

Accessories

Standard : ● Option : ★

Description	Modle	TGV-106	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.Workpiece 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		★	★	★
33. Electric Grease Lubricators		●	★	★

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

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.: 20230918- E15
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Hartford

Hartrol · Smartcenter · Robocell

We manufacture intelligent machines only

Facebook



Website



Hartford
EXCLUSIV
HartrolPlus APP

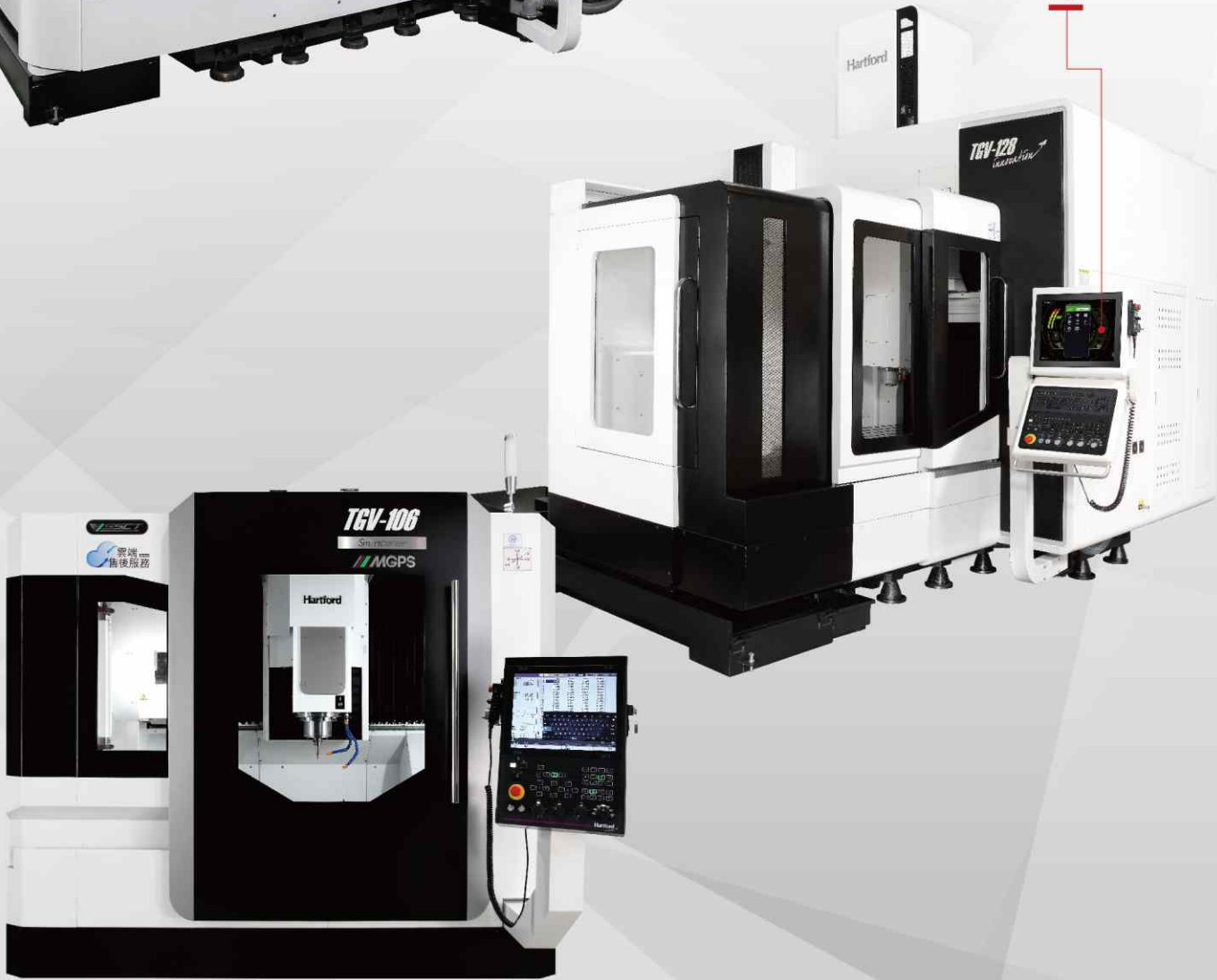
Intelligent
Machining Center



TGV Series
Smartcenter

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

HartrolPremium®
From tradition to intelligent



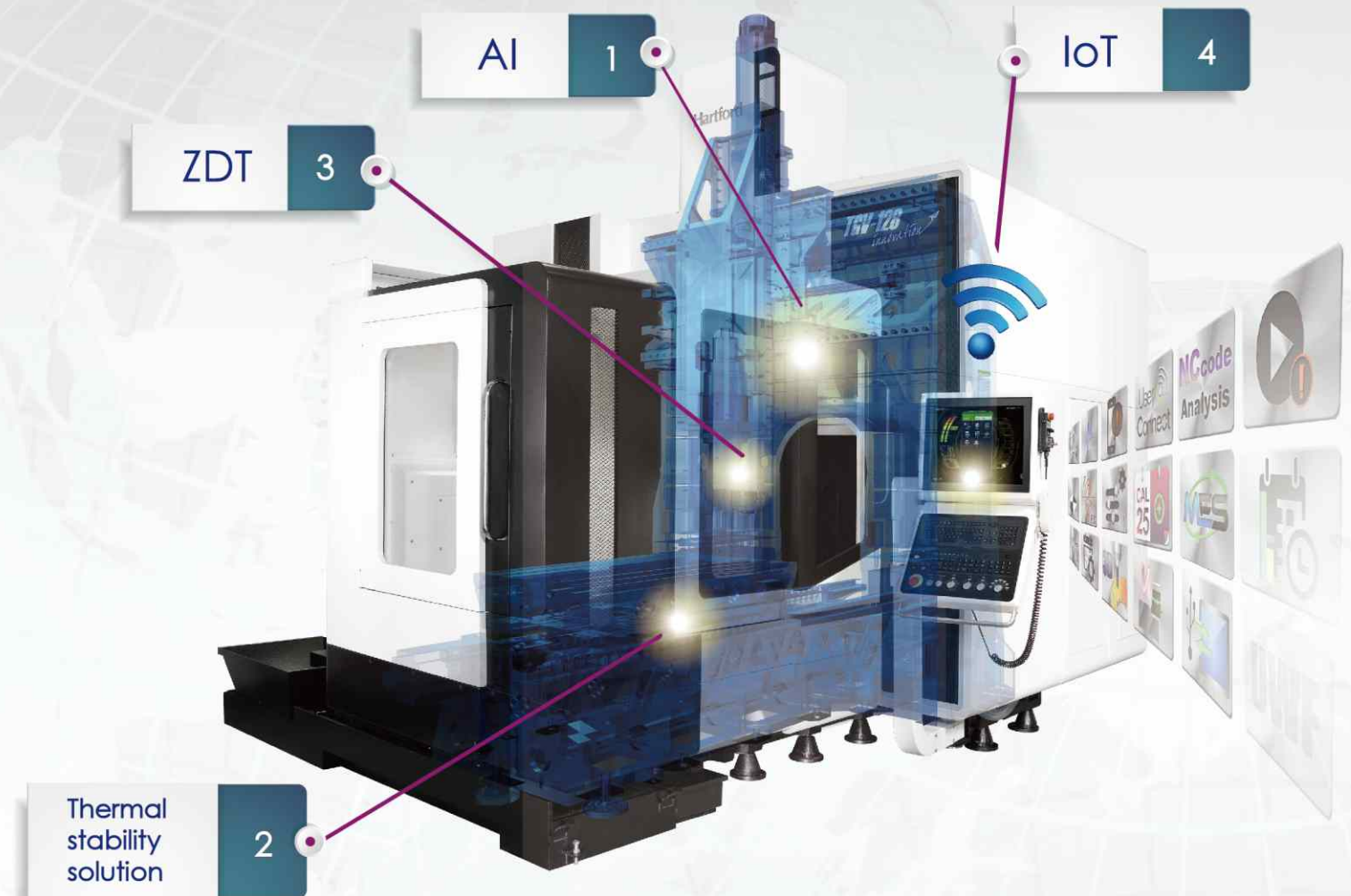
A.I. Applications inside, Hartrol Plus is the control which provides machining status with advanced features.

Imagine what future machines ought to be outlined.

