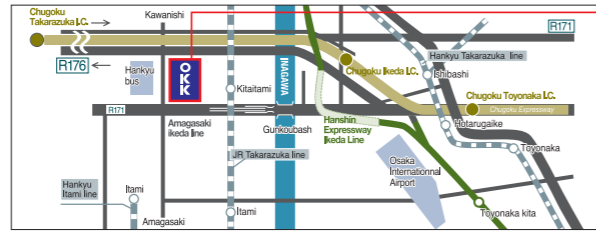


8-10, KITA-ITAMI, ITAMI
HYOGO 664-0831 JAPAN
Overseas Sales Department
TEL:(81)72-771-1112/1143
FAX:(81)72-772-7592
http://www.okk.co.jp
E-mail:ovsd@okk.co.jp

Access map



OKK Inagawa factory
8-10 Kitaitami, Itami, Hyogo Prefecture
664-0831, Japan

From Kansai International Airport :
Please take a airport bus bound for
Osaka (Itami) International Airport
and take a taxi to OKK.



Technical Center



M-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:
8-10, KITA-ITAMI, ITAMI, HYOGO 664-0831 JAPAN
TEL:(81)72-782-5121
FAX:(81)72-772-5156
E-mail:eigibu@okk.co.jp

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:

Water Maters

NOTE :

OKK reserves the right to change the information contained in this brochure without 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.

The export of this product is subject to an authorization from the government of the exporting country.
Check with the government agency for authorization.

OKK USA CORPORATION
100 REGENCY DRIVE, GLENDALE HEIGHTS, IL 60139 USA
TEL:(1)630-924-9000
FAX:(1)630-924-9010
http://www.okkcorp.com
E-mail:okkusa@okkcorp.com

OKK USA WESTERN REGIONAL OFFICE(LA)
17971 SKY PARK CIRCLE, SUITE D, IRVINE CA 92614 USA
TEL:(1)949-851-6800
FAX:(1)949-851-6888

OKK CANADA OFFICE(CANADA)
79 REGAL ROAD, UNITS 17 & 18, GUELPH, ONTARIO, N1K 1B6 CANADA
TEL:(1)630-924-9000
FAX:(1)630-924-9010

OKK EUROPE GmbH
HANSEMANNSTR. 33 41468 NEUSS GERMANY
TEL:(49)2131-29868-0
FAX:(49)2131-29868-41
http://www.okkeurope.com
E-mail:info@okkeurope.com

THAI OKK MACHINERY CO., LTD.
KUMTHORN HOLDING BUILDING 2ND FLOOR 897-897/1 RAMA III ROAD BANGPONGPANG, YANNAWA, BANGKOK 10120 THAILAND
TEL:(66)2-683-2160-2
FAX:(66)2-683-2163

PT. OKK INDONESIA
WISMA NUSANTARA BUILDING 12 FLOOR, JL.M.H.THAMRIN No.59, JAKARTA. 10350 INDONESIA
TEL:(62)21-390-2563
FAX:(62)21-390-2565

OKK(SHANGHAI) CO., LTD.
ROOM 2506, 2201 YAN AN ROAD(W.) CHANGNING DISTRICT SHANGHAI. 200336 CHINA
TEL:(86)21-62700930
FAX:(86)21-62700931
http://www.okk.com.cn
E-mail:shanghai@okk.com.cn

OKK CORPORATION SEOUL BRANCH
1203, E & C DREAM TOWER 8, 327-27, GASAN-DONG, GEUMCHEON-GU, SEOUL, 153-023 KOREA
TEL:(82)2-855-0416
FAX:(82)2-855-0426

Highly Efficient Vertical Machining Center

VM/R SERIES

VM 660 R

VM 940 R



**Best-in-class heavy-duty cutting capability is available!
This series enables highly-efficient machining of
difficult-to-cut materials.**

Machine main body has highly rigid box-shaped structure.
The solid square slide guide is used for the slideway of each axis for improved vibration attenuation property.
No. 50 taper spindle and large-diameter bearings enable highly-efficient machining of dies and molds,
automobile parts and aircraft parts.

Highly Efficient Vertical Machining Center

VM 660 R



● Main Specification

- Travel distance (X axis × Y axis × Z axis)
1300×660×660mm (51.18"×25.98"×25.98")
- Table size (X axis × Y axis)
1400×660mm (55.12"×25.98")
- Maximum tool diameter
φ200mm (7.87")
- Maximum tool mass
Maximum **20kg (44lbs)** / Average **10kg (22lbs)**
Total **300kg (661lbs)**
- Spindle rotating speed
4500min⁻¹
- Spindle motor output
18.5/15kW (25/20HP)
- Maximum tool length
350mm (13.78")
- Magazine Capacity
30 Tools



Highly Efficient Vertical Machining Center

VM 940 R

● Main Specification

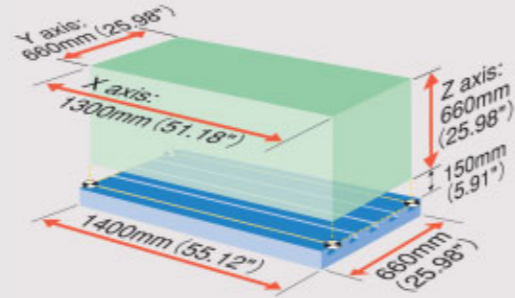
- Travel distance (X axis × Y axis × Z axis)
2060×940×820mm (81.10"×37.01"×32.28")
- Table size (X axis × Y axis)
2300×940mm (90.55"×37.01")
- Maximum tool diameter
φ200mm (7.87")
- Maximum tool mass
Maximum **20kg (44lbs)** / Average **10kg (22lbs)**
Total **400kg (882lbs)**
- Spindle rotating speed
4500min⁻¹
- Spindle motor output
18.5/15kW (25/20HP)
- Maximum tool length
400mm (15.75")
- Magazine Capacity
40 Tools

VM 660R

Machines with Highest in the class
Heavy duty Cutting Performance for
Proficiently Machining Hard to cut Materials



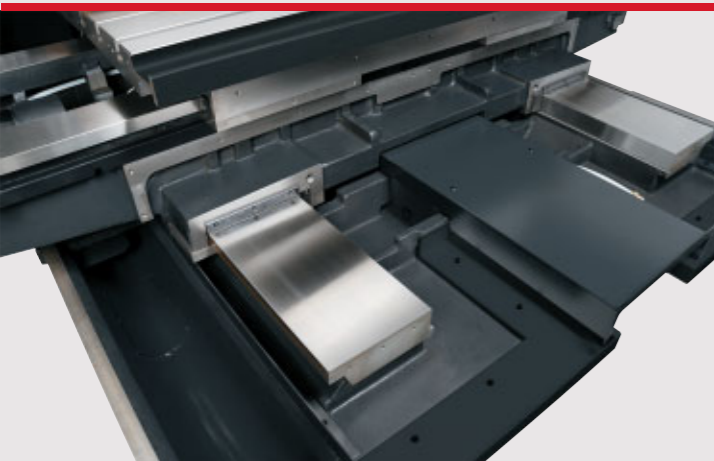
Wide machining area



Strokes as large as 1300mm (51.18")
660mm (25.98") and 660mm (25.98")
for the X-, Y- and Z-axis respectively,
allowing the accommodation of even
longer workpieces.

