Mazak

Optiplex
Nexus 3015

Mazak

YAMAZAKI MAZAK CORPORATION

1-131 Takeda, Oguchi-cho, Niwa-gun, Aichi-pref., Japan
TEL : +(81)587-95-1131

www.mazak.com

(E)

Compact, High-Performance Laser Processing Machine Designed to Provide You the Maximum Value

OPTIPLEX NEXUS 3015

Compact

Less floor space thanks to integrated oscillator and electrical cabinet.

Intelligent Functions

Intelligent Set-up Functions and Intelligent Cutting Functions provide stable cutting performance.

Advanced CNC

Touch-screen CNC, MAZATROL PREVIEW 3 improves operation and response. Simple input function for machining shape allows easy programming by selecting patterned shape.
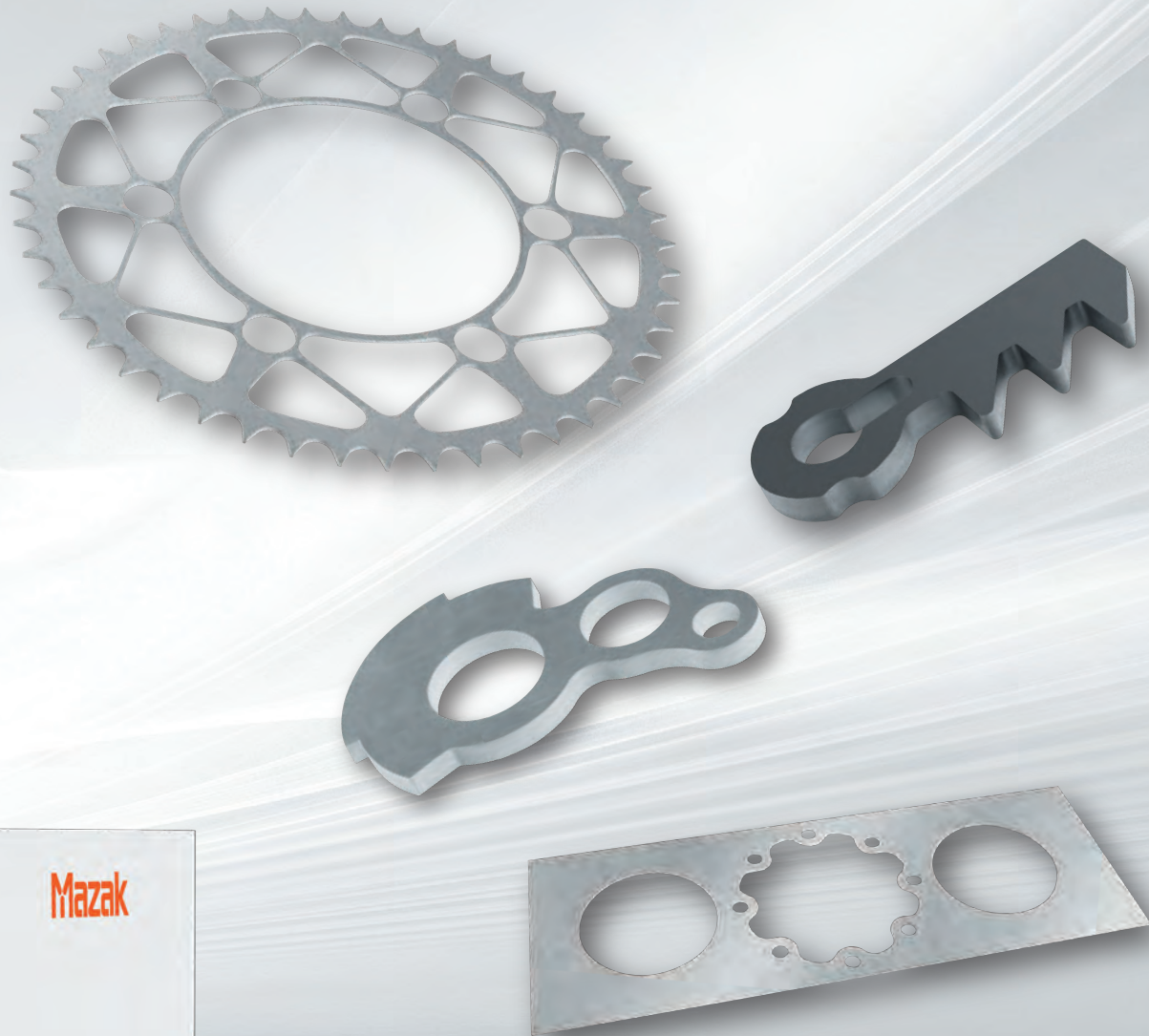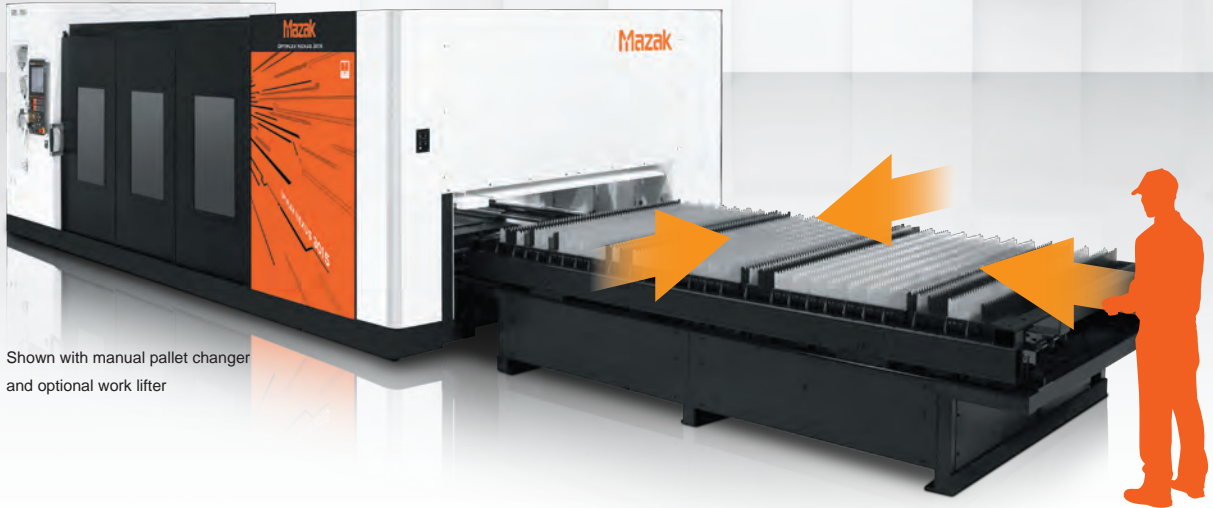
＊Shown with optional 2 pallet changer
＊Chiller unit, area sensor and 2P/C fences not shown for clarity

