AW MILLER
TECHNICAL SALES, INC.

EAST AURORA, NY 716.652.8282 | HARMONY, PA 724.453.1690 | STE-LAURENT, QC 514.333.9174 | HARLEYSVILLE, PA 215.256.8281

INTEGREX e-V
VORTEX e-V

Mazak

SERIES

Exceptional higher productivity for complex, large workpiece machining

Double column construction is suitable for machining large workpieces.
Multiple surface machining, and free curved machining by simultaneous 5-axis control plus turning operation can be performed for higher productivity.

Simultaneous 5-axis vertical multi-tasking machines

INTEGREX e-V SERIES

INTEGREX e-1600V/10S

Single table
Shown with optional equipment

The INTEGREX e-V and VORTEX e-V series utilize double column construction for easy milling of the workpiece top surface, stable machining accuracy and higher productivity.
Tilting milling spindle enables the machining not only the top surface of the workpiece, but also the side and slanted surfaces as well as multiple surface machining with 5-axis control.
Compared with the previous method requiring multiple machine setups and workpiece handling, it can reduce in-process inventory and production lead time as well as improving accuracy.
The INTEGREX e-V series can perform simultaneous 5-axis machining plus turning operation.

Simultaneous 5-axis vertical machining centers

VORTEX e-V SERIES

VORTEX e-1600V/10

2-pallet changer
Shown with optional equipment

Extensive Series Range

A variety of e-V and e-RAMTEC V machines are available to meet the machining requirements of a wide range of large workpieces

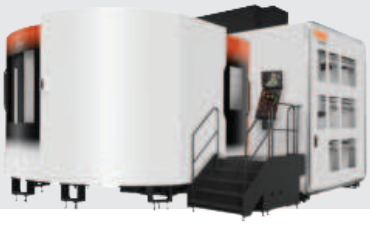
INTEGREX e-V

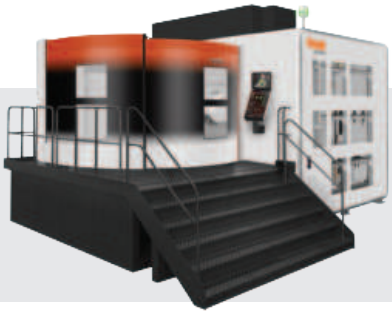

5-axis simultaneous machining


Turning

INTEGREX	e-1250V/8 [2-pallet changer]	e-1250V/8S [Single table]
Max. workpiece size	Φ1450 mm × 1600 mm (Φ57.09" × 62.99") (800 mm × 800 mm (31.5" × 31.5") tapped pallet*)	Φ1500 mm × 1655 mm (Φ59.06" × 65.16") (Φ800 mm (Φ31.5") faceplate with jaws*)
Max. load (including table / chuck weight)	2700 kg (5952 lbs)	4000 kg (8819 lbs)

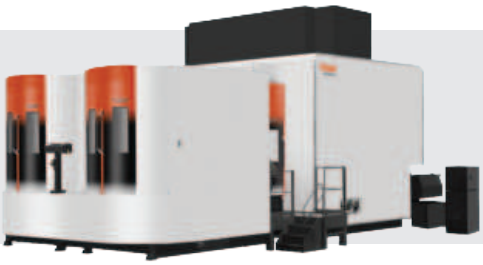
*Option





INTEGREX	e-1600V/10 [2-pallet changer]	e-1600V/10S [Single table]
Max. workpiece size	Φ2050 mm × 1600 mm (Φ80.71" × 62.99") (1000 mm × 1000 mm (39.37" × 39.37") tapped pallet*)	Φ2300 × 1684 mm (Φ90.55" × 66.30") (Φ1250 mm (Φ49.21") faceplate with jaws*)
Max. load (including table / chuck weight)	5000 kg (11023 lbs)	7000 kg (15432 lbs)

*Option



INTEGREX	e-1850V/12 [2-pallet changer]	e-1850V/25S [Single table]
Max. workpiece size	Φ2350 mm × 1800 mm (Φ92.52" × 70.87") (1250 mm × 1250 mm (49.21" × 49.21") tapped pallet*)	Φ3500 mm × 1800 mm (Φ137.8" × 70.87") (Φ2500 mm (Φ98.43") tapped pallet*)
Max. load (including table / chuck weight)	7000 kg (15432 lbs)	15000 kg (33069 lbs) (Simultaneous 5-axis:10000 kg (22046 lbs))

*Option

VORTEX e-V

5-axis simultaneous machining

VORTEX	e-1250V/8 [2-pallet changer]	e-1250V/8S [Single table]
Max. workpiece size	Φ1450 mm × 1600 mm (Φ57.09" × 62.99") (800 mm × 800 mm (31.5" × 31.5") tapped pallet*)	Φ1500 mm × 1655 mm (Φ59.06" × 65.16") (Φ800 mm (Φ31.5") faceplate with jaws*)
Max. load (including table / chuck weight)	2700 kg (5952 lbs)	4000 kg (8819 lbs)

*Option

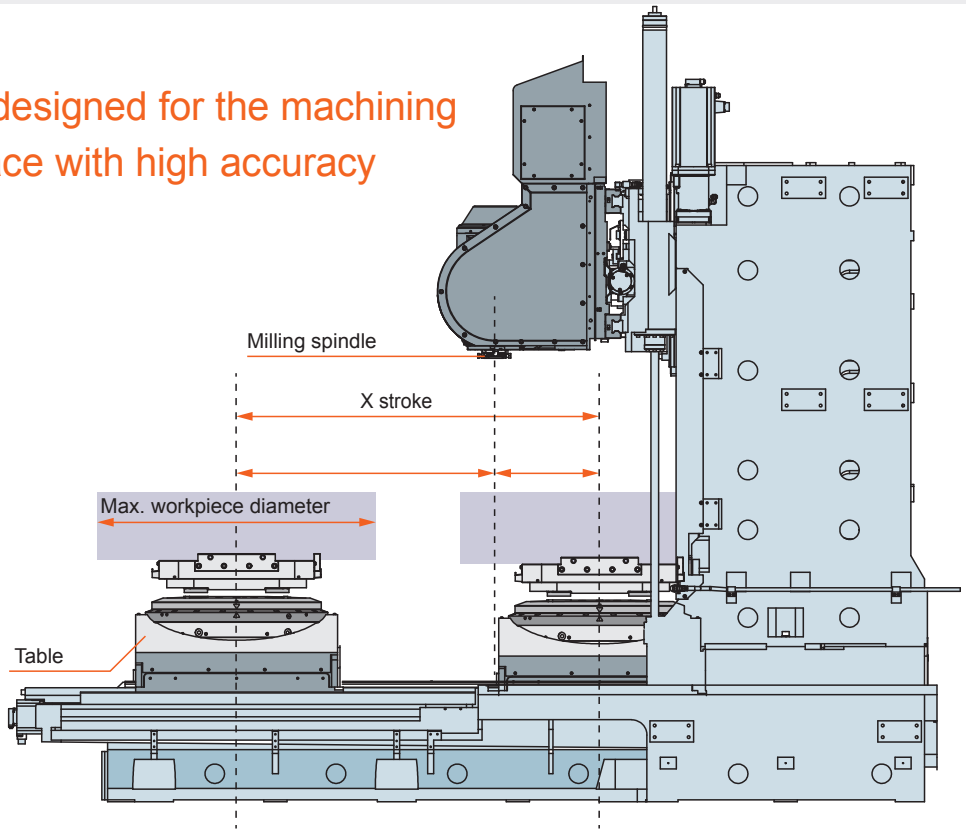
VORTEX	e-1600V/10 [2-pallet changer]	e-1600V/10S [Single table]
Max. workpiece size	Φ2050 mm × 1600 mm (Φ80.71" × 62.99") (1000 mm × 1000 mm (39.37" × 39.37") tapped pallet*)	Φ2300 × 1684 mm (Φ90.55" × 66.30") (Φ1250 mm (Φ49.21") faceplate with jaws*)
Max. load (including table / chuck weight)	5000 kg (11023 lbs)	7000 kg (15432 lbs)

*Option

Higher Accuracy & Higher Productivity

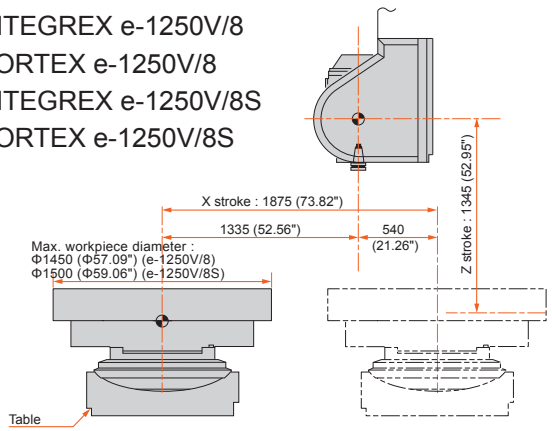
Double column construction designed for the machining of large workpiece's top surface with high accuracy

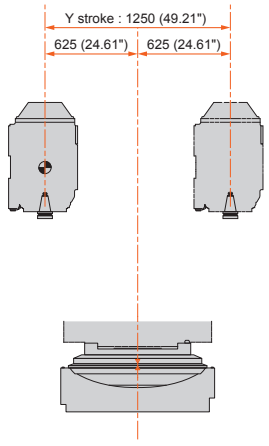
Utilizing double column construction,
the machining of workpiece top surface
can be performed with the large X-axis stroke
to ensure stable machining accuracy and higher
productivity.



Stroke Diagram

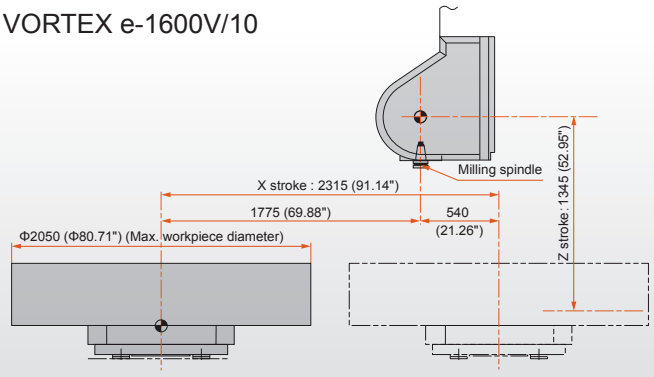
INTEGREX e-1250V/8
VORTEX e-1250V/8
INTEGREX e-1250V/8S
VORTEX e-1250V/8S

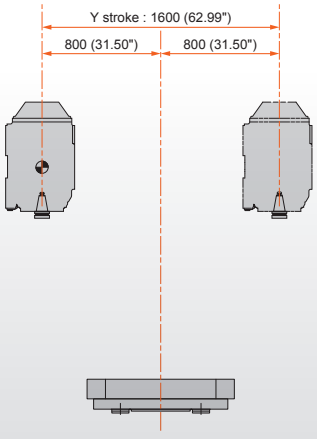




Unit : mm (inch)

INTEGREX e-1600V/10
VORTEX e-1600V/10

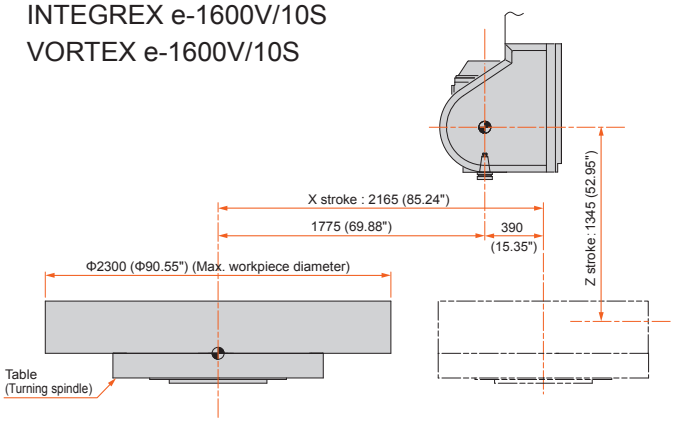


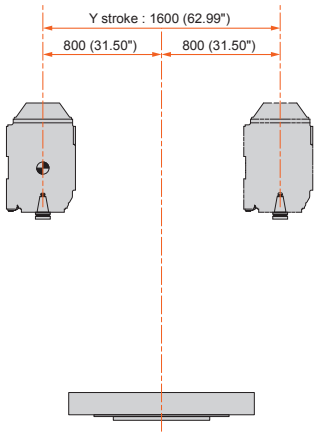


Unit : mm (inch)

INTEGREX e-1600V/10S
VORTEX e-1600V/10S

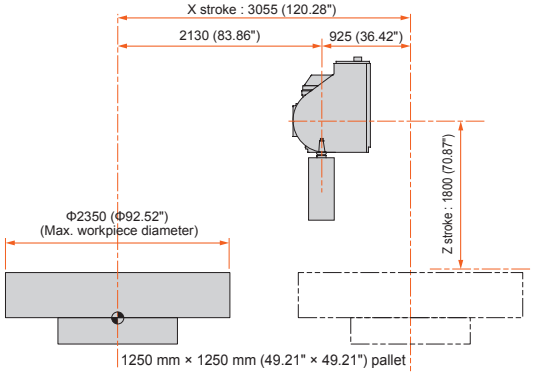
Unit : mm (inch)

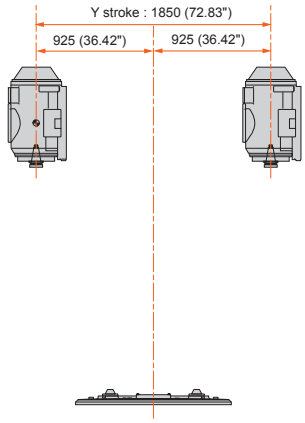




INTEGREX e-1850V/12

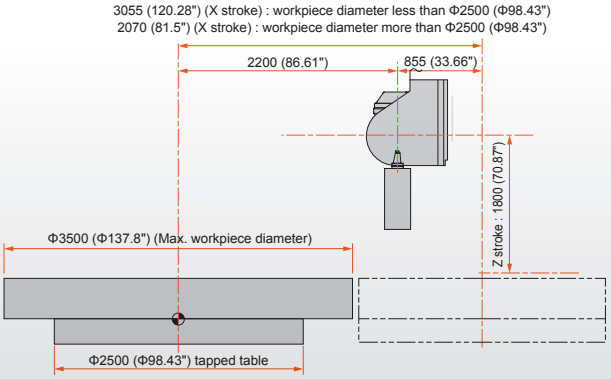
Unit : mm (inch)

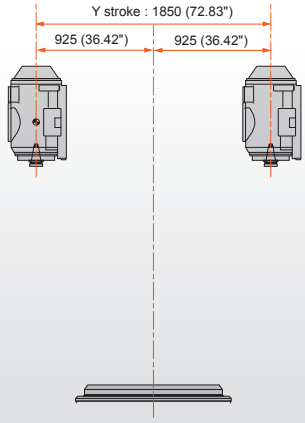




INTEGREX e-1850V/25S

Unit : mm (inch)





High rigidity construction for high accuracy machining

Prevention of temperature change — milling spindle cooling

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

Roller gear cam utilized by B-axis

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)

