Nidec
All for dreams

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NIDEC OKK CORPORATION

VM/R II SERIES

Vertical Machining Center

VM/R II SERIES

VM43R II
VM53R II
VM76R II

www.nidec.com/en/nidec-okk/

NIDEC OKK CORPORATION

VM/R SERIES

VERTICAL MACHINING CENTER

High Rigidity Heavy Cutting

Legendary Cutting

This vertical machining center continues our tradition of making highly rigid machines.

Wide column increases rigidity further !
Higher in accessibility and maintainability and easier to use than conventional machines.
Box guide way that is used traditionally provides excellent accuracy and rigidity.
The full range of stable machining is possible from common materials all the way to hard to cut materials like titanium.

VM43RⅡ

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 motor output (Short-term/ Continuous ratings)	11/7.5kW (15/10HP) (No.40 MITSUBISHI/FANUC) 15/11kW (20/15HP) (No.40 FAi) 15/11kW (20/15HP) (No.50)

VM53RⅡ

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")
Spindle motor output (Short-term/ Continuous ratings)	11/7.5kW (15/10HP) (No.40) 18.5/15kW (25/20HP) (No.50)

VM76RⅡ

|	
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 motor output (Short-term/ Continuous ratings)	37/18.5kW (50/25HP) (No.40 FANUC) 37/22kW (50/30HP) (No.40 MITSUBISHI) 18.5/15kW (25/20HP) (No.50)

Increased rigidity as a result of review of the casting structure!

Tapered column base and increased base width provide higher rigidity.（VM43RII:130%, VM53RII/VM76RII:150% of conventional column width）

VM53R column shape

VM53RII column shape
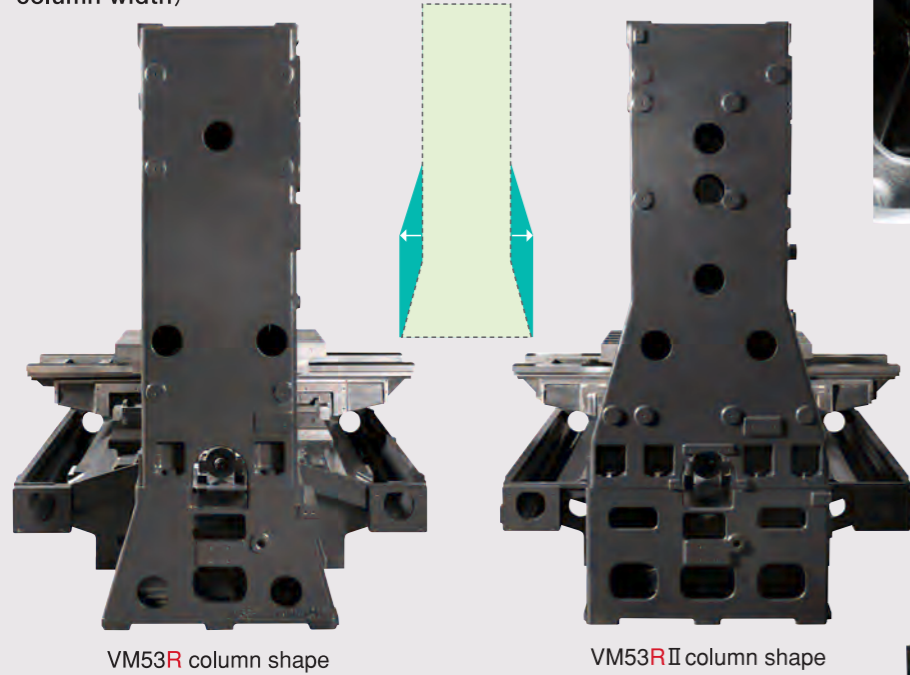
Increased rigidity of main body

High rigidity of the machines has become available by combining the wide column structure with the optimum design obtained from the analysis on the diagonal rib.

The photo shows VM43RII.

The photo shows VM53RII.

High maintainability

For improving the work efficiency, the equipment that need daily checkup are arranged in one go on the maintenance panel on the rear face.
The work space for chip discharge is larger than conventional machines as a result of optimizing the position of the oil cooler.
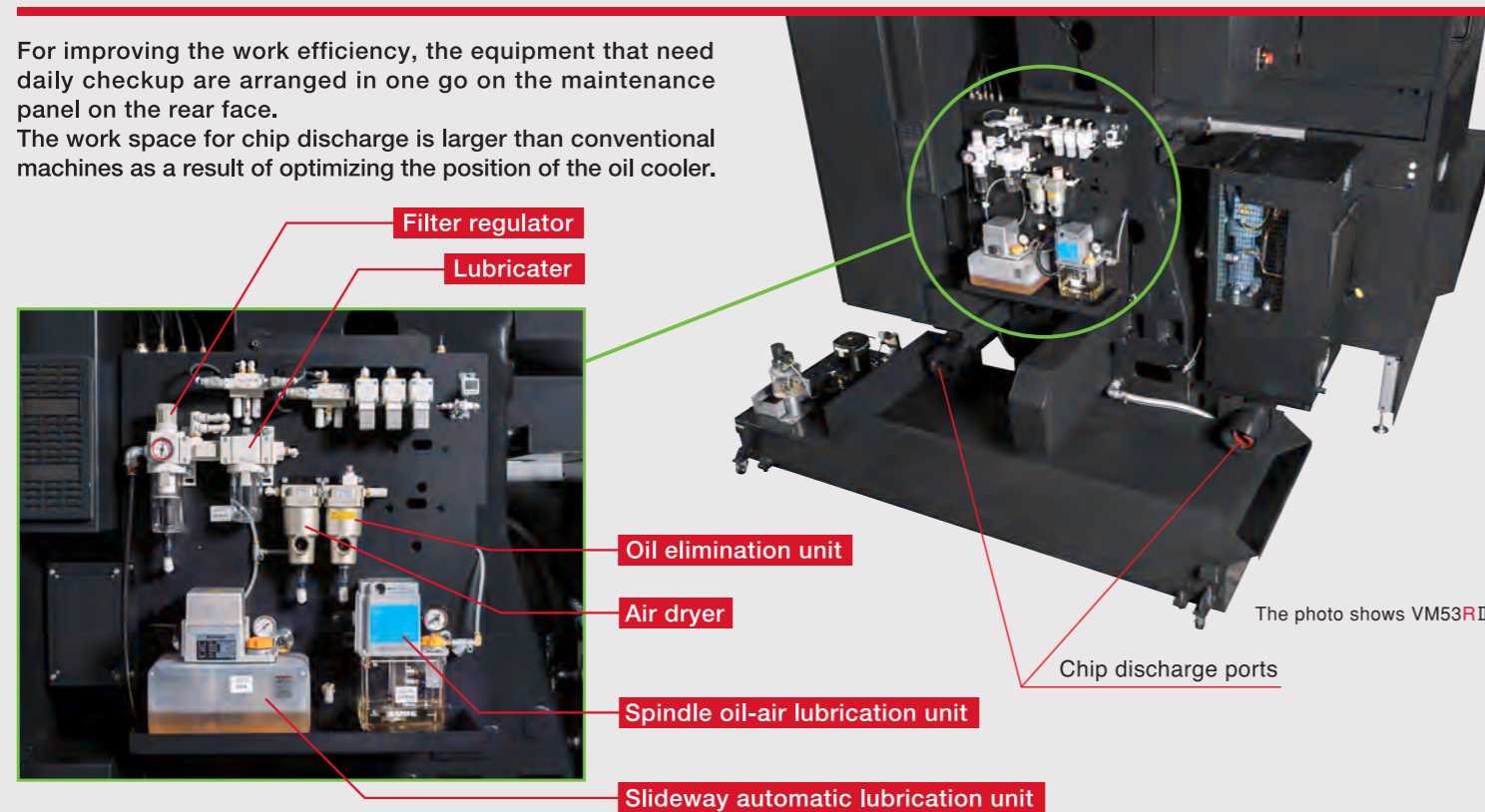
- Filter regulator
- Lubricater
- Oil elimination unit
- Air dryer
- Spindle oil-air lubrication unit
- Slideway automatic lubrication unit

Chip discharge ports

The photo shows VM53RII.

3

High accessibility and operability

Accessibility is greatly improved and higher operability is available due to 770-mm（30.31"）distance to the spindle from the cover front face and 225-mm（8.86"）distance to the table.

The front doors including the ceiling section open widely and allow smooth loading and unloading of workpieces with a crane. Large-sized VM76RII has storable steps and in-machine in its standard specifications for ease of the work inside the machine.

The photo shows VM76RII.

	VM43RII	VM53RII	VM76RII
A	715（28.15"）	770（30.31"）	1171（46.10"）
B	290（11.42"）	225（8.86"）	411（16.18"）
C	900（35.43"）	920（36.22"）	1000（39.37"）

Unit：mm

Wide machining area

Table size and travel distance

■Table size

X axis
1550（61.02"）
1260（49.61"）（VM53RII long-table specification）
1050（41.34"）
800（31.50"）

Y axis
760（29.92"）
560（22.05"）
420（16.54"）

VM43RII
VM53RII
VM76RII

■Travel distance of each axis

VM76RII
VM53RII
VM43RII

Z axis
460（18.11"）
510（20.8"）
660（25.98"）

630（24.80"）
430（16.93"）
530（20.87"）
760（29.92"）
1050（41.34"）
1540（60.63"）

X axis
Y axis
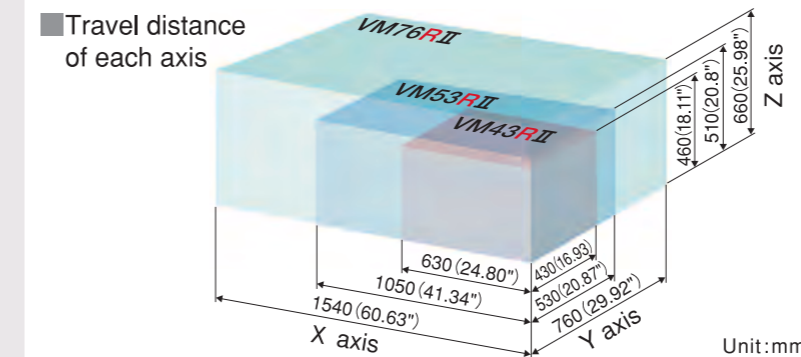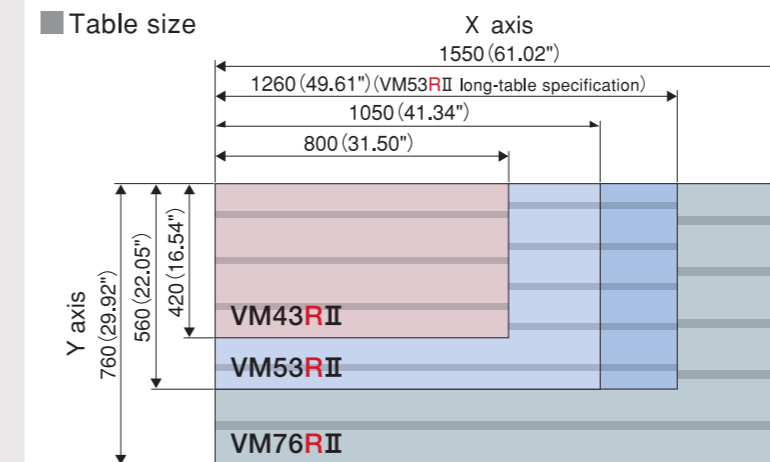
Unit：mm

Increased turning range of the operation panel enables visual check of the operation panel from inside of the machine.（Available on all models.）

The photo shows VM53RII.

4

Functions for high operability and environmental measures

Standard accessories

▊ Compatibility with long tools（VM53RⅡ／VM76RⅡ）

The machines are compatible with 380-mm（14.96"）-long long tools.

380mm（14.96"）
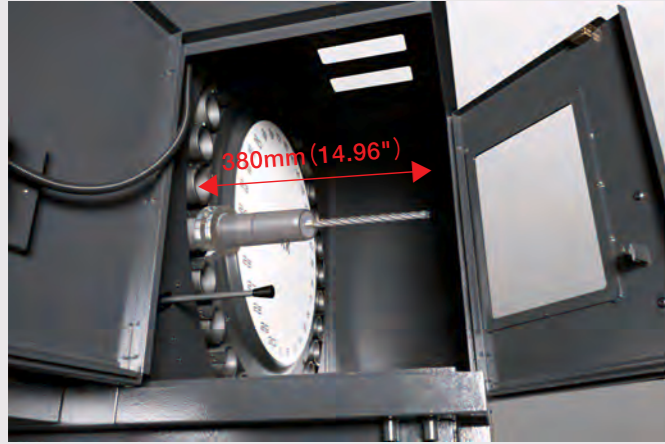
▊ Two LED lights on the right and left sides inside the machine

▊ Timer function for oil skimmer

This function enables operating the oil skimmer for a certain period of time after the automatic power-off.
Operation time can be set freely.
It helps keep the coolant clean by efficiently collecting the oil that flows into the tank just after stoppage of the machine.

▊ Top covers
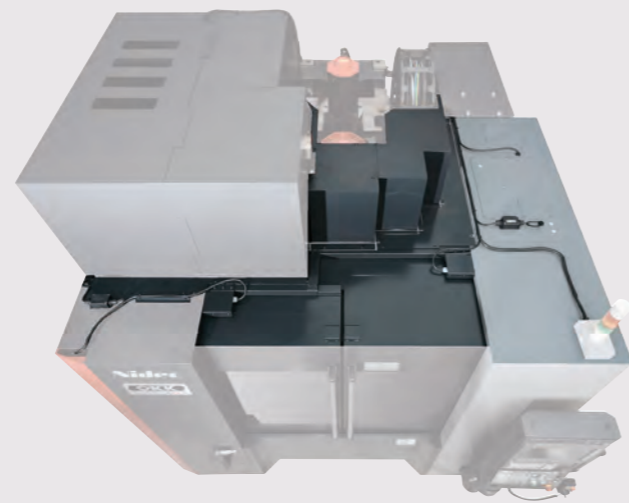
▊ Cleaning gun

▊ Nozzles for blowing air toward the spindle

Options for automatization

▊ Manual pallet changer

The manual pallet changer saves labor and improves efficiency by setting up externally with the pallet setup unit installed outside the machine. It is retrofittable at low cost.
You can layout the setup unit and the number of pallets freely. You can improve productivity while using the present machine.

