



Changes for the Better

for a greener tomorrow



2-Dimensional Fiber Laser Processing Systems NX-F Series



2-Dimensional Fiber Laser Processing Systems



Fiber Lasers - Pioneering the Future of Processing

Evolutionary leap in manufacturing industry realized through the fusion of fiber lasers and Mitsubishi Electric's advanced laser technologies pushing the performance envelope yet another level higher
— Now better than ever





The Ultimate Combination - Fiber Lasers and Mitsubishi Electric Laser Processing Systems

Shorter processing times, lower power consumption and high-quality processing.
Opening the door to a world of new possibilities.

High Speed

Towards zero axial downtime using built-in Mitsubishi High-speed Control for Laser (MHC-L).
Built-in processing head maximizes the excellent beam quality of fiber laser, shortening thin-plate processing time.

Ecology

Mitsubishi Electric CNC, drive unit and fiber-laser oscillator integrated for improved environmental performance
Equipped with eco mode* to minimize standby power consumption.

*Stops functions in stages when operation is stopped.

High Quality

Built-in power control function for faithful and stable laser output fiber-laser processing systems
equipped with dedicated processing head and new path control function ensures enhanced path precision.

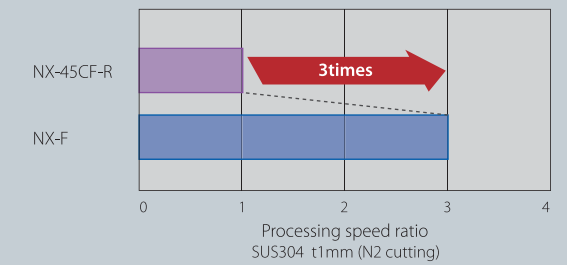
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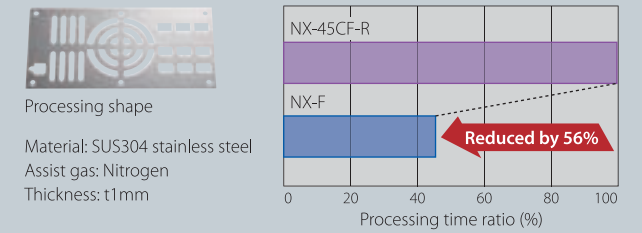


Shorter processing time

Newly developed processing head maximizes high focusing property of fiber laser and improves processing speed by 3times.

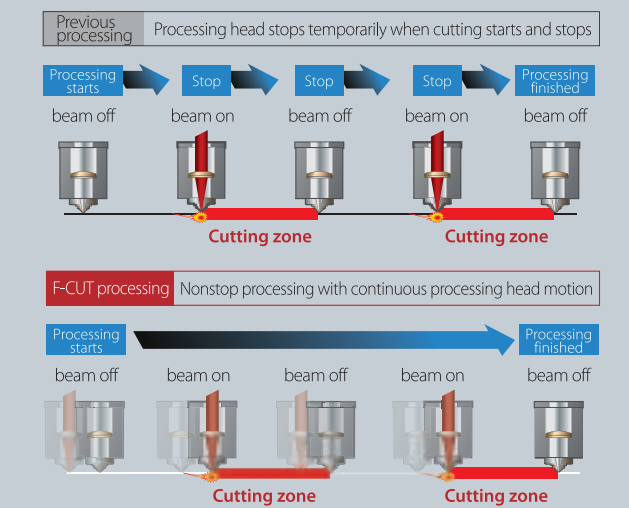


Oscillator equipped with Mitsubishi Electric's High-speed Control for Lasers (MHC-L) enables F-CUT processing, and FRG software optimizes F-CUT processing. Thin-plate processing time reduced by 56%.



F-CUT® function

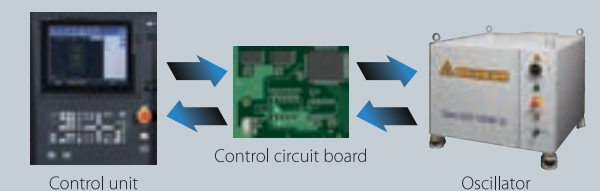
High-speed communication between oscillator and control unit controls turning the beam on/off without stopping the axis, thereby reducing processing time.



