Nidec
All for dreams

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NIDEC OKK A DIVERSIFIED MANUFACTURER OF MACHINE TOOLS
Specializes In:
Machining centers
Graphite cutting machining centers
Grinding centers
CNC Milling machines
Conventional milling machines
Total die and mold making systems
Flexible manufacturing cells and systems

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KCV SERIES

Nidec
All for dreams

Vertical Machining Center / 5-Axis Machining Center

KCV SERIES

KCV1000
KCV1000-5AX

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

NIDEC OKK CORPORATION

KCV SERIES

From Aircraft parts to Large LCD components, its flexible design meets the users needs.

- Conquering a wide range of applications from general to long work-pieces.
- Exceptional productivity with large strokes.
- In a continuous pursuit of high rigidity and high speed processing, KCV is the embodiment of overall efficient operations.
- A highly rigid machine body design produces powerful cutting performance.
- The traverse column provides excellent accessibility, operability and extensibility.
- An advanced controller facilitates the finest quality throughout high speed and rapid response machining.

KCV1000

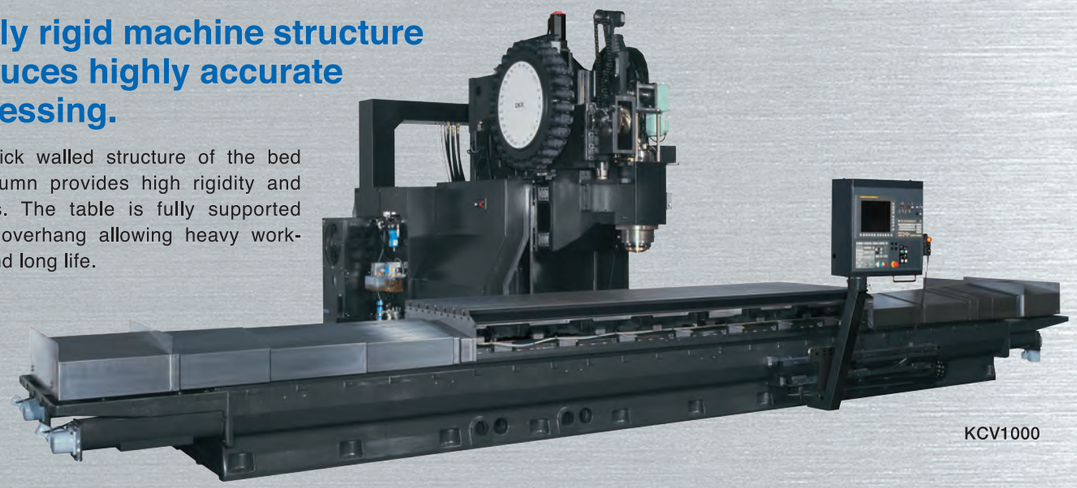
Touch sensor is optional

KCV1000-5AX

Exceptional productivity with large strokes.

Highly rigid machine structure produces highly accurate processing.

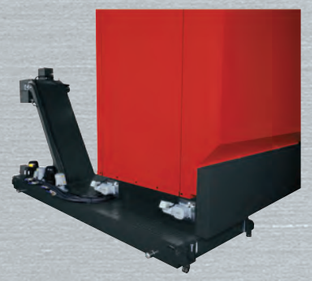
Solid thick walled structure of the bed and column provides high rigidity and stiffness. The table is fully supported without overhang allowing heavy work-piece and long life.



KCV1000

Comprehensive chip processing measures

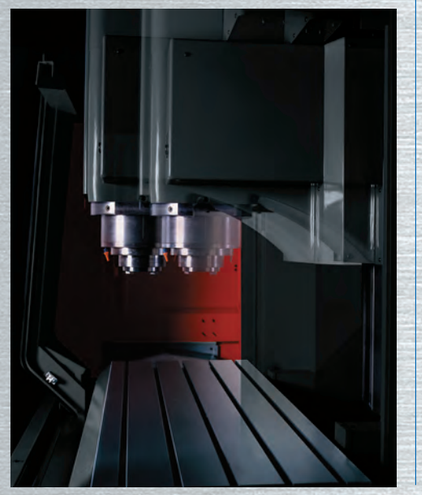
Coil conveyors are provided as standard equipment at the front and back of the table for improved chip discharge.
In addition, coil conveyors are added on the right and left sides of the column, and chips on the front of the column and on both sides of the X-axis shutter fall and are discharged from the machine onto the conveyor.
The coil conveyor is equipped with a reverse rotation function for easy discharge of chips even if they are stuck.



KCV1000

Operator friendly traversing column

Traversing column ensures easy access to fixtures enabling quick setup and work piece loading.



KCV1000

Thorough measures to control thermal displacement

Bearing heat is suppressed by usage of a spindle housing cooling mechanism; further the KCV1000 implements core chilled ball screws in the feed axis and utilizes a spindle coolant walljacket design.
These measures improve processing accuracy and stability.