Website video

The photo shows VM53R.

| | 10min | | 20min | | 10min | | 20min | |
| Machining | Set-up | Machining | Set-up | Machining |

	4min	20min	4min	20min
Machining	Machining	Machining
Set-up	Set-up

External set-up improves
Production efficiency by 20%.
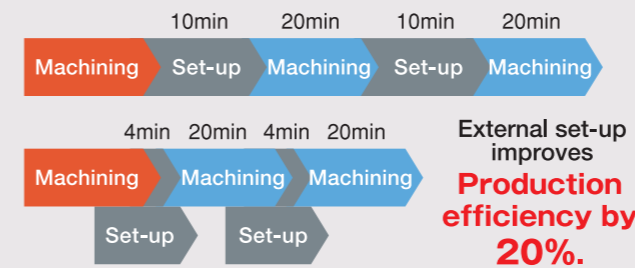
▊ Tool attachment／detachment supporting device

This device enables access to the spindle from the table by just attaching a tool manually to the device placed on the table.
Tools are exchanged automatically through the axial movement.

Website video

▊ CRASYS—Robotic pallet change system

Robots take over the continued manufacturing for an hour after the operator moves away from the machine for lunch and after the closing time so as to improve operating efficiency of the machine.
It is easily retrofittable to the existing machine.
It is easy to operate and you can save labor easily.

Website video

The photo shows VM53R.

Result of the robotic operation

| Normal operation | | Lunch break | | After closing |
| 8 hours a day | + | 1 hour | + | 1 hour |

25% improvement of production efficiency

▊ Remote-controlled nozzles

By changing the angle of nozzles easily with the M signals, you can supply coolant to the machining point efficiently.
You can also expect the effect of longer tool life caused by the efficient coolant supply.

Website video

▊ Other options

● Automatically opened and closed ATC cover
● Automatically opened and closed front doors, and other flexible measures are available.

5　6

Rich variations of the spindle allow appropriate selection according to the machining

No.40

VM43RII 6000-min⁻¹ gear-head spindle

MITSUBISHI／FANUC

337N・m (249 ft・lbs) 30-min rating
11kW (15HP) 30-min rating
230N・m (170 ft・lbs) Cont.rating
7.5kW (10HP) Cont.rating

Spindle Output[kW] — Spindle Torque[N・m]
25 311 1542 6000
1200
Spindle Rotating Speed[min⁻¹]

FAi

460N・m (339 ft・lbs) 15-min rating
15kW (20HP) 15-min rating
337N・m (249 ft・lbs) 60-min rating
11kW (15HP) 30-min rating
253N・m (187 ft・lbs) Cont.rating 60-min rating
7.5kW (10HP) Cont.rating

25 415 1542 6000
311 1200 2056
Spindle Rotating Speed[min⁻¹]

VM43RII 8000-min⁻¹ gear-head spindle

MITSUBISHI／FANUC

281N・m (207 ft・lbs) 30-min rating
11kW (15HP) 30-min rating
192N・m (142 ft・lbs) Cont.rating
7.5kW (10HP) Cont.rating

25 372 2053 8000
1450
Spindle Rotating Speed[min⁻¹]

FAi

384N・m (283 ft・lbs) 15-min rating
15kW (20HP) 15-min rating
281N・m (207 ft・lbs) 60-min rating
11kW (15HP) 30-min rating
211N・m (156 ft・lbs) Cont.rating
60-min rating
Cont.rating

25 497 2054 8000
373 1450 2738
Spindle Rotating Speed[min⁻¹]

VM53RII 8000-min⁻¹ gear-head spindle

MITSUBISHI

11kW (15HP) 30-min rating
281N・m (207 ft・lbs) 30-min rating
7.5kW (10HP) Cont.rating
192N・m (142 ft・lbs) Cont.rating

25 372 2053 8000
1450
Spindle Rotating Speed[min⁻¹]

FANUC

11kW (15HP) 30-min rating
281N・m (207 ft・lbs) 30-min rating
7.5kW (10HP) Cont.rating
192N・m (142 ft・lbs) Cont.rating

25 372 2053 8000
1450
Spindle Rotating Speed[min⁻¹]

VM43RII/VM53RII/VM76PII 14000-min⁻¹ MS (motorized spindle)

MITSUBISHI

37kW (50HP) 15%ED
250N・m (184 ft・lbs) 10%ED
22kW (30HP) 10%ED
118N・m (87 ft・lbs) 40%ED
18.5kW (25HP) 40%ED
62N・m (46 ft・lbs) 15%ED
87N・m (64 ft・lbs) Cont.rating
37N・m (27 ft・lbs) Cont.rating

100 1840 3500 5700 14000
1650 4000 13800
Spindle Rotating Speed[min⁻¹]

FANUC

37kW (50HP) 15%ED
250N・m (184 ft・lbs) 10%ED
26kW (35HP) 40%ED
22kW (30HP) Cont.rating
118N・m (87 ft・lbs) 15-min rating
18.5kW (25HP) 15-min rating
15kW (20HP) Cont.rating
95N・m (70 ft・lbs) Cont.rating
44N・m (32 ft・lbs) 40%ED
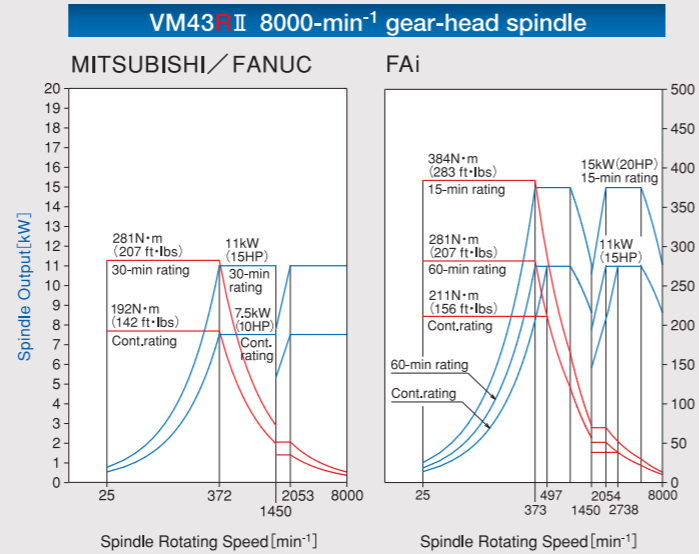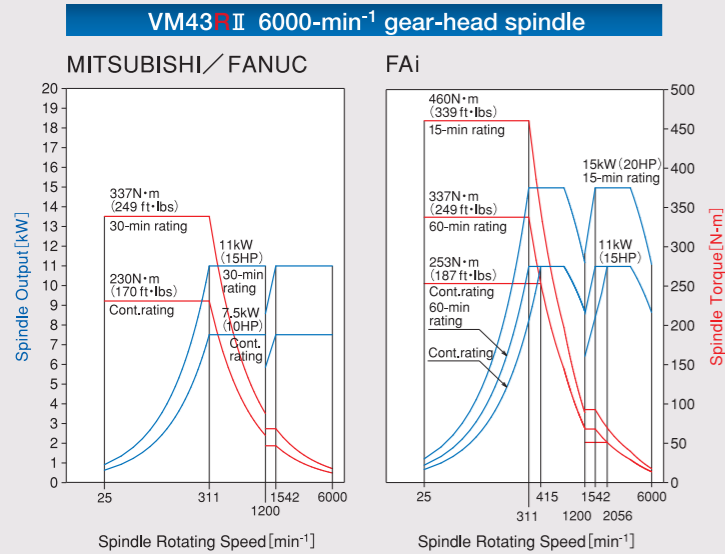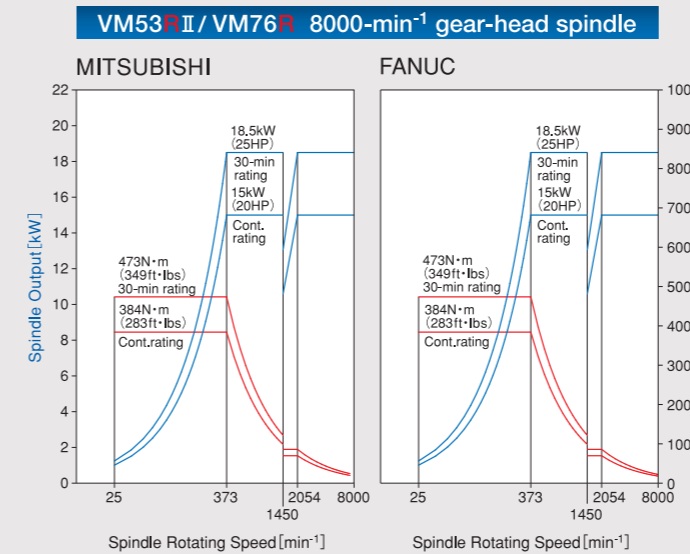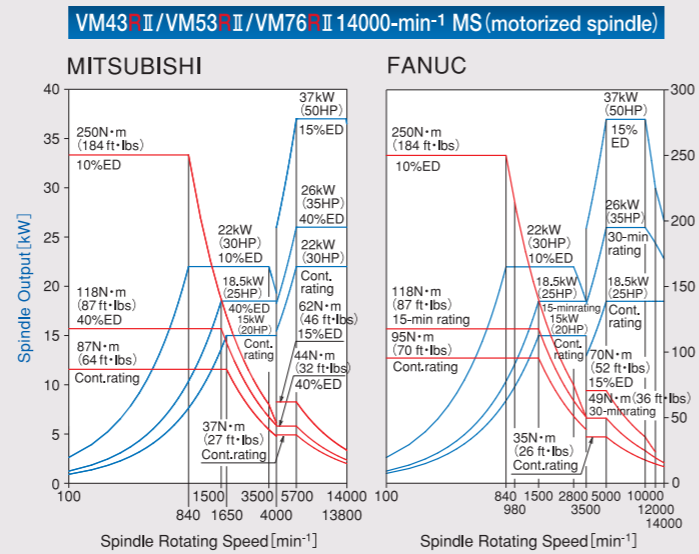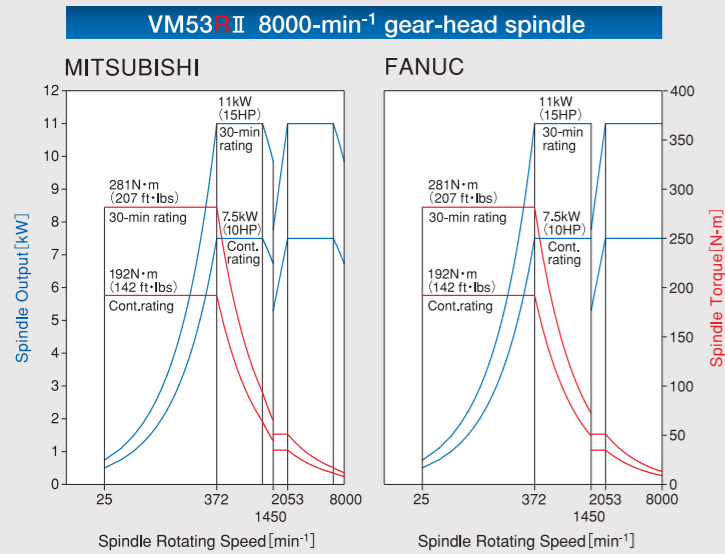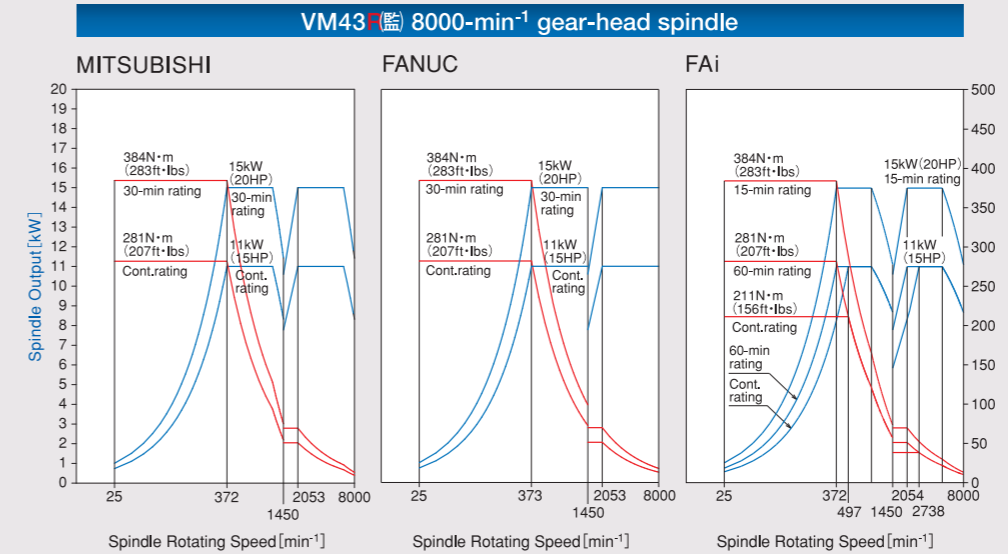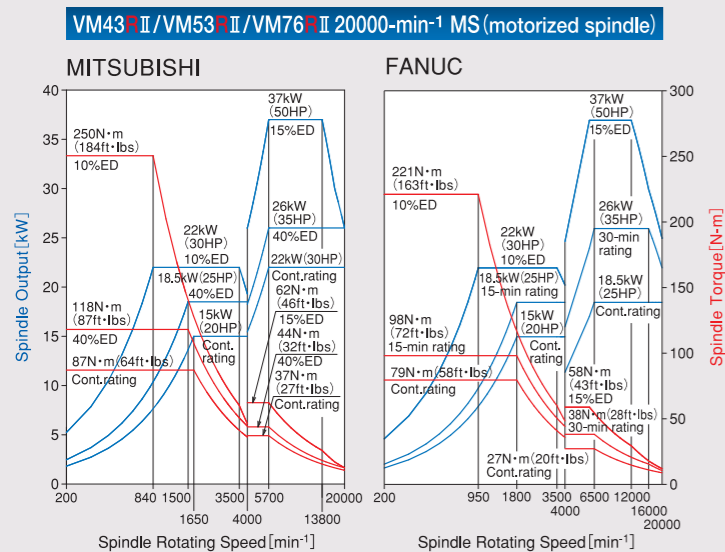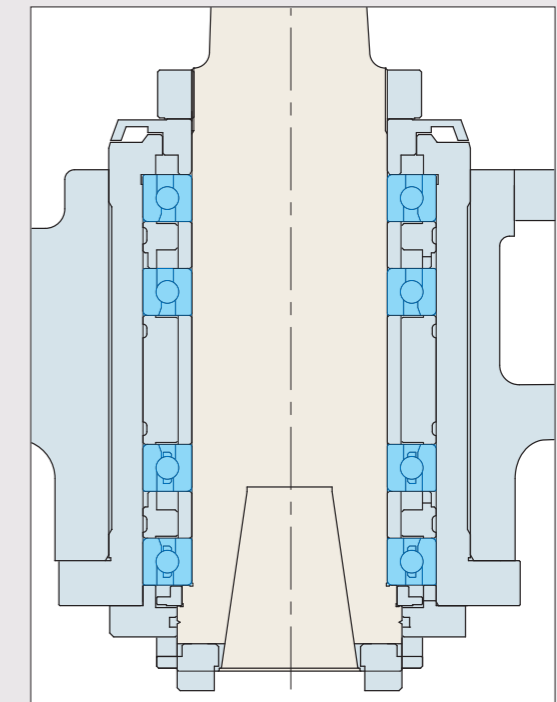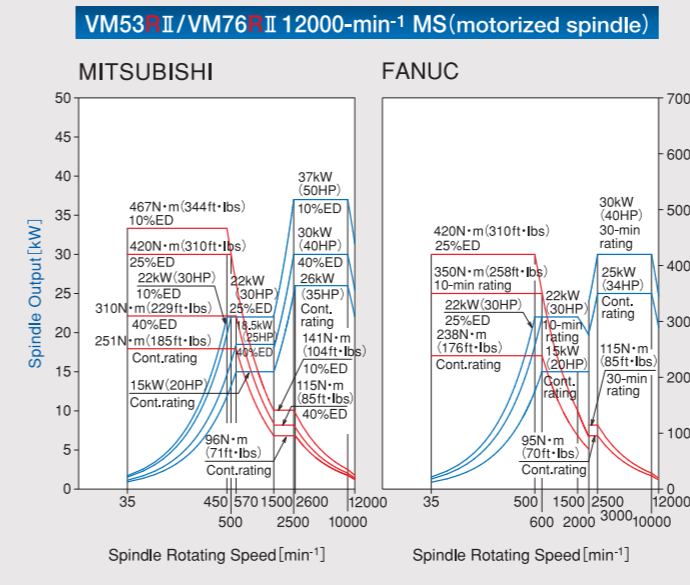35N・m (26 ft・lbs) Cont.rating
70N・m (52 ft・lbs) 15%ED
49N・m (36 ft・lbs) 30-min rating

