Hartford

Hartrol · Smartcenter · Robocell

We manufacture intelligent machines only

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Hartford

EXCLUSIVE HartrolPlus APP

Intelligent Machining Center

S Series

Smartcenter

- Hartrol plus controller
- 5-Year warranty on guideways
- Excellent tool change time
- Oversized column design

Hartrol Plus®

From tradition to intelligent

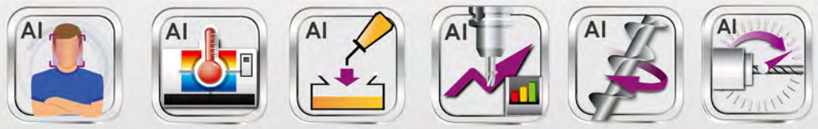
A.I. Applications inside, Hartrol Plus is the control which provides machining status with advanced features.

Imagine what future machines ought to be outlined.

AiSm@rtcontrol

Hartford
redefine the future

Major functions of Hartford AI controller



IoT 1
+ Remote Warm-up & Turn-on
+ Hartrol Plus Sync & Update
+ User Connect

Thermal stability solution 2
+ Spindle Thermal Compensation
+ Casting Thermal Compensation
+ Thermal Symmetry / Thermal Balancing

ZDT 3
+ Diagnosis Report on Spindle Operation
+ Alarm Report System

AI 4
+ Facial Recognition System
+ AI Efficient Lubrication Management
+ Smart Efficient Chip Collection

With more intelligent function equals to closer automation.

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

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 pursing perfection is incorporated into the design, the result is a perfect machine. The Hartford S 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 Gear

2.Water Bottle Cage for Bicycle

Actual cutting tests

Model : S8

■ Spindle : 8,000 rpm Pulley type 7.5kW ■ 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	216cc/min

End milling

Tool diameter	Ø63 mm
Feed rate	3,300mm/min
Cutting depth	30 mm
Cutting width	2 mm
Cutting volume	198 cc/min

Tapping

Tool diameter	M20 mm
Feed rate	508 mm/min
Cutting depth	25 mm
Spindle load	72%

Drilling

Tool diameter	Ø18 mm
Feed rate	200 mm/min
Cutting depth	30 mm
Spindle load	46%

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.

Detailed specifications please contact our sales staff

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 :

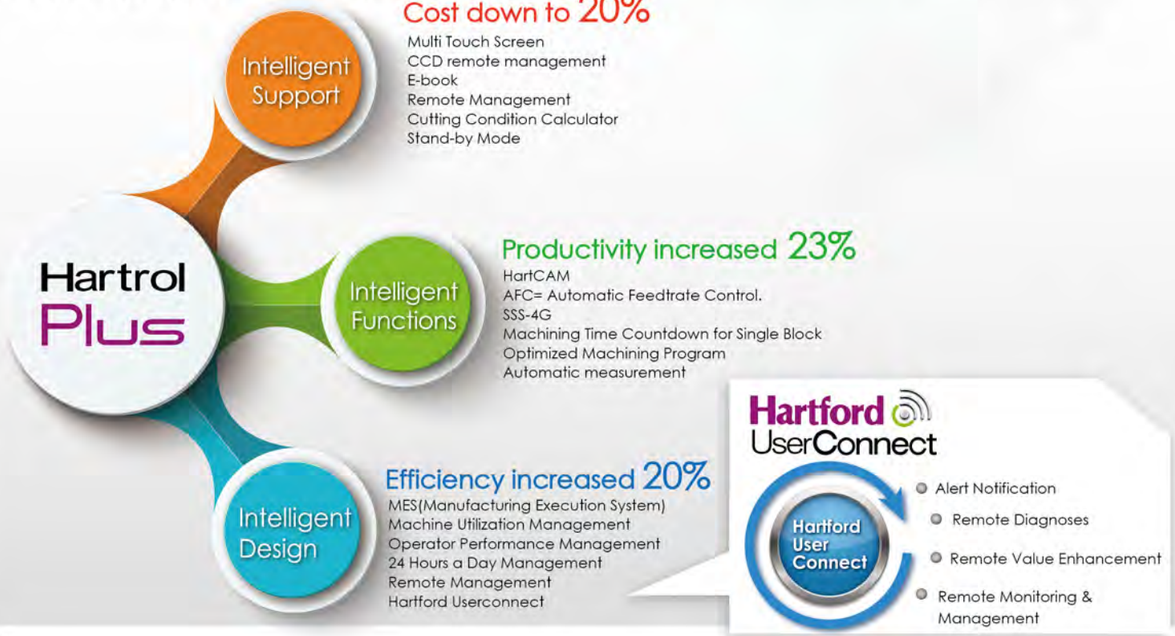
1. Internet connection, collect and analyze data, monitoring by portable device
2. Intelligent control: Auto revise human error and operating basis
3. Real time update new APPs