Wide slideway

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.

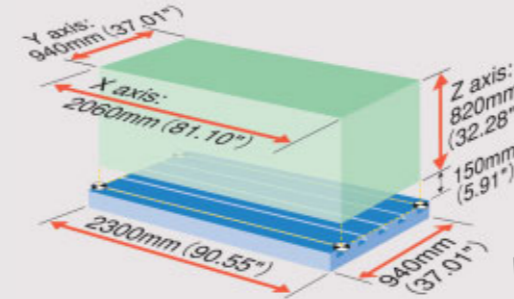


Square slide guide

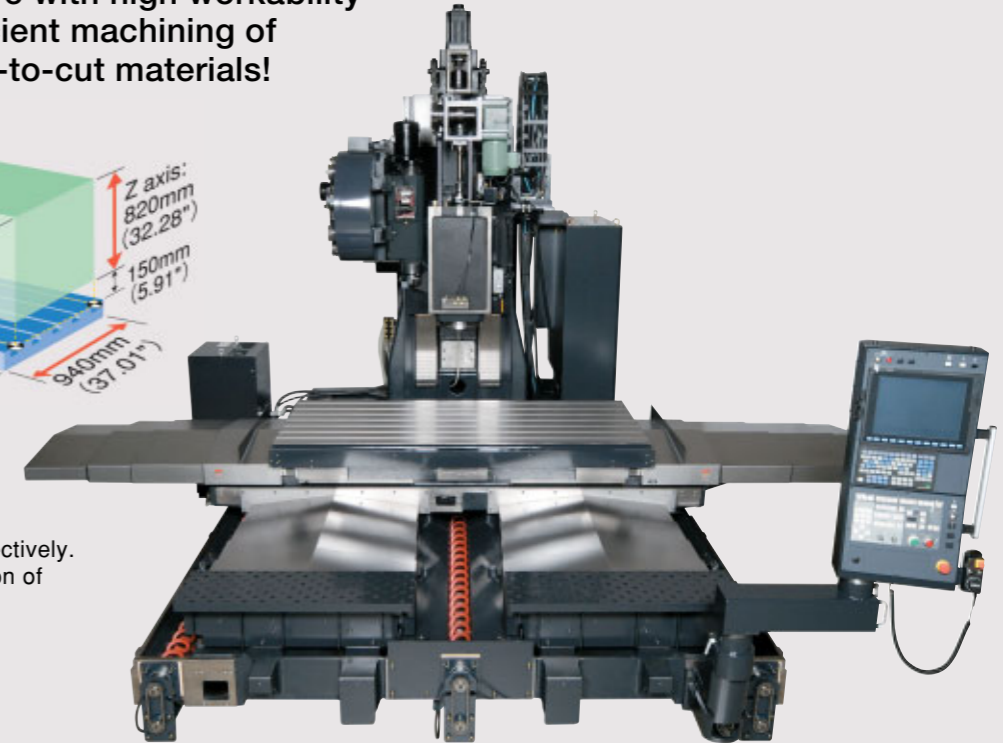


VM 940R

Highly rigid structure with high workability
enables highly-efficient machining of
large-sized difficult-to-cut materials!



Strokes as large as
2060mm (81.10")
940mm (37.01") and
820mm (32.28") for
the X-, Y- and Z-axis respectively,
allowing the accommodation of
even longer workpieces.



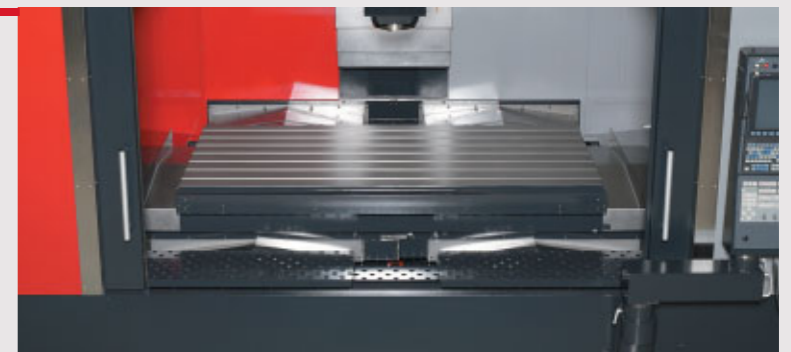
Smooth movement characteristic/ Controlled lost-motion property

Even under the heavy load, smooth
movement characteristic and good
lost-motion property are secured and
high accuracy is maintained over long
hours with the balanced twin ball
screws on the Y axis



Improvement in operability

Wide step is included as standard for
easy access to the machine inside.



Easy loading and unloading

As the top cover also opens together with the door, the workpiece loading and unloading operation with a crane can be carried out smoothly.



Photo is VM660R

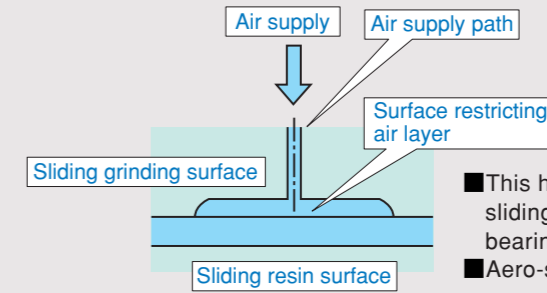
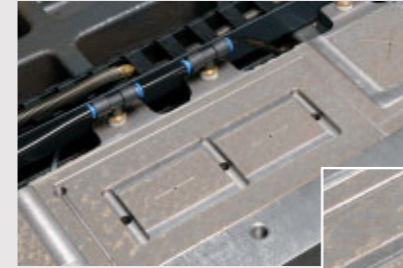


Photo is VM940R

Controlled lost-motion property

hybrid guide faces of low friction and high rigidity for the X and Y axes.

Hybrid guide face VM660R (OP) VM940R



- This hybrid guide face consists of the sliding guide face and the aerostatic bearing pad (shown in the photo).
- Aero-static bearing pad pressure opposes the guide ways face contact load.
- The reduction in guide way face friction improves the positioning accuracy, fine step feed characteristics and circular cutting accuracy.

ATC [Automatic Tool Changer]

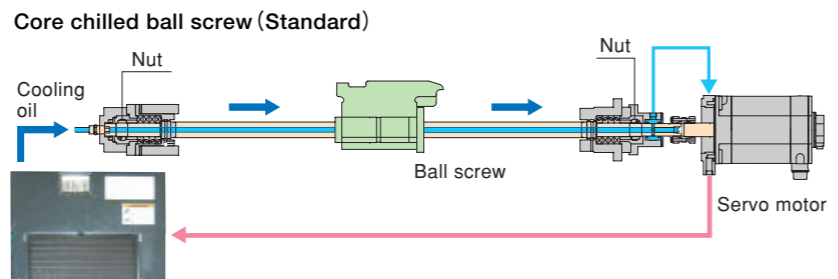
Consistent tool change operation and superior durability are ensured by use of OKK's original proven cam-controlled high-speed synchronized tool changer (OKK patent).



