Laser robot system

# AL-ROCK mobil

## MOBILE ROBOT SYSTEM FOR LASER HARDENING AND POWDER DEPOSITION WELDING

The AL-ROCK mobil with 4 kW laser is the ultimate mobile robot for surface metal hardening or for welding with wire or powder. The system is truly mobile because all components such as the laser, cooler and robot controller are integrated in the robot chassis. This eliminates the need to transport the control cabinet and other large accessories. The energy chain is located on the robot. The HMI with AL-APP is also integrated but can be removed and placed elsewhere.

Whether on site at the customer's or at changing locations in the hall, with the self-propelled caterpillar track, you drive the laser directly to the workpiece. The time-consuming removal of components to be processed can be omitted and the amount of reworking required is significantly reduced. All that is required is free access of the laser beam to the processing area. And above all, the system is ready for use within 5 minutes.

The laser beam precisely follows the workpiece contour in free 3D movements. This makes it easy to harden closing edges, grain structures, dimples or individual points.

The temperature-dependent control of the laser power applies the heat precisely to the desired spot to achieve maximum hardness there. The surrounding areas of the component experience little to no thermal stress. For quality control, the process is documented during the hardening process, so that process reliability and reproducibility are guaranteed.

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## Automated powder deposition welding

With the AL-ROCK mobil, however, you can also do powder and wire deposition welding. The powder conveyor or the automatic wire feed is then also already integrated.

Depending on the application, different laser processing optics are optionally available, with which seven different processes can be carried out: **Deep penetration welding, wire deposition welding, sweep welding, hardening with scanner optics, 3D printing, powder deposition welding and pulse welding.** Exchange of optics is accomplished in minutes.

A rotary tilt table can be operated with the system if required.

*Talk to us:*
*Together we will work out your machine concept.*

## Technical data

| | AL-ROCK mobil |
|---|---|
| **LASER** | |
| Laser type/wave length | Fiber 1070 nm |
| Average power | 4000 W |
| CW power | 4000 W |
| Peak pulse power | 4 kW |
| Pulse energy | 2 kJ |
| Pulse duration | 500 ms |
| Operating modes | CW/Modulated |
| Welding spot Ø | 0.8-5 mm |
| Focusing objective | according to lens data sheet |
| Pulse shaping | Adjustability of power curve within a laser pulse |
| Display and operation | Touchscreen for operating the ALPHA APP, additional panel for direct control and teaching of the robot. |
| Safety circle | Connection of door switches and active laser safety curtains |
| **OBSERVATION LENS** | Cameras for process monitoring from outside the booth. |
| **WORK AREA** | Length of the robot arm extended approx. 2118 mm |
| **EXTERNAL DIMENSIONS** | |
| W × D × H (basic part incl. chassis) | 1700 × 1200 × 2100 mm |
| Weight | approx. 1900 kg |
| **EXTERNAL CONNECTIONS** | |
| Electrical connection | 3 × 400 V / 50-60 Hz / 3 × 32 A / 32 A |
| External cooling | Connections for external cooling or fresh water cooling. Internal cooling for short stand-alone operation. |
| **OPTIONS** | LMD version with integrated powder feeder<br>ALPHA LASER optics<br>Rotary tilting table with 1000 kg payload |


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# LASERHEAD-S

## FOR HARDENING AND WOBBLE WELDING

As a scanning process head, the LASERHEAD-S is used for surface processing tasks. Complex laser hardening applications, but also laser welding and laser soldering tasks (e.g. gap bridging) can be carried out on a scan field of max. 250 mm edge length. For hardening, the LASERHEAD-S is additionally equipped with a thermal camera. The monitored temperature range is segmented.

Various wobble patterns are available for selection or can be edited by the user. Among other things, this can counteract the formation of cracks when processing difficult materials.

Direction-independent hardening is possible with a track width of 1-40 mm in X and Y respectively.

## Technical data

| | |
|---|---|
| *Laser* | *max. 4000 W single- or multimode (CW or pulse)* |
| *Laser type* | *Fiber laser (1064 nm/1070 nm)* |
| *Spot size* | *0.05-1 mm standard* |
| *Focusing objective* | *250 mm/500 mm (standard) - 150 mm (optional)* |
| *Collimation* | *90 mm (standard) - 150 mm (optional), motorized focus adjustment* |
| *Process monitoring* | *Ethernet camera* |
| *Temperature regulation* | *IR-camera* |
| *Cooling* | *Water* |
| *Process gas* | *Air, Ar oder $N_2$* |
| *Dimensions (B × T × H)* | *260 × 160 × 350 mm* |
| *Weight* | *approx. 8 kg* |
| *Mounting type* | *Machine connection via direct flange or quick change braket* |

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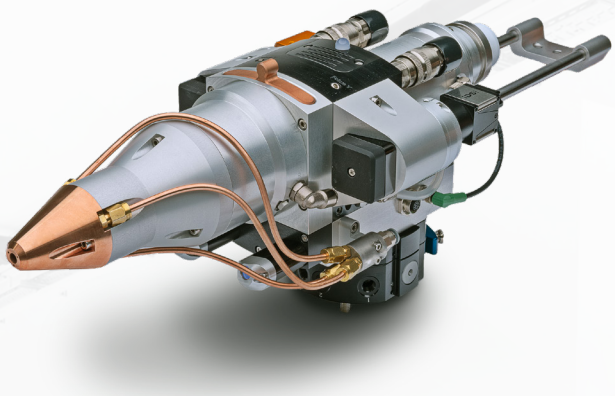
# LASERHEAD-P

## FOR JOINT WELDING, DEEP AND PULSE WELDING AS WELL AS FOR POWDER DEPOSITION WELDING AND 3D BUILDUP

Surfaces, lines or any geometries can be applied regardless of direction. By multi-layer coating of suitable materials, almost any layer thickness can be achieved, and 3D volumes can also be generated. For this purpose, the powder welding nozzle as well as a thermal camera are additionally mounted on the LASERHEAD-P. The powder conveyor for 1.5 or 5 liters powder is integrated into the robot system.

For joint welding, the powder nozzle is dismounted and replaced by a suitable welding attachment.



### Technical data

| | |
|---|---|
| *Laser* | *max. 4000 W single- or multimode (CW or pulse)* |
| *Laser type* | *Fiber laser (1064 nm/1070 nm)* |
| *Spot size* | *0.8-5 mm* |
| *Focusing objective* | *250 mm* |
| *Collimation* | *60 mm, motorized* |
| *Process monitoring* | *Ethernet camera* |
| *Temperature regulation* | *IR camera* |
| *Cooling* | *Water* |
| *Process gas* | *Air, Ar or $N_2$* |
| *Dimensions (B × T × H)* | *180 × 180 × 450 mm* |
| *Weight* | *12 kg* |
| *Mounting type* | *Machine connection via direct flange or quick clamping adapter by Schunk* |

# Rotary tilting table PTS-ORB 1000

Synchronous machining around 8 axes is possible with the rotary tilting table. The scope of delivery includes an additional axis control cabinet as well as measuring tools.

### Technical data

| | |
|---|---|
| *Payload* | *1000 kg max.* |
| *Inertia* | *1400 kg × m²* |
| *Static torque* | *On the main axis 850 Nm* |
| *Turning moment* | *10,000 Nm (maximum bending moment)* |
| *Time for 180° turnaround* | *3.5 s* |
| *Angle of rotation of the main axis* | *0.10 mm* |
| *Weight* | *460 kg* |

V1.1

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