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# ACE Laser

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## LASER CUTTING MACHINES

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*Model shown: ACE Laser2040 with 6.000 mm length tube cutting system.  
Housing design might vary depending on the size and optional accessories.*

**ROBUST DESIGN WITH HIGH QUALITY COMPONENTS**

**COMPLETE CUTTING PACKAGE**

**48 HOURS SERVICE FOR SOURCE AND CUTTING HEAD\*\***

**MAXIMUM EFFICIENCY AT AN AFFORDABLE PRICE**

*\*\*Valid only in Germany*

**ACE Laser Cutting Systems  
series 1530 2040**

**Art.- Nr.** 141010 141011 141012  
141013 141014 141015  
141016 141017 141018  
141019

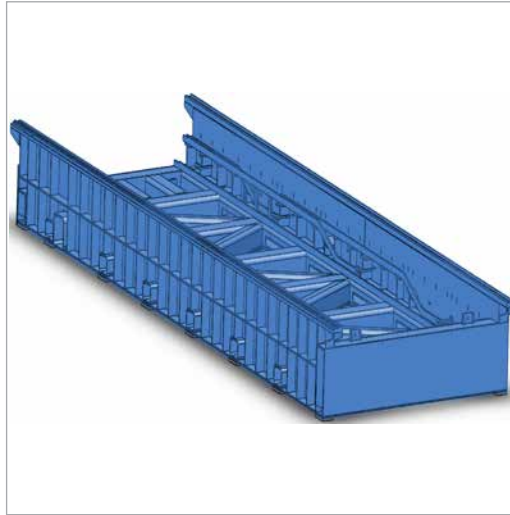
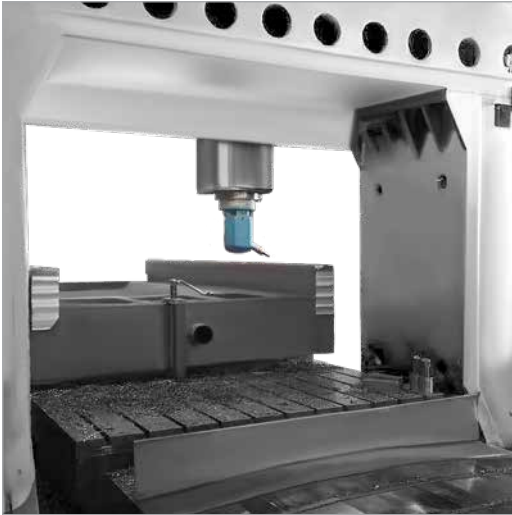
» The ACE laser is more than a machine, it's a cutting system that sets new standards in price and performance. It is fully customer oriented, designed for high performance and excellent part quality.

» It also fulfills your needs for productivity, safety and reliability. Extensive standard equipment gives users total operational control and versatility.

» These features make the ACE Laser the optimal choice for industrial laser cutting applications, from metal fabrication jobs for small shops to large series production for electronics, aerospace or automotive.

Main Features

Cutting table



- Machine design adopts latest technology standards. Lower body consists of a thoroughly welded frame from high quality steel, which is machined with modern industrial equipment to reach very high tolerance requirements.

- The side walls are reinforced to increase the structural rigidity. The customer can rely on a long-term and reproducible cutting-edge accuracy.

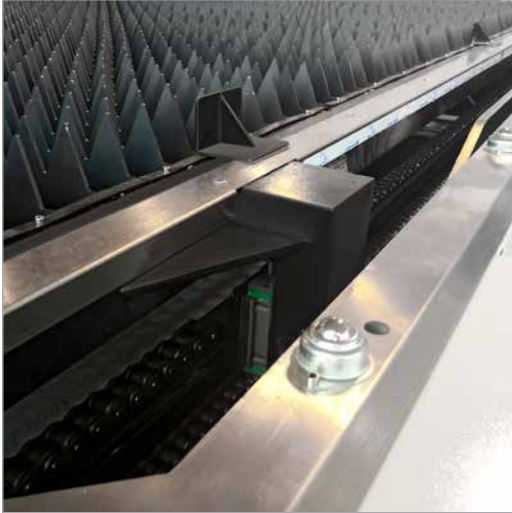


- A thermal treatment is applied to the welded machine frame and all structural parts. This eliminates all production-related material stresses – ensuring long-lasting, precise alignment of all components.

- All guideways and racks are fully covered with high quality bellows, which protects against premature wear, while keeping away dust, slag and small cut parts.

## Main Features

### Cutting table



- Workpiece weight is supported by brackets. After usage, they can be replaced via KNUTH, or can be machined by the customer. The DXF file for the brackets as well for the strips are already saved in the CNC control.



- Machine is equipped standard with lateral scrap drawers which allow the removal of small sized parts and waste material without interrupting the cutting process.

### Bridge



- This laser cutting system features a gantry type construction with drives on both sides and a large working area that can accommodate most common plate sizes.



- The Y axis bridge is made from high quality aerospace aluminum die-cast construction with low weight and high rigidity for excellent dynamics.
- An automatic centralized lubrication system is installed on the gantry, which increases machine reliability and minimizes service requirements.

