
Instruction manual (Specification, Maintenance manual, Foundation & Installation manual)	1 set	
Electrical instruction manuals (Operation manual, Hardware diagram)	1 set	

Special Accessories

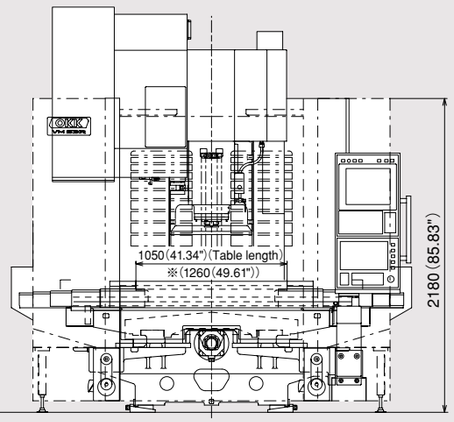
Item	Specification
Table width extension	Table width 1260mm (49.61")
Type of Tool shank	CAT40, DIN40 / CAT50, DIN50
Compatibility with Dual-contact tool	BT Type (with Magazine tool holder remove device)
Spindle motor	10000min-1 [11 (15HP) / 7.5 (10HP) kW] (No.40 Gear-drive spindle) 6000min-1 [18.5 (25HP) / 15 (20HP) kW] (No.50 Gear-drive spindle) 8000min-1 [15 (20HP) / 11 (15HP) kW, 18.5 (25HP) / 15 (20HP) kW] (No.50 Gear-drive spindle) 12000min-1 [30 (40HP) / 25 (34HP) kW] (No.40 MS spindle)
Changing the type of pull stud	MAS1(45°) / MAS2(60°) (only available No.50 taper soindle)
Number of stored tools	20 tools (Drum type) / 40 tools (Chain type)
Pallet changer	Shuttle type APC (Pallet top face specification T-slot specification / Tap specification)
Column-UP	250mm (9.84")
Chip discharge equipment	Chip flow coolant / without coil conveyor
Coolant pump motor	Rank up 1.1kw (1.5HP)
Oil skimmer	Belt type
Splash guard	Front door automatically open / close
Ceiling cover	Ceiling cover / ATC shutter
Addition of lighting system	LED light / Additional light (MG side)
Signal lamp (tower type / rotary type)	Two-lamp type / Three-lamp type (With buzzer / Without buzzer)
Linear scale feed back	XYZ-axis / XY-axis
Spindle through coolant	2Mpa (290psi) coolant / 7Mpa (1015psi) coolant / with air / Complete preparation for coolant through spindle with rotary joint
Coolant cooler	Separately installed type / High-pressure unit integrated type (High-pressure unit is required separately)
Air blow nozzle	
Compatibility with oil-mist blow	
Minimal quantity	
Swirl stopper block	For high-spindle / For angle attachment
Compatibility with oil-hole holder	
Workpiece flushing equipment	Shower gun type
Mist collector	2.2kW (3HP) installed separately / Compatibility with supplied device
Lift-up chip conveyor	Hinged type / Scraper type / Magnet scraper type / Scraper type with drum filter / Magnet scraper type with drum filter
Chip bucket	Fixed type / Swing type
Special operation panel	Pendant-type/console type
Manual pulse generator 3-axis	Stand type / Handy type
Foundation parts	Bond anchoring method
Bond for foundation work	1kg (2.2lbs)
Machine coating color	Color specified by customer
Standard tool set	Including a tool box
NC rotary table	
Touch sensor system T0	Workpiece measurement Tool length/diameter measurement
Touch sensor system T1 (Workpiece measurement)	Workpiece measurement
Touch sensor system T1 (Tool measurement)	Tool length measurement / Tool break detection

