

# GS / GSA SERIES



**VISION WIDE TECH CO., LTD.**

No. 1126-2, Bishan Rd., Caotun Township, Nantou 542, Taiwan  
Tel: +886-49-2338888  
Fax: +886-49-2330083

**VISION WIDE (AH) TECH CO., LTD.**

No. 1049, Dongcheng Road, Bowang District, Ma'anshan City,  
Anhui Province 243131, China  
Tel : +86-05552908886

E-mail: [info@visionwide.com.tw](mailto:info@visionwide.com.tw)  
[www.visionwide-tech.com](http://www.visionwide-tech.com)



GS/GSA-E-202301

# GS / GSA SERIES

3-axis / 3+2 axes Gantry Type Machining Center



## GS series is Particularly Design for Precision Mold and Aluminum Cutting Industries to Meet Strict Requirements

The performance of High Speed Machining (HSM)

- ▶ 0.5G acceleration
- ▶ 28,000 rpm
- ▶ 20 m/min feed rate (OPT. 30m/min)
- ▶ Powerful spindle

High speed and mess chip removal capacity.

- ▶ Precise contour accuracy
- ▶ High cutting feed rate
- ▶ Delicate surface roughness

Positioning accuracy P 0.006mm

Repeatability Ps 0.004mm

Aluminum alloy chips removal rate 5,000 cc/min

GS 3-axis series  
GSA 3+2 axes series

Indexing Head (IAC)  
Gantry Type Machining Center



Precise mechanism & multiple spindle create the varied machining applications !

## The Optimized Performance is from the Best Arrangement between Rigidity and Structure.

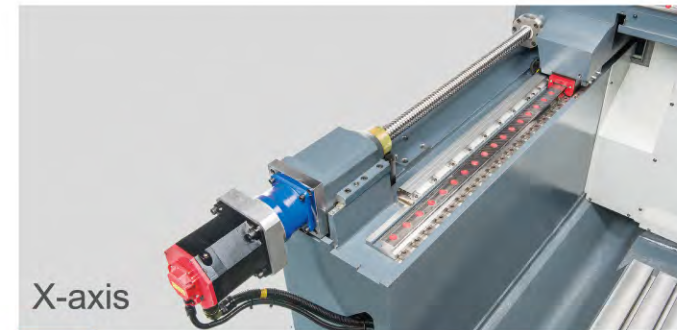
- ▶ Pyramid type weight is proportionally distributed into spindle, ran, cross beam, and bed.
- ▶ Position accuracy feedback on linear scales. Dual servo feeding system.
- ▶ Thermal symmetrical structure.
- ▶ Combination of columns, bed, and table in one piece casting.
- ▶ Low inertia at Z axis motion without counterweight.
- ▶ No weight affect during cutting.
- ▶ Linear scale is standard for 3 axis.



## 3 Axes Direct-driven with Roller Type Linear Ways Realize Rapid Motion at Cutting.

The maximum rapid of 3 axes is 24,000mm/min

The maximum feed rate is 24,000mm/min



X-axis

Dual direct-driven servo motor + dual linear scales ensures positioning accuracy at high speed motion.



Y-axis

Direct-driven servo motors + light rigid casting part improve performance.

### Z-axis

Z-axis adopted dual direct-driven motors without counter weight for high response speed. And its symmetrical design that deployed ball-screws aside spindle head enabled high speed and stability while processing.

The machine head used four-track linear to enhance load and rigidity for Z axis performance.

- ▶ DCG, Driving at the Center of Gravity
- ▶ High torque
- ▶ High acceleration
- ▶ Backlashless
- ▶ High accuracy positioning
- ▶ High transmission efficiency



## The Best Machine for High Speed Cutting

Easy operation for three in one function

- ▶ Lower table height
- ▶ Closer operating zone
- ▶ Wider door width



- Vertical type tool magazine
- Capacity: 20 / 32T (OPT.) / 40T (OPT.) / 60T (OPT.)
- High speed, contamination-free tool length measurement unit

● Tool length measurement

## The Best Solution on the Mass of Chip Removal



- 1 Chips during cutting:  
Spindle ring cutting coolant device(OPT.)  
Adjustable coolant nozzles
- 2 Chips on table:  
Chip clean flushing device(OPT.)
- 3 Chips at chip groove:  
Chip clean flushing device(OPT.)  
Foot pad above chip groove (OPT.)



- Caterpillar type chip conveyor /  
Water tank can remove iron chips efficiently.
- Dual belt type chip conveyor /  
Water tank(OPT.) can remove aluminum chips easily.

## High Speed Machining & High Feed Rate Machining Shorten Machining Time by 50% !

### Aerospace Aluminum Frame High Speed Machining (HSM)

- L1,425 x W680 x H70 mm
- Al 6061
- 10,500 rpm
- 24,000 mm/min
- 2,000 cc/min material removal rate
- Feature:
  - Cutting efficiency 100 cc/min kW
  - ( up to 200% increase in productivity)



### High Accuracy Test Workpiece

- 2,000 x 1,000 x 200 mm
- FC300
- Feature:
  - 1.8 x 0.8 m high position accuracy of boring hole: 0.02mm
  - D900 circular interpolation cutting accuracy: 0.02 mm
  - L50 pitch spacing tolerance: 0.005mm



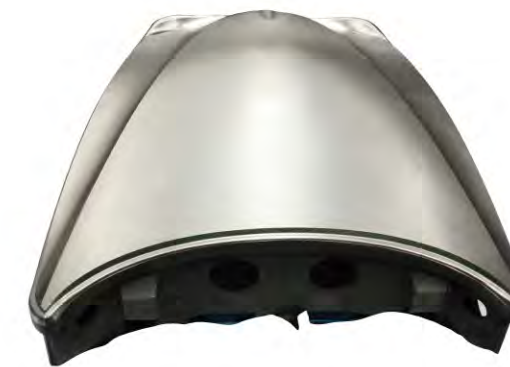
### Mold Base High Speed and High Feed Rate Cutting

- L800 x W550 x H250 mm
- S45C
- 2,000 rpm
- 10,000 mm/min
- Feature:
  - Vc 220 m/min
  - 300 cc/min material removal rate
  - Boring positioning accuracy 0.006 mm (Pitch 400 x 700mm)



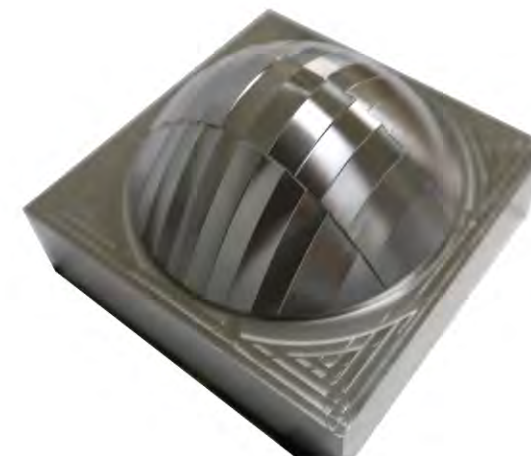
### High Speed Mold Surface Finishing Car Headlight Mold

- L800 x W550 x H250 mm
- P20
- 12,000 rpm
- 4,000 mm/min
- Feature:
  - Ra 0.4 μm
  - Contour Accuracy 0.04 mm



