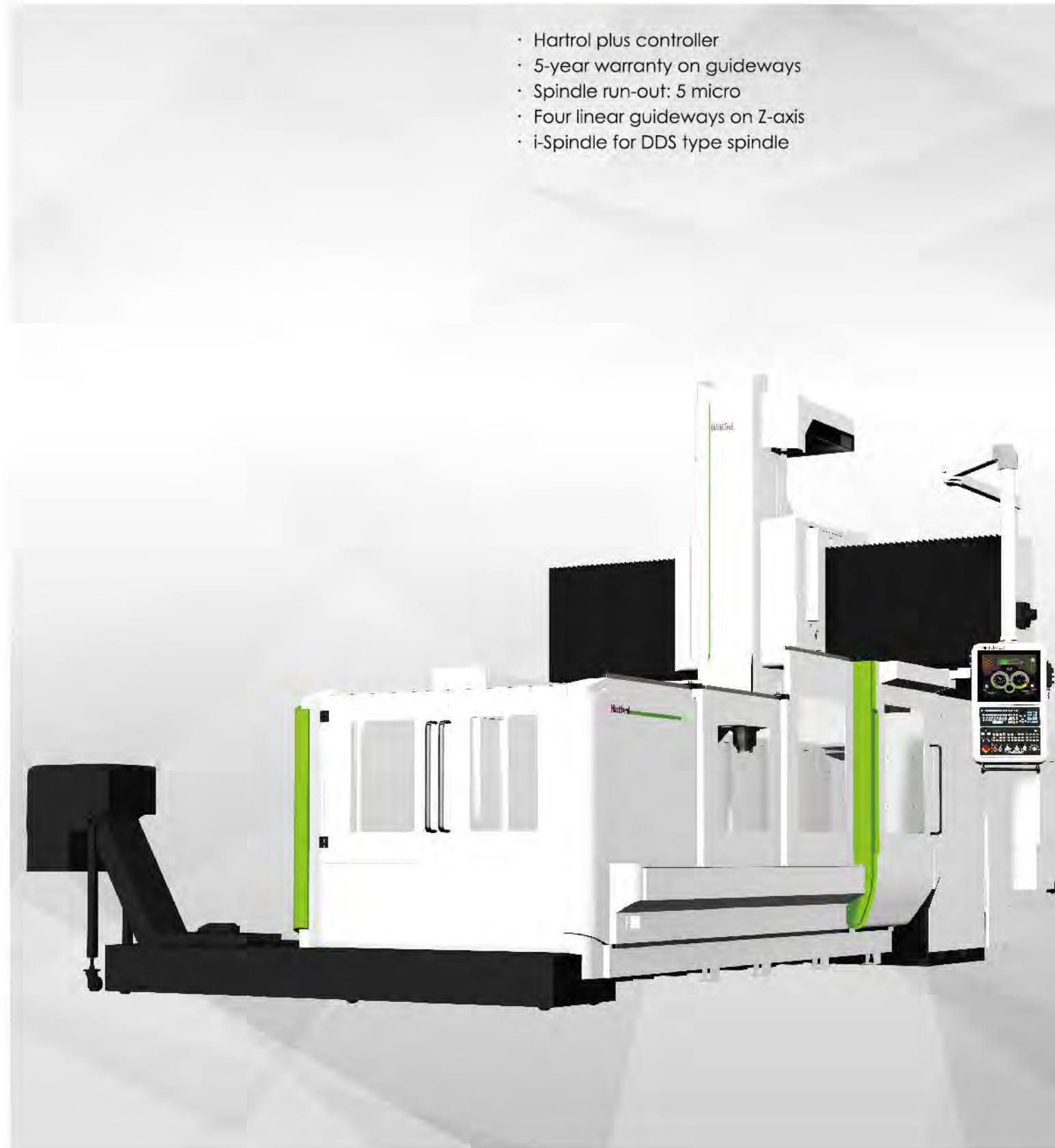


# HEP Series

Smartcenter

**Intelligent** Double column machining center

- Hartrol plus controller
- 5-year warranty on guideways
- Spindle run-out: 5 micro
- Four linear guideways on Z-axis
- i-Spindle for DDS type spindle



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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# Hartford

Hartrol • Smartcenter • Robocell

We manufacture intelligent machines only

# What is Smartcenter?

Smartcenter is Smart machine center, an intelligent machine if put it in a simple way.

A Hartford Smartcenter has to include

1. Intelligent operating interface
2. Intelligent machining: Machining accuracy/ surface accuracy/ self learning / self optimizing
3. Intelligent quality control: Auto compensation for machining accuracy
4. Intelligent maintenance program : Active notification/ Active machine down time schedule also include other intelligent functions, help user reaching the target of Zero Down Time.

## The benefits of Hartford smartcenter

- + Intelligent management : Fully aware of the machining status
- + Fully aware of the status of the machine key components.
- + Improving of the machine efficiency
- + Crash protection – Stop the machine immediately to prevent the further damage when alarm occurred .