AiSm@rtControl



Hartford
redefine the future



Major functions
of Hartford AI
controller



Facial
Recognition
system-Face ID



AI Environment
Thermal
Displacement
Compensation



AI Efficient
Lubrication
Management



Broken Tool
Detection
System



Highlight on
Intelligent
Auger



AI Navi

IoT

- + Remote Warm-up & Turn-on
- + Hartrol Plus Sync & Update
- + User Connect



Thermal stability solution

- + Spindle Thermal Compensation
- + Casting Thermal Compensation
- + Thermal Symmetry / Thermal Balancing



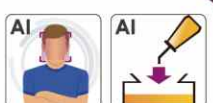
ZDT

- + Diagnosis Report on Spindle Operation
- + Alarm Report System



AI

- + Facial Recognition System
- + AI Efficient Lubrication Management
- + Smart Efficient Chip Collection



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

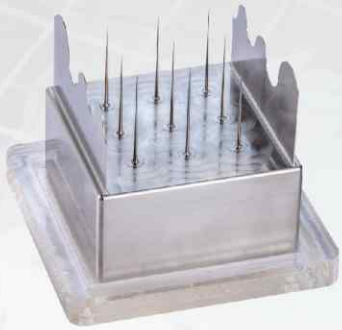
4. Other options

- 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. Fine needle-thin wall



2. Car headlight mold



3. Turbine blades

Actual Cutting Test

Model: TGV-128

■ Spindle: 15,000 rpm DDS 11kW ■ Cutting material : S45C ■ Controller : Hartrol Premium 1



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.

What is Hartrol Premium?

Hartrol premium 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 Premium	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.

Intelligent Support

Cost down to 20%

Multi Touch Screen
CCD remote management
E-book
Remote Management
Cutting Condition Calculator
Stand-by Mode

Hartrol Plus

Intelligent Functions

Productivity increased 23%

HartCAM
AFC= Automatic Feedrate Control.
SSS-4G
Machining Time Countdown for Single Block
Optimized Machining Program
Automatic measurement

Intelligent Design

Efficiency increased 20%

MES(Manufacturing Execution System)
Machine Utilization Management
Operator Performance Management
24 Hours a Day Management
Remote Management
Hartford Userconnect

Hartford UserConnect

- Alert Notification
- Remote Diagnoses
- Remote Value Enhancement
- Remote Monitoring & Management

Hartford APP Store

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.

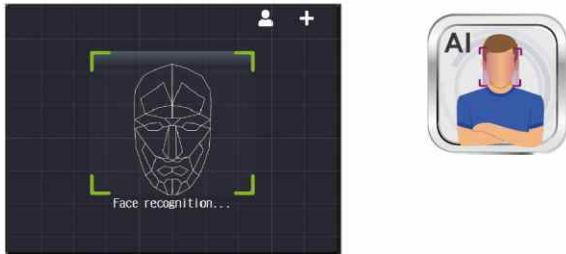
AI Environment Thermal Displacement Compensation(opt.)

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%**



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



Hartford ZDT

Eliminate machine down time and increase efficiency.
ZDT –

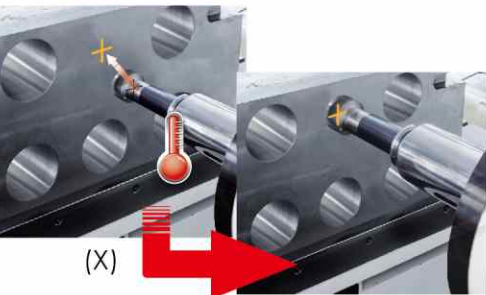
- Ease of use
- Check parts status clearly
- Eliminating unexpected down time
- Instand notification to your machine and your portable device



