

VERTICAL MACHINING CENTER

Compact, Durable, Powerful,
Strong and Accurate



**MEGA
TERA** SERIES

MICRO DYNAMICS VERTICAL MACHINING CENTER

The MEGA/TERA Series has been designed with the latest in technology being utilized throughout the machine with productivity in mind. From its EtherNet/IP architecture for easy automation and integration into systems and cells, to its Motion Control for fast and smooth operations used in all industries, the MEGA/TERA Series has quickly become one of the industries leading machine tool lines of Vertical Machining Centers.

Micro Dynamics Vertical Machining Center Line opens a new era in multi-purpose and versatile machining centers. Compact, durable, powerful, strong and accurate, the MEGA/TERA Series starts a revolution in the market: the smallest C-frame machines provide powerful and precise results for manufacturers of dies and molds, aerospace, automotive, semi-conductor, job shops and general machine sectors.

MEGA / TERA SERIES STANDARD EQUIPMENT

BUILT-IN SPINDLE

40 Taper
BBT 40

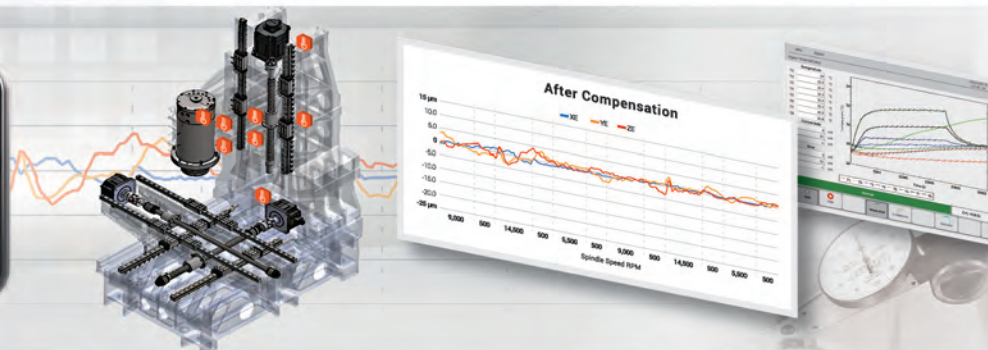
■ 15,000 rpm (std) ~ 24,000 rpm
■ 31 kW (std) ~ 35 kW

50 Taper
BBT 50

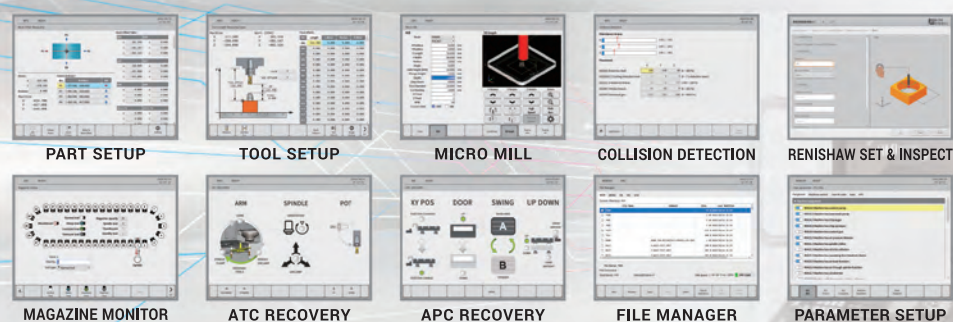
■ 12,000 rpm
■ 34 kW

Optional CAT / DIN / HSK

DYPEC® THERMAL COMPENSATION



MICRO DYNAMICS HMI



RAPID TRAVERSE
52,000
mm/min

LOOK AHEAD
5,400 block

TOOL TO TOOL
1.2 sec



POWERFUL

Integrated Micro Dynamics Built-in Spindle.

FAST

Mitsubishi CNC M830VW / CNC M850VW.(*)

RELIABLE

Highest quality mechanical and electrical components.

THERMAL COMPENSATION

DYPEC® - Dynamic Predictive Error Compensation.

MICRO MILL®

Conversational programming.

PC BASED HMI

Allows user friendly functions.

COMPACT

Design with small footprint.

STRONG

FC300 Meehanite® casting.

INTEGRATED AUTOMATION

EtherNet/IP networked I/O.

COLLISION DETECTION

Machine stops if a collision is detected in all axis.

RIGID TAP

Up to 6,000 rpm.

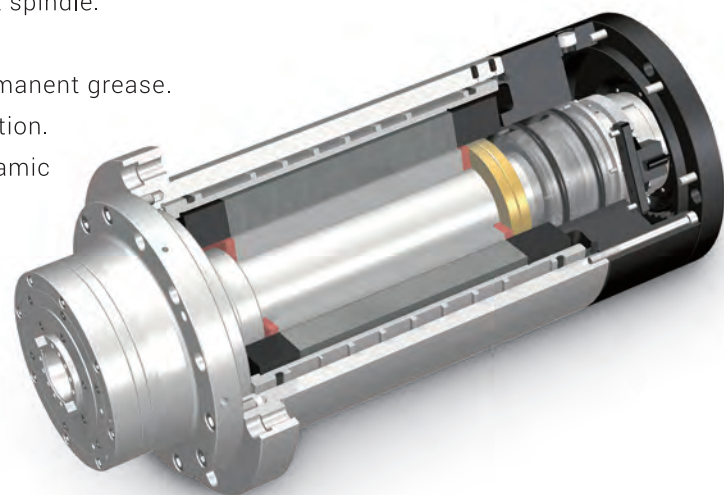
15" / 19"(*) TOUCHSCREEN

Ergonomically friendly.

MICRO DYNAMICS BUILT-IN SPINDLE

- Powerful integrated 40 Taper and 50 Taper dual contact spindle. (BBT / CAT / DIN / HSK)
- Standard 15,000 rpm and optional 18,000 rpm with permanent grease.
- Optional 20,000 rpm and 24,000 rpm with air-oil lubrication.
- ATE Motor (German made) is integrated with hybrid ceramic angular contact bearings.
- Micro Dynamics drawbar has been rigorously tested to sustain more than 2 million cycles.
- CTS (Coolant Through Spindle) designed to sustain up to 100 bar (1,500 psi). (*)

(*) CTS preparation is standard equipment.
CTS system is optional.



MULTIPURPOSE APPLICATIONS

- For all applications, from heavy duty to high speed machining.
- Highest productivity under any conditions and complexities.

POWERFUL	FAST	ACCURATE	PRODUCTIVE
Heavy Cutting	High Speed Milling	High Resolution Cutting	High Speed Tapping

MAXIMUM PRODUCTIVITY

All Micro Dynamics spindles are built with all shelf standard bearings which can be replaced without removing the rotor. This makes all machines simple and fast to maintain. Rebuild costs are very low due to the availability of the parts and the short service time.



Service Door

Headstock service door to facilitate access is standard on all models.



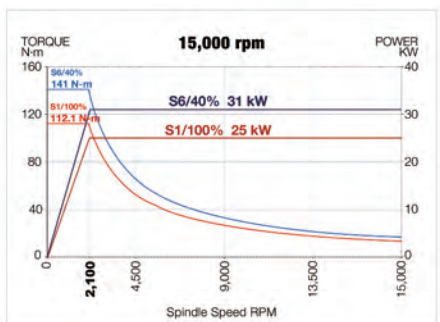
Coolant Through Spindle (opt) Air Through Spindle (opt)

- 20-Bar (290 psi)
- 40-Bar (580 psi)
- 70-Bar (1,000 psi)

40 TAPER DUAL CONTACT (BBT / CAT / DIN / HSK-63A)

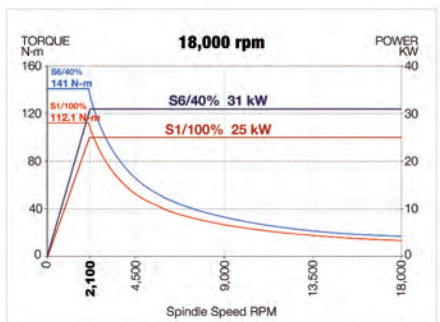
Standard 15,000 rpm

Power	31 kW
Torque	141 Nm
Acc. 0 – 12K	1.5 sec
Dec. 12K – 0	1.8 sec



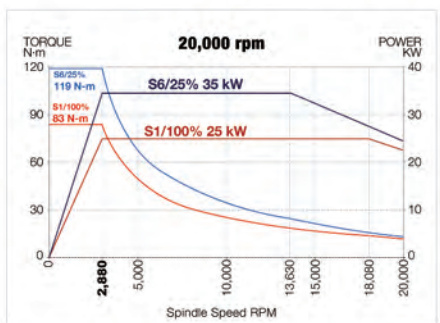
Option 18,000 rpm

Power	31 kW
Torque	141 Nm
Acc. 0 – 12K	1.5 sec
Dec. 12K – 0	1.8 sec



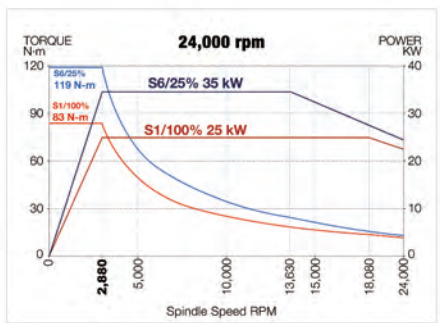
Option 20,000 rpm

Power	35 kW
Torque	119 Nm
Acc. 0 – 12K	1.5 sec
Dec. 12K – 0	1.8 sec



Option 24,000 rpm (*)

Power	35 kW
Torque	119 Nm
Acc. 0 – 15K	1.7 sec
Dec. 15 – 0	2.0 sec

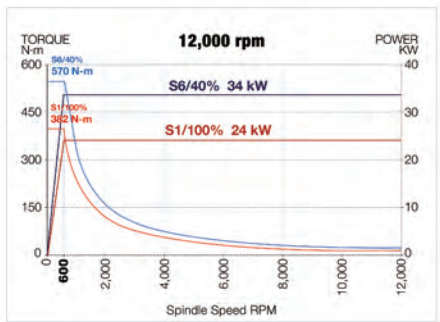


(*) Standard HSK-63A

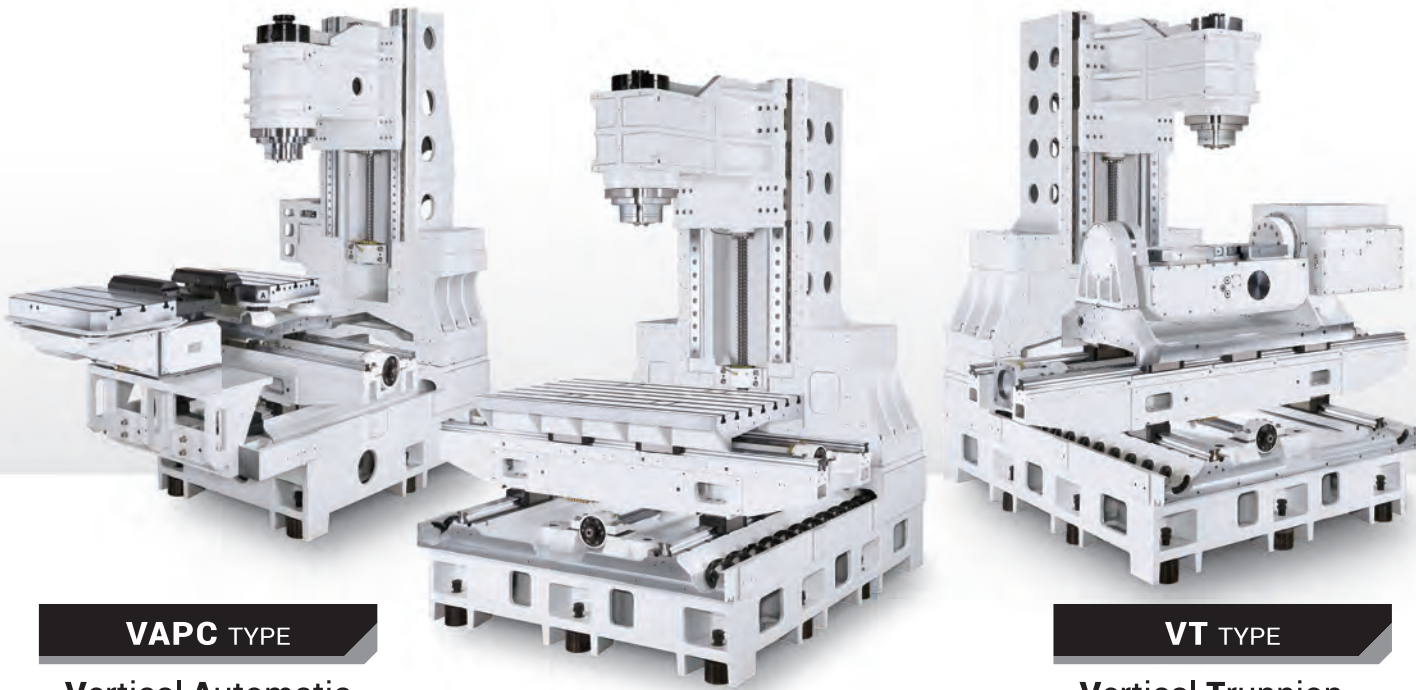
50 TAPER DUAL CONTACT (BBT / CAT / DIN / HSK-100A)

Standard 12,000 rpm

Power	34 kW
Torque	570 Nm
Acc. 0 – 8K	1.8 sec
Dec. 8K – 0	2.5 sec



STRUCTURE



VAPC TYPE
Vertical Automatic
Pallet Changer

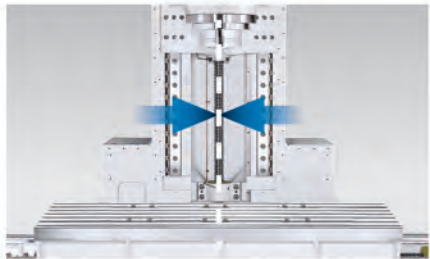
V TYPE
Vertical Machining

VT TYPE
Vertical Trunnion

The heavily ribbed structure is made of FC300 Meehanite® casting that has been FEA analyzed for strength and stability. All castings are designed to reach the maximum level of rigidity for the best machining performance.