KCV1000-5AX

Highly rigid feed systems

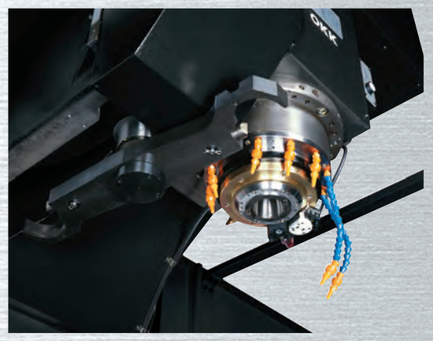
Accurate and highly rigid linear ball guides are used on the axis guide faces and linear roller guides.
For the feed screw supports a double anchoring method that ensures high feeding rigidity is adopted to realize high-speed response and powerful cutting performances.

Movable operation panel

KCV1000-5AX

ATC mechanism

The ATC unit of high-speed cam interlock method supports highly efficient processing: Tool exchange time of 2.5 seconds with #50 tools (tool-to-tool).
(KCV1000-5AX is arm swing type)



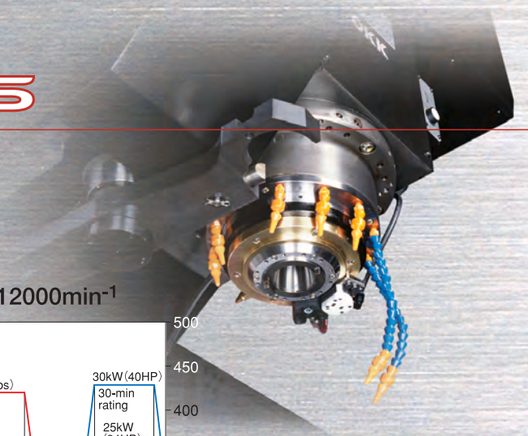
KCV1000

Maintenance-free structure

Designed to be the ultimate in safety and ease of operation.
KCV1000 eliminated hydraulic equipment, decreasing power consumption, noise, and maintenance at KCV1000.

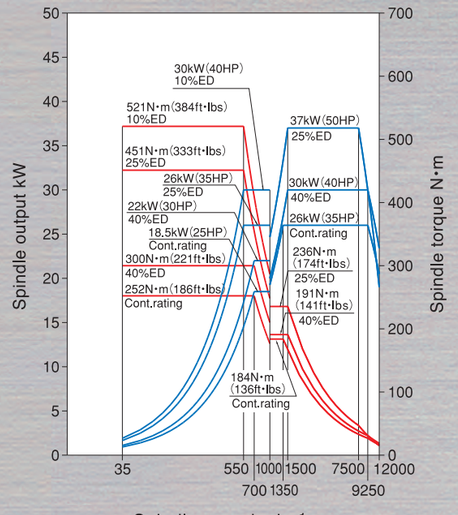
This picture is KCV1000 with optional specifications included.

KCV SERIES

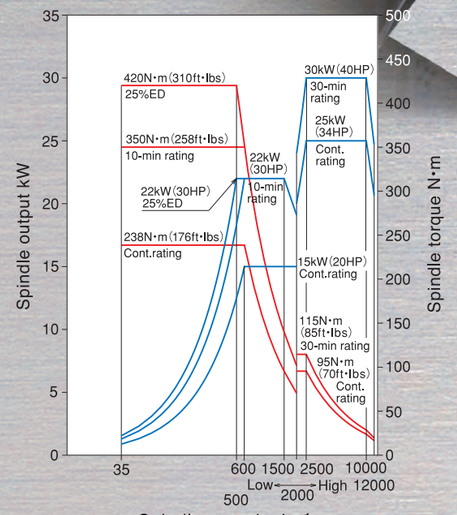


KCV1000

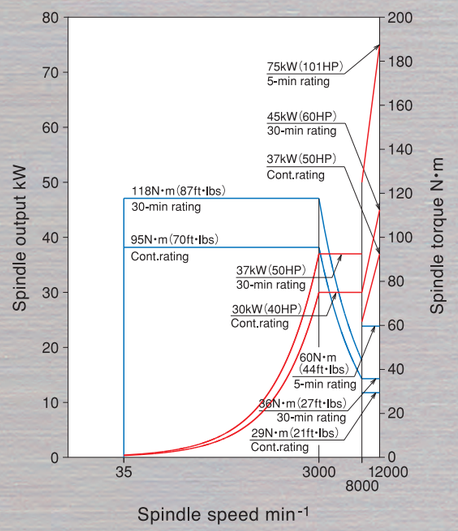
MITSUBISHI 12000min^{-1}



FANUC 12000min^{-1}



KCV1000-5AX



Spindle is designed to tilting and swiveling structure of the spindle.