Photo is VM940R

Measures against thermal displacement

In order to minimize influences of chips and heat of coolant over the machining accuracy, the machines use the sidewall cooling structure for the spindle head and the core cooling structure for the ball screws and have troughs in the bed section for flushing coolant.



Thermal displacement is reduced by circulation of cooling oil



Photo is VM660R

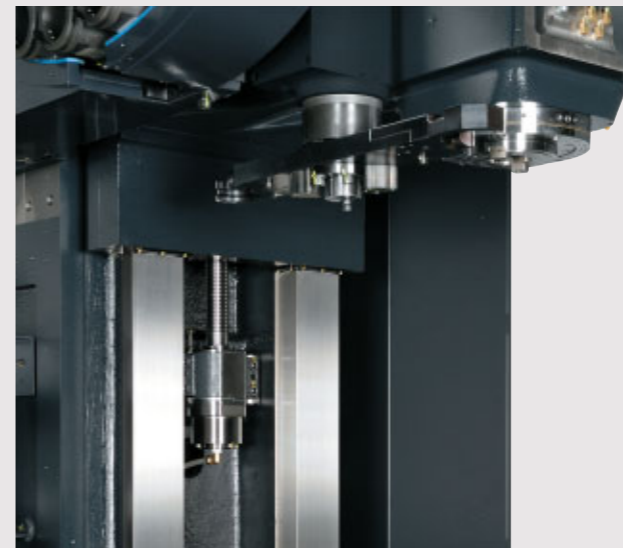
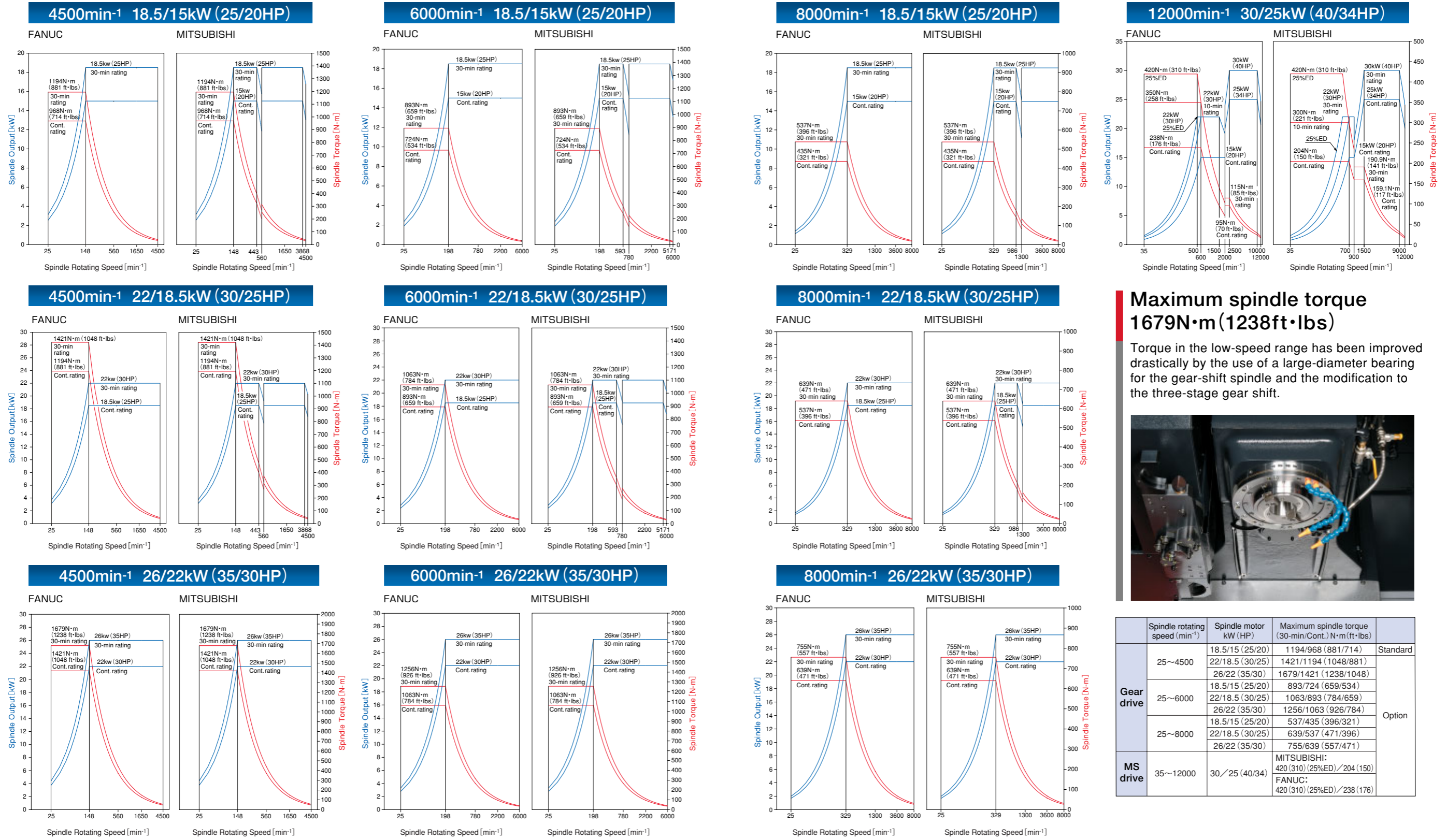


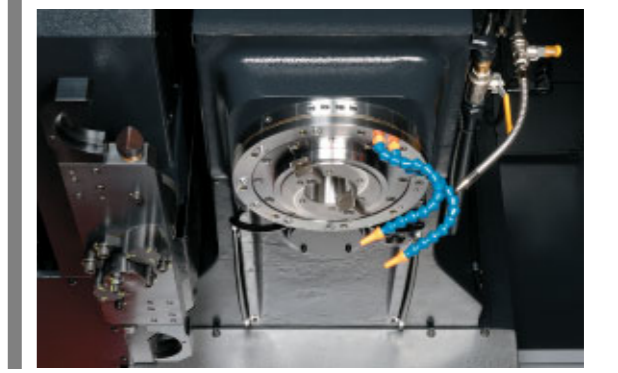
Photo is VM660R

- Maximum tool diameter ϕ 200mm (7.87")
- Maximum tool length VM660R 350mm (13.78") VM940R 400mm (15.75")
- Maximum tool mass VM660R Maximum 20kg (44 lbs) / Average 10kg (22 lbs) / Total 300kg (661 lbs) VM940R Maximum 20kg (44 lbs) / Average 10kg (22 lbs) / Total 400kg (882 lbs)
- Maximum tool moment 25.7N·m (19ft·lbs)
- Tool exchange time (tool-to-tool) 2.9 sec

Several Spindle variations to meet your machining requirements.