### Engine Hood Mold

- L2,000 x W1,600 x H500 mm
- FC300
- 12,000 rpm
- 10,000 mm/min
- Feature:
  - 10 m/min high feed mold face machining
  - 0.3G high acceleration machining
  - Total finish time : 5.2 Hrs.
  - NC path mark gaps < 2 μm

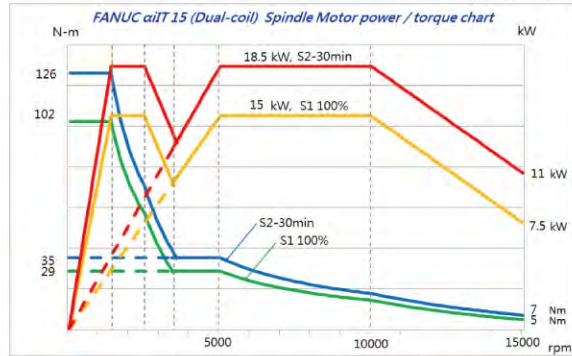


### Speedy Mold Surface Finishing Automotive Light Reflector Core

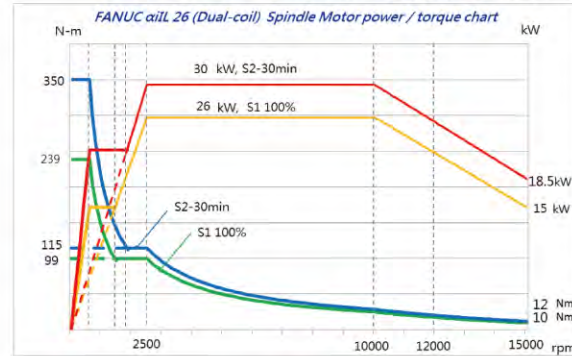
- L160 x W160 x H100 mm
- NAK 80
- 12,000 rpm
- 1,500 mm/min
- Feature:
  - Ra 0.4 μm
  - Contour Accuracy 0.02 mm

## Spindle Power and Torque Charts | FANUC Controller

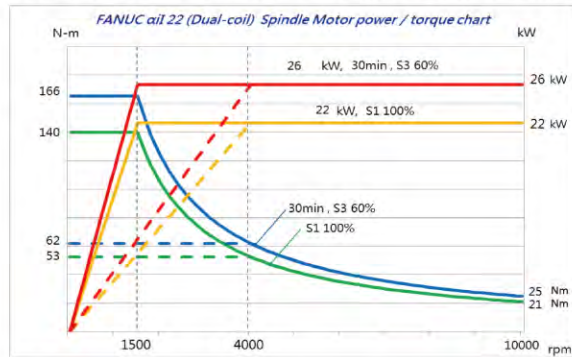
1. Fanuc  $\alpha$  iT 15/ Direct-driven/ 15,000 rpm/ BBT-40  
(Standard)



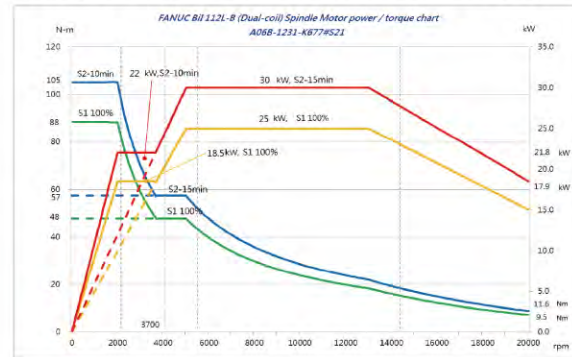
2. Fanuc  $\alpha$  iL26/ Direct-driven/ 15,000 rpm / BBT-40  
/ 12,000 rpm / BBT-50



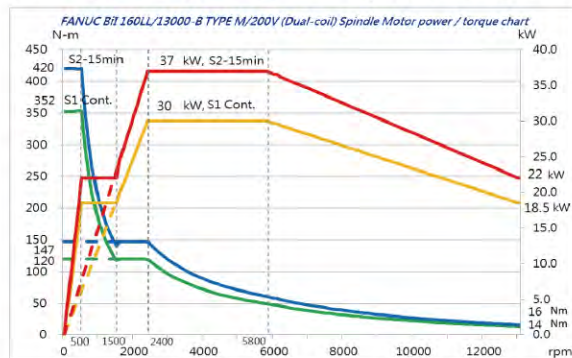
3. Fanuc  $\alpha$  iL 22/  $\alpha$  iL22T/ Direct-driven/ 10,000 rpm/ BBT-50



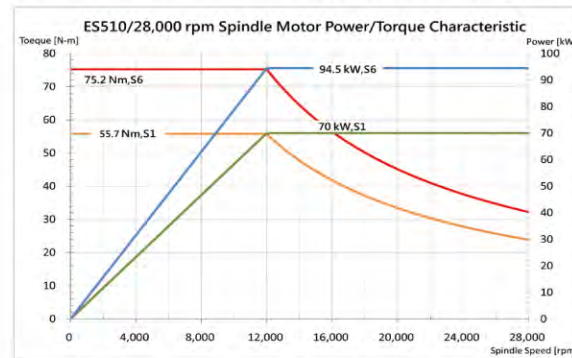
4. FANUC Bi112L/ Built-in/ 20,000 rpm/ HSK-A63



5. FANUC Bi160LL/ Built-in/ 12,000 rpm/ BBT-50

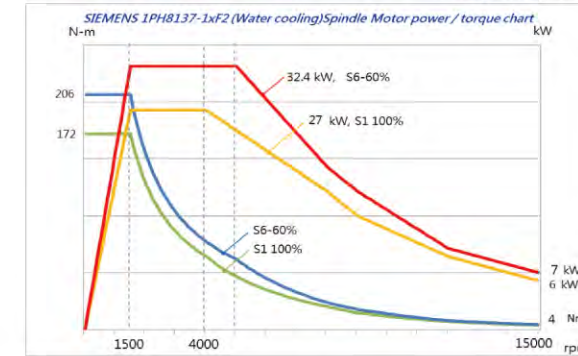


6. HSD ES 510 / Built-in / 28,000 rpm / HSK-A63

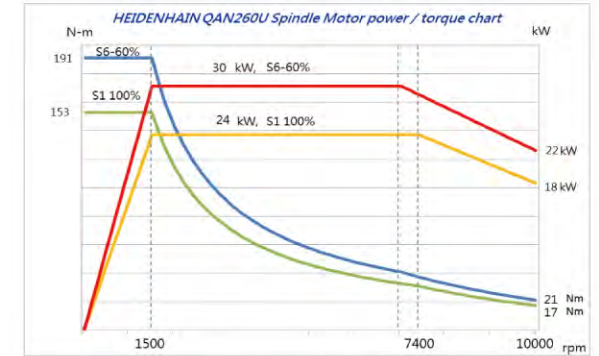


## Spindle Power and Torque Charts | HAIDENHAIN Controller

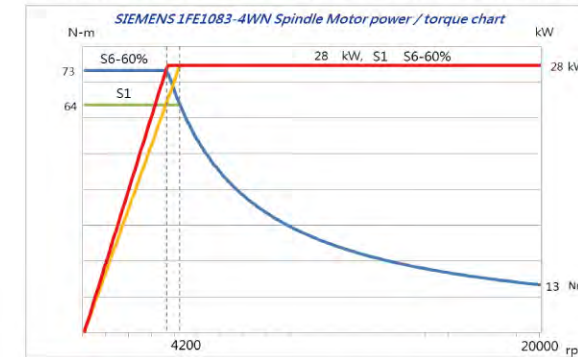
1. SIEMENS 1PH8137 / Direct-driven / 15,000rpm / BBT-40  
/ 12,000rpm / BBT-50  
/ 12,000rpm / BBT-40



