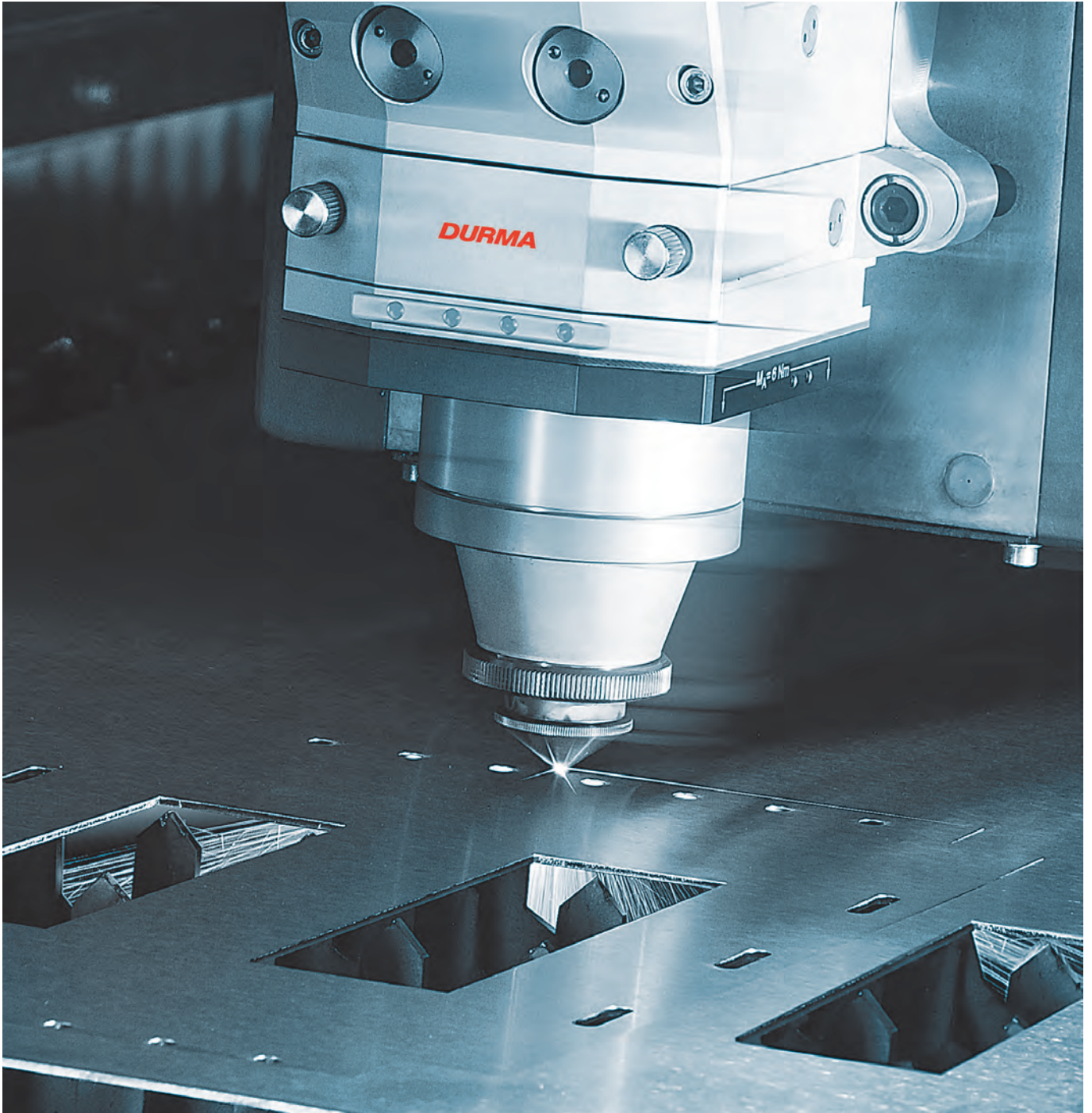


Fiber Laser Technology

DURMA

LASER CUTTING MACHINES



Fiber Laser Cutting Solutions

Cost-effective
Parts of the highest quality
Ease of operation and cleaver design

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Durma lasers guarantee precision, low maintenance costs, low operating costs and longterm reliability.

These features along with large investments in modern manufacturing equipment have made Durma the largest volume laser machine producer in the world.

All Durma laser machines are produced with modern design technology increase your productivity with excellent part production. Demanding applications are easily achieved. A broad offering of sizes and features satisfy nearly all economical requirements.



Durmazlar has aimed continuous development since 1956

Owes one of the world's most contemporary production plants in the production technology business. 3 different plants oriented to different product families, 1000 dedicated employees and 150.000 m² footprint.

In order to offer solution according to clients needs and enriching the quantity and quality of its own patent rights; long experienced Engineering Department transformed to Durma Research & Development Center has opened in the year 2010. Designed and engineered with modern technics; its products are equipped with proven quality components to precisely fulfill your requirements.

We serve "accuracy, speed, flexibility, durability, reliability and advanced technology" with high performance/price ratio. Worldwide Durma distributors and technical support network assures perfect support to our clients.

With its 60 years of experience, its product quality, innovative solutions Durma gives importance and cares you with proactive approach. We thank all our clients to hold us at the top segment of the world brands.



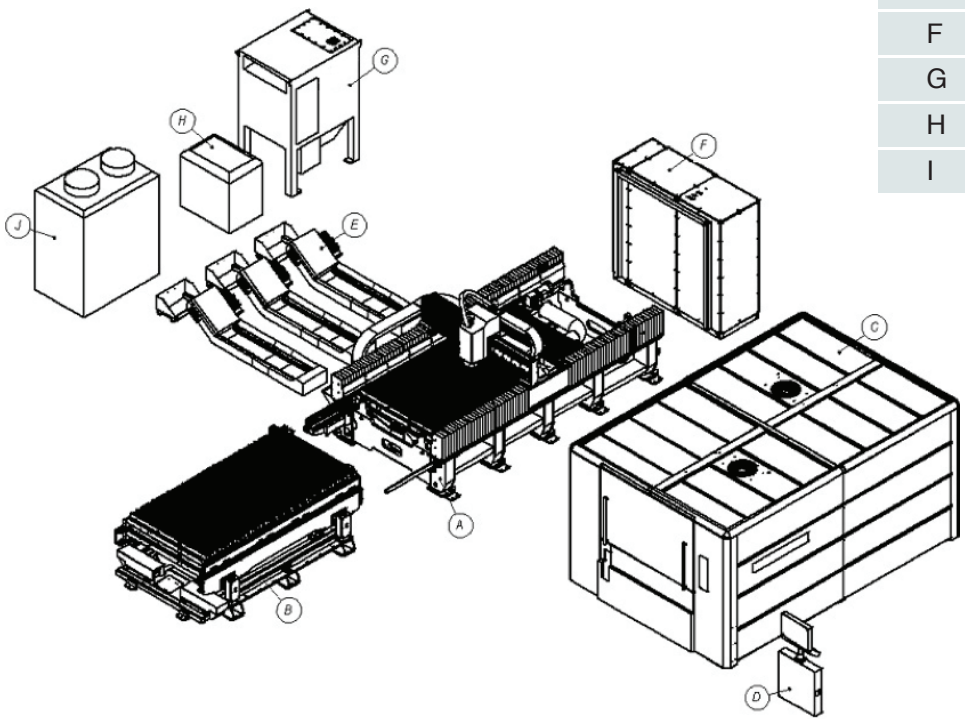
Visit us on our web site
www.durmazlar.com.tr

HDF / HDFL SERIES

Cost-effective
 Parts of the highest quality
 Ease of operation and clever design



A	Machine Frame
B	Shuttle Table
C	Machine Cabin
D	Command Panel
E	Scrap Conveyor - Box
F	Electric Panel
G	Filter
H	Resonator
I	Chiller



BASIC MACHINE

The DURMA HD-F / HD-FL machine is high speed 2-D laser cutting system for machining flat sheet plates. It works on the principle of "Flying optics". This means that the raw sheet rests on the cutting table and the laser head moves in X and Y directions. This construction type allows extremely high acceleration values and, in conjunction with a direct encoder measuring system, maximum precision of the component geometry. Moving axes are driven by dynamic low moment of inertia and high performance AC Servo motors that don't need maintenance. Machine and the bridge are welded construction. After the welding, machine body and the axes are subject to stress relieving treatment. This process eliminates the deviations in machine geometry and stresses that may result during welding. Dust and suspended particles are vacuumed via a sectioned chamber system during laser cutting. A conveyor system have been integrated to the machine in order to carry the scrap particles to the scrap bin during cutting. The shuttle table is designed to increase the productivity and minimize the material preparation time. The table allows loading of raw metal sheets or unloading of finished parts onto one table while the other table is on duty. The compact design of the machine requires less floor space and transfer, load and unload as one piece without disassembling the main frames.

Rack&Pinion Motion System (HD-F Series)

Axes motion is achieved by rack and pinion design. There are not any intermediate load transmitting elements between the motor and the pinion which otherwise could cause precision losses. High precision two-way, hardened helical racks with low clearance make it possible to achieve very high acceleration (10m/s^2), speed (100m/s) and accuracy ($0,05\text{ mm}$) values.



Linear Motor Motion System (HD-FL Series)

Moving axes are driven by high velocity and acceleration linear motors which are the latest development in linear technology. These motors make it possible to achieve very high acceleration (20m/ss^2), speed (200m/s) and accuracy ($0,03\text{ mm}$) values.



LASER SOURCE

The dynamic operating range of IPG's low-ordermode kilowatt class fiber lasers is available from 10% to full power with no change in beam divergence or beam profile throughout the entire range. This allows a single laser to be utilized for both high and low-power applications. IPG lasers' divergence specifications are far superior than other lasers and allow the use of long focal length processing lenses for vastly improved depth of field, less damage to optical components. The units can be supplied with fiber lengths to 100 meters, different fiber diameters. Fiber lasers have a monolithic, entirely solid state, fiberto- fiber design that does not require mirrors or optics to align or adjust and are typically smaller and lighter in weight than traditional lasers, saving valuable floor space.

