



FORZA
Apollo

V250603P

Technical Sheet
Model P6036P60



FORZA
Apollo

Industrial CNC laser cutting machine for tubes and profiles

CUTTING / MARKING / DRILLING

The FORZA Apollo laser cutter is designed to operate with high speed and precision, allowing clean and exact cuts in a wide variety of tubular profiles up to 360 mm, such as round, square, rectangular, angle tubes, channels

and among others.

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

Specific characteristics

FEATURE	DETAIL
Application	Cutting of pipes and profiles
Maximum pipe length and diameter	L: 6000mm x D: 360mm L: 20ft x D: 14in
Nominal laser power	6000W
Ideal cutting thickness in ASTM A36 (1)	19mm 3/4in
Maximum cutting thickness in ASTM A36 (2)	25mm 1in
Maximum travel speed (3)	60m/min 3.3ft/s
Maximum rotation speed (3)	60 rev/min
Cutting accuracy (4)	± 0.1mm

- 1. The ideal thickness is the one at which, when cut, the finished edge is completely clean and burr-free. When the ideal thickness is exceeded, lines and burrs appear in the finish.
- 2. The maximum thickness is the greatest thickness that can be cut under certain conditions of Parameterization. It is not recommended to scale the machine to the maximum thickness. Working with increasingly narrow thicknesses significantly restricts the cutting geometries that can be achieved due to the high temperatures the material reaches.
- 3. As the weight of the pipe increases, the movement parameters may decrease.
- 4. The cutting accuracy is taken on 0.7mm stainless steel plate, consider the repeatability and Machine accuracy. 0.1 mm accuracy means that when cutting a 100.0 mm plate, it could measure either 100.1 mm or 99.9 mm. If the material thickness increases, the error can be greater due to the nature of the materials and the width of the cut.
- 5.



Special Features

Smart Focus Technology



Automatic head for work in uneven surfaces, even if the material is slightly warped, the head will maintain a constant distance throughout the cut.

Marking Technology



Not only can it cut, it also has the marking function, ideal for engraving lines for post-processing.

bent or engrave numbers and letters.

FORZA Play T Software



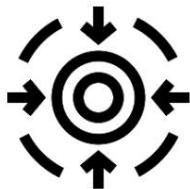
Specialized Spanish-language software for cutting pipes and profiles; user-friendly, with an alarm system and maintenance notifications.

Smart Tube Support



The height of the pipe support adjusts automatically based on the diameter and surface area, ensuring that it always coincides with the center of the mandrel during cutting.

Self-centering chuck



It incorporates two clamping chucks with pneumatic actuators that allow automatically center the tube, ensuring optimal work in

different types of profiles.

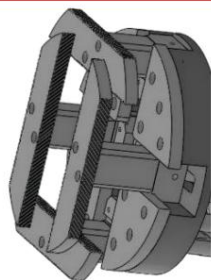
Auto Loading-Unloading (Optional)



An automatic tube loading and unloading system can be optionally implemented, allowing for continuous and efficient production.

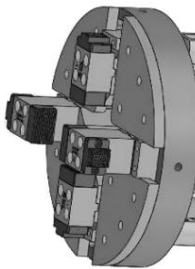
Optional upgrades

MUELAS ST
(IDEAL FOR OPEN PROFILES)



It allows working with larger dimensions in open profiles (angles, channels, I/H/T beams, among others), overcoming the clamping limitations of standard clamps.

MUELAS SP
(IDEAL FOR THIN THICKNESSES)



Anti-Slide technology improves contact friction, allowing for gripping thicknesses less than 1.25 mm, where standard jaws present limitations.

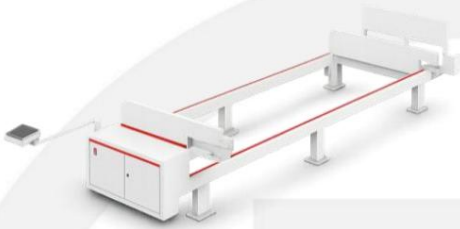
DOWNLOAD UNIT



Compact automatic separation and unloading system with servo-tracking support, which separates waste from finished parts and slides them toward the final carriage without manual intervention, optimizing space and precision.