Main Dimensions

Side View

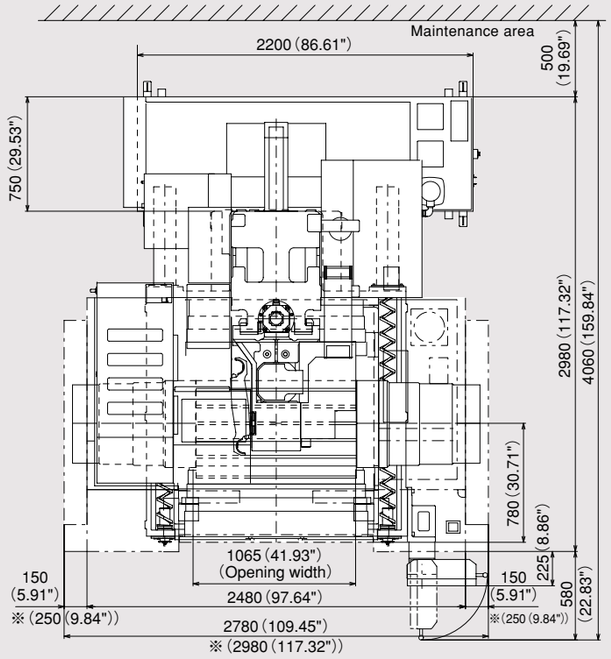


Front View



Note：The asterisked dimension varies with the machine specification.
※:1050mm (41.34") X-axis stroke + 1260mm (49.61") table length

Floor Space



Note：The asterisked dimension varies with the machine specification.
※:1050mm (41.34") X-axis stroke + 1260mm (49.61") table length

T-slot dimensions

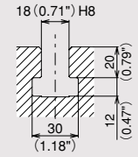
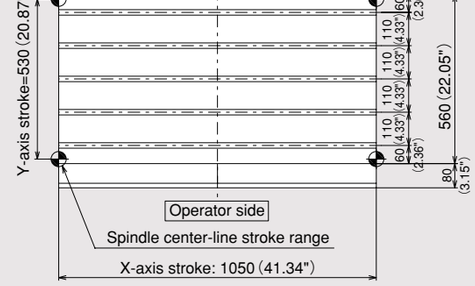
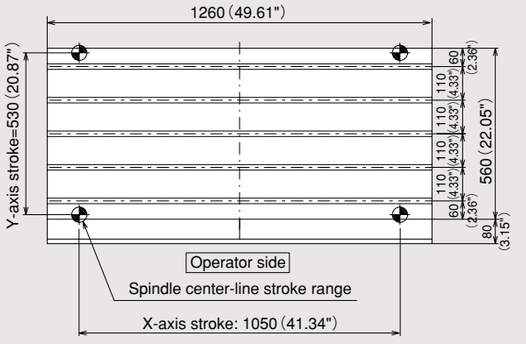


