



Laser joining solutions

Laser products overview

Since 2001 ABICOR BINZEL has been active in the area of wire feeding for laser welding and brazing, and has an excellent reputation in this critical area having supplied many products to automated production lines.

Due to the continuous rise in demand for laser processes within industrial production, in 2008 a forward-looking co-operation with SCANSONIC was established, with the aim to provide complete laser joining solutions.

The partner SCANSONIC – an innovative enterprise focussed on development and production of laser optics, as well as adaptive processing heads for automated laser and arc joining processes, and ABICOR BINZEL – experienced in arc welding as well as wire feeding and with subsidiaries worldwide – complement each other perfectly.

This strategic partnership and the combination of core competencies provides an ideal condition for success within the global arena and strengthens the technology portfolio for both enterprises.

ABICOR BINZEL ROBOTIC SYSTEMS is an innovative partner for supplying complete systems and providing solutions for their forward-looking customer base.

scansonic

www.scansonic.com

**ABICOR
BINZEL®**
ROBOTIC SYSTEMS 

www.binzel-abicor.com

Laser products overview

Optic for laser brazing / Optic for laser welding

ALO1

Optic for laser brazing



The patented seam tracking process is based on a simple, stable and highly reliable principle: The filler wire, which provides the material for the seam during welding and brazing, is also a mechanical sensing device. Pressed into the joint and melted in the laser focal point, it positions and guides the laser head precisely along the seam. Thus, the filler wire is a self-regenerating leader tip which sits directly in the laser focus and provides a consistently high accuracy. As the contour of the seam is continually guided along the edge of the melting point, no advance correction is necessary. No other process is able to produce such high quality flange and fillet welds.

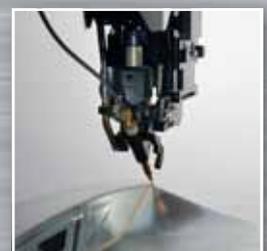
- Precise seam tracking with tactile sensor by using filler wire and servo motor
- Laser processing head for CW-Lasers up to 4 kW
- Setup via digital or analogue I/O
- Integrated cross jet
- Cold or hot wire up to 100 A / 230 A
- Camera and cross air generator

ALO3

Optic for laser brazing and welding

The patented tactile seam tracking process allows the ALO3 to find the beginning of the seam accurately and to guide the process precisely along the seam. Thereby the component tolerances are automatically balanced. The independent system with seam tracking can be mounted to every guiding machine and will be controlled via the system fieldbus (DeviceNet, Ethernet, Profinet, etc.).

- Setup via Ethernet
- Laser processing head for CW-Lasers up to 6 kW
- Auto focus for focus adjustments
- Suitable for high power diode, fiber and solid state lasers
- Cold or hot wire up to 100 A / 230 A
- Available for most fieldbus protocols
- High precision tool exchange

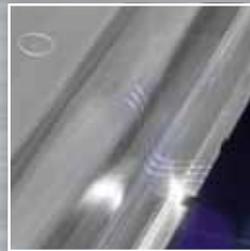
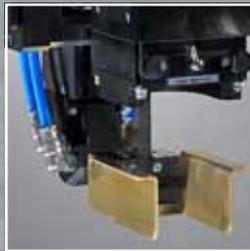
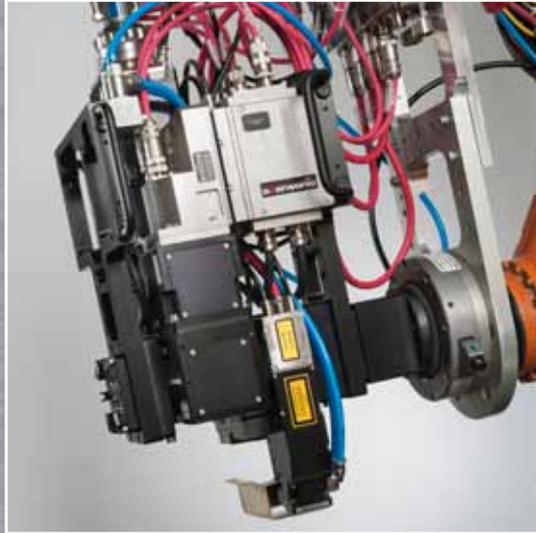


