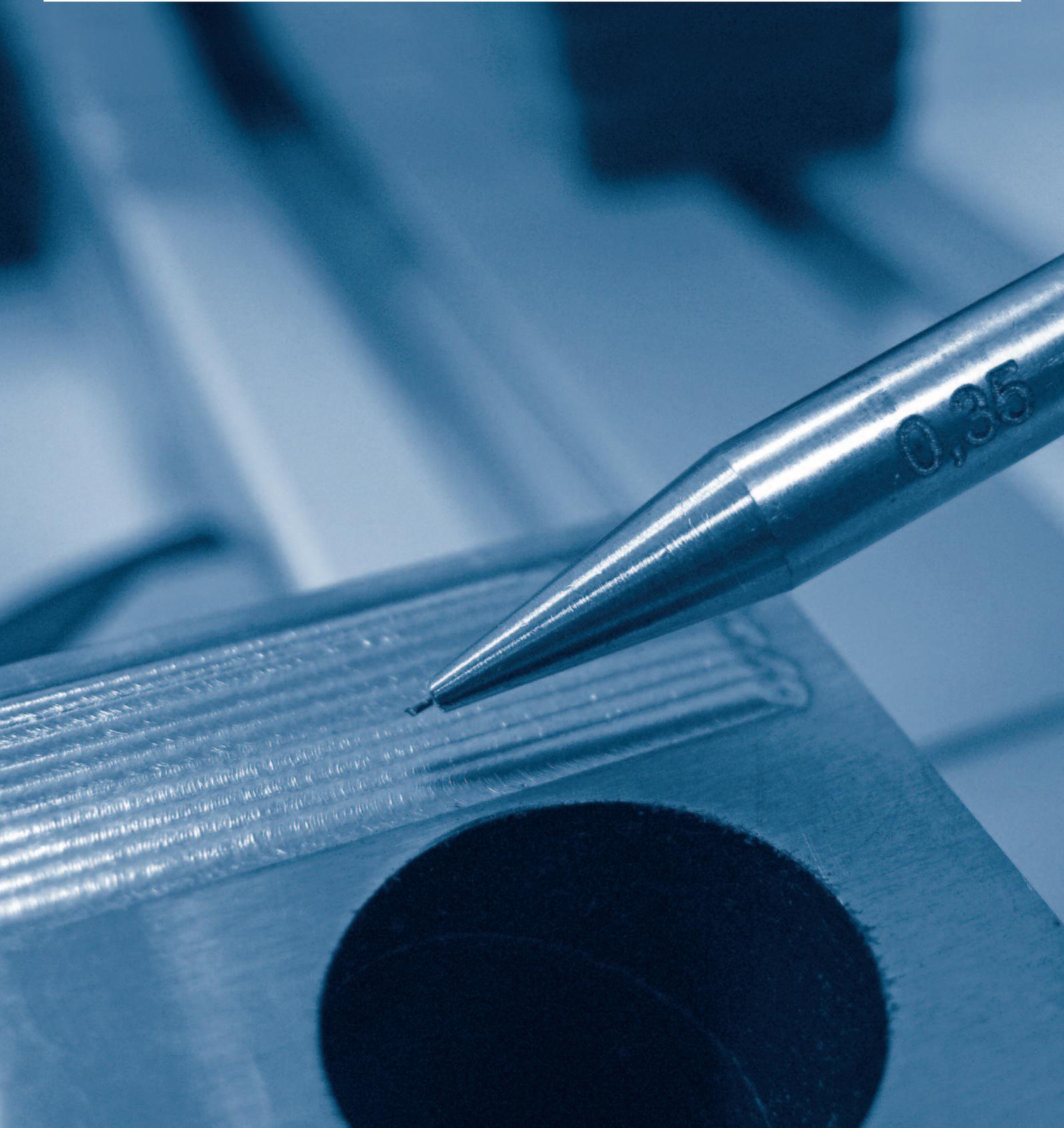




Laser Welding Systems
The basis for your welding success



Visions become Innovations





Visions today – innovations tomorrow

For ALPHA LASER these words are our motto. A vision made visible in our laser machines, which render welding work quicker and more precise. Improving manufacturing quality and increasing process-safety are foreground aspects of our work. With these as goals, ALPHA LASER has become the leading manufacturer of laser welding machines for tradespeople and for industrial production.

Particularly in the field of mobile welding works we have developed and realized extraordinary machine concepts: for manual welding, the systems AL and ALM mobile; for automatic welding applications, the ALFlak.

We stand in close relationship to our customers, maintaining always an open ear for their wishes and ideas. The intensive cooperation with our customers is mirrored in our development processes. That's how ALPHA LASER realizes new solutions for the changing demands of the market.

