Mazak

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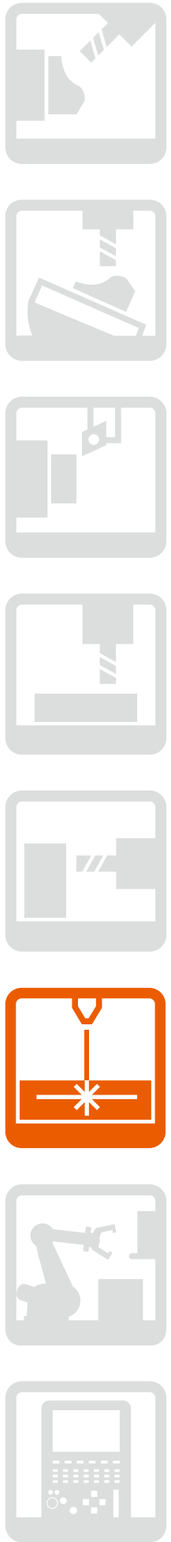
SUPER TURBO-X FIBER SERIES 17.10.1000 G 99J447616E2

SUPER TURBO-X FIBER SERIES

E



SUPER TURBO-X FIBER

SERIES

2412
3015

Mazak

The highly-regarded SUPER TURBO-X is now available with a fiber laser

SUPER TURBO-X FIBER SERIES unique features

- Table feed system realizes smallest floor space requirement in this machine class
  - **Can be installed in same floor space as the SUPER TURBO-X SERIES**
  - **Can be added to SUPER TURBO-X FMS system**
- Table feed system designed for excellent table access – especially effective for high-mix, small quantity production
- Ball screw drive system and cast bed for high rigidity

The Multi-Control Torch and the variety of Intelligent Functions provide incomparable operator support for exceptional ease of operation and the optimum machine efficiency

SUPER TURBO-X 3015 FIBER (2.0 kW)

High-precision, Fiber laser processing machine

SUPER TURBO-X FIBER SERIES

Versatile cutting performance of the fiber laser

- Higher productivity when cutting thin to medium thickness material
- Micro cutting – can only be done by the fiber laser
- Stable cutting of highly reflective material such as copper, brass and aluminum

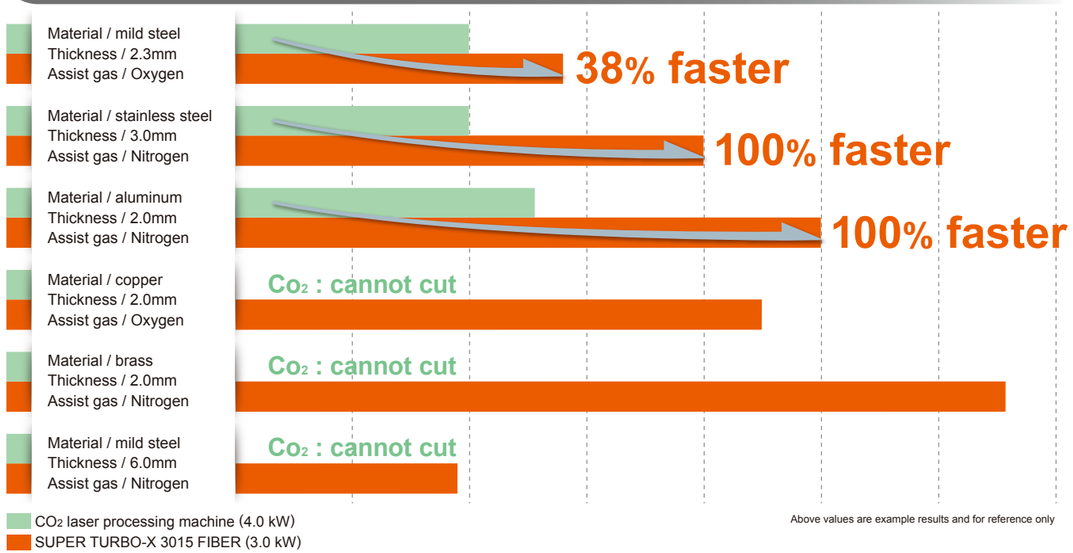
MULTI CONTROL TORCH

Featuring the new Multi-Control Torch – standard equipment

Thanks to the flexible beam diameter, optimum cutting with high-speed and high-accuracy can be performed by automatic setup – effective for both thin worksheets and thick plates

The optimum nozzle is automatically selected and changed for each material and thickness. Improved quality of processed components as well as reduced cutting time and running cost are ensured.