Laser products overview

Optic for remote laser welding / Optic for flange laser welding

RLW-A

Optic for remote
laser welding

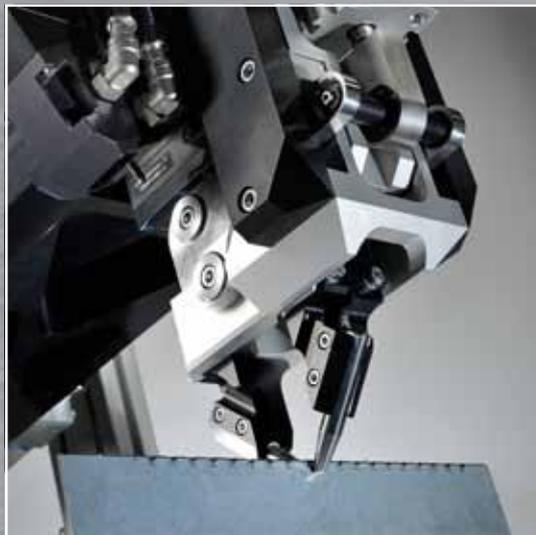


The RLW-A allows lightweight designs with reduced flange geometries by use of fillet welds. Therefore, the system combines optical seam tracking and high dynamical scanners. This enables the welding of difficult 3D geometries in BIW applications. During the robot movement the RLW-A detects and follows the seam by adjusting the mirror according to the measurement data of the seam tracking sensor. Laser beam and the measurement light use the same optical path which increases the accuracy and reliability of the seam tracking.

Highly efficient fillet welding process allows the reduction of material for flange application
Gap bridging technology allows sealed welds
Large working distance above the process allows travelling over clamps and fixtures
Patented seam tracking system ensures reliable finding and tracking of seam
Less operating costs by small cover glasses, less compressed air consumption, no filler wire, no shielding gas, high cycle time and high LASER ON time

F50

Optic for flange
laser welding



The F50 is designed to deal with flange welding in a new and different way. It offers advanced possibilities for BIW design concepts. Instead of laser welding through metal sheets the F50 is designed to weld the edges themselves. Continuously optical measurement of the actual joint configuration, the F50 accurately positions the laser spot directly between both mating sheets independent of part or robot path accuracies. The system comes with build-in force controlled clamping fingers, which continuously fix the work pieces in welding position. This cost effective solution avoids additional investment for external clamping for the welding process. There is no need to change clamping when producing different platform models in one assembly line.

Edge welding of metal sheets (for materials like Zn-coated and/or hot-stamped steel, aluminum) enables lightweight design with reduced flanges
Integrated seam tracking sensor with drift compensation
Two oscillating scanners to perform optional high speed X-Y beam oscillation
Switchable mirrors for two different inclination angles (tolerance compensation)
Integrated clamping perpendicular to welding

Laser products overview

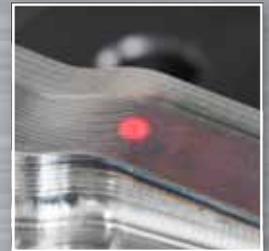
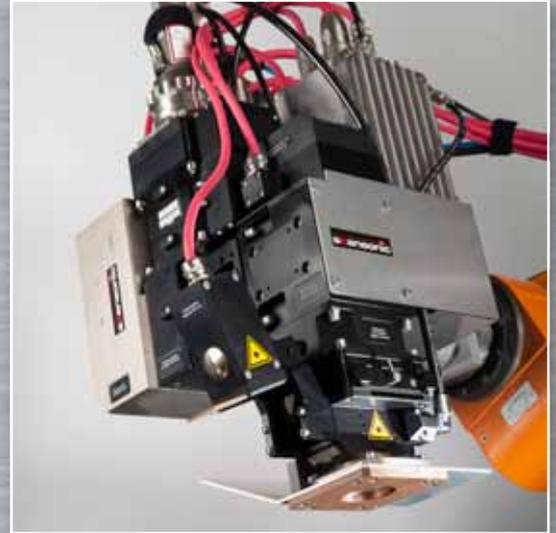
Optic for remote laser hardening / Seam tracking sensors