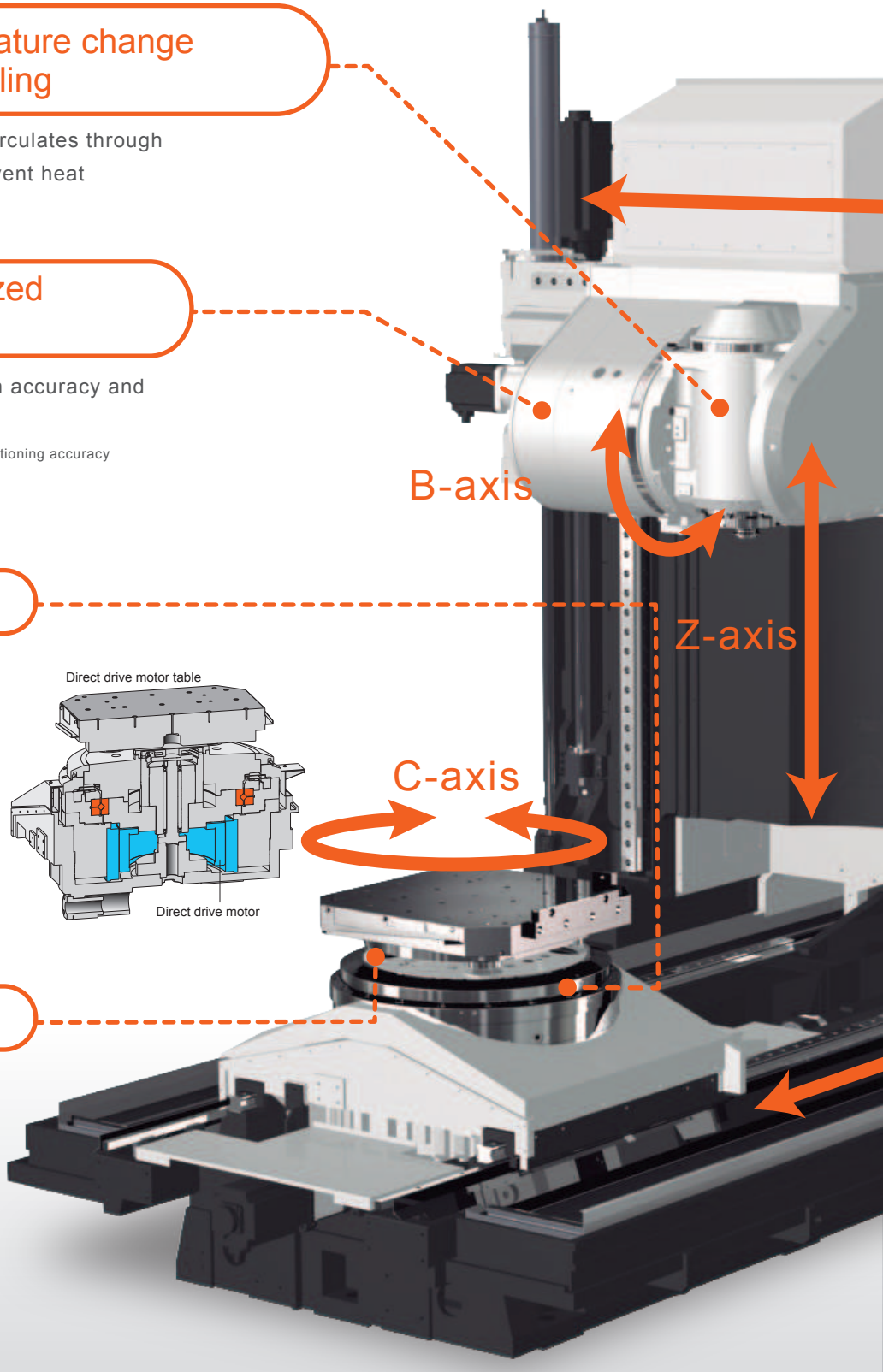
Direct drive motor

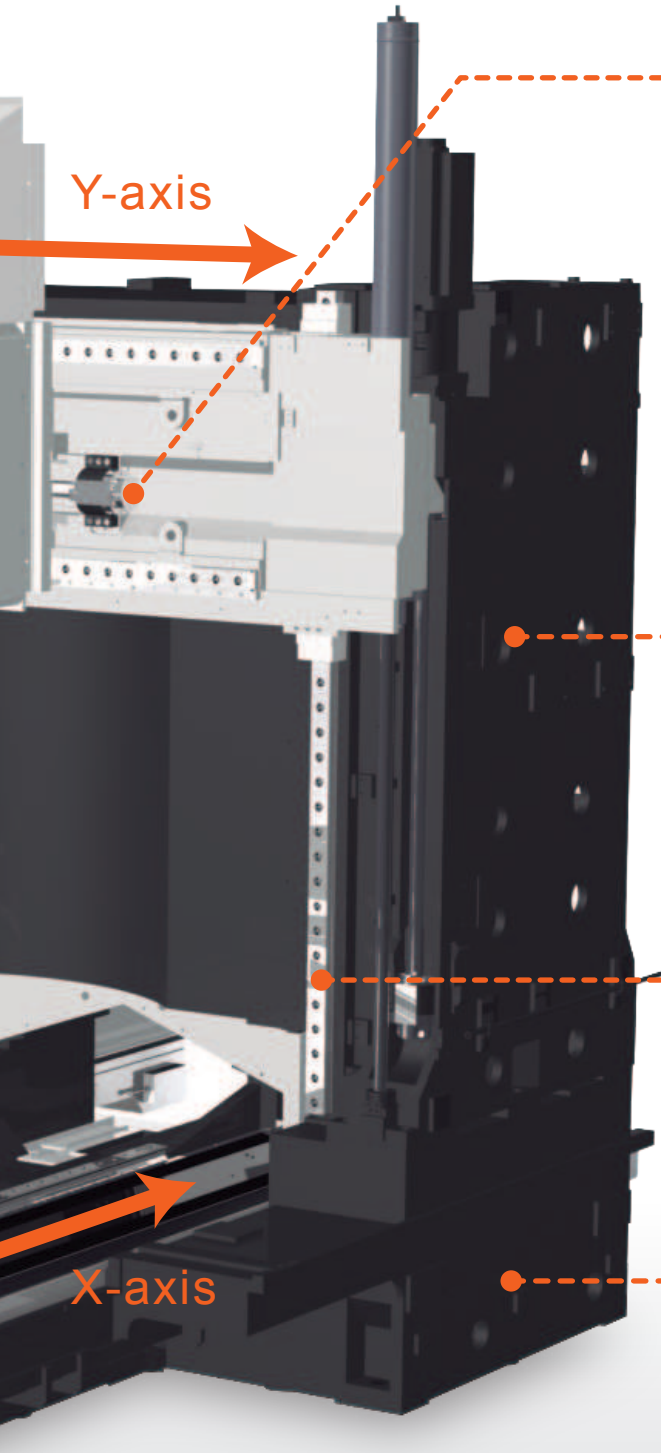
A direct drive motor is used for turning and C-axis operations. Since this eliminates a drive system made of belts and gears – there is no vibration, heat generation and backlash, high accuracy machining is realized.

Taper cones

The pallet and table are connected by the taper cone clamping system. High rigidity and positioning accuracy of consecutive pallet changes are ensured.

(single table e-1250V/8S and e-1600V/10S: tables are bolted to machine base)





Ball screw core cooling

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

Rigid, stable column

The column shape and weight distribution have been thoroughly analyzed so that the center of gravity is located to provide exceptional rigidity and stability.

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

Linear roller guides on the X-, Y-, and Z-axes are utilized by the INTEGREX e-V series and VORTEX e-V series in order to provide high-accuracy and heavy duty machining.

High rigidity base

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

* Mentioned above is for the e-1250V/8, e-1250V/8S, e-1600V/10, e-1600V/10S

Higher Productivity

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.

Machining example (standard specification)

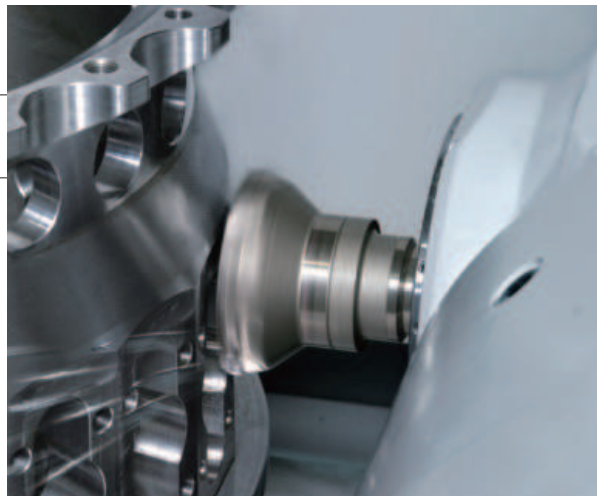
Material removal rate 1092 cc/min (66.6 in^3 / min)

Material C45

Tool Face mill Φ160 mm (Φ6.3"), 8 teeth

Cutting conditions

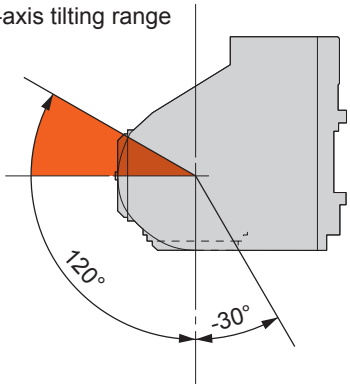
Spindle speed	500 rpm
Surface speed	250 m/min (820 FPM)
Depth of cut	4.2 mm (0.17")
Feedrate (per tooth)	0.45 mm (0.02") / tooth

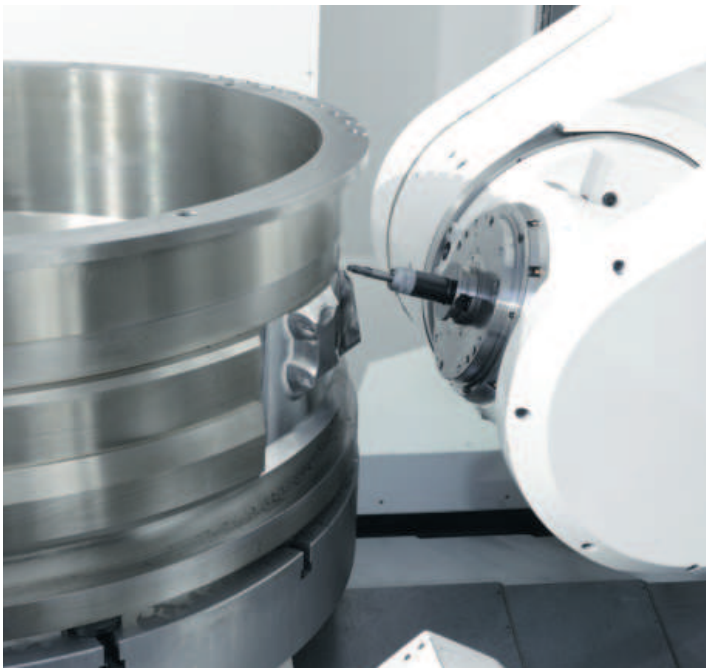


B-axis tilting range 150°

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

B-axis tilting range

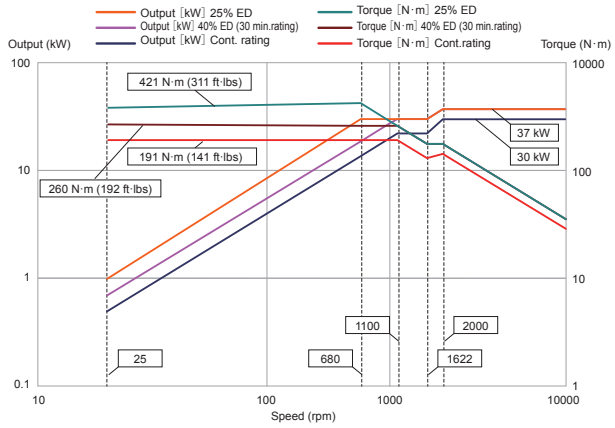




Standard 10000 rpm milling spindle

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

Max. speed	10000 rpm
Output (40% ED [30 min.rating] / Cont. rating)	37 kW (50 HP) / 30 kW (40 HP)
Max. torque (40% ED [30 min.rating] / Cont. rating)	260 N·m (192 ft·lbs) / 191 N·m (141 ft·lbs)

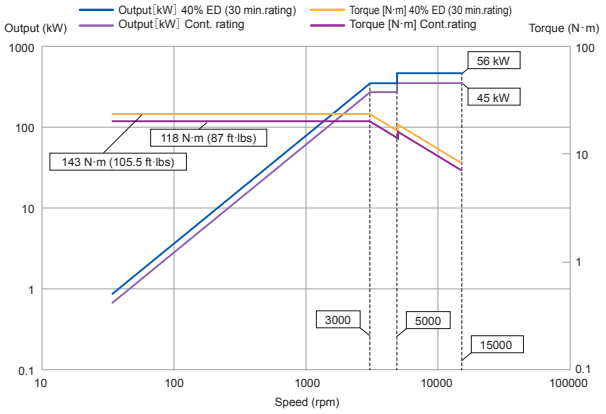


HSK T-100, 15000 rpm milling spindle OPTION

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

Max. speed	15000 rpm
Output (40% ED [30 min.rating] / Cont. rating)	56 kW (75 HP) / 45 kW (60 HP)
Max. torque (40% ED [30 min.rating] / Cont. rating)	143 N•m (105 ft•lbs)/ 118 N•m (87 ft•lbs)

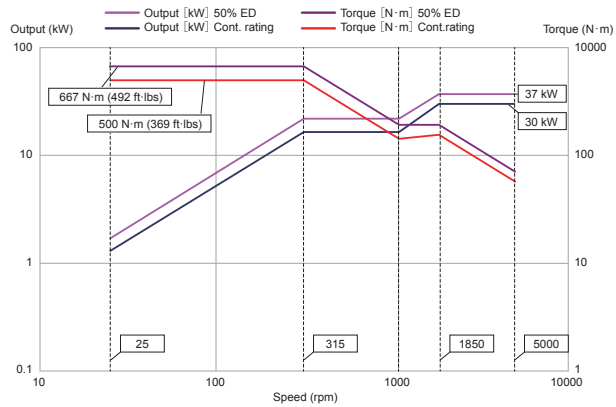
e-1250V/8, e-1250V/8S, e-1600V/10, e-1600V/10S : The distance from the B axis center of rotation to the tool gauge line is 350 mm - the machining area is reduced by 50 mm compared to the standard spindle.



High torque 5000 rpm milling spindle OPTION

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

Max. speed	5000 rpm
Output (50% ED/ Cont. rating)	37 kW (50 HP) / 30 kW (40 HP)
Max. torque (50% ED / Cont. rating)	667 N·m (492 ft·lbs) / 500 N·m (369 ft·lbs)



Higher Productivity

Powerful, high-torque table for turning and C-axis operations

Equipped with direct drive motor that can output large torque with a compact volume, achieving both high torque required for turning large workpieces and high response that enables agile positioning.

INTEGREX e-1250V/8, e-1250V/8S

Max. speed	500 rpm [300 rpm]
Spindle output (cont. rating)	AC 40 kW (53 HP) [AC 50 kW (66 HP)]
Max. torque (cont. rating)	3434 N•m (2533 ft•lbs) [6800 N•m (5015 ft•lbs)]
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	25 rpm

INTEGREX e-1600V/10, e-1600V/10S

Max. speed	300 rpm [300 rpm]
Spindle output (cont. rating)	AC 40 kW (53 HP) [AC 50 kW (66 HP)]
Max. torque (cont. rating)	3434 N•m (2533 ft•lbs) [6800 N•m (5015 ft•lbs)]
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	20 rpm

[ ] : High torque (option)

High-torque table for turning and C-axis operations

High efficiency turning from rough to finish machining of large, heavy workpieces is performed by high output motor and two-gear ranges. The C-axis can be indexed in 0.0001° indexing increments for high accuracy machining.

