ALPHALASER

LASERSYSTEMS

FOR METAL PROCESSING

PRODUCT CATALOGUE

01 MOBILE OPEN SYSTEMS

02 STATIONARY OPEN SYSTEMS

03 CLOSED MULTI-AXIS SYSTEMS

04 MANUAL WELDING LASERS

05 ROBOT SUPPORTED APPLICATIONS

06 LASER CUTTING

07 3D-PRINTING

Table of contents

From vision to innovation

Welcome to ALPHA LASER

Under its guiding principle “From Vision to Innovation”, ALPHA LASER has become 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

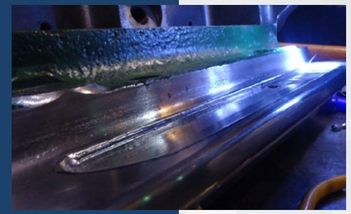
Did you know that our resonators are milled from a single piece to provide the best beam quality? Sophisticated, rotatable beam deflection and movable objectives ensure you a comfortable work position while reaching almost any location to be welded.

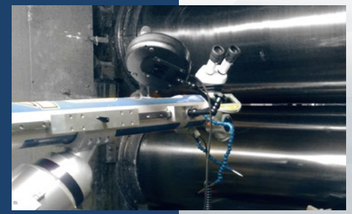
ALPHA LASER
Mobile open systems

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 // AL-CROSS // AL*flak* MAX
AL*flak* // AL-ARM
AL 1200 F // AL*flak* 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. 58/59)

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 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	530 mm
Highest working point	1590 mm
Arm deflection	1300 mm

EXTERNAL DIMENSIONS

W x D x H	730 x 1410 x 1585 mm
Weight	320 kg

EXTERNAL CONNECTIONS

Electrical connection	3 x 400 V / 50 - 60 Hz / 3 x 16 A
External cooling	**ALM 200:** Optional **ALM 250, 300:** Prepared

OPTIONS

Turn-tilt-objective // rotating axis with chuck 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 x 50 mm.

With the ALM you gain internal and external mobility.

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. 58/59)

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	1900 mm
Arm deflection	1300 mm

EXTERNAL DIMENSIONS

W x D x H	790 x 1590 x 1250 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 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

MULTIFUNCTIONAL AND COMPACT

The **AL-CROSS** is ideal for use in sheet metal applications or in mechanical engineering. Equipped with a 600 W laser source, it is an entry-level system for „heavy metal“ operations. Anyone who wants flexible pulsed or CW deep penetration welding – e.g. on large tanks – gets the necessary laser power and flexibility with the AL-CROSS. The welding behavior can be influenced via predefined pulse shapes.

The AL-CROSS fits in standard vans. Integrated eyelets on the robust steel housing plus a hook for a cable winch ensure that the system can be easily loaded or lifted. The sturdy aluminum handles provide impact protection for edges and housing.

AL*Flak* MAX

An especially long reach

Learn more in our product data sheet

Nd:YAG-LASER POWER (WATT)

250 300

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

LASER (technical values see p. 58/59)

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

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)	320 x 330 x 370 mm
Lowest working point	510 mm
Highest working point	1870 mm
Arm deflection	2700 mm

EXTERNAL DIMENSIONS

W x D x H (base unit incl. chassis)	1200 x 1200 x 1300 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	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

With its laser arm almonst 2.80 m long, the **AL*Flak* 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 AL*Flak* 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 AL*Flak* Max is available in two versions: with a self-propelled caterpillar track or a model that can be moved manually with a forklift.

AL-ARM 450 F

Manual welding laser

Find out more in our product video

FIBER LASER POWER (WATT)

450

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

LASER (technical values see p. 58/59)

Display and operation	Display with keypad
Focussing distance	120 mm
Welding spot Ø	0.2 to 3.0 mm

OBSERVATION OPTIC AND HAND PIECE

2-D Video-laser protection-google to visualize the welding process
Hand piece AL-AKO H with attachment A (automatic wire feed) and attachment M (manual)

EXTERNAL DIMENSIONS

W x D x H (supply unit)	550 x 600 x 1200 mm (height with swivel arm 2000 mm)
Length enery chain	3.5 m, optional 9 m
Weight supply unit	120 kg
Weight hand piece	1.5 kg

EXTERNAL CONNECTIONS

Electrical connection	200 - 240 V / 50 - 60 Hz / 16 A

OPTIONS

Different attachments // 9 m free length between hand piece and supply unit // Manipulator table

With the **AL-ARM** laser system, repair work in the car body production process – e.g. pores, penetrations and offset seams – can be carried out mobile, quickly and flexibly.
In mold making, you can weld directly in the press or milling machine – without set-up times.

The AL-ARM is different:
With this welding laser, the welding process is not observed as usual with a binocular, but with a 2D visualization. This is implemented by using pass-through 2D laser safety goggles, with which you can perceive the environment and the welding task at the same time. The welding area is shown enlarged and the process-relevant data such as the crosshairs are displayed directly in the glasses.