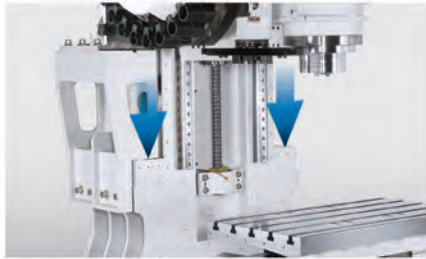
Hand Scraping



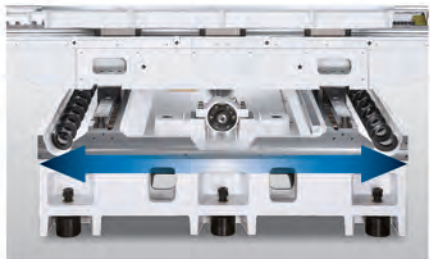
Symmetric Design



Honeycomb Ribbed



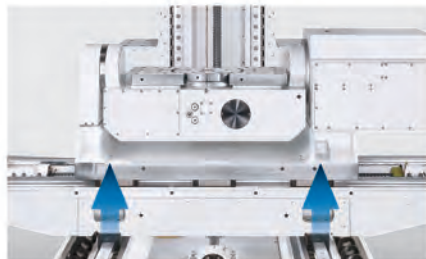
Supporting Shoulders



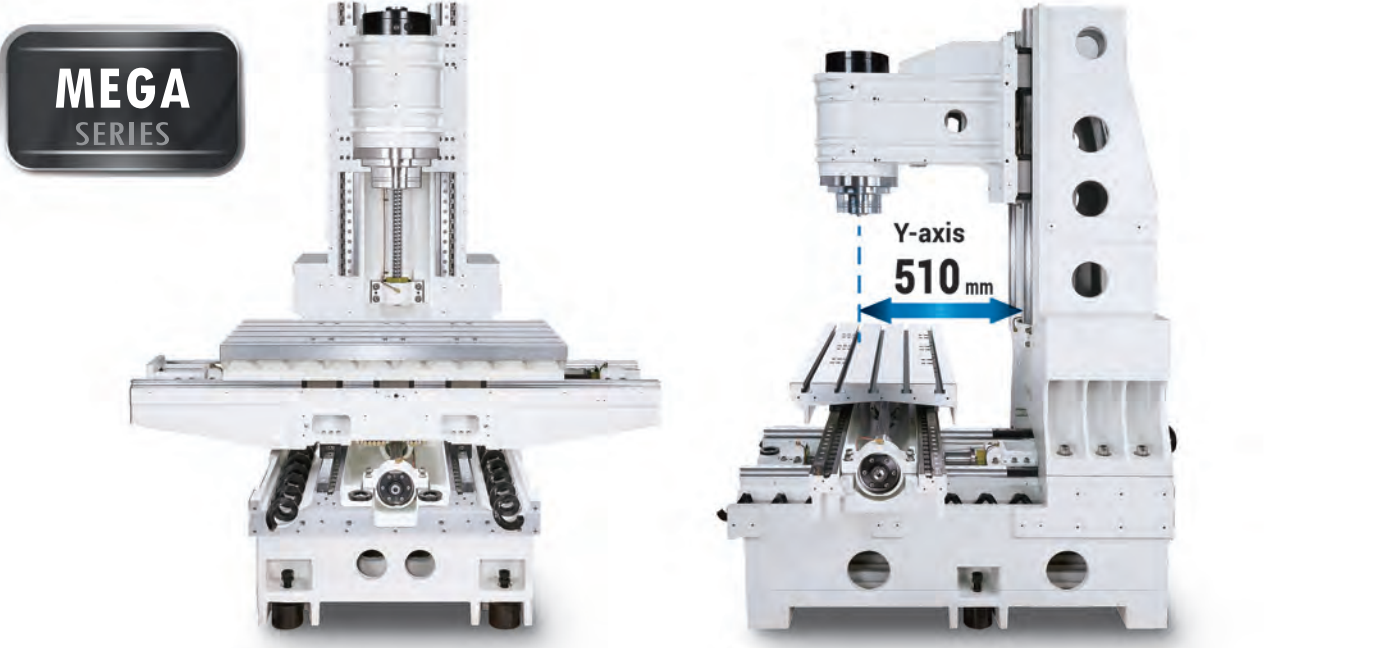
Wide Base



Integrated APC

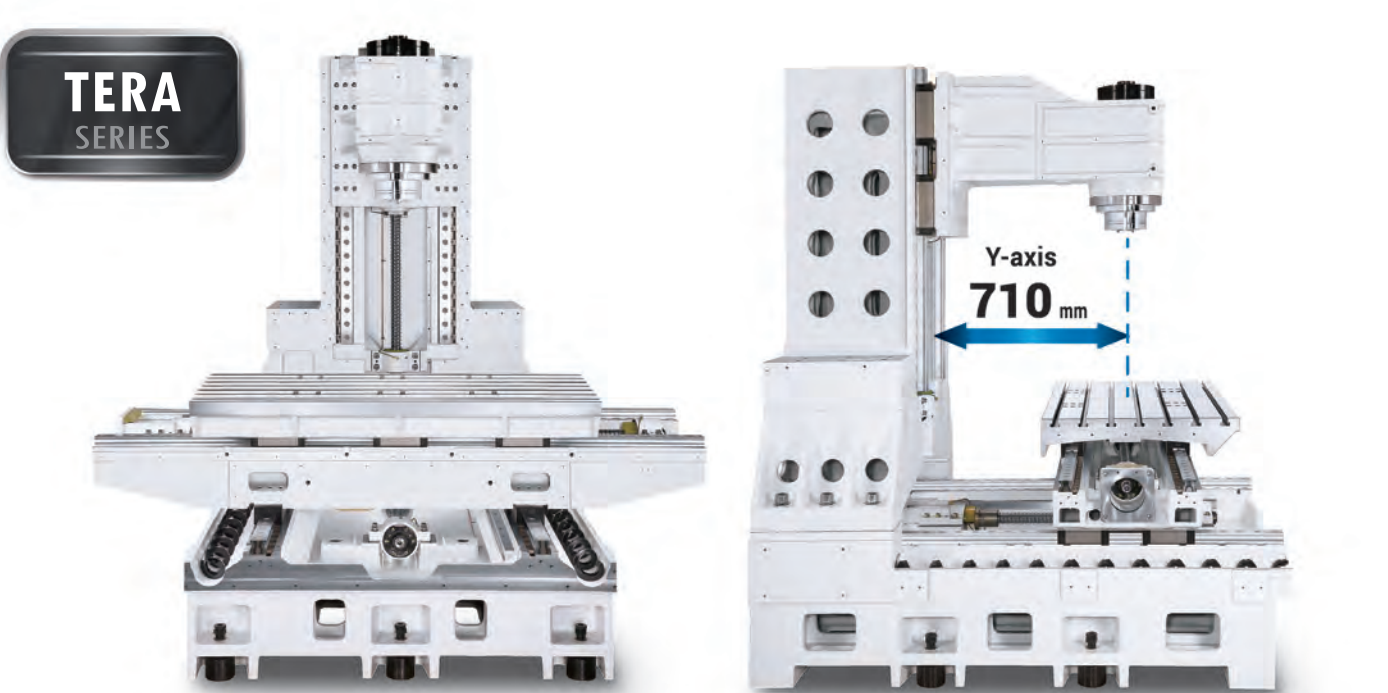


Full Stroke Support



MEGA/TERA represents the two C-frame sizes for the series. The compact frames with the proven design and placement for all the components, makes each model one of the smallest foot-prints in their class.

40 Taper Travel	X	Y	Z
MEGA 30V	760 mm	510 mm	510 mm
MEGA 40V	1,020 mm		
MEGA 20VAPC	600 mm	510 mm	510 mm
MEGA 30VT	780 mm	510 mm	441 mm



40 Taper Travel	X	Y	Z
TERA 40V	1,020 mm	710 mm	635 mm
TERA 50V	1,270 mm		
TERA 60V	1,524 mm		
TERA 50VT	970 mm	710 mm	500 mm

50 Taper Travel	X	Y	Z
TERA 50V/50	1,270 mm	710 mm	635 mm
TERA 60V/50	1,524 mm		
TERA 50VT/50	970 mm	710 mm	500 mm

AUTOMATIC TOOL CHANGER

The MEGA/TERA Series is equipped with a high-speed double arm tool changer with a 40-tool magazine(*). The magazine is integrated on the machine with an isolated structure, eliminating vibrations to the column, thus improving accuracy and finishes. The multi speed double arm allows the operator to adjust the speed of the tool changes for oversized, heavy tools and probes, to ensure accuracy and reliability. The ATC recovery function in HMI is a standard feature that assists the operator in recovering the position of the arm and the tool.

(* MEGA 30V standard is 30-tool magazine.

HIGH SPEED ATC (40 Taper)

Tool to Tool
1.2 sec

Chip to Chip
2.5 sec

Factory Conditions

Isolated Structure

The tool magazine is integrated to the machine with an isolated structure, eliminating vibrations to the column.

TOOL MAGAZINE



High Speed Tool Magazine

Standard	Option
■ 32 Tools for 50 Taper	■ 30 Tools (TERA 40V)
■ 40 Tools for 40 Taper	■ 60 Tools
(MEGA 30V is 30 Tools)	■ 90 Tools
	■ 120 Tools



Full Cover Magazine

The tool magazine is protected from the machining environment reducing chips and coolant from entering the magazine area.



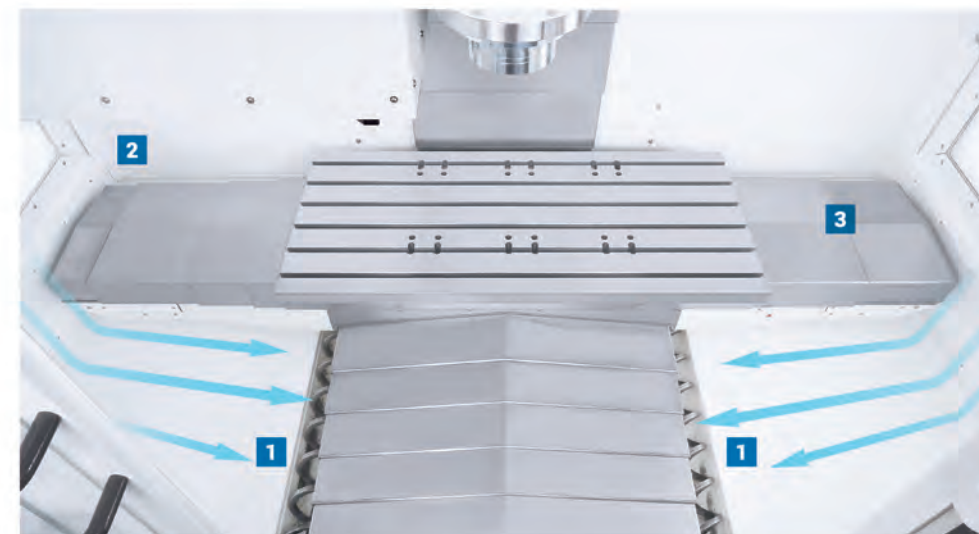
ATC rear operation panel(*) and door allow access for loading, unloading and inspection of tools while the machine is in operation. Tools can be called up either by tool number or by pocket number. During manual operation the machine will continue the cycle without interruption until ATC door is closed and the key is switched to automatic.

(*) Except 30 tools magazine.

CHIP MANAGEMENT SYSTEM

The chip management system includes base wash, dual augers and chip conveyor, virtually eliminating chip build-up. Coolant falls along the inside perimeter flushing chips down to the dual augers which evacuate chips to the front conveyor. All mounting hardware is bolted from the outside leaving a clean surface for chip evacuation.

EFFECTIVE DESIGN OPTIMIZES CHIP MANAGEMENT



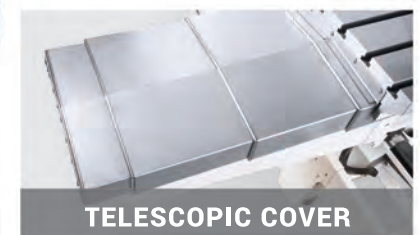
1. Dual augers in the extra-large working area.
2. No blind angle inside chip enclosure.
3. Triple protection on linear guides and ball screws: bottom cover, top cover and telescopic cover.



BOTTOM COVER



TOP COVER



TELESCOPIC COVER

MODULAR COOLANT / CHIP SYSTEM

1. Filter Chip Basket
2. Filter Chip Pan
3. Chip Conveyor
4. CTS Pump Option
5. Base Wash Pump
6. Coolant Pump



REVERSIBLE CONVEYOR

Standard in all MEGA/TERA Series. (except MEGA 20VAPC)
Rear chip conveyor available under request for all models.

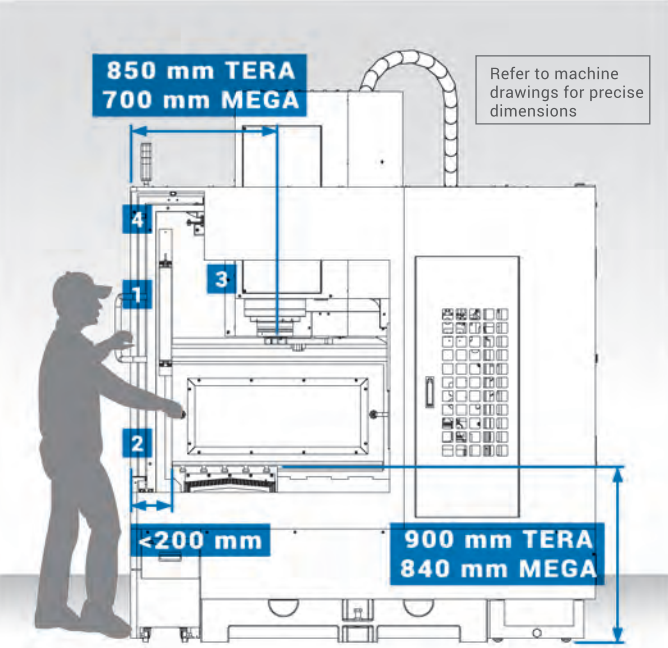


ERGONOMICS

WORKING AREA

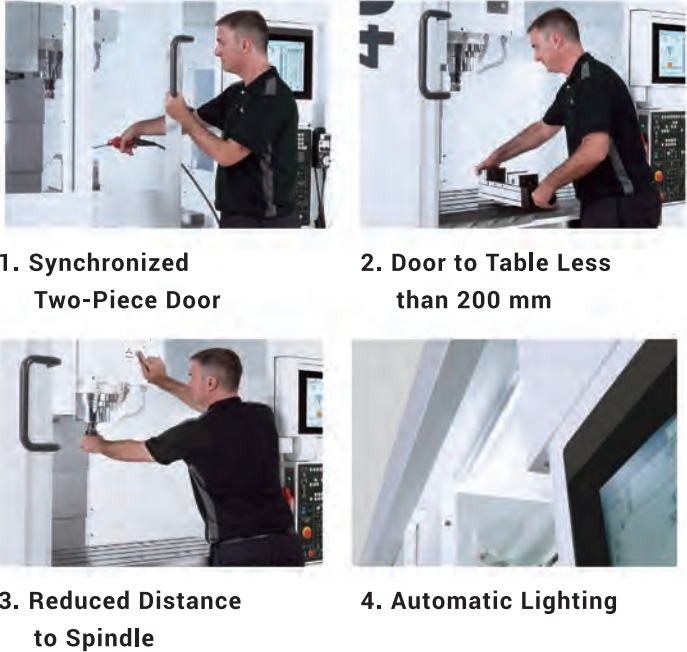
COMPLY WITH ERGONOMICS PRINCIPLES

MEGA/TERA Series is ergonomically designed for operator and maintenance convenience. The large wide front door can be opened with one hand. There are three LED lights, two in the sides and one over the work area.



EASY SETUP FOR OPERATOR

The distance from the door to the table is less than 200 mm for easy setup and part loading. The reach for operator access to the spindle is greatly reduced.



CONTROL PANEL

ADJUSTABLE CONTROL PANEL

EASY TO OPERATE PANEL



1. 15" and 19"(*) touchscreen.
2. Hard and resistant short travel buttons.
3. Micro Dynamics HMI app quick access buttons.
4. QWERTY and numerical keyboards.
5. Touchpad / Front USB.
6. Feedrate, spindle speed, spindle load, and tool number digital display.
7. Rapid feedrate override led knob.
8. Cutting feedrate override led knob.
9. Spindle speed override led knob.
10. Mode selection led knob.
11. MPG (Manual Pulse Generator).

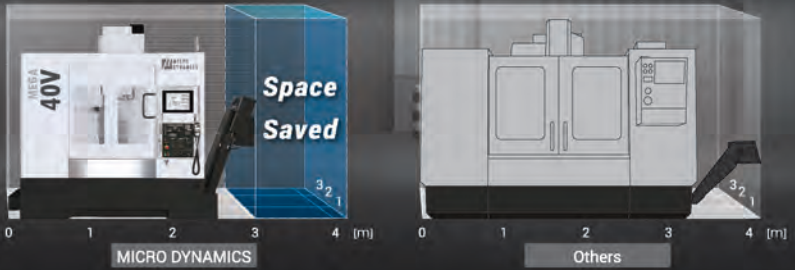
(*) Optional

The two-axis motion operator panel provides control for flat, tilting, and swivel movements. User can easily adjust the panel's tilt angle and rotation angle to achieve the best viewing angle and comfort, according to personal preferences or the requirements of the work.

FOOTPRINT

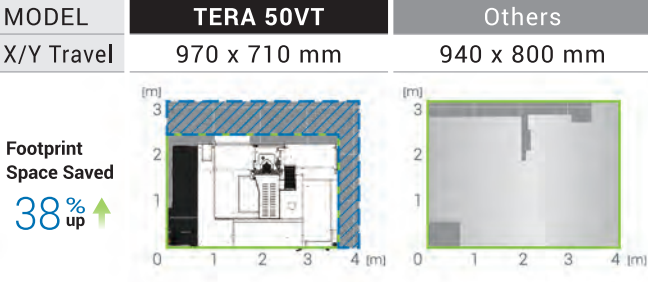
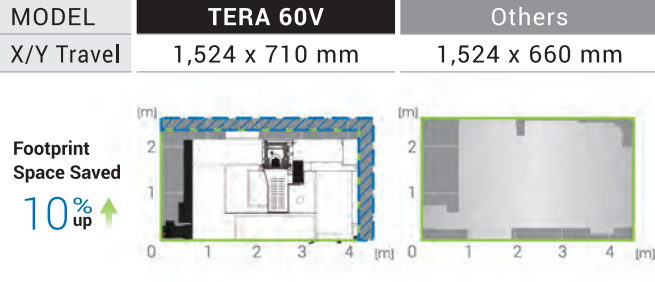
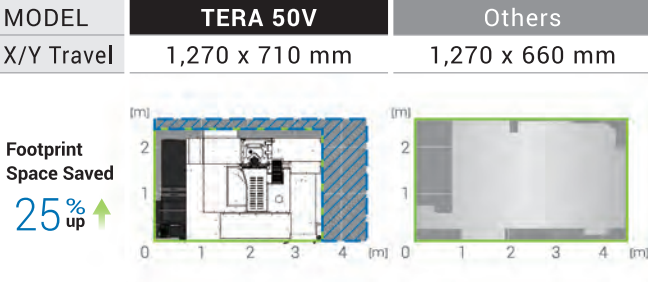
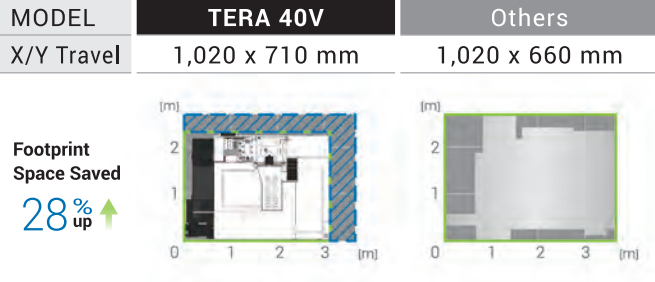
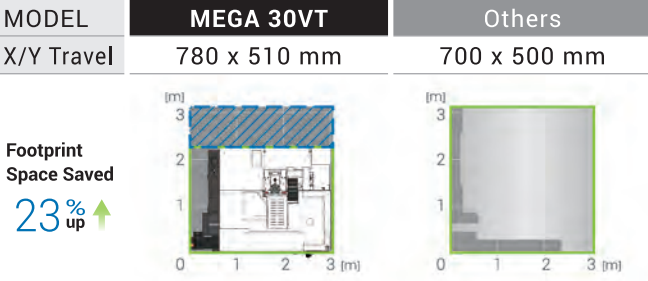
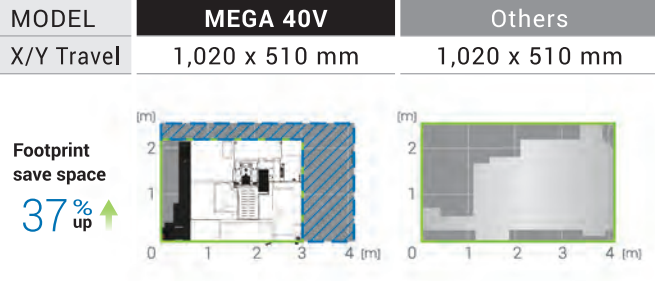
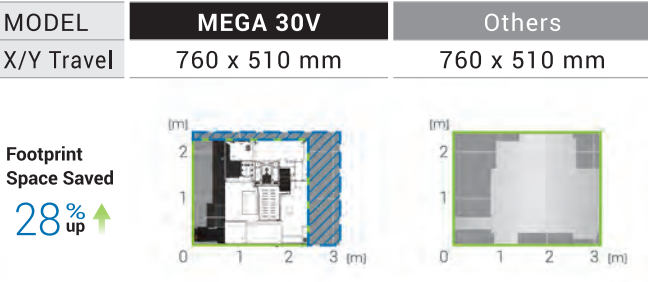
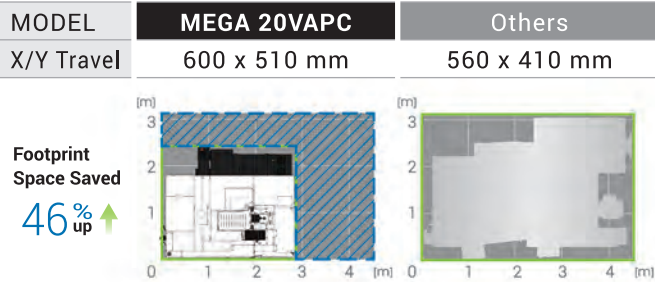
MINIMAL FOOTPRINT

