AL SERIES

FLEXIBLE FITTINGS

AL series lasers are extremely flexible when it comes to power, laser source and equipment. The AL can therefore be individually configured and optimally adapted to changing requirements.

AL series devices work excellently with AL-T Basic C workbenches.

However, you can also integrate the AL into your existing machine assembly. Nd:YAG laser sources are available with 100 to 300 watts of power. Your advantage: The laser power actually gets to the workpiece.

These compact laser welding devices can even perform very fine welding tasks. The cooling system is integrated into the laser on all devices.

AL 200 with resonator

Detail view: AL 300

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Technical data

	AL 100	AL 120	AL 150	AL 200	AL 300
LASER					
Laser type/wave length	Nd:YAG, 1,064 nm	Nd:YAG, 1,064 nm	Nd:YAG, 1,064 nm	Nd:YAG, 1,064 nm	Nd:YAG, 1,064 nm
Average power	100 W	120 W	150 W	200 W	300 W
Peak pulse power	7 kW	9 kW	9 kW	9 kW	9 kW
Pulse energy	80 J	90 J	90 J	90 J	90 J
Pulse duration	0,5-20 ms				
Pulse frequency	0-50 Hz		0-100 Hz		
Operating mode	Pulsed				
Welding spot Ø	0.2–2.0 mm With micro welding function (optional) 0.05-0.5 mm				
Focusing objective	Selectable (straight objective or turn/tilt objective)				
Pulse shaping	Adjustability of power curve within a laser pulse				
Display and operation	Removable touch display (for laser and motion system)				
OBSERVATION LENS	Leica microscope attachment with eyepieces for glasses wearers 10×, optional 16×.				
POWER SUPPLY UNIT					
W × D × H (basic component)	450 × 850 × 860 mm				
Weight	135 kg		150 kg		
LASER BEAM SOURCE					
With focusing unit (length × Ø)	820 × 120 mm	990 × 120 mm		1,100 × 120 mm	
Weight	approx. 20 kg	approx. 28 kg		approx. 30 kg	
EXTERNAL CONNECTIONS					
Electrical connection	200-240 V / 50–60 Hz / 16 A		3 × 400 V / 50-60 Hz / 3 × 16 A		
External cooling	optional				
OPTIONS	Turn and tilt objective Micro welding function Rotary axis module with chuck, tiltable, for horizontal to vertical rotation Camera system for demonstrating and observing the welding process Ergo wedge Programmable laser wire feed system AL-DV				

AL-T Basic C with AL 120-300: AL-IN

Removable touch-display

V2.2

Fiber laser system

Laser Welding Device AL-F

ONE SYSTEM – 4 POSSIBLE LASER HEADS

The AL is now also available with a fiber laser. The fiber source is highly energy efficient. For reproducible welds, output monitoring keeps an eye on the welding process.

The AL-F's possibilities range from mobile welding with a laser pistol and video goggles to manual welding viewed through a microscope or fully automatic welding processes observed through a camera.

Technical data

	AL 300 F	AL 450 F	AL 600 F	AL 900 F	AL 1200 F
LASER					
Laser type/wave length	Fiber laser, 1,070 nm	Fiber laser, 1,070 nm	Fiber laser, 1,070 nm	Fiber laser, 1,070 nm	Fiber laser, 1,070 nm
Average power	300 W	450 W	600 W	900 W	1,200 W
CW power	300 W	450 W	600 W	900 W	1,200 W
Peak pulse power	3 kW	4.5 kW	6 kW	9 kW	12 kW
Pulse energy	30 J	45 J	60 J	90 J	120 J
Pulse duration	0.2 ms-CW				
Pulse frequency	Single pulse -100 Hz				
Beam parameter product at 50 µm	2-3 mm * mrad			2 × (2-3 mm) * mrad (two fibers)	
Operating modes	Pulsed/CW				
Welding spot Ø	0.2-3.0 mm, optional 0.1-4.0 mm			0.3-3.0 mm, optional 1.1-4.0 mm	
Focusing objective	120-150 mm, further according to lens data sheet				
Pulse shaping	Adjustability of power curve within a laser pulse				
Display and operation	Laser parameters set through touchscreen or multifunctional footswitch AL-T Basis C triggered through laser touchscreen				
OBSERVATION LENS	Leica microscope attachment with eyepieces for glasses wearers, 10 ×, optional 16 ×.				
EXTERNAL DIMENSIONS					
Power supply unit W × D × H	550 × 600 × 1,050 mm				
Weight	approx. 100 kg				
LASER BEAM SOURCE					
With focusing unit (length × Ø)	Because various lenses are possible upon request				
ELECTRICAL CONNECTIONS					
Electrical connection	200-240 V / 50-60 Hz / 16 A		3 × 400 V / 50-60 Hz / 3 × 16 A		
External cooling			Lens water cooling integrated		
CONNECTIVITY	Integration of the AL-F in the system control and the movement system is possible on demand (digital IOs, bus system, customer-specific interface)				
OPTIONS	Turn and tilt objective Rotary axis module with chuck, tiltable, for horizontal to vertical rotation Camera system for demonstrating and observing the welding process Ergo wedge LAfet® – programmable laser wire feed system				

