OPTIPLEX
CHAMPION 3015 FIBER

Mazak

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OPTIPLEX CHAMPION 3015 FIBER 18.09.0 A 99J450918E0

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OPTIPLEX CHAMPION 3015 FIBER

[Fiber laser processing machine]

A laser processing machine with exceptional value for cutting thin- to mid-thickness worksheets

Applications

- Micro cutting – can only be done by fiber laser
- Stable cutting of highly reflective material such as copper, brass and aluminum

Material :
stainless steel

Thickness :
0.5 mm (0.02")

Assist gas :
Nitrogen

Material :
mild steel SS400

Thickness :
12 mm (0.47")

Assist gas :
Oxygen

Material :
copper

Thickness :
1 mm (0.04")

Assist gas :
Oxygen

- Intelligent Functions automatically perform setup and cutting tasks
  (Monitoring of cutting status - optionally available)
- Equipped with MAZATROL PREVIEW 3 CNC 15" touch panel for increased ease of operation
- **Equipped with OPTIPLEX CHAMPION 3015 FIBER - 2.0 kW and 3.0 kW laser resonator for high performance cutting**

Shown without area sensor for clarity

Fiber laser processing machine

OPTIPLEX CHAMPION 3015 FIBER

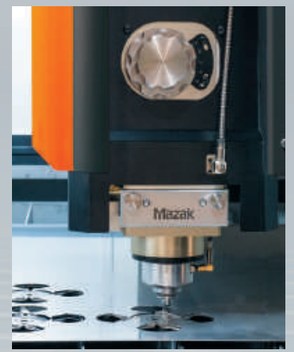
Machine Design and Functions

Wide door opening

Wide front door opening provides ease of setup and loading / unloading of smaller size worksheets.

Manual Torch

Focus point is measured by operator and adjusted according to material to improve cutting speed and surface finish.
Focus distance can be changed by turning a dial.



Intelligent Machine

A variety of Intelligent Functions provides incomparable operator support for exceptional ease of operation and optimum machine efficiency

ISF
INTELLIGENT SET-UP FUNCTIONS

IMF
INTELLIGENT MONITORING FUNCTIONS
OPTION

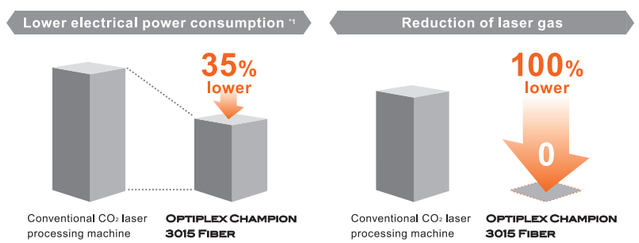
ICF
INTELLIGENT CUTTING FUNCTIONS

Lower Running Cost

Considerable reduction in gas and electrical power consumption

The OPTIPLEX CHAMPION 3015 FIBER does not require laser gas, which is used by CO_2 laser machines - also electrical power consumption is considerably lower, which results in a large reduction of running cost.

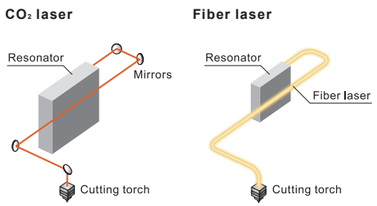
Comparison of OPTIPLEX CHAMPION 3015 FIBER and conventional CO_2 laser processing machine



*1 Example comparison of 2.5 kW CO_2 laser processing machine and OPTIPLEX CHAMPION 3015 FIBER 3.0 kW.

Considerable reduction in maintenance example

For conventional CO_2 laser processing machines, regular maintenance of components such as the resonator and mirrors is required in order to maintain stable cutting performance. The fiber laser processing machine eliminates the mirrors and other components by using optical fiber to significantly reduce the cost of maintenance.



