



LASERSYSTEMS

FOR METAL PROCESSING

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SYSTEMS

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From vision to innovation

Welcome to ALPHA LASER

Under its guiding principle “From Vision to Innovation”, ALPHA LASER became the leading manufacturer of laser systems in skilled trades and small-series industrial production.

Since introducing its first mobile laser welding device in 2003, ALPHA LASER has been renowned worldwide as the inventor of mobile laser welding. We cultivate close partnerships with our users to implement new functions in the laser systems. This results in solutions that allow our customers to meet the growing demands of their customers at short notice and with optimum quality.



Are you looking for a reliable, powerful laser system and a long-term supply of spare parts?

Do you value application expertise and a wide range of possible uses?

Ask us – we are glad to support you.



WE DEVELOP AND PRODUCE APPLICATION-ORIENTED LASER SYSTEMS THAT ENABLE OUR CUSTOMERS TO WELD, CUT, PRINT AND HARDEN THEIR WORK PIECES IN A PRECISE, SIMPLE AND QUICK MANNER.

Laser welding

Versatile, efficient and economical

WHY AN ALPHA LASER?

Laser systems from ALPHA LASER feature excellent performance and flexibility. With our robust, high-performance laser welding devices, we provide you a tool that enables complicated connections that would be difficult or impossible to manage with traditional joining techniques – even in the immediate vicinity of sensitive materials, such as plastic or glass. The good control of laser energy and exposure time allows welding of metallic materials with high melting temperatures and high thermal conductivity. It can even be used to connect different metals.

Laser systems from ALPHA LASER are durable. A motivated service team supports you quickly and competently in service demands. We assure you that spare parts will be available for a long time for all models, and we try to keep repair costs within limits by replacing parts and repairing components. In addition, this helps to protect the environment.

It doesn't matter whether it's laser deposition welding, repairs, series production, shafts, large moulds, medical technology components, sensors or sheet metal processing – we provide you with the fitting machine concept, the necessary laser power and a large number of accessories for professional work.

LASER WELDING CONSERVES RESOURCES

Worn components do not have to be replaced, since tools, spindles, molds, castings and so on can be repaired quickly. Even design changes are possible using laser deposition welding.

The service life or lifetime of many heavily stressed components can be significantly extended by laser surface hardening.

LASER SOURCES

The application determines the choice of laser source. ALPHA LASER offers Nd:YAG and fiber sources. We can therefore advise you on an application-related basis in order to find together the best solution for your tasks.

A wide range of accessories ensures that the laser system is ideally matched to your task. We invite our customers to extensively test the various laser sources, machines and power classes for material processing in our application rooms.



Our services

Good service from the start

// APPLICATION

Whether sample welding, process analysis, welding suitability or finding parameters: The application engineers from ALPHA LASER will support you with your welding tasks. We focus on your application and determine the process and the necessary laser parameters together. We can draw on a wide range of products and a wide variety of laser power classes. We have plenty of space in our demonstration room in order to work out solutions.

// TRAINING

Our trainers come from the trade and know how to quickly teach laser welding to newcomers. But they are also competent advisors for experienced welders. The training takes place at your company and is tailored to your needs. We offer operator, maintenance, software and application trainings.

// INSTALLATION

Trained employees take care of setting up your machine and instruct you in its operation.

// SPARE PARTS

Our service team – reinforced by qualified partners worldwide – is at your side with advice and action. Competent consultation regarding spare parts and fast delivery ensure that you can work reliably. We guarantee that spare parts will be available for a long time, so that your ALPHA LASER system will be available to you for many years.

Parts that can be repaired will be repaired, and we offer affordable second-hand parts for many components, keeping repair costs to a minimum.

// ONLINE-SHOP

You can conveniently order a large selection of welding wires, accessories, and consumables from us.

DID YOU KNOW THAT OUR FIRST LASERS FROM 1995 ARE STILL IN USE AND THAT YOU CAN STILL GET SPARE PARTS FOR THEM?

Areas of application

Lasers have versatile uses in production and repair, especially in the fields of...



TOOL AND MOLD MANUFACTURING

Repairing extensive, filigreed defects, both on small molds and tools weighing tons, along with design changes.



SHEET METAL PROCESSING

Wherever visually appealing weld seams, tight connections and little distortion are required. E.g. when welding electronic housings, stainless steel parts for household appliances, architectural elements and sculptures.



SPINDLE AND SHAFT REPAIR

Defects on parts subject to wear and tear can be quickly rectified.



MEDICAL TECHNOLOGY

The applications are diverse. With lasers you can weld surgical instruments, passive and active implants or endoscopic components.



PRECISION ENGINEERING

Welding precision metal parts individually or as small series production.



CASTING REPAIR

Repair blowholes and other defects. The cast part can thus often be saved.



SENSOR PRODUCTION

Welding of thermocouples, sensors and pressure membranes.

THE RESONATOR CLINCHES THE DECISION

Did you know that our resonators are milled from a single piece to provide the best beam quality? Sophisticated, rotatable beam deflection and movable objectives ensure you a comfortable work position while reaching almost any location to be welded.



ALPHA LASER

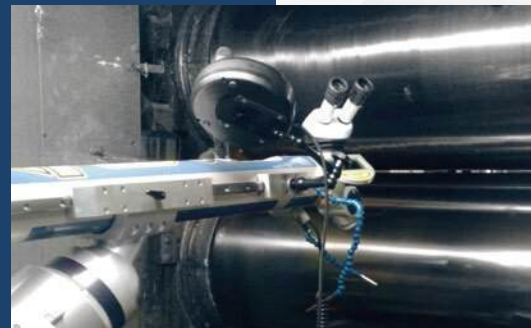
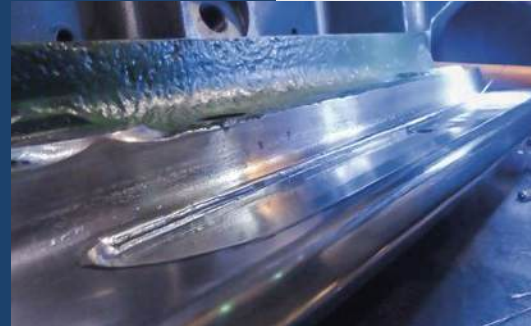
Mobile open systems

A class by themselves

Mobile laser welding has become an important branch of laser material processing, because its advantages are obvious: Repairs and material deposition can be done on large machine parts or molds and tools weighing tons, directly on site. Thus, with a mobile laser, for example, repairs can be made in injection molding machines or complete mold halves with very little positioning effort.

The mobility offers the user enormous flexibility and very short set-up times. These advantages provide cost reductions and competitive advantages.

LOW SET-UP
TIMES.
EXTREMELY
FLEXIBLE.



MOBILE OPEN SYSTEMS



01

ALM // ALFlak MAX
AL-CROSS Series // ALFlak
AL 1200 F // ALFlak 1200 F

ALM

The number 1. mobile laser

Nd:YAG-LASER POWER (WATT)

200 250 300



The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)

Display and operation Display with keypad. Laser parameters can also be set using a multifunctional footswitch, motor controls can be set through a touch screen or optional external operating unit.

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 ×, optional 16 ×

WORK AREA

The processing head can be freely positioned in the space and additionally moved using a joystick

Movement speed (X, Y, Z)	0 to 25 mm/s
Movement range (X, Y, Z)	120 × 110 × 800 mm
Lowest working point	530 mm
Highest working point	1,590 mm
Arm deflection	1,300 mm

EXTERNAL DIMENSIONS

W × D × H	730 × 1,410 × 1,585 mm
Weight	320 kg

EXTERNAL CONNECTIONS

Electrical connection	3 × 400 V / 50–60 Hz / 3 × 16 A
External cooling	ALM 200: optional ALM 250, 300: prepared

OPTIONS

Turn-tilt-objective // rotating axis with chuck, tiltable, for horizontal to vertical rotation // external operating unit // Camera system for demonstrating and observing the welding // Ergo wedge



Find out more in our product video

We recommend the **ALM** to users who want to carry out welding tasks flexibly and quickly – whether on large or small workpieces – and for whom high peak power is important.

The ALM is ready to use within minutes. The rotatable laser arm can be positioned quickly and fixed in the desired working position using electro-hydraulic brakes. You can choose to weld manually using a

joystick, semi-automatically or using an external control unit with a pulse function.

The laser system has a powerful and application-optimized PLC with new functions. E.g. the user coordinate control, which is programmable in the range 50 × 50 mm.

With the ALM you gain internal and external mobility.

ALFlak MAX

An especially long reach



Learn more in our product data sheet

With its laser arm almost 2.80 m long, the **ALFlak MAX** offers a large range and a swivel radius of 1.90 m. As a service provider or mold maker, you get even more flexibility for your applications.

Whether pressing tools, large molds or machine components – simply drive the **ALFlak Max** with its self-propelled caterpillar track to the workpiece, align the laser arm to the welding point and start welding. Welding seams up to

340 mm in length are possible without removing. A rotatable laser head, the unique optional tilt/swivel lens and various focusing lenses ensure that you can reach (almost) every part of the workpiece with the laser beam.

The ALFlak Max is available in two versions: with a self-propelled caterpillar track or a model that can be moved manually with a forklift.

Nd:YAG-LASER POWER (WATT)

250 300



The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)

Display and operation Display with keypad. Adjustment of the laser parameters additionally via multifunctional foot switch. WINLaser 4.0-software via external PC.

