

**Mazak**

# INTEGREX i-V VORTEX i-V SERIES



Higher productivity for multiple-surface machining,  
5-axis machining and turning

Machine large workpieces in a single setup

Improve accuracy and reduce in-process inventory

Tilting milling spindle to machine side surfaces as well as  
slanted surfaces



INTEGREX i-800V/8S (single table)  
Shown with optional equipment

Single-Column Machine for Large Workpieces

**INTEGREX i-V SERIES**  
**VORTEX i-V SERIES**



Extensive series range to meet your production requirements



Shown with optional equipment



Shown with optional equipment

INTEGREX i-800V/8

Stroke (X/Y/Z) [mm (inch)], (B/C) [angle]	1700 (66.93")/1500 (59.06")/1150 (45.28")/150°/360°
Pallet*/chuck* [mm (inch)]	□800 (□31.50"), □1000 (□39.37"), ø1000 (ø39.37"), □800 × 1000 (□31.50" × 39.37")
Max. load (including pallet) [kg (lbs)]	3000 (6614 lbs)
Max. workpiece diameter [mm (inch)]	ø1500 (ø59.06") [ø1100 (ø43.31")]**
Max. workpiece height [mm (inch)]	1500 (59.06") (with □800 (31.50") tapped pallet)

\*Option  
\*\*Max. workpiece diameter at - end of X-axis stroke

INTEGREX i-800V/8S

Stroke (X/Y/Z) [mm (inch)], (B/C) [angle]	1700 (66.93")/1500 (59.06")/1150 (45.28")/150°/360°
Pallet*/chuck* [mm (inch)]	ø1000 (ø39.37"), ø1250 (ø49.21")
Max. load (including pallet) [kg (lbs)]	3500 (7716 lbs)
Max. workpiece diameter [mm (inch)]	ø1700 (ø66.93") [ø1100 (ø43.31")]**
Max. workpiece height [mm (inch)]	1665 (65.55") (with ø1000 (ø39.37") bolt-on tapped pallet)



Shown with optional equipment



Shown with optional equipment

INTEGREX i-630V/6

Stroke (X/Y/Z) [mm (inch)], (B/C) [angle]	1425 (56.10")/1050 (41.34")/1050 (41.34")/150°/360°
Pallet*/chuck* [mm (inch)]	□630 (□24.80"), □800 (□31.50"), ø800 (ø31.50"), ø1000 (ø39.37")
Max. load (including pallet) [kg (lbs)]	1750 (3858 lbs)
Max. workpiece diameter [mm (inch)]	ø1050 (ø41.34")
Max. workpiece height [mm (inch)]	1000 (39.37") (with □630 (□24.80") tapped pallet)

\*Option  
\*\*Max. workpiece diameter at - end of X-axis stroke

INTEGREX i-630V/6S

Stroke (X/Y/Z) [mm (inch)], (B/C) [angle]	1425 (56.10")/1050 (41.34")/1050 (41.34")/150°/360°
Pallet*/chuck* [mm (inch)]	□630 (□24.80"), □800 (□31.50"), ø800 (ø31.50"), ø1000 (ø39.37")
Max. load (including pallet) [kg (lbs)]	1750 (3858 lbs)
Max. workpiece diameter [mm (inch)]	ø1250 (ø49.21") [ø1050 (ø41.34")]**
Max. workpiece height [mm (inch)]	1400 (55.12") (with □630 (□24.80") tapped pallet)



Shown with optional equipment

INTEGREX i-500V/5

Stroke (X/Y/Z) [mm (inch)], (B/C) [angle]	1100 (43.31")/800 (31.50")/900 (35.43")/150°/360°
Pallet*/chuck* [mm (inch)]	□500 (□19.69"), ø610 (ø24.02")
Max. load (including pallet) [kg (lbs)]	880 (1940 lbs)
Max. workpiece diameter [mm (inch)]	ø730 (ø28.74")
Max. workpiece height [mm (inch)]	1000 (39.37") (with □500 (□19.69") tapped pallet)

\*Option

INTEGREX  
i-V SERIES

5-axis vertical Multi-Tasking machines



Shown with optional equipment



Shown with optional equipment

VORTEX i-800V/8

Stroke (X/Y/Z) [mm (inch)], (B/C) [angle]	1700 (66.93")/1500 (59.06")/1150 (45.28")/150°/360°
Pallet*/chuck* [mm (inch)]	□800 (□31.50"), □1000 (□39.37"), ø1000 (ø39.37"), □800 × 1000 (□31.50" × 39.37")
Max. load (including pallet) [kg (lbs)]	3000 (6614 lbs)
Max. workpiece diameter [mm (inch)]	ø1500 (ø59.06") [ø1100 (ø43.31")]**
Max. workpiece height [mm (inch)]	1500 (59.06") (with □800 (31.50") tapped pallet)

\*Option  
\*\*Max. workpiece diameter at - end of X-axis stroke

VORTEX i-800V/8S

Stroke (X/Y/Z) [mm (inch)], (B/C) [angle]	1700 (66.93")/1500 (59.06")/1150 (45.28")/150°/360°
Pallet*/chuck* [mm (inch)]	□800 (□31.50"), □1000 (□39.37"), ø1000 (ø39.37")
Max. load (including pallet) [kg (lbs)]	3500 (7716 lbs)
Max. workpiece diameter [mm (inch)]	ø1700 (ø66.93") [ø1100 (ø43.31")]**
Max. workpiece height [mm (inch)]	1600 (62.99") (with □800 (31.50") tapped pallet)



Shown with optional equipment



Shown with optional equipment

VORTEX i-630V/6

Stroke (X/Y/Z) [mm (inch)], (B/C) [angle]	1425 (56.10")/1050 (41.34")/1050 (41.34")/150°/360°
Pallet*/chuck* [mm (inch)]	□630 (□24.80"), □800 (□31.50"), □630 × 800 (□24.80" × 31.50")
Max. load (including pallet) [kg (lbs)]	1750 (3858 lbs)
Max. workpiece diameter [mm (inch)]	ø1050 (ø41.34")
Max. workpiece height [mm (inch)]	1000 (39.37") (with □630 (□24.80") tapped pallet)

\*Option  
\*\*Max. workpiece diameter at - end of X-axis stroke

VORTEX i-630V/6S

Stroke (X/Y/Z) [mm (inch)], (B/C) [angle]	1425 (56.10")/1050 (41.34")/1050 (41.34")/150°/360°
Pallet*/chuck* [mm (inch)]	□630 (□24.80"), ø800 (ø31.50")
Max. load (including pallet) [kg (lbs)]	1750 (3858 lbs)
Max. workpiece diameter [mm (inch)]	ø1250 (ø49.21") [ø1050 (ø41.34")]**
Max. workpiece height [mm (inch)]	1400 (55.12") (with □630 (□24.80") tapped pallet)

VORTEX  
i-V SERIES

5-axis vertical machining centers

# Higher Productivity

## High-rigidity construction for high-accuracy machining

The machine design features 5-axis construction with a tilting spindle for simultaneous 5-axis machining and turning of large workpieces.

### Prevention of temperature change – milling spindle cooling

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

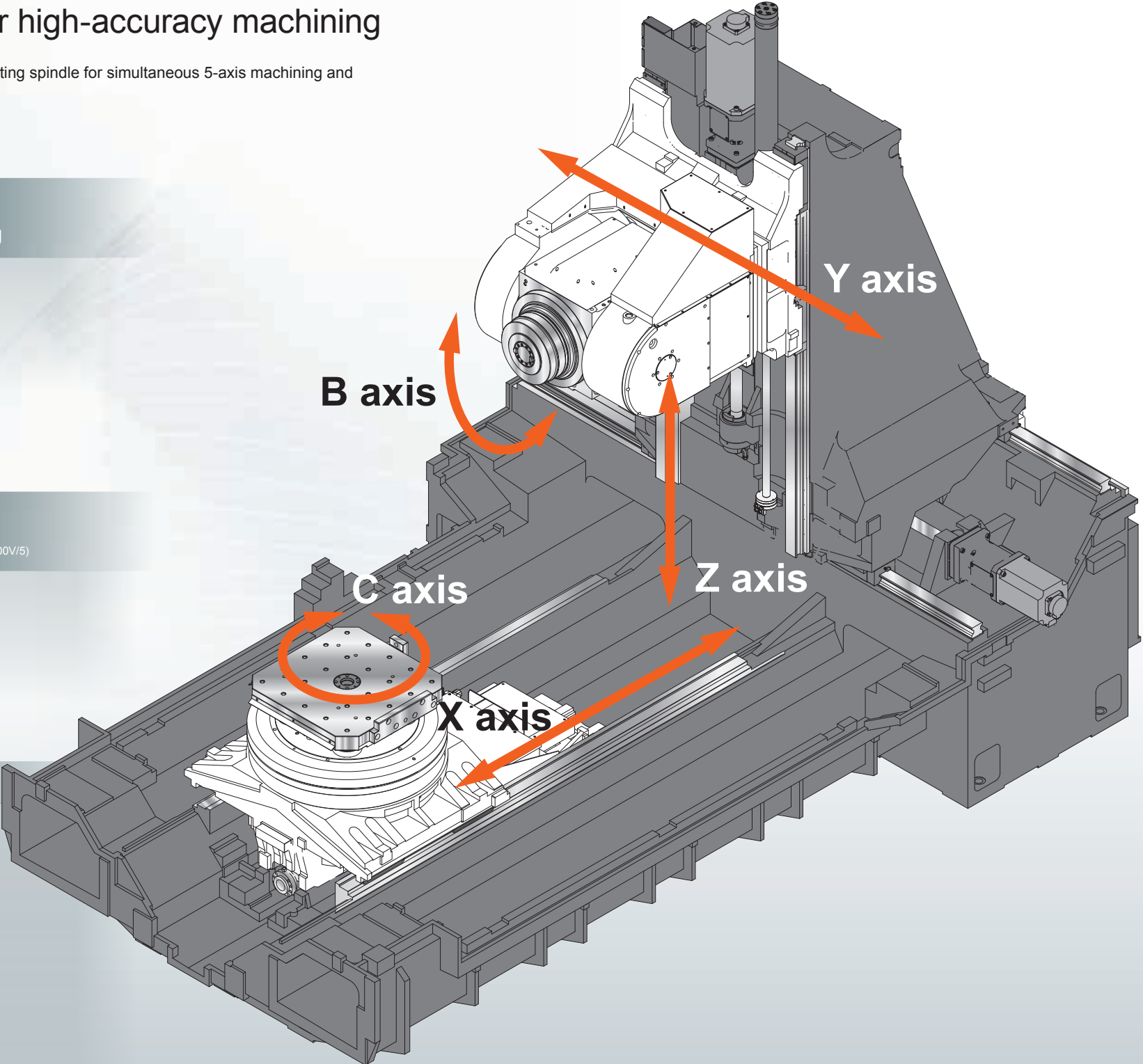
### INTEGREX i-V Series

### Direct drive motor Integral spindle/motor (INTEGREX i-500V/5)

The table and C axis use a direct-drive motor or integral spindle motor. This eliminates the belts and gears found in a conventional transmission, as well as vibration, heat and backlash, to ensure exceptional machined surface finishes.

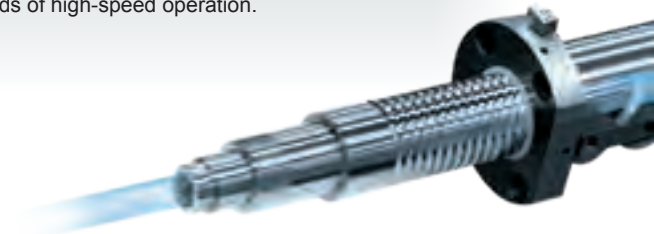
### Precision table clamping

The pallet and table are clamped on taper cones to ensure high-rigidity, 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 machine base.)



### Ballscrew core cooling (X, Y, Z axis)

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



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

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

### High-rigidity base

Rigidity is ensured thanks to the wide base with thick walls and optimized rib layout.

### VORTEX i-V Series

### C-axis roller gear cam

For high-accuracy machining over extended periods of operation, the NC rotary table utilizes a roller gear cam that can be indexed in 0.0001° increments.