Intelligent Machine

ISF

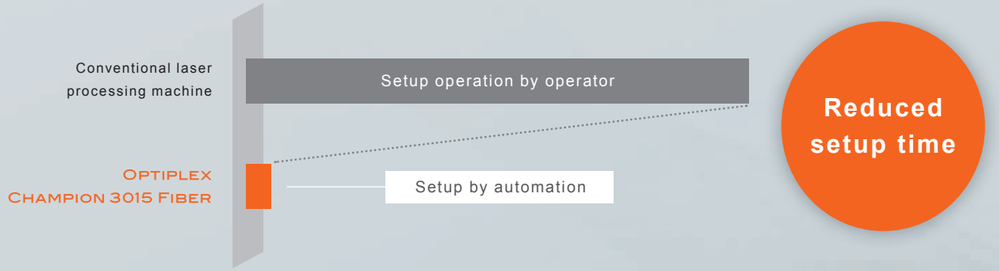
INTELLIGENT SET-UP FUNCTIONS

A wide variety of automation functions is available for ease of operation and reduced setup time.

Example of reduced setup time

Conventional laser processing machine	OPTIPLEX CHAMPION 3015 FIBER
Long in-process time and many processes requiring an operator	Setup time variance between different operators is eliminated
Automation	
Operator determines cutting conditions by referring to material cutting data	Optimum lens and nozzle can automatically be determined from the cutting conditions database by inputting thickness and type of material *1
Focus distance is measured by operator and adjusted according to material	Focal distance can automatically be detected*1, and manually be set by operator
Select and change optimum nozzle by operator	Can automatically change to optimum nozzle *1 Automatically removes cutting spatter from nozzle
Adjust gap calibration by operator	Profiling distance is automatically determined

*1 Option



Focus Detection OPTION

Focal distance measurement requires considerable setup time as well as a skilled and experienced operator. Even unskilled or inexperienced operators can now easily perform these operations by using the Focus Detection system by program commands.

Auto Nozzle Changing OPTION

Automatically change to optimum nozzle for continuous automatic operation.
The storage capacity is up to 8 nozzles.

Auto Profiler Calibration

Cutting distance position must be maintained for dross free cutting. When installing a new nozzle, gap distance is properly maintained with the use of auto profiler calibration. This automatic calibration maximizes the time between necessary operator intervention.

Auto Nozzle Cleaning

The torch head can be moved to the nozzle cleaning brush by program command which removes spatter that has adhered to the nozzle.

Intelligent Machine

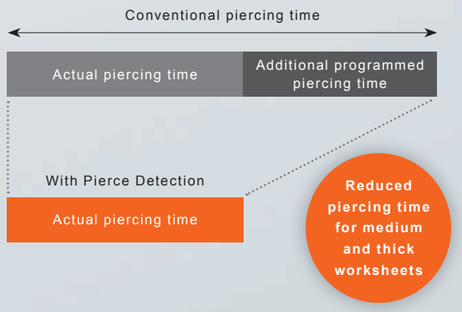
INTELLIGENT MONITORING FUNCTIONS OPTION

IMF

Monitoring of operation status of laser processing. The laser processing head is equipped with a sensor to detect piercing and defects (burning or plasma). If any plasma is detected, the operation is corrected to ensure high quality cutting. If burning is detected, the cutting is automatically stopped.

Pierce Detection

During the piercing cycle, if cutting starts before the completion of piercing, the result will be cutting failure. To avoid this, normally the piercing program is made for a longer cycle than the anticipated piercing time. By Pierce Detection, sensors detect the penetration of the laser beam through the material, and then cutting starts automatically - eliminating non-cutting time for higher productivity.



Plasma Detection

Plasma generated during cutting of medium / thick stainless steel worksheets frequently results in cutting failure that stops machine operation. The Plasma Detection monitors plasma generation during processing and makes automatic adjustments to maintain optimum conditions for consistent cutting quality.

Without Plasma Detection

With Plasma Detection

Burn Detection

Normally burning generated during the cutting of medium / thick mild steel worksheets often results in cutting failure. The Burn Detection monitors for abnormal burning during processing and automatically stops cutting if any is detected.

Burning

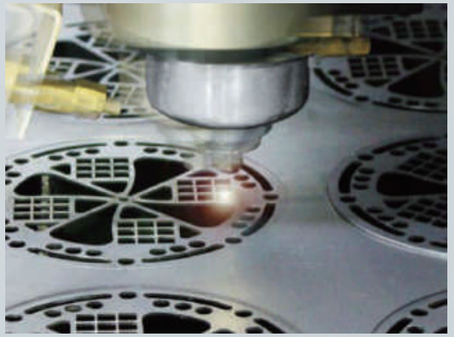
INTELLIGENT CUTTING FUNCTIONS

ICF

Automatic functions incorporating Mazak's expertise accumulated over many years that ensure high quality and high efficiency laser cutting.