Accuracy of KCV1000/KCV1000-5AX

Positioning accuracy (without linear scale)

mm (inch)

	X	Y	Z
Positioning Accuracy	±0.0090 (0.00035") / fill stroke	±0.0030 (0.00012") / fill stroke	±0.0050 (0.00020") / fill stroke
Repeatability	±0.0020 (0.00008") / fill stroke		

(Nidec OKK tolerance)

Positioning accuracy (with linear scale)

mm (inch)

		X	Y	Z
Positioning Accuracy	KCV1000-5AX	±0.0060 (0.00024") / fill stroke	±0.0020 (0.00008") / fill stroke	±0.0030 (0.00012") / fill stroke
	KCV1000	±0.0050 (0.00020") / fill stroke	±0.0020 (0.00008") / fill stroke	±0.0030 (0.00012") / fill stroke
Repeatability		±0.0010 (0.00004") / fill stroke		

(Nidec OKK tolerance)

Positioning accuracy (with encoder)

(sec)

Positioning Accuracy	A axis: ±5 sec	B axis: ±5 sec

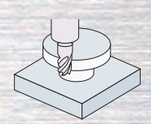
KCV1000-5AX only. (Nidec OKK tolerance)

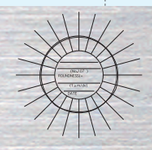
Remarks
1. The above sample data show the short-time machining examples and the results of continuous machining may differ from them.
2. The above sample data show the accuracies under Nidec OKK's in-house cutting test conditions. The results may vary with the conditions of the cutting tools and fixtures.

Circular cutting accuracy

mm (inch)

Item	Nidec OKK tolerance	Result
		KCV1000-5AX
Circularity	0.015 (0.00059")	0.0058 (0.00023")

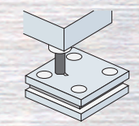


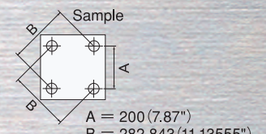


Cutting accuracy

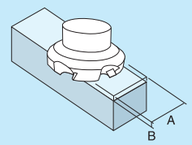
mm (inch)

Item	Nidec OKK tolerance	Result
Axis direction	0.015 (0.00059")	0.007 (0.00028")
Diagonal direction	0.015 (0.00059")	0.008 (0.00031")
Deviation of hole dia.	0.010 (0.00004")	0.005 (0.00020")

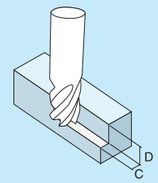




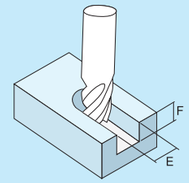
Machining Capabilities (Examples of cutting data)



Face Mill



Roughing End Mill



Roughing End Mill

		Face Mill		Roughing End Mill		Roughing End Mill	
		5" × 6t		ϕ40 × 6t	ϕ50 × 6t	ϕ40 × 6t	ϕ50 × 6t
		KCV1000	KCV1000-5AX	KCV1000	KCV1000-5AX	KCV1000	KCV1000-5AX
Spindle	kW (HP)	30/26 (40/35)	45/37 (60/50)	30/26 (40/35)	45/37 (60/50)	30/26 (40/35)	45/37 (60/50)
Workpiece material		S45C	S45C	S45C	S45C	S45C	S45C
Spindle rotating speed	min^{-1}	300	300	200	160	200	160
Cutting speed	m/min (ipm)	118 (4646)	120 (4724)	25 (984)	25 (984)	25 (984)	25 (984)
Cut width	mm (inch)	(A) 100 (3.94)	(A) 100 (3.94)	(C) 20 (0.79)	(C) 50 (1.97)	(E) 40 (1.57)	(E) 50 (1.97)
Cut depth	mm (inch)	(B) 6 (0.24)	(B) 3 (0.12)	(D) 50 (1.97)	(D) 5 (0.20)	(F) 15 (0.59)	(F) 5 (0.20)
Feed rate	mm/min (ipm)	500 (20)	300 (12)	200 (8)	140 (6)	300 (12)	192 (8)
Feed per tooth	mm (inch)/tooth	0.278 (0.011)	0.167 (0.007)	0.167 (0.007)	0.146 (0.006)	0.250 (0.010)	0.200 (0.008)
Cutting amount	cm^3 (in^3)/min	300 (18.3)	90 (5.5)	200 (12.2)	35 (2.1)	180 (11)	48 (2.9)
Spindle motor load	%	120	129	100	100	95	111

Note: The above machining data are only an example for reference.