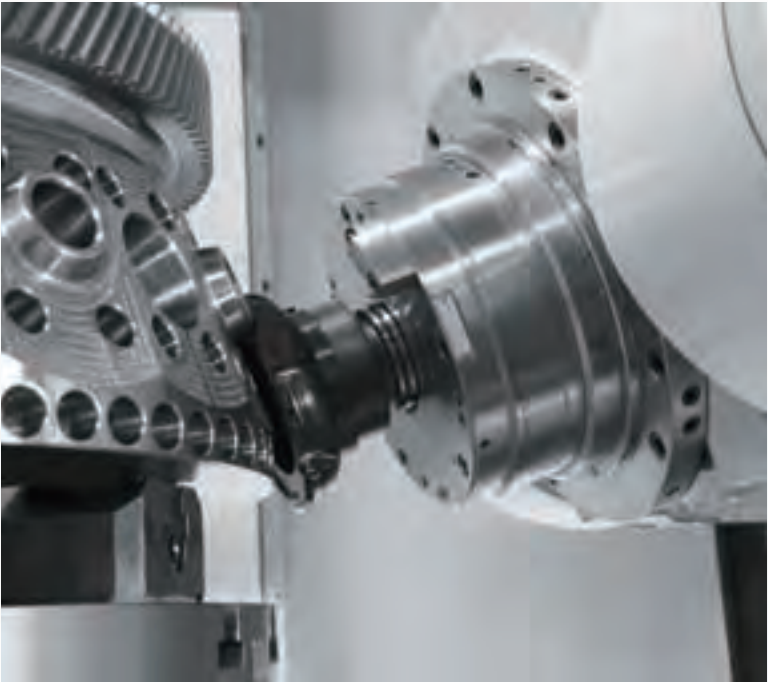


# Higher Productivity

Enhanced milling performance for high productivity

## High-speed, high-output milling spindle

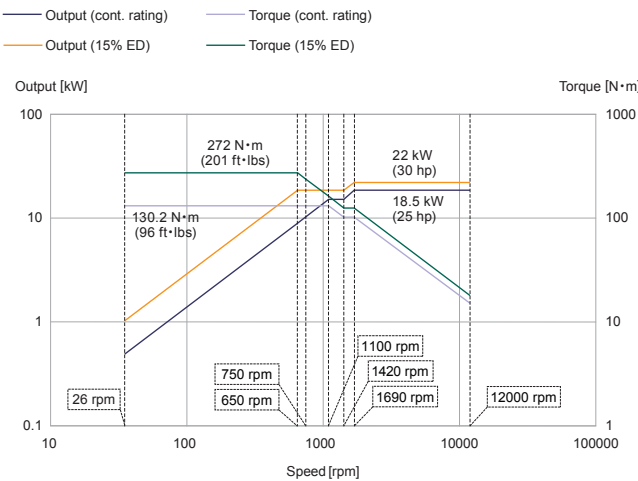
The No. 50 taper spindle on the i-630V/6, i-630V/6S, i-800V/8 and i-800V/8S has a standard top spindle speed of 10000 rpm, with a high-speed 15000 rpm spindle and high-torque 5000 rpm spindle optionally available. All feature an advanced integral spindle/motor for high performance.



## i-500V/5

Standard CAT No. 40, 12000 rpm milling spindle

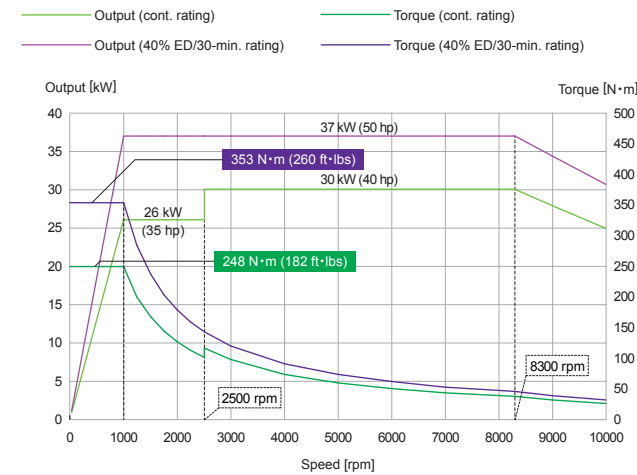
Output/torque diagram



## i-630V/6, i-630V/6S, i-800V/8, i-800V/8S

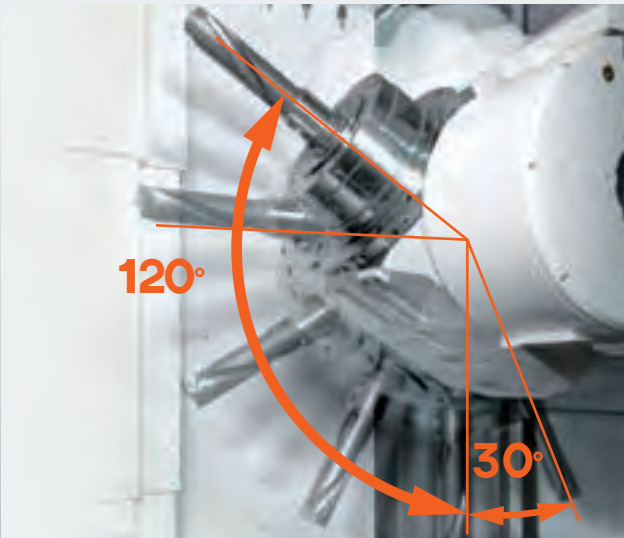
Standard CAT No. 50, 10000 rpm milling spindle

Output/torque diagram



## B-axis tilting range 150°

To ensure high accuracy, the B-axis tilting range 150°(-30° ~ 120°) is driven by a roller gear cam with no backlash.



## Designed for minimum interference

i-630V/6, i-630V/6S, i-800V/8, i-800V/8S

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

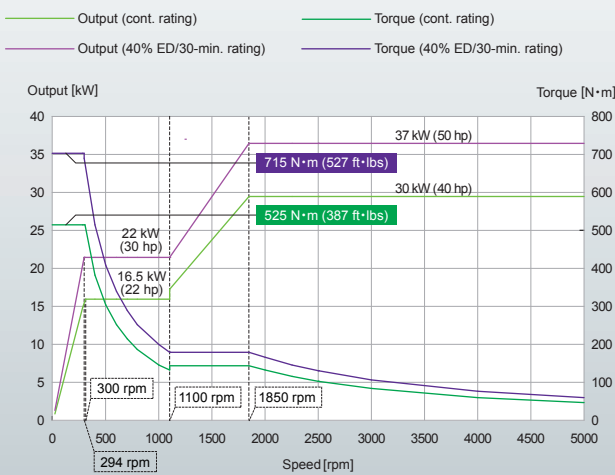


## i-630V/6, i-630V/6S, i-800V/8, i-800V/8S

High-torque 5000 rpm milling spindle

OPTION

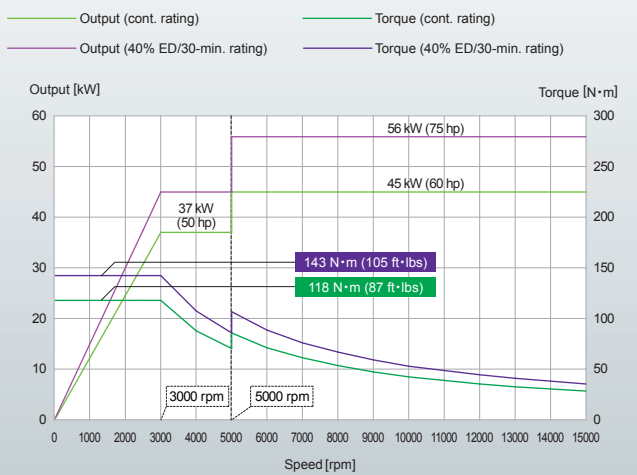
Output/torque diagram



High-speed 15000 rpm milling spindle

OPTION

Output/torque diagram



Higher Productivity

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

INTEGREX i-V Series

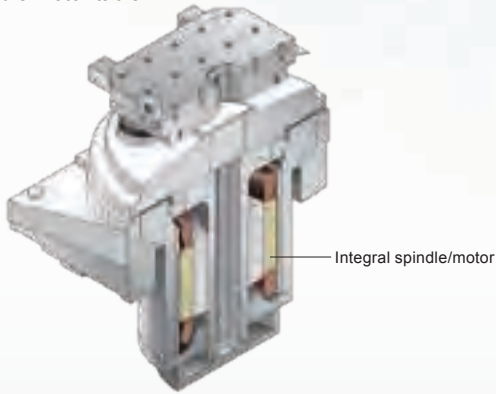
i-500V/5

The table and C-axis operations of the i-500V/5 are driven by an advanced integral spindle/motor. This system eliminates the belts and gears found in a conventional transmission as well as vibration, heat and backlash, to ensure exceptional machined surface finishes.

NC rotary table (C-axis) specifications

C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	100 rpm
Contouring	800 N·m (590 ft·lbs) (15 min. rating)

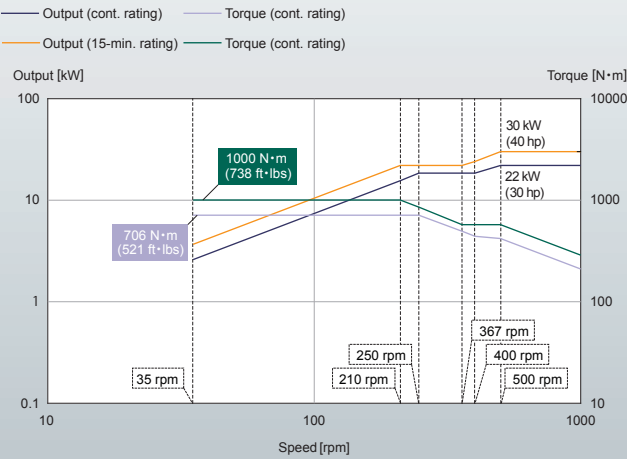
Integral spindle/motor table



Standard 1000 rpm turning table for the high-speed machining of steel and non-ferrous workpiece materials

Standard 1000 rpm table

Output/torque diagram



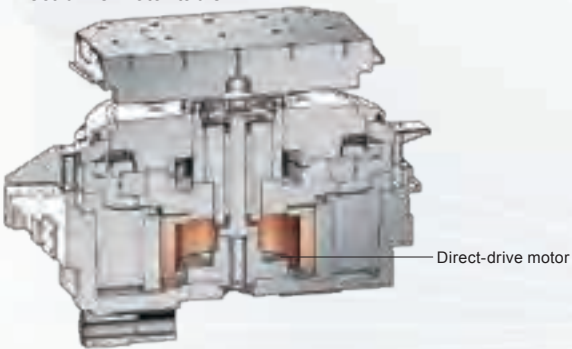
i-630V/6, i-630V/6S, i-800V/8, i-800V/8S

The table is driven by a compact, high-torque direct-drive motor. This provides the high torque required to machine large workpieces and provide fast positioning performance.

