![Nidec — All for dreams logo]

5-axis Control Vertical Machining Center

VC-X SERIES

VC-X350
VC-X350L
VC-X500
VC-X500L

NIDEC OKK CORPORATION

Effective for Highly-efficient Intensive machining of Dies and Parts that are more Complex or more Detailed and Complicated

This specialized 5-axis machining center has been developed from OKK's advanced technologies. This machine eliminates loss of accuracy and burden on the operators caused by multi-setup operation and shortens lead time under process integration.

VC-X350

VC-X500

Machine picture includes optional accessories.

Specifications — VC-X350

Travel distance
（X×Y×Z）
600×430×460mm (23.62"×16.93"×18.11")

（A×C）
-120°〜+30°×360°

Table size
φ350mm (φ13.78")

Number of stored tools
20tools

Specifications — VC-X500

Travel distance
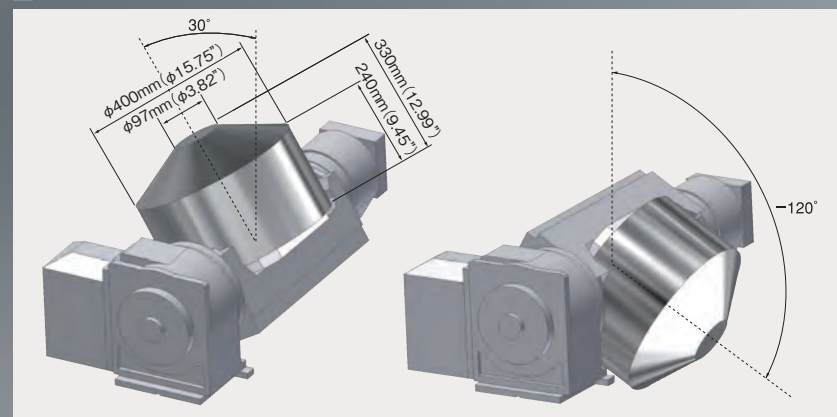（X×Y×Z）
700×850×610mm (27.56"×33.46"×24.02")

（A×C）
-120°〜+30°×360°

Table size
500×500mm (19.69"×19.69")

Number of stored tools
40tools
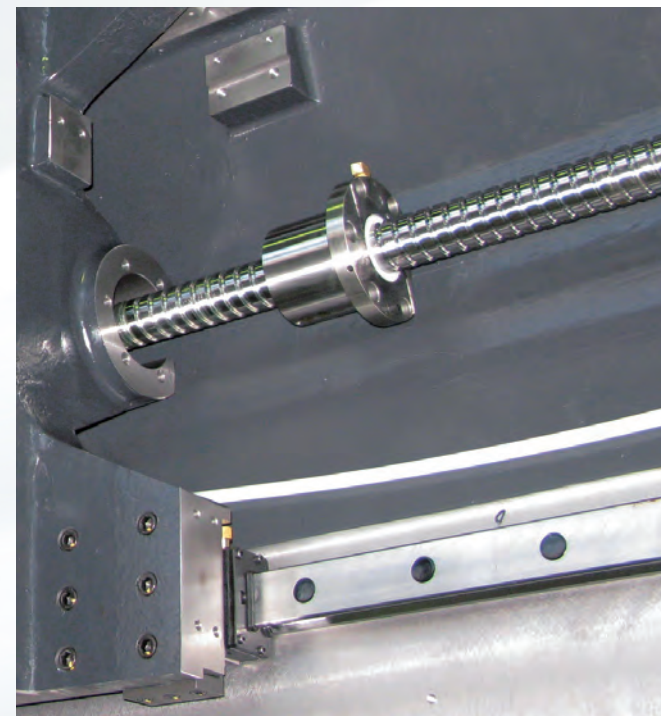
VC-X350

Compact machine with powerfully smooth feed

Powerfully Smooth Feed

Utilizing the larger than normal linear roller guides has doubled the guide-way rigidity.
The high-rigidity guide combined with the large-diameter ball screws contributes to a vast improvement in cutting performance.

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.

Environment-friendly eco design

Extending the maintenance period
Maintenance is extended to a long period by the using self-lubricated sealed ball screws and roller guides which also do not contribute any contaminating oil.
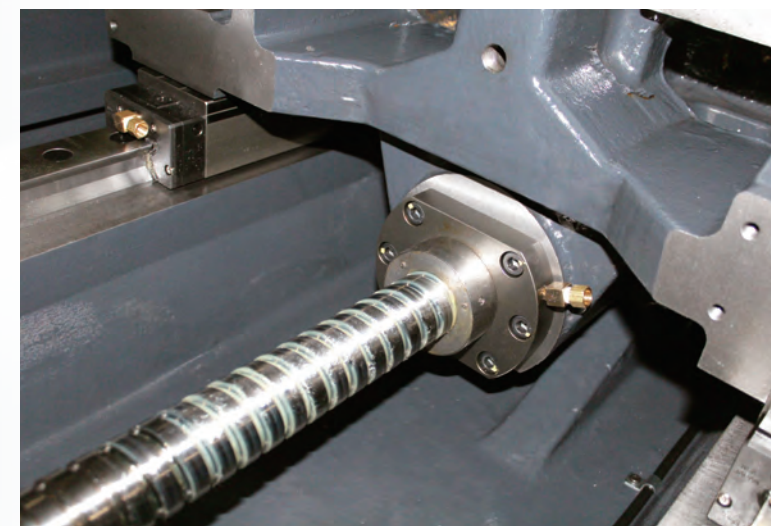
ECO sleep function
If the machine stands by for the period exceeding the specified time period, the machine's present mode is switched to a power-saving mode to reduce wasteful consumption of power, air and so on. When the power-saving mode is active, the equipment such as servos and chip conveyors are turned off. It is cancelled automatically when the setup operation is completed i.e. when the doors are closed.

LED light [Option]
LED light is used to reduce heat generated by the lighting system and contribute to power saving.
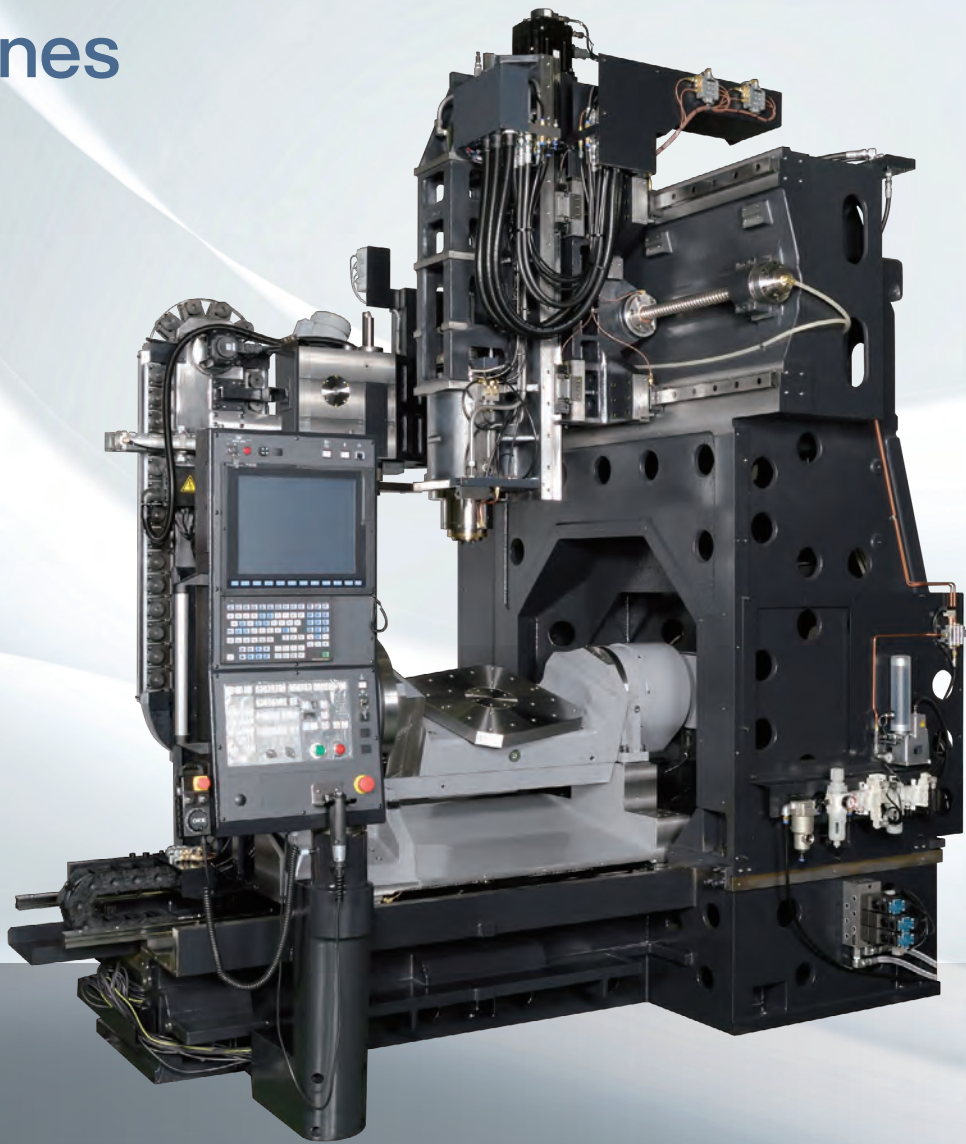
Provision of inverter-controlled hydraulic unit [Option]
An optional inverter-controlled hydraulic unit can be provided for the 5-axis table and tool clamp/unclamp mechanism which will reduce power consumption during non-operation.
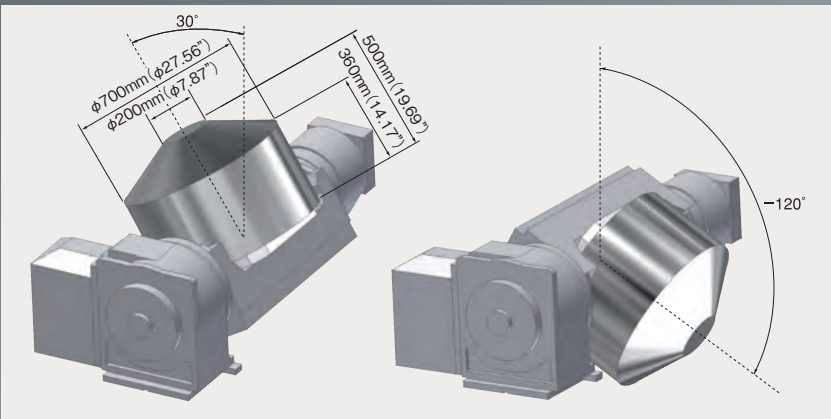
■Maximum dimensions loadable on table