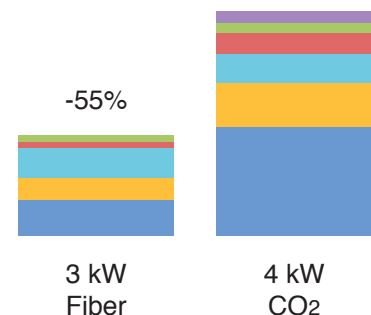
Resonator	1.0 kW	2.0 kW	3.0 kW	4.0 kW	6.0 kW
Product designation	YLS-1000	YLS-2000	YLS-3000	YLS-4000	YLS-6000
Available operation modes	CW, QCW, SM				
Polarization	Random				
Available output power	100-1000 w	200-2000 w	300-3000 w	400-4000 w	600-6000 w
Emission wavelength	1070 -1080nm				
Feed fiber diameter	Available in single mode, 50, 100, 200, 300µm				
Ancillary Options	Options Available: Internal coupler, Internal 1x2 beam switch, Internal 50:50 beam splitter, External 1x4 or 1x6 beam switch				
Interface	Standard: LaserNet, Digital I/O, Analog Control Additional Options: DeviceNet or Profibus				

Material (Cutting Capacity)	YLS 1000 (1kW)	YLS 2000 (1kW)	YLS 3000 (3kW)	YLS 4000 (4kW)	YLS 6000 (4kW)
Mild Steel	8mm	12mm	16mm	20mm	25mm
Stainless Steel	4mm	6mm	8mm	10mm	12mm
Aluminium (AlMg3)	4mm	6mm	8mm	12mm	15mm
Chiller					
HD-F	CHWM56	CHWT162 + CHA4	CHWT242 + CHA4	CHWT242 + CHA4	CHWT292 + CHA4
HD-FL	CHWM56	CHWT162 + CHA4 + CHWM56	CHWT242 + CHA4	CHWT242 + CHA4	CHWT292 + CHA4

LOWER PROCESSING COSTS

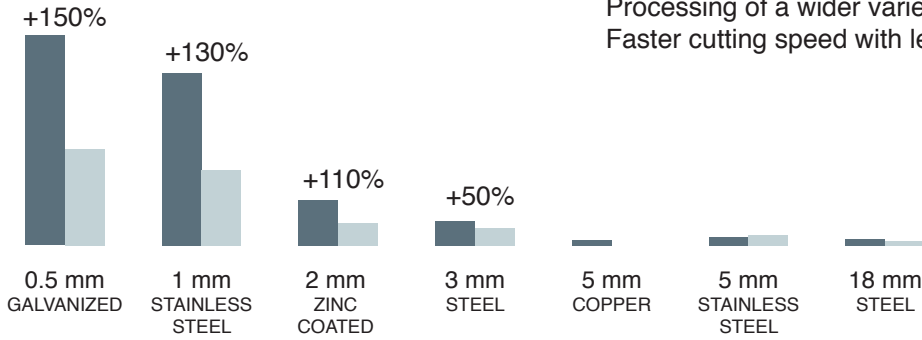
Improved productivity and significantly less energy consumption = lower cost per part

- Excellent beam parameter product (BPP)
- Constant BBP over entire power range
- Small focus over large working distance
- Maintenance free operation
- Modular 'Plug & Play' design
- Compact, Rugged & Easy to install
- Estimated diode lifetime up to 100,000 hours



FIBER CUTTING SPEEDS (kW/Material Thickness)

- 3 kW Fiber
- 4 kW CO₂



Material	YLR 500 (0.5 kW)	YLS 1000 (1 kW)	YLS 2000 (2 kW)	YLS 3000 (3 kW)	YLS 4000 (4 kW)	YLS 600 (6 kW)
Construction Steel	4	8	12	16	20	25
Stainless Steel	2	4	6	8	10	12
Aluminum (AlMg3)	2	4	6	8	12	15
Copper	1	2	3	5	6	10
Brass	2	4	6	8	10	12

STAINLESS STEEL					
Thickness (mm)	YLS 1000 Feed mm/min.	YLS 2000 Feed mm/min.	YLS 3000 Feed mm/min.	YLS 4000 Feed mm/min.	YLS 6000 Feed mm/min.
0.5	20000	30000	35000	35000	35000
1	15000	20000	25000	30000	30000
1.5	8000	14000	16000	20000	30000
2	5500	9000	12000	15000	18000
3	2500	5000	7500	9000	12000
4	1250	2800	4000	5000	10000
5		2500	3000	4000	7000
6		1200	2500	3200	5200
8			1200	1600	2000
10				950	1300
12					1000
16					
20	Nitrogen Cutting				
25	Oxygen Cutting				

MILD STEEL					
Thickness (mm)	YLS 1000 Feed mm/min.	YLS 2000 Feed mm/min.	YLS 3000 Feed mm/min.	YLS 4000 Feed mm/min.	YLS 6000 Feed mm/min.
0.5	20000	30000	35000	35000	35000
1	15000	20000	25000	30000	30000
1.5	8000	14000	16000	20000	30000
2	4800	8500	11000	12000	20000
3	2800	4000	4100	4400	5400
4	2200	3100	3300	3700	4400
5	1800	2600	2800	3500	3800
6	1500	2200	2600	3000	3400
8	1000	1600	2200	2500	2700
10	750	1200	1600	2000	2500
12		900	1100	1500	2000
16			850	1100	1300
20	Nitrogen Cutting			800	1000
25	Oxygen Cutting				700

ALUMINIUM					
Thickness (mm)	YLS 1000 Feed mm/min.	YLS 2000 Feed mm/min.	YLS 3000 Feed mm/min.	YLS 4000 Feed mm/min.	YLS 6000 Feed mm/min.
0.5	20000	30000	35000	35000	35000
1	15000	20000	25000	30000	30000
1.5	8000	14000	16000	20000	30000
2	3800	9000	12000	15000	18000
3	2000	5000	7500	12000	16000
4	1200	3000	5500	7500	12000
5		2600	3000	5000	7000
6		1200	2000	3500	4800
8			1200	1600	2400
10				1200	1800
12				650	1400
16					1000
20	Nitrogen Cutting				
25	Oxygen Cutting				

COMMAND UNIT

The Sinumerik 840D CNC controller is an efficient 32-bit microprocessor system with an integrated PC. The controller has a Durma operator interface and a complete cutting database for all standard cutting applications. The database includes the cutting parameters for standard materials (steel, stainless steel, aluminum) for common thickness ranges. Based on these reference values the operator can easily improve the cutting quality for different types of materials.

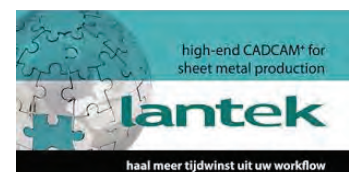
Control Unit	Control Unit
CNC	840D-SL, NCU573,5 6MB User RAM Memory
PC: PCU50.3	Win XP pro 2.0GHz Intel Processor 40 GB HD
Port	2x Ethernet;4xUSB; 1x Profibus
Expansion Slots	2xPCI ; 1xCF Card
Screen	15" TFT (Touch Screen) Colourful Monitor
Laser Cutting Head	PRECITEC PROCUTTER
Focus Length	150 mm



- The laser power is controlled as a function of the path, velocity, time and travel
- Closed-loop clearance control can be universally adapted
- Optional functions
- 6 MB expanded user memory and USB external memory option

CAD/CAM SOFTWARE

- Advanced optimisation: tools optimisation
- Fast tool way collision protection. Toolway optimisation to prevent damage from possible deformed material
- Real type writing styles: Writings supported by your operating system can be applied directly on the material to be cut
- Cutting direction, clockwise or opposite is supported
- Advanced corner applications provides perfect corners and soft cutting. Fillets, cooling, slowing down, circulation
- Shared Cuttings: This property is especially useful for thick plates and reduces the need for making holes during cutting
- Automatic entry point
- Fully automatic cutting
- Z-axis control



LASER CUTTING HEAD

The ProCutter offers a complete solution for the laser-based fusion cutting of thin and medium material thicknesses in the wavelength range around 1 μm . In flame cutting, greater material thicknesses can also be processed while maintaining high standards of quality. The potential of the cutting head is optimally converted into productivity, especially in the case of flatbed and pipe cutting machines, where innovative technologies are combined with proven concepts, providing the best possible performance, range of flexibility and degree of reliability.

The combination of proven technology and optimized design enables processing with up to 6 kW laser power in the near-infrared range – and gives you reduced installation space and weight at the same time.

A robust and dustproof housing ensures a long service life and allows external linear drive accelerations up to 4.5 g, enabling an efficient cutting operation. High-quality optics and the highest standards of quality in manufacturing and assembly ensure optimum laser beam guidance and shaping with high focal position stability, even at high laser power.

EFFICIENT

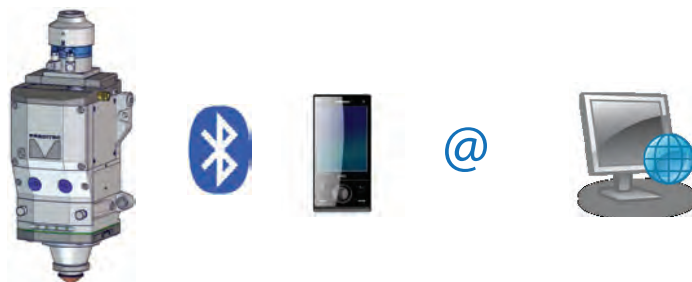
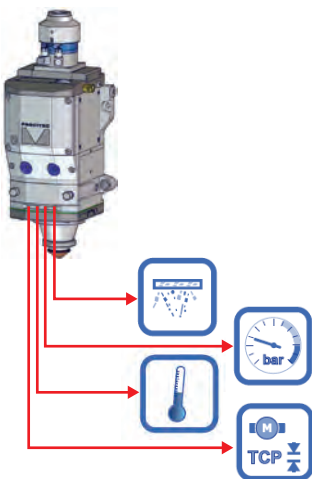
- + Lightweight and slim design created for fast acceleration and cutting speed
- + Motorized focus position adjustment for automatic machine setup and piercing work
- + Drift-free, fast-reacting distance measurement
- + Permanent protective window monitoring
- + Values displayed via Bluetooth®

FLEXIBLE

- + Selectable optical configuration, optimized for the range of applications
- + Straight and angled design versions adapted to the machine concept
- + Zoom lens for automatically adjusting the focus diameter
- + Motorized or manual focal position adjustment

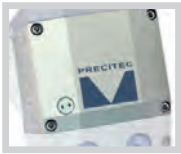
USER FRIENDLY & SAVE

- + Completely dustproof beam path with protective windows
- + LED operating status display
- + Display of operating parameters via Bluetooth® and interface for machine control
- + Pressure monitoring in the nozzle area (gas cutting) and in the head
- + Monitoring of the piercing process and detection of cutting breaks with CutMonitor



App for iOS and Android gadgets

The cutting head for every task Dynamic laser cutting machines require lightweight, intelligent cutting heads. Even installed in the smallest possible space, the ProCutter offers a fully-integrated sensor system that monitors the cutting process and provides the user with relevant information. The head ensures that each component can be reproducibly manufactured at a high standard of quality.