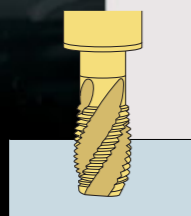
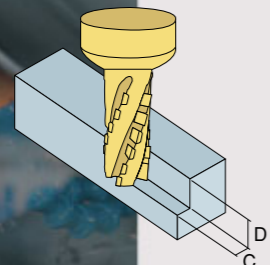
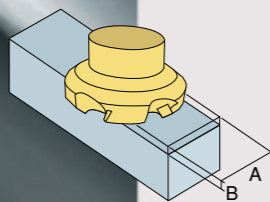


Maximum spindle torque 1679N·m(1238ft·lbs)
 Torque in the low-speed range has been improved drastically by the use of a large-diameter bearing for the gear-shift spindle and the modification to the three-stage gear shift.



	Spindle rotating speed (min⁻¹)	Spindle motor kW (HP)	Maximum spindle torque (30-min/Cont.) N·m (ft·lbs)	
Gear drive	25~4500	18.5/15 (25/20)	1194/968 (881/714)	Standard
		22/18.5 (30/25)	1421/1194 (1048/881)	
		26/22 (35/30)	1679/1421 (1238/1048)	
		18.5/15 (25/20)	893/724 (659/534)	
	25~6000	22/18.5 (30/25)	1063/893 (784/659)	Option
		26/22 (35/30)	1256/1063 (926/784)	
		18.5/15 (25/20)	537/435 (396/321)	
		22/18.5 (30/25)	639/537 (471/396)	
25~8000	26/22 (35/30)	755/639 (557/471)		
MS drive	35~12000	30/25 (40/34)	MITSUBISHI: 420 (310) (25%ED) / 204 (150) FANUC: 420 (310) (25%ED) / 238 (176)	

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



Cutting capability

Cutting data Workpiece material : S45C

VM660R : No.50 4500min⁻¹
26/22kW (35/30HP)

VM940R : No.50 6000min⁻¹
22/18.5kW (30/25HP)

Type of machining	VM660R	VM940R
	Face milling	
	φ160 (6.30") × 7T	φ160 (6.30") × 7T
Spindle rotating speed min ⁻¹	400	400
Width of cut (A) mm	120 (4.72")	120 (4.72")
Depth of cut (B) mm	6 (0.24")	6 (0.24")
Feed rate mm/min	960 (38ipm)	864 (34ipm)
Cutting rate cm ³ /min	691.2 (42.2in ³ /min)	622 (38in ³ /min)
Spindle motor load %	101	105

Type of machining	VM660R	VM940R
	Side milling	
	φ80 (3.15") × 4T [Chip type]	φ80 (3.15") × 4T [Chip type]
Spindle rotating speed min ⁻¹	500	500
Width of cut (C) mm	40 (1.57")	40 (1.57")
Depth of cut (D) mm	60 (2.36")	60 (2.36")
Feed rate mm/min	350 (14ipm)	244 (10ipm)
Cutting rate cm ³ /min	840 (51.3in ³ /min)	585.6 (35.7in ³ /min)
Spindle motor load %	119	107

Type of machining	VM940R
	Drill milling
	φ63 (2.48") [Chip type]
Spindle rotating speed min ⁻¹	760
Feed rate mm/min	91 (4ipm)
Feed mm/rev	0.12 (0.005in/rev)
Cutting rate cm ³ /min	283.5 (17.3in ³ /min)
Spindle motor load %	58

Type of machining	VM940R
	Tap milling
	M48 × P5
Spindle rotating speed min ⁻¹	47
Feed rate mm/min	235 (9ipm)
Spindle motor load %	21

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

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



Soft Scale III

Three functions for improving and retaining accuracy

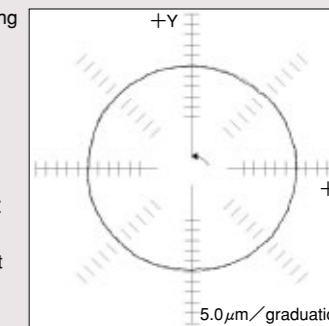
- Variable backlash compensation II**
It minimizes the backlash by compensating it according to the slideway's characteristics (Patent No.4750496)
- Ball screw elongation compensation**
Reduces any error generated by repeated feeding and positioning.
- Spindle's thermal displacement compensation**
It compensates the thermal displacement generated by rotation of the spindle.



Diagram of the 1-μm step-feed measurement

Circularity measurement

VM660R: 3.9 μm
VM940R: 4.4 μm



Circularity measurement sample

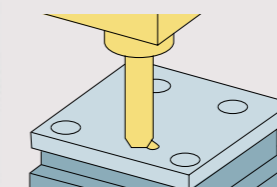
*The above data show the actual values. The results may vary with the conditions.

Accuracy

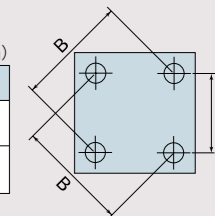
Positioning accuracy (mm) (OKK tolerance)

Item	VM660R	VM940R
Positioning accuracy	X/Y/Z: ±0.0030 (±0.00012") full stroke	X : ±0.0050 (±0.00020") Y/Z: ±0.0030 (±0.00012") full stroke
Repeated positioning accuracy	X/Y/Z: ±0.0020 (±0.00008") full stroke	X/Y/Z: ±0.0020 (±0.00008") full stroke

Positioning Machining Accuracy



	(mm)	
	VM660R	VM940R
A	200 (7.87")	200 (7.87")
B	282.843 (11.14")	282.843 (11.14")



Example record

Item	VM660R	VM940R
Axial direction	-0.004 (-0.00016")	0.005 (0.00020")
Diagonal direction	-0.003 (-0.00012")	0.004 (0.00016")
Difference in diameter	0.003 (0.00012")	0.005 (0.00020")

Notes

- The data shown above is an example and is based on short-time machining. The values may vary in during continuous machining.
- 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.
- 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.

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.



Improvement in operability

15-inch operation panel



N730

F31i-B

- 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.

Thorough chip processing measures

Coil-type chip conveyor (Standard)

Standard machine has three sets of rear discharge coil-type chip conveyors. The coil-type chip conveyors are capable of removing a large amount of chips from the machine promptly.

