

TGV Series

High speed, high accuracy machining center

- Hartrol plus controller
- 5-Year warranty on guideway
- Thermal solution
- Spindle run-out: 5 micro
- Built-in 24,000rpm spindle with cooling system



Website



FaceBook



Hartford has sold more than 46,000 machines to all over the world, accumulated more than 37,000 customers, who absolutely affirm Hartford's manufacturing experience and ingenious machine manufacture technology. We insist on providing customers with the best quality machining centers. We will devote more carefully, in order to continuously enhance the technical level of manufacture and applications.

Hartford
Innovation

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CAT. No.: 20170316-E01

Application program

Key technology

Intelligentization

Specification parameter

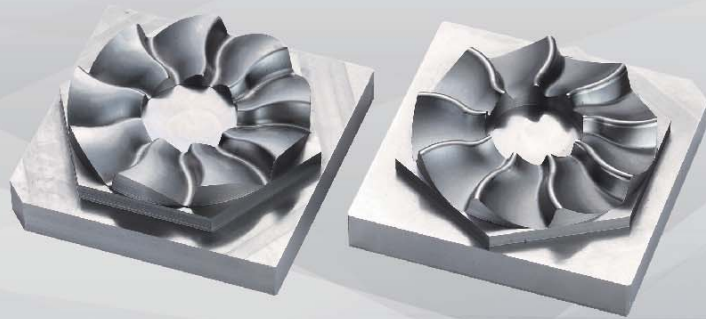
Versatile Machining for Industry

Actual Cutting Test

The new TGV series offers incredible versatility for your workshop. TGV offers a huge range of requirements delivering excellent surface finish And accuracy features to you.



1. Sole mold



2. Turbine blades



Model: TGV-128

Spindle: 15,000 rpm DDS 11kW

Cutting material: S45

Face milling

Tool diameter : $\phi 80$ mm

Feed rate: 2400 mm/min

Depth: 3 mm

Width: 65 mm

Cutting volume: 468 cc



End milling

Tool diameter : $\phi 63$ mm

Feed rate: 5200 mm/min

Depth: 30 mm

Width: 3 mm

Cutting volume: 468 cc



Tapping

Tool diameter : M24xP3

Feed rate: 450 mm/min

Depth: 30 mm



Drilling

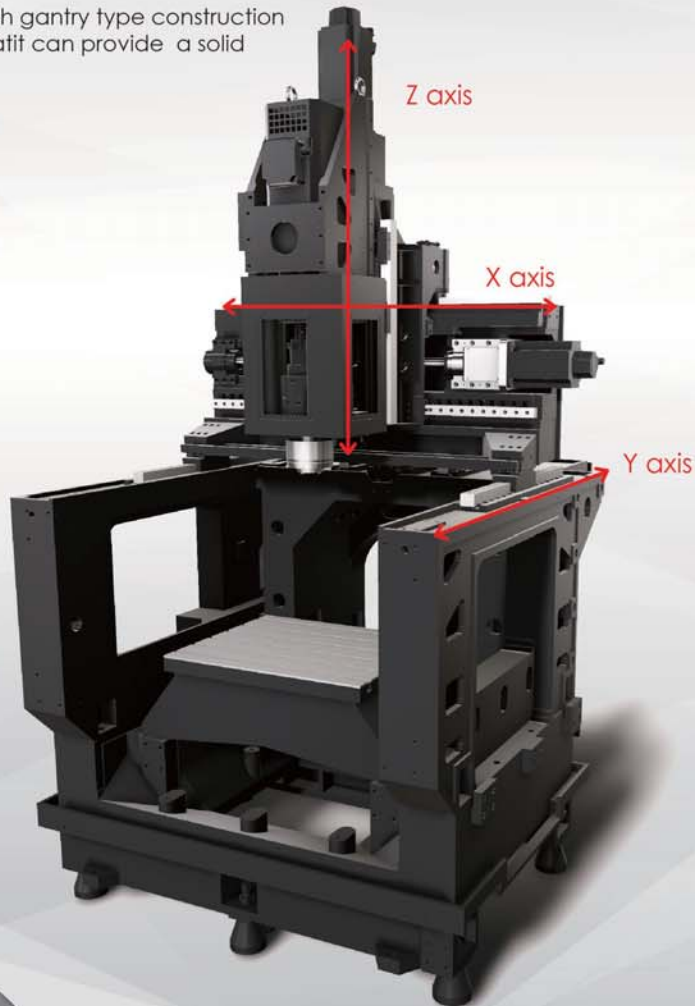
Tool diameter : $\phi 40$ mm

Feed rate: 120 mm/min

Depth: 35 mm

The incredible features of TGV-65

TGV-65 is designed with gantry type construction with rigid design so that it can provide a solid support for TGV-65.

