



V250818

Datasheet
Model V12050P300



FORZA

Vulcan

Heavy-duty tube and profile fiber laser cutting machine

CUTTING / MARKING / PERFORATION

The FORZA Vulcan is designed to handle ultra-heavy tubes and profiles, featuring a load capacity of up to 2 tons.

Thanks to its four chucks, it ensures optimal performance when processing long tubes, achieving complete material utilization and cost savings.

Main Features

FEATURE	DETAIL
Application	Cutting tubes and profiles
Maximum tube length & diameter	L: 40ft x D: 20in L: 12000mm x D: 500mm
Laser power rating	30kW
Nominal cutting thickness (ASTM A36) ⁽¹⁾	2in 50mm
Maximum cutting thickness (ASTM A36) ⁽²⁾	2 3/4in 70mm
Maximum travel speed ⁽³⁾	2.2ft/s 40m/min
Maximum rotation speed ⁽³⁾	40rev/min
Cutting precision ⁽⁴⁾	± 0.1mm

1. This is the maximum limit at which a burr-free and clean cut can be obtained. Up to this thickness, cutting can be performed continuously.
2. The maximum thickness is the greatest thickness that can be cut under certain parameter settings. It is not recommended to size the machine based on the maximum thickness. Working with thicknesses closer to the limit significantly restricts the cutting geometries that can be achieved, due to the high temperatures reached by the material.
3. As the tube weight increases, motion parameters may decrease.
4. Cutting precision is measured on a 0.027in stainless steel sheet, considering the machine's repeatability and accuracy. A precision of 0.0039in means that when cutting a 3.937in plate, the actual measurement may be 3.941in or 3.937in. If the material thickness increases, the error may become greater due to material properties and cut width.



Special Features

Smart Focus Technology



Automatic laser head adjustment for working on uneven surfaces. The head maintains a constant distance throughout the entire cut.

Marking Technology



Not only cuts but also performs a marking function, ideal for engraving bending lines for post-bending processes or for marking numbers and letters.

Super Pipe Processing Capabilities



Work capacity of up to 2 tons. Supports round, square, rectangular, and oval pipes, as well as various profile types such as channels, I-beams, H-beams, and others.

Smart Tube Support



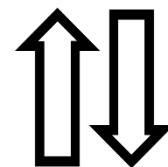
The tube support height adjusts automatically based on the diameter and surface, ensuring alignment with the center of the chuck throughout the cutting process.

Four-Chuck Structure



The four chucks are particularly useful for reverse cutting, enabling the processing of complete tubes and improving material utilization.

Auto Loading-Unloading



Equipped with an automatic tube loading and unloading system, enabling continuous and efficient production.

General Specifications

SPECIFICATION	DETAIL
Model	FORZA Vulcan – V12050P300
Laser Type/Technology	Fiber Laser 1064nm $\pm$ 10nm
Fiber laser diameter	150 μ m
Nominal fiber laser power	30kW
Fiber laser power range	10 a 100%
Laser working frequency	4 a 5000Hz
Laser source protection level	IP54
Laser source model	MFMC-30000W MAX PHOTONICS
Working modes	CUTTING / MARKING / PERFORATION
Focusing system	SMARTFOCUS TECHNOLOGY ⁽¹⁾
Auxiliar gas type for cutting	O ₂ , N ₂ or Air
Laser head model	BOCHU – BLT681H
Focal range	-50mm ~ +50mm
Maximum focusing acceleration	0.295in/s ² 7.5mm/s ²
Head protection system	Collision prevention and detection
Pre-loaded cutting profiles	Yes ⁽²⁾
Laser cutting width	0.004in ~ 0.06in 0.1mm ~ 1.5mm ⁽³⁾
Cutting precision	Thickness - dependent ⁽⁴⁾

1. The focusing system incorporates an internal servo motor that moves the lens, along with a capacitive sensor that maintains the distance between the laser head and the plate during cutting.
2. Cutting parameters are available on the library.forzalaser.com platform, where customers can download them for free. A local backup is also stored on the machine for quick access.
3. The cutting width is directly proportional to the material thickness; as thickness increases, so does the cutting width. The type of assist gas also plays a role, with oxygen producing a wider cut line.
4. Cutting precision is 0.0039mm for thicknesses up to 0.027mm. As material thickness increases, precision may be affected due to the widening of the cut line, reaching up to 0.019mm on ½in plates.

