

## Accessories

Standard : ● Optional : ★

Item	Model	LG-500	LG-800	LG-1000	LG-1370	LG-1570
1.Full-Enclosed Splash Guard		●	●	●	●	●
2.Full-Enclosed Splash Guard for cts		★	★	★	★	★
3.Cooling System		●	●	●	●	●
4.Coolant Flushing Device		★	★	★	★	★
5.Coolant Jets Around Spindle		●	●	●	●	●
6.Spindle Oil Cooler		★	★	★	★	★
7.Air Blast Through Spindle		●	●	●	●	●
8.Table side air blast M50 control		●	●	●	●	●
9.Centralized automatic lubrication system		●	●	●	●	●
10.Oil Fluid Separator		●	●	●	●	●
11.X/Y/Z Axis Ball Screw Enforce Pressure		●	●	●	●	●
12.Coolant tank		●	●	●	●	●
13.Link type chip conveyer		★	★	★	★	★
14.Front Mounted Screw Type Chip Conveyer		★	★	★	★	★
15.Fluorescent Lampx1		●	●	●	●	●
16.Fluorescent Lampx2		★	★	★	★	★
17.Air Blast Through Spindle		●	●	●	●	●
18.Table Side Air Blast		●	●	●	●	●
19.Spindle Air Curtain		●	●	●	●	●
20.Coiling Tube Coolant gun		★	★	★	★	★
21.Hydraulic Hose Coolant gun		★	★	★	★	★
22.Air gun		★	★	★	★	★
23.Leveling Bolts and Blocks		●	●	●	●	●
24.Foundation bolt, Concrete		★	★	★	★	★
25.Remote Manual Pulse Generator		★	●	●	●	●
26.Convection Heat Exchanger in Control		★	★	★	●	●
27.Air conditioning for electrical cabinet		-	-	-	★	★
28.Auto Power off		●	●	●	●	●
29.Operation Finish Lamp		●	●	●	●	●
30.RS-232 Interface		★	●	●	●	●
31.Operation Manual & Electric Drawing Equipment		●	●	●	●	●
32.Tool Package		●	●	●	●	●
33.#40 8000rpm Pulley spindle		-	-	-	●	●
34.#40 10000/12000rpmPulley spindle		-	-	-	★	★
35.#40 10000/12000/15000rpmDDS spindle		-	-	-	★	★
36.#40 Drum Type Tool Magazine		-	-	-	●	●
37.#40 Disk Type Tool Magazine		●	●	●	★	★
38. Suspension Operator Box		-	-	-	●	●
39.Coolant Through Spindle		★	★	★	★	★
40.20BAR Coolant Through Spindle		★	★	★	★	★
41.25Bar/40Bar/70Bar Coolant Through Spindle		★	★	★	★	★
42.NC Rotary Table		★	★	★	★	★
43.DNC Software		★	★	★	★	★
44.Auto Tool Length Measurement		-	-	-	★	★
45.Auto Tool Length and Diameter Measurement		-	-	-	★	★
46.Auto Work Piece Measurement		-	-	-	★	★
47.Closed Loop Linear Scale Positioning System		-	-	-	★	★
48.Mist coolant system		-	-	-	★	★
49.Oil Mist Collector System		-	-	-	★	★

**Hartford**  
EXCLUSIV  
Hartrol Plus APP

# Intelligent Machining Center

## LG Series Smartcenter

- Hartrol plus controller
- 5-Year warranty on guideways
- One-piece bed design
- Tool change time: 1.38 sec
- Oversized column design



**Hartrol Plus**<sup>®</sup>  
From tradition to intelligent



Website



Facebook



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# Hartford

Hartrol · Smartcenter · Robocell

We manufacture intelligent machines only



A.I. Applications inside, Hartrol Plus is the control which provides machining status with advanced features.

Imagine what future machines ought to be outlined.