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 ×, optional 16 ×

WORK AREA

Movement speed (X, Y, Z)	0 to 25 mm/s
Movement range (X, Y, Z)	320 × 330 × 370 mm
Lowest working point	510 mm
Highest working point	1,870 mm
Arm deflection	2,700 mm

EXTERNAL DIMENSIONS

W × D × H (base unit incl. chassis)	1,200 × 1,200 × 1,300 mm
Weight	With caterpillar track approx. 910 kg, without approx. 610 kg

EXTERNAL CONNECTIONS

Electrical connection	3 × 400 V / 50–60 Hz / 3 × 16 A
External cooling	prepared

OPTIONS

Turn-tilt-objective // rotating axis with chuck, tiltable, for horizontal to vertical rotation // Camera system for demonstrating and observing the welding // Ergo wedge

AL-CROSS

Passion for mobile precision welding

FIBER LASER POWER (WATT)

450 600



The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)

Display and operation Setting of the laser parameters via touch screen, multifunctional footswitch, keyboard or/and AL-DRIVE.

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 x, optional 16 x

WORK AREA

The processing head can be freely positioned in the space and additionally moved using a joystick

Movement speed (X, Y, Z)	0 to 25 mm/s
Movement range (X, Y, Z)	120 x 110 x 800 mm
Lowest working point	400 mm
Highest working point	1,900 mm
Arm deflection	1,300 mm

EXTERNAL DIMENSIONS

W x D x H	790 x 1,590 x 1,250 mm
Weight	480 kg

EXTERNAL CONNECTIONS

Electrical connection	3 x 400 V / 50-60 Hz / 3 x 16 A
External cooling / sealing air	AL-CROSS 450 F: Optics cooling/sealing air optional AL-CROSS 600 F: Optics cooling/sealing air included Connection possibility for an external cooler to support the cooling of the laser source.

OPTIONS

Turn-tilt-objective // rotating axis with chuck, tiltable, for horizontal to vertical rotation // Crossjet // Camera system for demonstrating and observing the welding // Ergo wedge



Find out more on our product page

The **AL-CROSS** and **AL-CROSS X** systems are ideal for welding applications in metal processing and mechanical engineering. Equipped with a 600 W laser source, they even offer entry-level solutions for “heavy metal” applications. The AL-CROSS provides the necessary power and flexibility for those who want to carry out flexible pulsed or CW deposition welding, for example on large tanks. The welding behavior can be adjusted using preset

pulse shapes. The devices are mobile thanks to easily movable wheels. With a width of just 780 mm, they can be easily moved through standard doors. The integrated gas cylinder carrier also promotes mobility. The stable aluminum handles provide effective impact protection for edges and bodies.

AL-CROSS X

Passion for mobile precision welding

FIBER LASER POWER (WATT)

450 600



The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)

Display and operation Setting of the laser parameters via touch screen, multifunctional footswitch, keyboard or/and AL-DRIVE.

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 x, optional 16 x

WORK AREA

The processing head can be freely positioned in the space and additionally moved using a joystick

Movement speed (X, Y, Z)	0 to 25 mm/s
Movement range (X, Y, Z)	120 x 110 x 800 mm
Lowest working point	400 mm
Highest working point	1,900 mm
Arm deflection	1,300 mm

EXTERNAL DIMENSIONS

W x D x H	790 x 1,590 x 1,250 mm
Weight	480 kg

EXTERNAL CONNECTIONS

Electrical connection	3 x 400 V / 50-60 Hz / 3 x 16 A
External cooling/sealing air	AL-CROSS 450 F: Optics cooling/sealing air optional AL-CROSS 600 F: Optics cooling/sealing air included Connection possibility for an external cooler to support the cooling of the laser source.

OPTIONS

Turn-tilt-objective // rotating axis with chuck, tiltable, for horizontal to vertical rotation // Crossjet // Camera system for demonstrating and observing the welding // Ergo wedge



Find out more in our product video

With its advanced arm settings, the option of welding at unusual heights and depths is offered by the **AL-CROSS X**. The high flexibility in welding positioning enables precise work from different angles and use in hard-to-reach places, which increases the flexibility and efficiency of welding projects.

Transportation is uncomplicated in standard vans. The robust steel housing has integrated eyelets that make it easy to load or lift the

system. There is also a hook for a cable winch.

MULTIFUNCTIONAL
AND
COMPACT

ALFlak

Self-propelled, robust, programmable

Nd:YAG-LASER POWER (WATT)

200 300



The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)

Display and operation Display with keypad. Adjustment of the laser parameters additionally via multifunctional foot switch. Operation of WINLaser 5.0 via touch screen.

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 x, optional 16 x

WORK AREA

Movement speed (X, Y, Z) 0 to 25 mm/s
Movement range (X, Y, Z) 340 x 330 x 370 mm
Lowest working point 200 mm
Highest working point 1,500 mm
Arm deflection 1,500 mm

EXTERNAL DIMENSIONS

W x D x H (base unit incl. chassis) 1,200 x 1,200 x 1,100 mm
Weight With caterpillar track approx. 850 kg, without approx. 550 kg

EXTERNAL CONNECTIONS

Electrical connection 3 x 400 V / 50-60 Hz / 3 x 16 A
External cooling Prepared

OPTIONS

Turn-tilt-objective // function micro welding // rotating axis with chuck, tiltable, for horizontal to vertical rotation // Camera system for demonstrating and observing the welding // Ergo wedge // AL-DV programmable laser wire feeder



Learn more in our product data sheet

The **ALFlak** flexible laser system for deposition and contour welding has you optimally equipped. Whether you want to make repairs and modifications or produce in series, you can effortlessly process sheet metal, aluminum, stainless steel and sectional steel.

Choose the laser source that fits your requirement: You can choose Nd:YAG 200 and 300 W laser sources, which

we recommend for applications in the mould and tool application. The **ALFlak's** laser arm projects great distance to effortlessly reach its welding position, even in deep or complex molds. Welding seams up to 340 mm are possible. Your bonus: you can carry out your welding task without permanent relocation.

ALFlak F

Fiber laser systems

FIBER LASER POWER (WATT)

300 450 600 900



The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)

Display and operation Touch display. Additional setting of the laser parameters via multifunctional foot switch. Operation of WINLaser 4.0 software via touch screen.

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 x, optional 16 x

WORK AREA

Movement speed (X, Y, Z) 0 to 25 mm/s
Movement range (X, Y, Z) 340 x 330 x 370 mm
Lowest working point 565 mm
Highest working point 1,780 mm
Arm deflection approx. 1,400 mm

EXTERNAL DIMENSIONS

W x D x H (base unit incl. chassis) 1,200 x 1,030 x 1,150 mm
Weight With caterpillar track approx. 910 kg, without approx. 610 kg

EXTERNAL CONNECTIONS

Electrical connection 3 x 400 V / 50-60 Hz / 3 x 16 A
External cooling, sealing air **ALFlak 300 F, 450 F:** Optional
ALFlak 600 F, 900 F additionally: Optics cooling and sealing air integrated

OPTIONS

Turn-tilt-objective // rotating axis with chuck, tiltable, for horizontal to vertical rotation // Camera system for demonstrating and observing the welding // Ergo wedge // AL-DV programmable laser wire feeder
ALFlak 600 F, 900 F additionally: Powder nozzle AL-FLOW Powder // water-cooled turn-tilt-objective



Learn more on our website

ALL ALFlak MACHINES ARE AVAILABLE WITH A SELF-PROPELLED CATERPILLAR TRACK OR AS A MANUALLY MOVING VERSION.

The **ALFlak** is also available with fiber laser sources: 300, 450, 600, 900 and even 1200 W. The fiber source model is recommended if your application requires a validated process, if you wish to weld using CW (continuous wave) method or pulses. For deep welding in sheet metal fabrication, for laser cladding. And also, for melting thick wire diameters up to 2.0 mm in the high performance classes.

There are a number of options available:

- Automatic wire feeder AL-DV
- Powder nozzle AL-FLOW Powder for automated powder deposition welding (fiber lasers > 450 W)
- Powder feeder AL-PF for automated powder deposition welding (fiber laser > 450 W)
- Heavy duty rotary axis for shaft welding
- Different lenses
- Mabotic and 3D-Scanner



The WINLaser 5.0® software is a new operating software for intuitive and efficient machine control.

AL 1200 F

For tough environments



The ALPHA LASER 1200-Watt welding lasers are ideal for applications in the oil & gas sector, marine shaft repair, hard facing with wire and powder, in hydroelectric power plants (casting repairs) and for large but sensitive components where TIG welding becomes problematic. The laser systems are also suitable for mobile use or as a stationary workplace in the workshop.

The **AL 1200 F** is our most powerful laser. The welding system is designed to withstand even the toughest environmental conditions, as its housing is completely closed and no ambient air can get inside the machine. This means that all parts, including the optics and electronics, are protected from dirt. The laser modules are water-cooled so that the machine doesn't

overheat while you are welding at high rates of material deposition (1.6 mm wire with a feed rate of 0.5 m/min). The wire can be fed with the **AL-DV** automatic wire feeder.

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

This model is also available with 900 W fiber laser power.

FOR LASER WELDING
PROFESSIONALS

FIBER LASER POWER (WATT)

1200



The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)

Display and operation Setting of the laser parameters via touch display, multifunctional footswitch, keyboard and AL-DRIVE. Control of the AL-T Basic table via laser touch screen.

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 ×, optional 16 ×

WORK AREA IN COMBINATION WITH AL-T BASIC C

Movement speed (X, Y, Z) 0 to 25 mm/s
Movement range (X, Y, Z) 400 × 210 × 300 mm

EXTERNAL DIMENSIONS

W × D × H 790 × 1,590 × 1,250 mm
Weight 480 kg

EXTERNAL CONNECTIONS

Electrical connection 3 × 400 V / 50–60 Hz / 3 × 16 A
External cooling Water cooled laser modules: system can only be operated with an external cooling unit

OPTIONS

Water-cooled turn-tilt-objective // sealing air // cross jet // various rotary axes // ergo-wedge // camera system // automatic wire feeder AL-DV

ALFlak 1200 F

Complete machine



Find out more on our website

The **ALFlak 1200 F** is already a complete machine. The system is ideal for automated processes: either with the AL-DV automatic wire feed or with the powder nozzle **AL-FLOW Powder** for powder deposition welding. For even easier programming, the Mabotic scanner kit is available for scanning, programming and welding complex component geometries.