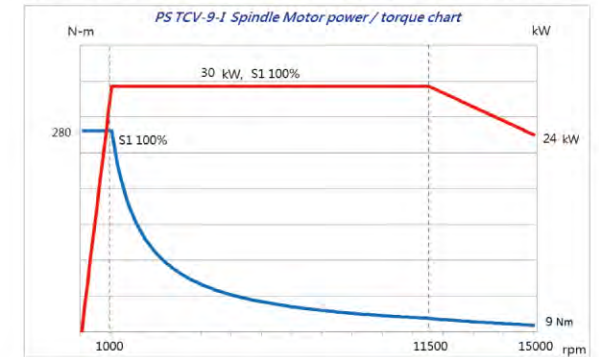
2. HEIDENHAIN QAN260U/ Direct-driven/ 10,000 rpm/ BBT-50



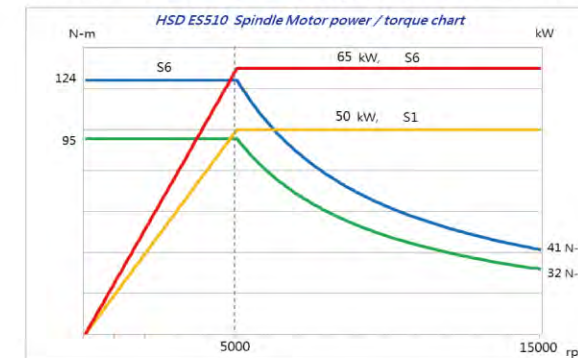
3. SIEMENS 1FE 1083/ Built-in/ 20,000 rpm/ HSK-A63



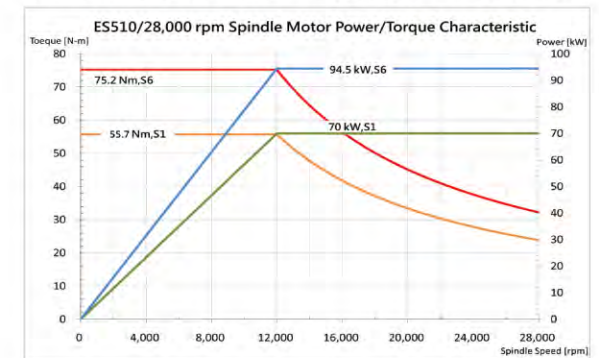
4. PS TCV-9-I / Built-in / 15,000 rpm / HSK-A100



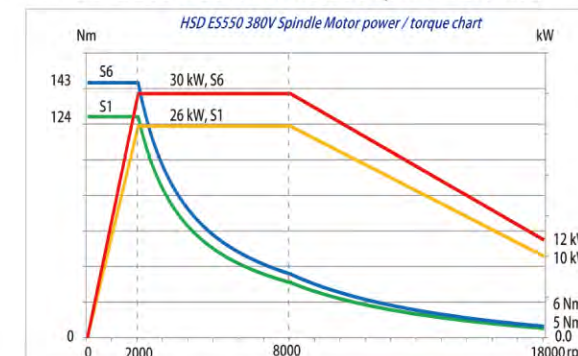
5. HSD ES 510 / Built-in / 15,000 rpm / HSK-A100



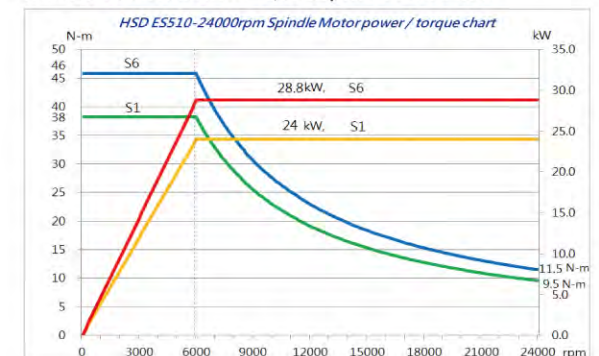
6. HSD ES 510 / Built-in / 28,000 rpm / HSK-A63



7. HSD ES550 Built-in / 18,000 rpm / HSK-A63



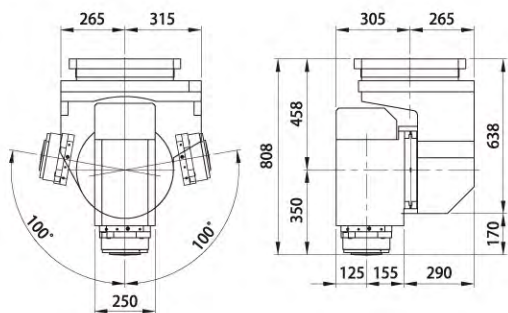
8. ES510 / Built-in / 24,000rpm / HSK-A63



Main Features of AC 2 Axes  
Attachment Head

High Power & Speed type

- Above 40kW driving capacity
- 12,000 / 15,000 / 24,000 rpm spindle speed
- Auto tool clamping
- Auto indexing: B axis 1° / C axis 1°
- Rotation range: B axis ±100° / C axis ±200°
- Spindle cooling system
- High tool clamping force: 20 kN
- Surrounding coolant nozzles
- Coolant through spindle interface, 20 / 70 bars
- Independent encoder for position feedback for each rotation axis.



Material:S45C

Unit:mm

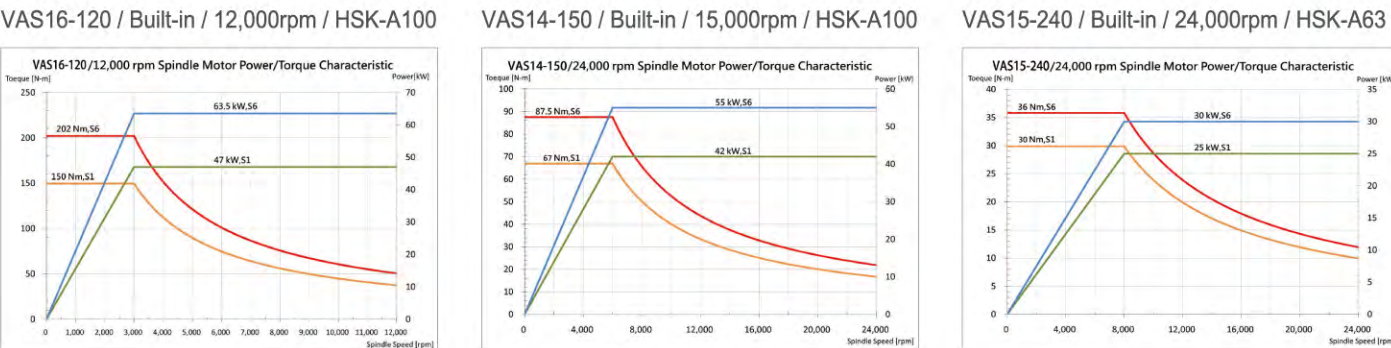
|                         |                                      |                      |                                     |                      |                                    |                      |
|-------------------------|--------------------------------------|----------------------|-------------------------------------|----------------------|------------------------------------|----------------------|
| IAC Speed               | 12,000 rpm (47/63.5 kW & 150/202 Nm) |                      | 15,000 rpm (50/65 kW & 95.5/124 Nm) |                      | 24,000 rpm (40/55 kW & 67/87.5 Nm) |                      |
| Cutting type            | Heavy                                | High Feed rate (HFM) | Heavy                               | High Feed rate (HFM) | Heavy                              | High Feed rate (HFM) |
| Tool Dia. (mm)          | 80                                   | 40                   | 80                                  | 40                   | 80                                 | 40                   |
| Cutting width (Ae) (mm) | 50                                   | 32                   | 50                                  | 32                   | 50                                 | 32                   |
| Cutting depth (Ap) (mm) | 3                                    | 2                    | 2                                   | 1.5                  | 1.3                                | 1.4                  |
| Feed rate (mm/min)      | 3,000                                | 12,000               | 3,000                               | 12,000               | 3,000                              | 12,000               |
| Removal rate (cc/min)   | 450                                  | 768                  | 300                                 | 576                  | 195                                | 540                  |