Dimensions (L x W x H)	1950 x 1060 x 770 mm
Maximum tube length after cutting	3000mm 9.8ft
Maximum discharge weight	300 kg

SEMI-AUTOMATIC LOADING UNIT
DOUBLE-ARM



Minimum tube length	4000mm 13ft
Maximum tube length	6000mm 20ft
Allowable tube diameter	50 – 340mm 2 – 13.5in
Maximum capacity per tube	240kg
Supported profile type	Circular, square, rectangular, angle, channel, I/H/T beam

AUTOMATIC LOADING UNIT



Allowed tube length	3500 – 6000mm 11.5 – 20ft
Allowable tube diameter	50 – 250mm 2 – 10in
Maximum capacity per tube	330kg
Tube storage capacity	3000kg
Supported profile type	Circular, square

SIMPLIFIED AUTOMATIC LOADING UNIT



Allowed tube length	3500 – 6000mm 11.5 – 20ft
Allowable tube diameter	50 – 250mm 2 – 10in
Maximum capacity per tube	260kg
Tube storage capacity	3000kg
Supported profile type	Circular, square

General Characteristics

SPECIFICATION	DETAIL
Model	FORZA Apollo – P6036P60
Laser Type/Laser Technology	Fiber Laser 1064nm \pm 10nm
Fiber laser diameter	150 μ m
Nominal power of the fiber laser	6000W
Fiber laser power range	5 to 100% (\pm 0.5%)
Stability in output power	\pm 1.5W
Laser working frequency	4 to 5000Hz
Protection level of the laser source	IP54
Laser source model	MFSC-6000W MAX PHOTONICS
Types of work	CUTTING / MARKING / DRILLING
Focusing system	SMARTFOCUS TECHNOLOGY ⁽¹⁾
Support gases for laser cutting	O2, N2 or Air
Proportional oxygen regulation	Analog control 10 bar AIRTAC
Laser head model	OSPRI – LC80
Focus range	-15mm ~ +15mm
Maximum focusing speed	200mm/s
Head protection system	Stroke prevention and detection
Creating pre-loaded cutting profiles	Yes ⁽²⁾
Laser cut width	0.1mm ~ 1.5mm ⁽³⁾
Cutting precision	Depending on the thickness ⁽⁴⁾

1. The focusing system incorporates an internal servo motor that moves the lens and in addition to a capacitive sensor that maintains the distance between the head and the plate during cutting.
2. The parameters are available on the library.forzalaser.com platform and the customer can download them. free and a local backup is left on the machine for quick access.
3. The width of the cut is directly proportional to the thickness of the material, the greater the thickness, the greater the width of the cut, The type of filler gas also has an impact; with oxygen the cutting line is wider.
4. The cutting accuracy is 0.1 mm for thicknesses up to 0.7 mm. If the cutting thickness increases, the accuracy is reduced. affected by the cutting width up to 0.5mm in ½ inch plates.

Cutting inclination angle	<2° (5)
Repeatability of XY motion	±0.03mm
XY motion accuracy	±0.05mm
Working length in pipe	2000 to 6000mm 6.6 to 20ft
Working diameter in pipe	50 to 360mm 2 to 14in
Minimum thickness in pipe	1mm 3/64in (6)
Maximum cutting speed	30m/min 1.64ft/s
Maximum travel speed	60m/min 3.3ft/s
Maximum rotation speed	60 rev/min
Maximum acceleration XY	0.6G 19.3ft/s ²
XY motion system	Rack/Pinion
Z-motion system	Ball screw
Servomotor brand	INNOVATION
Lubrication system	Automatic by work path
Wireless control system	WIFI remote control
Extraction system	Extraction by external motor
Maximum tube load	500kg (7)
Laser source power	18.5kW
Cooler power	8.5kW
Power of the exhaust fan	1.5kW
Motion and control system power	15kW
Charging and discharging system power (optional)	3.85kW
Maximum power of the equipment	43.5kW

5. The rake angle depends on the thickness of the cutting material and also the type of gas being used. The greater the thickness, the more the rake angle can be affected, oxygen can increase the rake angle of the cut.
6. Pipes with smaller thicknesses are susceptible to deformation or crushing during clamping with the mandrel. Do not work with pipes with thicknesses less than this value to ensure a safe and precise process.
7. Although the structure can support thick tubes, the cutting thickness indicated for this should not be exceeded. this laser power.

