

Mazak

INTEGREX i-V VORTEX i-V

S E R I E S



Mazak

INTEGREX i-V VORTEX i-V SERIES

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VORTEX i-V SERIES

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INTEGREX i-V, VORTEX i-V SERIES SmoothAi 21.03.0 G 99J291321E0



Exceptional Higher Productivity

In addition to multiple-surface machining, free curved surface machining with 5-axis control, and combined machining including turning can also be performed for higher productivity.

Vertical 5-axis Machining Center

VORTEX i-V SERIES



VORTEX i-630V/6S

Vertical 5-axis Machining Center
(single table)

Vertical Multi-Tasking Machine

INTEGREX i-V SERIES



INTEGREX i-630V/6

Vertical Multi-Tasking Machine
(2-pallet changer)

Shown with optional equipment

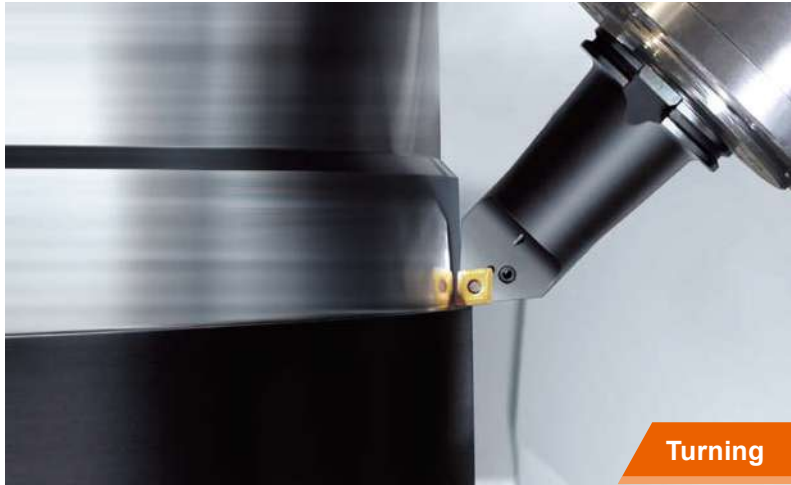
Extensive series range to meet your production requirements



5-axis machining



Multiple surface machining



Turning



Single table



2-pallet changer

Vertical 5-axis Machining Center

VORTEX i-V SERIES

Vertical Multi-Tasking Machine

INTEGREX i-V SERIES



VORTEX i-630V/6
(2-pallet changer)



VORTEX i-800V/8
(2-pallet changer)



INTEGREX i-630V/6
(2-pallet changer)



INTEGREX i-800V/8
(2-pallet changer)



VORTEX i-630V/6S
(single table)



VORTEX i-800V/8S
(single table)



INTEGREX i-630V/6S
(single table)



INTEGREX i-800V/8S
(single table)

Shown with optional equipment

High rigidity construction for high accuracy machining

■ Linear roller guides utilized on the X-, Y- and Z-axis

Linear roller guides on the X-, Y- and Z-axis are utilized in order to provide high accuracy and heavy duty machining.

■ B-axis roller gear cam

Elimination of backlash ensures high accuracy and high efficiency machining. (over the rotary positioning range of 150 degrees, positioning accuracy is two times better than the ISO standard)

■ C-axis roller gear cam VORTEX i-V series

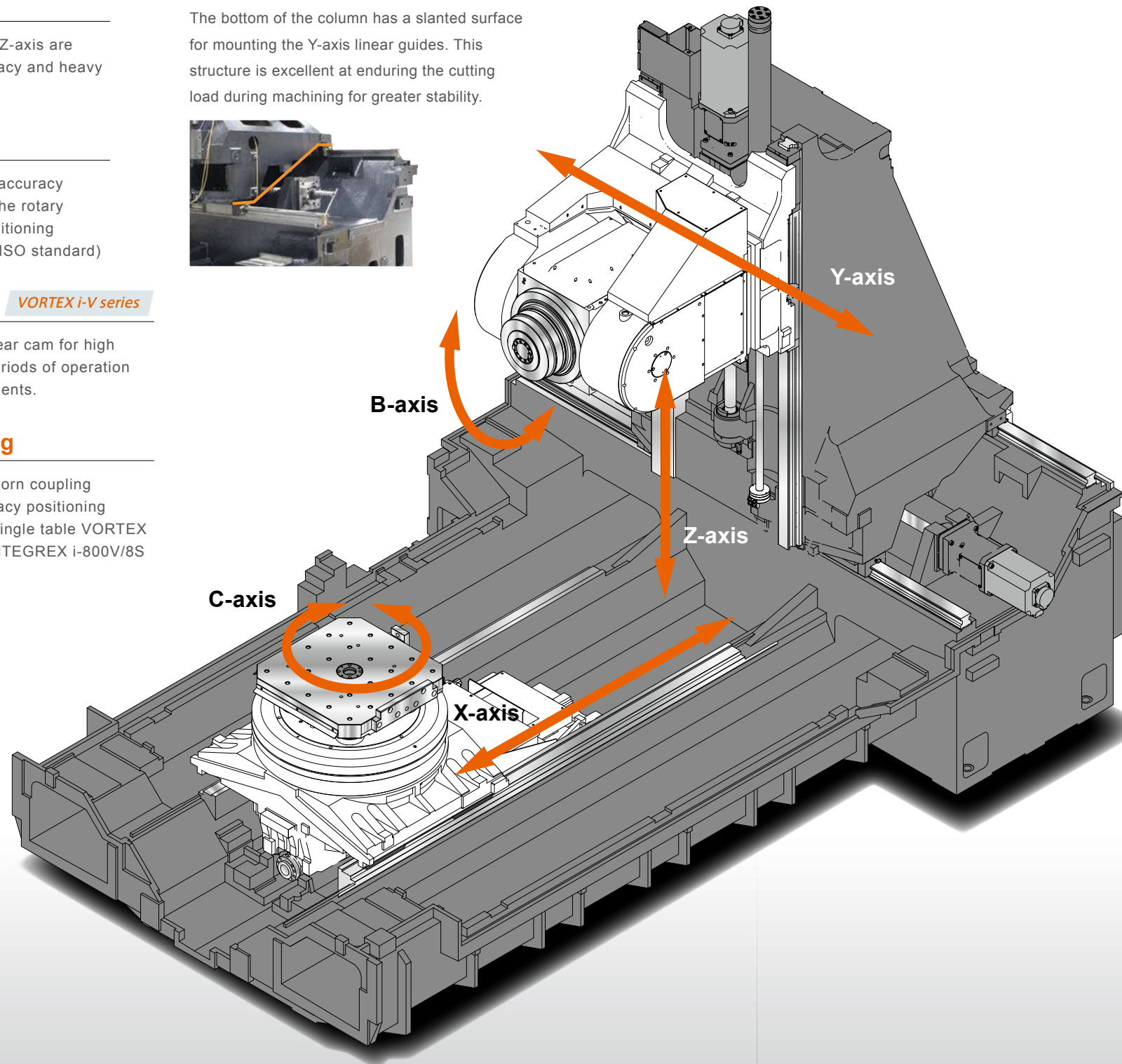
The NC rotary table utilizes a roller gear cam for high accuracy machining over extended periods of operation and can be indexed in 0.0001° increments.

■ Precision table clamping

The pallet and table are clamped on corn coupling to ensure high rigidity and high accuracy positioning repeatability during pallet changes. (single table VORTEX i-630V/6S, VORTEX i-800V/8S and INTEGREX i-800V/8S : table is bolted to table base.)

■ Y-axis slant structure

The bottom of the column has a slanted surface for mounting the Y-axis linear guides. This structure is excellent at enduring the cutting load during machining for greater stability.



High-precision function as standard equipment

■ Prevention of heat displacement - milling spindle cooling

Temperature controlled cooling oil circulates through the milling spindle motor to prevent heat displacement.

■ Ball screw core cooling (X-, Y-, Z-axis)

Temperature controlled cooling oil circulates through the ball screw cores to ensure stable machining accuracy over extended periods of high speed operation.



INTEGREX i-V series

■ Turning spindle and C-axis direct drive motor

Ensures high speed and high accuracy machining by eliminating power transmission components such as the belt and the gear.

Temperature controlled cooling oil is circulated in the stator part of the table preventing the heat displacement by the direct drive motor to ensure high accuracy machining.

■ Ai Thermal Shield

Ai Thermal Shield ensures enhanced heat displacement compensation. New algorithms automatically determines the amount of compensation to be applied according to changes in the temperature to ensure even higher machining accuracy.

Enhanced milling performance for high-productivity

Three milling spindles available to suit a wide range of applications from steel to non-ferrous materials. All have a built-in motor, ensuring size minimization and high output.

CAT No.50, 10000 rpm milling spindle

Standard spindle designed for high efficiency machining of a wide variety of applications such as cast iron, steel and non ferrous material.

Speed	10000 rpm
Output (40% ED / cont. rating)	AC 37 kW (50 HP) / AC 30 kW (40 HP)
Max. torque (40% ED / cont. rating)	353 N·m / 248 N·m

CAT No.50, 5000 rpm milling spindle **OPTION**

Designed for high torque machining, such as rough machining of cast iron and steel.

Speed	5000 rpm
Output (40% ED / cont. rating)	AC 37 kW (50 HP) / AC 30 kW (40 HP)
Max. torque (40% ED / cont. rating)	715 N·m / 525 N·m

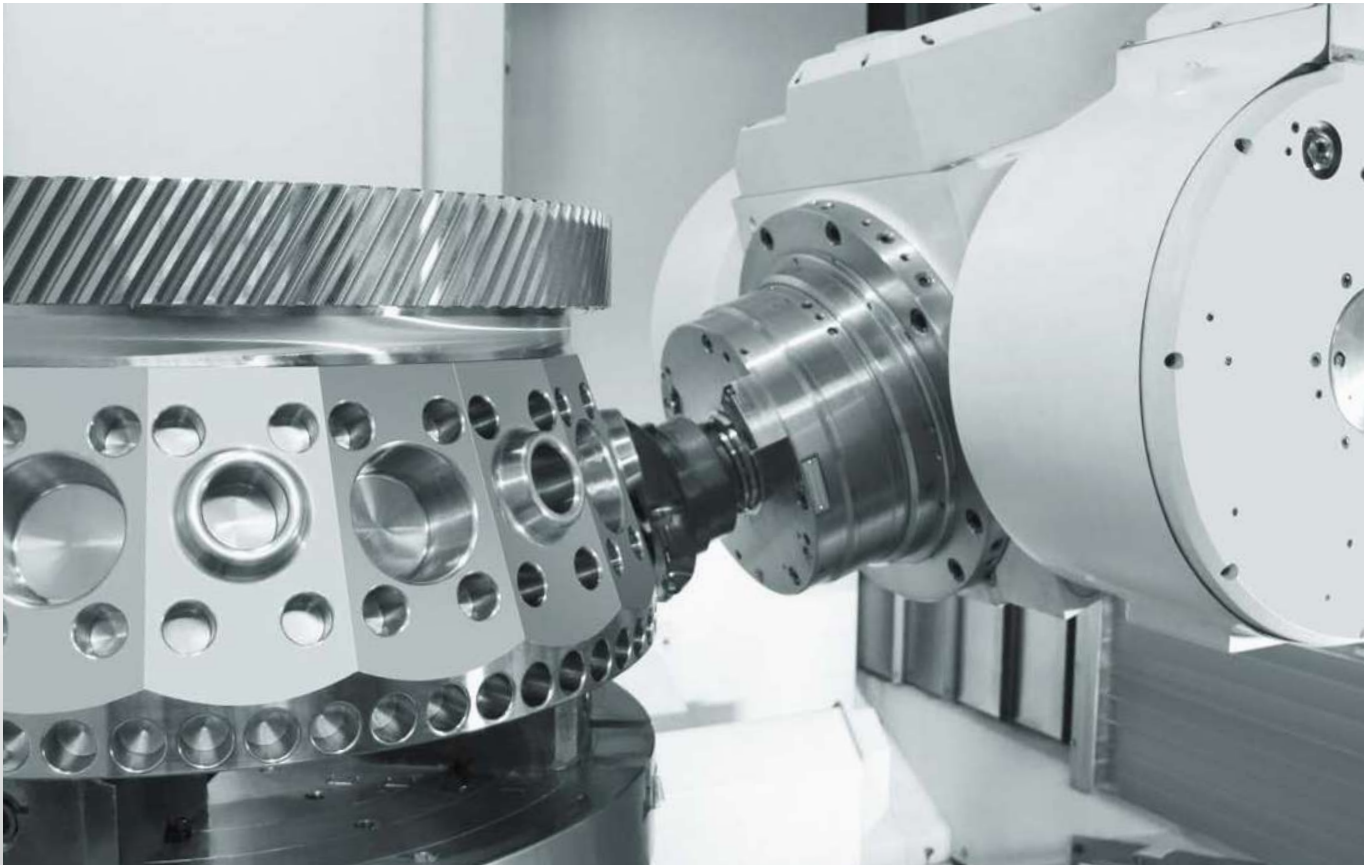
HSK T-100, 15000 rpm milling spindle **OPTION**

Ensures high speed machining of non ferrous materials and difficult-to-cut materials.