This laser welding system does not have a resonator, but instead a handset with automated wire feeder for wire thicknesses of up to 0.6 mm. The handle weighs just 1.5 kg and is connected to the supply unit via a 3.5 m long energy chain (optionally 9 m).

A new feature is that the system can now be operated with the ALPHA LASER **AL-DV** wire feeder. This allows wire to be fed endlessly from the wire spool.

AL*Flak*

Self-propelled, robust, programmable

Nd:YAG-LASER POWER (WATT)

200 300 500

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

LASER (technical values see p. 58/59)

Display and operation	**AL*Flak* 200, 300:** Display with keypad. Adjustment of the laser parameters additionally via multifunctional foot switch. WINLaserNC software via external PC. **AL*Flak* 500:** Display with touch function. Adjustment of the laser parameters additionally via multifunction foot switch. WINLaserNC software via integrated PC.

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	1500 mm
Arm deflection	1500 mm

EXTERNAL DIMENSIONS

W x D x H (base unit incl. chassis)	1200 x 1200 x 1100 mm
Weight	With caterpillar track approx. 850 kg, without approx. 550 kg

EXTERNAL CONNECTIONS

Electrical connection	**AL*Flak* 200, 300:** 3 x 400 V / 50 - 60 Hz / 3 x 16 A **AL*Flak* 500:** 3 x 400 V / 50 - 60 Hz / 3 x 32 A
External cooling	**AL*Flak* 200, 300:** Prepared **AL*Flak* 500:** Cooling required

OPTIONS

Turn-tilt-objective // function micro welding (not available for AL*Flak* 500) // 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 **AL*Flak*** 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 model with 500 W is ideal for the maintenance and repair of spindles and shafts.

The AL*Flak*'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.

AL*Flak* 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. 58/59)

Display and operation	Touch display. Additional setting of the laser parameters via multifunctional foot switch. Operation of WINLaserNC 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	1780 mm
Arm deflection	approx. 1400 mm

EXTERNAL DIMENSIONS

W x D x H (base unit incl. chassis)	1200 x 1030 x 1150 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	**AL*Flak* 300 F, 450 F:** Optional **AL*Flak* 600 F, 900 F:** 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
AL*Flak* 600 F, 900 F additionally:
Powder nozzle // water-cooled turn-tilt-objective

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

Learn more on our website

The **AL*Flak*** 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 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

AL 1200 F

For tough environments

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. 58/59)

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 x, optional 16 x

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 x 210 x 300 mm

EXTERNAL DIMENSIONS

W x D x H	790 x 1590 x 1250 mm
Weight	480 kg

EXTERNAL CONNECTIONS

Electrical connection	3 x 400 V / 50 - 60 Hz / 3 x 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

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 for heavy duty applications. 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.

AL*Flak* 1200F

Complete machine

The **AL*Flak* 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 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 **LASERHEAD-P** 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. 58/59)

Display and operation	Setting of the laser parameters via touch screen and multifunctional foot switch. Operation of WINLaserNC 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	1780 mm
Arm deflection	approx. 1400 mm

EXTERNAL DIMENSIONS

W x D x H (base unit incl. chassis)	1200 x 1030 x 1150 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	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

For powder deposition welding you need the powder nozzle LASERHEAD P and the powder feeder AL-PF.

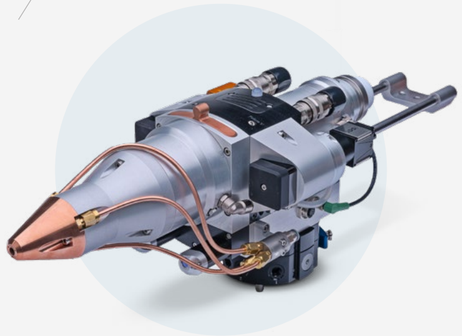
Powder Deposition Welding/ Laser Cladding

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.

THE PERFECT COMBINATION



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 **AL*flak*** or **AL-ROCK**. 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.

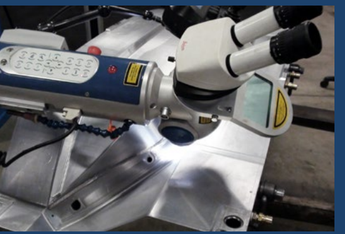
LASERHEAD-P

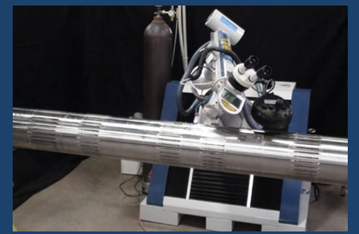
Areas, lines or any geometries can be applied regardless of the direction. By multi-layer coating of suitable materials, almost any layer thickness can be achieved and 3D volumes can also be generated. The layers produced show little dilution.

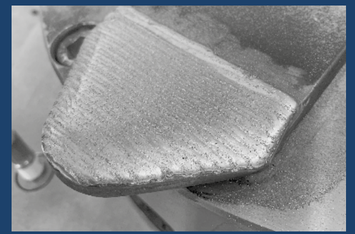
Using three coaxially positioned nozzles, the centrally guided laser beam melts the powder onto the workpiece under protective gas and with temperature control.