## Hartford Smartcenter will help you become an intelligent manager

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.



## Outstanding Machining Capability of MIRAGE

The superior machining capability of Hartford machining center is your best partner on machining.



1. Table of vertical machining center



2. Heat spreader

## Actual Cutting Test

Model: HEP-2150

■ Spindle: 6,000 rpm Gear type, 26kW ■ Cutting material : S45C



**Face milling**  
 Tool diameter  $\varnothing 125 \times 7T$  mm  
 Feed rate 1,760 mm/min  
 Spindle speed 1,100 rpm  
 Cutting depth 4 mm  
 Cutting volume 560 cc/mm  
 Cutting width 100 mm



**End milling**  
 Tool diameter  $\varnothing 63 \times 3T$  mm  
 Feed rate 1,600mm/min  
 Spindle speed 1,100 rpm  
 Cutting depth 35 mm  
 Cutting width 10 mm  
 Cutting volume 1600 cc/mm



**Drilling**  
 Tool diameter 76 mm  
 Feed rate 66 mm/min  
 Cutting depth 40 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.

# All New Structure Design Delivers Better Rigidity & Cutting Capability

Hartford MIRAGE double column machining center is designed for precision machining.



### Full range of box 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.



The picture show is HEP-2150



### Overlapped structure design

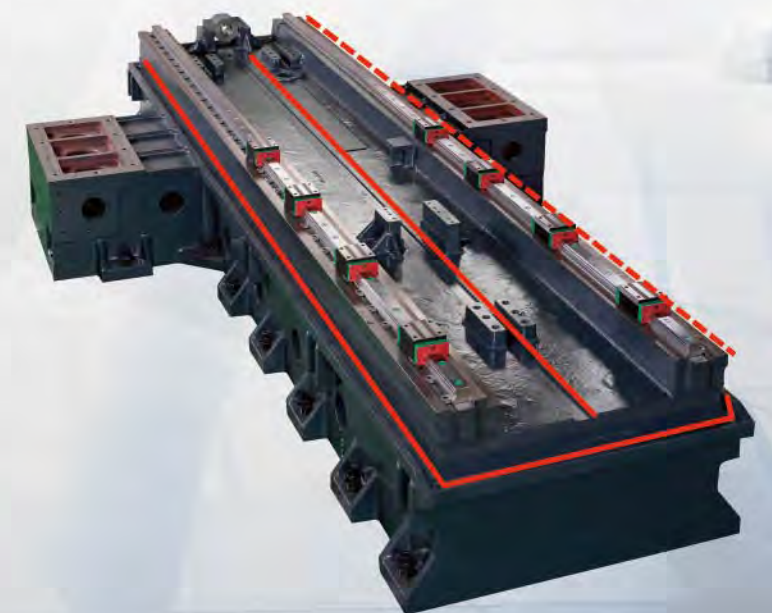
- **Durable, overlapped** beam, column and base construction.
- Extra high box type beam construction combined with shortened column length increase the rigidity of the entire structure.
- Scrapping accuracy calibration is easier to control.

### Rugged construction

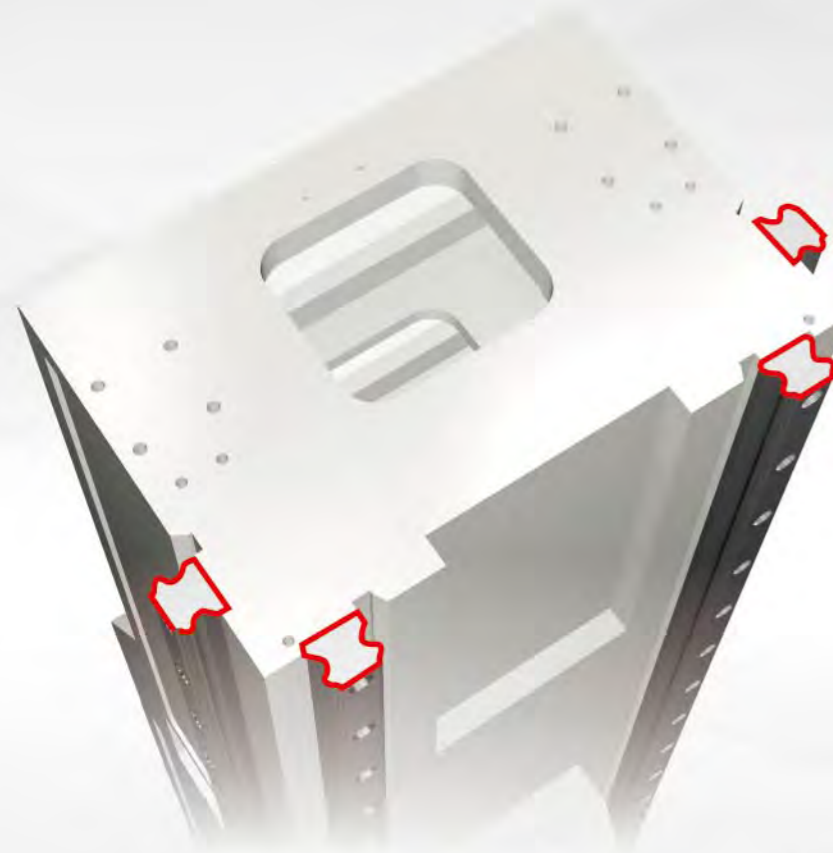
- The major structure parts, such as beam, table and base are **ruggedly** designed.
- It constricted with scientific reinforcement to remain deformation-free year-after-year.

