## ■ Standard and Optional Equipment

● : Standard ○ : Option - : N / A

| | | VTC-530/20 | |
|---|---|---|---|
| | | MAZATROL SmoothC | MAZATROL SmoothG |
| Machine | Work lights | ○ | ○ |
| | Spindle BIG-Plus | ○ | ○ |
| | Top cover | ○ | ○ |
| | Movable CNC control | ○ | ○ |
| | Ball screws core cooling | ○ | ○ |
| | Spindle multiple orient (M code / 1°) | ○ | ○ |
| Factory automation | Automatic tool length measurement & tool breakage detection | ○ | ○ |
| | Mazak monitoring system B | ○ | ○ |
| | Preparation for hydraulic fixture | ○ | ○ |
| | Preparation for pneumatic fixture | ○ | ○ |
| | Remote manual pulse generator (wired) | ● | ● |
| | Automatic power off | ● | - |
| | Calendar type automatic power on / off and warm-up operation | ○ | ● |
| | Machining end buzzer | ○ | ○ |
| | Status light (3 colors / square) | ○ | ○ |
| | Status light (1 color / square) | ○ | ○ |
| Coolant / chip disposal | Coolant system | ● | ● |
| | Coolant temperature control | ○ | ○ |
| | Flood coolant 4.5 kg/cm$^2$, 30 L/min | ○ | ○ |
| | Air through spindle (available during spindle rotation) | ○ | ○ |
| | Coolant through spindle 5 kg/cm$^2$ | ○ | ○ |
| | High pressure coolant through spindle 15 kg/cm$^2$ | ○ | ○ |
| | Work air blast | ○ | ○ |
| | Oil skimmer | ○ | ○ |
| | Oil mist coolant | ○ | ○ |
| | Mist collector | ○ | ○ |
| | Chip conveyor (right-side discharge, hinge, for steel) | ○ | ○ |
| | Chip conveyor (right-side discharge, ConSep) | ○ | ○ |
| | Chip bucket (swing) | ○ | ○ |
| | Chip bucket (fixed) | ○ | ○ |
| Table | Sub table (integrated) | ○ | ○ |
| | Sub table (separate) (for center partition) | ○ | ○ |
| | Center partition | ○ | ○ |
| Safety equipment | Operator's door interlock | ● | ● |
| Others | Manual (CD) | ● | ● |
| | Manual (paper) | ○ | ○ |
| | Additional manuals | ○ | ○ |
| | MAZATROL SmoothG dual monitor | - | ○ |


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Mazak

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■ This product is subject to all applicable export control laws and regulations.
■ The accuracy data and other data presented in this catalogue were obtained under specific conditions. They may not be duplicated under different conditions. (room temperature, workpiece materials, tool material, cutting conditions, etc.)


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VTC-530/20 22.08.0 TH 99J293322E

VTC-530/20

Mazak

# VTC-530/20

[ Vertical Travelling Column Machining Center ]

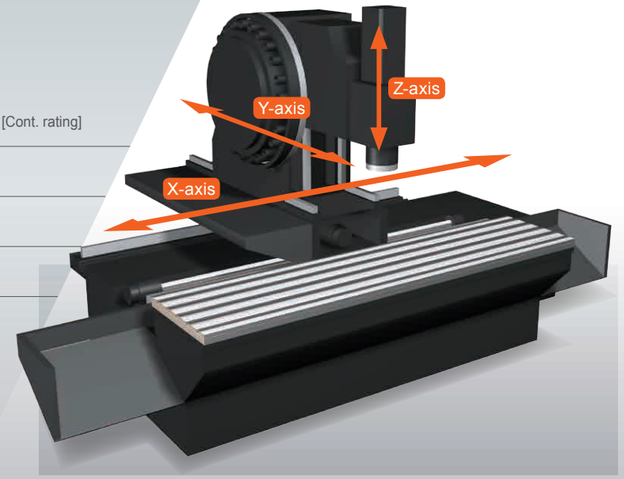
# VTC-530/20

## Travelling column design with fixed table provides exceptional versatility

- Excellent accessibility to the table
- The long 2300 mm × 530 mm table can be utilized for loading more than 2 workpieces and used like a 2-pallet changer. The stationary table allows robots and hydraulic fixtures to be easily installed
- Advanced CNC control system allows even inexperienced operators to quickly and easily make machining programs.
  CNC control system is selectable from SmoothG with touch screen to SmoothC with simplified display and key input operation.


