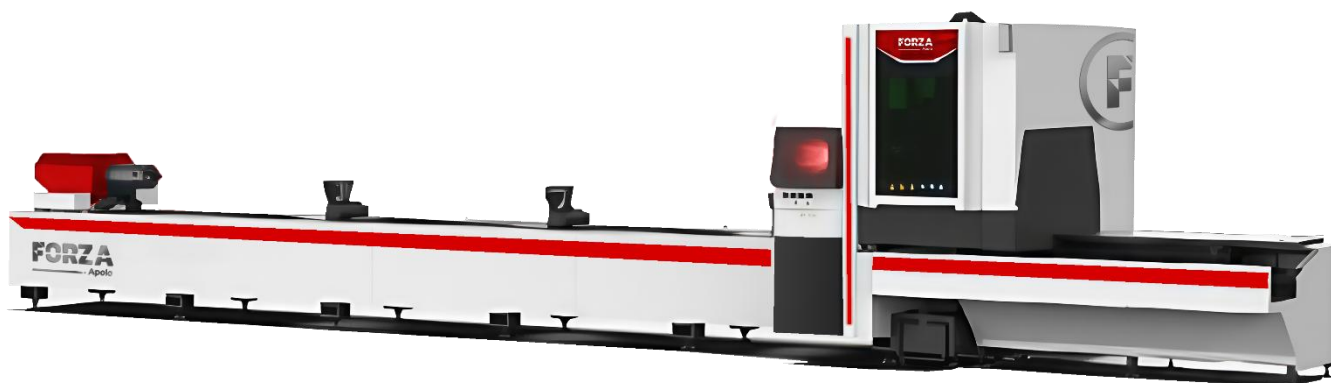




V250818

Datasheet
Model P6036P60



FORZA

Apolo

Industrial CNC laser cutting machine for tubes and profiles

CUTTING / MARKING / PERFORATION

The FORZA Apolo laser cutter is designed for high speed and precision operation, enabling clean and accurate cuts across a wide variety of tubular profiles up to 14in, including round, square, rectangular, angle, channel tubes and others.

It incorporates an intelligent dual-chuck system with automatic centering and leveling functions, ensuring precise, stable, and uniform work even on long tubes, eliminating any risk of deflection or vibration during cutting.

Main Features

FEATURE	DETAIL
Application	Cutting tubes and profiles
Maximum tube length & diameter	L:20ft x D:14 11/64in L:6000mm x D:360mm
Laser power rating	6000W
Nominal cutting thickness (ASTM A36) ⁽¹⁾	3/4in 19mm
Maximum cutting thickness (ASTM A36) ⁽²⁾	1 in 25mm
Maximum travel speed ⁽³⁾	3.3ft/s 60m/min
Maximum rotation speed ⁽³⁾	60 rev/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.

FORZA Play T Software



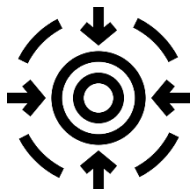
User-friendly Spanish/English cutting tubes and profiles specialized software with an integrated alarm system and maintenance notice.

Smart Tube Support



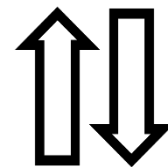
The tube support height adjusts automatically based on the diameter and surface, ensuring alignment with the center of the chuck throughout the cutting process.

Self centering chuck



Incorporates two clamping chucks with pneumatic actuators that enable automatic tube centering, ensuring optimal performance across various profile types.

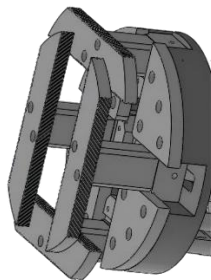
Auto Loading-Unloading (Optional)



Optionally, an automatic tube loading and unloading system can be implemented, enabling continuous, and efficient production.

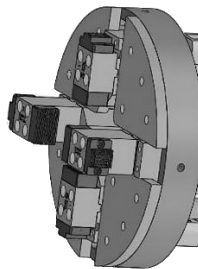
Optional Enhancements

ST JAWS
(IDEAL FOR OPEN PROFILES)



Allows working with larger dimensions in open profiles (angles, channels, I/H/T beams, among others), overcoming the clamping limitations of standards chucks.