※ VM660R: Two set of coil-type chip conveyous (Standrad)

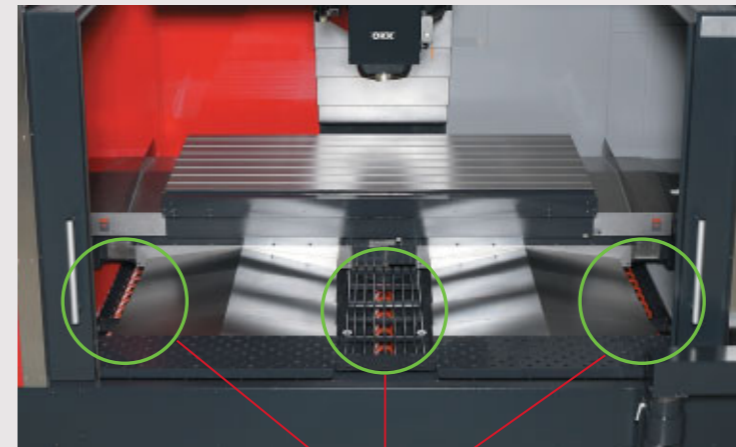


Photo is VM940R

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



Coil-type chip conveyor (Standard)

Coil-type chip conveyor (Standard)

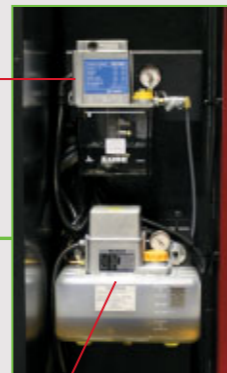
Maintenance

Easy to maintain

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

Oil separator unit

Air dryer



Automatic oil lubrication unit

Air lubrication

Filter regulator

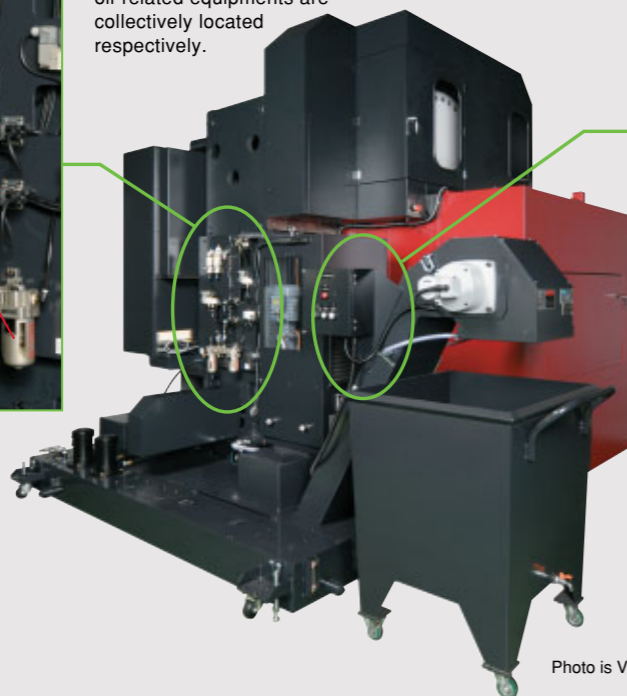


Photo is VM660R

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	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	○	○	×	×	×	×	×	-	×	-
		Cast iron	Needle shape	×	△*1	×	○	○*3	○	○	-	○	-
			Powder or small lump	×	△*1	×	○	○*3	○	○	-	○	-
			Needle shape	×	△*1	×	○	○*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.

Machine Main Body's Main Specification

Machine Body's Specification

Item	Unit	Specification
		4500min ⁻¹ (Gear-drive spindle)
Travel on X axis (Table right / left)	mm	1300 (51.18")
Travel on Y axis (Saddle back / forth)	mm	660 (25.98")
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	685 (26.97")
Table work surface area (X-axis direction × Y-axis direction)	mm	1400 (55.12") × 660 (25.98")
Max. workpiece weight loadable on table	kg	2000
Table work surface configuration (T-slot nominal dimension × spacing × number of T slots)	mm	22 (0.87") × 125 (4.92") × 5 tools
Distance from floor to table work surface	mm	980 (38.58")
Spindle rotating speed	min ⁻¹	25~4500
Number of spindle rotating speeds		3 steps
Spindle nose (nominal number)		7/24-tapered No.40
Spindle bearing bore diameter	mm	φ120 (4.72")
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 (79 ipm)
Type of Tool shank		JIS B 6339 BT50
Type of Pull stud		OKK only 90°
Number of stored tools	tools	30
Max. tool diameter (with tools in adjacent pots)	mm	φ103 (4.06")
Max. tool diameter (with no tools in adjacent pots)	mm	φ200 (7.87")
Max. tool length (from gauge line)	mm	350 (13.78")
Max. tool mass	kg	Max 20 (44.1 lbs) / AVERAGE 10 / Total 300
Max. tool mass [moment]	N·m	25.7
Tool selection method		Memory random method
Tool exchange time (tool-to-tool)	sec	2.9 (Speed is changeable for heavy tools)
Tool exchange time (cut-to-cut)	sec	8.9
Spindle motor (30-min/continuous rating)	MITSUBISHI FANUC kW	18.5 (25HP) / 15 (20HP)
Feed motors	MITSUBISHI FANUC kW	X/Y:3.5 (5HP) Z:4.5 (6HP)
	FANUC kW	X/Y:4.0 (5HP) 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 tool clamp	kW	0.75 (1HP)
Motor for ATC	kW	1.1 (1.5HP)
Motor for tool magazine	kW	0.55 (0.74HP)
Motor for coil-type chip conveyor	kW	0.2 (0.27HP) × 2
Power supply	MITSUBISHI FANUC kVA	37
	FANUC kVA	39
Supply voltage · Supply frequency	V·Hz	200V±10% 50/60Hz±1Hz 220V±10% 60Hz±1Hz
Compressed air supply pressure ※3	MPa	0.4~0.6 (58~87 psi)
Compressed air supply flow rate ※2, ※3	L/min (ANR)	400 (106 gpm)
Coolant tank capacity	L	360 (95 gal)
Spindle cooling oil tank capacity (oil cooler)	L	70 (18 gal)
Spindle lubrication oil tank capacity (oil air)	L	2.0 (0.5 gal)
Spindle bearing lubrication oil tank capacity	L	6.0 (1.6 gal)
Machine height (from floor surface)	mm	3215 (126.57")
Required floor space under operation (width×depth)	mm	3600 (141.73") × 3655 (143.90")
Required floor space including maintenance area (width×depth)	mm	4600 (181.10") × 4505 (177.36")
Machine weight	kg	11500 (25353 lbs)
Operation environment temperature	°C	5~40
Operation environment humidity	%	10~90 (No dew)

※1 : Available with the HQ or Hyper HQ control
 ※2 : The value for the standard specification It may vary with added options.
 ※3 : 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