Flash Cut

Cutting method by turning the laser ON / OFF without stopping axis movement. Axis movement and laser ON / OFF are synchronized to reduce cutting time.

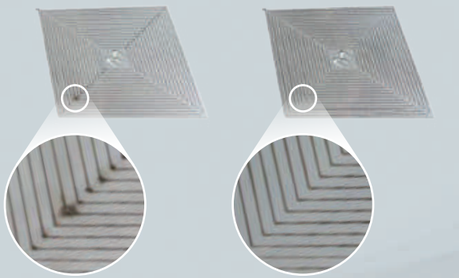


Fine Power Ramping

The Fine Power Ramping function controls laser output and feedrate - optimum cutting conditions are automatically used for high speed straight and corner cutting to prevent dross.

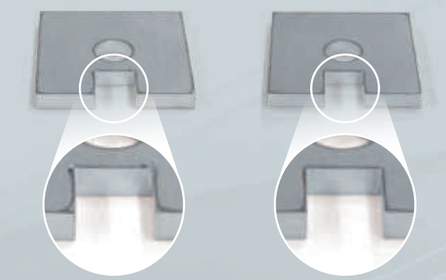
1 mm (0.04") stainless steel (nitrogen assist gas)

Without Fine Power Ramping | With Fine Power Ramping



4.5 mm (0.18") mild steel (nitrogen assist gas)

Without Fine Power Ramping | With Fine Power Ramping



MAZATROL CNC System

Unsurpassed speed of operation with touch screen

MAZATROL PREVIEW 3

Higher productivity by high-speed, high-accuracy control

Advanced hardware

- State-of-the-art CPU for unsurpassed operation speed
- High-response, high-speed machine motion

Optimum acceleration / deceleration for the reduction of cutting time

- Tolerance control ensures high-speed corner cutting
- ACTIVE VIBRATION CONTROL for stable high-speed cutting

Improved laser operation responsiveness

- Laser control is improved to generate optimum laser power in the minimum time
- Improved performance for Flash Cut

Designed for ease of operation

Easy-to-use button layout

- Easy input by software keyboard
- Buttons for frequently used manual operation
- Vertical and horizontal menu allows easy screen changes

15" touch screen

- Large screen improves ease of operation and visibility

Organized screen layout for convenient operation

- Fast access to frequently used displays, such as command screen, position screen and programming screen

Easy programming by pattern input - Simple input function for cutting shape

Round, square and elliptical shapes can easily be programmed by selecting shape pattern and inputting numerical values even for multiple hole cutting.

Select shape

Define shape

Input shape pattern

Direct MDI

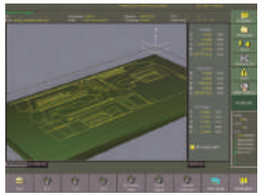
Increased programming efficiency is ensured by inputting necessary data when changing nozzle or adjusting gap distance.

Automatic determination of processing conditions

The required lens, nozzle, feedrate and laser output are automatically determined by the CNC for different materials and thicknesses. Cutting conditions can be edited while monitoring operation and registered in the CNC. The next time the same material is processed, the new cutting conditions will automatically be used.

Graphics screen

3D display of cutting path can be displayed after entering data.