Material:Al6061

Unit:mm

|                         |                                      |                           |                                     |                           |                                    |                           |
|-------------------------|--------------------------------------|---------------------------|-------------------------------------|---------------------------|------------------------------------|---------------------------|
| IAC Speed               | 12,000 rpm (47/63.5 kW & 150/202 Nm) |                           | 15,000 rpm (50/65 kW & 95.5/124 Nm) |                           | 24,000 rpm (40/55 kW & 67/87.5 Nm) |                           |
| Cutting type            | High speed cutting(HSC)              | High speed machining(HSM) | High speed cutting(HSC)             | High speed machining(HSM) | High speed cutting(HSC)            | High speed machining(HSM) |
| Tool Dia. (mm)          | 80                                   | 25                        | 80                                  | 25                        | 80                                 | 25                        |
| Cutting width (Ae) (mm) | 60                                   | 1.8                       | 60                                  | 2                         | 60                                 | 1.6                       |
| Cutting depth (Ap) (mm) | 3.8                                  | 70                        | 4                                   | 7                         | 3.3                                | 70                        |
| Feed rate (mm/min)      | 24,000                               | 24,000                    | 24,000                              | 24,000                    | 24,000                             | 24,000                    |
| Removal rate (cc/min)   | 5,472                                | 3,024                     | 5,760                               | 3,360                     | 4,752                              | 2,688                     |

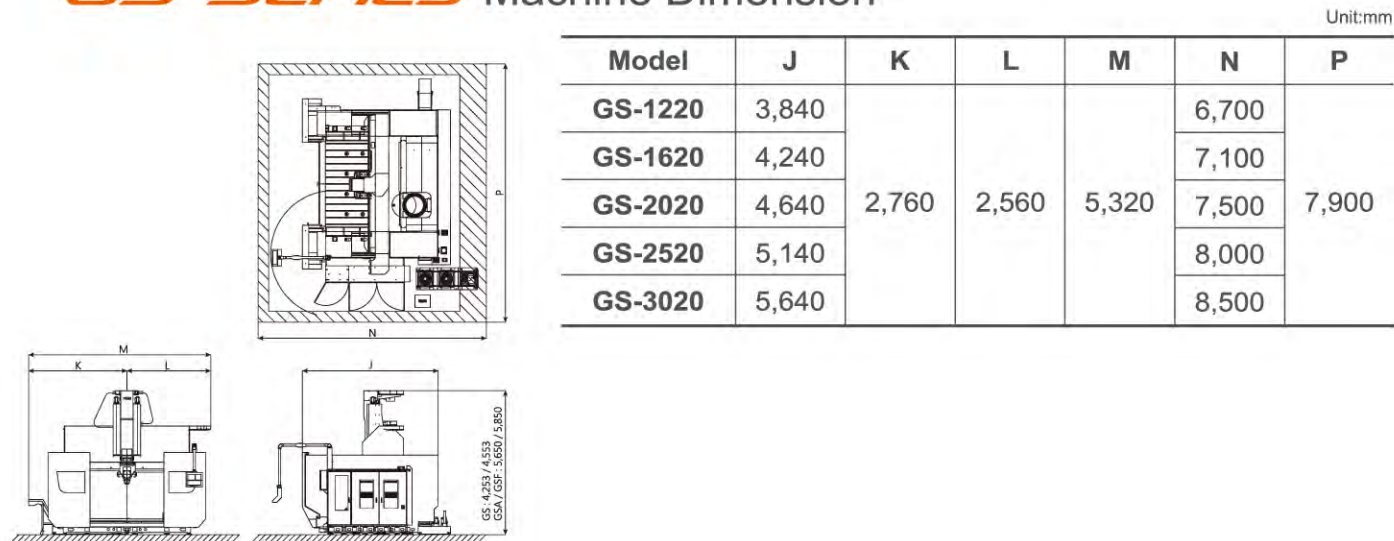
High Torque  
High Speed Spindle (HEIDENHAIN)



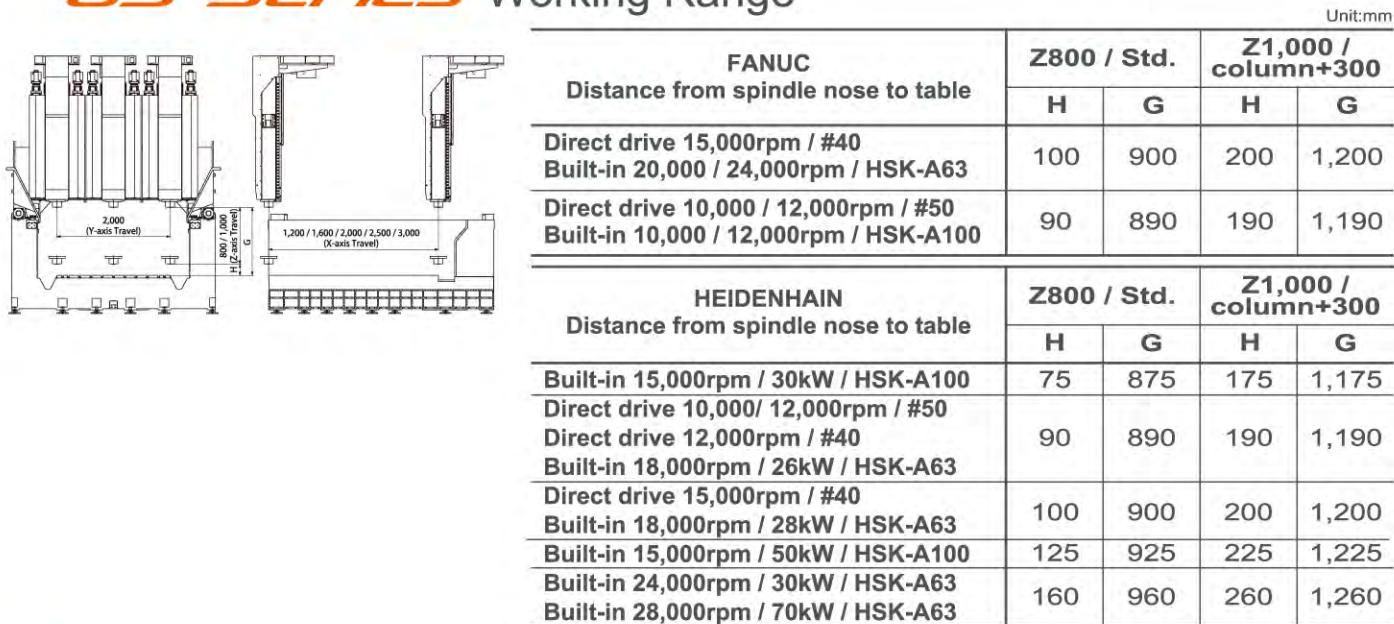
● Please contact our sales representatives for more spindle data.