INTEGREX e-1850V/12

Max. speed	250 rpm [150 rpm]
Spindle output (cont. rating)	AC 37 kW (50 HP)
Max. torque (cont. rating)	5307 N•m (3914 ft•lbs) [12230 N•m (9020 ft•lbs)]
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	6.7 rpm
Load (evenly distributed)	7000 kg [15432 lbs] (Including pallet)

[ ] : High torque (option)

INTEGREX e-1850V/25S

Max. speed	75 rpm [100 rpm]
Spindle output (cont. rating)	AC 37 kW (50 HP)
Max. torque (cont. rating)	19108 N•m(14093 ft•lbs)
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	1 rpm [3 rpm]
Load (evenly distributed)	15000 kg (33069 lbs) [10000 kg (22046 lbs)] (Including pallet)

[ ] : Simultaneous 5-axis control (option)

High-speed, high-precision table (C-axis)

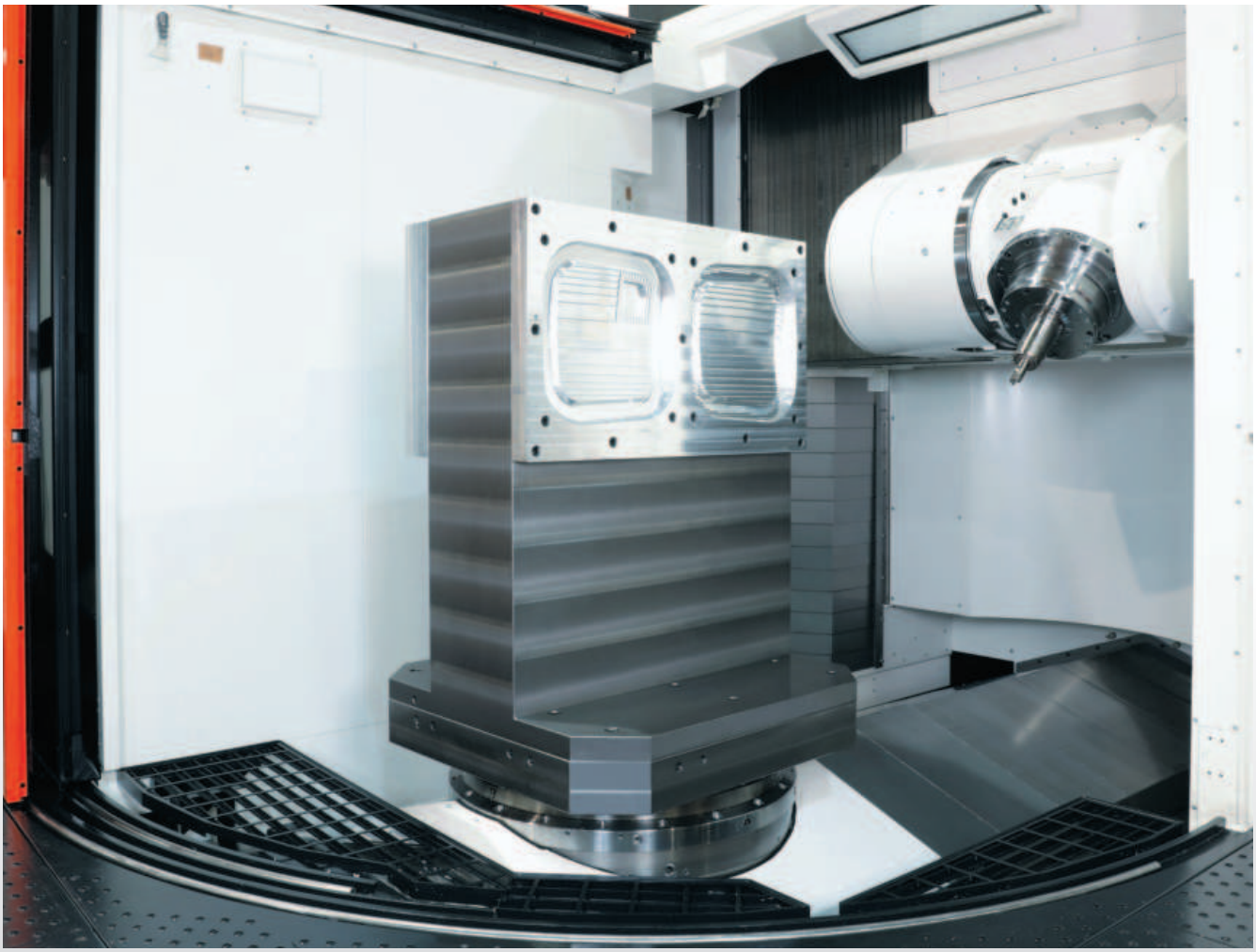
The table uses a direct drive motor for high speed C-axis feed. Since a direct drive motor directly delivers power to C-axis with less power loss, high speed feed is ensured with 5-axis control for enhanced productivity.

VORTEX e-1250V/8, e-1250V/8S

Least input increment (C-axis)	0.0001°
Rapid traverse rate (C-axis)	25 rpm
90° indexing time	1.1 sec
Contouring torque	3180 N□m (2345 ft□lbs)

VORTEX e-1600V/10, e-1600V/10S

Least input increment (C-axis)	0.0001°
Rapid traverse rate(C-axis)	20 rpm
90° indexing time	1.4 sec
Contouring torque	3180 N•m (2345 ft•lbs)



Tool magazine capacities available for any production requirement

High speed, high rigidity automatic tool changer

The automatic tool changer is designed for reliability and performs tool changes at high speed – including heavy tools as well.

■ Rack type tool magazine

INTEGREX, VORTEX e-1250V/8, e-1250V/8S, e-1600V/10, e-1600V/10S

Tools are stored vertically in racks resulting in a small space requirement for any tool storage capacity rack magazine. High speed and smooth tool loader movement reduces tool waiting time and vibration preventing any effect on machined surfaces. The 84 tool and 120 tool rack magazines can be expanded after the initial installation.

Tool storage	42 tools* (standard)	84 tools (option)	120 tools (option)	162 tools (option)
Tool selection method	Fixed pocket number			
Available tool capacity expansion	–	120 tools / 162 tools	162 tools	–

* 650 mm (25.59") long tools can be stored on the bottom rack (14 tools). The top and middle racks can store tools up to 500 mm (19.69") long.

Standard 42 tool rack magazine

■ Tool chain magazine

INTEGREX, VORTEX e-1850V/12, e-1850V/25S

Tool chain magazines are available with tool storage capacities up to 160 tools. This makes it possible to perform high-mix, low volume production as well as store back up tools when unmanned operation over extended periods is carried out.

Tool storage	40 tools (standard)	80 tools (option)	120 tools (option)	160 tools (option)
Tool selection method	Fixed pocket number Random selection, shortest path			

Tool chain magazine

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.

TOOL HIVE TERMINAL

240 tools TOOL HIVE magazine

e-1250V/8, e-1250V/8S, e-1600V/10, e-1600V/10S TOOL HIVE

Tool storage	180 tools	216 tools	252 tools	288 tools	324 tools	360 tools
Magazine	Rack type					
Tool selection method	Fixed pocket number					

e-1850V/12, e-1850V/25S TOOL HIVE

Tool storage	180 tools	204 tools	240 tools	288 tools	312 tools	348 tools
Magazine	Rack type					
Tool selection method	Fixed pocket number					

Maximum tool specifications

Machine models	INTEGREX, VORTEX e-1250V/8 INTEGREX, VORTEX e-1250V/8S INTEGREX, VORTEX e-1600V/10 INTEGREX, VORTEX e-1600V/10S	INTEGREX e-1850V/12 INTEGREX e-1850V/25S
Max. tool diameter (with / without adjacent tools)	135 mm (5.31") / 260 mm (10.24")	135 mm (5.31") / 260 mm (10.24")
Tool length (from gauge line)	650 mm (25.59")	650 mm (25.59")
Max. tool weight	30 kg (66 lbs)	30 kg (66 lbs)
Max. tool moment	49 N•m (36.1 ft·lbs)	29.4 N•m (21.7 ft·lbs)

2-pallet changer for reduced setup time

Automatically changes pallet loaded with heavy workpieces.
The next workpiece can be setup during the machining of the current one for higher productivity. To provide good access for setup, the pallet can be indexed every 90°.

Power pallet rotation

INTEGREX, VORTEX e-1600V/10,INTEGREX e-1850V/12

OPTION *INTEGREX, VORTEX e-1250V/8*

Pallet on the loading station driven by a motor can be indexed to four positions, to every 90° for ease of operation.

Workpiece centering equipment OPTION

INTEGREX e-1250V/8, e-1600V/10

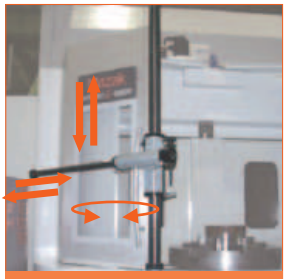
Dial gauge stand is optionally available for workpiece centering. Dial gauge stand as well as loading station rotation can support workpiece centering.

Folding the arm allows compact storage

Workpiece centering equipment with power rotation OPTION

INTEGREX e-1850V/12

With indicator stand and pallet power rotation, convenient workpiece centering is ensured for turning operation.

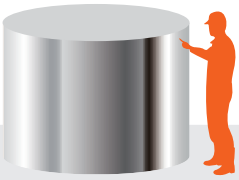


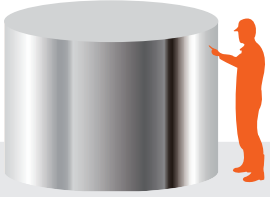
Indicator stand

Power rotation at setup station

2-pallet changer

Machine	INTEGREX e-1250V/8 VORTEX e-1250V/8	INTEGREX e-1600V/10 VORTEX e-1600V/10	INTEGREX e-1850V/12
Pallet change time	15 sec	25 sec	50 sec
Max. workpiece size	Φ1450 mm (Φ57.09") × 1600 mm (62.99")	Φ2050 mm (Φ80.71") × 1600 mm (62.99")	Φ2350 mm (Φ92.52") × 1800 mm (70.87")
Max. weight capacity (including pallet)	2700 kg (5952 lbs)	5000 kg (11023 lbs)	7000 kg (15432 lbs)

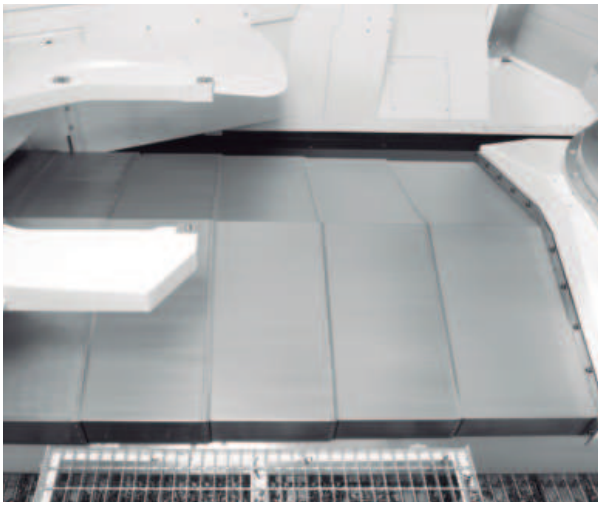




Optimum chip disposal for a wide range of applications

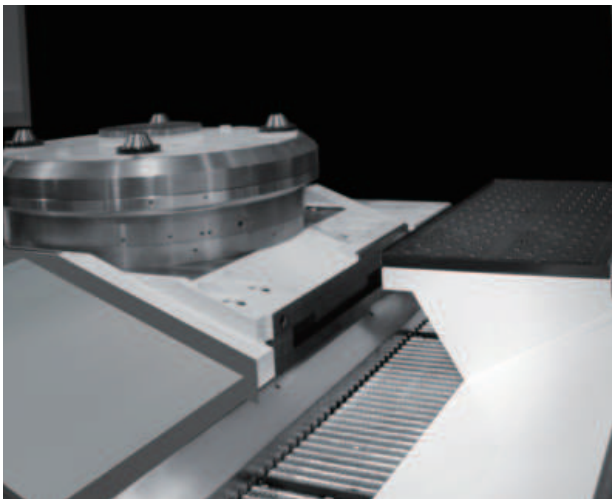
Chip accumulation prevention

The top surface of the slideway covers are angled so that machined chips and coolant will be smoothly discharged to prevent any accumulation.



Chip conveyors inside machine

The standard equipment hinge-type chip conveyors on both sides of the table smoothly remove machined chips.

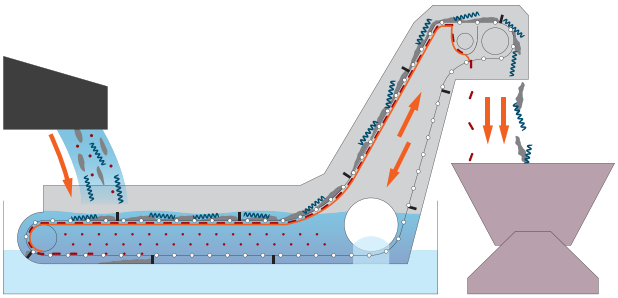


ConSep Chip conveyors (Built-in drum filter) OPTION

ConSep 2000 II WS

e-1250V/8, e-1600V/10 series

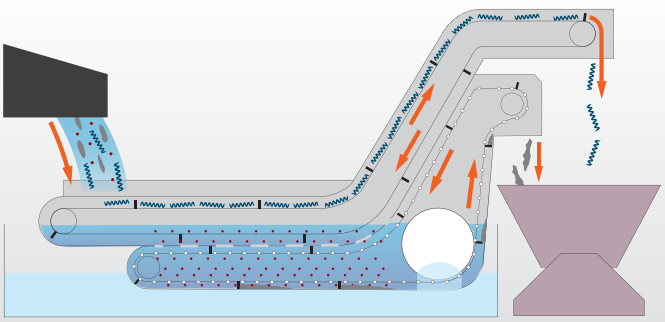
Chip conveyor with internal coolant filtration that is effective for removing small chips as well as long, curly chips.



ConSep

e-1850V/12, e-1850V/25S

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



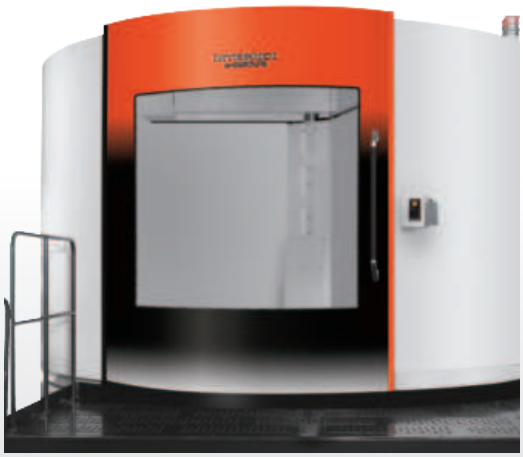
Design focus on ergonomics provides unsurpassed ease of operation

Large window

Large windows are located on the operator door and safety cover door for convenient monitoring of machine operation.

Large window on operator door

Large window on safety cover door



Smooth loading and unloading of workpieces

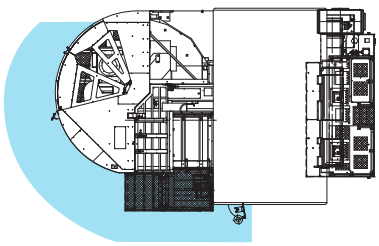
The wide opening of the cylindrical door of the 2-pallet changer provides excellent accessibility for an overhead crane during setup and loading / unloading.

Convenient location of tool magazine

The tool magazine is located next to the CNC operation panel to significantly reduce the distance the operator must cover for machine setup.

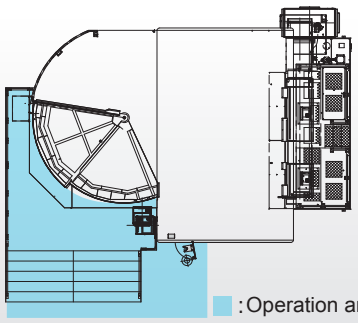
2-pallet changer

e-1250V/8
e-1600V/10



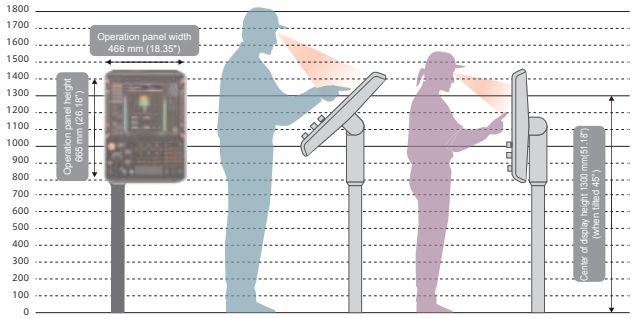
Single table

e-1250V/8S
e-1600V/10S



Adjustable CNC Operation Panel

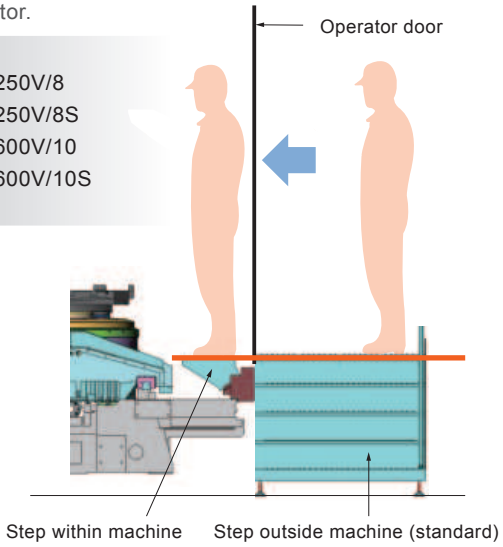
The operation panel can be tilted to the optimum position for any operator's height to ensure ease of operation.