VTC-530/20 [MAZATROL SmoothG]
Shown with optional equipment

| | |
|---|---|
| Spindle output | 11 kW (15 HP) [40% ED] 7.5 kW (10 HP) [Cont. rating] |
| Spindle speed | 12000 $min^{-1}$ (rpm) |
| Rapid traverse rate | X, Y, Z 42 m/min |
| Table size | 2300 mm × 530 mm |



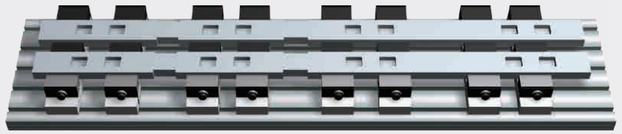
# Higher Productivity

## Long table

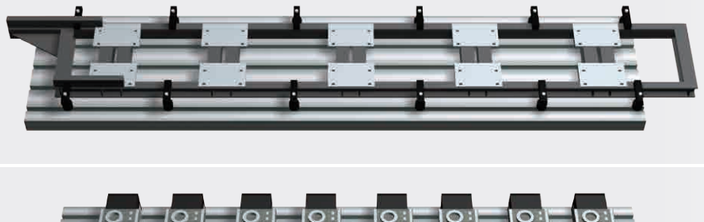
Large, long workpieces can be machined, even those that overhang from the large stationary table.

**Large, long workpiece**

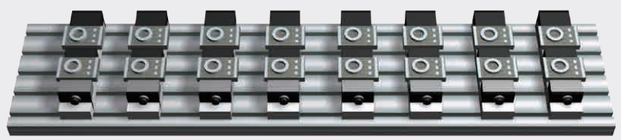
**Multiple parts from one piece of material**



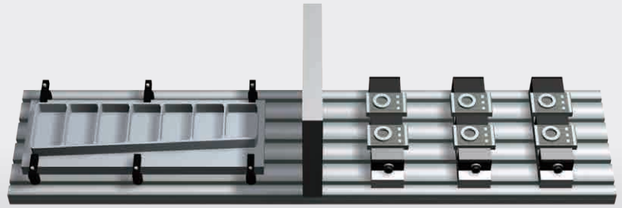
**Workpiece overhanging from the table**



**Multiple parts setup**

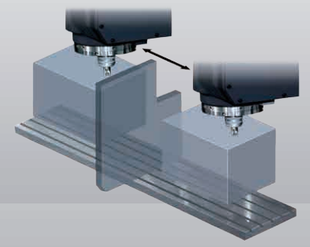


**2-pallet changer type operation**



### Center partition OPTION

The optional center partition allows the VTC-530/20 to be used as two separate machines.
Setups can be performed as well as workpiece loading / unloading on one side while machining is being performed on the other.



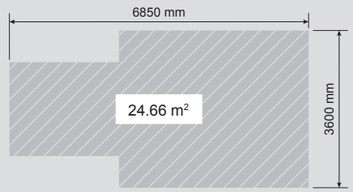
## Minimum floor space requirements

Normally, machining centers having a large X-stroke require a a large amount of floor space as the machines also have a large Y-axis and a large table. The VTC-530/20 has minimum floor space requirements even though the machine has long X-axis stroke of 1950 mm.

### Comparison

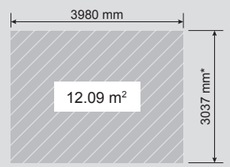
**Conventional machining center with large X-axis**

X-axis stroke 2000 mm Y-axis stroke 800 mm
Table size 2240 mm × 750 mm




**VTC-530/20**

X-axis stroke 1950 mm Y-axis stroke 530 mm
Table size 2300 mm × 530 mm




Floor space requirement is 50% smaller

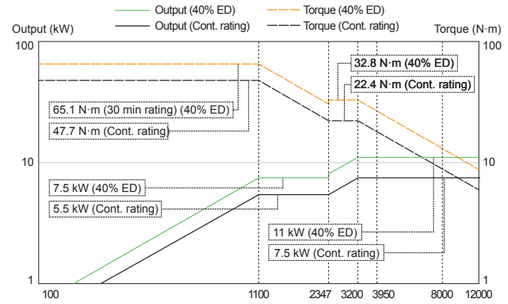
*MAZATROL SmoothC

## Spindle

Temperature controlled cooling liquid circulates through the spindle cartridge and motor housing to ensure minimum spindle heat displacement.