Application Examples

Mobile laser welding,
welding on big parts and powder
depostion 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 120 - 500 W Nd:YAG laser
AL-TW with 300 - 900 W fiber laser

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

STATIONARY OPEN SYSTEMS

02

AL-TW // AL-IN
AL-SERIE // AL-FIBER

AL-TW

The working table with integrated laser

Nd:YAG-LASER POWER (WATT)

200 300 500

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

FIBER LASER POWER (WATT)

300 450 600 900

LASER (technical values see p. 58/59)

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

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)	490 x 400 x 350 mm

EXTERNAL DIMENSIONS

W x D x H (base unit)	1200 x 1360 x 1260 mm
Weight	670 kg + 100 kg console

EXTERNAL CONNECTIONS

Electrical connection	3 x 400 V / 50 - 60 Hz / 3 x 16 A **AL-TW 500:** 3 x 400 V / 50 - 60 Hz / 3 x 32 A
External cooling Nd:YAG	**AL-TW 200, 300:** Preparation for cooling **AL-TW 500:** Integrated
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

Learn more in our product data sheet

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. 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 WINLaserNC 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.

AL-IN

Equally suitable for price-concious experts and beginners

Nd:YAG-LASER POWER (WATT)

120 150 200 300

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

FIBER LASER POWER (WATT)

300 450 600 900 1200

LASER (technical values see p. 58/59)

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	3 x 400 V / 50 - 60 Hz / 3 x 16 A **AL-IN 120:** 200 - 240 V / 50 - 60 Hz / 16 A
External cooling and sealing air fiber lasers:	**AL-IN 300 F, 450 F:** Optional **AL-IN 600 F - 1200 F:** Optical water-cooling and sealing air integrated

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 1250 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

Detailed technical data in the data sheet

We recommend the **AL-IN** for everyone who wants a lot of freedom when placing the workpiece. The components can be positio-ned 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.

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. 58/59)

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

SUPPLY PART

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

LASER BEAM SOURCE

With focusing unit (length x Ø)	**AL 100:** 820 x 120 mm, **AL 120, 150:** 990 x 120 mm **AL 200, 300:** 1100 x 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 x 400 V / 50 - 60 Hz / 3 x 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

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

The **FIBER LASER AL-F** is available with 300, 450, 600, 900 W. 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.

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.

FIBER LASER POWER (WATT)

300 450 600 900

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

LASER (technical values see p. 58/59)

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 x, optional 16 x

EXTERNAL DIMENSIONS

Supply part W x D x H	550 x 600 x 1050 mm
weight	approx. 100 kg

LASER BEAM SOURCE

Laser resonator with different objectives. (please ask)

EXTERNAL CONNECTIONS

Electrical connection	3 x 400 V / 50 - 60 Hz / 3 x 16 A
External cooling	**AL 600 F, 900 F:** Optical water-cooling integrated

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

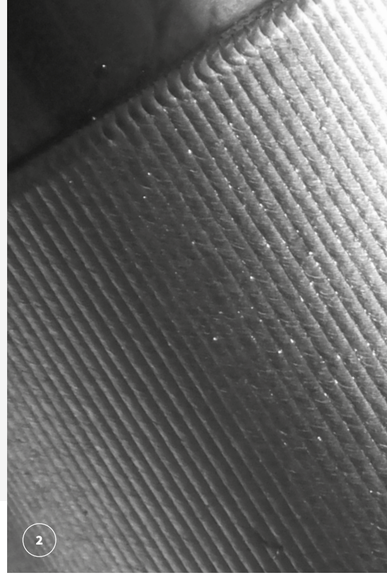
Turn-tilt-objective // rotating axis with chuck, tiltable, for horizontal to vertical rotation // Camera system for demonstrating and observing the welding // Ergo wedge // AL-DV programmable laser wire feeder

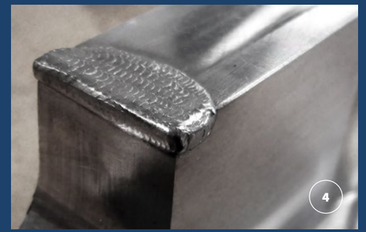
Learn more in our product data sheet

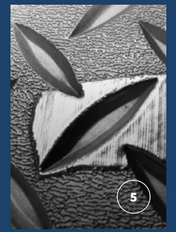
Application examples

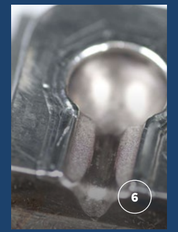
Stationary open systems

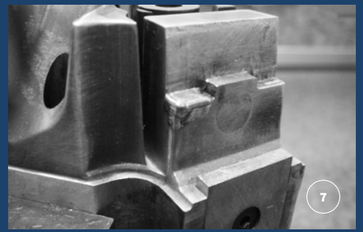
1. Laser welding of series parts (here anemometer)
2. Large area material deposition with welding wire
3. Transmission parts (here a gear) are welded with little heat impact
4. Repair of a worn sealing edge of a mould insert (Ampco-Bronze)
5. Repair of a pitted surface
6. Repair of washed out edges
7.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