Convenient access to machining area

Steps outside the machine and inside the machine are standard equipment to provide convenient access to the operator.

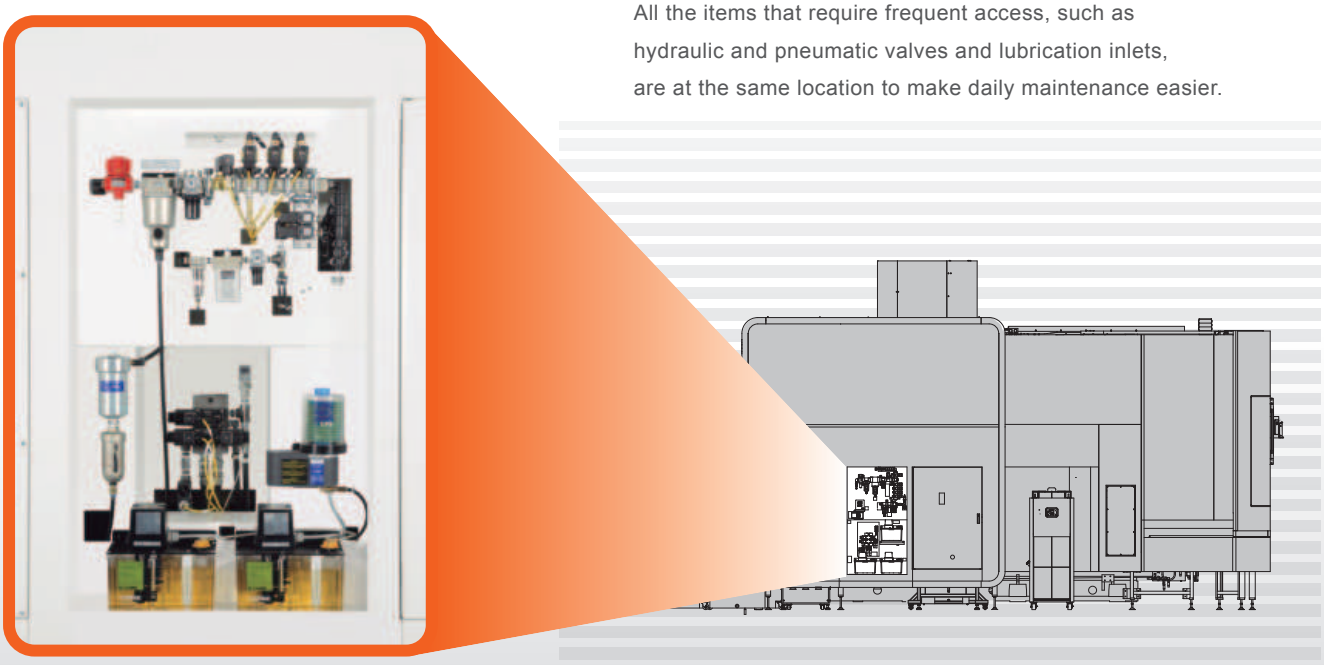
e-1250V/8
e-1250V/8S
e-1600V/10
e-1600V/10S



Convenient maintenance

Centralized location

All the items that require frequent access, such as hydraulic and pneumatic valves and lubrication inlets, are at the same location to make daily maintenance easier.



Achieve high productivity with multi-product machining

PALLETECH system

OPTION

- Flexible system expansion is possible in response to changing production volume
- Integrates different type of machines into one system
- Flexible connection to peripheral systems and devices that increase automatic operation time

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 stocker is available with one and two levels for large pallet storage capacity with small floor space requirements.

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

PALLETECH HIGH-RISE SYSTEM (2 level)

PALLETECH HIGH-RISE SYSTEM
with horizontal machining center

PALLETECH MANUFACTURING CELL (1 level)

PALLETECH MANUFACTURING CELL
with horizontal machining center

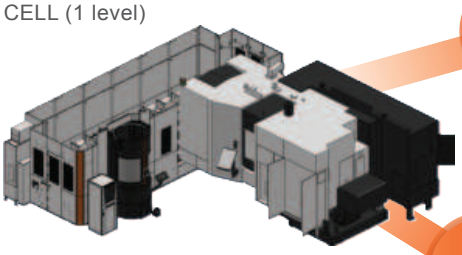
Flexible system expansion

The PALLETECH system can be used from the minimum scale according to the customer's production volume and investment budget. It also can be expanded flexibly in response to increased production volume after initial installation.

Example : PALLETECH MANUFACTURING CELL (1 level)

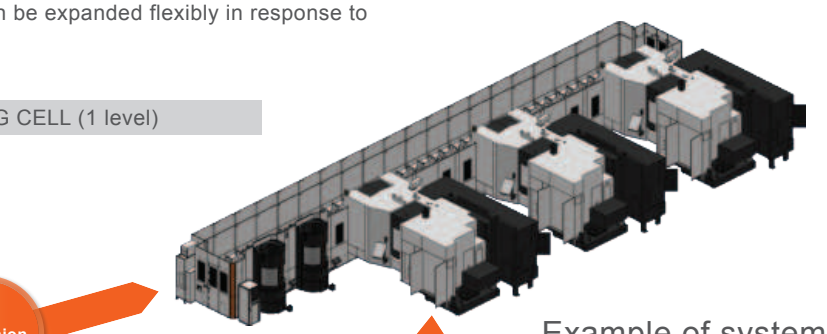
First installation (Starter set)

Required configuration of
PALLETECH MANUFACTURING
CELL (1 level)



1 machine
1 loading station
6 pallet stockers

Expansion

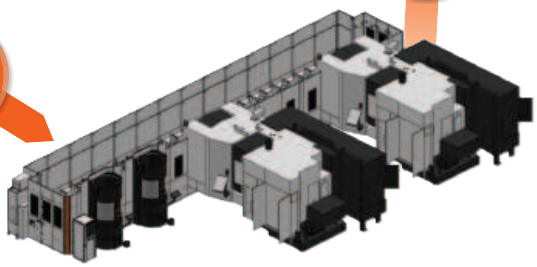


Example of system expansion 2

3 machines
2 loading stations
20 pallet stockers

Expansion

Expansion



Example of system expansion 1

2 machines
2 loading stations
14 pallet stockers

Long-term autonomous operation by connecting with peripheral systems and devices

Smooth Tool Management — OPTION

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.

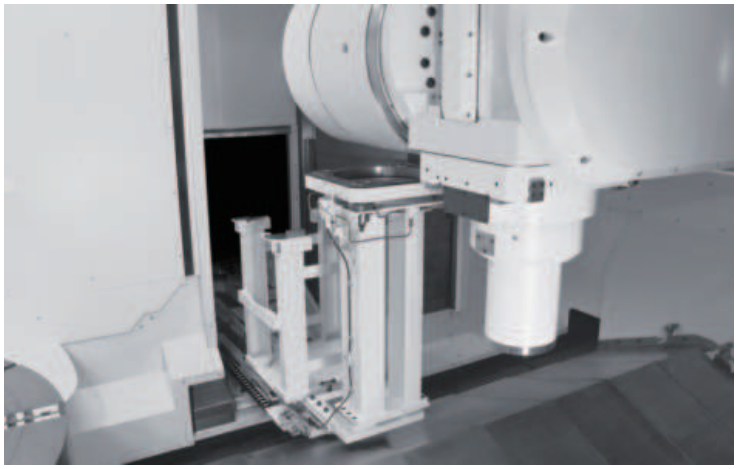
Enhanced versatility

4 point clamping attachment for further process integration (e-1600V/10, e-1600V/10S) OPTION

Process integration thanks to special tools for improved accuracy and productivity

High machining capability thanks to rigid construction of 4 point clamping attachment

Up to 4 of the 4 point clamping attachments can be stored in the attachment stocker for automatic attachment loading / unloading on the spindle

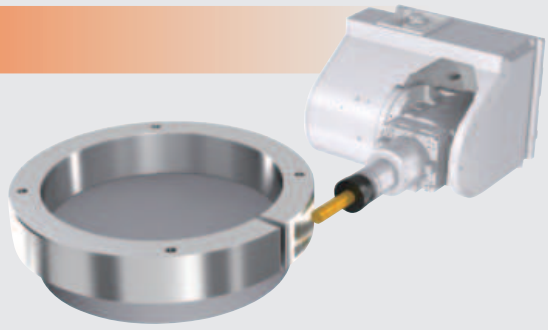


Snout head

Example attachments

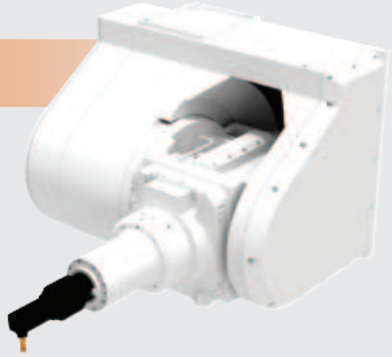
Very long tool machining

A long tool is not required with the high rigidity snout attachment. Tools can be automatically changed.



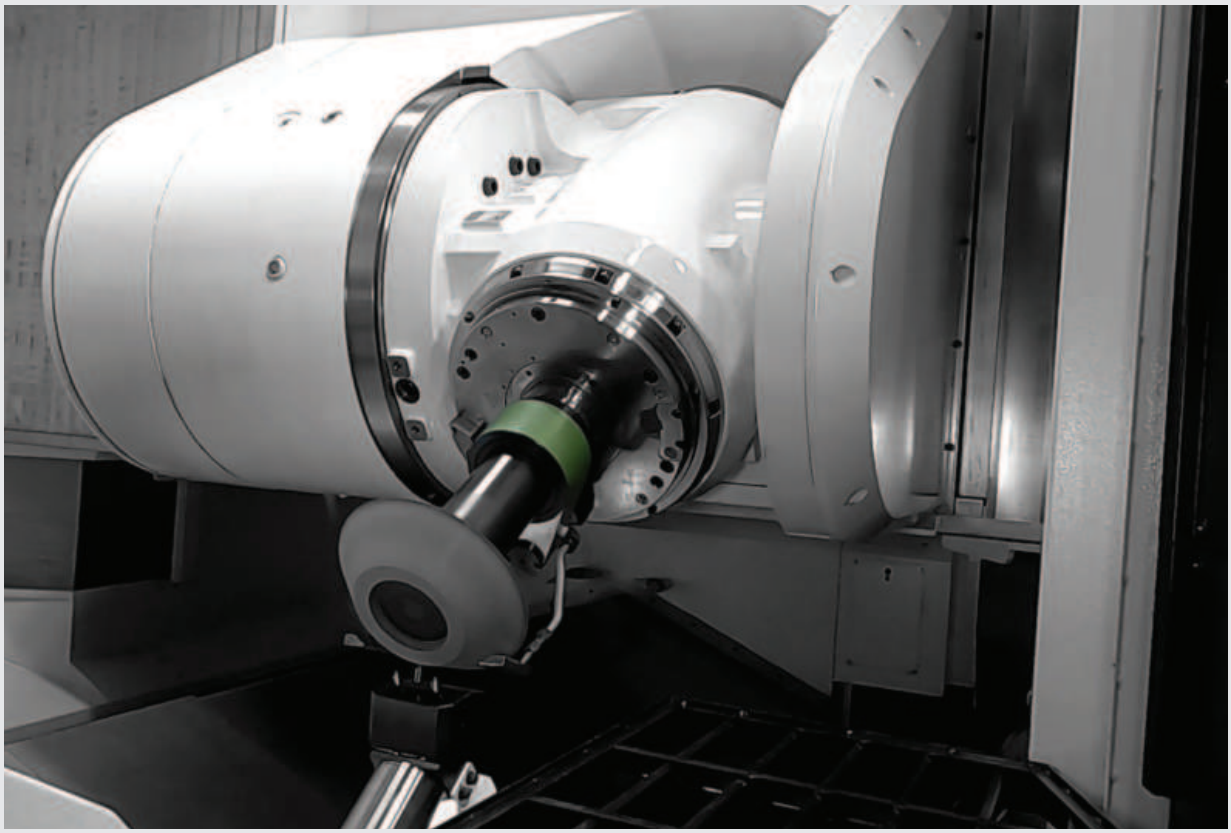
Angle processing

Angle tool can be mounted on the snout attachment for deep inner diameter machining.

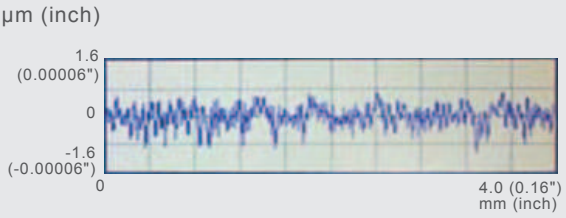


Grinding with contact detection sensor

Automatic high accuracy grinding is performed with 2 kinds of contact detection sensors.
Note : Protection is required to prevent any damage from chips.

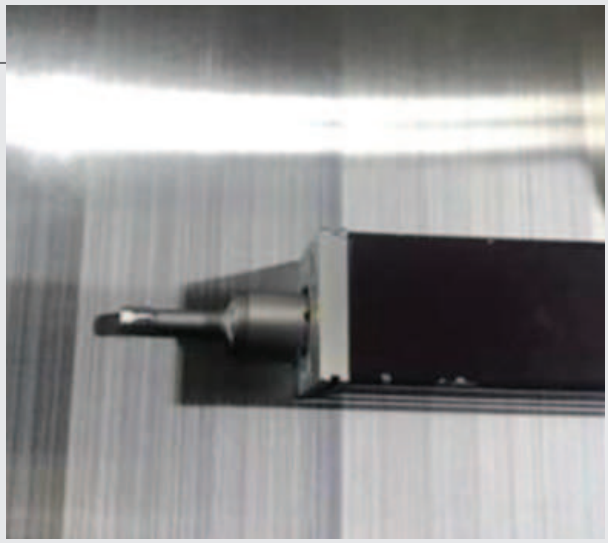


Roughness profiles



■ Surface roughness measured results

Ra 0.201 µm (0.000008")



Measure the surface after grinding operation

MAZATROL SMOOTH Ai

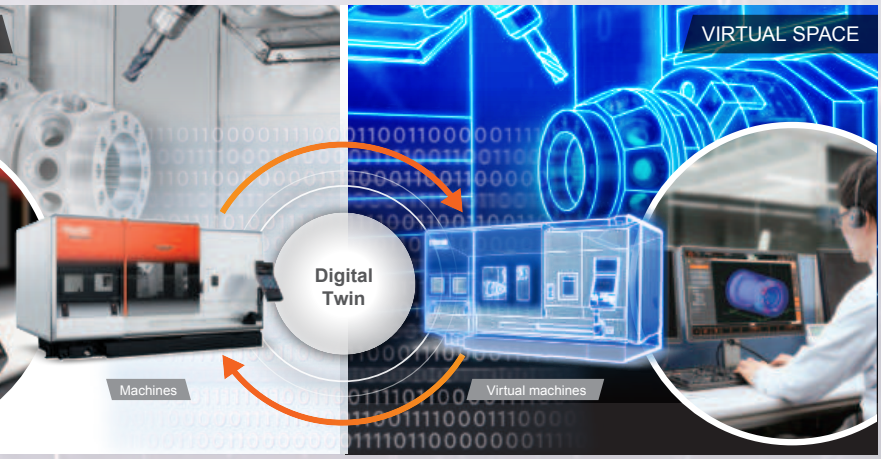
MAZATROL SmoothCNC

AI

Increase your productivity
with AI technology

Digital Twin

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



Shown with optional MAZATROL SmoothAi dual monitor

Innovative Functions For Higher Productivity

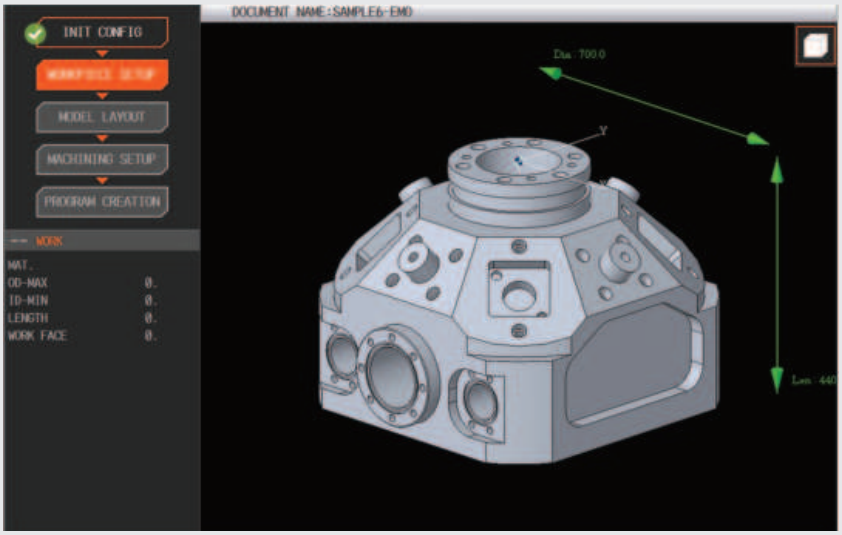
Innovative functions to improve productivity from programming to machining