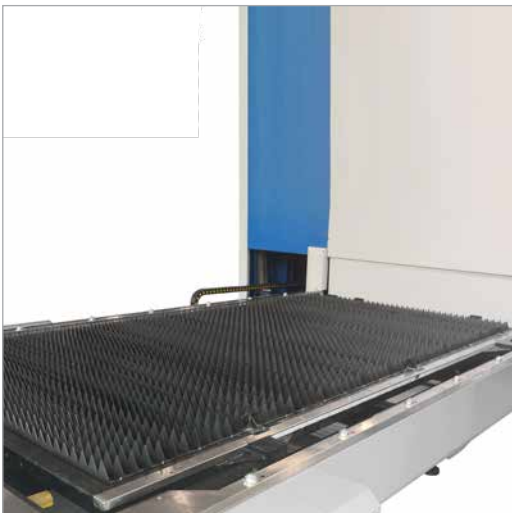
## Main Features

### Machine housing



- For the safety of people and the environment, the cutting system is equipped with a fully enclosed housing and filter extraction system.
- Front doors are equipped with windows with special protective glass, allowing the cutting area to be viewed without the laser beam escaping the enclosure.
- The design of the housing is very ergonomic for loading and unloading sheet metal plates. It features two front doors and large sliding doors on the right side. These doors have interlock system; opening them during operation will stop the machine.
- The design shown is for model including tube cutting system. Models without this option might have a slightly different housing design.

### Automatic Exchange Table



- The automatic exchange table system minimizes production downtimes, since the table can be loaded and unloaded during the cutting process.
- Using European technology, the pallet exchanging is done very fast and smoothly, via chain transmission, under 18 seconds.
- Secondary command panel at the backside of the machine with basic commands for controlling the exchange table.

## Main Features

### Kinematics



- High-performance Schneider Electric servo motors and drives on all axes enable fast and accurate positioning and support high-speed movement. Offering more than just improved performance, these servos are designed to drive the industries of tomorrow due to their long life, maintenance free and energy-efficient design.



- The transmission on X and Y axes is done using high quality helical rack and pinion from the Taiwanese supplier - KAI HE. This low-wear and low maintenance drive system easily handles heavy load capacities and duty cycles due to a higher contact ratio (number of effective teeth engaged).



- Low-backlash gearboxes offer high output in a compact design. As a result, they have high stiffness and overload capacity. They also have lifetime lubrication making them maintenance free and reliable.



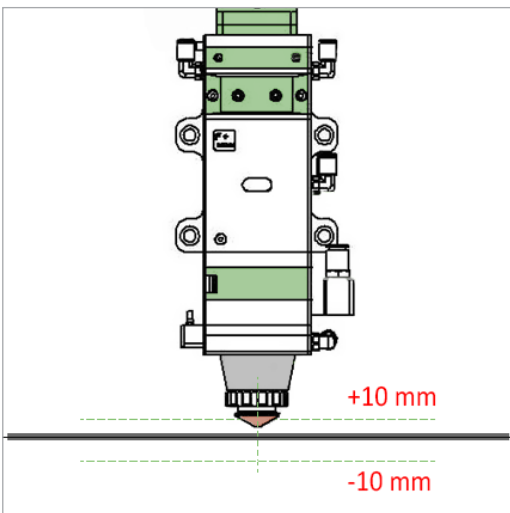
- Special linear guide ways from HIWIN on all axes, designed for large load capacity with high rigidity. They feature equal load ratings in the radial, reverse radial and lateral directions, and are self-aligning to absorb installation-error. They are designed for long life and smooth linear motion even at high speeds.

Main Features

**RayTools Cutting Head**



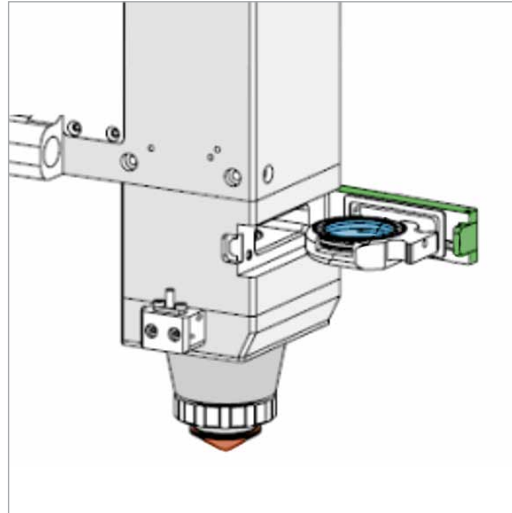
- High-quality cutter head made by the Swiss brand RayTools which comes with built-in motor and linear drive assuring a precise motorized focus position adjustment.
- The compact structure allows it to travel at high speed along the gantry on high quality linear guides with ball screws transmission.



- Focus lens can automatically change the position in the range of 25 mm (+10 ~ -10 mm) with adjustment accuracy of 0,05 mm. The user can set the focus continuously through the program to complete multiple paths of different thicknesses.
- Equipped standard with crash sensor which protects the head from collisions with the cut parts or the workpiece.