Adjustment of focal length:
Can be done manually or motorized via machine control



Focusing Lens:
High-quality optics | X/Y adjustment | no repositioning after changing necessary | additional protective glass below focusing lens



Protective Glass Cartridge:
to protect the optics against dirt and fume | monitoring of attendance and contamination | toolless, easy change



LED Bar:
For immediate display of the current system state (pressure, temperature, drive, contamination)



Distance Measurement:
fast, exact, drift-free distance measurement at any operating temperatures, even at high accelerations

External Interface: Output of all sensor data as an analog value | readout the values via Bluetooth® | set of thresholds

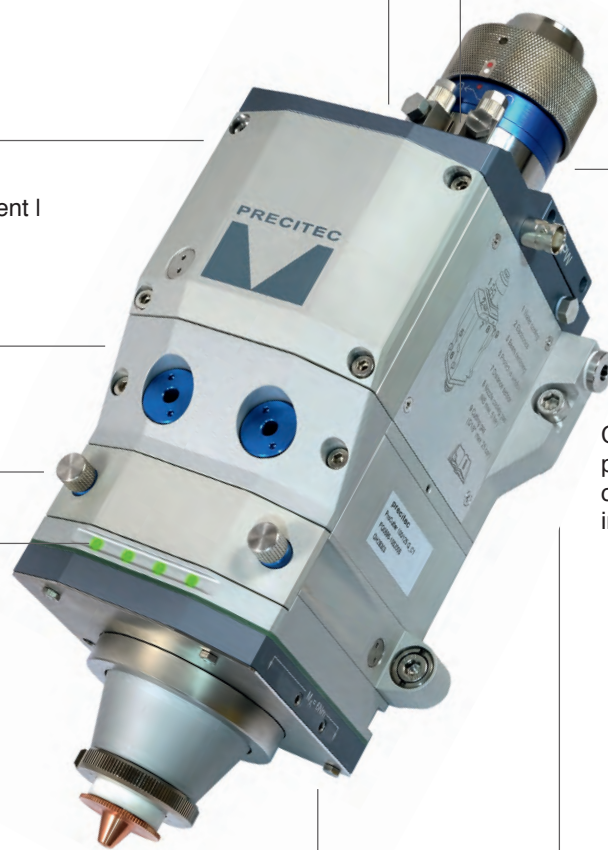
Protective Glass of Collimation Unit:
At straight configuration



CutMonitor: Monitoring of piercing process and detection of cut interruption | integration into angled collimation



Mounting of the head:
easy accessibility from the front



CHILLER

Mono-block refrigerators for internal and external use supplied with pump and tank designed for water or glycolate cooling systems. Especially designed for welders, inductors, food-packaging machinery, laser cutters, tooling machines, die-casting processes, molding and extruding processes of plastic materials, aerodynamic pumps and wine-making industry. Triplephase versions only, available. Various optionals are available to meet every industrial requirement.



UPS UNINTERRUPTED POWER SUPPLY

C1 Series Uninterruptible Power Supply (UPS) is a high technology product that was manufactured to provide uninterruptible energy to fields including but not limited to industrial facilities, hospital, schools, banks, business centers, and computer and communication systems. You can use your device, which is equipped with static bypass system, all necessary protection systems and an online structure with all loads safely.

Because this device was designed double conversion online system basis, it supplies all connected loads with continuous voltage with stable frequency and stable amplitude. Therefore, no transition period is necessary when electric power is interrupted or recovered.

With deployment of a DSP (Digital Signal Processor) based microprocessor in its design, UPS output voltage is accurately controlled, thereby ensuring stable operation of devices that are sensitive to voltage fluctuations.

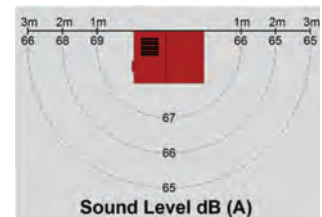


FILTER

Used to eliminate dust, particles and harmful fumes generated during cutting. It is fully automatic dust collecting shake filter.



Easy access to filters and dust bin mechanism



Less noise level

SAFETY

The laser cutting system, machine and CNC controller are fitted with safety devices. These switches and sensors, on one hand, protect the operator from hazards and, on the other hand, counteract damage to the system, e.g. as a result of incorrect path measurement programming or collision between the workpiece and the machine. A diagnosis system keeps the operator informed about the current status of the system and allows him to intervene in the dialogue to make corrections for remedy and faults. The steps that should be carried out for this purpose appear as plain text on the controller screen.



PROTECTIVE MEASURES

The working area of the machine is screened off with sliding doors. These can be opened to gain free access, e.g. to insert a new steel sheet billet, lens and head replacement, general maintenance and for other purposes. During a laser cutting operation the safety devices are electromagnetically locked in order to prevent an accidental triggering of the machine's EMERGENCY STOP function. The machine's safety equipment corresponds to the CE guidelines currently in force. The machine is windowed by makrolon coated material (allowing to see inside) and enclosed by a cabin.

MULTI CHAMBERS HIGH EFFICIENT SUCTION SYSTEM

With the multi chambers high efficient system offers the ability to make an equal amount of suction during the cutting operation of the whole machine cutting area.



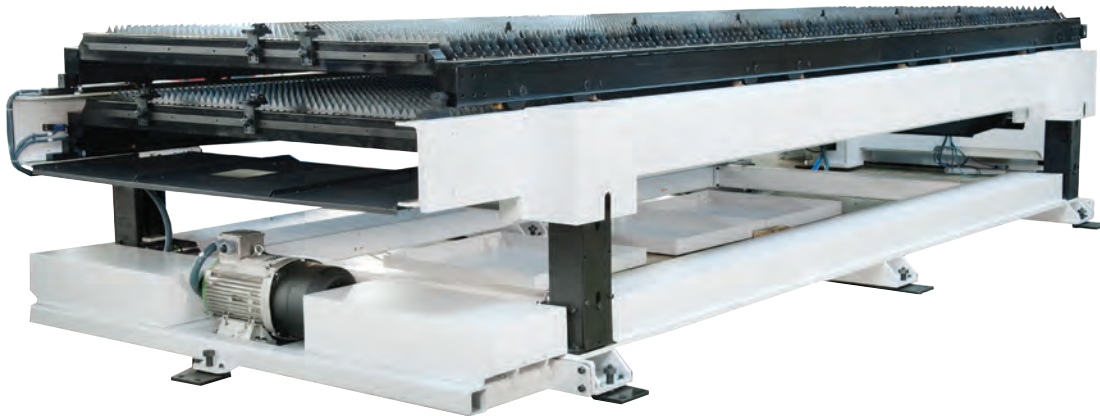
RIGID FRAME & GANTRY

The foundation basis of all Durma laser machines is a rigid stress-relieved welded steel frame construction upon which a stiff gantry axis system moves the cutting head. The design guarantees accurate parts even when cutting with the fastest speeds and under the highest accelerations.



SHUTTLE TABLE

Integrated shuttle tables are incorporated on the laser machine to maximize the productivity and minimize the material handling times. The shuttle table and pallet change system allows convenient loading of new sheets or unloading of finished parts while the machine is cutting another sheet inside the working area . The available shuttle tables on all machine models are fully electric and maintenance free: there are no hydraulic oils to handle and the table changes take place fast, smooth and energy-efficient.



SCRAP CONVEYOR

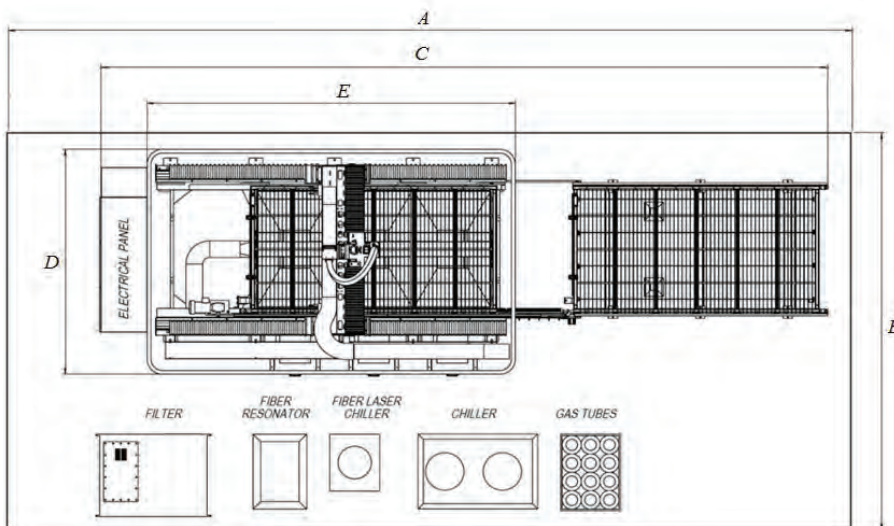
The optional lateral automatic scrap conveyors allow the removal of scrap pieces from the working area without the need to interrupt the cutting process. The sideways operation of the short conveyors allow for easy maintenance and trouble-free running.



TECHNICAL DATA

	3015	4020	6020	8020	12020		
X Axis	3060	4100	6150	8200	12200	mm	
Y Axis	1530	2100	2100	2100	2100	mm	
Z Axis	200	200	200	200	200	mm	
Max. Sheet Size	3000x1500	4064x2032	6096x2032	8128x2032	12192x2032	mm	
Max. Sheet Weight	200	200	200	200	200	Kg/m ²	
	Rack&Pinion HD-F			Lineer System HD-FL			
X Axis	85			200		m/min.	
Y Axis	100			200		m/min.	
Synchronous	131			280		m/min.	
Acceleration	10			20		m/s ²	
Positional Accuracy	±0,05			±0,03		mm	
Repeatability	±0,05			±0,03		mm	
Filter	VANTERM PL 2500		VANTERM PL 3000		VANTERM PL 4000		
Power	4.0		4.0		5.5		kW
Capacity	2500		3000		4000		m ³ /h

Model	A	B	C	D	E	(H) Height	(W) Weight Kg.
HD-F&L 3015	11.500	7.000	10.150	4.050	4.900	2.420	12.000
HD-F&L 4020	14.500	7.500	13.100	4.800	6.400	2.530	21.000
HD-F&L 6020	18.600	7.500	17.250	4.800	8.400	2.530	26.500
HD-F&L 8020	22.900	7.500	21.500	10.400	10.400	2.530	33.000



LOADING CELL

Two different lay-outs are possible and the system can be adapted for integration to automatic storages. The CELL is a full-functional system expansion of the laser cutting machine: work queues of several sheets are activated by pressing one single button and there is no separate control panel for the loading/unloading unit. When the productivity of a laser machine needs to be increased or when the material handling and flow in a factory needs to be optimized, the Durma Laser CELL will be the most efficient and most economic solution.

