

Intelligent Machining Center

S-Plus 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



HMG

Hartrol · Smartcenter · Robocell

We manufacture intelligent machines only

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Website



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Imagine what future machines ought to be outlined.

What is Automation?

HMG
 redefine the future



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



Before machining

1. Remote warm-up/turn-on
2. Tool/Workpiece recognition system
3. HartCAM
4. MES
5. Automatic workpiece alignment (OMP40/OMP60)
6. Automatic tool length measurement
7. 2D visual identification and part loading system
8. Automatic loading and unloading parts using robot

Machining

1. Rapid workpiece changing system
2. CCD monitor
3. Automatic robot Gripper changing system
4. Whole plant automatic coolant refill and Management system
5. Automatic logistics handling (QC station, Material supply station, Secondary Machining station)
6. Tool life management
7. Machine Thermal compensation
8. AFC
9. Alarm reporting system

Machining end

1. Auto Q.C.
2. Workpiece counting function
3. Eco motor
4. The whole plant utilization rate
5. ZDT
6. On-line up-date

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



With more intelligent function equals to closer automation.

How to quickly implement automation?

HMG Robot Production Cell

HMG 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. HMG 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)

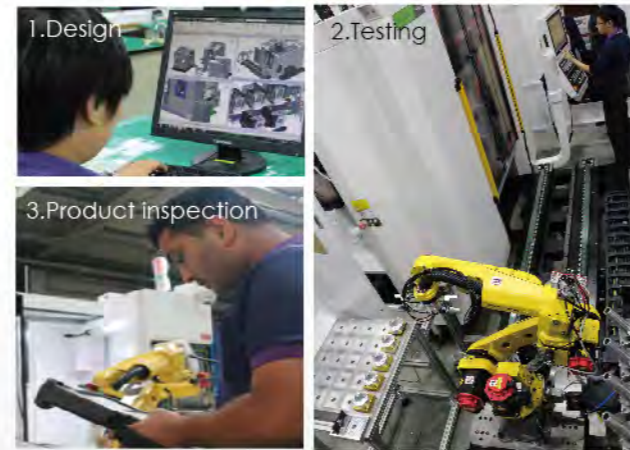
Easy to get started

HMG 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



Increased Efficiency & Greater Productivity

A perfect demonstration for machining accuracy and ability.

HMG S-Plus series is a high efficiency and productivity machining Center which can used for mass production jobs and dramatically Reduce your machining center.



1. Bicycle front fork part



3. Shock absorber for motorcycle



2. Fine dragon pillar

Actual cutting tests

Model : S-PLUS 10

■ Spindle : 10,000 rpm DDS type 11kW ■ Cutting material : S45C



Face milling

Tool diameter Ø80 mm
 Feed rate 1,500 mm/min
 Cutting depth 2 mm
 Cutting width 65mm
 Cutting volume 195cc/min



End milling

Tool diameter Ø63 mm
 Feed rate 2,240mm/min
 Cutting depth 30 mm
 Cutting width 3mm
 Cutting volume 201 cc/min



Tapping

Tool diameter Ø20 mm
 Feed rate 2,000 mm/min
 Cutting depth 25 mm



Drilling

Tool diameter Ø18 mm
 Feed rate 140mm/min
 Cutting depth 25 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 HMG electrical function together which developed and made by HMG.

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.