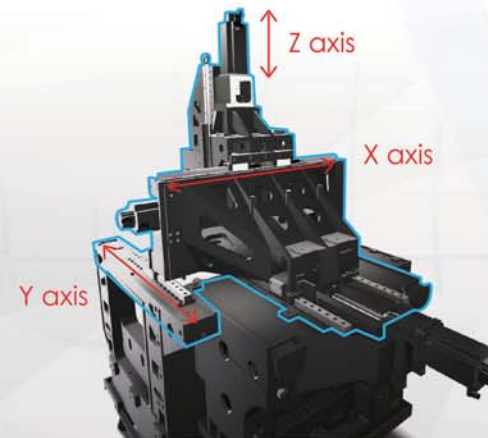


Full range of box guideway five-year warranty

Warranty coverage will not apply under the following conditions
 1. Improper operation (collision)
 2. Lack of regular cleaning of accumulated debris causing damaged to the linear rails and carriages.

Roller type linear guideways on 3 axes

- Makes high accuracy, heavy load resistance and long lifespan possible.
- Compare to ball type linear guideways, rigidity can be increased by **40%**
- Applicable with all TGV series machines.



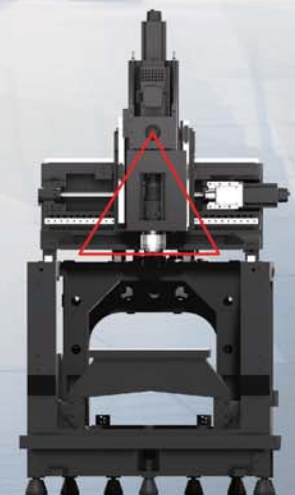
3-axis overlap design

- Workpiece does not move with three axis movement hence loads on three axis are constant.
- The positioning accuracy affection on three axis will be minimized.
- Spindle cutting accuracy can be increased.

Four linear guideways on Y-axis with drive through gravity

- The cross beam is supported by four linear guideways.
- With triangular gravity movement design in combination with 3-axes overlap structure.
- Enhance stable, dependable moving rigidity.
- Positioning accuracy:

Y axis: 0.006mm
Y axis: 0.002mm



The incredible features of TGV-128/1612

The bridge type construction delivery a highly stable.

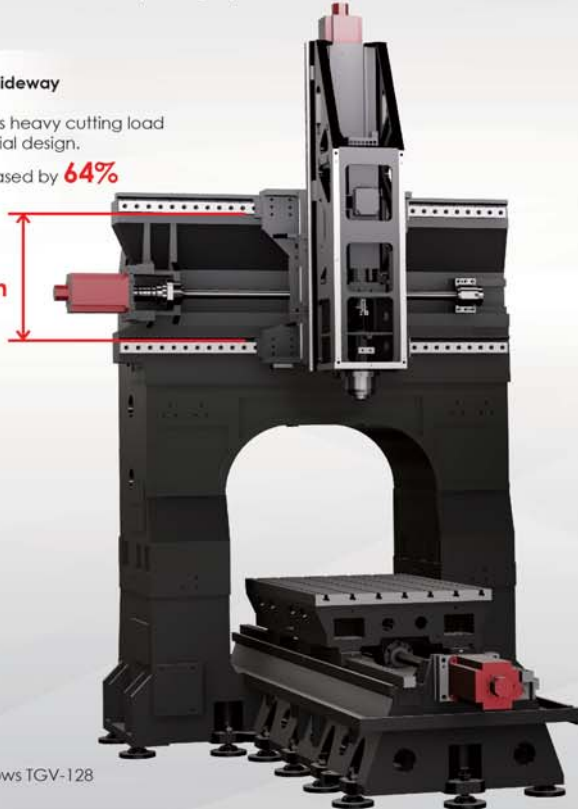
Great span on Y-axis linear guideway

The structural rigidity and resists heavy cutting load can be increased by this special design.