Minimum power for electrical sizing (8)	35.25kW		
Average energy consumption (9)	21.15kWh		
Working voltage	220V/250V/380V/440V/480V 3ph 50Hz-60Hz		
Minimum current per line	102.8A @ 220VAC 3ph		
	90.5A @ 250VAC 3ph		
	59.5A @ 380VAC 3ph		
	51.4A @ 440VAC 3ph		
	47.1A @ 480VAC 3ph		
Gauge of the conductor that goes to the thermal magnetic switch (ITM) (10)	Up to 60°C (TW, UF)	Up to 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
ITM and recommended ground conductor	ITM	PE Driver (Copper)	Voltage
	110A	6AWG	220VAC 3ph
	100A	8AWG	250VAC 3ph
	70A	10AWG	380VAC 3ph
	60A	10AWG	440VAC 3ph
	50A	10AWG	480VAC 3ph

8. The minimum power for electrical sizing is calculated considering the typical powers of the laser source and the cooler, along with half the power of the extractor and the machine's actuators.
9. Average consumption is calculated from 60% of peak consumption, not all components are on. During work, the on-and-off interactions of systems such as the chiller and power supply cause this index to drop. For an hourly electricity consumption calculation, use the average consumption.
10. The cable gauge sizing was carried out based on Table 310-15(b) (16) of NOM-001-SEDE for Maximum conductor temperatures of 60°C and 90°C, respectively, are considered for conduit installations. If installing the cable outdoors, a smaller gauge than the one shown in this document may be used after consulting with the FORZA Laser technical department.

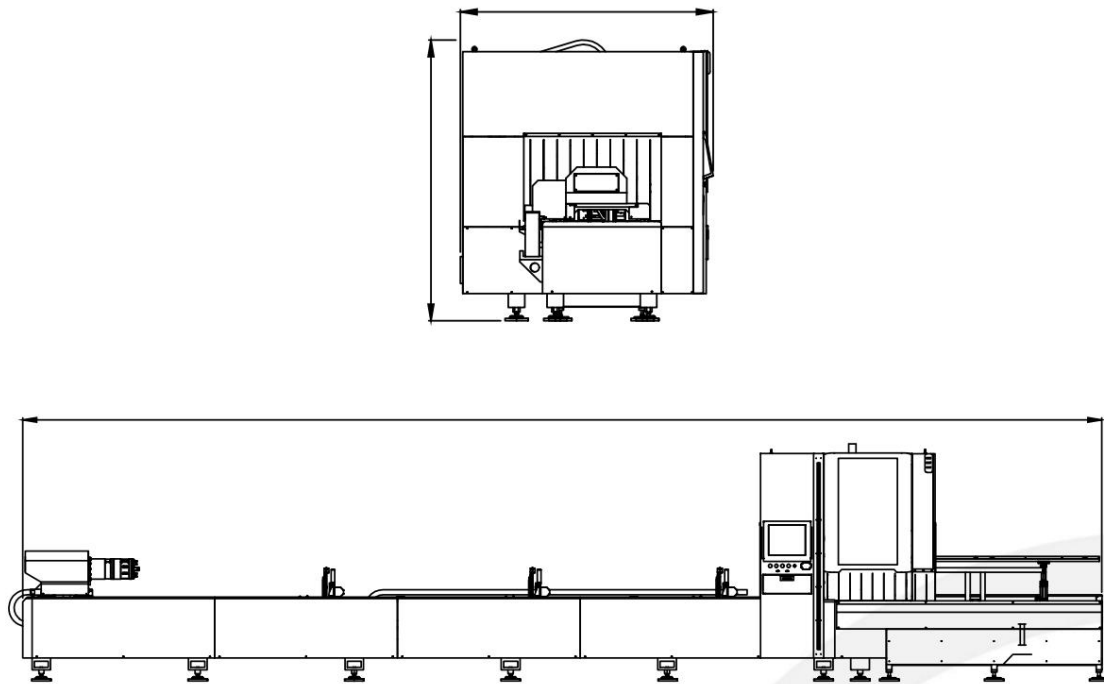
Power Conductor Length (11)	10m 32.8ft		
Pneumatic power supply for actuators	6 bar		
Type of communication	RJ45, WIFI, USB 3.0		
Supported design formats	2D: AI, DXF, PLT, LXD, G		
	3D: IGS, IGES, STP, STEP		
Software for use	FORZA Play T		
Software language	Spanish and English		
PC control interface	By screen and by manual control		
Cooling method	Dissipated by water		
Cooler tank size (12)	TFLW	CWFL	HL
	100L	70L	42L
Gas connection diameter	8mm O2 and 8mm N2 hose (Nylon)		
Maximum pressure allowed in the head	25 bar		
Maximum air/N2 inlet pressure	20 bar		
Maximum O2 inlet pressure	10 bar		
Recommended N2 inlet pressure	~16 bar		
Recommended O2 intake pressure	6 bar (13)		
Equipment weight	~5900kg		
Weight of the equipment for transport	~6100kg		
Equipment measurements	11520 x 2279 x 2530mm 12.5x2.2x2.5m		
Transport measures	12000 x 2800 x 3000mm 12x2.5x3m		
Resistance on the work floor	6.5Kgf/cm2		
Relative humidity	< 85%		
Working temperature	2 - 35 °C		
Storage temperature	8 - 30 °C		
Certifications	CE, RoHS		