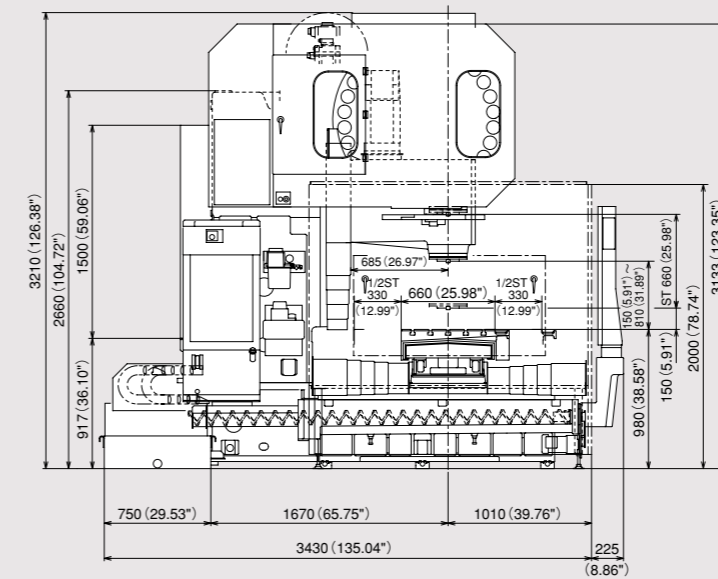
Name	Qty	備考
Illuminating lamp	1 set	
Coolant uni (t Separate coolant tank)	1 set	Tank capacity:360L (95 gal)
Entire machine cover (Splash Guard)	1 set	Including front door and maintenance cover electromagnetic lock
Sliding surface protection steel sliding cover for XYZ axes	1 set	
Electric leakage breaker	1 set	
Automatic power-off unit	1 set	
Coil-type chip conveyor	2 set	1 set for each of right and left
Spindle & ball screw cooling oil temperature controller	1 set	
Sliding surface lubrication unit	1 set	
Oil unit	1 set	
Leveling block	1 set	
Parts for machine transfer	1 set	
Instruction manual, Soft scale II/III manual	1 set	
Instruction manual	1 set	
Electrical instruction manuals (including hardware diagram)	1 set	

Special Accessories

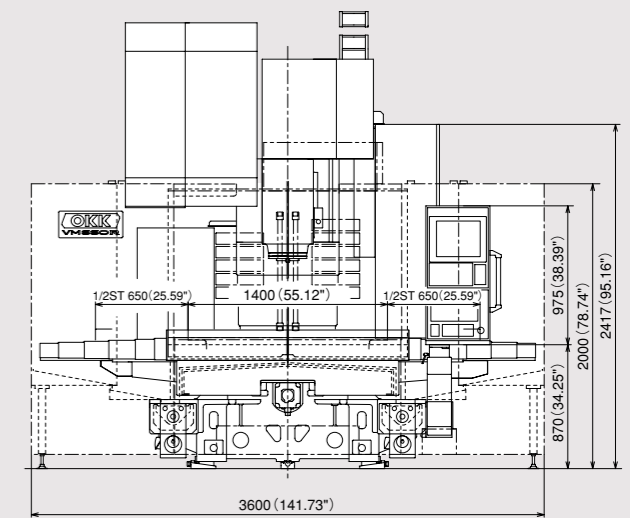
Item	Specification
Long table specification	Table width 1550mm (61.02")
Compatibility with Dual-contact tool	BT Type (with Magazine tool holder remove device) 6000min ⁻¹ [22 (30HP)/18.5 (25HP) kW] [26 (35HP)/22 (30HP) kW] (No.50 Gear-drive spindle)
Spindle motor	8000min ⁻¹ [22 (30HP)/18.5 (25HP) kW] [26 (35HP)/22 (30HP) kW] (No.50 Gear-drive spindle) 12000min ⁻¹ [30 (40HP) / 25 (34HP) kW] (No.50 MS spindle)
Changing the type of pull stud	50:MAS1 (45°) / MAS2 (60°)
Number of stored tools	40 tools, 60 tools
Pallet changer	Shuttle type 2APC (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)
Hybrid guide face	Sliding guide face & aerostatic specification
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)
Spare thickener bag filter	6 pcs (1 set)
Air blow nozzle	1 set
Compatibility with oil-mist blow	
Minimal quantity coolant supply equipment	External nozzle type / Spindle through type
Swirl stopper block	For high-spindle / For angle attachment
Compatibility with Oil-hole holder	Normal pressure (Increased pump output:Equivalent to 1.1kW (1.5HP)) / High pressure (2MPa (290psi))
Workpiece flushing equipment	Shower gun type
Mist collector	installed separately / Compatibility with supplied device (φ200)
Lift-up chip conveyor	Hinge type / Scraper type / Scraper type with floor magnet / for aluminum / for aluminum+FC Discharge: Right/Left
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
Machine coating color	Color specified by customer
Standard tool set	Including a tool box
Air dryer	
Extinguisher	
Sub table	
NC rotary table	
Motorized index table (Rotary table with controller)	
Touch sensor system T0	Workpiece measurement Tool length / diameter measurement
Touch sensor system T1	Workpiece measurement / Tool length measurement / Tool break detection

Main Dimensions

Side View



Front View



Floor Space

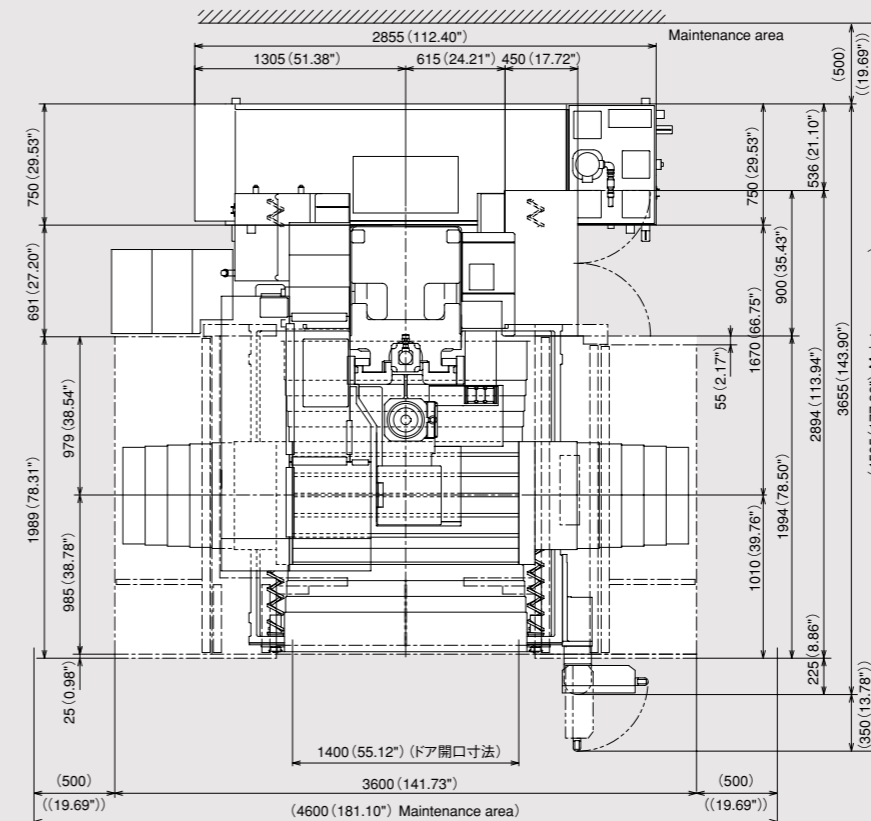
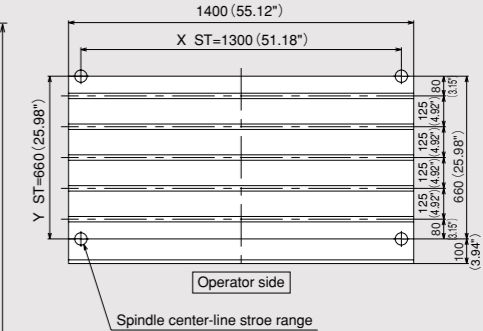
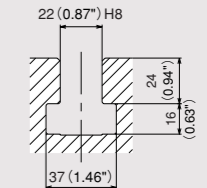