# AiSmartcontrol



## Hartford redefine the future



Major functions of Hartford AI controller

- Facial Recognition system-Face ID
- AI Environment Thermal Displacement Compensation
- AI Efficient Lubrication Management
- Broken Tool Detection System
- Highlight on Intelligent Auger
- AI Navi

### AI

- + Remote Warm-up & Turn-on
- + Hartrol Plus Sync & Update
- + User Connect



### Thermal stability solution

- + Spindle Thermal Compensation
- + Casting Thermal Compensation
- + Thermal Symmetry / Thermal Balancing



### ZDT

- + Diagnosis Report on Spindle Operation
- + Alarm Report System



### IoT

- + Facial Recognition System
- + AI Efficient Lubrication Management
- + Smart Efficient Chip Collection





# How to quickly implement automation?

## Hartford Robot Production Cell

### Easy to get started

Hartford Robocell provides you a professional robot training and rich automation experience, to let you quickly learn and easily operate your automation systems

### Quality control monitoring

Automation systems have to pass all the strict Quality Control tests at every stage like design, assembly, testing, final inspection and shipment, complete quality control processes for all the products.

### Professional analysis

Robocell Machining optimization service, to let you be on the top by using professional machining methods



What definition of Automation interface only :



### 1. Automatic Door

- Pneumatic/Automatic Door System\_Operating Door
- Pneumatic/ Servo Automatic Door System\_Right Side Door

### 2. Automatic Interface

- I/O Preparation
- Profibus Link Preparation
- CC-Link Preparation
- EtherNet/IP Link Preparation

### 3. Pneumatic/ Hydraulic Interface

- 1/2/3 Cell Automatic Pneumatic/ Hydraulic Interface in the machine

### 4. Other options

- High Pressure Spray Nozzle with Automatic Preparation
- HStainless Base
- High-volume chip-removal system comprising dual side augers

# A most durable and stable machining center.

A perfect demonstration for machining accuracy and ability.

A valuable vertical machining center is the result of constant creative concepts and total dedication to quality. When the ambition of pursuing perfection is incorporated into the design, the result is a perfect machine. The Hartford F1 vertical machining centers are designed and built with these concepts in mind. Over the years, Hartford engineers have spent great effort designing a unique VMC that is cost-effective for our customers.



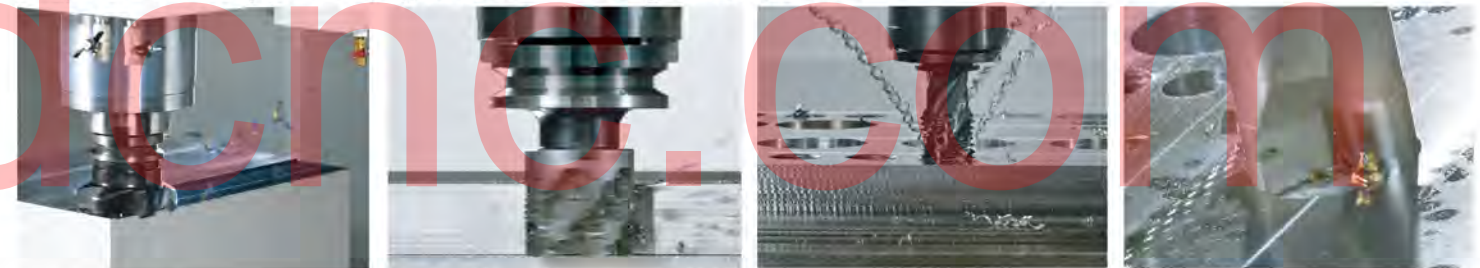
1. Bicycle

2. Auto industry- connecting rod

## Actual cutting tests

Model : LG -800

■ Spindle : 8,000 rpm Pulley type 11kW ■ Cutting material : S45C



#### Face milling

Tool diameter Ø80 mm  
Feed rate 1,800 mm/min  
Cutting depth 2 mm  
Cutting width 60 mm  
Cutting volume 216 cc/min

#### End milling

Tool diameter Ø50 mm  
Feed rate 2,600mm/min  
Cutting depth 30 mm  
Cutting width 2 mm  
Cutting volume 156 cc/min

#### Tapping

Tool diameter Ø20 mm  
Feed rate 508 mm/min  
Cutting depth 25 mm  
Spindle load 90%