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

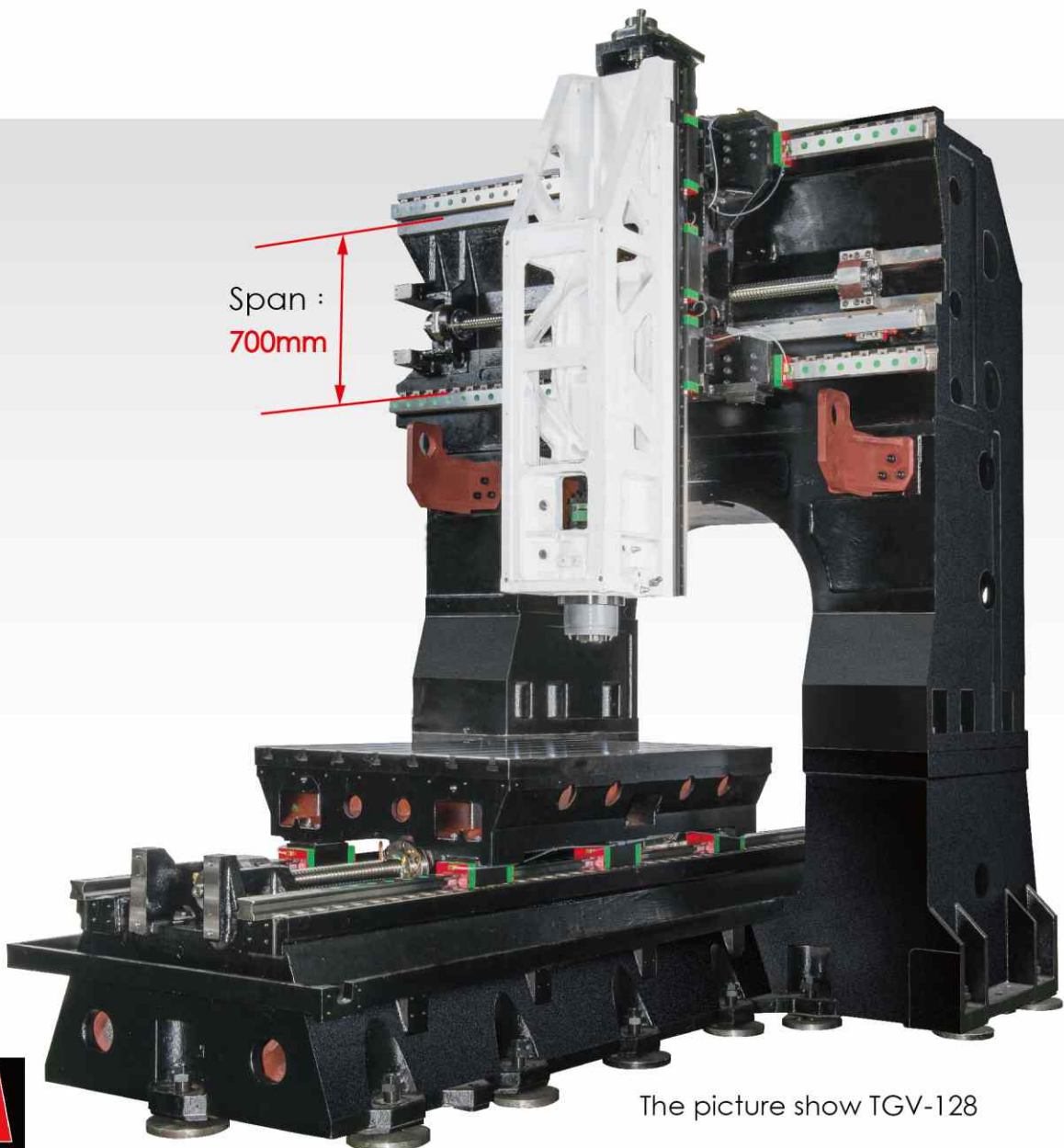


The incredible features of TGV Series

The bridge type construction delivery a highly stable.



The picture show TGV-106



The picture show TGV-128

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**

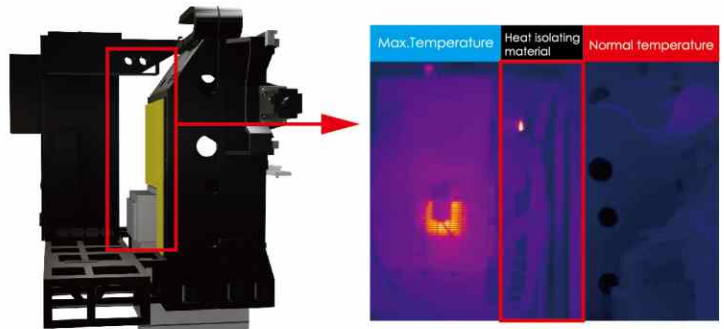


Bearing housing stop pin design

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

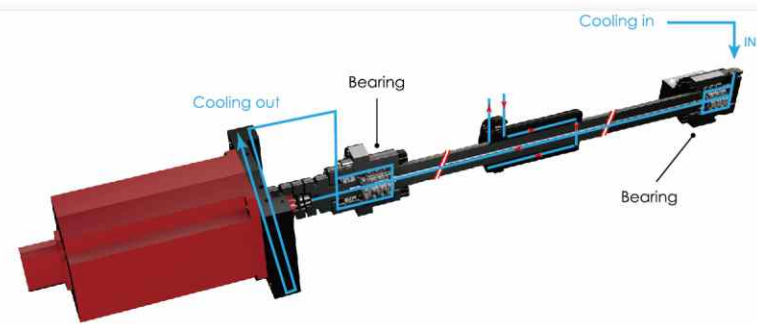
Unique Structure Design on TGV-106

- 1** One piece casting for Z-axis motor set with bearing set to best rigidity of spindle machining
- 2** One piece column & crossbeam design: wall type casting + column supporter = better stability structure.
- 3** Thicker motor & bearing set : Best transmission efficiency
- 4** One-piece base design



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%**.