MHC-L control (Mitsubishi High speed Control for Laser)

Mitsubishi Electric's original system is utilized to maximize the high-speed processing performance of the fiber laser.

- Faster communication between control system and oscillator
- Beam on/off timing is controlled in one-microsecond (1μsec) units (1/1,000,000sec).



Ecology

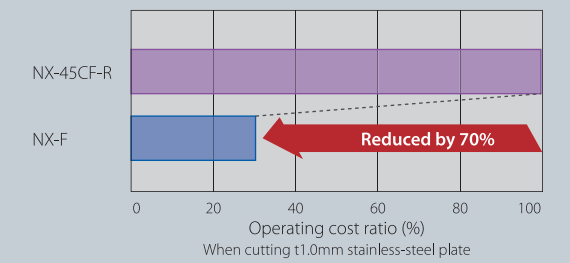
Mitsubishi Electric CNC, drive unit and fiber-laser oscillator integrated for improved environmental performance. Equipped with eco mode* to minimize standby power consumption.

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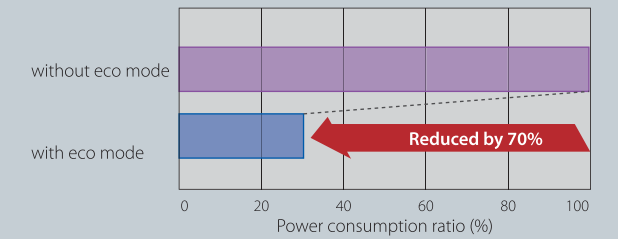


Low operating cost

As a result of shorter processing time and the built-in fiber laser, Mitsubishi Electric CNC and drive unit, operating cost has been reduced by 70%.



Eco mode reduces standby power consumption up to 70%.



Lower power consumption

Lower power consumption thanks to fiber laser oscillator. LED light and inverter-controlled cooling system realize further energy savings.

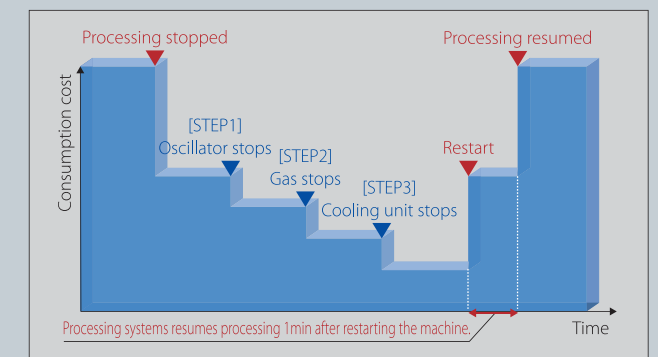
Power-saving CNC and drive unit

Power savings realized using Mitsubishi Electric CNC and drive unit best matched for the fiber-laser oscillator.