The difference between Hartrol plus and others

Function	Hartrol Plus P3	Others
Screen Size	15"Multi-touch Panel	10.4" (OPT:15")
Look Ahead Block	1350	400
Hard Drive	64GB 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%s

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

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 protable device

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

Hightlights

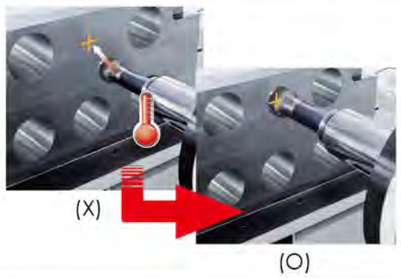
1. APP Vibration function is handy to set up manually.
2. Alert status on crash protection.
3. Responsive graphic is available for diagnosis by user, and analytic information is just-in-time served.

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!!

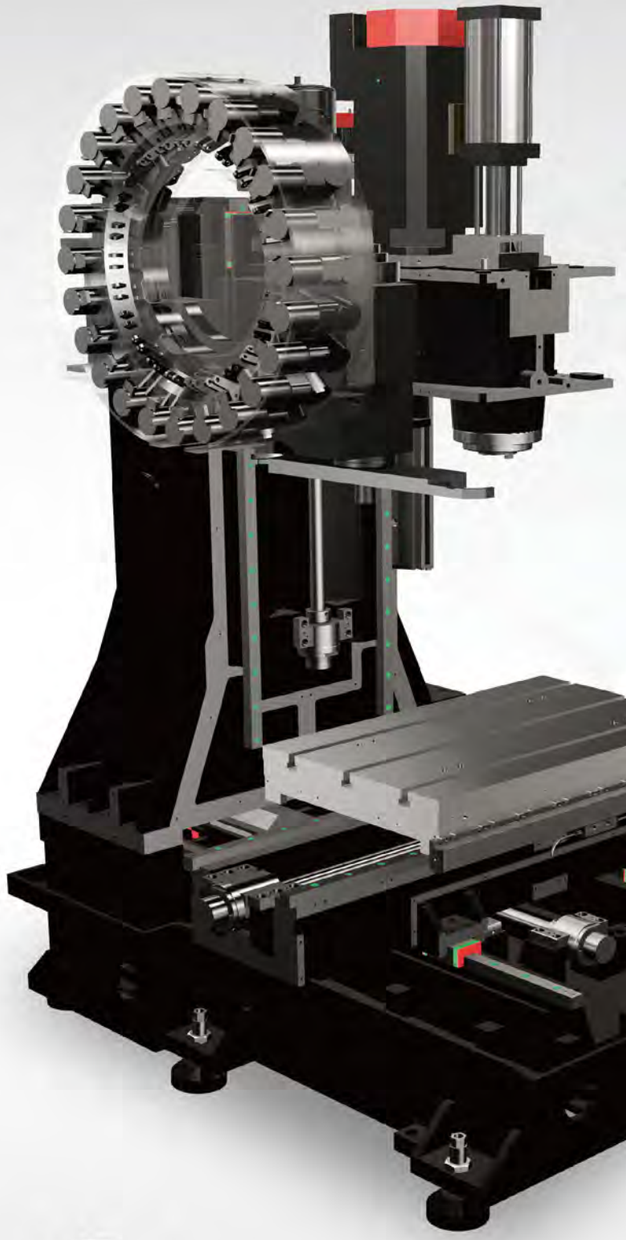
- Machine with compensation

#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

Tough, rugged and durable for S series



Hartford S series the Ultimate VMC

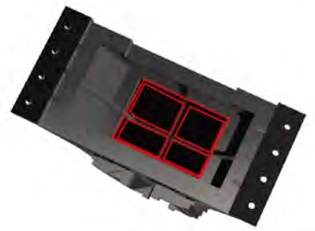
One of the important elements that determines a machining center's accuracy and capability is structural rigidity.
S8 series was designed according to the principles of FEA. Optimal rigid design construction assures stability, deformation-free precision year after year.

A Rigid Platform

The soundness of the structure is determined by the sturdiness of the foundation. The same principle applies to vertical machining centers. It all starts with the base and column structures. How well the machine cuts is tied to the sturdiness of the basic structure.

Stable structure