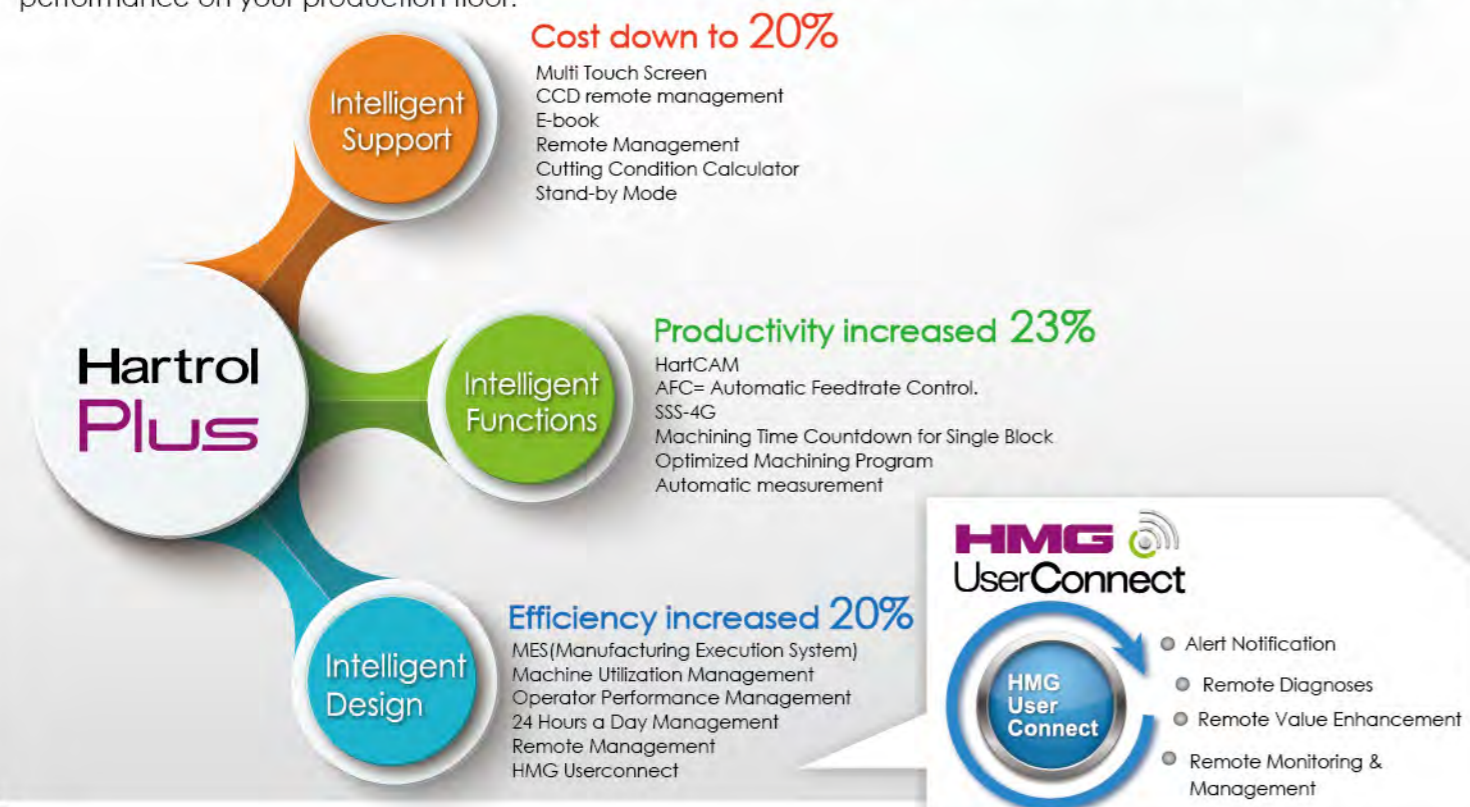


The Intelligent Controller You Should Have

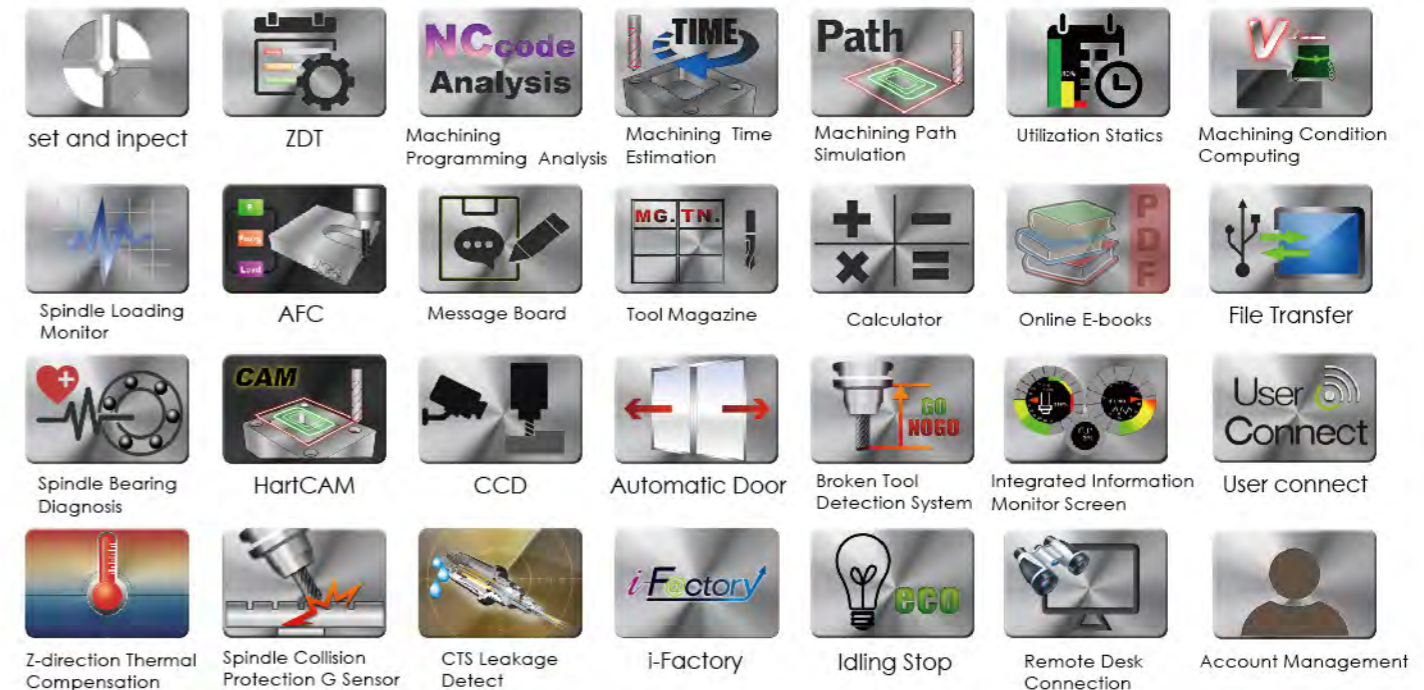
With three major solutions, Hartrol Plus takes you machining to the next level.

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.



HMG smartcenter APP



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

What HMG 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 !

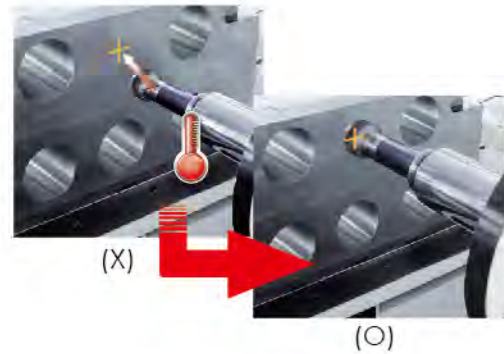
The Hartrol plus NC version must be A6 or above

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



Complete screen of the workpiece measurement



Set & Inspect(opt.)

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



HMG 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.



Lubricator detector is a new function (opt.)

