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Hartford innovation

THE NEXT 50 YEARS

HSA/EA/EAY Series

Smartcenter

Intelligent Double column machining center

- Hartrol plus controller
- 5-Year warranty on guideway
- Spindle run-out : 5 micro
- Gear type 8,000rpm spindle
- Four linear guideways on Z- axis

Website

Facebook

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/ slef learing / 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.

Strong cutting force; release your production potential

All New Infinity of high rigidity, high-precision can help you machine blank to become the finished mold of excellent precision and smoothness.

1. Auto industry - large sheet metal mold

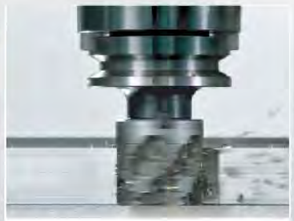
2. Auto industry- steering wheel

Actual Cutting Test

Model: HSA-428
■ Spindle: 6,000 rpm Gear type, 26kW ■ Cutting material : S45C

Face milling

Tool diameter	Ø125 mm
Feed rate	2,050 mm/min
Cutting depth	4 mm
Cutting volume	820mm



End milling

Tool diameter	Ø 63 mm
Feed rate	1,350mm/min
Cutting depth	40 mm
Cutting width	10 mm

Tapping

Tool diameter	Ø36 mm
Feed rate	480 mm/min
Depth	40 mm
Spindle load	35%

Drilling

Tool diameter	Ø53 mm
Feed rate	100mm/min
Cutting depth	50 mm
Spindle load	50%

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.

New ALL NEW INFINITY, from roughing to finishing, allows you to accomplish at one go

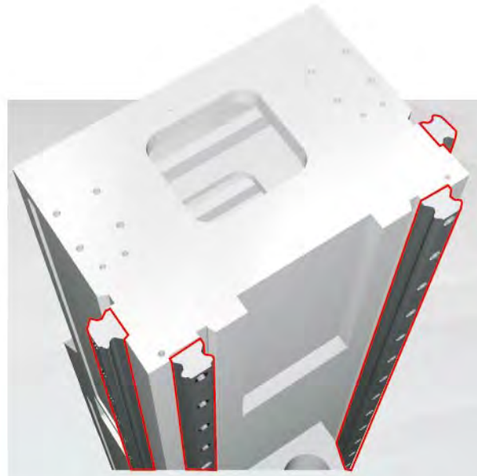
The new HSA Series gives you optimal processing performance and extreme precision performance, while increasing HSA architecture to pair up with homemade automatic switching head mechanism, reaching five-face machining models to meet a variety of your processing needs.

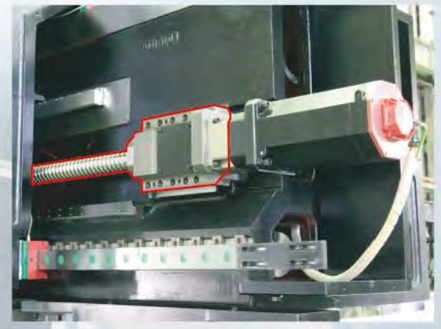
Z-axis four linear guideways three binding structure patented technology

The patented HSA four linear guideways three binding structure technology, two-way support provides high rigidity while cutting, bringing you excellent performance.

(HSA 2215 four linear guideways are optional feature; the rest machine is standard feature).

Patent No. 1264343 machining center Z-axis head Z-axis four linear guideways.





HSA three-axis direct-connected drive advantage

HSA series X-axis and Y-axis pair up with the planetary reducer, effectively enhancing the overall axial drive torque of the machine.

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.

X-axis three linear guideways design – HSA-X28/HSA-X32/HSA-X36

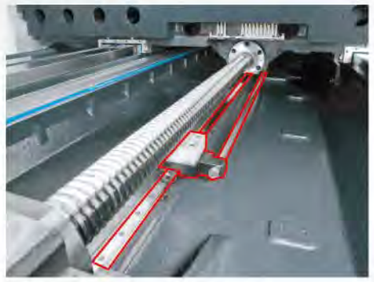
The X-axis three linear guideways design can be used to resist process rotation torsion and enhance rigidity by more than 50%. Moreover, the maximum load of a workbench can be 30,000kg, thus allowing you to meet your processing needs and help you reach your accuracy and quality requirements.
(HSA-X20/X23/X27 are two linear guideways)

Unique Machine Structure Design

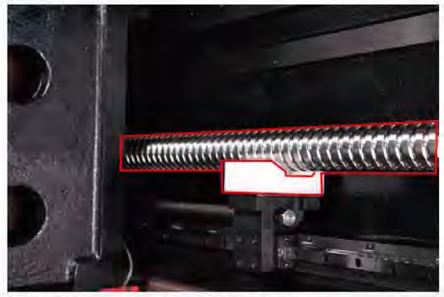
Screw support mechanism maintains excellent positioning accuracy

- In time of the transmission of the X and Y axes, ensure that power is maintained.
- Improve screw dead weight sagging; enhance the positioning accuracy and life of screw.
- Increase 1 level of screw specification; lift static rigidity.

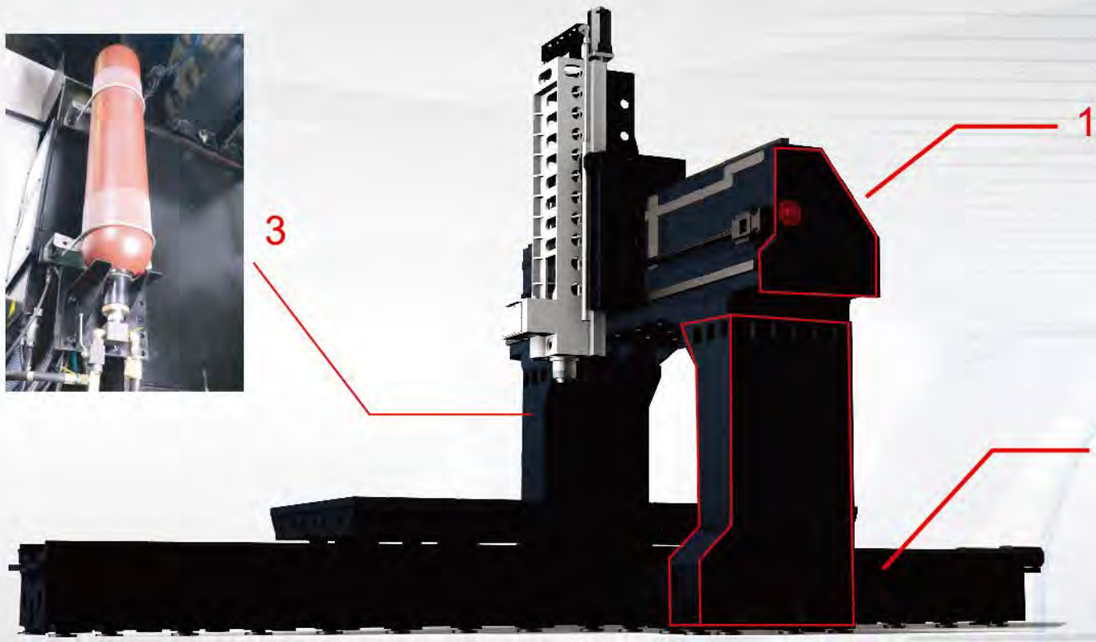
Model above the 5 meters X-axis is standard configuration; below 4 meters is optional configuration.
Y-axis support mechanism, X36 / EAY is standard configuration.
Y-axis support mechanism, X23 / X27 / X28 / X32 / EA is optional configuration.



X-axis screw support mechanism



Y-axis screw support mechanism



Diversified strong spindle meets your processing needs

Hartford made gear type 8,000 rpm
Two-stage spindle (optional feature)

- To follow the process attribute, pair up with high or low gear.
- Spindle-mounted structure design
- Thermal separation technology enables thermal extension to control and apply to HSA-X20 / X23 / X27 / X28 / X32 / X36.

Hartford made i-Tech hybrid type
10,000 rpm spindle (optional feature)

- Motor and spindle dual cooling circulation design
- Cooling cycle design
- Built-in motor – maximum 35kW, 600 N-m

Applicable models: EA / EAY

1 The new slant beam design effectively reduces vibration from cutting

- Reduce the vibration generated by the process.
- Enhance accuracy and surface sheet cleanliness during processing.

Patent:
M435318
Beam rear slant design

2 Extra-large columns effectively transfer the maximum cutting force

- The joint width between bottom of the column and the base is increased to1,250mm.
- Reduce overall vibration from cutting.

Patent:
M437316
Structure section has design to resist torsion.
M438938
Column foot span design

3 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%

Suitable for HSA-X20 / X23 / X27 / 32 / X36 and EA / EAY full range of models

Complete angular head design package

Hartford has a full range of angular head specifications, in addition to automatic universal heads, automatic 90 degrees head, automatically extension head, automatic grab head to pair up with a 90-degree head, there are series of manual and semi-automatic universal heads, 90 degrees head and extension head, etc., for you to choose to meet your wide range of processing needs.

