

Intelligent Machining Center

PRO Series Smartcenter

- Hartrol plus controller
- 5-year warranty on guideways
- Oversized column design
- Oil separation system design
- #40 one-piece spindle housing design

Hartrol Plus®
From tradition to intelligent



Website



Facebook



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Hartford

Hartrol · Smartcenter · Robocell

We manufacture intelligent machines only

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



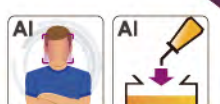
ZDT

- + 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

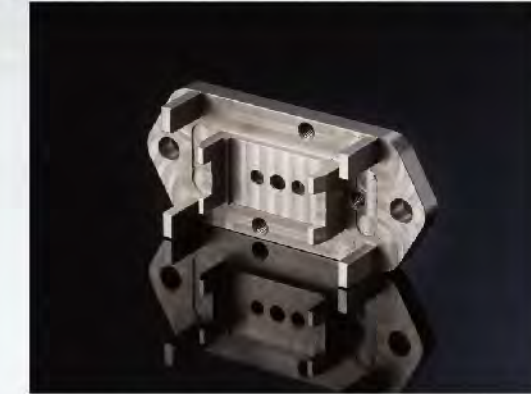
Increase Cutting Efficiency

A perfect demonstration for machining accuracy and ability.

Hartford Power Center is a compactly constructed package that combine greater cutting capabilities, critical accuracy and zero-defect features.



1. Oil pressure valve



2. Inspection jig part



3. Connecting rod

Actual Cutting Test

Model: PRO-1000

■ Spindle: 6,000 rpm Gear type, 11kW ■ Cutting material : S45C



Face milling

Tool diameter Ø80 mm
Feed rate 2,200 mm/min
Cutting depth 2 mm
Cutting volume 65 mm



End milling

Tool diameter Ø50 mm
Feed rate 1,100 mm/min
Cutting depth 10 mm
Cutting width 20 mm
Cutting volume 220 cc/min



Tapping

Tool diameter Ø30 mm
Feed rate 600 mm/min
Cutting depth 30 mm



Drilling

Tool diameter Ø50 mm
Feed rate 76 mm/min
Cutting depth 30 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 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 contorols 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.