100 840 1500 2800 5000 10000
980 3500 12000 14000
Spindle Rotating Speed[min⁻¹]

VM43RII/VM53RII/VM76RII 20000-min⁻¹ MS (motorized spindle)

MITSUBISHI

37kW (50HP) 15%ED
250N・m (184 ft・lbs) 10%ED
22kW (30HP) 10%ED
118N・m (87 ft・lbs) 40%ED
18.5kW (25HP) 40%ED
15kW (20HP) Cont.rating
87N・m (64 ft・lbs) Cont.rating
37N・m (27 ft・lbs) Cont.rating
26kW (35HP) 30-min rating
22kW (30HP) 15%ED
44N・m (32 ft・lbs) 40%ED
38N・m (28 ft・lbs) 30-min rating
27N・m (20 ft・lbs) Cont.rating

200 840 1500 3500 5700 20000
1650 4000 13800
Spindle Rotating Speed[min⁻¹]

FANUC

221N・m (163 ft・lbs) 10%ED
37kW (50HP) 15%ED
26kW (35HP) 30-min rating
22kW (30HP) 10%ED
18.5kW (25HP) 15-min rating
98N・m (72 ft・lbs) 15-min rating
79N・m (58 ft・lbs) 15-min rating
18.5kW (25HP) Cont.rating
15kW (20HP) Cont.rating
58N・m (43 ft・lbs) 15%ED
27N・m (20 ft・lbs) Cont.rating

200 950 1800 3500 6500 12000
4000 16000 20000
Spindle Rotating Speed[min⁻¹]

No.40 (table)

Model	Spindle	Controller	Spindle rotating speed	Spindle motor ratings (Short time／Continuous)	Maximum spindle torque (Short time／Continuous)	
VM43RII	Gear-head spindle	FANUC／MITSUBISHI	25～6000min⁻¹	11(30-min rating)／7.5kW (15(30-min rating)／10HP)	337(30-min rating)／230N・m (249(30-min rating)／170ft・lbs)	
		FAi		15(15-min rating)／11kW (20(15-min rating)／15HP)	460(15-min rating)／253N・m (339(15-min rating)／187ft・lbs)	
		FANUC／MITSUBISHI	25～8000min⁻¹	11(30-min rating)／7.5kW (15(30-min rating)／10HP)	281(30-min rating)／192N・m (208(30-min rating)／142ft・lbs)	VM43RII standard
		FAi		15(15-min rating)／11kW (20(15-min rating)／15HP)	384(15-min rating)／211N・m (283(15-min rating)／156ft・lbs)	
VM53RII		FANUC／MITSUBISHI		11(30-min rating)／7.5kW (15(30-min rating)／10HP)	281(30-min rating)／192N・m (208(30-min rating)／142ft・lbs)	VM53RII standard
VM43RII VM53RII VM76RII	MS	FANUC MITSUBISHI	100～14000min⁻¹	37(15%ED)／18.5kW (50(15%ED)／25HP)	250(10%ED)／95N・m (184(10%ED)／70ft・lbs)	VM76RII standard
		FANUC		37(15%ED)／22kW (50(15%ED)／30HP)	250(10%ED)／87N・m (184(10%ED)／64ft・lbs)	
		MITSUBISHI	100～20000min⁻¹	37(15%ED)／18.5kW (50(15%ED)／25HP)	221(10%ED)／79N・m (163(10%ED)／58ft・lbs)	
				37(15%ED)／22kW (50(15%ED)／30HP)	250(10%ED)／87N・m (184(10%ED)／64ft・lbs)	

No.50

VM43R(監) 8000-min⁻¹ gear-head spindle

MITSUBISHI

384N・m (283 ft・lbs) 30-min rating
15kW (20HP) 30-min rating
281N・m (207 ft・lbs) Cont.rating
11kW (15HP) Cont.rating

25 372 2053 8000
1450
Spindle Rotating Speed[min⁻¹]

FANUC

384N・m (283 ft・lbs) 30-min rating
15kW (20HP) 30-min rating
281N・m (207 ft・lbs) Cont.rating
11kW (15HP) Cont.rating

25 373 2053 8000
1450
Spindle Rotating Speed[min⁻¹]

FAi

384N・m (283 ft・lbs) 15-min rating
15kW (20HP) 15-min rating
281N・m (207 ft・lbs) 60-min rating
11kW (15HP) 15-min rating
211N・m (156 ft・lbs) Cont.rating
60-min rating
Cont.rating

25 372 2054 8000
497 1450 2738
Spindle Rotating Speed[min⁻¹]

VM53RII/VM76RII 8000-min⁻¹ gear-head spindle

MITSUBISHI

18.5kW (25HP) 30-min rating
15kW (20HP) Cont.rating
473N・m (349ft・lbs) 30-min rating
384N・m (283ft・lbs) Cont.rating

25 373 2054 8000
1450
Spindle Rotating Speed[min⁻¹]

FANUC

18.5kW (25HP) 30-min rating
15kW (20HP) Cont.rating
473N・m (349ft・lbs) 30-min rating
384N・m (283ft・lbs) Cont.rating

25 373 2054 8000
1450
Spindle Rotating Speed[min⁻¹]

VM53RII/VM76RII 12000-min⁻¹ MS (motorized spindle)

MITSUBISHI

467N・m (344ft・lbs) 10%ED
37kW (50HP) 10%ED
420N・m (310ft・lbs) 25%ED
30kW (40HP) 40%ED
22kW (30HP) 10%ED
310N・m (229ft・lbs) 40%ED
18.5kW (25HP) Cont.rating
251N・m (185ft・lbs) Cont.rating
15kW (20HP) Cont.rating
96N・m (71ft・lbs) Cont.rating

35 450 570 1500 2600 12000
500 2500 10000
Spindle Rotating Speed[min⁻¹]

FANUC

420N・m (310ft・lbs) 25%ED
30kW (40HP) 30-min rating
350N・m (258ft・lbs) 10-min rating
26kW (35HP) Cont.rating
22kW (30HP) 10-min rating
238N・m (176ft・lbs) Cont.rating
141N・m (104ft・lbs) 10%ED
22kW (30HP) 25%ED
115N・m (85ft・lbs) 30-min rating
95N・m (70ft・lbs) Cont.rating
25kW (34HP) Cont.rating
15kW (20HP) Cont.rating

35 500 1500 2500 12000
600 2000 3000 10000
Spindle Rotating Speed[min⁻¹]

Highly rigid four-row angular bearing is used for all the spindles of this series.

No.50 (table)

Model	Spindle	Controller	Spindle rotating speed	Spindle motor ratings (Short time／Continuous)	Maximum spindle torque (Short time／Continuous)	
VM43RII	Gear-head spindle	FANUC／MITSUBISHI	25～8000min⁻¹	15(30-min rating)／11kW (20(30-min rating)／15HP)	384(30-min rating)／281N・m (283(30-min rating)／207ft・lbs)	VM43RII standard
		FAi		15(15-min rating)／11kW (20(15-min rating)／15HP)	384(15-min rating)／211N・m (283(15-min rating)／156ft・lbs)	
VM53RII VM76RII		FANUC／MITSUBISHI	25～8000min⁻¹	18.5(30-min rating)／15kW (25(30-min rating)／20HP)	473(30-min rating)／384N・m (349(30-min rating)／283ft・lbs)	VM53RII standard VM76RII standard
		FANUC	100～12000min⁻¹	22kW(30HP) 25%ED	420(25%ED)／238N・m (309(25%ED)／176ft・lbs)	
	MS	MITSUBISHI		37(10%ED)／26kW (40(10%ED)／35HP)	467(10%ED)／251N・m (344(10%ED)／185ft・lbs)	

7

8

High cutting capability and highly accurate high-quality machining

Highest-level heavy cutting capability

Cutting data Workpiece material : S45C

VM43**R**Ⅱ:No.50   8000min⁻¹ 15/11kW(20/15HP)

VM53**R**Ⅱ:No.50   8000min⁻¹ 18.5/15kW(25/20HP)

VM76**R**Ⅱ:No.50   8000min⁻¹ 18.5/15kW(25/20HP)

Type of machining		VM43**R**Ⅱ	VM53**R**Ⅱ／VM76**R**Ⅱ
		Face milling	
		φ125(4.92")× 6T	
Spindle rotating speed	min⁻¹	500	560
Width of cut (A)	mm	100(3.94")	100(3.94")
Depth of cut (B)	mm	5(0.20")	6(0.24")
Feed rate	mm/min	720(28 ipm)	1000(39 ipm)
Cutting rate	cm³/min	360(21.96 in³/min)	600(36.60 in³/min)
Spindle motor load	%	112	123

Type of machining		VM43**R**Ⅱ	VM53**R**Ⅱ／VM76**R**Ⅱ
		Side milling	
		φ80(3.15")× 4T [Roughing end mill]	
Spindle rotating speed	min⁻¹	450	450
Width of cut (C)	mm	20(0.79")	30(1.18")
Depth of cut (D)	mm	50(1.97")	50(1.97")
Feed rate	mm/min	324(13 ipm)	270(11 ipm)
Cutting rate	cm³/min	324(19.76 in³/min)	405(24.70 in³/min)
Spindle motor load	%	101	89

Type of machining		VM43**R**Ⅱ	VM53**R**Ⅱ／VM76**R**Ⅱ
		Drilling	
		φ59(2.32") [Throw-away type]	
Spindle rotating speed	min⁻¹	650	650
Feed rate	mm/min	91(4 ipm)	91(4 ipm)
Feed	mm/rev	0.14(0.0058 in/rev)	0.14(0.0058 in/rev)
Cutting rate	cm³/min	249(15.19 in³/min)	249(15.19 in³/min)
Spindle motor load	%	102	73

Type of machining		VM43**R**Ⅱ	VM53**R**Ⅱ／VM76**R**Ⅱ
		Tapping	
		M30 × P3.5	M48 × P5
Spindle rotating speed	min⁻¹	74	47
Feed rate	mm/min	259(10 ipm)	235(9 ipm)
Spindle motor load	%	35	85

The values shown above are reference values indicated as reference information about the cutting capability.

Good reliable structure realizes the highly accurate high-quality machining

Soft Scale Ⅲ

Three functions for improving and maintaining accuracy

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

2 Ball screw elongation compensation
This function reduces the error generation caused by repeated feeding and positioning.

