

# GLH SERIES

Linear rail type Horizontal machining center

GLH400



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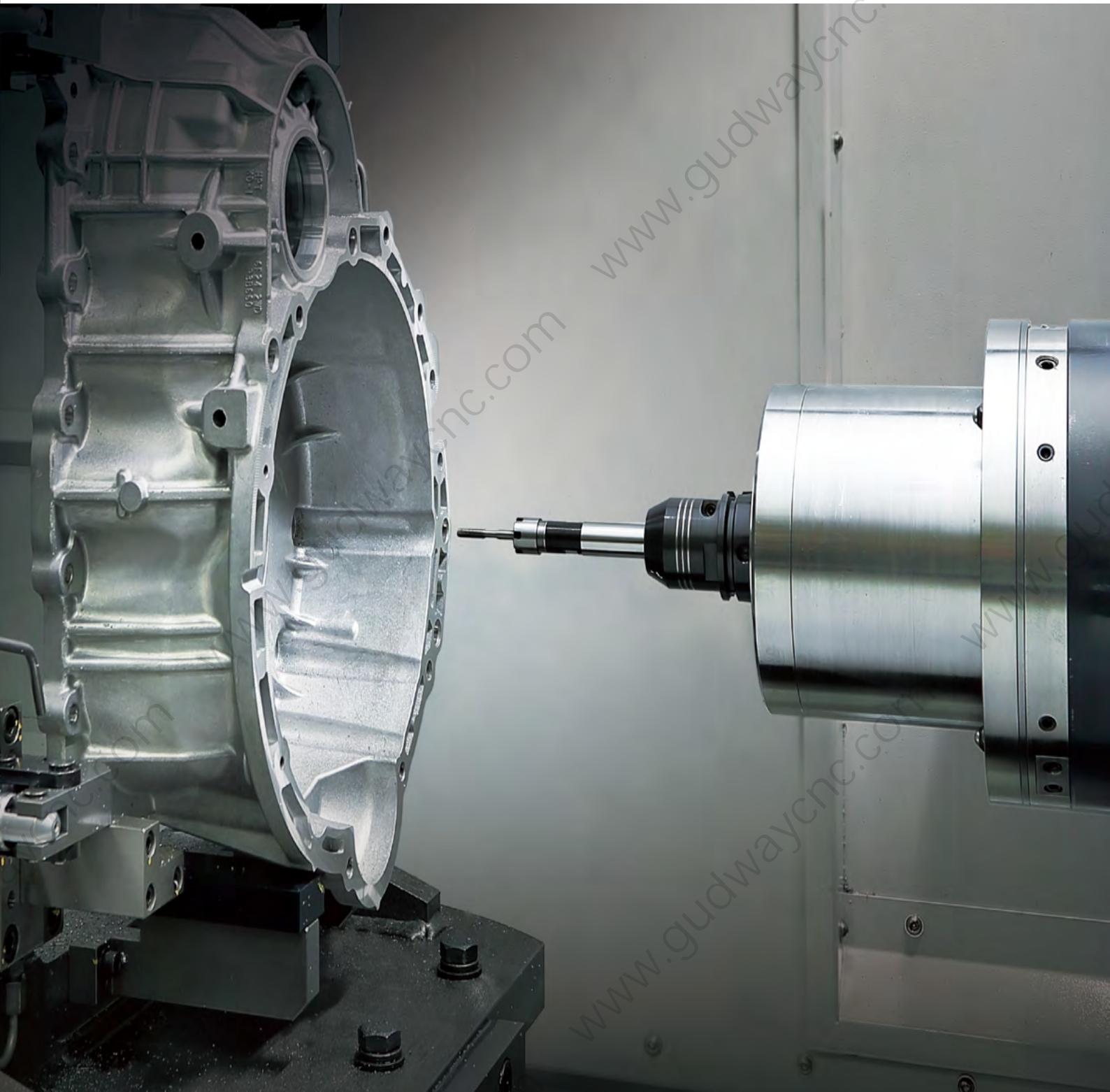
Web : <http://www.gudwaycnc.com>

## GLH400

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GLH400 horizontal machining centers, with their stable structures, thermal compensation systems and ability to minimize non-cutting time, deliver unrivalled accuracy and productivity. With grease lubrication used for all ballscrews, the machines are also eco-friendly and are the number one choice for manufacturers machining small and medium sized components.





### IMPROVED PRODUCTIVITY BY REDUCING NON-CUTTING TIME

- 15000/20000 r/min high speed built-in spindle
- Axis acceleration/deceleration rates of 1G, plus high-speed disc type tool magazine

### RELIABLE AND COMPACT MACHINE

- Proven reliability through multi million test cycles
- Grease lubrication prevents coolant contamination
- Three point bed support structure (No foundation work, minimum installation time)

### VARIOUS FUNCTIONS ARE APPLIED TO ENSURE HIGH PRECISION

- Spindle thermal compensation system as standard
- Spindle, ballscrew and bearing cooling system as standard

# BASIC STRUCTURE

Provides large machining area and three types of table (index, worm/wheel drive, direct drive)

## Travel distance (X x Y x Z-axis)

GLH 400

**560 x 640 x 660** mm

22.0 x 25.2 x 26.0 inch

(10% increase over previous model)