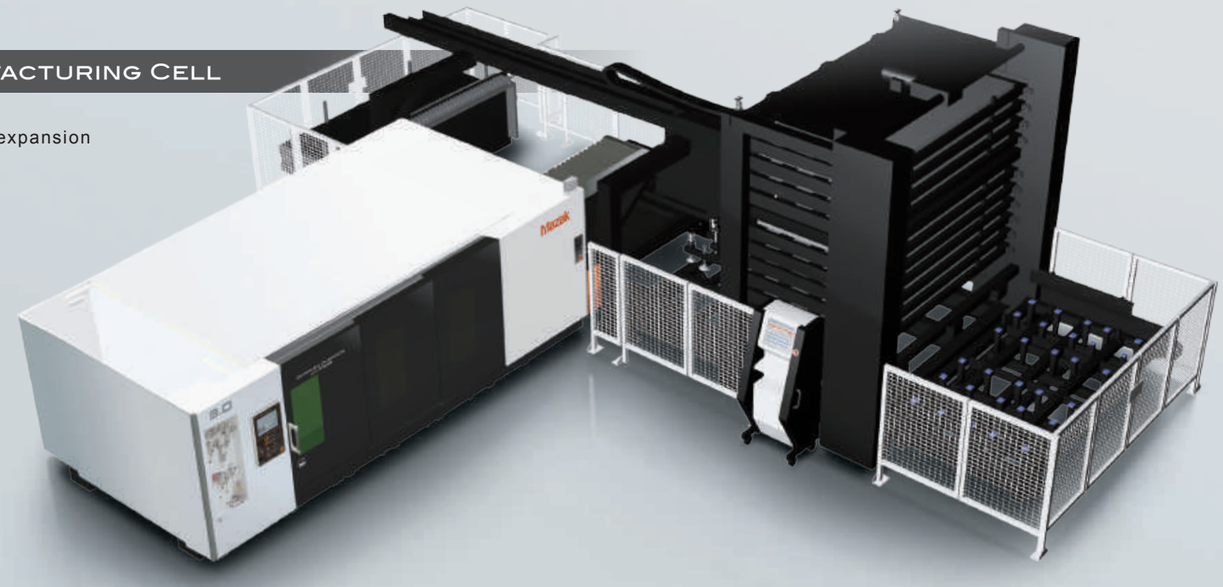
Automation

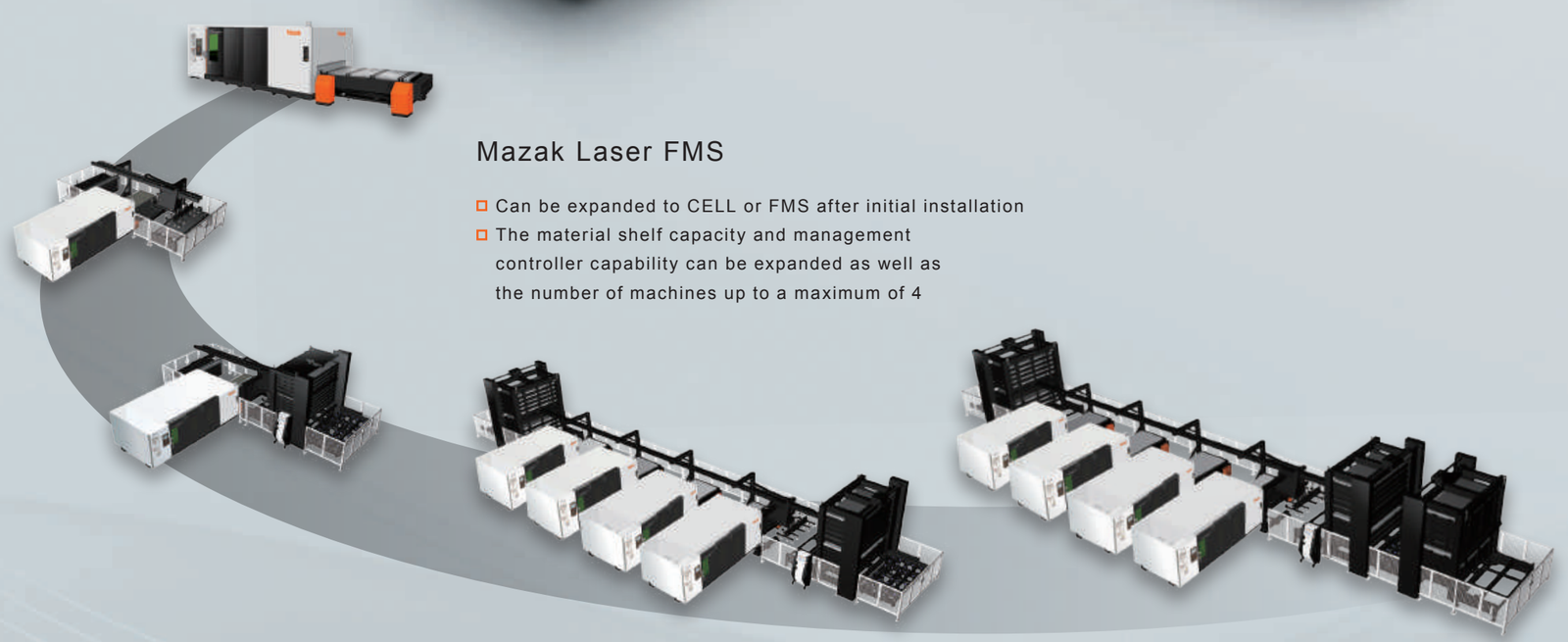
A variety of automation systems available to meet a wide range of production requirements

EXTENSIBLE MANUFACTURING CELL

Designed for convenient system expansion after the initial installation.