### Oil/fluid separation on base

- The complete oil/fluid separation design throughout the machine extends the life of fluids and saves on production costs.
- It meets environmental protection requirements.
- The patented oil/fluid separation tank achieves the best oil/fluid separation effect.



## Unique Structure & Design Delivers Stable Machining



### Four linear guideways on Z-axis

- This makes Z-axis movement smoother and faster.
- Four linear guideways design delivers higher supported rigidity.
- The quality motion control reduces reverse spike marks on the workpiece surface.
- Higher machining efficiency without sacrificing structural rigidity.

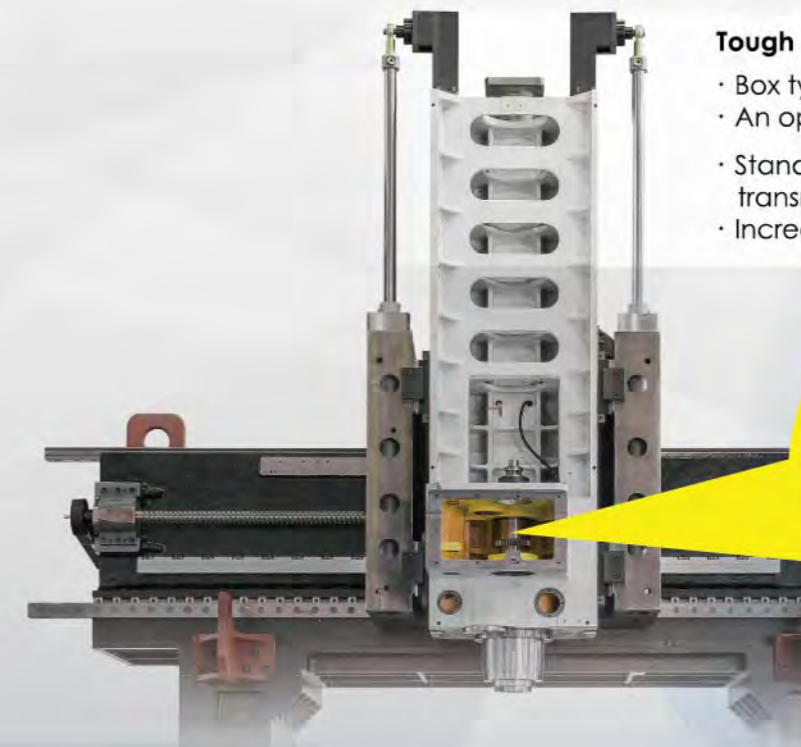


### DDS 10,000rpm spindle

- **Cooled design** decreases spindle thermal displacement .
- Direct type driven lower noise and vibration problems.
- Box type, thermal symmetry spindle head construction.
- The spindle features floating tool knocking without any direct force exerted on the bearing for extending the bearing life.
- A heat-isolated coupling is equipped between the motor and spindle. It prevents motor heat from transferring to the spindle for better accuracy control.
- i-Spindle option.

### Z-axis nitrogen accumulator weight system

- Reduce operating noise of hydraulic tank.
- Reduce hydraulic tank oil temperature by **50%**
- Effective energy-saving more than **20%**



### Tough gear-drive spindle head

- Box type and thermal symmetry design.
- An optimal spindle center layout.
- Standard **spur gear** drive offers greater transmission efficiency.
- Increases cutting rigidity and cutting stability.

# Intelligent Controller- **Hartrol Plus**

## What is Hartrol plus?


- 19" multi-touch screen
- IPC is equipped with the Windows operating system
- Automatic feed system control function(opt.)

By the use of open architecture, we begin to enter a new era of intelligent processing. In addition to basic functions, we have joined hardware and software exclusively developed by Hartford. Software, which can be added to and updated at any time with new features.



The Intelligent Controller You Should Have With  
 With three major solutions, Hartrol Plus takes your machining to the next level. Hartrol Plus Provides more powerful intelligent operation and control, which brings even more capabilities and productivity to your metal cutting process. Hartrol Plus, a controller you can not miss, that leads you toward easy operation, automation and smart management. This controller makes your machining more flexible and makes management more convenient.