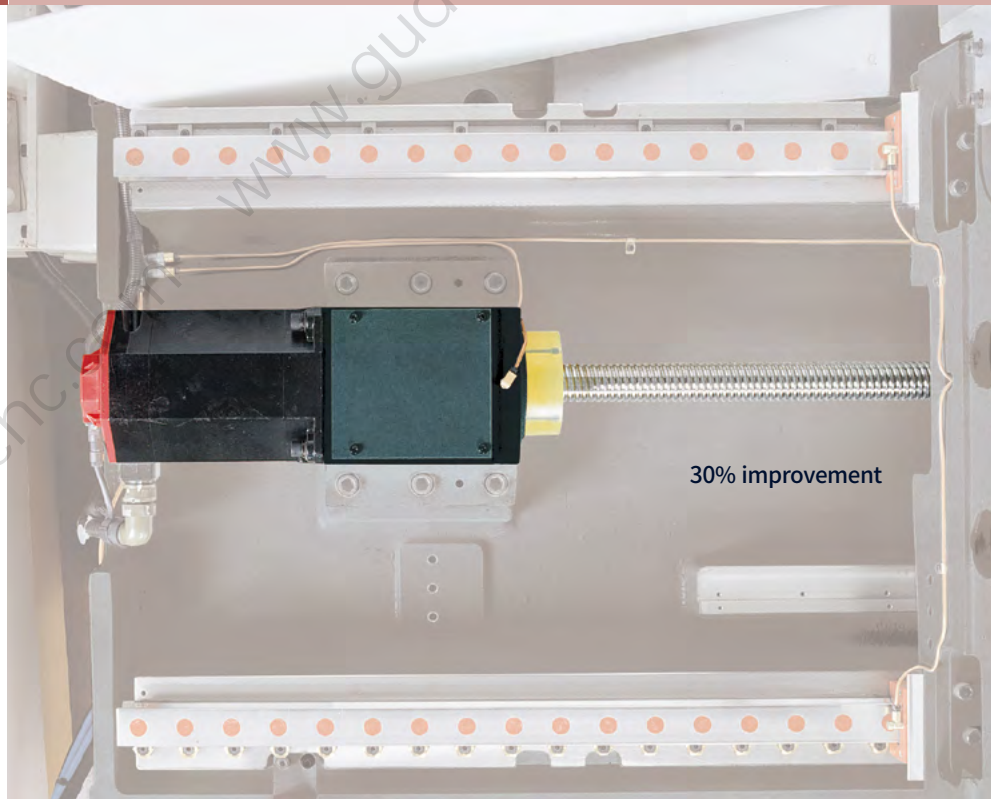
**3-point support bed structure provides stability and stiffness.**

Eco-friendly grease lubrication is applied to all axes as standard and high speed servo motors are installed to improve productivity.

## Rapid traverse rate (X / Y / Z-axis)

GLH 400

**1G / 1G / 1G**



# SPINDLE

High-speed built-in spindle supplied as standard. Benefits include - noise and vibration reduction, improved accuracies and finishes, longer tool life and increased productivity. In addition, tool change errors are minimized by a tool check analog sensor.



## Max. spindle speed

**15000** r/min

**15000** r/min

**20000** r/min

## Max. spindle motor power

**30** kW 40.2 Hp

**37** kW 49.6 Hp

**37** kW 49.6 Hp

## Max. spindle motor torque

**230** N·m 169.7 ft-lbs

**303** N·m 223.6 ft-lbs

**221** N·m 1633.1 ft-lbs

# TABLE

Provides large machining area and three types of table (index, worm/wheel drive, direct drive)

## Max. workpiece

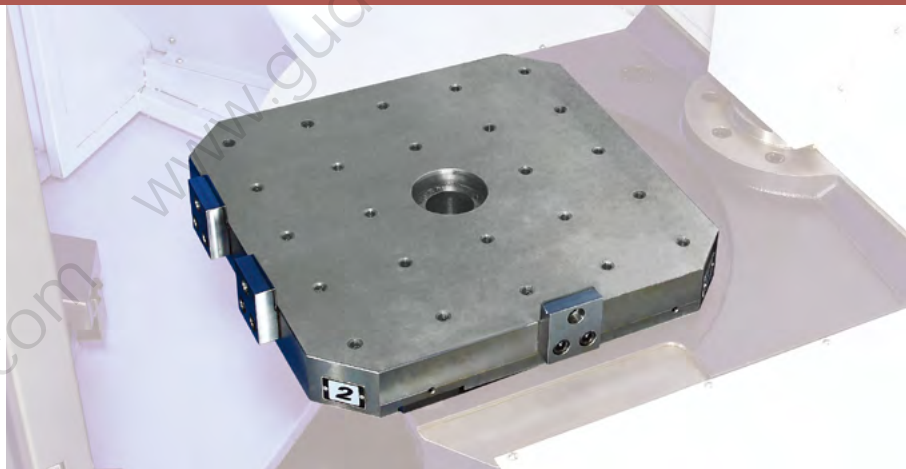
GLH 400

**Ø630 x H900** mm (A 10% increase over previous model)  
24.8 x 35.4 inch

## Max. workload

GLH4000

**400** kg (881.8 lb)



## 90 degree indexing time

Previous model 1.9 sec

GLH series 1.4 sec ↩ **26** %Improved

# CUTTING PERFORMANCE

The GLH Series realizes excellent machining performance thanks to its improved structure and comprehensive tooling system.

## Higher cutting power

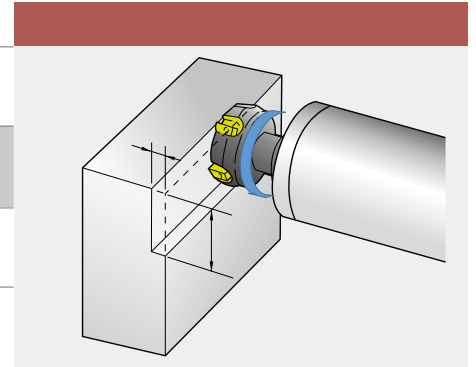
Heavy-duty machining can be carried out with speed and accuracy.

### GLH series

Face Mill\_Carbon Steel (SM45C) [ø125mm(4.9inch) Face mill (8Z)]

	Machining rate	Spindle speed	Feed rate
GLH series	788 cm <sup>3</sup> /min	1200 r/min	2160 mm/min

\* The results presented are provided as an example only. Different cutting and environmental conditions may well give different results.