Trust

Since 1995 ALPHA LASER has developed and produced solely laser welding machines

Reliability

Innovative but mature technology makes ALPHA LASER your reliable working tool

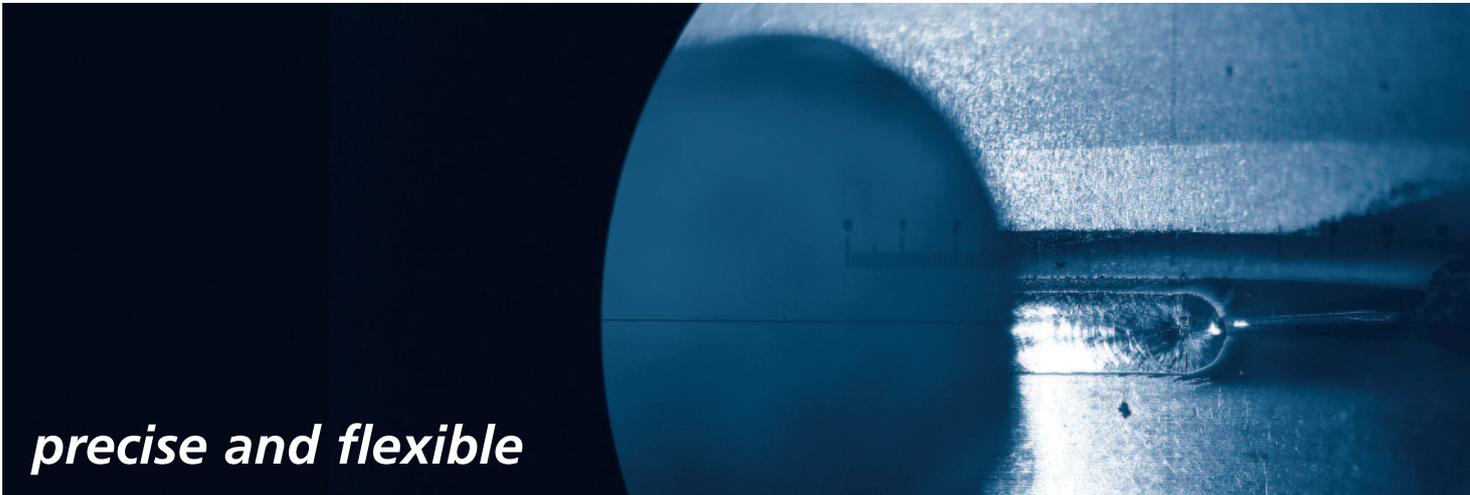
Presence

ALPHA LASER has a world-wide sales and service network at its disposal

Competence

Simple operation and powerful technology make best results possible, even for newcomers.





precise and flexible

Why Laser?

With our high-power, robust laser welding machines, you have at your disposal a machine that makes complicated joints possible, that would otherwise, with classical joining techniques, be difficult if not impossible to realize. Even in the immediate vicinity of sensitive materials such as plastic or glass, weldings are made possible. The excellent controllability of laser energy and the exposure time to the material allows for welding of metallic materials with high melting points and of high conductivity. Even different metal types can be joined.

Laser welding: manifold > time-saving > economical

- exact processing, even on the finest structures, with pin-point accuracy and precise energy-input
- The exact geometry of the workpiece remains the same, within the material tolerances. Only extremely slight distortions may take place on the workpiece, which can be disregarded.
- Only very minimal changes of the microstructure take place, due to the limited heat-affected zone
- Welding results without burning grooves. The quality of the adjacent areas of the material remains unaffected
- Process safety and a high degree of reproducibility of laser weldings
- The welding seams are free of shrinkage cavities and binding flaws, so that a high quality result is achieved
- Pre-warming is almost never necessary, even in the case of workpieces which are prone to tears
- The welding material properties can be specifically influenced. The choice of laser parameters and of welding additives affect the mechanical properties of the welding material, such as hardness, tensile strength or elongation.

4



Photo: HAKAMA AG, Bättwil

Lasers can be used in various areas of manufacture and repair. Major areas of application are:

Precision engineering

Welding precision metal parts

Die and mould-making

Repairing surface defects and voids in everything from small moulds to massive dies

Medical technology

Welding surgical instruments, passive and active implants, and endoscopic component

Sensor technology

Welding of thermal elements, measuring sensors and pressure membranes

Sheet metal work

Welding enclosures for electronic equipment, stainless steel parts for domestic appliances, architectural components and sculptures

Weldable materials

- > High alloy cold- and hot-working steels
- > Bronzes and copper alloys
- > Stainless steels
- > Steel and grey cast-iron alloys
- > High-tensile aluminium alloys
- > Titanium alloys
- > Nickel
- > Precious metals, e.g. platinum, gold and silver

Fully equipped

Our lasers are pulsed Nd:YAG lasers with wavelength 1064 nm.

All machines are fitted with a powerful integrated cooling system. The 200 W and 300 W machines are to be used, if necessary, in conjunction with an additional external cooling system.

High-quality observation optics provide for fatigue and glare-free working, even with pulsing frequencies of up to 100 Hz. Standard features are a well thought-through protective gas supply, a construction designed to be ergonomic and our pulse-shape function, which has proved successful.

A further plus: the successful Constant Power Control Technology, with which the initial and following pulse behaviour is optimised in a way, that the laser energy is efficiently coupled with the material. Your advantages: no material splatters, vapour bubbles are avoided and seam quality is improved.

Not to be forgotten: generous laser power that really arrives at the workpiece.

The higher pulse frequency of our 300 and 500 W lasers provide for continuous melting, thus similar welding characteristics to those of continuous-wave lasers of higher or medium power.

The machines with motion systems offer three processing possibilities:

- > Manual welding per Joystick
- > Semi-automatic welding – direction and speed of the axis movement is set by the user
- > Fully automatic welding by means of WINLaserNC Software.

Our options

Micro-welding aperture

The connectable fine-welding option offers a welding spot diameter of < 0,1 mm for high precision micro-welding

WINLaserNC Software

Unique comfort is offered by our patented, semi-automatic user-coordinate-control, with which three-dimensional motion-sequences can be put into practice with ease.

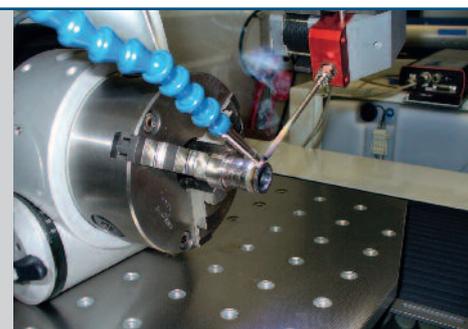
Regardless of how the areas to be welded are geographically positioned, the motion system allows for quick and comfortable setting, so that you, without distractions, can give your whole attention to the wel

Programmable laser-wire-feeding system LAfet®

Process-safety and a high level of reproducibility of laser weldings, as well as optimum welding time, are the striking properties that speak for operations with LAfet®. Laser filaments of Ø 0,25–0,5 mm are fed by LAfet® with high precision.

Manual laser-wire-feeding system LAfet®-mobil

Manual and comfortable wire feed by means of a handle. As soon as the tip of the wire touches the work-piece the wire feeding process starts continuously and with high precision. When the contact is interrupted, the feed will stop automatically. For wires with Ø 0,3–0,6 mm.



Turn-and-tilt optics

Our turn and tilt optics allows for unconstrained working, even on difficult workpiece spots. It is possible, within the entire 360° swivel range of the optic, to steer the laser beam continuously from the vertical up to an angle of 40°. Thus poorly accessible spots are reached, whilst you remain in an ergonomic working position.