Table Dimensions



T-slot dimension



Machine Main Body's Main Specification

Machine Body's Specification

Item	Unit	Specification
		4500min ⁻¹ (Gear-drive spindle)
Travel on X axis (Table right / left)	mm	2060 (81.10")
Travel on Y axis (Saddle back / forth)	mm	940 (37.01")
Travel on Z axis (Spindle head up / down)	mm	820 (32.28")
Distance from table top surface to spindle nose	mm	200 (7.87") ~ 1020 (40.16")
Distance from column front to spindle center	mm	1100 (43.31")
Table work surface area (X-axis direction × Y-axis direction)	mm	2300 (90.55") × 940 (37.01")
Max. workpiece weight loadable on table	kg	3000
Table work surface configuration (T-slot nominal dimension × spacing × number of T slots)	mm	22 (0.87") × 125 (4.92") × 7 tools
Distance from floor to table work surface	mm	1100 (43.31")
Spindle rotating speed	min ⁻¹	25~4500
Number of spindle rotating speeds		3 steps
Spindle nose (nominal number)		7/24-tapered No.50
Spindle bearing bore diameter	mm	φ120 (4.72")
Rapid traverse rate	m/min	X/Y:20 (787 ipm) Z:16 (630 ipm)
Cutting feed rate	mm/min	1~16000 (0.04 to 630 ipm) ※1
Jog feed rate	mm/min	2000 (79 ipm)
Type of Tool shank		JIS B 6339 BT50
Type of Pull stud		OKK only 90°
Number of stored tools	本	40
Max. tool diameter (with tools in adjacent pots)	mm	φ110 (4.33")
Max. tool diameter (with no tools in adjacent pots)	mm	φ200 (7.87")
Max. tool length (from gauge line)	mm	400 (15.75")
Max. tool mass	kg	Max 20 (44.1 lbs) / AVERAGE 10 / Total 400
Max. tool mass [moment]	N·m	25.7
Tool selection method		Memory random method
Tool exchange time (tool-to-tool)	sec	2.9 (Speed is changeable for heavy tools)
Tool exchange time (cut-to-cut)	sec	9.9
Spindle motor	MITSUBISHI FANUC kW	18.5 (25HP) / 15 (20HP)
Feed motors	MITSUBISHI FANUC kW	X/Z:4.5 (6HP) Y:3.5 (5HP) ×2 set X/Z:7.0 (9HP) Y:4.0 (5HP)
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 tool clamp	kW	0.75 (1HP)
Motor for ATC	kW	1.1 (1.5HP)
Motor for tool magazine	kW	1.1 (1.5HP)
Motor for coil-type chip conveyor	kW	0.2 (0.27HP) ×3
Power supply	MITSUBISHI FANUC kVA	40 44
Supply voltage · Supply frequency	V·Hz	200V±10% 50/60Hz±1Hz 220V±10% 60Hz±1Hz
Compressed air supply pressure ※3	MPa	0.4~0.6 (58~87 psi)
Compressed air supply flow rate ※2, ※3	L/min(ANR)	800 (211 gpm)
Coolant tank capacity	L	500 (132 gal)
Spindle cooling oil tank capacity (oil cooler)	L	70 (18 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 FANUC mm	3810 (150.00") 3920 (154.33")
Required floor space under operation (width×depth)	mm	5600 (220.47") × 5220 (205.51")
Required floor space including maintenance area (width×depth)	mm	6600 (259.84") × 6080 (239.37")
Machine weight	kg	23000 (50706 lbs)
Operation environment temperature	°C	5~40
Operation environment humidity	%	10~90 (No dew)

※1 : Available with the HQ or Hyper HQ control
 ※2 : The value for the standard specification It may vary with added options.
 ※3 : 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

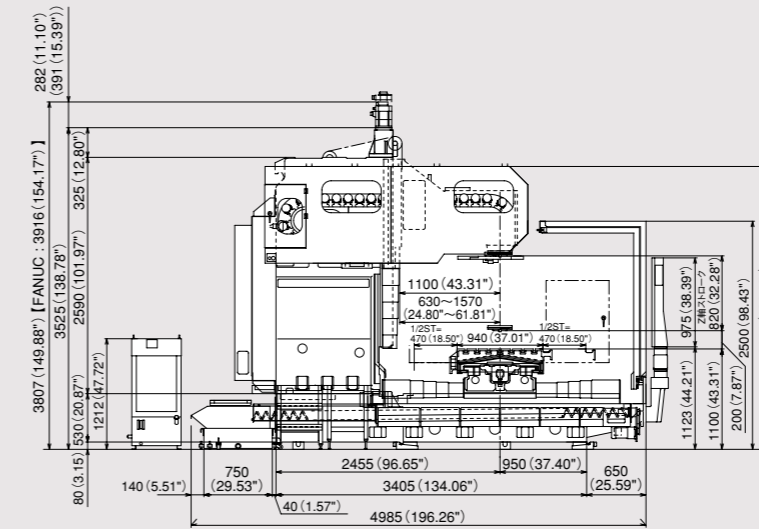
Name	Qty	備考
Illuminating lamp	1 set	
Coolant uni (1 Separate coolant tank)	1 set	Tank capacity:500L (132 gal)
Entire machine cover (Splash Guard)	1 set	Including front door and maintenance cover electromagnetic lock
Sliding surface protection steel sliding cover for X/Y/Z axes	1 set	
Electric leakage breaker	1 set	
Automatic power-off unit	1 set	
X/Y axes hybrid (aerostatic & sliding) guide face	1 set	
Coil-type chip conveyor	3 sets	1 set for each of right and senter and left
Spindle & ball screw cooling oil temperature controller	1 set	
Sliding surface lubrication unit	1 set	
Oil unit	1 set	
Leveling block	1 set	
Parts	1 set	Bond anchoring method
Parts for machine transfer	1 set	
Instruction manual, Soft scale II/m/III manual	1 set	
Instruction manual	1 set	
Electrical instruction manuals (including hardware diagram)	1 set	