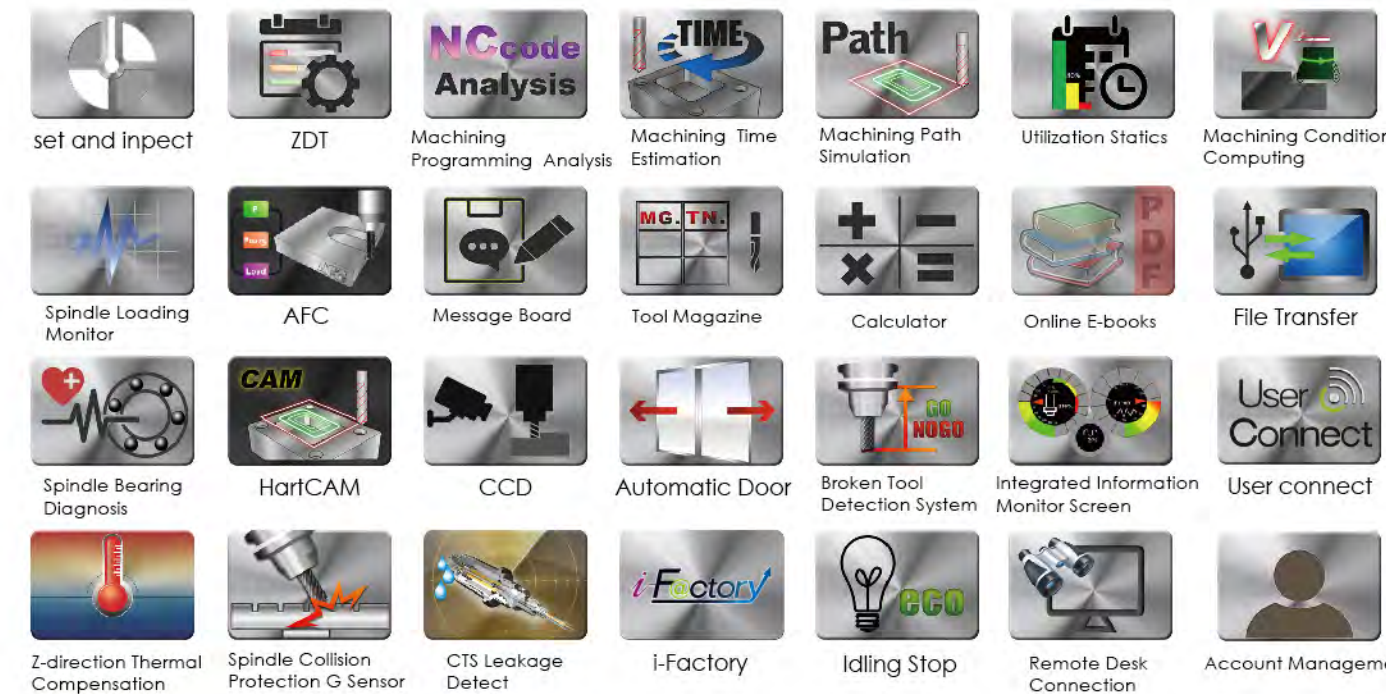


Hartford APP Store

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.

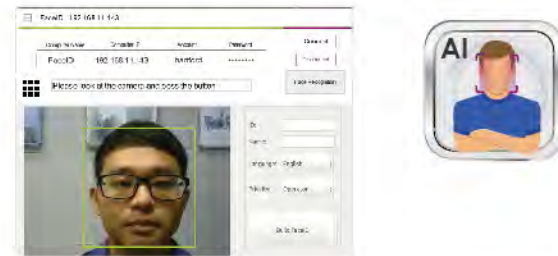
AI Environment Thermal Displacement Compensation(opt.)

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 !



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(opt.)

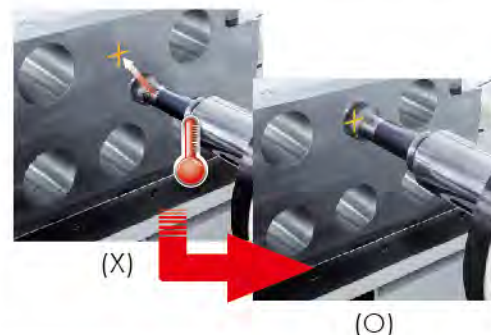
Highlights
1. APP Vibration function is handy to set up manually.
2. Alert status on crash protection.
3. Responsive graphic is available for diagnosis by user, and analytic information is just-in-time served.



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



Optimum Structure for Power Center

With unique structure and features , Hartford Power Center is right the machine
Which can boost your efficiency.



The picture shown is PRO-1000



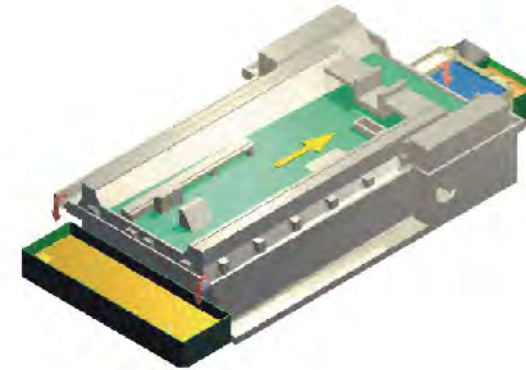
Full range of linear guideway five-year warranty

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.

Oil /fluid separation device

- Extend the life of cutting fluid.
- Cost reduction.
- Eco-friendly.
- Available with PRO-1000.



Increased and widen fastening surface on base

- Increase machine rigidity.
- The width of column base is 1,000mm.
- Increase structure rigidity.
- Machining range is :
1,000x600x630mm (PRO-1000)
- Increased and widen fastening contact surface on base increase machine stability.



#40 one-piece spindle housing design

- Increase machine rigidity and cutting performance.
- Reducing weight to reduce acceleration stresses and increase positional accuracy.
- Provide additional support for the spindle to absorb the cutting forces.
- Unavailable with PRO-1000 G8K.



Z-axis direct transmission between servo motor and ballscrew

- With out backlash or servo lag problem caused by a belt.
- High torque servo motors are directly coupled with ballscrews.
- Boosts machining efficiency and reliability.