Speed	15000 rpm
Output (40% ED / cont. rating)	AC 56 kW (75 HP) / AC 45 kW (60 HP)
Max. torque (40% ED / cont. rating)	143 N·m / 118 N·m

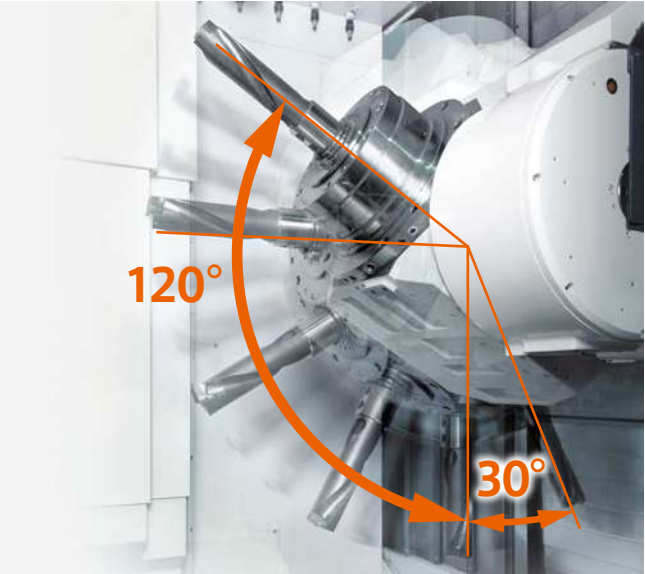
BIG-PLUS No.50·HSK T-100·CAPTO C8 **OPTION**

High-speed spindle utilizing two-face contact tool holders for high-rigidity machining.



B-axis tilting range 150°

The B-axis tilting range 150°(-30° ~ 120°) is driven by a roller gear cam without any backlash to ensure high accuracy.



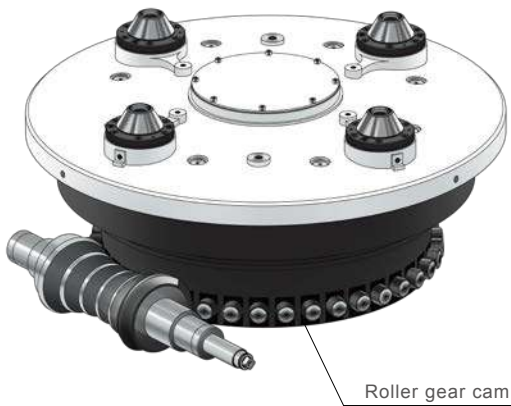
Designed for minimum interference

The compact milling spindle headstock design minimizes workpiece interference. Not only does it increase processing area, it allows shorter tools to be used for increased machining performance and accuracy.



High accuracy rotary table (C-axis)

Power is transferred through a roller gear cam which eliminates backlash and increases efficiency. NC rotary table positioning is performed with minimum program increments of 0.0001° and positioning accuracy is two times better than the ISO standard.



VORTEX i-630V/6, i-630V/6S

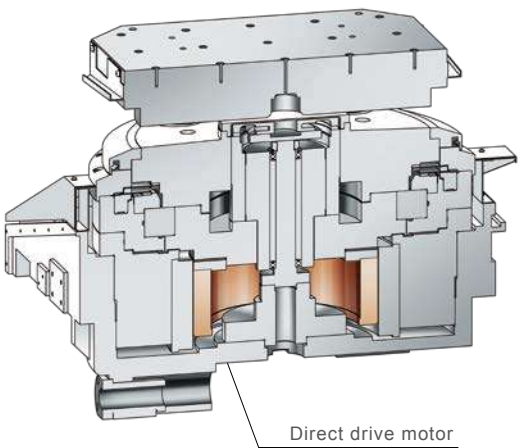
NC rotary table	
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	30 rpm
Contouring torque	1270 N·m [cont. rating]

VORTEX i-800V/8, i-800V/8S

NC rotary table	
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	25 rpm
Contouring torque	4000 N·m [cont. rating]

High torque, high accuracy, high speed table (turning spindle & C-axis)

The table is driven by a compact, high torque direct drive motor. This provides the high torque required for the machining of large workpieces as well as fast positioning performance.

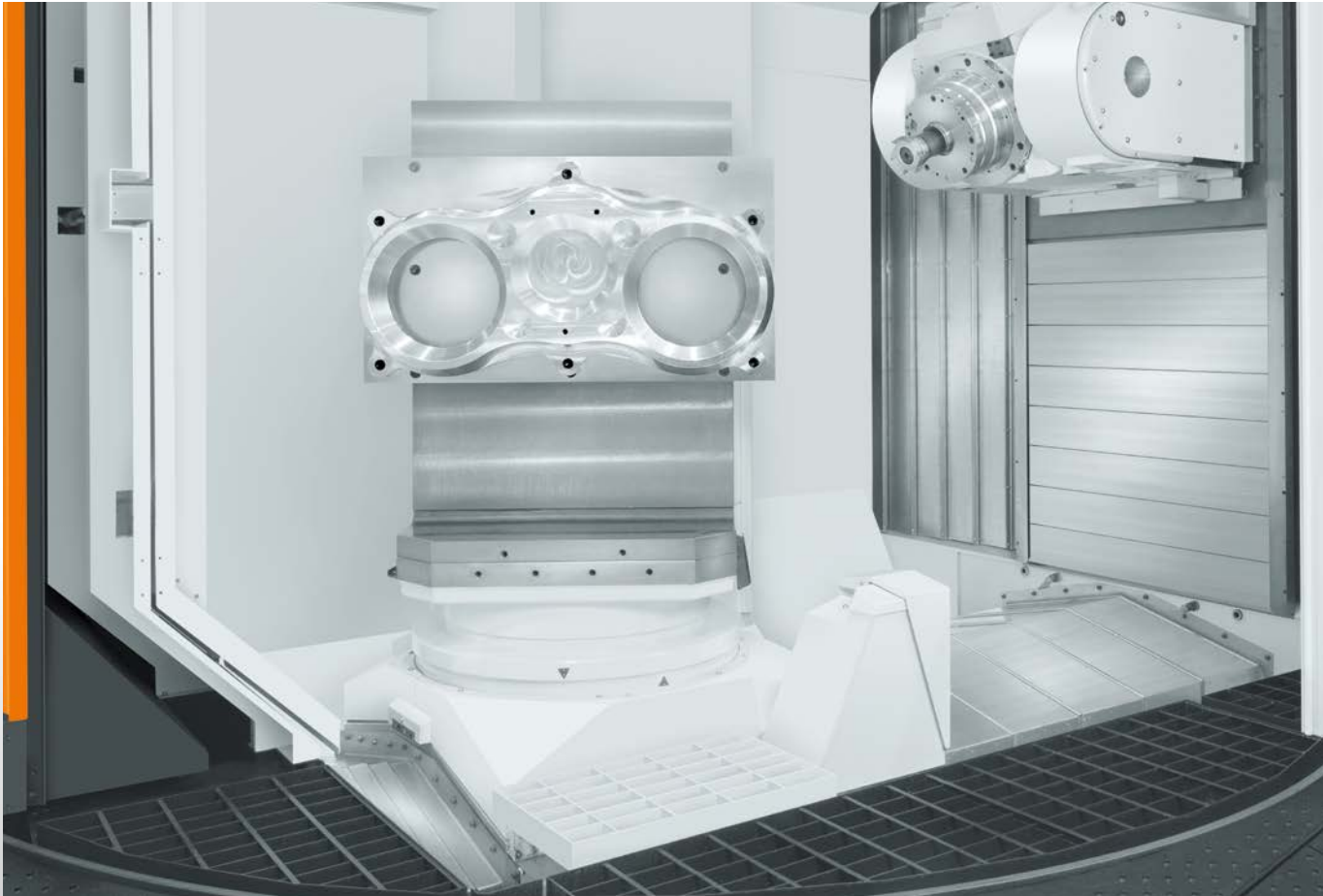


INTEGREX i-630V/6, i-630V/6S

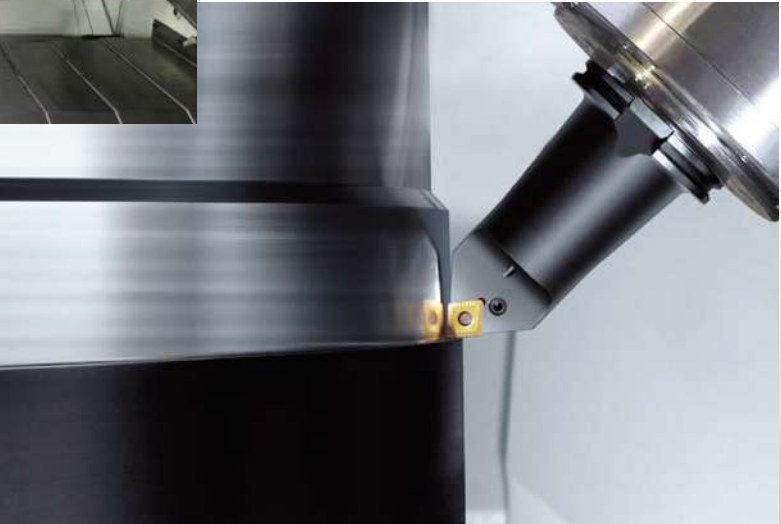
550 rpm table	
Speed	550 rpm
Output	AC 37 kW (50 HP) [cont. rating]
Max. torque	3120 N·m [cont. rating]
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	50 rpm
Contouring torque	3120 N·m [cont. rating]

INTEGREX i-800V/8, i-800V/8S

500 rpm table	
Speed	500 rpm
Output	AC 45 kW (60 HP) [cont. rating]
Max. torque	3120 N·m [cont. rating]
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	50 rpm
Contouring torque	3120 N·m [cont. rating]



Gear milling



O.D. turning

High precision machining with advanced technology

Smooth Ai Spindle

OPTION

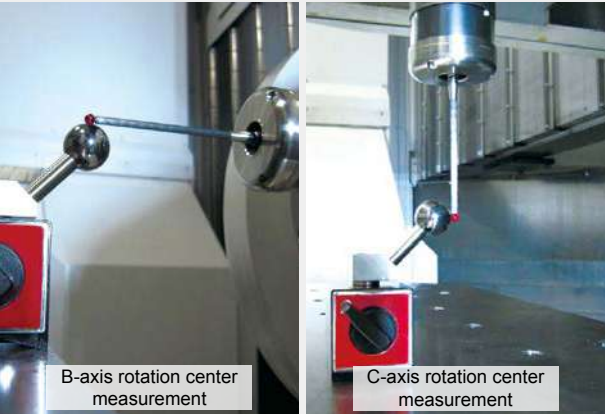
Mazak's unique AI adaptive control improves productivity and machined surface quality. If chatter vibration occurs during milling, the vibration sensor and AI adaptive control automatically change the machining conditions to surpass chatter vibration.