Max. spindle speed
12000 $min^{-1}$ (rpm)

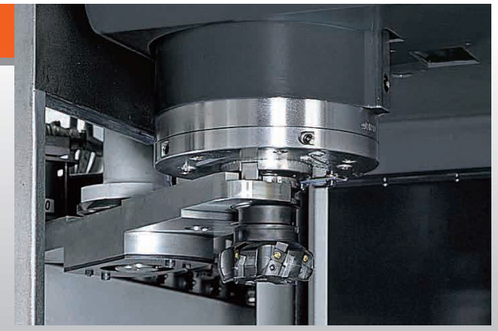
Output
11 kW (15 HP) [40% ED]
7.5 kW (10 HP) [Cont. rating]




## Tool magazine & Automatic tool changer (ATC)

A maximum of 30 tools can be stored in the roller cam driven drum type tool magazine. Tool change chip-to-chip time is significantly reduced as the tool magazine travels with the spindle.

Chip-to-chip 4.6 sec
Tool-to-tool 1.3 sec



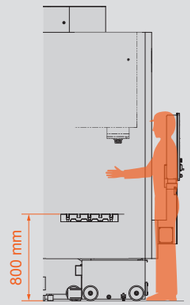
# Ergonomics

## Design focus on ergonomics provides unsurpassed ease of operation

1

### Short reach to machine table

The table is only 300 mm from the front of the machine. Additionally, a recess along the machine front provides space for the operator's feet for increased convenience.





2

### Convenient tool clamp / unclamp

The tool clamp / unclamp switch next to the spindle allows tools to be easily removed for changing inserts during operation.

3

### Convenient operation when using an overhead crane

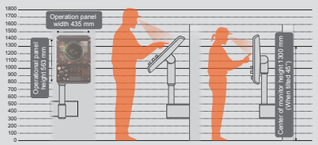
An overhead crane can be easily used for the loading / unloading of heavy, long workpieces and fixtures thanks to the automatic retractable top cover.

4

MAZATROL SMOOTH G

### Adjustable CNC touch panel

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




MAZATROL SMOOTH C

### Rotating operation panel

The operation panel easily rotates to each operator's preferred position.

OPTION

### Movable CNC control*

The CNC control can be moved to optimum position even when operator setup on the left side of table. Suitable for operation using center partition.

*Available for MAZATROL SmoothC and SmoothG


5

### Large window

4 large front windows allow the operator to easily monitor workpiece machining.

6

### Convenient maintenance

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.


## Process home screens

Five different home process screens — each home screen displays the appropriate data in an easy-to-understand manner.
Icons can be touched in each process display for additional screen displays.


Shown with MAZATROL SmoothG process home screens

Convenient Parameter Setting and Fine Tuning Function

## SMOOTH MACHINING CONFIGURATION

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


## MAZATROL SMOOTH G

Unsurpassed ease of operation with touch screen

## MAZATROL SMOOTH C

Simplified display and key input operation

Variable Acceleration Control Function

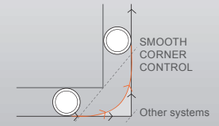
### VARIABLE ACCELERATION CONTROL

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

Seamless Corner Control Function

### SMOOTH CORNER CONTROL

Improved finished surfaces and reduced cycle times by optimized acceleration / deceleration when machining corners



# Ease of Programming

## MAZATROL conversational programming

MAZATROL interactive programming uses conversational language and it is easy to make / edit programs by inputting data on workpiece drawings in response to questions displayed on the operation screen. Even a beginner operator can quickly make programs with automatically determined cutting conditions and automatic creation of tool paths.

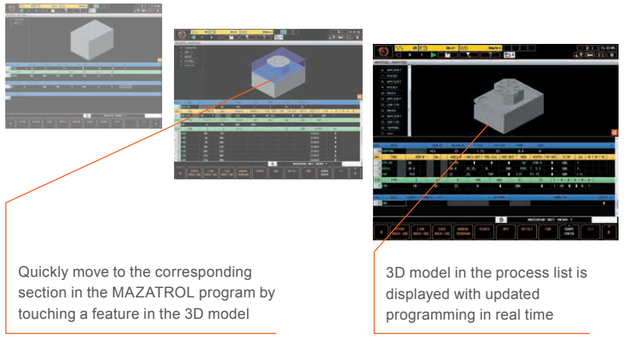

MAZATROL SmoothC shown

## QUICK MAZATROL

MAZATROL SMOOTH G

### Reduced time for conversational programming

After defining a machining unit in a MAZATROL program, the 3D shape is immediately displayed to easily and quickly check for any programming error.