11. The maximum length of the power cord is 10 m (32.8 ft) to avoid voltage drops and ensure performance optimum of the system.

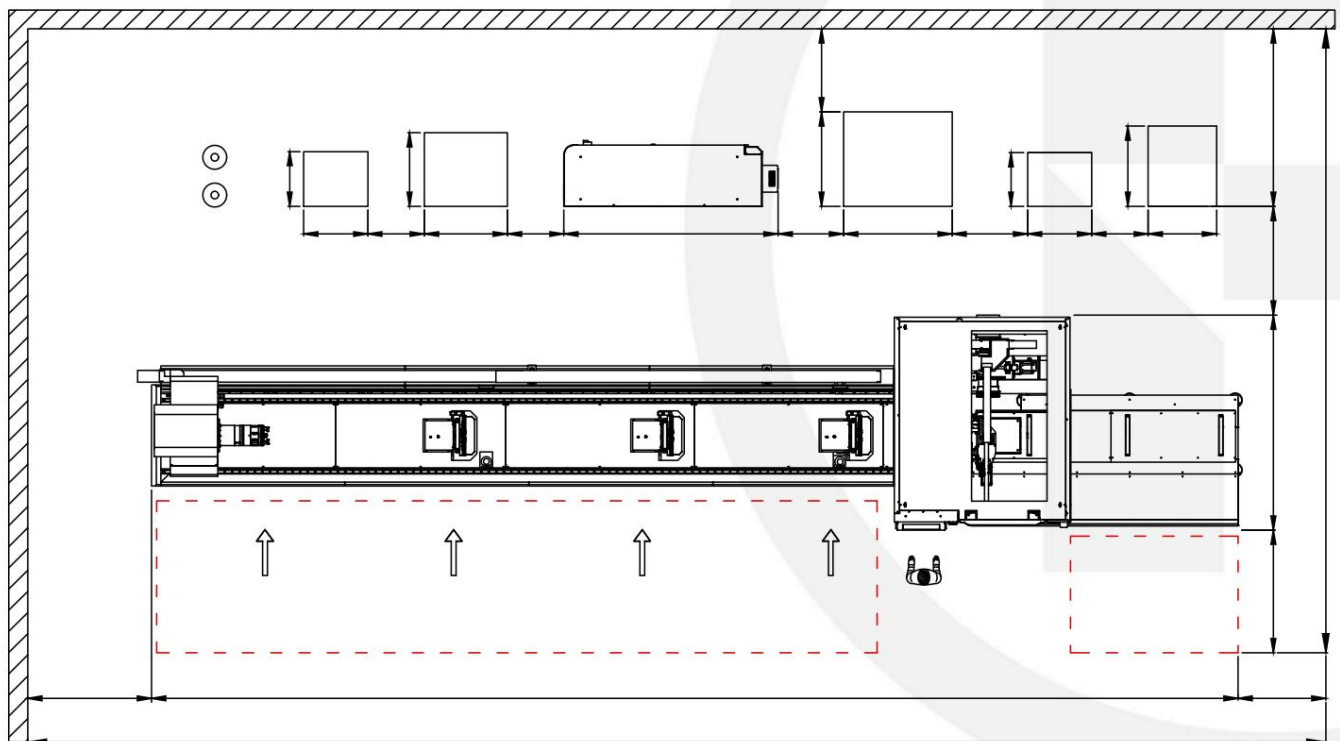
12. The tank size depends on the chiller model fitted to the laser machine. At the time of installation, At least 4L of distilled water must be added to the tank size to fill the water circuits between the chiller, the source and the laser head.