## High productivity

### Productivity test

# 18 % Improved

- Product : Cylinder block
- Material : Aluminum

### Cycle time

Previous model	193 sec
GLH series	158 sec

← 35 sec



### Productivity test

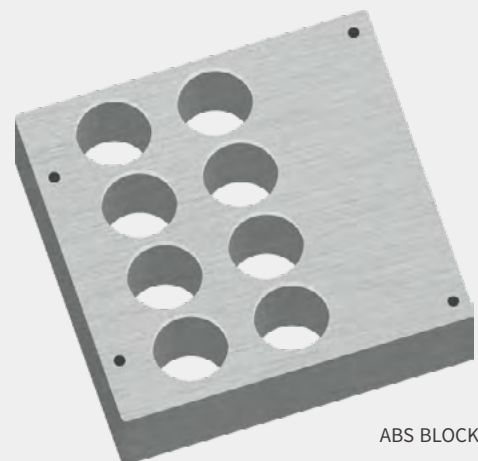
# 22 % Improved

- Product : ABS block
- Material : Aluminum

### Cycle time

Previous model	228 sec
GLH series	178 sec

← 50 sec



ABS BLOCK

\* The results presented are provided as an example only. Different cutting and environmental conditions may well give different results.

# MAGAZINE

Tool changeover times have been optimized to reduce non-cutting time.



## Disk type

40T option

60T

## Chain type

80T option

120T option

## Matrix type

171T option

275T option

### Tool to tool

Previous model 1.0 sec

GLH series 0.9 sec  $\leftarrow$  10% Improved

### Chip to chip\*

Previous model 3.8 sec

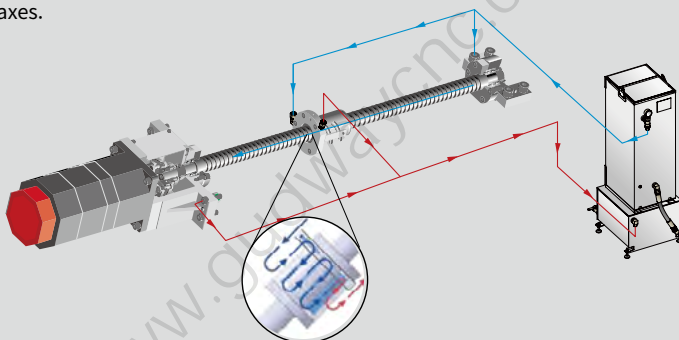
GLH series 2.3 sec  $\leftarrow$  30% Improved

\* MAS

High-accuracy options are available to provide stability and precision.

### Cooling system

Reduces thermal effects and maintains precision on machine's axes.



### Linear scales option

Maintain high precision over long machining runs/operation.




# STANDARD | OPTIONAL SPECIFICATIONS

A range of options is available to suit individual requirements.

Description	Features	GLH 400	
Spindle	15000 r/min	30/18.5 kW, 230 N·m	●
	15000 r/min	37/22 kW, 303 N·m	○
	20000 r/min	37/18.5 kW, 221 N·m	○
Magazine	Tool storage capacity	40 / 60 / 80 / 120 / 171 / 275 ea	○
Tool shank type	BIG PLUS BT40		●
	BIG PLUS CAT40/DIN/HSK63A		○
Coolant	FLOOD	0.7 MPa (1.1 kW)	●
		2 MPa (2.2kW)	○
	TSC	3 MPa (3.7 kW)	○
		7 MPa (7.5 kW)	○
Chip disposal	Chip conveyor	Drum type (Hinged)	○
		Drum type (Scraper)	○
	Chip bucket	Forklift type	○
		Rotation type	○
	Air gun		○
	Coolant gun		○
Precision machining option	Linear scale	X / Y / Z-axis	○
	AICC II (200Block)		●
	AICC II (600Block)		○
	AICC II (1000Block)		○
Measurement & automation	Automatic tool measurement	TS27R_RENISHAW	○
		RMI-Q_ONLY_RENISHAW	○
	Automatic workpiece measurement	RMP60_RENISHAW	○
		OMP60_RENISHAW	○
Others	LED Work light		●
	Signal tower		●
	Tool load monitoring		●
	EZ Guide i		○
	Automatic power off		○
Customized special option	Tool ID (matrix)		○
	Tool Management (TMT1, TMT2, TMT8 DIGIT)		○
	Setup shower coolant		○
	Auto door w/Safty edge		○
	U-axis drive		○
	MQL		○
	Smart thermal control		○
	Internal chip conveyor		○
	Spin window for main door (Electric type)		○
	Thru pallet fixture line		○
	Servo type yool broken direct		○
	Coolant level switch		○
APC setup auto indexing **		○	

● Standard ○ Optional X Not applicable

\*When using a semi-synthetic type or synthetic type, contact our sales representative or service center in advance.

 **Fire Safety Precautions** | There is a high risk of fire when using non-water-soluble cutting fluids, processing flammable materials, neglecting the controlled and careful use of coolants and modifying the machine without the consent of the manufacturer. Always check the SAFETY GUIDELINES carefully before using the machine.



# PERIPHERAL EQUIPMENT

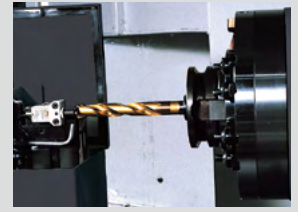
## Chip conveyor



## Measurement systems



Auto tool damage detection device I (BK 9) option



Auto tool damage detection device II (OMRON) option



Automatic tool measuring device (TS 27R) option

## Grease lubrication system

The standard grease lubrication system eliminates the need for an oil skimmer and reduces lubrication costs by about 65% compared to oil lubrication.