SP JAWS
(IDEAL FOR THIN THICKNESSES)



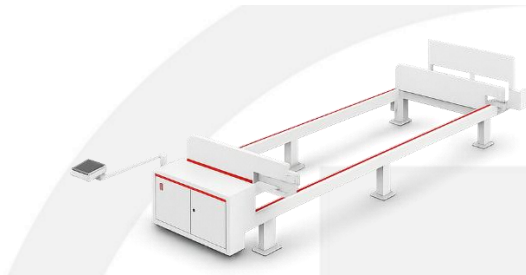
Anti-Slide technology improves contact friction, allowing clamping of thicknesses under 3/64in, where standard chucks have limitations.

UNLOADING UNIT



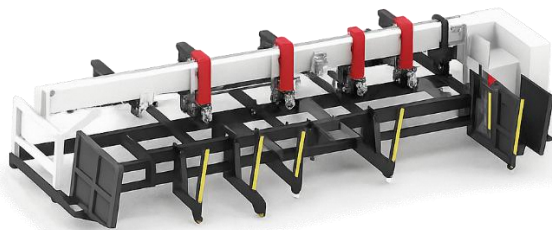
Automatic sorting and compact unloading system with servo-follower, which distinguishes scrap from finished parts and slides them onto the final cart without manual intervention, optimizing space and precision.	
Dimensions (L x W x H)	6.4 x 3.5 x 2.5 ft 1950 x 1060 x 770 mm
Maximum tube length after cutting	9.8ft 3000mm
Maximum unload weight	661lb 300 kg

SEMI-AUTOMATIC DUAL-ARM LOAD UNIT



Minimum tube length	13ft 4000m
Maximum tube length	20ft 6000mm
Admissible tube diameter	2 – 13.5in 50 – 340mm
Maximum tube capacity	529lb 240kg
Admissible profile type	Round, square, rectangular, angle channel, I/H/T beams

AUTOMATIC LOADING UNIT



Admissible tube length	11.5 – 20ft 3500 – 6000mm
Admissible tube diameter	2 – 10in 50 – 250mm
Maximum tube capacity	727.5lb 330kg
Tube storage capacity	6613lb 3000kg
Admissible profile type	Round, square

SIMPLIFIED AUTOMATIC LOADING UNIT



Admissible tube length	11.5 – 20ft 3500 – 6000mm
Admissible tube diameter	2 – 10in 50 – 250mm
Maximum tube capacity	573lb 260kg
Tube storage capacity	6613lb 3000kg
Admissible profile type	Round, square

General Specifications

SPECIFICATION	DETAIL
Model	FORZA Apolo – P6036P60
Laser Type/Technology	Fiber Laser 1064nm $\pm$ 10nm
Fiber laser diameter	150 μ m
Nominal fiber laser power	6000W
Fiber laser power range	5 a 100% ($\pm$ 0.5%)
Output power stability	$\pm$ 1.5W
Laser working frequency	4 a 5000Hz
Laser source protection level	IP54
Laser source model	MFSC-6000W MAX PHOTONICS
Working modes	CUTTING / MARKING / PERFORATION
Focusing system	SMARTFOCUS TECHNOLOGY ⁽¹⁾
Auxiliar gas type for cutting	O ₂ , N ₂ or Air
Proportional oxygen control	Analog control 145 psi (10 bar) AIRTAC
Laser head model	OSPRI – LC80
Focal range	-15mm ~ +15mm
Maximum focusing speed	7.87in/s 200mm/s
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⁾
XY movement repeatability	±0.03mm
XY movement accuracy	±0.05mm
Tube working length	6.6ft to 20ft 2000mm a 6000mm
Tube working diameter	2in to 14in 50mm a 360mm
Minimum tube thickness	3/64in 1mm ⁽⁶⁾
Maximum cutting speed	1.64ft/s 30m/min
Maximum travel speed	3.3ft/s 60m/min
Maximum rotation speed	60rev/min
Maximum XY acceleration	19.3ft/s² 0.6G
XY motion system	Rack and pinion
Z motion system	Ball screw
Servo motors brand	INOVANCE
Lubrication system	Automatic by working path
Wireless control	Wi-Fi enabled remote control
Fume extraction system	Extraction by external motor
Maximum plate load capacity	1102lb 500kg ⁽⁷⁾
Laser source power	18.5kW
Chiller power	8.5kW
Fume extractor power	1.5kW
Motion & control system power	7kW
Power of the loading and unloading system (optional)	3.85kW
Peak machine power	22.3kW