13. This pressure is used at the outlet of the tank pressure gauge, and the valves are calibrated from this pressure.

Machine measurements

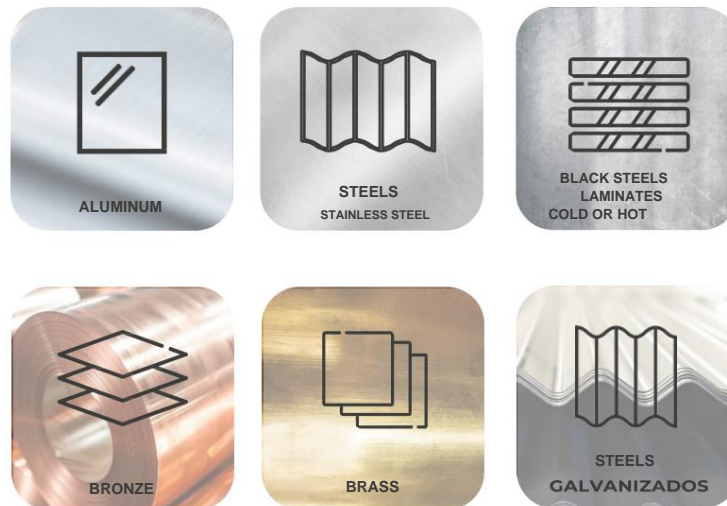


Space required

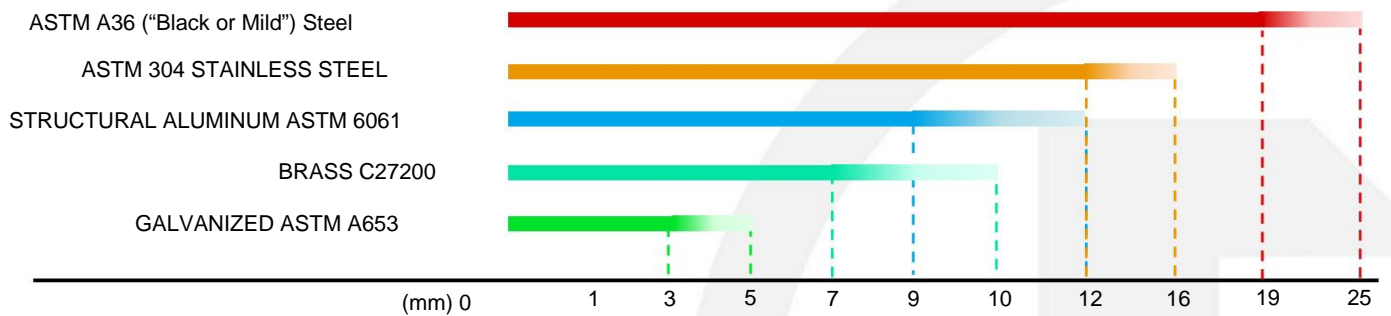


*Peripheral dimensions may vary depending on the machine.

Applicable materials




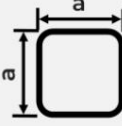
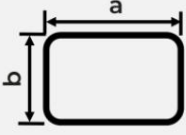
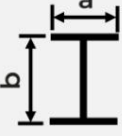
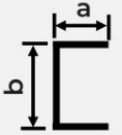
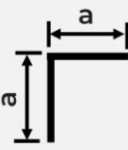
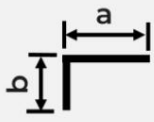
Cutting thicknesses by material



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

1. The ideal thickness is the one at which, when cut, the finished edge is completely clean and burr-free. When the ideal thickness is exceeded, lines and burrs appear in the finish.
2. The maximum thickness is the greatest thickness that can be cut under certain conditions of Parameterization. It is not recommended to scale the machine to the maximum thickness. Working with increasingly narrow thicknesses significantly restricts the cutting geometries that can be achieved due to the high temperatures the material reaches.