NC rotary table (C-axis) specifications

C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	50 rpm
Contouring	3120 N·m (2301 ft·lbs) (cont. rating)

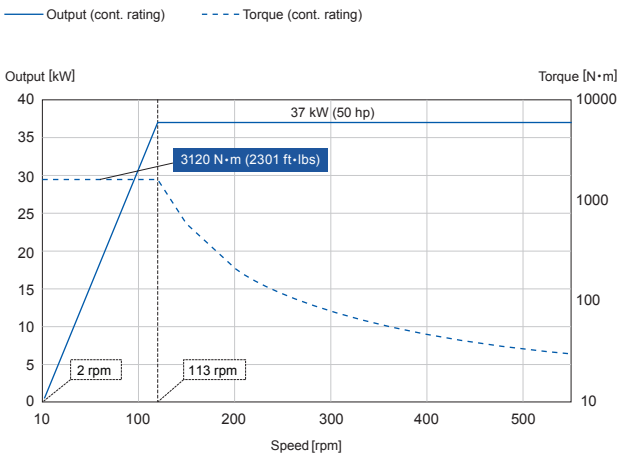
Direct-drive motor table



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

Standard 550 rpm table

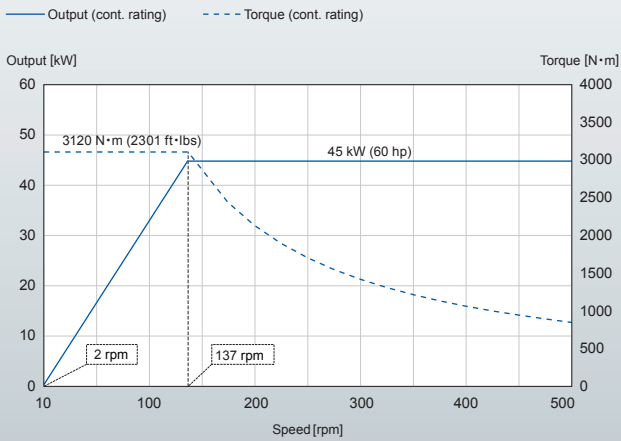
Output/torque diagram



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

Standard 500 rpm table

Output/torque diagram



High-accuracy/high-torque  
table (C-axis)

VORTEX i-V Series

i-630V/6, i-630V/6S, i-800V/8, i-800V/8S

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

NC rotary table (C-axis) specifications

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

C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	30 rpm
Contouring	1270 N·m (937 ft·lbs) (cont. rating)

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

C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	25 rpm
Contouring	4000 N·m (2950 ft·lbs) (cont. rating)

Roller gear cam table





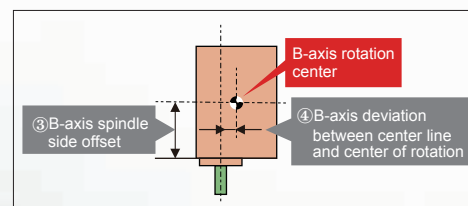
# Higher Accuracy

## Functions to ensure high accuracy

### High-accuracy 5-axis calibration MAZA-CHECK

MAZA-CHECK calibrates the deviation between the milling spindle center and table center of rotation to maintain machining accuracy.

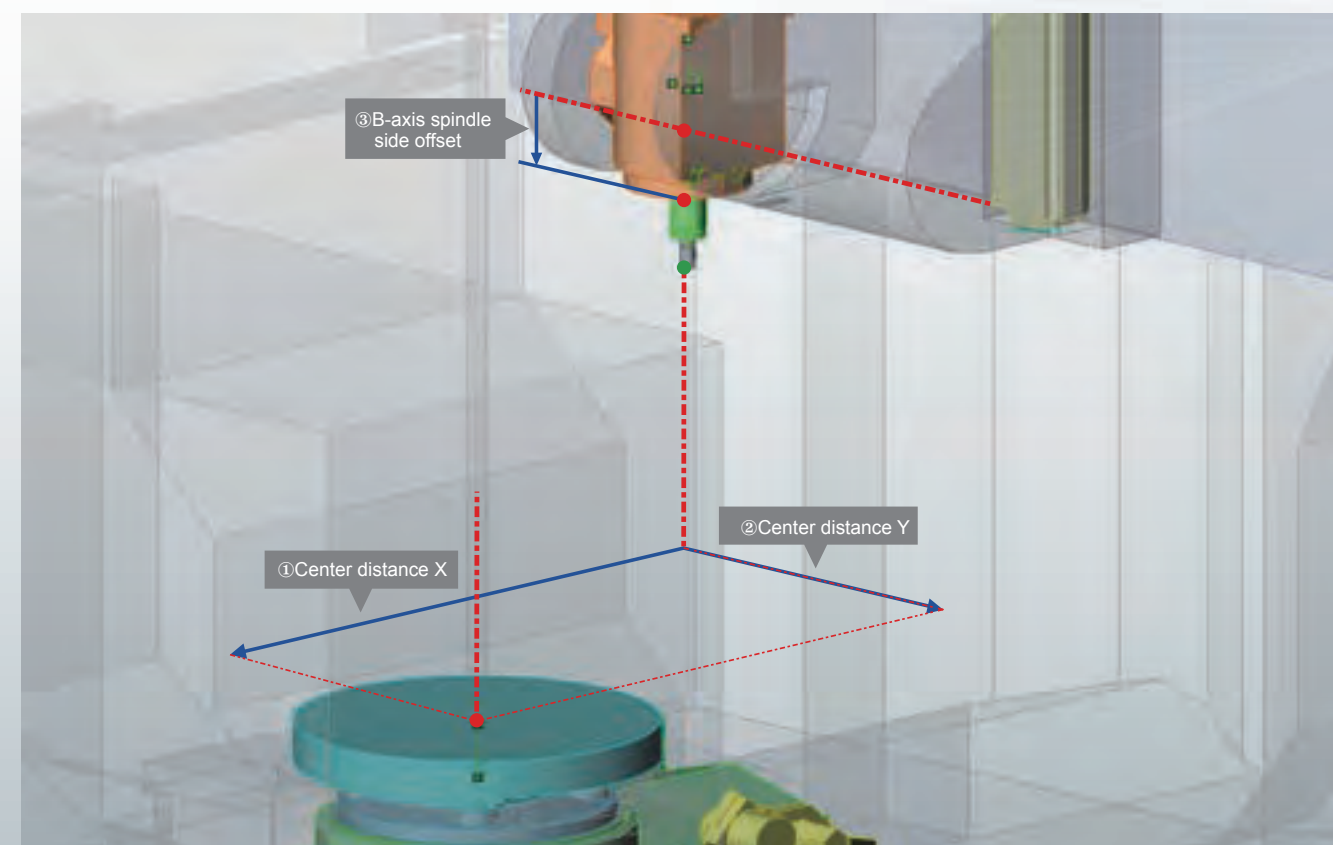
Two types of measurements are required to ensure 5-axis machining accuracy; first, the distance from the spindle center to the table (①②shown below) and second, the deviation between the B-axis center of rotation and the spindle center (③shown below ④shown to the right). MAZA-CHECK automatically measures and calibrates both measurements using a standard ball touch sensor and measurement macro. (RMP600 wireless high-accuracy touch sensor is required to use this function.)



B-axis rotation center measurement



C-axis rotation center measurement



### Heat displacement control THERMAL SHIELD

The THERMAL SHIELD is an automatic compensation for room temperature changes, which realizes enhanced continuous machining accuracy. Mazak has performed extensive testing in a variety of environments in a temperature-controlled room and has used the results to develop a control system that automatically compensates for temperature changes in the machining area. Changes in the room temperature and compensation data are shown visually.

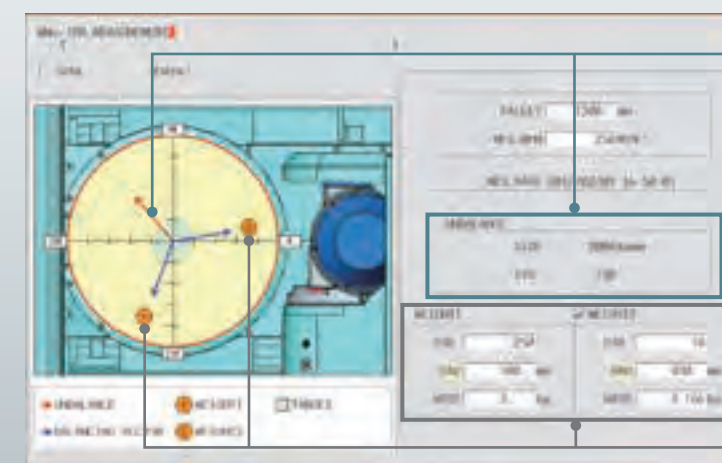


Temperature and compensation are displayed on screen. Operator can adjust compensation by looking at the data.

### Unbalanced table detection and analysis BALANCE ANALYZER

INTEGREX i-V Series

Shows required weight and locations to eliminate unbalanced conditions.



#### Analysis of amount of unbalance and direction

UNBALANCE	
SIZE	2000 kgmm
DIR	130°

#### Weight position for unbalance compensation

WEIGHT1	WEIGHT2
DIR	DIR
RAD	RAD
MASS	MASS



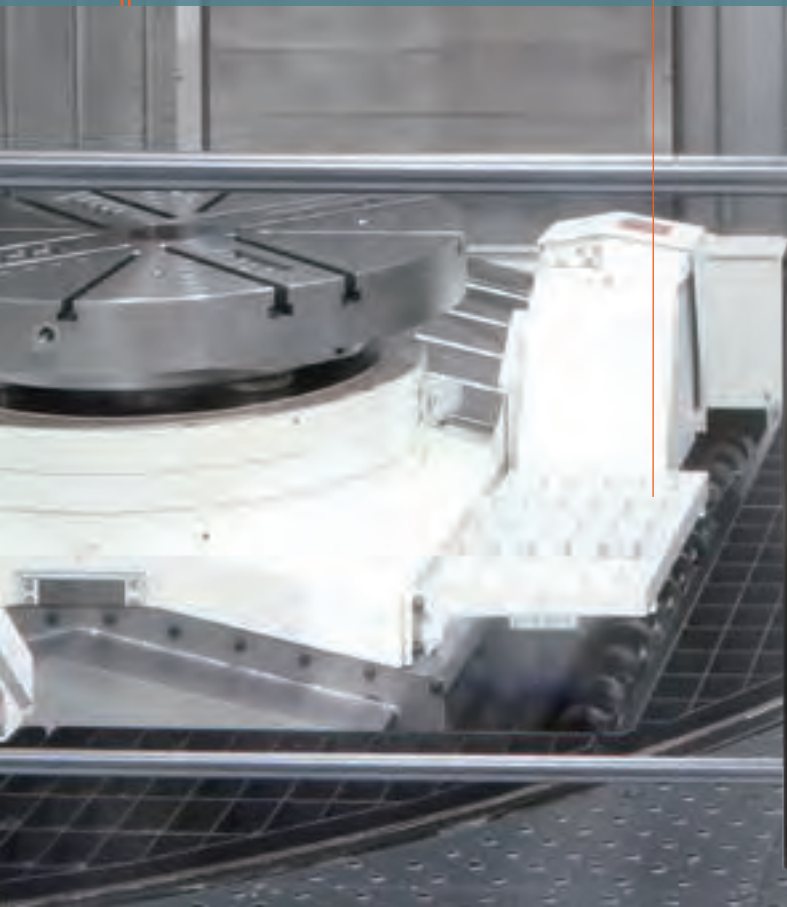
# Ergonomics

## Designed for ease of operation

A wide door opening plus optional external steps and platform (flush with platform inside machining area) provide excellent access to workpiece for unsurpassed ease of operation.

### Table step

Step provides convenient access to workpiece



External machine steps and platform are optional equipment.