30°
φ400mm(φ15.75")
φ97mm(φ3.82")
330mm(12.99")
240mm(9.45")
−120°

VC-X500

Highest-level space saving and loadable workpieces size among the same-class machines

Improved accessibility

Distance of front cover to spindle center	120mm (4.72")
Distance of front cover to table center	620mm (24.41")

120mm (4.72")
620mm (24.41")

Tool magazine

Standard specification is the 40-tool storage magazine. The required floor space is not increased when choosing the optional 60-, 80- or 120-tool magazines.

40-tool magazine

60-tool magazine

■ Maximum dimensions loadable on table

30°
Φ700mm (Φ27.56")
Φ200mm (Φ7.87")
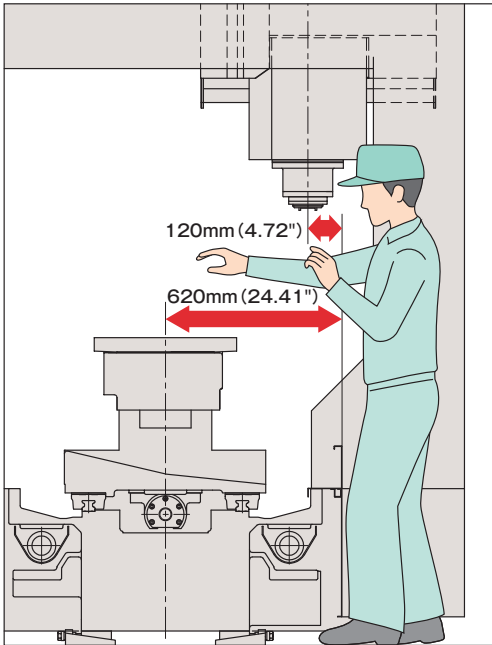500mm (19.69")
380mm (14.17")
−120°

Large workpieces can be handle even though the required floor space is as small as 3300×2450mm (129.92"×96.46"). (60% up graded workpieces size compare with our company's VP600-5AX)

VC-X350L VC-X500L

Equipped with Direct-Drive rotary table!
Next-generation 5-axis machine that enables turning!

Equipped with turning function

The maximum spindle speed of 1000 min⁻¹ has been realized for the C-axis and hydraulic disc clamp method is employed for the main spindle, which enables stable turning.
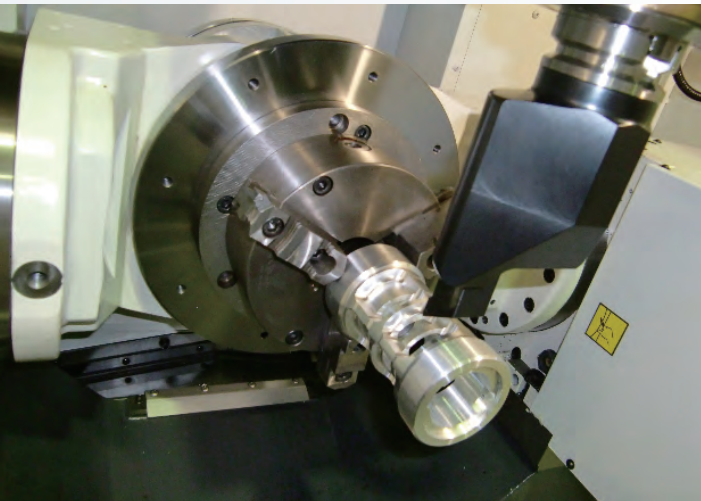
Combined with the main unit performance of the base machine, the Direct-Drive rotary table and unique clamp mechanism of the main spindle produce sufficient turning performance in terms of accuracy and rigidity.

Rotary table exclusive to VC-X350L, VC-X500L

The 1500 N·m (1106 ft·lbs) hydraulic clamp on the inclined axis (A-axis) and the 500 N·m (369 ft·lbs) air clamp on the rotational axis (C-axis) provide high-accuracy 5-axis machining allowing complex part geometries to be machined in a single operation.
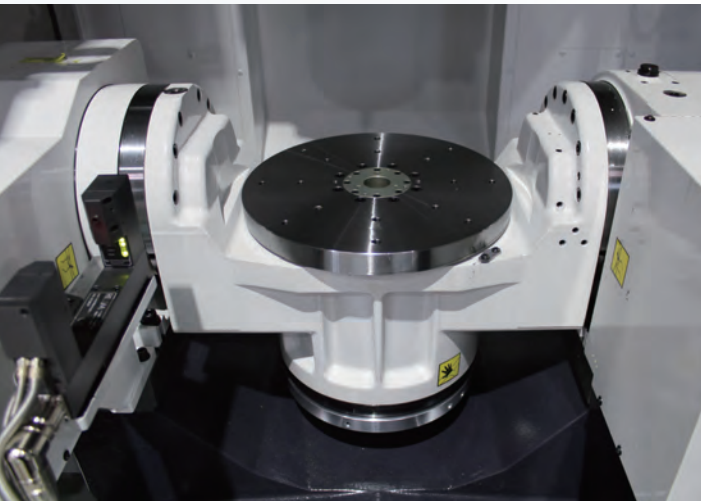
The standard specification includes three ports for supplying hydraulic/pneumatic pressure. They allow preparing for the jig by just adding valves and hoses.
We can increase flexibility of your choice by adding the Automatic Workpiece Changers made by the companies such as System 3R International and EROWA so that we meet users' requirements regarding workpiece sizes, the number of pallets, etc.

The self-lubricating ball screws and roller guide make the machine maintenance free for a long period of time and free from oil contamination.

Specifications — VC-X350L

Rapid speed
(X×Y×Z)
50×50×36m/min (1969×1969×1417ipm)
(A×C)
44.4×100min⁻¹
in the turning function mode
C-axis:1000min⁻¹
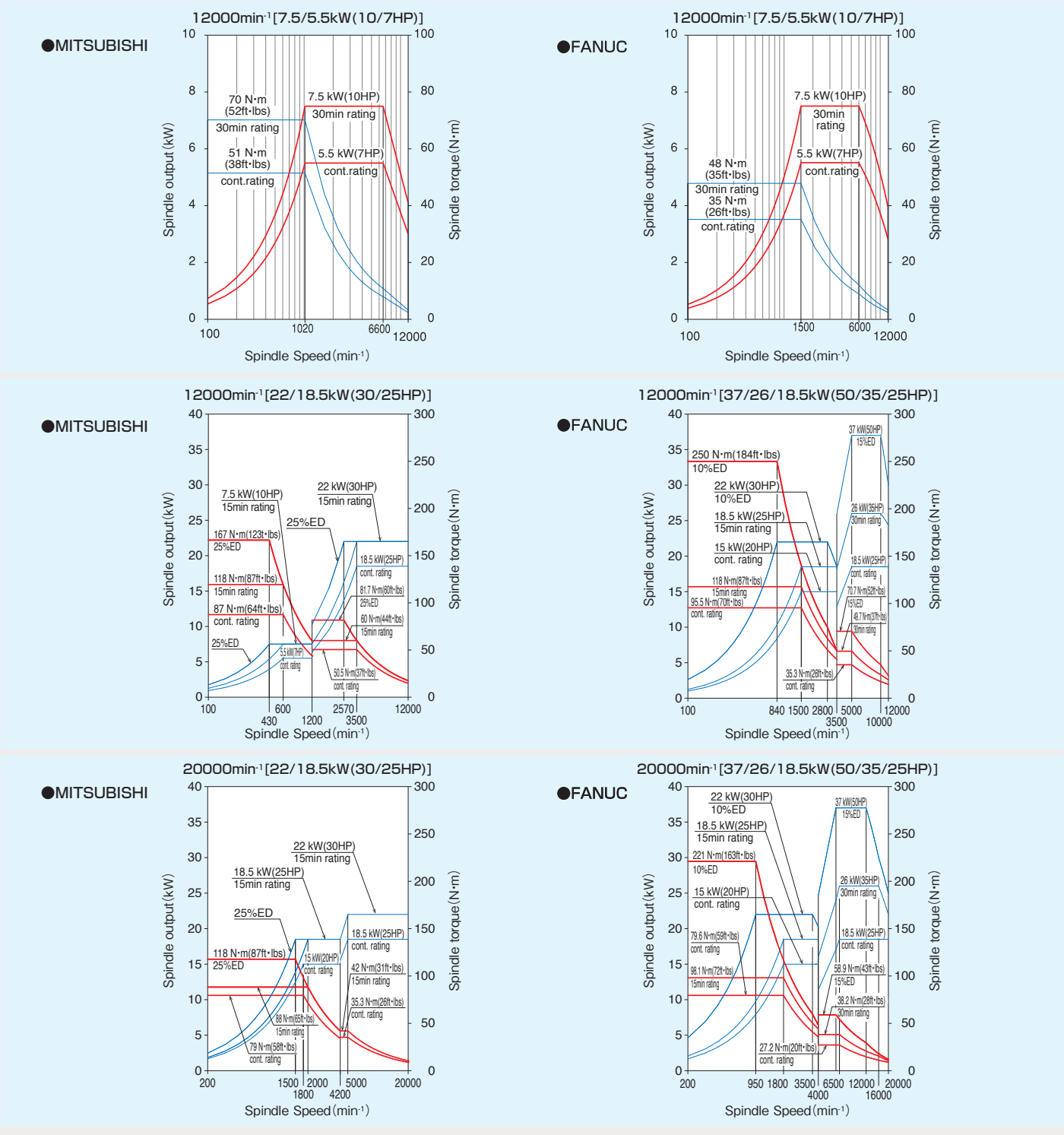Tool shank (nominal number)
BT40 Dual contact tool