Manual pallet changer

Excellent pallet access

Operator can approach the table from 3 directions for convenient loading of standard size worksheets

Shown with manual pallet changer
and optional work lifter

The manual pallet changer system, which is manually pushed / pulled by the operator, is standard equipment. With the optional work lifter, the operator can more easily load heavy material while at the same minimize the marring of the bottom side of stainless steel worksheets.

Pallet inside machine

Pallet setup

Wide opening door

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

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 incorporate the expertise of experienced machine operators that provides unsurpassed productivity and higher accuracy cutting.

INTELLIGENT SET-UP FUNCTIONS

ISF

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

- Auto Nozzle Changing **OPTION**
- Auto Profiler Calibration
- Focus Detection
- Auto Nozzle Cleaning
- Auto Focus Positioning

INTELLIGENT MONITORING FUNCTIONS

IMF

OPTION

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 plasma is detected, the operation is corrected to ensure high quality cutting.
If burning is detected, the cutting is automatically stopped.

- Pierce Detection
- Burn Detection
- Plasma Detection
- Lens Monitoring

INTELLIGENT CUTTING FUNCTIONS

ICF

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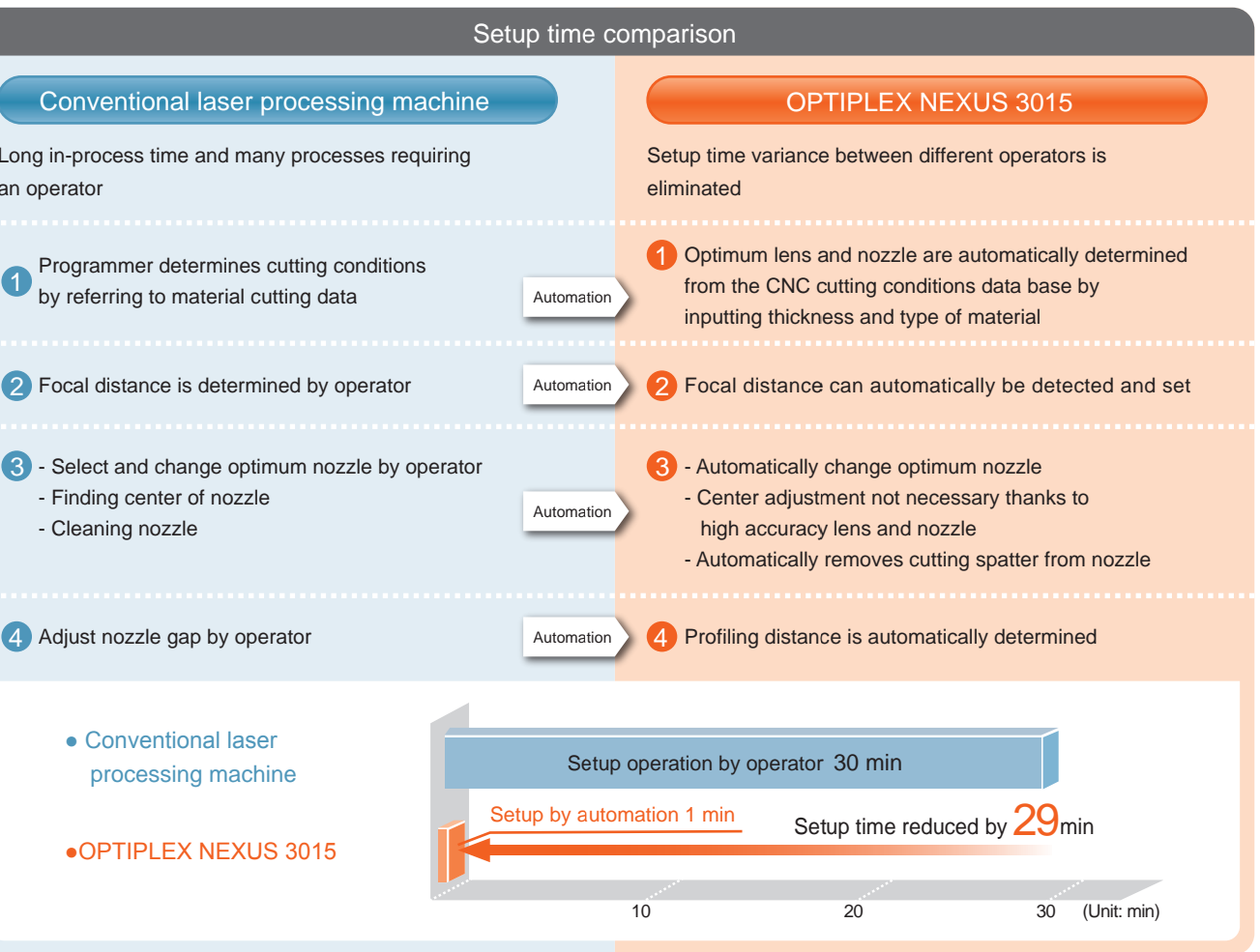
- Flash Cut
- Sharp cutting