Standard Specifications

Item			単　位	KCV1000	KCV1000-5AX
				Specification	
Travel	Travel on X axis (Table horizontal direction)		mm	3500 (137.80")	
	Travel on Y axis (Column front-back direction)		mm	1020+45 (ATCst) (40.16"+1.77")	
	Travel on Z axis (Spindle head vertical direction)		mm	720 (28.35")	
	Travel on A axis (Spindle head front-back direction)		deg	—	−35～35
	Travel on B axis (Spindle head horizontal direction)		deg	—	−35～35
	Distance from table top surface to spindle nose		mm	200～920 (7.87"～36.22")	
	Distance from column front to spindle center		mm	1085 (42.72")	
Table	Table work surface area (X-axis direction × Y-axis direction)		mm	3800×1020 (149.61"×40.16")	
	Max. workpiece mass loadable on table		kg	4000 (8800 lbs)	
	Table work surface configuration (Number and nominal dimension of T slots and spacing)		mm	22×140×7 tools (0.87"×5.51"×7)	
	Distance to the table work surface from the floor		mm	1000 (39.37")	
Spindle	Spindle rotating speed		min^{-1}	35～12000	
	Number of spindle speed change steps			Non step	
	Spindle nose (nominal number)			7／24 taper No.50	
	Spindle bearing bore diameter		mm	φ100 (dia.3.94")	
Feed Rate	Rapid traverse rate	X, Y and Z axes:	m／min	20 (787ipm)	
		A and B axes:	deg／min	—	3600
	Cutting feed rate	X, Y and Z axes:	mm／min	1～10000*1 (0.04 to 394ipm)	
		A and B axes:	deg／min	—	0.001～3600
	JOG feed rate	X, Y and Z axes:	mm／min	2000 (79ipm)	
		A and B axes:	deg／min	—	2000
Automatic Tool Changer	Tool shank (nominal number)			JIS B 6339 BT50	
	Pull stud (nominal number)			OKK only 90°	
	Number of storable tools		tools	30	
	Maximum tool diameter (with adjacent tools)		mm	φ100 (dia.3.94")	
	Maximum tool diameter (without adjacent tools)		mm	φ200 (dia.7.87")	
	Maximum tool length (from the gauge line)		mm	350 (13.78")	
	Maximum tool mass		kg	20 (44 lbs)	
	Tool selection method			Memory random method	Add fixed method
	Tool exchange time (tool-to-tool)		sec	2.5	
	Tool exchange time (cut-to-cut)		sec	8.5	15
Motors	For spindle (30-min rating／continuous rating)		kW	MISUBISHI 30／26 (40／35HP) FANUC 30／25 (40／34HP)	FANUC　45／37 (60／50HP)
	For spindle／ball screw cooling oil temperature controller (compression／discharge)		kW	1.5／0.75 (2／1HP)	
	For spindle oil-air lubrication pump		kW	—	0.018 (0.02HP)
	For feed supply	X, Y and Z axes:	kW (HP)	MITSUBISHI XYZ：7 (9.4) FANUC X：6 (8) Y：7 (9.4) Z：9 (12.1)	FANUC XY：9.0 (12.1)　Z：9.0×2 (12.1×2)
		A and B axes:	kW	—	FANUC AB：4.0 (5.4HP)
	For feed guide surface lubrication pump		kW	0.017 (0.02HP)	
	For coolant pump		kW	1.1×1 (1.5HP×1)　0.4×2 (0.5HP×2)	
	Workpiece flushing gun		kW	1.1 (1.5HP)	
	For turning ATC／unclamping a tool on the spindle		kW	0.75 (1HP)	Turning ATC：0.4 (0.5HP)*2
	For moving ATC		kW	—	0.5 (0.7HP)
	For turning magazine		kW	0.4 (0.5HP)	
	For driving pots		kW	0.09 (0.12HP)	—
	For coil conveyors		kW	X：0.2×2 (0.3HP×2)　Y：0.1×2 (0.15HP×2)	
	For hydraulic unit		kW	—	1.5 (2HP)
Required Power Sources	Power supply		kVA	MITSUBISHI：68　FANUC：63	FANUC：107
	Supply voltage × supply frequency		V × Hz	200V±10%×50／60Hz±1	
				220V±10%×60Hz±1*3	
	Compressed air supply pressure		MPa	0.4～0.6*4 (58～87psi)	
Tank Capacity	Compressed air supply flow rate		L／min^{-1} (ANR)	600*5 (159gpm)	400*5 (106gpm)
	Coolant tank		L	700 (185gal)	1100 (291gal)
	Spindle head cooling oil tank		L	70 (18gal)	
	Spindle lubricating oil tank		L	—	2 (0.5gal)
	Slideway lubricating oil tank		L	6 (1.6gal)	
	Hydraulic unit tank		L	—	20 (5gal)
Machine Size and Required Floor Space	Machine height from the floor surface		mm	3459 (136.18")	3730 (146.85")
	Floor space required for operation (width × depth)		mm	9420×5253 (370.87"×206.81")	9714×5793 (382.44"×228.07")
	Floor space including maintenance area (width × depth)		mm	11000×6000 (433.07"×236.22")	10714×6293 (421.81"×247.76")
	Machine mass		kg	28000 (61700 lbs)	32000 (70500 lbs)
	Controller type			F31iB (FANUC)／N830 (MITSUBISHI)	F30iB (FANUC)
	Temperature of operation environmert		℃	5～40	

＊1：Feed rate under the HQ or Hyper HQ control (Hyper HQⅡ is standard for 5AX.)
＊2：KCV1000-5AX uses the hydraulic system for unclamping tools.
＊3：When the supply voltage is 220VAC, the supply frequency of 60Hz only is applicable.
＊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 B 8392-1.
＊5：When optional specification such as an air blow is added, add appropriate air supply according to the operating frequency.