MAZA-CHECK

High accuracy 5-axis calibration

To ensure 5-axis machining accuracy, MAZA-CHECK measure and calibrate three values; first is the distance between the milling spindle center and table center of rotation (X-axis direction and Y-axis direction), second is the deviation between the B-axis center of rotation and the milling spindle center, and third is the offset amount between the B-axis center of rotation and the milling spindle edge surface. This calibration process is done automatically using a standard sphere, touch sensor*, and measurement macro. *The RMP-600 wireless type high precision touch sensor is required.



SMOOTH MACHINING CONFIGURATION

Machining parameter tuning function

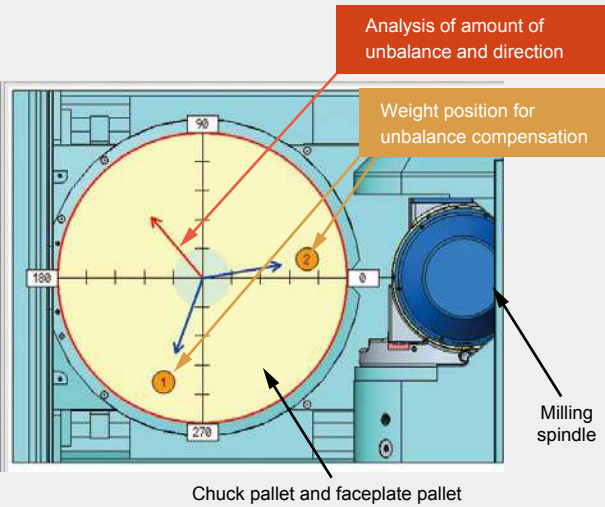
It is a function to adjust the machine characteristics related to the machining time / smooth finished surface / shape accuracy according to the machining workpiece and machining method.



BALANCE ANALYZER INTEGREX i-V series

Unbalanced table detection and analysis

By analyzing the unbalance of the turning table due to the fixture and workpiece that causes machining defects and machine damage, the position of the weight required for balancing is shown graphically. If the amount of unbalance is excessive, an alarm will be issued to stop the machine.



Achieve comfortable work and machine operation

Quickly check the status of workpiece at the setup station

The large windows on the cover door allow the operator to easily see the status of the workpiece in the setup station.



Improve the operability and safety of crane work

To prevent interference with the workpiece hanging wire, the door is integrated with the ceiling to ensure a wide opening. Crane work can be done easily and safely when loading and unloading large workpiece and fixtures.





(2-pallet changer)

(single table)

Shown with optional equipment

Check the processing status at a glance

The large operation window allows the operator to easily monitor workpiece machining.

Inside and outside steps with no height difference

OPTION

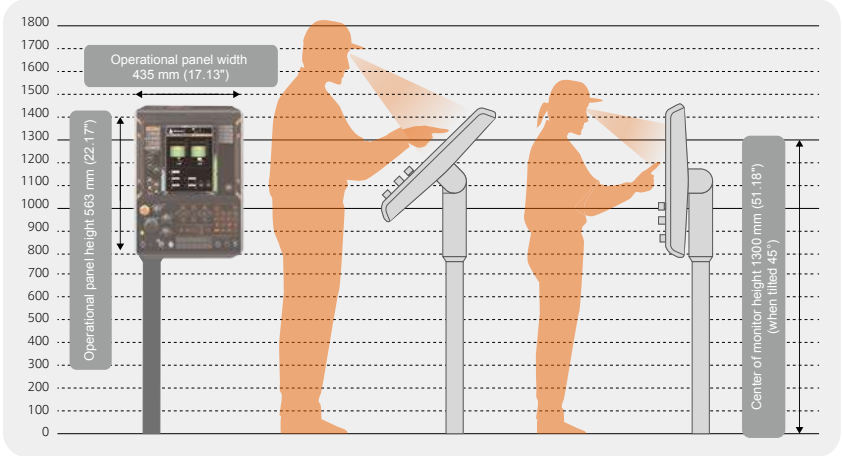
The step inside the machining area is the same height as the optional external platform providing excellent accessibility for workpiece or tool inspection.



MAZATROL SmoothAi operation panel

Adjustable CNC Operation Panel

The operation touch panel can be tilted to the optimum position for any operator's height to ensure ease of operation.



Manual pulse generator

Efficient operation inside the machine through checking the machine coordinate value

The remote manual pulse generator provides convenient operation when the operator is not close to the CNC operation panel. Its display shows the position display and the machine coordinate values. 4 different positions can be registered in memory by the remote manual pulse generator.



Tool magazine operation panel

Numeric keyboard for easy setup

The tool magazine operation panel is designed for increased ease of operation. Instead of having just a forward / reverse button for indexing the tool magazine and manually positioning the desired tool pocket, the pocket number or tool number can be input into the operation panel numeric keyboard and the desired pocket will be automatically brought into position. This is standard equipment for the different capacity tool magazines.





PALLETECH system

OPTION

The modular design of the PALLETECH conveniently allows more machines and increased pallet storage capacity to be added to the system after the initial installation in response to changing production requirements. The pallet stoker is available with one, two and three levels for large pallet storage capacity with small floor space requirements.

System specifications

		Minimum	Maximum
Machines		1	15
Number of pallets	1 level	6	240
	2 levels	12	240
	3 levels	18	240
Loading station(s)		1	8
Loading robot		1	1

Pallet stoker		i-630V/6	i-800V/8
1 level		○	○
2 levels		○	○
3 levels		○	—

○ : Available — : N / A



PALLETECH MANUFACTURING CELL (1 level)



PALLETECH HIGH RISE SYSTEM (3 levels)

SMOOTH
PMC

FMS control / management software -
unsurpassed ease of system operation to
meet sudden changes in schedule.



Tool transport system

OPTION

Machine's utilization significantly increases by the extended automatic operation time.

The number of stored tools in the machine magazine can be minimized. Special tools can be shared among machines.

Tool transport system allows the automatic tool transportation within the PALLETECH system by linking the Smooth Tool Management (option) and Smooth PMC.

Tools used in the PALLETECH system are intensively setup with the tool stocker, and tools that are not in the machine magazine will be automatically transported from the tool stocker or another machine within the PALLETECH system when necessary.

In addition, broken tools or those that have used all the preregistered tool life are automatically returned to the tool stocker.

*Available on 120 tool chain type magazine



Tool stocker

TOOL HIVE

OPTION

The TOOL HIVE can store more than 240 tools in a small space. Operation and tool data editing can be performed on the TOOL HIVE TERMINAL control panel to reduce the time required for tool setup. The TOOL HIVE tool storage capacity can be expanded after the initial installation. 240 tools and 348 tools storage are available.



TOOL HIVE TERMINAL



TOOL HIVE magazine (240 tools)

Retention bolt with tool ID

OPTION

Identifies each tool with Smooth Tool Management. Only the tool ID number is stored in tool ID, and the tool data is centralized and managed by the Smooth Tool Management (option).

By pushing the tool attachment button on the compatible tool ID magazine operation panel, the tool data is automatically inputted from the server computer of Smooth Tool Management (option) through the network.

Tool data registration and update on the machine are not required, significantly reducing the setup time.

The Smooth Tool Management is a optional software to manage a large number of tool data for higher productivity.

It reduces the time spent searching for and registering a large number of tools in the factory, and enables prompt and assured tool management.



Tool ID compatible magazine operation panel

TOOLTECH

OPTION (CAT No.50 only)

Compact rack type tool magazine with tool cart for tool loading / unloading. 206 and 348 tool storage capacities are available.



Tool cart



TOOLTECH magazine (206 tools)

Innovation for Higher Productivity

MAZATROL SMOOTH*Ai*

New MAZATROL SmoothCNC

Designed to provide unsurpassed productivity through even faster and higher precision control while elevating your production to the next level with AI and digital twin technology

- Touch screen operation — similar to using your smartphone / tablet
- MAZATROL Smooth graphical user interface for unsurpassed ease of operation
- CNC System integrates with your Windows® PC
- Latest hardware and software for unprecedented speed and precision
- Higher machining speed for high accuracy 5-axis machining
- Fine tuning function - easy machining parameter setting for various workpieces
- MAZATROL TWINS - software that enables real-time sharing and centralized management of various data for increase productivity

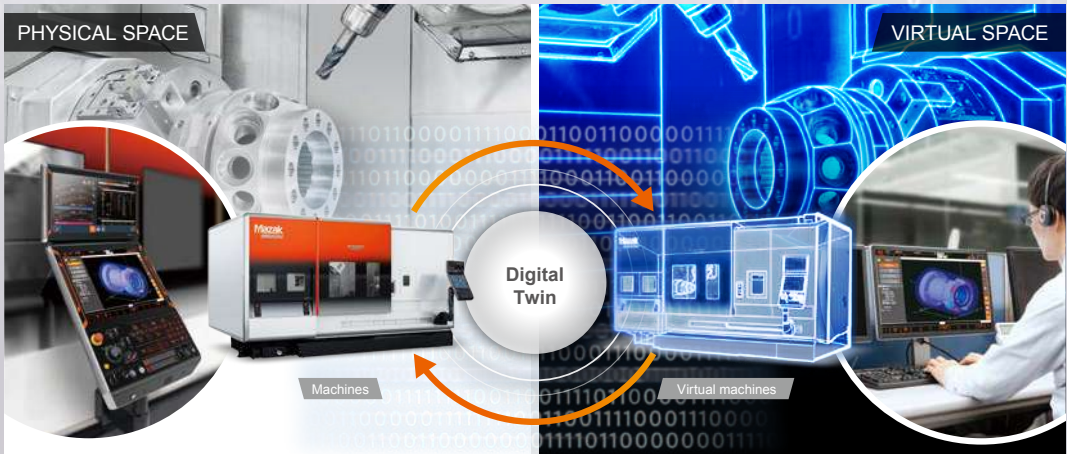
■ AI

Increase your productivity with AI technology



■ Digital Twin

Create a virtual machine on your office PC for efficient setup and improved productivity



■ Automation

Advanced automation utilizing robot and software



Shown with optional MAZATROL SmoothAi dual monitor

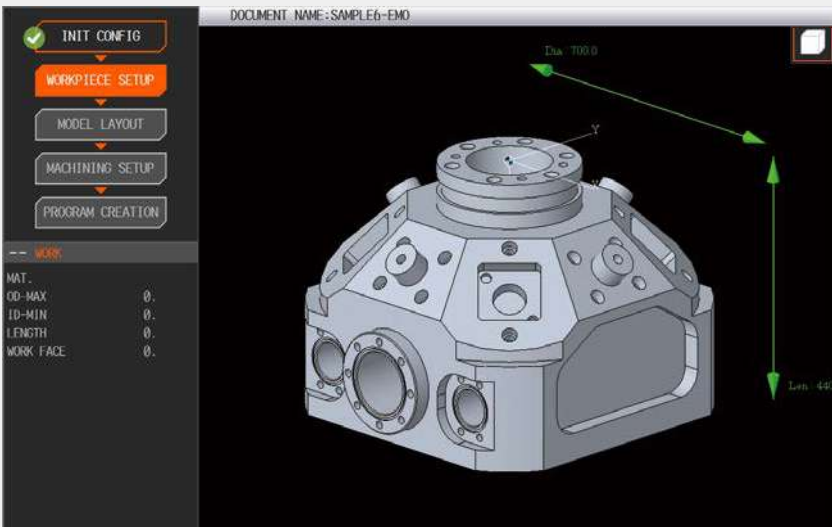
Innovative functions to improve productivity from programming to machining

Automatic programming

Solid MAZATROL

INTEGREX i-V series

A program is automatically generated from 3D CAD data.
AI learning utilizes the machining know-how from the programs created in the past, automatically calculates the machining process, generating the optimal program.