Comparison of cutting speed of SUPER TURBO-X 3015 FIBER (3.0 kW) and CO_2 laser processing machine (4.0 kW)

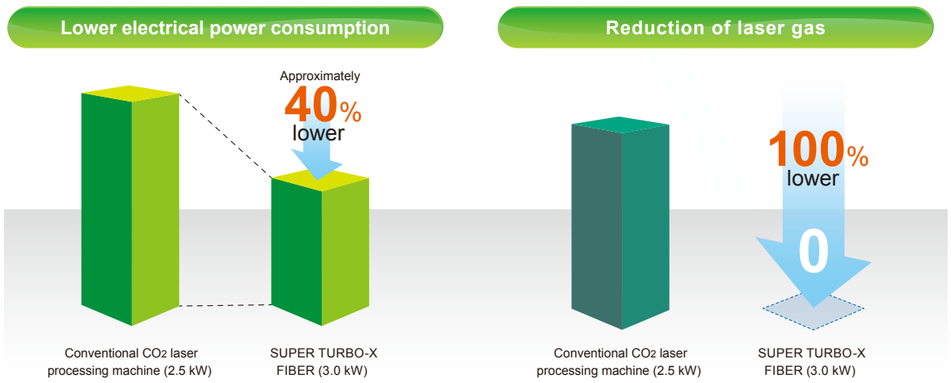


Above values are example results and for reference only

Lower running cost

The SUPER TURBO-X FIBER series 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 SUPER TURBO-X FIBER series and conventional CO_2 laser processing machine



Considerable reduction in cost of maintenance

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.

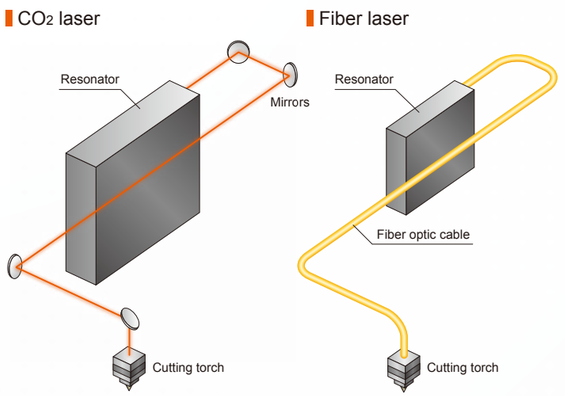


Table feed system

Designed for excellent table access, ease of operation, and convenient processing of a wide variety of workpieces.
Ease of loading / unloading not only for regular size worksheets but also remnant material even for a single part.

Ball screw drive system and cast bed for high rigidity

Work lifter

High positioning accuracy and ease of loading / unloading for a heavy worksheet is ensured. Marring on the bottom sides of stainless steel worksheets can be significantly reduced.

Auto open / close protective cover

The total machine cover, which covers the entire processing area, protects operators from the laser beam and cutting spatter. Oil smoke and dust can be recovered by the dust collector.

Intelligent Machine

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

Yamazaki Mazak has developed a variety of functions for the improvement of productivity, high accuracy cutting and operator support. A variety of unique technologies has been developed that incorporates the expertise of experienced machine operators that realizes unsurpassed productivity and higher accuracy cutting.

ISF

INTELLIGENT SET-UP FUNCTIONS

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

- Beam Diameter Control
- Focus Detection
- Auto Nozzle Changing
- Auto Focus Positioning
- Auto Profiler Calibration
- Auto Nozzle Cleaning

IMF

INTELLIGENT MONITORING FUNCTIONS

Operation status of laser processing can be monitored. The laser processing head is equipped with a sensor to check piercing and to detect defects (burning or plasma).
If any defect is detected, the operation is corrected or paused to realize optimum cutting.