Standard accessories

Item	KCV1000	KCV1000-5AX
	Specification	
Lighting system	Two LED lamps	
Coolant unit with lift-up type chip conveyor	Hinged type	Backwashing and filtration type aluminum chips
Coolant-through-spindle (Spindle compatibility only)	—	1set
Air blower	1set	—
Entire machine cover (Splash guard)	1set	
Door interlock control	1set	
Top cover	1set	
Signal lamp	1 set (3-lamp tower type with alarm buzzer)	
Workpiece flushing gun (moderate pressure)	1set	
ATC shutter	—	1set
Slideway protection covers for X, Y and Z axes	1set	
Feed system lubrication unit	1set	
Spindle head and ball screw cooling oil temperature controller	1set	
Hydraulic unit	—	1set
Coil conveyor with reverse rotation function	1set	
Leveling block	1set	
Foundation parts	1 set (including 3 × 330-ml bond for anchoring)	
Parts for machine transfer (excluding the hoisting jig)	1set	
Automatic power off	1set	
Rotary encoder (A axis／B axis)	—	1set
Electrical spare parts (fuses)	1set	
Instruction manual	1set	
Electrical manuals (including electrical diagrams)	1set	

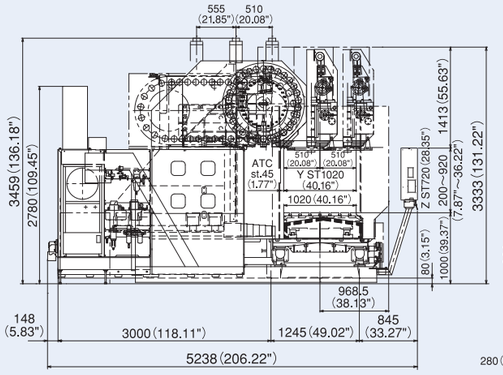
Special accessories

Item	KCV1000	KCV1000-5AX
	Specification	
Compatibility with two-surface locking tool	□	
Compatibility with MAS pull stud	MASⅠ／ MASⅡ	
Number of storable tools	40 tools	
Linear scale	XY axes ／ XYZ axes	
Lift-up type chip conveyor	□Scraper type □Scraper type with floor magnet □Drum type for aluminum chips	—
Chip bucket	□	
Oil skimmer	□	
Mist collector	□	
Compatibility with oil-hole holder	□Big　□NIKKEN Including 1.1-kW coolant pump	—
Thickener bag filter (Spare parts for high-pressure unit)	□	
HIGH SPINDLE ATM installation work	□Big　□NIKKEN	
Compatibility with through-spindle	□2Mpa　□7Mpa　□Air	Including 7-MPa high-pressure unit
Air blower	—	□
Oil mist blower	□	—
Coolant cooler	□	
Splash guard front door automatic operation	□	
ATC shutter	□	—
NC rotary table	□Type of rotary table specified by customer	—
Sub table	□T-slot fixing type specified by customer	—
Touch sensor system T1 (automatic)	□T1-A (Workpiece measurement) □T1-B (Workpiece measurement, Tool length measurement, Tool break detection)	
Tool break detection with limit switch	□	—
Tool length／diameter measurement with laser	□Renishaw laser system with no cover (□Max φ85／□Max φ135／□Max φ85) □BLUM Micro with no cover (□Max φ85)	
Addition of M signals	□4 sets　□8 sets	
Standard tool set	□	
Specified coating color	□	
Magazine operation panel	□	

