

Intelligent Machining Center

TGV Series Smartcenter

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

Hartrol Plus®
從傳統到智慧。



Website



Facebook



She Hong INDUSTRIAL CO. LTD.

No.3 Jingke N. Road, Taichung City, 408 Taiwan
www.hartford.com.tw Tel: 886-4-23501980 Fax: 886-4-23581793

CAT.No.: 20191120- E09

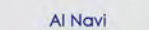
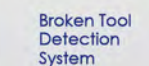
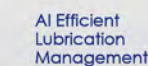
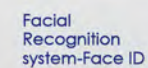
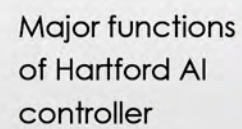
All Graphic and text on the catalog have been registered. Those who reprint will be held liable

Hartford

Hartrol • Smartcenter • Robocell

We manufacture intelligent machines only

AiSm@rtcontrol




How to quickly implement automation?

Hartford Robot Production Cell

Easy to get started

Hartford Robocell provides you a professional robot training and rich automation experience, to let you quickly learn and easily operate your automation systems

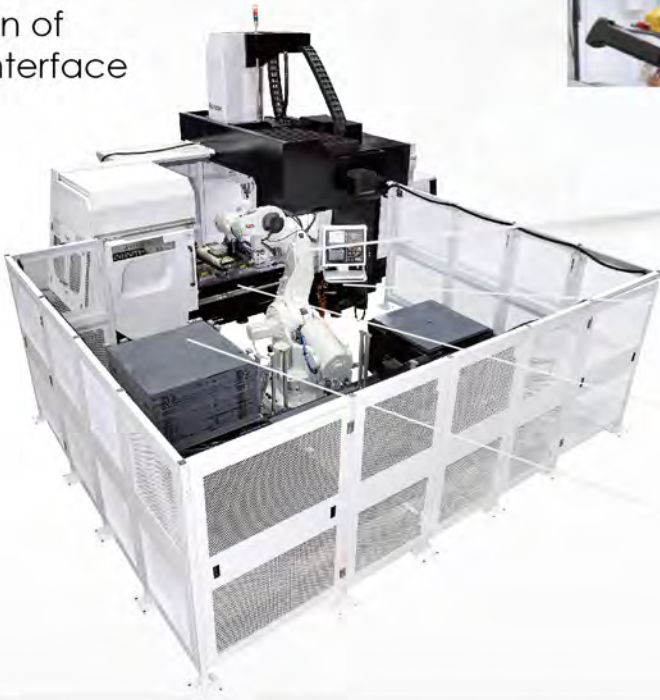
Quality control monitoring

Automation systems have to pass all the strict Quality Control tests at every stage like design, assembly, testing, final inspection and shipment, complete quality control processes for all the products.

Professional analysis

Robocell Machining optimization service, to let you be on the top by using professional machining methods

What definition of Automation interface only :



- 1. Automatic Door
- 2. Automatic Interface
- 3. Pneumatic/ Hydraulic Interface
- 4. Other options

1. Automatic Door - Pneumatic/Automatic Door System_Operating Door - Pneumatic/ Servo Automatic Door System_Right Side Door	2. Automatic Interface - I/O Preparation - Profibus Link Preparation - CC-Link Preparation - EtherNet/IP Link Preparation	3. Pneumatic/ Hydraulic Interface 1/2/3 Cell Automatic Pneumatic/ Hydraulic Interface in the machine
4. Other options - High Pressure Spray Nozzle with Automatic Preparation - HStainless Base - High-volume chip-removal system comprising dual side augers		