Quickly move to the corresponding section in the MAZATROL program by touching a feature in the 3D model

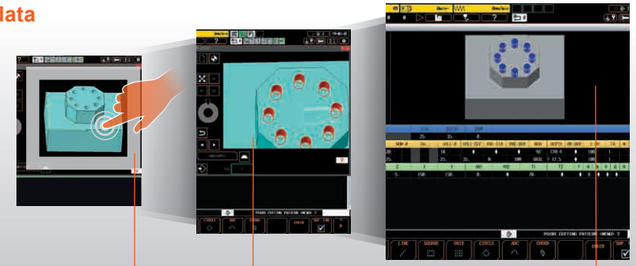
3D model in the process list is displayed with updated programming in real time

## 3D ASSIST

MAZATROL SMOOTH G

### Making a program directly from 3D CAD data

Workpiece and coordinates data can be imported from 3D CAD data to a MAZATROL program. No coordinate value inputs are required. Can reduce input errors and time for program checking.



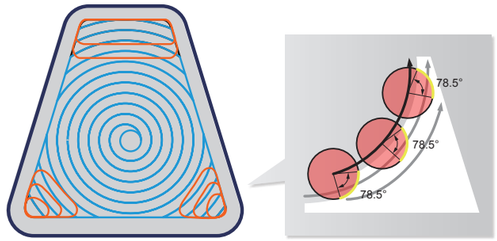
CAD model importing

Shape selection

Automatically input to MAZATROL program

## Pocket milling

Pocket Milling is a new pocketing cycle for MAZATROL programming. This function maintains a constant angle of engagement between the cutter and material to create a high efficiency tool path, reduce chip load variation, extend tool life and allow tools to be used to their full potential.




## Step over line machining

Previously, when programming line machining in a MAZATROL program, if the radial depth of cut was too small, multiple machining passes would have to be programmed. Programming of multiple machining passes is eliminated by this function to reduce the time required for programming.

Previous programming display

MAZATROL SmoothG programming display

## VFC function

By pushing the VFC key, the programmed cutting conditions can be overridden and changed in the machining program. The new cutting conditions data can be used when a new program is made.


## Reduced checking time of EIA / ISO programs

### QUICK EIA

MAZATROL SMOOTH G

Selecting tool path by touching the screen

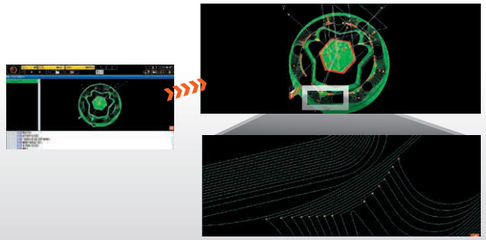
Moving to the corresponding EIA program line

### EIA program Visualization

By touching the tool path on the screen, it is possible to move to the corresponding EIA program, and check the program details.