Dimensions allowed per profile

PROFILE TYPE	FIGURE	DIMENSIONS (mm) WITH STANDARD GRINDING WHEELS	DIMENSIONS (mm) WITH ST MOLES
CIRCULAR		$50 < D < 360$	$50 < D < 360$
SQUARE		$50 < a < 360$	$50 < a < 360$
RECTANGULAR		$50 < a \text{ and } b < 360$	$50 < a \text{ and } b < 360$
H/I BEAM		$50 < a < 250$ $50 < b < 320$	$50 < a < 350$ $50 < b < 350$
CHANNEL		$50 < a < 250$ $50 < b < 320$	$50 < a < 350$ $50 < b < 350$
SYMMETRICAL ANGLE		$50 < a < 200$	$50 < a < 350$
ASYMMETRIC ANGLE		$50 < a < 200$ $50 < b < 125$	$50 < a < 350$ $50 < b < 350$

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 protection glasses with case
- 1 x Waste collection carts
- 20 x Machine leveling feet
- 1 x Gutter and track assembly kit
- 1 x Monitor screen
- 1 x Industrial CPU

- TOOL BOX -

- 1 x Plastic tool box
- 1 x Scotch tape
- 1 x Masking Tape
- 1 x Metric allen key set
- 1 x 4-piece screwdriver set
- 1 x Set of door keys and switch
- 1 x Parrot beak key
- 1 x Cotton swabs and cleansers
- 1 x Bag of 6mm bolts and wall plugs
- 1 x Wi-Fi module
- 1 x Set of electrical terminals
- 1 x Set of service terminal blocks
- 1 x QBH Protector
- 2 x Clamps for 10" extraction tube

- LICENSES -

- 1 x Lifetime Software License
- 1 x FORZA Vectors 1-year license
- 1 x Full FORZA Academy License 1 year
- 1 x 4-year Super 7 SUPPORT License

- PERIPHERALS -

- 1 x Electrical cabinet
- 1 x Voltage stabilizer 380V-3ph / 80 KVA
- 1 x 6kW Automatic Chiller
- 1 x MFSC Power Supply – 6000W Max Photonics
- 1 x Industrial fume extractor 1.5 kW
- 1 x Transformer [220V - 380V] of 80KVA. @220v3ph
- 1 x Transformer [250V - 380V] of 80KVA. @250v3ph
- 1 x Transformer [440V - 380V] of 80KVA. @440v3ph
- 1 x Transformer [480V - 380V] of 80KVA. @480v3ph

- CONSUMABLES -

- 1 x Top protection lens
- 9 x Lower protection lenses
- 20 x Cutting nozzles in various sizes
- 1 x Capacitive Sensor Ceramic Base
- 1 x Liter ISO 68 Oil

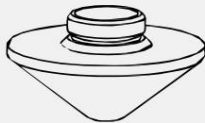
- POWER CABLES AND DUCT -

- 1 x Gas extraction tube/hose x 4.8m x 10"
- 1 x Monitor power cable
- 2 x PU hoses for CH cooling, 10mx8mm
- 2 x PU hoses for CF cooling, 10mx19mm
- 1 x Voltage regulator for display
- 5mxCable 3x1AWG + 1x6AWG, BT (T:Eye-Tip) @220v3ph
- 5mxCable 3x2AWG + 1x8AWG, BT (T:Eye-Tip) @250v3ph
- 5mxCable 3x4AWG + 1x10AWG, BE (T:Eye-Tip) @380v3ph
- 5mxCable 3x6AWG + 1x10AWG, BT (T:Eye-Tip) @440v3ph
- 5mxCable 3x6AWG + 1x10AWG, BT (T:Eye-Tip) @480v3ph
- 2mxCable 4x4AWG + 1x10AWG TE (T:Eye-Eye) @220/250/440/480v3ph
- 10mxCable 3x4AWG + 1x10AWG, EM (T:Eye-Tip)
- 15mxCable 4x12AWG, MX (T:Eye-Tip)

T: Transformer, B: ITM, E: Stabilizer, M: Machine, F: Laser Source, C: Chiller, H: Head, X: Extractor, G: Ground.
*Reference cables are TW type coated.