For powder deposition welding the powder nozzle and the powder feeder **AL-PF** are needed. A heavy-duty rotary axis or a rotary axis for smaller parts round off the systems.

FIBER LASER POWER (WATT)

1200



The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)

Display and operation Setting of the laser parameters via touch screen and multifunctional foot switch. Operation of WINLaser 4.0 software via touch screen.

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 ×, optional 16 ×

WORK AREA

Movement speed (X, Y, Z) 0 to 25 mm/s
Movement range (X, Y, Z) 340 × 330 × 370 mm
Lowest working point 565 mm
Highest working point 1,780 mm
Arm deflection approx. 1,400 mm

EXTERNAL DIMENSIONS

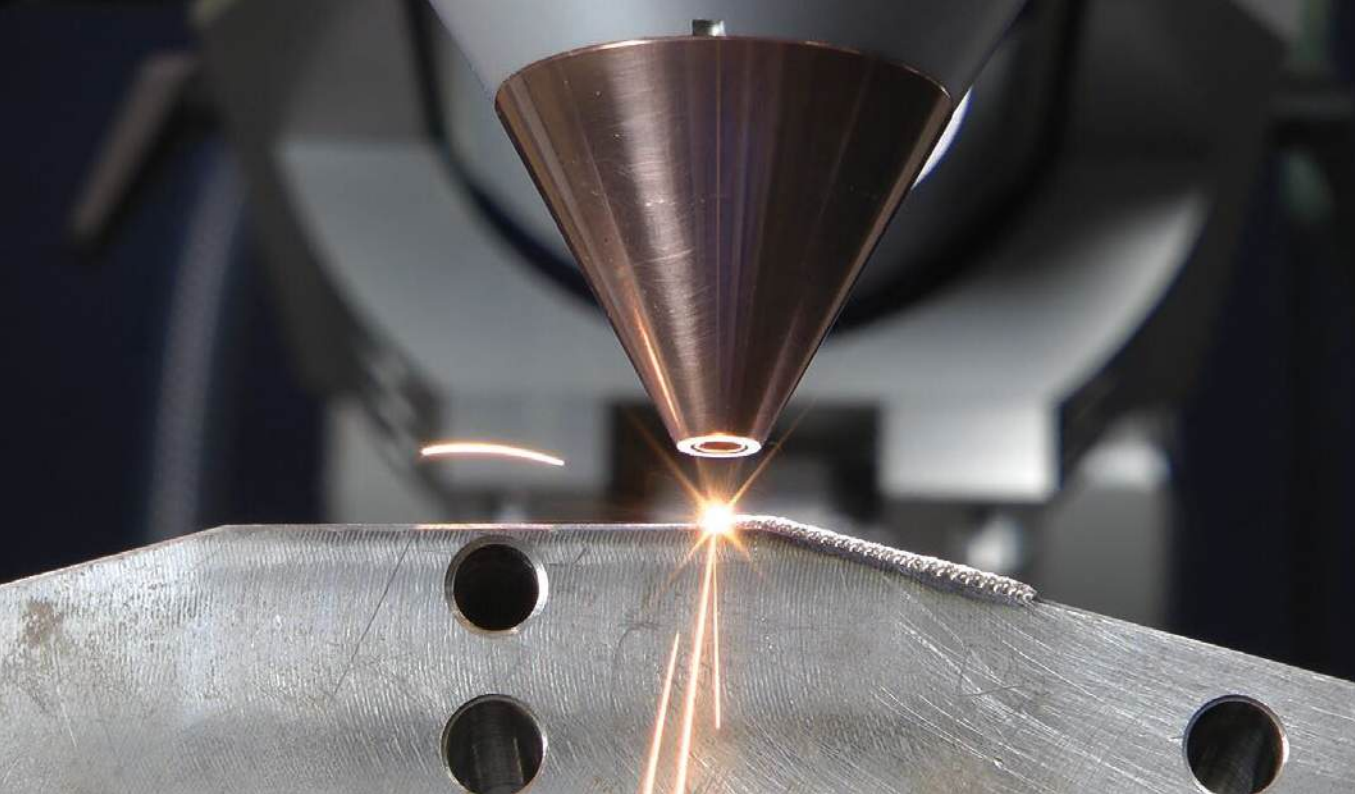
W × D × H (base unit incl. chassis) 1,200 × 1,030 × 1,150 mm
Weight With caterpillar track approx. 910 kg, without approx. 610 kg

EXTERNAL CONNECTIONS

Electrical connection 3 × 400 V / 50–60 Hz / 3 × 16 A
External cooling Water cooled laser modules: system can only be operated with an external cooling unit

OPTIONS

Water-cooled turn-tilt-objective // sealing air // cross jet // various rotary axes // ergo-wedge // camera system // automatic wire feeder AL-DV // powder nozzle AL-FLOW Powder



For powder deposition welding you need the processing head LASERHEAD-PP or the powder nozzle AL-FLOW Powder and the powder feeder AL-PF, depending on the carrier system.

Powder Deposition Welding/ Laser Cladding

With our laser welding systems from 900 W you can also do powder deposition welding. The process is ideal for coating components with high-quality wear protection layers.

Laser cladding makes it possible to mix different materials and thus combine the best material properties. The service life of the components can thus be increased

significantly. Hard coating (HRC60) and corrosion and abrasion protection (e.g. nickel alloy with embedded tungsten carbide particles) is possible. This process is also suitable for repairs in which pre-programmed geometries is filled in or built up. A large-area application of material can be implemented quickly and efficiently.

Furthermore, laser powder deposition welding can be used to bridge the gap when joining.

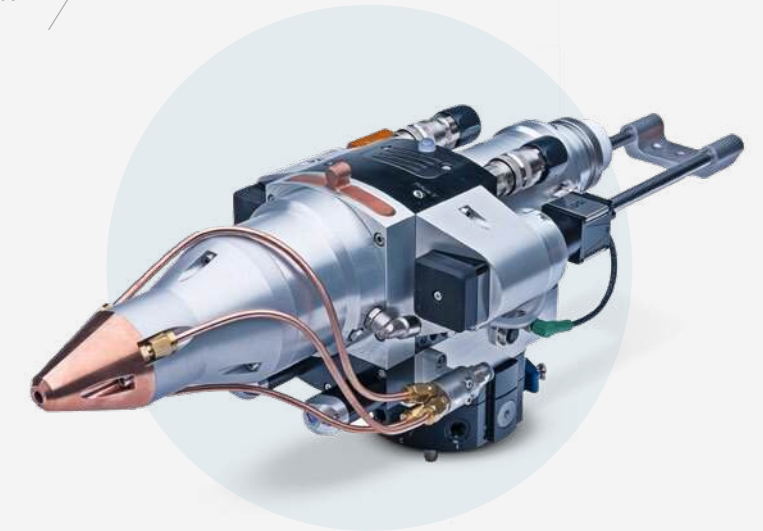


AL-PF

The **AL-PF** ensures the controlled conveyance of common powders for laser powder deposition welding with grain sizes of 45–140 microns. It is controlled directly by the ALPHA LASER systems **ALFlak** (AL-FLOW Powder) or **AL-ROCK** (LASERHEAD-PP). It can also be used as a stand-alone device.

The powder passage is dependent on the power of the laser system: the stronger the laser, the more powder can be melted. The powder delivery rate is precisely controlled via the platen speed. The application rate for e.g. steel is approx. 500–600 g per hour.

THE PERFECT
COMBINATION



LASERHEAD-PP

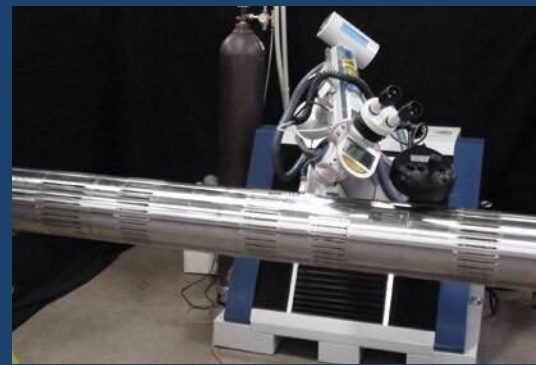
Areas, lines or any geometries can be applied regardless of the direction. By multi-layer coating of suitable materials, almost any layer thickness can be achieved and 3D volumes can also be generated. The layers produced show little dilution.

Using three coaxially positioned nozzles, the centrally guided laser beam melts the powder onto the workpiece under protective gas and with temperature control.



Application Examples

Mobile laser welding,
welding on big parts and powder
deposition welding



Stationary open systems

Work without restrictions

An essential criterion for optimal welding results is the stability of the movement system, because exact focusing of the laser is only possible with high stability. That is why our laser processing tables are particularly stable. With our open laser systems, you can weld large workpieces without restrictions but also carry out precision welding on small parts.

The following models are available as complete systems, i.e. laser source, table and controller:

- AL-IN with 120 – 300 W Nd:YAG laser
- AL-IN with 300 – 1200 W fiber laser
- AL-TW with 200 – 300 W Nd:YAG laser
- AL-TW with 300 – 900 W fiber laser



STATIONARY OPEN SYSTEMS



02

AL-TW // AL-IN
AL-SERIES // AL-FIBER

WE ARE HAPPY TO SUPPORT YOU ON THE SUBJECT OF LASER SAFETY AND WE ALSO OFFER A WIDE RANGE OF SAFETY ACCESSORIES.