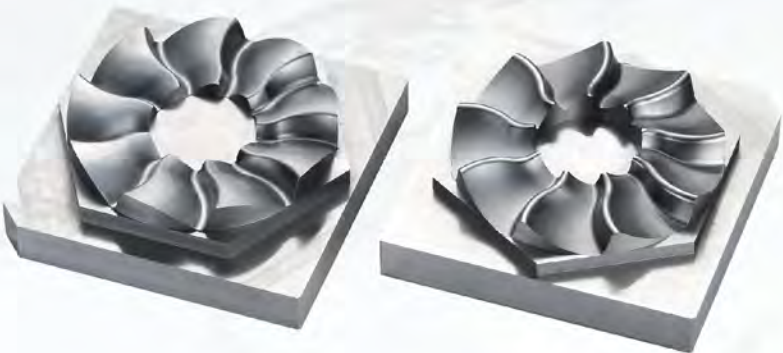
Versatile Machining for Industry

A perfect demonstration for machining accuracy and ability.

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

Actual Cutting Test

Model: TGV-128
■ Spindle: 15,000 rpm DDS 11kW ■ Cutting material : S45C



Face milling
Tool diameter Ø80 mm
Feed rate 2,400 mm/min
Cutting depth 3 mm
Cutting width 65 mm
Cutting volume 468cc



End milling
Tool diameter Ø63 mm
Feed rate 5,200mm/min
Cutting depth 30 mm
Cutting width 3 mm
Cutting volume 468cc



Tapping
Tool diameter M24XP3 mm
Feed rate 450 mm/min
Cutting depth 30 mm



Drilling
Tool diameter Ø40 mm
Feed rate 120mm/min
Cutting depth 35 mm

All the test results featured in this catalogue were produced under strict testing condition in a special zed testing environment. Under different testing conditions and in less than ideal testing environments, that the test results may vary from those shown in this catalogue.

The very first step for fully intelligent machining.

Hartford APP Store

What is Hartrol Plus ?

Hartrol plus is a brand new intelligent controller Hartrol , Hartnet and Hartford electrical function together which developed and made by Hartford.

HMI and operation is user friendly, it can achieve :

1. Internet connection, collect and analyze data, monitoring by portable device
2. Intelligent control: Auto revise human error and operating basis
3. Real time update new APPs

The difference between Hartrol plus and others

Function	Hartrol Plus P1	Others
Screen Size	19"Multi-touch Panel	10.4" (OPT:15")
Look Ahead Block	2700(G5P20000)	400(1000 Max.)
Hard Drive	32GB SSD	NO
Smoothing Interpolation	SSS 4G	Option
Industry 4.0	Hartford UserConnect	NO

The Intelligent Controller You Should Have

With three major solutions, Hartrol Plus takes you machining to the next level.

Highly optimized and intelligent controls bring even more capabilities and productivity to your metal cutting processes.

With ease use, advanced automation, and smart data collection, Hartrol plus is essential tool for enhancing performance on your production floor.



The main technologies of Hartford smartcenter include intelligent managing system, status monitoring, alarm predicting, machine status diagnosis, crash preventing, 3D program simulation, machining efficiency improving...etc. All the intelligent functions help you control the machine status and assure the job quality.



Hartford smartcenter APP



The fuctions mentioned above will need to option the Hartrol plus controller or Dual screen with Fanuc controller.

What Hartford APP can do for you?

The integrated intelligent functions of Hartrol plus could achieve your machining requirements.
For more Hartrol Plus functions, please contact our sales person.

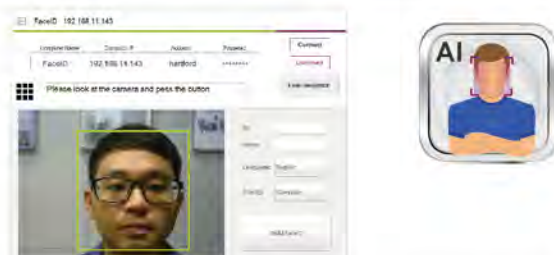
AI Environment Thermal Displacement Compensation(opt.)

Vertical machining center : **0.03mm**
Thermal displacement problem is improved up to **60%**
It can achieve good accuracy as in constant temperature room.