#### Drilling

Tool diameter Ø18 mm  
Feed rate 77 mm/min  
Cutting depth 30 mm

Model : LG-1570

■ Spindle : 12,000 rpm Pulley type 11kW ■ Cutting material : S45C



#### Face milling

Tool diameter Ø80 mm  
Feed rate 1,000 mm/min  
Cutting depth 3 mm  
Cutting width 65 mm  
Cutting volume 195cc/min

#### End milling

Tool diameter Ø63 mm  
Feed rate 3500mm/min  
Cutting depth 30 mm  
Cutting width 2 mm  
Cutting volume 210cc/min

#### Tapping

Tool diameter Ø20 mm  
Feed rate 750 mm/min  
Cutting depth 20 mm  
Spindle load 95%

#### Drilling

Tool diameter Ø17.5 mm  
Feed rate 800 mm/min  
Cutting depth 30 mm

All the results featured in this catalogue were produced under strict testing condition in a special zed testing environment. Under different testing conditions and in less than ideal testing environments. That the test results may vary form those shown in this catalogue.



# The very first step for fully intelligent machining.

## Hartford APP Store

### What is Hartrol Plus?

Hartrol plus is a brand new intelligent controller Hartrol , Hartnet and Hartford electrical function together which developed and made by Hartford.

HMI and operation is user friendly, it can achieve :

1. Internet connection, collect and analyze data, monitoring by portable device
2. Intelligent control: Auto revise human error and operating basis
3. Real time update new APPs

The difference between Hartrol plus and others

Function	Hartrol Plus P1	Others
Screen Size	19" Multi-touch Panel	10.4" (OPT:15")
Look Ahead Block	2700(G5P20000)	400(1000 Max.)
Hard Drive	32GB SSD	NO
Smoothing Interpolation	SSS 4G	Option
Industry 4.0	Hartford UserConnect	NO



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.



Hartford smartcenter APP

### The Intelligent Controller You Should Have

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

Highly optimized and intelligent controls bring even more capabilities and productivity to your metal cutting processes.

With ease use, advanced automation, and smart data collection, Hartrol plus is essential tool for enhancing performance on your production floor.

**Intelligent Support**

- Multi Touch Screen
- CCD remote management
- E-book
- Remote Management
- Cutting Condition Calculator
- Stand-by Mode

**Cost down to 20%**

**Intelligent Functions**

- HartCAM
- AFC= Automatic Feedrate Control.
- SSS-4G
- Machining Time Countdown for Single Block
- Optimized Machining Program
- Automatic measurement

**Productivity increased 23%**

**Intelligent Design**

- MES(Manufacturing Execution System)
- Machine Utilization Management
- Operator Performance Management
- 24 Hours a Day Management
- Remote Management
- Hartford Userconnect

**Efficiency increased 20%**

**Hartford UserConnect**

- Alert Notification
- Remote Diagnoses
- Remote Value Enhancement
- Remote Monitoring & Management

set and inspect	ZDT	Machining Programming Analysis	Machining Time Estimation	Machining Path Simulation	Utilization Statics	Machining Condition Computing
Spindle Loading Monitor	AFC	Message Board	Tool Magazine	Calculator	Online E-books	File Transfer
Spindle Bearing Diagnosis	HartCAM	CCD	Automatic Door	Broken Tool Detection System	Integrated Information Monitor Screen	User connect
Z-direction Thermal Compensation	Spindle Collision Protection G Sensor	CTS Leakage Detect	i-Factory	Idling Stop	Remote Desk Connection	Account Management

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



# What Hartford APP can do for you?

The integrated intelligent functions of Hartrol plus could achieve your machining requirements.  
 For more Hartrol Plus functions, please contact our sales person.

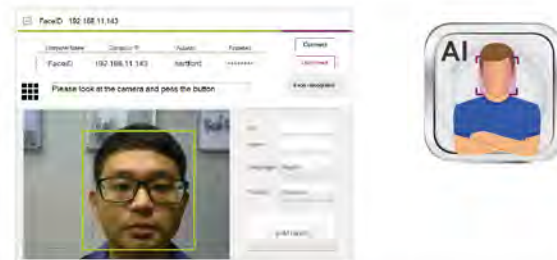
## AI Environment Thermal Displacement Compensation(opt.)

Vertical machining center : **0.03mm**  
 Thermal displacement problem is improved up to **60%**  
 It can achieve good accuracy as in constant temperature room.