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.

Minimum power for electrical system design ⁽⁸⁾	35.25kW		
Average energy consumption ⁽⁹⁾	21.15kWh		
Operating voltage	220V/250V/380V/440V/480V 3ph 50Hz-60Hz		
Minimum line current	102.8A @220VAC 3ph		
	90.5A @250VAC 3ph		
	59.5A @380VAC 3ph		
	51.4A @440VAC 3ph		
	47.1A @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 1AWG	3 x 3AWG	220VAC 3ph
	3 x 2AWG	3 x 4AWG	250VAC 3ph
	3 x 4AWG	3 x 6AWG	380VAC 3ph
	3 x 6AWG	3 x 8AWG	440VAC 3ph
	3 x 6AWG	3 x 8AWG	480VAC 3ph
Recommended MCCB and grounding conductor	MCCB	PE Conductor (Copper)	Voltage
	110A	6AWG	220VAC 3ph
	100A	8AWG	250VAC 3ph
	70A	10AWG	380VAC 3ph
	60A	10AWG	440VAC 3ph
	50A	10AWG	480VAC 3ph
Power cable length ⁽¹¹⁾	32.8ft 10m		

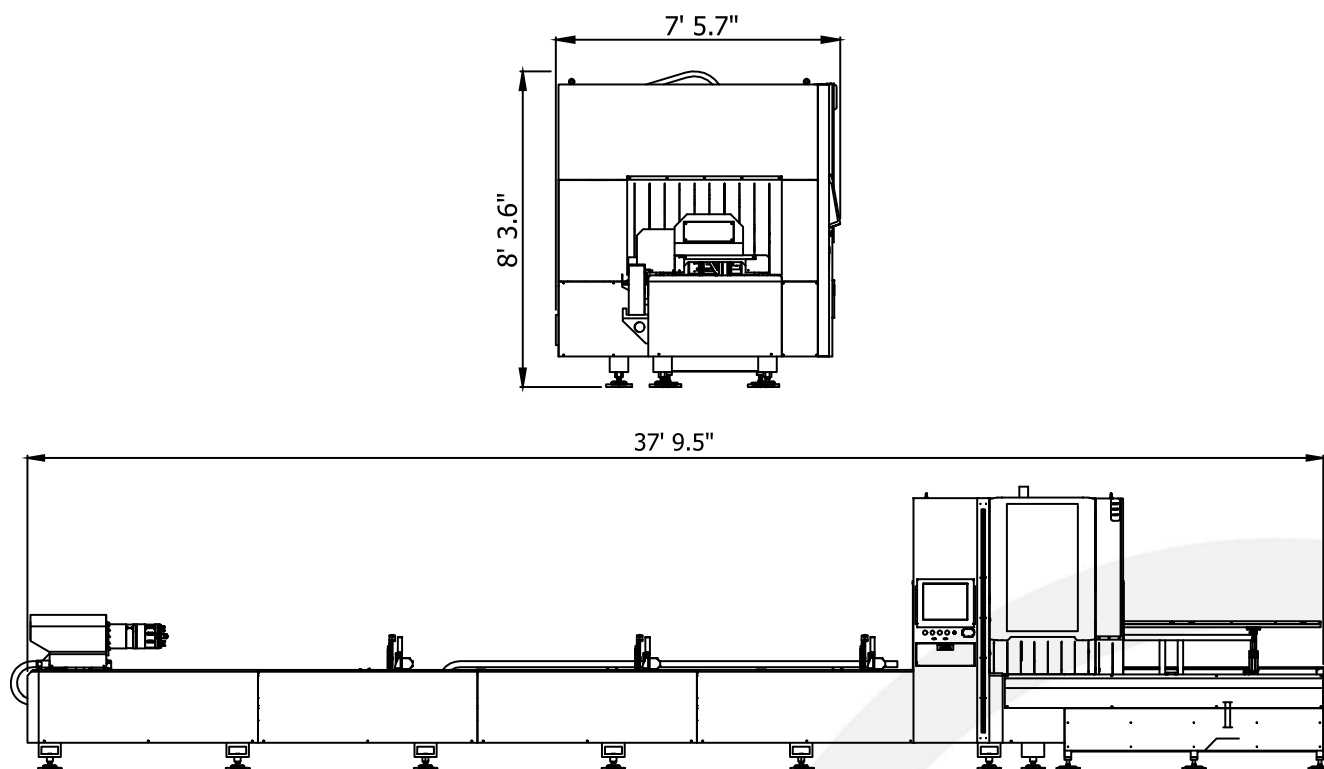
8. The minimum power sizing for electrical design is calculated based on typical power consumption of the laser source and chiller, along with half the power of the fume extractor and machine actuators.
9. Average power consumption is estimated at 60% of the measure peak power. Not all components operate 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.

