

Automatic machining center for manufacturer

LG Series Smartcenter

- Hartrol plus controller
- 5-Year warranty on guideways
- One-piece bed design
- Tool change time: 1.38 sec
- Oversized column design



Hartrol Plus[®]
From tradition to intelligent



Hartford

Hartrol · Smartcenter · Robocell

We manufacture intelligent machines only

Hartford has sold more than 50,000 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.

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Website



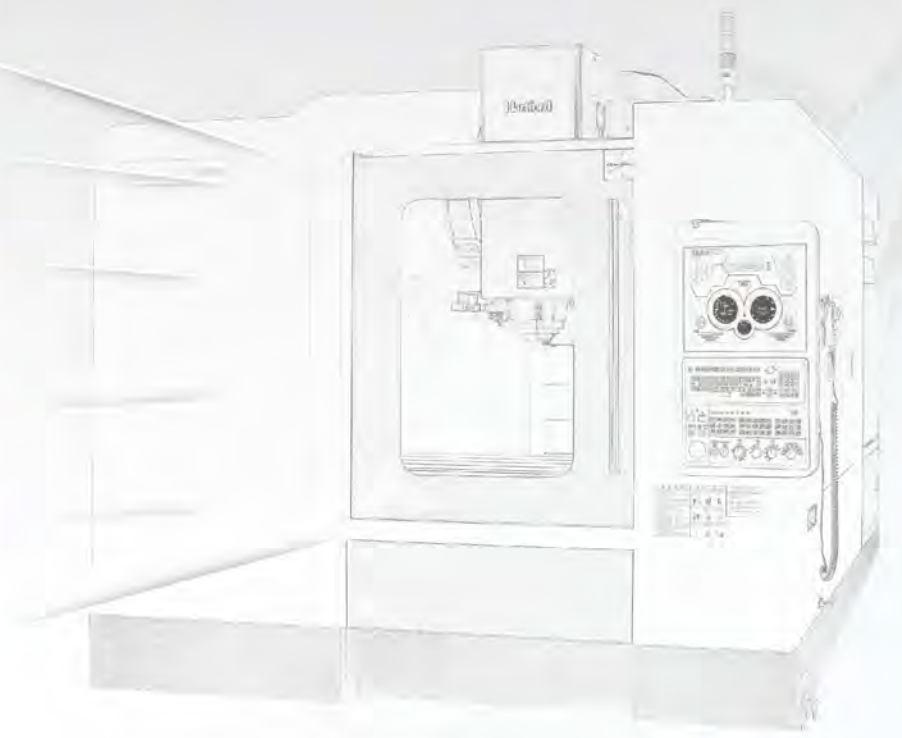
Facebook



Imagine what future machines ought to be outlined.

Hartford
 redefine the future

- 1. Networking
- 2. Intelligent
- 3. Automation
- 4. Ambient temperature is less pertinent to affect machine accuracy
- 5. Intelligent Factory
- 6. Intelligent energy control



- 1. Networking**
- Remote warm-up/turn-on
 - User connect
 - On-line up-date
 - Alarm reporting system
- 2. Intelligent**
- MES
 - Auto Q.C.
 - AFC
 - HartCAM
 - Spindle vibration monitoring system
 - CTS Leakage Detect
 - ZDT

- 3. Automation**
- Automation Door
 - Robocell HMI
 - Inspection for workpiece on the site
 - Automatic handling systems
- 4. Ambient temperature is less pertinent to affect machine accuracy.**
- Thermal compensation on spindle dual axes.
 - Thermal compensation for machine casting



- 5. Intelligent Factory**
- Management
 - Intelligent monitor
 - NC screen monitor
 - CCD remote monitor
 - Utilization rate management
 - Production capacity analysis
 - Embedded analytic information for operation abnormality
- 6. Intelligent energy control**
- Idling stop
 - Eco monitor
 - Machining time estimation
 - Countdown

What is Automation?

The meaning of automation?

Reducing manpower, increasing productivity, maintaining product quality & consistent precise movements without fatigue these all factors can be called "automation". There is a vast scope for automation from fully automatic engine cylinder manufacturing lines to simple robotic loading and unloading operations, the process of automatic workpiece measurement during machining can also be part of automation, so entering the field of automation is not so far away.