Cutting angle	<2° ⁽⁵⁾
Movement repeatability	±0.1mm
Movement accuracy	±0.05mm
Tube working length	20ft to 40ft 6000mm a 12000mm
Tube working diameter	2in to 20in 50mm a 500mm
Minimum tube thickness	1/8in 3mm ⁽⁶⁾
Maximum cutting speed	1.1ft/s 20m/min
Maximum travel speed	2.2ft/s 40m/min
Maximum rotation speed	40rev/min
Maximum travel acceleration	9.65ft/s ² 0.3G
Lubrication system	Automatic by working path
Wireless control	Wi-Fi enabled remote control
Fume extraction system	Extraction by external motor
Maximum plate load capacity	4.4klb 2000kg ⁽⁷⁾
Laser source power	90kW
Chiller power	35kW
Fume extractor power	3kW
Motion & control system power	40.5kW
Power of the unloading system	42kW
Peak machine power	210.5kW
Minimum power for electrical system design ⁽⁸⁾	147.5kW

5. The cut angle depends on the material thickness and the type of assist gas used. Thicker materials can result in greater cut angles, and oxygen may increase the cut angle.
6. Thin-walled tubes are susceptible to deformation or crushing during chuck clamping. Do not work with tubes thinner than this value to ensure a safe and precise process.
7. Although the structure can support thick-walled tubes, the cutting thickness specified for this laser power must not be exceeded.
8. The minimum power sizing for electrical design is calculated based on typical power consumption of the laser source and chiller, along with half the power of the fume extractor and machine actuators.

Average energy consumption ⁽⁹⁾	126.3kWh		
Operating voltage	220V/250V/380V/440V/480V 3ph 50Hz-60Hz		
Minimum line current	431A @ 220VAC 3ph		
	379A @ 250VAC 3ph		
	250A @ 380VAC 3ph		
	216A @ 440VAC 3ph		
	198A @ 480VAC 3ph		
Conductor wire gauge to the thermal-magnetic circuit breaker (MCCB) ⁽¹⁰⁾	Up to 140°F 60°C (TW, UF)	Up to 194°F 90°C (THHW, THHN)	Voltage
	3 x 750AWG	3 x 500AWG	220VAC 3ph
	3 x 700AWG	3 x 400AWG	250VAC 3ph
	3 x 300AWG	3 x 4/0AWG	380VAC 3ph
	3 x 250AWG	3 x 3/0AWG	440VAC 3ph
	3 x 4/0AWG	3 x 2/0AWG	480VAC 3ph
Recommended MCCB and grounding conductor	MCCB	PE - PEN (Copper)	Voltage
	450A	2AWG	220VAC 3ph
	400A	3AWG	250VAC 3ph
	250A	4AWG	380VAC 3ph
	225A	4AWG	440VAC 3ph
	200A	6AWG	480VAC 3ph
Power cable length ⁽¹¹⁾	32.8ft 10m		