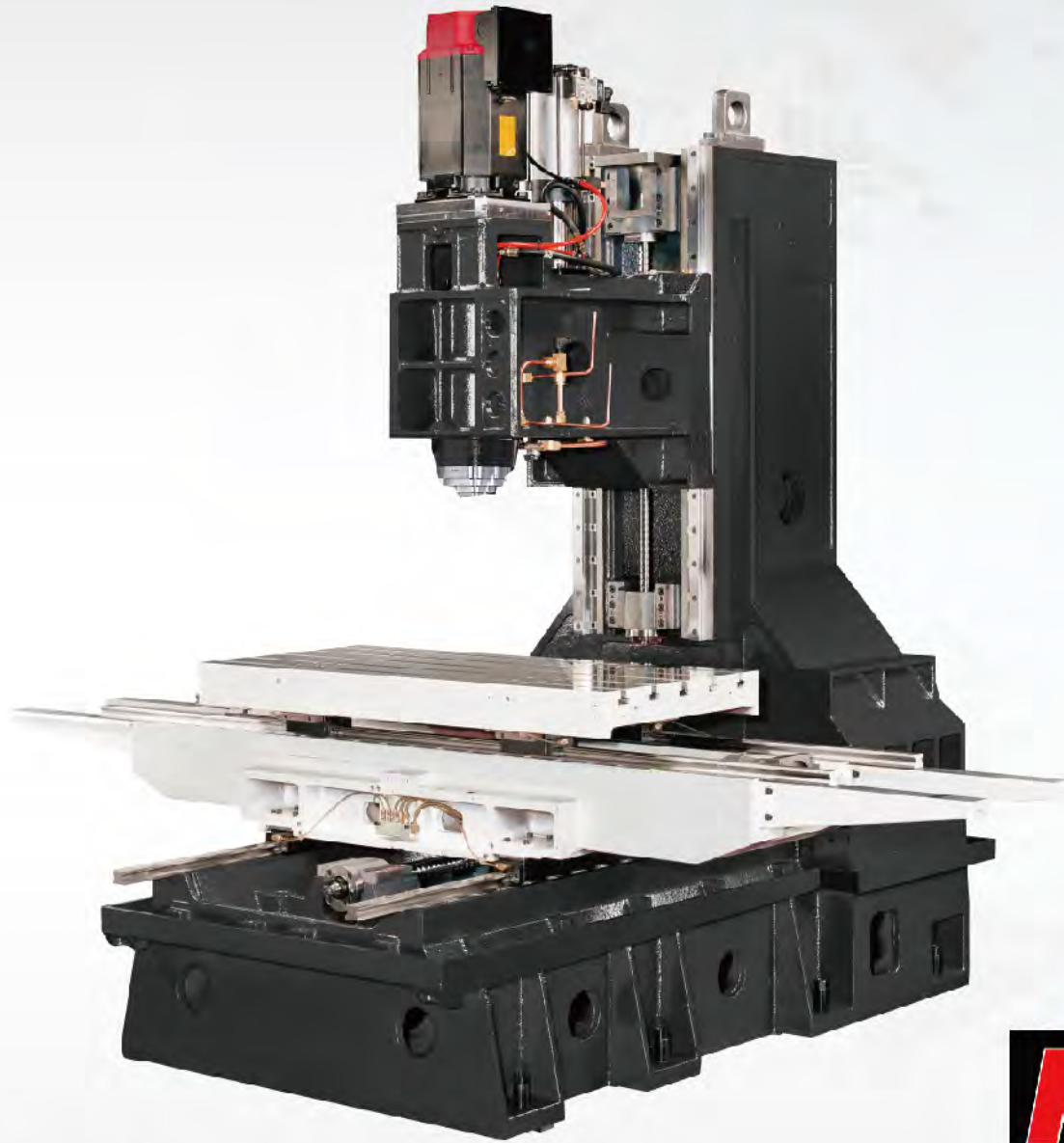
Ensuring your machine working smoothly.

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



A New Level of Rigidity and Stability Through a Perfectly Designed Structure

Ruggedly and precision built for years of accurate production work, the HMG S-Plus is specially designed for all users who required speed and accuracy



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.

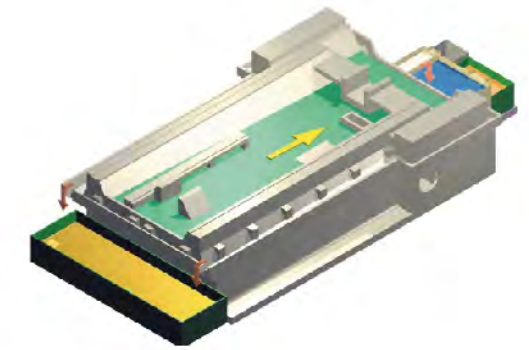
High accuracy linear guideway design

- 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** m/min.



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(opt.)