Table Dimensions

Standard table



Optional long table



Machine Main Body's Main Specification

Machine Body's Specification

Item	Unit	Specification	
		No.40	No.50
		MS drive spindle	Gear-drive spindle
		14000min^{-1}	6000min^{-1}
Travel on X axis (Table right / left)	mm	1540 (60.63")	
Travel on Y axis (Saddle back / forth)	mm	760 (29.92")	
Travel on Z axis (Spindle head up / down)	mm	660 (25.98")	
Distance from table top surface to spindle nose	mm	150 (5.91") ~810 (31.89")	
Distance from column front to spindle center	mm	785 (30.91")	
Table work surface area (X-axis direction × Y-axis direction)	mm	1550 (61.02") ×760 (29.92")	
Max. workpiece weight loadable on table	kg	1500 (3307 lbs)	
Table work surface configuration (T-slot nominal dimension × spacing × number of T slots)	mm	22 (0.87") ×140 (5.51") ×5 tools	
Distance from floor to table work surface	mm	1000 (39.37")	
Spindle rotating speed	min^{-1}	100~14000	25~6000
Number of spindle rotating speeds		2 steps	
Spindle nose (nominal number)		7/24-tapered No.40	7/24-tapered No.50
Spindle bearing bore diameter	mm	φ70 (2.76")	φ100 (3.94")
Rapid traverse rate	m/min	X/Y:24 (945 ipm)	Z:20 (787 ipm)
Cutting feed rate	mm/min	1~20000 (0.04 to 787 ipm) ※1	
Jog feed rate	mm/min	2000 (78.7 ipm)	
Type of Tool shank		JIS B 6339 BT40	JIS B 6339 BT50
Type of Pull stud		MAS403 P40T-1	OKK only 90°
Number of stored tools	tools	30	
Max. tool diameter (with tools in adjacent pots)	mm	φ80 (3.15")	φ103 (4.06")
Max. tool diameter (with no tools in adjacent pots)	mm	φ110 (4.33")	φ200 (7.87")
Max. tool length (from gauge line)	mm	350 (13.78")	
Max. tool mass [moment]	kg [N•m]	10 (22 lbs) [9.8 (7.2ft•lbs)]	20 (44.1 lbs) [29.4 (21.7ft•lbs)]
Tool selection method		Memory random method	
Tool exchange time (tool-to-tool)	sec	2.0 (Speed is changeable for heavy tools)	
Tool exchange time (cut-to-cut)	sec	7.0 (16.0 ※2)	
Spindle motor (30-min/continuous rating) MITSUBISHI	kW	22/18.5 (30HP/25HP)	15 (20HP) / 11 (15HP)
Spindle motor (30-min/continuous rating) FANUC	kW	22/18.5 (30HP/25HP)	15 (20HP) / 11 (15HP)
Feed motors MITSUBISHI	kW	X/Y:4.5 (6HP)	Z:4.5 (6HP)
Feed motors FANUC	kW	X/Y:7.0 (9HP)	Z:6.0 (8HP)
Coolant pump motor	kW	0.4 (0.5HP)	
Slideway lubrication pump motor	kW	0.017 (0.022HP)	
Spindle head cooling pump motor (oil cooler)	kW	0.75 (1HP)	
Spindle head cooling pump motor (oil air lubrication)	kW	0.018 (0.024HP)	
Motor for ATC	kW	0.4 (0.54HP)	0.75 (1HP)
Motor for tool magazine	kW	0.2 (0.27HP)	0.4 (0.54HP)
Motor for coil-type chip conveyor	kW	0.2 (0.27HP) ×2	
Power supply ※3 MITSUBISHI	kVA	53	44
Power supply ※3 FANUC	kVA	53	39
Supply voltage・Supply frequency	V・Hz	200V±10% 50/60Hz±1Hz 220V±10% 60Hz±1Hz	
Compressed air supply pressure ※4	MPa	0.4~0.6 (58~87 psi)	
Compressed air supply flow rate ※3,※4	L/min(ANR)	400 more (106 gpm more)	
Coolant tank capacity ※3	L	400 (106 gal)	
Spindle cooling oil tank capacity (oil cooler)	L	50 (13.2 gal)	
Spindle bearing lubrication oil tank capacity	L	2.0 (0.5 gal)	
Slideway lubrication oil tank capacity	L	6.0 (1.6 gal)	
Machine height (from floor surface) MITSUBISHI	mm	3300 (129.92")	3150 (124.02")
Machine height (from floor surface) FANUC	mm	3300 (129.92")	
Required floor space under operation (width×depth)		3980 (156.69") ×3700 (145.67")	
Machine weight	kg	13000 (28700 lbs)	
Operation environment temperature	℃	5~40	
Operation environment humidity	%	10~90 (No dew)	
Controller		N730 or F31i-A	

※1 : Available with the HQ or Hyper HQ control
※2 : ATC-shutter specification
※3 : The value for the standard specification It may vary with added options.
※4 : Purity of the supplied air should be equivalent to Class 3.5.4 specified in ISO 8573-1 / JIS B8392-1 or higher.