V1.3

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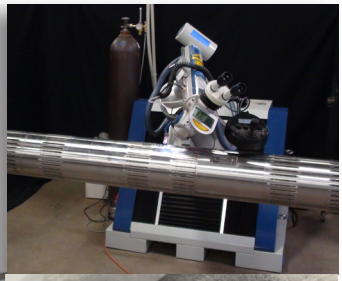
Fiber Laser Systems

1200 Watt Laser

FOR LASER WELDING PROFESSIONALS

The ALPHA LASER 1200 Watt systems are ideal for applications in oil & gas, shaft repair, hardfacing with wire and powder, in hydroelectric power plants (casting repairs) and for large but delicate components where TIG welding becomes problematic.
The laser systems are equally suitable for mobile applications or as a stationary workstation in the workshop.



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AL 1200 Watt F

FOR THE TOUGHEST ENVIRONMENTAL CONDITIONS

The AL 1200 F is our most powerful laser for heavy duty applications. The welding system is designed to resist even the toughest environmental conditions, as its housing is enclosed and no ambient air can get inside the machine. air gets inside the machine. Thus, all parts, including optics and electronics, are protected from contamination.

The laser modules are water-cooled, so the machine will not overheat while you are processing high material deposition rates (2 mm wire with a feed rate of 1 meter per minute) with wire welding.

The AL 1200 F requires a traversing system such as AL-T Basis C or an application device LAV 100 NL.

Technical data

FIBER LASER POWER	1200 W
LASER	
Peak pulse power	12 kW
Pulse energy max.	120 J
Pulse duration	0.2–50 ms/CW
Pulse frequency	Single pulse – 100 Hz
Welding spot Ø	0.3–3 mm, optional 1.1–4 mm
Display and operation	Setting of laser parameters via touch display. Multifunction footswitch, keyboard, control AL-T Basis C via laser touch display.
OBSERVATION LENS	Leica binoculars with eyepieces for eyeglass wearers 10 ×, optional 16 ×.
WORK AREA IN COMBINATION WITH ALT-T BASE C	
Movement speed (X, Y, Z)	0–25 mm/s
Movement range (X, Y, Z)	400 × 210 × 300 mm
EXTERNAL DIMENSIONS	
W × D × H	700 × 1590 × 1250 mm
Weight	480 kg
EXTERNAL CONNECTIONS	
Electrical connection	3 × 400 V / 50–60 Hz / 3 × 16 A
Cooling	Water-cooled laser modules: system only works in conjunction with external cooling
OPTIONS	Turn and tilt objective with connection water cooling // sealing air // Crossjet // various rotary axis modules // Ergo wedge // camera system // Laser wire feed system AL-DV // AL-DRIVE

The system fulfills the high safety requirements for Performance Level d.

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ALFLAK 1200 F

COMPLETE MACHINE

The ALFlak 1200 F is already a complete machine. The system is ideal for automated processes: either with AL-DV automatic wire feeder or with the powder nozzle for powder buildup welding. In addition, for even easier programming, the Mabotic Scanner Kit is available for scanning, programming and welding complex part geometries.

Technical data

FIBER LASER POWER	**1200 W**
LASER	
Peak pulse power	12 kW
Pulse energy max.	120 J
Pulse duration	0.2 ms – 50 ms/CW
Pulse frequency	Single pulse-100 Hz
Welding spot Ø	0.3-3 mm, optional 1.1-4 mm
Display and operation	Setting of laser parameters via touch display and via multifunction foot switch. WINLaserNC software can be operated via touch display.
OBSERVATION LENS	Leica binoculars with eyepieces for eyeglass wearers 10 ×, optional 16 ×.
WORK AREA	
Movement speed (X, Y, Z)	0-25 mm/s
Movement range (X, Y, Z)	340 × 330 × 370 mm
Lowest working point	565 mm
Highest working point	ca. 1400 mm (with caterpillar track 1780 mm)
EXTERNAL DIMENSIONS	
W × D × H	1200 × 1030 × 1150 mm
Weight	with caterpillar track approx. 910 kg, without 610 kg
EXTERNAL CONNECTIONS	
Electrical connection	3 × 400 V / 50-60 Hz / 3 × 16 A
Cooling	Water-cooled laser modules: system only works in conjunction with external cooling
OPTIONS	Turn and tilt objective with connection water cooling Crossjet // various rotary axis modules // Ergo wedge Mabotic camera system // Laser wire feed system AL-DV

The system fulfills the high safety requirements for Performance Level d.