## AI Facial recognition system(opt.)

Face ID log-in authority  
 Recognition time: **2 seconds**  
 Recognition accuracy: **100%**



## AI Tool breakage detection (opt.)

Available with tool size **6mm** above

- Tool wears when electric current ratio increased
- When tool abrasion over than your setting, machine alarms to avoid tool breakage



## Highlight on Intelligent Auger(opt.)

**50% efficacy increases**

- Intelligent auger automatically proceeds cleaning iron chips based on electrical current of spindle.
- Intelligent auger automatically performing reversal mode in case amount of iron chips outnumbers, preventing from machine stop.
- Auger is overly shielded



## AI Efficient Lubrication Management(opt.)

**50% lubrication saved.**

- Auto-adjustment oil supply base on machining condition.
- 50% oil consumption saved



## On line update

With online updating system similar to smart phone will make sure your operating system stays the latest version with Hartford.

- 24hr → Live updating , no boundary no time zone difference.
- NEW → Synchronize with Hartford for the latest information and functions.
- Easy → One key updating, easy and fast !



The Hartrol plus NC version must be A6 or above



Graphical user interfaces for part setting, inspection, tool setting

- Ease of use
- Increasing usability
- Eliminating manual set-up tasks
- Increasing efficiency



## Hartford ZDT

Eliminate machine down time and increase efficiency.  
 ZDT —

- Ease of use
- Check parts status clearly
- Eliminating unexpected down time
- Instand notification to your machine and your portable device



## Spindle Vibration Intelligent Monitoring System (B-Safe ) is ensuring spindle stability at times(opt.)

**Highlights**

- APP Vibration function is handy to set up manually.
- Alert status on crash protection.
- Responsive graphic is available for diagnosis by user, and analytic information is just-in-time served.

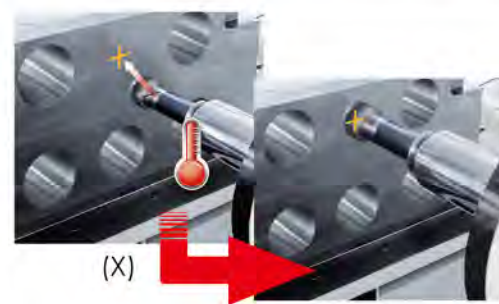


## AFC(opt.)

Machining efficiency is increased by **21%**

Controls the feed rate depending on the machining situation

- Adjusting feed rate automatically
- Lengthen your tool life
- Reduce machining time



## Thermal compensation on spindle(opt.)

No worries about HEAT!!

- Machine with compensation  
 #40 spindle thermal extension is within 0.03mm  
 #50 spindle thermal extension is within 0.02mm
- Machine without compensation  
 Spindle thermal extension is around 0.10mm

Notes: Above test is under room temperature





# Hartford F1-the Ultimate VMC (LG-500/800/1000)

# The Brand of Highest Efficiency for Electrical Industries (LG-1370/1570)

One of the important elements that determines a machining center's accuracy and capability is structural rigidity. LG series was designed according to the principles of FEA

Offering more unique features than any other competitive machine, providing superior value in speed, accuracy and stability.

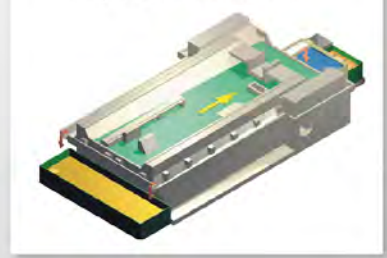


### Full range of linear guideway five-year warranty:

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.

### One-piece bed design

- The bed is one-piece design.
- The column is wider.
- Prevents twisting and distortion under even the most severe cutting forces.
- The fine grain Meehanite cast iron contributes to unparalleled damping characteristics.



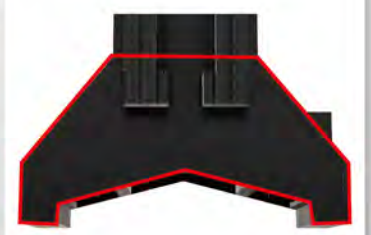
### Excellent tool change time

- LG-500 minimum tool change time **1.18** sec (tool-to-tool)
- LG-800/1000 minimum tool change time **1.38** sec (tool-to-tool).