Spindles Manufactured by Hartford Offer Quality Assurance

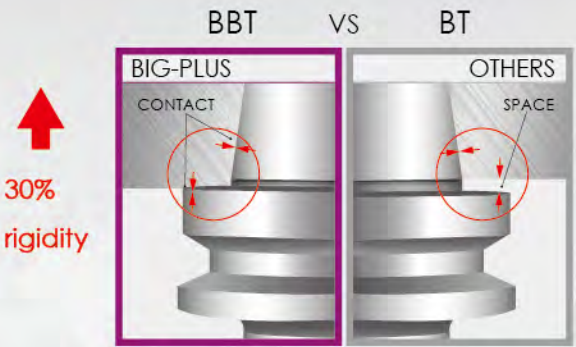
Machine Dimension

Spindle type

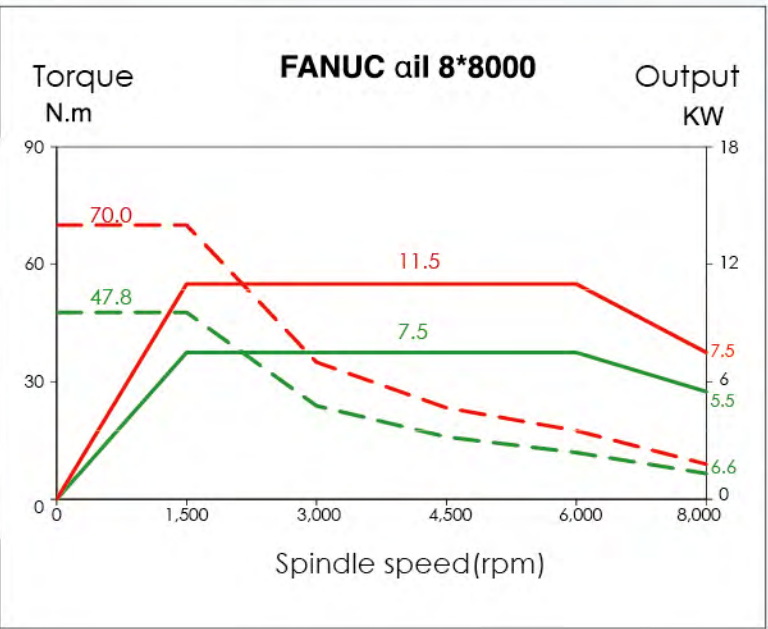
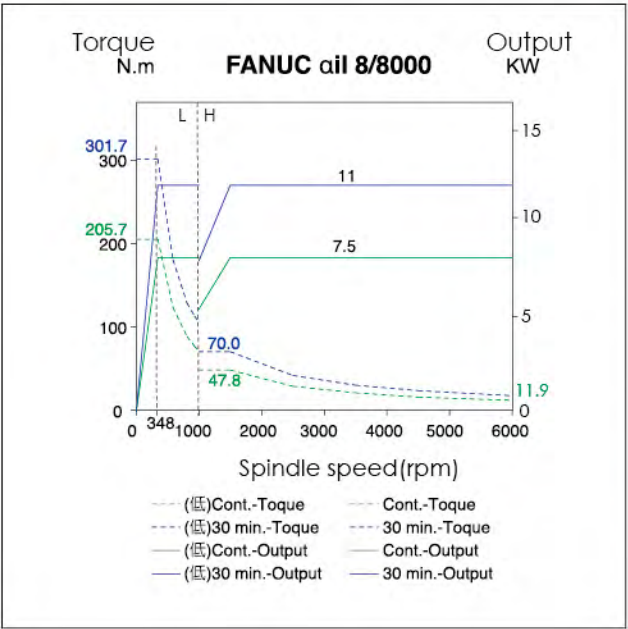
- #40 Pulley 8000rpm opt. 10000 rpm
- #40 Gear opt. 6,000/8000(PRO-1000) rpm