Standard Accessories

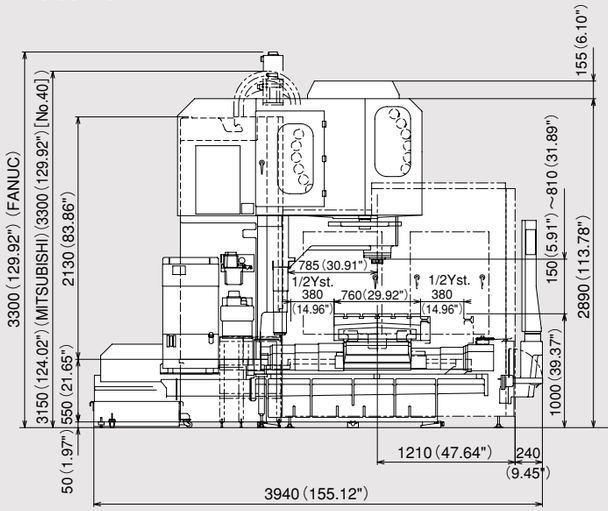
Name	Qty	Remark
Illuminating lamp	1 set	LED lamp
Coolant unit (Separate coolant tank)	1 set	Tank capacity:400L (106 gal)
Entire machine cover (Splash Guard)	1 set	Including front door and maintenance cover electromagnetic lock
Magazine safety cover	1 set	Including electromagnetic lock
Sliding surface protection steel sliding cover for X/Y/Z axes	1 set	
Spindle head cooling oil temperature controller	1 set	
Rear discharge coil-type chip conveyor	2 sets	1 set for each of right and left
Leveling block	1 set	
Parts for machine transfer	1 set	
Automatic power-off unit (with M02 or M30)	1 set	
Electric spare parts (fuses)	1 set	
Instruction manual (Specification, Maintenance manual, Foundation & Installation manual)	1 set	
Electrical instruction manuals (Operation manual, Hardware diagram)	1 set	

Special Accessories

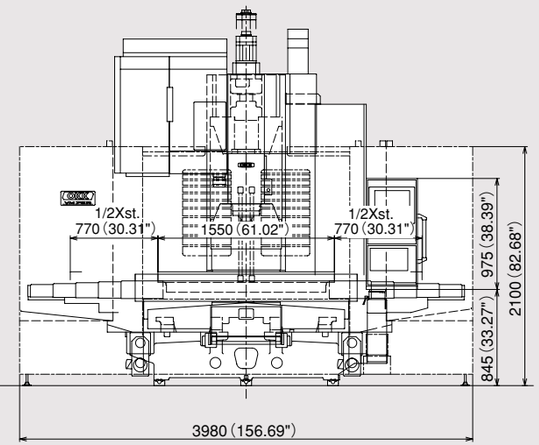
Item	Specification
Feed unit type	Core chilled double anchor ball screw
Workpiece weight loadable 2000kg (4400 lbs)	Y axis special Ball screw, Hybrid guide for Y axis / core chilled double anchor ball screw
Type of Tool shank	CAT40, DIN40 / CAT50, DIN50
Compatibility with Dual-contact tool	BT Type (with Magazine tool holder remove device)
Spindle motor	20000min^{-1} (22/18.5kW (30HP/25HP)) (No.40 MS spindle) 6000min^{-1} [18.5 (25HP)/15 (20HP) kW] (No.50 Gear-drive spindle) 8000min^{-1} [15 (20HP)/11 (15HP) kW, 18.5 (25HP)/15 (20HP) kW] (No.50 Gear-drive spindle) 12000min^{-1} [30 (40HP)/25 (34HP) kW] (No.50 MS spindle)
Changing the type of pull stud	No.40:MAS2 (60°)/ OKK only 90° No.50:MAS1 (45°)/MAS2 (60°)
Number of stored tools	20 tools (Drum type) / 40 tools, 60 tools (Chain type) (60 tools only No.50 available)
Pallet changer	Shuttle type APC (Pallet top face specification T-slot specification /Tap specification)
Column-UP	250mm (9.84")
Chip discharge equipment	Chip flow coolant / without coil conveyor
Coolant pump motor	Rank up 1.1kw (1.5HP)
Oil skimmer	Belt type
Splash guard	Front door automatically open / close
Ceiling cover	Ceiling cover / ATC shutter
Addition of lighting system	LED light / Additional light (MG side)
Signal lamp (tower type / rotary type)	Two-lamp type / Three-lamp type (With buzzer / Without buzzer)
Linear scale feed back	XYZ-axis / XY-axis
Spindle through coolant	2Mpa (290psi) coolant / 7Mpa (1015psi) coolant / with air / Complete preparation for coolant through spindle with rotary joint
Coolant cooler	Separately installed type / High-pressure unit integrated type (High-presure unit is required separately)
Air blow nozzle	
Compatibility with oil-mist blow	
Minimal quantity coolant supply equipment	
Swirl stopper block	For high-spindle / For angle attachment
Compatibility with Oil-hole holder	
Workpiece flushing equipment	Shower gun type
Mist collector	2.2kW (3HP) installed separately / Compatibility with supplied device
Lift-up chip conveyor	Hinged type / Scraper type / Magnet scraper type / Scraper type with drum filter / Magnet scraper type with drum filter
Chip bucket	Fixed type / Swing type
Special operation panel	Pendant-type / console type
Manual pulse generator 3-axis	Stand type / Handy type
Foundation parts	Bond anchoring method
Bond for foundation work	1kg (2.2lbs)
Machine coating color	Color specified by customer
Standard tool set	Including a tool box
NC rotary table	
Touch sensor system T0	Workpiece measurement Tool length / diameter measurement
Touch sensor system T1 (Workpiece measurement)	Workpiece measurement
Touch sensor system T1 (Tool measurement)	Tool length measurement / Tool break detection