Photo: LAWITEX GmbH, Langenfeld

ALM

Whether on the customer site or in your own workshop, the ALM offers you new, universal possibilities of use and greatest flexibility. Particularly large moulds, tools, casings and machine components of any size can be processed in an uncomplicated manner. It is possible to position the laser arm quickly and flexibly with millimetre accuracy. During the welding process, the arm can be steered per joystick, semi-automatically or by remote control. The turn-and-tilt processing head makes working possible at any point of the workpiece, even at deep lying spots. With the optional turn-and-tilt-optics the beam deflection can be set, infinitely variable, up to 40° from the vertical.



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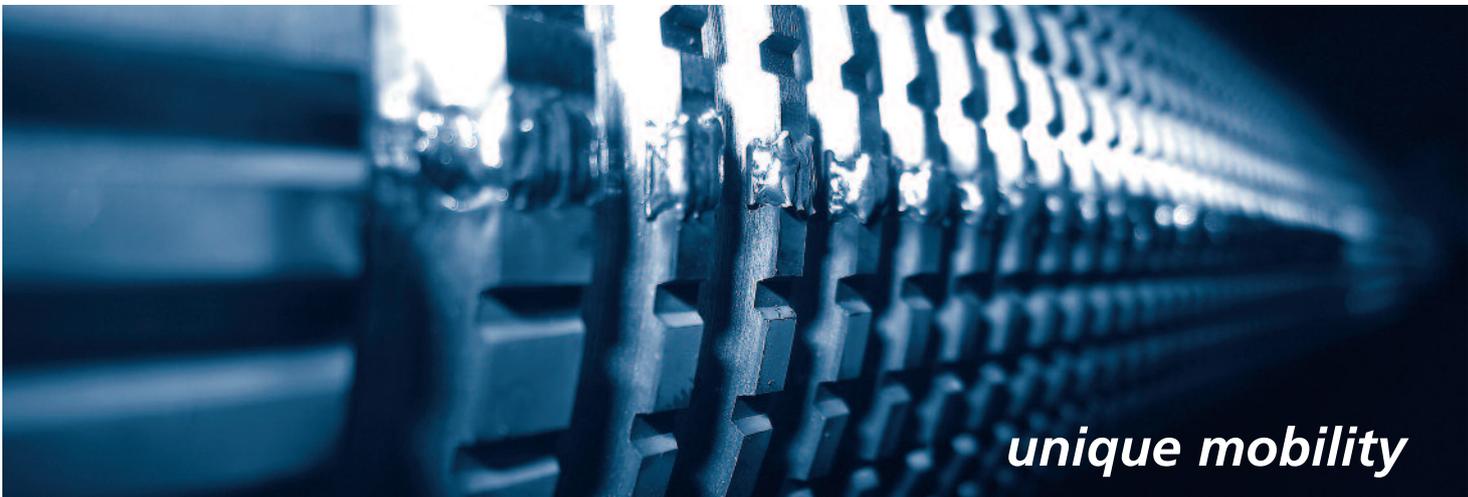


Mobile repair welding within the machine on a die-casting mould (Photo: Jutz Lasertechnik)



Repair welding (Photo: PML Lasertechnik, Nohra)

Technical data	ALM 200 DC	NEW: ALM 200	NEW: ALM 250
Laser			
Average power	200 W	200 W	250 W
Peak pulse power	9 kW	9 kW	9 kW
Pulse energy	90 J	90 J	90 J
Pulse duration	0.5 – 20 ms		
Pulse frequency	Single pulse up to 20 Hz	Single pulse up to 100 Hz	Single pulse up to 100 Hz
Welding spot diameter	0.2 – 2.0 mm		
Focusing optics	150 mm		
Pulse shaping	Adjustable power-shaping within a laser pulse		
Control	User-specific operation with up to 128 data records	User-specific operation with up to 39 data records	
Viewing system			
	Leica binoculars with oculars suitable for wearers of glasses		
Working range			
	Movement of the arm/processing head can be carried out manually or motor driven under joystick control		
Speed of motion (X, Y, Z)	0 – 2.5 mm/s	0 – 25 mm/s	0 – 25 mm/s
X, Y in mm	145 x 120		
Z in mm	1300		
Lowest working point in mm	450	510	
Highest working point in mm	1500	1560	
Arm travel in mm	1300	1300	
Mechanical dimensions			
LxWxH in mm	1400 x 672 x 1505	1410 x 730 x 1585	
Weight	290 kg	320 kg	320 kg
Electrical connection			
	3 x 400 V / 50–60 Hz / 3 x 16 A		
Options			
	> Turn-and-tilt optics > Tilttable turntable with chuck for horizontal to vertical rotation > Remote control > TV system for demonstrating and observing the welding process		



unique mobility

Photo: Schweißpunkt GmbH, Mühlacker

ALFlak

With our flexible laser for deposit and contour welding – *ALFlak* – we offer you even more possibilities for mobile laser repair welding.

Scope of motion and reach have been considerably extended, so that even welding spots in deep, complex moulds can be reached without problems, using the long laser arm. Welding seams of up to 500 mm length can be performed without a break. The *ALFlak* is available with a self-driving caterpillar track or as a manually transportable model. A unique comfort is provided by our patented, semi-automatic user-coordinate-control via WINLaserNC Software.



Technical data	ALFlak 200	ALFlak 300
Laser		
Average power	200 W	300 W
Peak pulse power	9 kW	9 kW
Pulse energy	90 J	90 J
Pulse frequency	Single pulse –100 Hz (in automatic mode and under observation)	
Pulse duration	0.5 ms – 20 ms	
Welding spot diameter	0.2 – 2.0 mm	
Focusing optics	150 mm	
Pulse shaping	Adjustable power-shaping within a laser pulse	
Control	User-specific operation with up to 39 data records	
Viewing system	Leica binoculars with oculars suitable for wearers of glasses	
Working range		
X, Y, Z in mm	1500 x 1000 x 1000	
Scope of Motion (X, Y, Z) in mm	340 x 320 x 420	
Lowest working point in mm	200	
Highest working point in mm	1500	
Arm travel in mm	1500	
Mechanical dimensions		
LxWxH of base unit in mm	approx. 1200 x 1200 x 1100	
Weight	with caterpillar track 850 kg – without caterpillar track 550 kg	
Electrical connection	3 x 400 V / 50–60 Hz / 3 x 16 A	
Options	<ul style="list-style-type: none"> > Micro-welding aperture for welding spot-Ø < 100µm > Turn-and-tilt-optics > Tilttable turntable with chuck for horizontal to vertical rotation > TV system for demonstrating and observing the welding process > LAfet® – programmable laser-filler-wire-feeder 	