Automatic programming

Solid MAZATROL

INTEGREX e-V series

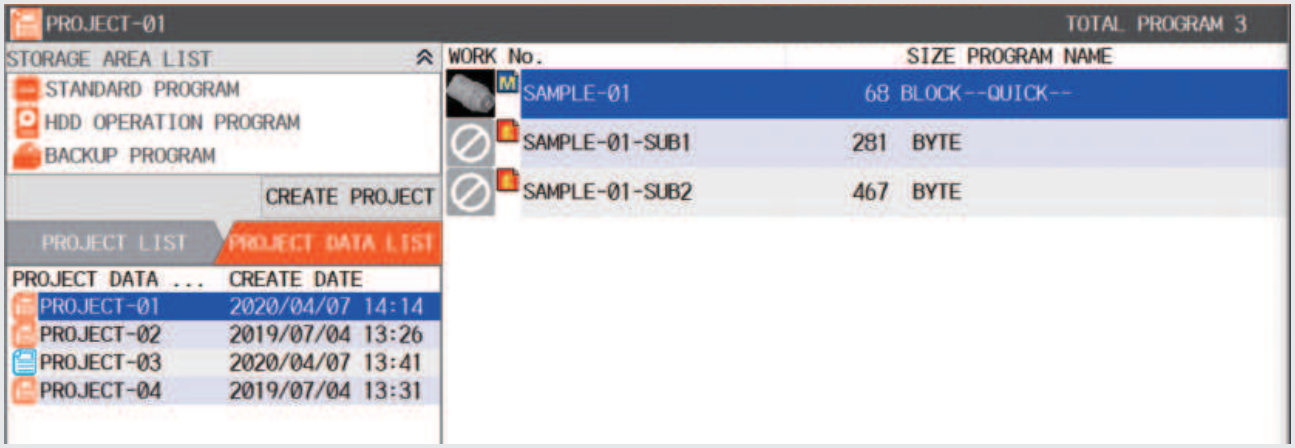
A program is automatically generated from 3D CAD data.
AI learning utilizes the machining know-how from the programs created in the past, automatically calculates the machining process, generating the optimal program.



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)



Simulation, Test cutting (machining analysis, optimization)

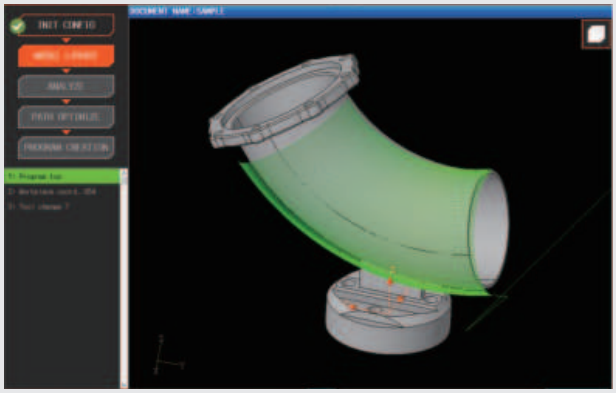
Cutting Adviser

Cutting adviser optimizes machining conditions by MAZATROL SmoothAi CNC.

SMC PLUS

OPTION

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.



Machining

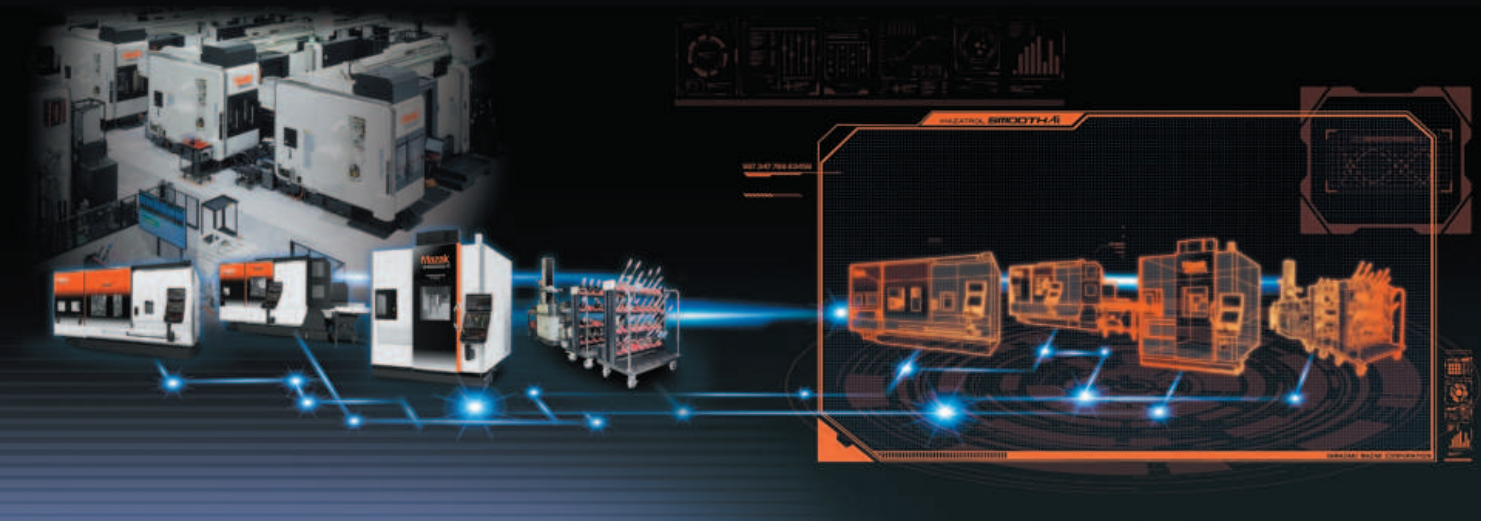
Ai Thermal Shield

Based on spindle speed and temperature of the machine, Ai Thermal Shield suppresses changes in the cutting edge position. It stabilizes continuous machining accuracy through meticulous machine control that takes into account temperature changes, machine position, coolant ON/OFF, and other factors. New algorithms have improved the accuracy of compensation. Furthermore, by accumulating and learning data from subsequent measurements, thermal displacement compensation can be optimized for each machining environment to stabilize machining accuracy.

Advanced Digital Technology

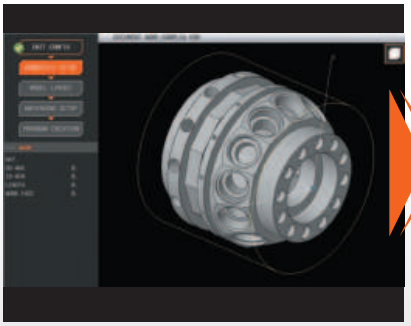
Digital twin software for high productivity OPTION

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.

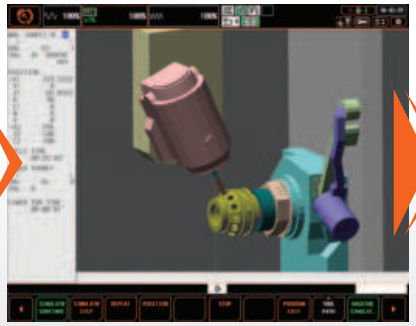


Smooth CAM Ai

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.

Smooth Monitor AX • Smooth Link

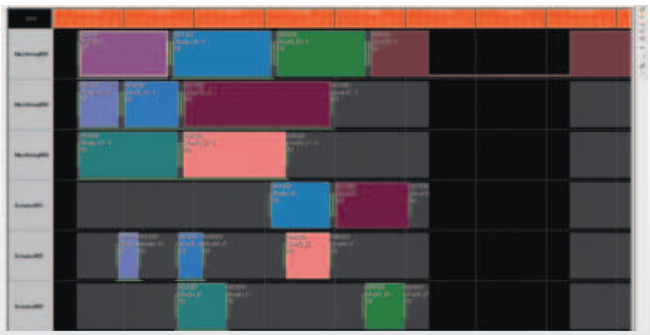
Smooth Monitor AX is software to monitor operational status and analyze accumulated manufacturing data for factory productivity improvement.
Smooth Link is software to view operational status and machining programs on tablets and smartphones, so the operator can instantly view necessary information while monitoring away from the monitor.

PMC NEO

PMC NEO is a software that manages the automatic operation and control of FMS. Through the PMC simulation function, it enables highly efficient long-term unmanned operation by predicting operating loads, tool shortages on each machine, and production volumes. By connecting to the network, operator can monitor scheduling and operating conditions from anywhere, be it an office PC, tablet, smartphone, or other devices.

Smooth Scheduler

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

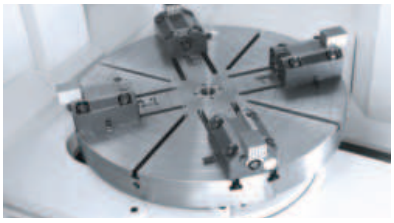


Standard and Optional Equipment

Pallet

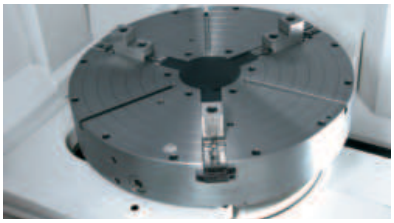
Faceplate with jaws OPTION

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.



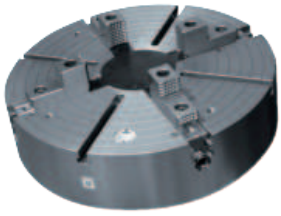
Scroll chuck with 3 jaws OPTION

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

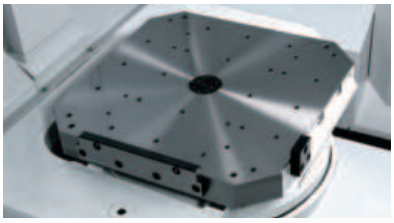
Used for cylindrical and square workpieces. Jaws can be moved separately to accurately center a workpiece. Perform high precision centering as it can conduct fine adjustment of a workpiece's central position.
When changing a workpiece's gripping diameter, it is able to perform simple setup by changing the jaw's installation position.



Tapped square pallet with location bore OPTION

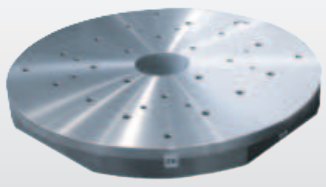
Used for the machining of irregularly shaped workpieces without turning operations.
A workpiece fixture can be mounted on the pallet.

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



Set up

Manual pulse generator (wired)

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.
A wireless version, with the same functions, is optionally available.

Manual pulse generator (wireless) OPTION

Wireless manual pulse generator connects to MAZATROL SmoothAi through radio wave, enabling convenient operation without any limitation of connecting cable.

Tool magazine operation panel (touch panel)

A numeric keypad is standard equipment. This allows easy call up of tools and effective for tool magazine with large capacity. The tool number is always displayed on the operation panel for fast and accurate setup.

Tool eye OPTION *INTEGREX e-V series*

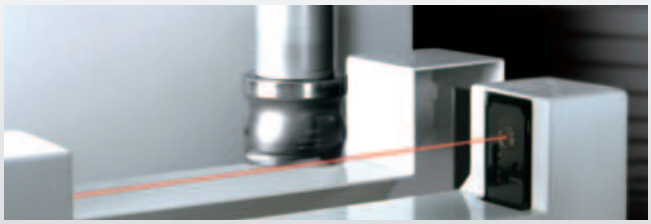
The tool eye can be programmed for automatic tool measurement and compensation as well as inspection for tool breakage. In addition, since tool setup is done by simply bringing the tool tip into contact with the tool eye, tool setup time is considerably reduced.

Mazak Monitoring System B OPTION

Coordinate values are automatically shifted according to the results of probing a workpiece by a touch sensor (RMP600).

Laser milling tool measurement system OPTION

The laser milling tool measurement system measures tool length and diameter at least Φ1.0 mm (Φ0.04") which cannot be done by conventional measurement systems. Tool breakage can be detected during automatic operation.



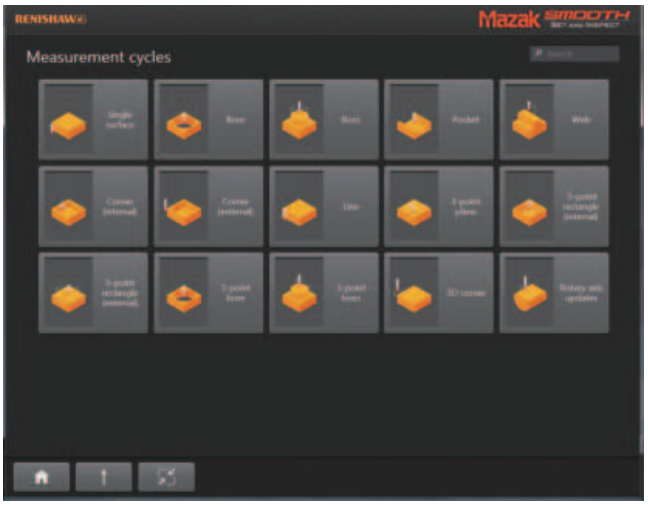
Standard and Optional Equipment

Set up

Smooth Set and Inspect
(on machine measurement software) OPTION FREE TRIAL

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

Note : The user is required to prepare the touch probe and reference sphere for on machine measurement. Touch probes and calibration sphere are required for on machine measurement.



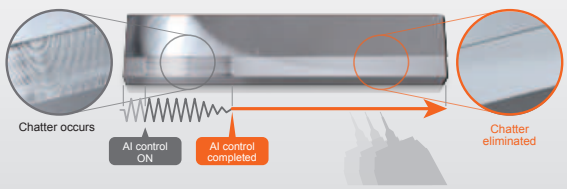
Smooth OMM
(on machine measurement software) OPTION FREE TRIAL

By manual operation, the touch probe can be moved to a measurement point and after the point is registered, a measurement program can be created. In addition to the automatic update of work coordinates and tool compensation using measurement results, geometric tolerances of workpiece features can also be measured.

Note : The user is required to prepare the touch probe and reference sphere for on machine measurement. Touch probes and calibration sphere are required for on machine measurement.

Smooth Ai Spindle OPTION

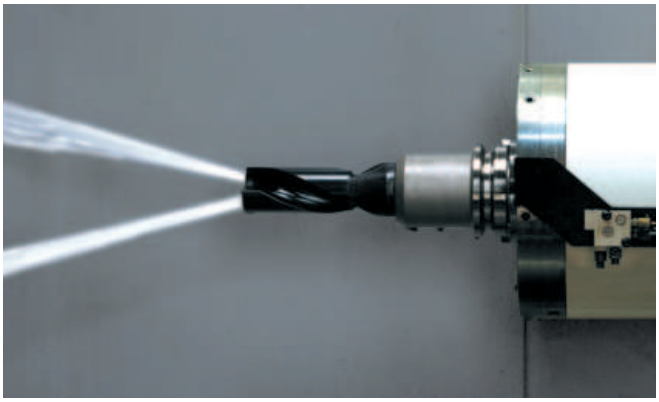
Using AI, the milling spindle vibration is detected and machining conditions are automatically changed to produce unsurpassed surface finishes and high productivity. Thanks to AI, adjustments can be easily made in a short time without a skilled operator.