### Oversized column design

- Increased width of the interface between the column and base.
- Enhances machine stability
- Increases machine rigidity and efficiency.



### High accuracy linear guideway design

- The line guideways on all 3-axes are high grade, providing stability for heavy cutting.
- High efficiency machining center.
- Maximum rapid traverse rate of **30,000** mm/min.



**1 Extra large interference between column and base**

- Increases column rigidity in X-axis direction.
- The extension of the column base increases rigidity in Y and Z axes.

**2 Column rear-inclination design**

- Reduces unnecessary mass.
- Shifts the center of gravity forwards.
- Increases the damping effect in the Y-axis direction.



**3-axis direct transmission between servo motor and ballscrew**

- High torque servo motors are directly coupled with ballscrews.
- Without backlash or servo lag problem caused by a belt.
- All ballscrews are center-supported plus both ends utilize precision angular contact bearings.
- Boosts machining efficiency and reliability.



The picture shows LG-1370



# Spindles Manufactured by Hartford Offer Quality Assurance

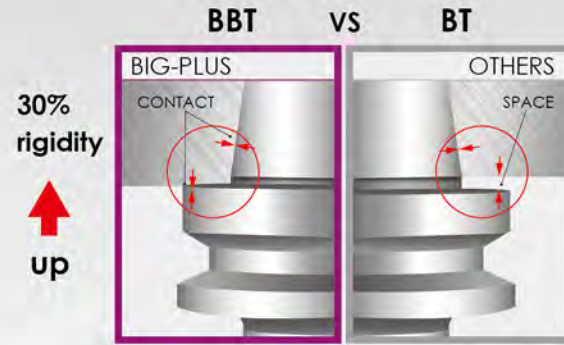
## Machine Dimensions

### Spindle type

- #40 Pulley 8000rpm opt. 10000 / 12000 rpm
- #40 DDS opt. 10000 / 12000 / 15000 rpm

### BBT for optional

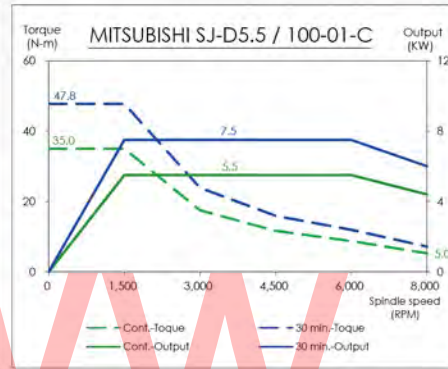
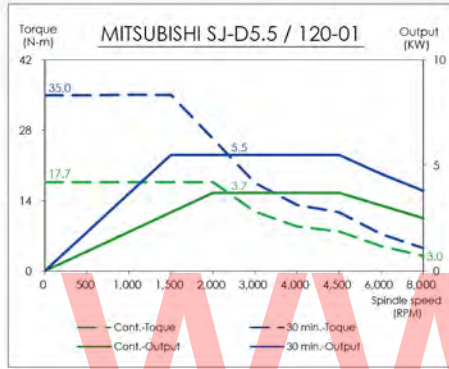
- Dual contact between the taper and the flange.
- Improves the rigidity, accuracy, speed and performance.
- Radial deflection, vibration and deviation are significantly reduced.