Pneumatic supply for actuators	87psi 6bar		
Communication Interface	RJ45, WIFI, USB 3.0		
Compatible design formats	IGS, IGES, STP, STEP		
Software	FORZA Play T		
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
	26.4gal 100L	18.5gal 70L	11.1gal 42L
Gas connection diameter	O ₂ and N ₂ 8mm (⁵ / ₁₆ 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	87psi 6bar ⁽¹³⁾		
Machine weight	~6.5ton ~5900kg		
Machine shipping weight	~6.7ton ~6100kg		
Machine dimensions	37.8 x 7.5 x 8.3 ft 11520 x 2279 x 2530 mm		
Transport dimensions	39.4 x 9.2 x 9.8 ft 12000 x 2800 x 3000 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		

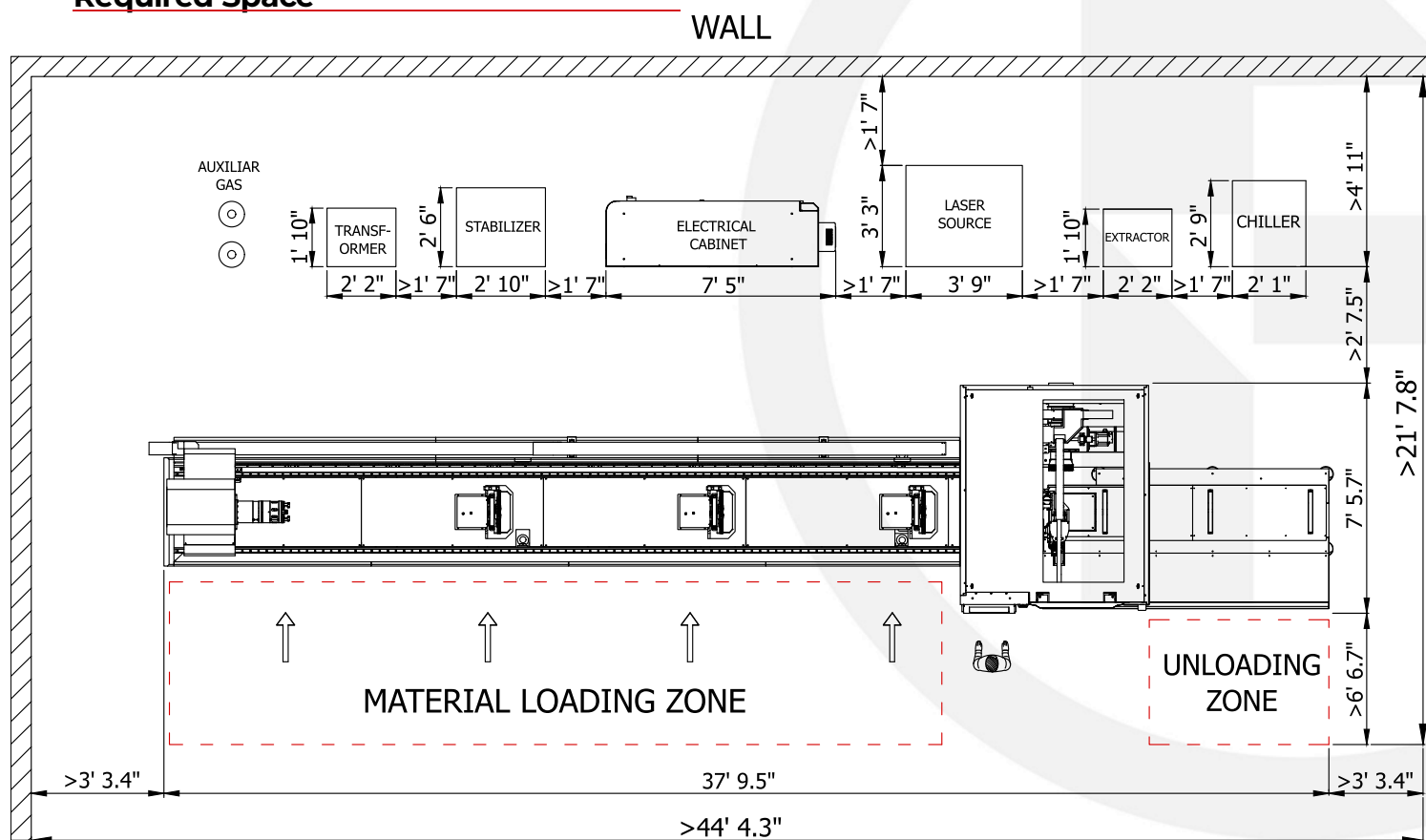
12. The tank size depends on the cooler model equipped in the laser machine. At the time of installation, at least 1.1 gallons (4 liters) of additional distilled water beyond the tank capacity must be available to fill the water circuits between the chiller, the power supply, and the laser head.