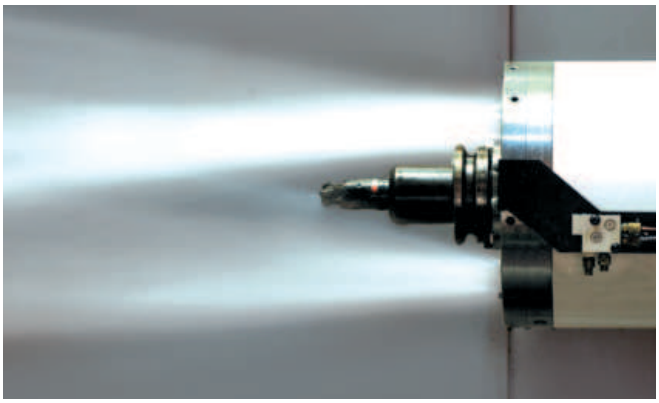


Coolant

Simultaneous discharge flood coolant and coolant through spindle 1.5 MPa (218 PSI)

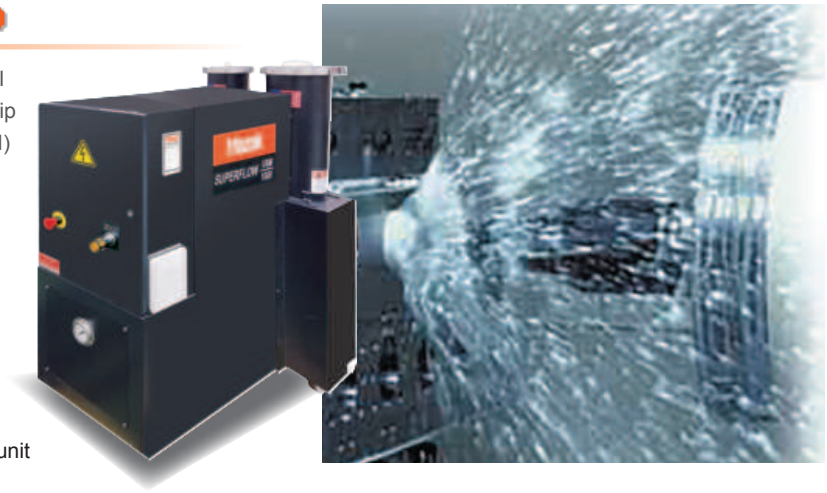
Coolant is discharged from the nozzles on spindle housing as well as the tool tip.
Coolant system ensures temperature control of tool tip, lubrication and removal of machined chips.





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 (1015 PSI) coolant pressure.
• Adjustable coolant pressure
• High performance cyclone filter with minimum maintenance requirements to reduce running cost



High pressure pump unit

Niagara coolant

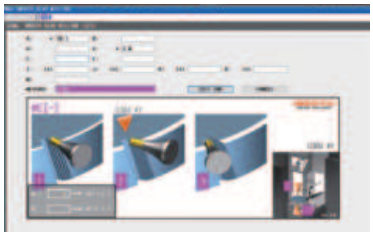
Large volume coolant is discharged from the nozzles mounted on the machine top cover to flush chips from the workpiece to conveyors on both sides of the table.

Standard and Optional Equipment

Machining software

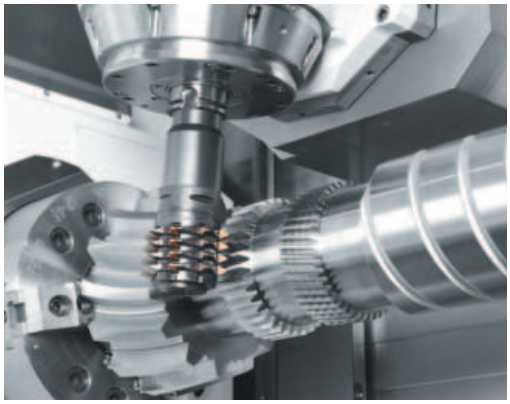
Smooth Gear Milling OPTION

Thanks to conversational CNC, external gear machining programs can be easily made without expensive CAD / CAM software. Various external gears can be machined flexibly with general endmills.



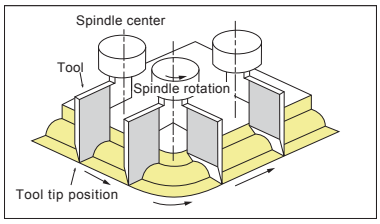
Smooth Gear Hobbing OPTION *e-1250V/8, e-1600V/10 series*

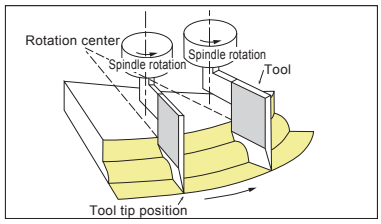
Gear machining can be performed with a hob cutter. Smooth Gear Hobbing generates the tool path and performs hob shift as well as modifying gear load and gear crowning. Programs can easily be made by just inputting gear specifications and cutting conditions using conversational CNC display.



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.





Environmentally Friendly

Mazak Go GREEN

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.

Reduction of lubrication consumption

The automatic tool changer and tool magazine gear box are lubricated by an oil-return system with lower consumption than other systems. The spindle oil-air lubrication system automatically stops when the spindle is not operating. The linear roller guides on the X, Y, and Z axes are lubricated by grease which eliminates tramp oil in the coolant resulting in a much longer service life for the coolant.

Reduced electrical power consumption

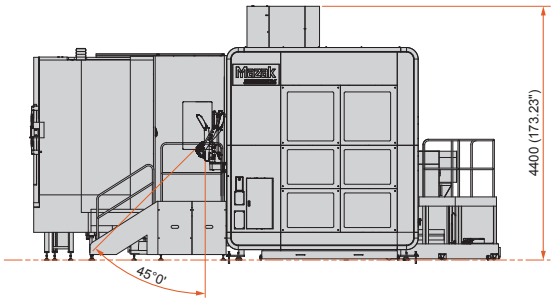
The automatic tool changer, tool shifter and tool magazine are all powered by servo motors. As a result, a smaller capacity hydraulic system is used with a corresponding reduction in the electrical power consumption.

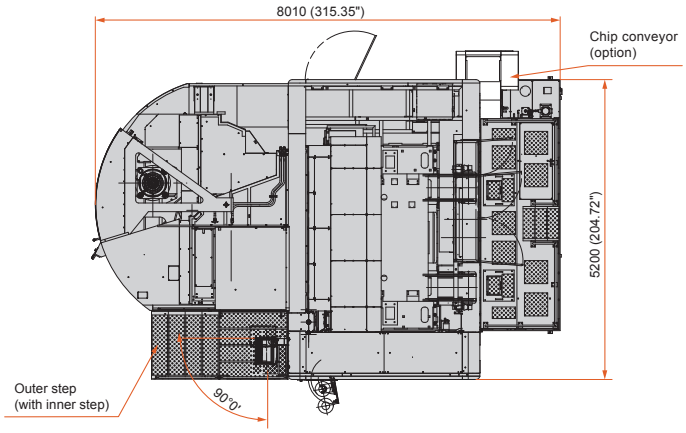
Auto-power off

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.

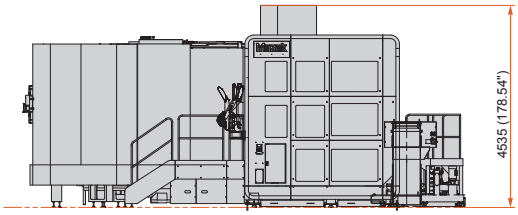
Machine Dimensions

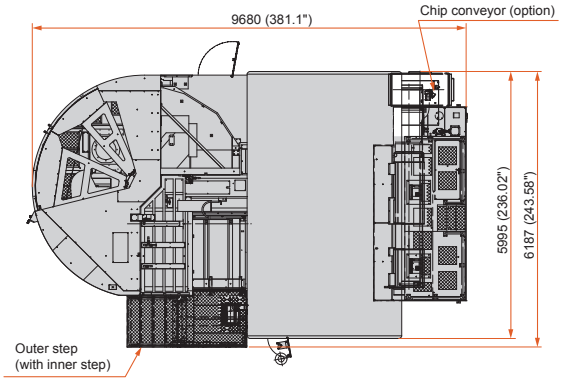
INTEGREX e-1250V/8, VORTEX e-1250V/8



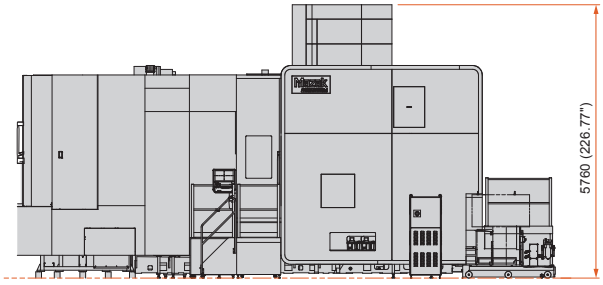


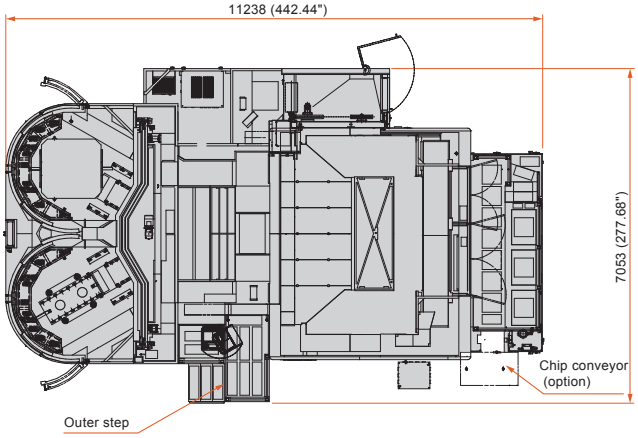
INTEGREX e-1600V/10, VORTEX e-1600V/10





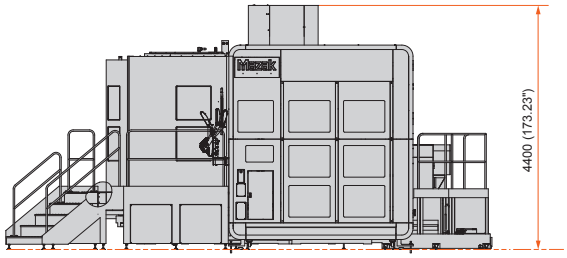
INTEGREX e-1850V/12

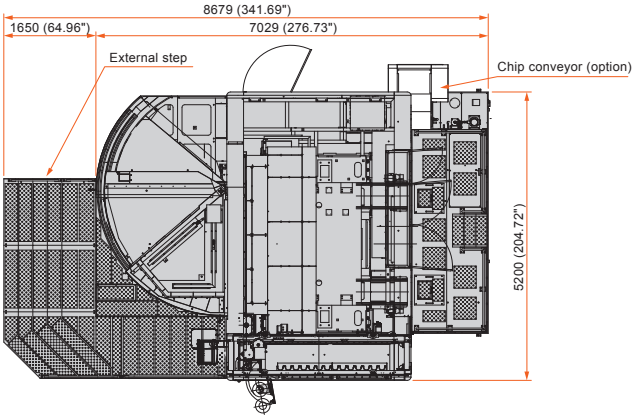




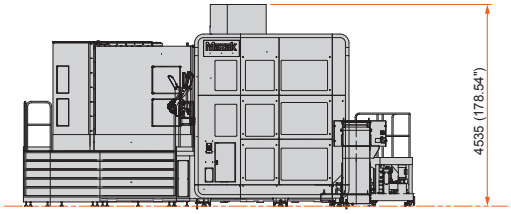
Unit : mm (inch)

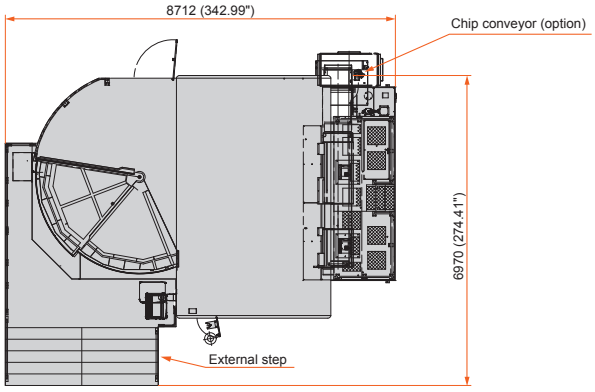
INTEGREX e-1250V/8S, VORTEX e-1250V/8S



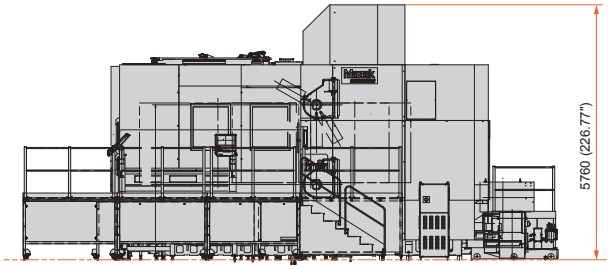


INTEGREX e-1600V/10S, VORTEX e-1600V/10S





INTEGREX e-1850V/25S



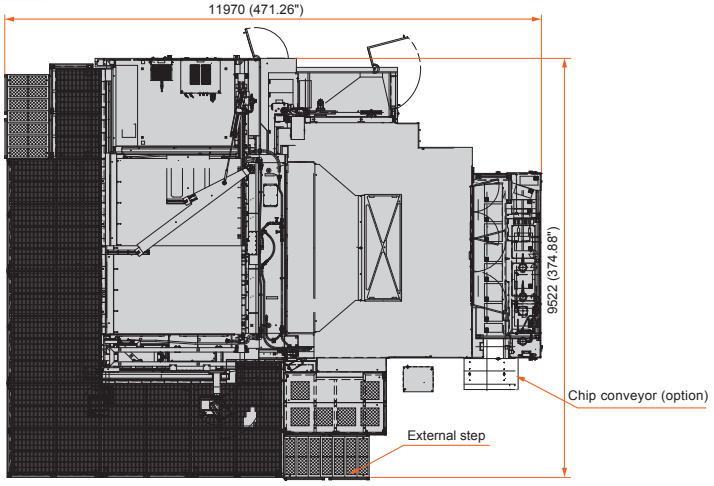
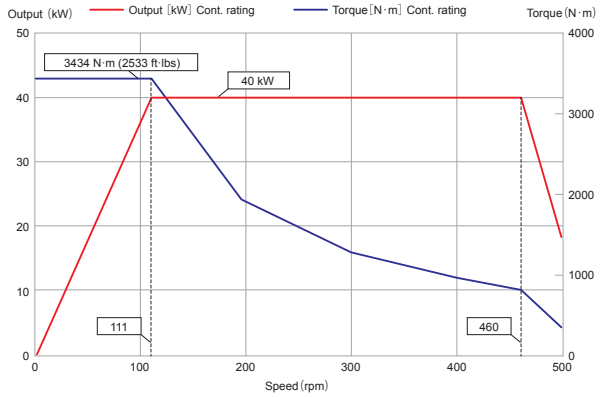


Table (turning spindle) output / torque diagram

INTEGREX e-1250V/8, INTEGREX e-1250V/8S

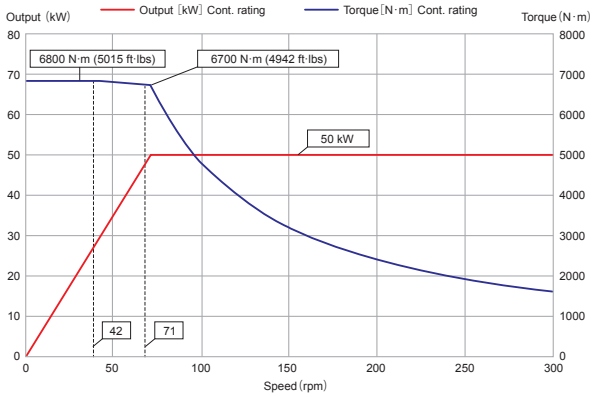
Standard 500 rpm table

Max. speed	500 rpm
Spindle output (cont. rating)	AC 40 kW (53 HP)
Max. torque (cont. rating)	3434 N•m (2533 ft•lbs)
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	25 rpm