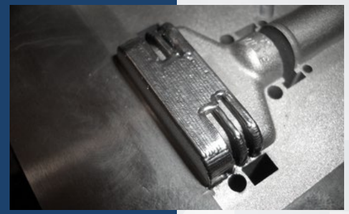
Closed multi-axes systems

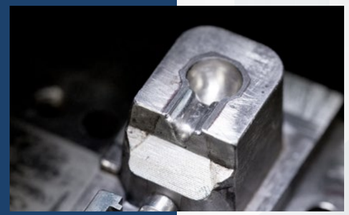
Laser welding machines for every work environment

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-fatique 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. 58/59)

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

OBSERVATION OPTIC

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

WORKING CHAMBER

W x D x H	1080 x 850 x 450 mm
Mounting plate (W x D)	600 x 475 mm
Workpiece weight	400 kg max., central
Workpiece movement	Motorized via joystick
Movement range (X, Y, Z)	478 x 340 x 332 mm

EXTERNAL DIMENSIONS

W x D x H	1190 x 1400 x 1740 mm (with display folded 1500 m)
Weight	900 kg

EXTERNAL CONNECTIONS

Electrical connection	3 x 400 V / 50 - 60 Hz / 3 x 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 systemes // optics cooling // sealing air (only for fiber lasers) // Cross Jet

Find out more in our product video

The closed, laser-safe housing makes the **ALW** a laser-protected workplace that can be used in the normal production environment without additional safety precautions. The stable steel construction ensures high precision of the movement mechanics, so that the ALW is 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**

LASER (technical values see p. 58/59)

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 x, optional 16 x

WORKING CHAMBER

W x D x H	580 x 420 x 530 mm
Mounting plate (W x D)	455 x 315 mm; Table feed through downwards (oblong hole Ø 46 x 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 x 90 x 280 mm
Movement speed	0 to 25 mm/s
Exhaust	Integrated

EXTERNAL DIMENSIONS

W x D x H	650 x 1160 x 1590 mm
Weight	260 kg

EXTERNAL CONNECTIONS

Electrical connection	**ALV 120, ALV 150 F:** 200 - 240 V / 50 - 60 Hz / 16 A **ALV 180, ALV 300 F:** 3 x 400 V / 50 - 60 Hz / 3 x 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

The compact and ergonomic **ALV** with its laser-safe working chamber is available with different laser powers, laser sources and with app or NC control.

The ALV is used in the areas of precision and deposit welding in tool and mold making, in sensor production and in medical and precision engineering.

The welding laser offers a large vertical travel and doors that can be opened wide, so that larger workpieces can also be accommodated. For sensor applications and for easy placement of long pipes, upward-opening hinged doors with a side slot can be ordered. In addition, a duct in the working chamber floor allows pipes to be inserted from below.
A fine welding function reduces the spot diameter to < 0.1 mm for high-precision micro-welds. The ALV has 3 linear movement axes, with the vertical Z-axis lifting up to 50 kg.

Different rotary axes for machining cylindrical parts are optionally available.
The device version with WINLaserNC control enables interpolated travel in XYZ for automated welding, e.g. processing magazines with several components. The ALV is operated via an intuitive touchscreen.

With just a few simple steps, the laser-safe, closed system can be turned into an open laser workplace for which appropriate laser safety precautions must then be taken.

AL-Q

Laser welding station for series production

FIBER LASER POWER (WATT)

150 300 450 600

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

LASER (technical values see p. 58/59)

Display and operation	15" Display with touch function. WINLaserNC-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	1850 x 1775 x 2470 mm (working position with door open) 1250 x 1140 x 1990 mm (transport position, door closed, without warning lamp)
Weight	475 kg

EXTERNAL CONNECTIONS

Electrical connnection	3 x 400 V / 50 - 60 Hz / 3 x 16 A

OPTIONS

turn-tilt-objective // sealing air // cross jet // rotary axis // Pneumatic // I/O

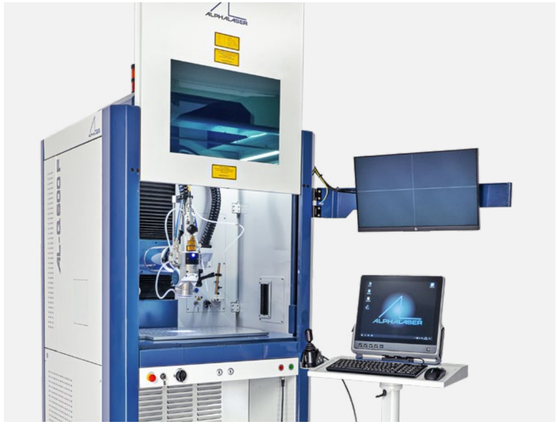
The **AL-Q** is a laser cell that is available with different air-cooled fiber laser sources with 150, 300, 450 or 600 watts. The 450 and 600 watts are optionally available with water cooling The machine can be flexibly equipped with all ALPHA LASER processing heads. A quick-change system is included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