Specifications — VC-X500L

Rapid speed
(X×Y×Z)
48×48×32m/min (1890×1890×1260ipm)
(A×C)
25×100min⁻¹
in the turning function mode
C-axis:1000min⁻¹
Tool shank (nominal number)
BT40 Dual contact tool

Standard NC functions for VC-X350L, VC-X500L

- Constant surface speed control
- Multi spindle control
- Turning G code system B/C
- Multiple repetitive cycles
- Tool geometry/wear compensation
- Tool offset for Milling and Turning function
- Turning/Machining G code system switching function

Spindle output and Torque diagram

12000min⁻¹ [7.5/5.5kW(10/7HP)]

●MITSUBISHI

- 70 N·m (52ft·lbs) 30min rating
- 51 N·m (38ft·lbs) cont.rating
- 7.5 kW(10HP) 30min rating
- 5.5 kW(7HP) cont.rating

Spindle output (kW) / Spindle torque (N·m) / Spindle Speed (min⁻¹)

12000min⁻¹ [7.5/5.5kW(10/7HP)]

●FANUC

- 48 N·m (35ft·lbs) 30min rating
- 35 N·m (26ft·lbs) cont.rating
- 7.5 kW(10HP) 30min rating
- 5.5 kW(7HP) cont.rating

12000min⁻¹ [22/18.5kW(30/25HP)]

●MITSUBISHI

12000min⁻¹ [37/26/18.5kW(50/35/25HP)]

●FANUC

20000min⁻¹ [22/18.5kW(30/25HP)]

●MITSUBISHI

20000min⁻¹ [37/26/18.5kW(50/35/25HP)]

●FANUC

		12000min⁻¹	12000min⁻¹	20000min⁻¹
VC-X350	MITSUBISHI	Standard: 7.5/5.5kW (10/7HP)	Option: 22/18.5kW(30/25HP)	Option: 22/18.5kW(30/25HP)
	FANUC	Standard: 7.5/5.5kW (10/7HP)	Option: 37/26/18.5kW(50/35/25HP)	Option: 37/26/18.5kW(50/35/25HP)
VC-X350L	FANUC	Standard: 7.5/5.5kW (10/7HP)	Option: 37/26/18.5kW(50/35/25HP)	Option: 37/26/18.5kW(50/35/25HP)
VC-X500	MITSUBISHI	—	Standard: 22/18.5kW(30/25HP)	Option: 22/18.5kW(30/25HP)
	FANUC	—	Standard: 37/26/18.5kW(50/35/25HP)	Option: 37/26/18.5kW(50/35/25HP)
VC-X500L	FANUC	—	Standard: 37/26/18.5kW(50/35/25HP)	Option: 37/26/18.5kW(50/35/25HP)

Standard provision of 12000min⁻¹ spindle

Cutting performance is largely improved by the use of the motorized spindle (MS) which integrates a motor covering a wide and high output range. Acceleration time of the spindle can be as short as only 1.5 seconds from the non-operating state to the speed of 12000min⁻¹. 22/18.5kW (30/25HP) high-power spindle or high-speed spindle of 20000min⁻¹ can also be adopted optionally.


Stator
Cooling oil
Rotor
Grease lubrication for bearings
Radiation cooling system
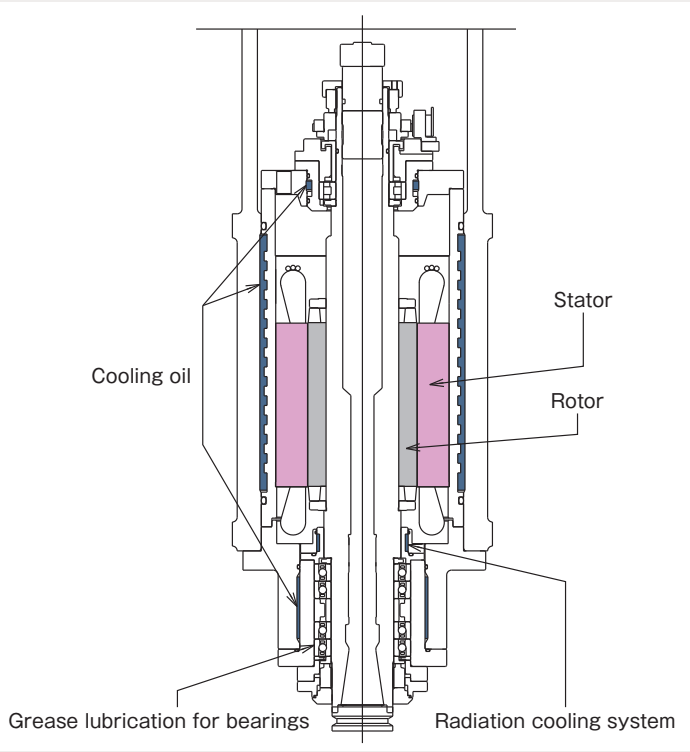
Accuracy

■Positioning accuracy (when Linear scale is not used) mm(inch)

Positioning accuracy	X,Y,Z : ±0.0020 (±0.00008") /full length
Positioning repeatability	X,Y,Z : ±0.0010 (±0.00004") /full length

(OKK tolerance)

■Positioning accuracy (when Linear scale is used) mm(inch)

Positioning accuracy	X,Y,Z : ±0.0010 (±0.00004") /full length
Positioning repeatability	X,Y,Z : ±0.0005 (±0.00002") /full length

(OKK tolerance)

■Positioning accuracy (when Rotary encoder is not used) mm(inch)

Positioning accuracy	C-axis : ±10sec

(OKK tolerance)

■Positioning accuracy (when Rotary encoder is used) mm(inch)

Positioning accuracy	A-axis : ±5sec C-axis : ±3sec

(OKK tolerance)
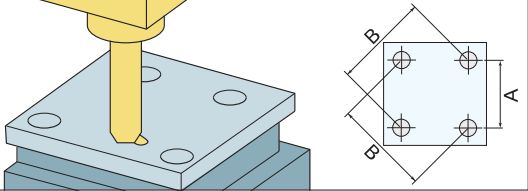
A=150(5.91"), B=212.132(8.35")

■Positioning machining accuracy mm(inch)

Item	OKK tolerance	Example record	
		VC-X350	VC-X500
Axial direction	0.015(0.00059")	0.003(0.00012")	0.003(0.00012")
Diagonal direction	0.015(0.00059")	0.005(0.00020")	0.005(0.00020")
Difference in diameter	0.010(0.00039")	0.005(0.00020")	0.005(0.00020")

■Circular machining accuracy mm(inch)

| Item	OKK tolerance	Example record	
		VC-X350	VC-X500
Circularity	0.005(0.00020")	0.0042(0.00017")	0.0042(0.00017")
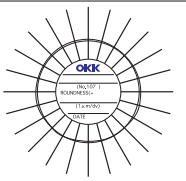
Remarks

※1 : The above sample data shows a short-time machining example and the results of continuous machining may differ from them.
※2 : The above sample data shows the accuracy under OKK's in-house cutting test conditions. The results may vary with the conditions of the cutting tools and fixtures.
※3 : The accuracy shown above are values obtained based on OKK's inspection standards under the conditions that the machine is installed according to OKK's foundation drawing and the ambient temperature remains constant.

Dual contact tool BT type

VC-X350 : Option VC-X350L, VC-X500, VC-X500L : Standard

Improvements in rigidity of tools have been chieved by contact faces of spindle-nose and tool holders flange. This has a great effect not only for heavy load machining but also high speed machining.
(The performance is different due to the cutting tools and cutting conditions.)
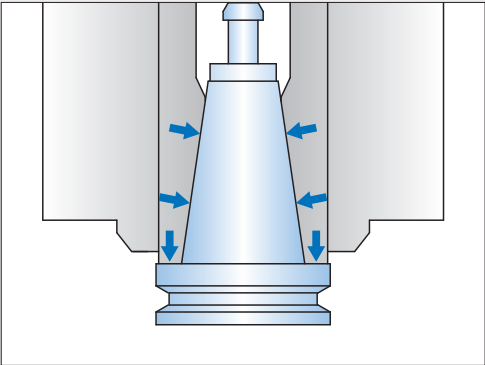
LED light

VC-X350, VC-X350L, VC-X500, VC-X500L : Standard

LED light is used to reduce heat generated by the lighting system and contribute to power saving.