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.

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.



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.

Spindles Manufactured by Hartford Offer Quality Assurance

Machine Dimension

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

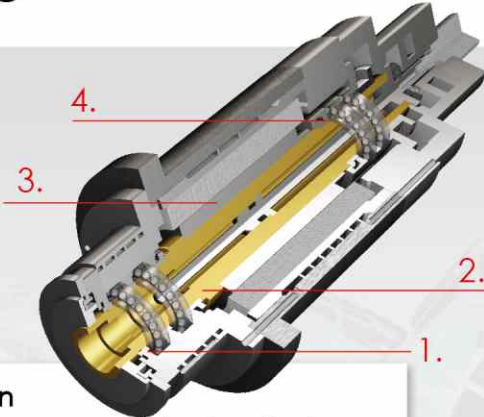
The high speed spindle may generate heat resulting in thermal displacement. A displacement tester can be applied for compensation of thermal elongation, so as to upgrade the spindle accuracy.

3. i - Balance

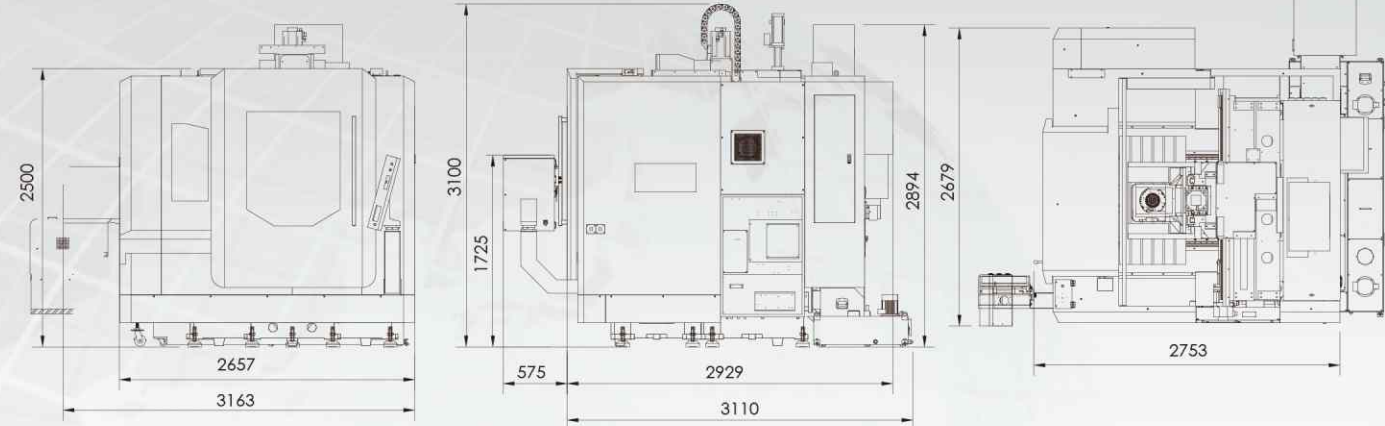
A conventional spindle is designed with only external circulated cooling, however the Hartford spindle is available to add internal spindle cooling for better thermal balance. This ensures high machining accuracy of the spindle at all time.