3 Spindle's thermal displacement compensation
This function compensates the thermal displacement caused by rotation of the spindle.
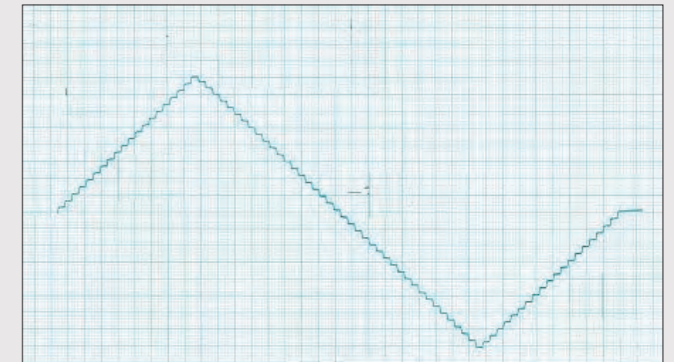
Diagram of 1-μm step-feed measurement

Circularity measurement

VM43**R**Ⅱ : 3.30μm

VM53**R**Ⅱ : 3.27μm
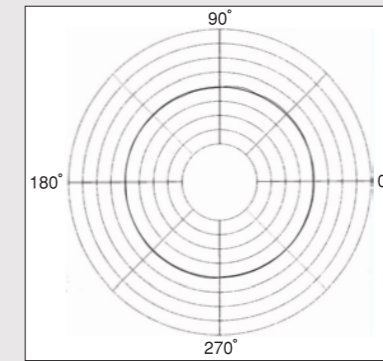
VM76**R**Ⅱ : 5.29μm

Circularity measurement example

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

Accuracy

■Positioning accuracy (mm)(Nidec OKK tolerance)

Item	VM43**R**Ⅱ	VM53**R**Ⅱ	VM76**R**Ⅱ
Positioning accuracy	X／Y／Z： ±0.0025(±0.00010")／full stroke	X／Y／Z： ±0.0030(±0.00012")／full stroke	X： ±0.0050(0.00020")／full stroke Y／Z： ±0.0030(0.00012")／full stroke
Repeated positioning accuracy	X／Y／Z： ±0.0015(±0.00006")／full stroke	X／Y／Z： ±0.0020(±0.00008")／full stroke	X／Y／Z： ±0.0020(±0.00008")／full stroke

■Positioning machining accuracy

Example of actual machining (Unit : mm)

Item	VM43**R**Ⅱ	VM53**R**Ⅱ	VM76**R**Ⅱ
Axial direction	0.006(0.00024")	0.004(0.00016")	0.006(0.00024")
Diagonal direction	0.004(0.00016")	0.001(0.00004")	0.003(0.00012")
Difference in diameter	0.006(0.00024")	0.001(0.00004")	0.005(0.00020")

(mm)
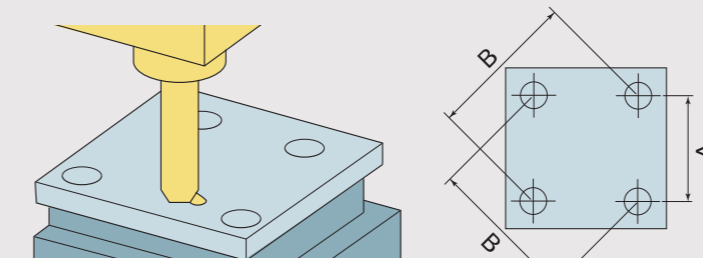
	VM43**R**Ⅱ	VM53**R**Ⅱ／VM76**R**Ⅱ
A	150(5.91")	200(7.87")
B	212.132(8.35")	282.843(11.14")

Notes
1. The data of the short-term machining are shown above as an example.
   The results of the continuous machining may be different from the above.
2. The accuracy data obtained under Nidec OKK's in-house cutting test conditions are shown above as an example.
   The results may vary with the cutting tools and the used jigs.
3. The above accuracy data are the laboratory data obtained by installing the machine according to Nidec OKK's foundation drawing and carrying the inspection based on Nidec OKK's inspection standard in an environment with controlled temperature.

9

10

Enhanced measures against thermal displacement

In addition to the side face cooling, the No.50 gear-head spindles for VM53RⅡ and VM76RⅡ have the structure for circulating the cooling oil in the front face.

Lubricating and cooling oil

Lubricating and cooling oil

Lubricating and cooling oil

Lubricating and cooling oil

MS（motorized spindle）

Gear-head spindle

Nidec OKK's original environmental thermal displacement correction

Soft Scale Cube

Thermal displacement is corrected adequately by estimating thermal deformation of the reference space assumed in the machining center's machining area based on the information obtained through the temperature sensors in various sections of the machine structure.

P2
P3　L3
L4　L2
P4
L1
P0　P1

Environmental thermal displacement measurement result 8μm/8℃ can be attained with Soft Scale Cube.

— Y measured value（μm）
— Z measured value（μm）
— Room temperature（℃）

6.7μm
5.2μm

Measured value / Room temperature / Time（hours）

2-ton specification for allowable mass of a workpiece on the table（Option for VM76RⅡ）

The small-lead ball screw used for the Y axis increases rigidity of the feed system and improves the machining accuracy. In addition, the hydrostatic air bearing decreases the frictional resistance and reduces the loading weight of the table. This specification helps improve the positioning accuracy, the characteristic of micro step feeding precision, and circularity.

Forced core cooling（option）

Nut　　Nut

Cooling oil

Ball screw

Servomotor

Thermal displacement is minimized by circulating the temperature-controlled cooling oil.

Hybrid slideway

The photo shows VM76RⅡ.
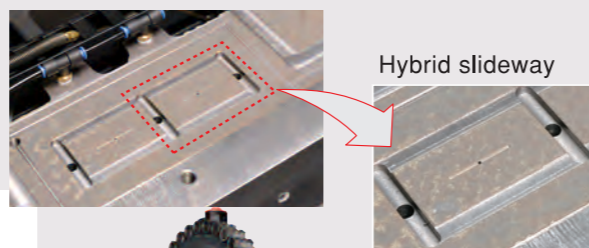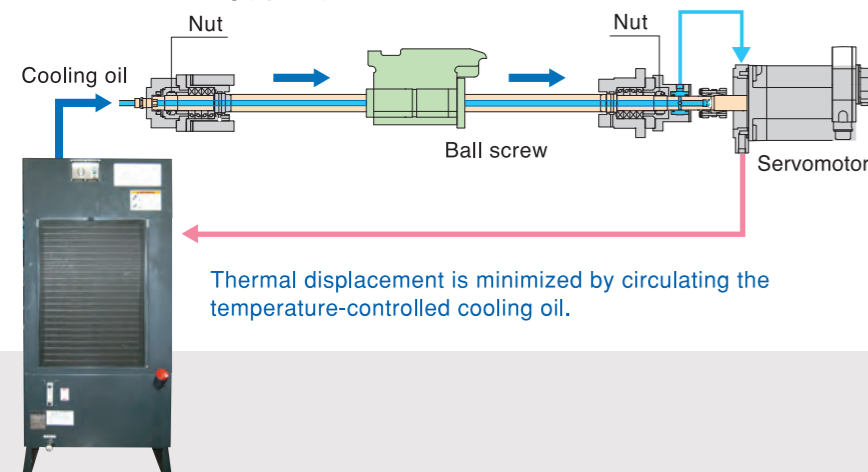
Automatic workpiece measurement by the use of a TOF camera

3D MEISTER（option）

3D MEISTER

A TOF camera installed inside the machine is used for 3D modeling of an actual workpiece.
In combination with the Touch Sensor System T1-A, Easily take the measurements to the center the workpiece.

匠 TAKUMI　AI
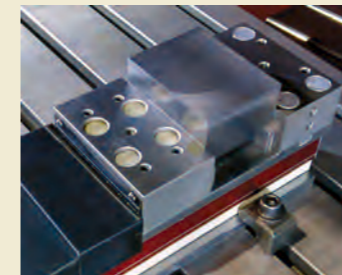
Photographing an actual workpiece

3D modeling

Automatic measurement for centering the workpiece

Batch management of data by using a PC/Smartphone

Net Monitor（option）

Connect　　　**Visualize[Monitoring]**　　　**Utilize data**
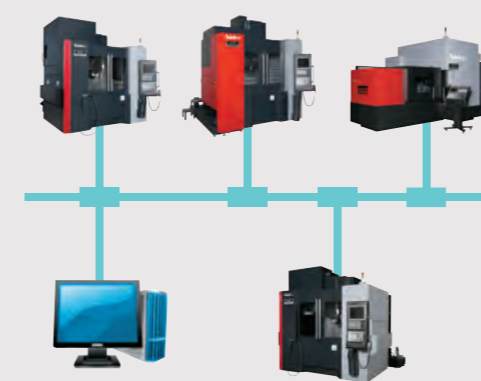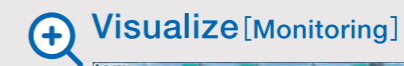
This function supports connection, visualization and utilization of data of the machine.
It monitors the operating performance, the operation history, and the machining results and aggregates their data.
It also enables batch management of the machining programs by the use of a PC.

Net Monitor remote control function（option）

On the move…

From outside…

At the desks…

Net Monitor is linked to the cloud service.
You can check a status of the machine and progress of machining even when you are outside the company or at home and even through a smartphone.
There is also the remote-control switch function.

Nidec OKK's Dedicated Control Functions

Programming Support Functions

■Program Editor

It enables editing the programs in the NC memory, the data server (or hard discs) and the memory cards. 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.

Setup Support Functions

■Tool Support

It enables batch management of each tool's various information such as the tool name, the form figure, and the offset number through a single screen. As it enables the tool measurement by just switching the menu, it is convenient for the setup operation.

▼Tool measurement

▲Tool measurement for setup

■WinGMC8 (N830 standard function)

It is an interactive automatic NC programming function that is user-friendly. 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.

■T0 Softwaer (Option)

By just operating the handle and moving the sensor to the desired measuring point, you can measure manually and easily.
Results of the measurement can be set as the data of the workpiece coordinate system or a specific tool offset number through the single key operation.
(Touch Sensor T1-A or T1-B (option) is necessary.)

Reference plane measurement　　　Width measurement　　　Diameter measurement

Rotation measurement

Distance measurement

Performance Management and Maintenance Function

■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)

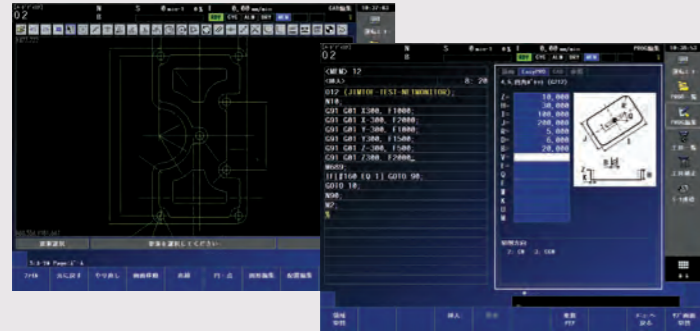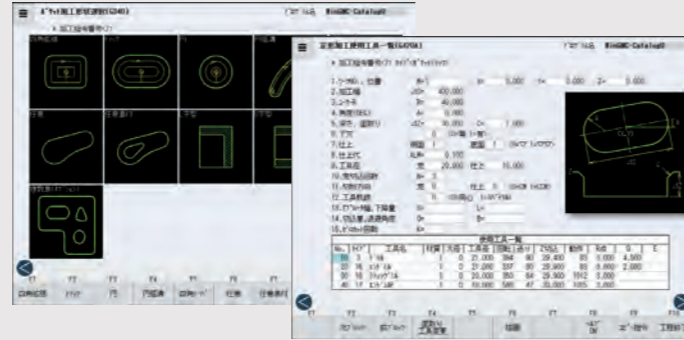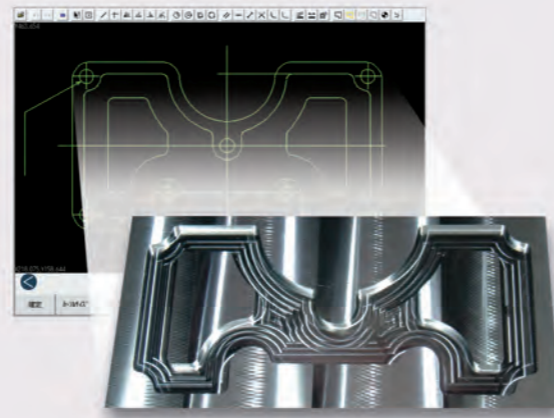It enables managing the number of machined workpieces and controlling the operation rate easily.
It is useful for managing the machine's operational statuses as you can output and write the data to the memory cards.

Functions for Reduced Setup and Unmanned Operation

■Soft AC (Option)

This function applies the feed rate override control automatically so that the value of the spindle load meter is constant. It helps prevent damages to tools caused by overload ad improve cutting efficiency.

●Adaptive control function
Feed override control in the range of 10 to 200% is available.
(An alarm is issued at the time of reaching the override lower limit value.)
●Air-cut reduction function
Feed rates during non-cutting operation can be increased up to 200%.
●Tool failure monitoring function
Specifications are similar to the soft CCM.
●Continuous unmanned machining at the time of tool failure
It can be combined with the automatic restart function (different option).

■Soft CCM (Option)

It monitors the spindle load meter and stops operation when the meter value exceeds the preset value (set with the M signal or set for the relevant T numbers through the setting screen) and generation of abnormal tool load is determined.

High-efficiency Control Function

■Hyper HQ Control (Option)

It improves the minute line segments processing capability and enables the high-speed machining.