AI Facial recognition system(opt.)

Face ID log-in authority
Recognition time: **2 seconds**
Recognition accuracy: **100%**



AI Tool breakage detection (opt.)

Available with tool size **6mm** above
■ Tool wears when electric current ratio increased
■ When tool abrasion over than your setting, machine alarms to avoid tool breakage



Highlight on Intelligent Auger(opt.)

50% efficacy increases
■ Intelligent auger automatically proceeds cleaning iron chips based on electrical current of spindle.
■ Intelligent auger automatically performing reversal mode in case amount of iron chips outnumbers, preventing from machine stop.
■ Auger is overly shielded



AI Efficient Lubrication Management(opt.)

50% lubrication saved.
■ Auto-adjustment oil supply base on machining condition.
■ 50% oil consumption saved



On line update

With online updating system similar to smart phone will make sure your operating system stays the latest version with Hartford.

- 24hr ➡ Live updating , no boundary no time zone difference.
- NEW ➡ Synchronize with Hartford for the latest information and functions.
- Easy ➡ One key updating, easy and fast !



The Hartrol plus NC version must be A6 or above



Graphical user interfaces for part setting, inspection, tool setting

- Ease of use
- Increasing usability
- Eliminating manual set-up tasks
- Increasing efficiency



CIS Integral Design page



Hartford ZDT

Eliminate machine down time and increase efficiency.
ZDT —

- 1.Ease of use
- 2.Check parts status clearly
- 3.Eliminating unexpected down time
- 4.Instand notification to your machine and your portable device



Spindle Vibration Intelligent Monitoring System (B-Safe) is ensuring spindle stability at times(opt.)

Highlights

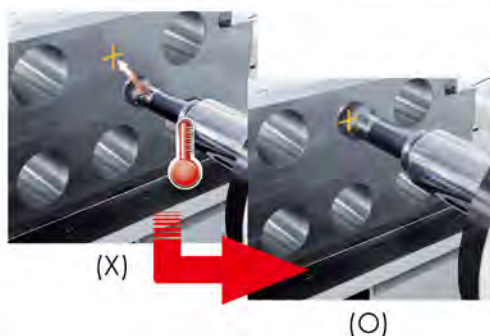
1. APP Vibration function is handy to set up manually.
2. Alert status on crash protection.
3. Responsive graphic is available for diagnosis by user, and analytic information is just-in-time served.



AFC(opt.)

Machining efficiency is increased by **21%**↑
Controls the feed rate depending on the machining situation

- Adjusting feed rate automatically
- Lengthen your tool life
- Reduce machining time



Thermal compensation on spindle(opt.)

No worries about HEAT!!

- Machine with compensation
#40 spindle thermal extension is within 0.03mm
#50 spindle thermal extension is within 0.02mm
- Machine without compensation
Spindle thermal extension is around 0.10mm

Notes: Above test is under room temperature



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



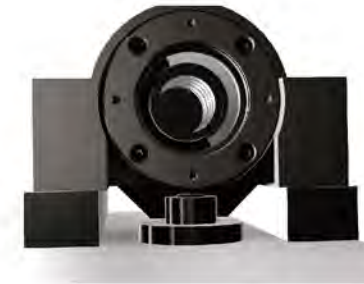
The picture show TGV-128



Full range of linear guideway five-year warranty

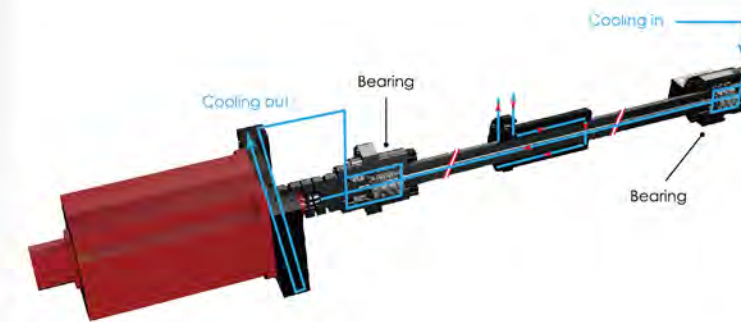
Warranty coverage will not apply under the following conditions

1. Improper operation (collision)
2. Lack of regular cleaning of accumulated debris causing damaged to the linear rails & carriages.