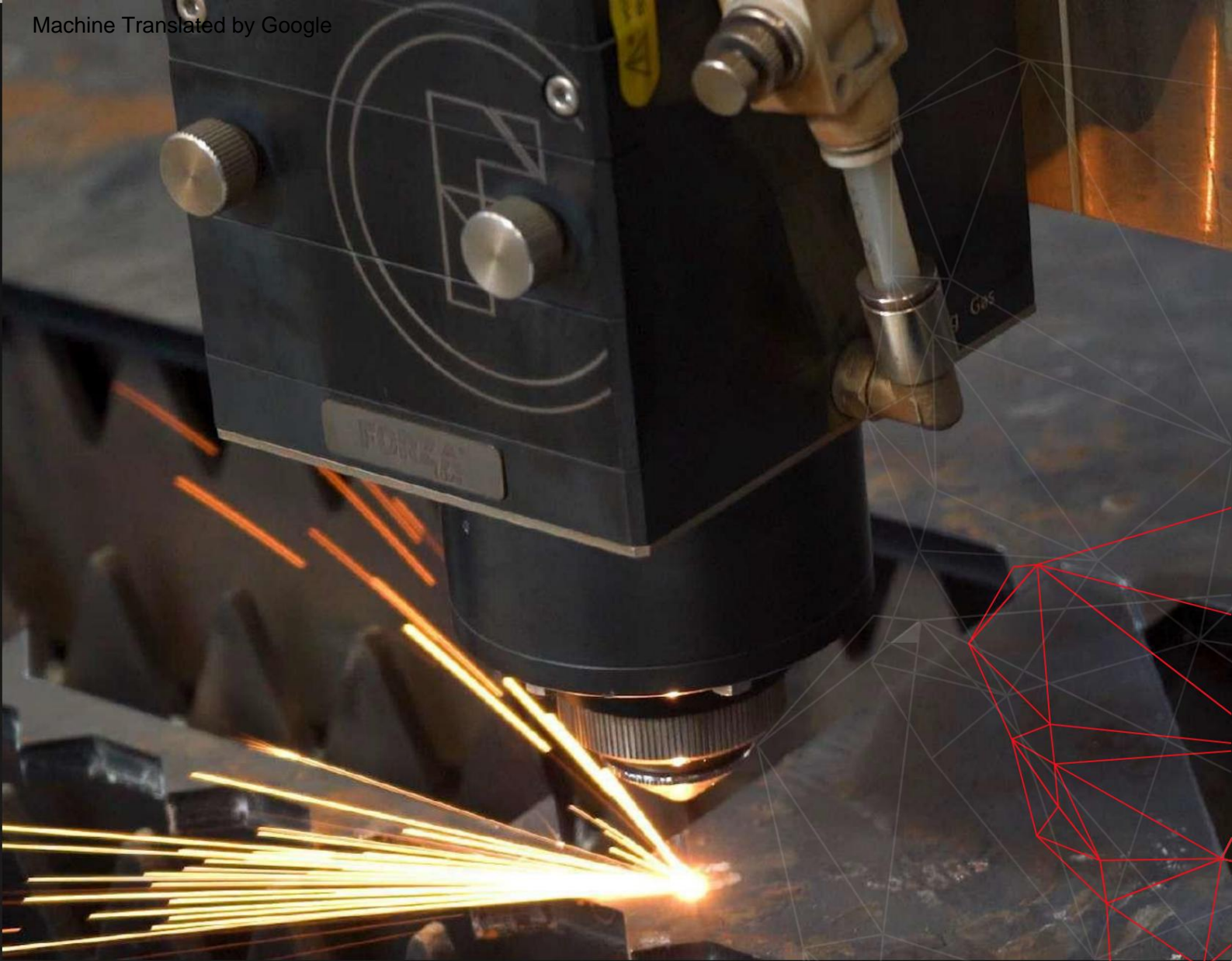
Transport symbols: (package), (inside the package), (installed on the machine).

Consumables

IMAGE	ARTICLE	MODEL	MEASURES	TIME OF LIFE
	Cutting nozzle:	xxxx	D:28mm M11x0.75 H:15mm	200 hours
	Lower protective lens	CF-L37.0x7.0-8K	D:37mm T:7mm	200 hours
	Distilled water	xxxx	100L / 70L / 42L	2 months
	Ceramic sensor base capacitive	CF-BDC28M11L12	From:28mm	1000 hours
			Di:24.5mm	
			M11x0.75	
			H:12mm	
	Lubricating oil ISOVG68	xxxx	1L	50,000 meters
	Blue grease for sprockets	xxxx	Lithium grease	10,000 meters
	Second lower protective lens	CF-L37.0x7.0-8K	D:37mm T:7mm	not specified
	Superior protection 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 grow your own business to the fullest.

Visit our social networks



forzaser.com

FORZA[®]
Laser