Main Dimensions

Side View



Front View



Floor Space

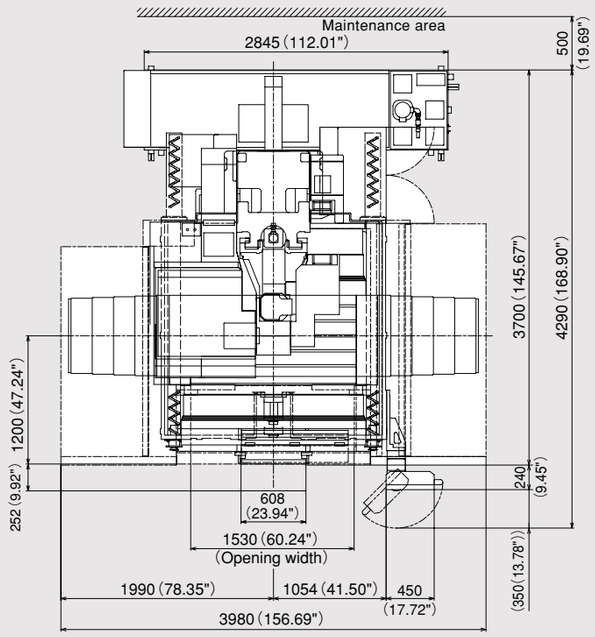
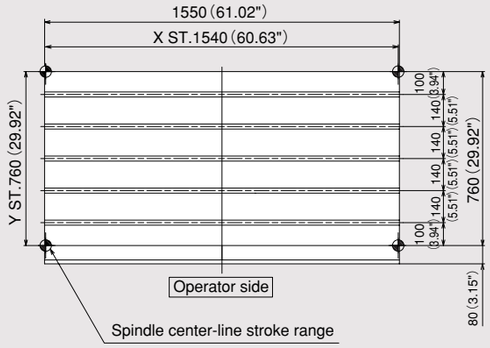
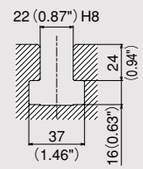