Machine rigidity can be increased by **64%**

- Y-axis span: **700mm**

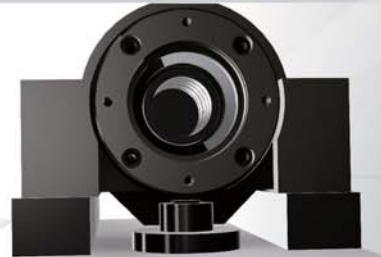
Span:
700mm



The picture shows TGV-128

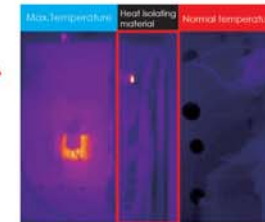
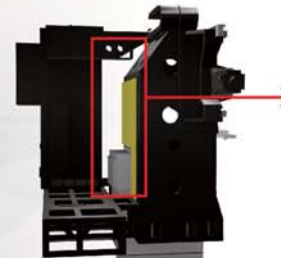
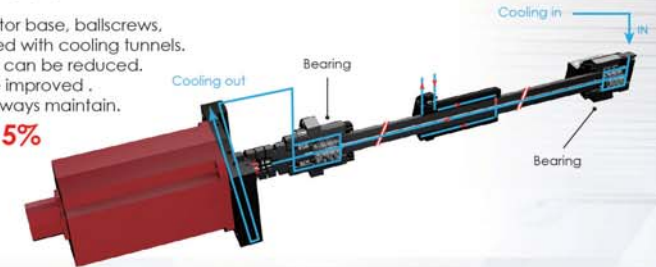
Bearing housing stop pin design

- The additional pin design on the bearing housing.
- Higher transmission rigidity can be achieved.
- Axis rigidity can be increased by **14%**



Thermal growth control on 3 axes (opt.)

- 3-axis feed system such as motor base, ballscrews, bearings and nuts are designed with cooling tunnels.
- Thermal deformation problem can be reduced.
- Machining movement can be improved.
- Cutting surface accuracy is always maintain.
- Axis accuracy increased by **15%**
- Features may vary by model.

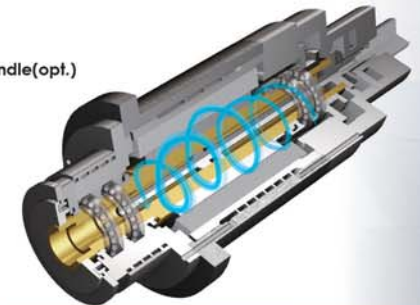


Thermal symmetry and heat isolation

- Assemble the insulation material between electric cabinet and machine column.
- Ensures the machine accuracy.
- Thermal deformation is not an issue for machine.
- Column thermal growth can be reduced by **13%**

Cooling shaft for high speed 24,000rpm built-in spindle(opt.)

- Low noise, low vibration and light.
- Available with all controllers.
- Available with optional smart sensor.
- Thermal deformation problem is reduced by **50%** with optional cooling shaft function.



Intelligent Controller- Hartrol Plus

What is Hartrol plus?

- 19" multi-touch screen
- IPC is equipped with the Windows operating system
- The world's fastest CNC
- Automatic feed system control function

By the use of open architecture, we begin to enter a new era of intelligent processing. In addition to basic functions, we have joined hardware and software exclusively developed by Hartford. Software can be added to and updated at any time with new features.



An Intelligent Controller

With three major solutions, Hartrol plus takes your machining to the next level. Highly optimized and intelligent controls bring even more capabilities and productivity to your metal cutting processes. With ease of use, advanced automation, and smart data collection, Hartrol plus is an essential tool for enhancing performance on your production floor.