Eco mode

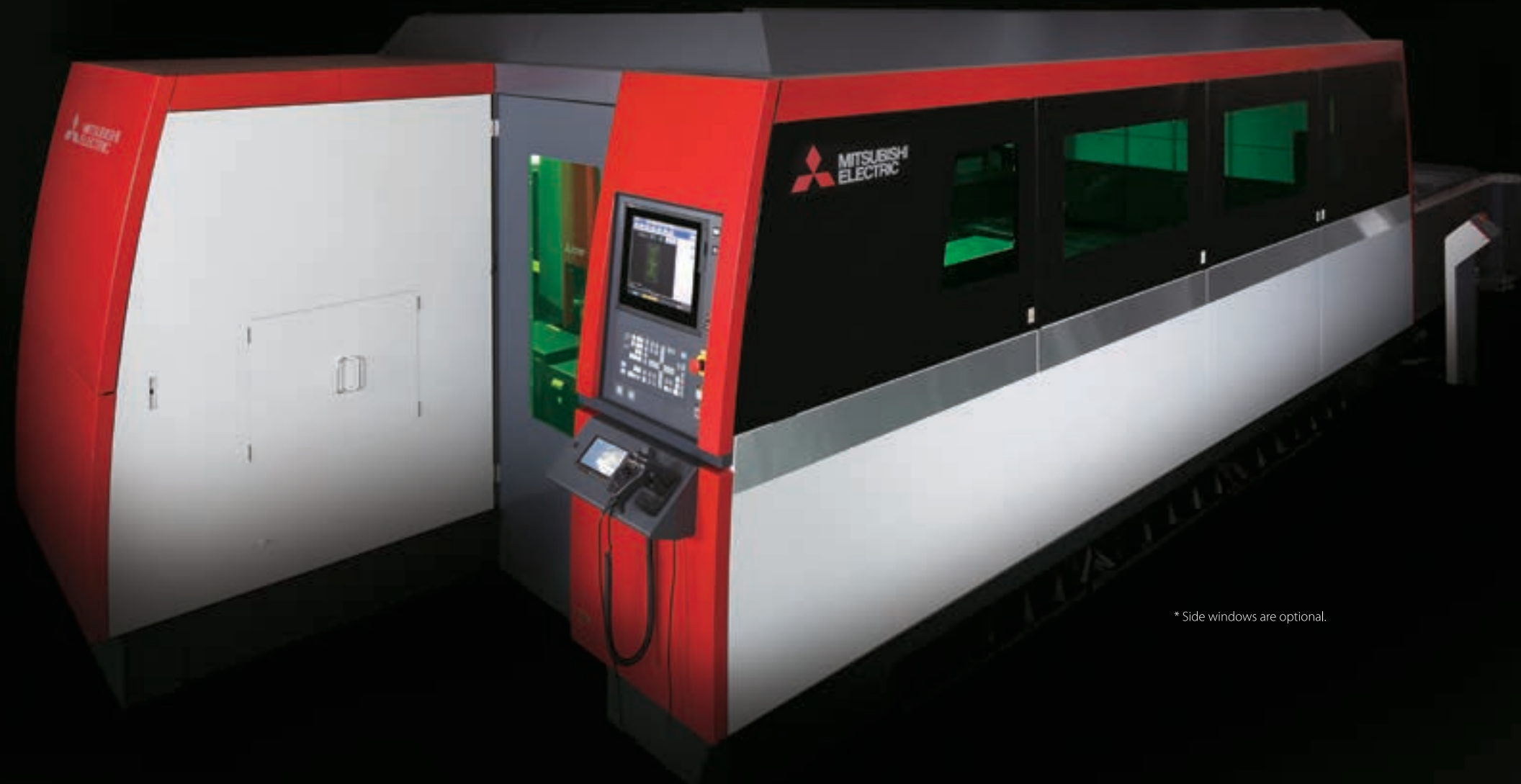
After processing stops, equipment automatically shuts down in stages.



*Time required to resume operation varies depending on the equipment and usage conditions.

High Quality

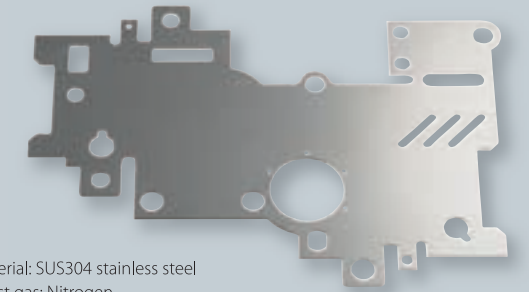
Built-in power control function for faithful and stable laser output
 fiber-laser processing systems equipped with dedicated processing head and
 new path control function ensures enhanced path precision.



* Side windows are optional.

Highly accurate processing

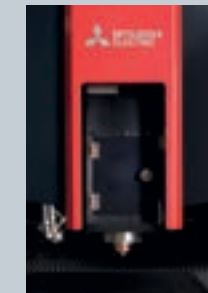
Highly accurate processing faithful and stable laser output.