Intelligent Machine

INTELLIGENT SET-UP FUNCTIONS

ISF

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

Setup time comparison

Conventional laser processing machine	OPTIPLEX NEXUS 3015
Long in-process time and many processes requiring an operator	Setup time variance between different operators is eliminated
1 Programmer determines cutting conditions by referring to material cutting data → Automation	1 Optimum lens and nozzle are automatically determined from the CNC 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 - Finding center of nozzle - Cleaning nozzle → Automation	3 - Automatically change optimum nozzle - Center adjustment not necessary thanks to high accuracy lens and nozzle - Automatically removes cutting spatter from nozzle
4 Adjust nozzle gap by operator → Automation	4 Profiling distance is automatically determined

● Conventional laser processing machine

●OPTIPLEX NEXUS 3015

Setup operation by operator 30 min

Setup by automation 1 min

Setup time reduced by **29** min

10   20   30   (Unit: min)

Auto Nozzle Changing (OPTION)

Automatically change to optimum nozzle for continuous automatic operation. Storage capacity: 8 nozzles.

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 Focus Positioning

By moving 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.
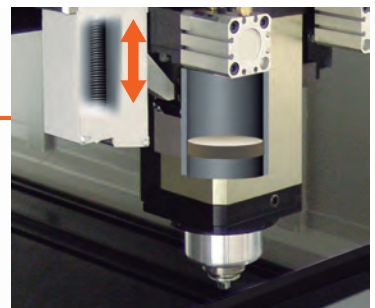
Auto Profiler Calibration

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

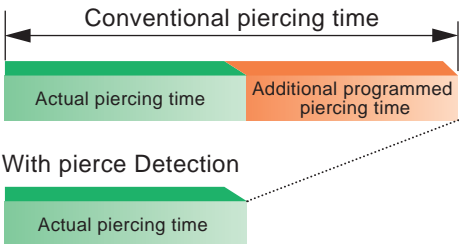## INTELLIGENT MONITORING FUNCTIONS (OPTION)

IMF

Monitoring of operation status of laser processing. The Laser processing head is equipped with a sensor to check piercing and to detect 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.

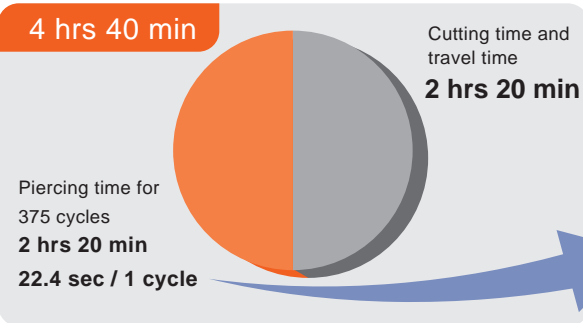### Reduced piercing time for medium and thick worksheets
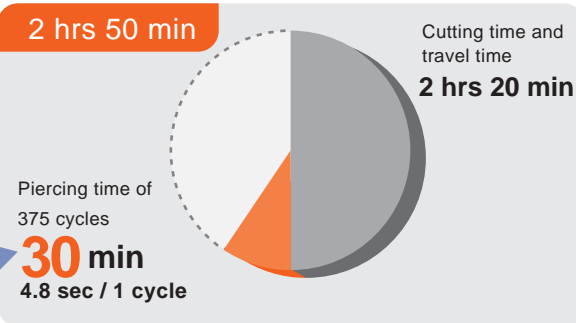
Pierce Detection

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.