When it comes to machining processes, following features we can recommend to help our customers to enter the field of automation

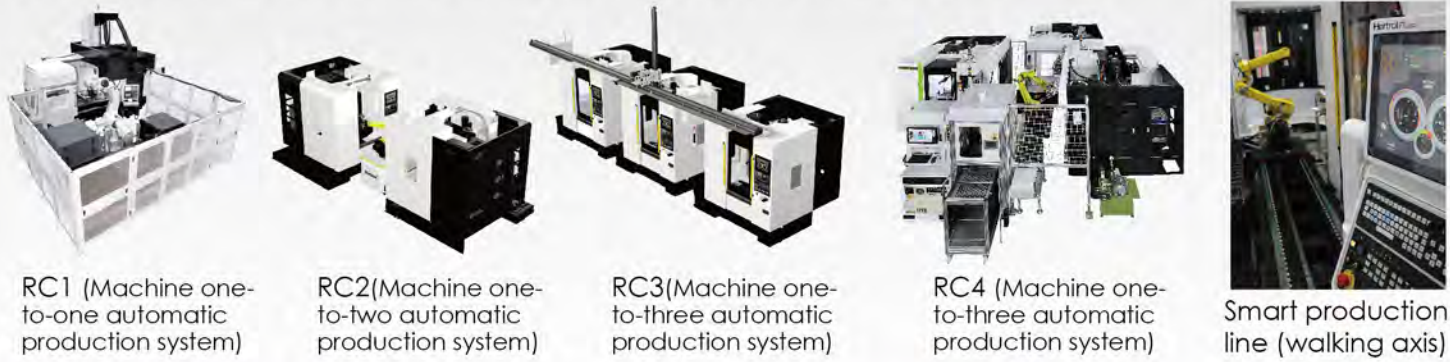


With more intelligent function equals to closer automation.

How to quickly implement automation?

Hartford Robot Production Cell

Hartford has the biggest automation solution team in Taiwan. We design and plan the project by ourself. To be professional, provide rapidly response and efficient are our points. In this modern age, labor shortage is always a big problem for many companies. Hartford provides you a set of stable and efficient automatic solution project to solve your problems.



RC1 (Machine one-to-one automatic production system)

RC2 (Machine one-to-two automatic production system)

RC3 (Machine one-to-three automatic production system)

RC4 (Machine one-to-three automatic production system)

Smart production line (walking axis)

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



Complete service

- Single window process
- Professional team
- Instant solution
- Quick service



A most durable and stable machining center.

A perfect demonstration for machining accuracy and ability.

A valuable vertical machining center is the result of constant creative concepts and total dedication to quality. When the ambition of pursuing perfection is incorporated into the design, the result is a perfect machine. The Hartford F1 vertical machining centers are designed and built with these concepts in mind. Over the years, Hartford engineers have spent great effort designing a unique VMC that is cost-effective for our customers.



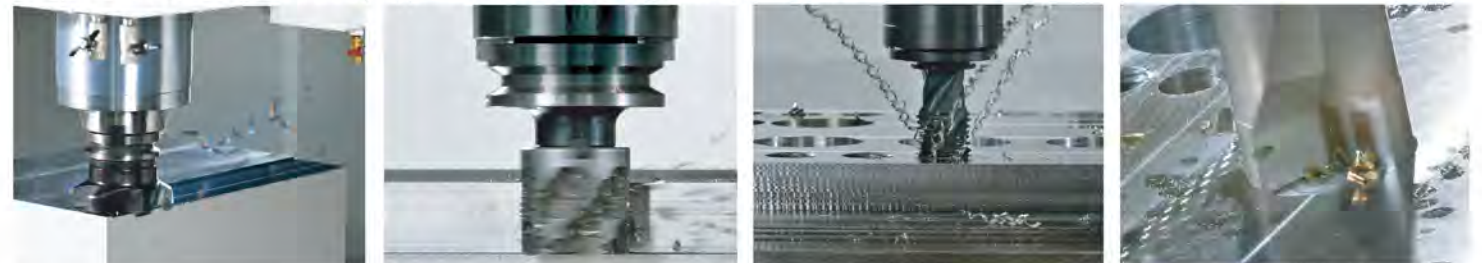
1. Bicycle

2. Auto industry- connecting rod

Actual cutting tests

Model : LG -800

■ Spindle : 8,000 rpm Pulley type 11kW ■ Cutting material : S45C



Face milling

Tool diameter Ø80 mm
Feed rate 1,800 mm/min
Cutting depth 2 mm
Cutting width 60 mm
Cutting volume 216 cc/min