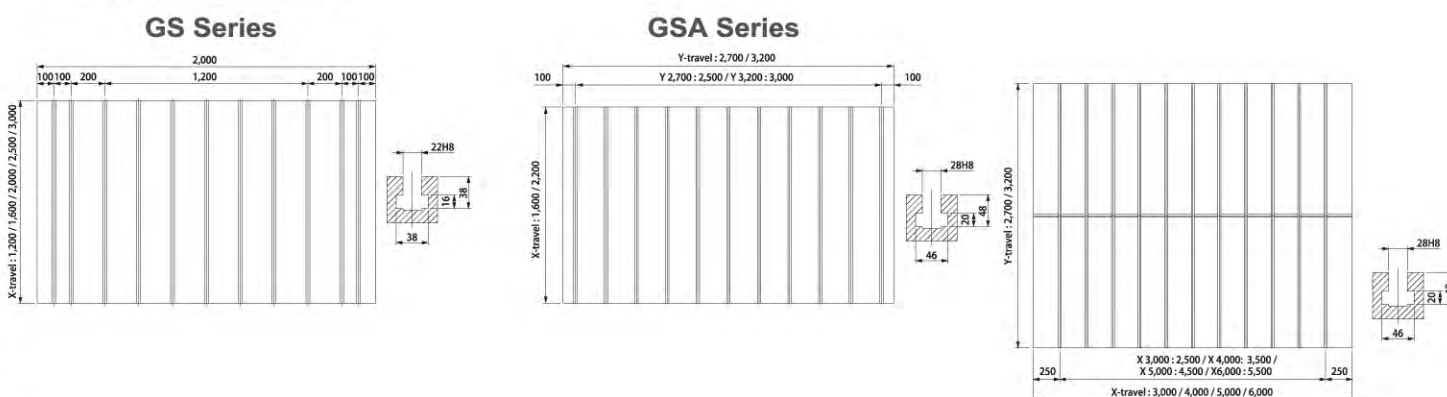
## GS Series Machine Dimension



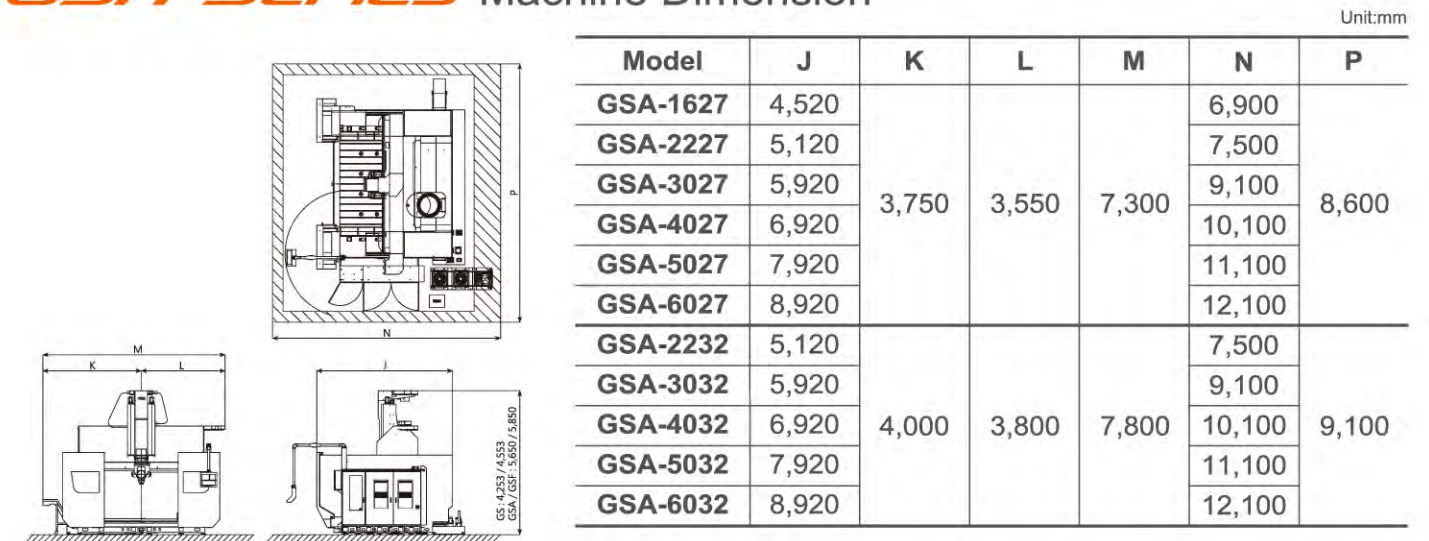
## GS Series Working Range



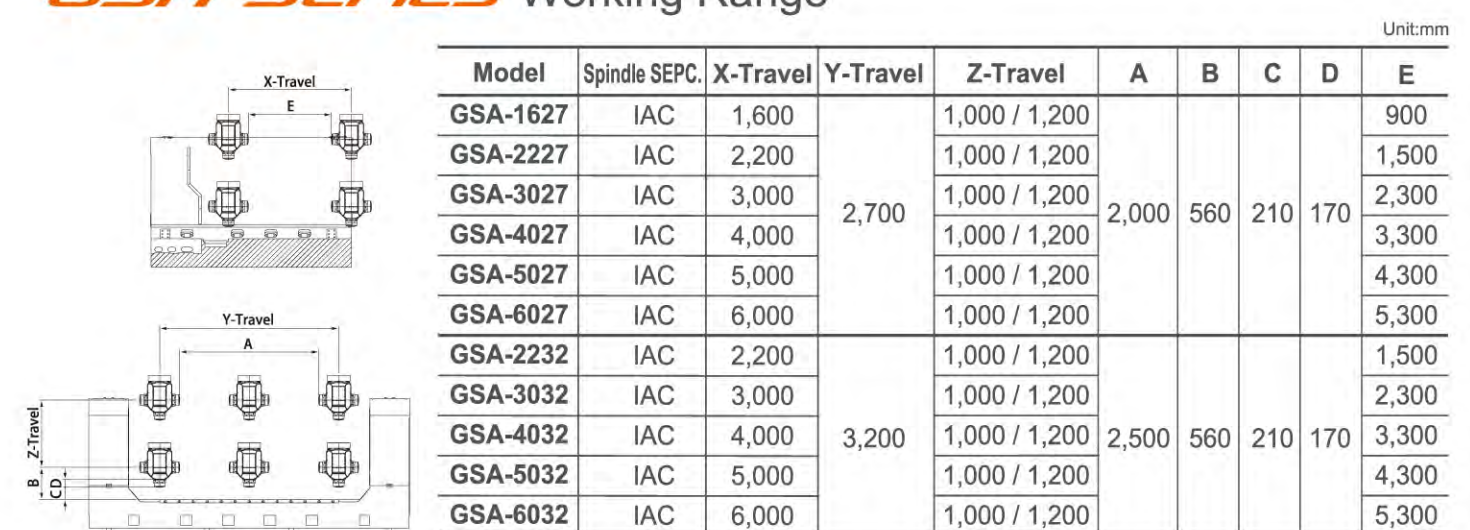
## Table & T slot



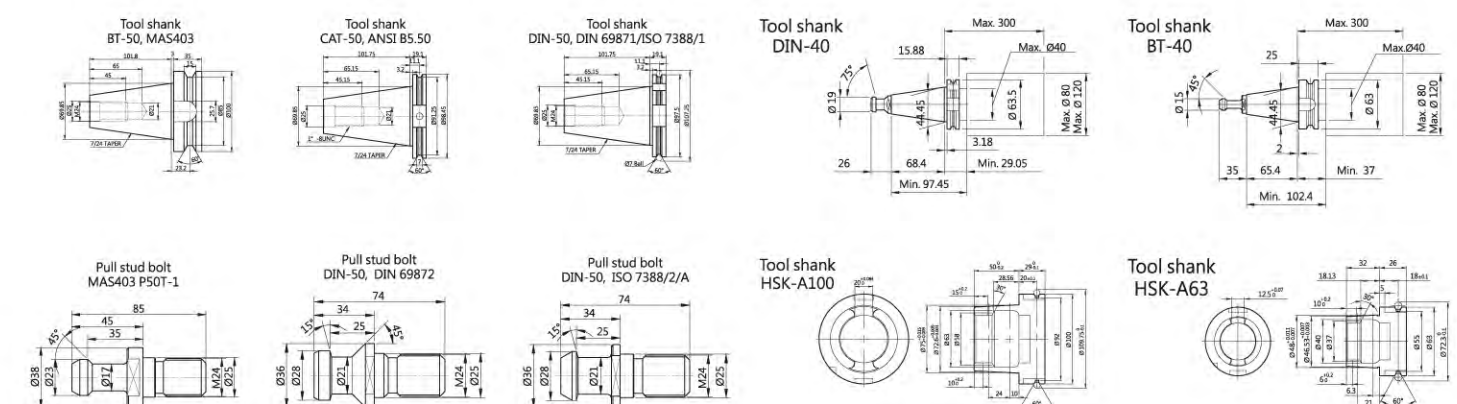
## GSA Series Machine Dimension



## GSA Series Working Range



## Tool Shank & Pull Stud



## GS Specification

| Model                                     |                  |                          | Unit   | GS-1220                                    | GS-1620         | GS-2020         | GS-2520         | GS-3020         |
|-------------------------------------------|------------------|--------------------------|--------|--------------------------------------------|-----------------|-----------------|-----------------|-----------------|
| Travel                                    |                  |                          |        |                                            |                 |                 |                 |                 |
| X axis                                    |                  |                          | mm     | 1,200                                      | 1,600           | 2,000           | 2,500           | 3,000           |
| Y axis                                    |                  |                          | mm     | 2,000                                      |                 |                 |                 |                 |
| Z axis                                    |                  |                          | mm     | 800 / 1,000 (Opt.)                         |                 |                 |                 |                 |
| Distance from spindle nose to table       | Direct-drive 40# | Z axis=800               | mm     | 100~900                                    |                 |                 |                 |                 |
|                                           |                  | Z axis=1000(column +300) | mm     | 200~1,200                                  |                 |                 |                 |                 |
| The distance between columns (Port width) |                  |                          | mm     | 2,600                                      |                 |                 |                 |                 |
| Table                                     |                  |                          |        |                                            |                 |                 |                 |                 |
| Dimension                                 |                  |                          | mm     | 1,200 x 2,000                              | 1,600 x 2,000   | 2,000 x 2,000   | 2,500 x 2,000   | 3,000 x 2,000   |
| T-slot (Dimension x Number x Pitch)       |                  |                          | mm     | 22 x 11 x 200                              |                 |                 |                 |                 |
| Max. table load                           |                  |                          | kg/m²  | 3,000                                      |                 |                 |                 |                 |
| Spindle ✳                                 |                  |                          |        |                                            |                 |                 |                 |                 |
| Spindle motor (S1/S6)                     |                  |                          | kW     | 15 / 18.5                                  |                 |                 |                 |                 |
| Spindle speed                             |                  |                          | rpm    | 15,000                                     |                 |                 |                 |                 |
| Tool shank                                |                  |                          | -      | BBT-40                                     |                 |                 |                 |                 |