AL-TW

The working table with integrated laser

Nd:YAG-LASER POWER (WATT)

200 300



FIBER LASER POWER (WATT)

300 450 600 900



LASER (technical values see p. 54/55)

Display and operation Setting of the laser parameters via touch screen and multifunctional foot switch.
Fiber: WINLaser 4.0-Software via touch display
ND:YAG: WINLaser 5.0-Software via touch display

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 x, optional 16 x

WORK AREA

Machines axes X, Y, Z – rotary axis optional.
 Workpiece movement motorized via Joystick.
Movement speed (X, Y, Z) 0.05 to 25 mm/s
Movement range (X, Y, Z, W) 620 x 400 x 350 x 200 mm

EXTERNAL DIMENSIONS

W x D x H (base unit) 1,200 x 1,360 x 1,260 mm
Side console (W x D x H) 726 x 500 x max. 2,025 mm
Weight approx. 800 kg (+ approx. 60 kg side console)

EXTERNAL CONNECTIONS

Electrical connection 3 x 400 V / 50-60 Hz / 3 x 16 A
External cooling Nd:YAG AL-TW 200, 300: Optional
External cooling and sealing air fiber lasers AL-TW 300 F, 450 F: Optional
 AL-TW 600 F, 900 F: Optical water cooling and sealing air integrated

OPTIONS

Turn-tilt-objective // rotating axis with chuck, tiltable, for horizontal to vertical rotation // Camera system for demonstrating and observing the welding // Ergo wedge // AL-DV programmable laser wire feeder



The system meets the high safety requirements of performance level d.



The **AL-TW** laser system has the laser source (Nd:YAG or fiber laser) integrated in the table. The workpieces can be precisely controlled in 3 axes (X, Y, Z) during welding. The height of the resonator is motorized adjustable via W-axis. In addition, a rotary axis for circumferential welding is available as an option.

The laser and movement system are operated very conveniently via the control panel with an integrated intuitive touchscreen.

The AL-TW is ideal for series production. It is extremely stable and can be operated either joystick-guided, semi-automatically or fully automatic using the WINLaser 4.0 or **WINLaser 5.0**-software. No matter whether deposition welding, repairs, series production, medical technology components or sensors – we provide you with the right laser power and a large selection of efficiency-enhancing, useful accessories.



Learn more on our product website

AL-IN

Equally suitable for price-conscious experts and beginners

Nd:YAG-LASER POWER (WATT)

120 150 200 300



FIBER LASER POWER (WATT)

150 300 450 600 900* 1200*



*Housing as for AL 1200 (p.18)

LASER (technical values see p. 54/55)

Display and operation Removable touch screen (for laser- and movement system)

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 x, optional 16 x

EXTERNAL CONNECTIONS

Electrical connection Nd:YAG AL-IN 120: 200-240 V / 50-60 Hz / 16 A
 AL-IN 150-300: 3 x 400 V / 50-60 Hz / 3 x 16 A
 AL-IN 150 F-600 F: 200-240 V / 50-60 Hz / 16 A
 AL-IN 900 F-1200 F: 3 x 400 V / 50-60 Hz / 3 x 16 A
System cooling Air-cooled
 AL 450 F-AL 1200 F: also available with water cooling

OPTIONS

Turn-tilt-objective // multifunctional footswitch // rotating axis with chuck // camera system // ergo-wedge // AL-DV programmable laser wire feeder // AL-DRIVE // AL-Hub work bench

MOVEMENT SYSTEM FOR AL-IN

EXTERNAL DIMENSIONS

W x D x H 950 x 1,250 x 850 mm
Weight 230 kg

WORK AREA

Machines axes X, Y, Z, rotary axis optional
Movement speed (X, Y, Z) Max. 25 mm/s
Movement range (X, Y, Z) 400 x 210 x 300 mm
Operation Joystick

OPTIONS

Table top with inclined stand // separate, vertically adjustable table // rotary axis with chuck, tilt joint // sealing air // optical water cooling (AL-IN 600 F – 1200 F: water cooling and sealing air integrated)



The system meets the high safety requirements of performance level d.



We recommend the **AL-IN** for everyone who wants a lot of freedom when placing the workpiece. The components can be positioned freely under or next to the laser system, because a wide variety of worktables can be placed in front of the lifting column or you can work directly on the pallet. A fixed tabletop is optionally available. The resonator of the laser can be pivoted 360° and fixed in any

pivoting position. The resonator, which sits in a sliding rail, can also be placed far forward or moved up or down using a tilting joint.



Find out more in our product video

AL-SERIES

With flexible equipment



Learn more in our product data sheet

Regarding power, laser source or equipment: the lasers of the **AL SERIES** are extremely flexible. Hence, the AL can be individually configured and perfectly adapted to changing tasks.

The devices of the AL SERIES are the perfect match for our worktables AL-T. However, they can also be integrated into existing machine structures.

You select the laser source depending on your requirements. Optionally, **Nd:YAG laser sources** with 100–300 W are available, which are characterized by a high pulse peak power. However, they can also be used to realize fine welds. It gets even finer with the optional, switchable fine welding option. This provides spot weld diameters < 0.1 mm for high-precision micro-welds.

Nd:YAG-LASER POWER (WATT)

100 120 150



200 300



The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)

Display and operation Removable touch screen (for laser- and movement system)

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 ×, optional 16 ×

SUPPLY PART

W × D × H (base unit) 450 × 850 × 860 mm
Weight **AL 100, 120:** 135 kg,
AL 150, 200, 300: 150 kg

LASER BEAM SOURCE

With focusing unit (length × Ø) **AL 100:** 820 × 120 mm,
AL 120, 150: 990 × 120 mm
AL 200, 300: 1,100 × 120 mm

Weight **AL 100:** 20 kg
AL 120, 150: 28 kg
AL 200, 300: 30 kg

EXTERNAL CONNECTIONS

Electrical connection **AL 100, 120:** 200–240 V / 50–60 Hz / 16 A
AL 150, 200, 300: 3 × 400 V / 50–60 Hz / 3 × 16 A

External cooling Optional

OPTIONS

Turn-tilt-objective // function micro welding // rotating axis with chuck, tiltable, for horizontal to vertical rotation // Camera system for demonstrating and observing the welding // Ergo wedge // AL-DV programmable laser wire feeder

AL-FIBER

Passion for mobile precision laser welding

FIBER LASER POWER (WATT)

150 300 450 600



The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)

Display and operation Setting of the laser parameters via touch screen and multifunctional foot switch.
 Control of AL-T Basic C via Laser-touchscreen.

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 ×, optional 16 ×

EXTERNAL DIMENSIONS

Supply part W × D × H 550 × 600 × 1,050 mm
Weight approx. 100 kg

LASER BEAM SOURCE

Laser resonator with different objectives. (Please ask)

EXTERNAL CONNECTIONS

Electrical connection 200–240 V / 50–60 Hz / 16 A
System cooling air cooling
AL 450 F, AL 600 F: also available with water cooling

CONNECTIVITY

It is possible to integrate the system into the plant control system and into the motion system (digital IOs, bus system, customer-specific interface)

OPTIONS

Turn-tilt-objective // rotating axis with chuck, tiltable, for horizontal to vertical rotation // Camera system for demonstrating and observing the welding // Ergo wedge // AL-DV programmable laser wire feeder // water-cooled optics (in AL 600 F integrated)



Find out more in our product website



We offer the **AL-F-RACK** solution for integration into machine structures.



The **FIBER LASER AL-F** is available with 150, 300, 450, 600 Watts. We recommend fiber lasers for sheet metal processing, for deep welding, for CW welding and for reproducible welding results thanks to the integrated power monitoring. The fiber source is characterized by high energy efficiency.

For integration into machine superstructures we offer the AL-F-RACK solution.

The **AL-F-RACK** consists of a control rack with PLC, the safety PLC and a laser rack that can be equipped with 150/300/450/600 W fiber laser sources. The components are housed in standard 19-inch racks. An external interface is available in order to be able to integrate the device into a system. All processing optics from ALPHA LASER can be connected either for welding, structuring, scribing, cutting etc.



Discover the future of machine control with WINLaser 5.0!

Our innovative WINLaser 5.0 operating software sets new standards in ease of use and efficiency. Discover how easy machine control can be and increase your productivity!

Clear Display

All relevant data, such as laser parameters, axis positions, wire feed, exhaust, and camera images, are available at a glance and can be set immediately. The display can be mounted directly on the resonator, ensuring the most important data always remains in the operator's field of view. Moreover, the key switch is positioned within easy reach.

Modern User Interface

All our devices operating with WINLaser 5.0 include a larger display for optimal information view and access, running on a browser-based user interface that makes ALPHA LASER devices simple to operate. Additionally, our operating system is available in German and English, with other languages available upon request.

App Feature Concept

Our operating system is divided into various apps that cover functions such as manual operation and automatic editing. Additional features like wire feed and pulse forming are integrated, and each app can be customized to display relevant data.

Integrated Image Capture

The image transmission is shown directly on the display, eliminating the need for a separate screen. In automatic mode, images are saved automatically, providing visual documentation of your work saved in the

Keyboard with Fixed Keys

Fixed keys make operation considerably easier compared to traditional keyboards, offering a high level of comfort. These keys are always in the same position and can be operated with either the right or left hand.

Joystick Control

The axis control in WINLaser 5.0 is smoother and more precise, providing you with even more accurate welds.