Our castings are reinforced with heavy ribs to resist flex and damp vibrations, and they're thoroughly inspected before and after machining to ensure they are free of flaws.



Anti-Flex, Reinforced Base & Column Castings

Our castings are reinforced with heavy ribs to resist flex and damp vibrations, and they're thoroughly inspected before and after machining to ensure they are free of flaws.

High pressure nozzle (opt.)

Hartford S8 are available with an optional High pressure nozzle that efficacious removes chips from the enclosure and conveniently discharges them of the machine.

High-Speed Side-Mount Tool Changer (opt.)

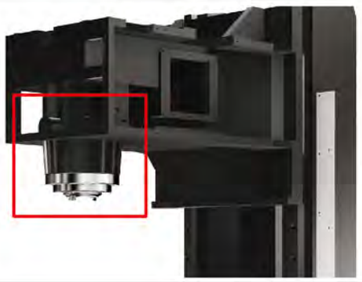
S8 minimum tool change time
1.38 sec (tool-to-tool)

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.

One- piece design for spindle housing and casting iron

- Increases rigidity and cutting performance.
- Reducing weight to reduce acceleration stresses and increase positional accuracy.
- The structural of the head has been adjusted.
- Provide additional support for the spindle to absorb the cutting forces.



5-Year Warranty

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.

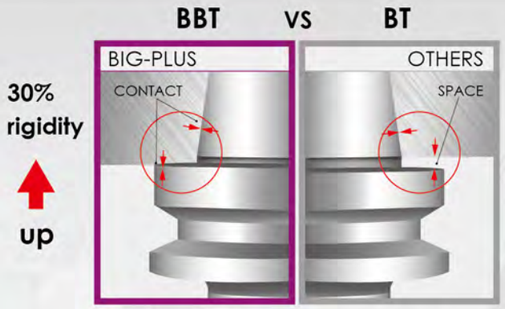
Spindles Manafactured by Hartford
OfferQuality Assurance

Spindle type

- #40 Pulley 8000rpm opt. 10000 rpm
- #40 DDS opt. 10000 rpm

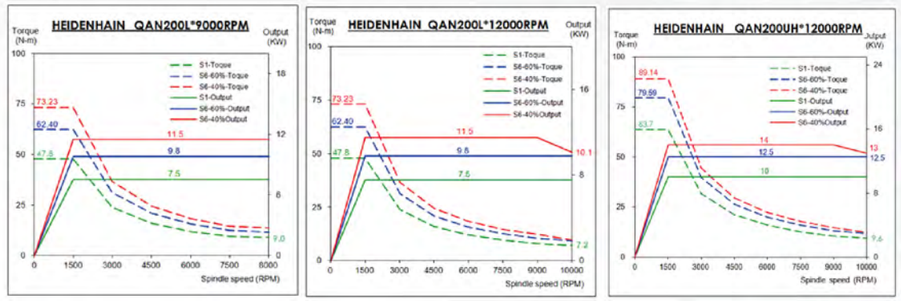
BBT for optional

- Dual contact between the taper and theflange.
- Improves the rigidity, accuracy, speed and performance. Radial deflection, vibration and deviationare significantly reduced.