Material: SUS304 stainless steel
 Assist gas: Nitrogen
 Thickness: t1 mm

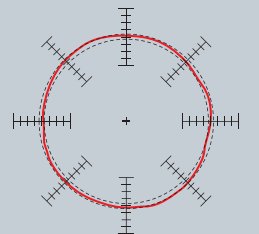
Path precision

Newly developed dedicated fiber-laser processing head and SuperHP Control 2 improve path precision when operating at high speeds.



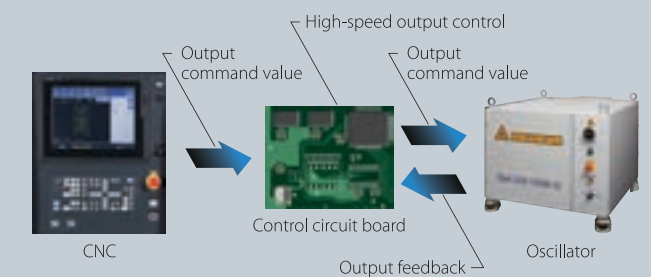
Dedicated fiber-laser processing head

Set processing speed : 30m/min
 50μm/div



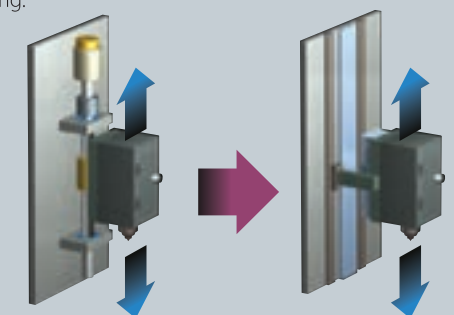
Power control

Output control function optimally matched to fiber laser realizes stable laser output.



Z-axis linear servo

Z-axis linear servo improves tracking performance for high-speed processing.



Ball-screw drive Linear servo drive
 Z-axis drive mechanism

Processing performance



Processing movies
can be viewed

Material/Thickness : Stainless steel(SUS304) t0.8mm
Model : NX-F



Material/Thickness :
Stainless steel(SUS304) t0.1mm
Model : NX-F



Material/Thickness :
Stainless steel(SUS304) t1.0mm, Copper(C1100) t1.0mm, Brass(C2801) t1.0mm
Model : NX-F



Material/Thickness :
Stainless steel(SUS304) t0.2mm
Model : NX-F



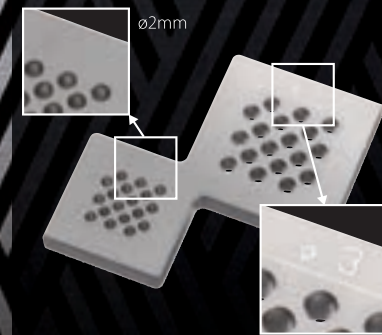
Material/Thickness :
Brass(C2801) t5mm
Model : NX-F



Material/Thickness :
Copper(C1100) t5mm
Model : NX-F40



Material/Thickness :
Mild steel(SS400) t6mm
Model : NX-F40



Material/Thickness :
Stainless steel(SUS304) t6mm
Model : NX-F40



Material/Thickness :
Mild steel(SS400) t19mm
Model : NX-F



Material/Thickness :
Aluminum alloy(A5052) t10mm
Model : NX-F



Material/Thickness :
Stainless steel(SUS304) t12mm
Model : NX-F40

Main equipment/functions

Control unit

Operation help screen

Step-by-step instructions are given with pictures and illustrations to help operators perform important tasks for each component.



Simple Nesting

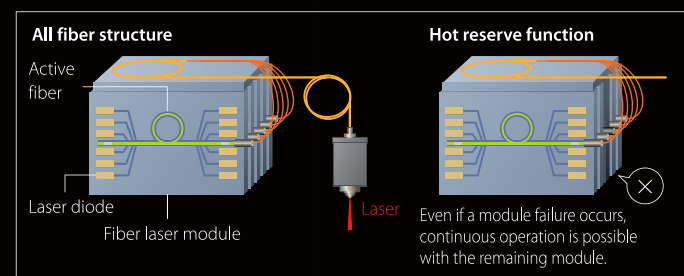
Allows for rectangular nesting at the laser's NC control to meet urgent needs for additional parts.