- Pierce Detection
- Plasma Detection
- Burn Detection

ICF

INTELLIGENT CUTTING FUNCTIONS

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

- Fine Power Ramping

Intelligent Machine

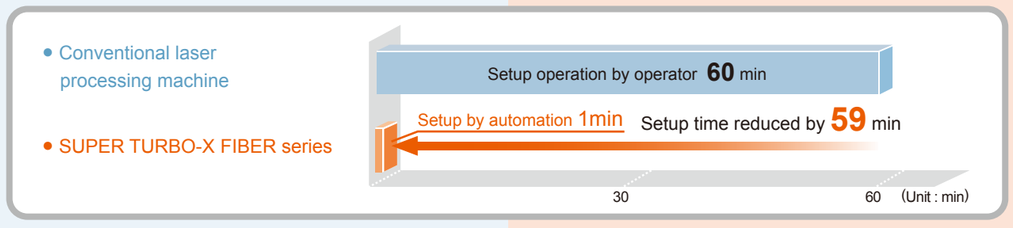
INTELLIGENT SET-UP FUNCTIONS

ISF

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

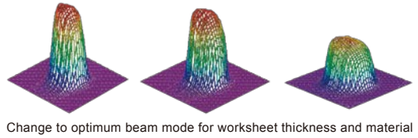
Example of reduced setup time

Conventional laser processing machine		SUPER TURBO-X FIBER series
Long in-process time and many processes require an operator		Consistent set-up and cutting times
1 Operator determines cutting conditions by referring to material cutting data	Automation	1 Optimum lens and nozzle can automatically be determined from the cutting conditions data base by inputting thickness and type of material
2 Focal distance is determined by operator	Automation	2 Focal distance can automatically be detected and set
3 • Select and change optimum nozzle by operator • Cleaning nozzle	Automation	3 • Can automatically change to optimum nozzle • Automatically removes cutting spatter from nozzle
4 Adjust calibration by operator	Automation	4 Profiling distance is automatically determined



Beam Diameter Control

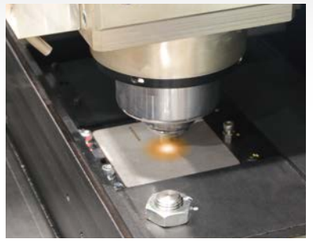
By moving the lens up or down, the laser beam diameter can be changed automatically. Stable cutting is realized — improved cutting speed for thin worksheets and increased cutting performance for thick sheets.



Change to optimum beam mode for worksheet thickness and material

Focus Detection

Traditionally focal distance measurement and adjustment 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. Additionally, this system automatically compensates for focal distance changes which occur due to lens contamination.



Auto Nozzle Changing

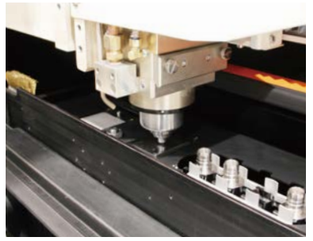
Automatically change to optimum nozzle for continuous automatic operation.
Storage capacity : 4 nozzles.

Auto Focus Positioning

By moving a lens up or down, the focal point position can be changed automatically. As a result, the focal point can be positioned for the optimum piercing performance as well as cutting for the maximum productivity.

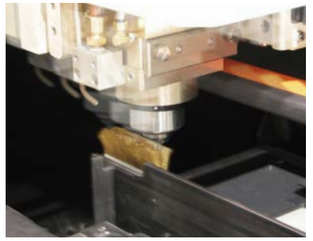
Auto Profiler Calibration

Cutting distance position must be maintained for dross free cutting.
When installing a new nozzle, gap distance is properly maintained with the use of the 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

IMF

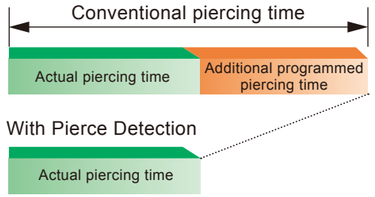
INTELLIGENT MONITORING FUNCTIONS

Operation status of laser processing can be monitored. The laser processing head is equipped with a sensor to check piercing and to detect defects (burning or plasma). When a defect is detected, the operation is corrected or paused to realize optimum cutting.