## Main Features

### RayTools Cutting Head



- Cutting head features optimized design which includes closed loop water cooling for collimation and focusing lenses to prevent heating and increase stability when working with high power lasers.

- Laser beam is guided by a flexible fiber optic cable which is maintenance-free and ensures a long tool life.
- The drawer type lens holder makes the replacement of protective lenses easy and quick.



- Cutting head uses a high quality nozzle with high pressure air flow cooling and ceramic body. The large clear aperture lens group effectively reduces stray light interference, guaranteeing high cutting quality.

- Cutting head includes interface on the CNC unit for various parameter optimization, predefined by KNUTH, very efficient when cutting plates which vary in size and material.



## Laser Sources

### Raycus - Laser Sources



- Our machines are equipped with high-power continuous fiber laser series developed and produced by Raycus. Our standard range spreads from 1.000W to 4.000W, but higher models can be provided upon request.
- Raycus laser sources are known for their high electro-optical conversion efficiency, high light beam quality, high energy density, wide modulation frequency and high reliability.
- This series product meets the demand of most application scenarios, on multiple control models.
- Optimized optical system of the product with output boost of the fiber laser, better facilitating customer's cutting requirements.
- The maintenance-free laser source significantly reduces maintenance and operating cost.

### Technical data

Laser source		1.000	1500	2000	3300	4000
Wavelength	µm	1,08 ± 10%				
Output power	kW	1.000	1.500	2.000	3.300	4.000
Power consumption	kW	14	17	20	28	32
Operation mode		CW / modulate				
Pulse frequency	Hz	5 - 20k				
Output power stability	%	< 3%				
Output fiber diameter	µm	100				
Supply voltage		AC 380V ± 10%, 50/60Hz, 3xL+N				
Cutting capacity in structural steel	mm	8	10	12	16	18
Cutting capacity in stainless steel	mm	4	5	6	8	12
Cutting capacity in aluminum	mm	2	4	5	6	10

*We reserve the right to change specifications without prior notice*

## Laser Sources

### Cutting Parameters

Material	Thickness	1.000 W	1.500 W	2.000 W	3.300 W	4.000 W
Carbon Steel	mm	Oxygen				
		m/min	m/min	m/min	m/min	m/min
	1	10 - 16	10 - 16	10 - 16	10 - 16	10 - 16
	2	5,0 - 6,0	5,0 - 8,0	5,0 - 8,0	5,0 - 8,0	5,0 - 8,0
	3	2,5 - 3,5	3,0 - 4,0	3,0 - 4,0	3,0 - 5,0	3,0 - 5,0
	5	1,2 - 1,8	1,5 - 1,8	2,5 - 3,0	3,0 - 3,5	3,0 - 3,5
	6	1,0 - 1,5	1,3 - 1,5	1,8 - 2,5	2,0 - 2,8	2,5 - 3,0
	8	0,8 - 1,0	1,0 - 1,2	1,6 - 2,0	1,8 - 2,2	2,0 - 2,5
	10	0,5 - 0,7	0,8 - 1,1	1,0 - 1,2	1,1 - 1,3	1,2 - 1,4
	12		0,7 - 0,8	0,8 - 1,0	0,9 - 1,1	1,0 - 1,2
	14			0,6 - 0,8	0,7 - 0,9	0,8 - 1,0
	16				0,6 - 0,8	0,6 - 0,8
18				0,5 - 0,7	0,6 - 0,7	
20					0,5 - 0,6	

We reserve the right to change specifications without prior notice

Material	Thickness	1.000 W		1.500 W		2.000 W		3.300 W		4.000 W	
Stainless Steel	mm	m/min		m/min		m/min		m/min		m/min	
		N2	Air	N2	Air	N2	Air	N2	Air	N2	Air
	1	20 - 24	22 - 26	30 - 35	32 - 38	35 - 40	33 - 38	35 - 45	38 - 48	40 - 50	40 - 50
	2	6,0 - 7,0	6,0 - 8,0	9,0 - 10	10 - 12	14 - 16	15 - 17	14 - 16	15 - 17	21 - 23	22 - 25
	3	2,0 - 3,0	2,5 - 3,5	4,0 - 5,0	4,5 - 5,5	5,0 - 6,5	6,0 - 7,0	8,0 - 9,0	9,0 - 10	12 - 14	14 - 16
	4	1,0 - 1,5	1,2 - 1,8	2,0 - 3,0	2,5 - 3,5	3,0 - 4,0	4,0 - 5,0	4,0 - 5,0	5,0 - 6,0	6,0 - 8,0	8,0 - 10
	5	0,5 - 0,8	0,6 - 0,9	1,0 - 1,5	1,2 - 1,8	1,5 - 2,5	2,0 - 3,0	2,5 - 3,3	3,0 - 4,0	4,5 - 5,0	5,0 - 6,0
	6			0,7 - 1,0	0,8 - 1,2	1,2 - 1,5	1,5 - 2,0	1,6 - 2,1	2,0 - 2,5	2,7 - 3,2	3,0 - 3,5
	8					0,6 - 0,8	0,7 - 1,0	0,9 - 1,2	1,0 - 1,5	1,3 - 1,6	1,5 - 2,0
	10							0,6 - 0,8	0,7 - 0,9	1,0 - 1,2	1,2 - 1,5
	12									0,7 - 0,8	0,8 - 1,0
	14									0,6 - 0,7	0,7 - 0,8
16									0,4 - 0,5	0,5 - 0,6	