Special Accessories

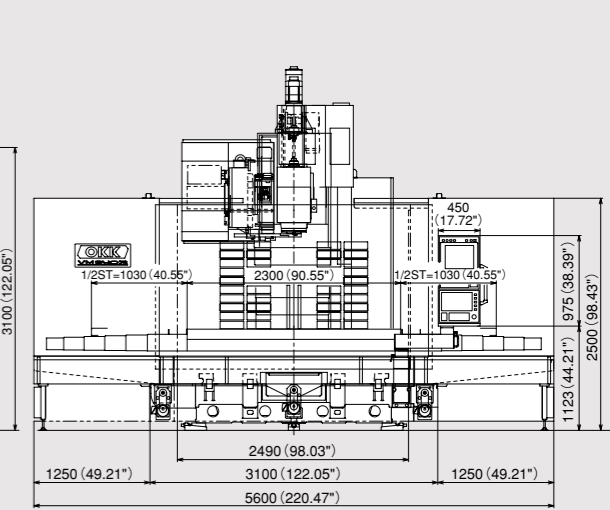
Item	Specification
Compatibility with Dual-contact tool	BT Type (with Magazine tool holder remove device)
Spindle motor	6000min ⁻¹ [22 (30HP) / 18.5 (25HP) kW] [26 (35HP) / 22 (30HP) kW] (No.50 Gear-drive spindle) 8000min ⁻¹ [22 (30HP) / 18.5 (25HP) kW] [26 (35HP) / 22 (30HP) kW] (No.50 Gear-drive spindle) 12000min ⁻¹ [30 (40HP) / 25 (34HP) kW] (No.50 MS spindle)
Changing the type of pull stud	50:MAS1 (45°) / MAS2 (60°)
Number of stored tools	60 tools
Pallet changer	Shuttle type 2APC (Pallet top face specification / T-slot specification / Tap specification)
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 1 set / Belt type 2 set
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)
Spare thickener bag filter	6 pcs (1 set)
Air blow nozzle	1 set
Compatibility with oil-mist blow Minimal quantity coolant supply equipment	External nozzle type / Spindle through type
Swirl stopper block	For high-spindle / For angle attachment
Compatibility with Oil-hole holder	Normal pressure (Increased pump output: Equivalent to 1.1kW (1.5HP)) / High pressure (2MPa (290psi))
Workpiece flushing equipment	Shower gun type
Mist collector	Installed separately / Compatibility with supplied device (φ150×2)
Lift-up chip conveyor	Hinge type / Scraper type / Scraper type with floor magnet / for aluminum / for aluminum·FC Discharge:Right/Left
Chip bucket	Fixed type / Swing type
Special operation panel	Pendant-type / console type
Manual pulse generator 3-axis	Stand type / Handy type
Foundation parts	
Machine coating color	Color specified by customer
Standard tool set	Including a tool box
Air dryer	
Extinguisher	
Sub table	
NC rotary table	
Motorized index table (Rotary table with controller)	
Touch sensor system T0	Workpiece measurement / Tool length / diameter measurement
Touch sensor system T1	Workpiece measurement / Tool length measurement / Tool break detection

Main Dimensions

Side View



Front View



Floor Space

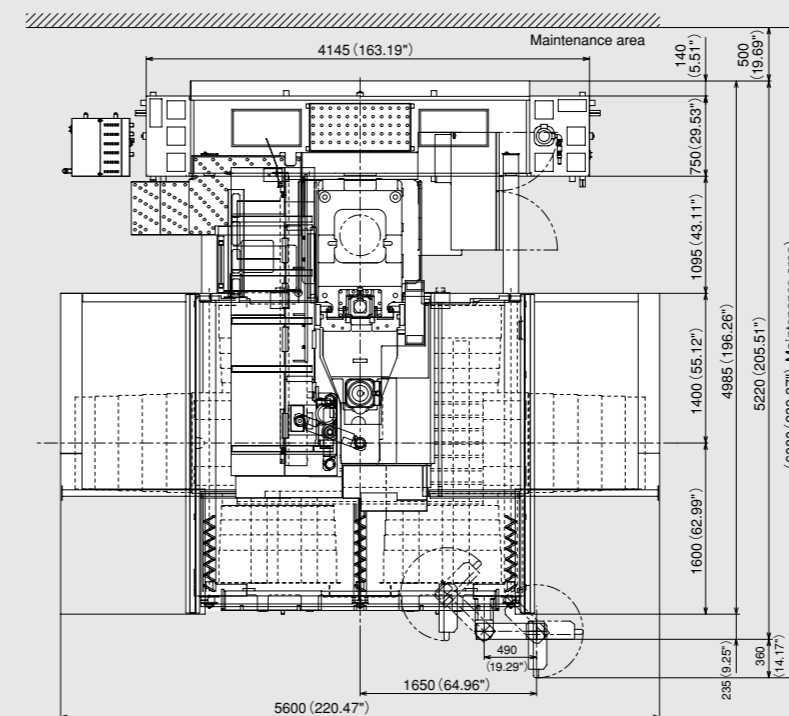
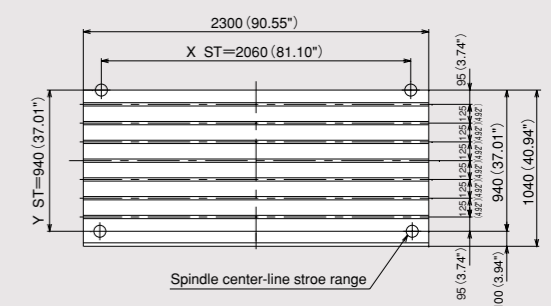
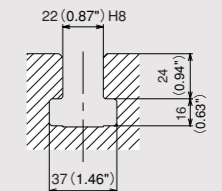


Table Dimensions



T-slot dimation



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:1mm
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 EditorSTD
EasyPROSTD
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 damage OP

Note : N750 controller is required.

F31i-B (WindowsCE-installed Open CNC)

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"
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]
No. of registered programs: 120
Background editing
Extended part program editing
15-inch color LCD
Clock function
MDI (Manual Data Input) operation
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
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 workpiececoordinate 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

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-B5) Note1
Least input increment IS-C: 0.0001mm / 0.00001"
FS15 tape format
Unidirectional positioning: G60
Helical interpolation PK1
Cylindrical interpolation
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
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)
RS232C interface: RS232C-1CH
Data server: ATA Card (1GB) PK2
Data server: ATA card (4GB)
Spindle contour control
Tool position offset
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
Addition of workpiece coordinate system (300 sets) : G54.1 P1 to P300
Machining time stamp function
Addition of optional block skip 9 in total
Tool retract and return
Sequence number comparison and stop
Manual handle interruption
Programmable mirror image PK1
Optional chamfering / corner R
Custom macro PK1
Interruption type custom macro
Addition of custom macro common variables: 600
Figure copy
Programmable coordinate system rotation: G68, G69
Scaling: G50, G51
Chopping function
Playback
Automatic tool length measurement: G37 / G37.1
Tool life management: 256 sets (FAi:128 sets) PK1
Addition of tool life management sets: 1024 sets in total
High-speed skip
Run hour and parts count display PK1
Manual Guide i (Milling cycle)

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 A mode OP
Hyper HQ control B mode PK2 OP
Hyper HQ value kit (including PK2) OP
NC option package (including PK1) OP
Special canned cycle (including circular cutting) OP
Cycle Mate F 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 damage OP

Note F31i-B5 is used when the simultaneous 5 axes control is required.