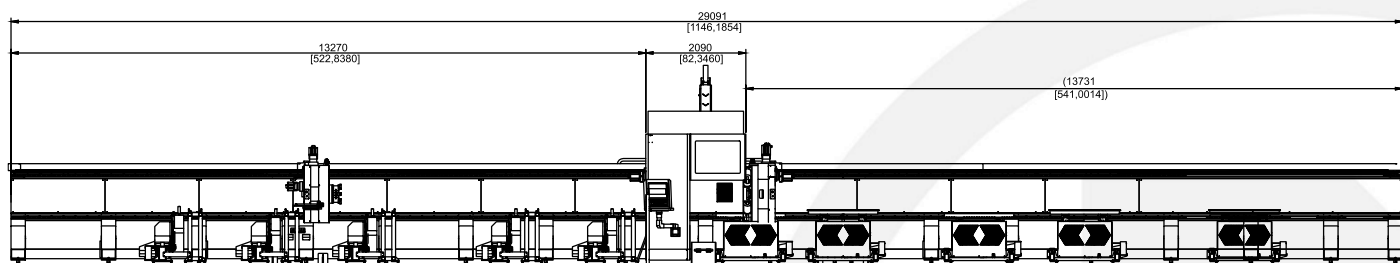
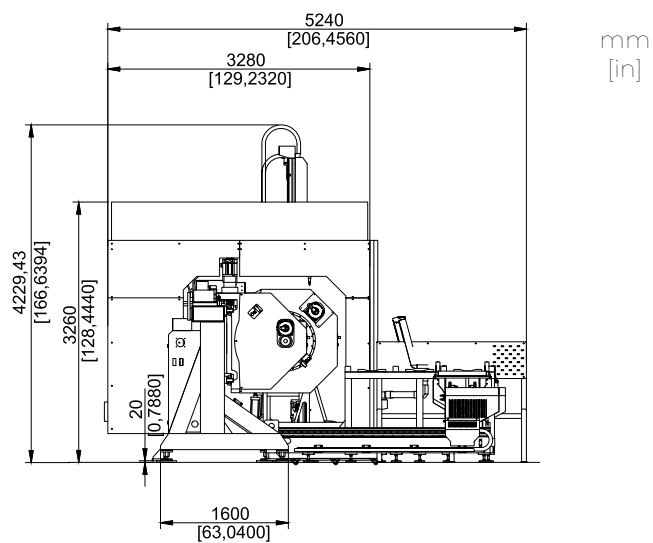
9. Average power consumption is estimated at 60% of the measure peak power. Not all components operate simultaneously; the intermittent activation of systems such as the chiller, motors, and laser source results in lower actual consumption. To estimate hourly power consumption, use the average consumption.
10. The cable gauge sizing was done based on NEC 310-16 for maximum conductor temperatures of 140°F and 194°F, considering conduit installation. If installing cables in open air, a smaller gauge may be used upon consultation with FORZA Laser's technical department.
11. The maximum length of the power cable is 32.8ft (10m) to prevent voltage drops and ensure optimal system performance.

Communication Interface	RJ45, WIFI, USB 3.0		
Compatible design formats	IGS, IGES, STP, STEP		
Software	TubePro		
Software language	Spanish and English		
PC control interface	By screen and by manual control		
Cooling method	Water-cooled		
Chiller tank capacity ⁽¹²⁾	TFLW	CWFL	HL
	68.7gal 260L	74.0gal 250L	71.4gal 270L
Gas connection diameter	O ₂ and N ₂ 10mm (²⁵ / ₆₄ in) hose (Nylon)		
Maximum gas pressure at laser head	362.59psi 25bar		
Maximum Air/N ₂ input pressure	290psi 20bar		
Maximum O ₂ input pressure	145psi 10bar		
Recommended N ₂ input pressure	≤232psi ≤16bar		
Recommended O ₂ input pressure	116psi 8bar ⁽¹³⁾		
Machine weight	~83.8klb ~38000kg		
Machine shipping weight	~84.1klb ~38150kg		
Machine dimensions	95.1 x 23.6 x 13.6 ft 29000 x 7200 x 4150 mm		
Required floor resistance	92.45psi 6.5Kgf/cm ²		
Relative humidity	< 85%		
Operating temperature	35.6 – 95 °F 2 - 35 °C		
Storage temperature	46.4 – 86 °F 8 - 30 °C		
Certifications	CE, RoHS		