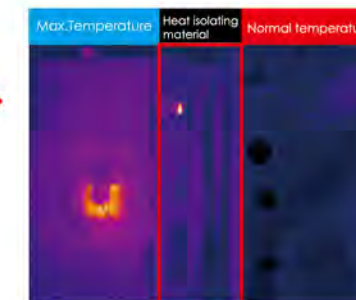
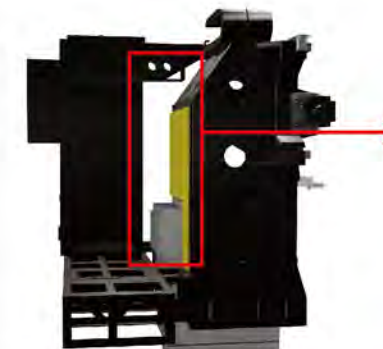
Bearing housing stop pin design

- 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.)

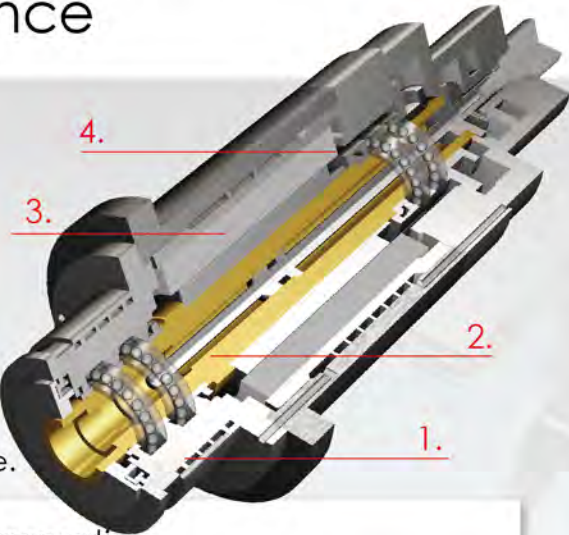
- Low noise, low vibration and light.
- Available with all controllers.
- Available with optional smart sensor.
- Thermal deformation problem is reduced by **50%** with optional cooling shaft function.

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.

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.

3.i-Balance

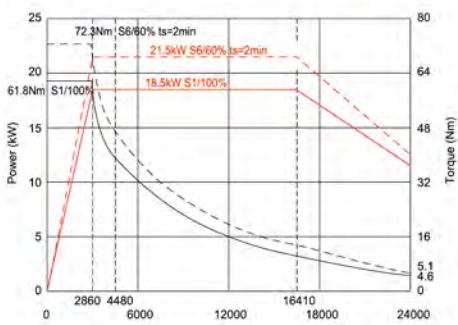
A conventional spindle is designed with only external circulated cooling, however the Hartford spindle is available to add internal spindle cooling for better thermal balance. This ensures high machining accuracy of the spindle at all time.

4.i-Protection

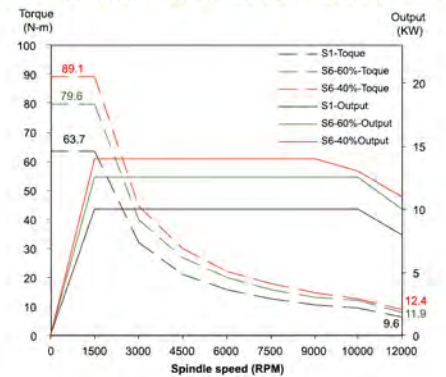
Increase of spindle overload or cooling during cutting an alarm will display to alert the operator. This function gives safety protection for the spindle.