| Spindle Torque (S1/S6)                    |                  |                          | Nm     | L: 120 / 126 H: 29 / 35                    |                 |                 |                 |                 |
| Feeding                                   |                  |                          |        |                                            |                 |                 |                 |                 |
| Cutting feed rate                         |                  |                          | mm/min | 1~24,000                                   |                 |                 |                 |                 |
| Rapid traverse                            |                  |                          | m/min  | XYZ: 24 / 30 (Opt.)                        |                 |                 |                 |                 |
| Accuracy                                  |                  |                          |        |                                            |                 |                 |                 |                 |
| Positioning accuracy (JIS-B6333)          |                  |                          | mm     | ±0.005 / Full Travel                       |                 |                 |                 |                 |
| Positioning accuracy (VDI3441)            |                  |                          | mm     | P0.006                                     |                 |                 |                 |                 |
| Repeatability accuracy (JIS-B6333)        |                  |                          | mm     | ±0.002                                     |                 |                 |                 |                 |
| Repeatability accuracy (VDI3441)          |                  |                          | mm     | Ps0.004                                    |                 |                 |                 |                 |
| ATC                                       |                  |                          |        |                                            |                 |                 |                 |                 |
| Magazine capacity                         |                  |                          | pcs    | 20T / 32T (Opt.) / 40T (Opt.) / 60T (Opt.) |                 |                 |                 |                 |
| MAX. tool(Dia./Length/Weight)             |                  |                          | kg     | BBT-40 : Ø75 ( Ø130) mm / 300 mm / 8kg     |                 |                 |                 |                 |
| Others                                    |                  |                          |        |                                            |                 |                 |                 |                 |
| Power requirement                         |                  |                          | kVA    | 50                                         |                 |                 |                 |                 |
| Pneumatic requirement                     |                  |                          | kg/cm² | 6                                          |                 |                 |                 |                 |
| Net weight                                |                  |                          | kg     | 25,500                                     | 28,500          | 31,500          | 34,500          | 37,500          |
| Machine gross weight                      |                  |                          | kg     | 29,500                                     | 32,500          | 35,500          | 38,500          | 41,500          |
| Max. floor space (L x W x H)              |                  |                          | m      | 6.9 x 7.8 x 3.8                            | 7.2 x 7.8 x 3.8 | 7.6 x 7.8 x 3.8 | 8.1 x 7.8 x 3.8 | 8.6 x 7.8 x 3.8 |

\* Please refer to the chart of page 9 & 10 for spindle power and torque information.