RLH-A

Optic for remote laser hardening

Laser hardening offers a lot of advantages compared to conventional processes. For transferring these benefits into industrial use RLH-A provides the opportunity to create variable track widths and geometries by a highly dynamic 1-D scanning unit. Simultaneously the workpiece surface temperature is measured with a pyrometer using the same optical path as the laser beam. The processing parameters are adaptable by a closed-loop control to prevent melting of surfaces or edges. For parts of higher thickness and heat conductivity these control guarantees that the required hardness values and depths are achievable.

- Selective hardening of workpiece geometries with multi-dimensional curved surfaces, holes or notches
- Less distortion on thin-walled parts
- Hardening and softening applications possible
- Closed-loop temperature controlled adaption of heat input levels by changing focus geometry (shape, diameter), laser power and scanning speed



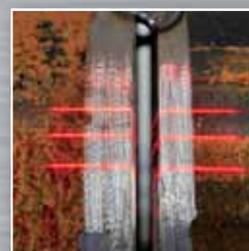
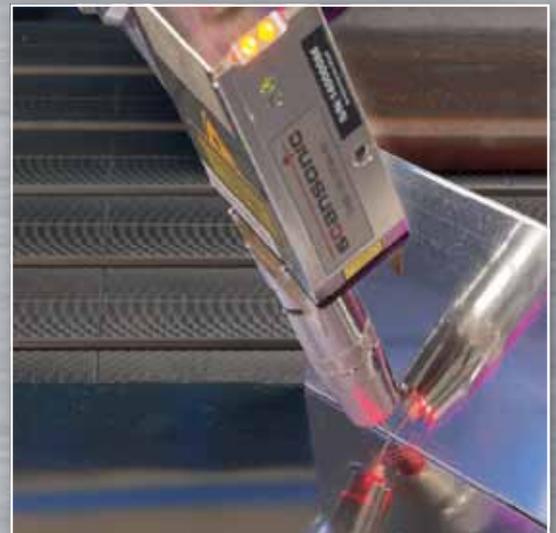
TH6D / TH6i

Seam tracking sensors

The seam tracking systems TH6D and TH6i provide a secure connection and a perfect welding seam. In order to achieve a consistently high welding quality tolerances of the components or deviations to the ideal welding path must be corrected. This can be done by means of both seam tracking systems which positions the welding tool in three dimensions accurately over the welding seam. The systems guarantee exact measurements in both gas-shielded welding processes as well as laser brazing and welding applications without any problems.

Equipped with an additional grey scale camera system the TH6i also makes gaps from 0.02 mm visible for the robot. Thus, the TH6i is the right choice particularly for components with very narrow gaps.

- Optical seam tracking for all common joints
- Applicable on reflective materials as stainless steel and aluminum
- Insensitive to electrical fields and ambient light
- High accessibility by 150 mm stand off
- Integrated air cooling, protective-glass cleaning system
- High accuracy through three laser line sensing technology



Laser products overview

Laser processing optics

BO

Optic for laser welding



This basic laser processing optic is developed for industrial laser applications up to 6 kW laser power and consists of collimating and focusing optics. The BO is available as a straight version or with a deflection unit. The usage of different image ratios corresponds to different working distances and focus diameter and thus, available for many different applications. Target applications are simple seam geometries and types for an inexpensive start into industrial laser welding application.