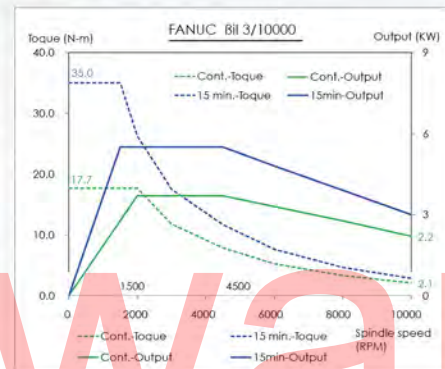
### Spindle torque diagrams

LG-500/800/1000

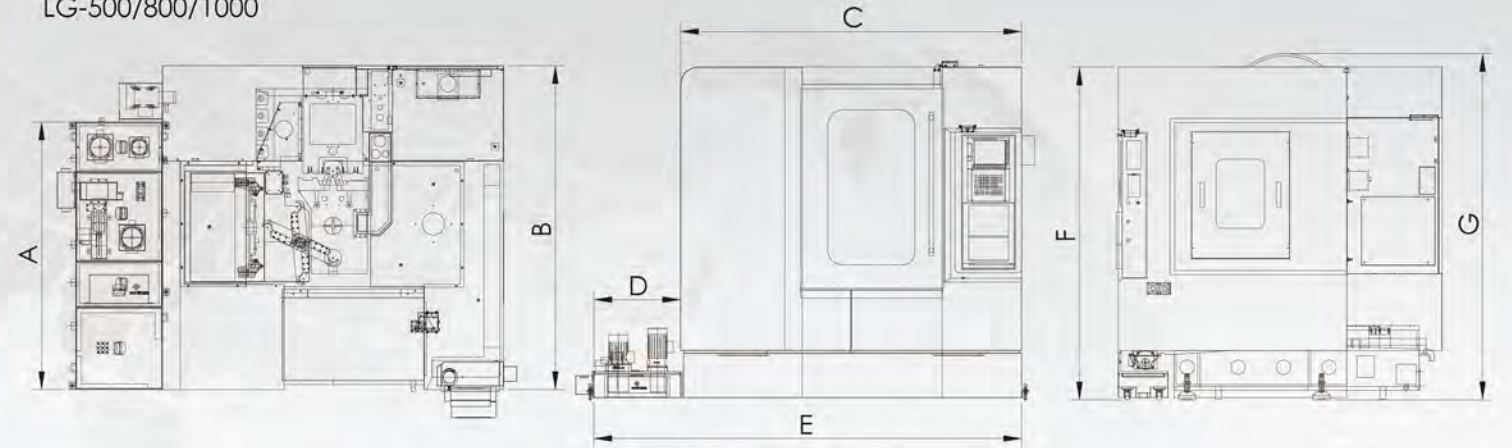
Mitsubishi



Fanuc



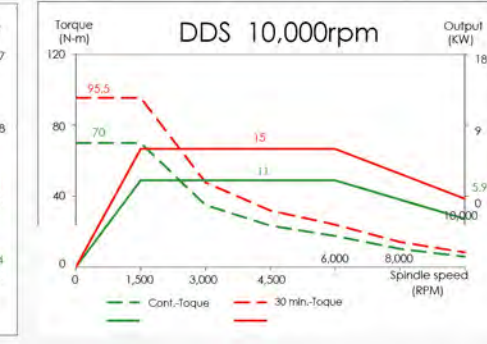
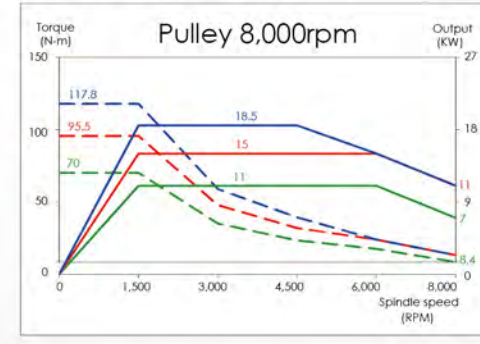
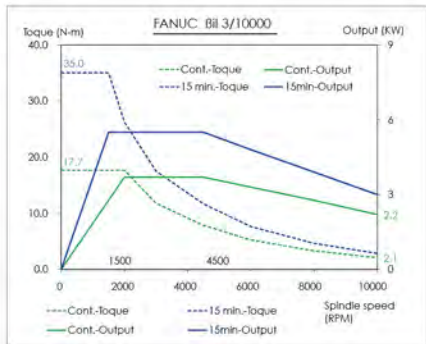
LG-500/800/1000