# Automation

## Large system automation

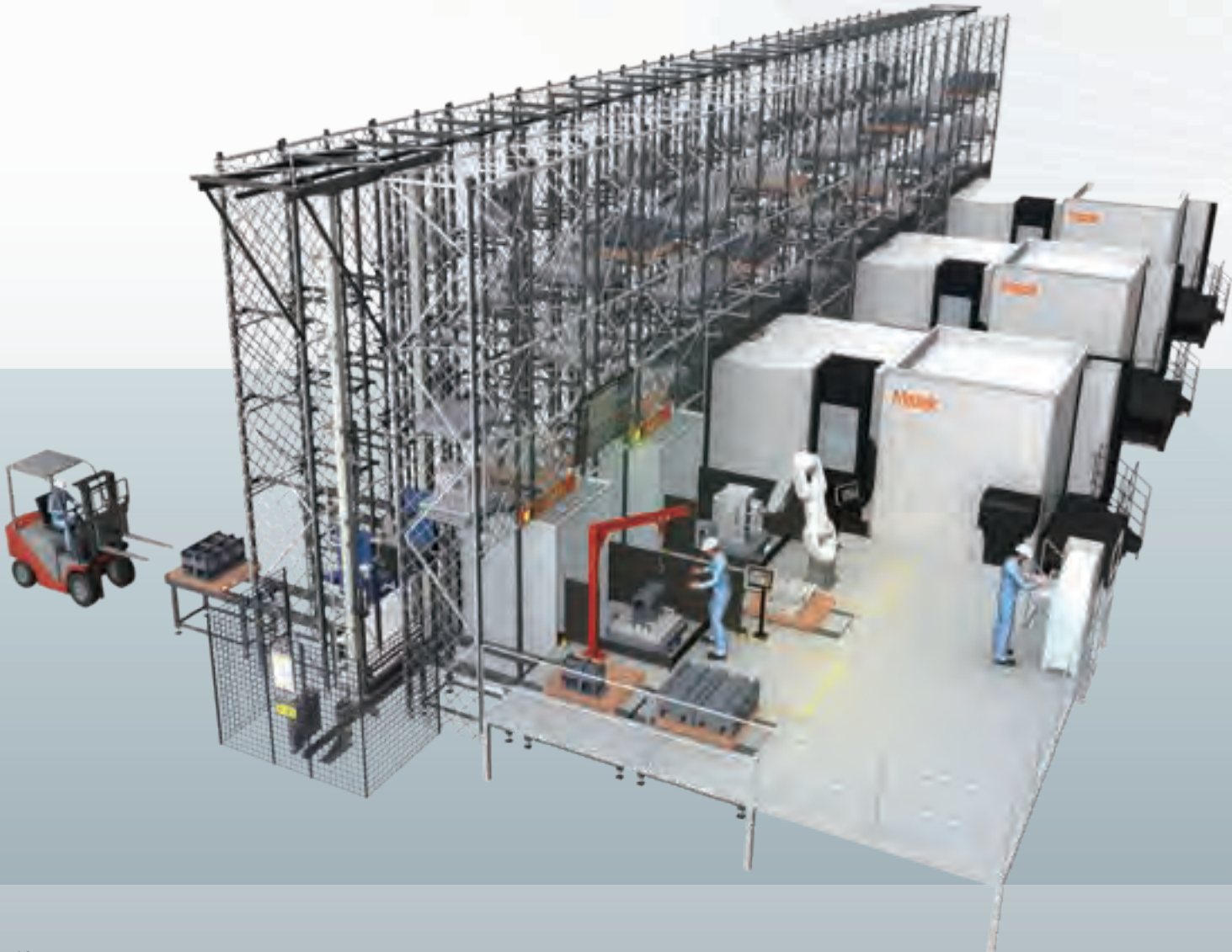
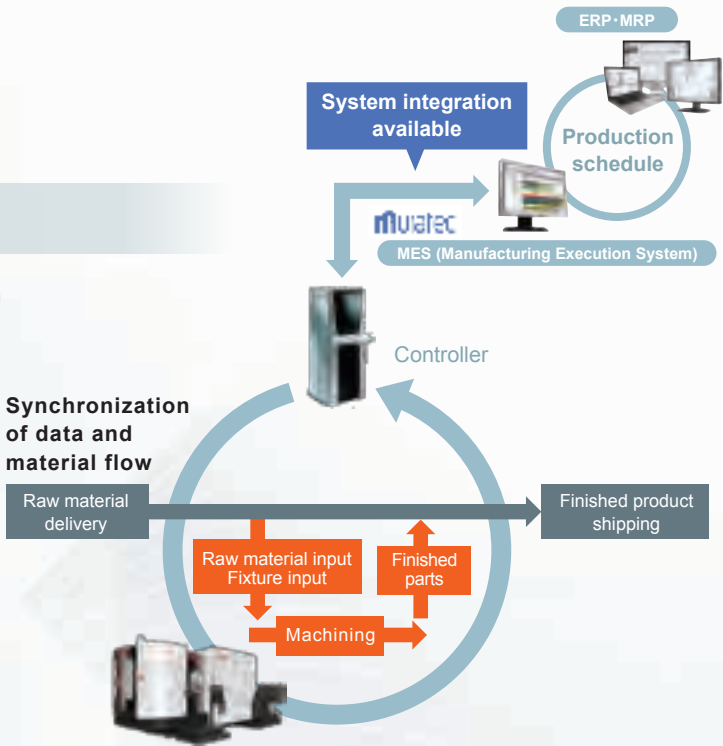
MAZATEC SMS

OPTION

Smart factory solutions: Based on pallet-stocker type automation system with AS/RS, this system features high space efficiency and large storage capacity that can be arranged to meet your production requirements.

### Integration with production management system available

- Synchronization of machining systems and automatic storage & retrieval system
- Machining and loading/unloading performed according to production control system



PALLETECH system

OPTION

The modular design of the PALLETECH system conveniently allows more machines and increased pallet storage capacity to be added after the initial installation in response to changing production requirements. The pallet stocker 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 stocker	i-500V/5	i-630V/6	i-800V/8
1 level	○	○	○
2 levels	○	○	○
3 levels	○	○	—

○: Available    —: N / A



## SMOOTH PMC

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



# Automation

## Automation for a single machine

### Robot system OPTION

Interface for connecting an external robot for workpiece loading/unloading to/from automatic hydraulic fixtures is optionally available.

- Field network CC-Link, PROFIBUS, Ethernet/IP available



## Large-capacity tool magazines for operation over extended periods of time

### TOOL HIVE OPTION

The TOOL HIVE can store more than 180 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. 180-tool, 240-tool and 348-tool storage capacities are available.



TOOL HIVE magazine (240 tools)

### Tool ID

Tool ID allows automatic input and update of tool data into the CNC for machines in a network. It eliminates mistakes when loading tools into the magazine and tool data input, reducing setup time (requires retention bolt with tool ID and tool presetter).



### TOOLTECH OPTION i-630V/6, i-630V/6S, i-800V/8, i-800V/8S CAT No. 50 only

Compact rack-type tool magazine with tool cart for tool loading/unloading. 206, 276 and 348-tool storage capacities are available.



TOOLTECH (rack type magazine)



# MAZATROL CNC System



Unsurpassed ease of operation  
with touch screen

MAZATROL **SMOOTHX**

## Five process home screens

Programming, confirmation, editing and tool data registration



Convenient Parameter Setting and Fine-Tuning Function

## SMOOTH MACHINING CONFIGURATION

Machining features including cycle time, finished surface and machining shape can be adjusted by slider switches on the display according to material requirements and machining methods. This is especially effective for complex workpiece contours defined in small program increments. Once the desired results are obtained, the settings can be stored in memory so that they can be used again easily in the future.



Variable Acceleration Control Function

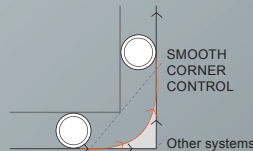
## ● VARIABLE ACCELERATION CONTROL

Variable acceleration control is a new function that permits the faster acceleration capability of linear axes to be used whenever possible. The slower acceleration of the rotary axes is not used for all program commands, resulting in faster machining cycle times.

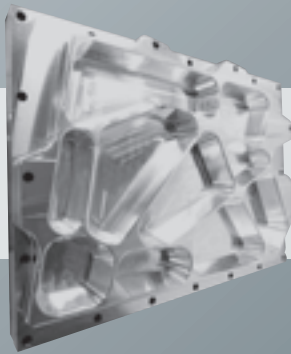
Seamless Corner Control

## ● SMOOTH CORNER CONTROL

Improve finished surfaces and reduce cycle times through optimized acceleration/deceleration when machining corners.



Cycle time reduced by  
**10~20%**  
(test results for reference only)





# Ease of Programming

## Visible programming screen

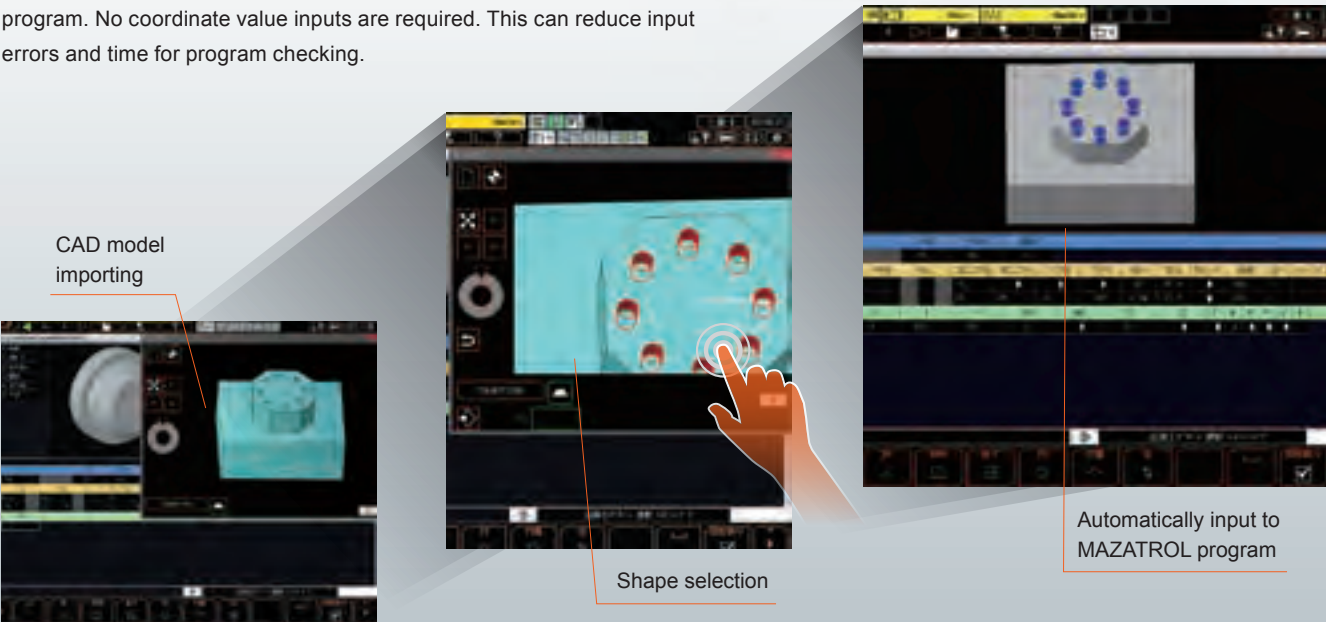
### QUICK MAZATROL

The MAZATROL program, unit list and 3D workpiece shape are linked to each other. After defining a machining unit in a MAZATROL program, the 3D shape is displayed immediately to allow users to check for any programming error easily and quickly.



### 3D ASSIST

Import workpiece and coordinate data from 3D CAD data to a MAZATROL program. No coordinate value inputs are required. This can reduce input errors and time for program checking.



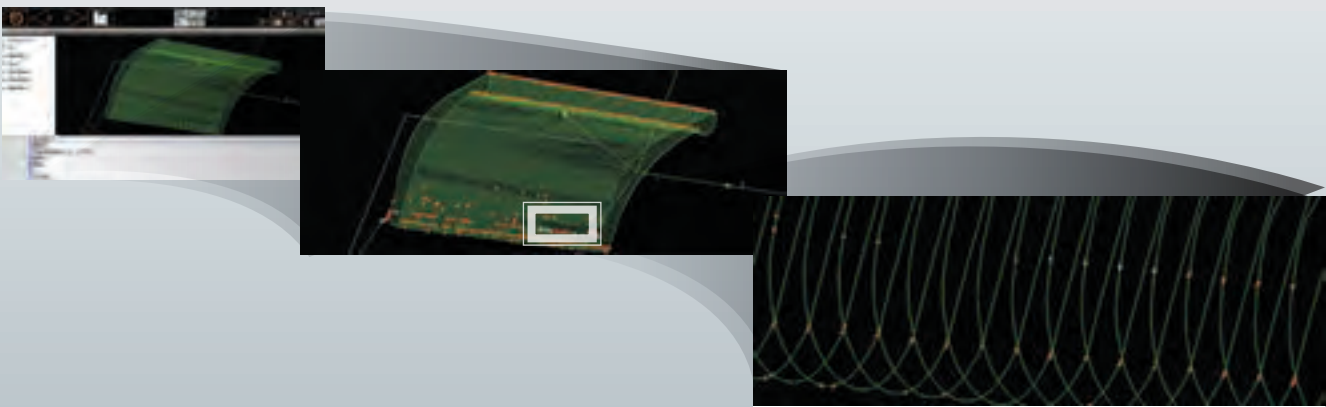
### QUICK EIA

The program, process list and 3D tool path display are linked to each other. Visible search on the touch screen can reduce the time for program checking.