We reserve the right to change specifications without prior notice

Bigger cutting speeds can be achieved when using Nitrogen

For simple shapes and small production

Maximum cutting thickness, only for sampling, not for production

## Laser Sources

### Cutting Parameters

Material	Thickness mm	1.000 W		1.500 W		2.000 W		3.300 W		4.000 W	
		m/min		m/min		m/min		m/min		m/min	
		N2	Air	N2	Air	N2	Air	N2	Air	N2	Air
Aluminum	1	10 - 14	10 - 14	16 - 20	16 - 20	25 - 30	25 - 30	30 - 35	30 - 35	35 - 40	35 - 40
	2	2,0 - 4,0	2,0 - 4,0	6,0 - 8,0	6,0 - 8,0	10 - 12	10 - 12	12 - 14	12 - 14	16 - 20	16 - 20
	3	0,5 - 1,0	0,5 - 1,0	2,0 - 3,0	2,0 - 3,0	4,5 - 5,0	4,5 - 5,0	7,0 - 7,5	7,0 - 7,5	10 - 12	10 - 12
	4			1,2 - 1,8	1,2 - 1,8	2,5 - 3,0	2,5 - 3,0	5,0 - 6,5	5,0 - 6,5	6,5 - 7,0	6,5 - 7,0
	5			0,5 - 1,0	0,8 - 1,0	1,0 - 2,0	1,0 - 2,0	3,0 - 3,5	3,0 - 3,5	4,0 - 5,0	4,0 - 5,0
	6					0,8 - 1,0	0,8 - 1,0	1,8 - 2,0	1,8 - 2,0	2,5 - 3,0	2,5 - 3,0
	8							0,9 - 1,0	0,9 - 1,0	1,0 - 1,5	1,0 - 1,5
	10									0,8 - 1,0	0,8 - 1,0
	12									0,6 - 0,8	0,6 - 0,8

We reserve the right to change specifications without prior notice

Material	Thickness mm	1.000 W		1.500 W		2.000 W		3.300 W		4.000 W	
		m/min		m/min		m/min		m/min		m/min	
		Nitrogen									
Brass	1	10 - 14		14 - 18		18 - 24		25 - 33		35 - 40	
	2	2,0 - 4,0		5,0 - 6,0		7,0 - 10		10 - 14		12 - 14	
	3	0,5 - 1,0		1,5 - 2,5		3,0 - 4,5		5,0 - 7,0		8,0 - 10	
	5			1,0 - 1,5		2,0 - 2,5		3,0 - 4,5		5,0 - 6,0	
	6			0,5 - 0,8		0,8 - 1,2		2,0 - 3,5		4,0 - 5,0	
	8					0,6 - 0,8		1,5 - 2,5		2,5 - 3,0	
	10							0,5 - 1,0		1,0 - 1,5	
	12									0,8 - 1,0	

We reserve the right to change specifications without prior notice

For simple shapes and small production

Maximum cutting thickness, only for sampling, not for production

Laser Sources

**Auxiliary Gases For Fiber Laser Cutting**



- The laser cutting process relies on an assist gas, either active or inert. The gases used currently in the industry are oxygen, nitrogen and air.
- Machine is equipped standard with automatic gas console for using oxygen. The solenoid and proportional valves regulate the gas pressures (set in the control) during the cutting process without the interference of the operator.

- **OXYGEN** - this is the most commonly used gas, especially when working with carbon steel. Being an active gas, during the cutting process the reaction between oxygen and metal generates additional energy, giving more heat to the process, allowing you to cut thicker plates.
- At the same time it is very important to have an optimized control - too much pressure will decrease cutting quality.

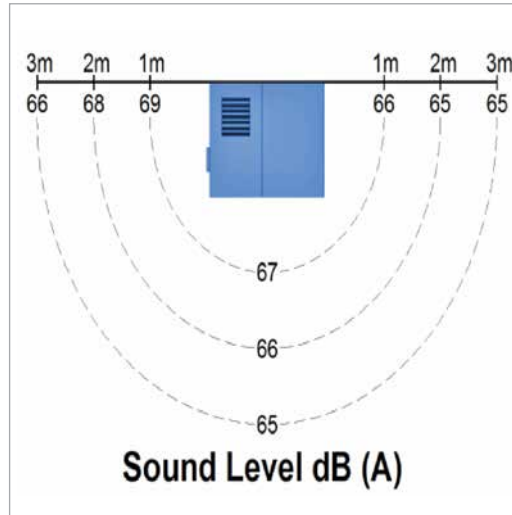


- **NITROGEN** – this non-reactive gas is mostly used for stainless steel and it is usually referred to clean cutting gas. Being an inert gas, it doesn't react with the metal, material removal being done only by the laser power. Therefore the cutting capacities are lower.
- At the same time, increasing gas pressure will result in higher cutting speeds. But the process is limited by the cooling effect of the high pressure gas.