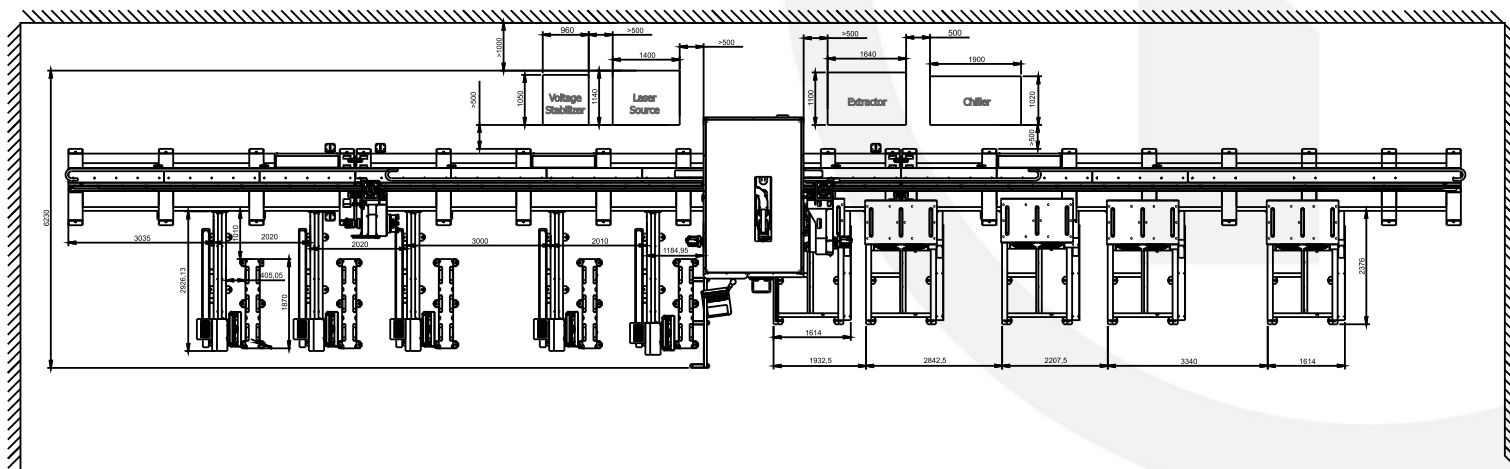
12. The tank size depends on the cooler model equipped in the laser machine. At the time of installation, at least 1.1 gallons (4 liters) of additional distilled water beyond the tank capacity must be available to fill the water circuits between the chiller, the power supply, and the laser head.

13. The specified pressure is measured at the tank pressure indicator output; from this pressure, the valves are calibrated.

Machine Dimensions

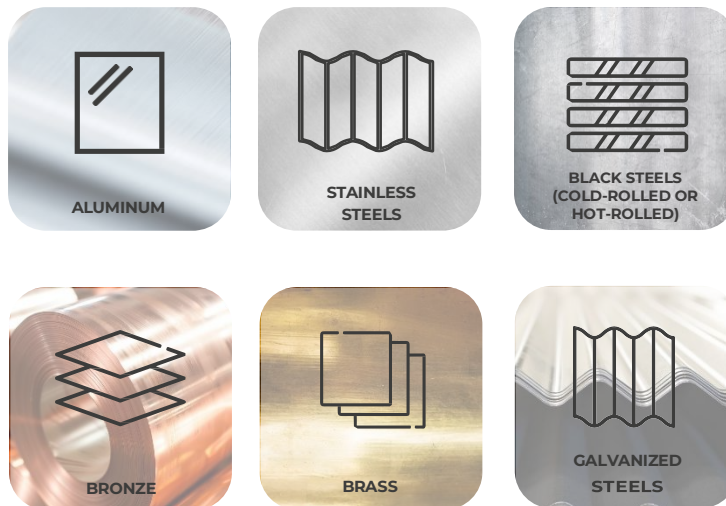


Required Space

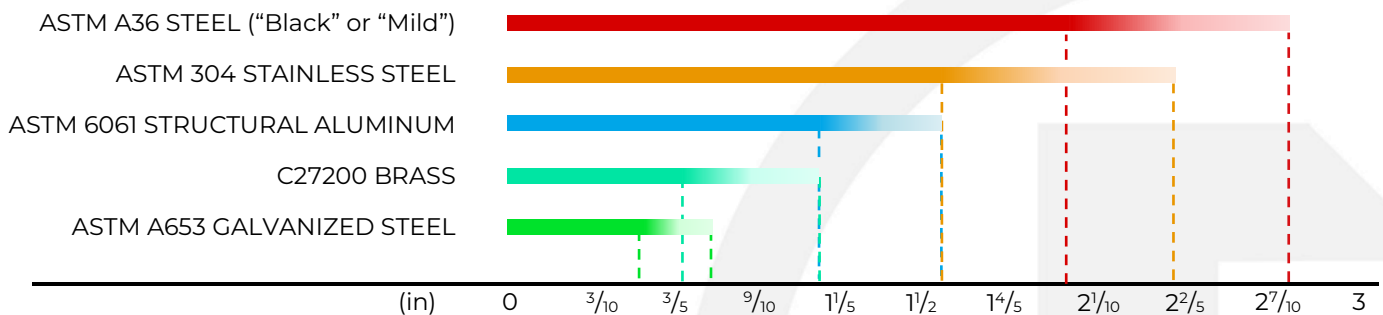


* Peripheral dimensions may vary depending on the machine model.