Optimize efficiency, cut costs, and boost flexibility with a reduced footprint compared to other vertical machining centers with the same travel.



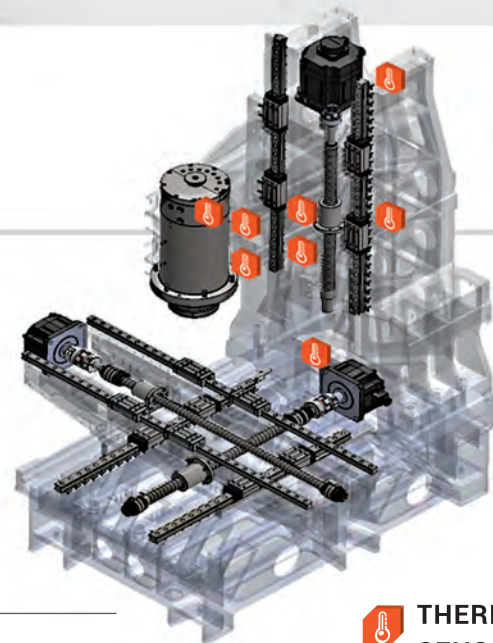
MICRO DYNAMICS vs. OTHERS

Footprint Space saved



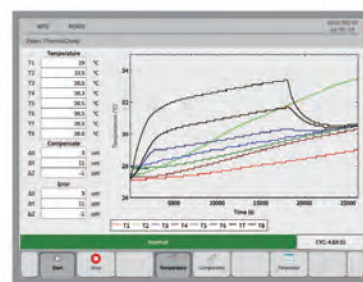
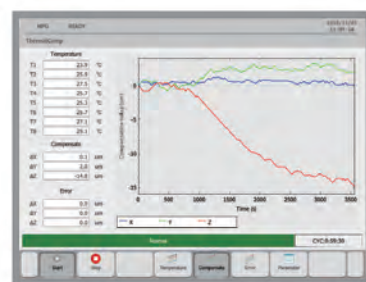
DYPEC® THERMAL COMPENSATION

Dynamic Predictive Error Compensation, corrects position error caused by thermal changes which improves accuracy and part finishes.
(resolution 0.1 µm)



 THERMAL SENSOR

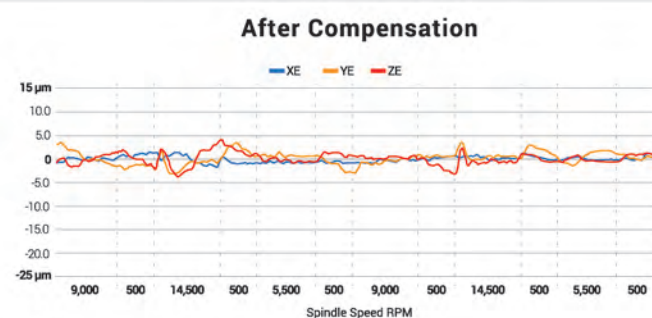
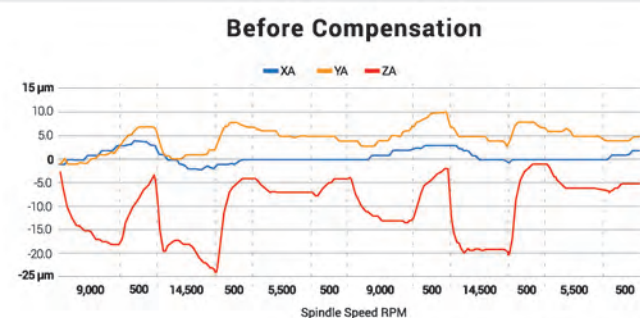
THERMAL COMPENSATION PARAMETER SETUP



Continuous monitoring of spindle axial deviation.
Long time run test to collect thermal changing data for each individual machine.

48 HOURS TEST

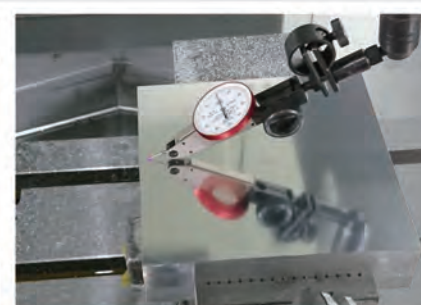
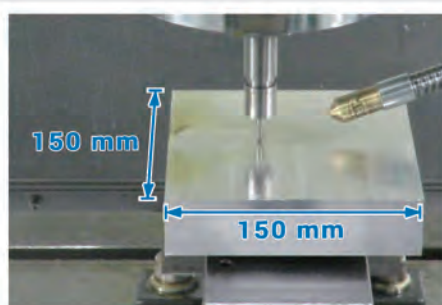
X/Y/Z axis static error in microns before and after DYPEC® compensation



DYPEC® "Real Time" Thermal Compensation data

THERMAL COMPENSATION FUNCTION TEST

DYPEC® mirror milling with ball end mill



Tools $\varnothing 6$ mm nose ball
Material 6061 Aluminum
Feed Rate 1,500 mm/min
Spindle Speed 15,000 rpm
Machining Time 2 h 24 min

Total Deviation < 2 µm

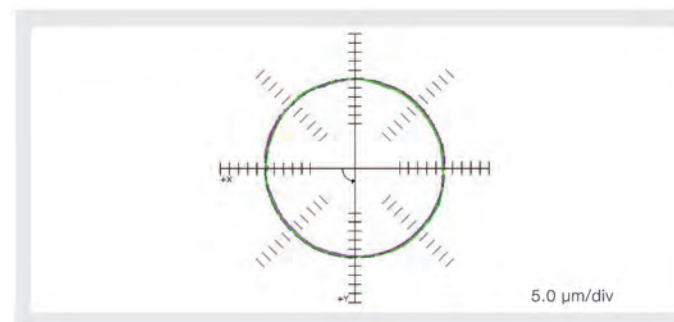
ACCURACY

Circle, diamond, square cutting test is done on all Micro Dynamics machines prior to shipment at 1,500 mm/min with a maximum tolerance under 5 microns linear.

- XY, XZ and YZ Double Ball Bar Test Results at 1,500 mm/min under 5 microns.
- X, Y and Z Axis Laser Compensation under 5 microns.
- 4th and 5th Axis Laser Compensation under 10 arcsecs.



DOUBLE BALL BAR TEST

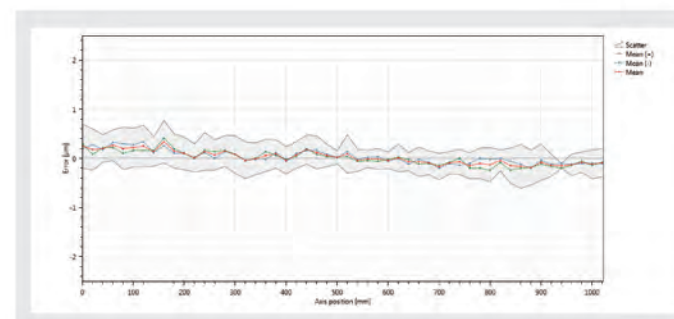


E.g. XY Double Ball Bar Test Results under 5 microns.

Factory Conditions

16% Squareness	6.3 µm/m
16% Backlash X	↔ -0.3 µm → 0.9 µm
13% Reversal spikes X	↔ -0.8 µm → -0.4 µm
12% Cyclic error Y	↑ 0.8 µm ↓ 0.7 µm
10% Lateral play X	↔ 0.8 µm → 0.4 µm
Circularity	2.7 µm

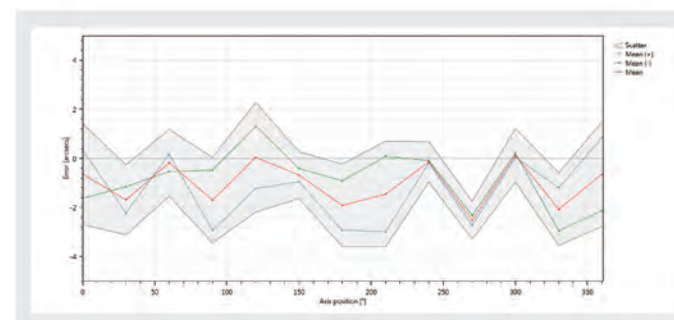
LASER COMPENSATION



E.g. X Axis Laser Compensation under 5 microns.

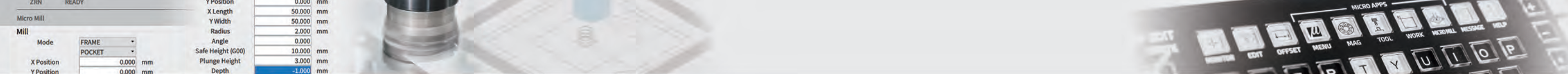
Factory Conditions

Linear X - Analysis features	
Name	VDI 3441 Value (µm)
Maximum reversal (U max)	0.2
Maximum scatter (Ps max)	0.8
Positional uncertainty (P)	1.4
Positional deviation (Pa)	0.5
Mean reversal	0.1
Mean scatter (Ps mean)	0.5
(Without scales)	



E.g. 5th Axis Laser Compensation under 10 arcsecs.

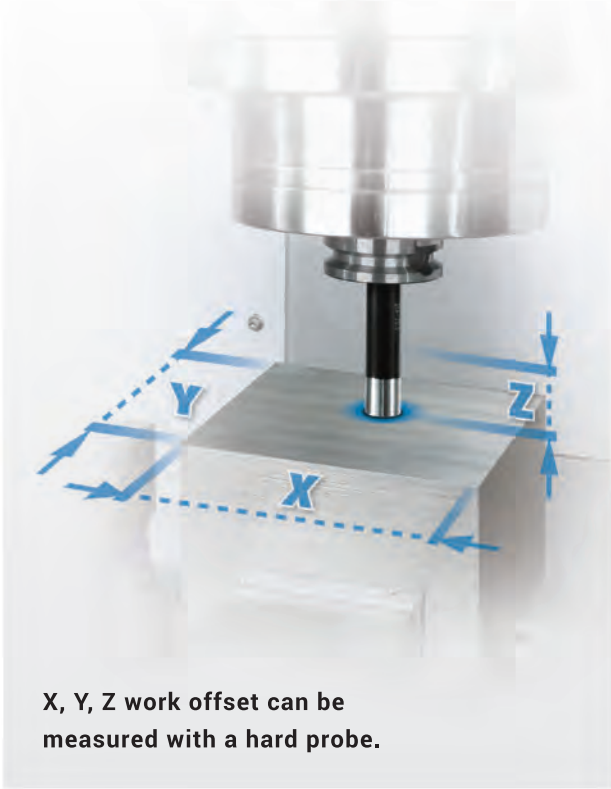
Angular C - Analysis features	
Name	VDI 3441 Value (arcsecs)
Maximum reversal (U max)	3.1
Maximum scatter (Ps max)	2.1
Positional uncertainty (P)	5.9
Positional deviation (Pa)	2.7
Mean reversal	1.5
Mean scatter (Ps mean)	1.5
(Without scales)	



MICRO DYNAMICS HMI

The Windows® embedded HMI CNC gives the user the ability to create or add apps to make it flexible to operate and automate the machine. Operator can load, run or edit any program from any device: internal HMI memory, PC hard drive or external USB device.

AUTO PART SETUP with HARD PROBING

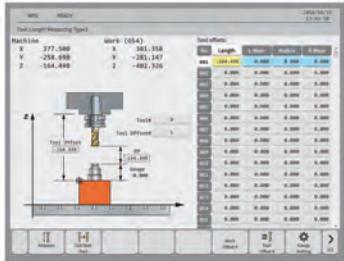


X, Y, Z work offset can be measured with a hard probe.



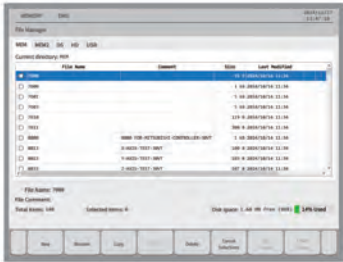
PART SETUP

Fast and easy function for manually or automatically setup the part.



TOOL SETUP

Fast and simple function for manually or automatically measure all the tools.



FILE MANAGER

Transfer files from USB, NC memory or Hard Drive in one click.



RENISHAW SET & INSPECT

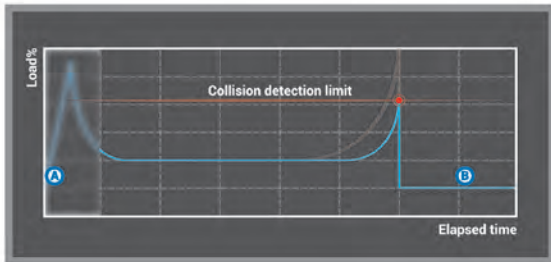
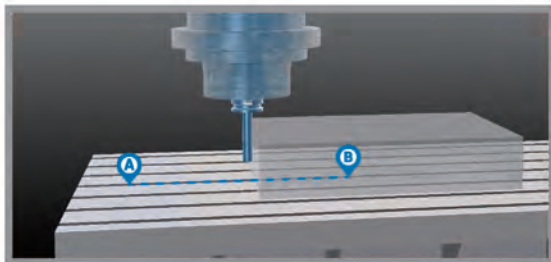
Simple, intuitive and easy-to-use on machine probing app.

COLLISION DETECTION

Machine stops if a collision is detected in all axis.

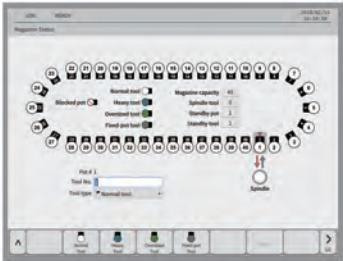


Collision detection is a Micro Dynamics function that allows the operator to setup the maximum load in all motors. If any motor exceeds the maximum load, the function will detect a collision and will stop the machine in all axis.



Please scan the QR code to watch the video.

The MEGA/TERA Series features Mitsubishi CNC M830VW / CNC M850VW(*) Control which is well suited to high-speed, high-accuracy machining and multi-axis, multi-part system control. Mitsubishi's tool path graphics verification makes it easier for end users to check G-Code program before machining.



MAGAZINE MONITOR

Load, unload and manage all tools in one screen.



MICRO MILL®

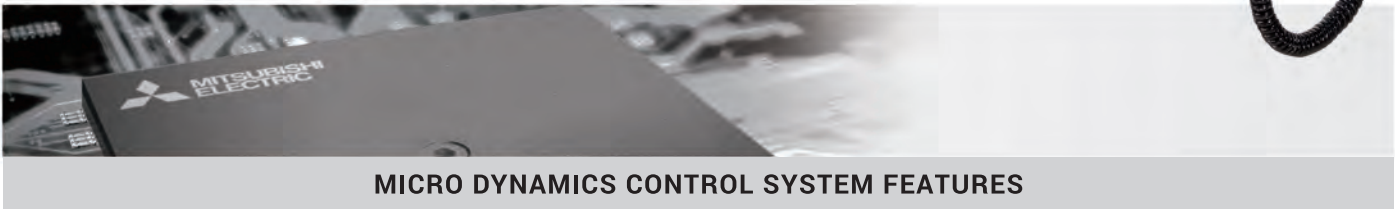
Conversational programming allows any operator to easily perform milling and drilling operations while creating G-Code and post to MDI or main memory.