Oscillator

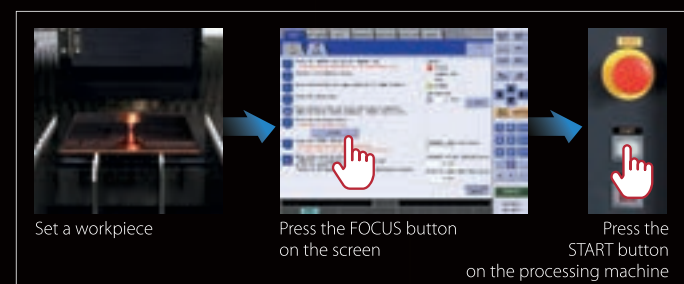
Fiber-laser oscillator

Processing systems built-in construction with all fiber structure realizes stable processing.



Automatic focusing

In-house development of the processing head enables the automatic focusing function to be provided as standard equipment.



Maintenance area

Maintenance area for centering, focusing, etc. is equipped outside the processing area.

Cast-metal chute

A cast-metal chute is equipped in the processing area. This realizes superior durability for high-output beams.

Side nozzle

Quickly pierces small-diameter holes in medium-thickness mild steel plate.

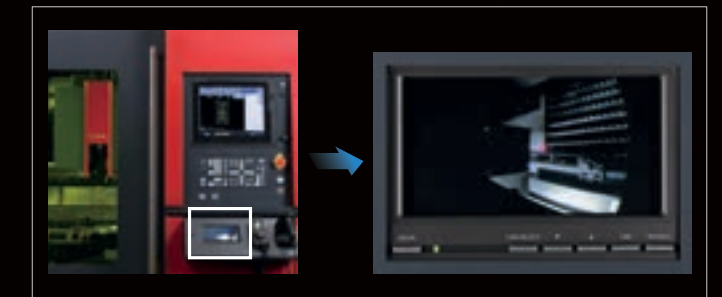
Sheet detection

Detects the sheet edge and automatically adjusts the orientation of the sheet to support continuous processing.

Processing machine

Camera function (for positioning)

Camera for positioning is equipped to improve operability. Position adjustment on the back side of the Processing systems can be checked using the monitor under the control unit.



Automatic lubrication

Performs automatic lubrication to the drive axis at the appropriate time.



Area sensor

Detection incursion into pallet changer area.



Lens cartridges for processing head

Achievement wide range cutting from thin to thick material. Equipped protection lens monitoring for NX-F and processing lens monitoring for NX-F40.



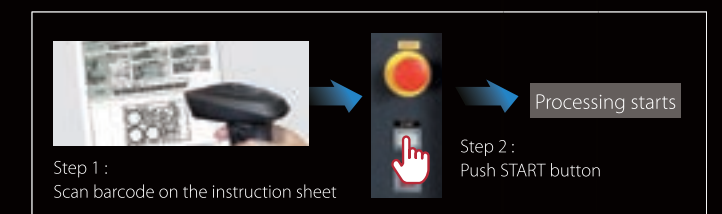
f4" lens cartridge (for NX-F40)
f8" lens cartridge (for NX-F40)



f4" lens cartridge (for NX-F)
f8" lens cartridge (for NX-F)

e-Processing mode

Simple two-action processing improves operability.



Quick gas change

Discoloration of the cut surface is prevented by quickly switching the type of gas, even if oxygen is used for piercing during non-oxidized cutting.

High-pressure gas NC control

An electropneumatic valve controls the assist gas pressure up to 2.5MPa.

Maintenance screen

Easy-to-understand support for maintenance work.

Self check

Notifies the appropriate maintenance period by monitoring processing systems conditions.

Option

Processing systems



Nozzle changer
These features reduce setup time and support system automation while maximizing productivity.



Side window
Processing state can be checked directly from the side.