The difference between Hartrol plus and others

| Function | Hartrol plus 1 | Others |
|-------------------------|-----------------------|----------------|
| Screen Size | 19" Multi-touch Panel | 10.4"(OPT:15") |
| Hard Drive | 32GB SSD | NO |
| Smoothing Interpolation | SSS-4G | Option |
| Look Ahead Block | 2700 | 400(1000 Max.) |



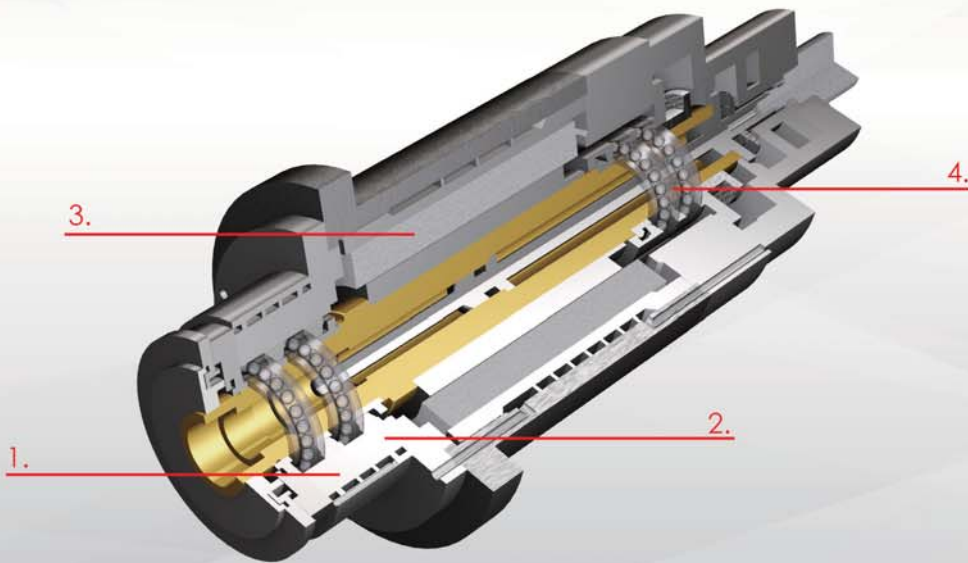
For more Hartrol plus features, please contact our sales staff.

Spindles Manufactured by Hartford Offer Quality Assurance

The self-designed and made built-in type 24,000rpm spindle guarantee the best quality for you and provide you instant solutions when you need.

Smart functions for high speed 24,000rpm spindle(opt.)

The spindle is available to integrate various smart functions such as i-Diagnosis, i-Compensation, i-Balance and i-Protection which provide safety protection of the spindle, increase the spindle accuracy and reduce down time.



1. i-Diagnosis

The spindle bearings may be accidentally damaged due to fatigue resulting from long time usage. With the use of early warning diagnosis technology, bearing life can be predicted. The function may avoid customer's loss due to accidental stopping of the machine.

3. i-Balance

A conventional spindle is designed with only external circulated cooling, however the Hartford spindle is available to add internal spindle cooling for better thermal balance. This ensures high machining accuracy of the spindle at all time.

2. i-Compensation

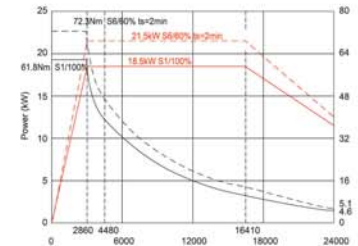
The high speed spindle may generate heat resulting in thermal displacement. A displacement tester can be applied for compensation of thermal elongation, so as to upgrade the spindle accuracy.

4. i-Protection

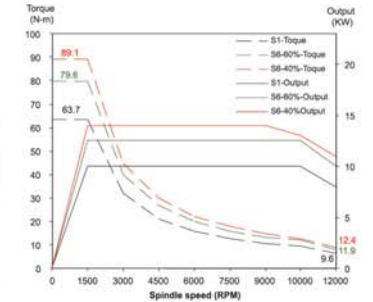
Increase of spindle overload or cooling during cutting an alarm will display to alert the operator. This function gives safety protection for the spindle.