### VIEW SURF

MAZATROL SMOOTH G



### Analyzing EIA programs

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

## ■ MAZATROL SmoothC Specifications

| | MAZATROL | EIA |
|---|---|---|
| Number of controlled axes | Simultaneous 2 ~ 4 axes | |
| Least input increment | 0.0001 mm, 0.00001 inch, 0.0001 deg | |
| High speed, high precision control | Shape compensation, Smooth corner control, Rapid traverse overlap, Rotary axis shape compensation | Shape compensation, Smooth corner control, Rapid traverse overlap, Rotary axis shape compensation, High-speed machining mode, High-speed smoothing control |
| Interpolation | Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Synchronous tapping* | Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Cylindrical interpolation*, Fine spline interpolation*, NURBS interpolation *, Polar coordinate interpolation* , Synchronous tapping* |
| Feedrate | Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Dwell (time / rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Variable acceleration control, G0 slope constant* | Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Inverse time feed, Dwell (time / rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Time constant changing for G1, Variable acceleration control, G0 slope constant* |
| Program registration | Number of programs : 256 (Standard) / 960 (Max.), Program memory : 2 MB, Program memory expansion : 8 MB*, Program memory expansion : 32 MB* | |
| Control display | Display : 10.4" touch panel, Resolution : VGA | |
| Spindle functions | 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) | 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) |
| 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 wear offset | |
| Coordinate system | Machine coordinate system, Work coordinate system, Local coordinate system, Additional work coordinates (300 set) | |
| Machine functions | – | Shaping function*, Dynamic compensation II* |
| Machine compensation | Backlash compensation, Pitch error compensation | |
| Protection functions | Emergency stop, Interlock, Pre-move stroke check | |
| Automatic operation mode | Memory operation | Memory operation, Tape operation, MDI operation, SD card operation, EtherNet operation* |
| Automatic operation control | Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Machine lock | Optional block skip, Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Restart2, Collation stop, Machine lock |
| Manual measuring functions | Tool length teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine | Tool length teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, Measurement on machine |
| Automatic measuring functions | WPC coordinate measurement, Automatic tool length measurement, Sensor calibration, Tool breakage detection, External tool breakage detection* | Automatic tool length measurement, Sensor calibration, Tool breakage detection, External tool breakage detection* |
| MDI measurement | Semi automatic tool length measurement, Full automatic tool length measurement, Coordinate measurement | |
| Interface | PROFIBUS-DP*, EtherNet/IP*, CC-Link* | |
| Card interface | SD card interface, USB | |
| EtherNet | 10 M / 100 M / 1 Gbps | |

*Option

## ■ MAZATROL SmoothG Specifications

| | MAZATROL | EIA |
|---|---|---|
| Number of controlled axes | Simultaneous 2 ~ 4 axes | |
| Least input increment | 0.0001 mm, 0.00001 inch, 0.0001 deg | |
| High speed, high precision control | Shape compensation, Smooth corner control, Rapid traverse overlap, Rotary axis shape compensation | Shape compensation, Smooth corner control, Rapid traverse overlap, Rotary axis shape compensation, High-speed machining mode, High-speed smoothing control |
| Interpolation | Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Synchronous tapping* | Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Cylindrical interpolation*, Fine spline interpolation*, NURBS interpolation *, Polar coordinate interpolation* , Synchronous tapping* |
| Feedrate | Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Dwell (time / rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Variable acceleration control, G0 slope constant* | Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Inverse time feed, Dwell (time / rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Time constant changing for G1, Variable acceleration control, G0 slope constant* |
| Program registration | Number of programs : 256 (Standard) / 960 (Max.), Program memory : 2 MB, Program memory expansion : 8 MB*, Program memory expansion : 32 MB* | |
| Control display | Display : 19" touch panel, Resolution : SXGA | |
| Spindle functions | 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) | 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) |
| 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 wear offset | |
| Coordinate system | Machine coordinate system, Work coordinate system, Local coordinate system, Additional work coordinates (300 set) | |
| Machine functions | – | Tilted working plane*1, Shaping function*, Dynamic compensation II*, Tool center point control*1, Workpiece positioning error compensation**1 |
| Machine compensation | Backlash compensation, Pitch error compensation, Ai Thermal shield | |
| Protection functions | Emergency stop, Interlock, Pre-move stroke check, SAFETY SHIELD (manual mode), SAFETY SHIELD (automatic mode)*, VOICE ADVISER | |
| Automatic operation mode | Memory operation | Memory operation, Tape operation, MDI operation, EtherNet operation* |
| Automatic operation control | Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Single process, Machine lock | Optional block skip, Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Restart2, Collation stop, Machine lock |
| Manual measuring functions | Tool length teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine | Tool length teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, Measurement on machine |
| Automatic measuring functions | WPC coordinate measurement, Automatic tool length measurement, Sensor calibration, Tool breakage detection, External tool breakage detection* | Automatic tool length measurement, Sensor calibration, Tool breakage detection, External tool breakage detection* |
| MDI measurement | Semi automatic tool length measurement, Full automatic tool length measurement, Coordinate measurement | |
| Interface | PROFIBUS-DP*, EtherNet/IP*, CC-Link*, CC-Link IE Field Basic | |
| Card interface | SD card interface, USB | |
| EtherNet | 10 M / 100 M / 1 Gbps | |