Applicable Materials



Cutting Thicknesses by Material



MATERIAL	IDEAL THICKNESS ⁽¹⁾		MAXIMUM THICKNESS ⁽²⁾	
	mm	in	mm	in
ASTM A36 STEEL ("Black" or "Mild")	50	2	70	2 3/4
ASTM 304 STAINLESS STEEL	40	1 9/16	60	2 3/8
ASTM 6061 STRUCTURAL ALUMINUM	25	1	40	1 9/16
C27200 BRASS	16	5/8	25	1
ASTM A653 GALVANIZED STEEL	12	15/32	19	3/4

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Packing List:

- ❑ 1 x FORZA Vulcan 30kW Machine 
- ❑ 1 x BLT681H Head 
- ❑ 1 x Wireless remote control 
- ❑ 1 x Wireless keyboard and mouse 
- ❑ 1 x Laser safety glasses with case 
- ❑ 1 x Waste collection carts 
- ❑ 40 x Machine leveling feet 
- ❑ 1 x Cable tray and drag chain assembly kit 
- ❑ 1 x Monitor screen 
- ❑ 1 x Industrial CPU 

- TOOLBOX -

- ❑ 1 x Plastic toolbox 
- ❑ 1 x Scotch tape 
- ❑ 1 x Masking tape 
- ❑ 1 x Metric Allen key set 
- ❑ 1 x Screwdriver set (4 pieces) 
- ❑ 1 x Door and switch key set 
- ❑ 1 x Adjustable wrench 
- ❑ 1 x Cotton swabs and cleaners 
- ❑ 1 x 6 mm (15/64in) bolts and anchors bag 
- ❑ 1 x Wi-Fi module 
- ❑ 1 x Electrical terminal set 
- ❑ 1 x Service terminal block set 
- ❑ 1 x QBH protector 
- ❑ 2 x 10" extraction duct clamps 

- LICENSES -

- ❑ 1 x **FORZA Play T** license – lifetime
- ❑ 1 x **FORZA Vectors** license – 1 year
- ❑ 1 x **FORZA Academy** full license – 1 year
- ❑ 1 x **Super 7 SUPPORT** license – 4 years

- PERIPHERALS -

- ❑ 1 x 380V 3ph / 275 KVA Voltage Stabilizer 
- ❑ 1 x Automatic 30kW Chiller 
- ❑ 1 x MFMC Power Supply – 30000W Max Photonics 
- ❑ 1 x 3 kW Industrial fume extractor 
- ❑ 1 x 275kVA Transformer [220V - 380V] @220v3ph 
- ❑ 1 x 275kVA Transformer [250V - 380V] @250v3ph 
- ❑ 1 x 275kVA Transformer [440V - 380V] @440v3ph 
- ❑ 1 x 275kVA Transformer [250V - 380V] @480v3ph 

- CONSUMABLES -

- ❑ 1 x Top protective lens 
- ❑ 9 x Bottom protective lenses 
- ❑ 20 x Cutting nozzles, multiple sizes 
- ❑ 1 x Ceramic base for capacitive sensor 
- ❑ 1 x 1 liter (0.26gal) ISO 68 oil 