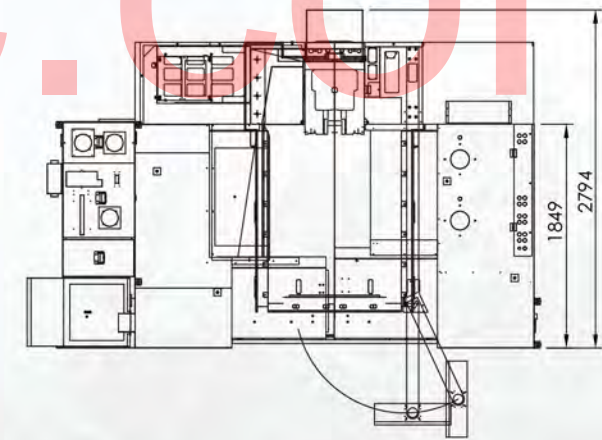
	A	B	C	D	E	F	G
LG-500	1885	2100	1850	300	2150	2140	-
LG-800	1850	2240	2360	600	2960	2300	2394
LG-1000	1850	2240	2900	600	3500	2300	2394

Fanuc

LG-1370/1570 Fanuc

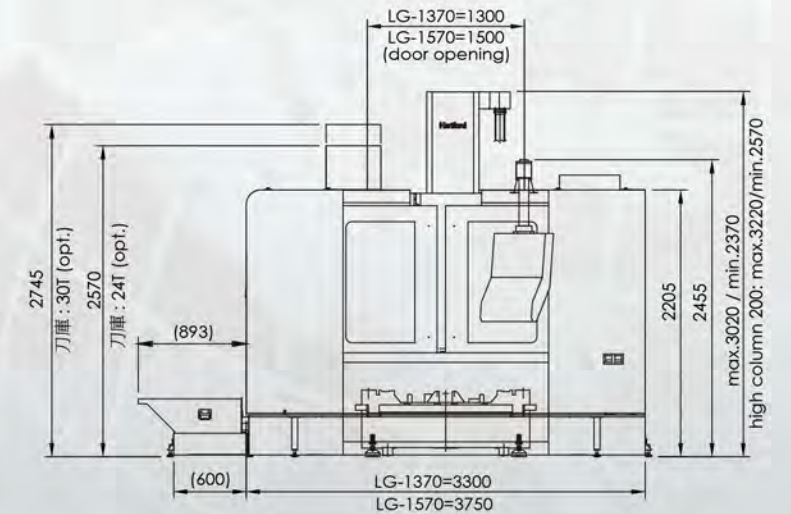
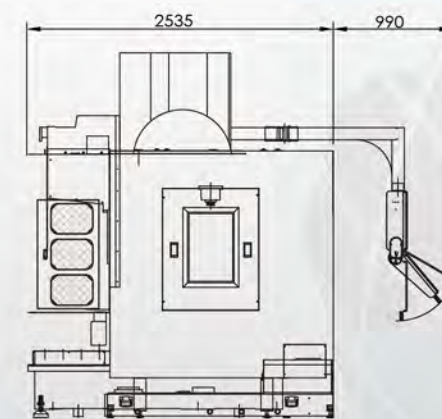
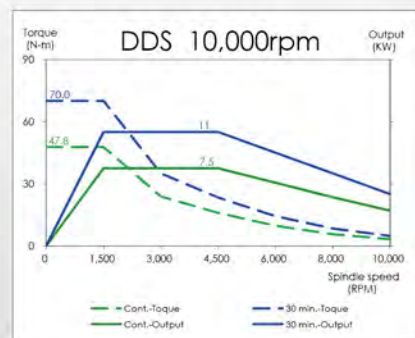
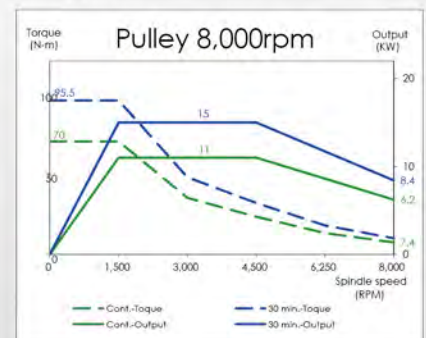