4. i - Protection

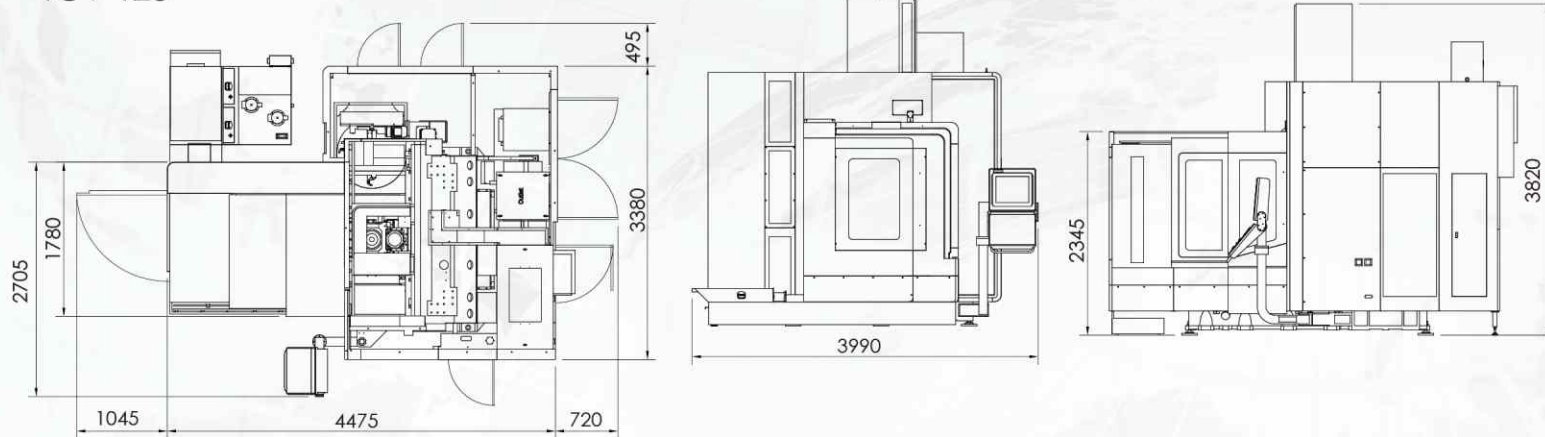
Increase of spindle overload or cooling during cutting an alarm will display to alert the operator. This function gives safety protection for the spindle.