Core chilled ball screw and Double-anchor pre-tension system

VC-X350, VC-X350L : Option VC-X500, VC-X500L : Standard

Lubricating oil temperature controller

Nut

Nut

Cooling oil

Ball screw

Servo motor

The X, Y and Z-axes use core chilled ball screws. This suppresses thermal displacement and helps maintain high accuracy for many hours of operation by circulating the temperature-controlled oil.
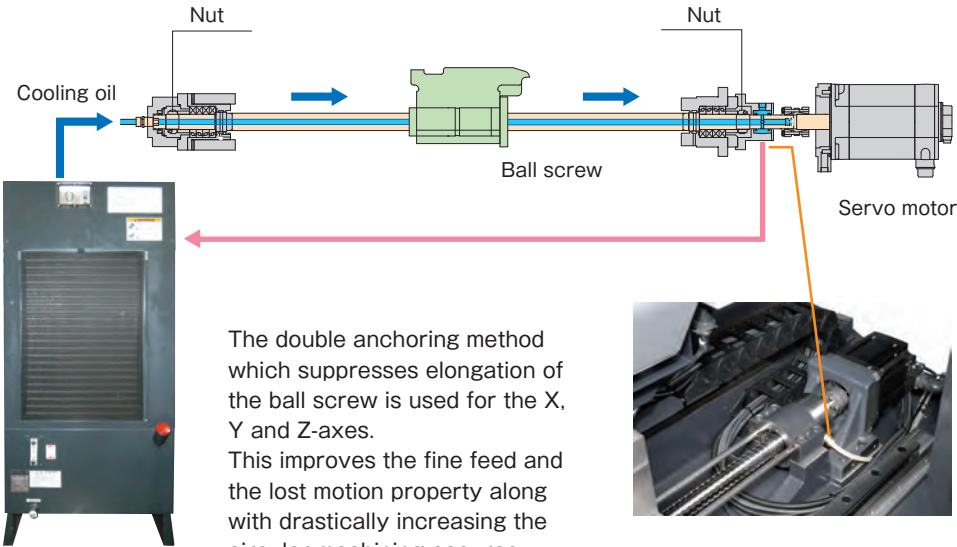
The double anchoring method which suppresses elongation of the ball screw is used for the X, Y and Z-axes.
This improves the fine feed and the lost motion property along with drastically increasing the circular machining accuracy.

Improved reliability and Operating efficiency

Maintenance

Daily-inspected equipment are installed together in one place to improve the operating efficiency.

Photo is VC-X500.

Coil-type chip conveyors（Standard）

Thorough chip processing measures

Standard machine has two coil-type chip conveyors. (VC-X350, VC-X350L and VC-X500) The coil-type chip conveyors are capable of removing a large amount of chips from the machine promptly.
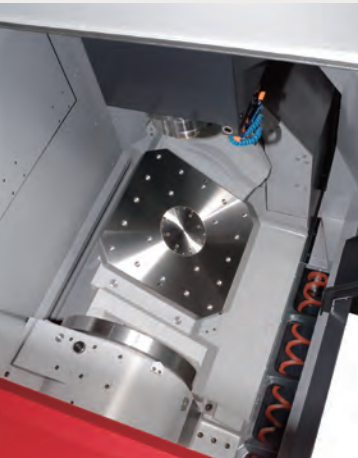
Photo is VC-X500.

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

※1 Minute chips can enter the conveyor casing through a gap between hinged plates. Therefore, cleaning inside the conveyor frequently is needed.

※2 Long chips can easily be caught by a scraper. Therefore, measures for shortening the chips such as the step feed and removing the caught chips are needed.

※3 If the coolant flow rate is large, chips can flow out of the conveyor casing and cause clogging of filters. Therefore, combined use of a magnet plate is recommended.

※4 If the coolant flow rate is large, chips can flow out of the conveyor casing and cause clogging of filters. Therefore, cleaning filters frequently is needed.

※5 Long chips can easily be caught by a scraper. Therefore, removing them regularly is needed. Drum filters are damaged if they are not removed.

Photo is Hinge type（Option）.
Chip bucket is another option.
There are fixed type and swivel type.
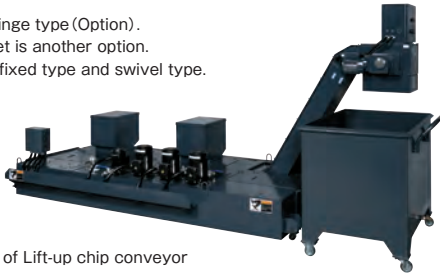
※Example of Lift-up chip conveyor

Sample workpieces

5-axis support technologies

5-axis Control Function

Tool center point control (Standard)

Conventional movement

This function's movement
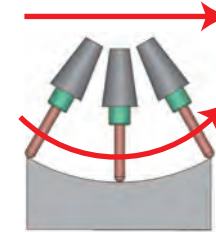
Produces errors due to movement of rotation axis
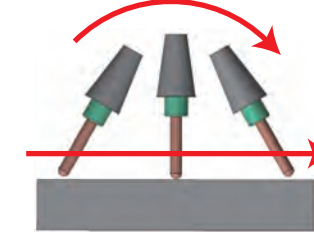
Loci of the tool tip as instructed

Tool Center Point Control simplifies 5-axis machining by controlling tool movement at the tool center, even if the tool axis direction changes. Tool tip speed is maintained and high-quality surfacing achieved.

5-axis indexing function

Inclined surface indexing (machining) command (Option)

The inclined surface indexing (machining) commands allow easy setting the surface to be machined by using the newly defined coordinate system (feature coordinate system).
It enables the simple creation of the machining programs similar to the programming for the normal 3-axis machining centers.

Original coordinate system

Feature coordinate system
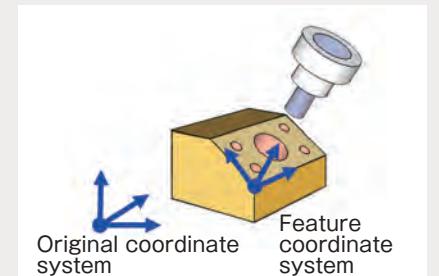
5-axis processing software MULTI-FACERⅡ (Standard)

When indexing the planes to be processed on 5-axis machining centers, it may take time for setting the workpiece origins. Those workpiece origins can be set with ease by using MULTI-FACERⅡ that enables creating index programs easily without using calculators.
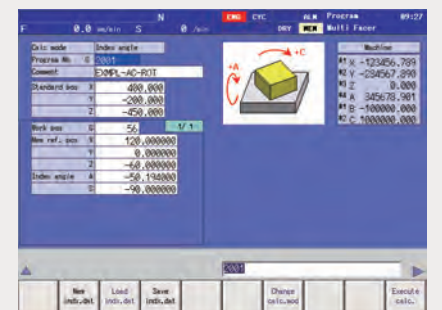
A⁵ system (Option)

In the machining with the 5-axis machining center, the geometric errors (rotation axis's inclination and displacement) influence the machining accuracy largely.
This function automatically measures and corrects the geometric errors with the touch sensor.
It makes the high-accuracy 5-axis indexing and the high quality simultaneous 5-axis machining even better.
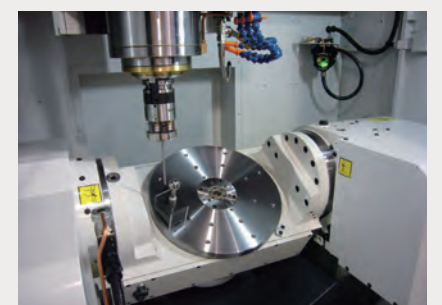
VC-X350 VC-X350L

SPECIFICATIONS

■ Main Specifications

Item		Unit	Specification	
			VC-X350	VC-X350L
Travel	Travel on X axis (Spindle head right / left)	mm	600 (23.62")	
	Travel on Y axis (Table back / forth)	mm	430 (16.93")	
	Travel on Z axis (Spindle head up / down)	mm	460 (18.11")	
	Travel on A axis (Table tilting)	deg	-120~+30	
	Travel on C axis (Table turning)	deg	360	
	Distance from table top surface to spindle nose	mm	70~530 (2.76"~20.87")	110~570 (4.33"~22.44")
	Distance from column front to spindle center	mm	520 (20.47")	
Table	Table work surface area	mm	ø350 (ø13.78")	
	Max. workpiece weight loadable on table	kg	200 (441 lbs)	100(220 lbs)※1
	Table work surface configuration (nominal screw-hole size × number of holes)		M10×16 holes	
	Distance to the table work surface from the floor	mm	1080 (42.52")	1120 (44.09")
Spindle	Spindle speed	min⁻¹	100~12000	
	Number of spindle speed change steps		Electric stepless speed change(MS)	
	Spindle nose (nominal number)		7/24 taper, No.40	
	Spindle bearing bore diameter	mm	ø65 (ø2.56")	
Feed Rate	Rapid traverse rate — X, Y and Z axes	m/min	XY:50 (1969 ipm) Z:36 (1417 ipm)	
	Rapid traverse rate — A and C axes	min⁻¹	A:44.4 C:66.7	A:44.4 C:100
	Cutting feed rate — X, Y and Z axes	mm/min	1~36000 (0.04~1417 ipm)※2	
	Cutting feed rate — A and C axes	min⁻¹	A:44.4 C:66.7	A:44.4 C:100
	in the turning function mode	min⁻¹	-	C:1000
Automatic Tool Changer	Tool shank (nominal number)		JIS B6339 BT40	BT40 (Dual-contact BT type)
	Pull stud (nominal number)		MAS403 P40T-1	
	Number of stored tools	tool	20	
	Max. tool diameter	mm	ø125 (ø4.92")	
	Max. tool length (from the gauge line)	mm	300 (11.81")	
	Max. tool weight	kg	7 (15 lbs)	
	Tool selection method		Memory random method	
	Tool exchange time (tool-to-tool)	sec	1.3	
	Tool exchange time (cut-to-cut)	sec	4.5※3	
Motors	for Spindle (30-min rating/continuous rating)	kW	7.5/5.5 (10/7 HP)	
	for Feed axes — X, Y and Z axes	kW	MITSUBISHI XY:2(2.7 HP) Z:3.5(4.7 HP)	-
			FANUC XY:3 (4 HP) Z:4 (5.4 HP)	
	for Feed axes — A and C axes	kW	MITSUBISHI A:3.5 (4.7 HP) C:2.2(3 HP)	-
			FANUC A:4.5(6 HP) C:2.7(3.6 HP)	FANUC A:4.5 (6 HP) C:6(8 HP)
Required Power Supply	Power supply	kVA	MITSUBISHI:33 FANUC:32	FANUC:32
	Supply voltage × supply frequency	V×Hz	200±10%×50/60±1	
			220±10%×60±1※4	
	Compressed air supply pressure	MPa	0.5 (73 psi)※5	
	Compressed air supply flow rate	L/min(ANR)	200 (53 gpm)※6	
Tank Capacity	Coolant tank	L	280 (74 gal)	
	Spindle head cooling oil tank	L	50 (13 gal)	
	Hydraulic unit tank	L	20 (5 gal)	
Machine Size and Required Floor Space	Machine height from the floor surface	mm	3070 (120.87")	3150 (124.02")
	Floor space required for operation (width × depth)	mm	1895×3440 (74.61"×135.43")	
	Machine weight	kg	8500 (18700 lbs)	
	Temperature of operation environment	℃	5~40	
	Humidity of operation environment	%	10~90 (No dew)	