- **AIR** - although not a new concept, it recently has become very popular mainly because of its low cost. Compared with N2, air assisted cuts are around 20% less in quality, but the cost reductions can reach up to 50%.
- The choice of the assist gas is determined by the type of applications. Clearly air is not the best gas for all instances, there are cutting jobs for which nitrogen or oxygen offer a better solution.

Dust collector and filtration unit

**VANTERM PL-Series**



- Machine comes standard with a dust collector and filtration unit which protects the operator and the environment against the noxious emissions from cutting operations.
- With compact design and minimal set-up time, these dust collectors are delivered as ready-to-operate (Plug-n-Play) units.
- With built-in fan with silencer, the sound level is extremely low, less than 69 dB(A).

**Filter elements**



- PL-Series features very high-quality filter units which are W3 Dedusting Class certified, best possible filtration level in today's technology.
- Filter element's average lifetime is 20.000 hours and have proven their efficiency with thousands of applications all over the world.
- Thanks to the HEPA 14 filter quality of VANTERM Panel Filter Technology, PL Dust collectors separate the ultra-fine dust particles including as small as 0,12 microns with 99,997% filtration efficiency.
- Filters are ePTFE membrane laminated which facilitates an easy dust release and long lifetime.

## Dust collector and filtration unit

### Functions



- This is a highly effective unit, synchronized with the CNC machine, specially designed for extraction and filtration of dust and fumes generated during cutting operations. It starts and stops with the machine and shares fault signals.

- Standard features include a spark separator function. This has double functionality: to cool down the cutting residuum and to remove (by cyclonic separation) the bigger parts to prevent damage to the filters.



- Additional integrated functions can be checked via optical sensors on the side control panel.
- Unit features a jet pulse cleaning system. This is controlled automatically and is activated based on the dust load on the filter surface.
- Dust level of the filter elements is shown in real-time by the top manometer.

- User friendly dust bin design which allows easy change in just a few minutes.
- Operators only clamp / unclamp the bin without having any contact with the hazardous dust particles.

## Tube Cutting System (OPTIONAL)

### Machine integration



- Option can only be ordered at the same time with the machine due to the changes required in machine design. There is no retrofitting possibility.
- The bridge is extended so the cutting head can travel up to the tube cutting area.
- Machine housing's width is extended to include the cutting system as well.
- Software update with tube cutting module - CypTube.
- This option allows you to extend your production range to cutting tubes as well. There are two sizes available:
  - » up to Ø150 mm pipe diameter with 3.000 mm length.
  - » up to Ø210 mm pipe diameter with 6.000 mm length.
- Choosing the tube cutting system is not dependent on the cutting length of the machine.

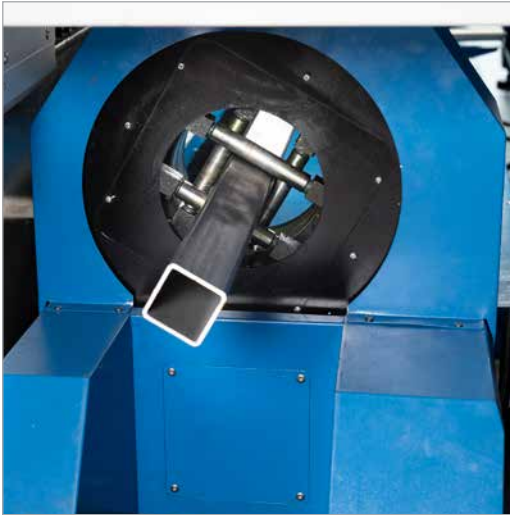
### Headstock



- Robust design of traveling headstock for precise tube positioning and feed.
- It travels smoothly on linear guides which, like the entire travel path are fully covered to prevent possible damage from sparks.
- It features a pneumatic 4-jaw self-centering chuck for fast tube clamping.
- The air pressure from the pneumatic system can be adjusted manually according to profile thickness and material.

Tube Cutting System (OPTIONAL)

**Front chuck and additional supports**



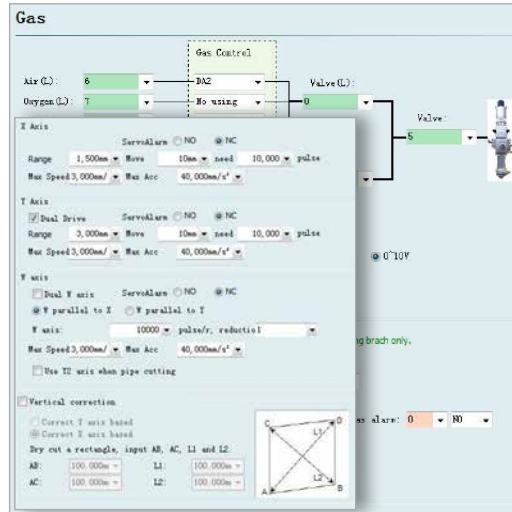
- The special design of the front chuck allows cutting of both round and rectangular profiles. Machine automatically detects the position.
- For the 3 m length model the adjustment of the jaws is done manually, while the 6 m length has motorized jaws.
- To achieve maximum precision and avoid vibrations of the workpiece, this machine features additional pipe supports.
- They are situated on the travel path of the tube and, to avoid collision with the headstock, they are automatically lowered/raised via a pneumatic system.