End milling

Tool diameter Ø50 mm
Feed rate 2,600mm/min
Cutting depth 30 mm
Cutting width 2 mm
Cutting volume 156 cc/min

Tapping

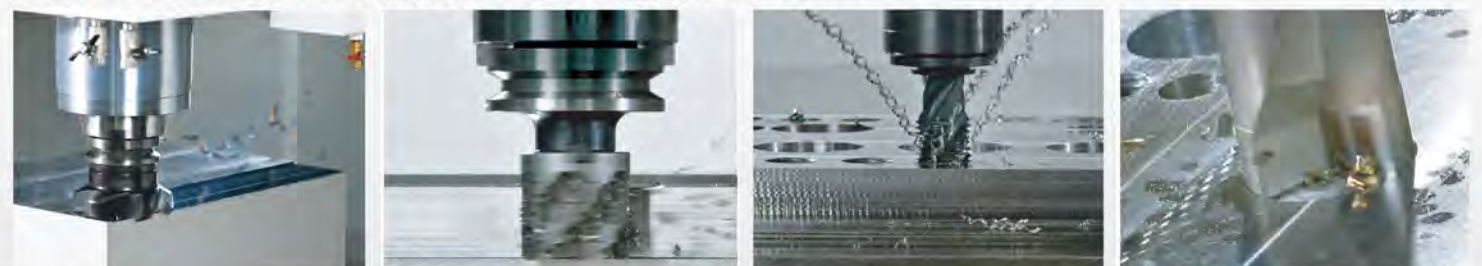
Tool diameter Ø20 mm
Feed rate 508 mm/min
Cutting depth 25 mm
Spindle load 90%

Drilling

Tool diameter Ø18 mm
Feed rate 177 mm/min
Cutting depth 30 mm

Model : LG-1570

■ Spindle : 12,000 rpm Pulley type 11kW ■ Cutting material : S45C



Face milling

Tool diameter Ø80 mm
Feed rate 1,000 mm/min
Cutting depth 3 mm
Cutting width 65 mm
Cutting volume 195cc/min

End milling

Tool diameter Ø63 mm
Feed rate 3500mm/min
Cutting depth 30 mm
Cutting width 2 mm
Cutting volume 210cc/min

Tapping

Tool diameter Ø20 mm
Feed rate 750 mm/min
Cutting depth 20 mm
Spindle load 95%

Drilling

Tool diameter Ø17.5 mm
Feed rate 800 mm/min
Cutting depth 30 mm

All the 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 form those shown in this catalogue.

The very first step for fully intelligent machining.

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



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.