Lay-out area	12000 mm x 7500 mm
Machine height	6340 mm
Machine width	4030 mm
Machine length	3500 mm
Machine weight	8000 kg
Working range	
Max. sheet dimension	3048 mm
Min. sheet dimension	1534 mm
Max. sheet thickness	25 mm
Min. sheet thickness	0.5 mm
Max. sheet weight	1000 kg
Max. height on unloading table (incl. pallet)	300 mm
Max. weight on unloading table	3000 kg
Max. height on loading table (incl. pallet)	300 mm
Max. weight on loading table	3000 kg



STANDART CUTTING AND CONSUMPTION VALUES

Laser / Lazer: IPG 2000 Watt
 Machine / Makine: DURMA FIBER LAZER
 Focal Distance / Odak: 125mm
 Material / Materyal: Mild Steel / Siyah Sac
 Cutting Gas / Kesme Gazı: Nitrogen / Azot

Thickness (mm)	Power (Watt)	IPG Power Consumption (kw / Hour)	Speed (mm/min)	Nozzle Type	Nozzle Diameter (mm)	Gas Pressure (bar)	Gas Consumption (lt/min)
Kalınlık (mm)	Güç (Watt)	IPG Güç Tüketimi (kW/saat)	Hız (mm/dak)	Nozul Tipi	Nozul Çapı (mm)	Gaz Basıncı (bar)	Gaz Tüketimi (lt/dak)
0.5	2000	6.4	30000	Single	1.5	10	229
1	2000	6.4	20000	Single	1.5	12	271
1.2	2000	6.4	16000	Single	1.5	15	333
1.5	2000	6.4	14000	Single	1.5	15	333
2	2000	6.4	8500	Single	1.5	15	333

Laser / Lazer: IPG 2000 Watt
 Machine / Makine: DURMA FIBER LAZER
 Focal Distance / Odak: 125mm
 Material / Materyal: Mild Steel / Siyah Sac
 Cutting Gas / Kesme Gazı: Oxygen/ Oksijen

Thickness (mm)	Power (Watt)	IPG Power Consumption (kw/Hour)	Speed (mm/min)	Nozzle Type	Nozzle Diameter (mm)	Gas Pressure (bar)	Gas Consumption (lt/min)
Kalınlık (mm)	Güç (Watt)	IPG Güç Tüketimi (kW/saat)	Hız (mm/dak)	Nozul Tipi	Nozul Çapı (mm)	Gaz Basıncı (bar)	Gaz Tüketimi (lt/dak)
0.5	2000	6.4		Double	1.2	0.5	20
1	2000	6.4		Double	1.2	0.5	20
1.5	2000	6.4		Double	1.2	0.5	20
2	2000	6.4		Double	1.2	0.6	21
3	2000	6.4	4000	Double	1.2	0.6	21
4	2000	6.4	3100	Double	1.2	0.6	21
5	2000	6.4	2600	Double	1.2	0.8	24
6	2000	6.4	2200	Double	1.2	0.8	24
8	2000	6.4	1600	Double	1.5	0.6	34
10	2000	6.4	1200	Double	1.8	0.7	36
12	2000	6.4	900	Double	2	0.7	63
16	2000	6.4	700	Double	2.5	0.7	99

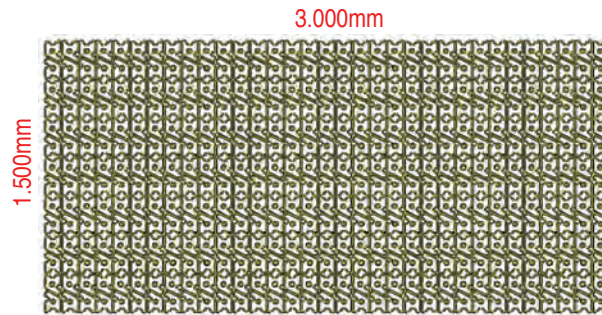
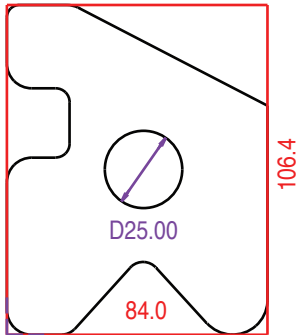
Laser / Lazer: IPG 2000 Watt
Machine / Makine: DURMA FIBER LAZER
Focal Distance / Odak: 125mm
Material / Materyal: Stainless Steel / Paslanmaz Çelik
Cutting Gas / Kesme Gazı: Nitrogen / Azot

Thickness (mm)	Power (Watt)	IPG Power Consumption (kw/Hour)	Speed (mm/min)	Nozzle Type	Nozzle Diameter (mm)	Gas Pressure (bar)	Gas Consumption (lt/min)
Kalınlık (mm)	Güç (Watt)	IPG Güç Tüketimi (kW/saat)	Hız (mm/dak)	Nozul Tipi	Nozul Çapı (mm)	Gaz Basıncı (bar)	Gaz Tüketimi (lt/dak)
0.5	2000	6.4	30000	Single	1.5	15	333
1	2000	6.4	20000	Single	1.5	15	333
1.5	2000	6.4	14000	Single	1.5	15	333
2	2000	6.4	9000	Single	1.5	15	333
3	2000	6.4	5000	Single	1.8	15	480
4	2000	6.4	2800	Single	2	15	592
5	2000	6.4	2500	Single	2.5	15	926
6	2000	6.4	1100	Single	2.5	15	926

Laser / Lazer: IPG 2000 Watt
Machine / Makine: DURMA FIBER LAZER
Focal Distance / Odak: 125mm
Material / Materyal: Aluminium / Alüminyum
Cutting Gas / Kesme Gazı: Nitrogen / Azot

Thickness (mm)	Power (Watt)	IPG Power Consumption (kw / Hour)	Speed (mm/min)	Nozzle Type	Nozzle Diameter (mm)	Gas Pressure (bar)	Gas Consumption (lt/min)
Kalınlık (mm)	Güç (Watt)	IPG Güç Tüketimi (kW/saat)	Hız (mm/dak)	Nozul Tipi	Nozul Çapı (mm)	Gaz Basıncı (bar)	Gaz Tüketimi (lt/dak)
0.5	2000	6.4	30000	Single	1.5	15	333
1	2000	6.4	20000	Single	1.5	15	333
1.5	2000	6.4	14000	Single	1.5	15	333
2	2000	6.4	9000	Single	1.5	15	333
3	2000	6.4	5000	Single	1.8	15	480
4	2000	6.4	3000	Single	2	15	592
5	2000	6.4	2600	Single	2.5	15	926
6	2000	6.4	1200	Single	2.5	15	926

CUTTING TIME & COST CALCULATION



Nitrogen Cutting

Oxygen Cutting

MILD STEEL 1 mm (N₂)

Machine Type	FIBER	CO ₂	FIBER	CO ₂
Power	2kW	2.5kW	4kW	4kW
Cutting speed mm/min.	20.000	16.000	30.000	20.000
One part time / sec	5.7	6.9	5.5	5.6
One part cost / €	0.0147	0.0297	0.0155	0.0263

MILD STEEL 6 mm (O₂)

Machine Type	FIBER	CO ₂	FIBER	CO ₂
Power	2kW	2.5kW	4kW	4kW
Cutting speed mm/min.	2.200	2.500	3.000	3.100
One part time / sec	19.4	18.2	14.9	14.4
One part cost / €	0.0286	0.0598	0.0243	0.0534

STAINLESS STEEL 1 mm (N₂)

Machine Type	FIBER	CO ₂	FIBER	CO ₂
Power	2kW	2.5kW	4kW	4kW
Cutting speed mm/min.	20.000	16.000	30.000	20.000
One part time / sec	5.7	6.9	5.5	5.6
One part cost / €	0.0147	0.0297	0.0155	0.0263

STAINLESS STEEL 4 mm (N₂)

Machine Type	FIBER	CO ₂	FIBER	CO ₂
Power	2kW	2.5kW	4kW	4kW
Cutting speed mm/min.	2.800	2.600	5.000	3.500
One part time / sec	14.7	19.2	9.6	11.9
One part cost / €	0.0532	0.104	0.0355	0.0670

CUTTING TIME & COST CALCULATION REPORT

Efficient working hours of an average laser in Europe

250 days x 16 hours = 4.000 working hours = 4.000 x 3.600 = 14.400.000 sec.

MILD STEEL 1 mm (N ₂)				
Power	Parts	CO ₂	FIBER	CO ₂
Cutting speed mm/min.	2kW	2.5kW	4kW	4kW
Part quantity / year	2.526.315	2.086.956	2.618.181	2.571.428
Total cutting cost €	37.136	61.982	40.582	67.629

MILD STEEL 6 mm (O ₂)				
Power	FIBER	CO ₂	FIBER	CO ₂
Cutting speed mm/min.	2kW	2.5kW	4kW	4kW
Part quantity / year	742.268	791.208	966.443	1.000.000
Total cutting cost €	21.229	47.314	23.484	53.400

STAINLESS STEEL 1 mm (N ₂)				
Power	FIBER	CO ₂	FIBER	CO ₂
Cutting speed mm/min.	2kW	2.5kW	4kW	4kW
Part quantity / year	2.526.315	2.086.956	2.618.181	2.571.428
Total cutting cost €	37.136	61.982	40.582	67.629

STAINLESS STEEL 4 mm (N ₂)				
Power	FIBER	CO ₂	FIBER	CO ₂
Cutting speed mm/min.	2kW	2.5kW	4kW	4kW
Part quantity / year	979.592	750.000	1.500.000	1.210.084
Total cutting cost €	52.114	78.000	53.250	81.075

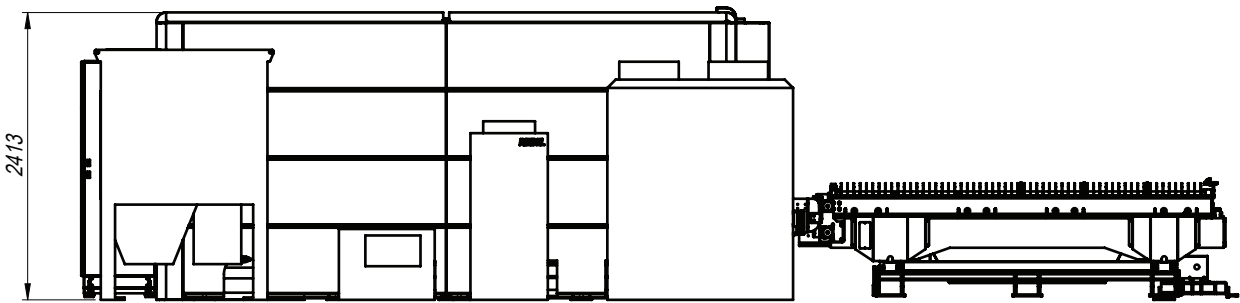
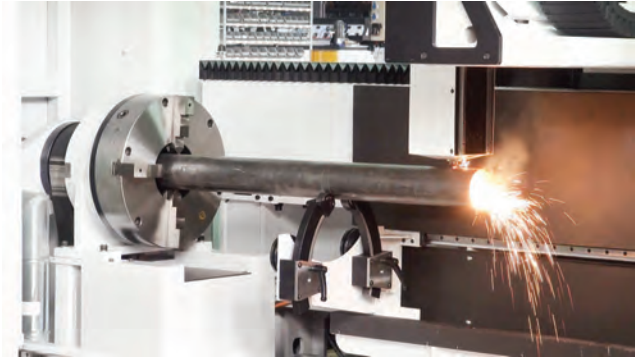
LASER MACHINE AVERAGE ELECTRICAL CONSUMPTIONS

MACHINE TYPE		Laser Power Source	MACHINE+ CHILLER+FILTER	RESONATOR	(Kw/h)
HDF	3015	1 Kw			
		2 Kw	18	6,4	24,4
		3 Kw	18	10	28
		4 Kw	18	15	33
	4020	6 Kw	18	22	40
		2 Kw	21	6,4	27,4
		3 Kw	21	10	31
		4 Kw	21	15	36
	6020	6 Kw	21	22	45
		2 Kw	23	6,4	29,4
		3 Kw	23	10	33
		4 Kw	23	15	38
		6 Kw	23	22	45

HDFL	3015	2 Kw	38	6,4	44,4
		3 Kw	38	10	48
		4 Kw	38	15	53
		6 Kw	38	22	60
	4020	2 Kw	41	6,4	47,4
		3 Kw	41	10	51
		4 Kw	41	15	56
		6 Kw	41	22	63
	6020	2 Kw	43	6,4	49,4
		3 Kw	43	10	53
		4 Kw	43	15	58
		6 Kw	43	22	65