LG-1370/1570



LG-1370/1570

Mitsubishi





# Machine Specifications

Model Table	Unit	LG-500	LG-800	LG-1000	LG-1370	LG-1570
Working Surface	mm	620 x 420	950 x 510	1150 x 510	1400 x 650	1600 x 650
T-slot (Size x Number x Pitch)	mm	18 x 3 x 130	18 x 3 x 160	18 x 3 x 160	18 x 5 x 125	18 x 5 x 125
Max Table Load	kg	300	500	700	1000	1000
<b>Travel</b>						
X-axis travel	mm	520	800	1000	1300	1500
Y-axis travel	mm	420	510	510	700	700
Z-axis travel	mm	450	630	630	650	650
Distance From Spindle End to Table Center	mm	100~550	100~730	100~730	150~800 (350~1000 opt.)	150~800 (350~1000 opt.)
Distance From Spindle Center to Column	mm	460	562.5	562.5	720	720
<b>Spindle</b>						
Spindle Speed (Pulley)	rpm	8000(10000 / 12000 opt.)	8000(10000/12000 opt.)	8000(10000/12000 opt.)	8000(10000/12000 opt.)	8000(10000/12000 opt.)
Spindle Speed (DDS)	rpm	10000(12000 opt.)	10000(12000/15000 opt.)	10000(12000/15000 opt.)	10000(12000/15000 opt.)	10000(12000/15000 opt.)
Spindle Nose Tape	rpm	#40	#40	#40	#40	#40
<b>Feed</b>						
Cutting feedrate (X/Y/ Z Axes)	m/min	10 / 10 / 10	12 / 12 / 12	12 / 12 / 12	15 / 15 / 15	15 / 15 / 15
Rapid Traverse feedrate (X/Y/ Z Axes)	m/min	30/30/24 (40/40/32)	30/30/24 (40/40/30)	30/30/24 (40/40/30)	30/30/24 (40/40/30)	30/30/24 (40/40/30)
<b>ATC</b>						
Tool Storage Capacity	pcs	A:24	A:24 / 30	A:24 / 30	A : 24 / 30 / 40	A : 24 / 30 / 40
Max. Tool Weight	kg	7	7	7	7	7
Max. Tool Size (Diameter x Length)	mm	A : Ø80x200L	A : Ø75 x 300L	A: Ø75 x 300L	A : Ø 75 x 300L	A: Ø 75 x 300L
Tool Shank		BT40 ( BBT / CAT / DIN)	BT40(BBT/CAT/DIN)	BT40(BBT/CAT/DIN)	BT40(BBT/CAT/DIN)	BT40(BBT/CAT/DIN)
Pull Stud Bolt		P40T-1/CAT-40/DIN69872	P40T-1/CAT-40/DIN69872	P40T-1/CAT-40/DIN69872	P40T-1/CAT-40/DIN69872	P40T-1/CAT-40/DIN69872
<b>Motor</b>						
Spindle Drive Motor (30min/Con) kW		5.5	7.5 (11 opt.)	7.5 (11 opt.)	11(15)	11(15)
<b>Positioning Accuracy</b>						
3 axes laser positioning accuracy (JIS B6338)						
Positioning accuracy/Full travel	mm	±0.008	±0.008	±0.008	±0.008	±0.008
Repetitive positioning accuracy	mm	±0.002	±0.002	±0.002	±0.003	±0.003
3 axes laser positioning accuracy (VDI 3441)/ Repeated 5 times						
Positioning accuracy	mm	0.010	0.010	0.010	0.014	0.014
Repetitive positioning accuracy	mm	0.006	0.006	0.006	0.008	0.008
<b>Other</b>						
Required Air Pressure	kg/cm <sup>2</sup>	6.5	6.5	6.5	6.5	6.5
Electric Power Consumption	KVA	10~25	10~30	10~30	20~40	20~40
Floor Space(Full Guarding)	mm	2150 x 2155	2960 x 2470	3500 x 2470	3900 x 2935	4350 x 2935
Net Weight	kg	3330	4300	4530	8300	9000
Coolant tank(Standard)	L	237	279	306	304	316

## Standard & Optional Electrical Function

### Hartrol / Standard

- Workpiece calibration by MPG directly
- Parameter package
- Thread cutting(Oi& 31i only)
- Tool magazine display(Oi&31i only)
- Tool status display((Oi&31i only)
- Special engraving marco

### Hartnet / Optional

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

### Electrical Function /Optional

- Lifting function against gravity
- Retraction for rigid tapping
- Intelligent MPG

VDI 3441 accuracy available upon order request.

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