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

Machine Dimensions

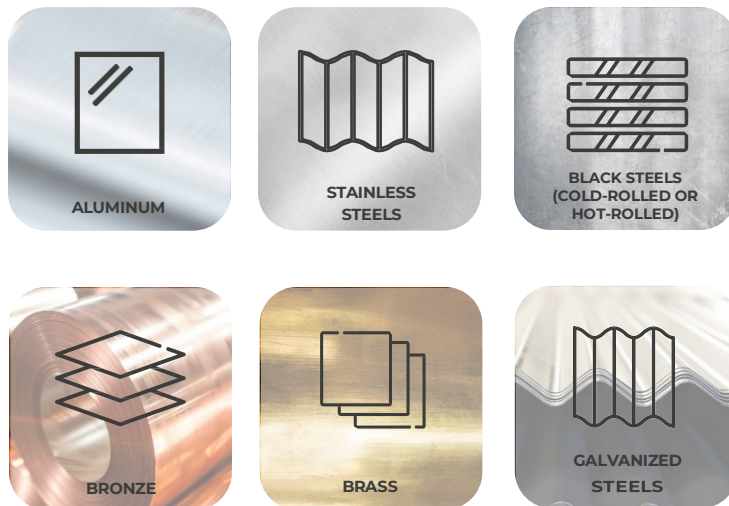


Required Space

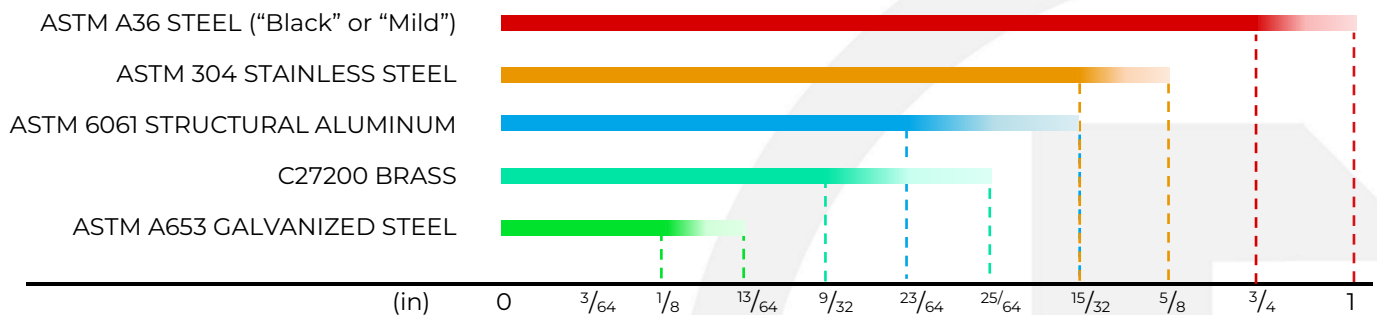


* Peripheral dimensions may vary depending on the machine model.

Applicable Materials



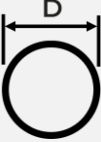
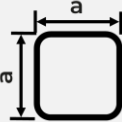
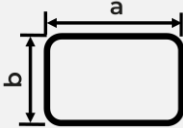
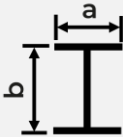
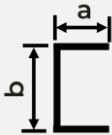
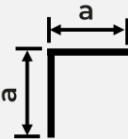
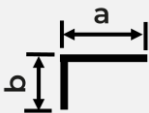
Cutting Thicknesses by Material



MATERIAL	IDEAL THICKNESS ⁽¹⁾			MAXIMUM THICKNESS ⁽²⁾		
	mm	in	gauge	mm	in	gauge
ASTM A36 STEEL ("Black" or "Mild")	19	3/4	-	25	1	-
ASTM 304 STAINLESS STEEL	12	15/32	-	16	5/8	-
ASTM 6061 STRUCTURAL ALUMINUM	9	13/64	-	12	15/32	-
C27200 BRASS	7	11/32	2	10	3/8	-
ASTM A653 GALVANIZED STEEL	3	1/8	12	5	3/16	6

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.

Supported dimensions per profile

PROFILE TYPE	SHAPE	DIMENSIONS (in) WITH STANDARD JAWS	DIMENSIONS (in) WITH ST JAWS