The comparison between Harerol Plus and others

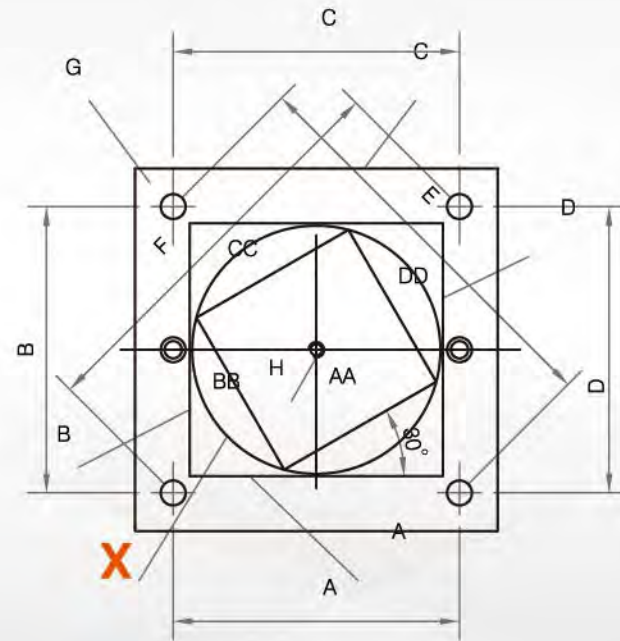
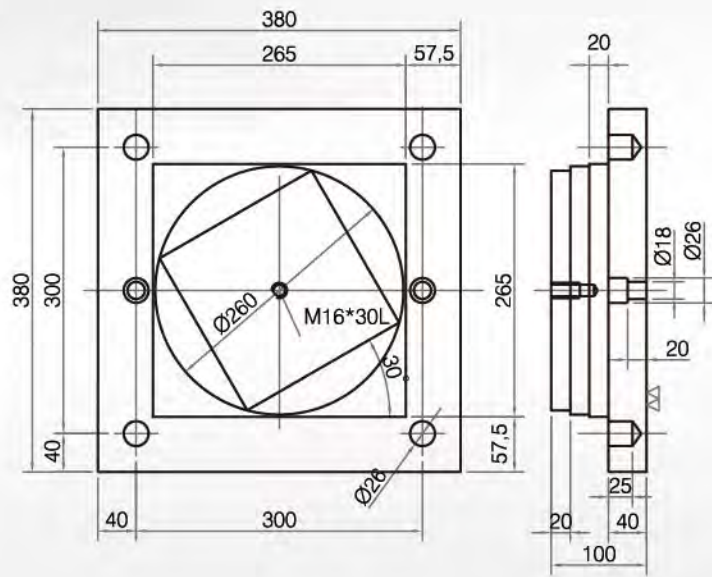
Function	Hartrol plus 	Others
Screen size	19" Multi-touch panel	10.4"(OPT:15")
Hardware	32GB CFast	NO
Smoothing interpolation	SSS-4G	Option
Look ahead block	2700	400 (1000 max.)



## 2D Cutting Test

### 2D cutting test report

- Model: HEP-2150
- Temperature: 20.0 °C/Humidity: 75%
- Material: FC25
- Tool:  $\phi$  25mmx4t