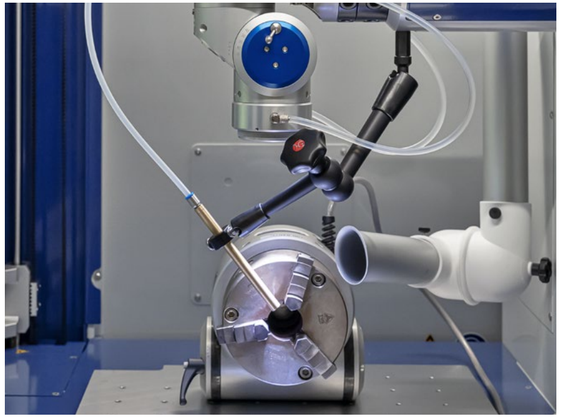
The AL-Q is ideal for automated work. An electric door opens and closes at the push of a button, ideal for quickly equipping the work chamber. Individual parts or magazines find enough space on the centrally arranged work-table. Long components can also be inserted into the cabin from underneath via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

Programming is easy to learn, since our well-known WINLaserNC 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 repairs at the jeweler's or clean connections of small workpieces – with our manual welding lasers, we equip industry and trade with laser welding devices that combine 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

VL 50 // ALO // ALO MICRO

VL 50

Desktop-laser

Nd:YAG-LASER POWER (WATT)

60

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

LASER (technical values see p. 58/59)

Display and operation	Display with keypad. Touchscreen optional.

OBSERVATION OPTIC

SMK (Leica Binolular optional)

WORKING CHAMBER

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

EXTERNAL DIMENSIONS

W x D x H	510 x 645 x 430 mm
Weight	50 kg

EXTERNAL CONNECTIONS

Electrical connnection	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 **VL 50** is a compact manual welding laser with best welding properties. It is ideal for freehand welding of dental, jewelery 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.

The VL 50 is loaded via a front flap.

ALO/ALO 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. 58/59)

Display and operation	**ALO 100, 120:** manual **ALO 120 micro:** PLC programmable via touch screen

WORKING CHAMBER

W x D x H	560 x 346 x 214 mm
Max. workpiece height	104 mm
Exhaust	Integrated

EXTERNAL DIMENSIONS

W x D x H	600 x 954 x 1300 mm
Weight	approx. 145 kg

EXTERNAL CONNECTIONS

Electrical connnection	200 - 240 V / 50 - 60 Hz / 16 A

OPTIONS

	ALO 100	ALO 120	ALO 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	○	○	○

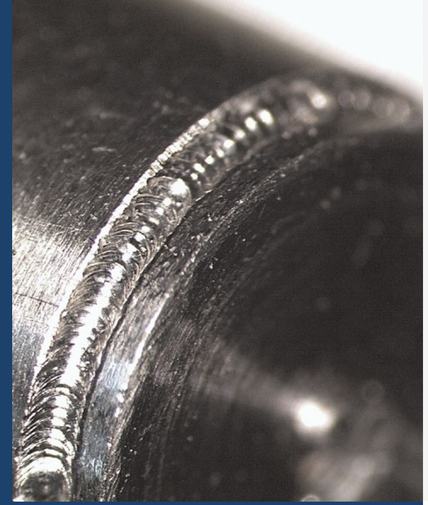
— Not available ○ Optional ● Standard

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-, precison 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.

VL 50

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 **VL 50** 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

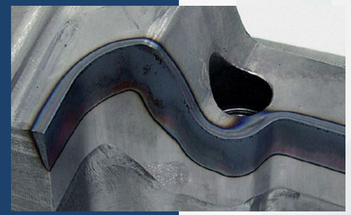
Laser hardening

Laser beam hardening is an inexpensive and extremely fast process for surface hardening. It enables the partial hardening of selected, stressed functional areas on the workpiece surface without changing their core properties. This also increases the strength properties, rigidity and fatigue strength. An important benefit is that the localized heating and associated minimal heat input reduces dimensional change and warping. Because the laser hardening process takes place using temperature-controlled power regulation, cut edges and narrow radii can also 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 APPLI-CATIONS