ROUND		$2 < D < 14$	$2 < D < 14$
SQUARE		$2 < a < 14$	$2 < a < 14$
RECTANGULAR		$2 < a y b < 14$	$2 < a y b < 14$
H/I BEAM		$2 < a < 9.8$ $2 < b < 12.6$	$2 < a < 13.8$ $2 < b < 13.8$
CHANNEL		$2 < a < 9.8$ $2 < b < 12.6$	$2 < a < 13.8$ $2 < b < 13.8$
SYMMETRIC ANGLE		$2 < a < 7.9$	$2 < a < 13.8$
ASYMMETRIC ANGLE		$2 < a < 7.9$ $2 < b < 4.9$	$2 < a < 13.8$ $2 < b < 13.8$

Packing List:

- ❑ 1 x FORZA Apolo 6000W Machine 
- ❑ 1 x LC80 Head 
- ❑ 1 x Wireless remote control 
- ❑ 1 x Wireless keyboard and mouse 
- ❑ 1 x Laser safety glasses with case 
- ❑ 1 x Waste collection carts 
- ❑ 20 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 -

- ❑ Electrical cabinet 
- ❑ 1 x 380V 3ph / 80 KVA Voltage Stabilizer 
- ❑ 1 x Automatic 6kW Chiller 
- ❑ 1 x MFSC Power Supply – 6000W Max Photonics 
- ❑ 1 x 1.5 kW Industrial fume extractor 
- ❑ 1 x 80 KVA Transformer [220V - 380V] @220v3ph 
- ❑ 1 x 80 KVA Transformer [250V - 380V] @250v3ph 
- ❑ 1 x 80 KVA Transformer [440V - 380V] @440v3ph 
- ❑ 1 x 80 KVA 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 