- Minimum tool change time is **1.38** sec (tool - to - tool)



3-axis direct transmission between servo motor and ballscrew

- High torque servo motors are directly coupled with ballscrews.
- With out backlash or servo lag problem caused by a belt.
- All ballscrews are center-supported plus both ends utilize precision angular contact bearing
- Boosts machining efficiency and reliability.



Spindles Manufactured by HMG Offer Quality Assurance

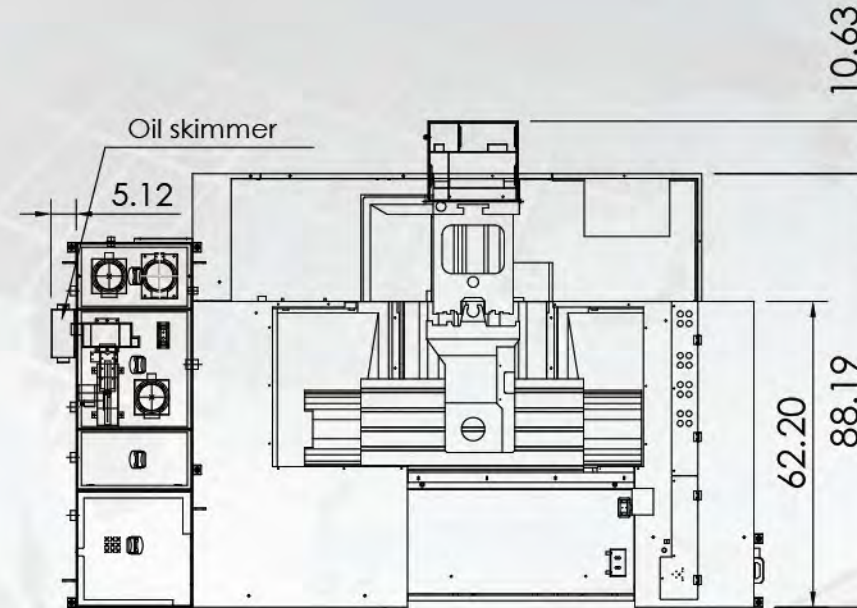
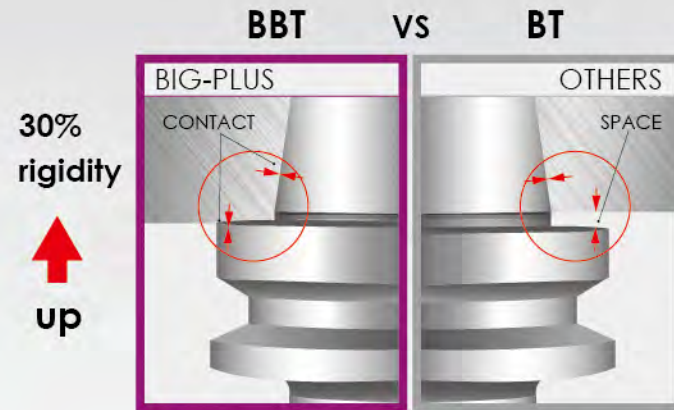
Machine Dimensions

Spindle type

- #40 belt - drive 8,000rpm opt. 10000 / 12000 rpm
- #40 direct-drive opt. 10,000 / 12,000 / 15,000 rpm