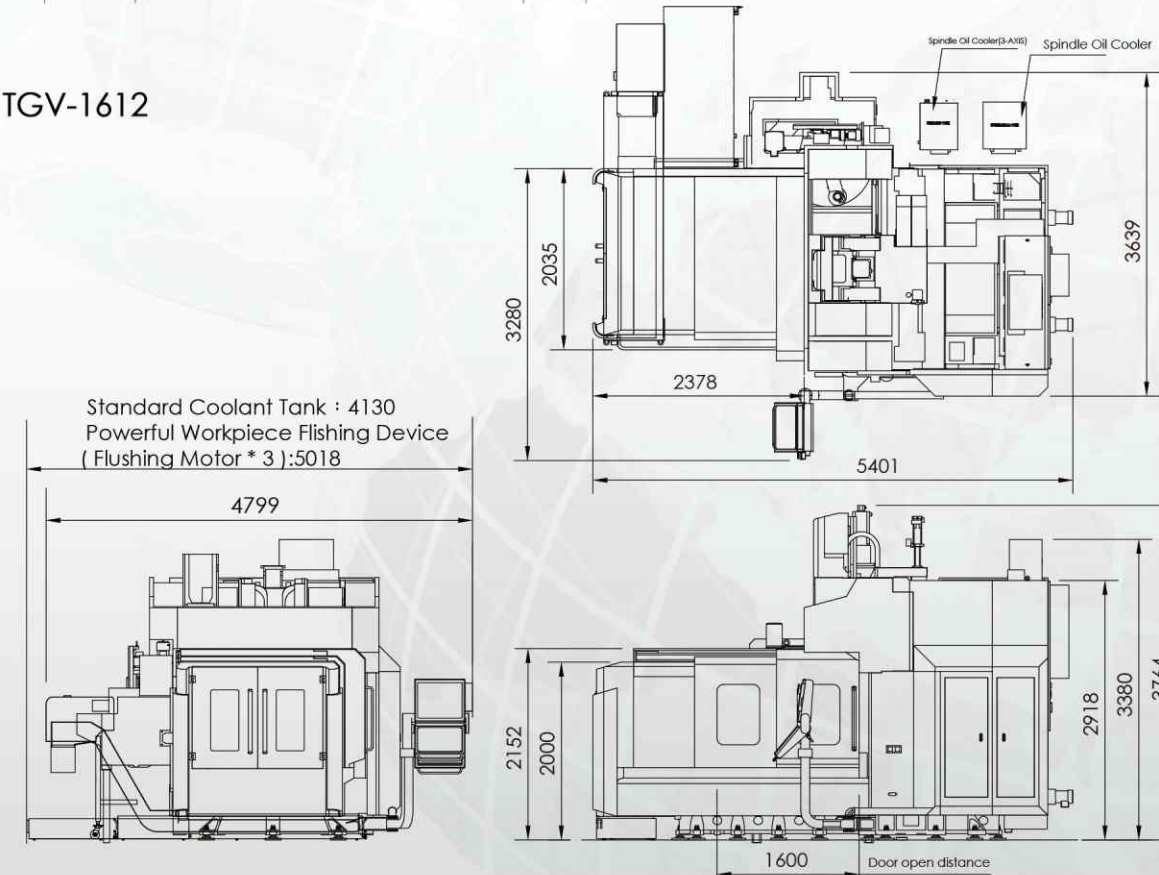
TGV-106



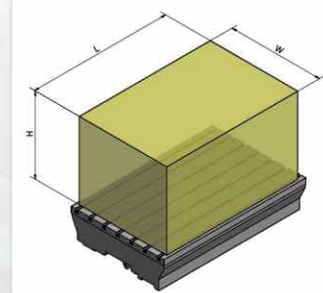
TGV-128



TGV-1612



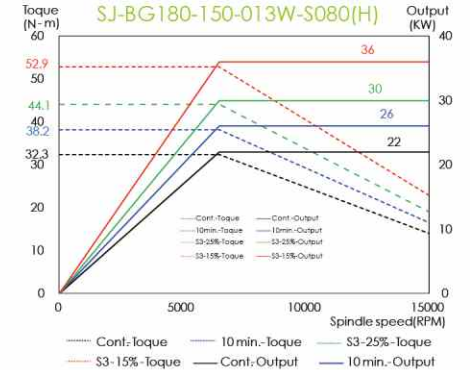
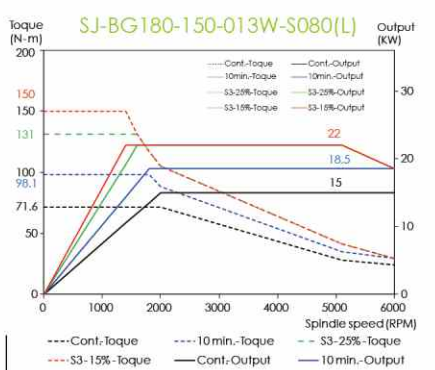
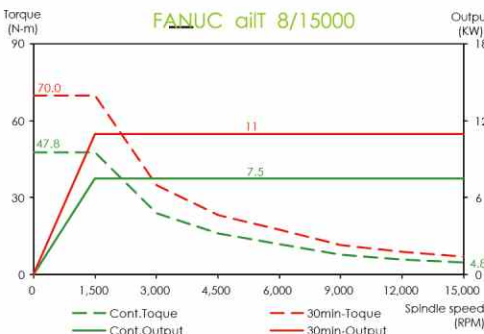
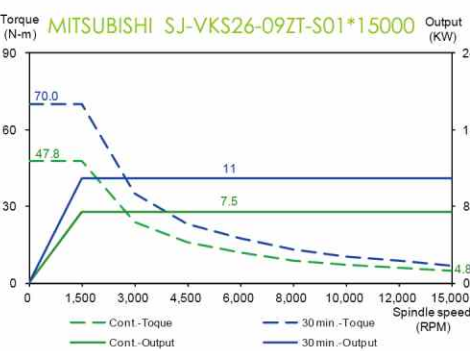
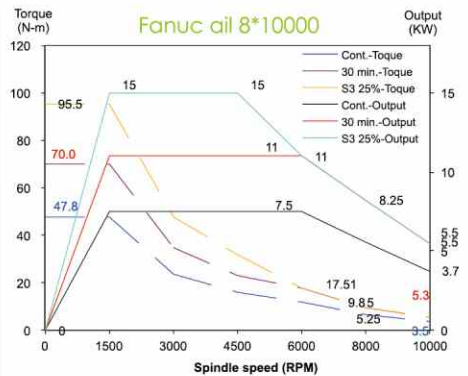
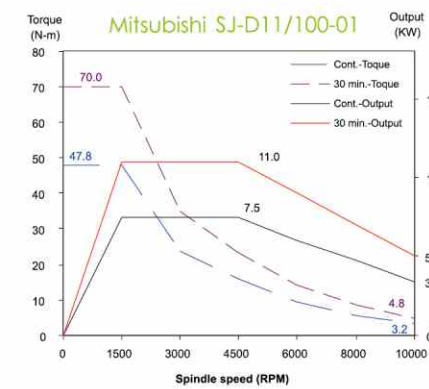
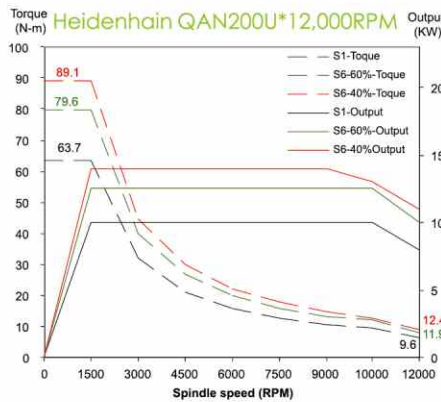
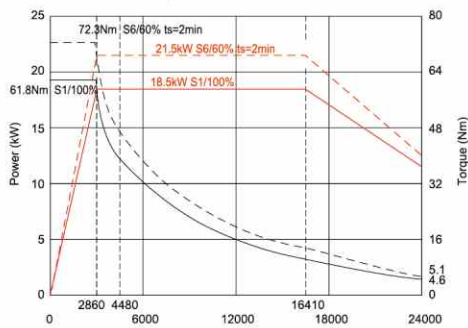
Max. working range