1. Automatic heads (automatic clamp) suitable for HSA-EA / EAY series models

Automatic universal head (2.5°/1°)	Axis	A / C axis division angle configuration table									
A / C axis automatic rotation angle Maximum speed: 4, 000 rpm Maximum power: 26 kW The maximum torque to withstand: 930 N-m Optional configuration of maximum pressure 70 BAR CTS	C-axis	1°	2.5°	1°	5°		2.5°		1°		
	A-axis	1°	2.5°	1°	2.5°	1°	5°	1°	5°	2.5°	
	Remark	ST. standard feature	OPT. customized specifications								

Automatic 90 ° head (2.5° / 1°)

Maximum speed: 4,000 rpm / 2,500 rpm (opt.)
Maximum power: 26 kW
The maximum torque to withstand: 930 N-m
Optional configuration of maximum pressure 70 BAR CTS
Minimum optional configuration C-axis positioning indexing: 1 degree

Automatically extension head (350 / 500 mm)

Maximum speed: 4,000 rpm
Maximum power: 25 kW
The maximum torque to withstand: 750 N-m
Optional configuration of maximum pressure 70 BAR CTS
Automatic tool change function

Automatic clamp/unclamp+ the manual 90° head

Maximum speed: 2,000 rpm
Maximum power: 18.5 kW
The maximum torque to withstand: 650 N-m
External guide pins enhance the positioning accuracy of the exchange head, with automatic grab head function and manual rotating angle function.

2. Manual position head (manually fixed) applicable to general model HSA

Universal head (manual / semi-automatic)		Manual universal head	Semi-automatic universal head
A axis: ± 110°, C-axis: ± 180° Maximum speed: 2,500 rpm Maximum power: 18.5 kW The maximum torque to withstand: 650 N-m	Binding mechanism	Manual	Manual
	Unclamping mechanism	Manual	Automatic
	C-axis rotation	Manual	Manual

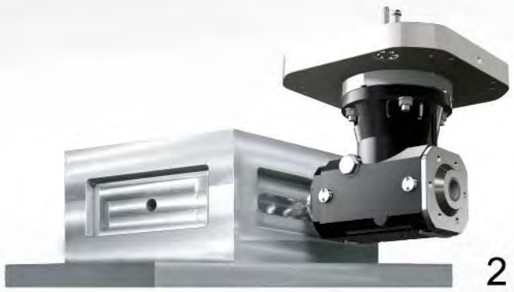
90° side milling head (manual / semi-automatic)		Manual 90° head	Semiautomatic 90° head
Manual tool change (manual / hydraulic lock release tool.) Maximum speed: 2,000rpm Maximum power: 18.5 kW The maximum torque to withstand: 650 N-m	Binding mechanism	Manual	Manual
	Unclamping mechanism	Manual	Automatic
	C-axis rotation	Manual	Manual

Extension head (350 / 500 mm)

Maximum speed:4,000 rpm
Maximum power: 18.5 kW
The maximum torque to withstand: 650 N-m

Automatic angular head machining patterns

1



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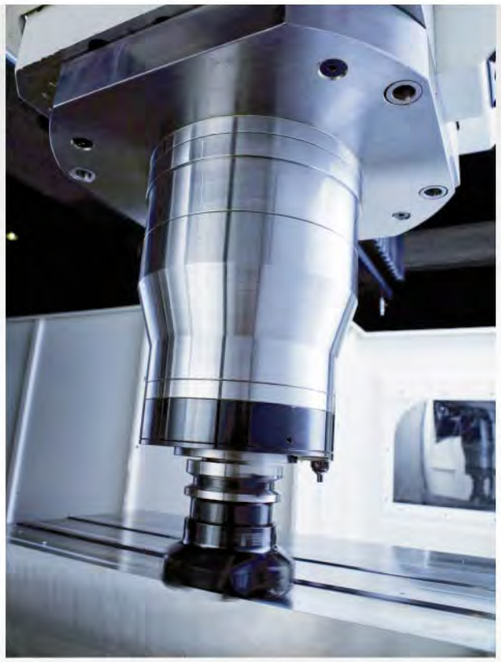


3

Working patterns	1. Composite bevel sharp cutting processing	2. 90 degrees side sharp machining	3. Elongation sharp cutting processing
Product form	AC universal head	90 degrees side cutting head	350 / 500 mm extension head
Model code	HF-AU360H	HF-A90L/H	HF-AE35/50L
Maximum speed (rpm)	4000	4000	4000
Tool form	BT50	BT50	BT50
Automatic indexing	5° /2.5° /1°	5° /2.5° /1°	—
Automatic switching head	Automatic	Automatic	Automatic
Automatic tool changing	Automatic	Automatic	Automatic
Rotation angle	C:±180° A:±110°	±180°	—

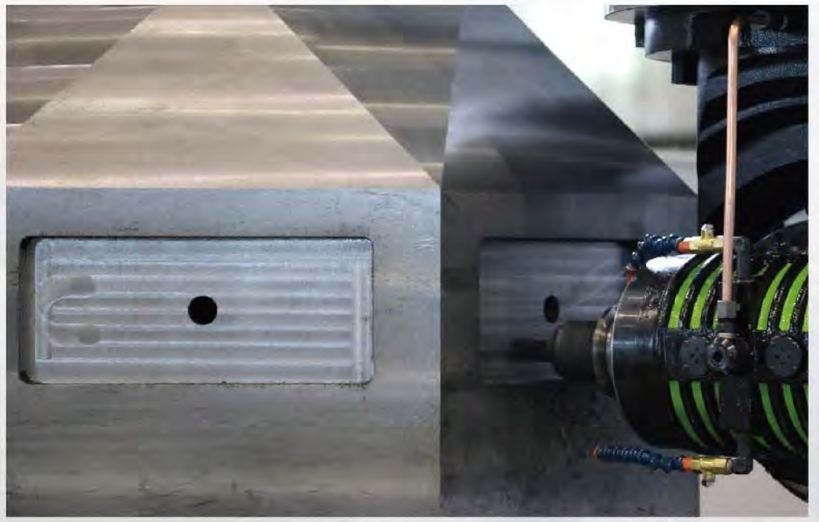
Application of automatic 90° head

Angular head cutting ability actual test data

Spindle motor specifications: a30 * 7000iRPM * 37KW (gear type)

Angle head	Auto AC universal axis (1°)		
Test models	HSA-428EAY	HSA-428EAY	HSA-428EAY
Angle	A : 90 / C : 90	A : 90 / C : 0	A : 0 / C : 0
Test item	Face milling / end milling	Face milling / end milling	Face milling / end milling
Test Results	1200(32.4cc/kw) / 720(19.5 cc/kw)	1200(32.4cdkw) / 720(19.5 cc/kw)	1200(32.4cc/kw) / 720(19.5 cc/kw)
The maximum depth of cut (mm)	5/10x40	5/10x40	5/10x40

Test item	The maximum test size (mm)	Spindle current ratio (%)
Drilling (violent drilling)	Φ76	38
Tapping	M32	20



Angular head exclusive technology

Patented technology

Clutch-type vertical skew angular axis head
The clutch lock of the horizontal axis (CHE)

During clutch, the electromagnetic brake will activate on both the rotating and linkage shaft. The slanting swing is generated by gravity. Reduce the amount of slanting swing while in clutch to avoid tooth jamming.

Angular head C-axis 1 degree positioning mechanism (TWC)

Angular head has a 1-degree indexing positioning function. Because the whole transmission system is a fully closed loop, it can still better eliminate the origin of mechanical backlash.

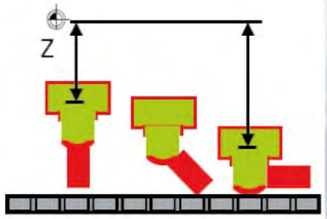
Angular head center coolant mechanism (UAC)

All automatic head classes have CTS function, can give customers maximum tool life and processing performance.