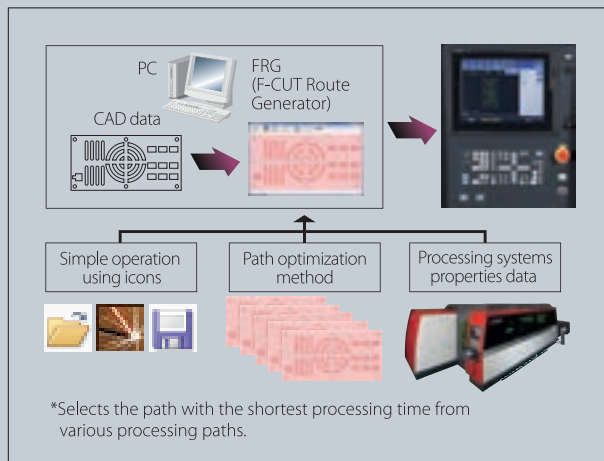


Oil spray function
Reduces spatter adhesion when piercing during mild-steel processing.



High Peak Piercing
Reduces piercing time for mild steel processing.

Software



F-CUT Route Generator (FRG)
Automatically creates the optimal NC program for F-CUT in a short time.

Option

Item	NX-F	NX-F40
Processing systems		
Nozzle changer	○	○
Side window	○	○
Oil spray function	—	○
High Peak Piercing	—	○

Specifications / Layout

Processing capabilities table

Oscillator	Material	Assist gas	Thickness (mm)											
			0	2	4	6	8	10	12	14	16	18	20	22
NX-F	Mild steel	Oxygen	[Bar chart showing capabilities for NX-F Mild steel/Oxygen]											
	Stainless steel	Nitrogen	[Bar chart showing capabilities for NX-F Stainless steel/Nitrogen]											
	Aluminum alloy	Nitrogen	[Bar chart showing capabilities for NX-F Aluminum alloy/Nitrogen]											
	Copper	Oxygen	[Bar chart showing capabilities for NX-F Copper/Oxygen]											
	Brass	Nitrogen	[Bar chart showing capabilities for NX-F Brass/Nitrogen]											
NX-F40	Mild steel	Oxygen	[Bar chart showing capabilities for NX-F40 Mild steel/Oxygen]											
	Stainless steel	Nitrogen	[Bar chart showing capabilities for NX-F40 Stainless steel/Nitrogen]											
	Aluminum alloy	Nitrogen	[Bar chart showing capabilities for NX-F40 Aluminum alloy/Nitrogen]											
	Copper	Oxygen	[Bar chart showing capabilities for NX-F40 Copper/Oxygen]											
	Brass	Nitrogen	[Bar chart showing capabilities for NX-F40 Brass/Nitrogen]											

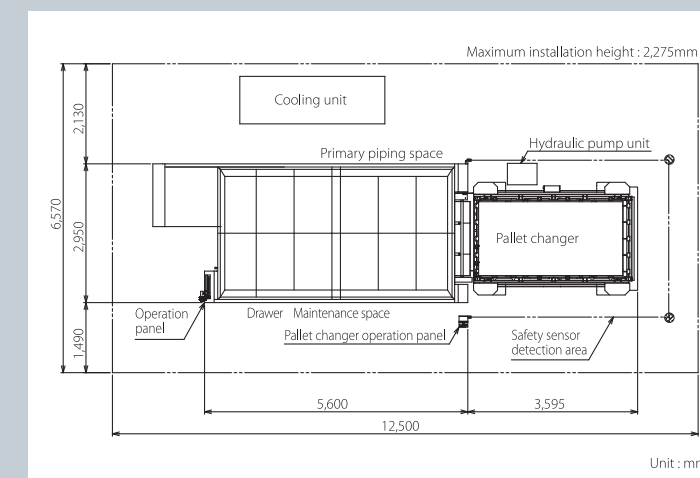
*The above processing capabilities are based on special conditions. The acceptance criteria are as stated in the specifications.
 *Actual performance/quality may vary depending on surface conditions and deviations in material composition even if materials have the same specifications.
 *Variation in processing performance/quality may occur depending on processing shape.
 *Regarding mild steel (S5400) with a thickness over t19mm, capacities listed in this catalog are based on the LS material (steel plate for laser cutting) of Chubu Steel Plate Co., Ltd.