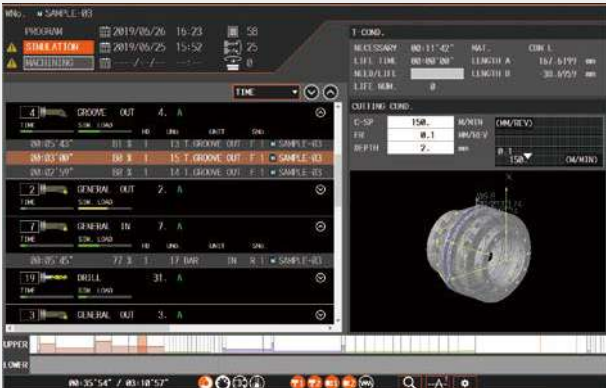
Simulation, Test cutting (machining analysis, optimization)

Cutting Adviser

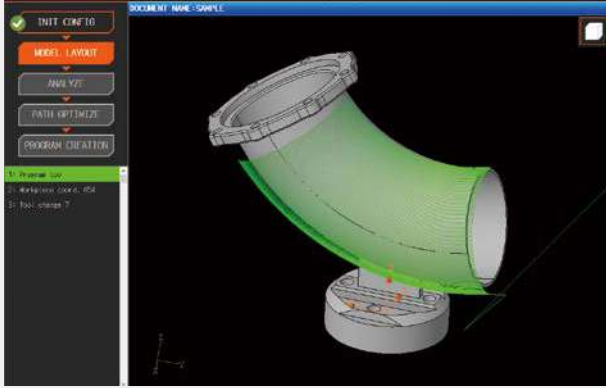
SMC PLUS

OPTION

Cutting adviser optimizes machining conditions by MAZATROL SmoothAi CNC and Smooth CAM Ai simulation (optional software).



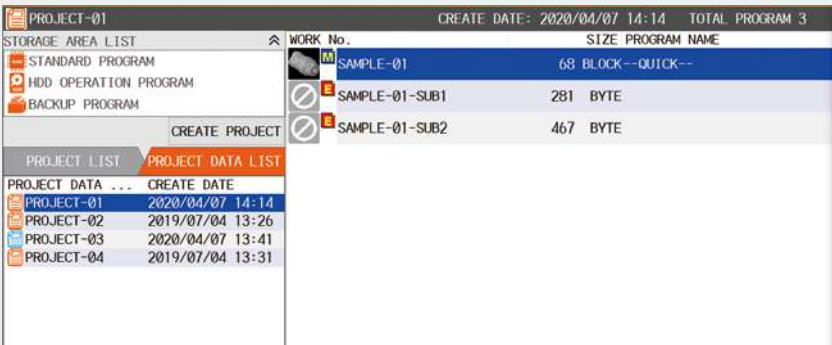
Compares the cutting point of the EIA program with the 3D model so the correct command point can be changed to ensure the correct tool path and high accuracy finished surfaces.



Set up

Project function

Data required to execute machining is managed as project data. Project data can be exported to the machine, drastically reducing time for inputting data.
Additionally, project data of entire factory can be managed with Smooth Project Manager. (optional software)



Machining

Ai Thermal Shield

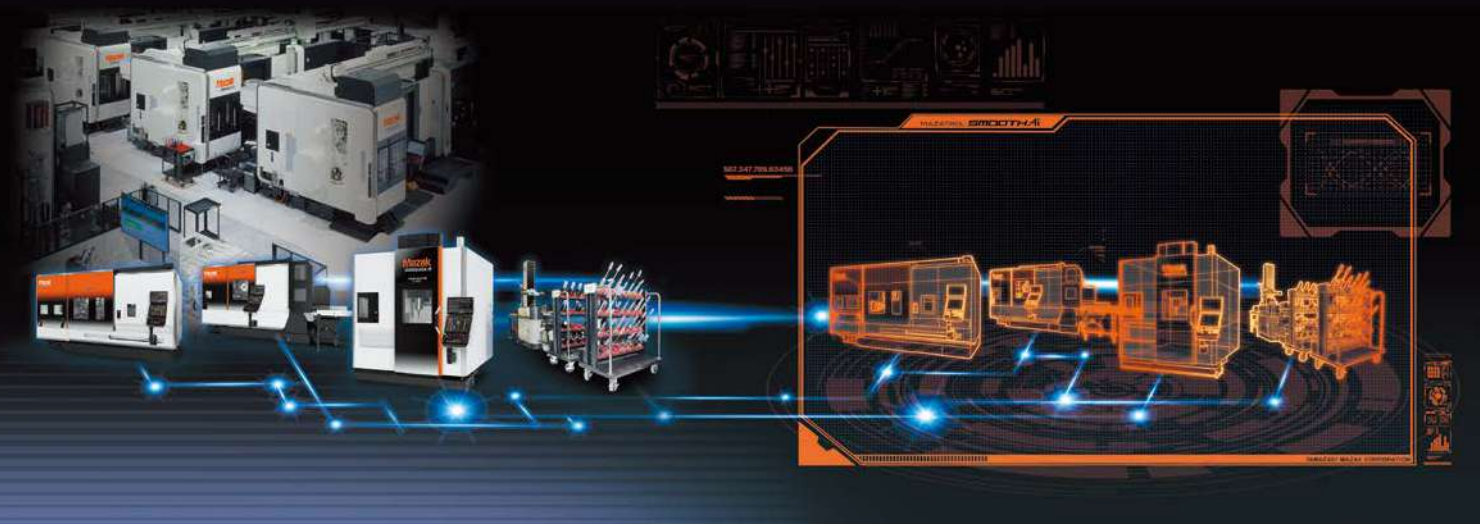
Ai Thermal Shield ensures enhanced heat displacement compensation. New algorithms automatically determine the amount of compensation to be applied according to changes in the temperature to ensure even higher machining accuracy.



MAZATROL TWINS (software) for high productivity **OPTION**

Virtual machines in your office accurately duplicate the operation of machines on your factory floor.

Available software can be used together with machines equipped with the MAZATROL SmoothAi CNC to substantially increase the efficiency of your production.



Smooth Tool Management

The Smooth Tool Management software manages data of the large number of tools in use by a factory for higher productivity.



Smooth Monitor AX • Smooth Link

Smooth Monitor AX is software to monitor operational status and analyze accumulated manufacturing data for factory productivity improvement.

Smooth Link is software to view operational status and machining programs on tablets and smartphones, so the operator can instantly view necessary information while monitoring away from the monitor.



Smooth PMC

Software for FMS's automatic operation and management.

Smooth simulation function enables highly efficient automatic operation by predicting the operation load, missing tools for each machine, and production output.

Create schedules and monitor operational status from a PC in an office, tablets and smartphones by connecting to the network.



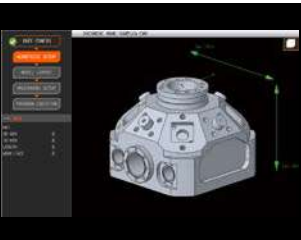
Smooth Scheduler

Smooth Scheduler is software to create effective machining schedules utilizing production data. Schedules are displayed for convenient monitoring of production progress.



Smooth CAM Ai

Programs can be made and edited, as well as performing simulation and analysis on the Smooth CAM Ai for multiple machines. This data is sent to machines in the factory for fast and accurate machine setups.



AI programming



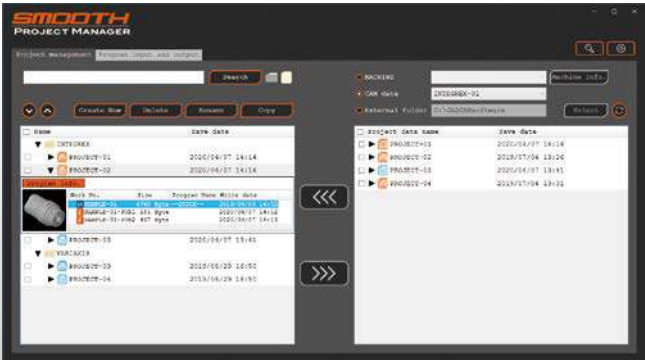
Fast simulation



Machining analysis • Optimization

Smooth Project Manager

Smooth Project Manager is used to manage the project data of the entire factory. The data can be synchronized between the machine in the factory and the PC in the office.



Pallets / chucks

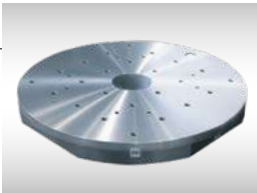
■ Tapped square pallet with location bore **OPTION**

Used for the machining of irregularly shaped workpieces without turning operations. A workpiece fixture can be mounted on the pallet.
Note : Turning spindle maximum speed when using square pallets is 50 rpm



■ Tapped round pallet with location bore **OPTION**

Used for machining irregularly shaped workpieces including turning. A fixture plate that mounts the workpiece is placed on this pallet for turning operations.



■ Face plate with jaws **OPTION**

Used for cylindrical and square workpieces. Jaws can be moved separately to accurately center a workpiece as well as be adjusted for different workpiece diameters.



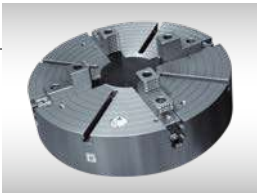
■ Scroll chuck with 3 jaws **OPTION**

Used for machining of cylindrical workpieces. By turning a wrench, all 3 jaws move towards the chuck center to easily center a workpiece.



■ 4-jaw independent chuck **OPTION**

Used for cylindrical and square workpieces. Jaws can be moved separately to accurately center a workpiece. Perform high precision centering as it can conduct fine adjustment of a workpiece's central position.
When changing a workpiece's gripping diameter, it is able to perform simple setup by changing the jaw's installation position.
Note : turning spindle maximum speed is limited according to specifications of circular pallets and chucks



Tool holder for turning *INTEGREX i-V series*

■ Standard tooling package

Comes with a tool holder (CAT No.50) for outer diameter and inner diameter machining.

Name	Bite shape	Insertion shape	Quantity
O.D. tool holder (right-handed)	25×25×25 mm	—	1
O.D. tool holder (left-handed)	25×25×25 mm	—	1
Boring bar holder (side-lock)	—	—	2
O.D. tool holder 45°	—	80° diamond-shape chip	2
I.D. tool holder (right-handed)	—	80° diamond-shape chip	2

Tool measurement

■ Tool eye **OPTION** *INTEGREX i-V series*

The tool eye can be programmed for automatic tool measurement and compensation as well as inspection for tool breakage. In addition, since tool setup is done by simply bringing the tool tip into contact with the tool eye, tool setup time is considerably reduced.