High torque 300 rpm table OPTION

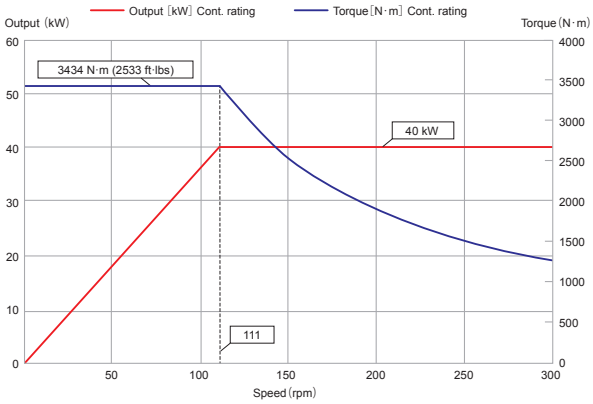
Max. speed	300 rpm
Spindle output (cont. rating)	AC 50 kW (66 HP)
Max. torque (cont. rating)	6800 N•m (5015 ft•lbs)
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	25 rpm



INTEGREX e-1600V/10, INTEGREX e-1600V/10S

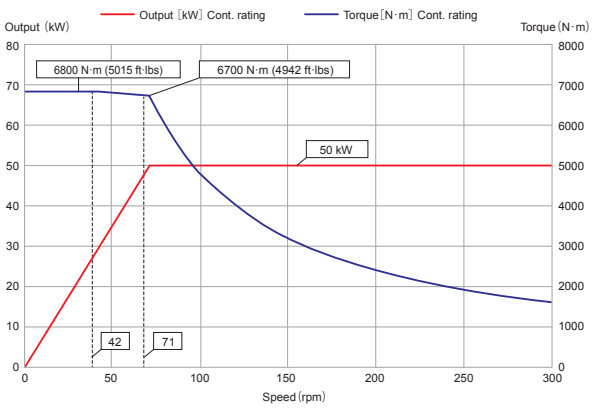
Standard 300 rpm table

Max. speed	300 rpm
Spindle output (cont. rating)	AC 40 kW (53 HP)
Max. torque (cont. rating)	3434 N•m (2533 ft•lbs)
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	20 rpm



High torque 300 rpm table OPTION

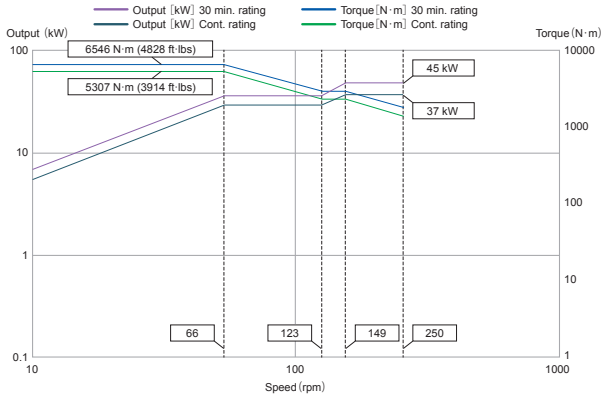
Max. speed	300 rpm
Spindle output (cont. rating)	AC 50 kW (66 HP)
Max. torque (cont. rating)	6800 N•m (5015 ft•lbs)
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	20 rpm



INTEGREX e-1850V/12

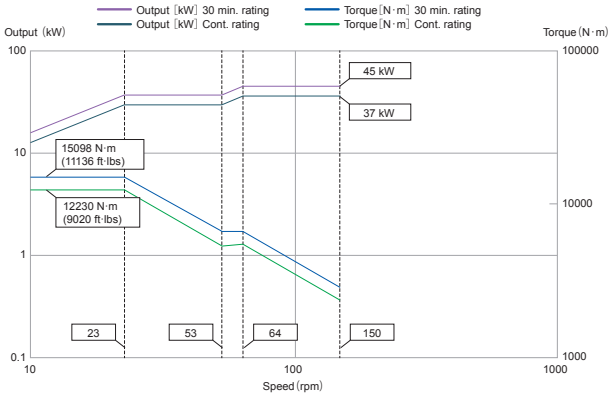
Standard 250 rpm table

Max. speed	250 rpm
Spindle output (cont. rating)	AC 37 kW (50 HP)
Max. torque (cont. rating)	5307 N•m (3914 ft•lbs)
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	6.7 rpm
Load (evenly distributed)	7000 kg (15432 lbs) (including pallet)



High torque 150 rpm table OPTION

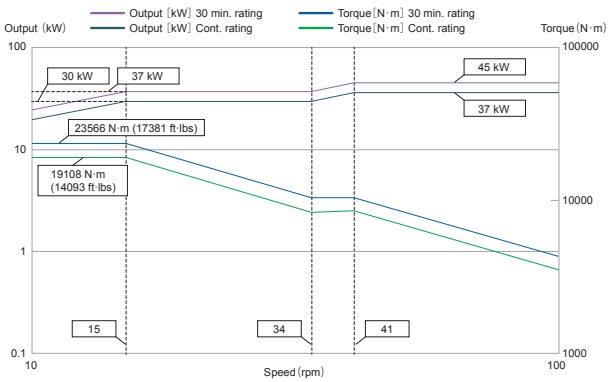
Max. speed	150 rpm
Spindle output (cont. rating)	AC 37 kW (50 HP)
Max. torque (cont. rating)	12230 N•m (9020 ft•lbs)
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	6.7 rpm
Load (evenly distributed)	7000 kg (15432 lbs) (including pallet)



INTEGREX e-1850V/25S

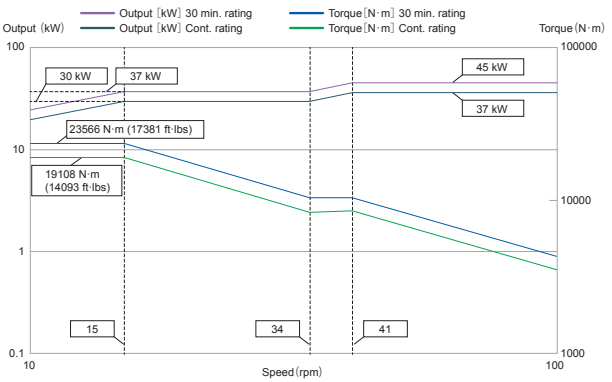
Standard 75 rpm table

Max. speed	75 rpm
Spindle output (cont. rating)	AC 37 kW (50 HP)
Max. torque (cont. rating)	19108 N•m (14093 ft•lbs)
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	1 rpm
Load (evenly distributed)	15000 kg (33069 lbs) (including pallet)



Simultaneous 5-axis control 100 rpm table OPTION

Max. speed	100 rpm
Spindle output (cont. rating)	AC 37 kW (50 HP)
Max. torque (cont. rating)	19108 N•m (14093 ft•lbs)
C-axis minimum indexing increment	0.0001°
C-axis rapid traverse rate	3 rpm
Load (evenly distributed)	10000 kg (22046 lbs)(including pallet)



Standard Machine Specifications

		INTEGREX e-1250V/8	VORTEX e-1250V/8	INTEGREX e-1250V/8S	VORTEX e-1250V/8S
Travel	X-axis (table forward / backward)	1875 mm (73.82")			
	Y-axis (spindle head travel right / left)	1250 mm (49.21")			
	Z-axis (spindle head travel up / down)	1345 mm (52.95")			
	B-axis (spindle head tilt)	150°(-30° to +120°)			
	C-axis (table rotation)	360° (Cont.)			
	Distance between B-axis rotation center and pallet center (X-axis at home)	1335 mm (52.56")			
	Distance between B-axis rotation center and pallet center (X-axis at stroke end)	-540 mm (-21.26")			
	Distance between spindle nose and pallet center (B-axis = +90°) (X-axis at home)	1035 mm (40.75")			
	Distance between B-axis rotation center and pallet top face*1	50 mm to 1395 mm (1.97" to 54.92")			105 mm to 1450 mm (4.13" to 57.09")
	Distance between spindle nose and pallet top face (B-axis=0°)*1	−250 mm to 1095 mm (−9.84" to 43.11")			-195 mm to 1150 mm (-7.68" to 45.28")
Capacity	Max. machining diameter	Φ1450 mm (Φ57.09")	—	Φ1500 mm (Φ59.06")	—
	Max. workpiece size*1	Φ1450 × 1600 mm (Φ57.09" × 62.99")		Φ1500 × 1655 mm (Φ59.06" × 65.16")	
	Table load capacity (evenly distributed)	2700 kg (5952 lbs) (including pallet weight)		4000 kg (8818 lbs) (including pallet weight)	
Table	Max. speed*2	500 rpm	—	500 rpm	—
	Rapid traverse rate (C-axis)	25 rpm			
	Min. indexing angle increment (C-axis)	0.0001°			
	Indexing time (C-axis)	1.1 sec / 90°			
Milling spindle	Max. speed	10000 rpm			
	Spindle taper	7/24 taper No.50			
	Spindle bearing ID	Φ100 mm (Φ3.94")			
	Spindle acceleration	3.1 sec (0 to 10000 rpm)			
	Rapid traverse rate (B-axis)	30 rpm			
	Min. indexing angle increment (B-axis)	0.0001°			
	Indexing time	0.7 sec / 90°			
Feedrate*3	Rapid traverse rate (X, Y, Z-axes)	42000 mm/min (1654 IPM)			
	Max. cutting feedrate (X, Y, Z-axes)	42000 mm/min (1654 IPM)			
Automatic tool changer	Tool shank	CAT No.50			
	Pull stud	Yamazaki ANSI type			
	Tool magazine capacity	42			
	Max. tool diameter / length (from gauge line)	Φ135 mm (Φ5.31") / 650 mm (25.59")			
	Max. weight / momentum	30 kg (66 lbs) / 49 N•m (36 ft·lbs)			
	Max. tool diameter with adjacent tool pockets empty	Φ260 mm (Φ10.24")			
Automatic pallet changer	Number of pallets	2		—	
	Pallet change time	15 sec		—	
	Pallet changer type	Rotary type		—	
Motors	Table motor (cont. rating)	AC 40 kW (53 HP)	—	AC 40 kW (53 HP)	—
	Milling spindle motor (40% ED [30 min.rating] / cont.rating)	AC 37 kW / 30 kW (50 HP / 40 HP)			
	Coolant pump motor (50 Hz / 60 Hz)	2.2 kW / 3.0 kW (3 / 4 HP)			
Power requirement	Electrical power supply (40% ED [30 min.rating] / cont.rating)	135.6 kVA / 124.5 kVA	123.3 kVA / 113.3 kVA	135.6 kVA / 124.5 kVA	123.3 kVA / 113.3 kVA
	Air supply	1000 L/min (35.31 ft^3/min) (ANR)			
Tank capacity	Coolant tank capacity	1100 L (291 gal)			
Machine size	Machine height (from floor)	4400 mm (173.23")			
	Floor space requirement	5200 × 8010 mm (204.72" × 315.35")		5200 × 8679 mm (204.72" × 341.69")	
	Machine weight	49500 kg (109127 lbs)		45000 kg (99206 lbs)	

*1 With e-1250V/8 : 800 mm × 800 mm (31.5" × 31.5") tapped pallet, e-1250V/8S : Φ800 mm (Φ31.5") faceplate with jaws
With e-1600V/10 : 1000 mm × 1000 mm (39.37" × 39.37") tapped pallet, e-1600V/10S : Φ1250 mm (Φ49.21") faceplate with jaws
*2 Depends on chuck / pallet specifications. 50 rpm for square pallet
*3 Limited feedrate with continuous movement

INTEGREX e-1600V/10	VORTEX e-1600V/10	INTEGREX e-1600V/10S	VORTEX e-1600V/10S
2315 mm (91.14")		2165 mm (85.24")	
1600 mm (62.99")			
1345 mm (52.95")			
150°(-30° to +120°)			
360°(Cont.)			
1775 mm (69.88")			
−540 mm (−21.26")		−390 mm (−15.35")	
1475 mm (58.07")			
100 mm to 1445 mm (3.94" to 56.89")		184 mm to 1529 mm (7.24" to 60.2")	
−200 mm to 1145 mm (−7.87" to 45.08")		-116 mm (4.57") to 1229 mm (48.39")	
Φ2050 mm (Φ80.71")	—	Φ2300 mm (Φ90.55")	—
Φ2050 × 1600 mm (Φ80.71" × 62.99")		Φ2300 × 1684 mm (Φ90.55" × 66.30")	
5000 kg (11023 lbs) (including pallet weight)		7000 kg (15432 lbs) (including pallet weight)	
300 rpm	—	300 rpm	—
20 rpm			
0.0001°			
1.4 sec / 90°			
10000 rpm			
7/24 taper No.50			
Φ100 mm (Φ3.94")			
3.1 sec (0 to 10000 rpm)			
30 rpm			
0.0001°			
0.7 sec (90°)			
42000 mm/min (1654 IPM)			
42000 mm/min (1654 IPM)			
CAT No.50			
Yamazaki ANSI type			
42			
Φ135 mm (Φ5.31") / 650 mm (25.59")			
30 kg (66 lbs) / 49 N•m (36 ft·lbs)			
Φ260 mm (Φ10.24")			
2		—	
25 sec		—	
Rotary type		—	
AC 40 kW (53 HP)	—	AC 40 kW (53 HP)	—
AC 37 kW / 30 kW (50 HP / 40 HP)			
2.2 kW / 3.0 kW (3 / 4 HP)			
133.0 kVA / 121.9 kVA	120.6 kVA / 110.7 kVA	133.0 kVA / 121.9 kVA	120.6 kVA / 110.7 kVA
1100 L/min (38.85 ft^3/min) (ANR)			
1100 L (291 gal)			
4535 mm (178.54")			
9680 × 6187 mm (381.10" × 243.58")		8712 × 6970 mm (342.99" × 274.41")	
58000 kg (127866 lbs)		46700 kg (102954 lbs)	

Standard Machine Specifications

		INTEGREX e-1850V/12	INTEGREX e-1850V/25S
Travel	X-axis (table forward / backward)	3055 mm (120.28")	
	Y-axis (spindle head travel right / left)	1850 mm (72.83")	
	Z-axis (spindle head travel up / down)	1800 mm (70.87")	
	B-axis (spindle head tilt)	150° (-30° to +120°)	
	C-axis (table rotation)	360°(Cont.)	
	Distance between B-axis rotation center and pallet center (X-axis at home)	2130 mm (83.86")	2200 mm (86.61")
	Distance between B-axis rotation center and pallet center (X-axis at stroke end)	−925 mm (−36.42")	−855 mm (−33.66")
	Distance between spindle nose and pallet center (B-axis = +90°) (X-axis at home)	1830 mm (72.05")	1900 mm (74.8")
	Distance between B-axis rotation center and pallet top face*1	100 mm to 1900 mm (3.94" to 74.80")	28 mm to 1828 mm (1.1" to 71.97")
	Distance between spindle nose and pallet top face (B-axis=0°)*1	−200 mm to 1600 mm (−7.87" to 62.99")	−272 mm to 1528 mm (−10.71" to 60.16")
Capacity	Max. machining diameter	Φ2350 mm (Φ92.52")	Φ3500 mm (Φ137.8")
	Max. workpiece size*1	Φ2350 × 1800 mm (Φ92.52" × 70.87")	Φ3500 × 1800 mm (Φ137.8" × 70.87")
	Table load capacity (evenly distributed)	7000 kg (15432 lbs) (including pallet weight)	15000 kg*4 (33069 lbs) (including pallet weight)
Table	Max. speed*2	250 rpm	75 rpm*5
	Rapid traverse rate (C-axis)	6.7 rpm	1.0 rpm*6
	Min. indexing angle increment (C-axis)	0.0001°	0.0001° *7 (no contouring)
	Indexing time (C-axis)	3.4 sec / 90°	15.4 sec / 90°*8
Milling spindle	Max. speed	10000 rpm	
	Spindle taper	7/24 taper No.50	
	Spindle bearing ID	Φ100 mm (Φ3.94")	
	Spindle acceleration	3.1 sec (0 to 10000 rpm)	
	Rapid traverse rate (B-axis)	30 rpm	
	Min. indexing angle increment (B-axis)	0.0001°	
	Indexing time	0.7 sec / 90°	
Feedrate*3	Rapid traverse rate (X, Y, Z-axes)	40000 mm/min (1575 IPM)	X-axes : 20000 mm/min (787 IPM) / Y, Z-axes : 40000 mm/min (1575 IPM)
	Max. cutting feedrate (X, Y, Z-axes)	40000 mm/min (1575 IPM)	X-axes : 20000 mm/min (787 IPM) / Y, Z-axes : 40000 mm/min (1575 IPM)
Automatic tool changer	Tool shank	CAT No.50	
	Pull stud	Yamazaki ANSI type	
	Tool magazine capacity	40	
	Max. tool diameter / length (from gauge line)	Φ135 mm (Φ5.31") / 650 mm (25.59")	
	Max. weight / momentum	30 kg (66 lbs) / 29.4 N·m (21 ft·lbs)	
	Max. tool diameter with adjacent tool pockets empty	Φ260 mm (Φ10.24")	
Automatic pallet changer	Number of pallets	2	—
	Pallet change time	50 sec	—
	Pallet changer type	Shuttle type	—
Motors	Table motor (40% ED [30 min.rating] / cont. rating)	AC 45 kW / 37 kW (60 HP / 50 HP)	
	Milling spindle motor (40% ED [30 min.rating] / cont. rating)	AC 37 kW / 30 kW (50 HP / 40 HP)	
	Coolant pump motor (50 Hz / 60 Hz)	0.73 kW / 1.21 kW (1 HP / 1.6 HP)	
Power requirement	Electrical power supply (40% ED [30 min.rating] / cont. rating)	130.91 kVA / 119.77 kVA	130.77 kVA / 119.63 kVA
	Air supply	700 L/min (24.72 ft^3/min) (ANR)	
Tank capacity	Coolant tank capacity	1300 L (343 gal)	
Machine size	Machine height (from floor)	5760 mm (226.77")	
	Floor space requirement	7053 mm × 11238 mm (277.68" × 442.44")	9522 mm × 11970 mm (374.88" × 471.26")
	Machine weight	60000 kg (132275 lbs)	75000 kg (165344 lbs)