### Standard accessories and function

- 1 FANUC 0i-MF controller
- 2 Direct drive spindle 15,000rpm
- 3 Z-axis travel 800mm
- 4 Spindle cooler system
- 5 Vertical type tool magazine 20T
- 6 Centralized auto lubrication system
- 7 Independent lubrication oil collector for 3-axis
- 8 Air blast through spindle
- 9 Wash gun & pneumatic interface
- 10 Cutting fluid cooling system
- 11 Enclosed sheet metal guard without roof
- 12 Screw type chip conveyor on table sides
- 13 Caterpillar type chip conveyor / Water tank
- 14 Heat exchanger for electrical cabinet
- 15 Working lamp
- 16 Operation cycle finish and alarm light
- 17 Movable manual pulse generator
- 18 RJ45 interface
- 19 Footswitch for tool clamping
- 20 XYZ-axis Linear scales(FAGOR)
- 21 Auto power off function
- 22 Spindle cutting load software protection
- 23 XYZ axis travel hard limits protection
- 24 Foundation pads and bolts kits
- 25 Adjustment tool and tool kits
- 26 Z-axis retract function at power failure
- 27 Thermal compensation system
- 28 Technical manuals  
(operation, maintenance manual and circuit diagram)

### Option accessories and function

- 1 FANUC 31iB controller;  
HEIDENHAIN TNC620/ 640 controller
- 2 Built-in spindle only for FANUC Controller:  
12,000rpm (#50/HSK-A100)  
20,000/ 24,000/ 28,000rpm (#40/HSK-A63)
- 3 Built-in spindle only for HEIDENHAIN Controller:  
15,000rpm (#50/HSK-A100)  
18,000/ 20,000/ 24,000/ 28,000rpm (#40/HSK-A63)
- 4 Direct driven spindle only for FANUC Controller:  
15,000rpm (#40/HSK-A63)  
10,000/ 12,000rpm (#50/HSK-A100)
- 5 Direct driven spindle only for HEIDENHAIN Controller:  
12,000/ 15,000rpm (#40/HSK-A63)  
10,000/ 12,000rpm (#50/HSK-A100)
- 6 XYZ-axis rapid traverse 30m/min
- 7 Z-axis travel 1,000mm, 300mm higher column
- 8 Vertical type tools magazine 32T/ 40T/ 60T
- 9 Coolant through spindle system 20/70 bar  
(Vertical spindle)
- 10 Spindle ring cutting coolant device
- 11 Oil skimmer
- 12 Oil mist cooling device
- 13 Enclosed sheet metal guard with roof
- 14 Chip clean flushing device on table side grooves
- 15 Helical blade screw conveyor on table sides
- 16 Foot pad above chip groove
- 17 Dual belt type chip conveyor/Water tank
- 18 Chip cart
- 19 Sub working table
- 20 3-axis independent manual pulse generator
- 21 Remote monitoring software-professional
- 22 Auto tool length measurement
- 23 Auto workpiece coordinate measurement
- 24 Transformer

## GSA Specification | GSA-xx27 Series

| Model                                | Unit               | GSA-1627                                    | GSA-2227      | GSA-3027             | GSA-4027      | GSA-5027             | GSA-6027      |
|--------------------------------------|--------------------|---------------------------------------------|---------------|----------------------|---------------|----------------------|---------------|
| Travel                               |                    |                                             |               |                      |               |                      |               |
| X axis                               | mm                 | 1,600                                       | 2,200         | 3,000                | 4,000         | 5,000                | 6,000         |
| Y axis                               | mm                 | 2,700                                       |               |                      |               |                      |               |
| Z axis                               | mm                 | 1,000 / 1,200(Opt.)                         |               |                      |               |                      |               |
| Distance from spindle nose to table  | mm                 | Z1,000: 210-1,210 / Z1,200: 210-1,410(Opt.) |               |                      |               |                      |               |
| Distance between columns(port width) | mm                 | 3,400                                       |               |                      |               |                      |               |
| Table                                |                    |                                             |               |                      |               |                      |               |
| Dimension                            | mm                 | 1,600 x 2,700                               | 2,200 x 2,700 | 3,000 x 2,700        | 4,000 x 2,700 | 5,000 x 2,700        | 6,000 x 2,700 |
| T-slot (Dimension x Number x Pitch)  | mm                 | 28 x 11 x 250                               |               |                      | 28 x 15 x 250 | 28 x 19 x 250        | 28 x 23 x 250 |
| Max. table load                      | kg/m <sup>2</sup>  | 3,000                                       |               |                      |               |                      |               |
| Spindle                              |                    |                                             |               |                      |               |                      |               |
| Spindle motor (S1/S6)                | kW                 | 50 / 65                                     |               |                      |               |                      |               |
| Spindle speed                        | rpm                | 15,000                                      |               |                      |               |                      |               |
| Tool shank                           | -                  | HSK-A100                                    |               |                      |               |                      |               |
| Spindle Torque (S1/S6)               | Nm                 | 95.5 / 124                                  |               |                      |               |                      |               |
| Feed rate                            |                    |                                             |               |                      |               |                      |               |
| Cutting feedrate                     | mm/min             | 1-20,000                                    |               |                      |               |                      |               |
| Rapid traverse (X/Y/Z)               | m/min              | XY:32 / Z:20                                |               |                      |               |                      |               |
| Accuracy                             |                    |                                             |               |                      |               |                      |               |
| Positioning accuracy (JIS-B6333)     | mm                 | ±0.005 / Full Travel                        |               | ±0.007 / Full Travel |               | ±0.008 / Full Travel |               |
| Positioning accuracy (VDI3441)       | mm                 | P0.008                                      |               |                      | P0.010        | P0.012               | P0.015        |
| Repeatability accuracy (JIS-B6333)   | mm                 | ±0.002                                      |               |                      |               |                      |               |
| Repeatability accuracy (VDI3441)     | mm                 | PS0.006                                     |               |                      |               | PS0.008              | PS0.012       |
| ATC                                  |                    |                                             |               |                      |               |                      |               |
| ATC capacity                         | pcs                | 20 / 32(Opt.) / 40(Opt.) / 60(Opt.)         |               |                      |               |                      |               |
| Max. tool size (Full tools)          | mm                 | Ø 125                                       |               |                      |               |                      |               |
| Max. tool size (Next pockets empty)  | mm                 | Ø 250                                       |               |                      |               |                      |               |
| Max. tool length                     | mm                 | 300                                         |               |                      |               |                      |               |
| Max. tool weight                     | kg                 | 18                                          |               |                      |               |                      |               |
| Others                               |                    |                                             |               |                      |               |                      |               |
| Electric power consumption           | kVA                | 130                                         |               |                      |               |                      |               |
| Pneumatic input pressure             | kg/cm <sup>2</sup> | 6                                           |               |                      |               |                      |               |
| Net weight                           | kg                 | 38,500                                      | 43,500        | 43,000               | 52,000        | 60,500               | 70,000        |
| Max. floor space (L x W x H)         | m                  | 6.9x8.6x5.5                                 | 7.5x8.6x5.5   | 9.1x8.6x5.5          | 10.1x8.6x5.5  | 11.1x8.6x5.5         | 12.1x8.6x5.5  |