■ Automatic tool length measurement & tool breakage detection *VORTEX i-V series*

Tool length is automatically measured and registered in CNC system. Tool breakage can be detected during automatic operation.

■ Laser milling tool measurement system **OPTION**

The laser milling tool measurement system measures tool length and diameter at least Φ0.5 mm which cannot be done by conventional measurement systems.



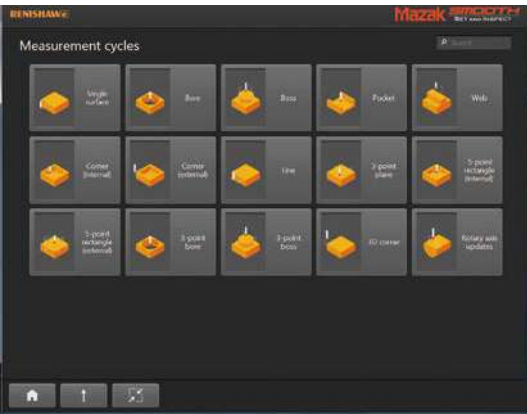
Coordinate and workpiece measurement

■ Mazak monitoring system B RMP-600 **OPTION**

Coordinate values are automatically shifted according to the results of probing a workpiece by a touch sensor mounted in the machine spindle.
Reads the current position by a contact signal with the measurement device (touch sensor tool) and a workpiece, and reflects the information on the CNC.

■ Smooth Set and Inspect **OPTION**

Inspection programs can be easily made. Work coordinates and tool compensation can automatically be updated using measurement results.



Coolant · chip disposal

SUPERFLOW coolant system OPTION

The SUPERFLOW coolant system features lower tool tip temperatures, improved coolant lubrication and chip disposal by supplying a maximum 7.0 MPa (70 kgf/cm²) coolant pressure.

- Adjustable coolant pressure
- High performance cyclone filter with minimum maintenance requirements to reduce running cost

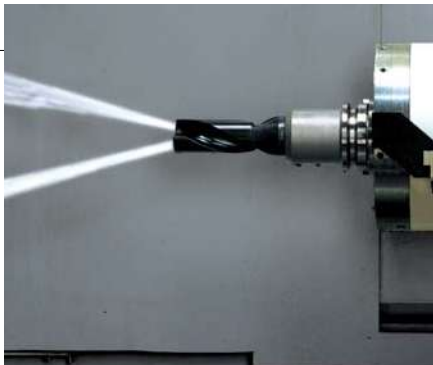


High pressure pump unit



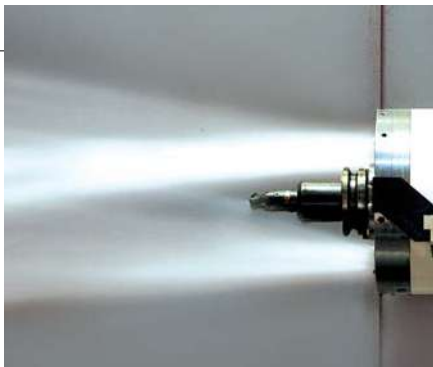
Coolant through spindle OPTION

Coolant is fed to the tool tip by passages through the tool. 3 pump pressure specifications are available : 0.8 MPa (8.16 kgf/cm²), 1.5 MPa (15.3 kgf/cm²) and 7.0 MPa (71.38 kgf/cm²).



Flood coolant

Coolant is discharged from nozzles on spindle housing to cool workpiece and remove chips.



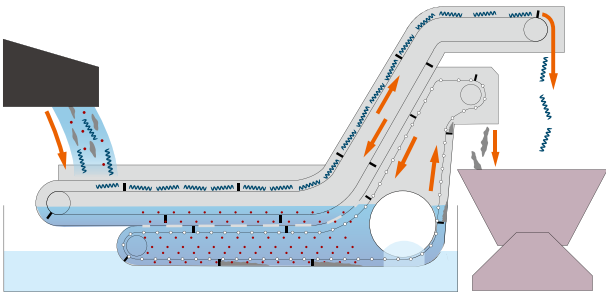
Niagara coolant

Large volume coolant is discharged from the nozzles mounted on the machine top cover to flush chips from the workpiece to conveyors on both sides of the table.



Chip conveyor (ConSep2000) OPTION

The upper conveyor discharges long and curly chips. The lower conveyor discharges fine chips and performs coolant filtration using the drum filter.



Chip conveyor

The type of chip conveyor to be selected is based on the type of machined chips that will be produced.

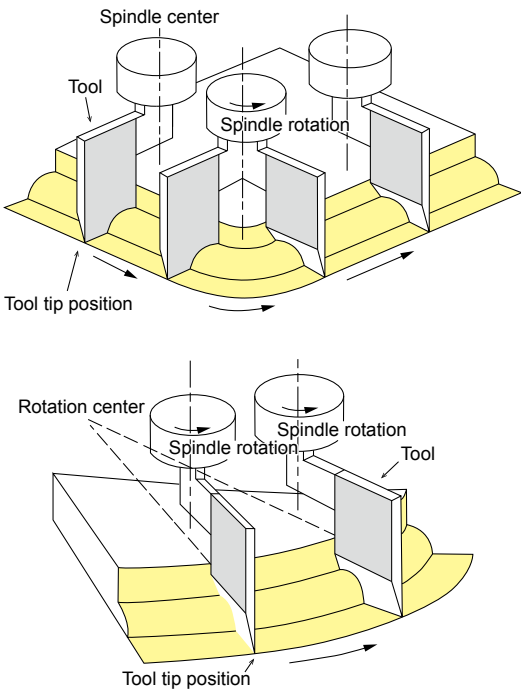
○ : Applicable × : Not applicable

Chip shape		Sludge-like chips (0.25 mm ~ 1 mm)	Needle-like chips (~0.5 mm)	1~5mm	5~30mm (Max. 30mm)	30~70mm (Max. 70mm)	70mm -	Features
Hinge	For ferrous machining	×	×	×	×	○	○	Applicable for long, steel chips
	For ferrous / aluminium / cast-iron machining	○	○	○	○	○	○	Applicable regardless of chip length

Machining software

Shaping OPTION

By radially positioning and feeding a shaping tool, features such as grooves and sealing surfaces can be machined with better surface finishes than those produced by an endmill.

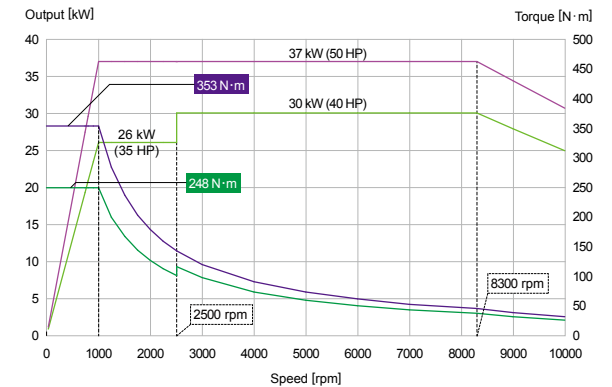


■ Milling spindle output / torque diagram

CAT No.50, 10000 rpm milling spindle

Max. speed 10000 rpm
Output (40% ED / cont. rating) AC 37 kW (50 HP) / AC 30 kW (40 HP)
Max. torque (40% ED / cont. rating) 353 N·m / 248 N·m

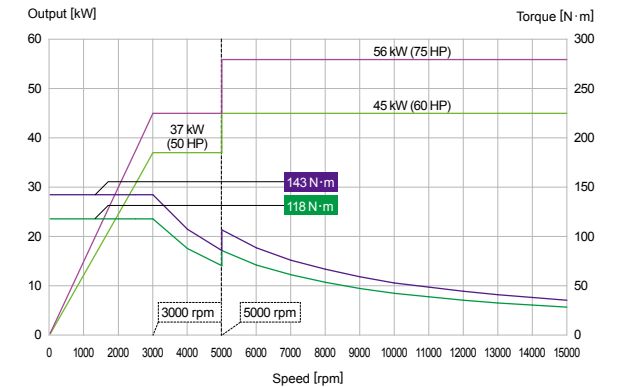
Output (cont. rating) Torque (cont. rating)
Output (40% ED) Torque (40% ED)



HSK T-100, 15000 rpm milling spindle **OPTION**

Max. speed 15000 rpm
Output (40% ED / cont. rating) AC 56 kW (75 HP) / AC 45 kW (60 HP)
Max. torque (40% ED / cont. rating) 143 N·m / 118 N·m

Output (cont. rating) Torque (cont. rating)
Output (40% ED) Torque (40% ED)

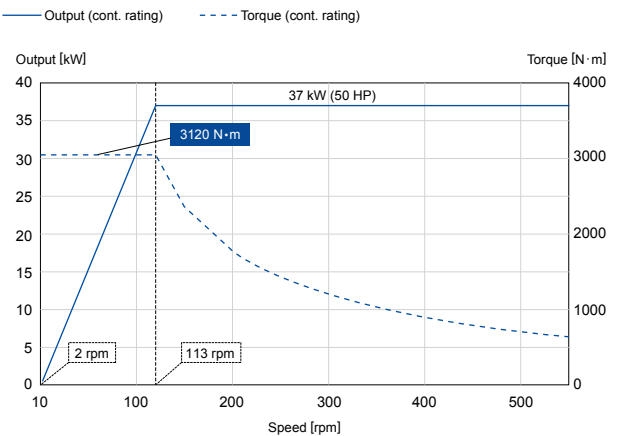


■ Table (turning spindle) output / torque diagram

INTEGREX i-630V/6, i-630V/6S
550 rpm table (turning spindle)

Max. speed 550 rpm
Output AC 37 kW (50 HP) [cont. rating]
Max. torque 3120 N·m [cont. rating]
Min. indexing angle increment (C-axis) 0.0001°
Rapid traverse rate (C-axis) 50 rpm
Contouring torque 3120 N·m [cont. rating]

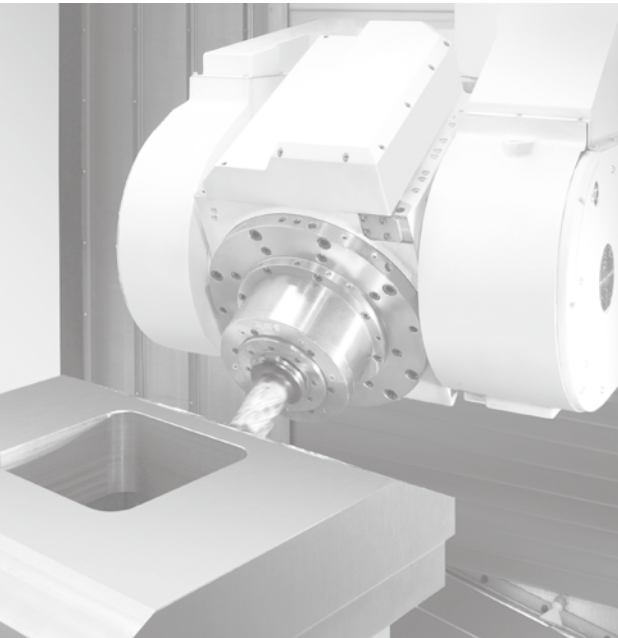
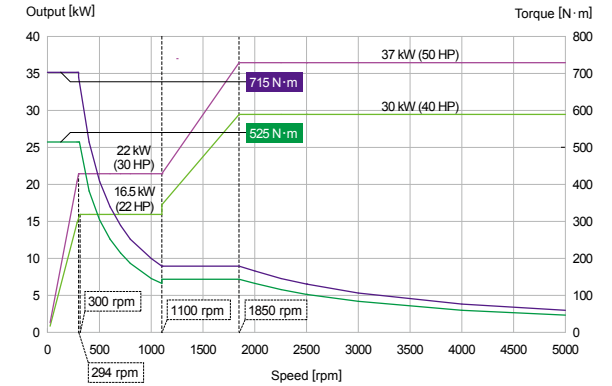
Output (cont. rating) Torque (cont. rating)