Table Dimensions



T-slot dimensions



CONTROLLER

N730

Standard Specification
No.of controlled axes: 3 axes (X, Y, Z)
No.of simultaneously controlled axes: 3 axes
Least input increment: 0.001mm / 0.0001"
Least control increment:1nm
Max. programmable dimension:±99999.999mm / 9999.9999"
Absolute / Incremental programming: G90 / G91
Decimal point input Ⅰ / Ⅱ
Inch / Metric conversion: G20 / G21
NC tape: EIA / ISO data input format
Program format: Meldas standard format (M2 format needs to be instructed.)
Positioning: G00
Linear interpolation: G01
Circular interpolation: G02 / G03 (CW / CCW) (Radius designation on arc)
Cutting feed rate: 5.3-digit F-code, direct command
One digit F-code feed
Dwell: G04
Manual handle feed: manual pulse generator 1set (0.001, 0.01, 0.1mm)
Rapid traverse override: 0 / 1 /10/ 25 / 50 / 100%
Cutting feed rate override: 0 to 200% (every 10%)
Feed rate override cancel: M49 / M48
Rigid tapping: G84, G74
Part program storage capacity: 160m [60KB]
No. of registered programs: 200
Part program editing
Background editing
Buffer modification
Color touch-panel display (15" LCD / QWERTY key MDI)
Integrating time display
Clock function
User definable key
MDI (Manual Data Input) operation
Menu list
Parameter / Operation / Alarm guidance
Ethernet interface
IC card interface / USB Memory interface
IC card driving
Hard disk mode
Spindle function: 5-digit S-code direct command
Spindle speed override: 50 to 150% (every 5%)
Tool function: 4-digit T-code direct command
ATC tool registration
Miscellaneous function: 3-digit M-code programming
Multiple M-codes in 1 block: 3 codes (Max 20 settings)
Tool length offset: G43, G44
Tool position offset: G45 to G48
Cutter compensation: G38 to G42
Tool offset sets: 200 sets
Tool offset memory Ⅱ: tool geometry and wear offset
Manual reference position return
Automatic reference position return: G28 / G29
2nd to 4th reference position return: G30 P2 to P4
Reference position return check: G27
Automatic coordinate system setting
Coordinate system setting: G92
Selection of machine coordinate system setting: G53
Selection of workpiece coordinate system setting: G54 to G59
Local coordinate system setting: G52
Program stop: M00
Optional stop: M01
Optional block skip: ／
Dry run
Machine lock
Z-axis feed cancel
Miscellaneous function lock
Program number search
Sequence number search
Program restart function
Cycle start
Auto restart
Single block
Feed hold
Manual absolute on / off parameter
Machining time computation
Automatic operation handle interruption
Manual numerical command
Sub program control
Canned cycle: G73, G74, G76, G80 to G89
Linear angle designation
Circular cutting
Mirror image function: Parameter
Mirror image function: G code
Variable command: 200 sets
Automatic corner override
Exact stop check / mode
Programmable data input: G10 / G11
3D solid program check
Graphic display check
Backlash compensation
Memory pitch error compensation
Manual tool length measurement
Emergency stop
Data protection key
NC alarm display
Machine alarm message
Stored stroke limit Ⅰ / Ⅱ
Load monitor
Self-diagnosis
Absolute position detection

Optional Specification	
Additional one axis control: name of axis (A, B, C, U, V, W)	
Additional two axes control: name of axis (A, B, C, U, V, W) Note	
Simultaneously controlled axes: 4-axes,5-axes (N750)	
Tape format: M2 / M0 format	
Unidirectional positioning: G60	***PK***
Helical interpolation	***PK***
Cylindrical interpolation	
Hypothetical axis interpolation	
Spiral interpolation	
NURBS interpolation (Hyper HQ control mode Ⅱ is required)	
Handle feed 3 axes (Remote control pulse handle not available)	
Part program storage capacity:320m [125KB] (200)	
Part program storage capacity:600m [250KB] (400)	
Part program storage capacity:1280m [500KB] (1000)	***PK***
Part program storage capacity: 2560m [1MB] (1000)	
Part program storage capacity: 5120m [2MB] (1000)	
RS232C interface: RS232C-1CH	
Computer link B: RS232C	
Spindle contour control (Spindle position control)	
3-dimensional cutter compensation	
Tool offset sets: 400 sets	
Tool offset sets: 999 sets	
Addition of workpiece coordinate system (48 sets) : G54.1 P1 to P48	***PK***
Addition of workpiece coordinate system (96 sets) : G54.1 P1 to P96	
Optional block skip: Total 9	
Tool retract and return	
Sequence number comparison and stop	
Corner chamfering / corner R: Insert into straight line-straight line / straight line-circle.	***PK***
User macro and user macro interruption	***PK***
Variable memory expansion: 300 sets in total	
Variable memory expansion: 600 sets in total	***PK***
Pattern rotation	
Programmable coordinate system rotation:G68, G69 / G68.1, G69.1	***PK***
Parameter coordinate system rotation	***PK***
Special canned cycles: G34 to G36, G37.1 / G34 to G37	
Scaling: G50, G51	
Chopping function	
Playback	
Skip function: G31	***PK***
Automatic tool length measurement: G37 / G37.1	
Tool life management Ⅱ with 200 sets spare tools	***PK***
Additional tool life management sets: 400 in total	
Additional tool life management sets: 600 in total	
Additional tool life management sets: 800 in total	
Additional tool life management sets: 1000 in total	
External search (Standard for the machine with APC)	