### VIEW SURF

By analyzing the tool path, any predictable failure on the finished surface can be visualized. Program modification can be done before machining to minimize the time for test cutting.

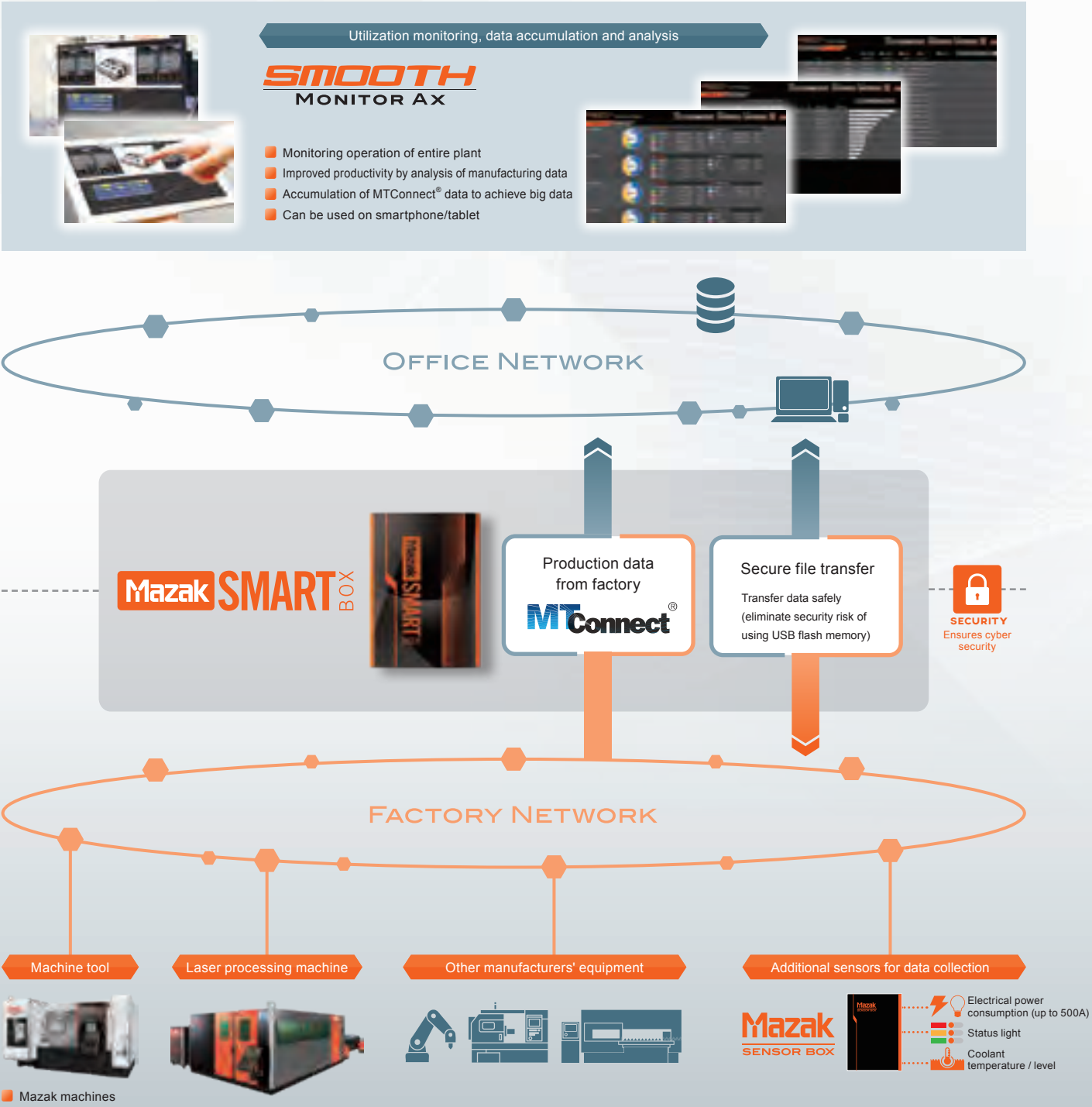




# Digitally driven manufacturing

Real-time data sharing provides effective management. Analysis of data contributes to increased factory efficiency.

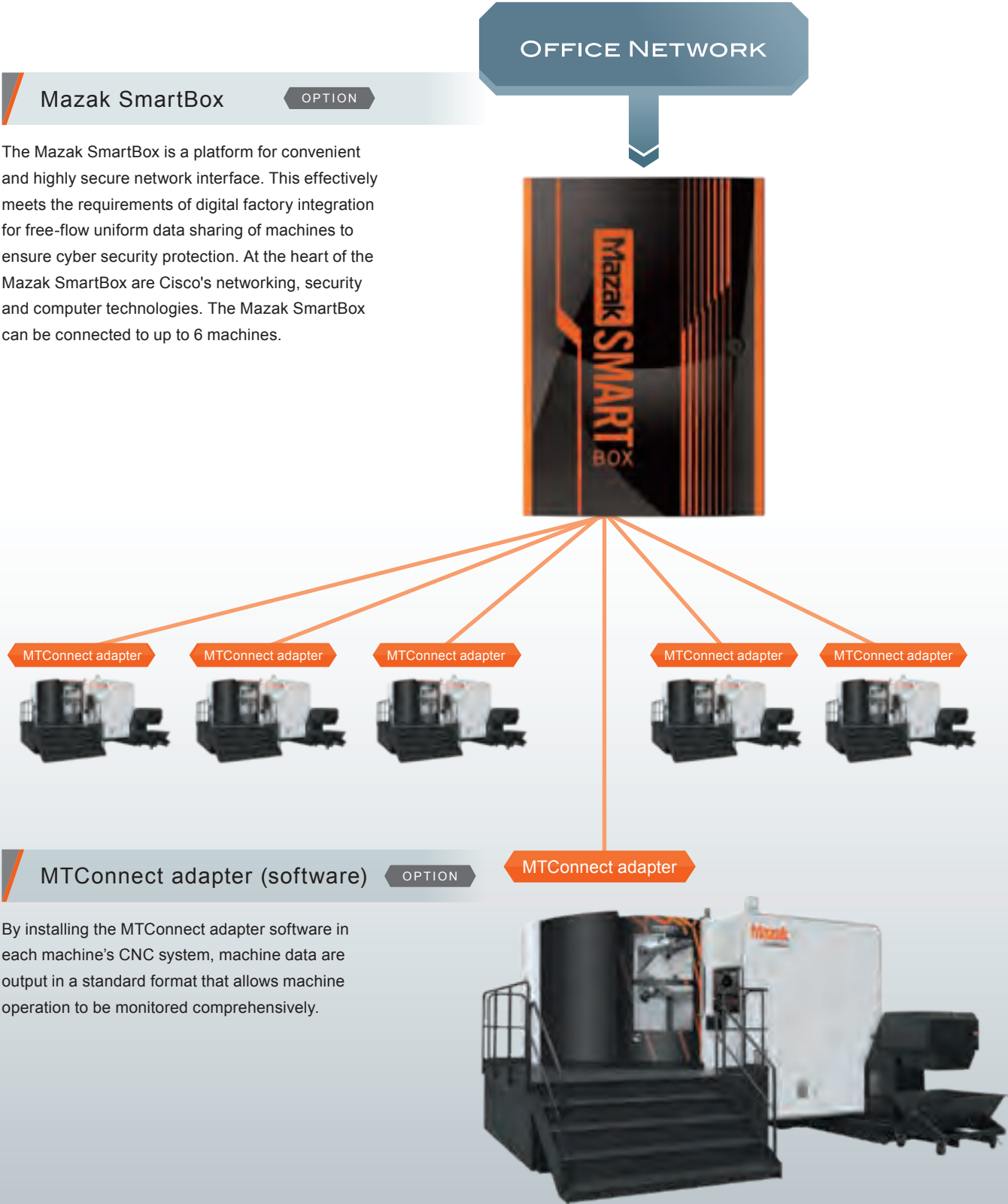
In addition to Mazak machine tools and laser processing machines, other manufacturers' equipment can be connected for overall factory management. The Mazak SmartBox™ ensures network security.



MTConnect adapter software required for all production equipment

# IoT equipment and software for smart factory operation

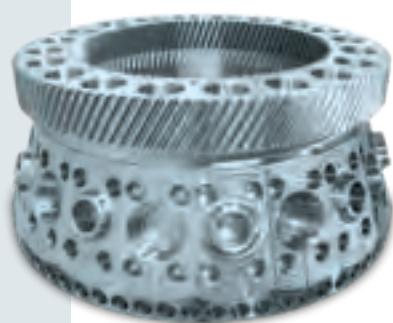
Data collection from production equipment



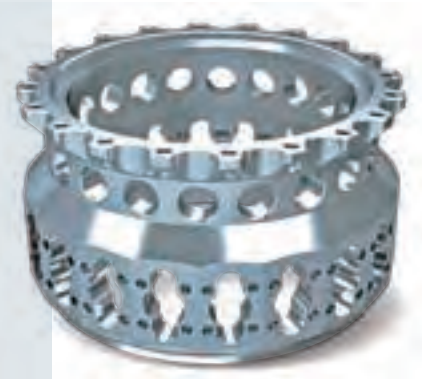
# Applications

Large application examples from a variety of industries

Name: housing  
Category: energy-related component  
Material: steel



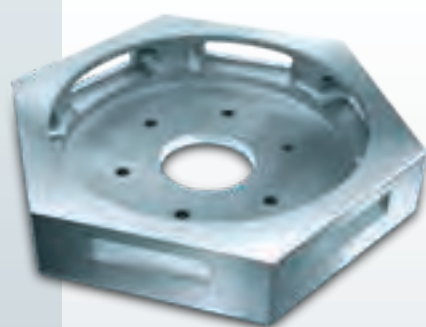
Name: casing  
Category: power generation component  
Material: steel



Name: planetary carrier  
Category: construction machinery component  
Material: cast iron



Name: casing  
Category: vacuum chamber component  
Material: aluminum



Name: knuckle  
Category: truck component  
Material: aluminum



Name: housing  
Category: energy industry component  
Material: aluminum



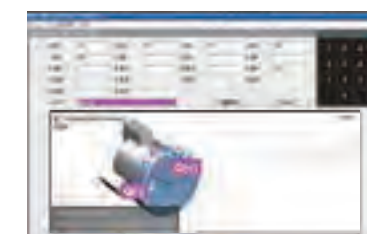
## Process integration

### SMOOTH Gear Milling

OPTION

INTEGREX i-V Series

O.D. gears can be machined using standard end mills and ball nose end mills. The machining program is made using conversational programming and does not require expensive CAD/CAM software.

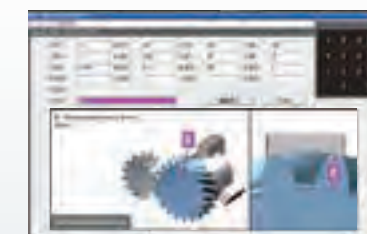


### SMOOTH Gear Hobbing

OPTION

INTEGREX i-V Series

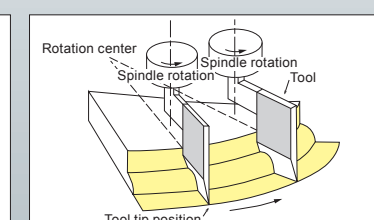
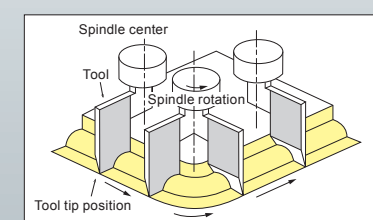
Hobbing of large gear diameters can be performed thanks to the wide Y-axis stroke. Turning before hobbing and then gear hobbing can be done in a single setup. Using conversational programming, the machining program can be made by just inputting gear specifications and machining conditions.