Repair welding on roller (Photo: tcms, Gummersbach)



Loading the ALFlak (Photo: tcms, Gummersbach)

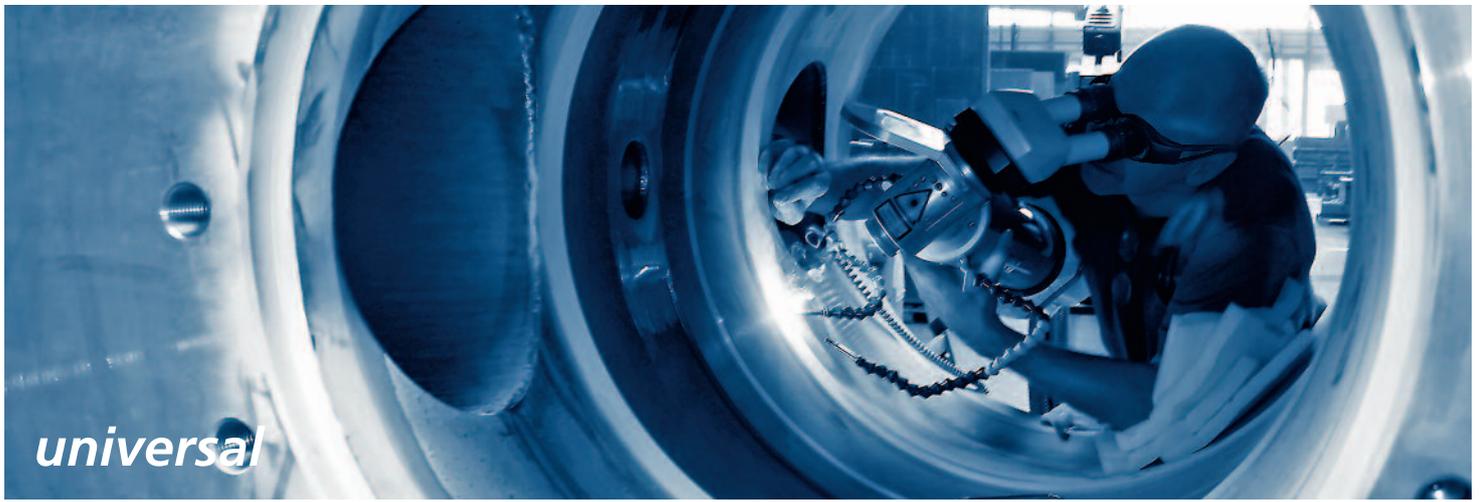


Photo: DSI Laserservice GmbH, Maulbronn

AL

The laser-series AL offers the appropriate laser power for each and every application. The laser is an optimum fit for the workbench AL-T, can however also be simply integrated into existing machine constructions. Diverse processing optics aid you in guiding the laser beam to the position you want to have it in. That makes for quick setting and adjustment of the laser to the workpiece in question. Thanks to many options, you can configure the optimum machine for your area of work.



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Pressure-sensor for brake system
(Photo: ADZ NAGANO GmbH, Ottendorf)



Circular welding at stainless steel housing
(Photo: HAKAMA AG, Switzerland)

Technical data	AL 75	AL 120	AL 150	AL 200	AL 300
Laser					
Average power	75 W	120 W	150 W	200 W	300 W
Peak pulse power	7 kW	9 kW	9 kW	9 kW	9 kW
Pulse energy	60 J	75 J	75 J	90 J	90 J
Pulse duration	0.5 – 20 ms	0.5 – 20 ms	0.5 – 20 ms	0.5 – 20 ms	0.5 – 20 ms
Pulse frequency	–50 Hz	–50 Hz	–100 Hz	–100 Hz	–100 Hz
				(under observation)	
Welding spot diameter	0.2 – 2.0 mm				
Focusing optics	150 mm				
Pulse shaping	Adjustable power-shaping within a laser pulse				
Control	User-specific operable with up to 39 data records interface for external controls				
Viewing system					
	Leica binoculars with oculars suitable for wearers of glasses				
Supply unit					
Dimensions LxWxH	820 x 400 x 910				
Weight	120 kg	120 kg	120 kg	120 kg	120 kg
Laser beam source					
With focusing unit (length x Ø)	900 x 120 mm			1100 x 120 mm	
Weight	approx. 18 kg	approx. 18 kg	approx. 18 kg	approx. 20 kg	approx. 20 kg
Electrical connection					
	200–240 V / 50–60 Hz / 16 A		3 x 400 V / 50–60 Hz / 3 x 16 A N		
Options					
	<ul style="list-style-type: none"> > Micro-welding aperture for welding spot-Ø < 100µm > Turn-and-tilt optics > Rotational welding optics > Tilttable turntable with chuck for horizontal to vertical rotation > TV system for demonstrating and observing the welding process > LAfer® – programmable laser-wire-feeder 				



High-Performer

Photo: DSI Laserservice GmbH, Maulbronn

AL 500

With an average power of 500 W, the AL 500 is the most powerful of our ALs. With this high performance laser extremely fast and efficient welding is possible since wires with large diameters can be used. With the AL 500 we recommend the *ALFlak* movement system or alternatively our table AL-T 500.