05

AL-ROCK MOBILE
AL-ROCK MODULAR

AL-ROCK MOBILE

For laser hardening and power deposition welding

Find out more in our product video

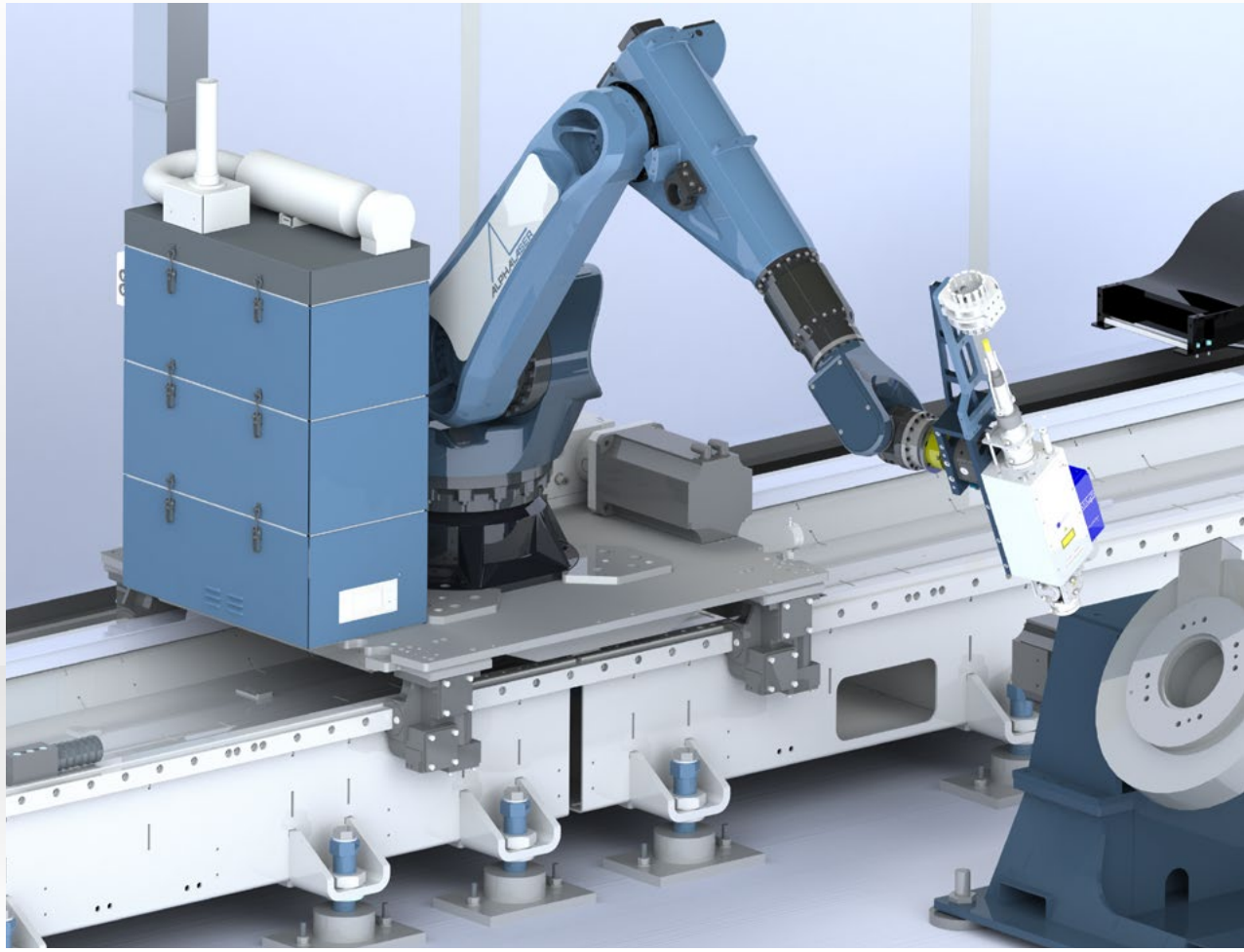
The **AL-ROCK MOBILE (our MINI-ROCK)** is the first truly mobile robot for the targeted laser hardening of metal surfaces. All components such as laser source, optics, control, cooling, powder feeder and safety technology are integrated in the system.

This means that the AL-ROCK mobile can be loaded 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.

AL-ROCK MODULAR

Set-up according to your needs

Learn more in our
Product data sheet



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.

WE HELP YOU
TO FIND THE
IDEAL MACHINE
SET-UP

Laser cutting

For small series and prototypes

From basic geometric forms to complex, ornate jewelry items made of precious metal, with the flexible **cutting system AC 300/450 F** you can cut sheets up to 3 mm in thickness automatically, quickly and accurately.
The CAD-generated cutting paths are converted within minutes and can be cut directly – ideal also for prototypes and small series.
With a small footprint of 1.340 x 1.180 mm, the compact system offers a spacious work area of 500 x 500 mm, where plates of arbitrary lengths and widths of up to 500 mm can be processed.

The fully automatic cutting process takes place in the closed, laser-proof working chamber and can be observed through a large protection window. The system is operated via the intuitive touch screen.
The nesting function shines especially in mass production. This function provides optimized use of materials, preventing unnecessary waste of material. Precious metal residues are collected and can be reused later.

Depending on your needs, fiber laser sources with 300 W or 450 W of laser power are available.