Intelligent technology

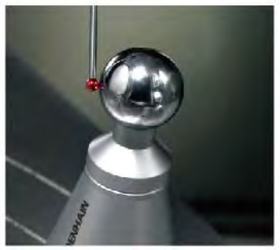
Minimum optional configuration A/C-axis positioning indexing: 1 degree

In AC travel, arbitrary integer angular inclined surface processing needs. (Optional accessory)



Auto angular head travel intelligent switching

Solves the problems of switching between travel and protected areas so that the travel limit (Y-axis & Z axis) is automatically adjusted according to the universal head angular.
(Standard accessory)

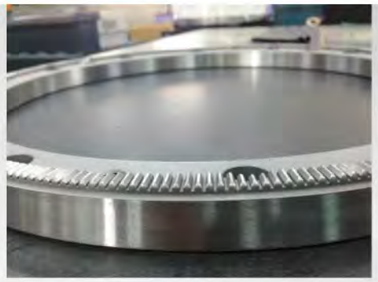


AC universal head rotation center + Tool tip automatic error measurement function

Raises processing accuracy, reduces manual measurement error, and shortens the measurement time. In time of measurement, error value is to be measured comprising a heat deflection of the angle head, so it is possible to improve accuracy errors.
(Optional accessory)

Assembly quality assurance

・Adjust teeth clearance

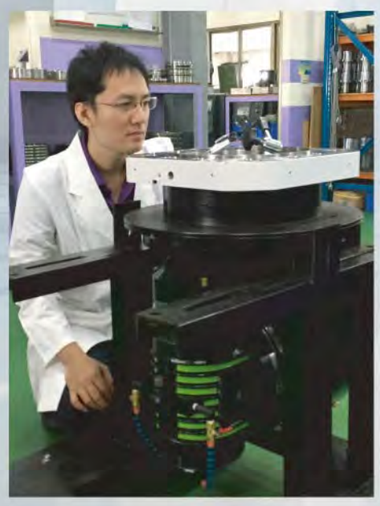


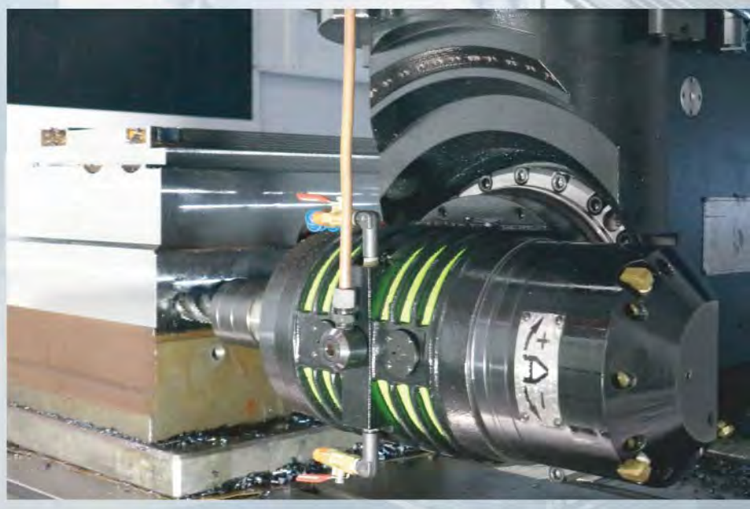
・Check gear

・End surface flatness correction

Adhere to quality and meticulous detail

Hartford adheres to each graduation, grasps every possibility, and is devoted to adhering to quality and meticulous detail.
By demanding quality precision within each process, we remain dedicated to producing the best.





Automatic angular head switching head compartment

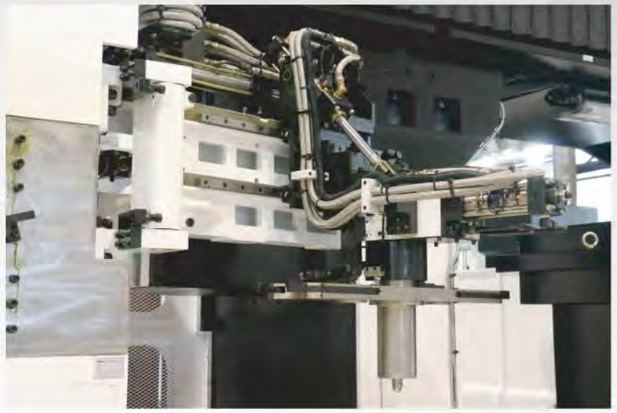
EA / EAY series can be combined with automated switching head compartment and vertical and horizontal tool change system, to provide highly efficient, versatile processing.

EA / EAY jib head compartment module

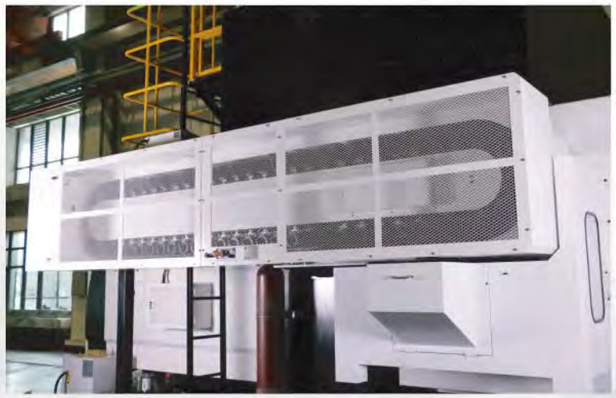
- It can be used with automatic universal head / automatic 90-degree head / automatically extension head.
- Fully automated exchange head compartment is fitted with protective cover and independent angle head compartment.
- It is designed to be driven by a hydraulic cylinder to provide the angle head fast switching capability.
- Each compartment is fitted with an independent movable door, which opens only during switching of the head, to prevent chips from contaminating angle head.

Besides, there are multi-head compartment specifications. If required, please contact our sales staff.

Choose a variety of tool magazines



1. The vertical and horizontal tool magazine

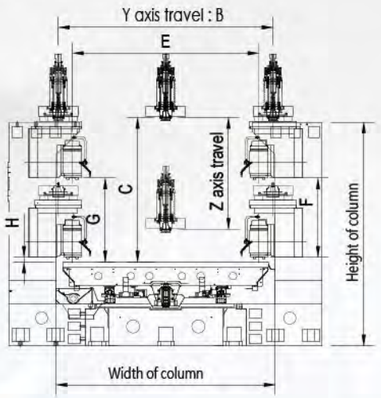


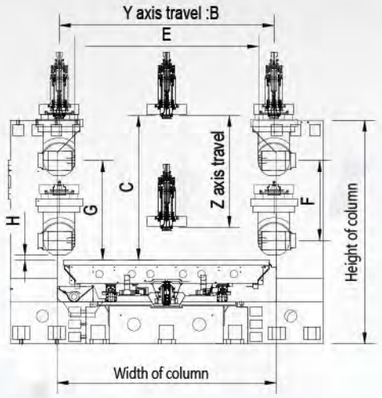
2. Vertical tool magazine

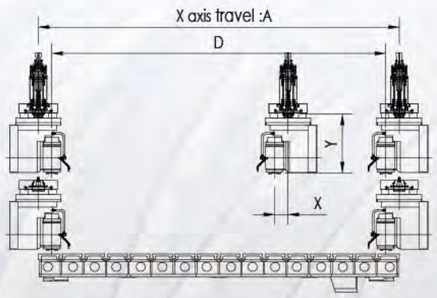
- Automatic switching processing tool
- All tool change action and tool change points are fitted with detector and sequential scanning to ensure stability and reliability for machine tool change.
- Vertical type tool magazine: can be used with 32/40/60/90 tools (standard feature).
- Vertical and horizontal tool magazine: can be used with 32/40/62 tools (optional configuration).

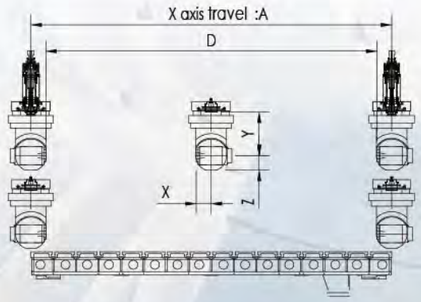
The new Y-axis is designed to bring a broader range of processing

ALL NEW INFINITY series models providing increased Y-axis travel design, you can upgrade your range of processing through the increase of Y-axis travel. We have achieved our purpose to process the widest range with the minimum cost.







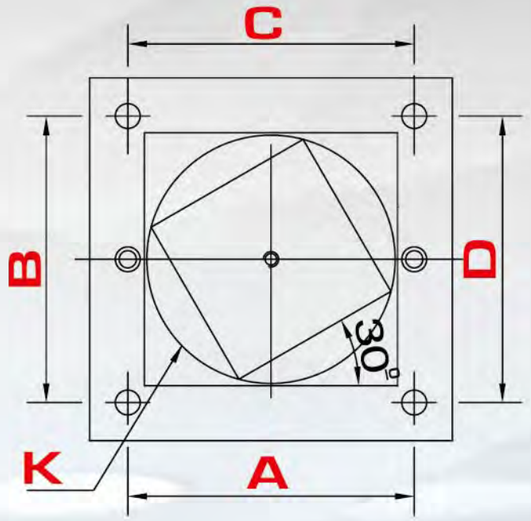


Model	Z - TRAVEL	COLUMN - HIGH	COLUMN - WIDTH	B	C	E(V) B-(X*2)	F(V) C-(Y+H)	G(V)	E(H) B-(X*2)	F(H) C-(Y+H)	G(H)	H
HSA-X20EA	1000	2200	2000	2000	1350	1700	650	700	1670	655	865	50
HSA-X20EAY				2800		2500			2470			
HSA-X23EA			2300	2300	1350	2000	650	700	1970	655	865	
HSA-X23EAY				3100		2800			2770			
HSA-X27EA			2700	2700	1350	2400	650	700	2370	655	865	
HSA-X27EAY				3500		3200			3170			
HSA-X28EA			2800	2800	1310	2500	610	660	2470	615	825	
HSA-X28EAY				3600		3300			3270			
HSA-X32EA			3200	3200	1310	2900	610	660	2870	615	825	
HSA-X32EAY				4000		3700			3670			
HSA-X36EA			3600	3600	1310	3300	610	660	3270	615	825	
HSA-X36EAY				4400		4100			4070			

QC cutting ability test presents the best quality of Hartford

HSA-423 Mold Testing

Test materials	F25C
Cutting speed	F200 - 500
Spindle speed	S500 - 800
Test tool diameter	Φ25 mm



Positioning machining precision
Positioning accuracy

Through FIG cutting accuracy
Precision through FIG.