※1:Max. inertia is 0.9 kg·m² for turning function.
※2:Under the HQ or Hyper HQ control
※3:Includes thr ATC shutter operating time
※4:When the supply voltage is 220VAC, the supply frequency of 60Hz only is applicable.
※5:Purity of the supplied air should be equivalent to Class 3.5.4 specified in ISO 8573-1 / JIS B8392-1 or higher.
※6:The flow rate for the standard specification machines is specified in the above.
　　When optional specification such as an air blow is added, add the correspnding air supply according to the operating frequency.

■ Standard Accessories

Item	Qty	Remark
Compatibility with Dual contact tool※1	1 set	BT type
Compatibility with turning specification※1	1 set	C axis:1000min⁻¹
Lighting system	1 set	Fluorescent light ×1
Coolant unit (Separate coolant tank)	1 set	Tank capacity:280L (74 gal)
Coil-type chip conveyor	1 set	1 set for each of right and left
Entire machine cover (Splash guard)	1 set	
Slideway protection covers for X and Y axes	1 set	
ATC shutter	1 set	
Spindle head cooling oil temperature controller	1 set	
Hydraulic unit	1 set	
Safty equipment	1 set	Including frontdoor and magazine door electromagnetic lock
Leveling block	1 set	
Parts for machine transfer	1 set	
Automatic power-off unit	1 set	
Rotary encoder	1 set	for A axis (tilting axis) ※2 for A axis (tilting axis) and C axis (turning axis) ※1
Electric spare parts (fuses)	1 set	
Instruction manual	1 set	
Electrical manuals (operation, maintenance, parts list, hardware diagrams)	1 set	

※1:for VC-X350L only
※2:for VC-X350 only

■ Optional Accessories

Item	Specification
Compatibility with Dual contact tool	BT type※1, HSK-A63
Spindle motor	12000min⁻¹ MITSUBISHI 22/18.5kW(30/25HP) FANUC 37/26/18.5kW(50/35/25HP)
	20000min⁻¹ MITSUBISHI 22/18.5kW(30/25HP) FANUC 37/26/18.5kW(50/35/25HP)
Number of stored tools	30tools, 40tools, 60tools, 80tools,
Linear scale feed back※2	XY-axis / XYZ-axis
Rotary encoder※1	for C axis (turning axis)
Lift-up chip conveyor	Hinged type / Scrraper type / Scraper type with floor magnet / Scraper type with dram filter
Flushing chips with coolant	
Compatibility with oil-hole holder	1.1kW(1.5 HP)
Spindle through coolant	2MPa(290 psi) coolant / 7MPa(1015 psi) coolant / with air
Foundation parts	Bond anchoring method
Workpiece flushing equipment	Shower gun type
Oil-mist/air blower	
Air blower	
Signal lamp	Two-lamp type / Three-lamp type (With buzzer / Without buzzer)
Splash guard automatically open / close	Front door
Hydraulic supply ports for fixture	VC-X350:Max.6 ports, VC-X350L:Max.3 ports
Touch sensor system T0	Workpiece measurement, Tool length/ diameter measurement
Touch sensor system T1	Workpiece measurement, Tool length measurement, Tool break detection
Lighting system	Fluorescent light ×2, LED light ×1 / ×2

※1:for VC-X350 only
※2:When the linear scale is added, cleanliness of the supplied air should be equivalent to or higher than the classes 1.5.1 specified in ISO 8573-1 / JIS B8392-1 in order to prevent generating problems.

Main dimensions of the machine

[ ] : VC-X350L dimensions

Front view
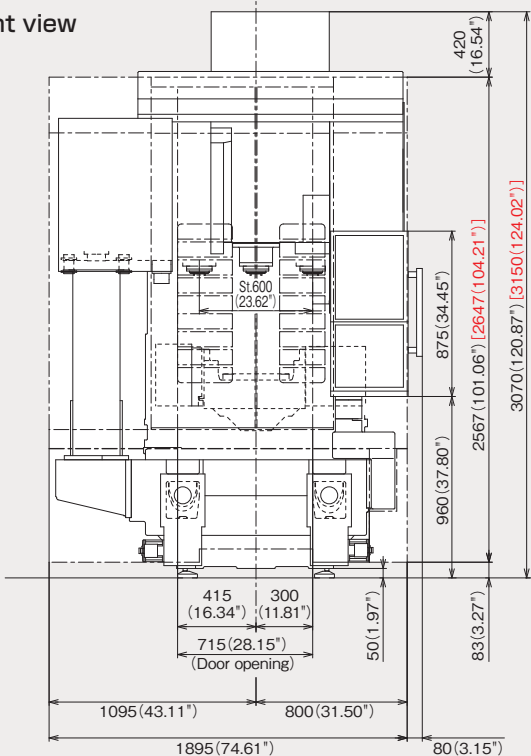
Side view
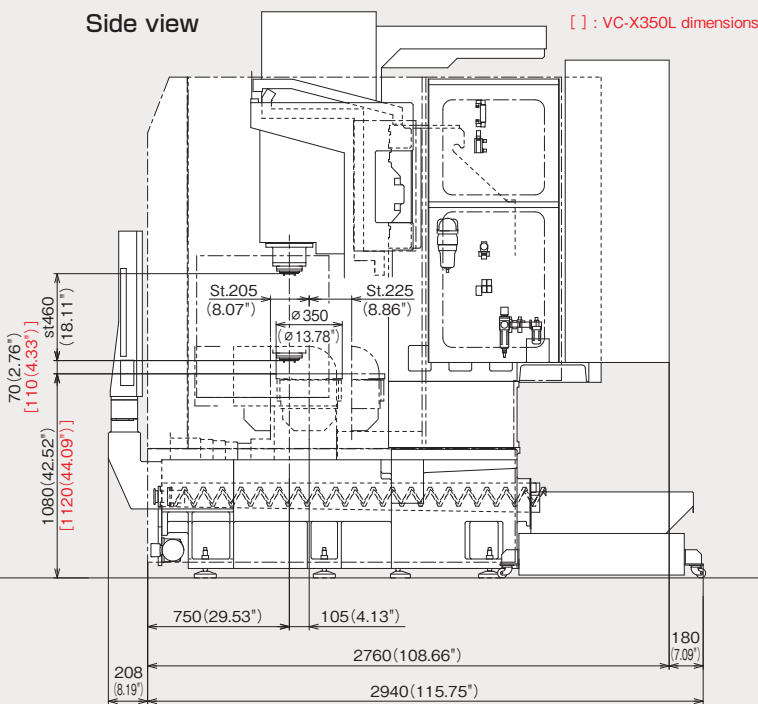
Floor Space