FIBER LASER POWER (WATT)

300 450

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

EXTERNAL DIMENSIONS

Supply part W x D x H	1343 x 1180 x 1341 (bzw. 1960) mm
Footprint	1343 x 1180 mm
Weight	approx. 913 kg

ELEKTRISCHER ANSCHLUSS

3-phase	3 x 400 V, 50 - 60 Hz, 3 x 10 A, 3 kW + Neutral conductor and grounding conductor

LASER (technical values see p. 58/59)

Lasertype / Wavelength	Fiber laser, 1070 nm
Average power	**AC 300 F:** 300 W, **AC 450 F:** 450 W
Peak pulse power	**AC 300 F:** CW - 3 kW, **AC 450 F:** CW - 4.5 kW
Pulsenergie	**AC 300 F:** 30 J, **AC 450 F:** 45 J
Pulse duration	0.2 ms - CW1
Laser protection class	1
Pilotlaser	630 - 680 nm (≤ 1 mW)
Laser cooling	Pressure cooling

CUTTING

Focal spot Ø / Cutting width	min. 60 µm
Focal distance	f = 86 mm
Work area	500 x 500 mm
Maximum sheet size (W x D x H)	500 x arbitrary[3] x 3 mm
Cutting speed[3]	max. 3 m/min

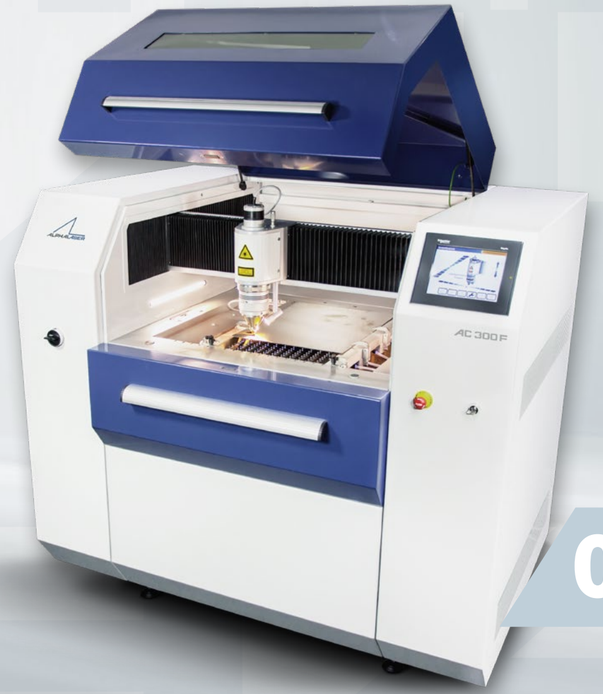
MOVEMENT SYSTEM

Precision[3]	(at 1 m measurement length)
Smallest programmable increment	0.001 mm
Positional deviation	+/- 0.03 mm max.
Average positioning scatter	+/- 0.03 mm max.

SONSTIGES

Cutting gas supply	Included
Smoke exhaustion	Can be connected
Software CAD/CAM-Module	PEPS by Camtec/cncCUT by IBE

LASER CUTTING



06

AC 300 F // AC 450 F

3D-Printer

Additive manufacturing

Safe, clean and economical powder handling characterizes the 3D printer **AL3D-METAL 200:** The closed powder circuit ensures a plus for occupational safety, because the operator doesn't come into contact with the powder during the entire printing process. The introduction of powder and the removal of the printed component takes place in a cartridge cycle.

1. **Fill the cartridge with the desired material**
2. **insert it into the printer**
3. **select the print file**
4. **start the printing process**
5. **remove the cartridge with the printed component and remove the residual powder in the unpacking station.**

The closed gas circuit with housed filter cartridges ensures minimal gas consumption when 3D printing metal. With the AL3D-METAL you can even stop the printing process and then start with another material to continue (combined mixed print of different materials). Frequent powder changes can be realized in the shortest possible time. The user has the option of maximum intervention in the machine parameters.

This freedom offers a high degree of flexibility for tasks in research and development as well as for certified production environments.

The AL3D-METAL requires very little space. With a footprint of 600 x 617 mm, the system also fits into small rooms.

Component platform 50 mm or 100 mm
The small cartridge with a Ø 50 building platform is ideal for printing with expensive precious metals and can be safely stored in the safe with the precious metal content. The cartridge is also available with a diameter of 100 mm.

Using 3D metal printing, you can produce components for high quality requirements with enormous freedom of design and geometry. Additive manufacturing with metal is resource-saving because it builds up layer by layer and does not mill from the solid.
The new 3D printer AL3D-METAL 200 from ALPHA LASER has all these properties and is particularly characterized by safe, clean and economical powder handling.

3D-PRINTER ADDITIVE MANU-FAC-TURING

07 AL3D-METAL

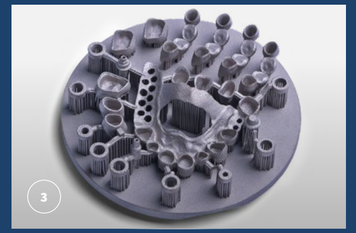
Application examples

For 3D-metal printing

The additive manufacturing process, which is used by many industries and users, allows completely new freedom in terms of geometry and functional integration in the manufacture of metal components. The use of 3D printers can significantly shorten development cycles and also meet more complex requirements thanks to the high level of design freedom. Here we present some applications with details of the powder used and the printing time.