## Standard accessories and function

- |                                                                 |                                                      |                                                     |
|-----------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|
| 1 HEIDENHAIN TNC640 controller                                  | 11 X axis ball screw support device (axis 4m above)  | 24 Working lamp                                     |
| 2 IAC-15,000rpm/HSK-A100                                        | 12 X axis dual linear scale, Y/Z-axis linear scale   | 25 Operation cycle finish and alarm light           |
| 3 IAC head protection system:                                   | 13 XYZ-axis travel hard limits protection            | 26 Movable manual pulse generator                   |
| Spindle and motor temperature monitoring                        | 14 X/Z axis is driven by dual ballscrew and          | 27 RJ45 interface                                   |
| Rotation axis motor temperature monitoring                      | Y axis is driven by single ballscrew                 | 28 Footswitch for tool clamping                     |
| Spindle cutting load software protection                        | 15 Centerized auto lubrication system                | 29 Remote monitoring software-standard              |
| 4 IAC head rotation error mechanism chain correction            | 16 Independent lubrication oil collector             | 30 Auto power off function                          |
| 5 Z-axis travel 1,000 mm                                        | 17 Wash gun and pneumatic interface                  | 31 Tool axis retract function at power failure      |
| 6 Spindle and structure temperature thermal compensation system | 18 Enclosed sheet metal guard without roof           | 32 Foundation pads and bolts kits                   |
| 7 Air blast through spindle                                     | 19 Vertical type tool magazine 20T with arm type ATC | 33 Adjustment tool and tool kits                    |
| 8 Spindle cooling system                                        | 20 Screw type chip conveyor on table sides           | 34 Technical manuals                                |
| 9 Spindle ring cutting coolant device(for no head attachment)   | 21 Caterpillar type chip conveyor / Water tank       | (operation, maintenance manual and circuit diagram) |
| 10 Cutting fluid cooling system                                 | 22 Swiveling arm type operation panel                |                                                     |
|                                                                 | 23 Air conditioner for electrical cabinet            |                                                     |

## GSA Specification | GSA-xx32 Series

| Model                                | Unit               | GSA-2232                                    | GSA-3032             | GSA-4032      | GSA-5032      | GSA-6032             |
|--------------------------------------|--------------------|---------------------------------------------|----------------------|---------------|---------------|----------------------|
| Travel                               |                    |                                             |                      |               |               |                      |
| X axis                               | mm                 | 2,200                                       | 3,000                | 4,000         | 5,000         | 6,000                |
| Y axis                               | mm                 | 3,200                                       |                      |               |               |                      |
| Z axis                               | mm                 | 1,000 / 1,200(Opt.)                         |                      |               |               |                      |
| Distance from spindle nose to table  | mm                 | Z1,000: 210-1,210 / Z1,200: 210-1,410(Opt.) |                      |               |               |                      |
| Distance between columns(port width) | mm                 | 3,900                                       |                      |               |               |                      |
| Table                                |                    |                                             |                      |               |               |                      |
| Dimension                            | mm                 | 2,200 x 3,200                               | 3,000 x 3,200        | 4,000 x 3,200 | 5,000 x 3,200 | 6,000 x 3,200        |
| T-slot (Dimension x Number x Pitch)  | mm                 | 28 x 13 x 250                               | 28 x 11 x 250        | 28 x 15 x 250 | 28 x 19 x 250 | 28 x 23 x 250        |
| Max. table load                      | kg/m <sup>2</sup>  | 3,000                                       |                      |               |               |                      |
| Spindle                              |                    |                                             |                      |               |               |                      |
| Spindle motor (S1/S6)                | kW                 | 50 / 65                                     |                      |               |               |                      |
| Spindle speed                        | rpm                | 15,000                                      |                      |               |               |                      |
| Tool shank                           | -                  | HSK-A100                                    |                      |               |               |                      |
| Spindle Torque (S1/S6)               | Nm                 | 95.5 / 124                                  |                      |               |               |                      |
| Feed rate                            |                    |                                             |                      |               |               |                      |
| Cutting feedrate                     | mm/min             | 1-20,000                                    |                      |               |               |                      |
| Rapid traverse (X/Y/Z)               | m/min              | XY:32 / Z:20                                |                      |               |               |                      |
| Accuracy                             |                    |                                             |                      |               |               |                      |
| Positioning accuracy (JIS-B6333)     | mm                 | ±0.005 / Full Travel                        | ±0.007 / Full Travel |               |               | ±0.008 / Full Travel |
| Positioning accuracy (VDI3441)       | mm                 | P0.008                                      |                      | P0.010        | P0.012        | P0.015               |
| Repeatability accuracy (JIS-B6333)   | mm                 | ±0.002                                      |                      |               |               |                      |
| Repeatability accuracy (VDI3441)     | mm                 | PS0.006                                     |                      |               | PS0.008       | PS0.012              |
| ATC                                  |                    |                                             |                      |               |               |                      |
| ATC capacity                         | pcs                | 20 / 32(Opt.) / 40(Opt.) / 60(Opt.)         |                      |               |               |                      |
| Max. tool size (Full tools)          | mm                 | Ø 125                                       |                      |               |               |                      |
| Max. tool size (Next pockets empty)  | mm                 | Ø 250                                       |                      |               |               |                      |
| Max. tool length                     | mm                 | 300                                         |                      |               |               |                      |
| Max. tool weight                     | kg                 | 18                                          |                      |               |               |                      |
| Others                               |                    |                                             |                      |               |               |                      |
| Electric power consumption           | kVA                | 130                                         |                      |               |               |                      |
| Pneumatic input pressure             | kg/cm <sup>2</sup> | 6                                           |                      |               |               |                      |
| Net weight                           | kg                 | 46,000                                      | 45,500               | 55,000        | 64,000        | 73,500               |
| Max. floor space (L x W x H)         | m                  | 7.5x9.1x5.5                                 | 9.1x9.1x5.5          | 10.1x9.1x5.5  | 11.1x9.1x5.5  | 12.1x9.1x5.5         |

## Option accessories and function

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|-----------------------------------------------------------------------------|-------------------------------------------------------------|
| 1 HEIDENHAIN DCM (Dynamic Collision Monitoring)                             | 15 Foot pad above chip groove                               |
| 2 IAC-12,000 rpm/HSK-A100                                                   | 16 Chip cart                                                |
| 3 IAC-24,000 rpm/HSK-A63                                                    | 17 Sub working table                                        |
| 4 Automatic correction software of rotary axis error                        | 18 XYZ-axis independent manual pulse generator (only FANUC) |
| 5 Z-axis travel 1,200 mm                                                    | 19 Remote monitoring software-professional                  |
| 6 Vertical type tool magazine 32T with arm type ATC                         | 20 Auto tool length measurement                             |
| 7 Coolant through spindle system: 20 bar / 70 ba                            | 21 Auto workpiece coordinate measurement                    |
| 8 The interface of coolant through spindle                                  | 22 Transformer                                              |
| 9 Oil skimmer                                                               | 23 Transformer and Voltage Stabilizer                       |
| 10 Oil mist cooling device                                                  | 24 Oil mist recycle device                                  |
| 11 Enclosed sheet metal guard with roof                                     | 25 Adaptive Feed Control (AFC)(for head attachment)         |
| 12 Helical blade screw conveyor on table sides                              |                                                             |
| 13 Dual belt type chip conveyor / Water tank                                |                                                             |
| 14 Without chip conveyor system (Chip auger, chip conveyor, and water tank) |                                                             |