Conventional piercing time

Actual piercing time | Additional programmed piercing time

With pierce Detection

Actual piercing time

Without Pierce Detection and Auto Focus Positioning

4 hrs 40 min

Cutting time and travel time
2 hrs 20 min

Piercing time for 375 cycles
2 hrs 20 min
22.4 sec / 1 cycle

With Pierce Detection and Auto Focus Positioning

2 hrs 50 min

Cutting time and travel time
2 hrs 20 min

Piercing time of 375 cycles
30 min
4.8 sec / 1 cycle

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.
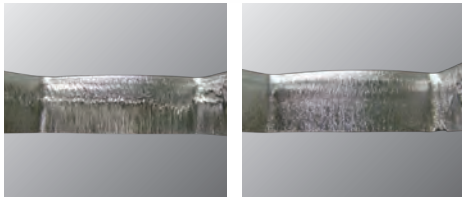
Without Plasma Detection   With Plasma Detection

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.

Lens Monitoring

If the torch lens becomes contaminated by dust, the dust could possibly ignite and damage the lens. The condition of the lens is monitored and if problem is detected, cutting will automatically stop.
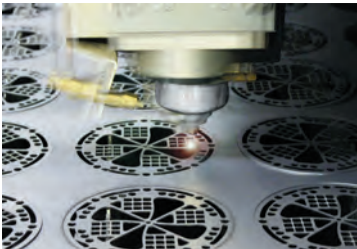
Burning

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.
Axis movement and laser ON / OFF are synchronized to reduce cutting time.

Sharp cutting

High quality corner cutting in thick material requires considerable operator expertise, otherwise the surfaces are typically burnt or melted due to the heat of cutting. This function synchronizes the feedrate, cutting conditions, assist gas pressure and other items to ensure high quality corner cutting.
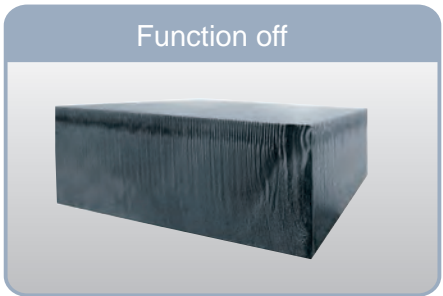
Function off
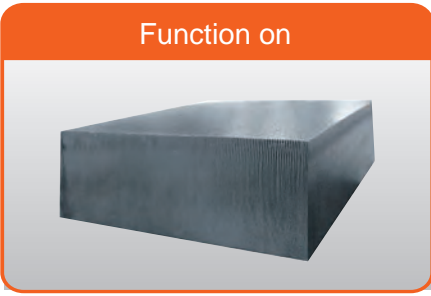
Function on

High-Performance 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
- 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 cutting and sharp edge cutting

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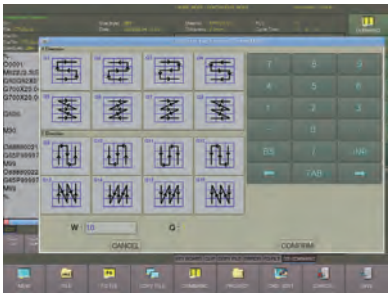
Round, square and ellipse shapes can easily be programmed by selecting shape pattern and inputting numerical values even for multiple hole cutting.

Select shape · Shape input · Input shape pattern

Manual operation of Intelligent Setup Functions by MDI

Increased programming efficiency is ensured by manually inputting necessary information without having to change program data, for example nozzle changing or adjusting gap distance.

Automatic determination of processing conditions

The required lens, nozzle, federate 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.