Reduced piercing time for medium and thick worksheets

Pierce Detection

Normally, it is quite difficult to stabilize piercing operations for medium / thick worksheets resulting in piercing problems. The Intelligent piercing sensor detects when the laser beam pierces the material and completes hole piercing. This function ensures continuous piercing operation resulting in the minimum piercing time.



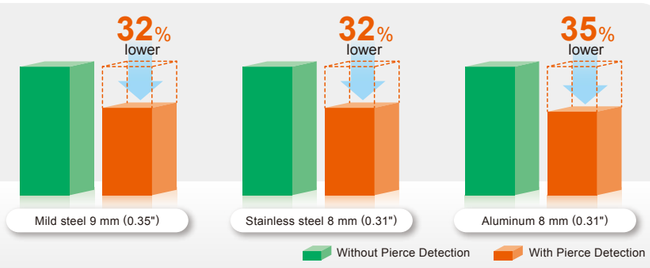
Comparison of cutting time

Machine

SUPER TURBO-X FIBER (2.0 kW)

Method

Conduct 100 piercing cycles with Pierce Detection and without Pierce Detection.
(Values are results and for reference only)



ICF

INTELLIGENT CUTTING FUNCTIONS

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

Fine Power Ramping

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.

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

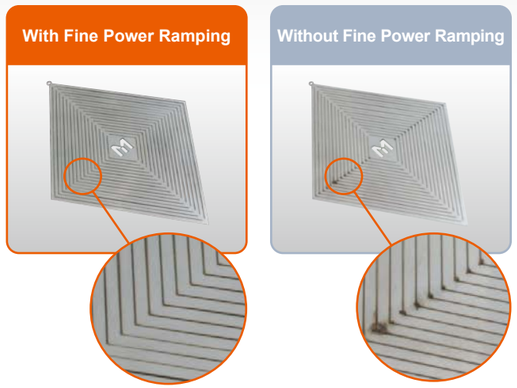
With Plasma Detection

Burn Detection

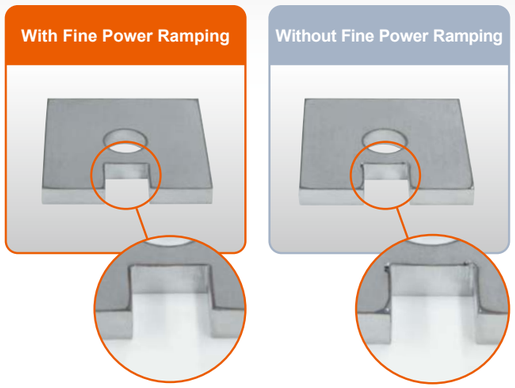
Normally burning generated during the cutting of medium / thick mild steel worksheets often results in cutting failure. The Burn Detection monitors for abnormal burning during processing and automatically stops cutting if any is detected.

Burning

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



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



Ease of Programming

Unsurpassed speed of operation

MAZATROL PREVIEW 3

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

Improved laser operation response

· Laser control is improved to generate optimum laser power in the minimum time
Improved performance for sharp edge cutting

Designed for ease of operation

Optimum button layout with ergonomic design

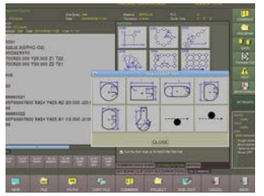
15” touch screen

Organized screen layout for convenient operation

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

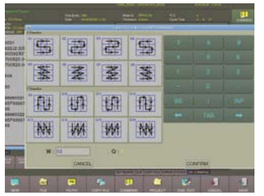
Easy programming by pattern input - Simple input function for cutting shape

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



Select shape

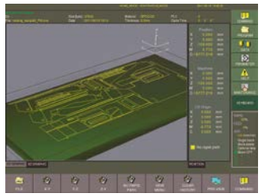
Shape input



Input shape pattern

Graphics screen

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



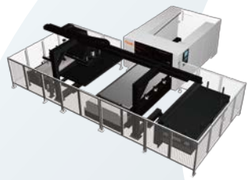
Automatic determination of processing conditions