OPTIPLEX CHAMPION 3015 FIBER
material stocker (10 shelves) + loader / unloader + finished work table





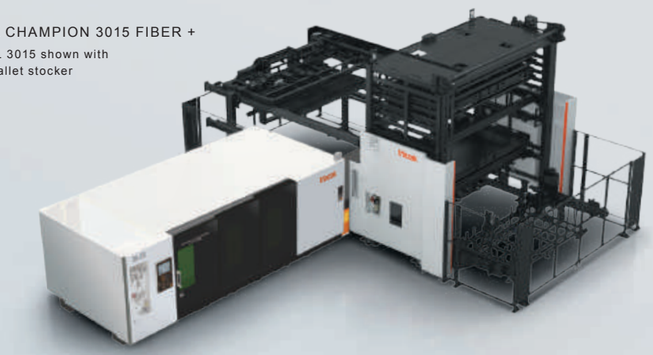
Mazak Laser FMS

- Can be expanded to CELL or FMS after initial installation
- The material shelf capacity and management controller capability can be expanded as well as the number of machines up to a maximum of 4

QUICK CELL 3015

The loader and unloader units each have a separate drive system instead of one used for both. As a result, the operation time of each unit is much faster when compared to a conventional system. By loading and unloading the pallets at the same position, factory floor space is used more efficiently.

OPTIPLEX CHAMPION 3015 FIBER +
QUICK CELL 3015 shown with optional 6-pallet stocker



COMPACT MANUFACTURING CELL

10 pallets with material and finished worksheets can be stored in the stocker. The number of micro-joints used can be minimized since the finished worksheets are unloaded to the stocker with the pallet. Time for finishing operations can also be reduced.

OPTIPLEX CHAMPION 3015 FIBER +
COMPACT MANUFACTURING CELL

Machine specifications

		OPTIPLEX CHAMPION 3015 FIBER
Max. worksheet size		1525 mm × 3050 mm (60.04" × 120.08")
Table height		900 mm (35.43")
Axis travel	X-axis	3100 mm (122.05")
	Y-axis	1580 mm (62.2")
	Z-axis	150 mm (5.91")
Rapid traverse rate	X-axis	60 m/min (2362 IPM)
	Y-axis	60 m/min (2362 IPM)
	Z-axis	60 m/min (2362 IPM)
	Vectorial (X-, Y-axis)	85 m/min (3346 IPM)
Max.feed	X-axis	60 m/min (2362 IPM)
	Y-axis	60 m/min (2362 IPM)
	Z-axis	60 m/min (2362 IPM)
Positioning accuracy	X-axis	±0.05 mm / 500 mm (±0.002" / 19.69")
	Y-axis	±0.05 mm / 500 mm (±0.002" / 19.69")
	Z-axis	±0.01 mm / 100 mm (±0.0004" / 3.94")
Repeatability	X-axis	±0.03 mm (±0.0012")
	Y-axis	±0.03 mm (±0.0012")
	Z-axis	±0.03 mm (±0.0012")
Machine weight (including chiller, transformer, resonator and 2-pallet changer)	2.0 kW	12500 kg (17557 lbs)
	3.0 kW	12800 kg (28219 lbs)
Electrical power requirement*1	2.0 kW	31.0 kVA
	3.0 kW	36.0 kVA

*1 Total electrical requirement does not include optional equipment.