〈N830's minute line segments processing capability〉

Specification	Line segment data processing speed (m/min)	Commands
Without Hyper HQ control	16.8 (661 ipm)	
Hyper HQ control mode Ⅰ	33.7 (1327 ipm)	ON : G5P1 OFF : G5P0
Hyper HQ control mode Ⅱ	168 (6614 ipm)	ON : G5P2 OFF : G5P0

〈F31i's minute line segments processing capability〉

Specification	Line segment data processing speed (m/min)	Commands
Without Hyper HQ control	15.0 (591 ipm)	
Hyper HQ control mode A	30.0 (1181 ipm)	ON : G5.1Q1 OFF : G5.1Q0
Hyper HQ control mode B	150 (5906 ipm)	ON : G5.1Q1 OFF : G5.1Q0

The above values show (theoretical) maximum speeds for processing 1-mm-segment blocks constructing a straight line.

■HQ Tuner (Option)

It enables adjusting the parameters for the hyper HQ control according to the machining conditions.
The hyper HQ control can be adjusted according to the process. For example, for roughing, the machining time can be reduced while focusing on the machining speed, and, for finishing, geometric accuracy of corners and arcs is improved by focusing on accuracy.

Network Function

■Data Server (Option for F31i)

Large machining programs can be transferred to the data server through the network connected to the host computer.
The transferred machining programs are executed as main programs or sub programs that are called up by using the M198.

■Hard Disc Operation (N830 standard function)

Large machining programs can be transferred to the hard disc inside the machine through the network connected to the host computer.
The transferred machining programs are executed as main programs or sub programs.

Large machining programs are transferred at high speed.

13　　14

Specification of Machine Main Body

Item	Unit	Specification	
		No.40	No.50
		Gear-head spindle	
		8000min⁻¹	
Travel on X axis (Table longitudinal direction)	mm	630 (24.80")	
Travel on Y axis (Saddle cross direction)	mm	430 (16.93")	
Travel on Z axis (Spindle head vertical direction)	mm	460 (18.11")	
Distance from table top surface to spindle nose	mm	150 to 610 (5.91" to 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 × 420 (31.50"×16.54")	
Max. workpiece mass loadable on table	kg	500 (1102 lbs)	
Table work surface configuration (T-slot nominal dimension × spacing × number of T slots)	mm	18 × 125 × 3 slots (0.71"× 4.92"× 3 slots)	
Distance from floor surface to table work surface	mm	900 (35.43")	
Spindle rotating speed	min⁻¹	25 to 8000	
Number of spindle rotating speeds		2 speeds	
Spindle nose (Nominal number)		7/24-tapered No.40 Two-surface locking type	7/24-tapered No.50 Two-surface locking type
Spindle bearing bore diameter	mm	φ70 (dia.2.76")	φ85 (dia.3.35")
Rapid traverse rate	m/min	X/Y：30 (1181ipm)	Z：20 (787ipm)
Cutting feed rate	mm/min	1 to 20000 (0.04 to 787ipm) (See Note 1)	
Jog feed rate	mm/min	2000 (79ipm)	
Type of tool shank (Nominal number)		BT40 two-surface locking tool	BT50 two-surface locking tool
Type of pull stud (Nominal number)		MAS1 45°	OKK 90°
Number of storable tools	tools	20	
Max. tool diameter (with tools in adjoining pots)	mm	φ82 (dia.3.23")	φ108 (dia.4.25")
Max. tool diameter (with no tools in adjoining pots)	mm	φ110 (dia.4.33")	φ160 (dia.6.30")
Max. tool length (from the gauge line)	mm	350 (13.78") (300 (dia 11.81") (See Note 2))	
Max. tool mass (moment)	kg (N·m)	10 (22 lbs) (9.8 (7ft·lbs))	20 (44 lbs) (29.4 (22ft·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	5.0 (12.0 (See Note 2))	5.9 (12.9 (See Note 2))
Spindle motor (Short-term rating / Continuous rating)	MITSUBISHI kW	11/7.5 (15/10HP)	15/11 (20/15HP)
	FANUC (F31i-B) kW	11/7.5 (15/10HP)	15/11 (20/15HP)
	FAi kW	15/11 (20/15HP)	15/11 (20/15HP)
Feed motor	MITSUBISHI kW	X/Y：2.0 (2.7HP)	Z：3.5 (4.7HP)
	FANUC (F31i-B) kW	X/Y：3.0 (4HP)	Z：4.0 (5.4HP)
	FAi kW	X/Y：1.8 (2.4HP)	Z：3.0 (4HP)
Motor for coolant pump	kW	1.1 (1.5HP) (60Hz) / 0.75 (1.01HP) (50Hz)	
Motor for slideway lubrication pump	kW	0.017 (0.02HP)	
Motor for spindle head cooling pump (oil cooler)	kW	1.2 (1.61HP) (compression) / 0.75 (1.01HP) (discharge)	
Motor for unclamping the spindle tool / ATC	kW	0.4 (0.54HP)	0.75 (1.01HP)
Motor for turning the magazine	kW	0.2 (0.27HP)	0.4 (0.54HP)
Motors for coil-type chip conveyors	kW	0.2 × 2 (0.3HP×2)	
Power supply (See Note 3)	MITSUBISHI kVA	26	32
	FANUC (F31i-B) kVA	24	29
Supply voltage and supply frequency	V·Hz	200V±10% 50/60Hz±1Hz 220V±10% 60Hz±1Hz	
Compressed air supply pressure (See Note 4)	MPa	0.4 to 0.6 (58psi to 87psi)	
Compressed air supply flow rate (Atmospheric pressure) (See Notes 3 and 4)	L/min (ANR)	360 (95 gal) or more	
Coolant tank capacity (See Notes 3)	L	250 (66 gal)	
Spindle head cooling oil tank capacity (oil cooler)	L	50 (13 gal)	
Slideway lubrication oil tank capacity	L	6.0 (1.6 gal)	
Machine height (from the floor surface)	mm	2623 (103.27")	2713 (106.81")
Required floor space (width × depth)	mm	1980×2710 (77.95"×106.69")	2090×2710 (82.28"×106.69")
Machine mass	kg	5500 (12100 lbs)	5700 (12600 lbs)
Operating environment temperature	℃	5 to 40	
Operating environment humidity	%	10 to 90 (No condensation)	

Note 1: The feed rate under the HQ or Hyper HQ control.
Note 2: ATC shutter specification
Note 3: The value for the standard specification. It may vary with added options.
Note 4: Purity of the supplied air should be equivalent to or higher than the Classes 3, 5 and 4 specified in ISO 8573-1 / JIS B8392-1.
Note: Use the machine in the appropriate environment as the machine installation environment affects accuracies of the machine and the machining.

Standard Accessories

Name	Qty	Remark
Lighting system	1 set	Two LED lamps
Coolant unit (Separately-installed coolant tank)	1 set	Tank capacity : 250L (66 gal)
Overall machine cover (Splash guard)	1 set	Including electromagnetic locks on front doors and right and left maintenance covers
Magazine safety cover	1 set	Including electromagnetic lock
Slideway protection steel sliding covers for X, Y and Z axes	1 set	
Spindle head lubricating oil temperature controller	1 set	
Slideway lubrication unit	1 set	
Rear-discharging coil-type chip conveyor (including the reverse rotation function)	2 sets	1 set for each of right and left sides
Oil skimmer	1 set	Screw type
Air blower	1 set	
Signal lamp	1 set	3-lamp type including buzzer alarm
Workpiece cleaning gun	1 set	Shower gun type (normal pressure)
Tool removing device	1 set	Manual operation type
Leveling block	1 set	
Earth leakage breaker	1 set	
Automatic power off (with M02 or M30)	1 set	
Electrical spare parts (fuses)	1 set	
Safety manual and instruction manual for Soft Scale II m / III	1 set / each	
Instruction manual, Foundation and Installation Instruction Manual, and Standard Specifications	1 set / each	Standard Specifications are not included when Final Specifications are submitted.
Electrical instruction manual	1 set	Including electrical diagrams
Instruction manual for integrated machining support software	1 set	Including the manuals for Program Editor and Tool Support. Manuals are not submitted when FANUC Ai controller is used.
Supplementary manual for Manual Guide i	1 set	This manual is not submitted when MITSUBISHI controller is used.
Manual for controller (NC)	1 set	CD-ROM
Programming manual and operating procedures	1 set / each	

Special Accessories

Item	Specification
Spindle motor	6000min⁻¹ (11/7.5kW (15/10HP)) (MITSUBISHI/FANUC) (No.40 gear-head) 14000min⁻¹ (37/26/22kW (50/35/30HP)) (MITSUBISHI) (No.40-MS) 14000min⁻¹ (37/26/18.5kW (50/35/25HP)) (FANUC) (No.40-MS) 20000min⁻¹ (37/26/22kW (50/35/30HP)) (MITSUBISHI) (No.40-MS) 20000min⁻¹ (37/26/18.5kW (50/35/25HP)) (FANUC) (No.40-MS)
Type of tool shank	CAT40, DIN40 / CAT50、DIN50
Type of pull stud	No.40：MAS2 (60°) / OKK 90° No.50：MAS1 (45°) / MAS2 (60°)
Number of storable tools	30 tools (Drum type) (No.40 only)
Pallet changer	Shuttle-type APC (T-slots / Tapped holes on pallet work surface specification)
Column raise (Column-UP)	200mm (7.87") (Standard for the machine with APC)
Ejection of chips from the machine	Chip flushing with coolant (Sharing with the coil-type chip conveyor is not possible.) / Coil-type chip conveyor is excluded.
Splash guard	Front door automatic opening and closing specification
Automatically opened and closed ATC cover	Max. tool length is limited to 300mm (11.81").
Signal lamp	2-lamp type with/without buzzer alarm
Linear scale	X axis, Y axis, Z axis / X axis, Y axis
Compatibility with through-spindle	2-MPa (290psi) coolant / 7-MPa (1015psi) coolant / Air / Preparation for coolant
Coolant cooler	Separate tank specification / Integrated with the high-pressure unit (High-pressure unit needs to be selected separately.)
Oil mist blower	
Minimal quantity coolant supply system	
Spindle-nose swirl stopper block	For high-power spindle / For angle attachment
Compatibility with oil hole holder	
Mist collector	Installed separately / Installation of the supplied equipment
Lift-up type chip conveyor	Hinged type / Scraper type / Scraper type with floor magnet / Backwashing filtration type for aluminum / Backwashing filtration type for aluminum and casting Chip discharge from left / right side
Chip bucket	Fixed chip bucket / Tilting chip bucket
Spare Thickener bag filter	6 pieces (1 set)
Change of operation panel	Pendant type / Movable console type
3-axis manual pulse generator	Stand type / Handy type
Foundation parts	For bond anchoring method
Bond for foundation work	HILTI
Change in machine coating color	Color specified by customer
Standard tool set	Including a tool box
NC rotary table	
Electrical indexing table (Rotary table with controller)	
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

Side View

Front View

Workpiece cleaning gun

Note: Asterisked dimension changes with the machine specification.
※ : No.50

Floor Space

Table Dimensions

T-slot Dimensions
18 (0.71") H8

Note: Asterisked dimension changes with the machine specification.
※ : No.50

Specification of Machine Main Body

Item	Unit	Specification No.40	No.50
		Gear-head spindle	
		8000min⁻¹	
Travel on X axis（Table longitudinal direction）	mm	1050（41.34"）	
Travel on Y axis（Saddle cross direction）	mm	530（20.87"）	
Travel on Z axis（Spindle head vertical direction）	mm	510（20.08"）	
Distance from table top surface to spindle nose	mm	150～660（5.91" to 25.98"）	
Distance from column front to spindle center	mm	565（22.24"）	
Table work surface area（X-axis direction×Y-axis direction）	mm	1050×560（41.34"×22.05"）	
Max. workpiece mass loadable on table	kg	800（1764 lbs）	
Table work surface configuration（T-slot nominal dimension×spacing×number of T slots）	mm	18×110×5 slots（0.71"×4.33"×5 slots）	
Distance from floor surface to table work surface	mm	920（36.22"）	
Spindle rotating speed	min⁻¹	25 to 8000	
Number of spindle rotating speeds		2 speeds	
Spindle nose（Nominal number）		7/24-tapered No.40 Two-surface locking type	7/24-tapered No.50 Two-surface locking type
Spindle bearing bore diameter	mm	φ70（dia.2.76"）	φ100（dia.3.94"）
Rapid traverse rate	m/min	X/Y：30（1181 ipm）	Z：20（787 ipm）
Cutting feed rate	mm/min	1 to 20000（0.04 to 787ipm）（See Note 1）	
Jog feed rate	mm/min	2000（79ipm）	
Type of tool shank（Nominal number）		BT40 two-surface locking tool	BT50 two-surface locking tool
Type of pull stud（Nominal number）		MAS1 45°	OKK 90°
Number of storable tools	tools	30	
Max. tool diameter（with tools in adjoining pots）	mm	φ80（dia.3.15"）	φ103（dia.4.06"）
Max. tool diameter（with no tools in adjoining pots）	mm	φ110（dia.4.33"）	φ200（dia.7.87"）
Max. tool length（from the gauge line）	mm	380（14.96"）	
Max. tool mass（moment）	kg（N・m）	10（22lbs）（9.8（7ft・lbs））	20（44 lbs）（29.4（22ft・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（See Note 2））	5.9（13.9（See Note 2））
Spindle motor（Short-term rating／Continuous rating）	MITSUBISHI	kW	11/7.5（15/10HP）	18.5/15（25/20HP）
	FANUC（F31i-B）	kW	11/7.5（15/10HP）	18.5/15（25/20HP）
Feed motor	MITSUBISHI	kW	X/Y：2.0（2.7HP）	Z：3.5（4.7HP）
	FANUC（F31i-B）	kW	X/Y：3.0（4HP）	Z：4.0（5.4HP）
Motor for coolant pump	kW	1.1（1.48HP）（60Hz）／0.75（1.01HP）（50Hz）	
Motor for slideway lubrication pump	kW	0.017（0.02HP）	
Motor for spindle head cooling pump（oil cooler）	kW	1.2（1.61HP）（compression）／0.75（1.01HP）（discharge）	
Motor for spindle oil-air lubrication pump	kW	—	0.017（0.023HP）（60Hz）／0.018（0.024HP）（50Hz）
Motor for unclamping the spindle tool／ATC	kW	0.4（0.54HP）	0.75（1.01HP）
Motor for turning the magazine	kW	0.2（0.27HP）	0.4（0.54HP）
Motors for coil-type chip conveyors	kW	0.2×2（0.27HP×2）	
Power supply（See Note 3）	MITSUBISHI	kVA	26	33
	FANUC（F31i-B）	kVA	24	35
Supply voltage and supply frequency	V・Hz	200V±10%　50/60Hz±1Hz 220V±10%　60Hz±1Hz	
Compressed air supply pressure（See Note 4）	MPa	0.4 to 0.6（58 psi to 87 psi）	
Compressed air supply flow rate（Atmospheric pressure）（See Notes 3 and 4）	L／min（ANR）	360（95 gal）or more	
Coolant tank capacity（See Notes 3）	L	280（74 gal）	
Spindle head cooling oil tank capacity（oil cooler）	L	50（13 gal）	
Spindle oil-air lubrication oil tank capacity	L	—	2.0（0.5 gal）
Slideway lubrication oil tank capacity	L	6.0（1.6 gal）	
Machine height（from the floor surface）	mm	2752（108.35"）	2815（110.83"）
Required floor space（width×depth）	mm	2825×2985（111.22"×117.52"）	
Machine mass	kg	7800（17200 lbs）	8000（17600 lbs）
Operating environment temperature	℃	5 to 40	
Operating environment humidity	%	10 to 90（No condensation）	