Model	L	W	H
TGV-106	1000	600	510
TGV-128	1200	800	700
TGV-1612	1600	1200	700

Spindle diagram

Built-in Spindle 24,000RPM



Specification

item			Model	Unit	TGV-106	TGV-128	TGV-1612
Table	Working surface	mm			1150 x 600	1300 x 850	1800 x 1300
	T-slot Width X pitch(number)	mm			18 x 100 (5)	18 x 125 (7)	18 x 125(10)
	Max. load (Average)	kg			1000	2500	4000
Travel	X -axis travel	mm			1000	1200	1600
	Y -axis travel	mm			600	800	1200
	Z -axis travel	mm			510	700	700
	Distance from Spindle End to Table	mm			150~660	200~900	#40: 200~900 #50: 150~850
	Distance between two columns	mm			1260	1100	1240
Spindle	Spindle nose taper	rpm			#40	#40	#40 #50
	Spindle speed(DDS)	rpm			12000/15000	10000/15000 ; 20000	#40: 10000/15000,20000 #50: 10000/12000
	Spindle speed(Built-in)	rpm			15000/24000	24000	#40: 24000 #50: 12000
Feed	Cutting feedrate(X / Y / Z)	m/min			20/20/20	20/20/20	20/20/20
	Rapid traverse rate (X / Y / Z)	m/min			36/36/30	30/30/30	30/30/30
ATC	Capacity	pcs			A:24(30)	A:24(30/40)	#40 : A24(30/40); #50 : A32(40/60)
	Max. tool weight	kg			7	7	#40: 7 ; #50: 20
	Max. tool size(dia.X length)	mm			Ø 75x300L ; Ø60x300L (24000rpm)	Ø 75x300L ; Ø60x300L (24000rpm)	#40 : Ø 75x300L,60x300L(24000rpm) #50 : Ø 125x300L
	Tool shank				BT40(BBT/CAT/DIN/HSK A63)	BT40(BBT/CAT/DIN/HSK A63)	#40 : BT40(BBT/CAT/DIN/HSK A63) #50 : BT50(BBT/CAT/DIN)
	Pull stub bolt				MAS-P40T-1 (CAT-40/DIN69872)	MAS-P40T-1 (CAT-40/DIN69872)	#40 : MAS-P40T-1 (CAT-40/DIN69872) #50 : MAS-P50T-1 (CAT-50/DIN69872)
Motor	Spindle drive motor (cont./30 min)	kw			7.5/11 opt.15/18.5	7.5/11 opt.15/18.5	#40:7.5/11 opt.15/18.5 #50:15/18.5 opt.18.5/22,22/26
Positioning Accuracy	3-axis laser positioning accuracy(JIS B6330), without linear scale						
	Positioning accuracy	mm			±0.008	±0.006	±0.006
	Repeatability	mm			±0.002	±0.002	±0.002
	3-axis laser positioning accuracy(JIS B6330), with linear scale						
	Positioning accuracy	mm			±0.006	±0.005	±0.005
	Repeatability	mm			±0.002	±0.002	±0.002
	3-axis laser positioning accuracy(VDI3441)repeat 5 time						
other	Positioning accuracy	mm			0.008	0.015	0.015
	Repeatability	mm			0.005	0.014	0.014
	Required air pressure	kg/cm ²			6.5	6.5	6.5
	Electric power requirement	KVA			45~60	25~50	#40:30-55 #50:40-65
	Machine weight	kg			8500	14000	17900
	Floor space	mm			3685 x 3163	6600 x 4900	7128 x 5220
	Machine dimension(L x W x H)	mm			2929 x 2657 x 3100	4703 x 3380 x 3818	5410 x 3710 x 3764

VDI 3441 accuracy available upon order request.

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