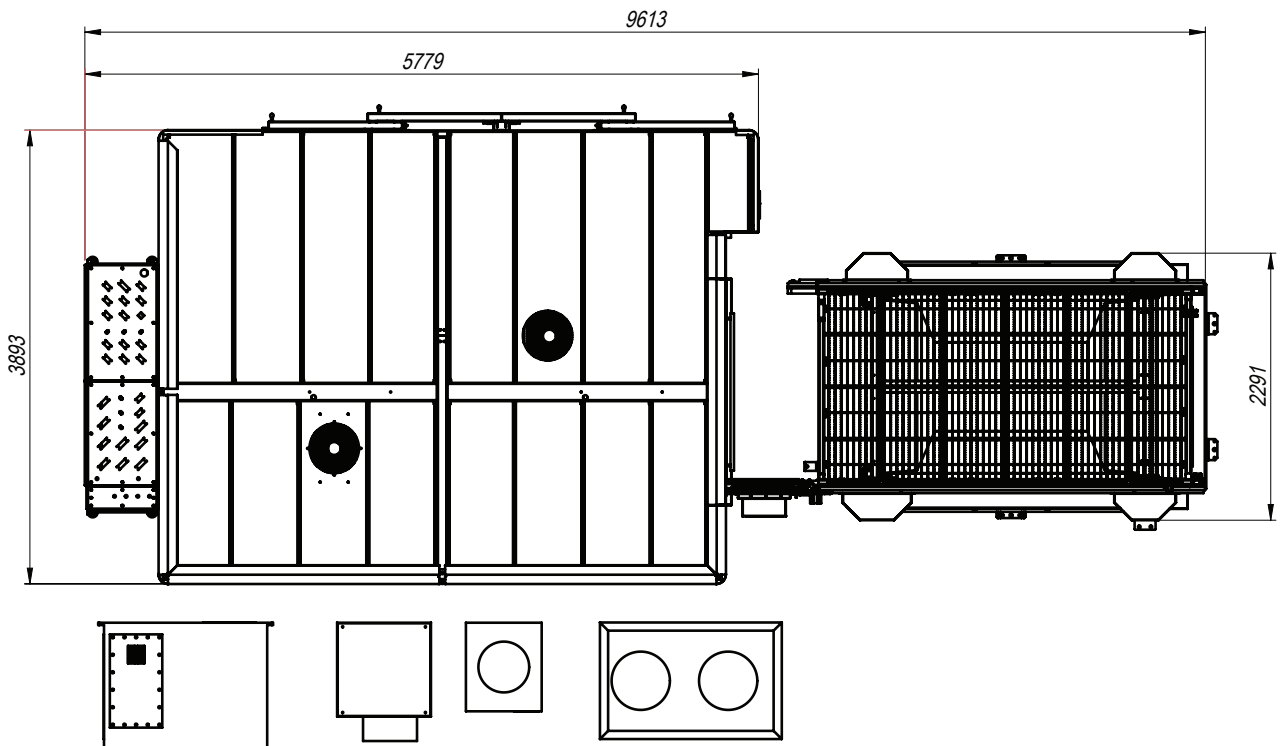
HDF / HDFL BH

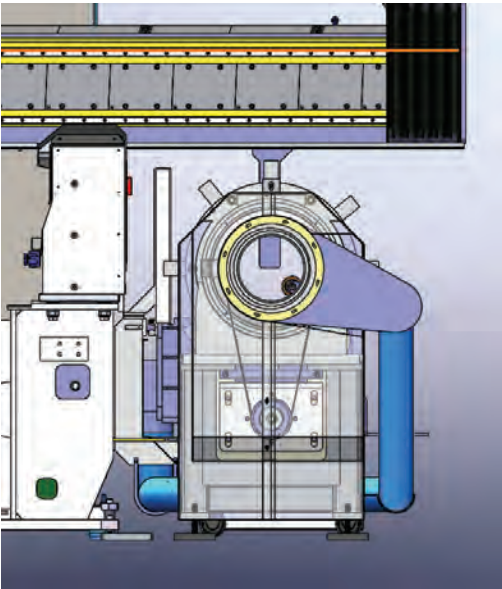
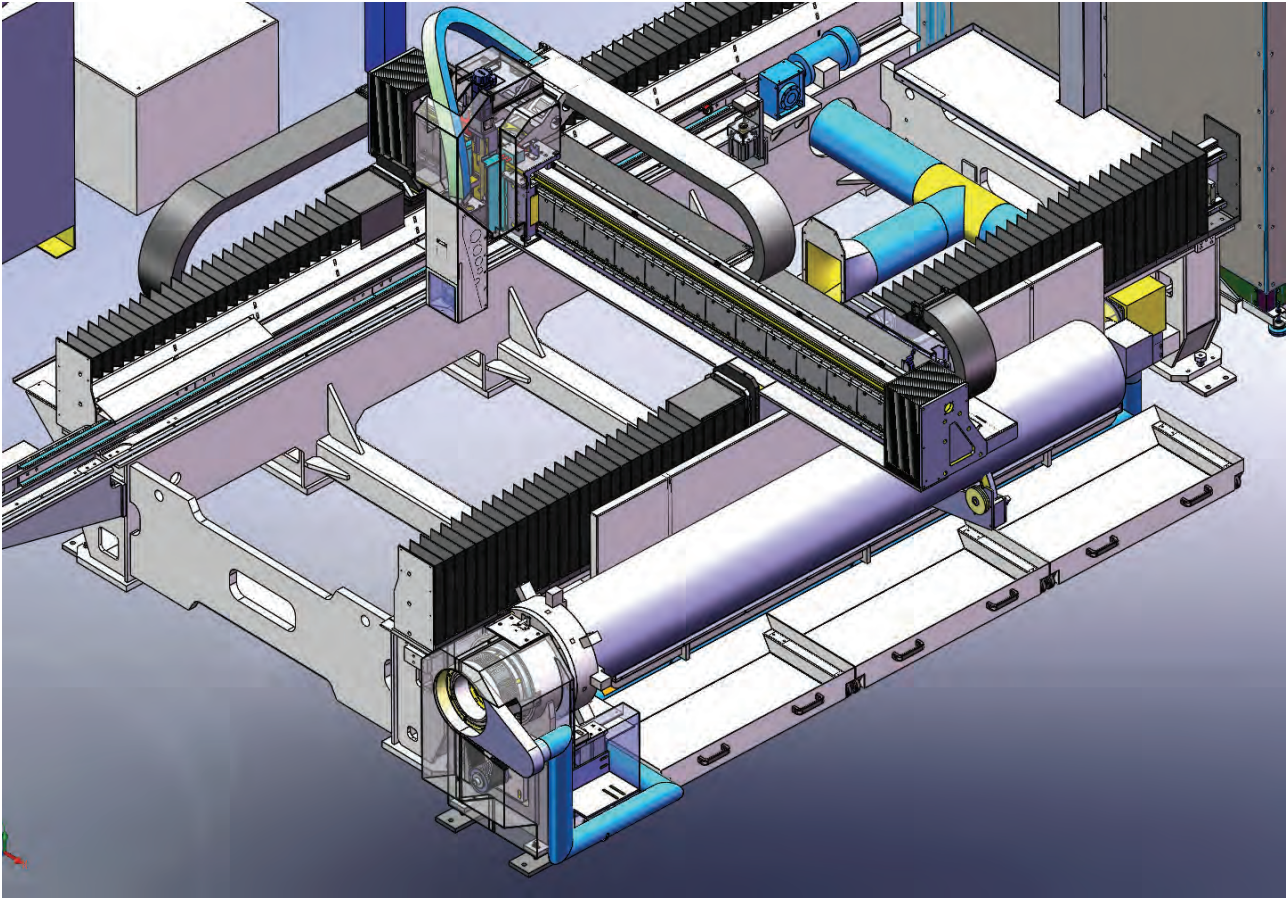
(with pipe cutting application)



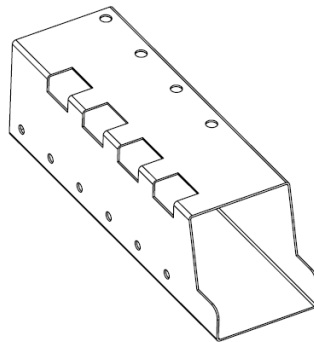
Laser Pipe Cutting Technical Specifications

Cutting length	mm	2600mm
Max pipe loading	Kg/m	120
Laser power source	IPG	1-6 KW
Working diameter	Min/Max	Ø50 / Ø400
Max pipe thickness	mm	Up to 12 mm depending on material and laser power
Square profile cutting	Max	150x150 mm
Maximum positioning speed X/Y	m/min	100
Positioning accuracy	mm	+/-0.1
Repeatability	mm	0.1
Materials		Mild steel/Stainless steel/Aluminum/Copper/Brass
Cutting head	-	Precitec
Dust evacuation and filter	-	Available
Axis motors	-	Siemens
Electrical equipments	-	Siemens or Telemecanique
CNC control	-	Siemens
Software	-	Lantek Flex3D Tube
Network Card	-	Optional
Modem	-	Optional

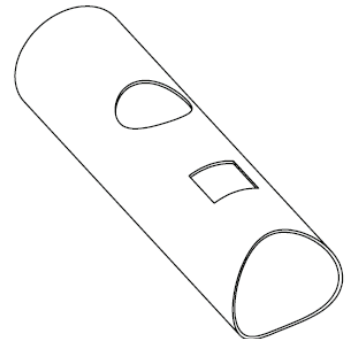




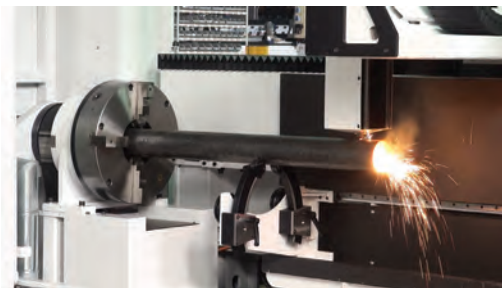
Pipe and tube profile rotation system
 Pipe diameter capacity of $\text{Ø}50$ up to $\text{Ø}400$
 Square profile capacity of 150×150
 Fume extraction connection
 Adjustable support units for pipe and tube profile