### 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 end mill.



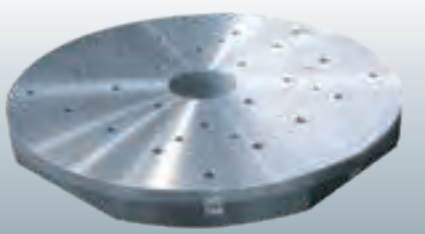





# Standard and Optional Equipment

## Pallets/chucks

OPTION

A variety of pallets/chucks is available to meet any machining requirement

	<p><b>Tapped round pallet with location bore</b></p> <p>Used for machining irregularly shaped workpieces, including turning. A fixture plate that mounts the workpiece is placed on this pallet for turning operations.</p>
	<p><b>Face plate with jaws</b></p> <p>Used for cylindrical and square workpieces. Jaws can be moved separately to center a workpiece accurately, and can be adjusted for different workpiece diameters.</p>
	<p><b>Scroll chuck with three jaws</b></p> <p>Used for machining of cylindrical workpieces. By turning a wrench, all 3 jaws move towards the chuck center to center a workpiece easily.</p>
	<p><b>Four-jaw independent chuck</b></p> <p>Used for cylindrical and square workpieces. Jaws can be moved separately to center a workpiece accurately.</p>
	<p><b>Tapped square pallet with location bore</b></p> <p>Used for the machining of irregularly shaped workpieces without turning operations. A workpiece fixture can be mounted on the pallet.</p> <p>Note: Turning spindle maximum speed when using square pallets is 50 rpm.</p>

Note: Turning spindle maximum speed is limited according to specifications of circular pallets and chucks.

## Coolant system for longer tool life and higher productivity

- Reduces tool wear by controlling rise in temperature of tool tip
- Higher-quality surface and machining performance thanks to lubrication of tool and workpiece
- Prevents tool damage by removing long chips from tool and workpiece

### SUPERFLOW V30C-J

OPTION

The SUPERFLOW V30C-J coolant system features lower tool tip temperatures, improved coolant lubrication and chip disposal by supplying a maximum 7.0 MPa (1015 psi) coolant pressure.

- Coolant pressure easily set to seven levels
- Inverter controlled pump motor for high energy efficiency
- Filter does not need to be changed as long as cartridge is cleaned periodically



### Coolant through spindle

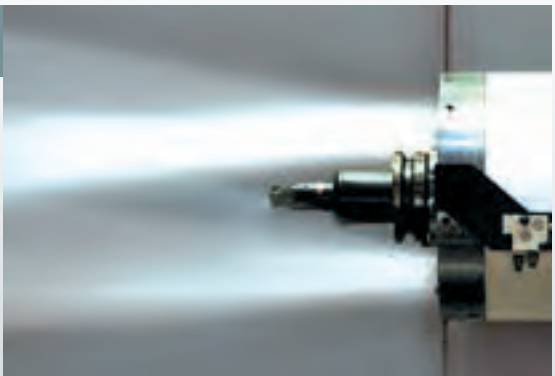
OPTION

Coolant is fed to the tool tip by passages through the tool. Three pump pressure specifications are available: 0.8 MPa (116 psi), 1.5 MPa (218 psi) and 7.0 MPa (1015 psi)



### Flood coolant

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



### Niagara coolant

OPTION

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

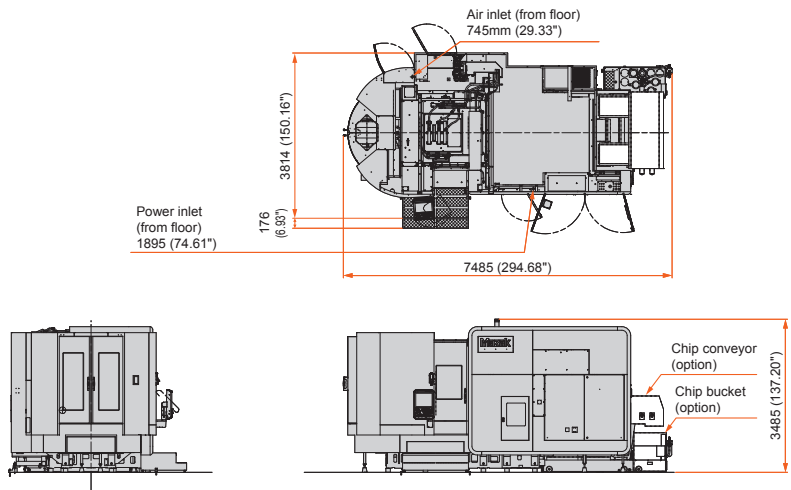


Machine Dimensions

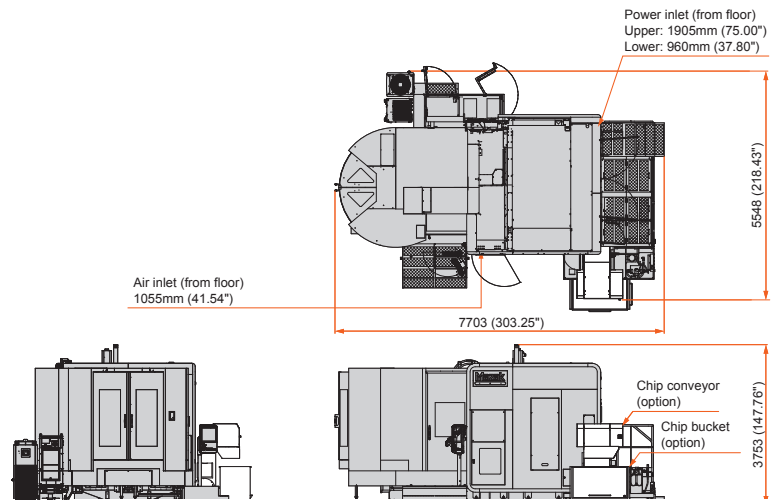
Unit: mm (inch)

Unit: mm (inch)

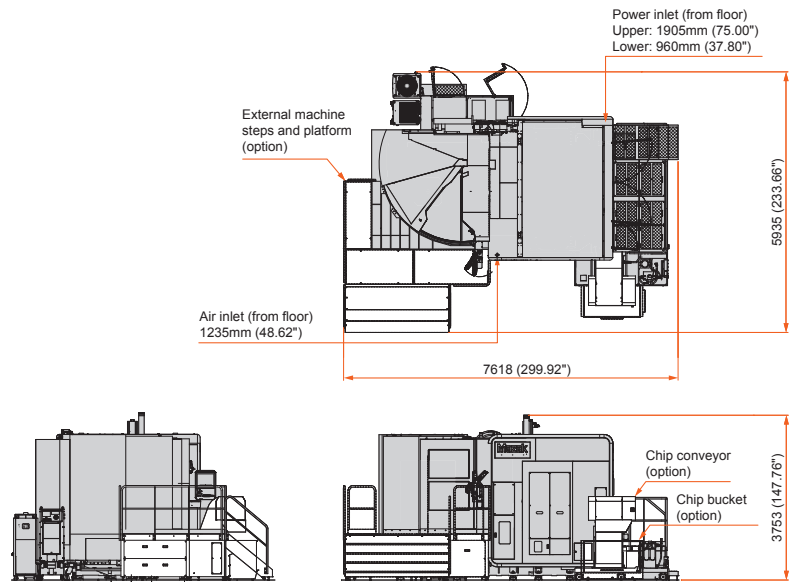
INTEGREX i-500V/5 40-tool magazine, chip conveyor (rear discharge, ConSep 2000)



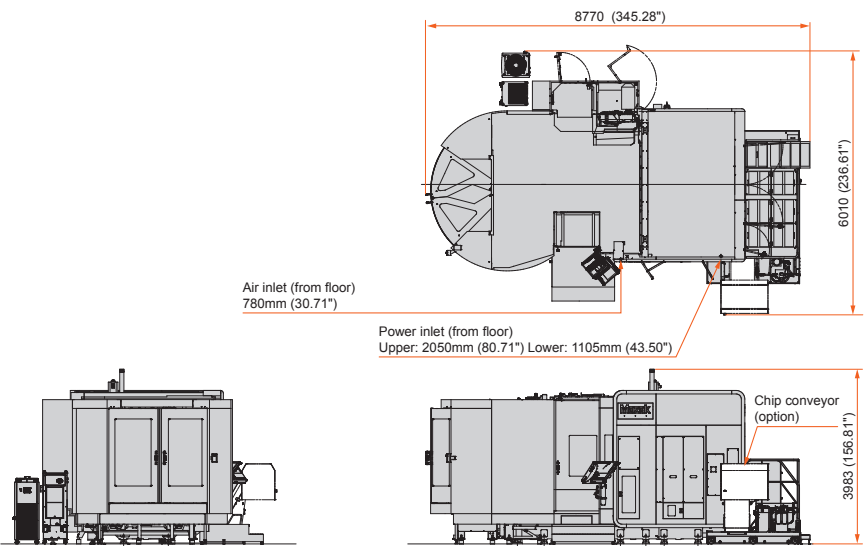
INTEGREX i-630V/6 43-tool magazine, chip conveyor (rear right discharge, ConSep 2000)



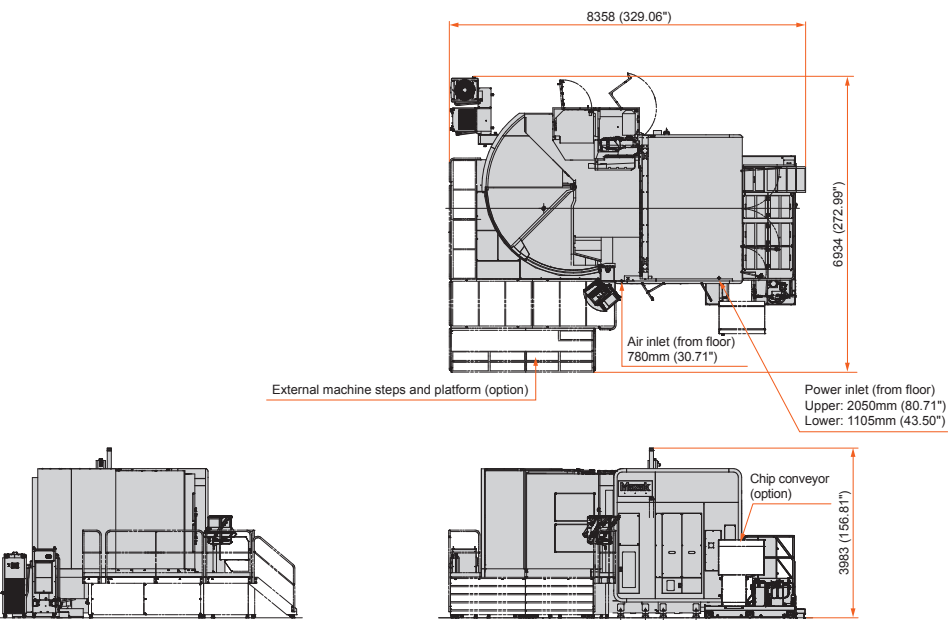
INTEGREX i-630V/6S 43-tool magazine, chip conveyor (rear right discharge, ConSep 2000)



INTEGREX i-800V/8 43-tool magazine, chip conveyor (rear right discharge, ConSep 2000)



INTEGREX i-800V/8S 43-tool magazine, chip conveyor (rear right discharge, ConSep 2000)