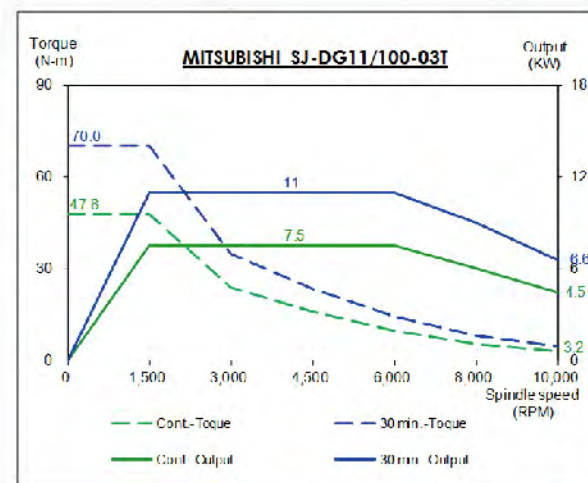
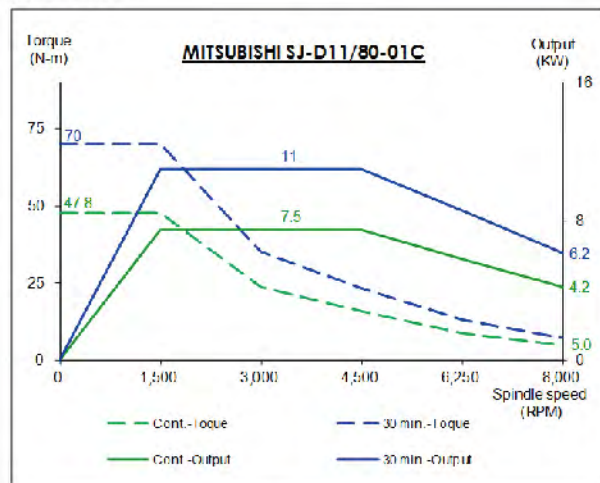
BBT SPINDLE TYPE (OPTIONAL)

- Two faces binding design for increasing cutting capability and machining accuracy
- Dramtucally redyce erris and vibration