Specifications of laser resonator

Resonator	2.0 kW, 3.0 kW
Wave length	1070 nm (Center wave)

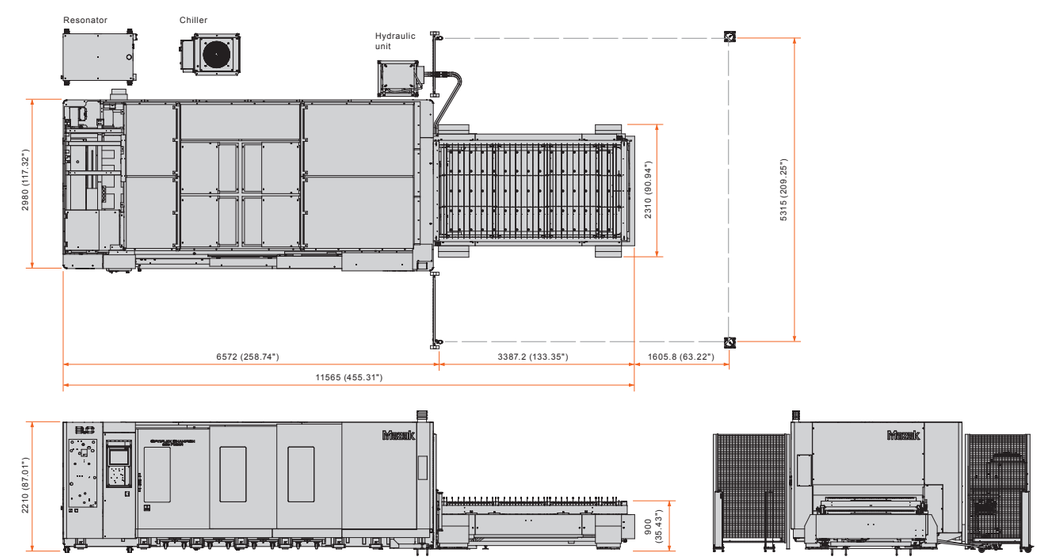
CNC standard specifications

CNC	MAZATROL PREVIEW 3
CPU	64 bit
Control method	Preview control
Minimum program increment unit	0.001 mm (0.0001")
Programming method	EIA / ISO
Display	15" color LCD (TFT)

Standard and optional equipment

●: Standard ○: Option

Machine	Auto nozzle changer (holders : 8)	○
	Auto profiler calibration	●
	Auto nozzle cleaning	●
	Laser light shielding cover window (1 position)	●
	Additional laser light shielding cover window	○
	Work lifter	○
	Knife-edge (100 mm (3.94") pitch)	●
	Knife-edge (50 mm (1.97") pitch)	○
	Non-contact profiler with retry	●
	Manual worksheet clamps (2 clamps per pallet)	●
	Manual worksheet clamps	○
	Additional locator	○
	Work light	●
	Resonator status indicator light	●
	Chiller unit	●
Torch	Manual Torch	●
	Protection window for Manual Torch	●
	Protection window cartridge for Manual Torch	●
	Additional protection window for Manual Torch	○
	Additional protection window cartridge for Manual Torch	○
Nozzle	Mazak pencil nozzle (single) Φ1.0, 1.2, 1.5, 2.0, 3.0 mm (1 each)	●
	Mazak pencil nozzle (single) Φ1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 5.5 mm (1 set of 3 of same size)	○
	Mazak pencil nozzle (dual) Φ1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 7.0 mm (1 set of 3 of same size)	○
	Mazak pencil nozzle HP (single) Φ1.0, 1.2, 1.5 mm (1 set of 3 of same size)	○
	Mazak pencil nozzle HP (dual) Φ1.5-1.5 mm (1 set of 3 of same size)	○
Assist gas	3rd assist gas piping (supply : 3.0 MPa (435 PSI))	●
	4th assist gas piping (supply : 3.0 MPa (435 PSI))	○
	Assist gas changer	●
	Assist gas pressure NC control (setup pressure : 0.02 ~ 2.5 MPa (3 ~ 363 PSI))	●
Factory automation	2-pallet changer	●
	Auto power off	●
	QUICK CELL 3015 preparation	○
	FMS preparation	○
	EXTENSIBLE MANUFACTURING CELL	○
Environment	Preparation for dust collector	●
	Chip pan	●
CNC	Focus Detection	○
	Pierce Detection	○
	Plasma Detection	○
	Burn Detection	○
	Fine Power Ramping	●
	Flash Cut	●
	Work edge detection / coordinate rotation	●
	EtherNet I/F	●
	USB I/F	●
	NC retry function	●
	Laser monitor	●
	MTConnect adapter	○
	Robot open interface	○
	QR code reader	○
Others	1 set of manuals	●
	Additional set of manuals	○

Floor Space

Unit : mm (inch)