ATC RECOVERY function allows the operator to recover the tool changer.



APC RECOVERY function allows the operator to recover the pallet changer.



- Mitsubishi CNC M830VW / CNC M850VW(*).
- 15" / 19"(*) Touchscreen display.
- 5,400 Block Look Ahead.
- 60 GB Data Server.
- 1,000 Programs in editing memory.
- 999 Sets in tool compensation.
- DXF import.
- 54 Sets work offsets.
- 400 Sets tool life management.
- 8,000 Sets macro variable.
- 64 Bit microprocessor.
- 2,048 KB Program memory.

- Main and subprograms can be edited and run as one file.
- Programs can be run from the front side USB or the hard drive.
- 3D circular interpolation.
- G-Code guidance.
- Helical interpolation.
- NURBS interpolation.(**)
- Programmable in-position check.
- Scaling.
- Simple programming (NAVI mill conversational programming).

- 4G SSS Control (Super Smooth Surface).
- Tolerance control.
- Spiral / conical interpolation.
- Tool Center Point Control.
- 3D tool radius compensation.
- Workpiece position offset for rotary axis.
- Inverse time feed.
- Polar coordinate command.
- Upgradable to 5 axes simultaneous control.(**)

(*) Optional (**) for authorized regions 14

MEGA 20VAPC

Dual pallet changer MEGA 20VAPC is designed for high production. The servo driven pallet changer switches tables in 8.5 sec. With the APC recovery function in the HMI the operator can easily perform maintenance of the pallet changer.

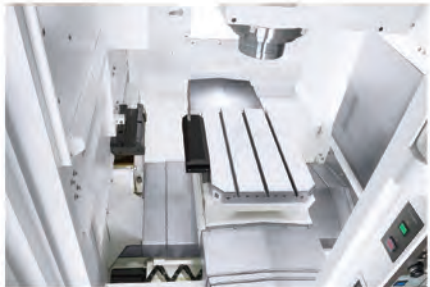
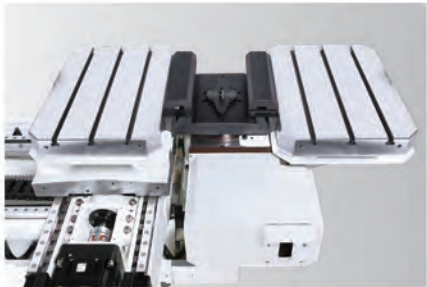


Table Size: 560 x 400 mm

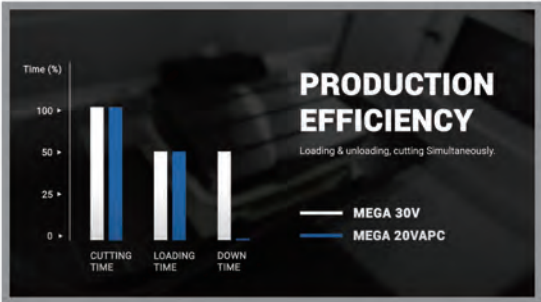


Servo driven pallet changer
Switches tables in 8.5 sec



Pressurized cones
Repeatability 0.004 mm

AUTOMATION AND MULTI-AXIS



Please scan the QR code to watch the video.

MEGA 30VT / TERA 50VT



The MEGA 30VT and TERA 50VT are Micro Dynamics's five-axis trunnion (4+1) table machines with hydraulic brakes. The design allows the user to load three vises or can be used as a 500 x 300 mm work table with a 220 mm diameter face plate in MEGA 30VT and 720 x 400 mm work table with a 320 mm diameter face plate in TERA 50VT.

For automation the through hole of the rotary table allows for the plumbing of hydraulics, pneumatics or other devices. A true five-axis simultaneous version is available as an option.

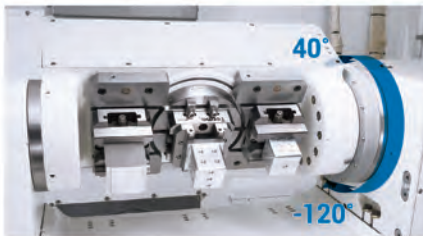


Rotary axis motion ranges

COMPLETE PROCESS IN 1 CYCLE



- Machine 6 Sides In One Load**
- Left vise: cut dove tail.
 - Central vise: 5-side machining.
 - Right vise: finish dove tail.



Tilting axis motion ranges

TRUNNION TABLE FACE PLATE			
MODEL	Standard	Option (Field interchangeable)	
	Ø220 mm	Ø300 mm	Ø350 mm
MEGA 30VT			
	Ø320 mm	Ø500 mm	Ø630 mm
TERA 50VT			

MACHINING CAPACITY

40 TAPER BUILT-IN SPINDLE

ON 1050 STEEL

Factory Conditions



FACE MILL

TOOL **63 mm**

Cut (Width x Depth)	50 x 6 mm
Feedrate	2,533 mm/min
Spindle Speed	2,173 rpm

766 cc/min

87%



END MILL

TOOL **32 mm**

Cut (Width x Depth)	32 x 5 mm
Feedrate	2,300 mm/min
Spindle Speed	3,800 rpm

368 cc/min

47%



DRILL

TOOL **45 mm**

Cut (Depth)	35 mm
Feedrate	530 mm/min
Spindle Speed	2,100 rpm

834 cc/min

90%



TAP

TOOL **33 x 3 mm**

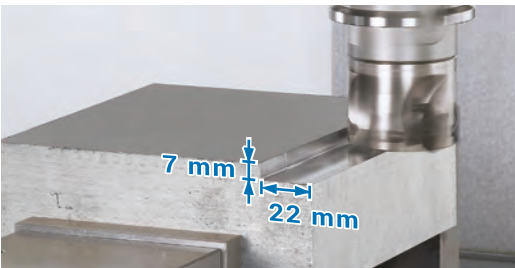
Feedrate	384 mm/min
Spindle Speed	128 rpm

-

46%

FACTORY TEST - 40 TAPER

Micro Dynamics standard factory tests for all models includes the circle, diamond, square cutting test, as well as milling, drilling, tapping and the heavy milling test.



Tool	50 mm End Mill
Material	1050 Steel
Cutting Width	22 mm
Cutting Depth	7 mm
Feedrate	700 mm/min
Spindle Speed	1,100 rpm
Load	40%

50 TAPER BUILT-IN SPINDLE

ON 1050 STEEL

Factory Conditions



FACE MILL

TOOL **160 mm**

Cut (Width x Depth)	100 x 5 mm
Feedrate	1,500 mm/min
Spindle Speed	450 rpm

750 cc/min

97%



END MILL

TOOL **32 mm**

Cut (Width x Depth)	32 x 5 mm
Feedrate	2,300 mm/min
Spindle Speed	3,800 rpm

368 cc/min

20%



DRILL

TOOL **80 mm**

Cut (Depth)	50 mm
Feedrate	160 mm/min
Spindle Speed	800 rpm

804 cc/min

94%



TAP

TOOL **48 x 5 mm**

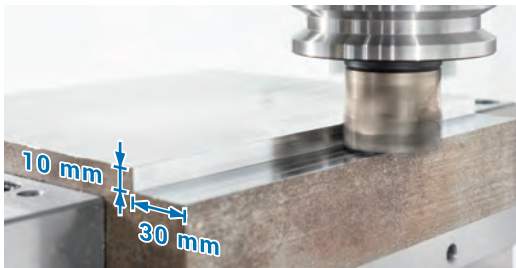
Feedrate	430 mm/min
Spindle Speed	86 rpm

-

63%

FACTORY TEST - 50 TAPER

Micro Dynamics standard factory tests for all models includes the circle, diamond, square cutting test, as well as milling, drilling, tapping and the heavy milling test.



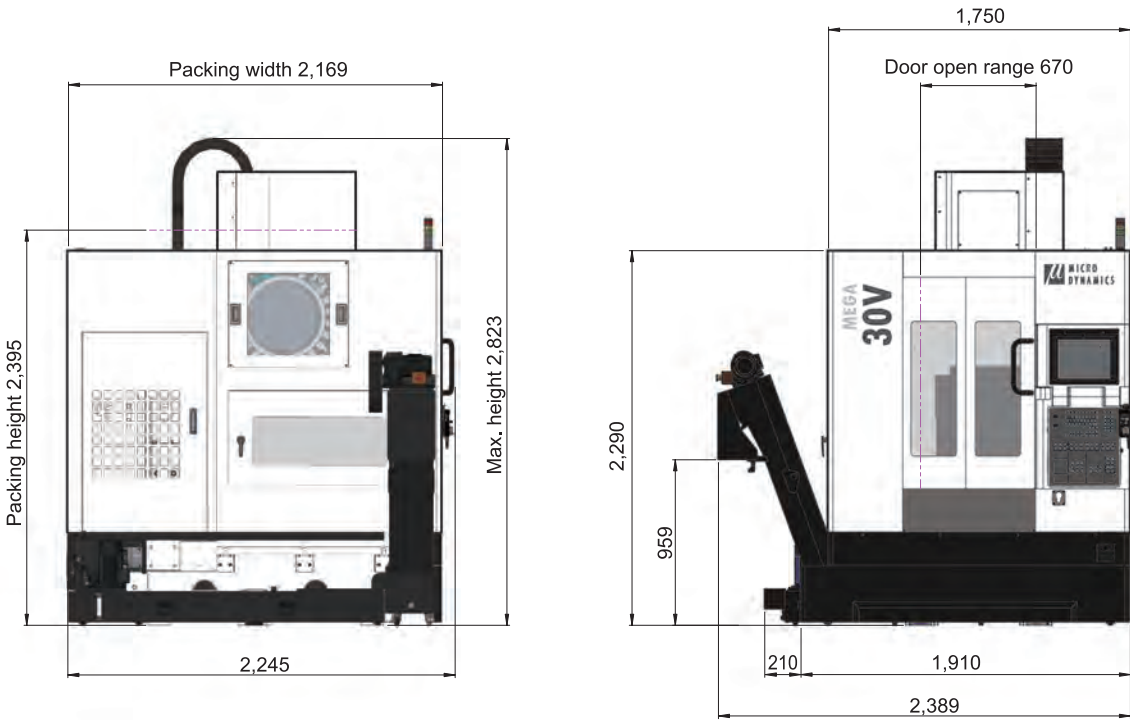
Tool	50 mm End Mill
Material	1050 Steel
Cutting Width	30 mm
Cutting Depth	10 mm
Feedrate	1,500 mm/min
Spindle Speed	2,000 rpm
Load	47%