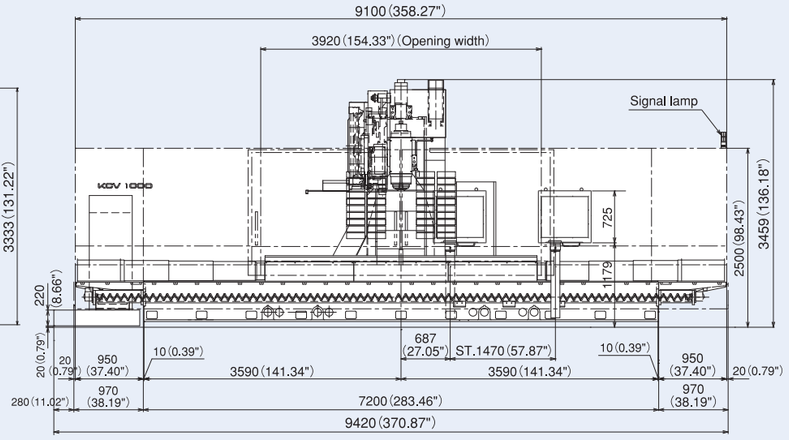
KCV1000

Main Dimensions

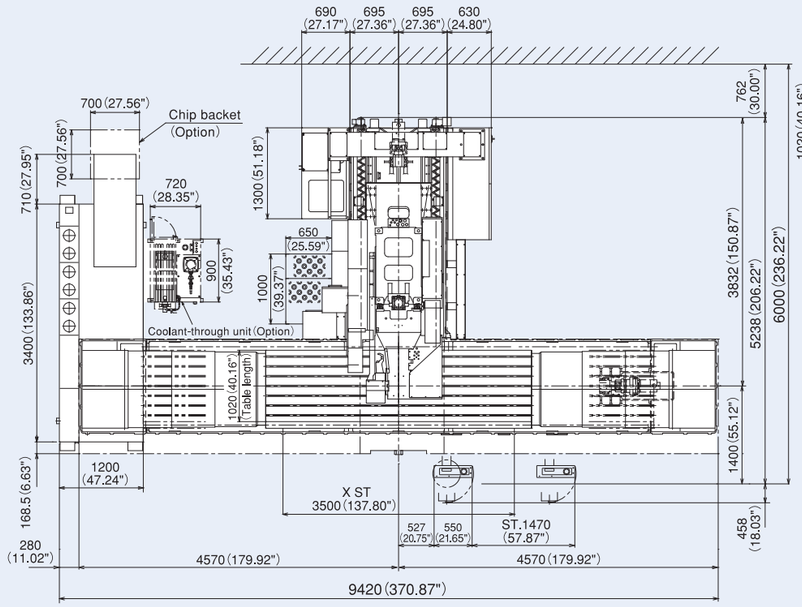
Side view



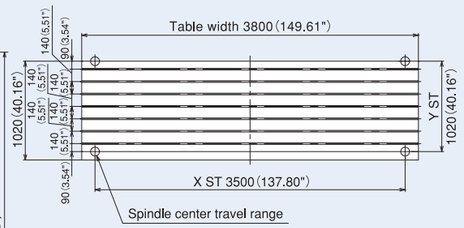
Front view



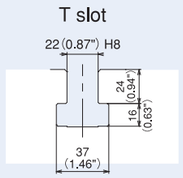
Floor space



Table



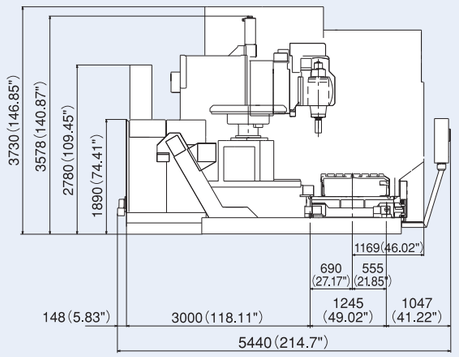
T slot



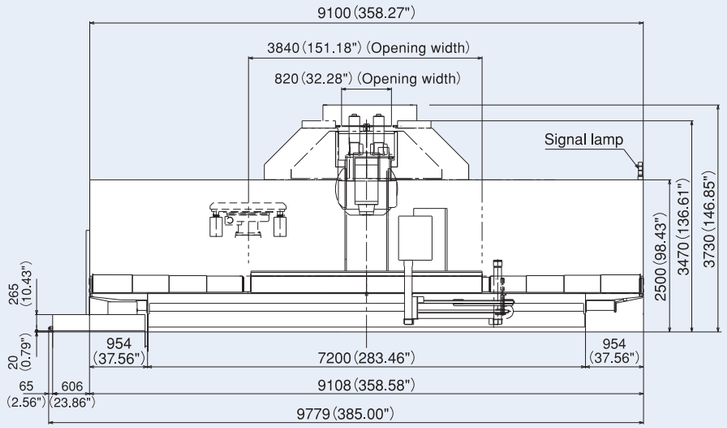
KCV1000-5AX

Main Dimensions

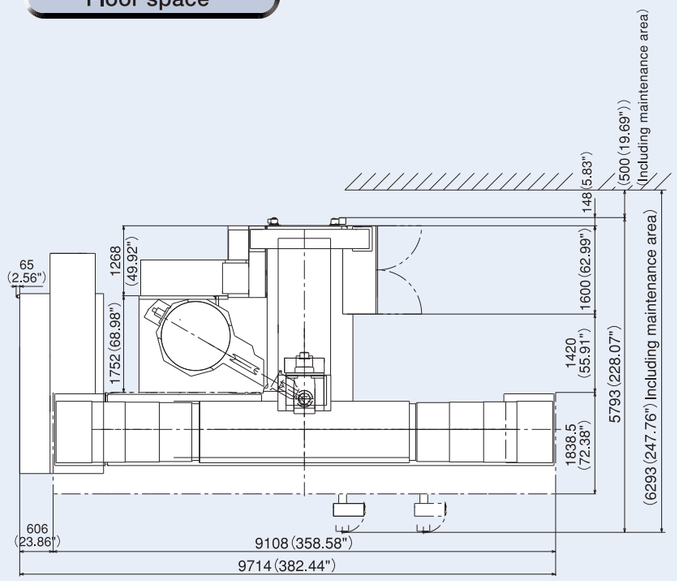
Side view



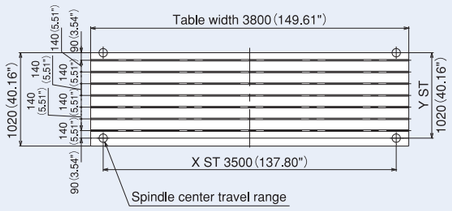
Front view



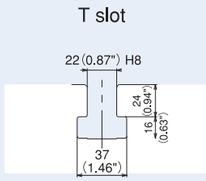
Floor space



Table



T slot



Neomatic 830 (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: 0.001 mm / 0.0001"
Max. programmable dimension:
±99999.999 mm / ±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: Total 200 sets
Tool offset memory Ⅱ:
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 setting 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 management Ⅱ: 200 sets
External search
Emergency stop
Data protection key
NC alarm display
Machine alarm message
Stored stroke limit Ⅰ/Ⅱ
Load monitor
Self-diagnosis
Absolute position detection