Spindle diagram

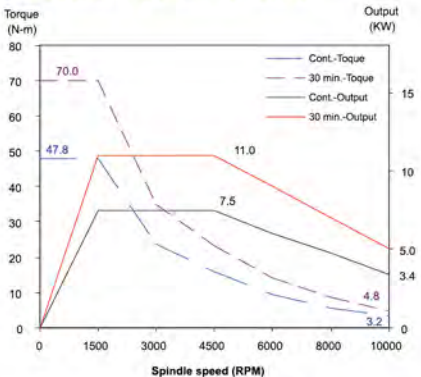
Built-in Spindle 24,000RPM



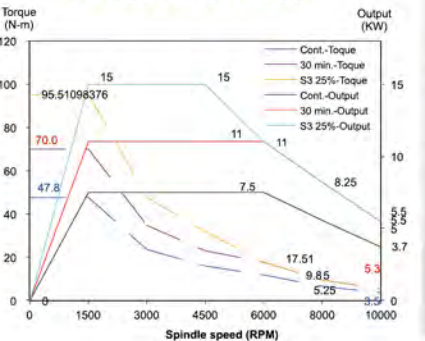
Heidenhain QAN200U*12,000RPM



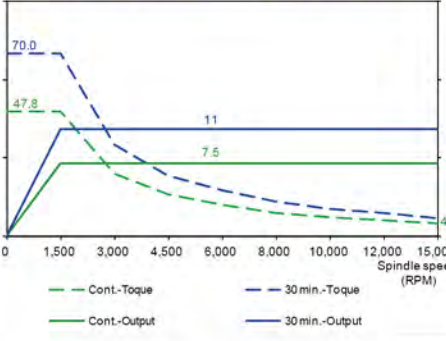
Mitsubishi SJ-D11/100-01



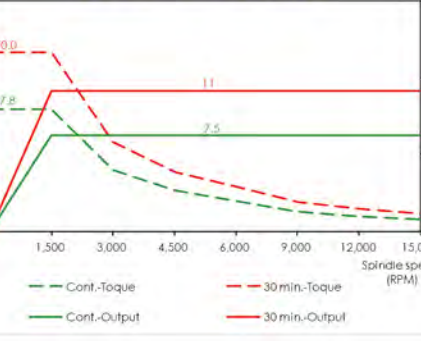
Fanuc ail 8*10000