	A	B	C	D	K
Error value	0.025	0.025	0.025	0.025	0.020
Actual value	0.0016	0.0015	0.0070	0.0019	0.0037
	(⊕)	(⊕)	(⊕)	(⊕)	(◯)

Unit(mm)

Accuracy	Error value	The actual value
The true flatness of bed top surface (X / Y-axis)	1000▾0.05/M, 1000-2000▴0.06/M, 2000 0.07/M	0.02
Right angle of mutual movement of each axis (X / Y-axis)	0.020/500	0.005
Right angle of mutual movement of each axis (Y / Z axis)	0.02/500	0.005
Slanting swing in spindle hole	Fixed Side:0.005, Free Side:0.012/300	0.001/0.005
Accuracy through roundness	0.012/150 (Machine X-axis above 5M within 0.012/150)	0.003

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 conparison between Harerol Plus and others

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

Hartrol Plus

Intelligent Support — Cost Down 20%
- Multi-touch screen
- E-book
- Remote control
- Cutting condition calculator
- Stand-by Mode
- Hartford User Connect

Intelligent Functions — Productivity Increased by 18%
- AFC (Automatic feedrate control)
- SSS-4G high speed high accuracy control
- Machining time countdown for single block
- Optimized machining program

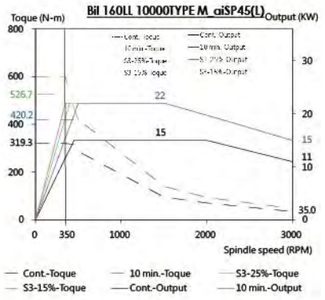
Intelligent Design — Efficiency Upgraded by 20%
- Machine utilization management
- operators performance management
- 24 hours a day management
- Remote management

A variety of Hartford made spindles have quality assurance

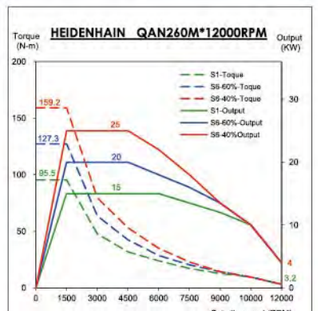
Torque curve diagram

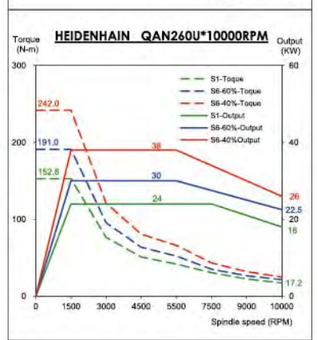
6,000 rpm gear type spindle
8,000 rpm gear type spindle (optional configuration)
10,000 rpm direct-connected spindle (optional configuration)
12,000 rpm direct-connected spindle (optional configuration)
15,000 rpm direct-connected spindle (optional configuration)
40 is applicable to HAS-2212/3212/2215/x23/x27 (optional configuration)
Hybrid 10,000 rpm spindle (optional configuration is applicable to EA / EAY.)