BBT Option

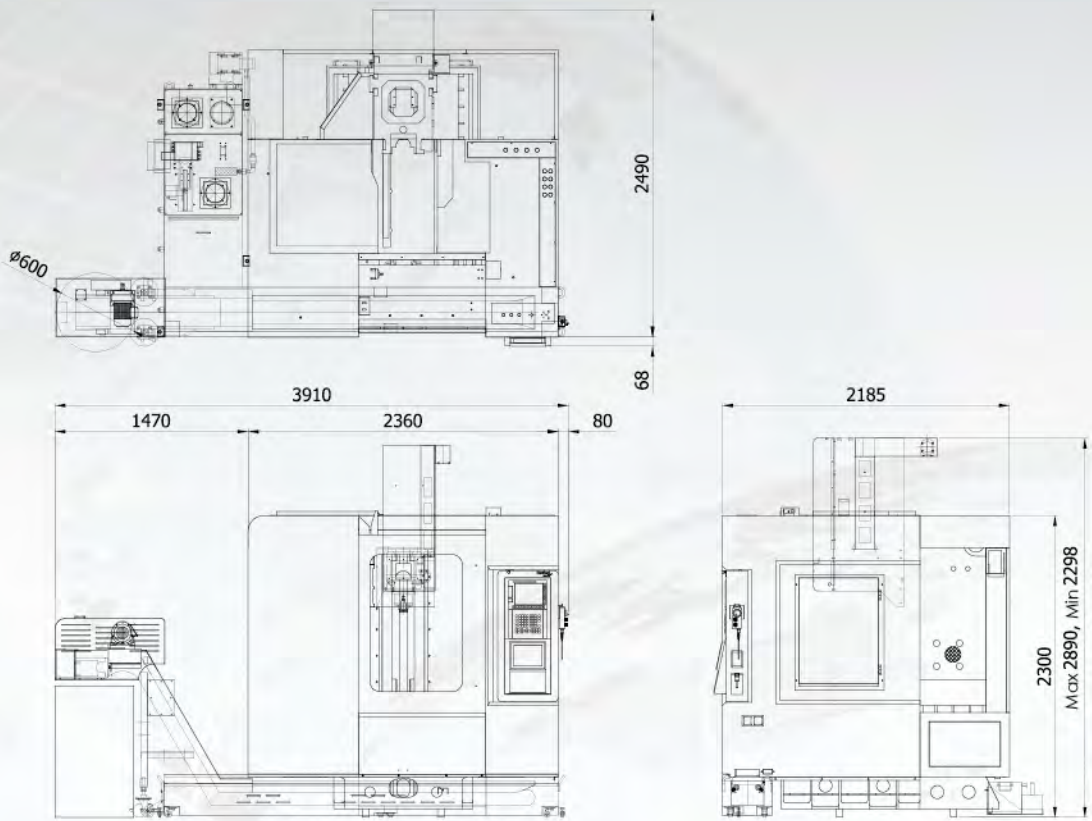
- Dual contact between the taper and the flange.
- Improves the rigidity, accuracy, speed and performance.
- Radial deflection, vibration and deviation are significantly reduced.