Technical data

AL 500

Laser

Average power	500 W
Peak pulse power	15 kW
Pulse energy	100 J
Pulse duration	0.5 – 20 ms
Pulsfrequenz	–100Hz (under observation)
Welding spot diameter	0.5 – 2.5 mm
Focusing optics	150 mm
Pulse shaping	Adjustable power-shaping within a laser pulse
Steuerung	User-specific operable with up to 124 data records à 5 parameters interface for external controls

Viewing system

Leica binoculars with oculars suitable for wearers of glasses

Supply unit

Dimensions LxWxH	1060 x 570 x 1000
Weight	180 kg

Laser beam source

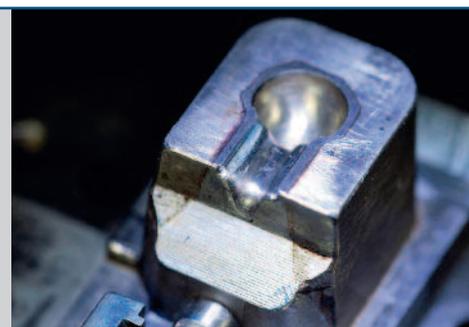
With focusing unit (length x Ø)	800 x 120 mm
Weight	25 kg

Electrical connection

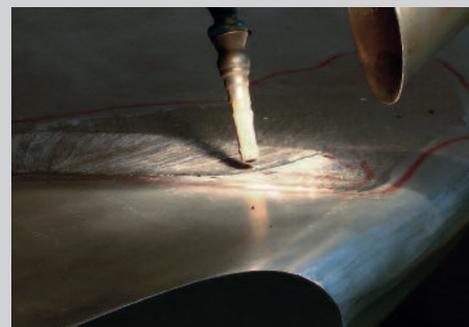
3 x 400 V / 50–60 Hz / 3 x 32 A

Options

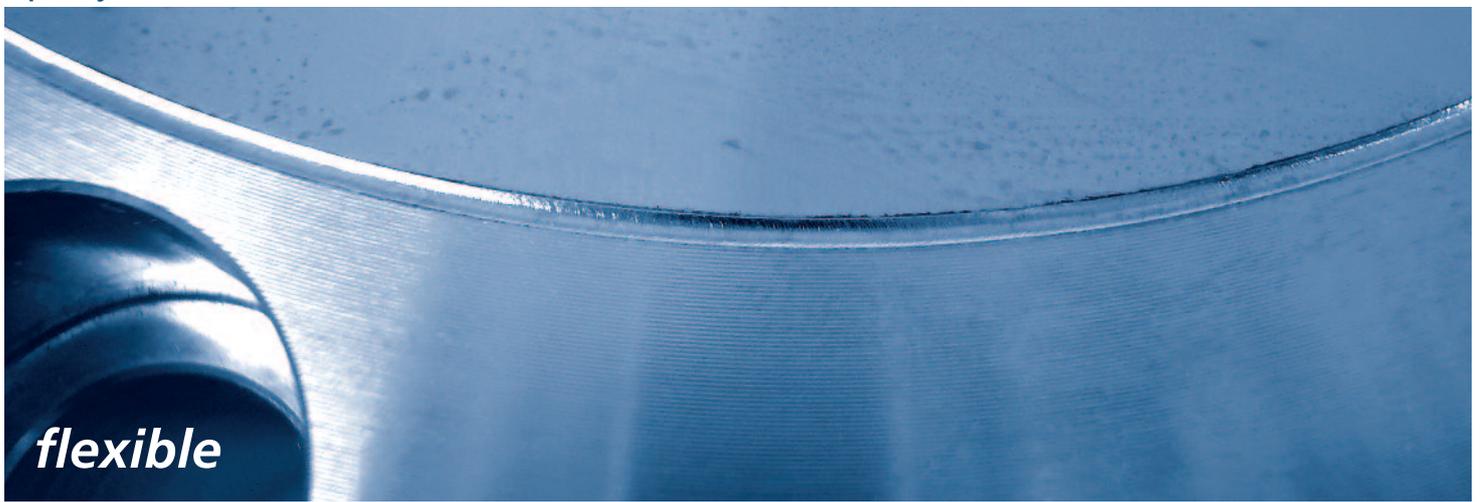
- > Turn-and-tilt optics
- > Telescope available in 3 versions
- > Tilttable turntable with chuck for horizontal to vertical rotation
- > TV system for demonstrating and observing the welding process
- > LAfer® – programmable laser-wire-feeder
External chiller necessary



Die insert for an injection mould
(Photo: Grübel KG, Tabarz)



Large-scale material deposit with AL 500



flexible

Photo: A.S.T. GmbH

AL-TBasis

The AL-TBasic is for use in situations in which very different types of workpiece are to be processed flexibly, and if programmed welding or high precision isn't necessary.

The resonator clamp can be rotated 360° and fixed in any position within the swivel range. The resonator can be moved lengthways along a rail system.

The steering is carried out with the Joystick, on 3 axes (x, y, z), with the rotational axis optionally available.



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Restoration of worn waterproof edges of a mould element of Ampco-Bronze (Photo: L&A Lasertechnik, Radebeul)



Changing the radius on the matrix of a punching tool of 1.2379 (Photo: L&A Lasertechnik, Radebeul)

Technical data

AL-TBasis

Mechanical dimensions

WxDxH in mm	950 x 1250 x 850
Working plate surface (WxD) in mm	800 x 740 (Height above the floor 830 mm)
Max. workpiece weight	max. 100 kg
Workpiece motion	motorized
Scope of motion	x 400, y 210, z 300 mm
Speed of motion	x, y, z – max. 25 mm/s
Weight	230 kg

Electrical connection

200–240 V / 50–60 Hz / 16 A or 3 x 400 V / 50 Hz / 3 x 16 A (depending on laser)

Options

- > Tilttable turntable with chuck for horizontal to vertical rotation
- > Magnetic workpiece bracket for free positioning of workpieces
- > Tilttable joint – can be tilted up to 30° downwards and up to 10° upwards





stable

Photo: L&A Lasertechnik, Radebeul

AL-T 500

The laser workbench AL-T, combined with the laser AL, makes laser welding without limitations of working space possible. Even large, voluminous workpieces are easy to process. When welding, the workpieces allow themselves to be precisely steered on 3 axes (x, y, z). An optional rotary axis for round weldings is also available.

Welding tasks can be carried out by joystick, in semi-automatic mode, or fully automatically by means of WINLaserNC Software.