Additional I/Os

WINLaser 5.0 allows functions to be easily linked to inputs and outputs to be controlled. The I/O configuration can be adapted quickly and flexibly.

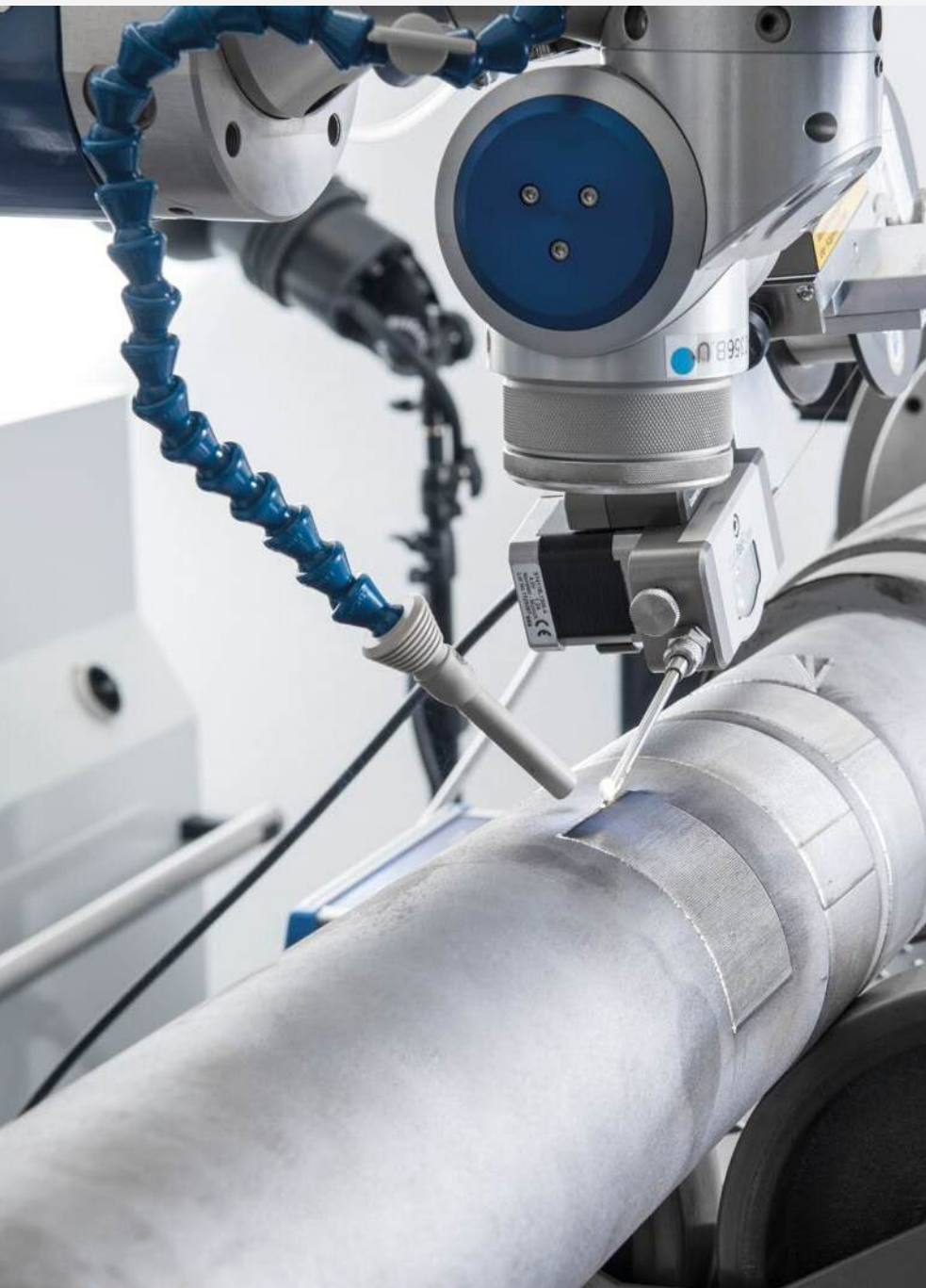
User Administration

Individual assignment of rights protects important settings from unauthorized access. Individual assignment of rights and permissions protects important settings from unauthorized access. Using the administrative user profile, functionalities can be removed or added from the regular user profile.

Remote Maintenance

An optional remote maintenance router enables a secure connection to the customer network via LAN or WLAN. A three-stage key switch provides additional security. The Nd:YAG laser systems **ALFlak** and **AL-TW** are currently equipped with the new operating software. Others will follow.

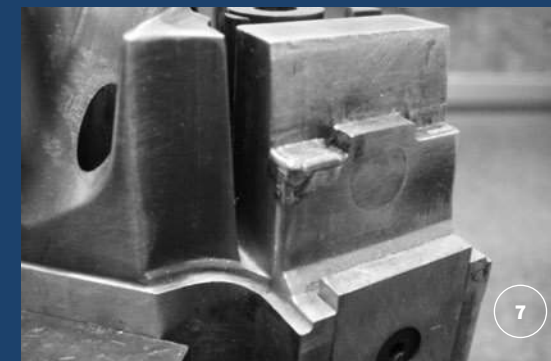
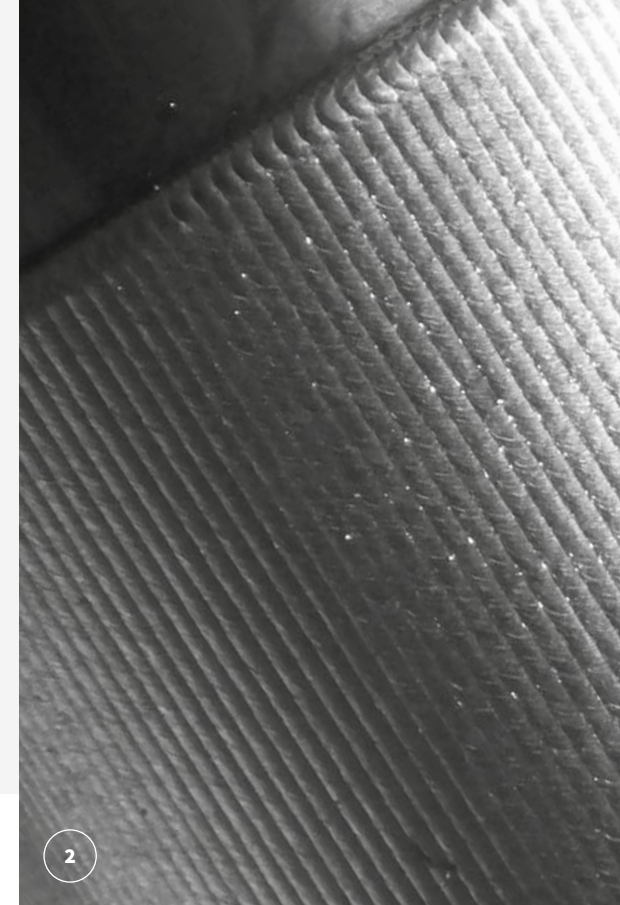
WINLaser 5.0, developed by ALPHA LASER, will elevate your welding routines to a whole new level with more precision, comfort, efficiency, and ease of use.



Application examples

Stationary open systems

1. Laser welding of series parts (here anemometer)
2. Large area material deposition with welding wire
3. Transmission parts (here a gear) are welded with little heat impact
4. Repair of a worn sealing edge of a mould insert (Ampco-Bronze)
5. Repair of a pitted surface
6. Repair of washed out edges
7. Material deposition on a broken area



Closed multi-axes systems

Laser welding machines for every work environment

Thanks to their closed, laser-proof working chambers, the ALW, ALV and AL-Q systems are workstations with all-around laser protection. Without any further safety precautions, they can be used in any imaginable production environment.

We have placed great value on ergonomics. All of our systems are comfortable seated workplaces enabling low-fatigue and high-concentration work.

With our lasers, the indicated laser power actually gets to the workpiece. Challenge us!



CLOSED MULTI-AXES SYSTEMS OFFER IDEAL LASER PROTECTION

CLOSED MULTI-AXES SYSTEMS



03

ALW // ALV // AL-Q

ALW

Ergonomic seated workplace

Nd:YAG-LASER POWER (WATT)

200 300



The system meets the high safety requirements of performance level d.

FIBER LASER POWER (WATT)

300 450

LASER (technical values see p. 54/55)

Display and operation 12.1" Display with touch function. Setting of the laser parameters via touch screen and multifunctional foot switch. WINLaser 4.0-Software programmable with the integrated PC.

OBSERVATION OPTIC

Leica ergotubus with eyepieces for glasses wearers 10 ×, optional 16 ×

WORKING CHAMBER

W × D × H 1,080 × 850 × 450 mm
Mounting plate (W × D) 600 × 475 mm
Workpiece weight 400 kg max., central
Workpiece movement Motorized via joystick
Movement range (X, Y, Z) 460 × 340 × 332 mm

EXTERNAL DIMENSIONS

W × D × H 1,190 × 1,400 × 1,740 mm (with display folded 1,500 mm)
Weight 900 kg

EXTERNAL CONNECTIONS

Electrical connection 3 × 400 V / 50–60 Hz / 3 × 16 A
External cooling Optional
Exhaust **ALW Nd:YAG:** Exhaust system integrated
ALW FIBER LASER: Connection for external exhaust system integrated
USB keyboard and mouse Port available

OPTIONS

Turn-tilt-objective // rotating axis with chuck, tiltable, for horizontal to vertical rotation // Camera system for demonstrating and observing the welding // Ergo wedge // AL-DV programmable laser wire feeder // function micro welding for Nd:YAG systems // optics cooling // sealing air (only for fiber lasers) // Cross Jet



Find out more in our product video

ideally suited for automatic applications, but also for the exact positioning of components when repairing molds and tools. Workpieces weighing up to 400 kg can be moved precisely on 3 axes (X, Y, Z). In addition, a rotary axis for circumferential welding is available as an option. You select the laser source depending on your requirements.