Original OKK Software	
Machining support integrated software (incl.help guidance,etc.)	STD
Tool support function	STD
Program Editor	STD
EasyPRO	STD
Work Manager	OP
HQ control	STD
Hyper HQ control mode Ⅰ	OP
Hyper HQ control mode Ⅱ	OP
NC option package (including PK)	OP
Win GMC7	OP
Cycle Mate	OP
Soft scale Ⅲ	STD
Touch sensor T0 software	OP
Tool failure detection system (Soft CCM)	OP
Adaptive control unit (Soft AC)	OP
Automatic restart at tool damag	OP

Note : Require N750 controller.

F31i-A / FAi (WindowsCE-installed Open CNC)

Standard Specification	F31i	FAi
No. of controlled axes: 3 axes (X, Y, Z)		
No. of simultaneously controlled axes: 3 axes		
Least input increment: 0.001mm / 0.0001"		
Max.programmable dimension: ±999999.999mm / ±39370.0787"		
Absolute / Incremental programming: G90 / G91		
Decimal point input / Pocket calculator type decimal point input		
Inch / Metric conversion: G20 / G21		
Program code: ISO / EIA automatic discrimination		
Program format: FANUC standard format		
Nano interpolation (internal)		
Positioning: G00		
Linear interpolation: G01		
Circular interpolation: G02 / G03 (CW / CCW) (Radius designation on arc)		
Cutting feed rate: 6.3-digit F-code, direct command		
Dwell: G04		
Manual handle feed: manual pulse generator 1 set (0.001、0.01、0.1mm)		
Rapid traverse override: 0 / 1 /10 / 25 / 50 / 100%		
Cutting feed rate override: 0 to 200% (every 10%)		
Feed rate override cancel: M49 / M48		
Rigid tapping: G84, G74 (Mode designation: M29)		
Part program storage capacity: 160m [64KB]		—
Part program storage capacity: 1280m [512KB]	—	
No. of registered programs: 120		—
No. of registered programs: 400	—	
Background editing		
Extended part program editing		
15-inch color LCD		—
10.4-inch color LCD	—	
Clock function		
MDI (Manual Data Input) operation		
Memory card interface		—
Memory card interface／USB interface	—	
Spindle function: 5-digit S-code direct command		
Spindle speed override: 50 to 150% (every 5%)		
Tool function: 4-digit T-code direct command		
ATC tool registration		
Miscellaneous function: 3-digit M-code programming		
Multiple M-codes in 1 block: 3 codes (Max 20 settings)		
Tool length offset: G43, G44 / G49		
Tool diameter and cutting edde R compensation:G41,G42/G40		
Tool offset sets: 99 sets		—
Tool offset sets: 400 sets	—	
Tool offset memory C		
Manual reference position return		
Automatic reference position return: G28 / G29		
2nd reference position return: G30		
Reference position return check: G27		
Automatic coordinate system setting		
Coordinate system setting: G92		
Selection of machine coordinate system setting: G53		
Selection of workpiece coordinate system setting: G54 to G59		
Local coordinate system setting: G52		
Program stop: M00		
Optional stop: M01		
Optional block skip: /		
Dry run		
Machine lock		
Z-axis feed cancel		
Auxiliary function lock		
Graphic display		
Program number search		
Sequence number search		
Program restart function		
Cycle start		
Auto restart		
Single block		
Feed hold		
Manual absolute on / off parameter		
Sub program control		
Canned cycle: G73, G74, G76, G80 to G89		
Mirror image function parameter		
Automatic corner override		
Exact stop check/mode		
Programmable data input: G10		
Backlash compensation for each rapid traverse and cutting feed		
Smooth backlash		
Memory pitch error compensation (interpolation type)		
Skip function		
Tool length measurement		
Emergency stop		
Data protection key		
NC alarm display / alarm history display		
External alarm message		
Stored stroke check 1		
Load monitor		
Self-diagnosis		
Absolute position detection		
Manual Guide i (Basic)		