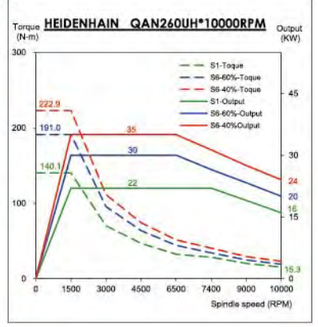
Hybrid 10,000 RPM

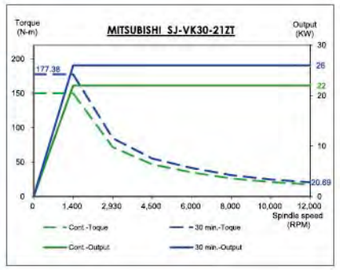


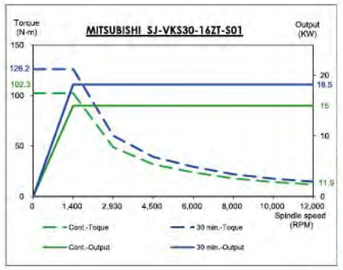
Direct type

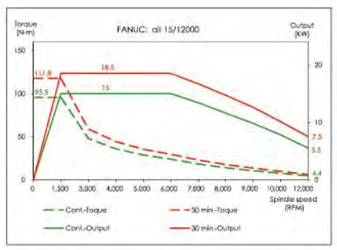


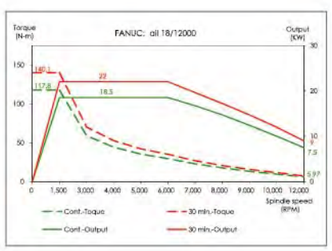


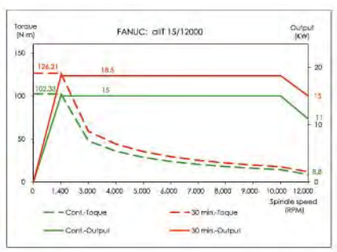


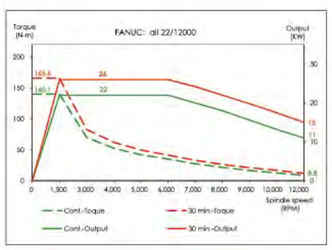




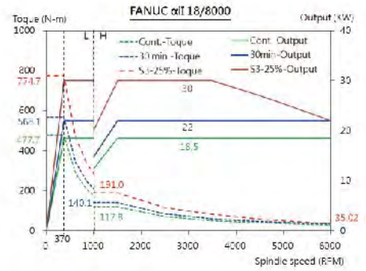


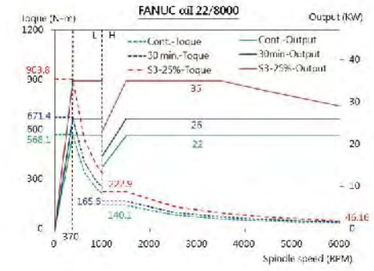


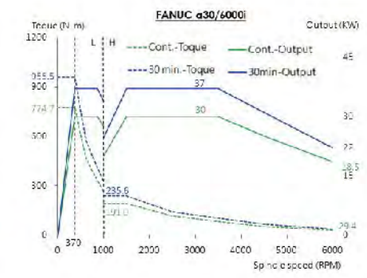


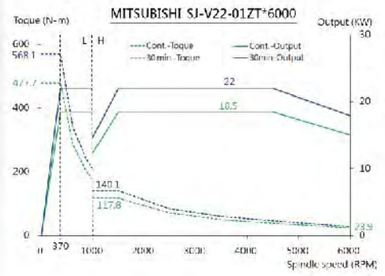


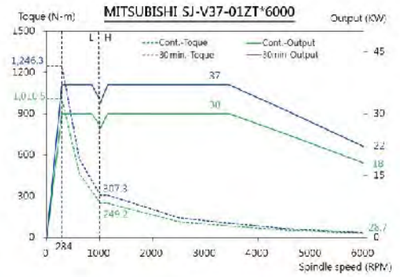
Gear type 6,000 RPM

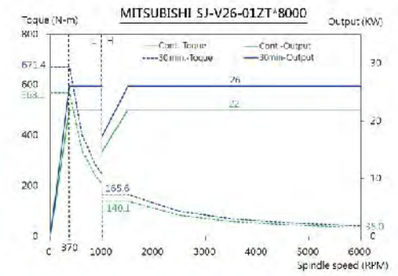


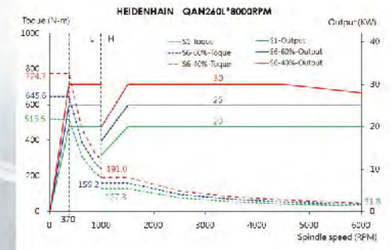


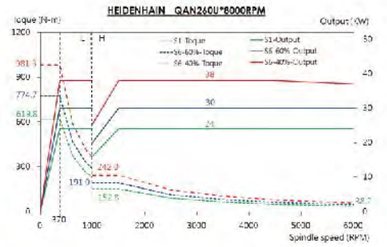




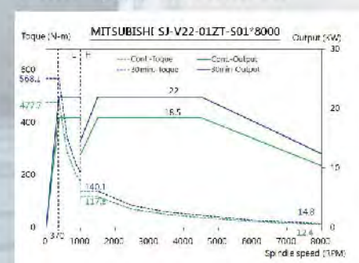


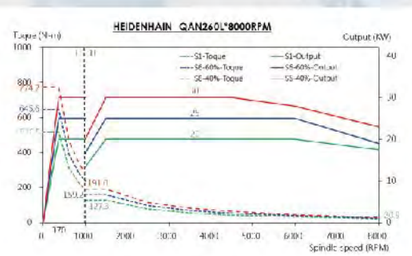


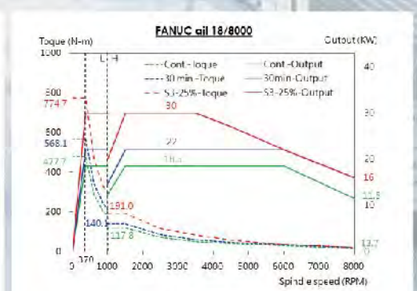


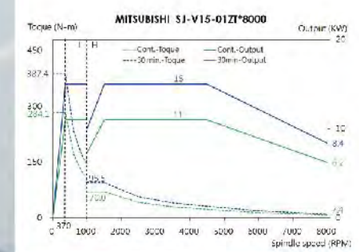


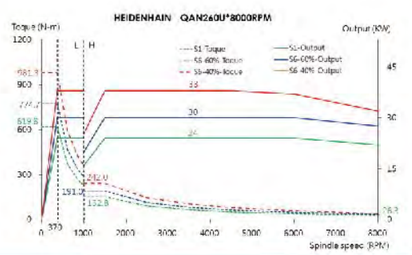
Gear type 8,000 RPM

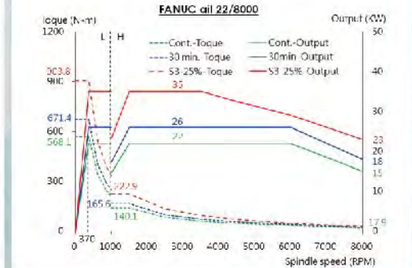




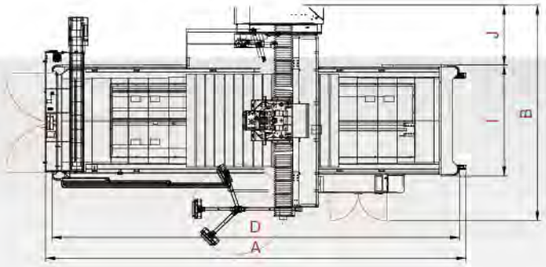


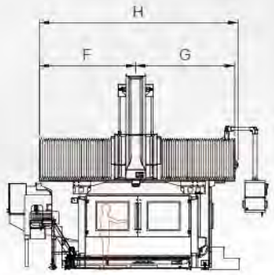


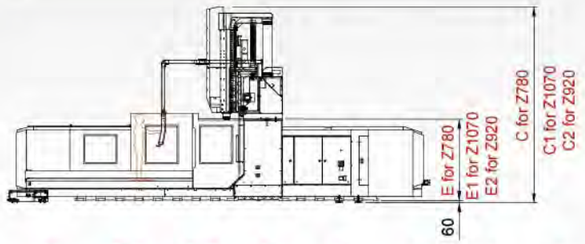




Machine Dimension







HSA-X20/X23/X27/X28/X32/X36 series

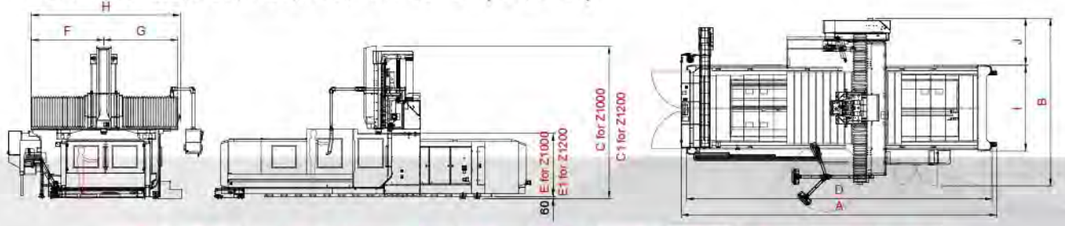
Model	A	B	C	C1	C2	D	E	E1	E2	F	G	H	I	J
HSA-220	7755	5040	4900	5300	5700	7545	1900	2200	2400	2130	2190	4400	2194	1630
HSA-320	9000	5040	4900	5300	5700	8795	1900	2200	2400	2130	2190	4400	2194	1630
HSA-420	11000	5040	4900	5300	5700	10795	1900	2200	2400	2130	2190	4400	2194	1630
HSA-323	9000	5340	4900	5300	5700	8795	1900	2200	2400	2205	2265	4625	2494	1630
HSA-423	11000	5340	4900	5300	5700	10795	1900	2200	2400	2205	2265	4625	2494	1630
HSA-523	13000	5340	4900	5300	5700	12795	1900	2200	2400	2205	2265	4625	2494	1630
HSA-623	15000	5340	4900	5300	5700	14795	1900	2200	2400	2205	2265	4625	2494	1630
HSA-327	9000	5840	4900	5300	5700	8795	1900	2200	2400	2525	2585	5195	2994	1630
HSA-427	11000	5840	4900	5300	5700	10795	1900	2200	2400	2525	2585	5195	2994	1630
HSA-527	13000	5840	4900	5300	5700	12795	1900	2200	2400	2525	2585	5195	2994	1630
HSA-627	15000	5840	4900	5300	5700	14795	1900	2200	2400	2525	2585	5195	2994	1630
HSA-328	9000	5840	4900	5300	5700	8795	2000	2200	2400	2525	2585	5195	2994	1630
HSA-428	11000	5840	4900	5300	5700	10795	2000	2200	2400	2525	2585	5195	2994	1630
HSA-528	13000	5840	4900	5300	5700	12795	2000	2200	2400	2525	2585	5195	2994	1630
HSA-628	15000	5840	4900	5300	5700	14795	2000	2200	2400	2525	2585	5195	2994	1630
HSA-728	17000	5840	4900	5300	5700	16795	2000	2200	2400	2525	2585	5195	2994	1630
HSA-828	19000	5840	4900	5300	5700	18795	2000	2200	2400	2525	2585	5195	2994	1630
HSA-432	11000	6240	4900	5300	5700	10795	2000	2200	2400	2750	2810	5670	3394	1630
HSA-532	13000	6240	4900	5300	5700	12795	2000	2200	2400	2750	2810	5670	3394	1630
HSA-632	15000	6240	4900	5300	5700	14795	2000	2200	2400	2750	2810	5670	3394	1630
HSA-732	17000	6240	4900	5300	5700	16795	2000	2200	2400	2750	2810	5670	3394	1630
HSA-832	19000	6240	4900	5300	5700	18795	2000	2200	2400	2750	2810	5670	3394	1630
HSA-436	11000	6740	4900	5300	5700	10795	2000	2200	2400	3025	3085	6195	3794	1730
HSA-536	13000	6740	4900	5300	5700	12795	2000	2200	2400	3025	3085	6195	3794	1730
HSA-636	15000	6740	4900	5300	5700	14795	2000	2200	2400	3025	3085	6195	3794	1730
HSA-736	17000	6740	4900	5300	5700	16795	2000	2200	2400	3025	3085	6195	3794	1730
HSA-836	19000	6740	4900	5300	5700	18795	2000	2200	2400	3025	3085	6195	3794	1730

HSA-2212/3212

Model	A	B	C	C1	D	E	F	G	H	I	J
HSA-2212	6805	3855	4120	4320	6355	1700	1423.5	1193.5	2832.5	1480	1425
HSA-3212	8805	3855	4120	4320	8355	1700	1423.5	1193.5	2832.5	1480	1425

Note: Above machine dimension is not suitable for 2017 new cover, please check with sales window directly.