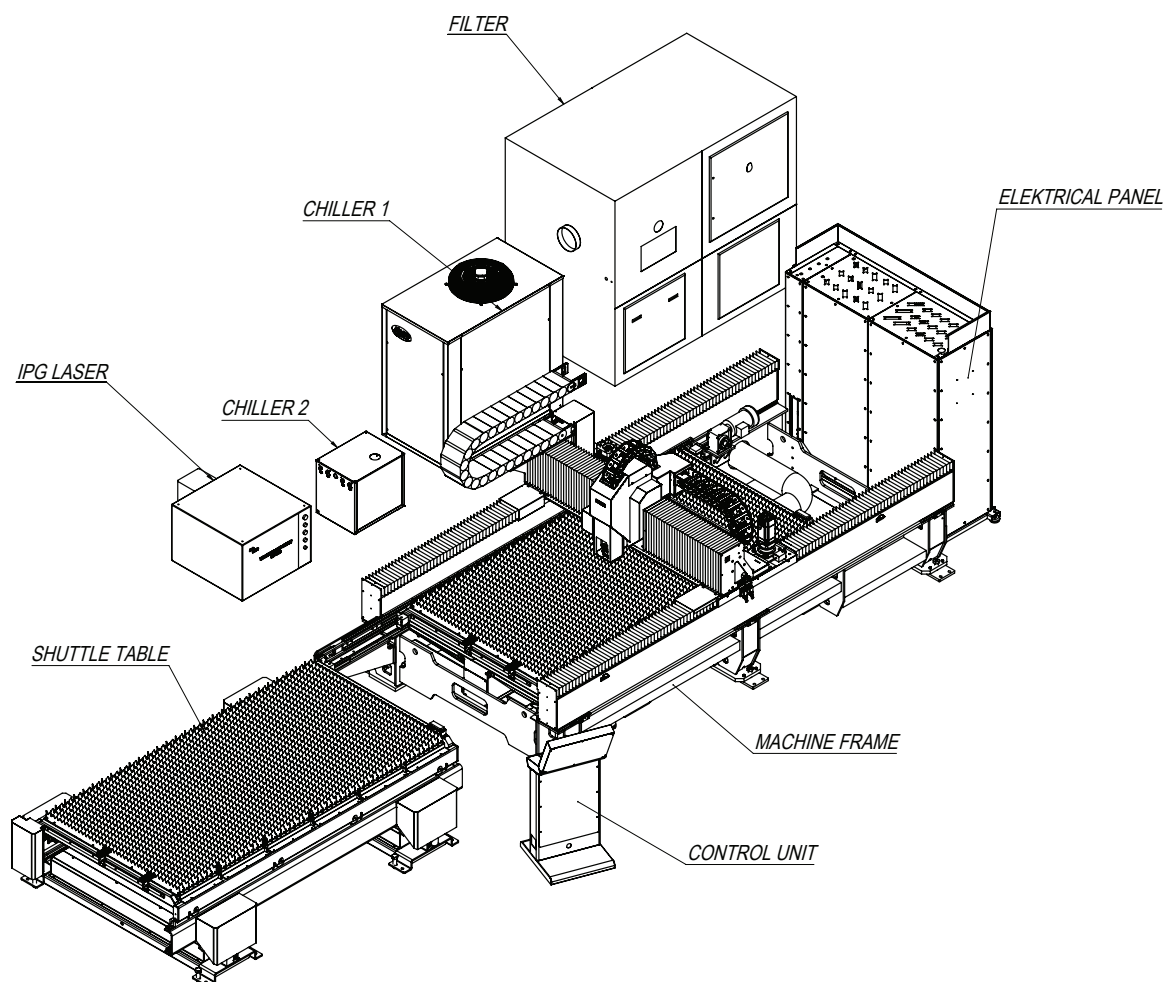
Shapely pipe cutting



Shapely cutting on all faces of tube profile.



HDF / HDFL III 3015 SERIES

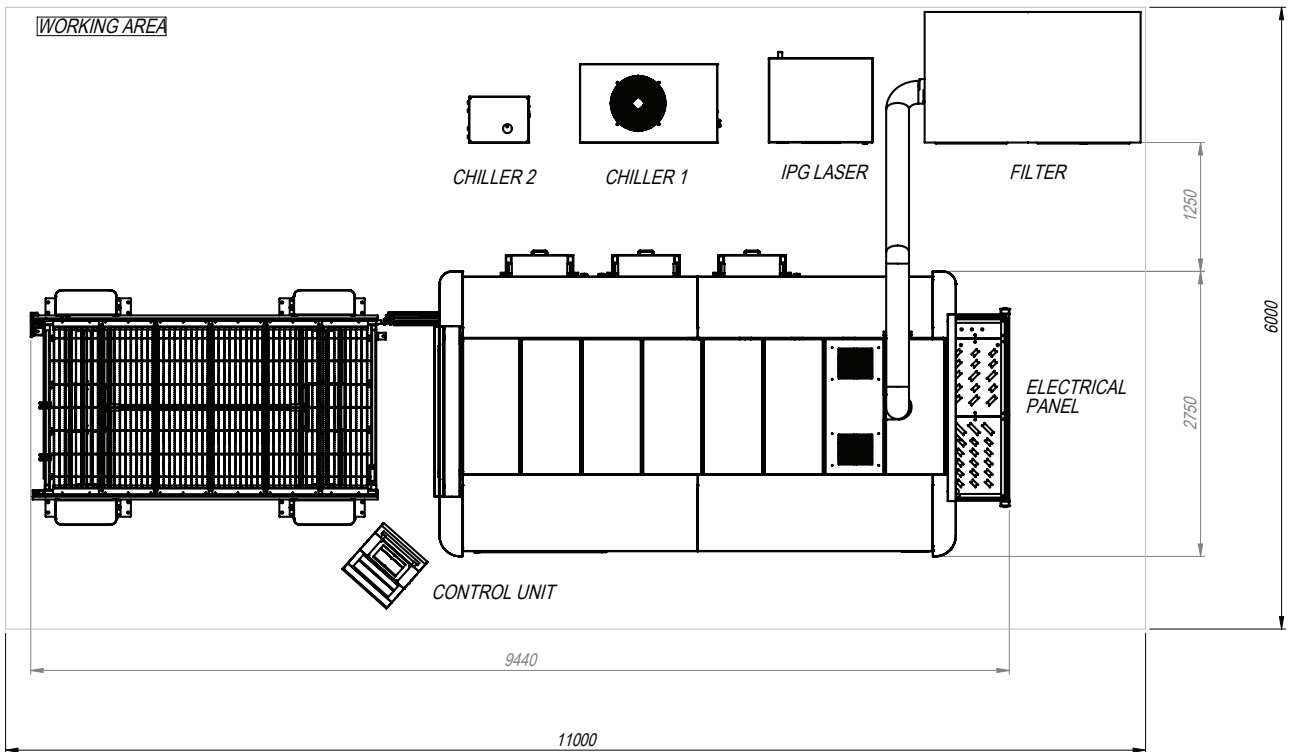
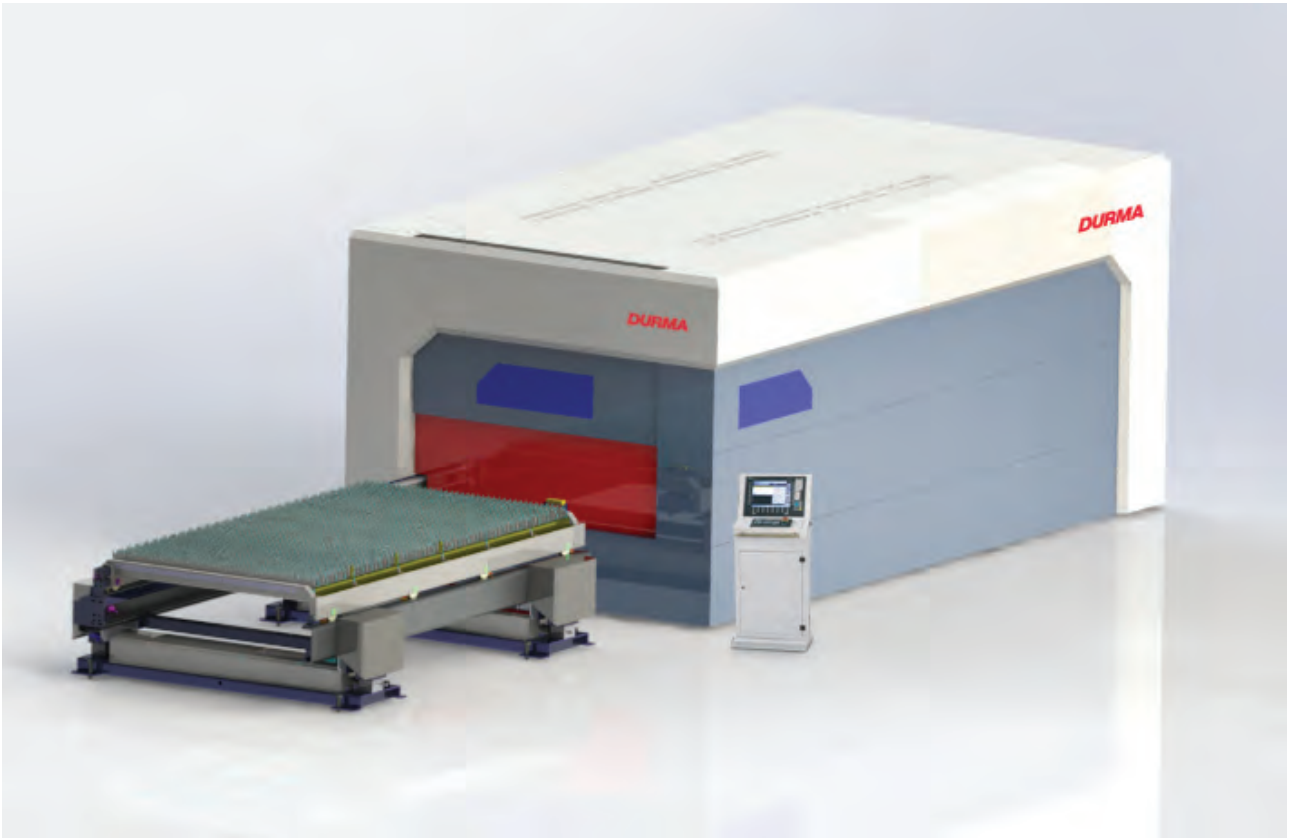


Improvements for Customer

- Smaller layout
- Automatic front door
- Lower level of cutting table
- New cutting head
- Lighter bridge
- Higher acceleration on Z-axis
- Easier and faster assembly
- Less electric consumption with leds for inner lighting

Technical Improvements

- New optical scale
- New suction unit
- New shuttle table
- Faster table change
- Protection for Z-ballscrew
- Better connection between X and Y axis (for linear machine)