CAT No.50, 5000 rpm milling spindle **OPTION**

Max. speed 5000 rpm
Output (40% ED / cont. rating) AC 37 kW (50 HP) / AC 30 kW (40 HP)
Max. torque (40% ED / cont. rating) 715 N·m / 525 N·m

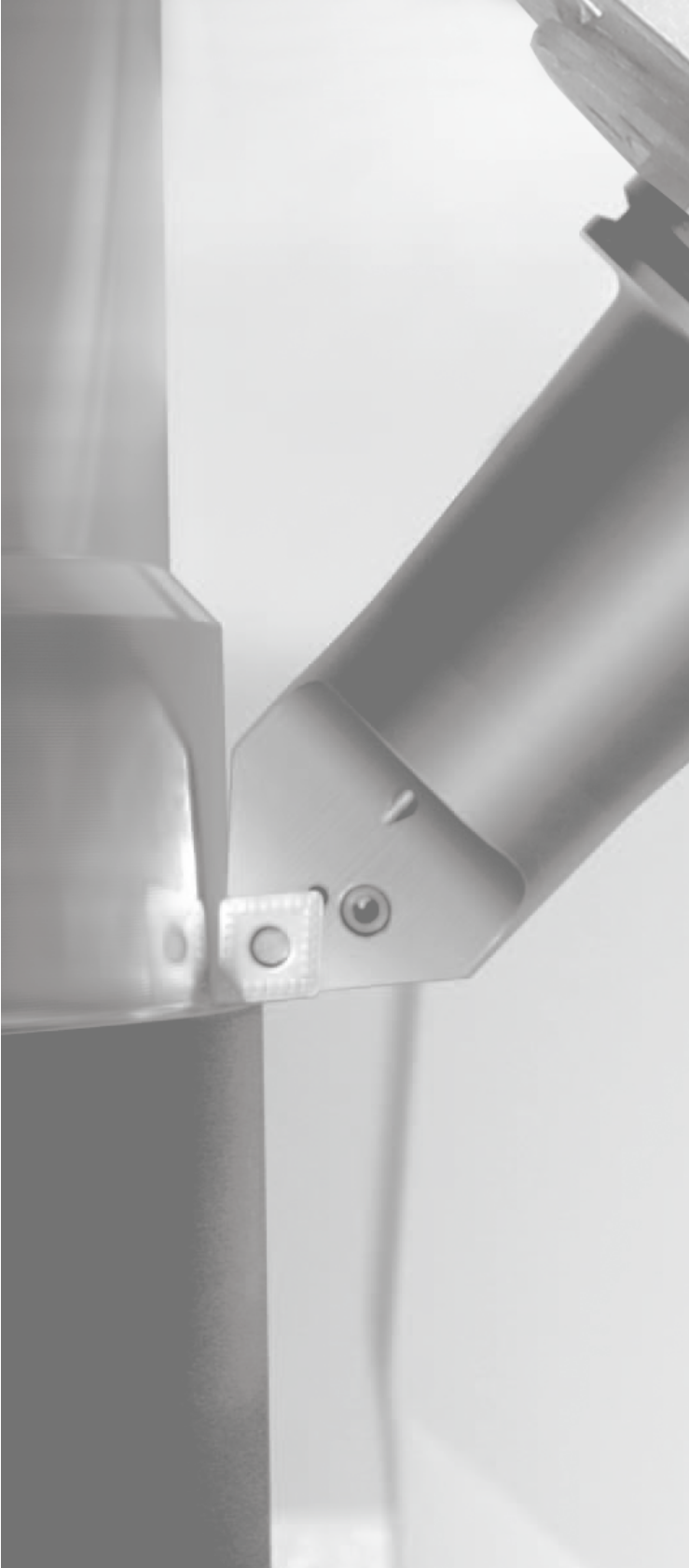
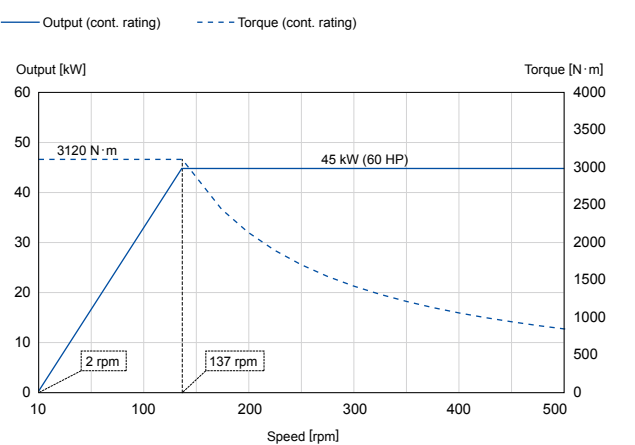
Output (cont. rating) Torque (cont. rating)
Output (40% ED) Torque (40% ED)



INTEGREX i-800V/8, i-800V/8S
500 rpm table (turning spindle)

Max. speed 500 rpm
Output AC 45 kW (60 HP) [cont. rating]
Max. torque 3120 N·m [cont. rating]
Min. indexing angle increment (C-axis) 0.0001°
Rapid traverse rate (C-axis) 50 rpm
Contouring torque 3120 N·m [cont. rating]

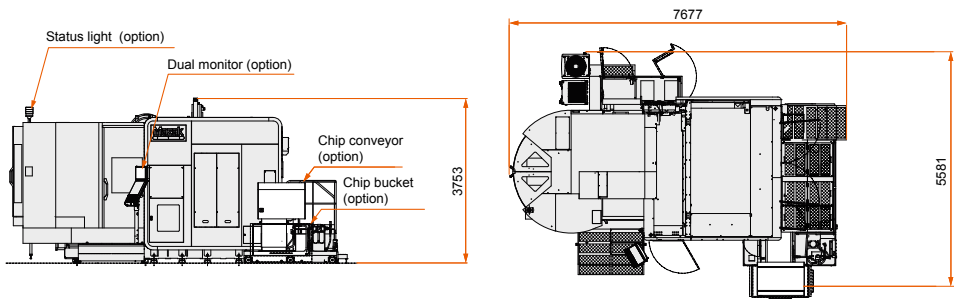
Output (cont. rating) Torque (cont. rating)