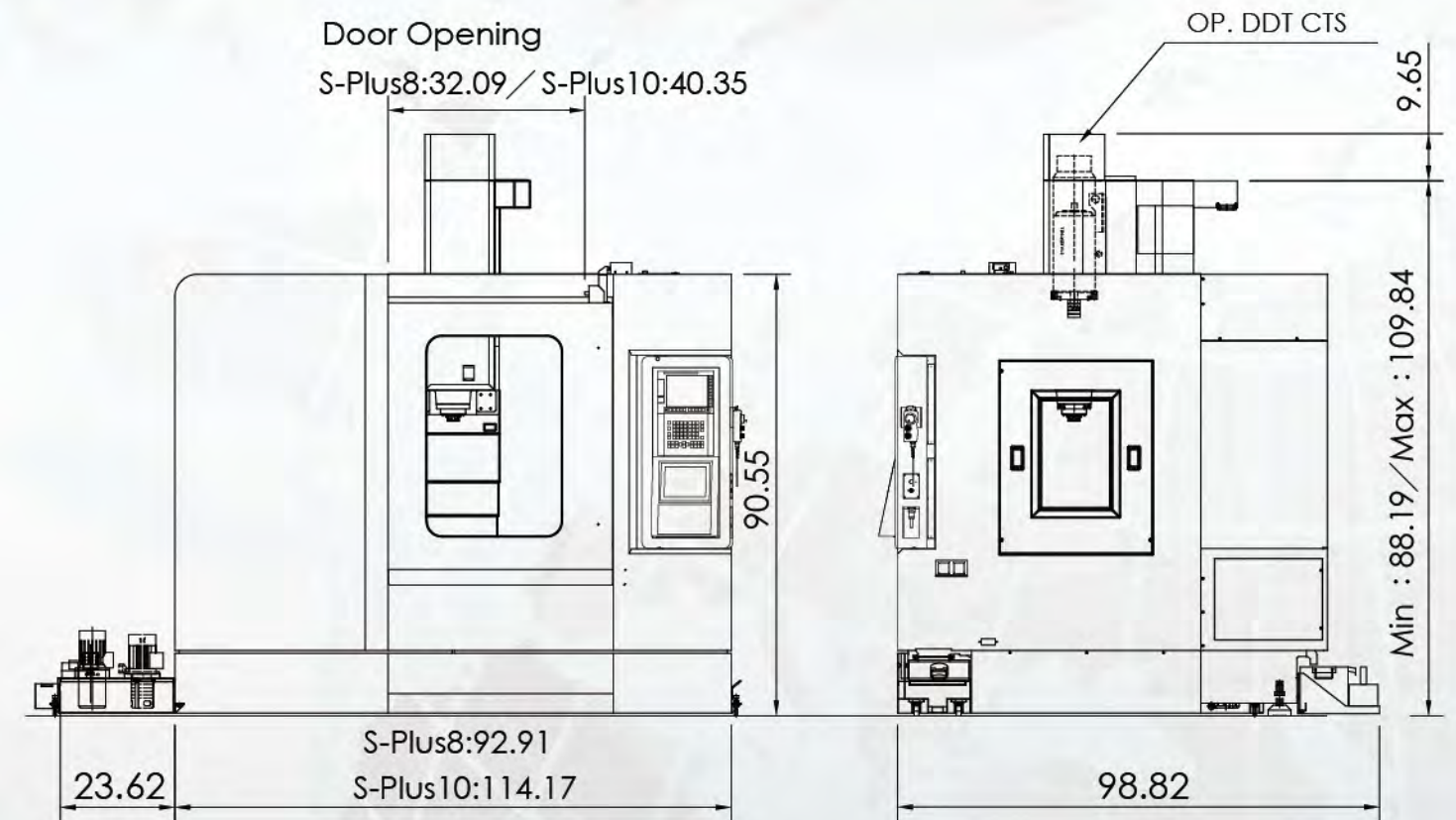
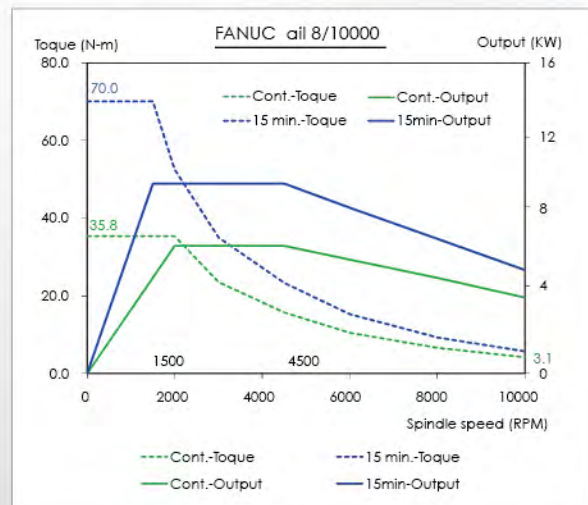
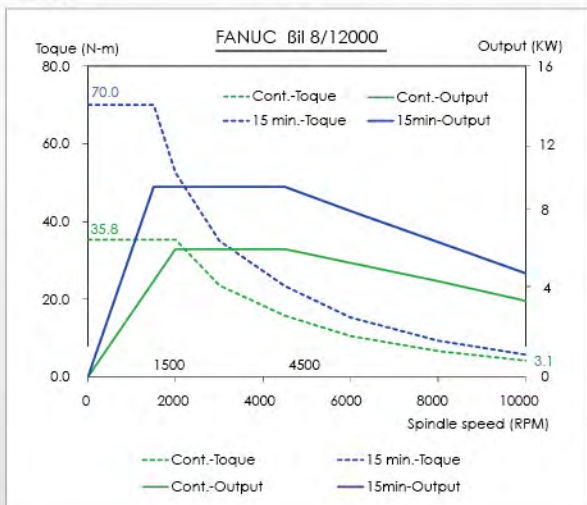