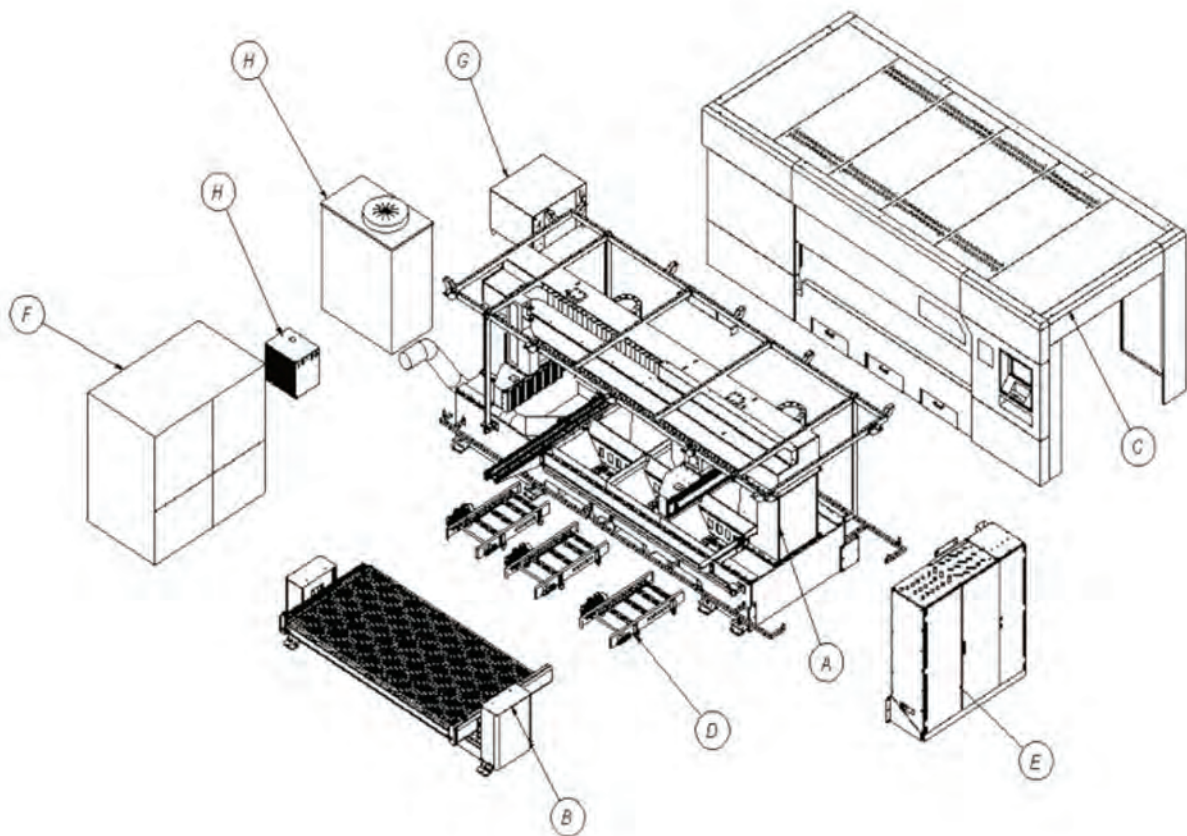
HDF III TECHNICAL DATA

HDF III 3015				
X Axis	3060 mm			
Y Axis	1530 mm			
Z Axis	125 mm			
Max. Sheet Size	3048x1524 mm			
Max. Sheet Weight	200 Kg/m ²			
Rack&Pinion				
X Axis	100 m/min.			
Y Axis	100 m/min.			
Synchronous	141 m/min.			
Acceleration	14 m/s ²			
Positional Accuracy	±0,05 mm			
Repeatability	±0,05 mm			
Filter VANTERM PL 2500				
Power	4.0 kW			
Capacity	2500 m ³ /h			
Max. Cutting Thickness Depending on Laser Power				
	YLS-1000	YLS-2000	YLS-3000	YLS-4000
Mild Steel (mm)	8	12	16	20
Stainless Steel (mm)	4	6	8	10
Aluminium (AlMg3 / mm)	4	6	8	12
Brass (mm)	4	6	8	10
Copper (mm)	2	3	5	6
Cutting Head (Precitec)				
	YLS-1000	YLS-2000	YLS-3000	YLS-4000
Laser Cutting Head	LightCutter	ProCutter	ProCutter	ProCutter
Focus	Manual	Automatic	Automatic	Automatic
Electrical Consumption				
	YLS-1000	YLS-2000	YLS-3000	YLS-4000
Electrical panel (kW)	20	20	20	20
Filter (kW)	4	4	4	4
Chiller (kW)	7	10+1	14+1	14+1
Resonator (kW)	3,9	7	10	13
Total	34,5 kW	42 kW	49 kW	52 kW

HDFL III TECHNICAL DATA

	HDFL III 3015				
X Axis	3060				mm
Y Axis	1530				mm
Z Axis	125				mm
Max. Sheet Size	3048x1524				mm
Max. Sheet Weight	200				Kg/m ²
	Linear Motors				
X Axis	200				m/min.
Y Axis	200				m/min.
Synchronous	282				m/min.
Acceleration	28				m/s ²
Positional Accuracy	±0,02				mm
Repeatability	±0,02				mm
Filter	VANTERM PL 2500				
Power	4.0				kW
Capacity	2500				m ³ /h
Max. Cutting Thickness Depending on Laser Power					
	YLS-1000	YLS-2000	YLS-3000	YLS-4000	
Mild Steel (mm)	8	12	16	20	
Stainless Steel (mm)	4	6	8	10	
Aluminium (AlMg3 / mm)	4	6	8	12	
Brass (mm)	4	6	8	10	
Copper (mm)	2	3	5	6	
Cutting Head (Precitec)					
	YLS-1000	YLS-2000	YLS-3000	YLS-4000	
Laser Cutting Head	LightCutter	ProCutter	ProCutter	ProCutter	
Focus	Manual	Automatic	Automatic	Automatic	
Electrical Consumption					
	YLS-1000	YLS-2000	YLS-3000	YLS-4000	
Electrical panel (kW)	38	38	38	38	
Filter (kW)	4	4	4	4	
Chiller (kW)	7	10+1	14+1	14+1	
Resonator (kW)	3,9	7	10	13	
Total	52,5 kW	60 kW	67 kW	70 kW	

HDFS 3015 SERIES



A Machine Frame

B Shuttle Table

C Machine Cabin

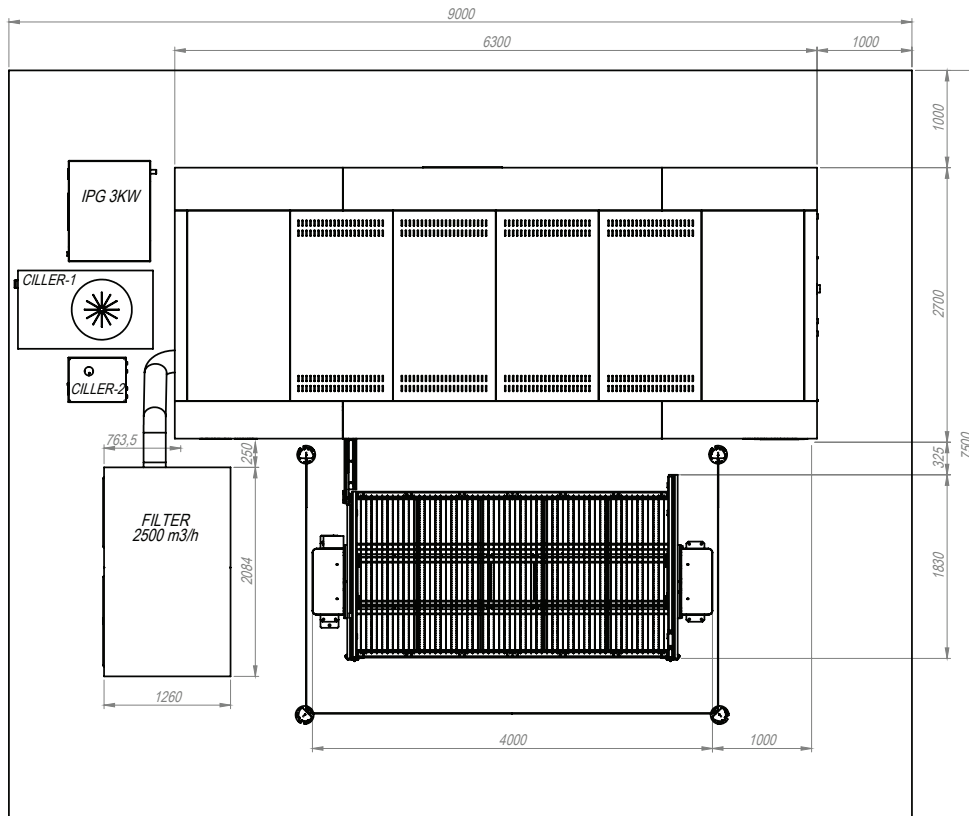
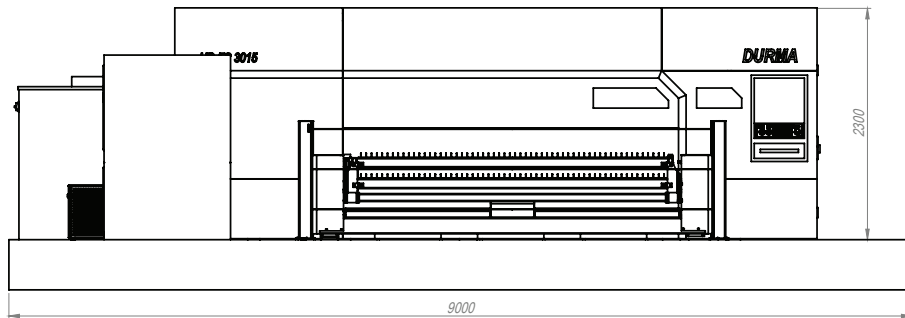
D Scrap Conveyor

E Electric Panel

F Filter

G Resonator

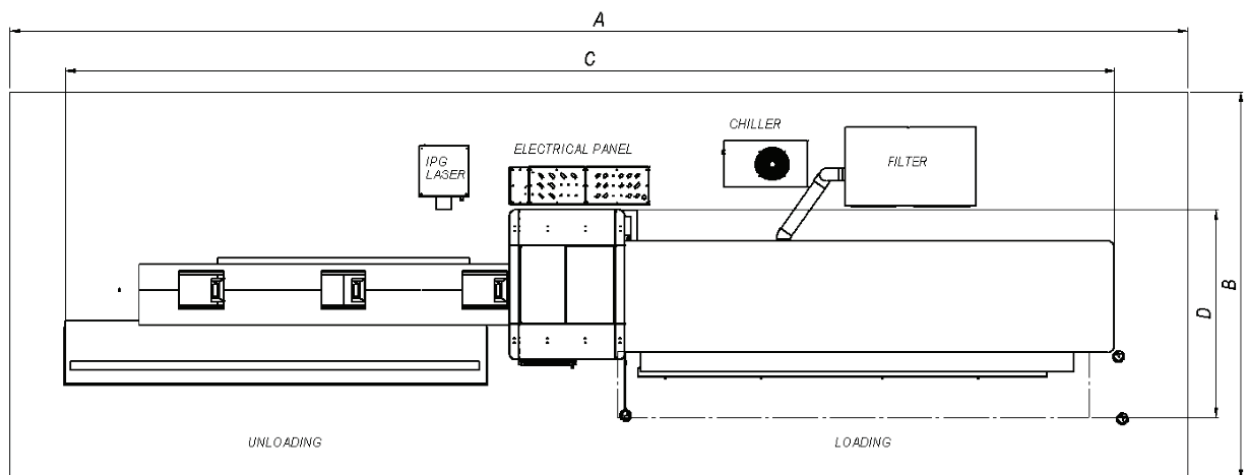
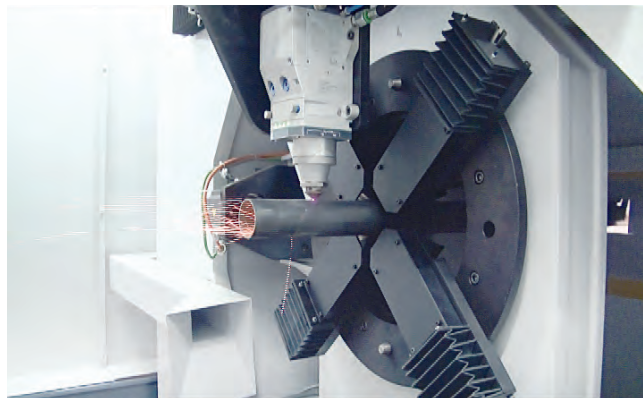
H Chiller