Note 1: The feed rate under the HQ or Hyper HQ control.
Note 2: ATC shutter specification
Note 3: The value for the standard specification. It may vary with added options.
Note 4: Purity of the supplied air should be equivalent to or higher than the Classes 3, 5 and 4 specified in ISO 8573-1 / JIS B8392-1.
Note:　Use the machine in the appropriate environment as the machine installation environment affects accuracies of the machine and the machining.
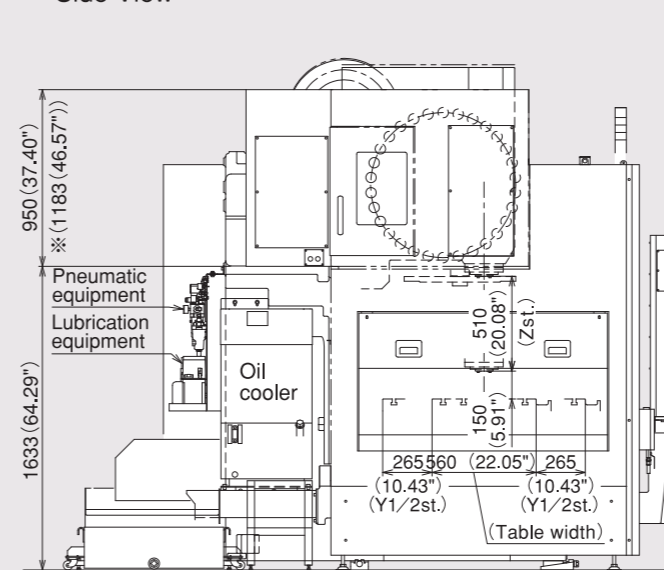
Standard Accessories

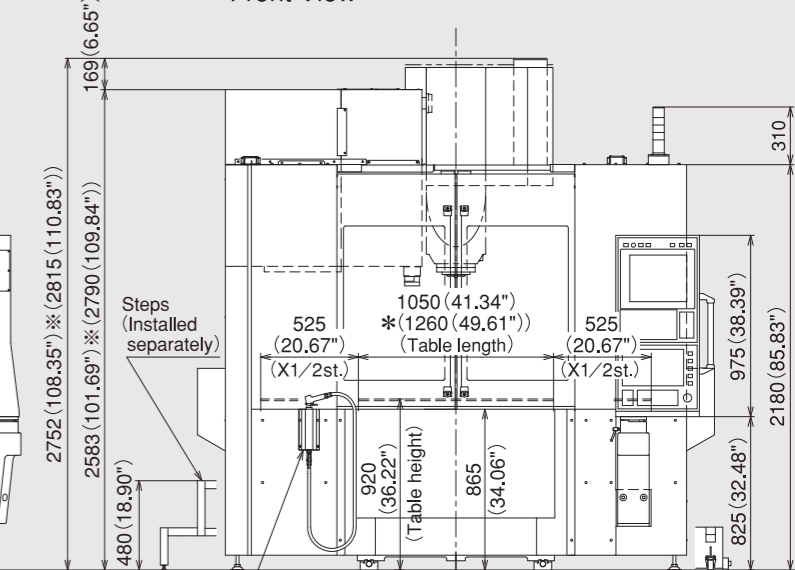| Name	Qty	Remark
Lighting system	1 set	Two LED lamps
Coolant unit（Separately-installed coolant tank）	1 set	Tank capacity：250L（66 gal）
Overall machine cover（Splash guard）	1 set	Including electromagnetic locks on front doors and right and left maintenance covers
Magazine safety cover	1 set	Including electromagnetic lock
Slideway protection steel sliding covers for X, Y and Z axes	1 set	
Spindle head lubricating oil temperature controller	1 set	
Slideway lubrication unit	1 set	
Rear-discharging coil-type chip conveyor（including the reverse rotation function）	2 sets	1 set for each of right and left sides
Oil skimmer	1 set	Screw type
Air blower	1 set	
Signal lamp	1 set	3-lamp type including buzzer alarm
Workpiece cleaning gun	1 set	Shower gun type（normal pressure）
Tool removing device	1 set	Manual operation type
Leveling block	1 set	
Earth leakage breaker	1 set	
Automatic power off（with M02 or M30）	1 set	
Electrical spare parts（fuses）	1 set	
Safety manual and instruction manual for Soft ScaleⅡm／Ⅲ	1 set／each	
Instruction manual, Foundation and Installation Instruction Manual, and Standard Specifications	1 set／each	Standard Specifications are not included when Final Specifications are submitted.
Electrical instruction manual	1 set	Including electrical diagrams
Instruction manual for integrated machining support software	1 set	Including the manuals for Program Editor and Tool Support.
Supplementary manual for Manual Guide i	1 set	This manual is not submitted when MITSUBISHI controller is used.
Manual for controller（NC）	1 set	CD-ROM
Programming manual and operating procedures	1 set／each	

Special Accessories

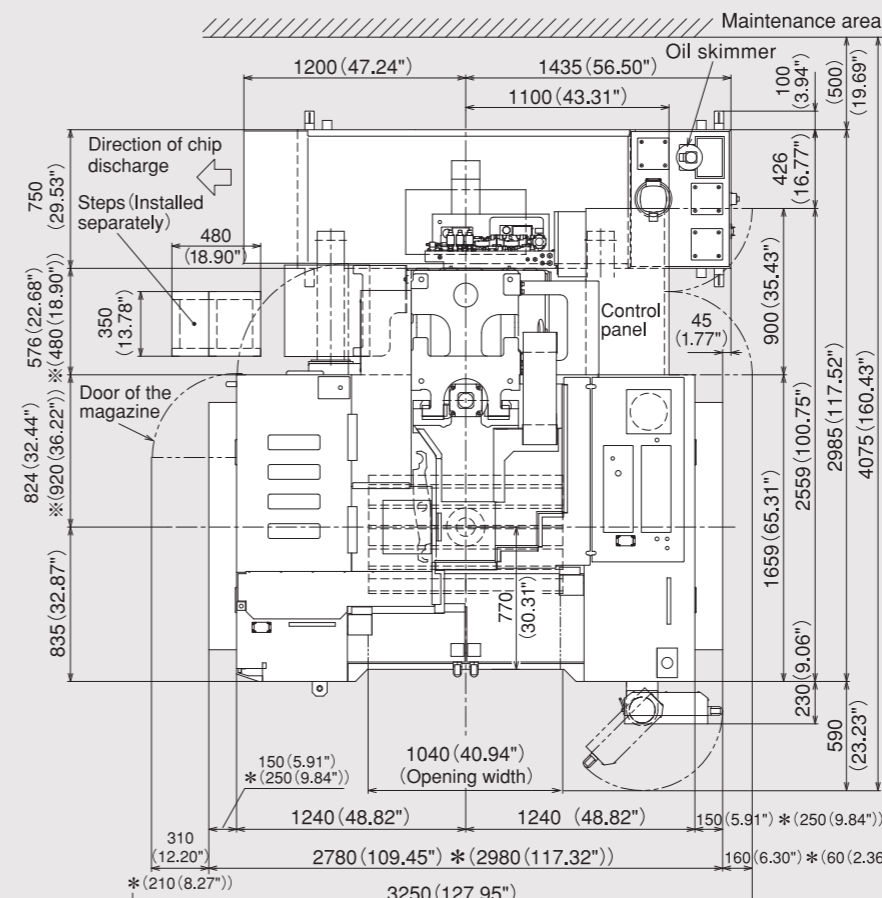| Item	Specification
Long-table specification	1260-mm（49.61"）table width
Spindle motor	14000min⁻¹（37/26/22kW）（50/35/30HP）（MITSUBISHI）（No.40-MS） 14000min⁻¹（37/26/18.5kW）（50/35/25HP）（FANUC）（No.40-MS） 20000min⁻¹（37/26/22kW）（50/35/30HP）（MITSUBISHI）（No.40-MS） 20000min⁻¹（37/26/18.5kW）（50/35/25HP）（FANUC）（No.40-MS） 12000min⁻¹（37/30/26kW）（50/40/35HP）（MITSUBISHI）（No.50-MS） 12000min⁻¹（30/25kW）（40/34HP）（FANUC）（No.50-MS）
Type of tool shank	CAT40、DIN40／CAT50、DIN50
Type of pull stud	No.40：MAS2（60°）／OKK 90° No.50：MAS1（45°）／MAS2（60°）
Number of storable tools	40 tools（Chain type）
Pallet changer	Shuttle-type APC（T-slots／Tapped holes on pallet work surface specification）
Column raise（Column-UP）	250mm（9.84"）（Standard for the machine with APC）
Ejection of chips from the machine	Chip flushing with coolant（Sharing with the coil-type chip conveyor is not possible.）／Coil-type chip conveyor is excluded.
Splash guard	Front door automatic opening and closing specification
Automatically opened and closed ATC cover	
Signal lamp	2-lamp type with/without buzzer alarm
Linear scale	X axis, Y axis, Z axis／X axis, Y axis
Compatibility with through-spindle	2-MPa（290psi）coolant／7-MPa（1015psi）coolant／Air／Preparation for coolant
Coolant cooler	Separate tank specification／Integrated with the high-pressure unit（High-pressure unit needs to be selected separately.）
Oil mist blower	
Minimal quantity coolant supply system	
Spindle-nose swirl stopper block	For high-power spindle／For angle attachment
Compatibility with oil hole holder	
Mist collector	Installed separately／Installation of the supplied equipment
Lift-up type chip conveyor	Hinged type／Scraper type／Scraper type with floor magnet／Backwashing type／Scraper type for aluminum／Backwashing filtration type for aluminum and casting Chip discharge from left／right side
Chip bucket	Fixed chip bucket／Tilting chip bucket
Spare Thickener bag filter	6 pieces（1 set）
Change of operation panel	Pendant type／Movable console type
3-axis manual pulse generator	Stand type／Handy type
Foundation parts	For bond anchoring method
Bond for foundation work	HILTI
Change in machine coating color	Color specified by customer
Standard tool set	Including a tool box
NC rotary table	
Electrical indexing table（Rotary table with controller）	
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

Dimensions — Main Dimensions

Side View

Pneumatic equipment
Lubrication equipment
Oil cooler

950（37.40"）※（1183（46.57"））
1633（64.29"）
510（20.08"）（Zst.）
150（5.91"）
265　560（22.05"）　265
（10.43"）（Y1／2st.）　（10.43"）（Y1／2st.）
（Table width）

Front View

2752（108.35"）※（2815（110.83"））
2583（101.69"）※（2790（109.84"））
169（6.65"）
Steps（Installed separately）
525（20.67"）（X1／2st.）　1050（41.34"）※（1260（49.61"））（Table length）　525（20.67"）（X1／2st.）
310（12.20"）
975（38.39"）
2180（85.83"）
920（36.22"）（Table height）
865（34.06"）
825（32.48"）
480（18.90"）
Workpiece cleaning gun

Note: Asterisked dimension changes with the machine specification.
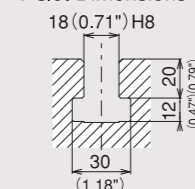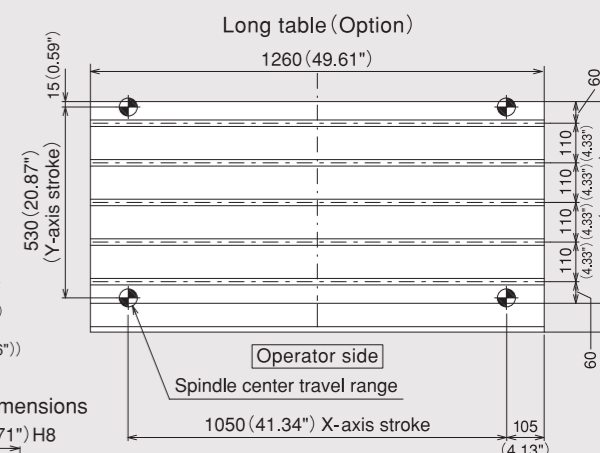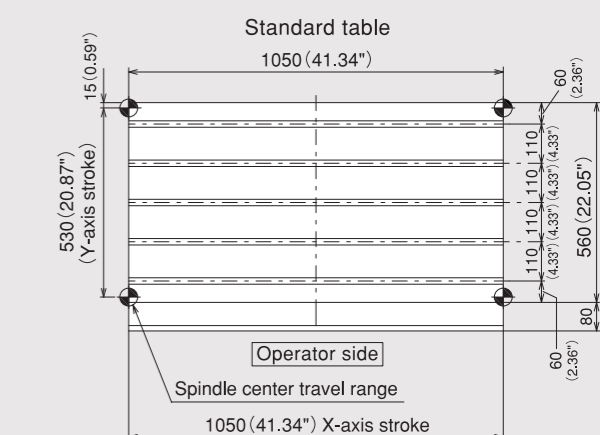※：No.50
＊：Long-table specification（Table width:1260mm（49.61"））