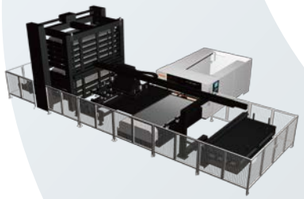
The required lens, nozzle, feedrate and laser output are automatically determined by the CNC for different materials and thicknesses. Cutting conditions can be edited while monitoring operation and registered in the CNC.
The next time the same material is processed,
the new cutting conditions will automatically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

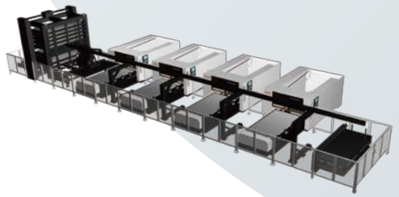
Automation

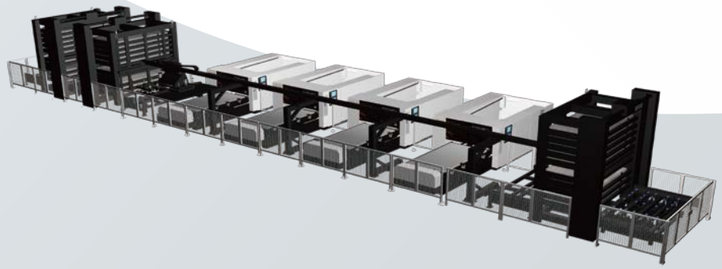
Variety of automation systems available to meet a wide range of production requirements

EXTENSIBLE MANUFACTURING CELL









Designed for convenient system expansion after the initial installation

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

High-productivity

- Production control can be managed thanks to scheduled operation
- Worksheets up to 25 mm (1”) can be transported for reduced loading / unloading time and heavy labor for operator

SUPER TURBO-X 510 Mk III and EXTENSIBLE MANUFACTURING CELL shown.

Mazak IoT Solution

By incorporating all production equipment in a network that utilizes the MTConnect communication protocol, comprehensive monitoring can be performed in real time and production results can be thoroughly analyzed to realize higher productivity and efficiency.

Not only Mazak laser processing machines and machine tools but also other manufacturers' production equipment can be connected to the Mazak SMARTBOX™ to ensure cyber security.

Utilization monitoring, data accumulation and analysis

SMOOTH MONITOR AX

- Timely action by monitoring operation of entire plant
- Improved productivity by analysis of manufacturing data
- Production results database
- Accessible by smart phone / tablet

OFFICE NETWORK

Mazak SMART BOX

Ensures cyber securi ty

SECURITY

Manufacturing data from factory

MTConnect

Secure file transfer

Transfer data safely (eliminate security risk of using USB flash memory)

FACTORY NETWORK

Laser processing machines | Machine tools | Other manufacturers' production equipment | Additional sensors data collection

Mazak SENSOR BOX

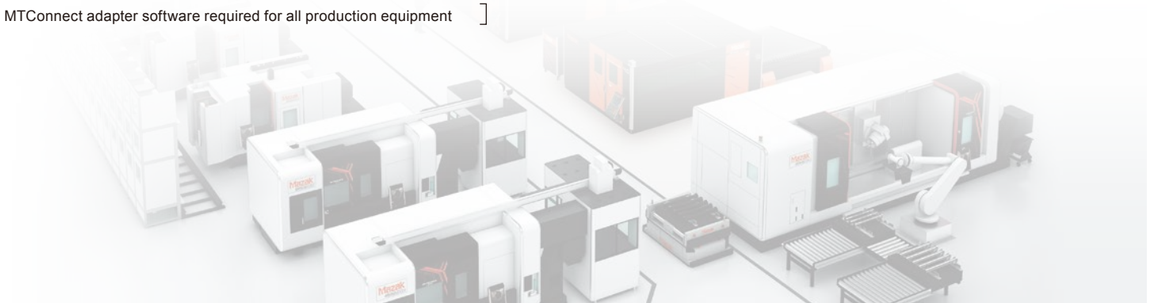
Electrical power consumption (up to 500A)

Status light

- Mazak machines

[MTConnect adapter software required for all production equipment]