Table
VC-X350

VC-X350L

VC-X5OO VC-X5OOL

SPECIFICATIONS

■ Main Specifications

Item		Unit	Specification	
			VC-X500	VC-X500L
Travel	Travel on X axis (Table right / left)	mm	700 (27.56")	
	Travel on Y axis (Spindle head back / forth)	mm	850 (33.46")	
	Travel on Z axis (Spindle head up / down)	mm	610 (24.02")	
	Travel on A axis (Table tilting)	deg	-120~+30	
	Travel on C axis (Table turning)	deg	360	
	Distance from table top surface to spindle nose	mm	150~760 (5.91"~29.92")	
	Distance from column front to spindle center	mm	530 (20.87")	
Table	Table work surface area	mm	500×500 (19.69"×19.69")	φ500 (φ19.69")
	Max. workpiece weight loadable on table	kg	500 (1102 lbs)	250 (551 lbs)※1
	Table work surface configuration (nominal screw-hole size × number of holes)		M16×20 holes	M16×24 holes
	Distance to the table work surface from the floor	mm	1080 (42.52")	
Spindle	Spindle speed	min⁻¹	100~12000	
	Number of spindle speed change steps		Electric 2-step speed change(MS)	
	Spindle nose (nominal number)		7/24 taper, No.40	
	Spindle bearing bore diameter	mm	φ65 (φ2.56")	
Feed Rate	Rapid traverse rate	X, Y and Z axes	m/min	XY:48 (1890 ipm) Z:32 (1260 ipm)	
		A and C axes	min⁻¹	A:25 C:50	A:25 C:100
	Cutting feed rate	X, Y and Z axes	mm/min	1~32000 (0.04~1260 ipm)※2	
		A and C axes	min⁻¹	A:25 C:50	A:25 C:100
	in the turning function mode		min⁻¹	—	C:1000
Automatic Tool Changer	Tool shank (nominal number)		BT40 (Dual-contact BT type)	
	Pull stud (nominal number)		MAS403 P40T-1	
	Number of stored tools	tool	40	
	Max. tool diameter	mm	φ82 (φ3.23") [φ125 (φ4.92") with no tools in adjacent pots]	
	Max. tool length (from the gauge line)	mm	350 (13.78")	
	Max. tool weight	kg	7 (15 lbs)	
	Tool selection method		Address fixed random method	
	Tool exchange time (tool-to-tool)	sec	2.0	
	Tool exchange time (cut-to-cut)	sec	4.8	
Motors	for Spindle		kW	MITSUBISHI (15-min rating/ continuous rating) 22/18.5(30/25HP)	—
				FANUC (15%ED/30-min rating/continuous rating) 37/26/18.5(50/35/25HP)	
	for Feed axes	X, Y and Z axes	kW	MITSUBISHI X:4.5 (6 HP) YZ:3.5 (4.7 HP)	—
				FANUC X:5.5 (7.4 HP) YZ:4.5 (6 HP)	
		A and C axes	kW	MITSUBISHI A:4.5 (6 HP) C:3.5 (4.7 HP)	—
				FANUC A:5.5 (7.4 HP) C:4.5 (6 HP)	FANUC A:5.5 (7.4 HP) C:12.1 (16.2 HP)
Required Power Supply	Power supply	kVA	MITSUBISHI:51 FANUC:54	FANUC:46
	Supply voltage × supply frequency	V×Hz	200±10%×50/60±1	
			220±10%×60±1	
	Compressed air supply pressure	MPa	0.4~0.6 (58~87 psi)※3	
	Compressed air supply flow rate	L/min(ANR)	200 (53 gpm)※3	
Tank Capacity	Coolant tank	L	260 (69 gal)	
	Spindle head cooling oil tank	L	50 (13 gal)	
	Hydraulic unit tank	L	20 (5 gal)	
Machine Size and Required Floor Space	Machine height from the floor surface	mm	3495 (137.60")	3500 (137.80")
	Floor space required for operation (width × depth)	mm	3720×2450 (146.46"×96.46")	
	Machine weight	kg	12000 (26500 lbs)	
	Temperature of operation environment	℃	5~40	
	Humidity of operation environment	%	10~90 (No dew)	

※1:Max. inertia is 7.8 kg·m² for turning function.
※2:Under the HQ or Hyper HQ control.
※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

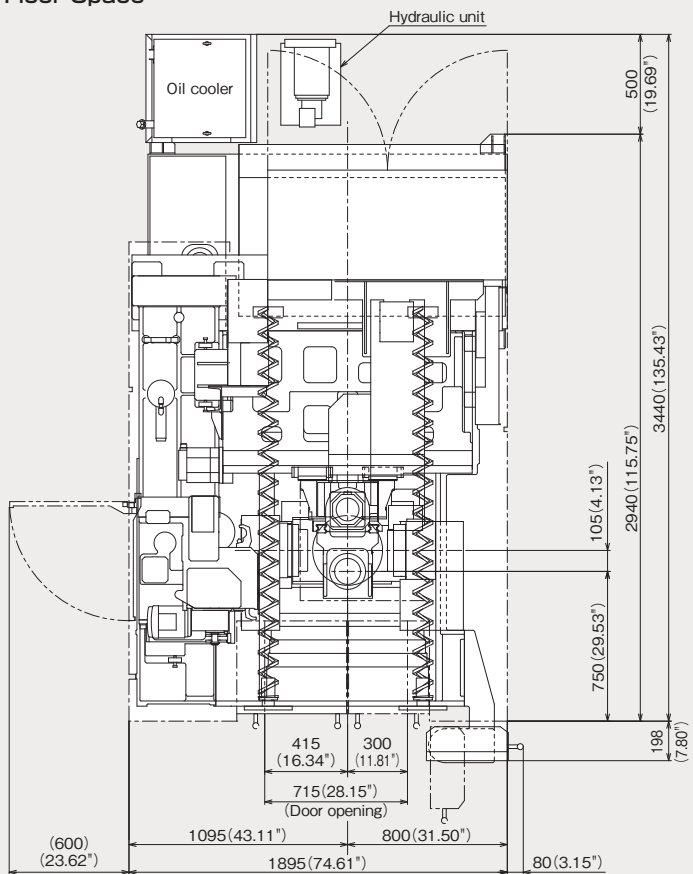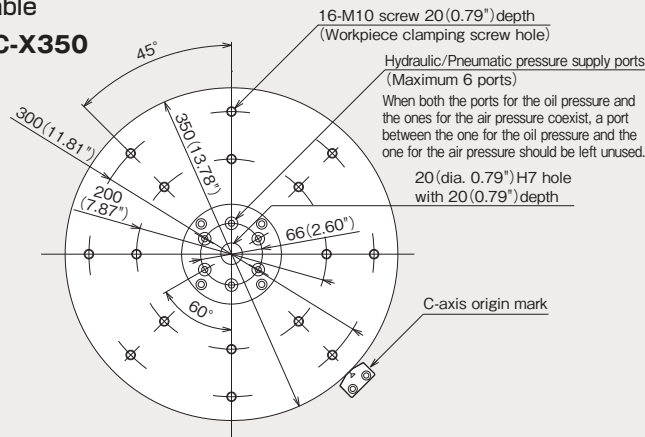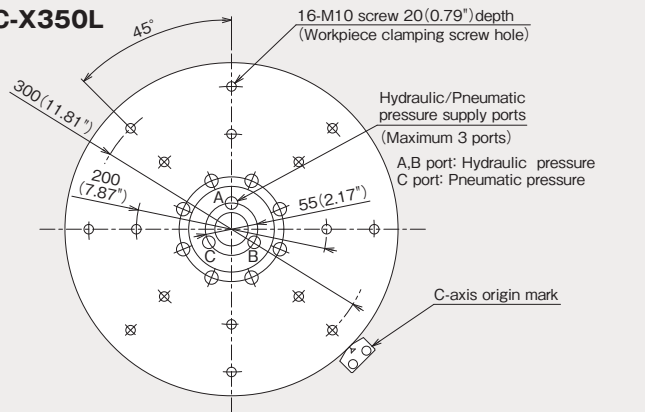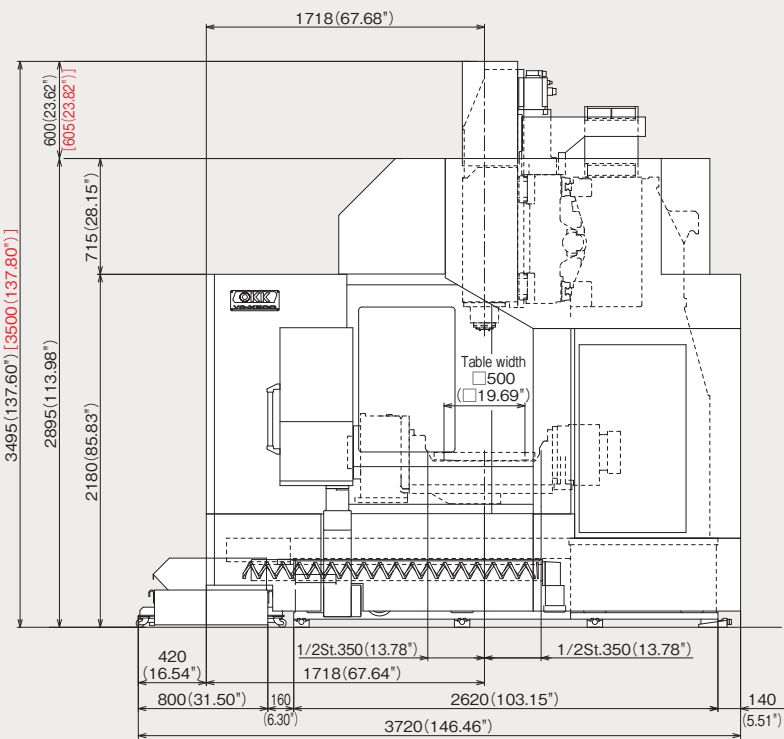| Item	Qty	Remark
Compatibility with Dual contact tool	1 set	BT type
Compatibility with turning specification※1	1 set	C axis:1000min⁻¹
Lighting system	1 set	LED light ×1
Coolant unit (Separate coolant tank)	1 set	Tank capacity:260L (69 gal)
Coil-type chip conveyor	1 set	1 set for each of front and rear sides
Entire machine cover (Splash guard)	1 set	
Slideway protection covers for X and Y axes	1 set	
ATC shutter	1 set	
Spindle head cooling oil temperature controller	1 set	
Automatic greasing unit	1 set	
Hydraulic unit	1 set	for clamping A/C axis table
Safty equipment	1 set	Including magazine door and operater door electromagnetic lock
Leveling block	1 set	
Parts for machine transfer	1 set	
Automatic power-off unit	1 set	
Rotary encoder	1 set	for A axis (tilting axis) and C axis (turning axis)
Electric spare parts (fuses)	1 set	
Instruction manual	1 set	
Electrical manuals (operation, maintenance, parts list, hardware diagrams)	1 set	

※1:for VC-X500L only

■ Optional Accessories

Item	Specification
Compatibility with Dual contact tool	HSK-A63
Spindle motor	20000min⁻¹ MITSUBISHI※¹ 22/18.5kW(30/25HP) FANUC 37/26/18.5kW(50/35/25HP)
Number of stored tools	60tools, 80tools, 120tools
Linear scale feed back※2	XY-axis / XYZ-axis
Lift-up chip conveyor	Hinged type※3 / Scraraper type※3 / Scraper type with floor magnet※3 / Scraper type with dram filter※4
Compatibility with oil-hole holder	
Spindle through coolant	2MPa(290 psi) coolant / 7MPa(1015 psi) coolant / with air
Workpiece flushing equipment	Shower gun type
Oil-mist/air blower	
Air blower	
Signal lamp	Two-lamp type / Three-lamp type (With buzzer / Without buzzer)
Splash guard automatically open / close	Front door
Hydraulic supply ports for fixture	Max.8 ports
Touch sensor system T0	Workpiece measurement, Tool length/ diameter measurement
Touch sensor system T1	Workpiece measurement, Tool length measurement, Tool break detection
T0 soft	
Mist collector	
Foundation parts	Bond anchoring method
Standard tool set	
Color specified by customer	
Lighting system	LED light ×2

※1:for VC-X500 only
※2:When the linear scale is added, cleanliness of the supplied air should be equivalent to or higher than the classes 1.5.1 specified in ISO 8573-1 / JIS B8392-1 in order to prevent generating problems.
※3:The machine columns should be raised by 30 mm.
※4:The machine columns should be raised by 100 mm.