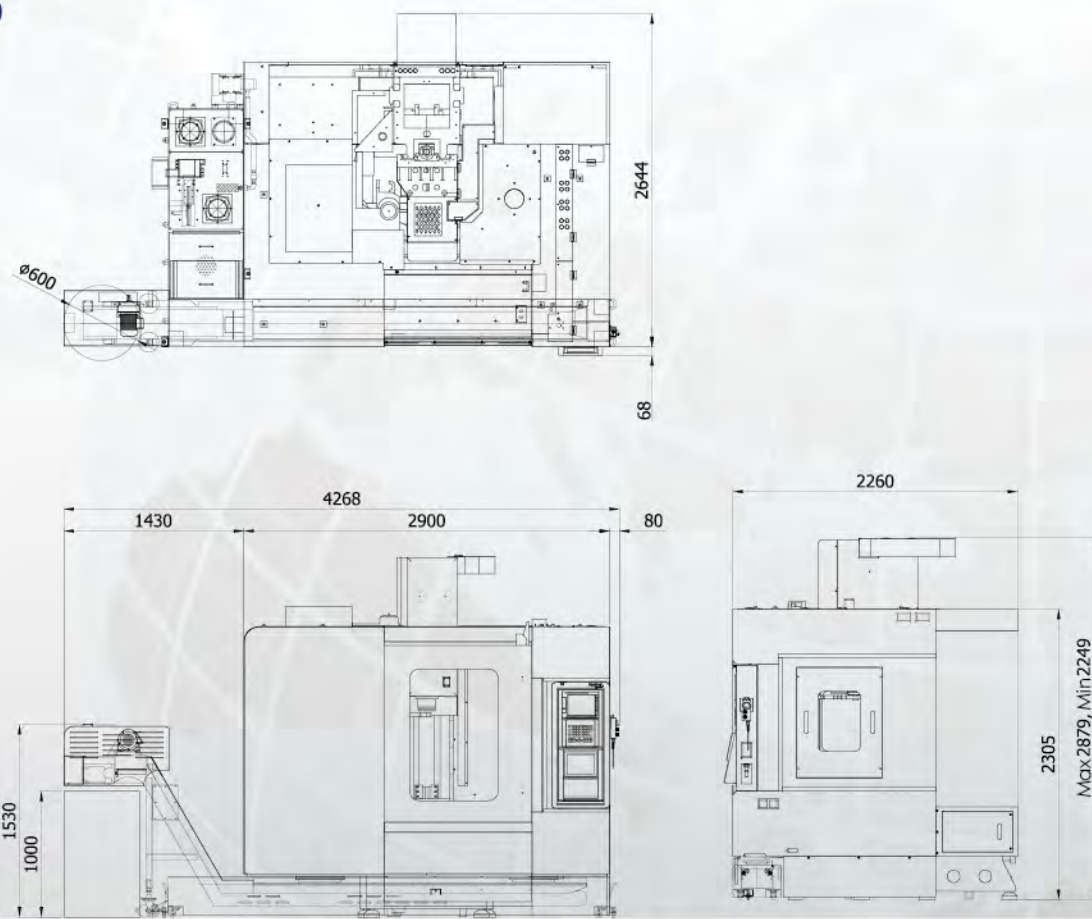
Spindle diagrams



PRO-800



PRO-1000



Specification

Model	unit	PRO-800	PRO-1000
Table			
Working Surface	mm	900 x 470	1150 x 600
T-slot (Size x Number x Pitch)	mm	18 x 4 x 100	18 x 5 x 120
Max Table Load	kg	500	700
Travel			
Longitudinal Travel (X-axis)	mm	800	1000
Gross Travel (Y-axis)	mm	510	600
Vertical Travel (Z-axis)	mm	630	630
Distance From Spindle End to Table Center	mm	75 ~ 705	100 ~ 730
Distance From Spindle Center to Column	mm	550	650
Spindle			
Spindle Speed(Pulley)	rpm	8000(10000 opt.)	8000(10000 opt.)
Spindle Speed (Gear)	rpm	6000 opt.	6000(8000 opt.)
Spindle Nose Tape	rpm	#40	#40
Feed			
Cutting feedrate (X, Y, Z Axes)	m/min	12 / 12 / 12	12 / 12 / 12
Rapid Traverse feedrate (X, Y, Z Axes)	m/min	24 / 24 / 20	20 / 20 / 20
ATC			
Tool Storage Capacity	pcs	A:24/30	S:16 A:24/30
Max. Tool Weight	kg	24PCS : 6kg 30PCS : 7kg	16/24PCS : 6kg 30PCS : 7kg
Max. Tool Size (Diameter x Length)	mm	A: Ø75 x 300L	A: Ø75 x 300L (S: Ø90 x 250L opt.)
Tool Shank		BT40(BBT/CAT/DIN)	BT40(BBT/CAT/DIN)
Pull Stud Bolt		P40T-1/CAT-40/DIN69872	P40T-1/CAT-40/DIN69872
Motor			
Spindle Drive Motor (Cont/30min)	kW	7.5 (11 opt.)	7.5 (11 opt.)
Positioning Accuracy			
3 axes laser positioning accuracy (JIS B6338)			
Positioning accuracy/Full travel	mm	±0.010	±0.010
Repetitive positioning accuracy	mm	±0.003	±0.003
3 axes laser positioning accuracy (VDI 3441) / Repeated 5 times			
Positioning accuracy	mm	0.022	0.022
Repetitive positioning accuracy	mm	0.01	0.01
Other			
Required Air Pressure	kg/cm ²	6.5	6.5
Electric Power Consumption	KVA	15~25	15~30
Floor Space(Full Guarding)	mm	2360 x 2490 x 2890	2900 x 2570 x 2865
Net Weight	kg	A: 5600	S:6500 A: 6700
Collant tank(Standard)	L	279	306

Accessories

Standard : ● Optional : ★

Item	modle	PRO-800	PRO-1000
1.Full-Enclosed Splash Guard		●	●
2.Full-Enclosed Splash Guard & top cover		★	★
3.Cooling System		●	●
4.Coolant Jets Around Spindle		●	●
5.Spindle Air Curtain		●	●
6.Air Blast Through Spindle		●	●
7.Table side air blast		●	●
8.Lubrication System		●	●
9.Fluorescent Lamp x1		●	●
10.Fluorescent Lamp x2		★	★
11.Leveling Bolts And Blocks		●	●
12.NC Rotary Table		★	★
13.Spindle Oil Cooler(Pulley 8000RPM)		★	★
14.Spindle Oil Cooler(Gear type & Pulley 10000RPM)		●	●
15.Coolant Tank with chip bucket		●	●
16.Link type chip conveyor & portable chip bucket		★	★
17.Front mounted chip conveyor		★	★
18.Oil Skimmer		★	★
19.Coolant Through Spindle		★	★
20.Coolant Through Spindle-20BAR		★	★
21.Coolant Through Spindle-20BAR		★	★
22.Coolant Flushing Device		★	★
23.Coolant Gun		★	★
24.Air Gun		★	★
25.Tool package		●	●
26.Individual machine manual x1		●	●
27.Individual machine manual x2		★	★
28.Individual machine manual x3		★	★
29.RS-232 Interface		●	●
30.Auto Power Off		●	●
31.DNC Software		★	★
32.Operation Finish Lamp		●	●

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

VDI 3441 accuracy available upon order request.

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