Optional Specification	F31i	FAi
Additional one axis control: name of axis (A, B, C, U, V, W)		
Additional two axes control: name of axis (A, B, C, U, V, W) Note1		
Simultaneously controlled axes: 4-axes, 5-axes (F31i-A5) Note1		4 axis
Least input increment IS-C: 0.0001mm / 0.00001"		
FS15 tape format		—
FS10／11 tape format	—	
Unidirectional positioning: G60		STD
Helical interpolation ***PK1***		STD
Cylindrical interpolation		STD
Hypothetical axis interpolation		—
Conical/Spiral interpolation		—
Smooth interpolation (Hyper HQ control B mode is required.)		—
NURBS interpolation (Hyper HQ control B mode is required.)		—
Involute interpolation		—
One-digit F code feed		STD
Handle feed 3 axes (Remote control pulse handle not available)		—
Part program storage capacity: 320m [128KB] (250 in total)		—
Part program storage capacity: 640m [256KB] (500 in total)		—
Part program storage capacity: 1280m [512KB] (1000 in total) ***PK1***		—
Part program storage capacity: 2560m [1MB] (1000 in total)		—
Part program storage capacity: 5120m [2MB] (1000 in total)		—
Part program storage capacity: 10240m [4MB] (1000 in total)		—
Part program storage capacity: 20480m [8MB] (1000 in total)		—
Part program storage capacity: 5120m [2MB] (400 in total)	—	

	F31i	FAi
RS232C interface: RS232C-1CH		
Data server: ATA Card (1GB) ***PK2***		
Data server: ATA card (4GB)		—
Spindle contour control		
Tool position offset		STD
3-dimensional cutter compensation		—
Tool offset sets: 200 sets ***PK1***		—
Tool offset sets: 400 sets		—
Tool offset sets: 499 sets		—
Tool offset sets: 999 sets		—
Addition of workpiece coordinate system (48 sets) : G54.1 P1 to P48 ***PK1***		STD
Addition of workpiece coordinate system (300 sets) : G54.1 P1 to P300		—
Machining time stamp function		—
Optional block skip: Total 9		STD
Tool retract and return		—
Sequence number comparison and stop		STD
Manual handle interruption		STD
Programmable mirror image ***PK1***		STD
Optional chamfering / corner R		STD
Custom macro ***PK1***		STD
Interruption type custom macro		STD
Addition of custom macro common variables: 600		STD
Figure copy		—
Programmable coordinate system rotation: G68, G69		STD
Scaling: G50, G51		STD
Chopping function		—
Playback		—
Automatic tool length measurement: G37 / G37.1		STD
Tool life management: 256 sets (FAi:128 sets) ***PK1***		STD
Addition of tool life management sets: 1024 sets in total		—
High-speed skip		
Run hour and parts count display ***PK1***		STD
Manual Guide i (Milling cycle)		

Original OKK Software	F31i	FAi
Machining support integrated software (incl.help guidance,etc.)	STD	—
Tool support function	STD	—
Program Editor	STD	—
EesyPRO	STD	—
Work Manager	OP	—
HQ control	STD	STD
Hyper HQ control A mode	OP	OP
Hyper HQ control B mode Note 2 ***PK2***	OP	—
Hyper HQ value kit (including PK2)	OP	—
NC option package (including PK1)	OP	—
Special canned cycle (including circular cutting)	OP	OP
Cycle Mate F	OP	OP
Soft Scale Ⅱm	—	STD
Soft Scale Ⅲ	STD	—
Touch sensor T0 software	OP	OP
Tool failure detection system (Soft CCM)	OP	OP
Adaptive control unit (Soft AC)	OP	OP
Automatic restart at tool damage	OP	OP

Note 1 F31i-A5 is used when the simultaneous 5 axes control is required.
Note 2 Hyper HQ control mode "B" is not available for FAi control.
Note 3 FAi control is not available for VM76R
— : Not available