Yearly maintenance cost

Max. **65%** ↓



## Environmentally-friendly equipment



Oil skimmer



Mist collector option

## Chip disposal system



Flushing coolant



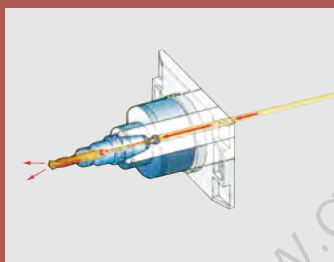
Coolant spray gun on the spindle head



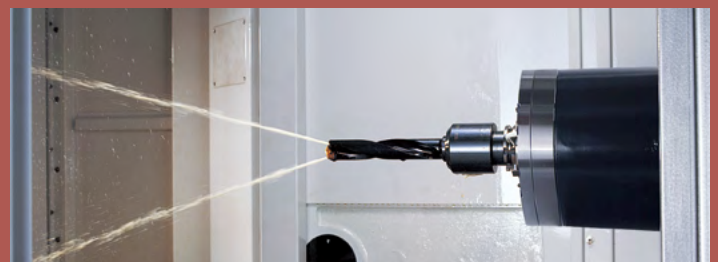
Shower coolant option



Coolant gun option



MQL system option Misting device



Coolant-through-spindle spray device option

# MULTI PALLET SYSTEM

## GLH 400 LPS, RPS & Single pallet system

Linear pallet system (LPS), round pallet system (RPS) and single pallet system provide customers with a choice of proven automation solutions.



### Linear pallet system (LPS 4000/5000)

LPS 4000/5000 are compact and cost-competitive multi-pallet automation systems designed to deliver high-productivity in a compact footprint. Different pallet sizes are available (400mm x 400mm/ 15.7 inch x 15.7 inch), and (500mm x 500mm/ 19.7 inch x 19.7 inch).

### Round pallet system (RPS 4000/5000)

This slim, compact multi-pallet system is designed for new 40 taper horizontal machining centres.

## EXPANDABLE

### Features

- An optimized space-saving design - available at a competitive price
- Optimized AGV of Single Mast & Single Fork Structure
- Simple one-piece installation
- Easy retrofitting to horizontal machining centers
- User friendly intuitive way to register basic information for flexible manufacturing

**Simplify  
AGV**

**15 %**  
Reduced length

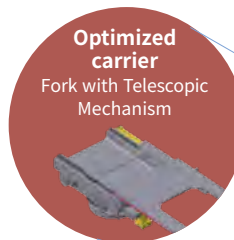
**Improved  
Cycle Time**

**32 %**

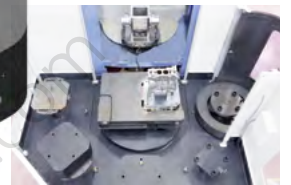
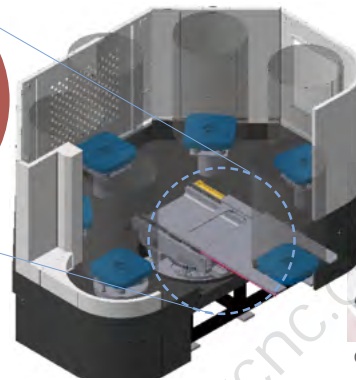
**Reduced  
footprint**

**10.8 %**

LINEAR PALLET SYSTEM



Optimized carrier  
Fork with Telescopic  
Mechanism



Optimized Design for Space Saving

### Features

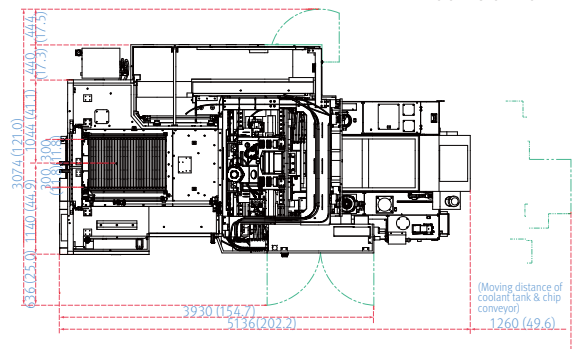
- An optimized space-saving design - available at a competitive price
- Telescopic fork-like mechanism LPS II
- Simple installation and easy maintenance
- Easy field retrofit to HMC

ROUND PALLET SYSTEM

## External dimensions

Unit : mm (inch)

\* TOP AUTO  
DOOR IS OPTION



SINGLE PALLET SYSTEM

# FANUC 31i PLUS

Fanuc 31i Plus maximizes customer productivity and convenience.

## 15" Touch screen + New OP

Fanuc 31iB/B5 Plus' operation panel enhances operating convenience by incorporating common-design buttons and layout. It features a Qwerty keyboard for fast and easy data input and operation.



## iHMI touchscreen

iHMI provides an intuitive interface that uses a touchscreen for quick and easy operation.

## Range of applications

Providing various applications related to planning, machining, improvement and utility, for customer convenience.

## Fanuc 31i Plus

- 15-inch color display
- Intuitive and user-friendly design

## USB and PCMCIA card QWERTY keyboard

- EZ-Guide i standard
- Ergonomic operator panel
- 4MB Memory
- Hot keys
- Enhance AICC BLOCK
- Touch pen provided as standard