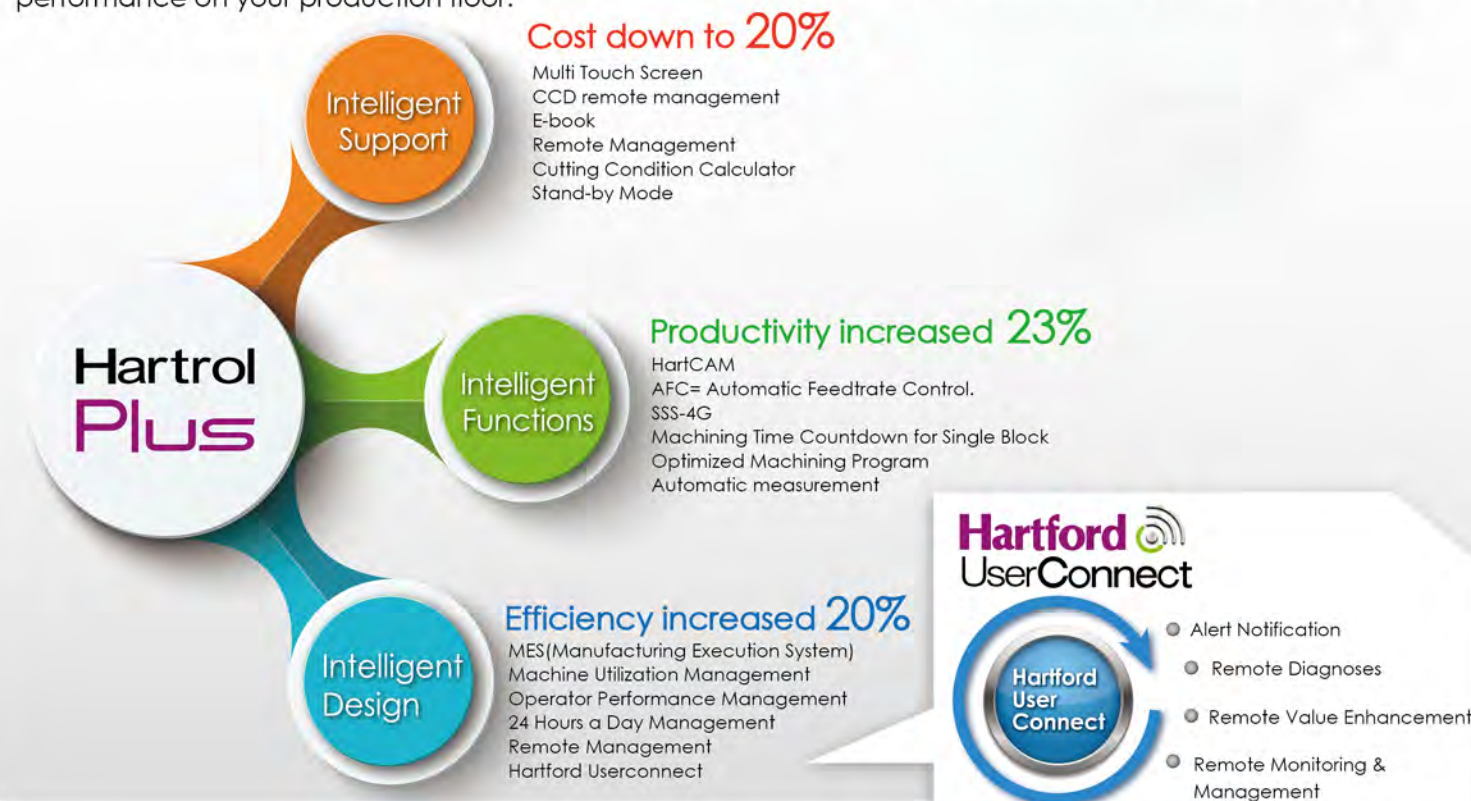


The Intelligent Controller You Should Have

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.



Hartford smartcenter APP

set and inspect	ZDT	NCcode Analysis	Machining Time Estimation	Machining Path Simulation	Utilization Statics	Machining Condition Computing
Spindle Loading Monitor	AFC	Message Board	Tool Magazine	Calculator	Online E-books	File Transfer
Spindle Bearing Diagnosis	HartCAM	CCD	Automatic Door	Broken Tool Detection System	Integrated Information Monitor Screen	User connect
Z-direction Thermal Compensation	Spindle Collision Protection G Sensor	CTS Leakage Detect	i-Factory	Idling Stop	Remote Desk Connection	Account Management

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.



On line update

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

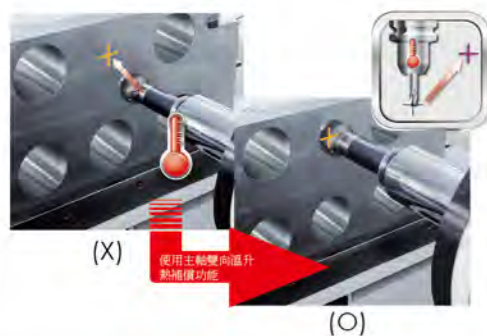
- 24hr ➡ Live updating , no boundary no time zone difference.
- NEW ➡ Synchronize with Hartford for the latest information and functions.
- Easy ➡ One key updating, easy and fast !

The Hartrol plus NC version must be A6 or above

On line intelligent remote system.

Integrate 4 major intelligent functions: remote booting warning, controller monitoring, CCD live feeding, auto alarm noticing. Save your time and efficiently increase the connivance of machine operating.

- Increase production efficiency and profit.
- Time saving and better productivity
- Prevent the machine damaging by on time operation monitoring.



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



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



Set & Inspect(opt.)

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—

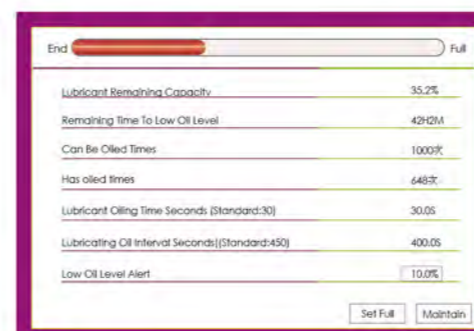
1. Ease of use
2. Check parts status clearly
3. Eliminating unexpected down time
4. Instand notification to your machine and your portable device



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

Highlights

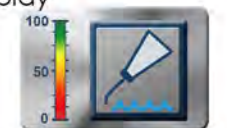
1. APP Vibration function is handy to set up manually.
2. Alert status on crash protection.
3. Responsive graphic is available for diagnosis by user, and analytic information is just-in-time served.