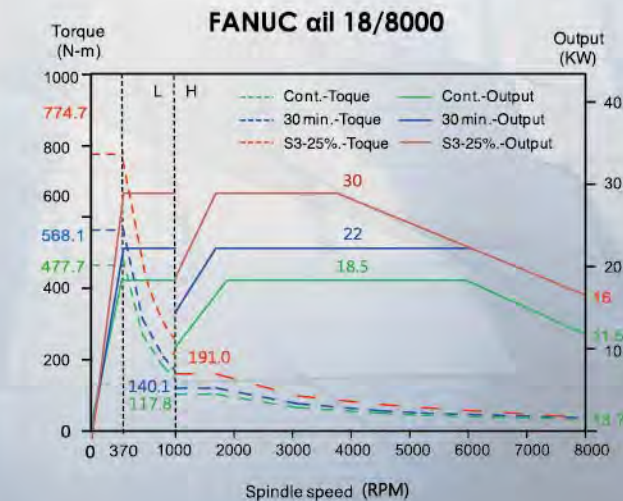
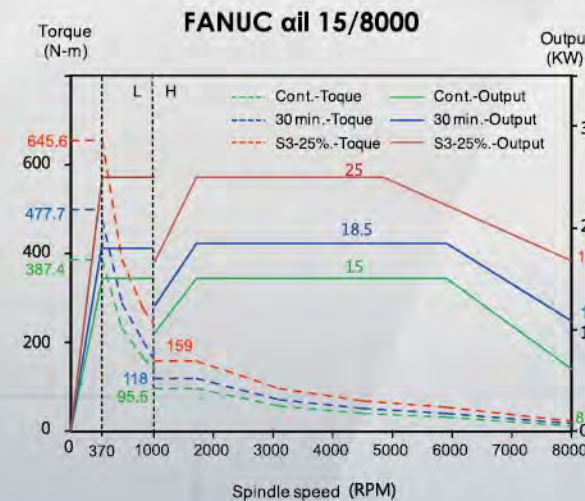
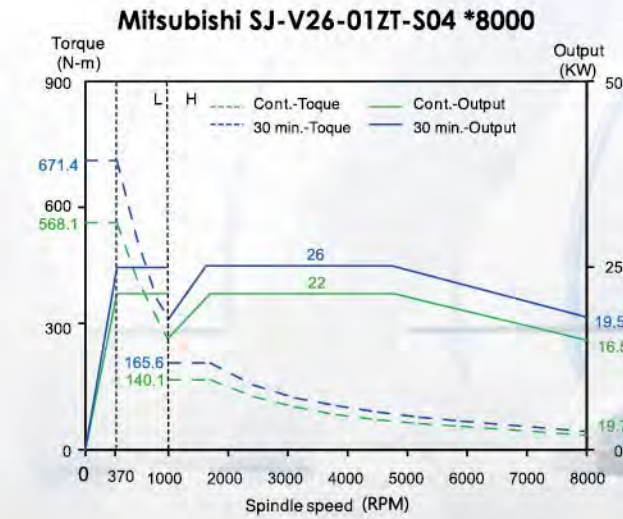
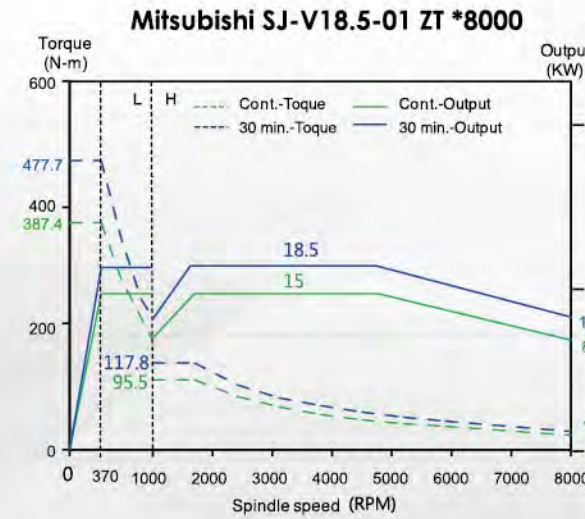
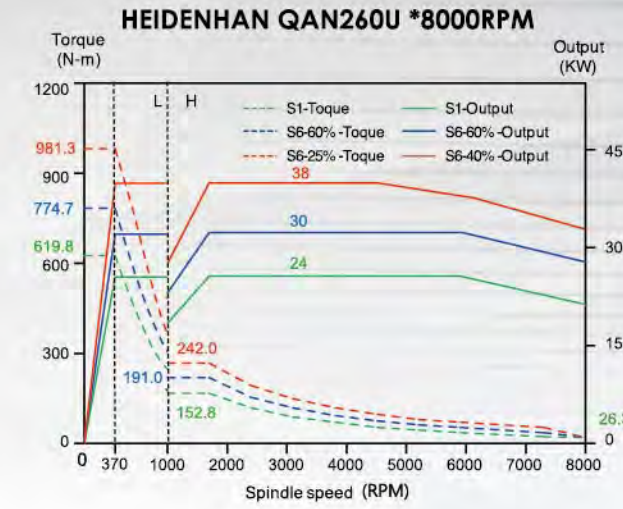
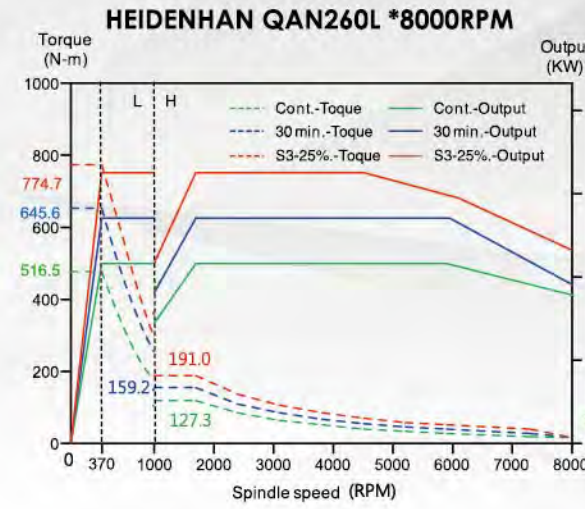