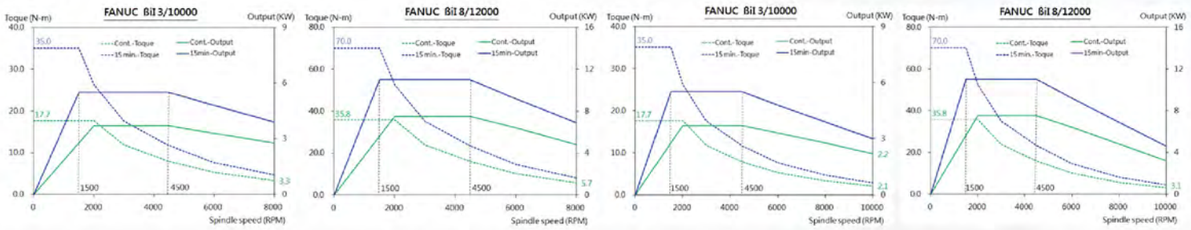


Spindle torque diagrams

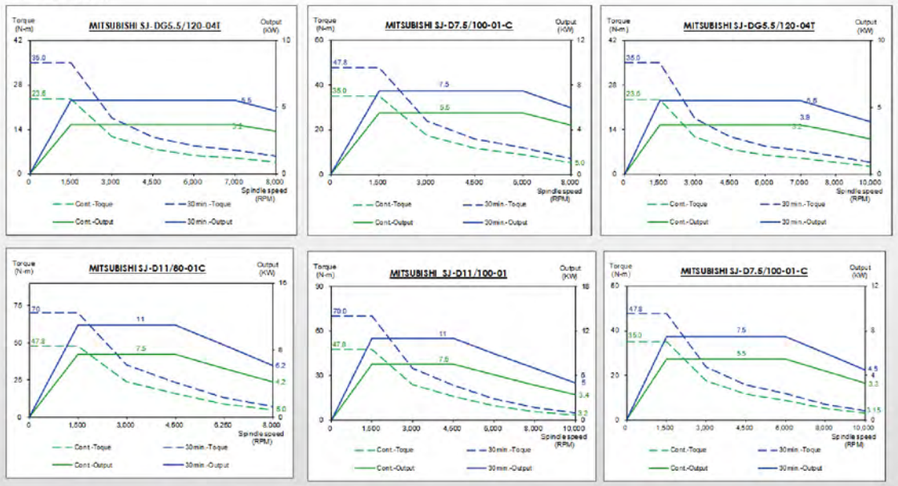
HEIDENHAIN



Fanuc

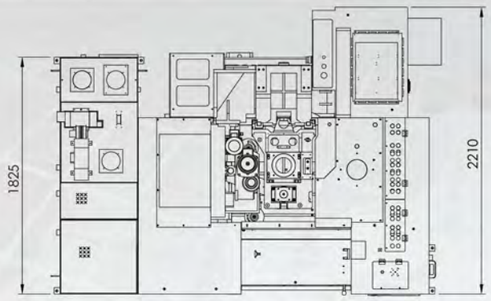


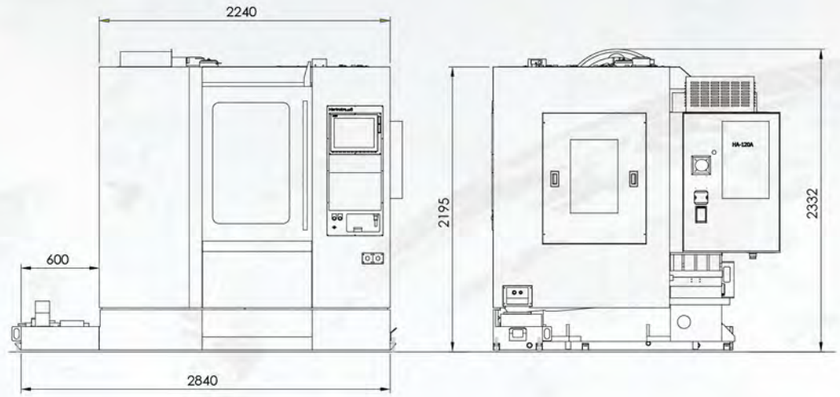
Mitsubishi



Machine Dimensions

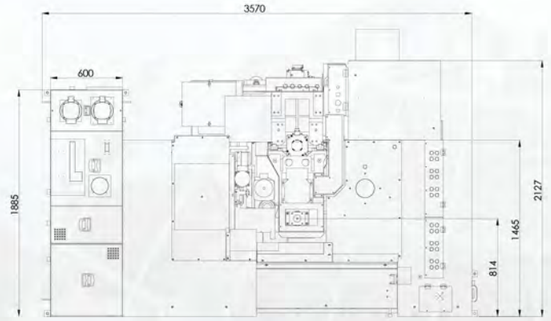
S8

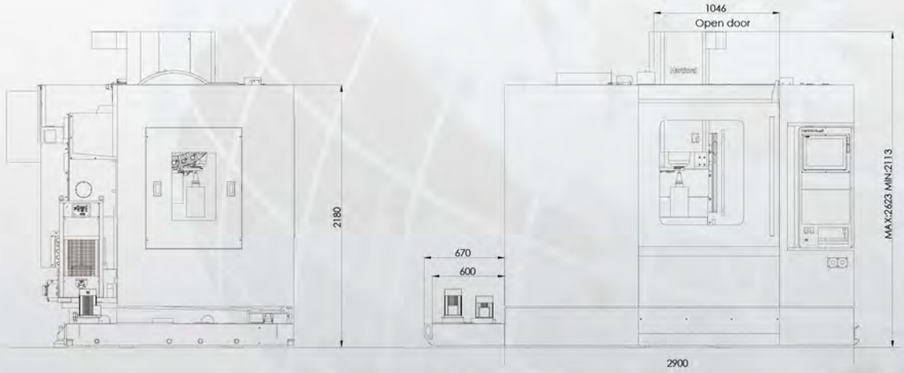




Unit:mm

S10





Machine Specifications

Model		unit	S8	S10
Table	Working Surface	mm	800 x 500	1150 x 510
	T-slot (Size x Number x Pitch)	mm	18 x 3 x 160	18 x 3 x 160
	Max Table Load	kg	450	600
Travel	Longitudinal travel (X-axis)	mm	700	1000
	Cross travel (Y-axis)	mm	420	510
	Vertical travel (Z-axis)	mm	510	510
	Distance From Spindle End to Table Center	mm	100~610	100~610
	Distance From Spindle Center to Column	mm	530	590
Spindle	Spindle Nose Tape		ISO40	ISO40
	Spindle Speed (Pulley)	rpm	8000(10000 opt.)	8000(10000 opt.)
	Spindle Speed (DDS)	rpm	10000	10000
Feed	Cutting feedrate (X / Y / Z Axes)	m/min	12/12/12	12/12/12
	Rapid Traverse feedrate (X / Y / Z Axes)	m/min	30 / 30 / 24	30 / 30 / 24
ATC	Tool Storage Capacity (A type)	pcs	24(30 opt.)	24(30 opt.)
	Max. Tool Weight	kg	7	7
	Max. Tool Size (Diameter x Length)	mm	ø75 x 300L	ø75 x 300L
	Tool selection		A type	A type
	Tool change time (A type)	sec.	2.9	2.9
	Tool Shank		BT40 / CAT40 /DIN69871	BT40 / CAT40 /DIN69871
	Tool stud bolt		MAS-P40T-1/CAT40/DIN69872	MAS-P40T-1/CAT40/DIN69872