- POWER CABLES AND TRAYS -

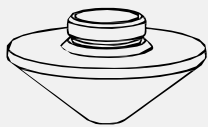
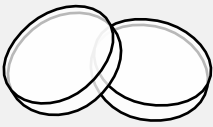
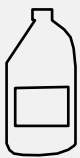
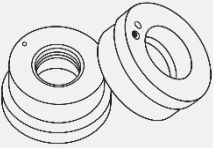
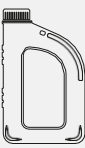
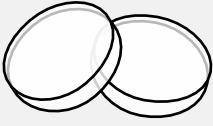
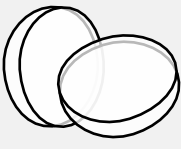
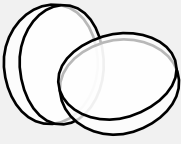
- ❑ 1 x Gas extraction tube/hose, 4.8m (15.75ft) x 10" 
- ❑ 1 x Monitor power cable 
- ❑ 2 x PU hoses for C-H cooling, 10mx8mm (32.81ftx5/16in) 
- ❑ 2 x PU hoses for C-F cooling, 10mx19mm (32.81ftx3/4in) 
- ❑ 1 x Voltage stabilizer for monitor 
- ❑ 5m (16.4ft) x Cable 3x750AWG + 1x2AWG, B-T (T: Ring-Spade) @220v3ph 
- ❑ 5m (16.4ft) x Cable 3x700AWG + 1x3AWG, B-T (T: Ring-Spade) @250v3ph 
- ❑ 5m (16.4ft) x Cable 3x300AWG + 1x4AWG, B-E (T: Ring-Spade) @380v3ph 
- ❑ 5m (16.4ft) x Cable 3x250AWG + 1x4AWG, B-T (T: Ring-Spade) @440v3ph 
- ❑ 5m (16.4ft) x Cable 3x4/0AWG + 1x6AWG, B-T (T: Ring-Spade) @480v3ph 
- ❑ 2m (6.56ft) x Cable 4x300AWG + 1x4AWG, T-E (T: Ring-Ring) @220/250/440/480v3ph 
- ❑ 10m (32.81ft) x Cable 3x300AWG + 1x4AWG, E-M (T: Ring-Spade) 
- ❑ 15m (49.2ft) x Cable 4x12AWG, M-X (T: Ring-Spade) 

T: Transformer, B: MCCB, E: Stabilizer, M: Machine, F: Laser source, C: Chiller, H: Head, X: Extractor, G: Ground.

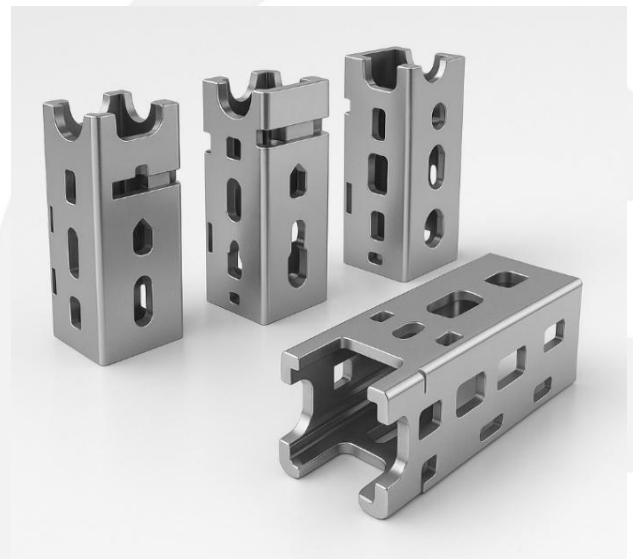
* Reference cables are coated with TW-type insulation