MEGA 30V

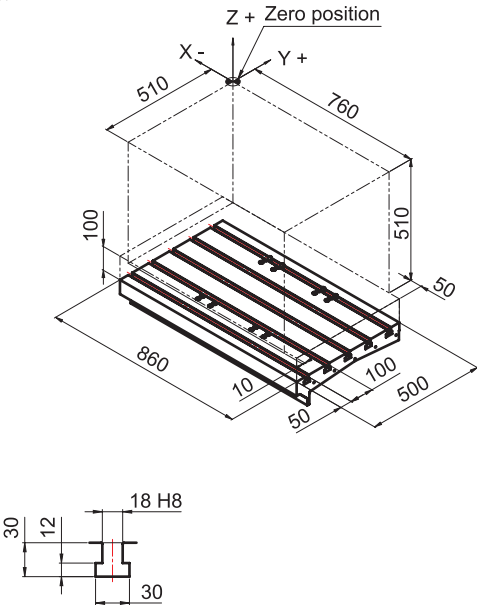


MACHINE DIMENSIONS

Unit: mm



Unit: mm

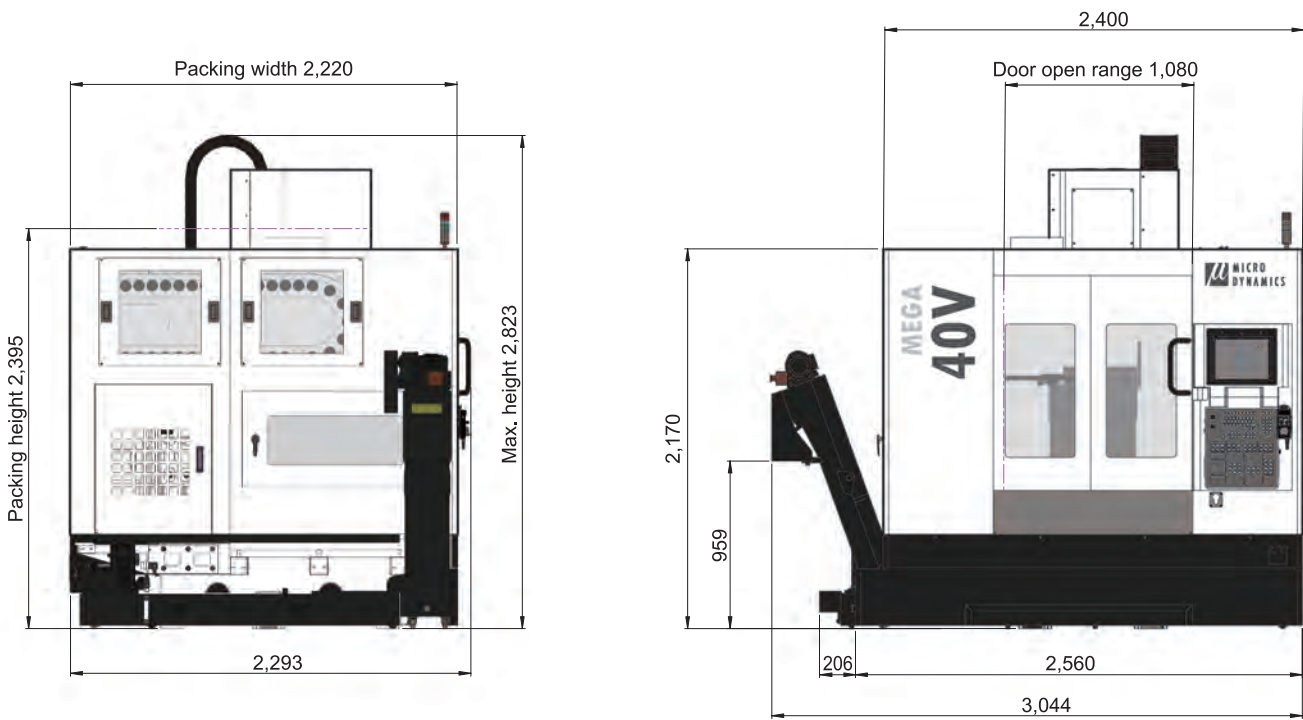


MEGA 40V

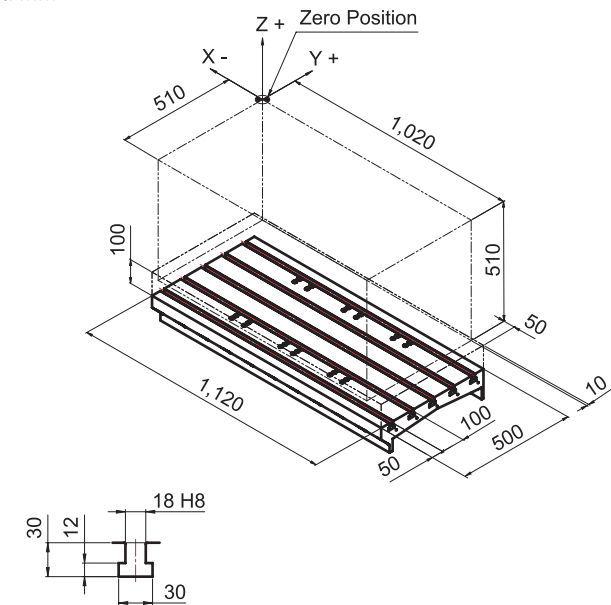


MACHINE DIMENSIONS

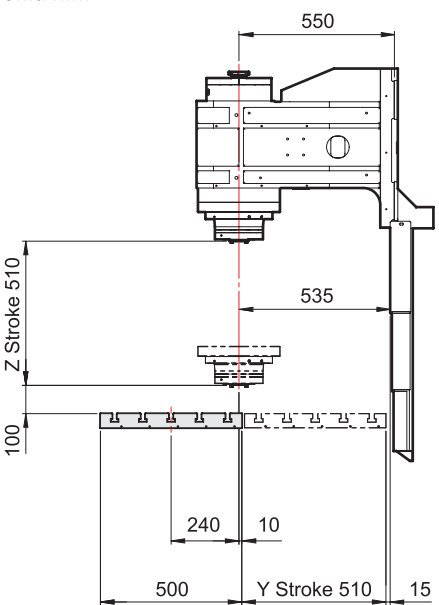
Unit: mm



Unit: mm



Unit: mm

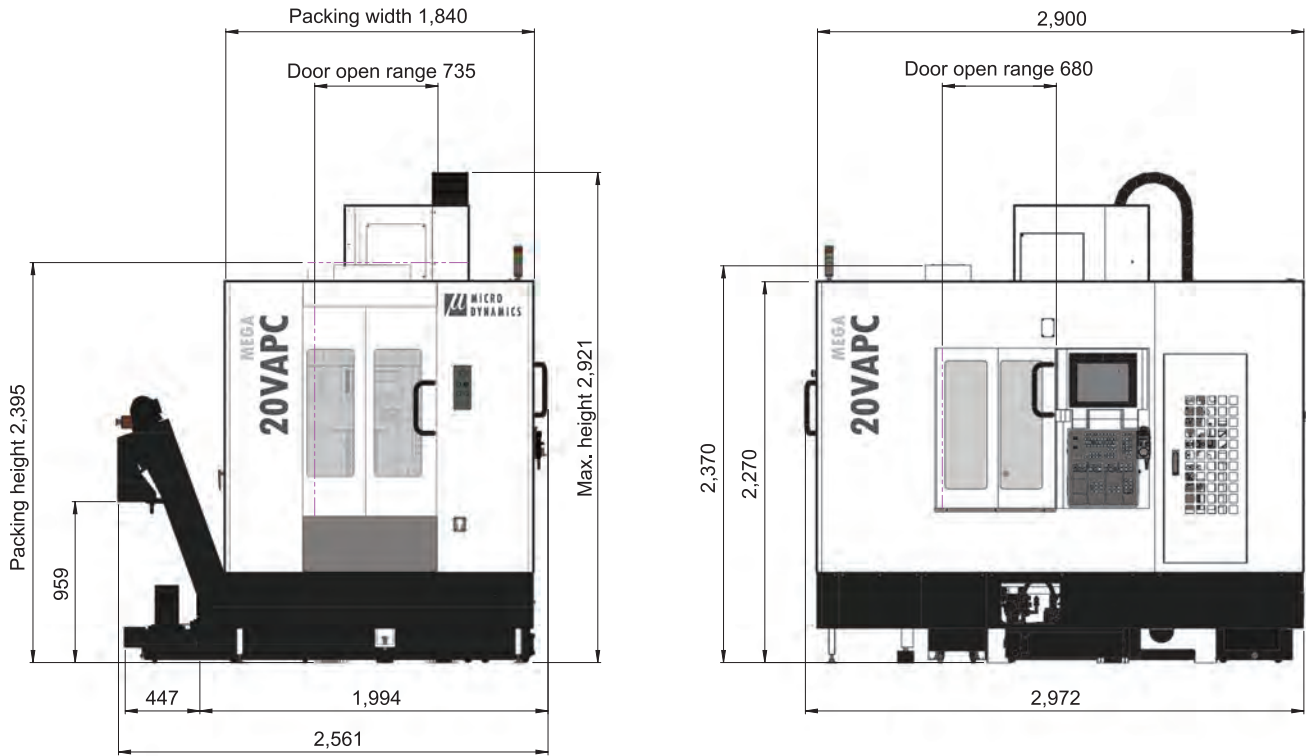


MEGA 20VAPC

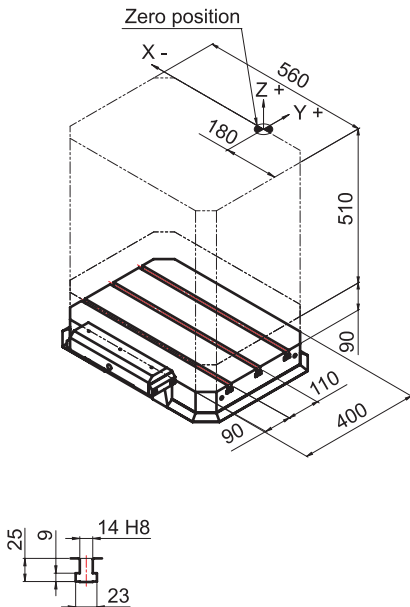


MACHINE DIMENSIONS

Unit: mm



Unit: mm

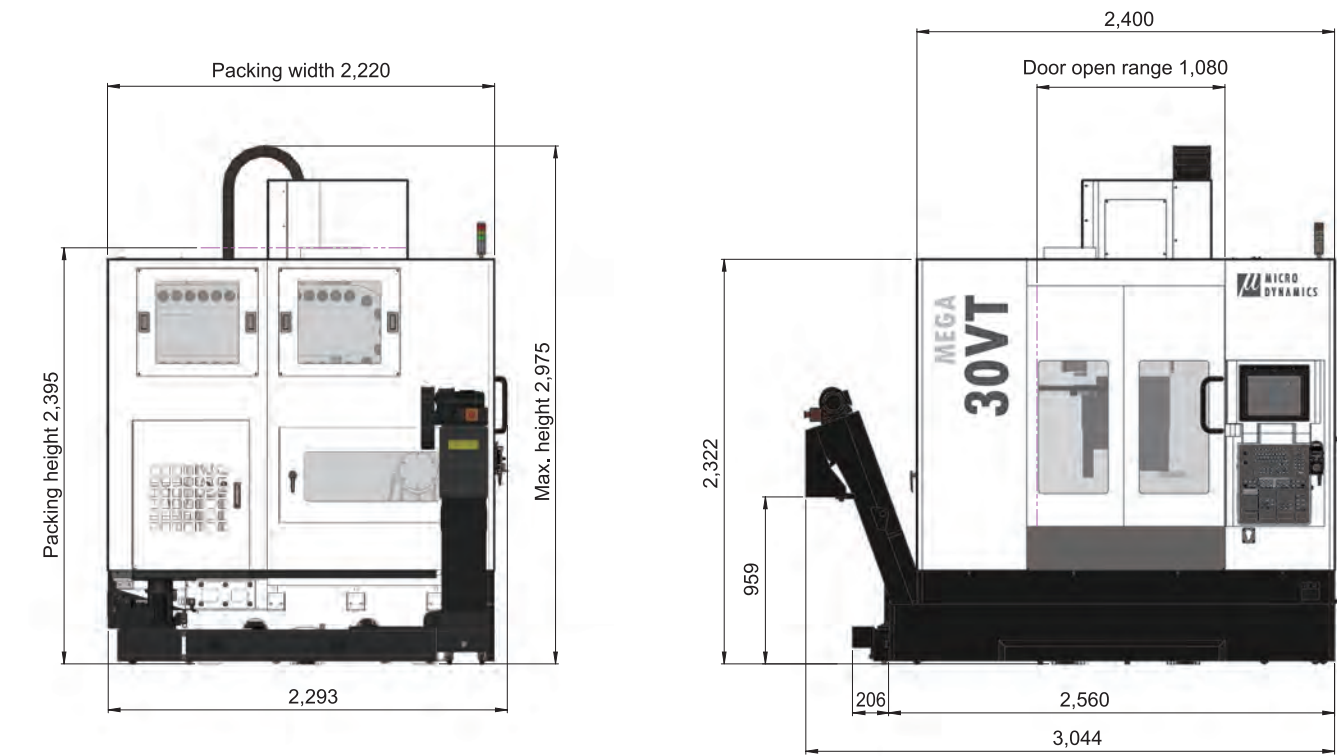


MEGA 30VT

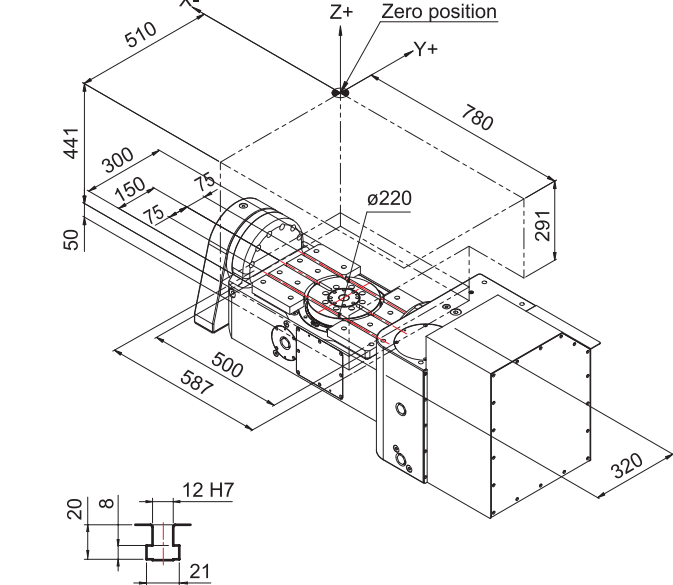


MACHINE DIMENSIONS

Unit: mm

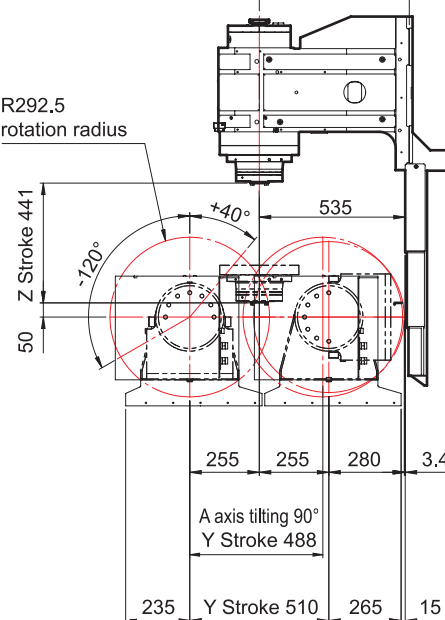


Unit: mm



* ø300 mm and ø350 mm face plate visit www.microdynamicsfa.com

Unit: mm

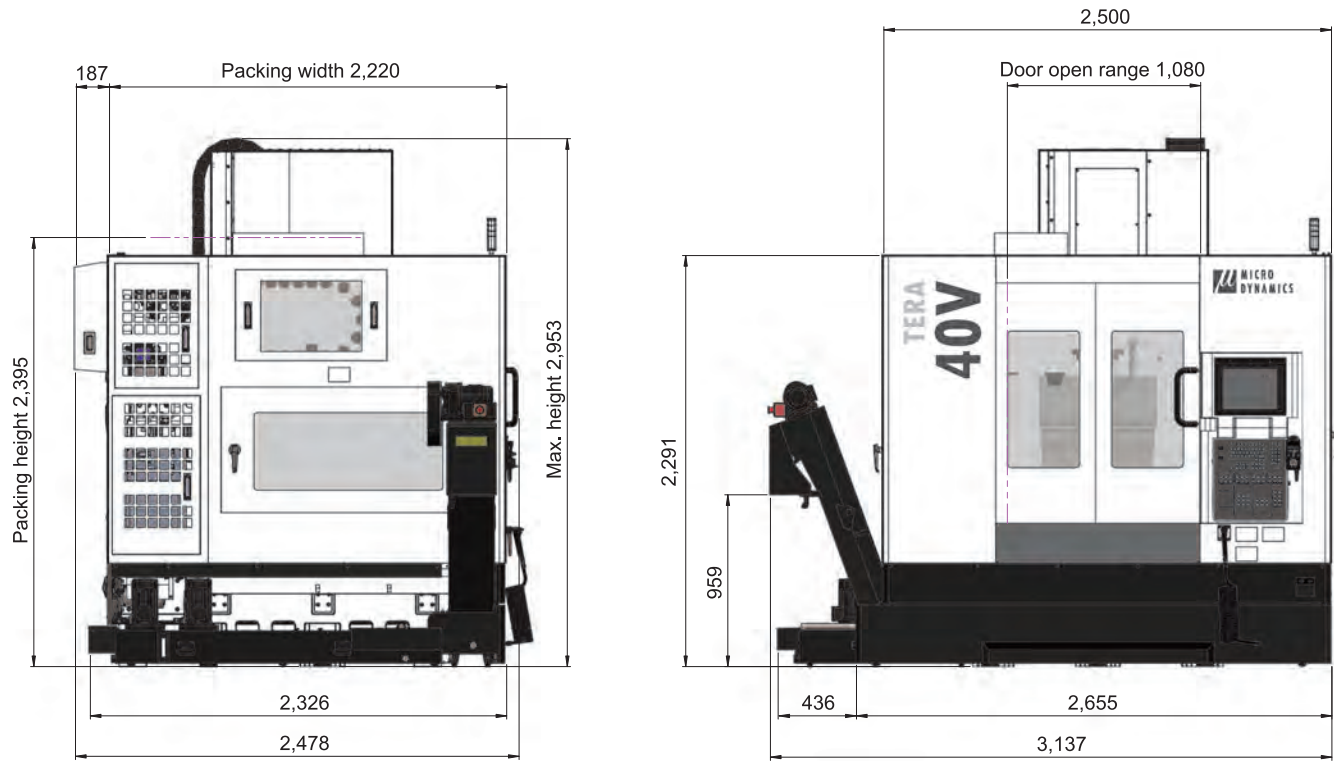


TERA 40V

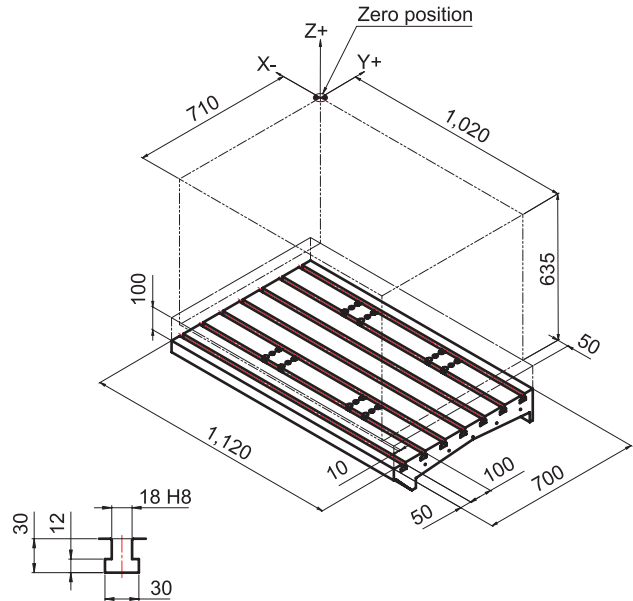


MACHINE DIMENSIONS

Unit: mm



Unit: mm

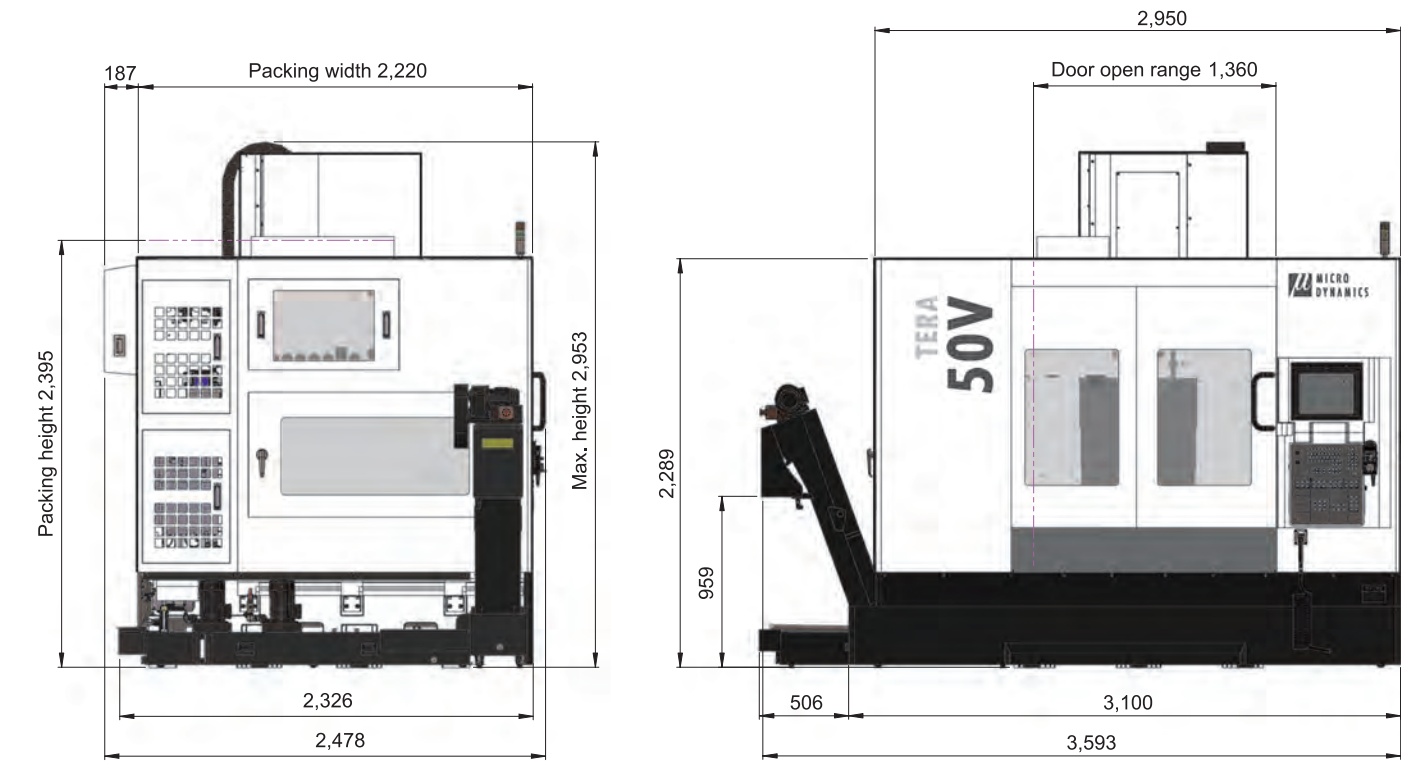


TERA 50V

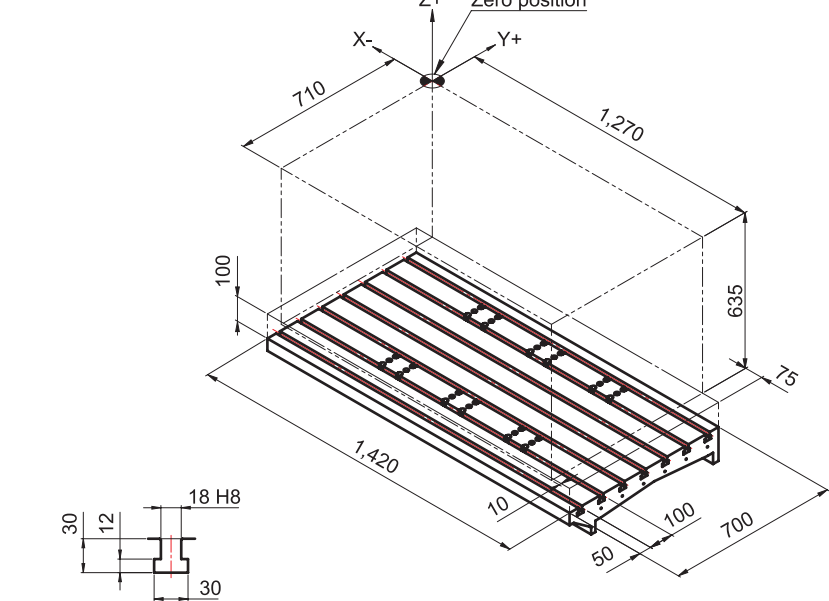


MACHINE DIMENSIONS

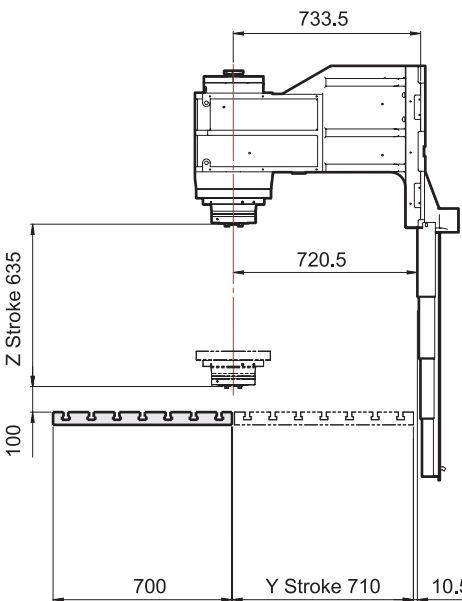
Unit: mm



Unit: mm



Unit: mm

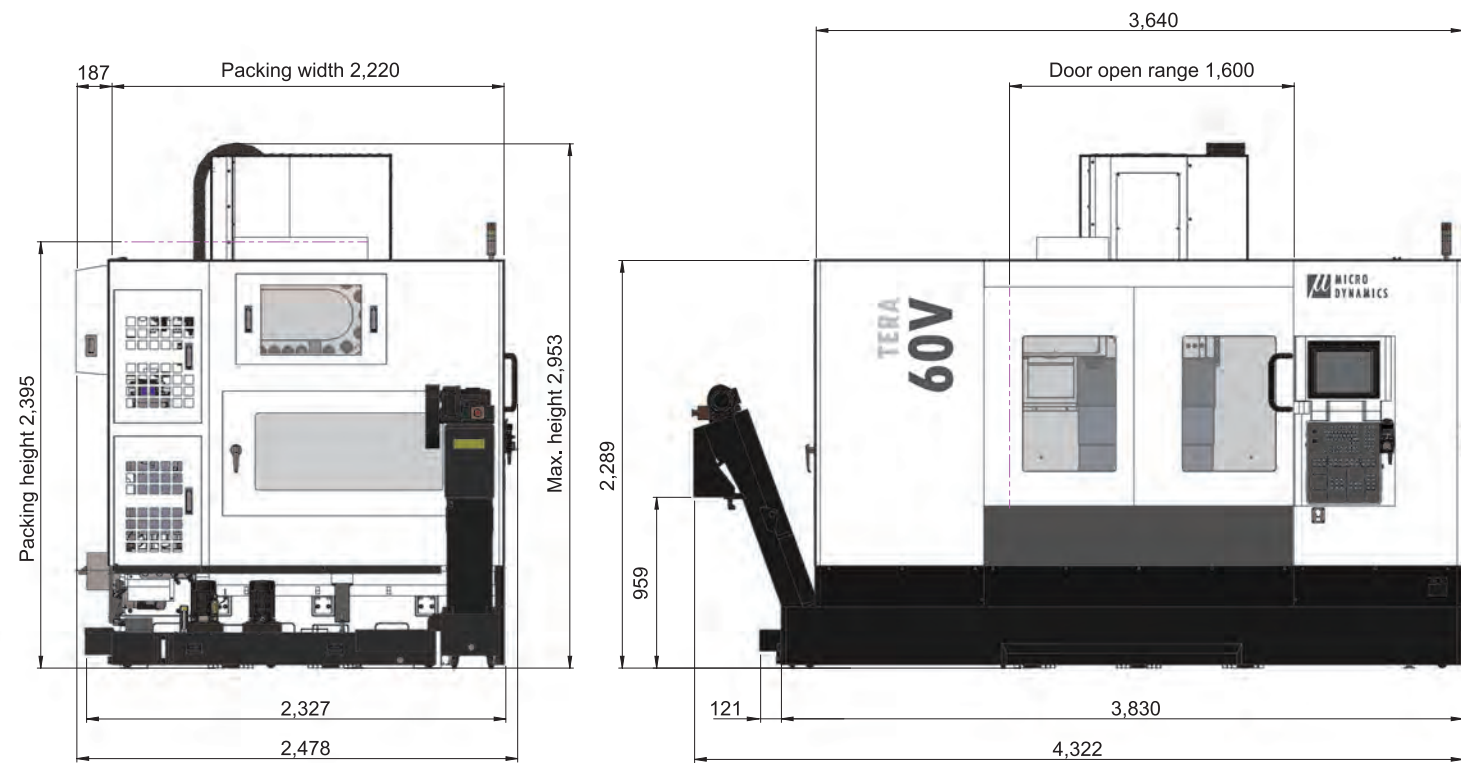


TERA 60V

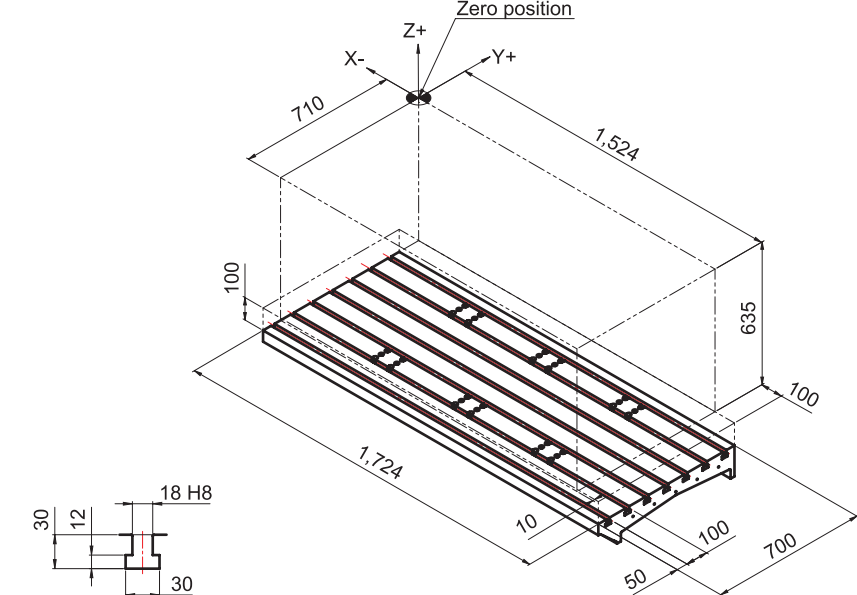


MACHINE DIMENSIONS

Unit: mm



Unit: mm

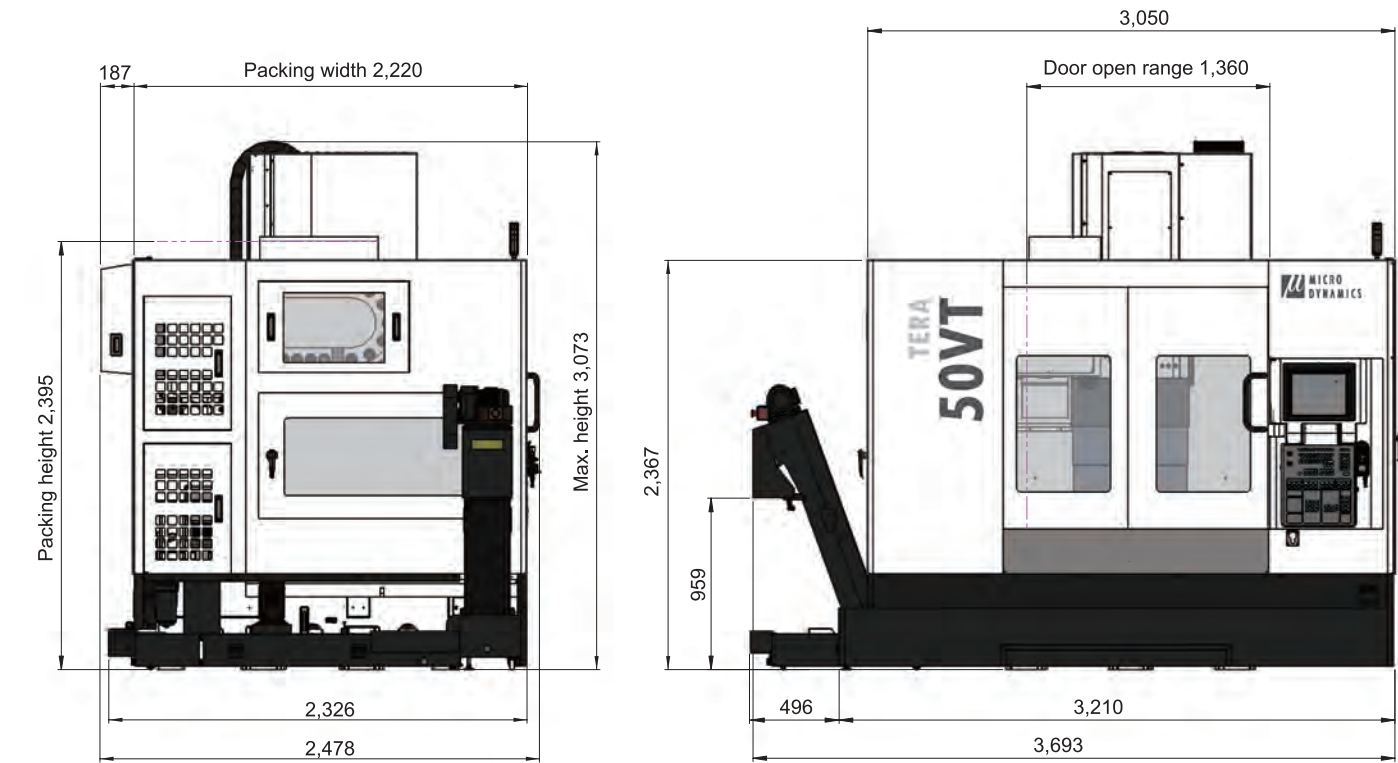


TERA 50VT

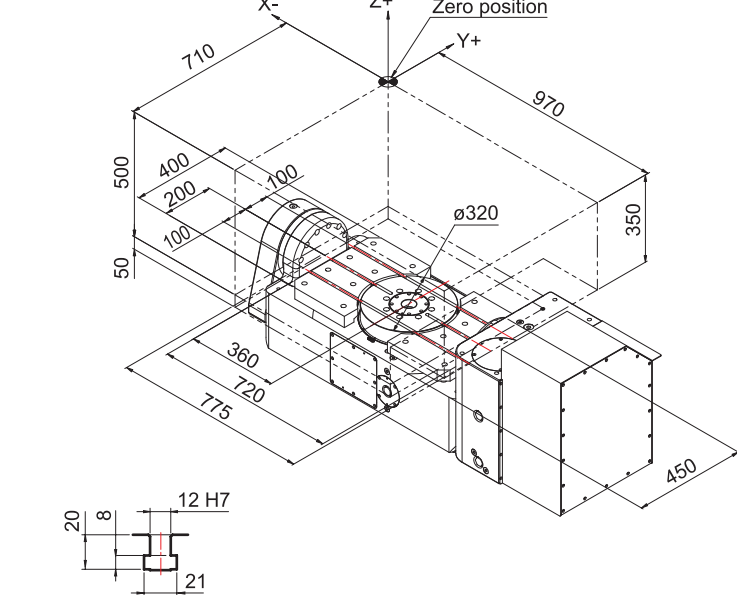


MACHINE DIMENSIONS

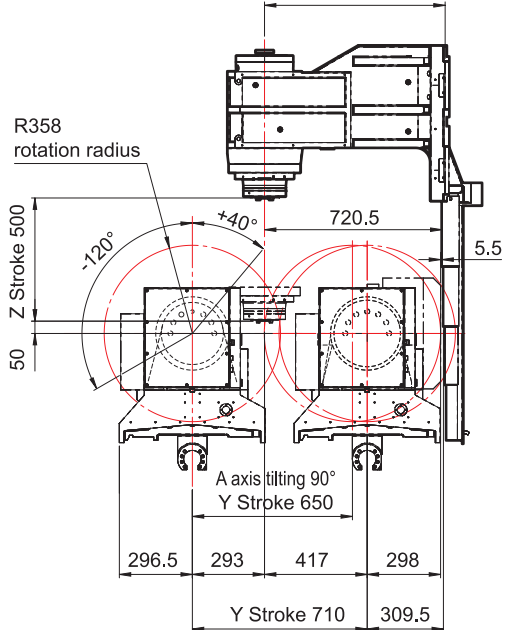
Unit: mm



Unit: mm



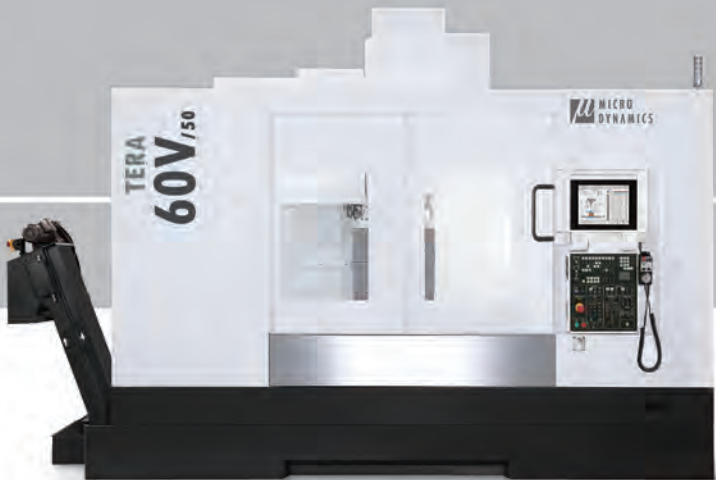
Unit: mm



TERA 50V_{/50}

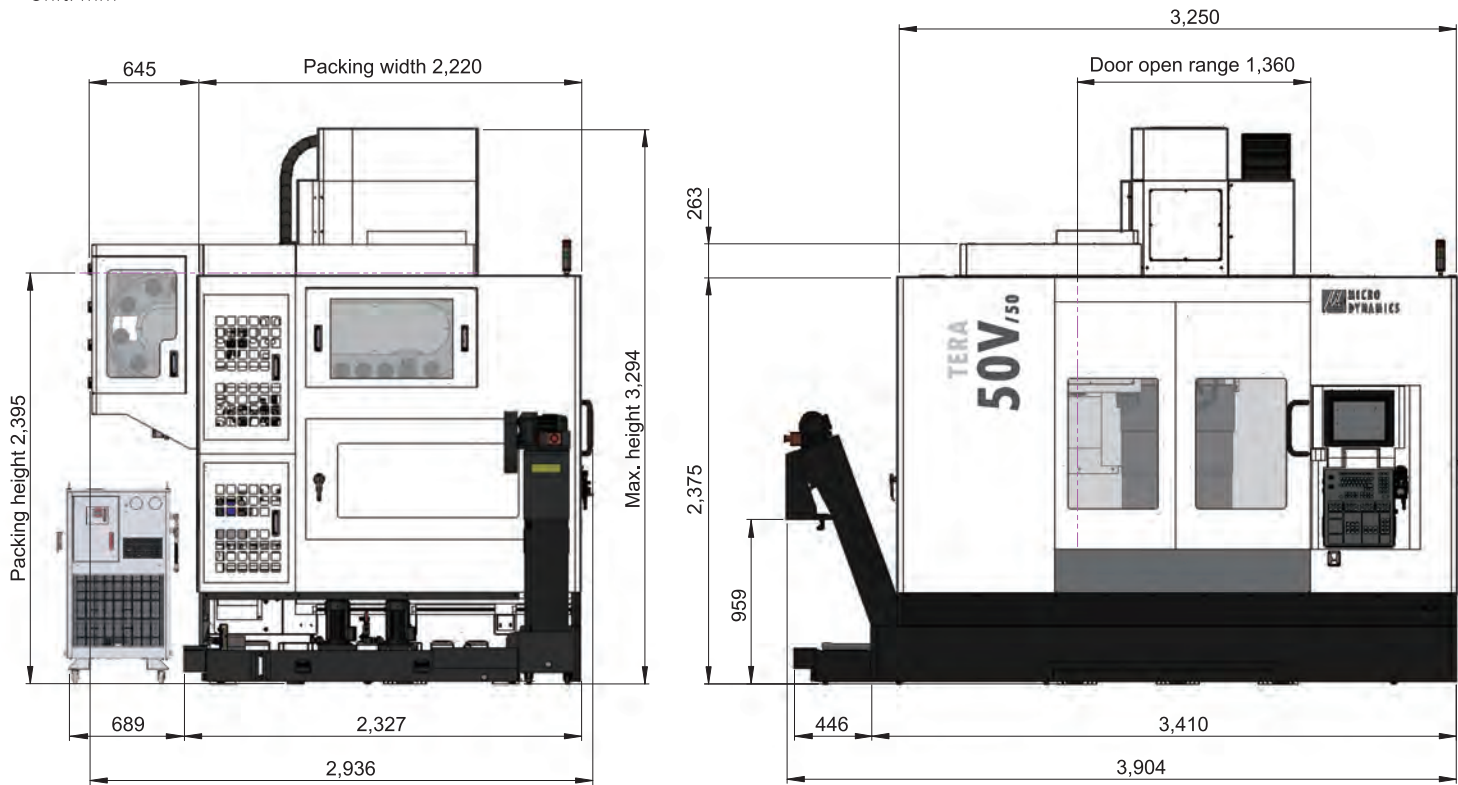


TERA 60V_{/50}



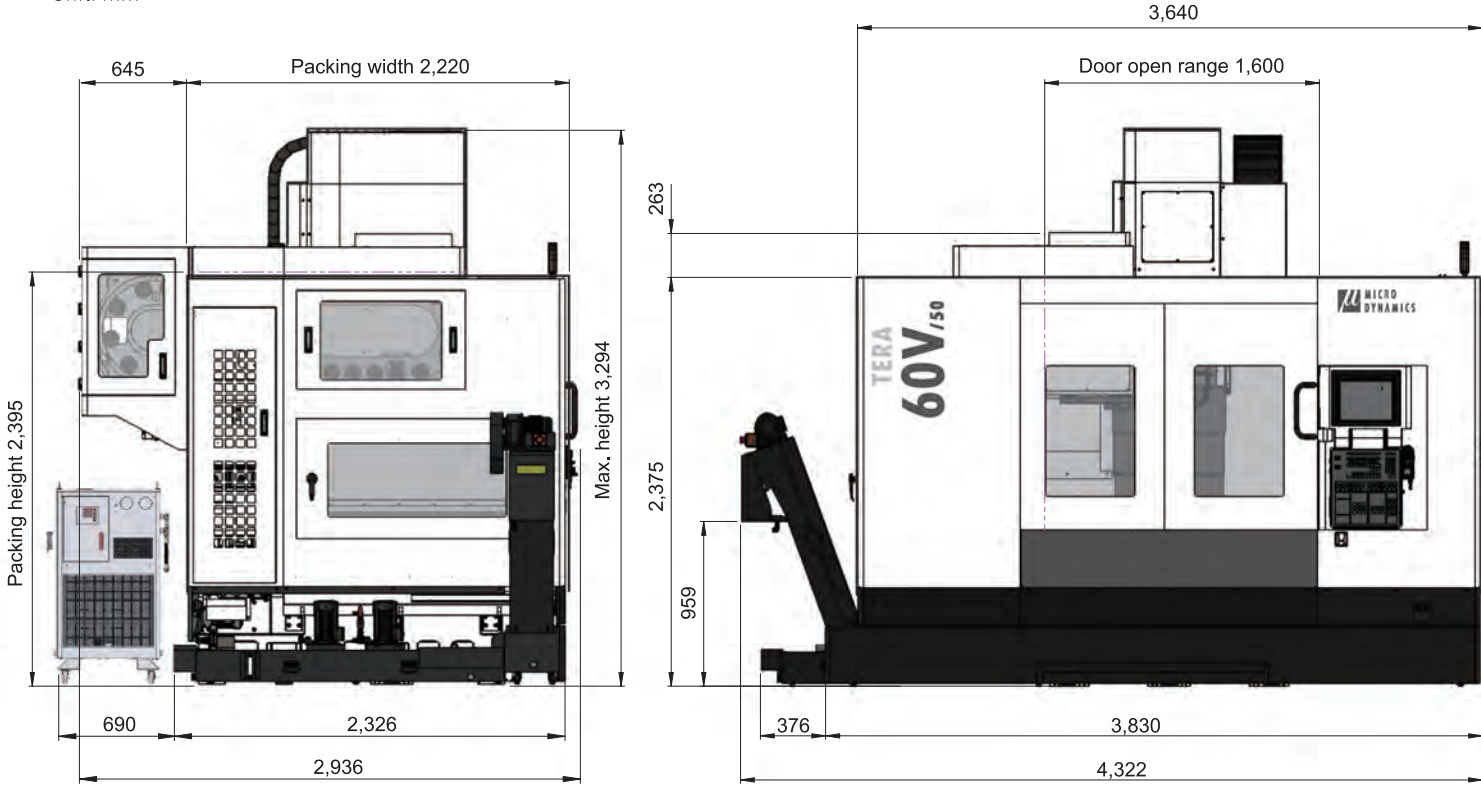
MACHINE DIMENSIONS

Unit: mm

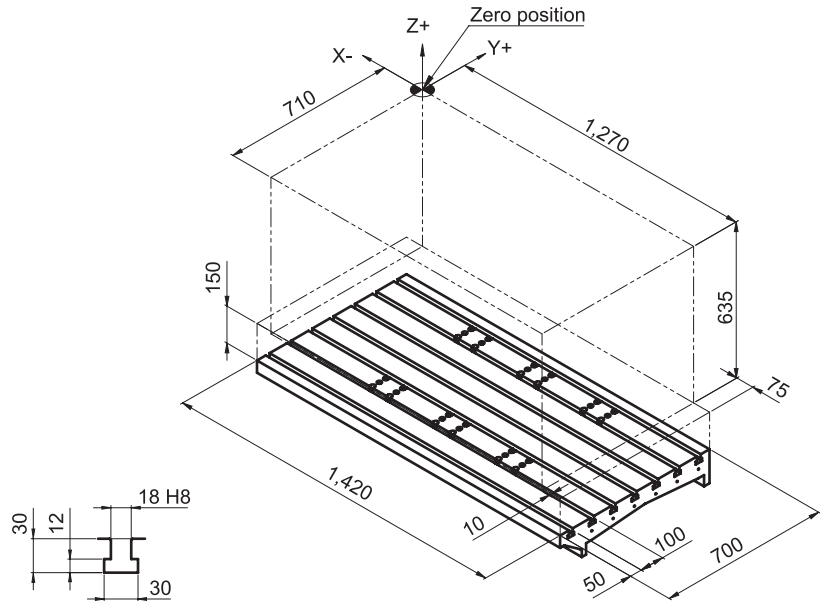


MACHINE DIMENSIONS

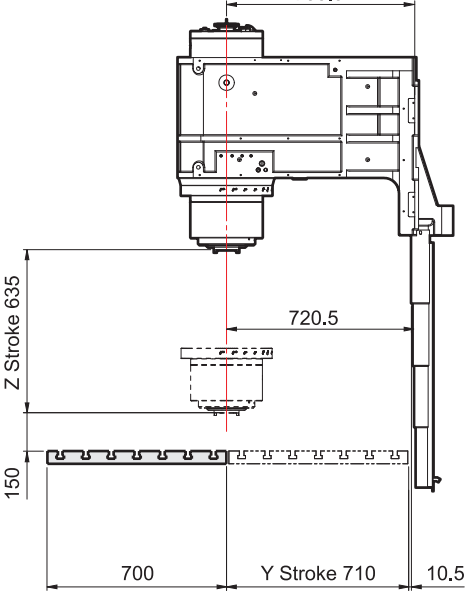
Unit: mm



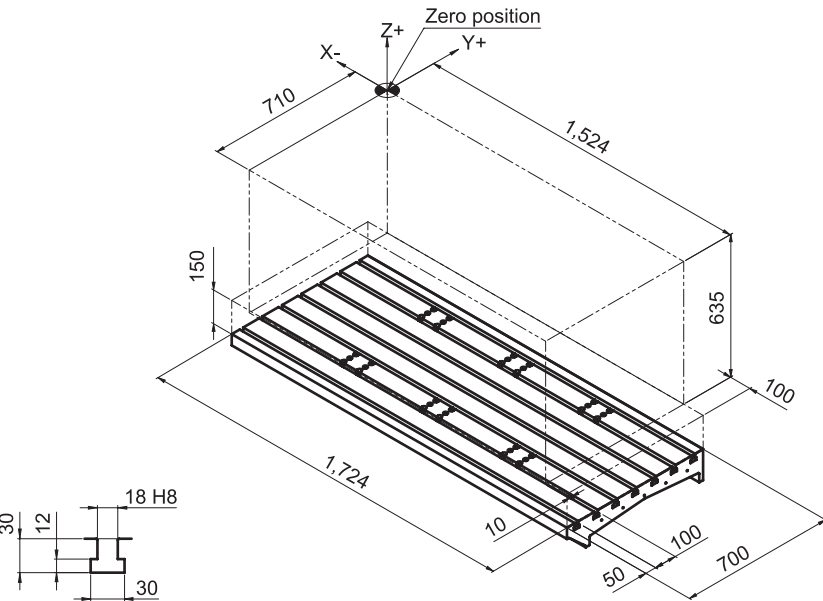
Unit: mm



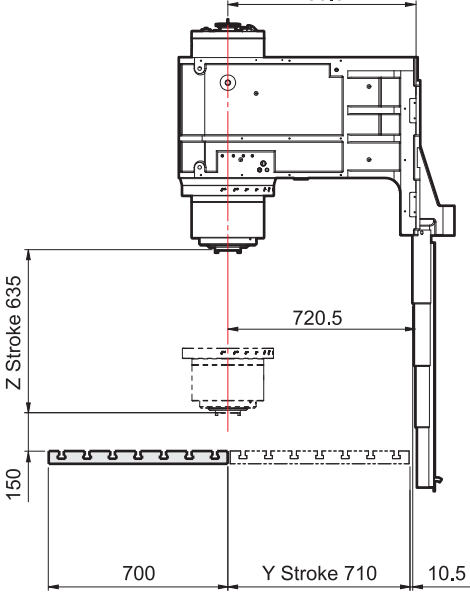
Unit: mm



Unit: mm



Unit: mm



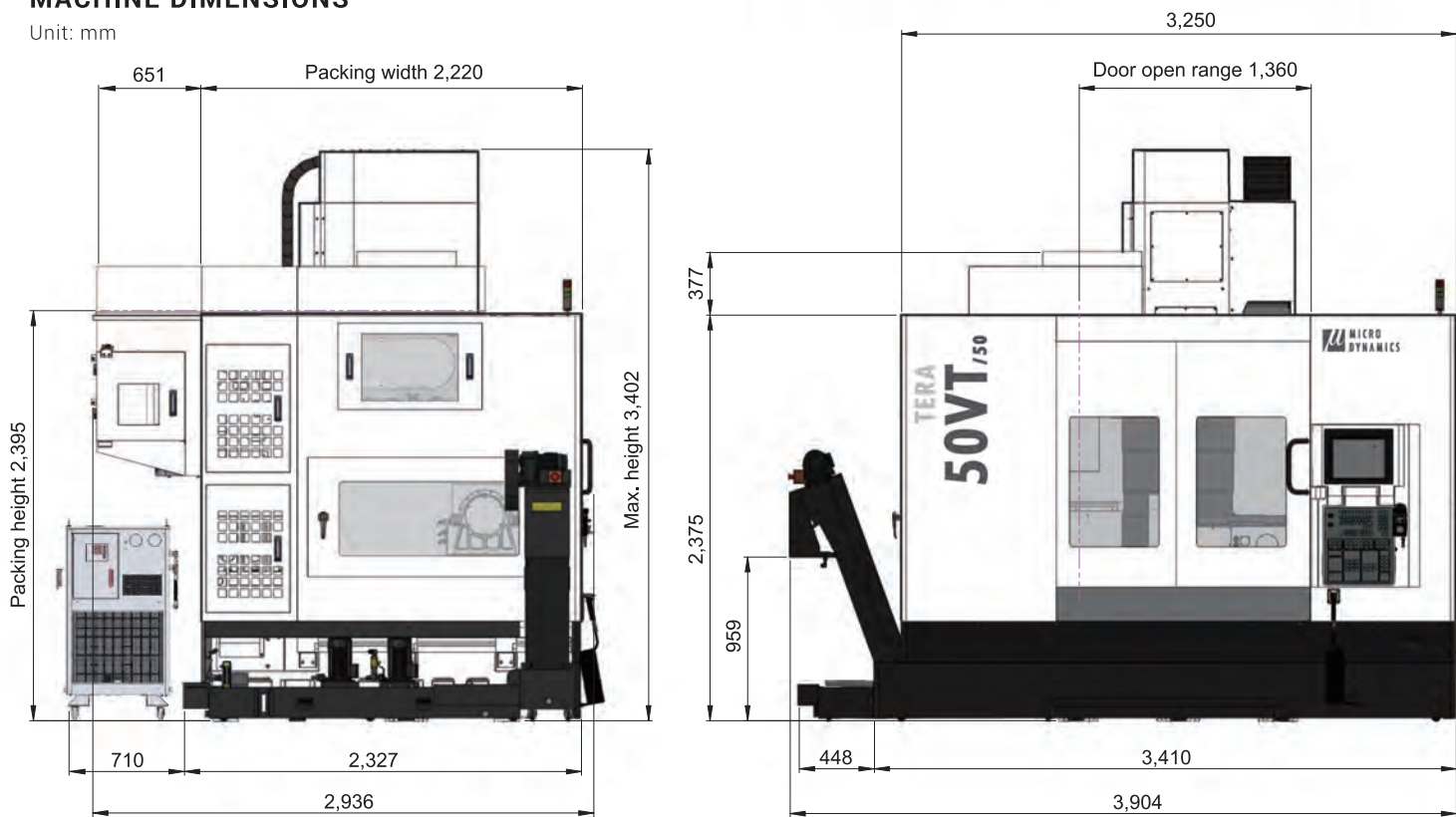
TERA 50VT_{/50}



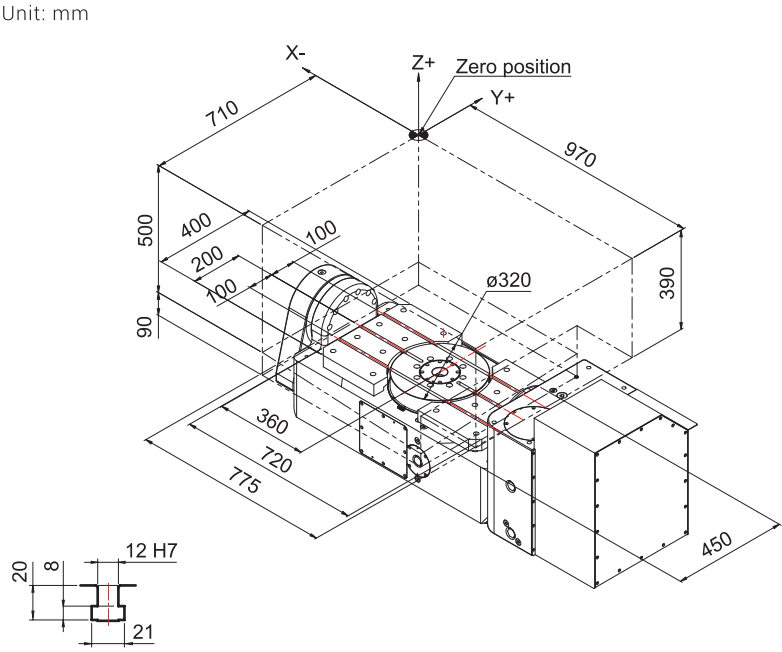
TOOL SYSTEM

MACHINE DIMENSIONS

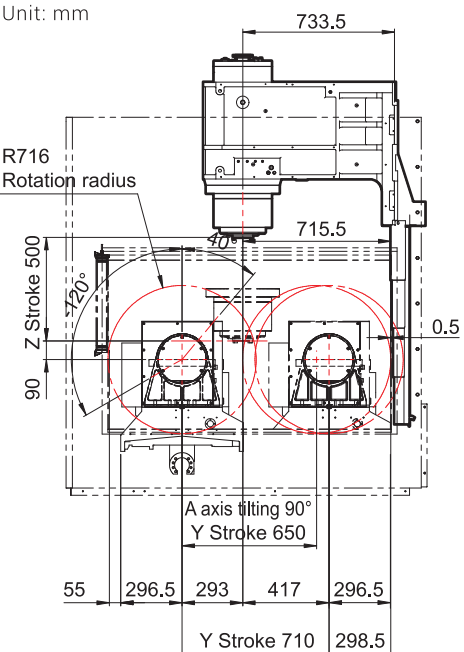
Unit: mm



Unit: mm



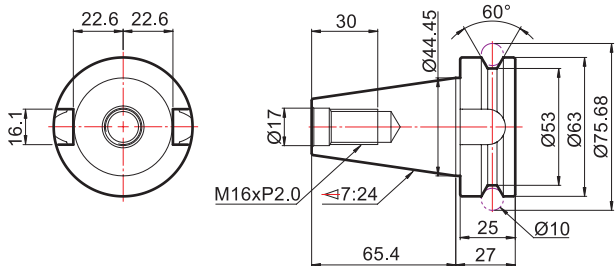
Unit: mm



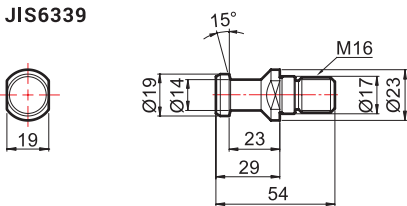
BT40

Tool Shank JIS6339

Unit: mm



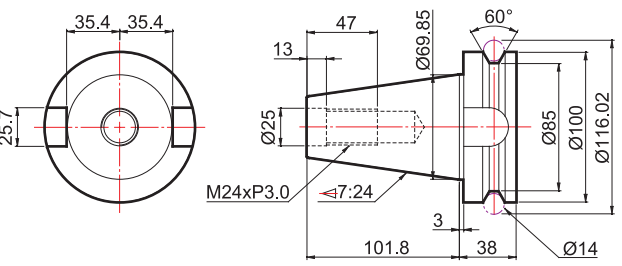
Pull Stud JIS6339



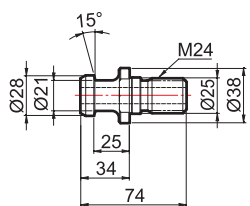
BT50

Tool Shank JIS6339

Unit: mm



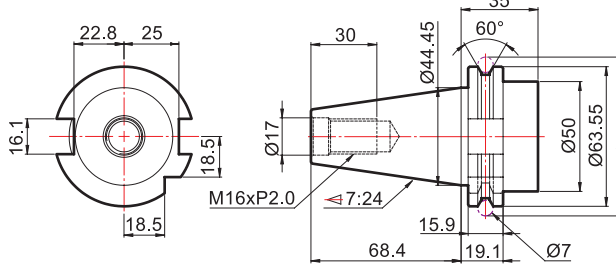
Pull Stud JIS6339



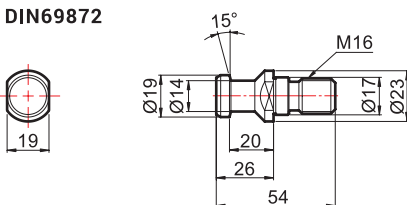
DIN40

Tool Shank DIN69871

Unit: mm



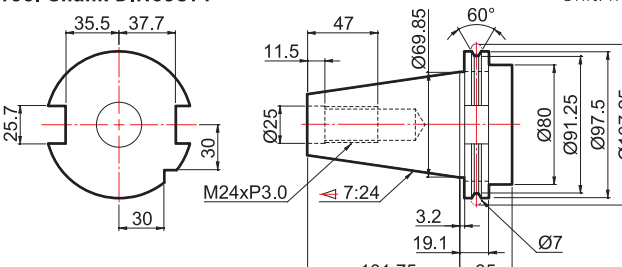