Specifications

Model	ML3015NX-F	ML3015NX-F40		
Drive system	Flying optic (3-axis beam movement)			
Control system	X,Y,Z simultaneous 3-axis control (Z-axis height sensing control is possible)			
Processing systems	Workpiece dimensions (mm)	3,050X1,525		
	Pallet load weight(kg)	950		
	Workpiece support height(mm)	850		
	Stroke	X-axis (mm)	3,200	
		Y-axis (mm)	1,600	
		Z-axis (mm)	150	
	Speed	Rapid feedrate	Max. 170 (combined)	
		Positioning accuracy	XY-axis (mm)	0.05/500
	Z-axis (mm)		0.1/100	
	Repeatability	XY-axis (mm)	±0.01	
Processing head	Auto-focus preset processing head			
Oscillator	Rated power(W)	2,500	4,000	
Power consumption (kW)*		9	12	
Weight	Processing systems (including oscillator)(kg)	Approx. 10,000	Approx. 11,000	
	Pallet changer(kg)	Approx. 2,300		
	Cooling equipment(kg)	Approx. 800		

*including oscillator, depending on the machining program.

Layout



FA-related products

PLC | MELSEC iQ-R Series



Revolutionary, next generation controllers building a new era in automation

- ◎High-speed, high-accuracy multiple CPU control system based on the iQ Platform
- ◎New high-speed system bus and inter-module sync realizes improved productivity and reduced TCO*
- ◎Reducing development costs through intuitive engineering (GX Works3)
- ◎Robust security features (such as security key authentication, IP filter)

Product Specifications

Program capacity	40K steps to 1200K steps
LD instruction speed	0.98 ns
Available modules	I/O, analog, high-speed counter, positioning, simple motion, network module
Control system architecture	Rack-mounted modular based system
Supported networks	Ethernet, CC-Link IE Control Network, CC-Link IE Field Network, CC-Link, RS-232, RS-422/485

*Total Cost of Ownership

AC Servo | Mitsubishi General-Purpose AC Servo MELSERVO-J4 Series



Industry-leading level of high performance servo

- ◎Industry-leading level of basic performance: Speed frequency response (2.5kHz), 4,000,000 (4,194,304p/rev) encoder
- ◎Advanced one-touch tuning function achieves the one-touch adjustment of advanced vibration suppression control II, etc.
- ◎Equipped with large capacity drive recorder and machine diagnosis function for easy maintenance.
- ◎2-axis and 3-axis servo amplifiers are available for energy-conservative, space-saving, and low-cost machines.

Product Specifications

Power supply specifications	1-phase/3-phase 200V AC, 1-phase 100V AC, 3-phase 400V AC
Command interface	SSCNET III/H, SSCNET III (compatible in J3 compatibility mode), CC-Link IE Field Network interface with Motion, pulse train, analog
Control mode	Position/Speed/Torque/Fully closed loop
Speed frequency response	2.5kHz
Tuning function	Advanced one-touch tuning, advanced vibration suppression control II, robust filter, etc.
Safety function	STO, SSI
	SS2, SOS, SLS, SBC, SSM (compatible when combined with motion controller)
Compatible servo motor	Rotary servo motor (rated output: 0.05 to 22kW), linear servo motor (continuous thrust 50 to 3000N), direct drive motor (rated torque: 2 to 240N·m)

CNC | Mitsubishi CNC M700V Series



High-grade model equipped with advanced complete nano control

- ◎Achieve complete nano control with the latest RISC-CPU and high-speed optical servo network.
- ◎Realize super-high grade processing by combining the complete nano control, state-of-the-art SSS control and OMR control, etc.
- ◎Display of essential information of grouped on three screens to greatly reduce processing setup time with easy operability.
- ◎The M700VW Series with WindowsXPe and M700VS Series with integrated control unit and display type are available.