Spindle diagram

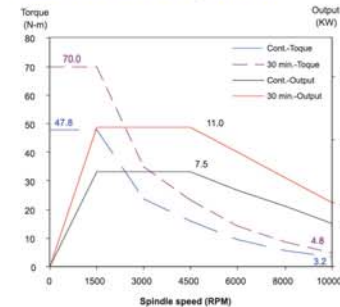
Built-in Spindle 24,000RPM



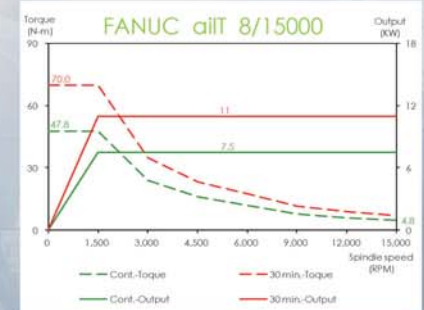
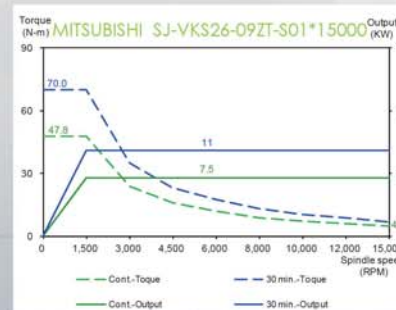
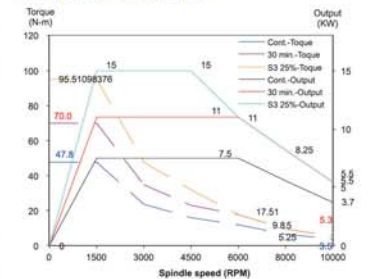
Heidenhain QAN200U*12,000RPM



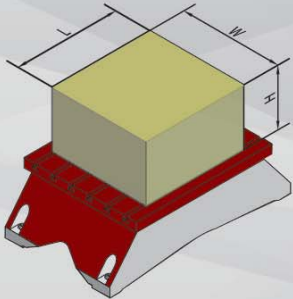
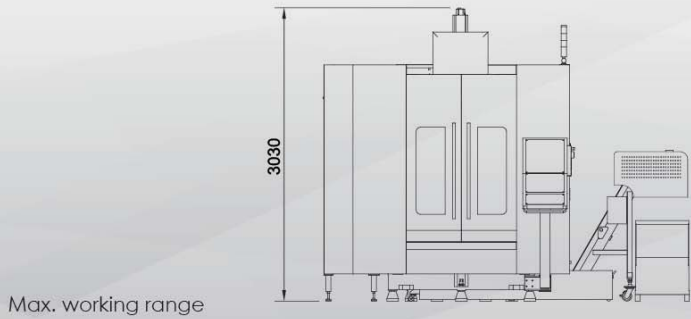
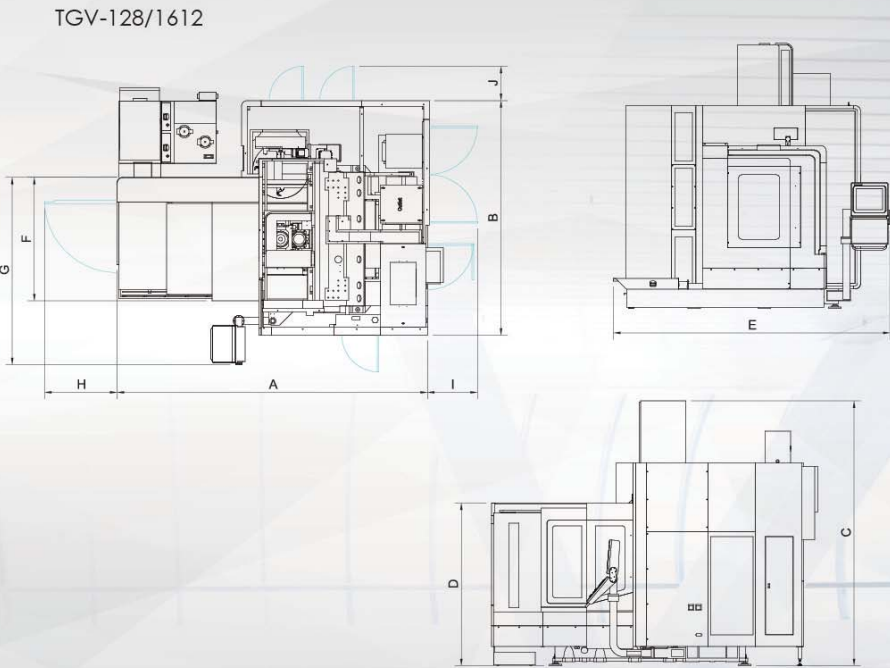
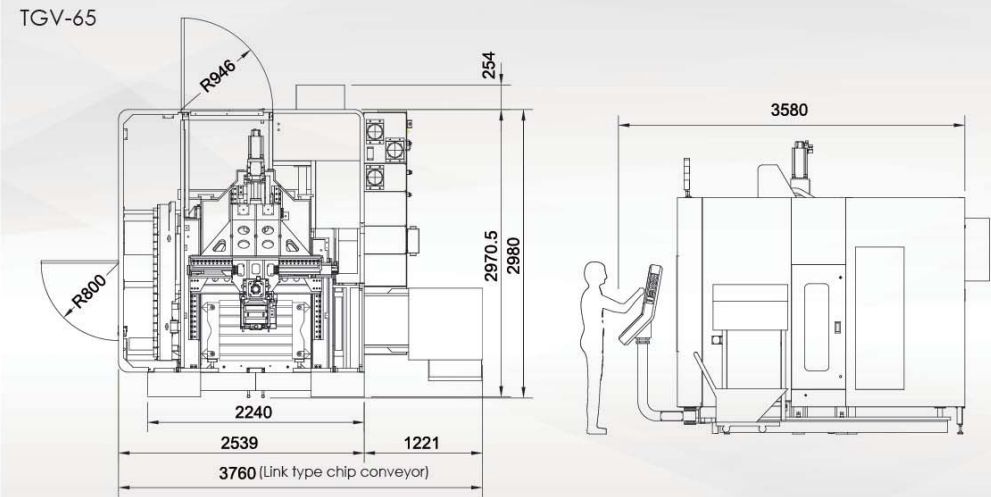
Mitsubishi SJ-D11/100-01