*Option
*1 Simultaneous 4-axis interpolation

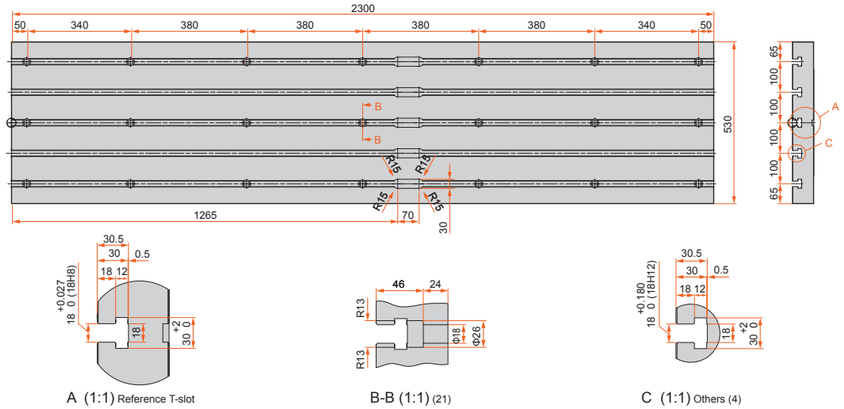
## Standard Machine Specifications

| | | |
|---|---|---|
| Travel | X-axis (column left / right) | 1950 mm |
| | Y-axis (spindle head back / forth) | 530 mm |
| | Z-axis travel (spindle head up / down) | 510 mm |
| | Distance from table top to spindle nose | 180 mm ~ 690 mm |
| | Distance from spindle center line to front of column | 620 mm |
| Table | Table size | 2300 mm × 530 mm |
| | Table load capacity (evenly distributed) | 1000 kg |
| | Table top surface | 18 mm T-slot × 5, 100 mm pitch |
| Spindle | Spindle speed | 40 $min^{-1}$(rpm) ~ 12000 $min^{-1}$(rpm) |
| | Gear ranges | 1 stepless |
| | Spindle taper | 7/24 taper No.40 |
| Feedrate | Rapid traverse rate (X, Y, Z-axes) | 42000 mm/min |
| | Cutting feedrate (X, Y, Z-axes) | 1 mm/min ~ 8000 mm/min |
| Automatic tool changer | Tool shank | MAS BT-40 |
| | Tool magazine capacity | 30 |
| | Max. tool diameter / length (from gauge line) / weight | Φ80 mm / 350 mm / 8 kg |
| | Max. tool diameter with adjacent pockets empty | Φ125 mm |
| | Tool selection method | MAZATROL random memory (random pocket assignment) |
| | Tool change time (chip-to-chip) | 4.6 sec |
| Motors | Spindle motor (40%ED / cont. rating) | 11 kW (15 HP) / 7.5 kW (10 HP) |
| Power requirement | Required power capacity (40%ED / cont. rating) | 26.53 kVA / 21.45 kVA |
| | Air source (pressure / capacity) | More than 0.5 MPa (5 kgf / $cm^2$) / 120 L/min |
| Machine size | Height (from floor)* | 2718 mm |
| | Floor space requirement (MAZATROL SmoothC) | 3980 mm × 3037 mm |
| | Floor space requirement (MAZATROL SmoothG) | 3980 mm × 3211 mm |
| | Machine weight (including CNC control) | 9000 kg |

*Depends on machine specifications

## Table Dimensions

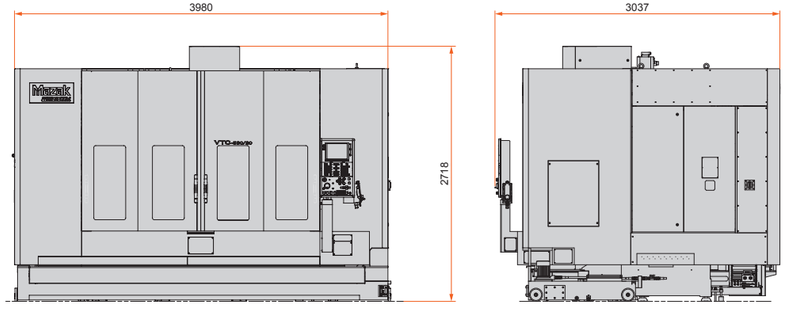
Unit : mm




## Machine Dimensions

Unit : mm

### VTC-530/20 [MAZATROL SmoothC]




### VTC-530/20 [MAZATROL SmoothG]