**Technical data**

<b>Tube cutting system</b>		<b>3000</b>	<b>6000</b>
Tube length	mm	3.000	6.000
Round tube diameter	mm	ø30 - 150	ø20 - 210
Square tube size	mm	30×30 - 105×105	20×20 - 140×140
Minimum tailing size	mm	300	300
<b>Front chuck</b>			
Chuck type		manual clamping	motorized clamping
<b>Rear chuck</b>			
Chuck type		pneumatic	pneumatic
Drive mode		belt drive	gear transmission
Max. rotation speed	rpm	100	100



## Control Unit



- Machine control and operation are done on the main control panel which is located in front of the machine.
- It is a high performance CNC system with short look-ahead processing time and intelligent speed control to provide the best cutting experience.
- Very intuitive and user friendly user interface with various powerful functions.

- KNUTH engineers ensure optimal controlled laser power and cutting process by predefining advanced settings for laser input, focus control, height control and auxiliary gas connections.
- Machine is delivered with preconfigured mechanical parameters like feed speed, pitch compensation, origins, software limits, axis directions, etc.



- Additionally, for quicker and easier workpiece preparation, the machine is delivered standard with MPG.

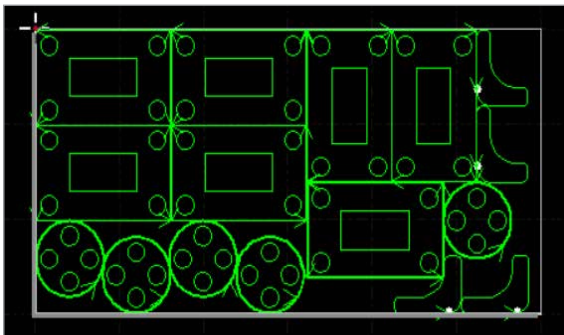
- You can have full visualization of the cutting process through two cameras which provide complete real time monitoring of operations. One is inside the housing, targeted on the cutting process and the second one is in the back, for checking the table exchange system.

## Build in cutting software

### CypCut - Builtin Nesting and Cutting Software

#### General Overview

- Our machine is delivered standard with Cypcut software. It provides all the necessary features and tools to manipulate the design you add, as well as ways to directly send programs to the cutting machine while showing the status about the operation at all times.
- To give the operator the full control of the part production, the software takes you through all steps of the process, from importing the drawing until part cutting.
- Supports remote control through wireless teach box and Ethernet.

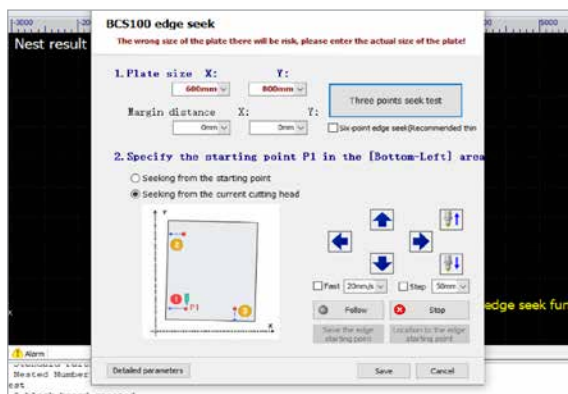


#### File management

- With powerful material library functions, you can keep all processing parameters so that it can be used again for the same material.
- It supports most common file extensions AI, DXF, PLT, Gerber, LXD and other graphic data formats.
- When importing the graphics, CypCut will automatically remove trivial and duplication, combine near as well as automatically smooth, sort and ungroup.

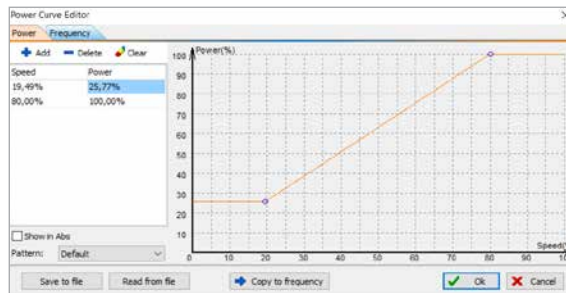
#### Functions

- Automatically seek edge and precise positioning.
- You can easily set the lead, slotted compensation, lead seal without gap, all basic editing functions, like mirror, rotation, alignment and advanced editing functions like curve splitting, curve connection, curve smoothness, text-to-curve, component integration, and many other functions.