Unit:mm

Item	JIS standard	Harford standard	Cutting result
Positioning accuracy	0.025 mm	0.025 mm	0.0017
Positioning accuracy	0.025 mm	0.025 mm	0.0052
Positioning accuracy	0.035 mm	0.035 mm	0.003
Circularity	0.040 mm	0.02 mm	0.0083
Perpendicularity bet. Adjacent sides	0.03 mm	0.03 mm	0.0036
Parallelism	0.03 mm	0.03 mm	0.0041
Perpendicularity	0.04 mm	0.04 mm	0.0019
Perpendicularity	0.04 mm	0.04 mm	0.0027
Perpendicularity	0.04 mm	0.04 mm	0.0035
Perpendicularity	0.04 mm	0.04 mm	0.0062
Parallelism	0.04 mm	0.04 mm	0.0053
Parallelism	0.04 mm	0.04 mm	0.0042

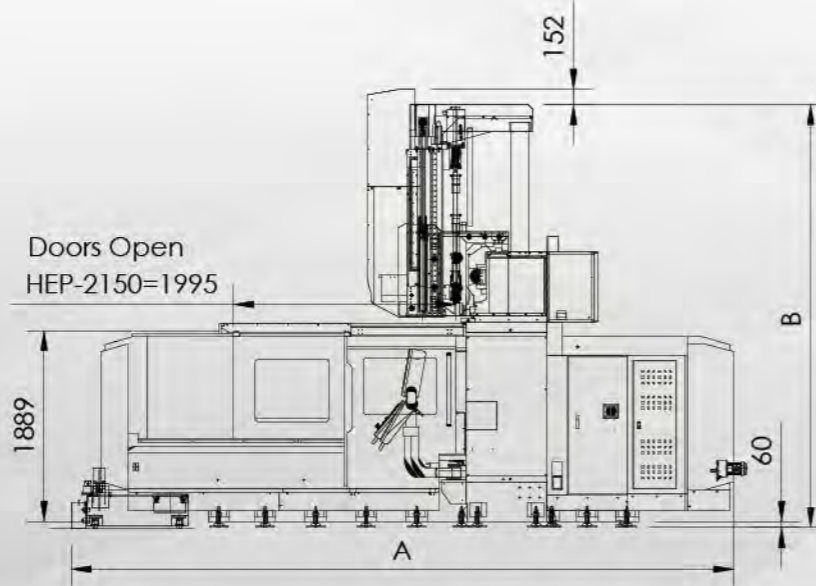
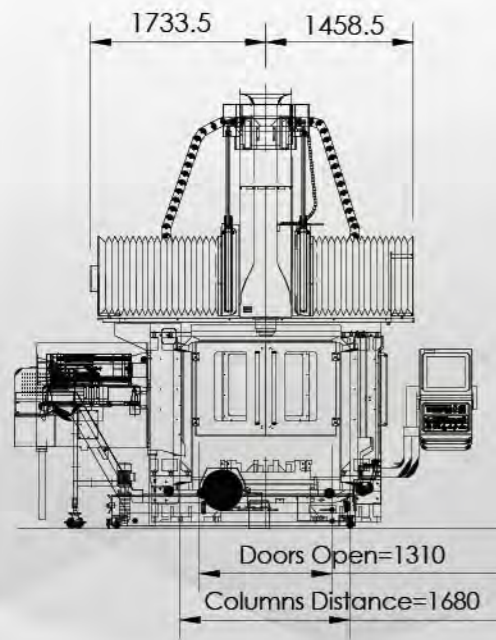
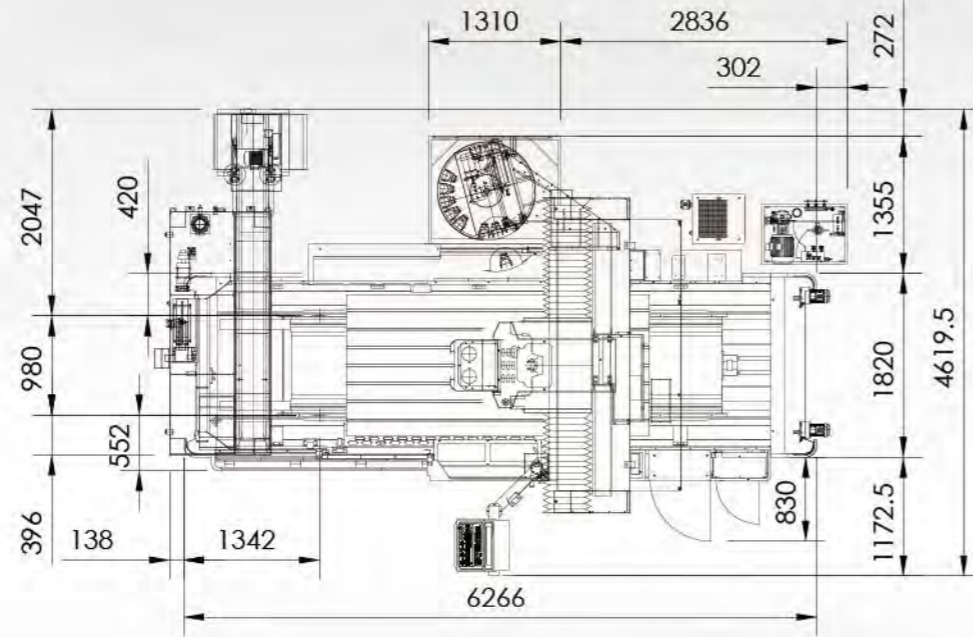
The test reports will vary with cutting conditions.