Technical data

AL-T 500

Mechanical dimensions

WxDxH in mm	1200 x 1360 x 1260
Working plate surface (WxD) in mm	600 x 475
Max. Workpiece weight	max. 400 kg
Workpiece motion	motorized
Scope of motion	x 490, y 400, z 350 mm extendable to 500 mm
Speed of motion	x, y, z – max. 25 mm/s
Weight	550 kg

Electrical connection

3 x 400 V / 50–60 Hz / 3 x 16 A

Options

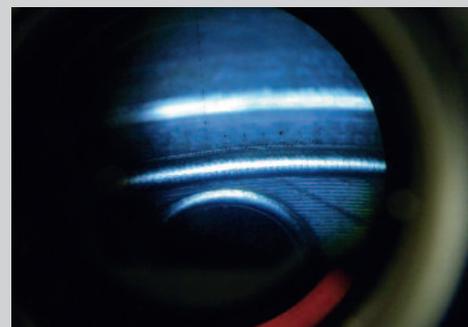
- > CNC control for automatic manufacture of parts in series (WINLaserNC)
Accuracy of positioning: +/- 0,05 mm
Accuracy of repetition: +/- 0,01 mm
- > Rotational table with chuck, tiltable for horizontal to vertical rotational motion
- > Magnetic workpiece bracket for free positioning of workpieces



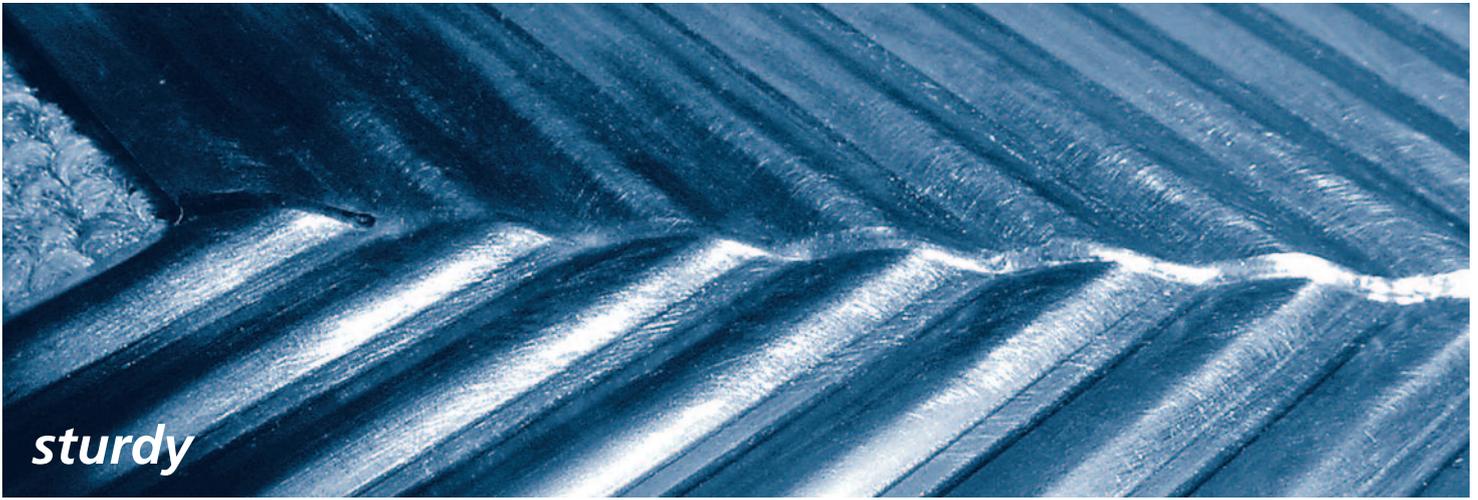
AL-T 500
with Laser AL



Repair of a defective edge of an injection mould



Detail welding seam



sturdy

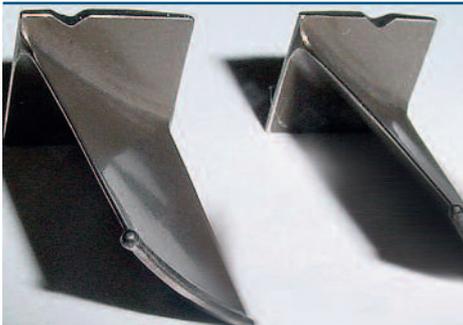
Photo: L&A Lasertechnik, Radebeul

ALW

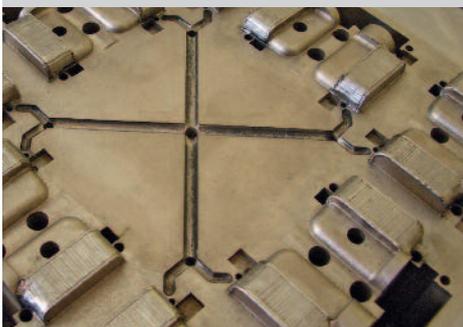
The spacious working chamber of the ALW allows workpieces of up to 350 kg to be processed, e.g. in tool and mould construction. With the 4-axis-motion system, the parts get precisely positioned underneath the laser beam, either with the joystick or automatically. With the tilt-able optics, workpieces can be welded at a variable angle whereby the laser beam remains optimally aligned to the joint



12



Repair of damaged contours on turbine flaps
(Photo: L&A Lasertechnik, Radebeul)



Multi-layer welding to re-shape an 8-cavity mould
(Photo: Jutz Lasertechnik GmbH, Wien)

Technical data	ALW 100	ALW 150
Laser		
Average power	100 W	150 W
Pulse energy	75 J	100 J
Peak pulse power	9 kW	10 kW
Pulse duration	0.5 – 20 ms	
Pulse frequency	Single pulse –15 Hz	–20 Hz
Welding spot diameter	0.2 – 2.0 mm, can be continuously set	
Focusing optics	150 mm	
Pulse shaping	Adjustable power-shaping within a laser pulse	
Control	User-specific operation with up to 128 data records	
Viewing system		
	Leica Trinocular with ocular for wearers of glasses, connection for CCD-camera	
Working chamber		
LxWxH in mm	800 x 850 x 500	
Working surface (WxD) in mm	600 x 600	
Max. workpiece weight	350 kg, centrally positioned	
Workpiece motion	motorized via joystick	
Scope of motion	X, Y: 180 x 180 mm, Z: 380 mm	
Mechanical dimensions		
LxWxH in mm	1220 x 920 x 1570	
Weight	500 kg	
Electrical connection		
	3 x 400 V, 50–60 Hz, 3 x 16 A	3 x 400 V, 50–60 Hz, 3 x 16 A
Options		
	<ul style="list-style-type: none"> > CNC control with CAD data input for automatic operation for manufacturing serial parts (WINLaserNC) > Micro-welding aperture for welding spot-Ø < 100µm > Tilttable turntable with chuck for horizontal to vertical rotation > Coaxial lighting for optimal illumination of cavities in the workpiece > Magnetic workpiece bracket for free positioning of workpieces > TV system for demonstrating and observing the welding process 	