Lubricator detector is a new function

Ensuring your machine working smoothly.

- Lubricant remaining capacity on display
- Reminder time to low oil level on display
- Pumping times on display



Hartford F1-the Ultimate VMC (LG-500/800/1000)

The Brand of Highest Efficiency for Electrical Industries (LG-1370/1570)

One of the important elements that determines a machining center's accuracy and capability is structural rigidity. LG series was designed according to the principles of FEA

Offering more unique features than any other competitive machine, providing superior value in speed, accuracy and stability.



Full range of linear guideway five-year warranty:

Warranty coverage will not apply under following conditions

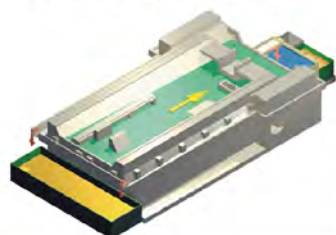
1. Improper operation (collision)
2. Lack of regular cleaning of accumulated debris causing damage to the linear rails & carriages.



The picture shows LG-1370

One-piece bed design

- The bed is one-piece design.
- The column is wider.
- Prevents twisting and distortion under even the most severe cutting forces.
- The fine grain Meehanite cast iron contributes to unparalleled damping characteristics.



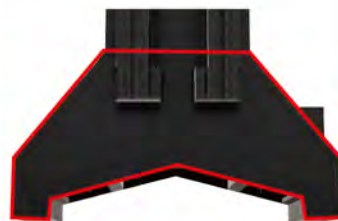
Excellent tool change time

- LG-500 minimum tool change time **1.18** sec (tool-to-tool)
- LG-800/1000 minimum tool change time **1.38** sec (tool-to-tool).



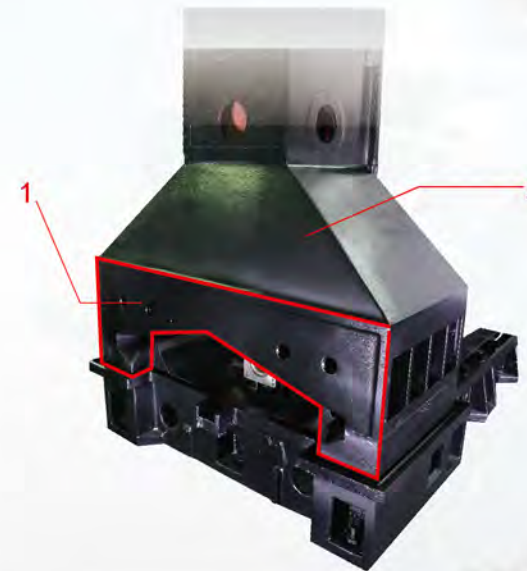
Oversized column design

- Increased width of the interface between the column and base.
- Enhances machine stability
- Increases machine rigidity and efficiency.



High accuracy linear guideway design

- The line guideways on all 3-axes are high grade, providing stability for heavy cutting.
- High efficiency machining center.
- Maximum rapid traverse rate of **30,000** mm/min.



1 Extra large interference between column and base

- Increases column rigidity in X-axis direction.
- The extension of the column base increases rigidity in Y and Z axes.

2 Column rear-inclination design

- Reduces unnecessary mass.
- Shifts the center of gravity forwards.
- Increases the damping effect in the Y-axis direction.



3-axis direct transmission between servo motor and ballscrew

- High torque servo motors are directly coupled with ballscrews.
- Without backlash or servo lag problem caused by a belt.
- All ballscrews are center-supported plus both ends utilize precision angular contact bearings.
- Boosts machining efficiency and reliability.