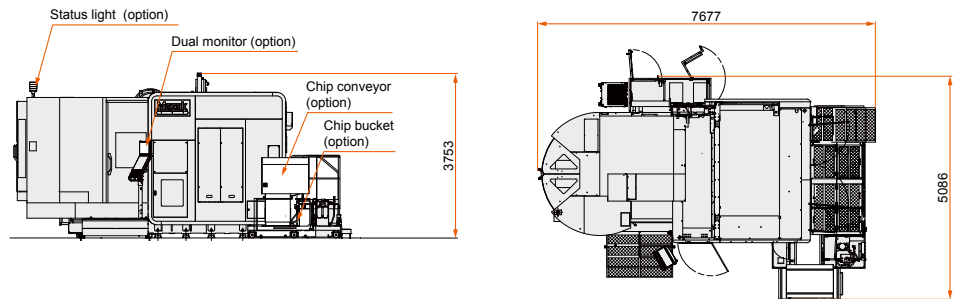
Machine Dimensions

Unit : mm

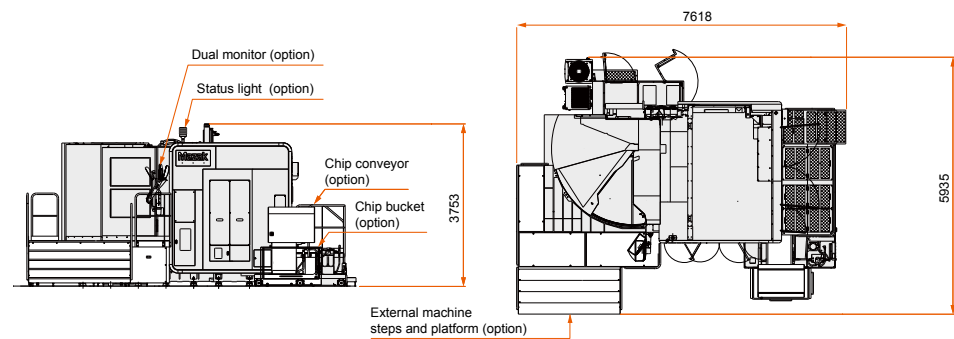
INTEGREX i-630V/6



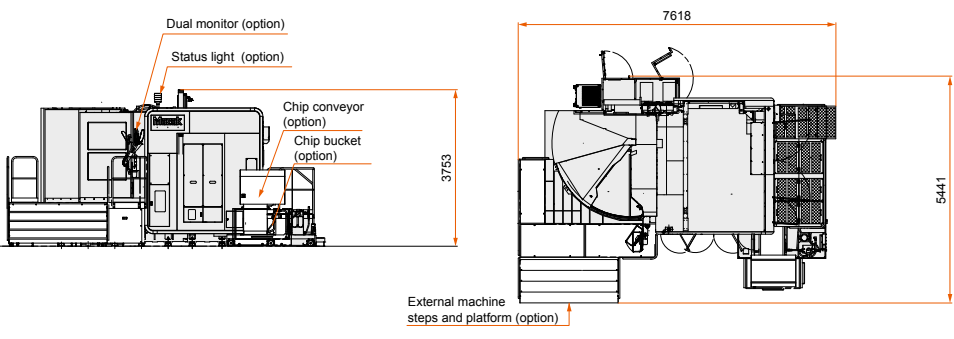
VORTEX i-630V/6



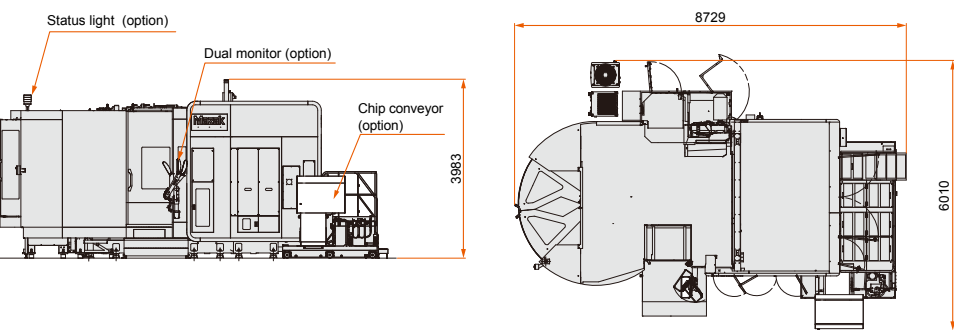
INTEGREX i-630V/6S



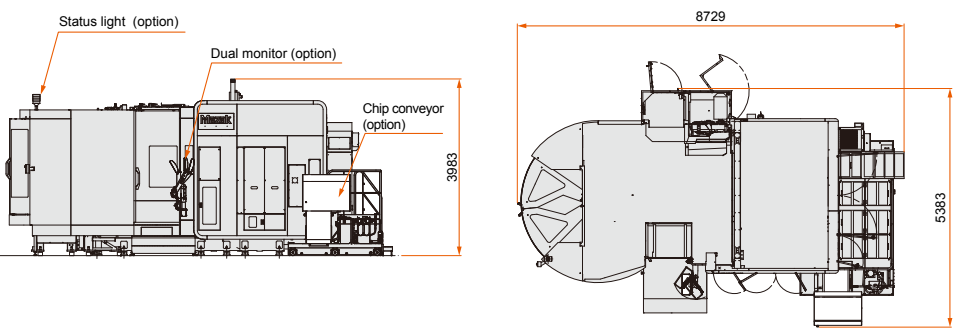
VORTEX i-630V/6S



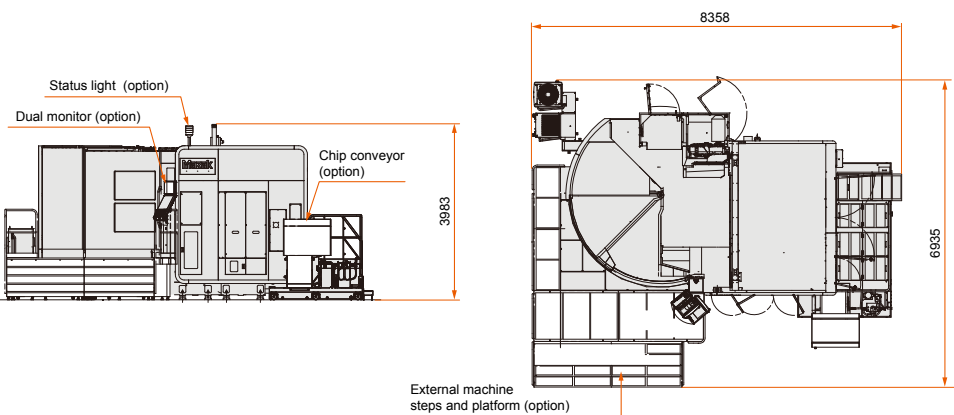
INTEGREX i-800V/8



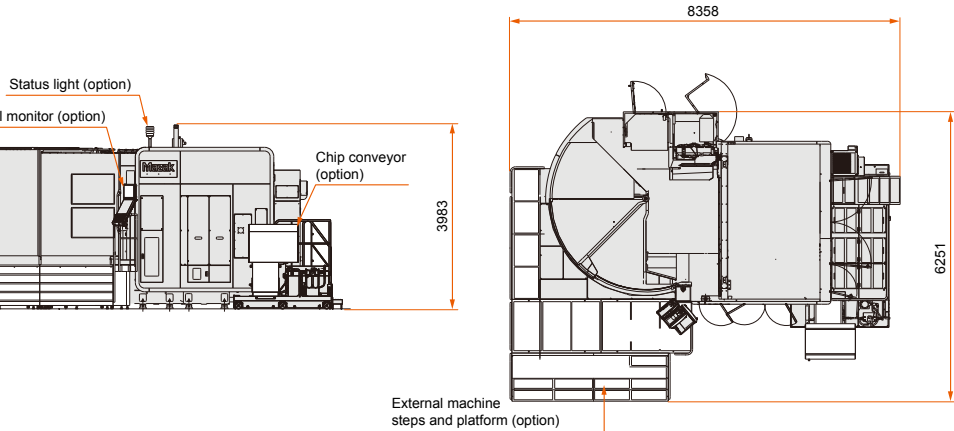
VORTEX i-800V/8



INTEGREX i-800V/8S



VORTEX i-800V/8S



■ Standard Machine Specifications

			VORTEX i-630V/6	INTEGREX i-630V/6	VORTEX i-630V/6S		INTEGREX i-630V/6S	VORTEX i-800V/8	INTEGREX i-800V/8	VORTEX i-800V/8S	INTEGREX i-800V/8S
Stroke	X-axis (table forward / backward)		1425 mm		1425 mm		1700 mm				
	Y-axis (spindle head travel right / left)		1050 mm		1050 mm		1500 mm				
	Z-axis (spindle head travel up / down)		1050 mm		1050 mm		1150 mm				
	B-axis (spindle head tilt)		150° (−30° ~ +120°)		150° (−30° ~ +120°)		150° (−30° ~ +120°)				
	C-axis (table rotate)		360° (cont.)		360° (cont.)		360° (cont.)				
	Distance between B-axis rotation center and pallet center (X-axis at home)		1395 mm		1395 mm		1690 mm				
	Distance between B-axis rotation center and pallet center (X-axis at - end)		−30 mm		−30 mm		−10 mm				
	Distance between spindle gauge line and pallet center (B-axis = +90°) (X-axis at home)		1045 mm		1045 mm		1340 mm				
	Distance between B-axis rotation center and pallet top face* ¹		100 mm ~ 1150 mm		100 mm ~ 1150 mm		100 mm ~ 1250 mm				165 mm ~ 1315 mm
Distance between spindle gauge line and pallet top face (B-axis =0°)* ¹		−250 mm ~ 800 mm		−250 mm ~ 800 mm		−250 mm ~ 900 mm				−185 mm ~ 965 mm	
Capacity	Max. machining diameter (O.D.)		—	Φ 1050 mm	—		Φ 1250 mm	—	Φ 1500 mm	—	Φ 1700 mm
	Max. workpiece diameter		Φ 1050 mm		Φ 1250 mm (X-axis at - end : Φ 1050 mm)		Φ 1250 mm (X-axis at - end : Φ 1050 mm)	Φ 1500 mm (X-axis at - end : Φ 1100 mm)		Φ 1700 mm (X-axis at - end : Φ 1100 mm)	
	Max. workpiece height* ¹		1000 mm		1400 mm		1400 mm	1500 mm		1600 mm	1665 mm
	Max. workpiece load (evenly distributed)* ¹		1500 kg		1500 kg		1500 kg	2500 kg		3000 kg	3020 kg
	Max. load (including pallet)		1750 kg		1750 kg		1750 kg	3000 kg		3500 kg	
Table	Max. spindle speed* ²		—	550 rpm	—		550 rpm	—	500 rpm	—	500 rpm
	Rapid traverse rate (C-axis)		30 rpm	50 rpm	30 rpm		50 rpm	25 rpm	50 rpm	25 rpm	50 rpm
	Max. cutting feedrate (C-axis)		—	8.33 rpm	—		8.33 rpm	—	7.69 rpm	—	7.69 rpm
	Min. indexing angle increment (C-axis)		0.0001°		0.0001°		0.0001°				
	Indexing time		1.5 s / 90°	1.6 s / 90°	1.5 s / 90°		1.6 s / 90°	2.1 s / 90°			
Milling spindle	Max. spindle speed		10000 rpm		10000 rpm		10000 rpm	10000 rpm			
	Spindle taper		7/24 taper No.50		7/24 taper No.50		7/24 taper No.50	7/24 taper No.50			
	Spindle bearing ID		Φ 100 mm		Φ 100 mm		Φ 100 mm	Φ 100 mm			
	Spindle acceleration		5.6 s [0 ~ 10000 rpm]		5.6 s [0 ~ 10000 rpm]		5.6 s [0 ~ 10000 rpm]	4.9 s [0 ~ 10000 rpm]			
	Rapid traverse rate (B-axis)		30 rpm		30 rpm		30 rpm	30 rpm			
	Max. cutting feedrate (B-axis)		10 rpm		10 rpm		10 rpm	8.33 rpm			
	Min. indexing angle increment (B-axis)		0.0001°		0.0001°		0.0001°	0.0001°			
	Indexing time (B-axis)		2.2 s / 90°		2.2 s / 90°		2.2 s / 90°	2.2 s / 90°			
Feedreate* ³	Rapid traverse rate (X-, Y-, Z-axis)		52000 mm/min		52000 mm/min		52000 mm/min	52000 mm/min			
	Max. cutting feedrate (X-, Y-, Z-axis)* ⁴		8000 mm/min		8000 mm/min		8000 mm/min	8000 mm/min			
Automatic tool changer	Tool shank		No.50		No.50		No.50	No.50			
	Pullstud		Yamazaki ANSI type		Yamazaki ANSI type		Yamazaki ANSI type	Yamazaki ANSI type			
	Tool magazine capacity		43		43		43	43			
	Max. tool diameter / length (from gauge line) / weight		Φ 125 mm / 500 mm / 30 kg		Φ 125 mm / 500 mm / 30 kg		Φ 125 mm / 500 mm / 30 kg	Φ 125 mm / 650 mm / 30 kg			
	Max. tool diameter with adjacent tool pockets empty		Φ 250 mm* ⁵		Φ 250 mm* ⁵		Φ 250 mm* ⁵	Φ250 mm* ⁶			
	Tool selection method		Random selection, shortest path (fixed pocket assignment)		Random selection, shortest path (fixed pocket assignment)		Random selection, shortest path (fixed pocket assignment)	Random selection, shortest path (fixed pocket assignment)			
	Tool change time (chip-to-chip) [Mill H → Mill H]* ⁷		8.5 s		8.5 s		8.5 s	10.2 s	11.0 s	10.2 s	11.0 s
Automatic pallet changer	Number of pallets		2		—		—	2		—	
	Pallet change time		11 s		—		—	22 s		—	
	Change system		Rotary type		—		—	Rotary type		—	
Motors	Table motor		—	AC 37 kW (50 HP) [cont. rating]	—		AC 37 kW (50 HP) [cont. rating]	—	AC 45 kW (60 HP) [cont. rating]	—	AC 45 kW (60 HP) [cont. rating]
	Milling spindle motor		AC 37 / 30 kW (50 / 40 HP) [40% ED / cont. rating]		AC 37 / 30 kW (50 / 40 HP) [40% ED / cont. rating]		AC 37 / 30 kW (50 / 40 HP) [40% ED / cont. rating]	AC 37 / 30 kW (50 / 40 HP) [40% ED / cont. rating]			
Electrical and air requirements	Electrical power supply [50 Hz]	short-duration rating cont. rating	104.3 kVA (40% ED) 94.3 kVA	120.90 kVA (40% ED) 110.97 kVA	104.3 kVA (40% ED) 94.3 kVA		120.90 kVA (40% ED) 110.97 kVA	108.5 kVA (30min. rating) 98.8 kVA	97.85 kVA (30min. rating) 88.11 kVA	108.5 kVA (30min. rating) 98.8 kVA	97.85 kVA (30min. rating) 88.11 kVA
	Electrical power supply [60 Hz]	short-duration rating cont. rating	106.2 kVA (40% ED) 96.2 kVA	122.79 kVA (40% ED) 112.86 kVA	106.2 kVA (40% ED) 96.2 kVA		122.79 kVA (40% ED) 112.86 kVA	110.8 kVA (30min. rating) 101.1 kVA	99.49 kVA (30min. rating) 89.75 kVA	110.8 kVA (30min. rating) 101.1 kVA	99.49 kVA (30min. rating) 89.75 kVA
	Air supply (pressure)		0.5 MPa (5 kgf/cm ³)		0.5 MPa (5 kgf/cm ³)		0.5 MPa (5 kgf/cm ³)	0.5 MPa (5 kgf/cm ³)	0.5 MPa (5 kgf/cm ³)	0.5 MPa (5 kgf/cm ³)	0.5 MPa (5 kgf/cm ³)
	Air supply (flow rate)		600 L/min		600 L/min		600 L/min	600 L/min	800 L/min	600 L/min	800 L/min
	Tank capacity		Coolant tank capacity		1400 L		1400 L	1400 L			
Machine size	Machine height		3753 mm		3753 mm		3753 mm	3983 mm			
	Floor space requirement		5086 mm × 7677 mm	5581 mm × 7677 mm	5441 mm × 7618 mm		5935 mm × 7618 mm	5383 mm × 8729 mm	6010 mm × 8729 mm	6251 mm × 8358 mm	6935 mm × 8358 mm
	Machine weight		32650 kg		30850 kg		30850 kg	38650 kg	39650 kg	34650 kg	35650 kg
CNC			MAZATROL SmoothAi		MAZATROL SmoothAi		MAZATROL SmoothAi				
Sound	Equivalent continuous sound pressure level at operator position (dependant on equipment options)		Less than 80 dB (A)		Less than 80 dB (A)		Less than 80 dB (A)				

*¹ i-630V/6 and i-630V/6S : with □630 mm tapped pallet, i-800V/8 : with □800 mm tapped pallet and i-800V/8S : with Φ1000 mm bolt-on tapped pallet.