*1 With V/12 : 1250 mm × 1250 mm (49.21" × 49.21") tapped pallet, V/25S : Φ2500 mm (Φ98.43") tapped pallet
*2 Depends on chuck / pallet specifications. 50 rpm for square pallet
*3 Limited feedrate with continuous movement
*4 Specification for simultaneous 5-axis control : 10000 kg (22046 lbs) (including table)
*5 Specification for simultaneous 5-axis control : 100 rpm
*6 Specification for simultaneous 5-axis control : 3 rpm
*7 Specification for simultaneous 5-axis control : 0.0001°
*8 Specification for simultaneous 5-axis control : 5.4 sec / 90°

Standard and Optional Equipment

● : Standard ○ : Option – : N/A

		e-1250V/8		e-1250V/8S		e-1600V/10		e-1600V/10S	
		INTEGREX	VORTEX	INTEGREX	VORTEX	INTEGREX	VORTEX	INTEGREX	VORTEX
Milling spindle	Standard specification 10000 rpm	●	●	●	●	●	●	●	●
	High torque specification 5000 rpm, 500 N•m (369 ft•lbs) (cont. rating)	○	○	○	○	○	○	○	○
	High speed specification 15000 rpm, 45 kW (cont. rating) [HSK T-100]	○	○	○	○	○	○	○	○
Table (turning spindle)	Standard specification 500 rpm, 3434 N•m (2533 ft•lbs) (cont. rating)	●	—	●	—	—	—	—	—
	High torque specification 300 rpm, 6800 N•m (5015 ft•lbs) (cont.rating)	○	—	○	—	—	—	—	—
	Standard specification 300 rpm, 3434 N•m (2533 ft•lbs) (cont. rating)	—	—	—	—	●	—	●	—
	High torque specification 300 rpm, 6800 N•m (5015 ft•lbs) (cont.rating)	—	—	—	—	○	—	○	—
	Standard specification NC rotary table contouring torque 3180 N•m (2345 ft•lbs)	—	●	—	●	—	●	—	●
	High torque specification NC rotary table contouring torque 5810 N•m (4285 ft•lbs)	—	○	—	○	—	○	—	○
Column	High column 250 mm (9.84") [1345 mm (52.95") stroke]	○	○	—	—	—	—	—	—
	High column 250 mm (9.84") [1595 mm (62.80") stroke]	○	○	—	—	—	—	—	—
Tool magazine	42 tools-rack type tool magazine	●	●	●	●	●	●	●	●
	84,120,162 tools-rack type tool magazine	○	○	○	○	○	○	○	○
	180, 216, 252, 288, 324, 360 tools TOOL HIVE	○	○	○	○	○	○	○	○
	HSK	○	○	○	○	○	○	○	○
	CAPTO	○	○	○	○	○	○	○	○
	BIG-PLUS	○	○	○	○	○	○	○	○
Pallet	800 mm × 800 mm (31.5" × 31.5") tapped pallet with location bore	○	○	—	—	—	—	—	—
	1000 mm × 1000 mm (39.37" × 39.37") tapped pallet with location bore	○	○	—	○	○	○	—	—
	Φ1000 mm (39.37 ") tapped pallet with location bore	○	○	—	—	—	—	—	—
	Φ1250 mm (49.21") tapped pallet with location bore	—	—	○	—	—	—	—	—
	Φ1400 mm (55.12") tapped pallet with location bore	—	—	—	—	○	—	—	—
	Φ1000 mm (39.37") 3-jaw scroll chuck	○	○	○	—	—	—	—	—
	Φ1400 mm (55.12") 3-jaw scroll chuck	—	—	—	—	○	—	—	—
	Φ1000 mm (39.37") 4-jaw independent chuck	○	○	○	—	—	—	—	—
	Φ1400 mm (55.12") 4-jaw independent chuck	—	—	—	—	○	—	—	—
	Φ 800 mm (31.50") faceplate with jaws	—	—	○	—	—	—	—	—
	Φ 1000 mm (39.37") faceplate with jaws	○	○	○	—	—	—	—	—
	Φ 1250 mm (49.21") faceplate with jaws	—	—	○	—	—	—	○	—
	Φ 1400 mm (55.12") faceplate with jaws	—	—	—	—	○	—	○	—
	Φ1500 mm (59.06") faceplate with jaws	—	—	—	—	—	—	○	—
	Φ 1650 mm (64.96") faceplate with jaws	—	—	—	—	—	—	○	—
Pallet changer	Manual pallet rotation at 2PC loading station	●	●	—	—	—	—	—	—
	Power pallet rotation at 2PC loading station	○	○	—	—	●	●	—	—
	Workpiece centering equipment	○	—	—	—	○	—	—	—
	FMS preparation for 2PC (pallet can rotate at loading station)	○	○	—	—	○	○	—	—
	2PC for FMS (pallet cannot rotate at loading station)	○	○	—	—	○	○	—	—
Tooling	Standard tooling package	●	—	●	—	●	—	●	—

Standard and Optional Equipment

● : Standard ○ : Option — : N / A

		e-1250V/8		e-1250V/8S		e-1600V/10		e-1600V/10S	
		INTEGREX	VORTEX	INTEGREX	VORTEX	INTEGREX	VORTEX	INTEGREX	VORTEX
Setup	Absolute position detection (linear axes)	●	●	●	●	●	●	●	●
	Manual pulse generator	●	●	●	●	●	●	●	●
	Automatic tool eye	○	—	○	—	○	—	○	—
	Laser milling tool measurement system (NC4 / air blast)	○	○	○	○	○	○	○	○
	Laser milling tool measurement system (NC4 / full function, software not included)	○	○	○	○	○	○	○	○
	Tool breakage detection (detection in ATC area)	○	○	○	○	○	○	○	○
	Preparation for Mazak monitoring system B (RMP-600)	●	●	●	●	●	●	●	●
	Wireless touch probe (RMP-600)	○	○	○	○	○	○	○	○
	Magazine operation panel for tool ID (touch panel, EUCHNER)	○	○	○	○	○	○	○	○
Automation	Pull stud with tool ID (#50 Euchner)	○	○	○	○	○	○	○	○
	Preparation for flash tool	○	—	○	—	○	—	○	—
	Auto power on / off + warm up	●	●	●	●	●	●	●	●
High accuracy	Chiller unit (milling spindle, turning spindle [table], ball screw core cooling)	●	●	●	●	●	●	●	●
	Ball screw core cooling (X, Y, Z-axes)	●	●	●	●	●	●	●	●
	Scale feedback (Z-axis)	●	●	●	●	●	●	●	●
	Scale feedback (X, Y-axes)	○	○	○	○	○	○	○	○
	Scale feedback (B-axis)	○	○	○	○	○	○	○	○
	Scale feedback (C-axis)	●	●	●	●	●	●	●	●
	Hydraulic unit temperature control	○	○	○	○	○	○	○	○
	Coolant temperature control	○	○	○	○	○	○	○	○
Coolant / chip disposal	Air through milling spindle (cannot be used with spindle rotating)	●	●	●	●	●	●	●	●
	Flood coolant and coolant through spindle 1.5 MPa (218 PSI)	●	●	●	●	●	●	●	●
	SUPERFLOW coolant system	○	○	○	○	○	○	○	○
	Niagara coolant	●	●	●	●	●	●	●	●
	Oil skimmer (RB-200)	○	○	○	○	○	○	○	○
	Magnet plate	○	○	○	○	○	○	○	○
	Magnetic separator for cast iron	○	○	○	○	○	○	○	○
	Mist collector (GP-3000)	○	○	○	○	○	○	○	○
	Hand held coolant nozzle	—	—	○	○	—	—	○	○
	Hand held coolant nozzle for pallet changer	○	○	—	—	○	○	—	—
	Pressure switch for coolant through spindle	○	○	○	○	○	○	○	○
	Secondary filter for coolant (for aluminum)	○	○	○	○	—	—	—	—
	Chip conveyor (left-side rear discharge, ConSep 2000 II WS)	○	○	○	○	○	○	○	○
Safety equipment	Operator door interlock	●	●	●	●	●	●	●	●
	Overload detection system	○	○	○	○	○	○	○	○
	Hydraulic pressure interlock	●	●	●	●	●	●	●	●

● : Standard ○ : Option — : N / A

		INTEGREX	
		e-1850V/12	e-1850V/25S
Milling spindle	Standard specification 10000 rpm	●	●
	High torque specification 5000 rpm, 500 N•m (369 ft•lbs) (cont. rating)	○	○
	High speed specification 15000 rpm, 45 kW (cont. rating) [HSK T-100]	○	○
Table (turning spindle)	Standard specification 250 rpm	●	—
	High torque specification 150 rpm, 12230 N•m (9020 ft•lbs) (cont. rating)	○	—
	Table load 10 ton (including pallet)	○	—
	Standard specification 75 rpm (not available with 5-axis control)	—	●
	Simultaneous 5-axis specification 100 rpm (contouring)	—	○
Tool magazine	40 tools-chain type tool magazine	●	●
	80, 120, 160 tools-chain type tool magazine	○	○
	180, 204, 240, 288, 312, 348 tools TOOL HIVE magazine	○	○
	HSK	○	○
	CAPTO	○	○
	BIG-PLUS	○	○
Pallet	1250 mm × 1250 mm (49.21" × 49.21") tapped pallet with location bore	○	—
	1250 mm × 1600 mm (49.21 × 62.99") tapped pallet with location bore	○	—
	Φ1650 mm (64.96") tapped pallet with location bore	○	—
	Φ1850 mm (72.83") tapped pallet with location bore	○	—
	Φ2500 mm (98.43") tapped pallet with location bore	—	○
	Φ1650 mm (64.96") 3-jaw scroll chuck	○	—
	Φ1850 mm (72.83") 3-jaw scroll chuck	○	—
	Φ1650 mm (64.96") 4-jaw independent chuck	○	—
	Φ1850 mm (72.83") 4-jaw independent chuck	○	—
	Φ1650 mm (64.96) faceplate with jaws	○	—
	Φ1850 mm (72.83") faceplate with jaws	○	—
	Φ2500 mm (98.43") faceplate with jaws	—	○
	Φ3000 mm (118.11") faceplate with jaws	—	○
Pallet changer	Power pallet rotation at 2PC loading station	●	—
	Workpiece centering equipment at 2PC with power pallet rotation	○	—
	FMS preparation for 2PC (pallet can rotate at loading station)	○	—
	2PC for FMS (pallet cannot rotate at loading station)	○	—
Tooling	Standard tooling package	●	●

Standard and Optional Equipment

● : Standard ○ : Option — : N / A

		INTEGREX	
		e-1850V/12	e-1850V/25S
Setup	Absolute position detection (linear axes)	●	●
	Manual pulse generator	●	●
	Automatic tool eye	○	○
	Laser milling tool measurement system (NC4 / air blast)	○	○
	Laser milling tool measurement system (NC4 / full function, software not included)	○	○
	Tool breakage detection (detection in ATC area)	○	○
	Preparation for Mazak monitoring system B (RMP-600)	●	●
	Wireless touch probe (RMP-600)	○	○
	Magazine operation panel for tool ID (touch panel, EUCHNER)	○	○
Automation	Pull stud with tool ID (#50 Euchner)	○	○
	Preparation for flash tool	○	○
	Auto power on / off + warm up	●	●
High accuracy	Chiller unit (milling spindle, turning spindle [table], ball screw core cooling)	●	●
	Ball screw core cooling (X, Y, Z-axes)	●	●
	Scale feedback (Z-axis)	●	●
	Scale feedback (X, Y-axes)	○	○
	Hydraulic unit temperature control	○	○
	Coolant temperature control	○	○
Coolant / chip disposal	Air through milling spindle (cannot be used with spindle rotating)	●	●
	Flood coolant and coolant through spindle 1.5 MPa (218 PSI)	●	●
	SUPERFLOW coolant system	○	○
	Niagara coolant	●	●
	Oil skimmer (RB-200)	○	○
	Magnet plate	○	○
	Magnetic separator for cast iron	○	○
	Mist collector (GP-3000)	○	○
	Hand held coolant nozzle	—	○
	Hand held coolant nozzle for pallet changer	○	—
	Pressure switch for coolant through spindle	○	○
	Secondary filter for coolant (for aluminum)	○	○
	Chip conveyor (side discharge, ConSep)	○	○
Safety equipment	Operator door interlock	●	●
	Overload detection system	○	○
	Hydraulic pressure interlock	●	●

MAZATROL SmoothAi Specifications

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 to 4 axes	Simultaneous 5 axes*2
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*2, Path error suppression control*2, Tool path optimization*2
Interpolation	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Cylindrical interpolation, Polar coordinate interpolation, Constant lead threading*1, Re-threading*1*2, Thread start point compensation*1*2, Thread cut-speed override*1*2, Synchronous tapping*2	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Constant lead threading*1, Variable lead threading*1, Threading (C-axis interpolation type)*1, Cylindrical interpolation*2, Involute interpolation*2, Fine spline interpolation*2, NURBS interpolation*2, Polar coordinate interpolation*, Re-threading*1*2, Thread start point compensation*1*2, Thread cut-speed override*1*2, Synchronous tapping*2
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*2	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*2
Program registration	Number of programs : 256 (Standard) / 960 (Max.), Program memory : 2 MB, Program memory expansion : 8 MB*2, Program memory expansion : 32 MB*2	
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)*1	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)*1
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*1, Tool wear offset, Fixed amount offset*1, Simple wear offset*1	Tool position offset, Tool length offset, Tool diameter / tool nose R offset, Tool wear offset, Fixed amount offset*1, Simple wear offset*1
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*2, Hobbing II*2, Shaping function*2, Dynamic compensation II*2, Tool center point control*2, Tool radius compensation for 5-axis machining*2, Workpiece positioning error compensation*2, 5-axis tool length compensation*2, 5-axis parameter select*2
Machine compensation	Backlash compensation, Pitch error compensation, Geometric deviation compensation, Ai Thermal shield, Volumetric compensation*2	
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*2
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*1	Tool length teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, Measurement on machine, Tool eye measurement*1
Automatic measuring function	WPC coordinate measurement, Automatic tool length measurement, Laser tool length / diameter measurement, Workpiece measurement*1, Sensor calibration, Tool eye auto tool measurement*1, Tool breakage detection, External tool breakage detection*2	Automatic tool length measurement, Laser tool length / diameter measurement, Workpiece measurement*1, Sensor calibration, Tool eye auto tool measurement*1, Tool breakage detection, External tool breakage detection*2
MDI measurement	Coordinate measurement, Laser measurement	
Peripheral network	PROFIBUS-DP*2, EtherNet /IP*2, CC-Link*2, CC-Link IE Field Basic	
Interface	SD card interface, USB	
EtherNet	10 M / 100 M / 1 Gbps	
Security	Security software	

*1 : INTEGREX e-V series only
*2 : Option

INTEGREX e-V
VORTEX e-V SERIES

Mazak

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