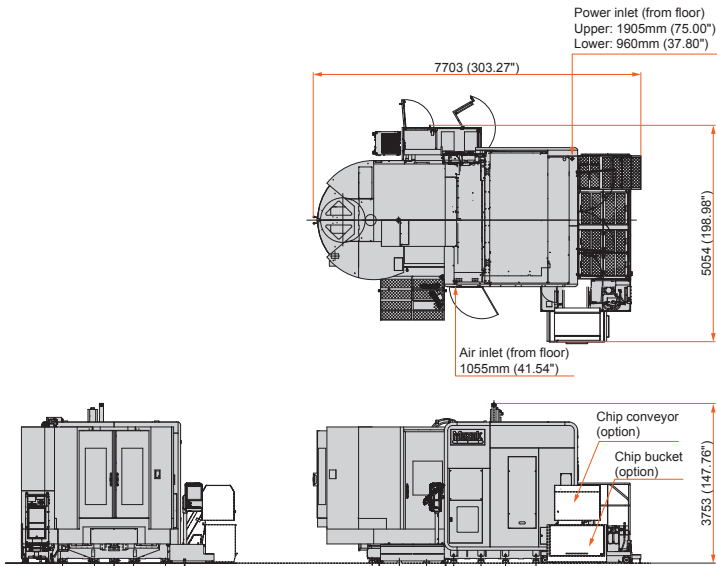


Machine Dimensions

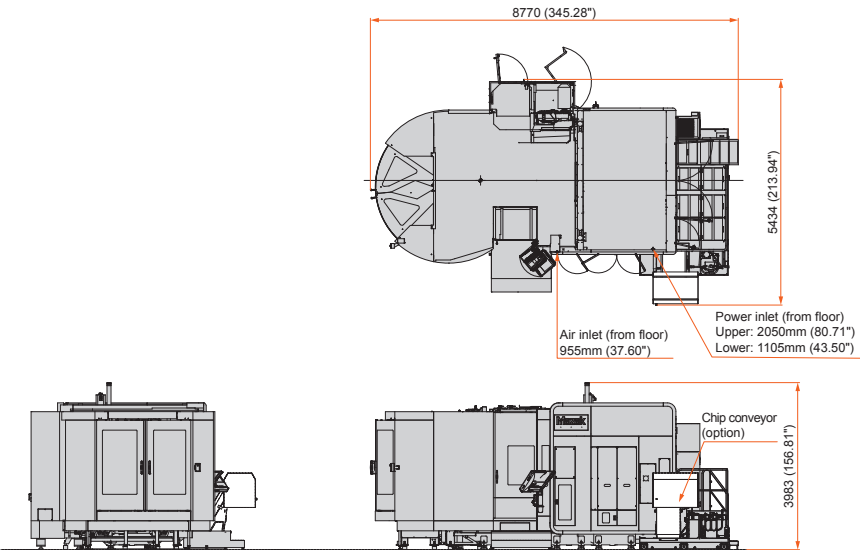
Unit: mm (inch)

Unit: mm (inch)

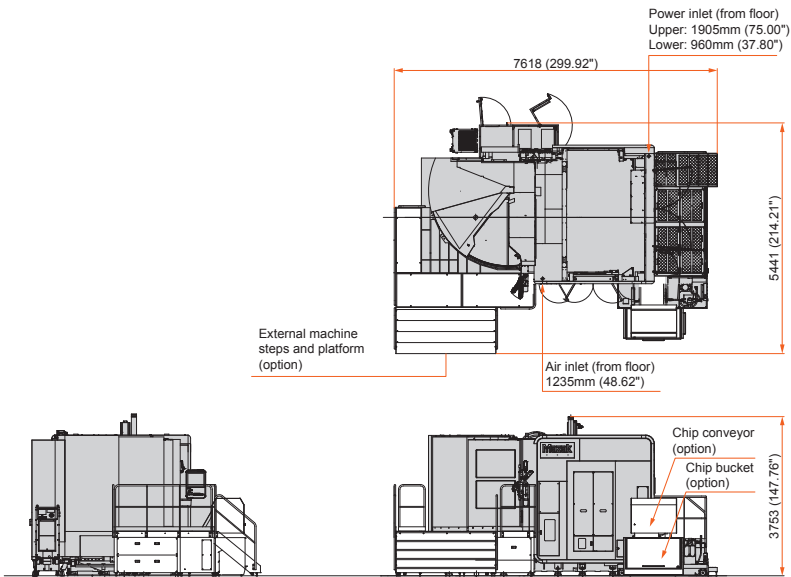
VORTEX i-630V/6 43-tool magazine, chip conveyor (rear right discharge, ConSep 2000)



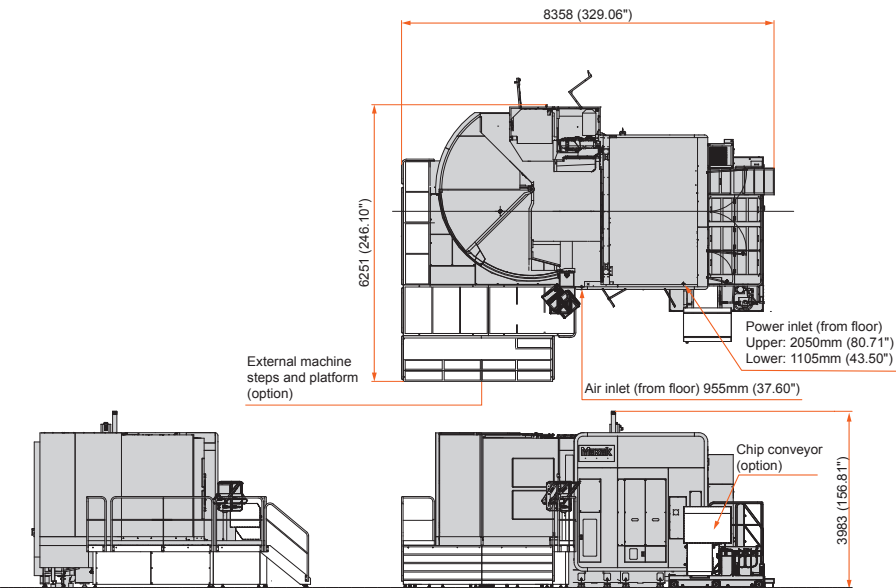
VORTEX i-800V/8 43-tool magazine, chip conveyor (rear right discharge, ConSep 2000)



VORTEX i-630V/6S 43-tool magazine, chip conveyor (rear right discharge, ConSep 2000)



VORTEX i-800V/8S 43-tool magazine, chip conveyor (rear right discharge, ConSep 2000)



Standard Machine Specifications

			INTEGREX i-500V/5	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)		1100 mm (43.31")	1425 mm (56.1")		1425 mm (56.1")		1700 mm (66.93")			
	Y axis (spindle head travel right/left)		800 mm (31.5")	1050 mm (41.34")		1050 mm (41.34")		1500 mm (59.06")			
	Z axis (spindle head travel up/down)		900 mm (35.43")	1050 mm (41.34")		1050 mm (41.34")		1150 mm (45.28")			
	B axis (spindle head tilt)		150° (-30° ~ +120°)	150° (-30° ~ +120°)		150° (-30° ~ +120°)		150° (-30° ~ +120°)			
	C axis (table rotate)		360° (cont.)	360° (cont.)		360° (cont.)		360° (cont.)			
	Distance between B-axis rotation center and pallet center (X axis at home)		1020 mm (40.16")	1395 mm (54.92")		1395 mm (54.92")		1690 mm (66.54")			
	Distance between B-axis rotation center and pallet center (X axis at - end)		-80 mm (-3.15")	-30 mm (-1.18")		-30 mm (-1.18")		-10 mm (-0.39")			
	Distance between spindle gauge line and pallet center (B axis = +90°) (X axis at home)		771 mm (30.35")	1045 mm (41.14")		1045 mm (41.14")		1340 mm (52.76")			
	Distance between B-axis rotation center and pallet top face*1		100 mm ~ 1000 mm (3.94" ~ 39.37")	100 mm ~ 1150 mm (3.94" ~ 45.28")		100 mm ~ 1150 mm (3.94" ~ 45.28")		100mm ~ 1250mm (3.94" ~49.21")		100mm ~ 1250mm (3.94" ~ 49.21")	165mm ~ 1315mm (6.50" ~ 51.77")
	Distance between spindle gauge line and pallet top face (B axis = 0°)*1		-149 mm ~ 751 mm (-5.87" ~ 29.57")	-250 mm ~ 800 mm (-9.84" ~ 31.5")		-250 mm ~ 800 mm (-9.84" ~ 31.5")		-250 mm ~ 900 mm (-9.84" ~ 35.43")		-250mm ~ 900mm (-9.84" ~ 35.43")	-185mm ~ 965mm (-7.28" ~ 37.99")
Capacity	Max. machining diameter (O.D.)		ø730 mm (ø28.74")	—	ø1050 mm (ø41.34")	—	ø1250 mm (ø49.21")	—	ø1500 mm (ø59.06")	—	ø1700 mm (ø66.93")
	Max. workpiece diameter		ø730 mm (ø28.74")	ø1050 mm (ø41.34")		ø1250 mm (ø49.21") [X-axis at - end: ø1050 mm (ø41.34")]		ø1500 mm (ø59.06") [X axis at - end: ø1100 mm (ø43.31")]		ø1700 mm (ø66.93") [X axis at - end: ø1100 mm (ø43.31")]	
	Max. workpiece height*1		1000 mm (39.37")	1000 mm (39.37")		1400 mm (55.12")		1500 mm (59.06")		1600 mm (62.99")	1665 mm (65.55")
	Max. load (including pallet)		880 kg (1940 lbs)	1750 kg (3858 lbs)		1750 kg (3858 lbs)		3000 kg (6614 lbs)		3500 kg (7716 lbs)	
Table	Max. speed*2		1000 rpm	—	550 rpm	—	550 rpm	—	500 rpm	—	500 rpm
	Rapid traverse rate (C axis)		100 rpm	30 rpm	50 rpm	30 rpm	50 rpm	25 rpm	50 rpm	25 rpm	50 rpm
	Min. indexing angle increment (C axis)		0.0001°	0.0001°		0.0001°		0.0001°			
	Indexing time		0.9 s/90°	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		12000 rpm	10000 rpm		10000 rpm		10000 rpm			
	Spindle taper		7/24 taper, No. 40	7/24 taper, No. 50		7/24 taper, No. 50		7/24 taper, No. 50			
	Spindle bearing ID		ø80 mm (ø3.15")	ø100 mm (ø3.94")		ø100 mm (ø3.94")		ø100 mm (ø3.94")			
	Spindle acceleration		3.2 s (0 ~ 12000 rpm)	5.6 s (0 ~ 10000 rpm)		5.6 s (0 ~ 10000 rpm)		4.9 s (0 ~ 10000 rpm)			
	Rapid traverse rate (B axis)		50 rpm	30 rpm		30 rpm		30 rpm			
	Min. indexing angle increment (B axis)		0.0001°	0.0001°		0.0001°		0.0001°			
	Indexing time (B axis)		0.5 s/90°	2.2 s/90°		2.2 s/90°		2.2 s/90°			
Feedrate*3	Rapid traverse rate (X, Y, Z axis)		50000 mm/min (1969 ipm)	52000 mm/min (2047 ipm)		52000 mm/min (2047 ipm)		52000 mm/min (2047 ipm)			
	Cutting feedrate (X, Y, Z axis)		50000 mm/min (1969 ipm)	52000 mm/min (2047 ipm)		52000 mm/min (2047 ipm)		52000 mm/min (2047 ipm)			
Automatic tool changer	Tool shank		CAT No. 40	CAT No. 50		CAT No. 50		CAT No. 50			
	Pullstud		ANSI	ANSI		ANSI		ANSI			
	Tool magazine capacity		40	43		43		43			
	Max. tool diameter/length (from gauge line)/weight		ø95 mm/400 mm/12 kg (ø3.74"/15.75"/26 lbs)	ø125 mm/500 mm/30 kg (ø4.92"/19.69"/66 lbs)		ø125 mm/500 mm/30 kg (ø4.92"/19.69"/66 lbs)		ø125 mm/650 mm/30 kg (ø4.92"/25.59"/66 lbs)			
	Max. tool diameter with adjacent tool pockets empty		ø150 mm (ø5.91")	ø250 mm (ø9.84")*4		ø250 mm (ø9.84")*4		ø250 mm (ø9.84")*5			
	Tool selection method		Random selection/shortest path	Random selection/shortest path		Random selection/shortest path		Random selection / shortest path			
	Tool change time (chip-to-chip)*6		5.2 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		—		2		—	
	Pallet change time		10.0 s	11.0 s		—		21.0 s		—	
	Change system		Rotary type	Rotary type		—		Rotary type		—	
Motors	Table motor		AC 30/22 kW (40/30 hp) [15-min. rating/cont. rating]	—	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 22/18.5 kW (30/25 hp) [15-min. rating/cont. rating]	AC 37/30 kW (50/40 hp) [40% ED (30-min. rating)/cont. rating]		AC 37/30 kW (50/40 hp) [40% ED (30-min. rating)/cont. rating]		AC 37/30 kW (50/40 hp) [40% ED (30-min. rating)/cont. rating]			
Electrical and air requirements	Electrical power supply [50 Hz]	30-min. rating	78.54 kVA	104.3 kVA (40% ED)	120.90 kVA (40% ED)	104.3 kVA (40% ED)	120.90 kVA (40% ED)	107.65 kVA	97.85 kVA	107.65 kVA	97.85 kVA
		cont. rating	53.73 kVA	94.3 kVA	110.97 kVA	94.3 kVA	110.97 kVA	97.90 kVA	88.11 kVA	97.90 kVA	88.11 kVA
	Electrical power supply [60 Hz]	30-min. rating	80.14 kVA	106.2 kVA (40% ED)	122.79 kVA (40% ED)	106.2 kVA (40% ED)	122.79 kVA (40% ED)	109.54 kVA	99.49 kVA	109.54 kVA	99.49 kVA
		cont. rating	55.33 kVA	96.2 kVA	112.86 kVA	96.2 kVA	112.86 kVA	99.79 kVA	89.75 kVA	99.79 kVA	89.75 kVA
	Air supply (pressure)		0.5 MPa (73 psi)	0.5 MPa (73 psi)		0.5 MPa (73 psi)		0.5 MPa (73 psi)	0.5 MPa (73 psi)	0.5 MPa (73 psi)	0.5 MPa (73 psi)
	Air supply (flow rate)		700 L/min (24.72 ft³/min)	600 L/min (21.19 ft³/min)		600 L/min (21.19 ft³/min)		600 L/min (21.19 ft³/min)	800 L/min (28.25 ft³/min)	600 L/min (21.19 ft³/min)	800 L/min (28.25 ft³/min)
Tank capacity	Coolant tank capacity		1060 L (280 gal)	1400 L (370 gal)		1400 L (370 gal)		1400 L (370 gal)			
Machine size	Machine height		3485 mm (137.20")	3753 mm (147.76")		3753 mm (147.76")		3983 mm (156.81")			
	Floor space requirement		3990 mm × 7485 mm (150.16" × 294.69")	5054 mm × 7703 mm (198.98" × 303.25")	5548 mm × 7703 mm (218.43" × 303.25")	5441 mm × 7618 mm (214.21" × 299.92")	5935 mm × 7618 mm (233.66" × 299.92")	5434 mm × 8770 mm (213.94" × 345.28")	6010 mm × 8770 mm (236.61" × 345.28")	6251 mm × 8358 mm (246.10" × 329.06")	6934 mm × 8358 mm (272.99" × 329.06")
	Machine weight		23000 kg (50705 lbs)	32650 kg (71980 lbs)		30850 kg (68011 lbs)		38150 kg (84105 lbs)	39250 kg (86530 lbs)	34350 kg (75728 lbs)	35250 kg (77712 lbs)
CNC			MAZATROL SmoothX	MAZATROL SmoothX		MAZATROL SmoothX		MAZATROL SmoothX			