- Sensor data converted to MTConnect® format



Machine specifications

		SUPER TURBO-X 2412 FIBER	SUPER TURBO-X 3015 FIBER
Max. workpiece size		1250 mm × 2500 mm (49.21" × 98.43")	1525 mm × 3050 mm (60.04" × 120.08")
Work table height		900 mm (35.43")	
Axis travel	X-axis	2520 mm (99.21")	3070 mm (120.87")
	Y-axis	1270 mm (50")	1545 mm (60.83")
	Z-axis	170 mm (6.69")	
Rapid traverse rate		X, Y : 50 m/min (1969 IPM)	
		Z : 25 m/min (984 IPM)	
Max. feedrate		50 m/min (1969 IPM)	
Positioning accuracy		±0.01 mm / 500 mm (X, Y) (±0.0004" / 19.69")	
		±0.01 mm / 100 mm (Z) (±0.0004" / 3.94")	
Repeatability		±0.005 mm (X, Y, Z) (±0.0002")	
Machine weight		10500 kg (23148 lbs)	12200 kg (26896 lbs)
Electrical power consumption-actual measurement (stand-by to maximum) *1		3.0 kW : 8~17 kW / h	
Electrical power requirement *2		28 kVA (2.0 kW) / 36 kVA (3.0 kW)	
Sound *3		Less than 80 db (A)	

*1 Electricity consumption is for reference only.
*2 Without dust collector
*3 Equivalent continuous sound pressure level at operator position (dependent on equipment)

Specifications of Resonator

Resonator	2.0 kW, 3.0 kW
Wave length	1070 nm

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

		2412 / 3015
Machine	Auto nozzle changer (storage capacity : 4)	●
	Work lifter	●
	Side air blast	●
	Non-profiler with retry function	●
	Workpiece clamps (4) & locator	●
	Additional manual clamp (1)	○
	Auto open/close protective cover	●
	Work light	●
	Resonator status indicator light	●
	Chiller unit	●
Torch	Multi-Control Torch	●
	Window protection cover	●
	Window protection cover cartridge	●
	Additional protection window	○
	Additional protection window cartridge	○
Nozzle	Mazak high accuracy pencil nozzle (single) Φ1.0 , 1.2 , 1.5 , 2.0 , 3.0 mm	●
	Mazak high accuracy pencil nozzle (single) Φ1.0 , 1.2 , 1.5 , 2.0 , 2.5 , 3.0 , 3.5 , 4.0 , 5.0 mm (same diameter size-3/set)	○
	Mazak high accuracy pencil nozzle (dual) Φ1.5 , 2.0 , 2.5 , 3.0 , 3.5 , 4.0 , 4.5 mm (same diameter size-3/set)	○
Assist gas	3rd assist gas piping (Supply 3.0 MPa)	●
	4th assist gas piping (Supply 3.0 MPa)	○
	Assist gas changer	●
	Assist gas pressure NC control	●
Factory automation	Auto power off	●
	Preparation for FMS installation	○
Working environment	Conveyor	●
	Preparation for dust collector	●
CNC	MAZATROL PREVIEW 3	●
	Intelligent set-up function (Beam Diameter Control, Focus Detection, Auto Nozzle Changing, Auto Focus Positioning, Auto Profiler Calibration, Auto Nozzle Cleaning)	●
	Intelligent monitoring function (Pierce Detection, Plasma Detection, Burn Detection)	●
	Intelligent cutting function (Fine Power Ramping)	●
	Automatic cutting conditions determination	●
	Simple cutting shape input function	●
	EtherNet I/F	●
	USB I/F	●
	NC retry function	●
	MT connect adaptor	○
	Open robot interface	○
Others	1 set of manuals	●
	Additional manuals	○

Floor space

Unit : mm (inch)

Standard machine dimensions

	SUPER TURBO-X 2412 FIBER		SUPER TURBO-X 3015 FIBER	
	2.0 kW	3.0 kW	2.0 kW	3.0 kW
L	6680 (262.99")		7330 (288.58")	
W	2600 (102.36")		2875 (113.19")	
H1	2232 (87.87")			
H2	2080 (81.89")			
H3	1880 (74.02")	2676 (105.35")	1880 (74.02")	2676 (105.35")