Nd:YAG laser sources with either 200 or 300 W are available, which are characterized by a high pulse peak power. However, they can also be

used to realize fine welds. It gets even finer with the optional, switchable fine welding option. This provides spot weld diameters < 0.1 mm for high-precision micro-welds.

You can also get the ALW with a 300 or 450 W **fiber source**. We recommend fiber lasers for sheet metal processing, for deep penetration welding, for CW welding and for reproducible welding results thanks to the integrated power monitoring. The fiber source is characterized by high energy efficiency.

ALV

It's your choice

Nd:YAG-LASER POWER (WATT)

120 180



The system meets the high safety requirements of performance level d.

FIBER LASER POWER (WATT)

150 300 450

LASER (technical values see p. 54/55)

Display and operation Touchscreen. Setting of the parameters also via the optional multifunctional foot switch.

OBSERVATION OPTIC

Leica microscope attachment with eyepieces for glasses wearers 10 ×, optional 16 ×

WORKING CHAMBER

W × D × H 580 × 420 × 530 mm
Mounting plate (W × D) 455 × 315 mm; Table feed through downwards (oblong hole Ø 46 × 40 mm)
Workpiece weight Max. 50 kg, zentrale Last
Workpiece movement Motorized via Joystick (manual, semi-automatic or automatic)

Movement range (X, Y, Z) 110 × 90 × 280 mm
Movement speed 0 to 25 mm/s
Exhaust Integrated

EXTERNAL DIMENSIONS

W × D × H 650 × 1,160 × 1,590 mm
Weight 260 kg

EXTERNAL CONNECTIONS

Electrical connection 200–240 V / 50–60 Hz / 16 A
ALV 180: 3 × 400 V / 50–60 Hz / 3 × 16 A

OPTIONS

Various rotary axis modules with chuck (also pneumatic) for horizontal/vertical rotary movements // micro welding function // camera system for demonstration and observation of the welding process // ergo wedge // multifunctional foot switch // hinged doors // turn-tilt-objective // lens extension for f = 120 mm laminar nozzle



Find out more in our product video

with the vertical Z-axis lifting up to 50 kg. The vertical traversing range of the worktable and ALV's wide opening range door enable welding of larger workpieces. For sensor applications and long pipes, two upward-opening hinged doors with a side slot can be installed, added to that, the ALV has a duct in the working chamber floor making it possible for pipes to be inserted from below.

Users can set a reduced welding focus function, decreasing the welding spot diameter to less than 0.1 mm for high-precision micro-welds.

Additionally, different rotary axes for machining cylindrical parts are available as add-ons, enhancing support in production or repair. The ALV includes WINLaser 4.0, an operational system that enables interpolated travel in XYZ for automated welding, such as processing magazines with several components. With a few simple steps, this laser-safe, closed system can be converted into an open laser workplace.

The compact **ALV**, featuring a laser-safe working chamber, offers various laser powers and sources, controlled via an app or NC control with an intuitive touch screen. It is ideal for precision and deposit welding in tool and mold making, sensor production, and medical and precision engineering. The system has three linear movement axes,

AL-Q

Laser welding station for series production



Find out more in our product video

FIBER LASER POWER (WATT)
150 300 450 600



The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)

Display and operation 15" Display with touch function. WINLaser 4.0-Software programmable via integrated PC, keyboard and mouse.

OBSERVATION

Monitor

WORKING CHAMBER

W x D x H 900 x 650 x 850 mm
Mounting plate (W x D) 610 x 440 mm
Workpiece weight 100 kg, zentral
Movement range (X, Y, Z) 210 mm, 175 mm, approx. 300 mm
Total vibration value > 2.5 m/s²

EXTERNAL DIMENSIONS

W x D x H 1,850 x 1,775 x 2,470 mm (working position with door open)
 1,250 x 1,140 x 1,990 mm (transport position, door closed, without warning lamp)

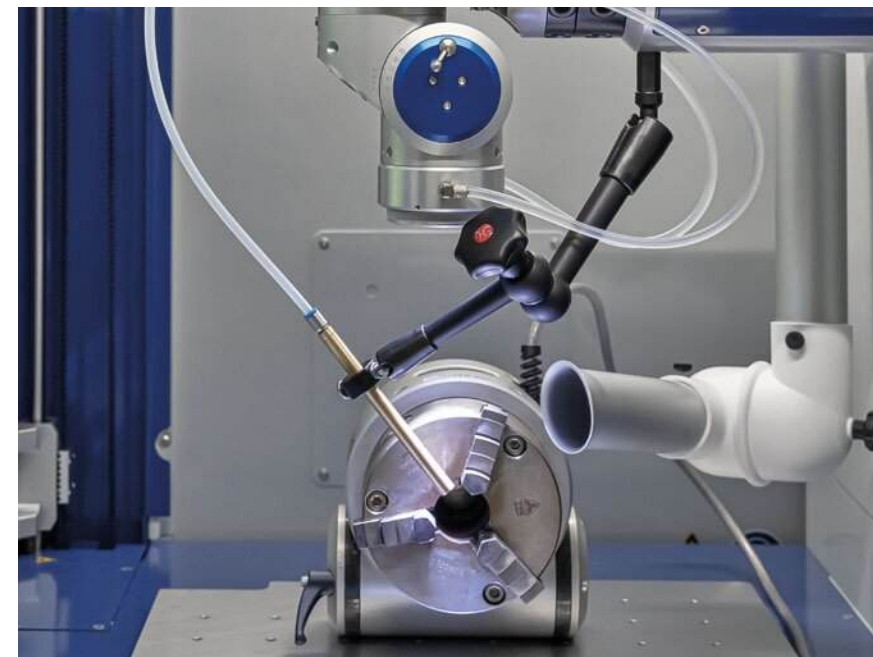
Weight 475 kg

EXTERNAL CONNECTIONS

Electrical connection 3 x 400 V / 50-60 Hz / 3 x 16 A
Cooling air-cooled
AL-Q 450 F, AL-Q 600 F: also water-cooled available

OPTIONS

turn-tilt-objective // sealing air // cross jet // rotary axis // Pneumatic // I/O // gas nozzle included // water-cooled optics



The **AL-Q** is a laser cell that is available with different air-cooled fiber laser sources with 150, 300, 450 or 600 watts. The 450 and 600 watts are optionally available with water cooling. The machine can be flexibly equipped with all ALPHA LASER processing heads. A quick-change system is included as standard.

The AL-Q is ideal for automated work. An electric door opens and closes at the push of a button, ideal for quickly equipping the work chamber. Individual parts or magazines find enough space on the centrally arranged worktable. Long components can also be inserted into the cabin from underneath via a passage in the worktable or via slots on the side of the housing. A pick-and-place system can be connected or retrofitted for more automation.

Programming is easy to learn, since our well-known WINLaser 4.0 software doesn't require G-codes. Different user levels and access rules can be defined to avoid working errors.

Even manual welding tasks can be carried out on the AL-Q (rework, single piece, etc.). Just connect the optional ALPHA LASER 2D-video goggles to observe the welding process.

Work is then carried out with the door open – with additional laser protection measures. An external extraction (start-stop integrated in the AL-Q) reliably extracts welding fumes.

Manual welding lasers

Flexible, precise manual laser welding without set-up times and with best welding quality

Whether laser welding in the dental lab, jewelry repair in the jeweler's shop or clean joining of small workpieces - with our manual welding lasers, we provide industry and trade with laser welding equipment that combines easy and simple operation with high-quality, precise welding results. Our laser systems offer soft welding behavior. They are compact, durable and easy to operate. Without any further safety precautions, they can be used in any imaginable production environment.

Laser welding can be learned quickly. Due to the uncomplicated handling, the user achieves laser-welded joints of the best quality within a very short time. The extraction system for the welding fumes is integrated.



MANUAL WELDING LASERS



04

VLO 60 // ALO // ALO 120 micro

VLO 60

Desktop-laser

Nd:YAG-LASER POWER (WATT)
60

The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)
 Display and operation Display with keypad. Touchscreen optional.

OBSERVATION OPTIC
 SMK (Leica Binocular optional)

WORKING CHAMBER
 W × D × H 475 × 232 × 192 mm
 Max. workpiece height 88 mm (200 mm with deeper working chamber)
 Exhaust Integrated (H14)

EXTERNAL DIMENSIONS
 W × D × H 510 × 645 × 430 mm
 Weight 50 kg

EXTERNAL CONNECTIONS
 Electrical connection 200–240 V / 50–60 Hz / 10 A

OPTIONS
 Micro welding function // camera system for demonstration and observation of the welding process // ergo wedge // halogen dimmer // LED ring lighting



The **VLO 60** is a compact manual welding laser with best welding properties. It is ideal for freehand welding of dental, jewelry and sensor applications or for small welding tasks in tool and mold making.

This desktop laser with 60 watts offers a powerful beam behavior and is characterized by a steady, powerful and yet soft welding behavior. The spacious work chamber is brightly lit and the light intensity can be optionally dimmed. A welding fume extraction is integrated as standard.

Even the finest joints can be made with the optional precision welding function.

ALO/ALO 120 micro

Ergonomic and flexible

Nd:YAG-LASER POWER (WATT)
100 120

The system meets the high safety requirements of performance level d.