\*1-i-500V/5: with □500 mm (□19.69") tapped pallet (option), i-630V/6 and i-630V/6S: with □630 mm (□24.80") tapped pallet (option), i-800V/8: with □800 mm (□31.50") tapped pallet (option) and i-800V/8S: with ø1000 mm (□39.37") bolt-on tapped pallet.

\*2Max. 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.

\*3Limited feedrate with continuous movement.

\*4When adjacent pockets are empty and pockets next to them have tools less than ø240 mm (ø9.45"), maximum tool diameter is ø260 mm (ø10.24").

\*5When adjacent pockets are empty and pockets next to them have tools less than ø200 mm (ø7.87"), maximum tool diameter is ø300 mm (ø11.81").

\*6Mill-H → Mill-H/ EIA program



MAZATROL SmoothX Specifications

●: INTEGREX i-V Series only		
	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 ~ 4 axes	Simultaneous 5 axes*
Minimum 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*
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: 2MB, Program memory expansion: 8MB*, Program memory expansion: 32MB*	
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 offsets: 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 offsets: 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*, HobbingII*, Shaping function*, Dynamic compensationII*, 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, 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 block skip, 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, WPC coordinate 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	10M/100M/1Gbps	

\* Option

Standard and Optional Equipment

		●: Standard   ○: Option   —:N / A									
		i-500V/5	i-630V/6		i-630V/6S		i-800V/8		i-800V/8S		
		INTEGREX	INTEGREX	VORTEX	INTEGREX	VORTEX	INTEGREX	VORTEX	INTEGREX	VORTEX	
Milling spindle	12000 rpm (CAT No. 40)	●	—		—		—		—		
	12000 rpm (BBT-40, HSK T-63, CAPTO C6)	○	—		—		—		—		
	10000 rpm (CAT No. 50)	—	●		●		●		●		
	10000 rpm (BBT-50, HSK T-100, CAPTO C8)	—	○		○		○		○		
	5000 rpm (CAT No. 50, BBT-50, HSK T-100, CAPTO C8)	—	○		○		○		○		
	15000 rpm (HSK T-100)	—	○		○		○		○		
Table	Taper cones	●	●		●	—	●		○		
	Bolt-on	—	—		—	●	—		●		
Pallet	□500 mm (□19.69") tapped pallet with location bore	○	—		—		—		—		
	□630 mm (□24.80") tapped pallet with location bore	—	○		○		—		—		
	□800 mm (□31.50") tapped pallet with location bore	—	○		○		○		—	○	
	□630 × 800 mm (□24.80 × 31.50") tapped pallet with location bore	—	—	○	—		—		—		
	□800 × 1000 mm (□31.50 × 39.37") tapped pallet with location bore	—	—		—		○		—		
	□1000 mm (□39.37") tapped pallet with location bore	—	—		—		○		—	○	
	□630 mm (□24.80") T-slot pallet with location bore	—	○		○		—		—		
	□800 mm (□31.50") T-slot pallet with location bore	—	○		○		○		—		
	□630 × 800 mm (□24.80 × 31.50") T-slot pallet with location bore	—	—	○	—		—		—		
	ø610 mm (ø24.80") tapped pallet with location bore	○	—		—		—		—		
	ø800 mm (ø31.50") tapped pallet with location bore	—	○	—	○		—		—		
	ø1000 mm (ø39.37") tapped pallet with location bore	—	○	—	○	—	○		○		
	ø1250 mm (Φø49.21") tapped pallet with location bore	—	—		—		—		○	—	
	ø610 mm (ø24.02") 4-jaw independent chuck	○	—		—		—		—		
	ø1000 mm (ø39.37") 4-jaw independent chuck	—	—		—		○	—	○	—	
	ø1250 mm (ø49.21") 4-jaw independent chuck	—	—		—		—		○	—	
	ø610 mm (ø24.02") 3-jaw scroll chuck	○	—		—		—		—		
	ø800 mm (ø31.50") 3-jaw scroll chuck	—	○	—	○	—	—		—		
	ø1000 mm (ø39.37") 3-jaw scroll chuck	—	—		—		○	—	○	—	
	ø800 mm (ø31.50") face plate with jaws	—	○	—	○	—	—		—		
	ø1000 mm (ø39.37") face plate with jaws	—	—		—		○	—	○	—	
	ø1250 mm (ø49.21") face plate with jaws	—	—		—		—		○	—	
Pallet changer	2-pallet changer	●	●		—		●		—		
Tool magazine	40	●	—		—		—		—		
	43	—	●		●		●		●		
	80, 120	○	○		○		○		○		
	160	—	○		○		○		○		
	TOOL HIVE 180, 240, 348	○	○		○		○		○		
	TOOL TECH 206, 276, 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	○	○		○		○		○		

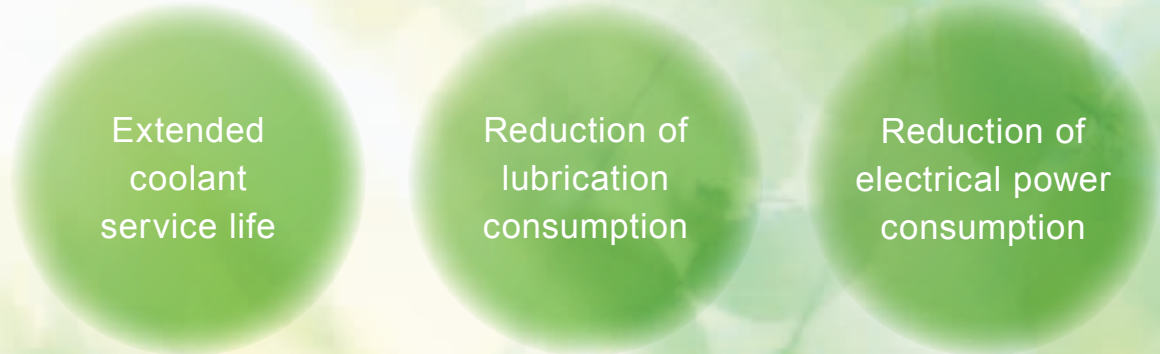
Standard and Optional Equipment

		●: Standard    ○: Option    -: N / A									
		i-500V/5		i-630V/6		i-630V/6S		i-800V/8		i-800V/8S	
		INTEGREX		INTEGREX	VORTEX	INTEGREX	VORTEX	INTEGREX	VORTEX	INTEGREX	VORTEX
Setup	External steps in front of CNC operation panel (2PC)	●		●		—		●		—	
	External steps and platform (single)	—		—		○		—		○	
	Manual pulse generator (wired)	○		●		●		●		●	
	Manual pallet rotation at 2-pallet changer loading station	●		●		—		●		—	
	Automatic pallet rotation at 2-pallet changer loading station	○		○		—		○		—	
Automation	Preparation for PALLETECH	○		○		—		○		—	
	Automatic power ON/OFF + warm-up operation	●		●		●		●		●	
High accuracy	Ballscrew core cooling (X, Y, Z axis)	●		●		●		●		●	
	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 (116 psi)]	○		○		○		○		○	
	Coolant through milling spindle [1.5 MPa (218 psi)]	○		○		○		○		○	
	Preparation for high pressure coolant through milling spindle [7.0 MPa (1015 psi)]	○		○		○		○		○	
	SUPERFLOW V30C-J [7.0 MPa (1015 psi)]	○		○		○		○		○	
	Niagara coolant	●		●		●		●		●	
	Hand held coolant nozzle (setup area)	○		○		—		○		—	
	Hand held coolant nozzle	—		—		○		—		○	
	Secondary coolant filter for aluminum	○		○		○		○		○	
	Magnetic separator for cast iron	○		○		○		○		○	
	Mist collector	○		○		○		○		○	
	Oil skimmer (RB-200)	○		○		○		○		○	
	Chip conveyor (ConSep 2000)	○		○		○		○		○	
Measurement	Preparation for Mazak monitoring system B RMP-600	●		●		●		●		●	
	Mazak monitoring system B (wireless) RMP-600	○		○		○		○		○	
	Mazak NC gage package	○		○		○		○		○	
	SMOOTH Set & Inspect	○		○		○		○		○	
IoT	MAZAK SmartBox	○		○		○		○		○	
	MTConnect adapter	○		○		○		○		○	
	Energy Dashboard	○		○		○		○		○	
Maintenance	ATC automatic recovery system	●		●		●		●		●	

Environmentally Friendly

Designed with environmental considerations

The environment and our impact on natural surroundings have always been important concerns for Yamazaki Mazak. 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 ballscrews are lubricated by grease, which eliminates tramp oil in the coolant, resulting in a much longer coolant service life.

When the machine is not operated for a predetermined period of time, the worklights and CNC backlight turn off automatically. They automatically turn on when the motion sensor detects the operator’s return.







## YAMAZAKI MAZAK CORPORATION

1-131 Takeda, Oguchi-cho, Niwa-gun, Aichi-pref., Japan  
TEL : +(81)587-95-1131

[www.mazak.com](http://www.mazak.com)

- Specifications are subject to change without notice.
- This product is subject to all applicable export control laws and regulations.
- The accuracy data and other data presented in this catalogue were obtained under specific conditions. They may not be duplicated under different conditions. (room temperature, workpiece materials, tool material, cutting conditions, etc.)