Item

# NUMERIC CONTROL SPECIFICATIONS

**FANUC**

Item		Specifications	F31iB PLUS GLH400
Controlled axis	Controlled axes		4 (X,Y,Z,B)
	Simultaneously controlled axes		4 axes
	Additional controlled Axis	Add 1 Axis (5th Axis)	●
Data input/output	Fast data server		○
	Memory card input/output		●
	USB memory input/output		●
Interface function	Large capacity memory(2GB)*2	Note *2) Available Option only with 15" Touch LCD (iHMI Only)	○
	Embedded Ethernet		●
	Fast Ethernet		○
Operation	Enhanced Embedded Ethernet function		●
	DNC operation	Included in RS232C interface.	●
	DNC operation with memory card		●
Program input	Workpiece coordinate system	G52 - G59	●
	Addition of workpiece coordinate system	G54.1 P1 X 48 (48 pairs)	●
	Tool number command		T4 digits
Feed function	Tilted working plane indexing command	G68.2 TWP	○
	AI contour control I	G5.1 Q_ , 40 Blocks	X
	AI contour control II	G5.1 Q_ , 200 Blocks	X
	AI contour control II	G5.1 Q_ , 600 Blocks	X
	AI contour control II	G5.1 Q_ , 1000 Blocks	●
Operation Guidance Function	High smooth TCP		X
	EZ Guidei (Conversational Programming Solution)		●
	iHMI with Machining Cycle	Note *1) Only with 15" Touch LCD standard	●
Setting and display	EZ Operation package		●
	CNC screen dual display function		●
Network	FANUC MT Connect		⊕
	FANUC OPC UA		⊕
Others	Display unit	15" color LCD	X
		15" color LCD with Touch Panel	●
		640M(256KB) _500 programs	X
		1280M(512KB) _1000 programs	X
		2560M(1MB) _1000 programs	X
		5120M(2MB) _1000 programs	X
		10240M(4MB) _1000 programs	●
		20480M(8MB) _1000 programs	○
		2560M(1MB) _2000 programs	○
		5120M(2MB) _4000 programs	○
	10240M(4MB) _4000 programs	○	
20480M(8MB) _4000 programs	○		
Part program storage size & Number of registerable programs			

Network: FANUC MTConnect and FANUC OPC UA available.

● Standard ○ Optional X Not Available ⊕ Available

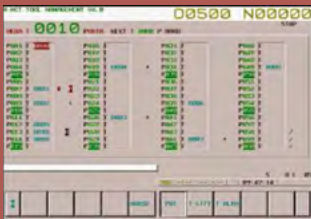
# EZ WORK

The software developed by features numerous functions designed for convenience and ease of operation.

## EZ work

The EZ work package delivers speed and efficiency. This menu-driven innovation not only helps customers reduce setup times, but also simplifies common tasks and procedures, reducing the potential for errors. EZ work reduces operating time, protects machinery, enhances quality and speeds up maintenance interventions.

## Tool support functions



### Tool management I

- Tool magazine control
- Tool state display
- Fastems Tool Add/Remove Function option



### Tool management II option

- Tool magazine control
- Tool life management
- Tool life prediction
- Tool state control
- Balluff Tool ID function



### Tool load monitor option

- Detection of tool damage
- Detection of abnormalities during operation
- Detection of no-load air cutting

## Productivity improvement functions



### Adaptive Feed Control

Function to control feedrate so that the cutting can be carried out at a constant load



### APC Setting Screen

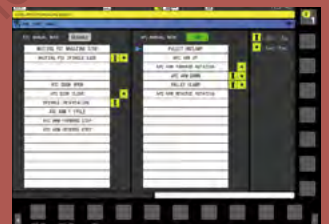
A simple automation function that supports automatic processing of the next pallet by setting the processing program for each pallet of the equipment including APC in advance

## Pallet magazine support functions



### Work Load Control

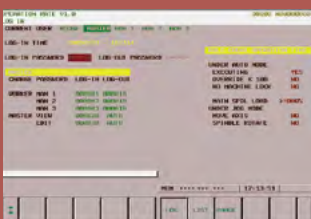
Optimal machining values can be automatically entered into parameters according to the weight of the workpiece placed on the table



### PMC Soft Panel Switch

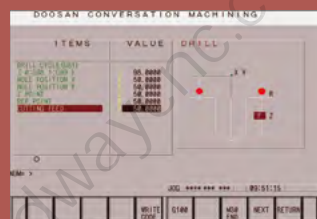
Manual operations that occur continuously in each stages for APC,ATC change command

## Operation support, Help desk functions



### Operation rate

- Measure various machine operating rate
- Support 3 shift operation
- calculate and save 30 days operating rate
- Show data for a specific period



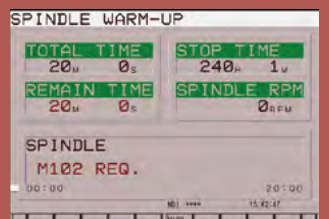
### Pattern Cycle

A function to automatically create frequently used part programs.



### Renishaw GUI

Renishaw tool length measuring and compensate function



### Spindle Warm Up

A function that assists spindle warm-up for spindle life when the spindle has not been used for a certain period of time

# CONVENIENT OPERATION

Siemens 840D

## 15.6" screen + new operation panel

The newly-designed operation panel improves the customer convenience by incorporating and using common-design buttons and layouts, and includes the familiar QWERTY keyboard for fast and easy operation.

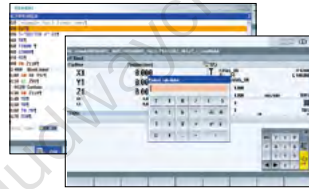
- 15.6" display
- 10MB high capacity user memory
- USB & ethernet (standard)
- QWERTY keyboard (standard)
- High-speed calculation and simulation can be fulfilled by improved processor functionality