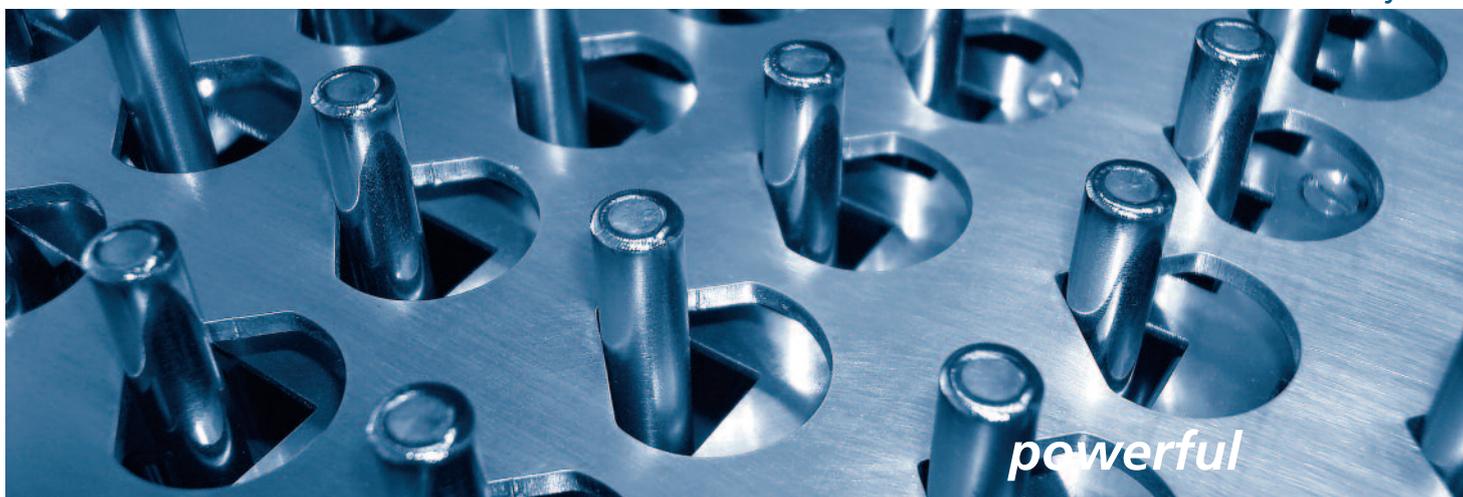


Photo: D-Sensors GmbH, Stahnsdorf

Until now the ALW has been used mainly for repair and deposit welding on tools and moulds. The ALW 200/300 meets the increased demands of industries and trades-people to carry out ambitious welding jobs on materials such as Aluminium, precious metals, Titanium and sensitive alloys. Such jobs are in increasing demand, and in such areas the advantages of Alpha Laser's new resonator concept are becoming visible.

The new, stable steel construction of the ALW allows for high precision of the motion system, thus for extremely exact movement of the work-piece. The ALW is predestined for automatic applications. If several weldings of the same type are to be carried out in series, then programming by means of the WINLaserNC software realizes exact repetition with simplicity. We have placed great value, with the ALW, on creating a seated workstation with plenty of legroom, allowing the user to work in a relaxed and ergonomic position. This means that work can be carried out over longer periods of time without the user becoming tired, providing thus for full concentration on the welding task at hand.



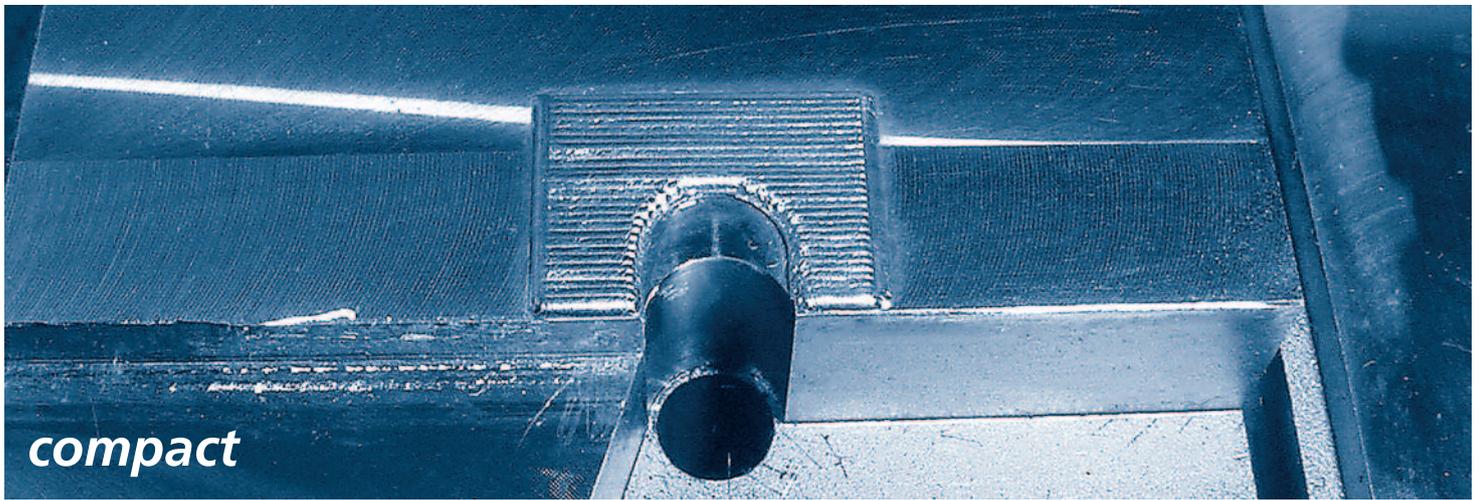
Technical data	ALW 200	ALW 300
Laser		
Average power	200 W	300 W
Pulse energy	90 J (max. pulse energy limited by the software)	90 J (max. pulse energy ltd. by the software)
Peak pulse power	9 KW	9 KW
Pulse duration	0.5 – 20 ms	
Pulse frequency	Single pulse –100 Hz (in automatic mode and under observation)	
Welding spot diameter	0.2 – 2.0 mm, can be continuously set	
Focusing optics	150 mm	
Pulse shaping	Adjustable power-shaping within the laser pulse	
Control	User specific operation with up to 39 parameter sets	
Viewing system	Leica Ergotubus (including Ergo Wedge) with ocular for wearers of glasses	
Working chamber		
LxWxH in mm	850 x 1080 x 450	
Working surface (WxD) in mm	600 x 475	
Max. workpiece weight	400 kg, centrally positioned	
Workpiece motion	motorized via joystick	
Scope of motion	X, Y: 490 x 400 mm, Z: 350 mm	
Mechanical dimensions		
LxWxH in mm	approx. 1400 x 1190 x 1500	
Weight	approx. 870	
Electrical connection	3 x 400 V, 50/60 Hz, 3 x 16 A	
Options	<ul style="list-style-type: none"> > Turn-and-tilt optics > Micro-welding aperture for welding spot-Ø < 100µm > Tilttable turntable with chuck for horizontal to vertical rotation > Magnetic workpiece bracket for free positioning of workpieces > TV system for demonstrating and observing the welding process > Connection for regulated external cooling 	