MITSUBISHI SJ-VKS26-09ZT-S01*15000

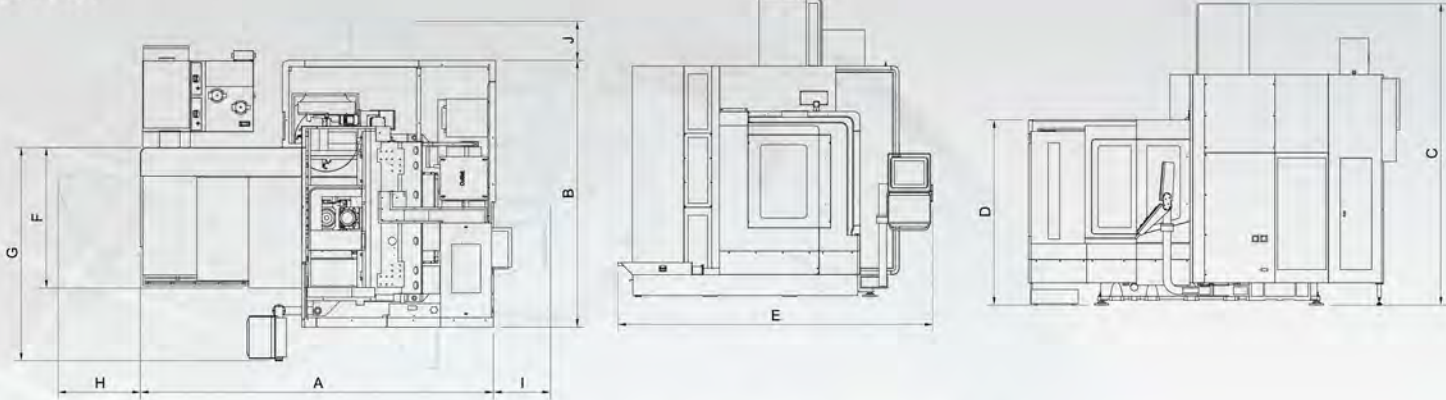


FANUC ailT 8/15000



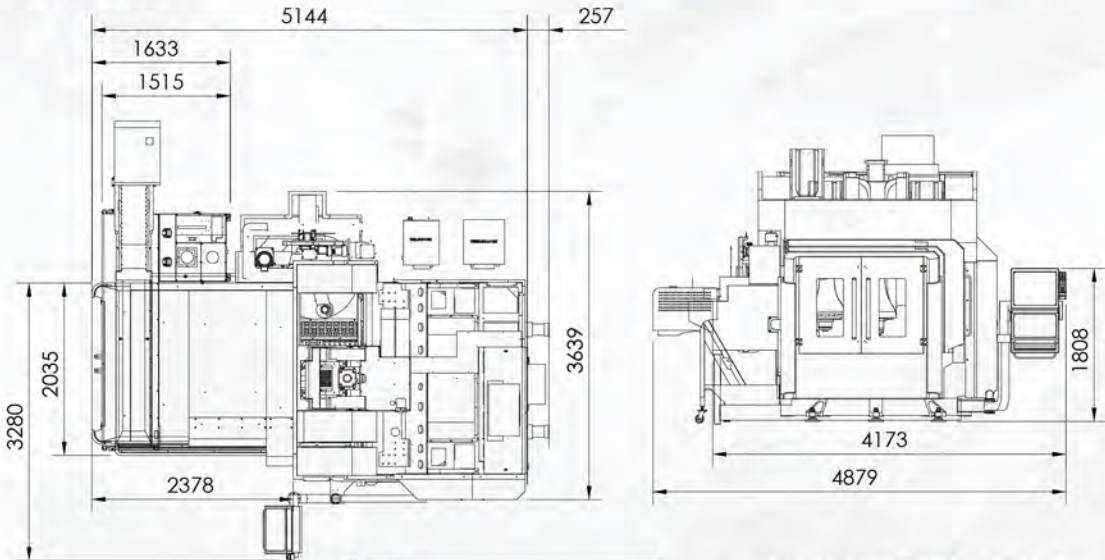
Machine Dimension

TGV-128

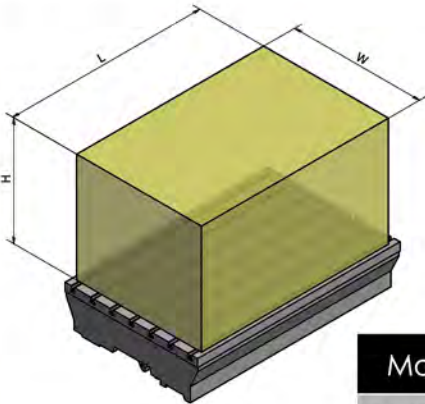


Model	A	B	C	D	E	F	G	H	I	J
TGV-128	4475	3380	3820	2345	3990	1780	2705	1045	720	495