*² Max. speed of the main spindle is limited according to the specifications of the round pallet and chuck. When equipped with square pallet, the spindle speed is limited to 50 rpm.

*³ Limited feedrate with continuous movement.

*⁴ Value of G01. Able to perform fast at G61.1 depending on the condition.

*⁵ When adjacent pockets are empty and pockets next to them have tools less than Φ240 mm, maximum tool diameter is Φ260 mm.

*⁶ When adjacent pockets are empty and pockets next to them have tools less than Φ200 mm, maximum tool diameter is Φ300 mm.

*⁷ Required time for EIA program utilizing BT.

MAZATROL SmoothAi Specifications

● : INTEGREX i-V series only		
	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 ~ 4 axes	Simultaneous 5 axes*
Least input increment	0.0001 mm, 0.00001 inch, 0.0001 deg	
High speed, high precision control	Shape compensation, Smooth corner control, Rapid traverse overlap, Rotary axis shape compensation	Shape compensation, Smooth corner control, Rapid traverse overlap, Rotary axis shape compensation, High-speed machining mode, High-speed smoothing control, 5-axis spline*, Path error suppression control*, Tool path optimization*
Interpolation	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Cylindrical interpolation, Polar coordinate interpolation, Constant lead threading●, Re-threading*●, Thread start point compensation*●, Thread cut-speed override*●, Synchronous tapping*	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Constant lead threading●, Variable lead threading●, Threading (C-axis interpolation type)●, Cylindrical interpolation*, Involute interpolation*, Fine spline interpolation*, NURBS interpolation*, Polar coordinate interpolation*, Re-threading*●, Thread start point compensation*●, Thread cut-speed override*●, Synchronous tapping*
Feedrate	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Dwell (time / rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Variable acceleration control, G0 slope constant*	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Inverse time feed, Dwell (time / rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Time constant changing for G1, Variable acceleration control, G0 slope constant*
Program registration	Number of programs : 256 (Standard) / 960 (Max.), Program memory : 2 MB, Program memory expansion : 8 MB*, Program memory expansion : 32 MB*	
Control display	Display : 19" touch panel, Resolution : SXGA	
Spindle function	S code output, Spindle speed limitation, Spindle speed override, Spindle speed reaching detection, Multiple position orient, Constant surface speed, Spindle speed command with decimal digits, Synchronized spindle control, Spindle speed range setting	
Tool functions	Number of tool offset : 4000, T code output for tool number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces), Tool life monitoring (wear)●	Number of tool offset : 4000, T code output for tool number, T code output for group number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces), Tool life monitoring (wear)●
Miscellaneous functions	M code output, Simultaneous output of multiple M codes	
Tool offset functions	Tool position offset, Tool length offset, Tool diameter / tool nose R offset, Tool nose shape offset*, Tool wear offset, Fixed amount offset●, Simple wear offset●	Tool position offset, Tool length offset, Tool diameter / tool nose R offset, Tool wear offset, Fixed amount offset●, Simple wear offset*
Coordinate system	Machine coordinate system, Work coordinate system, Local coordinate system, Additional work coordinates (300 set)	
Machine functions	—	Rotary axis prefilter, Tilted working plane, Polygonal machining*, Hobbing II*, Shaping function*, Dynamic compensation II*, Tool center point control*, Tool radius compensation for 5-axis machining*, Workpiece positioning error compensation*, 5-axis tool length compensation*, 5-axis parameter select*
Machine compensation	Backlash compensation, Pitch error compensation, Geometric deviation compensation, Ai Thermal shield, Volumetric compensation*	
Protection functions	Emergency stop, Interlock, Pre-move stroke check, Barrier, SAFETY SHIELD (manual mode), SAFETY SHIELD (automatic mode), VOICE ADVISER	
Automatic operation mode	Memory operation	Memory operation, Tape operation, MDI operation, EtherNet operation*
Automatic operation control	Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Single process, Machine lock	Optional block skip, Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Restart 2, Collation stop, Machine lock
Manual measuring function	Tool length teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine, Tool eye measurement●	Tool length teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, Measurement on machine, Tool eye measurement●
Automatic measuring function	WPC coordinate measurement, Automatic tool length measurement, Laser tool length / diameter measurement, Workpiece measurement●, Sensor calibration, Tool eye auto tool measurement●, Tool breakage detection, External tool breakage detection*	Automatic tool length measurement, Laser tool length / diameter measurement, Workpiece measurement●, Sensor calibration, Tool eye auto tool measurement●, Tool breakage detection, External tool breakage detection*
MDI measurement	Coordinate measurement, Laser measurement	
Peripheral network	PROFIBUS-DP*, EtherNet /IP*, CC-Link*	
Interface	SD card interface, USB	
EtherNet	10 M / 100 M / 1 Gbps	

* Option

Standard and Optional Equipment

		● : Standard ○ : Option — : N / A							
		i-630V/6		i-630V/6S		i-800V/8		i-800V/8S	
		INTEGREX	VORTEX	INTEGREX	VORTEX	INTEGREX	VORTEX	INTEGREX	VORTEX
Milling spindle	10000 rpm (CAT No.50)	●		●		●		●	
	10000 rpm (BIG-PLUS No.50, HSK T-100, CAPTO C8)	○		○		○		○	
	5000 rpm (CAT No.50, BIG-PLUS No.50, HSK T-100, CAPTO C8)	○		○		○		○	
	15000 rpm (HSK T-100)	○		○		○		○	
Table	Corn coupling	●		●	—	●		○	
	Bolt-on	—		—	●	—		●	
Pallet	□630 mm tapped pallet with location bore	○		○		—		—	
	□630 mm T-slot pallet with location bore	○		○		—		—	
	□800 mm tapped pallet with location bore	○		○		○		—	○
	□800 mm T-slot pallet with location bore	○		○		○		—	
	□1000 mm tapped pallet with location bore	—		—		○		—	○
	630 × 800 mm tapped pallet with location bore	—	○	—		—		—	
	630 × 800 mm T-slot pallet with location bore	—	○	—		—		—	
	800 × 1000 mm tapped pallet with location bore	—		—		○		—	
	Φ 610 mm tapped pallet with location bore	—		—		—		—	
	Φ 800 mm tapped pallet with location bore	○	—	○		—		—	
	Φ 1000 mm tapped pallet with location bore	○	—	○	—	○		○	
	Φ 1250 mm tapped pallet with location bore	—		—		—		○	—
	Φ 1000 mm 4-jaw independent chuck	—		—		○	—	○	—
	Φ 1250 mm 4-jaw independent chuck	—		—		—		○	—
	Φ 800 mm 3-jaw scroll chuck	○	—	○	—	—		—	
	Φ 1000 mm 3-jaw scroll chuck	—		—		○	—	○	—
	Φ 800 mm face plate with jaws	○	—	○	—	—		—	
	Φ 1000 mm face plate with jaws	—		—		○	—	○	—
	Φ 1250 mm face plate with jaws	—		—		—		○	—
Pallet changer	2-pallet changer	●		—		●		—	
Tool magazine	43	●		●		●		●	
	80, 120, 160	○		○		○		○	
	TOOL HIVE 240, 348	○		○		○		○	
	TOOLTECH 206, 348	○		○		○		○	
Setup	Automatic tool length measurement & tool breakage detection	—	●	—	●	—	●	—	●
	Laser milling tool measurement system	○		○		○		○	
	Tool eye (automatic)	○	—	○	—	○	—	○	—
	Tool breakage detection (detection in ATC area)	○		○		○		○	
	Magazine operation panel for tool ID	○		○		○		○	

■ Standard and Optional Equipment

		● : Standard ○ : Option — : N/A							
		i-630V/6		i-630V/6S		i-800V/8		i-800V/8S	
		INTEGREX	VORTEX	INTEGREX	VORTEX	INTEGREX	VORTEX	INTEGREX	VORTEX
Setup	External steps in front of CNC operation panel	●		—		●		—	
	External steps and platform	—		○		○		○	
	Manual pulse generator (wired)	●		●		●		●	
	Manual pallet rotation at 2-pallet changer loading station	●		—		●		—	
Automation	PMC preparation	○		—		○		—	
	PMC application	○		—		○		—	
	Automatic power ON / OFF + warm-up operation	●		●		●		●	
High accuracy	Ball screw core cooling (X-, Y-, Z-axis)	●		●		●		●	
	Spindle chiller unit	●		●		●		●	
	Hydraulic unit temperature control	○		○		○		○	
	Coolant temperature control	○		○		○		○	
	Scale feedback (X-, Y-, Z-axis)	○		○		○		○	
Coolant / chip disposal	Flood coolant	●		●		●		●	
	Coolant through milling spindle 0.8 MPa (8.16 kgf/cm ²)	○		○		○		○	
	Coolant through milling spindle 1.5 MPa (15.3 kgf/cm ²)	○		○		○		○	
	Preparation for high pressure coolant through milling spindle 7.0 MPa (71.38 kgf/cm ²)	○		○		○		○	
	SUPERFLOW coolant system 7.0 MPa (71.38 kgf/cm ²)	○		○		○		○	
	Niagara coolant	●		●		●		●	
	Hand held coolant nozzle (setup station)	○		—		○		—	
	Hand held coolant nozzle	—		○		—		○	
	Secondary coolant filter for aluminum (2 sets)	○		○		○		○	
	Magnetic separator for cast iron	○		○		○		○	
	Mist collector	○		○		○		○	
	Oil skimmer (RB-200)	○		○		○		○	
	Chip conveyor (ConSep 2000)	○		○		○		○	
Measurement	Mazak monitoring systemB (wireless) RMP600	○		○		○		○	
	Smooth OMM	○		○		○		○	
	Smooth Set and Inspect	○		○		○		○	
IoT	MTConnect adapter	○		○		○		○	
	Energy dashboard	○		○		○		○	
Maintenance	ATC automatic recovery system	●		●		●		●	

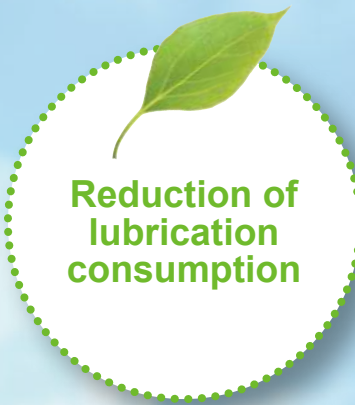
Environmentally Friendly

INTEGREX i-V, VORTEX i-V SERIES

Designed with environmental considerations

The environment and our impact on natural surroundings have always been important concerns of Yamazaki Mazak.

This is shown by the fact that all factories in Japan where Mazak machine tools are produced are ISO 14001 certified, an international standard confirming that the operation of our production facilities does not adversely affect air, water or land.



The linear roller guides and ball screws are lubricated by grease which eliminates tramp oil in the coolant resulting in a much longer service life for the coolant.

When the machine is not operated for a pre-registered period of time, the machine worklights and the CNC backlight are turned off automatically. They are automatically turned on when the motion sensor detects the return of the operator.





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