Pull Stud DIN69872



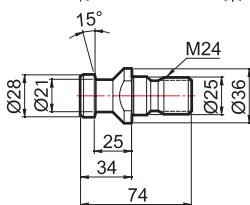
DIN50

Tool Shank DIN69871

Unit: mm



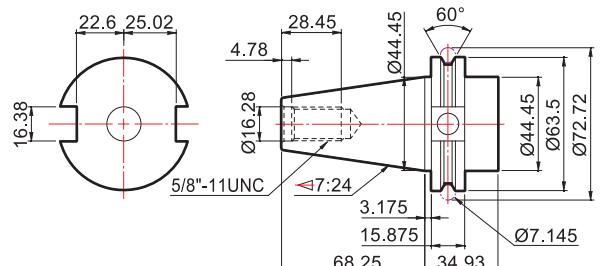
Pull Stud DIN69872



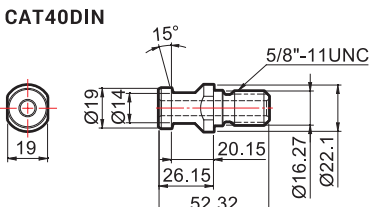
CAT40

Tool Shank ANSI B5.50

Unit: mm



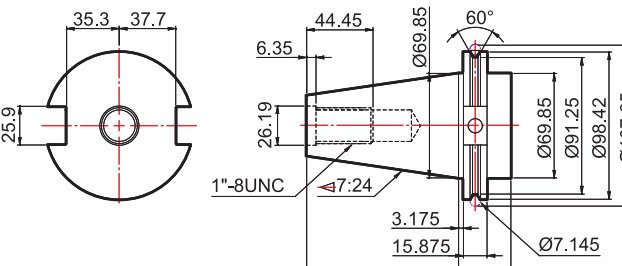
Pull Stud CAT40DIN



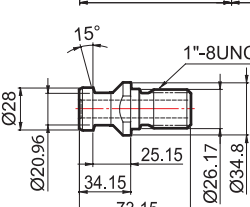
CAT50

Tool Shank ANSI B5.50

Unit: mm



Pull Stud CAT50DIN



EQUIPMENT

● Standard ○ Option

ITEM / MODEL		MEGA				TERA						
		30V	40V	20VAPC	30VT	40V	50V	60V	50VT	50V _{/50}	60V _{/50}	50VT _{/50}
Spindle	15,000 rpm Built-In Spindle: 40 Taper	●	●	●	●	●	●	●	●	-	-	-
	18,000 & 20,000 rpm Built-In Spindle: 40 Taper	○	○	○	○	○	○	○	○	-	-	-
	24,000 rpm Built-In Spindle: HSK-63A	○	○	○	○	○	○	○	○	-	-	-
	12,000 rpm Built-In Spindle: 50 Taper	-	-	-	-	-	-	-	-	●	●	●
Accuracy & Scales	DYPEC® Thermal Compensation	●	●	●	●	●	●	●	●	●	●	●
	X / Y / Z Axis Linear Scale	○	○	○	○	○	○	○	○	○	○	○
	A / C Axis Rotary Scale	-	-	-	○	-	-	-	○	-	-	○
Control & HMI	15" Touchscreen Display	●	●	●	●	●	●	●	●	●	●	●
	19" Touchscreen Display	○	○	○	○	○	○	○	○	○	○	○
	Micro Dynamics® HMI	●	●	●	●	●	●	●	●	●	●	●
	Tool Measurement / Workpiece Measurement	○	○	○	○	○	○	○	○	○	○	○
	8 M-Codes (M20 ~ M27)	●	●	●	●	●	●	●	●	●	●	●
	Additional 8 M-Codes (M130 ~ M137)	○	○	○	○	○	○	○	○	○	○	○
	Automatic Power Off	●	●	●	●	●	●	●	●	●	●	●
Tool Magazine	30 Tools ⁽¹⁾ : 40 Taper	●	-	-	-	○	-	-	-	-	-	-
	40 Tools ⁽¹⁾ : 40 Taper	○	●	●	●	●	●	●	●	-	-	-
	60 / 90 / 120 Tools ⁽¹⁾ : 40 Taper	○	○	○	○	○	○	○	○	-	-	-
	32 Tools ⁽¹⁾ : 50 Taper	-	-	-	-	-	-	-	-	●	●	●
	Servo Tool Magazine ⁽¹⁾	○	○	○	○	○	○	○	○	○	○	○
	ATC Auto Door ⁽¹⁾	○	○	○	○	○	○	○	○	○	○	○
	ATC Magazine Panel	○	●	●	●	●	●	●	●	●	●	●
	Tool Magazine LED	●	●	●	●	●	●	●	●	●	●	●
4th / 5th Axis	4th / 5th Axis Pre-wiring	○	○	○	-	○	○	○	-	○	○	-
Coolant & Chip Management	Metal Coolant Ring	○	○	○	○	○	○	○	○	○	○	○
	Spinning Window	○	○	○	○	○	○	○	○	○	○	○
	20-Bar (290 psi) / 40-Bar (580 psi) / 70-Bar (1,000 psi) CTS	○	○	○	○	○	○	○	○	○	○	○
	CTS Preparation (without Rotary Union)	●	●	●	●	●	●	●	●	●	●	●
	Coolant Gun & Air Gun	●	●	●	●	●	●	●	●	●	●	●
	Scraper Type Chip Conveyor	●	●	●	●	●	●	●	●	●	●	●
	Chain Type Chip Conveyor	○	○	○	○	○	○	○	○	○	○	○
	Drum Type Chip Conveyor	○	○	○	○	○	○	○	○	○	○	○
	Rear Type Chip Conveyor ⁽¹⁾	○	○	○	○	○	○	○	○	○	○	○
	Twin Chip Augers	●	●	●	●	●	●	●	●	●	●	●
	Disc Type Oil Skimmer	○	○	○	○	○	○	○	○	○	○	○
	Oil Mist Collector	○	○	○	○	○	○	○	○	○	○	○