HSA-X20/X23/X27/X28/X32/X36 series (EA/EAY)



Model	A	B	C	C1	D	E	E1	F	G	H	I	J
HSA-220EA	7755	5040	5235	5635	7545	2200	2400	2130	2190	4400	2194	1630
HSA-320EA	9000	5040	5235	5635	8795	2200	2400	2130	2190	4400	2194	1630
HSA-420EA	11000	5040	5235	5635	10795	2200	2400	2130	2190	4400	2194	1630
HSA-323EA	9000	5340	5235	5635	8795	2200	2400	2205	2265	4625	2494	1630
HSA-423EA	11000	5340	5235	5635	10795	2200	2400	2205	2265	4625	2494	1630
HSA-523EA	13000	5340	5235	5635	12795	2200	2400	2205	2265	4625	2494	1630
HSA-623EA	15000	5340	5235	5635	14795	2200	2400	2205	2265	4625	2494	1630
HSA-327EA	9000	5840	5235	5635	8795	2200	2400	2525	2585	5195	2994	1630
HSA-427EA	11000	5840	5235	5635	10795	2200	2400	2525	2585	5195	2994	1630
HSA-527EA	13000	5840	5235	5635	12795	2200	2400	2525	2585	5195	2994	1630
HSA-627EA	15000	5840	5235	5635	14795	2200	2400	2525	2585	5195	2994	1630
HSA-328EA	9000	5840	5235	5635	8795	2200	2400	2525	2585	5195	2994	1630
HSA-428EA	11000	5840	5235	5635	10795	2200	2400	2525	2585	5195	2994	1630
HSA-528EA	13000	5840	5235	5635	12795	2200	2400	2525	2585	5195	2994	1630
HSA-628EA	15000	5840	5235	5635	14795	2200	2400	2525	2585	5195	2994	1630
HSA-728EA	17000	5840	5235	5635	16795	2200	2400	2525	2585	5195	2994	1630
HSA-828EA	19000	5840	5235	5635	18795	2200	2400	2525	2585	5195	2994	1630
HSA-432EA	11000	6490	5235	5635	10795	2200	2400	2750	2810	5670	3394	1630
HSA-532EA	13000	6490	5235	5635	12795	2200	2400	2750	2810	5670	3394	1630
HSA-632EA	15000	6490	5235	5635	14795	2200	2400	2750	2810	5670	3394	1630
HSA-732EA	17000	6490	5235	5635	16795	2200	2400	2750	2810	5670	3394	1630
HSA-832EA	19000	6490	5235	5635	18795	2200	2400	2750	2810	5670	3394	1630
HSA-436EA	11000	6990	5235	5635	10795	2200	2400	3025	3085	6195	3794	1715
HSA-536EA	13000	6990	5235	5635	12795	2200	2400	3025	3085	6195	3794	1715
HSA-636EA	15000	6990	5235	5635	14795	2200	2400	3025	3085	6195	3794	1715
HSA-736EA	17000	6990	5235	5635	16795	2200	2400	3025	3085	6195	3794	1715
HSA-836EA	19000	6990	5235	5635	18795	2200	2400	3025	3085	6195	3794	1715
HSA-220EAY	7755	5290	5235	5635	7545	2200	2400	2380	2280	4740	2194	1880
HSA-320EAY	9000	5290	5235	5635	8795	2200	2400	2380	2280	4740	2194	1880
HSA-420EAY	11000	5290	5235	5635	10795	2200	2400	2380	2280	4740	2194	1880
HSA-323EAY	9000	5590	5235	5635	8795	2200	2400	2625	2535	5225	2494	1880
HSA-423EAY	11000	5590	5235	5635	10795	2200	2400	2625	2535	5225	2494	1880
HSA-523EAY	13000	5590	5235	5635	12795	2200	2400	2625	2535	5225	2494	1880
HSA-623EAY	15000	5590	5235	5635	14795	2200	2400	2625	2535	5225	2494	1880
HSA-327EAY	9000	6090	5235	5635	8795	2200	2400	2875	2785	5725	2994	1880
HSA-427EAY	11000	6090	5235	5635	10795	2200	2400	2875	2785	5725	2994	1880
HSA-527EAY	13000	6090	5235	5635	12795	2200	2400	2875	2785	5725	2994	1880
HSA-627EAY	15000	6090	5235	5635	14795	2200	2400	2875	2785	5725	2994	1880
HSA-328EAY	9000	6090	5235	5635	8795	2200	2400	2875	2785	5725	2994	1880
HSA-428EAY	11000	6090	5235	5635	10795	2200	2400	2875	2785	5725	2994	1880
HSA-528EAY	13000	6090	5235	5635	12795	2200	2400	2875	2785	5725	2994	1880
HSA-628EAY	15000	6090	5235	5635	14795	2200	2400	2875	2785	5725	2994	1880
HSA-728EAY	17000	6090	5235	5635	16795	2200	2400	2875	2785	5725	2994	1880
HSA-828EAY	19000	6090	5235	5635	18795	2200	2400	2875	2785	5725	2994	1880
HSA-432EAY	11000	6740	5235	5635	10795	2200	2400	3100	3010	6220	3394	1880
HSA-532EAY	13000	6740	5235	5635	12795	2200	2400	3100	3010	6220	3394	1880
HSA-632EAY	15000	6740	5235	5635	14795	2200	2400	3100	3010	6220	3394	1880
HSA-732EAY	17000	6740	5235	5635	16795	2200	2400	3100	3010	6220	3394	1880
HSA-832EAY	19000	6740	5235	5635	18795	2200	2400	3100	3010	6220	3394	1880
HSA-436EAY	11000	7240	5235	5635	10795	2200	2400	3275	3185	6525	3794	1965
HSA-536EAY	13000	7240	5235	5635	12795	2200	2400	3275	3185	6525	3794	1965
HSA-636EAY	15000	7240	5235	5635	14795	2200	2400	3275	3185	6525	3794	1965
HSA-736EAY	17000	7240	5235	5635	16795	2200	2400	3275	3185	6525	3794	1965
HSA-836EAY	19000	7240	5235	5635	18795	2200	2400	3275	3185	6525	3794	1965

Note: Above machine dimension is not suitable for 2017 new cover, please check with sales window directly.