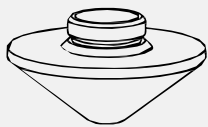
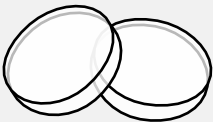
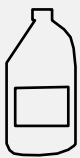
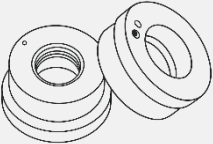
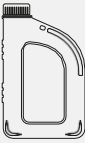
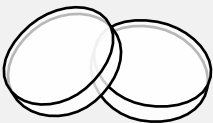
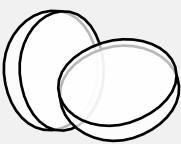
- POWER CABLES AND TRAYS -

- ❑ 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 3x1AWG + 1x6AWG, B-T (T: Ring-Spade) @220v3ph 
- ❑ 5m (16.4ft) x Cable 3x2AWG + 1x8AWG, B-T (T: Ring-Spade) @250v3ph 
- ❑ 5m (16.4ft) x Cable 3x4AWG + 1x10AWG, B-E (T: Ring-Spade) @380v3ph 
- ❑ 5m (16.4ft) x Cable 3x6AWG + 1x10AWG, B-T (T: Ring-Spade) @440v3ph 
- ❑ 5m (16.4ft) x Cable 3x6AWG + 1x10AWG, B-T (T: Ring-Spade) @480v3ph 
- ❑ 2m (6.56ft) x Cable 4x4AWG + 1x10AWG, T-E (T: Ring-Ring) @220/250/440/480v3ph 
- ❑ 10m (32.81ft) x Cable 3x4AWG + 1x10AWG, E-M (T: Ring-Spade) 
- ❑ 15m (49.2ft) x Cable 4x12AWG, M-X (T: Ring-Spade) 

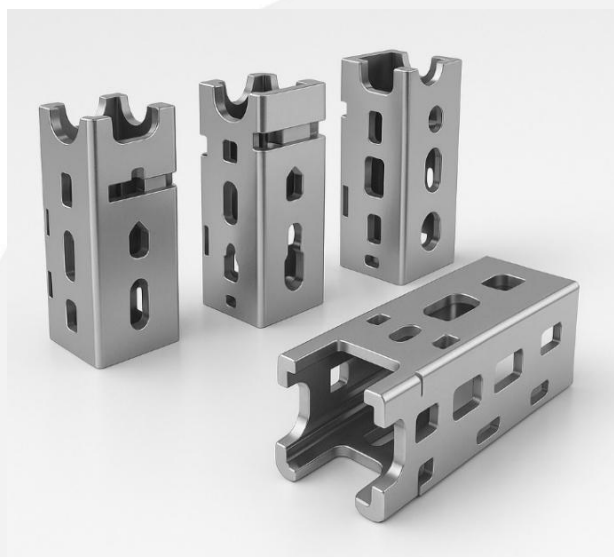
T: Transformer, B: MCCB, E: Stabilizer, M: Machine, F: Laser source, C: Chiller, H: Head, X: Extractor, G: Ground.
* Reference cables are coated with TW-type insulation