Optional Specification

Additional one axis control:
name of axis (A, B, C, U, V, W)
Additional two axes control:
name of axis (A, B, C, U, V, W) Note
Simultaneously controlled axes: 4 axes
Simultaneously controlled axes: 5 axes Note
Least input increment: 0.0001 mm / 0.00001 inch
Program format: M2 / M0 format
Spiral / Conical interpolation
Cylindrical interpolation
Hypothetical axis interpolation
NURBS interpolation
(Hyper HQ control mode Ⅱ is required)
Handle feed 3 axes:
Standard pulse handle is removed.
Inverse time feed
Part program storage capacity: 2560m [1MB]
(No. of registered programs: total 1000)
Part program storage capacity: 5120m [2MB]
(No. of registered programs: total 1000)
RS232C interface: RS232C-1CH
Computer link B: RS232C
Spindle contour control (Spindle position control)
3-dimensional cutter compensation
Tool offset sets: total 400 sets
Tool offset sets: total 999 sets
Addition of workpiece coordinate system
(total 96 sets): G54.1 P1 to G54.1 P96
Addition of workpiece coordinate system
(total 300 sets): G54.1P1 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

Integrated machining support system ····· STD
Tool support ····· STD
Program Editor ····· STD
EasyPRO ····· STD
Work Manager ····· Opt
HQ control ····· STD
Hyper HQ control mode Ⅰ ····· OPt
Hyper HQ control mode Ⅱ ····· OPt
Soft Scale Ⅱm ····· STD
WinGMC8 (Including option H) ····· STD
Cycle Mate ····· Opt
Touch sensor T0 software ····· Opt
Soft CCM (Tool failure detection system) ····· Opt
Soft AC (Adaptive control unit) ····· Opt
Automatic restart at tool damage ····· Opt

Note: N850 (Windows 8-installed Open CNC)
STD: Standard Opt: Option

F31i-B Plus (WindowsCE-installed Open CNC)

Standard Specification

No. of controlled axes: 3 axes (X, Y, Z)
No. of simultaneously controlled axes: 3 axes
Least input increment: 0.001mm / 0.0001"
Max. programmable dimension:
+999999.999mm/+39370.0787"
Absolute / Incremental programming: G90 / G91
Decimal point input/Pocket calculator type decimal point input
Inch/ Metric conversion: G20 / G21
Program code: ISO / EIA automatic discrimination
Program format: FANUC standard format
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 X1, X10, X100/graduation
Dwell: G04
One-digit F code feed
inverse time feed
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
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
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
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: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 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

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 1
No. of simultaneously controlled axes: 4 axes
No. of simultaneously controlled axes: 5 axes Note 1
Least input increment: 0.0001mm / 0.00001"
Spiral / Conical interpolation
Cylindrical interpolation
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 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
Manual handle interruption
Tool retract and return
Figure copy
Interruption type custom macro
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

Integrated machining support software
(incl. help guidance, etc.) ····· STD
Tool support ····· STD
Program Editor ····· STD
EasyPRO ····· STD
Work Manager ····· Opt
HQ control ····· STD
Hyper HQ control mode A ····· Opt
Hyper HQ control mode B ····· Opt
Hyper HQ varue kit Note 2 ····· Opt
Special canned cycle
(including circular cutting) ····· Opt
Cycle Mate F ····· Opt
Soft Scale Ⅱm ····· STD
Touch sensor T0 software ····· Opt
Soft CCM (Tool failure detection system) ····· Opt
Soft AC (Adaptive control unit) ····· Opt
Automatic restart at tool damage ····· Opt

Note 1: F31i-B5 Plus (WindowsCE-installed Open CNC)
Note 2: Includes Data server: ATA card (1GB) and Hyper HQ control mode B
STD: Standard Opt: Option

KCV1000-5AX CONTROLLER

F30i-B (WindowsCE-installed Open CNC)

Standard Specification

No. of controlled axes: 5 axes (X, Y, Z, A, B)
No. of simultaneously controlled axes: 5 axes
Least input increment: 0.001mm / 0.0001"
Max. programmable dimension:
±999999.999mm / ±39370.0787"
Absolute / Incremental programming: G90 / G91
Decimal point input /
Pocket calculator type decimal point input
Inch / Metric conversion: G20 / G21
Program code: ISO / EIA automatic discrimination
Program format: FANUC standard format
Nano interpolation (internal)
Positioning: G00
Linear interpolation: G01
Circular interpolation: G02 / G03 (CW / CCW)
(Including radius designation)
Helical interpolation
Cutting feed rate: 6.3-digit F-code, direct designation
Dwell: G04
Manual handle feed:
Least input increment ×1, ×10, ×100 / graduation
Rapid traverse override: 0 / 1 / 10 / 25 / 50 / 100%
Cutting feed rate override: 0 to 200% (every 10%)
Feed rate override cancel: M49 / M48
Rigid tapping: G84, G74 (Mode designation: M29)
Part program storage capacity:
total 1280m [512KB] (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
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 200 sets
Tool offset memory C
Manual reference position return
Automatic reference position return: G28 / G29
2nd reference position return: G30
Reference position return check: G27
Automatic coordinate system setting
Coordinate system setting: G92
Machine coordinate system: G53
Workpiece coordinate system: G54 to G59
Addition of workpiece coordinate system
(total 48 sets): G54.1 P1 to P48
Local coordinate system: G52
Program stop: M00
Optional stop: M01
Optional block skip: /
Dry run
Machine lock
Z-axis feed cancel
Auxiliary function lock
Program number search
Sequence number search
Program restart
Cycle start
Auto restart
Single block
Feed hold
Manual absolute (ON / OFF with PMC parameter)
Sub program control
Canned cycle: G73, G74, G76, G80 to G89
Mirror image function parameter
Automatic corner override
Exact stop check / mode
Programmable data input: G10
Programmable mirror image
Custom macro
Graphic function
Backlash compensation for each rapid traverse and cutting feed
Smooth backlash
Interpolation type pitch error compensation
Skip function
Tool length manual measurement
Tool life management: total 256 sets
Emergency stop
Data protection key
NC alarm display / alarm history display
Machine alarm display
Stored stroke check 1
Load monitor
Self-diagnosis
Absolute position detection
Manual Guide i (Basic)
Tool centor point control for 5 axis machining
Inverse time feed
Unidirectional positioning: G60
Data server: ATA card (1GB)
Instructonof inclined plane indexing
(Instruction of inclined plane machining)
Manual feed for 5-axis machining
Tool length compensation along tool vector
Straightness compensation
3-dimentional coordinate system conversion