Product Specifications

Maximum number of control axes (NC axes + spindles + PLC axes)	16 axes (M720VW/M720VS have 12 axes)
Maximum number of part systems	Machining center system: 2 systems Lathe system: 4 systems
Least command increment	1nm (M720VW/M720VS 0.1 μm)
Least control increment	1nm
Maximum program capacity	2,000KB (5,120m)
Maximum PLC program capacity	128,000 steps
Main functions (for machining center)	Simultaneous 5-axis machining, SSS control, high-speed high-accuracy control, tool nose point control, tilt plane machining, etc.
Main functions (for lathe)	Milling interpolation, 2-system simultaneous thread cutting, inter-system control axis synchronization, control axis superimposition, combination control, etc.

HMI | Graphic Operation Terminal GOT2000 Series GT27 Model



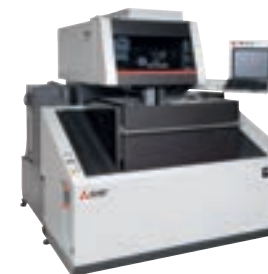
To the top of HMIs with further user-friendly, satisfactory standard features.

- ◎Comfortable screen operation even if high-load processing (e.g. logging, device data transfer) is running. (Monitoring performance is twice faster than GT16)
- ◎Actual usable space without using a SD card is expanded to 128MB for more flexible screen design.
- ◎Multi-touch features, two-point press, and scroll operations for more user-friendliness.
- ◎Outline font and PNG images for clear, beautiful screen display.

Product Specifications

Screen size	15", 12.1", 10.4", 8.4"
Resolution	XGA, SVGA, VGA
Intensity adjustment	32-step adjustment
Touch panel type	Analog resistive film
Built-in interface	RS-232, RS-422/485, Ethernet, USB, SD card
Applicable software	GT Works3
Input power supply voltage	100 to 240VAC (+10%, -15%), 24VDC (+25%, -20%)

EDM | Wire EDM MV1200R



Next-generation Innovations of our best selling Performance Machine.

- ◎Total running cost reduced up to 42%, which is accounted for 90% by filter, ion exchange resin and power consumption.
- ◎Improved productivity by an innovative automatic wire threading.
- ◎Faster machining is realized with improved power-supply performance. (Rz3. 5 μm/Ra0. 45 μm with 3cuts) (Rz2. 0 μm/Ra0. 28 μm with 4cuts)

Product Specifications

Model	MV1200R
Machining travel (X×Y×Z)[mm] (in)	400(15.7)×300(11.8)×220(8.7)(XY axis OPT-drive specifications)
Machining travel (U×V)[mm] (in)	±60(2.4)×±60(2.4)(OPT-drive specifications)
Max. taper angle [°]	15° (maximum 200mm)(7.9°)
Max. workpiece dimensions [mm] (in)	810(31.9)×700(27.6)×215(8.5)
Wire diameter [mm] (in)	0.1(0.004) to 0.3(0.012)*1
Dielectric fluid	Water
Footprint (W×D)[mm] (in)	2025(79.7)×2760(108.7)

*1: Φ0.2(0.008) DD guides and Φ1.5(0.06) jet nozzle are standard equipment.

Robot | MELFA F Series



High speed, high precision and high reliability industrial robot

- ◎Compact body and slim arm design, allowing operating area to be expanded and load capacity increased.
- ◎The fastest in its class using high performance motors and unique driver control technology.
- ◎Improved flexibility for robot layout design considerations.
- ◎Optimal motor control tuning set automatically based on operating position, posture, and load conditions.

Product Specifications

Degrees of freedom	Vertical:6 Horizontal:4
Installation	Vertical:Floor-mount, ceiling mount, wall mount (Range of motion for J1 is limited) Horizontal:Floor-mount
Maximum load capacity	Vertical:2-20 kg Horizontal:3-20kg
Maximum reach radius	Vertical:504-1503mm Horizontal:350-1,000mm



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* Not all models are supported for all countries and regions.

* Machine specifications differ according to the country and region, so please check with your dealer.

* Processing data provided in this brochure is for reference only.