Changing a contour 1.2767
 (Photo: L&A Lasertechnik, Radebeul)



Repairing a water cooled cylinder head of Aluminium
 (Photo: L&A Lasertechnik, Radebeul)



compact

Photo: L&A Lasertechnik, Radebeul

ALV

The compact laser machine ALV with the laser proof casing is used for fine welding work and for deposit welding. Its advantages become visible in tool and mould construction, in sensor manufacturing and in medical technology. The ALV offers three possibilities for processing: manual welding by joystick, semi-automatic welding and fully automatic welding by means of WINLaserNC-Software. In addition, the worktable's large vertical scope enables processing of larger tools and moulds.



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Welding in the membrane of a pressure sensor



Windradfertigung
(Foto: FSG Fernsteuer Mess- und Regeltechnik GmbH)

Technical data	ALV 100	ALV 150
Laser		
Average power	100 W	150 W
Pulse energy	75 J	75 J
Peak pulse power	9 kW	9 kW
Pulse duration	0.5 – 20 ms	
Pulse frequency	Single pulse –15 Hz	– 20 Hz
Welding spot diameter	0.2 – 2.0 mm, infinitely variable settings	
Focusing lens	150 mm	
Pulse shaping	Adjustable power-shaping within a laser pulse	
Control	User-specific operation with up to 128 data records	
Viewing system		
Leica binoculars with oculars suitable for wearers of glasses		
Working chamber		
LxWxH in mm	590 x 450 x 550	
Working surface (WxD) in mm	360 x 335	
Max. workpiece weight	50 kg, centrally positioned	
Workpiece motion	motorized via joystick, Speed of motion 0 – 25 mm/s	
Scope of motion	z: 250 mm x,y: 100 x 100 mm	
Mechanical dimensions		
LxWxH in mm	1010 x 650 x 1350	
Weight	260 kg	
Electrical connection		
	200–240 V / 50–60 Hz / 16 A	3 x 400 V, 50–60 Hz, 3 x 16 A
Options		
<ul style="list-style-type: none"> > CNC control for automatic manufacture of parts in series (WINLaserNC). > Micro-welding aperture for welding spot-Ø < 100µm > Multi functional foot pedal for setting of the laser parameters > Tilttable turntable with chuck for horizontal to vertical rotation > Coaxial lights for optimum lighting of workpiece cavities > TV system for demonstrating and observing the welding process 		



Photo: Käppeli Schweißmechanik AG, Hünenberg

VL / ALS

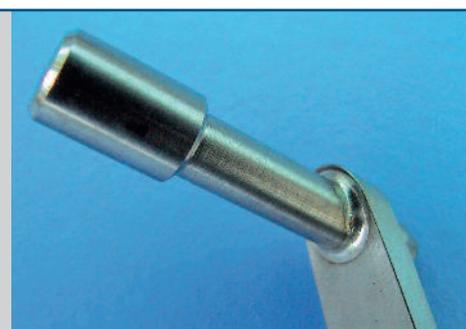
Their state of the art technology combined with an attractive design characterize the laser welding systems VL 50 and ALS 100.

These lasers are just as suitable for skill-demanding manual welding tasks as they are for industrial production of small

batches. The large working chamber offers a brightly illuminated working area, loaded via two side doors (ALS) or over a front hood (VL 50). The high average power makes a quick pulsing rate possible (up to 25 Hz), even if high energy settings are used. Thus, work can be done quickly with excellent welding results, due to the homogenous amalgamation of the working materials – especially when welding challenging metals such as silver and copper.



Technical data	VL 50	ALS 100	ALS 100S
Laser			
Average power	50 W	100 W	100 W
Pulse energy	40 J	60 J	95 J
Peak pulse power	5 kW	7 kW	10 kW
Pulse duration	0.5 – 20 ms		
Pulse frequency	Single pulse 25 Hz		
Welding spot diameter	0,2 – 2,0 mm, infinitely variable settings		
Pulse shaping	3 pre-set pulse shapes		
Program memory	39 parameter data records can be stored		
Viewing system	Leica binoculars with oculars suitable for wearers of glasses		
Mechanical dimensions			
LxWxH in mm	645 x 510 x 430	800 x 570 x 1260	
Weight	50 kg	100 kg	
Electrical connection	200–240 V / 50–60 Hz / 10 A		200–240 V / 50–60 Hz / 16 A
Options	<ul style="list-style-type: none"> > Ergo Wedge > Camera system > Micro-welding aperture for welding spot-Ø < 100µm > 50 Hz technology (option for ALS) > Halogen dimmer > Illumination by LED ring 		



Positioning instrument
(Photo: Käppeli Schweißmechanik AG, Hünenberg)



Hip joint grate
(Photo: Käppeli Schweißmechanik AG, Hünenberg)



Your success in focus

We are looking forward to your inquiry



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