TGV-1612



Max. working range



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

Specification

Model	單位	TGV-128	TGV-1612
Table			
Working Surface	mm	1300x850	1800x1300
T-slot (Size x Number x Pitch)	mm	18x7x125	18x10x125
Max Table load	kg	2500	4000
Travel			
Longitudinal Travel (X-axis)	mm	1200	1600
Gross Travel (Y-axis)	mm	800	1200
Vertical Travel (Z-axis)	mm	700	700
Distance From Spindle End to Table Center	mm	200~900	#40 200~900 #50 150~850
Spindle			
Spindle Nose Tape		ISO40, HSK-A3	ISO40, HSK-A3 ISO 50
Spindle Speed(DDS)	rpm	#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 #50opt.12000
Feed			
Cutting feedrate (X/Y/Z Axes)	M/min	20/20/20	20/20/20
Rapid Traverse feedrate(X/Y/Z Axes)	M/min	30/30/30	30/30/30
ATC			
Tool Storage Capacity	pcs	16(24/30/40 opt.)	#40 16(24/30/40 opt.) #50 20(32/40opt.)
Max. Tool Weight	kg	7	7
Max. Tool Size(Diameter x Length)	mm	#40 Ø75x300L #40 Ø60X300L(24000rpm)	#40 Ø75x300L #40 Ø60X300L(24000rpm) #50 Ø125x300L
Tool Shank		ISO 40/HSK-A63	ISO 40/HSK-A63/ISO50
Pull Stud Bolt		#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	#40 11 #50 18.5
Spindle Drive Motor/Fanuc(30min)	kw	11	#40 11 #50 18.5
Spindle Drive Motor/Heidenhain(30min)	kw	12.5	12.5
X/Y/Z axis drive motor/Mitsubishi	kw	3.5/3.5/7	7/4.5/7
X/Y/Z axis drive motor/Fanuc	kw	4/4/9	7/7/9
X/Y/Z axis drive moto/Heidenhain	kw	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	±0.008	±0.010
Repetitive positioning accuracy	mm	±0.002	±0.002
3 axes laser positioning accuracy (VDI 3441)/ Repeated 5 times			
Positioning accuracy	mm	0.010	0.012
Repetitive positioning accuracy	mm	0.008	0.010
Other			
Required Air Pressure	kg/cm²	6.5	6.5
Electric Power Consumption	KVA	25~50	30~55(#40) 40~65(#50)
Machine Dimension	mm	4475x3380	5340x3710
Machine weight	kg	14000	19000
Coolant Capacity(Standard)	L	300	300

Accessories

Description	Modle	Standard : ● Option : ★	
		TGV-128	TGV-1612
1.Full-enclosed splash guard		●	●
2.Operator Panel, stand type		●	●
3.Spray around spindle		●	●
4.Spindle air curtain		●	●
5.Fluorescent lampx1		●	●
6.Air blast through spindle_M53		●	●
7.Remote manual pulse generator		●	●
8.Spindle oil cooler		●	●
9.Screw type chip conveyor		●	●
10.Tool Package		●	●
11.Foundation bolt,Concrete		●	●
12.Control cabinet air conditioning		●	●
13.Hartford manual		●	●
14.Centralized automated lubrication system		●	●
15Automatic Power OFF		●	●
16.Link type chip conveyor &portable chip bucket(1 EA)		★	★
17.Coolant through spindle, Prepare, without water cart		★	★
18.Coolant through spindle,20BAR,with water cart		★	★
19.Coolant through spindle,25BAR,with water cart		★	★
20.Coolant through spindle,40BAR,with water cart		★	★
21.Coolant through spindle,70BAR,with water cart		★	★
22.Fluorescent lampx2		★	★
23.Auto Tool Length Measurement		★	★
24.Workpiccec Measure Probe		★	★
25.X,Y,Z -axis linear scale system		★	★
26.Spindle shaft with coolant system		★	★
27.3 axes ballscrew coolant system		★	★
28.Coiling Tube Coolant gun		★	★
29.Air gun		★	★
30.Oil mist collector system		★	★
31.Coolant Flushing Device		★	★
32.Oil skimmer		★	★

Specifcations & dimensions are subject to change without notice
(for actual weight, shipped product shall prevail.)

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
- Character carving marco

Electrical Function/
Optional

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