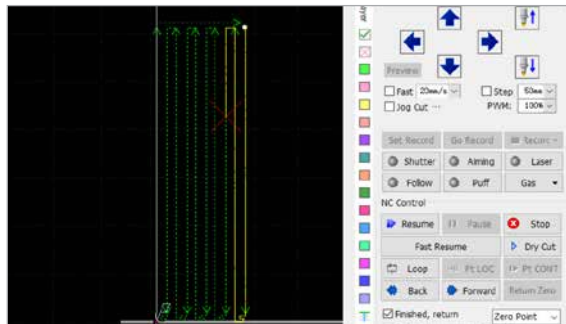
#### Real time laser power adjustment

- It allows you to edit the power curve and frequency in real-time, and to set parameters of slow starting.



#### Breakpoint memory

- With processing breakpoint memory, for tracing the breakpoint forwards and backwards, useful function when processing advanced graphics. Allows you to get positioned at any point of the process, to stop or temporarily stop and start processing from any position.

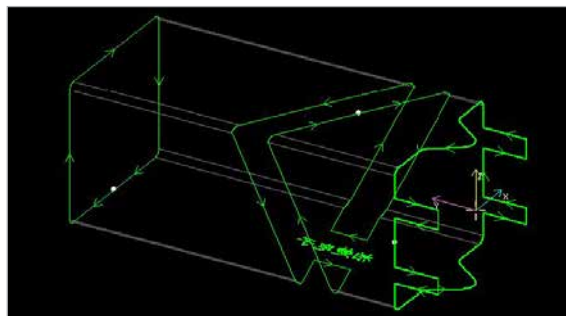


#### Nesting

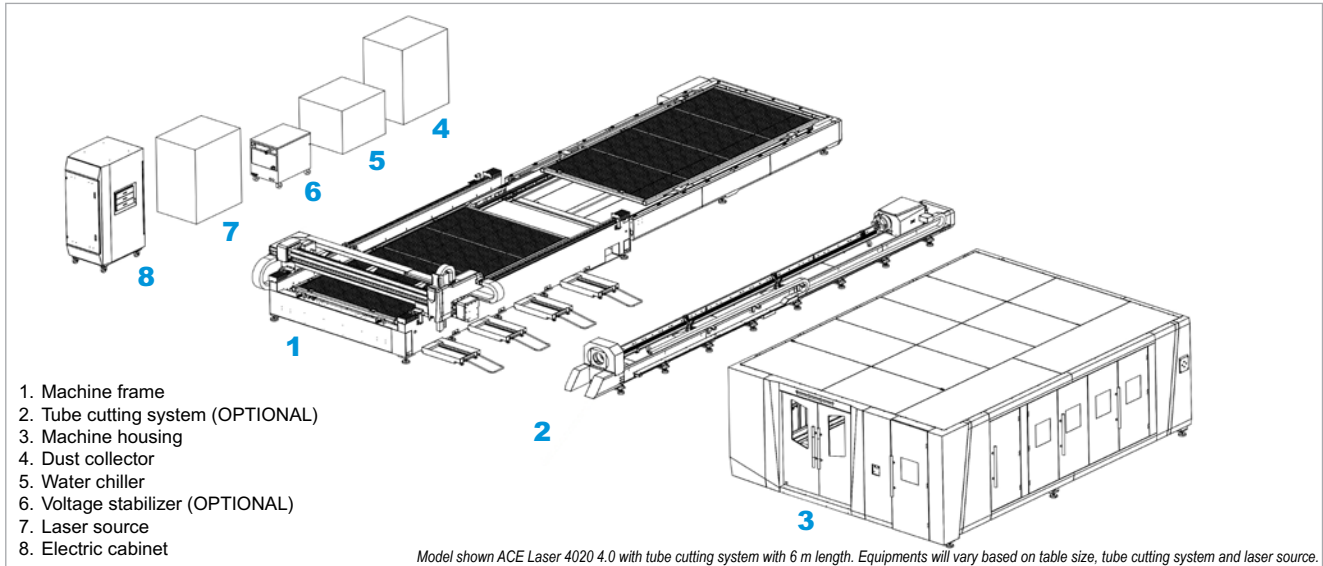
- Time saving automatic nesting with various options which can be tailored according to customer's application and guarantee minimum material loss.
- The software includes several predefined nesting patterns which cover most common cutting scenarios.

#### CypTube Module (Optional)

- This powerful module is used when cutting tubes and is delivered together with the pipe cutting system.
- Programming is done same as in CypCut.



## Technical Data



ACE Laser Series		ACE Laser 3015	ACE Laser 4020								
<b>Working area</b>											
Table dimensions	mm	3.000×1.500	4.000×2.000								
Max. workpiece weight	kg	1.000	1.500								
Axis acceleration X / Y axis	m/s <sup>2</sup>	10	10								
Axis acceleration Z axis	m/s <sup>2</sup>	5	5								
<b>Travels</b>											
Travel X-axis	mm	1.520	2.020								
Travel Y-axis	mm	3.050	4.050								
Travel Z-axis	mm	100	100								
<b>Rapid feed</b>											
X axis rapid feed	m/min	100	100								
Y axis rapid feed	m/min	100	100								
Change time at cutting table	sec	10 - 15	12 - 17								
<b>Drive capacity</b>											
Machine drive capacity X-axis	kW	1,0	1,0								
Machine drive capacity Y-axis	kW	1,5	1,5								
Machine drive capacity Z-axis	kW	0,4	0,4								
Supply voltage	V	400									
<b>Measures and weights</b>											
Overall dimensions (L x W x H)	m	9,8x3,7x2,15			10,34x4x28x2.2						
Weight	kg	8.000			9.000						
Fiber laser source	W	1.000	1.500	2.000	3.300	4.000	1.000	1.500	2.000	3.300	4.000
Part No.		141010	141011	141012	141013	141014	141015	141016	141017	141018	141019

\* Due to the process of constant improvement, products and product's data can change without notice.