In the following we present some applications with indication of the powder used and the printing time:

1. Printing of powder nozzles made of CuSn10 copper-tin alloy (bronze)
   Print duration: 9 h
2. Ag 925 (sterling silver) hookah mouthpiece printing
   Printing time: 4 h
3. Partial denture and crowns made of CoCr
   Print duration: 3 h
4. Multi-material printing – different powders for one component CuSn10 and 316L/1.4404
   Print duration: 6 h



POWDER EXCHANGE DURING ONE PRINT JOB POSSIBLE.

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 with a diameter of 0 – 20 mm can be welded here.
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

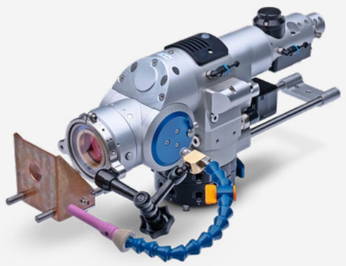
The **LASER SPINDLE-C/ CL** is used for notching, scribing and drilling, i.e for creating predetermined breaking points on rotationally symmetrical components made of brittle metals, e.g. on connecting rods or crankshaft housings (insertion depth -1 m). The process head is water-cooled and therefore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

Laser head for laser and powder deposition welding

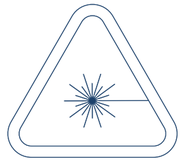
The **LASERHEAD-L** is a process head for fully or partially automated laser welding or powder deposition welding. Thanks to the modular design, a wide variety of individually adapted process heads can be put together according to customer requirements. For example, a choice of six different fiber plug 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 1064 nm to 1070 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, 1064 nm	Average power	Peak pulse power	Pulse energy	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*
AL*Flak* 500	500 W	20 kW	100 J	0.5 - 20 ms	0 - 100 Hz	0.2 - 2 / 0.5 - 2.5 / 1 - 3 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, 1070 nm	Average power	Peak pulse power	Pulse energy	Pulse duration	Pulse frequency	Welding spot Ø
Faser-150 F	150 W	1.5 kW	15 J	0.2 - CW	0 - 100 Hz	0.2 - 3 mm, optional 0.1 - 4 mm
Faser-300 F	300 W	3 kW	30 J	0.2 - CW	0 - 100 Hz	0.2 - 3 mm, optional 0.1 - 4 mm
Faser-450 F	450 W	4.5 kW	45 J	0.2 - CW	0 - 100 Hz	0.2 - 3 mm, optional 0.1 - 4 mm
Faser-600 F	600 W	6 kW	60 J	0.2 - CW	0 - 100 Hz	0.2 - 3 mm, optional 0.1 - 4 mm
Faser-900 F	900 W	9 kW	90 J	0.2 - CW	0 - 100 Hz	0.3 - 3 mm, optional 1.1 - 4 mm
Faser-1200 F	1200 W	12 kW	120 J	0.2 - 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 AL*Flak* Max).
It delivers spot diameters < 0.1 mm for high-precision micro-welds.

// WINLaserNC-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.

// 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

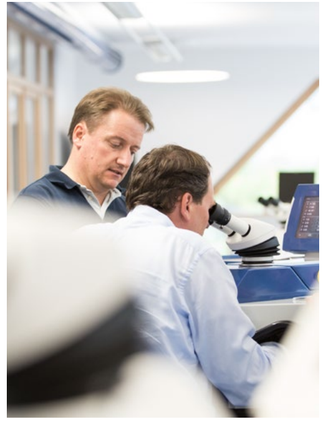
ALPHA LASER offers a wide variety of rotary axes: from the precise adjustable rotary axis for the ALO micro to the heavy-duty rotary axis for shafts and spindles.

// POWDER FEEDER AL-PF

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

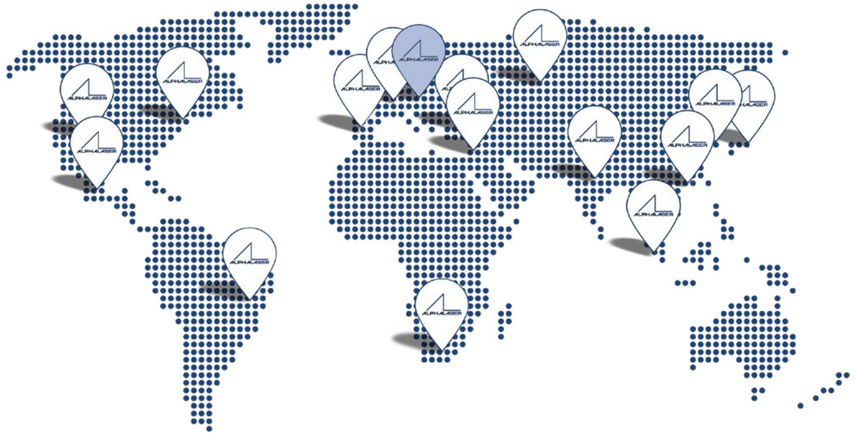
// POWDER NOZZLE LASERHEAD-P

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

Contact our offices



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