Motor	Spindle drive motor (30 min rating) MITSUBISHI	kw	7.5	7.5
	Spindle drive motor (30 min rating) FANUC	kw	11	11
	Spindle drive motor (30 min rating) HEIDENHAIN	kw	9.8	9.8
	X.Y.Z axis drive motor MITSUBISHI	kw	1.0 / 1.5 / 3	1.5 / 2 / 3
	X.Y.Z axis drive motor FANUC	kw	1.2 / 1.8 / 2.5	1.8 / 1.8 / 2.5
	X.Y.Z axis drive motor HEIDENHAIN	kw	2.18 / 2.18 / 3.1	3.5 / 5
Positioning Accuracy	3 axes laser positioning accuracy (JIS B6338)			
	Positioning accuracy/Full travel	mm	±0.008	±0.008
	Repetitive positioning accuracy	mm	±0.002	±0.002
	3 axes laser positioning accuracy (VDI 3441) / Repeated 5 times			
	Positioning accuracy	mm	0.010	0.010
	Repetitive positioning accuracy	mm	0.006	0.006
Other	Required Air Pressure	kg/cm^2	6.5	6.5
	Electric Power Consumption	kVA	10~30	10~30
	Floor Space(Full Guarding)	mm	2840 x 2210	3570 x 2127
	Net Weight	kg	3880	4500
	Coolant tank(Standard)	L	243	306

VDI 3441 accuracy available upon order request.

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

Accessories

Standard : ● Optional : ✸

Item \ Model	S8/10
1.Full-Enclosed Splash Guard	●
2.Full-enclosed splash guard & top cover	✸
3.Front Mounted Screw Type Chip Conveyor	✸
4.Link type chip conveyor & portable chip bucket	✸
5.Coolant Jets Around Spindle	✸
6.Coolant system_Coolant Pump Motor, Standard	●