For both models, there is a wide range of expansion options:

- *Rotary axis,*
- *Heavy duty rotary axis,*
- *Turn and tilt objective for fast positioning of the laser beam,*
- *AL-DV automatic wire feeder,*
- *Powder nozzle for automated powder welding (fiber laser > 450 W),*
- *AL-PF Powder feeder*

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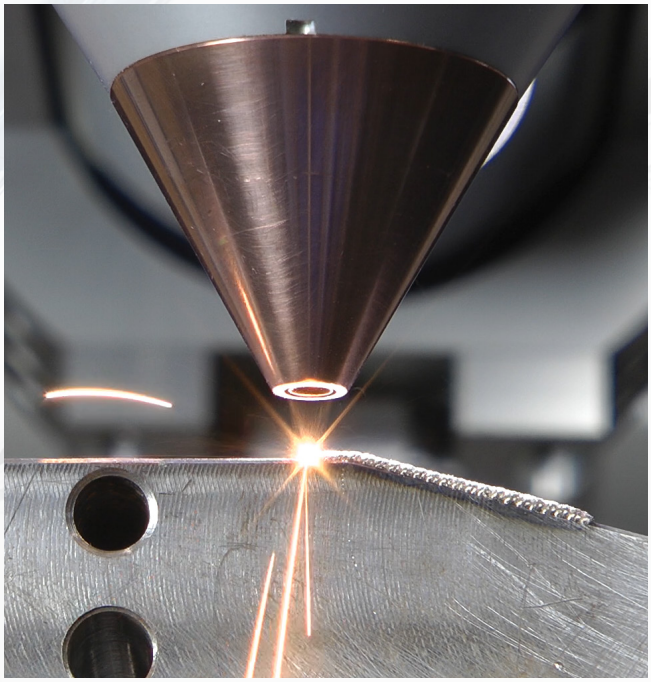
Laser Cladding

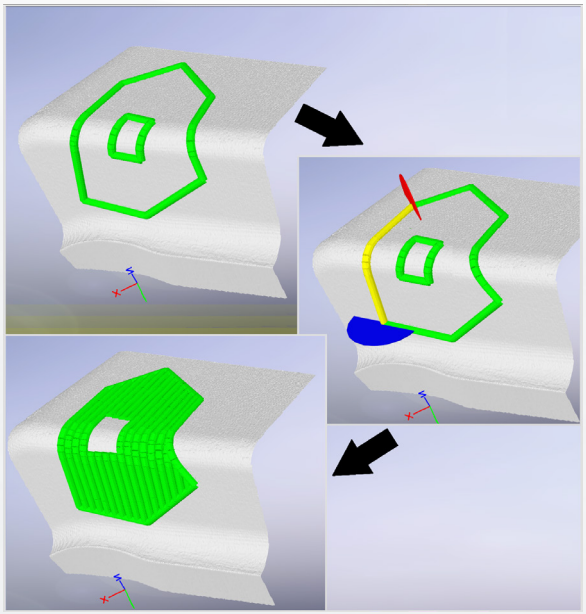
The process is ideal for coating components with high-quality wear-resistant coatings.

Laser powder cladding enables the combining of different materials and thus a combination of the best material properties. The service life of components can therefore be significantly increased. Examples such as hard coatings (HRC60), corrosion and abrasion protection (e.g. nickel alloy with embedded tungsten carbide particles) are possible. The process is also suitable for repairs in which pre-programmed geometries are filled or built up. Large-area material application can be realized quickly and efficiently. Furthermore, laser powder cladding can be used for gap bridging when joining.



Mabotic Scanner-Kit

Complex component geometries are no longer a problem with the Mabotic Scanner Package. This makes powder cladding child's play. A 3D surface scanner enables the digitization of complex workpiece surfaces directly with the machine. Weld path planning and programming are based on the scanned workpiece data. This eliminates the need for time-consuming teaching, as the software communicates directly with the machine. Code programming skills are also not required, as the Weldfactory software is intuitive to use.



V1.0