Fanuc ail 8*10000

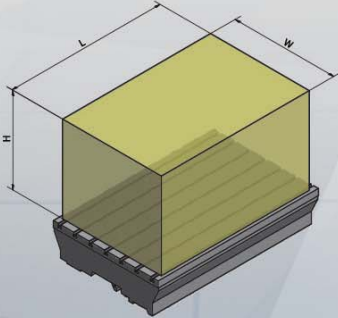


Machine Dimensions



| Model | L | W | H |
|--------|-----|-----|-----|
| TGV-65 | 750 | 520 | 310 |

Max. working range



| Model | L | W | H |
|----------|------|------|-----|
| TGV-128 | 1200 | 800 | 700 |
| TGV-1612 | 1600 | 1200 | 700 |

| Model | A | B | C | D | E | F | G | H | I | J |
|----------|------|------|------|------|------|------|------|------|-----|-----|
| TGV-128 | 4475 | 3380 | 3820 | 2345 | 3990 | 1780 | 2705 | 1045 | 720 | 495 |
| TGV-1612 | 5340 | 3710 | 4060 | 2575 | 4320 | 2000 | 3035 | 1120 | 975 | 940 |

Machine Specifications

| Model | Unit | TGV-65 | TGV-128 | TGV-1612 |
|---|--------------------|-----------------------------------|--|--|
| Table | | | | |
| Working Surface | mm | 750x620 | 1300x850 | 1800x1300 |
| T-slot (Size x Number x Pitch) | mm | 18x6x100 | 18x7x125 | 18x10x125 |
| Max Table Load | kg | 500 | 2500 | 4000 |
| Travel | | | | |
| Longitudinal Travel (X-axis) | mm | 660 | 1200 | 1600 |
| Gross Travel (Y-axis) | mm | 550 | 800 | 1200 |
| Vertical Travel (Z-axis) | mm | 460 | 700 | 700 |
| Distance From Spindle End to Table Center | mm | 150~610 | 200~900 | #40 200~900 #50 150~850 |
| Spindle | | | | |
| Spindle Nose Tape | | ISO40, HSK-A63(20/24K only) | ISO40, HSK-A3 | ISO40, HSK-A63, ISO 50 |
| Spindle Speed (DDS) | rpm | #40 10000(12000/15000/20000 opt.) | #40 10000(15000/20000 opt.) | #40 10000(15000/20000 opt.) #50 10000(12000 opt.) |
| Spindle Speed (Built-in) | rpm | #40 opt.24000 | #40 opt.24000 | #40 opt.24000 #50 opt.12000 |
| Feed | | | | |
| Cutting Feedrate (X, Y, Z Axes) | m/min | 20/20/20 | 20/20/20 | 20/20/20 |
| Rapid Traverse (X, Y, Z Axes) | m/min | 30/30/30 | 30/30/30 | 30/30/30 |
| ATC | | | | |
| Tool Storage Capacity | pcs | 24(30/40/60 opt.) | 16(24/32/40 opt.) | 16(24/32/40 opt.) |
| Max. Tool Weight | kg | 7 | 7 | 7 |
| Max. Tool Size (Diameter x Length) | mm | φ75x250L | #40 φ75x300L #40 φ60x300L(24000rpm) | #40 φ75x300L #40 φ60x300L(24000rpm) #50 φ125x300L |
| Tool Shank | | ISO40/HSK-A63 | ISO40/HSK-A63 | ISO40/HSK-A63/ISO50 |
| Pull Stud Bolt | | #40 MAS-P40-1/CAT-40/DIN69872 | #40 MAS-P40T-1/CAT-40/DIN69872 | #40 MAS-P40T-1/CAT-40/DIN69872 #50 MAS-P50T-1/CAT-50/DIN69872 |
| Motor | | | | |
| Spindle Drive Motor /Mitsubishi (30min) | kw | 11 | 11 | 11 |