Mechanical Specifications Table

Model		HSA-2212/3212	HSA-220/320/420	HSA-323/423/523/623/723	HSA-327/427/527/627	HSA-328/428/528/628/728/828	HSA-432/532/632/732/832	HSA-436/536/636/736/836
Workbench	unit							
Workbench size	mm	2000/3000 x 1100	2000/3000/4000x1800	3000/4000/5000/6000/7000x2200	3000/4000/5000/6000 x 2200	3000/4000/5000/6000/7000/8000x2500	4000/5000/6000/7000/8000x2500	4000/5000/6000/7000/8000x3000
T-shaped slot (slot frame x slot number x slot distance)	mm	22 x 6 x 160	22x7/11/15x250	28x11/15/19/23 /27x250	28x11/15/19/23 x 250	28x11/15/19/23/27/31x250	28x15/19/23/27/31x250	28x 15/19/23/27/31x250
Maximum load	kg	3500/4500	8000/10000/12000	10000/12000/15000/18000/20000	10000/12000/15000/18000	15000/18000/20000/23000/25000/27000	18000/20000/23000/25000/27000	18000/21000/24000/27000/30000
Travel								
X-axis travel	mm	2250/3250	2000/3000/4000	3000/4000/5000/6000/7000	3000/4000/5000/6000	3000/4000/5000/6000/7000/8000	4000/5000/6000/7000/8000	4000/5000/6000/7000/8000
Y-axis travel	mm	1200	2000	2300	2700	2800	3200	3600
Z-axis travel	mm	780	780(1000/1200)	780(1000/1200)	780(1000/1200)	780(1000/1200)	780(1000/1200)	780(1000/1200)
Spindle nose to workbench	mm	120 ~ 900 (Z: 780_Column1700)# 50 320 ~ 1100 (Z: 780_Column1900)# 50 180 ~ 960 (Z: 780_Column1700)# 40 380 ~ 1160 (Z: 780_Column1900)# 40	200~980(Z:780_Column1900) 280~1280(Z:1000_Column2200) 280~1480(Z:1200_Column2400)	200~980(Z:780_Column1900) 280~1280(Z:1000_Column2200) 280~1480(Z:1200_Column2400)	200~980(Z:780_Column1900) 280~1280(Z:1000_Column2200) 280~1480(Z:1200_Column2400)	260~1040(Z:780_Column2000) 240~1240(Z:1000_Column2200) 240~1440(Z:1200_Column2400)	260~1040(Z:780_Column2000) 240~1240(Z:1000_Column2200) 240~1440(Z:1200_Column2400)	260~1040(Z:780_Column2000) 240~1240(Z:1000_Column2200) 240~1440(Z:1200_Column2400)
Spindle center to column	mm	450	450	450	450	450	450	450
Door width	mm	1300	2000	2300	2800	2800	3200	3600
Spindle								
Gear type speed	rpm	6000(8000)	6000(8000)	6000(8000)	6000(8000)	6000(8000)	6000(8000)	6000(8000)
Direct-connected type speed	rpm	10000 (15000 Only on #50)	(10000/12000)	(10000/12000)	(10000/12000)	(10000/12000)	(10000/12000)	(10000/12000)
Nose taper		ISO50 / ISO40	ISO50	ISO50	ISO50	ISO50	ISO50	ISO50
Speed								
Cut rate (X / Y / Z-axis)	mm / min	10000	12000	12000/12000/12000 (323) 10000/12000/12000 (423) 8000/12000/12000 (523) 8000/12000/12000 (623) 8000/12000/12000 (723)	12000/12000/12000(327) 10000/12000/12000(427) 8000/12000/12000(527) 8000/12000/12000(627)	10000/12000/12000(328) 10000/12000/12000(428) 8000/12000/12000(528) 8000/12000/12000(628) 8000/12000/12000(728) 6000/12000/12000(828)	10000/12000/12000(432) 8000/12000/12000(532) 8000/12000/12000(632) 8000/12000/12000(732) 6000/12000/12000(832)	10000/10000/10000(436) 8000/10000/10000(536) 8000/10000/10000(636) 8000/10000/10000(736) 6000/10000/10000(836)
Feedrate (X / Y / Z axis)	mm / min	24000/ 24000/ 20000(2212) 20000/ 24000/ 20000(3212)	24000/18000/16000(220) 20000/18000/16000(320) 20000/18000/16000(420)	20000/18000/16000 (323) 20000/18000/16000 (423) 14000/18000/16000 (523) 12000/18000/16000 (623) 12000/18000/16000 (723)	20000/18000/16000(327) 20000/18000/16000(427) 14000/18000/16000(527) 12000/18000/16000(627)	20000/18000/16000(328) 16000/18000/16000(428) 12000/18000/16000(528) 10000/18000/16000(628) 10000/18000/16000(728) 8000/18000/16000(828)	16000/18000/16000(432) 12000/18000/16000(532) 10000/18000/16000(632) 10000/18000/16000(732) 8000/18000/16000(832)	16000/16000/16000(436) 14000/16000/16000(536) 12000/16000/16000(636) 10000/16000/16000(736) 8000/16000/16000(836)
Automatic Tool Changer								
Tool number	pcs	24/32 A-type , 40 A-type Only on #50	20 S-type,32 A-type	20 S-type,32 A-type	20 S-type,32 A-type	20 S-type,32 A-type	20 S-type,32 A-type	20 S-type,32 A-type
Maximum tool weight	kg	18 (#50), 7 (#40)	15 S-type,20 A-type	15 S-type,20 A-type	15 S-type,20 A-type	15 S-type,20 A-type	15 S-type,20 A-type	15 S-type,20 A-type
Tool size (diameter x length)	mm	ϕ110 x 350L (24) / ϕ125 x 350L (32 / 40) (Ø75 x 300L Only on #40)	ϕ125 x 350(S-type)/ ϕ125 x 400(A-type)	ϕ125 x 350(S-type) ϕ125 x 400(A-type)	ϕ125 x 350(S-type)/ ϕ125 x 400(A-type)	ϕ125 x 350(S-type)/ ϕ125 x 400(A-type)	ϕ125 x 350(S-type)/ ϕ125 x 400(A-type)	ϕ125 x 350(S-type)/ ϕ125 x 400(A-type)
Tool holder		BT50 (BBT40, 50 / CAT40, 50 / DIN)	BT-50/CAT50/DIN/BBT50	BT-50/CAT50/DIN/BBT50	BT-50/CAT50/DIN/BBT50	BT-50/CAT50/DIN/BBT50	BT-50/CAT50/DIN/BBT50	BT-50/CAT50/DIN/BBT50
Pulling bolt		P50T-1/CAT-50/DIN, MAS-P40T-1/CAT-40/DIN	P50T-1	P50T-1	P50T-1	P50T-1	P50T-1	P50T-1
Motor								
Spindle power (Fanuc)	kW(30min/Cont)	#50: 18.5 / 15 (22 / 26DDS for Fanuc) #40: 11 / 7.5 DDS for Fanuc	22/18.5	22/18.5	22/18.5	22/18.5	22/18.5	22/18.5
Positioning accuracy								
3-axis laser positioning accuracy (JIS B6330)								
Positioning accuracy / full travel	mm	±0.010	±0.010	±0.010/0.010/0.012/±0.012/0.012	±0.010/0.010/0.012/0.012	±0.010/0.010/0.012/0.012/0.012/0.012	±0.012	±0.012
Repeated positioning accuracy	mm	±0.003	±0.003	±0.003	±0.003	±0.003	±0.003	±0.003
3-axis laser positioning accuracy (VDI3441) repeats 5 times.								
Positioning accuracy	mm	0.015/ 0 016	0.015/0.016/0.018	0.016/0.018/0.020/ 0.028/0.028	0.016/0.018/0.020/0.028	0.016/0.018/0.026/0.028/0.028/0.030	0.018/0.026/0.028/0.028/0.030	0.018/0.026/0.028/0.028/0.030
Repeated positioning accuracy	mm	0.014	0.014/0.014/0.015	0.014/0.015/0.021/0.024/0.024	0.014/0.015/0.021/0.024	0.014/0.015/0.021/0.024/0.024/0.026	0.015/0.021/0.024/0.024/0.026	0.015/0.021/0.024/0.024/0.026
Other								
Required air pressure	kg/cm²	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Required power	KVA	50/65	55/55/60	55/55/60/ 65/65	55/55/60/65	65/65/65/65/65/70	65/65/70/70/70	65/65/70/70/70
Covering area	mm	7930/10160x5440	11000/13000/15000x6100	11000/13000/15000/17000/19000x6400	11000/13000/15000/17000x6900	11440/13440/15440/17440/19440/21440x7280	13440/15440/17440/19440/21440x7680	12790/14790/16790/18790/20790x8140
Net weight	kg	14720/18200	24500/27500/30500(Z-axis 780) 25500/28500/31500(Z-axis 1000) 26500/29500/32500(Z-axis 1200)	30100/34100/38100/ 42100/46100(Z-axis 780) 31420/35420/39420/ 43420/47420(Z-axis 1000) 32000/36200/40200/44200/48200(Z-axis 1200)	33370/37370/41370/45370(Z-axis 780) 34690/38690/42690/46900(Z-axis 1000) 35470/39470/43470/47470(Z-axis 1200)	34000/39000/44000/50000/55000/60000(Z-axis 780) 34500/39500/44500/50500/55500/60500(Z-axis 1000) 35000/40000/45000/51500/56500/61500(Z-axis 1200)	41000/46000/52000/58000/64000(Z-axis 780) 41500/46500/52500/58500/64500(Z-axis 1000) 42000/47000/53000/59000/65000(Z-axis 1200)	50000/56000/62000/67000/72000(Z-axis 780) 50500/56500/62500/67500/72500(Z-axis 1000) 51000/57000/63000/68000/73000(Z-axis 1200)

The factory laser precision is JIS B6330.
If VDI 3441 demand,
you may further propose

1. Electrical features Standard equipment & optional features

A: Hartrol (standard equipment)

- ∞Manual workpiece alignment
- ∞Tool magazine graphics and data display
- ∞Pop-up computer
- ∞Supporting processing parameters
- ∞Machine utilization rate analysis (only suitable for Fanuc)
- ∞Internal and external thread cutting (only suitable for Fanuc)
- ∞ Tool magazine data display - Tool style graphical data display (only suitable for Fanuc)
- ∞Tool life monitoring (only suitable for Fanuc)
- ∞Lettering processing function
- ∞Tool correction screen & fast tool change function (only suitable for Fanuc)

B:Hartnet(optional features)

- ∞Whole plant utilization rate management system
- ∞Processing countdown management
- ∞Whole plant file transfer system
- ∞Output management

C:Electrical function (optional features)

- ∞Power-off gravity axis lift function
- ∞Coordinate display hand input
- ∞Tool magazine HMI
- ∞Rigid tapping tool retraction
- ∞Spindle thermal displacement compensation

Specifications & dimensions are subject to change without notice (for actual weight, shipped product shall prevail.) At maximum load, X-axis rapid feed & cutting feed rate should be halved. In case of any questions, please contact our sales staff.
Hartrol (standard equipment) does not apply to Hartrol plus