7.Coolant system_Coolant Pump Motor, Upgrade	✸
8.Spray around spindle	●
9.Spindle Air Curtain	●
10.Air Blast Through Spindle-Standard tool change	●
11.Air blast through spindle-Quick Tool change	✸
12.Spindle Oil Cooler_Pulley Spindle	✸
13.Resistance System	●
14.Oil Fluid Separator	✸
15.Pulley Spindle 8000RPM	●
16.Pulley Spindle 10000 RPM	✸
17.Direct Drive Spindle 10000 RPM	✸
18.Disk Type Tool Magazine_24T	●
19.Disk Type Tool Magazine_30T	✸
20.X, Y, Z-axis ball screw enforce pressure	✸
21.Additional Column Height 100MM	✸
22.Tool Package	●
23.Foundation bolt, General	●
24.Foundation bolt, Concrete	✸
25.Coiling Tube Coolant gun	✸
26.Hydraulic Hose Coolant gun	✸
27.Air gun	✸
28.Mist coolant system	✸
29.Oil skimmer	✸
30.Oil Mist Collector System	✸
31.4th/5th axis rotary table	✸
32.X/Y/Z axis linear scale system	✸
33.Coolant Through Spindle	✸
34.Coolant Through Spindle-20BAR	✸
35.Coolant Through Spindle-25 / 40 / 70BAR	✸
36.Manual x1	●
37.Manual x 2	✸
38.DNC Software	●
39.Remote manual pulse generator	●
40.Convection Heat Exchanger in Control	●
41.Auto Power off	●
42.RS232 Interface	●
43.Fluorescent lamp x1	●
44.Fluorescent lamp x2	✸
45.Operation Finish Lamp	✸
46.Auto Tool Length Measurement	✸
47.Auto Work Piece Measurement	✸

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

Electrical Function /Optional

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