LASER (technical values see p. 54/55)
 Display and operation **ALO 100, 120:** manual
ALO 120 micro: PLC programmable via touch screen

WORKING CHAMBER
 W × D × H 560 × 346 × 214 mm
 Max. workpiece height 104 mm
 Exhaust Integrated

EXTERNAL DIMENSIONS
 W × D × H 600 × 954 × 1,300 mm
 Weight approx. 145 kg

EXTERNAL CONNECTIONS
 Electrical connection 200–240 V / 50–60 Hz / 16 A

OPTIONS

	ALO 100	ALO 120	ALO 120 micro
Micro welding function	○	○	●
Working chamber with slots	—	—	●
LED deflection unit	○	○	●
Motor for rotary axis	○	○	●
Connection for cooling	○	○	○
Rotary axis manual	○	○	○
Rotary axis pneumatic	—	—	○
Micro manipulator	○	○	○

— Not available ○ Optional ● Standard



Find out more in our product video

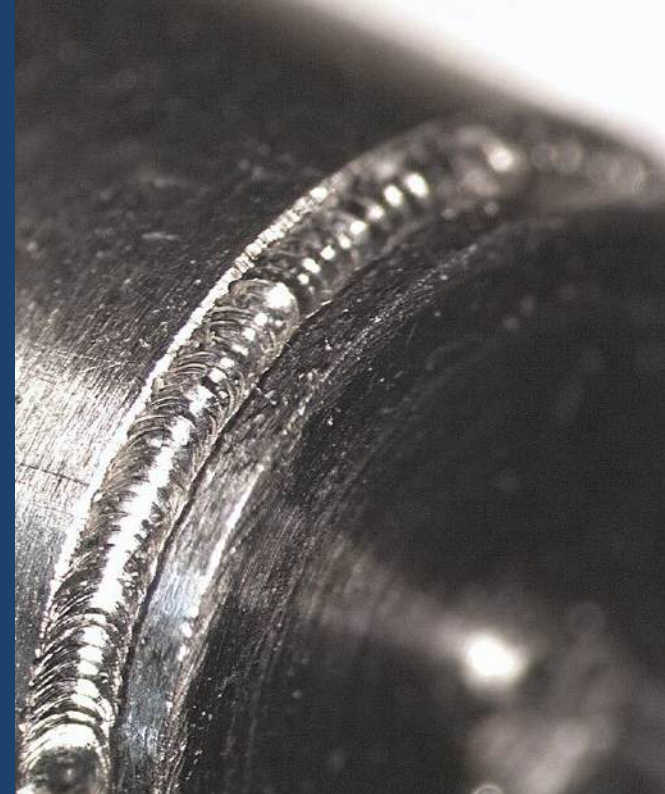
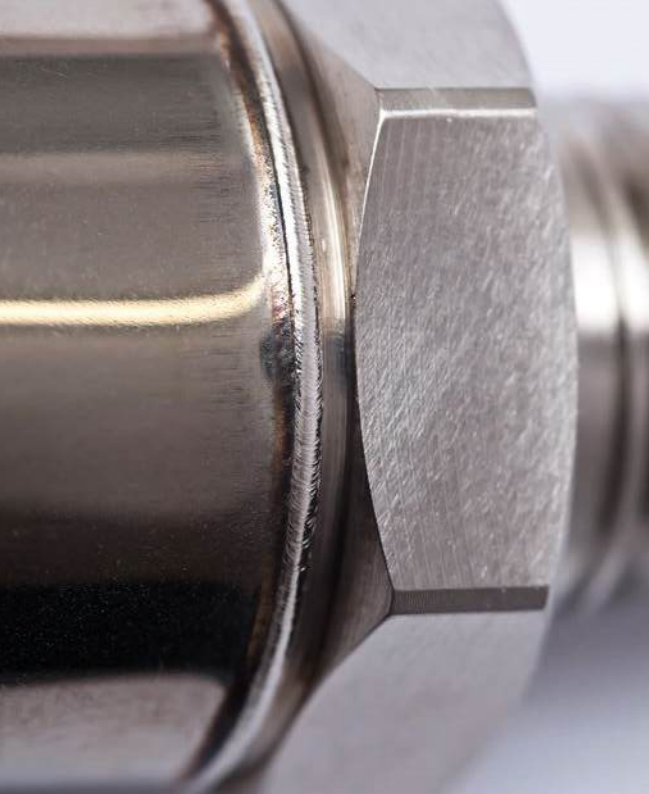


The **ALO** is the ideal device for anyone who wants to weld long or bulky parts quickly, manually and flexibly. It offers an easy loading and working in the shielded laser safety area.

The work chamber can be loaded via various laser-safe openings: A large opening at the front offers easy access to the spacious working chamber. Lateral slots as well as a

passage at the bottom of the work chamber support when inserting long components. The armrest is extremely comfortable – relaxed work is therefore guaranteed. Due to the possibility of an external cooling connection, work can be carried out at high frequency over a long period of time.

The **ALO micro** also has a precision welding option, various optics, a special rotary axis with fine adjustment, a funnel for inserting tubes and other useful accessories help with precision welding



Precision welding in sensor-, precision engineering and medical technology

With the laser welding process, very fine, high-strength welded joints can be achieved on all common metallic materials in sensor production as well as in medical and precision engineering.

The laser welding devices from ALPHA LASER enable you to carry out precision welding in production and to repair your products. Materials such as titanium, CoCr, CrNi and common steels are ideal for welding.



AL-SWS

This multifunctional laser system offers the possibility to work with various inserts, so that different steps in the production of thermocouples can be carried out with one machine: compacting, tube scribing, micro-welding, circumferential welding or welding under pressure. The variable inserts for the special tasks of sensor production can be easily exchanged so that you can quickly switch between the applications. The **AL-SWS** is available in several performance classes.



ALV

With the **ALV**, small series can be manufactured in automatic mode. An optional fine welding function reduces the spot diameter to less than 0.1 mm. Special door concepts for inserting long parts are available. Rotary axes with jaw chucks or pneumatic collets support circular welding.



ALO 120_{micro}

Best welding results, fast loading, well thought-out rotary axes and a fine welding function that reduces the spot diameter to less than 0.1 mm make the **ALO** a valuable tool for precision manufacture of your components. Various optics, a special rotary axis with fine adjustment, a useful funnel for inserting tubes and other convenient accessories help with the precision manufacture of components.



VLO 60

For quick, manual welding such as compacting, contacting and spot welding. Pipes and cables can be quickly inserted into the working chamber with the bristle-equipped system. Due to the lower investment costs, the **VLO 60** is often used as a second device, since the processor doesn't need to leave his workplace to bring the parts to the welding station and the welding station isn't blocked for other tasks.

Robot supported applications

Laser hardening

Laser beam hardening is a cost-effective and extremely fast surface hardening process. It allows partial hardening of selected, stressed functional areas on the workpiece surface without changing the core properties. This also increases strength properties, stiffness and fatigue strength. An important benefit is that the localized heating and associated minimal heat input reduces dimensional change and distortion. Because the laser hardening process is temperature controlled, cut edges and tight radii can be hardened without the risk of melting.

Another advantage: the hardening process is contactless and almost wear-free.

The cooling required for the hardening process takes place by self-quenching in the component if the component volume is appropriate. No additional quenching medium such as oil or water is required, thus preventing corrosion and surface contamination. This enables a clean and resource-saving hardening process.

Contour-accurate laser hardening on grooves, free-form surfaces or other geometries is of course also possible. Surface layer hardening using our laser machines saves rework on the workpiece and can be used flexibly for spontaneous additional tasks.

LASER HARDENING SAVES TIME,
IS PRECISE, DELIVERS CONSISTENT QUALITY,
SAVES ENERGY, IS FUTURE-ORIENTED.



ROBOT SUPPORTED APPLICATIONS

05

AL-ROCK mobil
AL-ROCK modular

AL-ROCK mobil

For laser hardening and power deposition welding



Find out more in our product video

The **AL-ROCK mobil** is the first truly mobile robot for the targeted laser hardening of metal surfaces. All components such as laser source, optics, control, cooling, powder feeder and safety technology are integrated in the system. This means that the AL-ROCK mobil can be loa-

ded or placed quickly. The component to be hardened no longer has to be moved or built out, since the laser can be driven directly to the workpiece. The only requirement is that the laser beam has free access to the workpiece surface to be hardened.

The sweeping robotic arm easily reaches hard-to-reach places.

WE HELP YOU TO FIND THE IDEAL MACHINE SET-UP



The monitor can be removed for safe operation outside the laser safety barriers.



The ALPHA LASER system **AL-ROCK modular** is a flexible, stationary robot system with up to 16 synchronized axes for targeted surface hardening of metal surfaces on a large number of different components, or for automated

powder deposition welding. Only one controller is required to control all axes. As a result, the operation of the hardening system – also with the addition of powder deposition welding – can be learned very easily and

quickly. Components of all sizes can be processed: from small to very long.

AL-ROCK modular

Set-up according to your needs



Learn more in our product website

Laser processing heads for fiber lasers



Automated welding of pins



Laser Spindle-CL



rod with scribing position



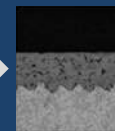
cracked rod



Smooth surface before laser machining



Surface roughened with Laser Spindle-S



Coated surface

Orbital welding

The **LASER SPINDLE-O** is used for automatic circular welding of rotationally symmetrical, metallic components. Components in the diameter range 0–20 mm or 20–40 mm can be welded. The co-rotating gas nozzle allows optimal gas coverage on the workpiece. Using an HDMI camera and integrated LED lighting, the laser process is easily and precisely adjusted to the workpiece and can be monitored. The LASER SPINDEL-O is water-cooled and therefore suitable for continuous operation

Surface scribing

The **LASER SPINDLE-C/ CL** is used for notching, scribing and drilling, i.e for creating predetermined breaking points on rotationally symmetrical components made of brittle metals, e.g. on connecting rods or crankshaft housings (insertion depth -1 m). The process head is water-cooled and therefore suitable for continuous use.