Optional Specification

Least input increment: 0.0001mm / 0.00001"
FS15 tape format
Cylindrical interpolation
Hypothetical axis interpolation
Spiral / Conical interpolation
Smooth interpolation
(Hyper HQ control B mode is required)
NURBS interpolation
(Hyper HQ control B mode is required)
Involute interpolation
One-digit F code feed
Handle feed 3 axes:Standard pulse handle is removed
Part program storage capacity:
total 2560m [1MB] (1000 in total)
Part program storage capacity:
total 5120m [2MB] (1000 in total)
Part program storage capacity:
total 10240m [4MB] (1000 in total)
Part program storage capacity:
total 20480m [8MB] (1000 in total)
RS232C interface: RS232C-1CH
Data server: ATA card (4GB)
Spindle contour control (Cs contour control)
Tool position offset
3-dimensional cutter compensation
Tool offset sets: total 400 sets
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
Machining time stamp
Optional block skip: Total 9
Tool retract and return
Sequence number comparison and stop
Manual handle interruption
Optional chamfering / corner R
Interruption type custom macro
Addition of custom macro common variables:
total 600
Figure copy
Coordinate system rotation: G68, G69
Scaling: G50, G51
Chopping
Playback
Addition of tool life management sets: total 1024 sets
High-speed skip
Stored stroke check 2, 3 (3: For the interference area preset by the manufacturer)
Manual Guide i (Milling cycle)

Original Nidec OKK Software

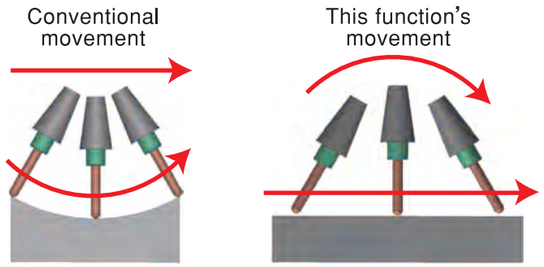
Integrated machining support software
(incl. help guidance, etc.) ····· STD
Tool support ····· STD
Program Editor ····· STD
EasyPRO ····· STD
Work Manager ····· Opt
HQ control ····· STD
Hyper HQ control mode B ····· OPt
Special canned cycle
(including circular cutting) ····· Opt
Cycle Mate F ····· Opt
Touch sensor T0 software ····· Opt
Soft CCM (Tool failure detection system) ····· Opt
Soft AC (Adaptive control unit) ····· Opt
Automatic restart at tool damage ····· Opt

Note: F31i-B5 (Windows CE-installed Open CNC)
STD: Standard Opt: Option

5-axis Machining Support Technologies KCV1000-5AX

5-axis Control Function

Tool Center Point (TCP) Control



Deviation is caused by the movement of the rotation axis

Tool tip path as commanded

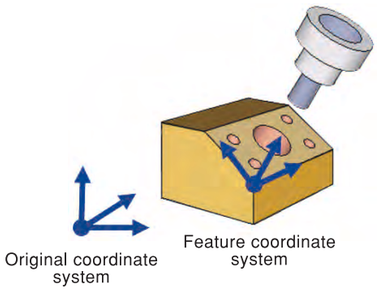
Normally the liner interpolation while changing the tool posture requires the commands for the changes in the tool shaft direction in accordance with the changes in the angle of the tool posture. Thus, the relevant machining data using minute line segments become complicated.

With the Tool Center Point (TCP) control, the tool tip path is as commanded regardless of the commands for the rotation axis.
As the speed of the tool tip is constant (the commanded speed), high-quality surfaces can be achieved.

5-axis Indexing Function

Inclined Surface Indexing (Machining) Command (Option)

The inclined surface indexing (machining) commands allow defining flexibly the surface to be machined by setting a new coordinate system (feature coordinate system) so that the machining programs can be created efficiently similarly to the ones for the normal 3-axis machining centers.



MULTI-FACER Ⅱ

At the time of indexing the surface to be machined with the 5-axis machining center, it may take time to set the workpiece origin.
MULTI-FACER Ⅱ makes it possible to create the programs for indexing easily without using calculators and to set the workpiece origin easily.