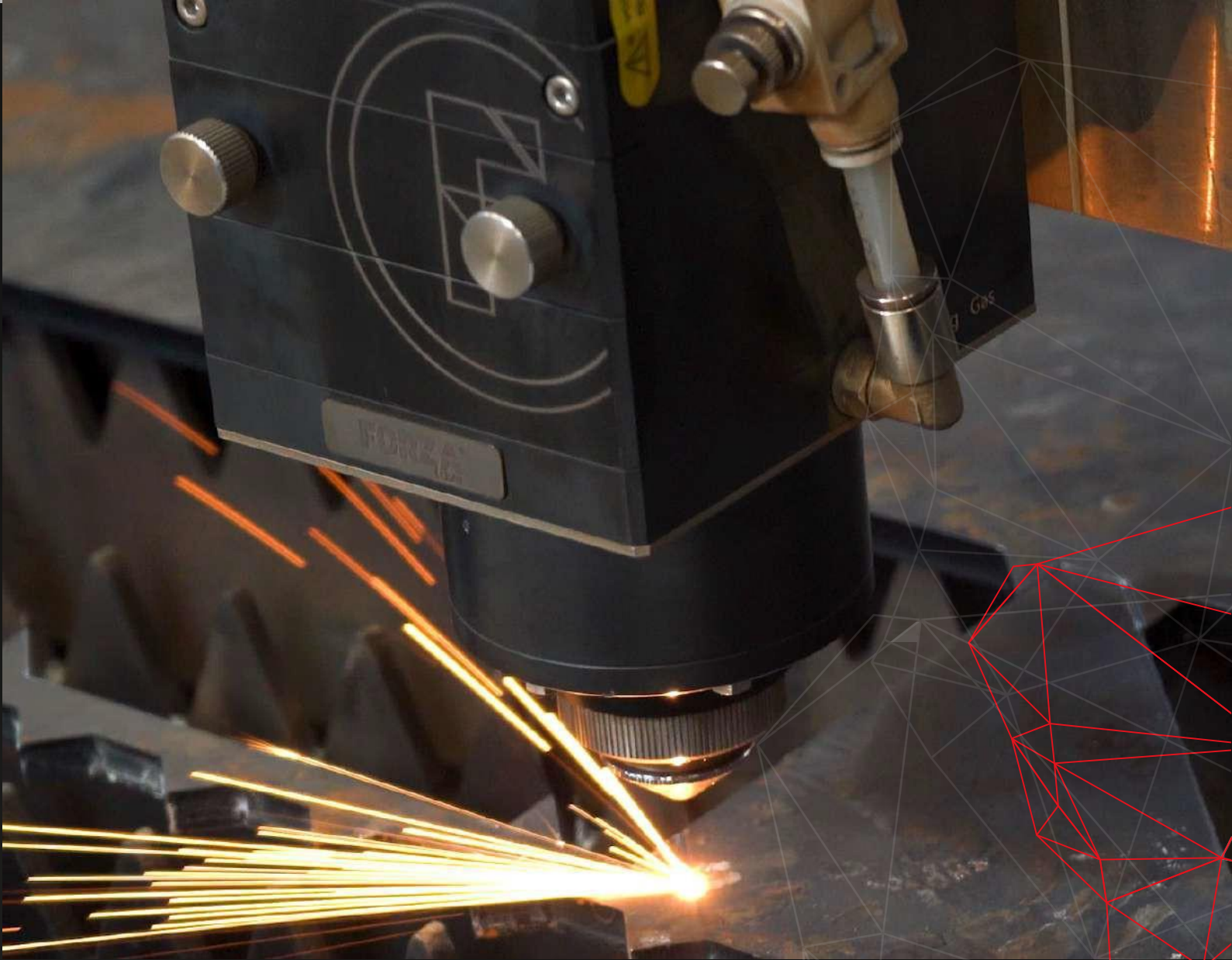
Transportation symbols:  (package),  (inside the package),  (installed on the machine).

Consumables:

IMAGE	ITEM	MODEL	DIMENSIONS	LIFETIME
	Cutting nozzle:	xxxx	D:28mm M11x0.75 H:15mm	200 hours
	Bottom protective lens	CF-L37.0x7.0-8K	D:37mm T:7mm	200 hours
	Distilled water	xxxx	26.4gal 18.5gal 11.1gal 100L 70L 42L	2 months
	Ceramic base for capacitive sensor	CF-BDC28M11L12	D:28mm	1000 hours
			D:24.5mm	
			M11x0.75	
			H:12mm	
	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-L37.0x7.0-8K	D:37mm T:7mm	Not specified
	Top protective lens	CF-L21.5x2.0-8K	D:21.5mm T:2mm	Not specified

Manufactured Parts:





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

Find us on our social media



forzaser.com

FORZA[®]
Laser