Machine Specifications

Model	Unit	LG-500	LG-800	LG-1000	LG-1370	LG-1570
Table						
Working Surface	mm	620 x 420	950 x 510	1150 x 510	1400 x 650	1600 x 650
T-slot (Size x Number x Pitch)	mm	18 x 3 x 130	18 x 3 x 160	18 x 3 x 160	18 x 5 x 125	18 x 5 x 125
Max Table Load	kg	300	500	700	1000	1000
Travel						
X-axis travel	mm	520	800	1000	1300	1500
Y-axis travel	mm	420	510	510	700	700
Z-axis travel	mm	450	630	630	650	650
Distance From Spindle End to Table Center	mm	100~550	100~730	100~730	150~800 (350~1000 opt.)	150~800 (350~1000 opt.)
Distance From Spindle Center to Column	mm	460	562.5	562.5	720	720
Spindle						
Spindle Speed (Pulley)	rpm	8000(10000 / 12000 opt.)	8000(10000/12000 opt.)	8000(10000/12000 opt.)	8000(10000/12000 opt.)	8000(10000/12000 opt.)
Spindle Speed (DDS)	rpm	10000(12000 opt.)	10000(12000/15000 opt.)	10000(12000/15000 opt.)	10000(12000/15000 opt.)	10000(12000/15000 opt.)
Spindle Nose Tape	rpm	#40	#40	#40	#40	#40
Feed						
Cutting Feedrate (X/Y/ Z Axes)	m / min	10 / 10 / 10	12 / 12 / 12	12 / 12 / 12	15 / 15 / 15	15 / 15 / 15
Rapid Traverse (X/Y/ Z Axes)	m / min	30/30/24 (40/40/32)	30/30/24 (40/40/30)	30/30/24 (40/40/30)	30/30/24 (40/40/30)	30/30/24 (40/40/30)
ATC						
Tool Storage Capacity	pcs	A:24	A:24 / 30	A:24 / 30	A : 24 / 30 / 40	A : 24 / 30 / 40
Max. Tool Weight	kg	7	7	7	7	7
Max. Tool Size (Diameter x Length)	mm	A : Ø80x200L	A : Ø75 x 300L	A: Ø75 x 300L	A : Ø 75 x 300L	A: Ø 75 x 300L
Tool Shank		BT40 (BBT / CAT / DIN)	BT40(BBT/CAT/DIN)	BT40(BBT/CAT/DIN)	BT40(BBT/CAT/DIN)	BT40(BBT/CAT/DIN)
Pull Stud Bolt		P40T-1/CAT-40/DIN69872	P40T-1/CAT-40/DIN69872	P40T-1/CAT-40/DIN69872	P40T-1/CAT-40/DIN69872	P40T-1/CAT-40/DIN69872
Motor						
Spindle Drive Motor (30min/Con) kW		5.5	7.5 (11 opt.)	7.5 (11 opt.)	11(15)	11(15)
Positioning Accuracy						
3 axes laser positioning accuracy (JIS B6338)						
Positioning accuracy/Full travel	mm	±0.008	±0.008	±0.008	±0.008	±0.008
Repetitive positioning accuracy	mm	±0.002	±0.002	±0.002	±0.003	±0.003
3 axes laser positioning accuracy (VDI 3441)/ Repeated 5 times						
Positioning accuracy	mm	0.010	0.010	0.010	0.014	0.014
Repetitive positioning accuracy	mm	0.006	0.006	0.006	0.008	0.008
Other						
Required Air Pressure	kg/cm ²	6.5	6.5	6.5	6.5	6.5
Electric Power Consumption	KVA	15	20	20	20	20
Floor Space(Full Guarding)	mm	2150 x 2155	2960 x 2470	3500 x 2470	3900 x 2935	4350 x 2935
Net Weight	kg	3330	A:4300 (4270 opt.)	A:4530 (S:4410 opt.)	8300	9000
Coolant tank(Standard)	L	237	279	306	304	316

Standard & Optional Electrical Function

Hartrol / Standard

- Workpiece calibration by MPG directly
- Parameter package
- Thread cutting(0i& 31i only)
- Tool magazine display(0i&31i only)
- Tool status display((0i&31i only)
- Special engraving 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 splash guard(CTS)
- Coolant tank
- Automatic lubrication system
- Air blast through spindle
- Operation manual & electric drawing
- Leveling bolts & blocks
- Spindle air curtain
- MPG
- Automatic power off
- Operation finish lamp x 1
- Fluorescent lamp x 1
- Coolant jets around spindle
- #40 8000rpm spindle
- #40 One-piece design on spindle housing

Optional

- Full enclosed splash guard(CTS)
- NC rotary table
- Front mounted screw type chip conveyor
- Link type chip conveyor
- Coolant flushing device
- Coolant through spindle
- Wash down hose
- Air gun
- Spindle oil cooler
- Oil separation system
- Automatic door

VDI 3441 accuracy available upon order request.

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