Floor Space

Maintenance area
Oil skimmer
1200（47.24"）　1435（56.50"）
1100（43.31"）
Direction of chip discharge
Steps（Installed separately）
480（18.90"）
Control panel
45（1.77"）
Door of the magazine
100（3.94"）
426（16.77"）
900（35.43"）
2985（117.52"）
4075（160.43"）
（500）（19.69"）
2559（100.75"）
1659（65.31"）
230（9.06"）
590（23.23"）
770（30.31"）
350（13.78"）
750（29.53"）
576（22.68"）※480（18.90"）
824（32.44"）※920（36.22"）
835（32.87"）
150（5.91"）＊（250（9.84"））
1040（40.94"）（Opening width）
1240（48.82"）　1240（48.82"）　150（5.91"）＊（250（9.84"））
310（12.20"）
2780（109.45"）＊（2980（117.32"））　160（6.30"）＊（60（2.36"））
＊（210（8.27"））
3250（127.95"）

Note: Asterisked dimension changes with the machine specification.
※：No.50
＊：Long-table specification（Table width:1260mm（49.61"））

Table Dimensions

Standard table

1050（41.34"）
530（20.87"）（Y-axis stroke）
15（0.59"）
60（2.36"）
110（4.33"）110（4.33"）110（4.33"）
560（22.05"）
80（3.15"）
60（2.36"）
Operator side
Spindle center travel range
1050（41.34"）X-axis stroke

Long table（Option）

1260（49.61"）
530（20.87"）（Y-axis stroke）
15（0.59"）
60（2.36"）
110（4.33"）110（4.33"）110（4.33"）
560（22.05"）
80（3.15"）
60（2.36"）
Operator side
Spindle center travel range
1050（41.34"）X-axis stroke　105（4.13"）

T-slot Dimensions

18（0.71"）H8
12　20
（0.47"）（0.79"）
30（1.18"）

Specification of Machine Main Body

Item	Unit	Specification No.40 MS(Motorized spindle) 14000min⁻¹	Specification No.50 Gear-head spindle 8000min⁻¹
Travel on X axis (Table longitudinal direction)	mm	1540 (60.63")	
Travel on Y axis (Saddle cross direction)	mm	760 (29.92")	
Travel on Z axis (Spindle head vertical direction)	mm	660 (25.98")	
Distance from table top surface to spindle nose	mm	150~810 (5.91" to 31.89")	
Distance from column front to spindle center	mm	785 (30.91")	
Table work surface area (X-axis direction×Y-axis direction)	mm	1550×760 (61.02"×29.92")	
Max. workpiece mass loadable on table	kg	1500 (3300 lbs)	
Table work surface configuration (T-slot nominal dimension × spacing × number of T slots)	mm	22×140×5 slots (0.87"×5.51"×5 slots)	
Distance from floor surface to table work surface	mm	1000 (39.37")	
Spindle rotating speed	min⁻¹	100 to 14000	25 to 8000
Number of spindle rotating speeds		2 speeds	
Spindle nose (Nominal number)		7/24-tapered No.40 Two-surface locking type	7/24-tapered No.50 Two-surface locking type
Spindle bearing bore diameter	mm	φ70 (dia.2.76")	φ100 (dia.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) See note 1	
Jog feed rate	mm/min	2000 (79 ipm)	
Type of tool shank (Nominal number)		BT40 two-surface locking tool	BT50 two-surface locking tool
Type of pull stud (Nominal number)		MAS1 45°	OKK 90°
Number of storable tools	tools	30	
Max. tool diameter (with tools in adjoining pots)	mm	φ80 (dia.3.15")	φ103 (dia.4.06")
Max. tool diameter (with no tools in adjoining pots)	mm	φ110 (dia.4.33")	φ200 (dia.7.87")
Max. tool length (from the gauge line)	mm	380 (14.96")	
Max. tool mass (moment)	kg (N·m)	10 (22 lbs) (9.8 (7ft·lbs))	20 (44 lbs) (29.4 (22ft·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 (See Note 2))	
Spindle motor (Short-term rating / Continuous rating) MITSUBISHI	kW	37/22 (50/30HP)	18.5/15 (25/20HP)
Spindle motor FANUC (F31i-B)	kW	37/18.5 (50/25HP)	18.5/15 (25/20HP)
Feed motor MITSUBISHI	kW	X/Y:4.5 (6HP)	Z:4.5 (6HP)
Feed motor FANUC (F31i-B)	kW	X/Y:7.0 (9.4HP)	Z:6.0 (8HP)
Motor for coolant pump	kW	1.1 (1.5HP) (60Hz) / 0.75 (1.01HP) (50Hz)	
Motor for slideway lubrication pump	kW	0.017 (0.02HP)	
Motor for spindle head cooling pump (oil cooler)	kW	1.2 (1.61HP) (compression) / 0.75 (1.01HP) (discharge)	
Motor for spindle oil-air lubrication pump	kW	0.017 (0.023HP) (60Hz) / 0.018 (0.024HP) (50Hz)	
Motor for unclamping the spindle tool / ATC	kW	0.4 (0.54HP)	0.75 (1.01HP)
Motor for turning the magazine	kW	0.2 (0.27HP)	0.4 (0.54HP)
Motors for coil-type chip conveyors	kW	0.2 (0.27HP) × 2	
Power supply (See Note 3) MITSUBISHI	kVA	46	36
Power supply FANUC (F31i-B)	kVA	46	41
Supply voltage and supply frequency	V·Hz	200V±10% 50/60Hz±1Hz 220V±10% 60Hz±1Hz	
Compressed air supply pressure (See Note 4)	MPa	0.4 to 0.6 (58psi to 87psi)	
Compressed air supply flow rate (Atmospheric pressure) (See Notes 3 and 4)	L/min (ANR)	400 (106gal) or more	
Coolant tank capacity (See Notes 3)	L	600 (159gal) or more	
Spindle head cooling oil tank capacity (oil cooler)	L	50 (13gal)	
Spindle oil-air lubrication oil tank capacity	L	2.0 (0.5gal)	
Slideway lubrication oil tank capacity	L	6.0 (1.6gal)	
Machine height (from the floor surface) MITSUBISHI	mm	3130 (123.23")	3185 (125.39")
Machine height FANUC (F31i-B)	mm	3300 (129.92")	
Required floor space (width × depth)		3980×3700	
Machine mass	kg	13000 (28700 lbs)	
Operating environment temperature	℃	5 to 40	
Operating environment humidity	%	10 to 90 (No condensation)	

Note 1: The feed rate under the HQ or Hyper HQ control.
Note 2: ATC shutter specification
Note 3: The value for the standard specification. It may vary with added options.
Note 4: Purity of the supplied air should be equivalent to or higher than the Classes 3, 5 and 4 specified in ISO 8573-1 / JIS B8392-1.
Note: Use the machine in the appropriate environment as the machine installation environment affects accuracies of the machine and the machining.
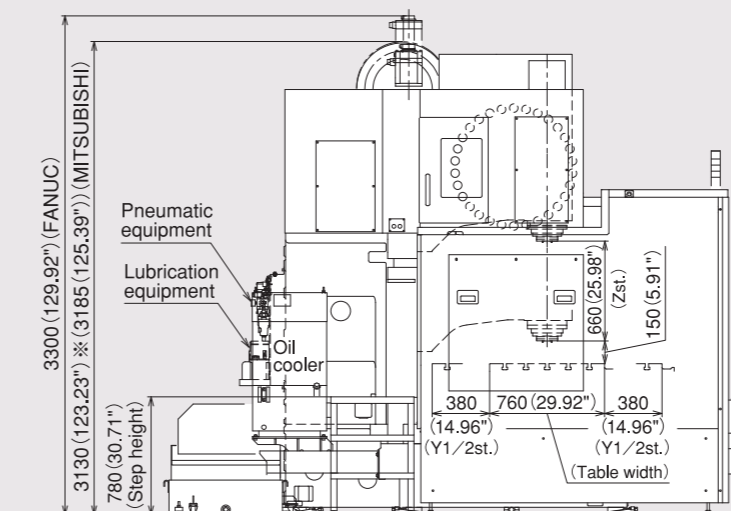
Standard Accessories

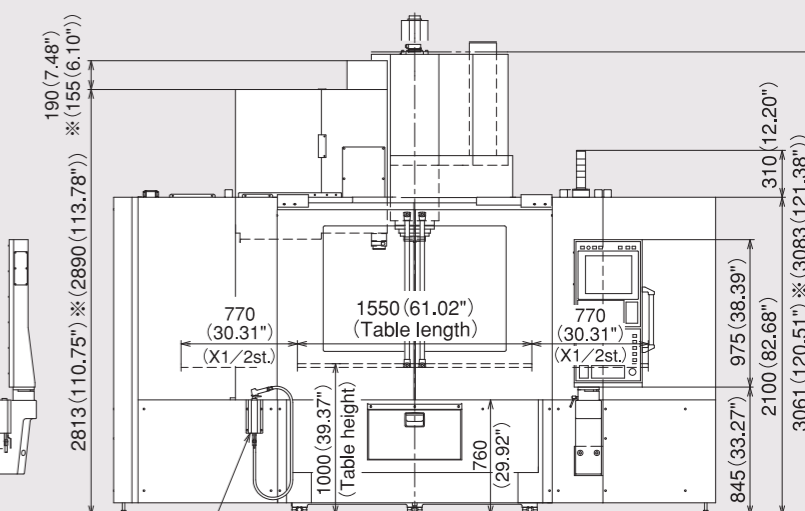| Name	Qty	Remark
Lighting system	1 set	Two LED lamps
Coolant unit (Separately-installed coolant tank)	1 set	Tank capacity :250L (66 gal)
Overall machine cover (Splash guard)	1 set	Including electromagnetic locks on front doors and right and left maintenance covers
Magazine safety cover	1 set	Including electromagnetic lock
Slideway protection steel sliding covers for X, Y and Z axes	1 set	
Spindle head lubricating oil temperature controller	1 set	
Slideway lubrication unit	1 set	
Oil-air unit	1 set	
Rear-discharging coil-type chip conveyor (including the reverse rotation function)	1 set	1 set for each of right and left sides
Oil skimmer	1 set	Screw type
Air blower	1 set	
Signal lamp	1 set	3-lamp type including buzzer alarm
Workpiece cleaning gun	1 set	Shower gun type (normal pressure)
Tool removing device	1 set	Manual operation type
Leveling block	1 set	
Earth leakage breaker	1 set	
Automatic power off (with M02 or M30)	1 set	
Electrical spare parts (fuses)	1 set	
Safety manual and instruction manual for Soft Scale III m/ III	1 set / each	
Instruction manual, Foundation and Installation Instruction Manual, and Standard Specifications	1 set / each	Standard Specifications are not included when Final Specifications are submitted.
Electrical instruction manual	1 set	Including electrical diagrams
Instruction manual for integrated machining support software	1 set	Including the manuals for Program Editor and Tool Support.
Supplementary manual for Manual Guide i	1 set	This manual is not submitted when MITSUBISHI controller is used.
Manual for controller (NC)	1 set	CD-ROM
Programming manual and operating procedures	1 set / each	

Special Accessories

Item	Specification
Type of feeding equipment	Double anchor specification, Ball screw cooling
2000-kg loading capacity of the table	Ball screw dedicated to Y axis, Y-axis static pressure guiding specification, Double anchor specification, Ball screw cooling
Spindle motor	20000min⁻¹ (37/26/22kW) (50/35/30HP) (MITSUBISHI) (No.40-MS) 20000min⁻¹ (37/26/18.5kW) (50/35/25HP) (FANUC) (No.40-MS) 12000min⁻¹ (37/30/26kW) (50/40/35HP) (MITSUBISHI) (No.50-MS) 12000min⁻¹ (30/25kW) (40/34HP) (FANUC) (No.50-MS)
Type of tool shank	CAT40, DIN40 / CAT50, DIN50
Type of pull stud	No.40 : MAS2 (60°) / OKK 90° No.50 : MAS1 (45°) / MAS2 (60°)
Number of storable tools	40 tools, 60 tools (Chain type) (60 tools are available only in the case of No. 50)
Pallet changer	Shuttle-type APC (T-slots / Tapped holes on pallet work surface specification)
Column raise (Column-UP)	250mm (9.84") (Standard for the machine with APC)
Ejection of chips from the machine	Chip flushing with coolant (Sharing with the coil-type chip conveyor is not possible.) / Coil-type chip conveyor is excluded.
Splash guard	Front door automatic opening and closing specification
Automatically opened and closed ATC cover	
Signal lamp	2-lamp type with/without buzzer alarm
Linear scale	X axis, Y axis, Z axis / X axis, Y axis
Compatibility with through-spindle	2-MPa (290psi) coolant / 7-MPa (1015psi) coolant / Air / Preparation for coolant
Coolant cooler	Separate tank specification / Integrated with the high-pressure unit (High-pressure unit needs to be selected separately.)
Oil mist blowe	
Minimal quantity coolant supply system	
Spindle-nose swirl stopper block	For high-power spindle / For angle attachment
Compatibility with oil hole holder	
Mist collector	Installed separately / Installation of the supplied equipment
Lift-up type chip conveyo	Hinged type / Scraper type / Scraper type with floor magnet / Backwashing filtration type for aluminum / Backwashing filtration type for aluminum and casting Chip discharge from left / right side
Spare Thickener bag filter	6 pieces (1 set)
Chip bucket	Fixed chip bucket / Tilting chip bucket
Change of operation panel	Pendant type / Movable console type
3-axis manual pulse generator	Stand type / Handy type
Foundation parts	For bond anchoring method
Bond for foundation work	HILTI
Change in machine coating color	Color specified by customer
Standard tool set	Including a tool box
NC rotary table	
Electrical indexing table (Rotary table with controller)	
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

Side View

Pneumatic equipment
Lubrication equipment
Oil cooler

3300 (129.92") (FANUC)
3130 (123.23") ※ (3185 (125.39")) (MITSUBISHI)
780 (30.71") (Step height)
660 (25.98")
150 (5.91")

Front View

190 (7.48") ※ (155 (6.10"))
2813 (110.75") ※ (2890 (113.78"))
310 (12.20")
3061 (120.51") ※ (3083 (121.38"))
845 (33.27")
975 (38.39")
2100 (82.68")
1000 (39.37") (Table height)
760 (29.92")
770 (30.31") (X1 / 2st.)
1550 (61.02") (Table length)
770 (30.31") (X1 / 2st.)
380 (14.96") (Y1 / 2st.)
760 (29.92") (Table width)
380 (14.96") (Y1 / 2st.)