Graphic screen

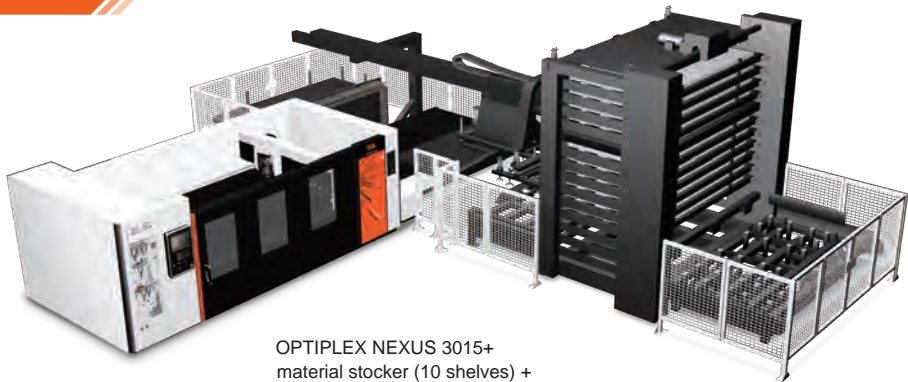3D display of cutting path can be displayed after entering data.

10

11
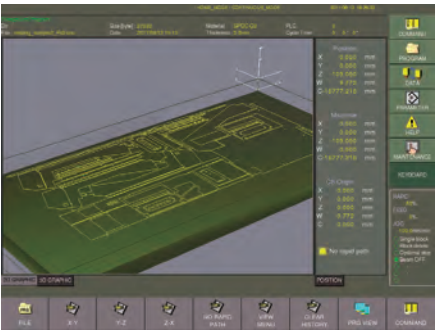
Automation

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

OPTIPLEX NEXUS 3015+
material stocker (10 shelves) +
loader / unloader + finished workpiece table

Designed for convenient expansion

Mazak Laser FMS

◆ A single machine can be expanded to a CELL or FMS after the 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

◆ System controller effectively controls operation according to the production schedule

◆ Worksheets up to 25 mm (0.98") thick can be transported for reduced loading / unloading time and minimized operator requirements

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 NEXUS 3015 + COMPACT MANUFACTURING CELL

QUICK CELL 3015

The QUICK CELL performs automatic changing of worksheets and finished parts in a compact floor space.

OPTIPLEX 3015 FIBER III + QUICK CELL 3015 6 pallet stocker

Machine Specifications

Max. workpiece size		1525 mm × 3050 mm (60.04"×120.08")
Work table height		900 mm (35.43")
Axis stroke	X-axis	3100 mm (122.05")
	Y-axis	1580 mm (62.2")
	Z-axis	150 mm (5.91")
Rapid traverse rate		60 m/min (2362 IPM)
Max. cutting feedrate		60 m/min (2362 IPM)
Positioning accuracy	X, Y-axis	±0.05 / 500 mm (±0.0020" / 19.69")
	Z-axis	±0.01 / 100 mm (±0.0004" / 3.94")
Repeatability		±0.03 mm (±0.0012")
Machine weight *1		11000 kg (24250 lbs) (With manual pallet changer, standard)
		13600 kg (29982 lbs) (With 2 P/C specification, option)
Total electrical requirement *1		51 kVA
Sound *2		Less than 80dB

*1 Without dust collector

*2 Equivalent continuous sound pressure level at operator position (dependent on equipment options)

Laser Oscillator Specifications

Resonator type	2.5 kW
Laser mixed gas	Mixed gas of He, N_2, CO_2
Gas consumption rate*	10 L/h