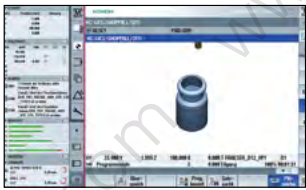
## Conversational convenient function



Simulation and machining contour monitoring



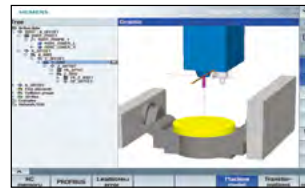
Smart function



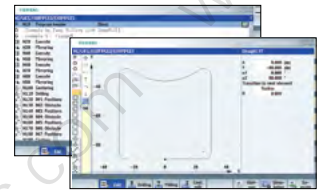
Side screen widget



5-axis kinematic measuring cycles



3D collision avoidance and collision avoidance ECO



Shop mill part programming

# NUMERIC CONTROL SPECIFICATIONS

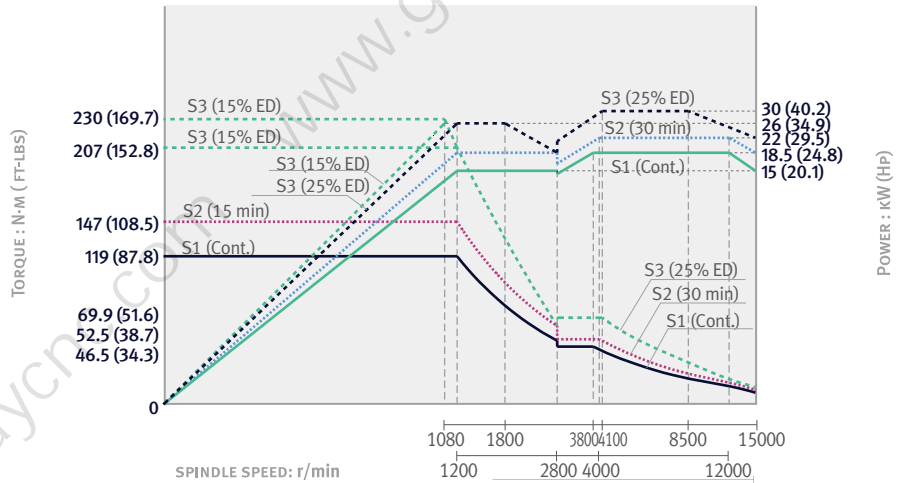
SIEMENS

	Item	Specifications	840Dsl GLH400
Controlled axis	Controlled axes	5 axes	4축
	Simultaneously controlled axes	5 axes	4축
Data input/output	Memory card input/output	(Local drive)	●
	USB memory input/output		●
Interface function	Ethernet	(X130)	●
Operation	On network drive	(without EES option, Extcall)	●
	On USB storage medium, e.g. memory stick	(without EES option, Extcall)	●
Program input	Workpiece coordinate system	G54 - G57	●
	Addition of workpiece coordinate system	G505 - G599	●
Interpolation & feed function	Advanced surface		●
	Top surface		○
Programming & editing function	Look ahead number of block	S/W version 4.8	1000
	3D simulation, finished part		●
	Simultaneous recording		●
	Measure kinematics		X
Operation guidance function	DXF Reader for PC integrated in SINUMERIK Operate		○
	ShopMill		●
Setting and display	EZ Work		●
	Operation via a VNC viewer		●
Network	MTCConnect		⊕
	OPCUA		○
Etc. function	15.6" color display with touch screen		●
	19" color display without touch screen		○
	21.5" color display with touch screen		○
	CNC user memory	10 MB	●
	Expansion by increments	2 ~ 12 MB	○
	Collision avoidance		○
Collision avoidance ECO (machine, working area)		○	

# POWER | TORQUE

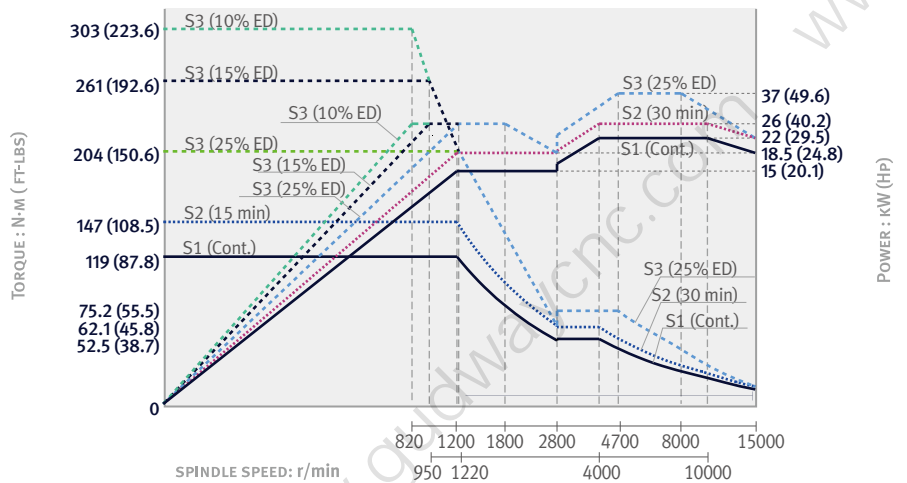
## 15000 r/min

Power : 30 kW (40.2 Hp)  
Torque : 230 N·m (169.7 ft-lbs)



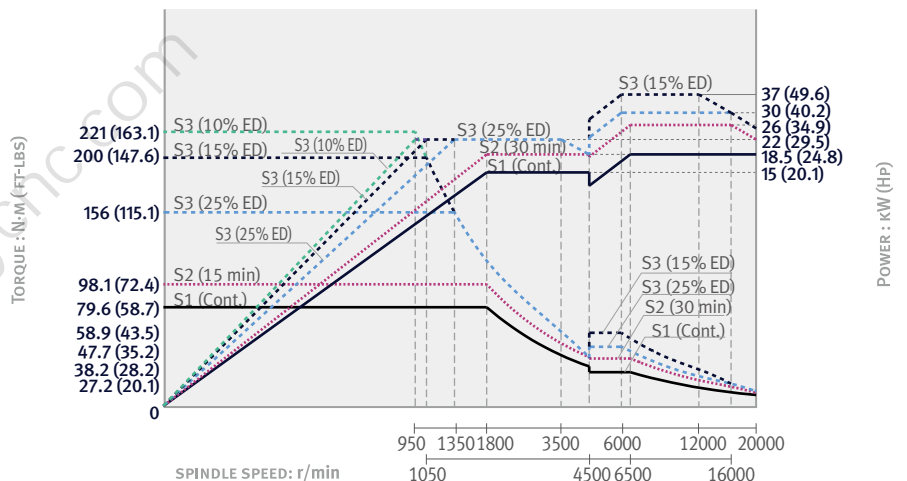
## 15000 r/min high torque option

Power : 37 kW (49.6 Hp)  
Torque : 303 N·m (223.6 ft-lbs)