The **AL-RACK 150 F**, which contains a 150 W single-mode laser module and controls the optics, is ideal for using the LASER SPINDLE-C/CL.

Surface structuring

The rotating laser head **LASER SPINDLE-S** is used for automatic surface structuring of cylindrical inner surfaces of metallic components. Workpieces with Ø 60–180 mm and a depth of up to 250 mm can be processed. A wide variety of surface structures can be applied to the workpiece. Extraordinarily high process times are achieved with a maximum speed of 10,000 rpm.

This laser roughening process is extremely resource-friendly in terms of energy and gas consumption. Even in continuous use, the LASER SPINDLE-S impresses with its minimal wear.

Scanning processing head

The **LASERHEAD-S** is a scanner optics with temperature monitoring for complex surface processing tasks such as laser hardening, laser welding or laser soldering. It has a wobble function with different wobble patterns. It has a scan field with a maximum edge length of 150 mm. The scanner optics are characterized by a compact and lightweight design. The complete control and the electronic components are housed in the process head.

Processing head for joint, wire and powder deposition welding

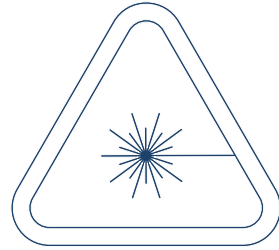
The **LASERHEAD-L** is a process head for fully or partially automated laser welding or powder deposition welding. Thanks to the modular design, a wide variety of individually adapted process heads can be put together according to customer requirements. For example, a choice of six different fiber plug adapters is possible, as is a choice of four different lenses

Processing head with camera observation

The **LASERHEAD-K** can be connected to any fiber-coupled laser source with a QBH-compatible connector and integrated into existing machine setups. The process head offers continuously fixable focusing of the laser beam without shifting the working plane. The shielding gas nozzle is integrated and a thermostat protects against overheating. An optional camera transmits the welding process to an external monitor.

Laser safety

Protection – Against what?



// LASER RADIATION

Without eye protection, invisible laser radiation in the wavelength range of 1,064 nm to 1,070 nm damages the eyes. Therefore, suitable laser protection goggles must always be worn in the laser area.

// SECONDARY RADIATION

When the laser beam meets the material, UV radiation and bright bluelight occur in the “plasma flare”. This secondary radiation can damage the skin and eyes. You can protect yourself by using suncream and sunglass-clips for your protection goggles.

// SMOKE

When the laser beam meets the material, toxic smoke occurs, which proper exhaustion will keep away from the user and other people.

// MISCELLANEOUS

E.g. Heat and cut injuries.

Laser safety

Safety is one of our top priorities

Our laser systems offer you not only optimal results for your welding, cutting and hardening tasks, but also ensure safe work. As the manufacturer of the world's first laser system with TÜV certification for meeting the high safety requirements for Performance Level d, we offer a wide range of safety accessories, ideally suited to our devices. We maintain close contact with the relevant committees, professional associations and expert groups.

WE CAN ADVISE YOU ON THE
SUBJECT OF LASER
SAFETY AND OFFER
TRAINING AND
PROTECTIVE EQUIPMENT



TÜV SAFETY

ALPHA LASER is the world's first manufacturer of laser systems with TÜV certification for safety level 'Performance Level d'. The TÜV seal confirms the laser system's functional safety according to European standard DIN EN ISO 13849.

This means that the laser system remains safe even during a technical malfunction.

Technical data laser

Nd:YAG-laser – Pulsed laser welding

Pulse shaping: adjustability of the power curve within a laser pulse

Nd:YAG, 1,064 nm	Average power	Peak pulse power	Pulse energy max.	Pulse duration	Pulse frequency	Welding spot Ø
VL 50	60 W	7.5 kW	50 J	0.5–20 ms	0–25 Hz	0.2–2 mm*
ALO 100	100 W	7 kW	60 J	0.5–20 ms	0–25 Hz	0.2–2 mm*
AL 100	100 W	9 kW	90 J	0.5–20 ms	0–50 Hz	0.2–2 mm*
ALO 120	120 W	10 kW	95 J	0.5–20 ms	0–50 Hz	0.2–2 mm*
AL 120	120 W	9 kW	90 J	0.5–20 ms	0–50 Hz	0.2–2 mm*
YAG-150	150 W	9 kW	90 J	0.5–20 ms	0–100 Hz	0.2–2 mm*
YAG-200	200 W	9 kW	90 J	0.5–20 ms	0–100 Hz	0.2–2 mm*
YAG-250	250 W	9 kW	90 J	0.5–20 ms	0–100 Hz	0.2–2 mm*
YAG-300	300 W	9 kW	90 J	0.5–20 ms	0–100 Hz	0.2–2 mm*

* optional precision welding function available for spot weld diameters smaller than 0.1 mm

Technical data laser

Fiber laser – Pulsed laser welding and CW welding

Pulse shaping: adjustability of the power curve within a laser pulse

Fiber laser, 1,070 nm	Average power	Peak pulse power	Pulse energy max.	Pulse duration	Pulse frequency	Welding spot Ø
Fiber-150 F	150 W	1.5 kW	15 J	0.2–50 ms/CW	0–100 Hz	0.2–3 mm, optional 0.1–4 mm
Fiber-300 F	300 W	3 kW	30 J	0.2–50 ms/CW	0–100 Hz	0.2–3 mm, optional 0.1–4 mm
Fiber-450 F	450 W	4.5 kW	45 J	0.2–50 ms/CW	0–100 Hz	0.2–3 mm, optional 0.1–4 mm
Fiber-600 F	600 W	6 kW	60 J	0.2–50 ms/CW	0–100 Hz	0.2–3 mm, optional 0.1–4 mm
Fiber-900 F	900 W	9 kW	90 J	0.2–50 ms/CW	0–100 Hz	0.3–3 mm, optional 1.1–4 mm
Fiber-1200 F	1200 W	12 kW	120 J	0.2–50 ms/CW	0–100 Hz	0.3–3 mm, optional 1.1–4 mm

Options

// TURN-TILT-OBJECTIV - TTO

Our swivel lens significantly facilitates work in difficult workpiece positions. In the entire 360° rotation range of the lens, the beam can be steplessly deflected by up to 40° from the vertical. This allows you to reach hard-to-reach places, while maintaining an ergonomically favorable working posture. Our TTO is also available water-cooled.

// FUNCTION MICRO-WELDING

The switchable fine welding option is available for Nd:YAG systems up to 300 W (except ALM and ALFlak Max). It delivers spot diameters < 0.1 mm for high-precision micro-welds.

// WINLaser® 4.0-SOFTWARE

Our patented semi-automatic User Coordinate Controller offers unique ease of use, making 3D motion sequences easy. However the areas to be joined are positioned in space, the movement system allows fast, easy setup, so that you can concentrate on the welding task.

// WINLaser® 5.0-SOFTWARE

The new WINLaser 5.0 operating software makes machine control intuitive and efficient. Thanks to the clear display and modern user interface, all important laser parameters and functions can be set conveniently. The integrated camera and precise joystick control optimize the workflow, while additional apps and flexible I/O configurations enable adaptation to specific needs.

// PROGRAMMABLE LASER WIRE FEED SYSTEM AL-DV

Process reliability and highest reproducibility of laser welding with optimized welding time are striking features that speak for the use of ALPHA LASER wire feeding system AL-DV. Welding wires from 0.2–1.6 mm are fed with high precision by the AL-DV. The AL wire feed unit has integrated sensors for wire detection, including wire end sensor, wire feed monitoring and wire freeze monitoring.

Via two buttons on the feed unit manual feeding of wire is possible. In addition, the external handpiece is available, with which wire can be applied manually.

// ROTARY AXES

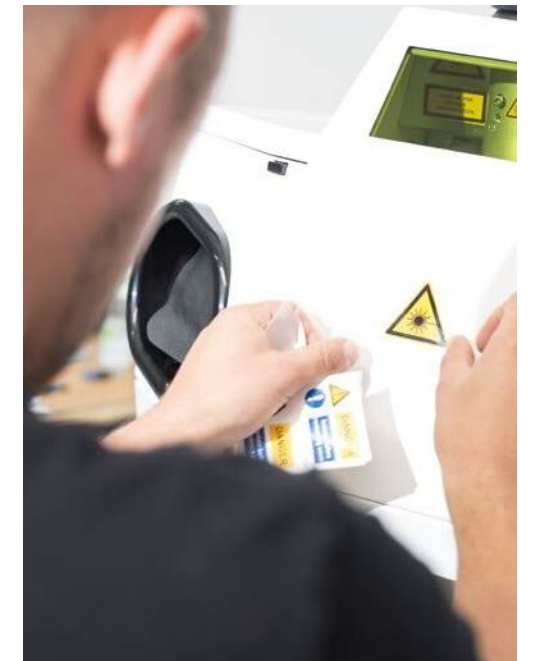
ALPHA LASER offers a wide variety of rotary axes: from the precise adjustable rotary axis for the ALO micro to the heavy-duty rotary axis for shafts and spindles.

// POWDER FEEDER AL-PF

The AL-PF provides controlled conveying of common powders for laser powder deposition welding with grain sizes from 45–140 µm. It is controlled directly by the ALPHA LASER systems ALFlak or AL-ROCK but it can also be used as a stand-alone device.

// POWDER NOZZLE AL-FLOW Powder

The powder nozzle is suitable for fiber lasers up to 4 kW average power. Powder particle sizes from 45–140 µm can be processed.



Locations

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