## Standard Accessories

### Ytterbium Raycus Fiber Laser source



- High-Power fiber laser sources from Raycus, with very high electro-optical conversion efficiency.
- Standard with laser power between 1-4 kW, but we have bigger sources available on demand.

### CNC controller with integrated CypCut cutting software



- Windows based CNC controller with integrated CypCut cutting software designed as a complete solution for laser cutting industry.
- Includes drawing import and editing, nesting, path generation and real-time process control.

### RayTools cutting head



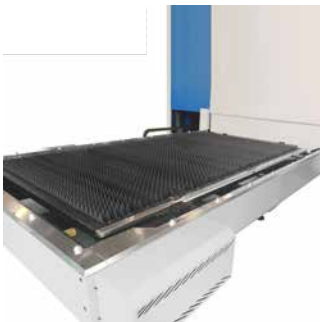
- High quality Swiss designed fiber laser cutting head with built-in motor and drive unit, auto-focus, collision sensor and closed-loop water cooling system for collimation and focusing lens.

### Modern design housing



- Working area covered by ergonomic housing with protective special glass windows and two front doors with interlock system.
- Models with tube cutting system have one extra front door and large side sliding ones.

### Automatic shuttle table



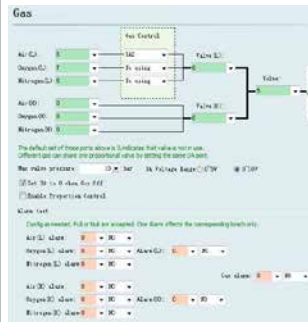
- Automatic shuttle table system which minimizes production downtime using the second table for setting the plates or unloading the cut parts, during the cutting process.

### Vanterm - filter exhaust system



- Top quality highly certified filtration unit designed to extract and filter the dust, fume and smoke which are generated during cutting operations.
- Unit capacity depends on machine cutting surface and the power of the laser source.

### Automatic gas console



- Integrated in the machine, this unit adjusts and maintains gas pressure when cutting with oxygen to ensure the best cutting quality.
- It's controlled by the CNC unit and while cutting it doesn't require any assistance from the operator.

### Central lubrication



- Mounted behind the bridge, this unit ensures automatic central lubrication, which minimizes service requirements and greatly increases machine reliability.

### Electric cabinet



- Ergonomically designed electric unit with high mobility and three drawers for storage.
- Protected from overheating by an excellent AC air flow.
- All electric components are from worldwide renowned suppliers.

### Water chiller



- Energy efficient water chiller with very high cooling performance to deliver a constant laser power for best cutting quality and speed.
- Standard features include automatic temperature adjustment, parameters setting, pressure and level control.

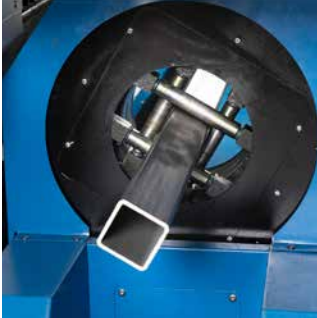
### Operator manual



- Contains details about installation, machine components, operation and maintenance.
- Includes technical diagrams and spare parts list.
- Includes software and programming instructions.

## Optional Accessories

### Pipe cutting system for 3 m pipe length



- Enables tube cutting
- Tube size:
  - round: Ø30 - 150 mm
  - square: 30×30 - 105×105 mm
  - length - 3.000 mm
- Software update with tube cutting module - CypTube.

### Pipe cutting system for 6 m pipe length



- Enables tube cutting
- Tube size:
  - round: Ø20 - 210 mm
  - square: 20×20 - 140×140 mm
  - length - 6.000 mm
- Software update with tube cutting module - CypTube.

### Voltage stabilizer



- Designed to provide real time power compensation and active harmonic voltage in demanding environments,
- Minimizes voltage variations caused by unstable power grids or heavy industrial loads.

### Laser head starting set for mild steel



- Set of consumables for first start-up and tests.
- Contains protective glass, ceramic part and nozzles.
- Suitable for cutting mild steel.

### Laser head starting set for stainless steel / aluminum



- Set of consumables for first start-up and tests.
- Contains protective glass, ceramic part and nozzles.
- Suitable for cutting stainless steel or aluminum.



**KNUTH Werkzeugmaschinen GmbH**

Schmalenbrook 14

D-24647 Wasbek / Neumünster

Tel. +49 (0)4321 - 609-0

Fax +49 (0)4321 - 68900

E-Mail [info@knuth.de](mailto:info@knuth.de)

**[www.knuth.de](http://www.knuth.de)**