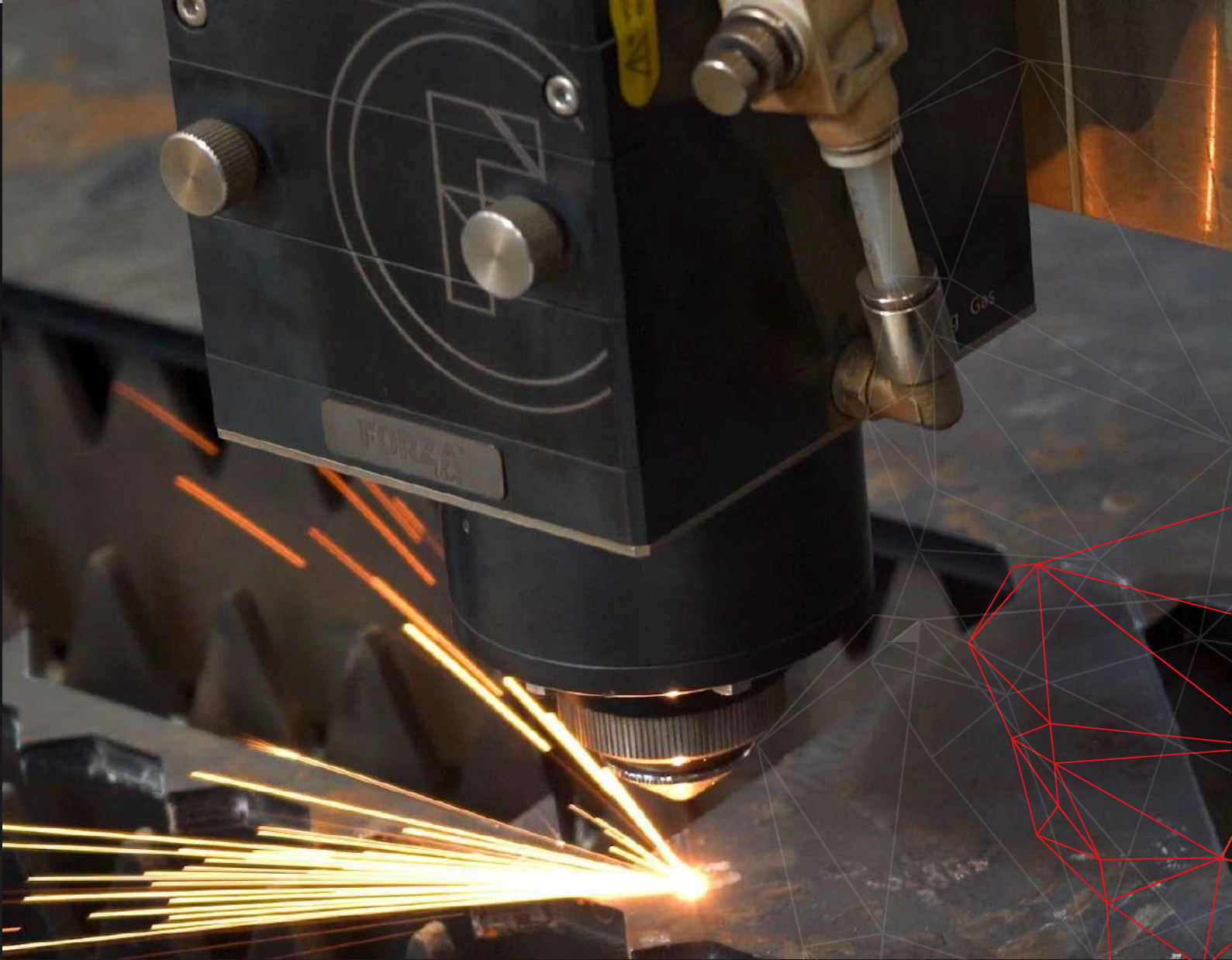
Transportation symbols:  (package),  (inside the package),  (installed on the machine).

Consumables:

IMAGE	ITEM	MODEL	DIMENSIONS	LIFETIME
	Cutting nozzle:	xxxx	D:28mm M11x0.75 H:15mm	200 hours
	Bottom protective lens	CF-L37.0x7.0-30K	D:37mm T:7mm	200 hours
	Distilled water	xxxx	68.7gal 74.0gal 71.4gal 260L 280L 270L	2 months
	Ceramic base for capacitive sensor	CF-BDC41M11L50	D _e :41mm	1000 hours
			M11	
			H:50mm	
	ISOVG68 lubricating oil	xxxx	0.26gal 1L	31.09 miles 50 000 meters
	Blue grease for pinions	Xxxx	Lithium grease	6.21 miles 10 000 meters
	Secondary Bottom Protective Lens	CF-L34.0x5.0-30K	D:34.0mm T:5mm	Not specified
	Top protective lens	CF-L21.5x2.0-30K	D:21.5mm T:2mm	Not specified
	Secondary Top protective lens	CF-L25.4x4.0-30K	D:25.4mm T:4mm	Not specified

Manufactured Parts:





At FORZA Laser, laser specialists, our team has everything you need to take your business to the next level.

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