## Spindle Diagram



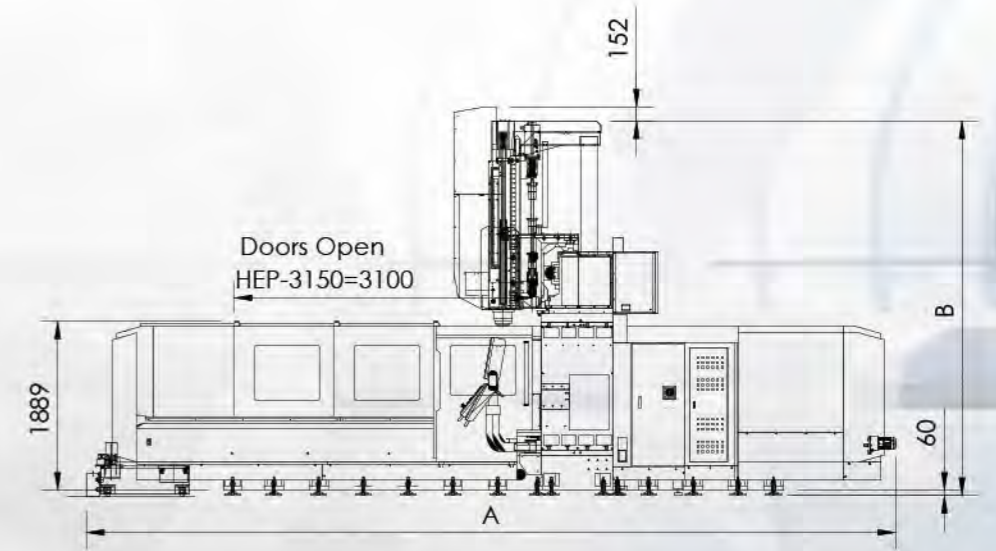
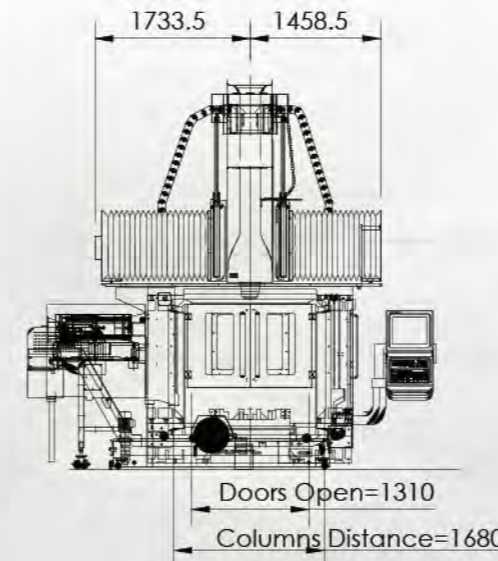
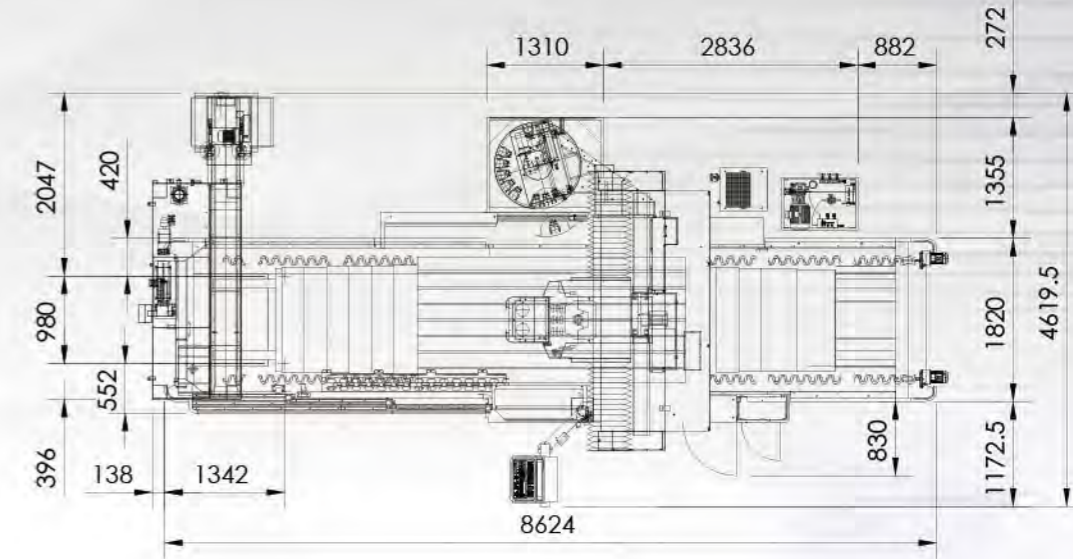
# Machine Dimension