Main dimensions of the machine

[ ] : VC-X500L dimensions

Front view

Side view

Floor Space

Table

VC-X500

Hydraulic/Pneumatic pressure supply ports (Maximum 8 ports)
When both the ports for the oil pressure and the ones for the air pressure coexist, a port between the one for the oil pressure and the one for the air pressure should be left unused.

VC-X500L

A,B port: Hydraulic pressure
C port: Pneumatic pressure
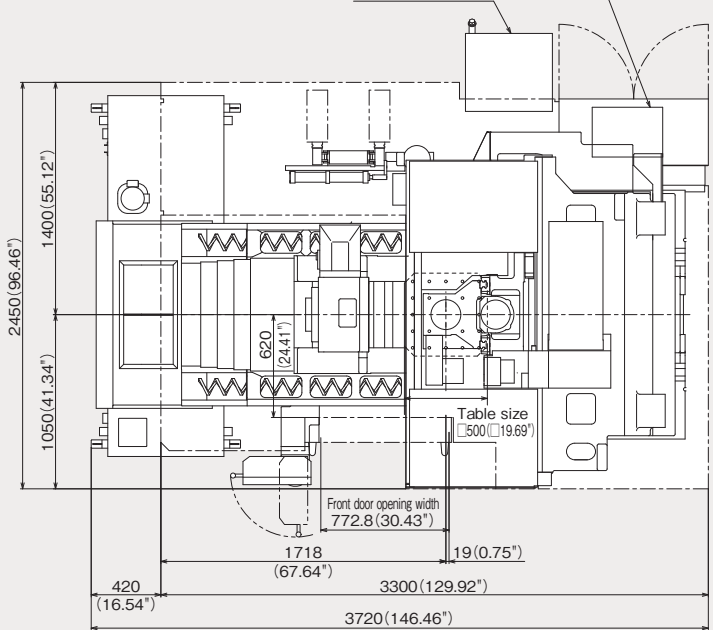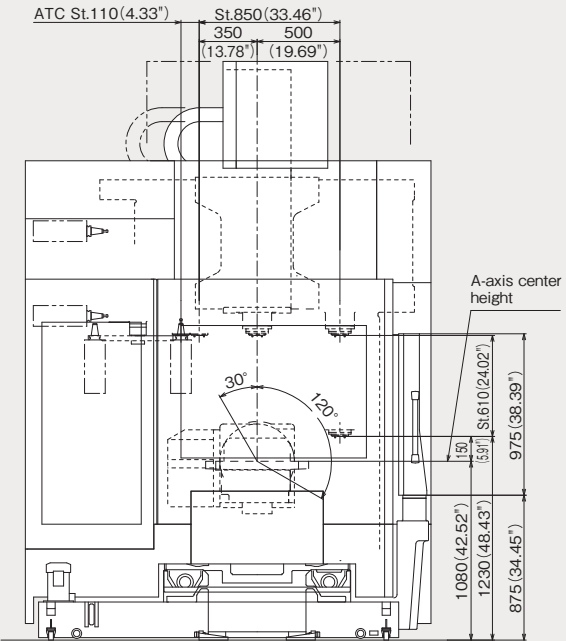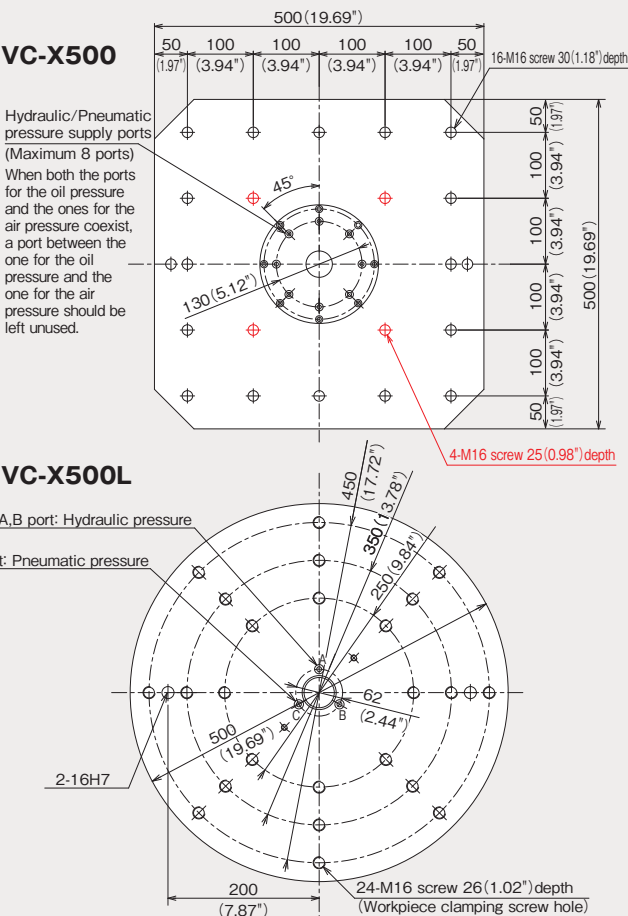
VC-X350/VC-X350L/VC-X500/VC-X500L CONTROLLER

■ FANUC Controller F31i-B5

(WindowsCE-installed Open CNC)

Standard Specification	Standard Specification	Optional Specification	
No. of controlled axes : 5 (X, Y, Z, A, B)	Auto restart	Part program storage capacity: 20480m[8MB] (1000 in total)	
No. of simultaneously controlled axes : 5 axes	Single block	Data server: ATA card(4GB)	
Least input increment: 0.001mm / 0.0001"	Feed hold	Spindle contour control(Cs contour control)	
Max.programmable dimension: ±999999.999mm / ±39370.0787"	Manual absolute on/off parameter	Tool position offset	
Absolute / Incremental programming: G90 / G91	Sub program control	3-dimensional cutter compensation	
Decimal point input / Pocket calculator type decimal point input	Canned cycle: G73, G74, G76, G80 to G89	Tool offset sets: 200 sets in total	PK1
Inch / Metric conversion: G20 / G21	Mirror image function parameter	Tool offset sets: 400 sets in total	
Program code: ISO / EIA automatic discriminaton	Automatic corner override	Tool offset sets: 499 sets in total	
Program format: FANUC standard format	Exact stop check/mode	Tool offset sets: 999 sets in total	
Nano interpolation(internal)	Programmable data input: G10	Addition of workpiece coordinate system (48 sets in total): G54.1 P1 to P48	PK1
Positioning: G00	Graphic display	Addition of workpiece coordinate system (300 sets in total): G54.1 P1 to P300	
Linear interpolation: G01	Backlash compensation for each rapid traverse and cutting feed	Machining time stamp	
Circular interpolation: G02 / G03(CW / CCW) (including Radius designation)	Smooth backlash compensation	Optional block skip: Total 9	
Cutting feed rate: 6.3-digit F-code, direct command	Memory pitch error compensation(interpolation type)	Tool retract and return	
Dwell: G04	Skip function	Sequence number comparison and stop	
Manual handle feed: manual pulse generator 1 set (0.001, 0.01, 0.1mm)	Tool length manual measurement	Manual handle interruption	
Rapid traverse override: 0 / 1 / 10 / 25 / 50 / 100%	Emergency stop	Programmable mirror image	PK1
Cutting feed override: 0 to 200%(every 10%)	Data protection key	Optional chamfering / corner R	
Feed rate override cancel: M49 / M48	NC alarm display / alarm history display	Custom macro	PK1
Rigid tapping: G84, G74 (Mode designation: M29)	Machine alarm display	Interruption type custom macro	
Part program storage capacity: 160m[64KB]	Stored stroke limit 1	Addition of custom macro common variables: 600	
No. of registered programs: 120	Stored stroke limit 2,3 (for OKK use) Note 1	Figure copy	
Part program editing	Load monitor	Scaling: G50, G51	
Background editing	Self-diagnosis	Chopping	
Extended part program editing	Absolute position detection	Playback	
15-inch color LCD / QWERTY key MDI	Manual Guide i (Basic) ※ for VC-X350 and VC-X500	Tool life management: 256 sets in total	PK1
Clock function	Tool center point control for 5 axis machining	Addition of tool life management sets: 1024 sets in total	
MDI (manual data input)operation	Coordinate system rotation: G68, G69	High-speed skip	
Memory card / USB interface	Inverse time feed	Run hour and parts count display	PK1
Spindle function: 5-digit S-code direct command	Unidirectional positioning: G60	Manual Guide i (Milling cycle) ※ for VC-X350 and VC-X500	
Spindle speed override: 50 to 150%(every 5%)	Hyper HQ control mode B	Instruction of inclined plane indexing (Instruction of inclined plane machining)	
Tool function: 4-digit T-code direct command	Data server: ATA card(1GB)	RS232C interface: RS232C-1CH	
ATC tool registration	Multi spindle control Note 2		
Auxiliary function: 3-digit M-code programming	Constant surface speed control Note 2		
Multiple M-codes in 1 block: 3 codes (Max. 20 settings)	Multiple repetitive cycles Note 2	**Original OKK Software**	
Tool length offset: G43, G44/G49	Tool offset for Milling and Turning function Note 2	Machining support integrated software (incl. Help guidance, etc.)	STD
Tool diameter and cutting edge R compensation: G41, G42/G40	Tool geometry/wear compensation Note 2	Tool support	STD
Tool offset sets: 99 sets	Turning/Machining G code system switching function Note 2	Program Editor	STD
Tool offset memory C	Turning G code system B/C Note 2	EasyPRO	STD
Manual reference position return		A5-system (A) Measurement of turning center	OP
Automatic reference position return: G28/G29		A5-system (B) Measurement of turning center + Measurement of geometric error	OP
2nd reference position return: G30	**Optional Specification**	Work Manager	OP
Reference position return check: G27	Least input increment: 0.0001mm / 0.00001"	HQ control	STD
Automatic coordinate system setting	FS15 tape format	NC option package (including the items with "PK1")	OP
Coordinate system setting: G92	Helical interpolation	PK1	Multi-Facer Ⅱ (5-axis processing software)	STD
Machine coordinate system: G53	Cylindrical interpolation	Special canned cycle (including circular cutting)	OP
Workpiece coordinate system: G54 to G59	Hypothetical axis interpolation	Cycle Mate F	OP
Local coordinate system: G52	Spiral/Conical interpolation	Soft Scale Ⅱm	STD
Program stop: M00	Smooth interpolation	Touch sensor T0 software	OP
Optional stop: M01	NURBS interpolation	Tool failure detection system (Soft CCM)	OP
Optional block skip: /	Involute interpolation	Adaptive control (Soft AC)	OP
Dry run	One-digit F code feed	Automatic restart at tool damage	OP
Machine lock	Handle feed 3 axes (Standard pulse handle is removed)		
Z-axis feed cancel	Part program storage capacity: 320m[128KB] (250 in total)		
Auxiliary function lock	Part program storage capacity: 640m[256KB] (500 in total)		
Program number search	Part program storage capacity: 1280m[512KB] (1000 in total) PK1		
Sequence number search	Part program storage capacity: 2560m[1MB] (1000 in total)	Note 1: Standard specification for VC-X500/VC-X500L	
Program restart	Part program storage capacity: 5120m[2MB] (1000 in total)	Note 2: Standard specification for VC-X350L/VC-X500L	
Cycle start	Part program storage capacity: 10240m[4MB] (1000 in total)	STD: Standard specification	
		OP: Optional specification	