| Spindle Drive Motor /Fanuc (30min) | kw | 11 | 11 | 11 |
| Spindle Drive Motor /Heidenhain (30min) | kw | 12.5 | 12.5 | 12.5 |
| X/Y/Z axis drive motor/Mitsubishi | kw | 3.5/3.5/3.5 | 3.5/3.5/7 | 7/4.5/7 |
| X/Y/Z axis drive motor/Fanuc | kw | 4/4/4 | 4/4/9 | 7/7/9 |
| X/Y/Z axis drive motor/Heidenhain | kw | 4.5/5.1/5.4 | 8.6/8.6/8.9 | 8.6/8.6/8.9 |
| Positioning Accuracy | | | | |
| 3 axes laser positioning accuracy (JIS B6338) | | | | |
| Positioning accuracy/Full travel | mm | ±0.006 | ±0.008 | ±0.010 |
| Repetitive positioning accuracy | mm | ±0.002 | ±0.002 | ±0.002 |
| 3 axes laser positioning accuracy (VDI 3441)/Repeated 5 times | | | | |
| Positioning accuracy | mm | 0.008 | 0.010 | 0.012 |
| Repetitive positioning accuracy | mm | 0.006 | 0.008 | 0.010 |
| VDI 3441 accuracy available upon order request | | | | |
| Other | | | | |
| Required Air Pressure | kg/cm ² | 6.5 | 6.5 | 6.5 |
| Electric Power Consumption | KVA | 50 | 40(65 opt.) | 40(65 opt.) |
| Machine dimension | mm | 3230x2980 | 4475x3380 | 5340x3710 |
| Machine weight | kg | 9600 | 14000 | 19000 |
| Coolant capacity(Standard) | L | 320 | 300 | 300 |

Standard & Optional Electrical Function

Hartrol /Standard

- Workpiece calibration by MPG directly
- Parameter package
- Character carving marco

Hartnet/ Optional

- Management system of utilization
- Machining time countdown
- Convenient file transfer

Electrical Function/Optional

- Lifting function against gravity
- Retraction for rigid tapping
- Intelligent MPG

Standard & Optional Mechanical Accessories

Standard

- Full-enclosed splash guard
- Spray around spindle
- Centralized automated lubrication system
- Spindle air curtain
- Fluorescent lamp
- Air blast through spindle
- Remote manual pulse generator
- Spindle oil cooler
- Screw type chip conveyor(TGV-128/1612 only)
- Tool package
- Leveling bolts and blocks
- Control cabinet air conditioning
- Hartford manual
- Auto power off

Optional

- Link type chip conveyor and portable chip bucket
- Coolant through spindle(20/25/40/70BAR)
- Fluorescent lamp*2
- Auto tool length measurement
- Auto workpiece measurement
- X/Y/Z-axis linear scale system
- Spindle shaft with coolant system(Built-in 24,000rpm spindle)
- 3-axis ballscrew coolant system
- Hydraulic hose coolant gun
- Air gun
- Oil mist coolant system
- Coolant flushing devise