## 20000 r/min option

Power : 37 kW (49.6 Hp)  
Torque : 221 N·m (163.1 ft-lbs)

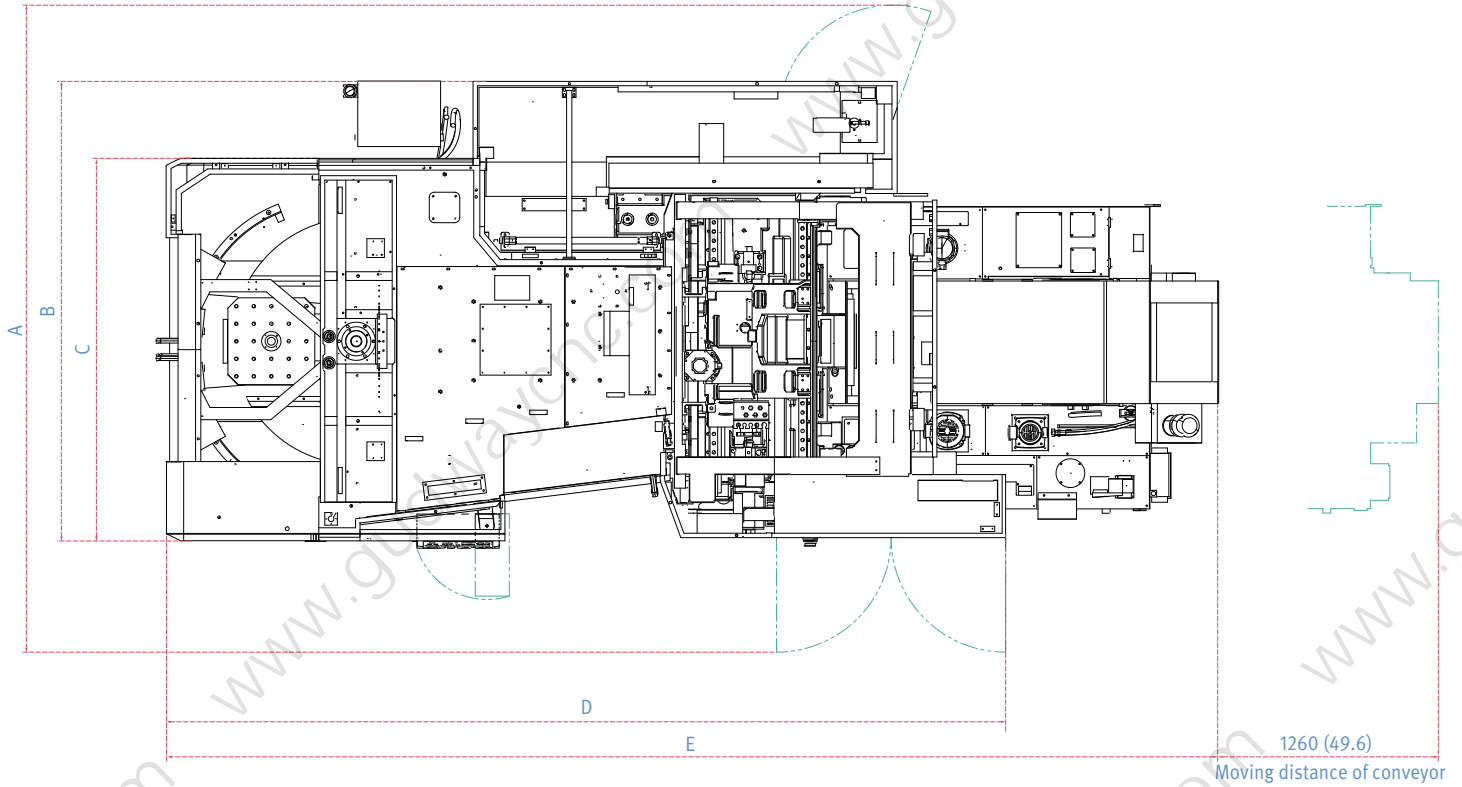


# DIMENSIONS

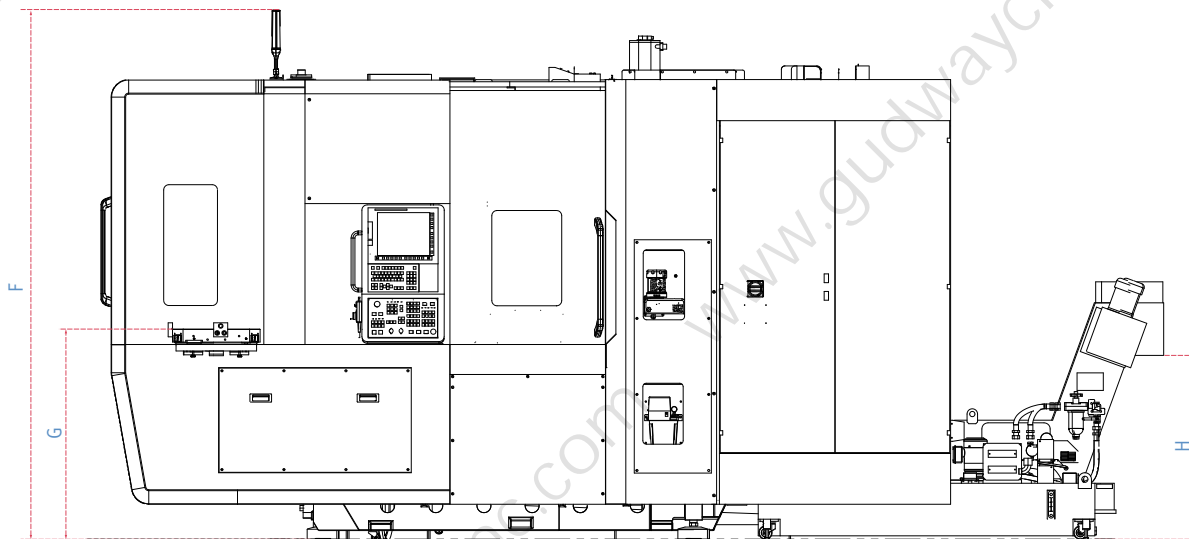
GLH400

Units : mm (inch)

TOP



FRONT



Model	A	B	C	D	E	F	G	H
GLH 400	3389 (133.4)	2300 (90.6)	1859 (73.2)	4329 (170.4)	5506 (216.8)	2894 (113.9)	1100 (43.3)	1050 (41.3)

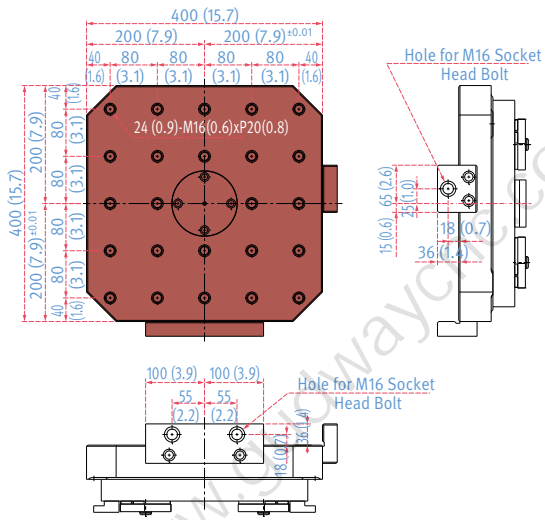
\* Some peripheral equipment can be placed in other areas.

# PALLET

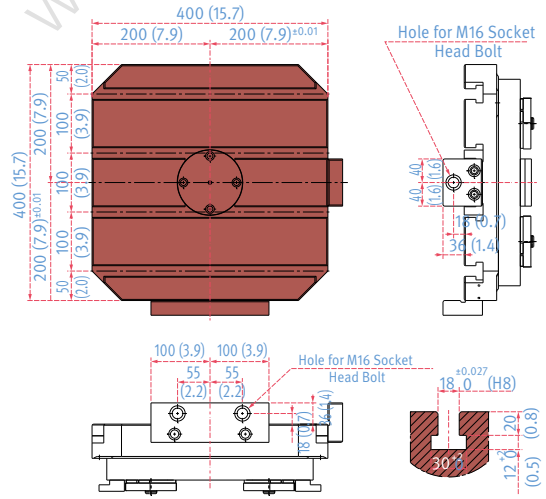
GLH 400

Units : mm (inch)

TAP PALLET



T-SLOT PALLET



T-SLOT DETAIL



# MACHINE SPECIFICATIONS

Description		Unit	GLH 400	
Travel	Travel distance	X-axis	mm (inch) 560 (22.0)	
		Y-axis	mm (inch) 640 (25.2)	
		Z-axis	mm (inch) 660 (26.0)	
	Distance from spindle nose to table top		mm (inch)	80 ~ 720 (3.1 ~ 28.3)
	Spindle nose to table center		mm (inch)	80 ~ 740 (3.1 ~ 29.1)
Table	Pallet size		mm (inch) 400 x 400 (15.7 x 15.7)	
	Workpiece size		mm (inch) $\varnothing$ 630 x 900h ( $\varnothing$ 24.8 x 35.4h)	
	Tool storage capacity		kg (lb) 400 (881.8)	
Spindle	Max. spindle speed		r/min 15000 {20000}*	