VC-X350/VC-X500 CONTROLLER

■ MITSUBISHI Controller N750

Standard Specification	Standard Specification	Optional Specification	
No. of controlled axes : 5 (X, Y, Z, A, C)	Optional block skip:／	Computer link B: RS232C	
No. of simultaneously controlled axes : 5 axes	Dry run	Spindle contour control (Spindle position control)	
Least input increment : 0.001mm / 0.0001"	Machine lock	3-dimensional cutter compensation	
Max. programmable dimension:±99999.999mm / ± 9999.9999"	Z-axis feed cancel	Tool offset sets: 400 sets	
Absolute / Incremental programming: G90 / G91	Miscellaneous function lock	Tool offset sets: 999 sets	
Decimal point inputI/Ⅱ	Program number search	Addition of workpiece coordinate system pair (48 pairs): G54.1 P1 to P48	PK1
Inch / Metric conversion: G20 / G21	Sequence number search	Addition of workpiece coordinate system pair (96 pairs): G54.1 P1 to P96	
Program code: EIA / ISO automatic discrimination	Program restart	Optional block skip: Total 9	
Program format: Meldas standard format (M2 format needs to be instructed)	Cycle start	Tool retract and recover	
Least control increment:1nm	Auto restart	Sequence number comparison and stop	
Positioning:G00	Single block	Corner chamfering / corner R: Insert into straight line-straight line / straight line-circle arc	PK1
Linear interpolation:G01	Feed hold	User macro and user macro interruption	PK1
Circular interpolation: G02 / G03(CW / CCW) (including Radius designation)	Manual absolute on / off parameter	Variable command: 300 sets in total	
Cutting feed rate: 5.3-digit F-code, direct command	Machining time computation	Variable command: 600 sets in total	PK1
One digit F-code feed	Automatic operation handle interruption	Pattern rotation	
Dwell: G04	Manual numerical command	Parameter coordinate system rotation	PK1
Manual handle feed: Manual pulse generator 1 set(0.001, 0.01, 0.1mm)	Sub program control	Special canned cycles: G34 to G36, G37.1 / G34 to G37	
Rapid traverse override: 0 / 1 / 10 / 25 / 50 / 100%	Canned cycle: G73, G74, G76, G80 to G89	Scaling: G50, G51	
Cutting feed rate override: 0 to 200%(every 10%)	Linear angle designation	Chopping function	
Feed rate override cancel: M49 / M48	Circular cutting	Playback	
Rigid tap cycle: G84, G74	Mirror image function: Parameter	Skip function: G31	PK1
Part program storage capacity: 160m[60KB]	Mirror image function: G code	Tool life management Ⅱ: 200 sets	PK1
No. of registered programs: 200	Variable command: 200 sets	Additional tool life management sets: 400 in total	
Part program editing	Automatic corner override	Additional tool life management sets: 600 in total	
Background editing	Exact stop check / mode	Additional tool life management sets: 800 in total	
Buffer modification	Programmable data input: G10 / G11	Additional tool life management sets: 1000 in total	
15° color touch-panel LCD	3D solid program check	External search (Standard for the machine with APC)	
Integrating time display	Graphic display check	Inclined surface machining command	
Clock function	Backlash compensation		
User definable key	Memory pitch error compensation		
MDI (Manual Data Input)operation	Manual tool length measurement	**Original OKK Software**	
Menu list	Emergency stop	Machining support integrated software (incl. Help guidance, etc.)	STD
Parameter/Operation/Alarm guidance	Data protection key	Tool support	STD
Ethernet interface	NC alarm display	Program Editor	STD
IC card/USB memory interface	Machine alarm message	EasyPRO	STD
IC card driving	Stored stroke limit I/Ⅱ	A5-system (A) Measurement of turning center	STD
Hard disk driving	Load monitor	A5-system (B) Measurement of turning center + Measurement of geometric error	OP
Spindle function: 5-digit S-code direct command	Self-diagnosis	Work Manager	OP
Spindle speed override: 50 to 150%(every 5%)	Absolute position detection	HQ control	STD
Tool function: 4-digit T-code direct command	Tool center point control for 5 axis machining	Hyper HQ control mode Ⅱ	STD
ATC tool registration	Programmable coordinate system rotation:G68, G69 / G68.1, G69.1	NC option package (including the items with "PK1")	OP
Miscellaneous function: 3-digit M-code programming	Inverse time feed	Multi-Facer Ⅱ (5-axis processing software)	STD
Multiple M-codes in 1 block: 3 codes (Max. 20 settings)	Unidirectional positioning: G60	Cycle Mate	OP
Tool length offset: G43, G44		Soft Scale Ⅱm	STD
Tool position offset: G45 to G48		Touch sensor T0 software	OP
Cutter compensation: G38 to G42	**Optional Specification**	Tool failure detection system (Soft CCM)	OP
Tool offset sets: 200 sets	Program format: M2 / M0 format	Adaptive control (Soft AC)	OP
Tool offset memoryⅡ: tool geometry and wear offset	Helical interpolation	PK1	Automatic restart at tool damage	OP
Manual reference position return	Cylindric interpolation		
Automatic reference position return: G28 / G29	Hypothetical axis interpolation		
2nd to 4th reference position return: G30 P2 to P4	Spiral/Conical interpolation		
Reference position return check: G27	NURBS interpolation		
Automatic coordinate system setting	Handle feed 3 axes (Standard pulse handle is removed)		
Coordinate system setting: G92	Part program storage capacity:320m[125KB] (200)		
Selection of machine coordinate system setting: G53	Part program storage capacity:600m[250KB] (400)		
Selection of workpiece coordinate system setting: G54 to G59	Part program storage capacity:1280m[500KB] (1000) PK1		
Local coordinate system setting: G52	Part program storage capacity:2560m[1MB] (1000)		
Program stop: M00	Part program storage capacity:5120m[2MB] (1000)	STD: Standard specification	
Optional stop: M01	RS232C interface: RS232C-1CH	OP: Optional specification	

NIDEC OKK CORPORATION

8-10, KITA-ITAMI, ITAMI
HYOGO 664-0831 JAPAN
International Sales Department
TEL:(81)72-771-1143
www.nidec.com/en/nidec-okk/
E-mail:nokk.ovsd@nidec.com

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NIDEC OKK USA CORPORATION
100 REGENCY DRIVE, GLENDALE HEIGHTS, IL 60139 U.S.A.
TEL:(1)630-924-9000
FAX:(1)630-924-9010

NIDEC OKK Europe GmbH
HANSEMANNSTR 33 41468 NEUSS, GERMANY
TEL:(49)2131-29868-0
FAX:(49)2131-29868-41

NIDEC OKK Machinery (THAILAND) Co.,Ltd.
KUMTHORN HOLDING BUILDING 2nd FLOOR 897-897/1 Rama 3 Road, Bangpongpang, YANNAWA, BANGKOK 10120 THAILAND
TEL:(66)2-683-2160-2
FAX:(66)2-683-2163

NIDEC OKK (SHANGHAI) CO.,LTD.
12F, TOWER B, 100 ZUNYI ROAD, CHANG NING DISTRICT, SHANGHAI, CHINA
TEL:(86)21-62700930
FAX:(86)21-62700931