SPINDLE TORQUE DIGRAM

Mitsubishi



Fanuc



unit: inch

Machine Specifications

Model	S-plus 8	S-plus 10
Table		
Working Surface	37.4 x 20.47	45.28 x 20.47
T-slot (Size x Number x Pitch)	0.71 x 0.2 x 3.94	0.71 x 0.2 x 3.94
Max Table Load	1102.31	1543.24
Travel		
X-axis travel	31.50	40.16
Y-axis travel	20.47	20.47
Z-axis travel	21.65	21.65
Distance From Spindle End to Table Center	3.94-25.59 (300-850 opt.)	3.94-25.59 (11.81-33.46 opt.)
Spindle		
Spindle Speed (Pulley)	8000(10000 / 12000 opt.)	8000(10000 / 12000 opt.)
Spindle Speed (DDS)	10000(12000 /15000 opt.)	10000(12000 /15000 opt.)
Spindle Nose Tape	#40	#40
Feed		
Cutting Feedrate (X/Y/ Z Axes)	393.7 / 393.7 / 393.7	393.7 / 393.7 / 393.7
Rapid Traverse (X/Y/ Z Axes)	1181.1/1181.1/944.88 (1574.8/1574.8/1259.84 opt.)	1181.1/1181.1/944.88 (1574.8/1574.8/1259.84opt.)
ATC		
Tool Storage Capacity	A:24/30	A:24/30
Max. Tool Weight	15.43	15.43
Max. Tool Size (Diameter x Length)	A:Ø2.95x11.81L	A:Ø2.95x11.81L
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 (30min/Con)	14.75	14.75
Positioning Accuracy		
3 axes laser positioning accuracy (JIS B6338)		
Positioning accuracy/Full travel	±0.008	±0.008
Repetitive positioning accuracy	±0.002	±0.002
3 axes laser positioning accuracy (VDI 3441)/ Repeated 5 times		
Positioning accuracy	0.010	0.010
Repetitive positioning accuracy	0.006	0.006
Other		
Required Air Pressure	92.45	92.45
Electric Power Consumption	15~40	15~40
Floor Space(Full Guarding)	116.54 x 98.82	137.8 x 98.82
Net Weight	10361.73	11023.11
Coolant tank(Standard)	68.69	75.29

VDI 3441 accuracy available upon order request.

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

Accessories

Standard : ● Optional : ★

item	model	S Plus-8	S Plus-10
1.Full-Enclosed Splash Guard		●	●
2.Full-enclosed splash guard & top cover		★	★
3.Automatic door system_Operating door		★	★
4.Chip collecting tank type		●	●
5.Front Mounted Screw Type Chip Conveyor		★	★
6.Link Type Chip Conveyor & Portable chip bucket		★	★
7.Link type chip conveyor & portable chip bucket (with Two side screw type chip)		★	★
8.Coolant Flushing Device		★	★
9.Chassis on both sides of the stainless steel plate		★	★
10.Coolant System_Coolant Pump Motor, Standard		●	●
11.Coolant System_Coolant Pump Motor, Upgrade		★	★
12.Spray Around Spindle		●	●
13.Spindle Air Curtain		●	●
14.Air Blast Through Spindle		●	●
15.Air blast through spindle		★	★
16.Lubrication System		●	●
17.Spindle Oil Cooler_Pulley Spindle		★	★
18.Spindle Oil Cooler_Direct Drive Spindle		●	●
19.Pulley Spindle 8000RPM		●	●
20.Pulley Spindle 10000/12000RPM		★	★
21.Direct Drive Spindle 10000 / 12000 / 15000 RPM		★	★
22.Disk Type Tool Magazine 24T		●	●
23.Disk Type Tool Magazine 30T		★	★
24.Intelligent tool change system(T to T)_1.38 sec.		★	★
25.Oil Skimmer		★	★
26.Oil Mist Collector System		★	★
27.X, Y, Z-Axis Ball Screw Enforce Pressure		●	●
28.Foundation bolt, General		●	●
29.Foundation bolt, Concrete		★	★
30.Table side air blast		●	●
31.Tool Package		●	●
32.Coiling Tube Coolant gun		★	★
33.Hydraulic Hose Coolant gun		★	★
34.Air Gun		★	★
35.X, Y, Z axis linear scale system		★	★
36.Machine head guard + Fan (For DDT. spindle)		★	★
37.Coolant through spindle, Prepare, without water cart		★	★
38.Coolant Through Spindle_20BAR Without Water Cart		★	★
39.Coolant Through Spindle_20BAR With Water Cart		★	★
40.Coolant Through Spindle_25/40/70 BAR With Water Cart		★	★
41.Fluorescent Lampx1		●	●
42.Fluorescent Lampx2		★	★
43.Hartford Manual x1		●	●
44.Operation Finish Lamp		★	★
45.Convection Heat Exchanger in Control		●	●
46.Rs-232 Interface		●	●
47.Auto Tool Length Measurement		★	★
48.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)
- Character carving 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