TECHNICAL DATA

	HDFS 3015				
X Axis	3100				mm
Y Axis	1550				mm
Z Axis	125				mm
Max. Sheet Size	3000x1500				mm
Max. Sheet Weight	200				Kg/m ²
	Rack&Pinion				
X Axis	85				m/min.
Y Axis	85				m/min.
Synchronous	120				m/min.
Acceleration	10				m/s ²
Positional Accuracy	±0,05				mm
Repeatability	±0,05				mm
Filter	VANTERM PL 2500				
Power	4.0				kW
Capacity	2500				m ³ /h
Max. Cutting Thickness Depending on Laser Power					
	YLS-500	YLS-1000	YLS-2000	YLS-3000	
Mild Steel (mm)	4	8	12	16	
Stainless Steel (mm)	2	4	6	8	
Aluminium (AlMg3 / mm)	2	4	6	8	
Brass (mm)	2	4	6	8	
Copper (mm)	1	2	3	5	
Cutting Head (Precitec)					
	YLS-500	YLS-1000	YLS-2000	YLS-3000	
Laser Cutting Head	LightCutter	LightCutter	ProCutter	ProCutter	
Focus	Manual	Manual	Automatic	Automatic	
Electrical Consumption					
	YLS-500	YLS-1000	YLS-2000	YLS-3000	
Electrical panel (kW)	20	20	20	20	
Filter (kW)	4	4	4	4	
Chiller (kW)	-	7	10+1	14+1	
Resonator (kW)	1,9	3,9	7	10	
Total	25,9 kW	34,5 kW	42 kW	49 kW	

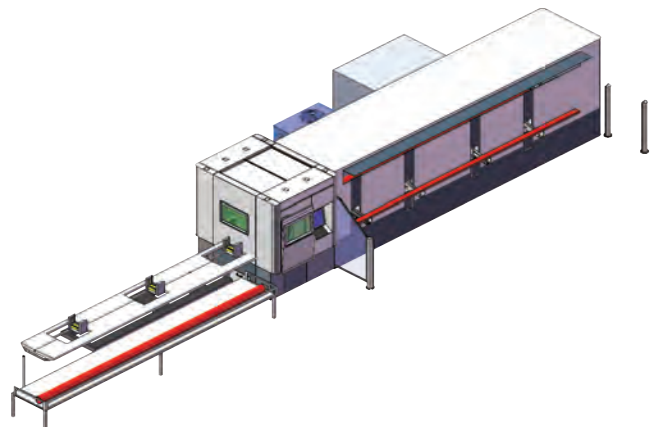
HDTC 60170 TUBE CUTTING



A	B	C	D	H	W
18.800mm	6.200mm	16.700mm	3.300mm	2.420mm	14.000kg

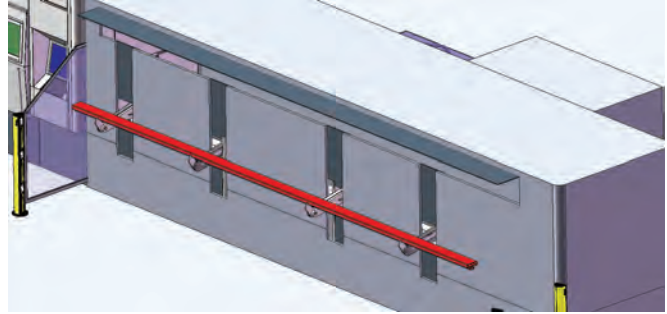
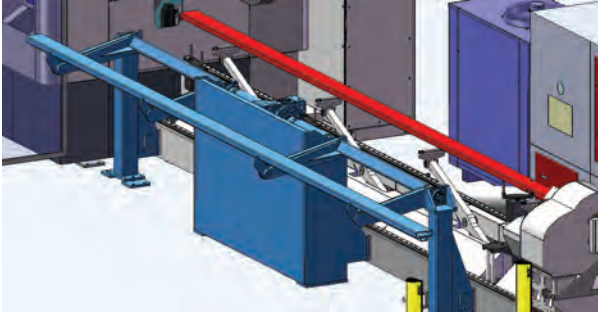
TECHNICAL DATA

Tube Cutting Technical Specifications	
Maximum pipe diameter (mm)	Ø170
Maximum square profile dimension	120x120
Maximum rectangular profile dimension (mm)	150x100
Min. pipe-profile diameter (mm)	Ø25
Max. Profile length (mm)	6500
Min. profile length (for automatic loading)	2700
Max. Profile weight (kg/m)	37,5
Max. Material thickness (mm) (for 2 kW)	8
Min. Material thickness (mm)	0,8
Automatic loading	Yes
Automatic unloading	Yes
Cutting Head	2D
Driver mirror amount	1
Centering mirror	Var
Last cut profile left length (mm)	85
Driver mirror linear velocity (m/min.)	120
Driver mirror linear acceleration (m/s ²)	10
Accuracy (mm)	±0,05
Repeatability (mm)	±0,05
Profiles can be cut	Round, Square, Rectangular H, C, U, L



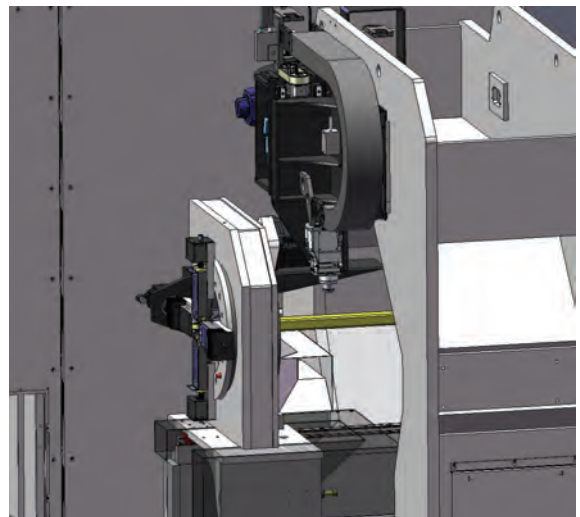
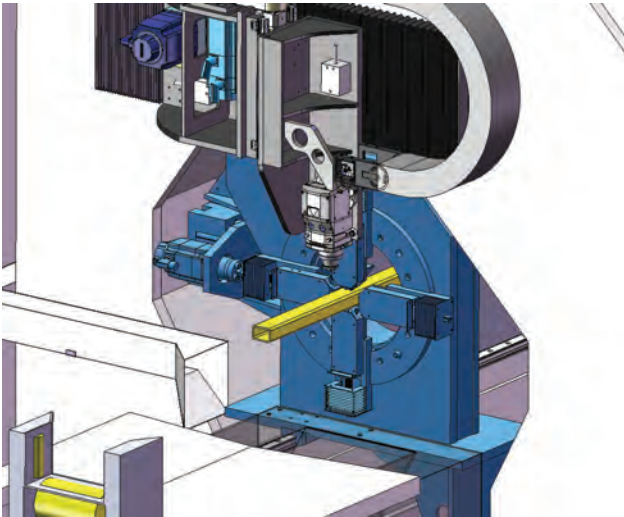
LOADING ARM

Profile loading is made by Loading arms outside the cover.
Profile that placed to loading arm automatically move to cutting area and centered.
During cutting next profile placed to the loading arm to save time.
During loading covers open and after loading closed for protection from laser beam.
Light barrier for loading arm does not stop the machine, only stops the loading arm.



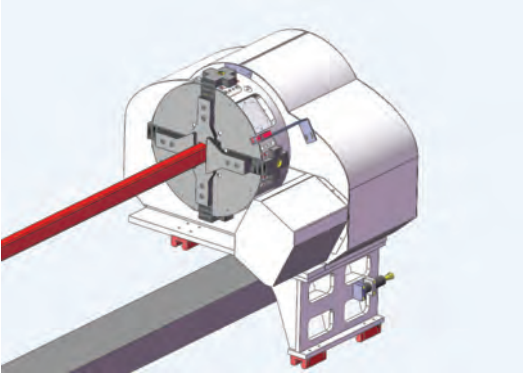
CENTERING MIRROR

To get cutting precision, centers the profile as close as possible to cutting head.
Driver turn synchronized with mirror.
4 independent clamps come to position automatically before profile comes.
Centering mirror moves forward and backward on rack and pinion. Because of forward move laser head goes behind the mirror and min. Left material achieved on last profile cut.
Because of backward move with sensor at mirror, loaded profile zero point measured and send to the system.



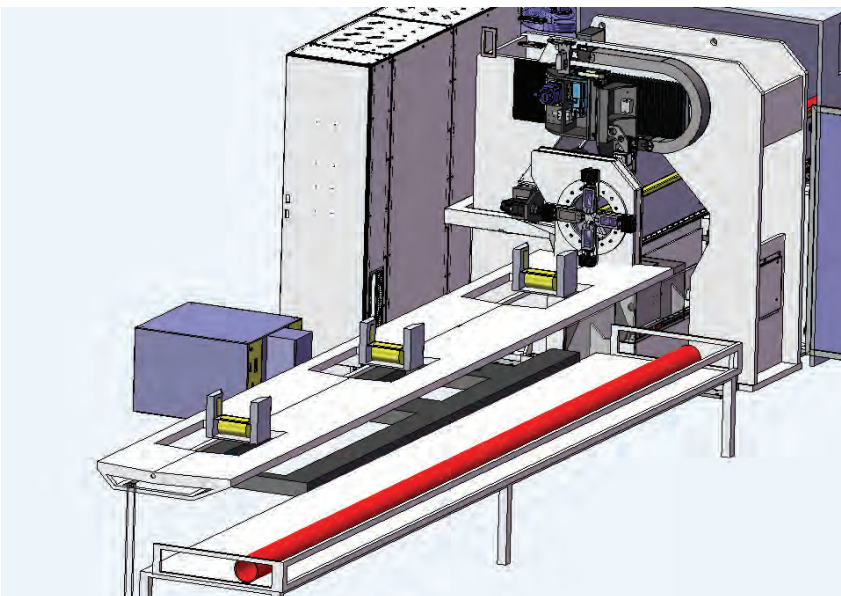
HYDRAULIC PROFILE HOLDER

It can hold variety of profiles by 4 clamps working independently as 2+2.
Adjust hydraulic pressure automatically according to profile material thickness.
With laser sensor on it measures profile length and send the data to the system.



UNLOADING UNIT

Unloading unit support mechanism height controlled by servo motor and keep supporting profile during cutting.
Because of unloading table that moves forward and backward through profile, cut profile parts can be released to different table according to their lengths.



DURMA



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