* During continuous operation

CNC Standard Specifications

|	
Name	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	Non-profiler with retry function	●
	Manual workpiece clamps (2)	●
	Manual clamp (1)	○
	Additional locator	○
	Work light	●
	Oscillator status indicator light	●
	Chiller unit	●
	Knife edges (100 mm pitch)	●
	Knife edges (50 mm pitch)	○
Torch	7.5" servo focus torch	●
	Additional servo focus torch without lens	○
	5" servo focus torch without lens	○
Lens	7.5" Mazak high accuracy lens (2.5MPa)	●
	Additional 7.5" Mazak high accuracy lens (2.5 MPa) (1)	○
	5"Mazak high accuracy lens (2.5 MPa) (1)	○
Nozzle	Mazak high accuracy nozzle adapter (3)	●
	Additional Mazak high accuracy nozzle adaptor (3)	○
	Mazak pencil nozzle (single) Φ1.2 mm , Φ2.0 mm , Φ3.0 mm (1)	●
	Mazak pencil nozzle (single) Φ1.2 mm , Φ1.5 mm , Φ2.0 mm , Φ2.5 mm , Φ3.0 mm , Φ3.5 mm , Φ 4.0 mm (3)	○
	Mazak pencil nozzle (dual) Φ1.5mm , Φ2.0 mm , Φ2.5 mm , Φ3.0 mm , Φ3.5 mm , Φ 4.0 mm (3)	○
Assist gas	Assist gas changer	●
	Assist gas pressure NC control	●
	3rd assist gas piping (Supply 3.0 MPa)	●
	4th assist gas piping (Supply 3.0 MPa)	○
Automation	Manual pallet changer	●
	2 pallet changer	○
	Auto power off	●
	Preparation for FMS	○
	COMPACT MANUFACTURING CELL (multiple shelf stocker)	○
	Worksheet lifter (for 2 P/C)	○
Working environment	Preparation for dust collector installation	●
	Scrap bucket	●
CNC	Auto nozzle changing (holders: 8)	○
	Focus detection	●
	Auto focus Positioning	●
	Auto profiler calibration	●
	Auto nozzle cleaning	●
	Pierce detection	○
	Plasma detection	○
	Burn detection	○
	Lens monitoring	○
	Flash cut	●
	Sharp cut	●
	Simple input function for cutting shape	●
	Work edge detection / coordinate rotational function	●
	LAN connection function for external communication	●
	USB I/F	●
	NC retry function	●
	Relocation detection system	●
Others	Manuals	●
	Additional manuals	○

Floor space

Unit: mm (inch)

OPTIPLEX NEXUS 3015 (Manual pallet changer) [standard]
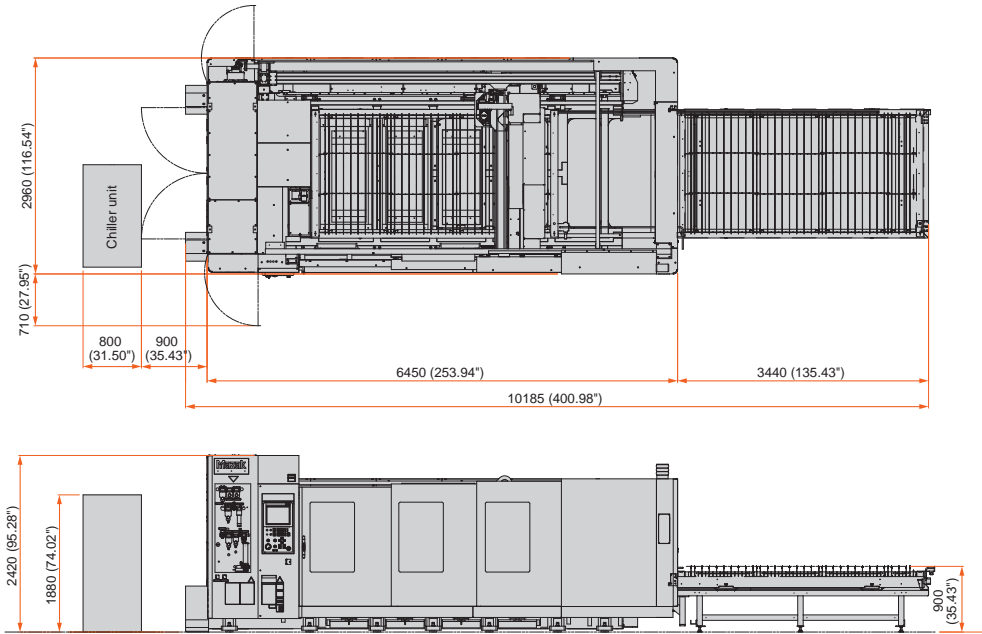
OPTIPLEX NEXUS 3015 (2 pallet changer) [option]