**HEP-2150**



HEP-X150		HEP-2150	
		A	B
Z780	C1420	6682	4186
	C1520		4286
	C1620		4386
	C1720		4486

**HEP-3150**



HEP-X150		HEP-3150	
		A	B
Z780	C1420	9040	4186
	C1520		4286
	C1620		4386
	C1720		4486

## Specifications

Model	Unit	HEP-2150	HEP-3150
Metric			
<b>Table</b>			
Working Surface	mm	2000x1400	3000x1400
T-slot (Size x Number x Pitch)	mm	22x7x180	22x7x180
Max Table Load	kg	8000	10000
<b>Travel</b>			
Longitudinal Travel (X-axis)	mm	2250	3250
Gross Travel (Y-axis)	mm	1600 (opt. 1500 for Z-axis box guideway)	1600 (opt. 1500 for Z-axis box guideway)
Vertical Travel (Z-axis)	mm	780	780
Distance From Spindle End to Table Center	mm	160-940 (Z780_column1420) 260-1040(Z780_column1520) 360-1140(Z780_column1620) 460-1240(Z780_column1720)	160-940 (Z780_column1420) 260-1040(Z780_column1520) 360-1140(Z780_column1620) 460-1240(Z780_column1720)
Distance From Spindle Center to Column	mm	430	430
Width Between Column	mm	1600	1600
<b>Spindle</b>			
Spindle Nose Tape		# 50	# 50
Spindle Speed (Gear)	rpm	6000 (8000 opt.)	6000 (8000 opt.)
Spindle Speed (DDS)	rpm	(10000/12000 opt.)	(10000/12000 opt.)
<b>Feed</b>			
Cutting Feedrate (X, Y, Z Axes)	m/min	12/12/12	12/12/12
Rapid Traverse (X, Y, Z Axes)	m/min	24/24/20	20/24/20
<b>ATC</b>			
Tool Storage Capacity	pcs	S:20 opt.A:32/40	S:20 opt.A:32/40
Max. Tool Weight	kg	18	18
Max. Tool Size (Diameter x Length)	mm	φ 125x300L opt. φ 200x300L(neighbor empty)	φ 125x300L opt. φ 200x300L(neighbor empty)
Tool Shank		BT50(BBT/CAT/DIN)	BT50(BBT/CAT/DIN)
Pull Stud Bolt		MAS-P50T-1/CAT50/DIN69872	MAS-P50T-1/CAT50/DIN69872
<b>Motor</b>			
Spindle Drive Motor (Cont/30min)	kw	18.5 opt. 22/26	18.5 opt. 22/26
<b>Positioning Accuracy</b>			
3 axes laser positioning accuracy (JIS B6330)			
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	0.015	0.015
Repetitive positioning accuracy	mm	0.014	0.014
VDI 3441 accuracy available upon order request			
<b>Other</b>			
Required Air Pressure	kg/cm <sup>2</sup>	6.5	6.5
Electric Power Consumption	KVA	50	50
Machine dimension	mm	8272 x 5915.5	10630 x 5915.5
Net Weight	kg	22000	26000
Collant tank(Standard)	L	480	480

Standard&Optioanl Mechanical  
Accessories

## Standard

- Semi-enclosed Splash guard
- Spindle air curtain
- Coolant Tank (with chip bucket)
- Pre-load on 3 axes
- Z Axis Counter Balance
- Table side air blast M50 control
- Spray around spindle
- Tool package
- Hartford manual x 1
- RS-232
- Operator Panel, Rotary type
- Automatic Power OFF
- Lubrication system
- Fluorescent lampx1
- Foundation bolt, General

## Optional

- Full-enclosed splash guard & top cover
- 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 seperation system
- Hoist Seat
- Automatic door system\_ Operating door
- Auto tool length measurement
- Auto workpiece measurement
- Closed-loop linear scale positioning system
- Ladder of maintenance (Side-column)
- Fluorescent lampx2
- Three-Steps Treadle (Side-Operation) L1500 x W810 x H852mm

Standard & Optioanl  
Electrical Function

## Hartrol /Standard

- Workpiece calibration by MPG directly
- Tool magazine display
- Pop-up calculator (in Hartrol screen)
- Parameter package
- Utilization rate of machining(Fanuc only)
- Machining countdown(Fanuc only)
- Thread cutting(0i/31i only)
- Tool type display on magazine display screen(0i/31i only)
- Monitoring of tool status(0i/31i only)
- Character carving macro
- Tool change function on tool offset screen

## Hartnet/ Optional

- Management system of utilization
- Machining time countdown
- Convenient file transfer
- Production management

## Electrical Function/Optional

- Lifting function against gravity
- Retraction for rigid tapping
- Intelligent MPG
- Compensation of temperature displacement
- HMI for tool magazine