	Taper		- ISO #40	
	Spindle power (S3/Cont.)		kW (Hp) 30/18.5 (40.2/24.8) {37/22 (49.6/29.5), 37/18.5 (49.6/24.8)}*	
	Max. spindle torque		N·m (ft-lbs) 230 (169.7) {303, 221 (223.6, 163.1)}*	
Feedrate	Rapid traverse rate	X-axis	m/min (ipm) 60 (2362.2)	
		Y-axis	m/min (ipm) 60 (2362.2)	
		Z-axis	m/min (ipm) 60 (2362.2)	
	Acc./Dec.	X/Y/Z	G	1 / 1 / 1
Automatic tool changer (ATC)	Type of tool shank	Tool shank	- BT 40 {CAT 40 / DIN / HSK 63A}*	
		Pull stud	- PS806 (Modified DIN, DIN 69872 #40)	
	Tool storage capa.		ea	40 {60, 80, 120, 171, 275}*
	Max. tool diameter	Continuous	mm (inch)	75 (3.0)
		Without adjacent tools	mm (inch)	170 (6.7)
	Max. tool length		mm (inch)	450 (17.7)
	Max. tool weight		kg (lb)	12 (26.5)
	Max. tool moment		N·m (ft-lbs)	11.8 (8.7)
Tool change time (Tool-to-tool)		sec	0.9	
Tank capacity	Coolant tank capacity		L (gal) 760 (200.8)	
Machine dimensions	Height		mm (inch) 2690 (105.9)	
	Length (/w Chip Conveyor)		mm (inch) 4950 (194.9)	
	Width		mm (inch) 2300 (90.6)	
	Weight		kg (lb) 9700 (21384.5)	
Control	NC system		Fanuc 31i Plus {CUFOS, Siemens}* *1 : Option 5000S.	