Workpiece cleaning gun

Note: Asterisked dimension changes with the machine specification.
※ : No.50

Floor Space

Maintenance area
Oil skimmer
Direction of chip discharge
Control panel
Steps
Front steps

1400 (55.12")
1640 (64.57")
1175 (46.26")
35 (1.38")
546 (21.50")
500 (19.69")
750 (29.53")
590 (23.23")
350 (13.78")
915 (36.02")
596 (23.46")
900 (35.43")
835 (32.87")
3154 (124.17")
3700 (145.67")
4800 (188.98")
2035 (80.12")
2254 (88.74")
1200 (47.24")
1171 (46.10")
240 (9.45")
600 (23.62")
252 (9.92")
608 (23.94")
1570 (61.81") (Opening width)
1990 (78.35")
1990 (78.35")
3980 (156.69")

Table Dimensions

1550 (61.02")
1540 (60.63") X-axis stroke
100 (3.94")
760 (29.92") (Y-axis stroke)
140, 140, 140 (5.51") (5.51") (5.51")
760 (29.92")
Operator side
Spindle center travel range
100 (3.94")
80 (3.15")

T-slot dimention

22 (0.87")
H8
24 (0.94")
16 (0.63")
37 (1.46")

N830（Windows 8-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:±99999.999mm / ±9999.9999"
Inch / Metric conversion: G20 / G21
Program format: Meldas standard format （M2 / M0 format needs to be instructed separately.）
Decimal point input Ⅰ/Ⅱ
Absolute / Incremental programming: G90 / G91
Program code: ISO / EIA automatic discrimination
Least control increment: 1nm
Positioning: G00
Linear interpolation: G01
Circular interpolation: G02/G03（Including radius designation）
Unidirectional positioning
Helical interpolation
Cutting feed rate: 5.3-digit F-code, direct designation
One digit F-code feed
Rapid traverse override: 0 / 1 / 10 / 25 / 50 / 100%
Cutting feed rate override: 0 to 200%（every 10%）
Feed rate override cancel: M49 / M48（cancel）
Rigid tap cycle: G74, G84
Manual handle feed: Least input increment ×1, ×10, ×100 / graduation
Dwell: G04
Part program storage capacity: 1280m［500KB］
No. of registered programs: 1000
Part program editing
Background editing: Possible to program or edit the machining program while NC machining is executed.
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 guidance
Alarm guidance
Ethernet interface
SD card / USB memory interface
Operation inside display unit with high-speed program server
Operation with SD card / USB memory
Spindle function: Direct designation of spindle speed with 5-digit S-code
Spindle speed override: 50 to 150%（every 5%）
Tool function: Direct designation of called tool number with 4-digit T-code
ATC tool registration
Miscellaneous function: Designation with 3-digit M-code
Multiple M-codes in 1 block: Maximum 3 codes in 1 block（Maximum 20 settings）
Tool length offset: G43, G44, G49（cancel）
Tool position offset: G45 to G48
Cutter compensation: G38 to G42
Tool offset sets: 200 sets
Tool offset memoryⅡ: tool geometry（length/diameter）and wear offset
Machine coordinate system: G53
Coordinate system setting: G92
Automatic coordinate system setting
Workpiece coordinate system: G54 to G59
Local coordinate system: G52
Manual reference position return

Automatic reference position return
2nd to 4th reference position return: G30 P2 to P4
Reference position return check: G27
Optional block skip: / n（n:1 to 9）
Single block
Dry run
Machine lock
Z-axis feed cancel
Miscellaneous function lock
3D solid program check
Graphic display check
Program number search
Sequence number search
Sequence number comparison and stop
Program restart function
Cycle start
Feed hold
Manual absolute（ON / OFF with PLC parameter）
Auto restart
Program stop: M00
Optional stop: M01
Machining time computation
Automatic operation handle interruption
Manual numerical command
Sub program control: M98, M99
Canned cycle: G73, G74, G76, G81 to G89, G80（cancel）
Linear angle designation
Circular cutting: G12, G13
Parameter mirror image
Programmable mirror image: G51.1, G50.1（cancel）
User macro and user macro interruption
Variable command: total 700 sets
Programmable coordinate system rotation: G68, G69（cancel）
Parameter coordinate system rotation
Corner chamfering / corner R: Insert between straight line-straight line / straight line-circle blocks
Programmable data input: G10 / G11（cancel）
Automatic corner override
Exact stop check / mode
Playback
Memory pitch error compensation
Backlash compensation
Skip function: G31
Manual tool length measurement
Tool life managementⅡ: 200 sets
External search
Emergency stop
Data protection key
NC alarm display
Machine alarm message
Stored stroke limitⅠ/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
Simultaneously controlled axes: 5 axes Note
Least input increment: 0.0001mm / 0.00001"

Program format: M2 / M0 format
Spiral / Conical interpolation
Cylindrical interpolation
Hypothetical axis interpolation
NURBS interpolation（Hyper HQ control modeⅡ is required）
Handle feed 3 axes: Standard pulse handle is removed
Inverse time feed
Part program storage capacity: 2560m［1Mbyte］（No.of registered programs: 1000）
Part program storage capacity: 5120m［2Mbyte］（No.of registered programs: 1000）
Color touch-panel display（19" LCD / Software key MDI）
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（total 96）: G54.1 P1 to G54.1 P96
Addition of workpiece coordinate system（total 300）: G54.1 P1 to G54.1 P300
Tool retract and return
Scaling: G51, G50（cancel）
Pattern rotation
Chopping function
Special canned cycles: G34, G35, G36, G37
Additional tool life management sets: total 400 sets
Additional tool life management sets: total 999 sets

Original Nidec OKK Software

	VM43RⅡ	VM53RⅡ	VM76RⅡ
Integrated machining support system	STD	STD	STD
Tool support	STD	STD	STD
Program Editor	STD	STD	STD
EasyPRO	STD	STD	STD
Work Manager	Opt	Opt	Opt
HQ control	STD	STD	STD
Hyper HQ control modeⅠ	Opt	Opt	Opt
Hyper HQ control modeⅡ	Opt	Opt	Opt
Soft ScaleⅢ	STD	STD	STD
Cube environmental thermal displacement correction	STD	STD	STD
WinGMC8（including the option H）	STD	STD	STD
Cycle Mate	Opt	Opt	Opt
Touch sensor T0 software	Opt	Opt	Opt
Soft CCM（Cutting failure monitoring）	Opt	Opt	Opt
Soft AC（Adaptive control）	Opt	Opt	Opt
Automatic restart at the time of tool breakage	Opt	Opt	Opt

STD：Standard　Opt：Option

F31i-B Plus（WindowsCE-installed Open CNC）, OKK-FANUC Ai

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		
FS15 tape format	—	
Nano interpolation（internal）		
Positioning: G00		
Linear interpolation: G01		
Circular interpolation: G02 / G03（CW/CCW） （Including radius designation）		
Helical interpolation		
Unidirectional positioning: G60		
Cutting feed rate: 6.3-digit F-code, direct designation		
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）		
Manual handle feed:Least input increment ×1, ×10, ×100 / graduation		
Dwell: G04		
One-digit F code feed		
inverse time feed		
Part program storage capacity: total 1280m［512KB］（total 400 programs）	—	
Part program storage capacity:total 10240m ［4MB］（total 1000 programs）	—	
Part program editing		
Background editing: Possible to program or edit the machining program while NC machining is executed.		
Extended part program editing		
10.4-inch color LCD/MDI	—	
15-inch color LCD/QWERTY key MDI	—	
Clock function		
MDI（manual data input）operation		
Run hour and parts count display		
Memory card/USB interface		
Spindle function: Direct designation of spindle speed with 5-digit S-code		
Spindle speed override: 50 to 150%（every 5%）		
Tool function: Direct designation of called tool number with 4-digit T-code		
ATC tool registration		
Auxiliary function: Designation with 3-digit M-code		
Multiple M-codes in 1 block: Maximum 3 codes in 1 block（Maximum 20 settings）		
Tool length offset: G43, G44 / G49		
Tool diameter and cutting edge R compensation: G41, G42 / G40		
Tool offset sets: total 400 sets		
Tool offset memory C		
Tool position offset		
Automatic reference position return: G28 / G29		
2nd reference position return: G30		
Machine coordinate system: G53		
Coordinate system setting: G92		
Automatic coordinate system setting		

Standard Specification	F31i	FAi
Workpiece coordinate system: G54 to G59 G54.1 P1 ～ P48		
Local coordinate system: G52		
Polar coordinate command: G15,G16	—	
Manual reference position return		
Reference position return check: G27		
Optional block skip:/		
Single block		
Dry run		
Machine lock		
Z-axis feed cancel		
Auxiliary function lock		
Graphic function		
Program number search		
Sequence number search		
Program restart		
Cycle start		
Feed hold		
Manual absolute（ON/OFF with PMC parameter）		
Auto restart		
Program stop: M00		
Optional stop: M01		
Sequence number collation and stop		
Sub program control		
Canned cycle: G73, G74, G76, G80 to G89		
Mirror image function parameter		
Custom macro		
Interactive graphic input	—	
Programmable mirror image		
Programmable data input: G10		
Automatic corner override		
Manual Guide i（Basic）		
Exact stop check / mode		
Scaling: G50, G51		
Additional custom macro common variables: 600	—	
Additional custom macro common variables: 1000	—	
Coordinate system rotation: G68, G69		
Optional chamfering / corner R		
Playback	—	
Interpolation type pitch error compensation		
Backlash compensation for each rapid traverse and cutting feed		
Smooth backlash	—	
Skip function		
Tool life management: total 128 sets	—	
Tool life management: total 256 sets	—	
Tool length manual measurement		
Data protection key		
NC alarm display / alarm history display		
Machine alarm display		
Stored stroke check 1		
Stored stroke check 2		
Load monitor		
Self-diagnosis		
Absolute position detection		

Optional Specification	F31i	FAi
Additional one axis control: name of axis（A, B, C, U, V, W）Note1		
Additional two axes control: name of axis（A, B, C, U, V, W）Note2	—	
No. of simultaneously controlled axes: 4 axes	—	
No. of simultaneously controlled axes: 5 axes Note2	—	

Optional Specification	F31i	FAi
Least input increment: 0.0001mm / 0.00001"		
FS10 / F11 tape format	—	
Spiral / Conical interpolation		—
Cylindrical interpolation		STD
Hypothetical axis interpolation		—
Involute interpolation		—
NURBS interpolation		—
Smooth interpolation （Hyper HQ control B mode is required）		—
Handle feed 3 axes: Standard pulse handle is removed		
Part program storage capacity: total 5120m [2MB]（400 in total）		—
Part program storage capacity: total 20480m [8MB]（1000 in total）		—
Machining time stamp		
Data server: ATA card（1GB）		
Data server: ATA card（4GB）		—
RS232C interface: RS232C-1CH		
Spindle contour control（Cs contour control）		
Tool position offset		—
Tool offset sets: total 499 sets		—
Tool offset sets: total 999 sets		—
Addition of workpiece coordinate system （total 300 sets）: G54.1 P1 to P300		
Optional block skip: Total 9		STD
Manual handle interruption		STD
Tool retract and return		—
Figure copy		—
Interruption type custom macro		STD
Instruction of inclined plane indexing		—
Chopping		
Manual Guide i（Milling cycle）		
Addition of tool life management sets: total 1024 sets		—
High-speed skip		

Original Nidec OKK Software

	F31i	FAi
Integrated machining support software （incl. help guidance, etc.）	STD	—
Tool support	STD	—
Program Editor	STD	—
EasyPRO	STD	—
Work Manager	Opt	—
HQ control	STD	STD
Hyper HQ control mode A	Opt	Opt
Hyper HQ control mode B	Opt	—
Hyper HQ varue kit Note3	Opt	—
Special canned cycle（including circular cutting）	Opt	Opt
Cycle Mate F	Opt	Opt
Soft ScaleⅡm	—	STD
Soft ScaleⅢ	STD	—
Cube environmental thermal displacement correction	STD	—
Touch sensor T0 software	Opt	Opt
Soft CCM（Tool failure detection system）	Opt	Opt
Soft AC（Adaptive control unit）	Opt	Opt
Automatic restart at tool damage	Opt	Opt

STD：Standard　Opt：Option
Note 1: FAi enables indexing only.
Note 2: The controller F31i-B5 Plus（Windows CE-installed Open CNC）
　　　　is used when five axes are controlled simultaneously.
Note 3: The hyper HQ value kit is accompanied by the "data
　　　　server: ATA card（1GB）" and the hyper HQ control Mode B.
Note 4: The controller FAi is compatible only with VM43RⅡ.

Note: The controller N850（Windows 8-installed Open CNC）
　　　is used when five axes are controlled simultaneously.