Column Riser	MEGA series 100 / 150 / 250 mm ⁽²⁾	○	○	○	○	-	-	-	-	-	-	-
	TERA series 120 mm ⁽³⁾	-	-	-	-	○	○	○	-	-	-	-
Face Plate	300 / 350 mm Diameter Face Table	-	-	-	○	-	-	-	-	-	-	-
	500 / 630 mm Diameter Face Table	-	-	-	-	-	-	-	○	-	-	○
Safety & Power	CE-Conformity Package	○	○	○	○	○	○	○	○	○	○	○
	Transformer	○	○	○	○	○	○	○	○	○	○	○
Automation	Automatic Door (Pneumatic / Servo)	○	○	○	○	○	○	○	○	○	○	○
Others	Full Chip Enclosure	●	●	●	●	●	●	●	●	●	●	●
	Safety Door	●	●	●	●	●	●	●	●	●	●	●
	Manuals / Tool Kit / Foundation Kit	●	●	●	●	●	●	●	●	●	●	●

⁽¹⁾ Factory order ⁽²⁾ MEGA 20VAPC standard is 100 mm. MEGA 30VT standard is 150 mm.

⁽³⁾ TERA 50VT standard is 120 mm. TERA 50V_{/50}, TERA 60V_{/50} standard is 150 mm. TERA 50VT_{/50} standard is 257 mm.

SPECIFICATIONS

SERIES		MEGA series				TERA series						
ITEM / MODEL	UNIT	MEGA 30V	MEGA 40V	MEGA 20VAPC	MEGA 30VT	TERA 40V	TERA 50V	TERA 60V	TERA 50VT	TERA 50V _{/50}	TERA 60V _{/50}	TERA 50VT _{/50}
TRAVEL												
X Axis	mm	760	1,020	600	780	1,020	1,270	1,524	970	1,270	1,524	970
Y Axis	mm	510	510	510	510	710	710	710	710 / 650 (90°)	710	710	710 / 650 (90°)
Z Axis	mm	510	510	510	441	635	635	635	500	635	635	500
A Axis (Tilting Axis)	deg	N/A			40° ~ -120°	N/A			40° ~ -120°	N/A		40° ~ -120°
C Axis (Rotary Axis)	deg	N/A			360°	N/A			360°	N/A		360°
Spindle Nose to Table Surface	mm	100 ~ 610	100 ~ 610	90 ~ 600	50 ~ 491	100 ~ 735	100 ~ 735	100 ~ 735	50 ~ 550	150 ~ 785	150 ~ 785	90 ~ 590
Spindle Center to Column Front	mm	550	550	550	550	733.5	733.5	733.5	733.5	733.5	733.5	733.5
TABLE												
Table Size	mm	860 × 500	1,120 × 500	560 x 400	ø220 (500 x 300)	1,120 x 700	1,420 x 700	1,724 x 700	ø320 (720 x 400)	1,420 x 700	1,724 x 700	ø320 (720 x 400)
Min. Table Index Unit	deg	N/A			0.001°	N/A			0.001°	N/A		0.001°
Max. Table Load	kg	800	1,000	200 x 2	150	1,500	1,500	2,000	300	1,500	2,000	300
Table Height (from the Ground)	mm	840	840	950	1,108	900	900	900	1,205	900	900	1,205
SPINDLE												
Spindle Taper		40 Taper Dual Contact (BBT / CAT / DIN / HSK-63A)				40 Taper Dual Contact (BBT / CAT / DIN / HSK-63A)				50 Taper Dual Contact (BBT / CAT / DIN / HSK-100A)		
I.D. of Spindle Bearing	mm	ø70				ø70				ø100/80		
Spindle Speed	rpm	50 ~ 15,000				50 ~ 15,000				50 ~ 12,000		
Max. Power	kW	31				31				34		
Max. Cutting Torque	Nm	141				141				570		
Clamping Force	kgf	1,200				1,200				2,100		
Max. Speed for Rigid Tapping	rpm	6,000				6,000				3,000		
FEEDRATE												