Laser processing head for CW-Lasers up to 6 kW
Suitable for high power diodes, fiber and solid state lasers



BO-SF

Optic for laser welding

The BO-SF laser processing optic is designed for industrial use where a stable focal position is critically important. Its design and construction ensure a high quality beam with minimal power loss. Varying operational clearances and focus diameters are possible as different object-to-image ratios can be used. Therefore, the BO-SF can easily be integrated into various different applications.

Laser processing head for CW-Lasers up to 30 kW
Diffractive, lens free-system using mirror design
Mirror technology ensures high TCP consistency - no robot reprogramming necessary
Quasi free of focus shift



Laser products overview

Wire feeding

MFS-V3

Master feeder system



In co-operation with leading car manufacturers and ABICOR BINZEL ROBOTIC SYSTEMS, the specific requirements of laser and arc processes in vehicle construction were analysed.

The result of this is a fully digitally controlled, high-precision wire feeding system that is optimally geared to the high demands of the respective production environment in every respect: MFS-V3 - the third generation master feeder system with completely redeveloped eBOX and service software.

The MFS-V3 is used in laser-based joining processes with welding filler metal or braze for relatively small process windows. It is ideal particularly for applications which require high connection strength and finish quality and which allow little or no reworking. The system feeds even critical welding filler metals optimally and reliably. Thus, it also allows the integration of special wire electrodes into automated series production and ensures technological advancement in the long term.

Independently digitally controlled motors, whereby no synchronisation is necessary
Fast motor control due to 32-bit processor
High accuracy even at very low wire feeding speeds

Proportional speed control
Control system: analogue, digital or by fieldbus
Automatic master pull or push-push recognition (with MF1 and MF1-Rear)

Wide-range input
Compatible with MFS-V2

Licence-free service software for visualisation, documentation, diagnostics and maintenance
Job mode selectable (64 jobs)

Programming of maintenance intervals
With wire buffer function for applications with two drives

Ideally suited in combination with the adaptive optic ALO3

Laser products overview

Wire feeding / Wire cutting

MFS-V3 eBOX



Globally compatible wide-range input or multi-voltage connection for supply voltage
Motherboard with modular structure, allowing operations of various types of motors (e.g. different sizes, powers or even servomotors)
More accurate and more precise digital wire feeding with fast 32-bit control, which minimises the response times accompanying the process
Optimised maintenance and service interfaces for user-friendly operation
Special AIDA eBOXes with safety relay to allow threading in of wire for service activities after a voltage drop

MFS-V3 Service- Software

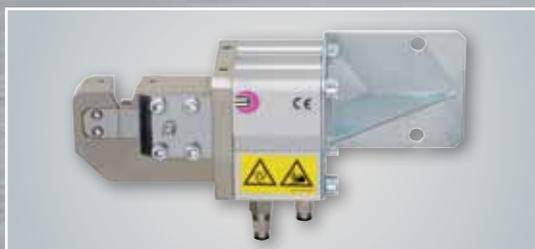
Setting and editing of up to 64 different jobs
Comprehensible documentation of the processes
Fault display in plain text
Fault log with analysis and troubleshooting
Creation and management of freely definable maintenance intervals possible
Diagnostics: clear system status display, which shows directly whether the system is operational or whether there is a fault
Several eBOX devices can be given station information by assigning the IP address
Saved station information is shown in the log files
Multilingual user interface: six different languages can be selected (German, English, French, Italian, Polish and Spanish)
Setting the wire buffer function
Different user levels:

- Read authorisation
- Administrator rights



DAV

Wire cutting
device



The ABICOR BINZEL DAV wire cutting fixture is a robust designed cutting device to ensure a sharp-edged, residue-free wire end. It gives a consistent wire stick-out which is essential for a perfect laser joining process in conjunction with filler material.

To prevent undesired bendings, the DAV clamps and holds the wire securely before shearing. The long life shearing blade had been tested with \varnothing 1.2 mm stainless steel wire to 20,000 cuts with no discernible wear.



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