Mechanical Specifications Table

Model unit	HSA-220/320/420(EA)	HSA-323/423/523/623/723(EA)	HSA-327/427/527/627(EA)	HSA-328/428/528/628/728/828(EA)	HSA-432/532/632/732/832 (EA)	HSA-436/536/636/736/836(EA)
Workbench						
Workbench size mm	2000/3000/4000/x1800	3000/4000/5000/6000/7000x2200	3000/4000/5000/6000 x2200	3000/4000/5000/6000/7000/8000x2500	4000/5000/6000/ 7000/8000 x2500	4000/5000/6000/7000/8000x3000
T-shaped slot (slot frame x slot number x slot distance) mm	22x7/11/15x250	28x11/15/19/23/27x250	28x11/15/19/23x250	28x11/15/19/23/27/31x250	28x15/19/23 /27/31 x250	28x15/19/23 /27/31x250
Maximum load kg	8000/10000/12000	10000/12000/15000/18000/20000	10000/12000/15000/18000	15000/18000/20000/23000/25000/27000	18000/20000/23000/25000/27000	18000/21000/24000/27000/30000
Travel						
X-axis travel mm	2000/3000/4000	3000/4000/5000/6000/7000	3000/4000/5000/6000	3000/4000/5000/6000/7000/8000	4000/5000/6000 /7000/8000	4000/5000/6000/7000/8000
Y-axis travel mm	EA:2000 EAY:2800	EA:2300 EAY:3100	EA:2700 EAY:3500	EA:2800 EAY:3600	EA:3200 EAY:4000	EA:3600 EAY:4400
Z-axis travel mm	1000(1200)	1000(1200)	1000(1200)	1000(1200)	1000(1200)	1000(1200)
Spindle nose to workbench mm	350~1350(Z:1000_Column2200) 350~1550(Z:1200_Column2400)	350~1350(Z:1000_Column2200) 350~1550(Z:1200_Column2400)	350~1350(Z:1000_Column2200) 350~1550(Z:1200_Column2400)	310~1310(Z:1000_Column2200) 310~1510(Z:1200_Column2400)	310~1310(Z:1000_Column2200) 310~1510(Z:1200_Column2400)	310~1310(Z:1000_Column2200) 310~1510(Z:1200_Column2400)
Spindle center to column mm	450	450	450	450	450	450
Door width mm	2000	2300	2800	2800	3200	3600
Spindle						
Gear type speed rpm	6000(8000)	6000(8000)	6000(8000)	6000(8000)	6000(8000)	6000(8000)
Direct-connected type speed rpm	10000	10000	10000	10000	10000	10000
Nose taper	ISO50	ISO50	ISO50	ISO50	ISO50	ISO50
Speed						
Cut rate (X / Y / Z-axis) mm / min	12000/12000/12000(220) 12000/12000/12000(320) 12000/12000/12000(420)	12000/12000/12000(323) 10000/12000/12000(423) 8000/12000/12000(523) 8000/12000/12000(623) 8000/12000/12000(723)	12000/12000/12000(327) 10000/12000/12000(427) 8000/12000/12000(527) 8000/12000/12000(627)	10000/12000/12000(328) 10000/12000/12000(428) 8000/12000/12000(528) 8000/12000/12000(628) 8000/12000/12000(728) 6000/12000/12000(828)	10000/12000/12000(432) 8000/12000/12000 (532) 8000/12000/12000 (632) 8000/12000/12000 (732) 6000/12000/12000 (832)	10000/10000/10000(436) 8000/10000/10000(536) 8000/10000/10000(636) 8000/10000/10000(736) 6000/10000/10000(836)
Feedrate (X / Y / Z axis) mm / min	24000/18000/16000(220) 20000/18000/16000(320) 20000/18000/16000(420)	20000/18000/16000(323) 20000/18000/16000(423) 14000/18000/16000(523) 12000/18000/16000(623) 10000/18000/16000(723)	20000/18000/16000(327) 20000/18000/16000(427) 14000/18000/16000(527) 12000/18000/16000(627)	20000/18000/16000(328) 16000/18000/16000(428) 12000/18000/16000(528) 10000/18000/16000(628) 10000/18000/16000(728) 8000/18000/16000(828)	16000/18000/16000(432) 12000/18000/16000(532) 10000/18000/16000(632) 10000/18000/16000(732) 8000/18000/16000(832)	16000/16000/16000(436) 14000/16000/16000(536) 12000/16000/16000(636) 10000/16000/16000(736) 8000/16000/16000(836)
Automatic Tool Changer						
Tool number pcs	32(40/60/90) A-type	32(40/60/90) A-type	32(40/60/90) A-type	32(40/60/90) A-type	32(40/60/90) A-type	32(40/60/90) A-type
Maximum tool weight kg	20	20	20	20	20	20
Tool size (diameter x length) mm	ϕ125 x 400	ϕ125 x 400	ϕ125 x 400	ϕ125 x 400	ϕ125 x 400	ϕ125 x 400
Tool holder	BT-50/CAT50/DIN/BBT50	BT-50/CAT50/DIN/BBT50	BT-50/CAT50/DIN/BBT50	BT-50/CAT50/DIN/BBT50	BT-50/CAT50/DIN/BBT50	BT-50/CAT50/DIN/BBT50
Pulling bolt	P50T-1	P50T-1	P50T-1	P50T-1	P50T-1	P50T-1
Motor						
Spindle power (Fanuc) kW(30min/Cont)	22/18.5 35/30(Hybrid spindle for Fanuc)	22/18.5 35/30(Hybrid spindle for Fanuc)	22/18.5 35/30(Hybrid spindle for Fanuc)	22/18.5 35/30(Hybrid spindle for Fanuc)	22/18.5 35/30(Hybrid spindle for Fanuc)	22/18.5 35/30(Hybrid spindle for Fanuc)
Positioning accuracy						
3-axis laser positioning accuracy (JIS B6330)						
Positioning accuracy / full travel mm	±0.010	±0.010/0.010/0.012/0.012/0.012	±0.010/0.010/0.012/0.012	±0.010/0.010/0.012/0.012/0.012/0.012	±0.012	±0.012
Repeated positioning accuracy mm	±0.003	±0.003	±0.003	±0.003	±0.003	±0.003
3-axis laser positioning accuracy (VDI3441) repeats 5 times.						
Positioning accuracy mm	0.015/0.016/0.018	0.016/0.018/0.026/0.028/0.028	0.016/0.018/0.026/0.028	0.016/0.018/0.026/0.028/0.028/0.030	0.018/0.026/0.028 /0.028/0.030	0.018/0.026/0.028 /0.028/0.030
Repeated positioning accuracy mm	0.014/0.014/0.015	0.014/0.015/0.021/0.024/0.024	0.014/0.015/0.021/0.024	0.014/0.015/0.021/0.024/0.024/0.026	0.015/0.021/0.024 /0 024/0 026	0.015/0.021/0.024 /0 024/0 026
Other						
Required air pressure kg / cm²	6.5	6.5	6.5	6.5	6.5	6.5
Required power KVA	55/55/60	60/60/65/65/70	60/60/65/65	60/65/65/65/70	65/65 /70/70/70	65/65/70/70/70
Covering area mm	9000/11000/13000x6500(EA) 9000/11000/13000x6750(EAY)	11000/13000/15000/17000/19000x6800(EA) 11000/13000/15000/17000/19000x7050(EAY)	11000/13000/15000/17000 x7300(EA) 11000/13000/15000/17000 x7550(EAY)	11000/13000/15000/17000/1900/2100x7300(EA) 11000/13000/15000/17000/1900/2100x7550(EAY)	13000/15000/17000/1900/2100 x7700(EA) 13000/15000/17000/1900/2100 x7950(EAY)	13000/15000/17000/1900/2100x8400(EA) 13000/15000/17000/1900/2100x8650(EAY)
Net weight kg	26000/29000/32000(EA) 26500/29500/32500(EAY)	32000/36000/40000/44000/48000(EA) 33500/37500/41500/45500/49500(EAY)	35300/39300/43300/47500(EA) 36800/40800/44800/49000(EAY)	36300/41300/46300/51300/56300/61300(EA) 37800/42800/47800/52800/57800/62800(EAY)	41500/46500/52500 /57500 /62500 (EA) 43000/48000/54000 /59000 /64000 (EAY)	53000/58000/63000/68000/73000(EA) 54500/59500/64500/69500/74500(EAY)

The factory laser precision is JIS B6330. If VDI 3441 demand, you may further propose

2. The machine is equipped with standard equipment & optional features

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

A: Standard equipment

- ∞Centralized automatic lubrication system
- ∞Spindle air blow device
- ∞Spindle oil temperature cooler
- ∞Removable crumb barrels x 2 (not suitable for HSA-2215 / HSA-X212)
- ∞Fluorescent lamp
- ∞Full cover type anti-splash protection cover
- ∞Workbench side blowing device (single tube)
- ∞Electrical control box convection heat exchanger (applies to pair up with Mitsubishi, Fanuc, Syntec motor)
- ∞Spindle air curtain
- ∞6000 rpm gear type spindle head
- ∞Bamboo hat type tool magazine (not applicable to EA / EAY / HSA-X212)
- ∞Hollow spiral cutting conveyor screw

B:Optional Accessories

- ∞Semi-cover type anti-splash protection cover (HSA-2215 / HSA-X212 have no semi-cover.)
- ∞CTS full cover type anti-splash protection cover
- ∞Spindle central coolant apparatus
- ∞90° angle head
- ∞Extending head
- ∞Universal milling head
- ∞Measuring system
- ∞Closed loop optical ruler (standard length: X axis 6m or longer)
- ∞Chain-type cut conveyor (HSA-X212 standard feature)
- ∞10000 rpm / 12000 rpm direct-connected axis (not applicable to EA / EAY)
- ∞ATC-40T / 60 T / 90 T / 120 T
- ∞8000 rpm gear type spindle head
- ∞Cut coolant system devices (HSA-2215 / HSA-X 212 standard feature)
- ∞Automatic angle head jib base