Rapid Feedrate - X Axis	mm/min	52,000	52,000	52,000	48,000	52,000	52,000	52,000	48,000	52,000	52,000	48,000
Rapid Feedrate - Y Axis	mm/min	52,000	52,000	52,000	48,000	52,000	52,000	52,000	48,000	52,000	52,000	48,000
Rapid Feedrate - Z Axis	mm/min	48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000	32,000	32,000	32,000
Rapid Feedrate - A (Tilting) Axis	rpm	N/A			25	N/A			33	N/A		33
Rapid Feedrate - C (Rotary) Axis	rpm	N/A			33	N/A			66	N/A		66
Cutting Feedrate	mm/min	20,000				20,000				20,000		
ATC												
Magazine Capacity		30	40			40				32		
Tool Selection		Bi-Direction / Random				Bi-Direction / Random				Bi-Direction / Random		
Tool Shank Type		JIS6339 (BT40) / DIN69871 (DIN40) / ANSI B5.50 (CAT40)				JIS6339 (BT40) / DIN69871 (DIN40) / ANSI B5.50 (CAT40)				JIS6339 (BT50) / DIN69871 (DIN50) / ANSI B5.50 (CAT50)		
Pull Stud Type		JIS6339 / DIN69872 / CAT40DIN				JIS6339 / DIN69872 / CAT40DIN				JIS6339 / DIN69872 / CAT50DIN		
Max. Tool Diameter x Length	mm	ø75 × 230	ø75 × 300	ø75 × 240	ø75 × 300	ø75 × 260	ø75 × 300	ø75 × 300	ø75 × 300	ø125 × 350	ø125 × 350	ø125 × 350
Without Adjacent Tool	mm	ø150				ø150				ø229		
Max. Tool Weight	kg	7				7				15		
PERIPHERAL												
Power Consumption (220V/3PH)	KVA	30				40			50	55		
Pneumatic Supply	L/min (ANR)	300 (0.6 MPa)				300 (0.6 MPa)				300 (0.6 MPa)		
Cutting Coolant Pump Motor	kW	1.1				1.1				1.1		
Base Wash Pump Motor	kW	1.1				1.1				1.1		
CTS Pump Motor (opt)	kW	3				3				3		
Coolant Tank Capacity	L	250	300	300	300	300	400	400	400	350	400	350
Foot Print Size (W x D)	mm	2,389 × 2,245	3,044 x 2,293	2,561 x 2,972	3,044 x 2,293	3,137 x 2,478	3,606 x 2,478	4,322 x 2,478	3,693 x 2,478	3,904 x 2,936	4,322 x 2,936	3,904 x 2,936
Machine Height (H)	mm	2,823	2,823	2,921	2,975	2,953	2,953	2,953	3,073	3,294	3,294	3,402
Packing Size (W x D x H)	mm	2,750 x 2,300 x 2,550	3,300 x 2,310 x 2,550	3,200 x 2,200 x 2,550	3,300 x 2,310 x 2,550	3,400 x 2,310 x 2,550	4,100 x 2,310 x 2,550	4,900 x 2,310 x 2,550	3,400 x 2,300 x 2,550	4,100 x 2,310 x 2,550	4,900 x 2,310 x 2,550	4,100 x 2,310 x 2,700
Machine Net Weight	kg	4,890	5,610	6,400	6,350	8,040	8,600	9,170	9,560	9,600	10,170	10,600
Machine Gross Weight	kg	5,070	5,850	6,710	6,590	8,280	8,890	9,560	9,910	9,890	10,560	10,910
ACCURACY												
Positioning Accuracy / Full Stroke	mm	0.005 (VDI 3441)				0.005 (VDI 3441)				0.005 (VDI 3441)		
Repeatability Accuracy	mm	±0.0025				±0.0025				±0.0025		