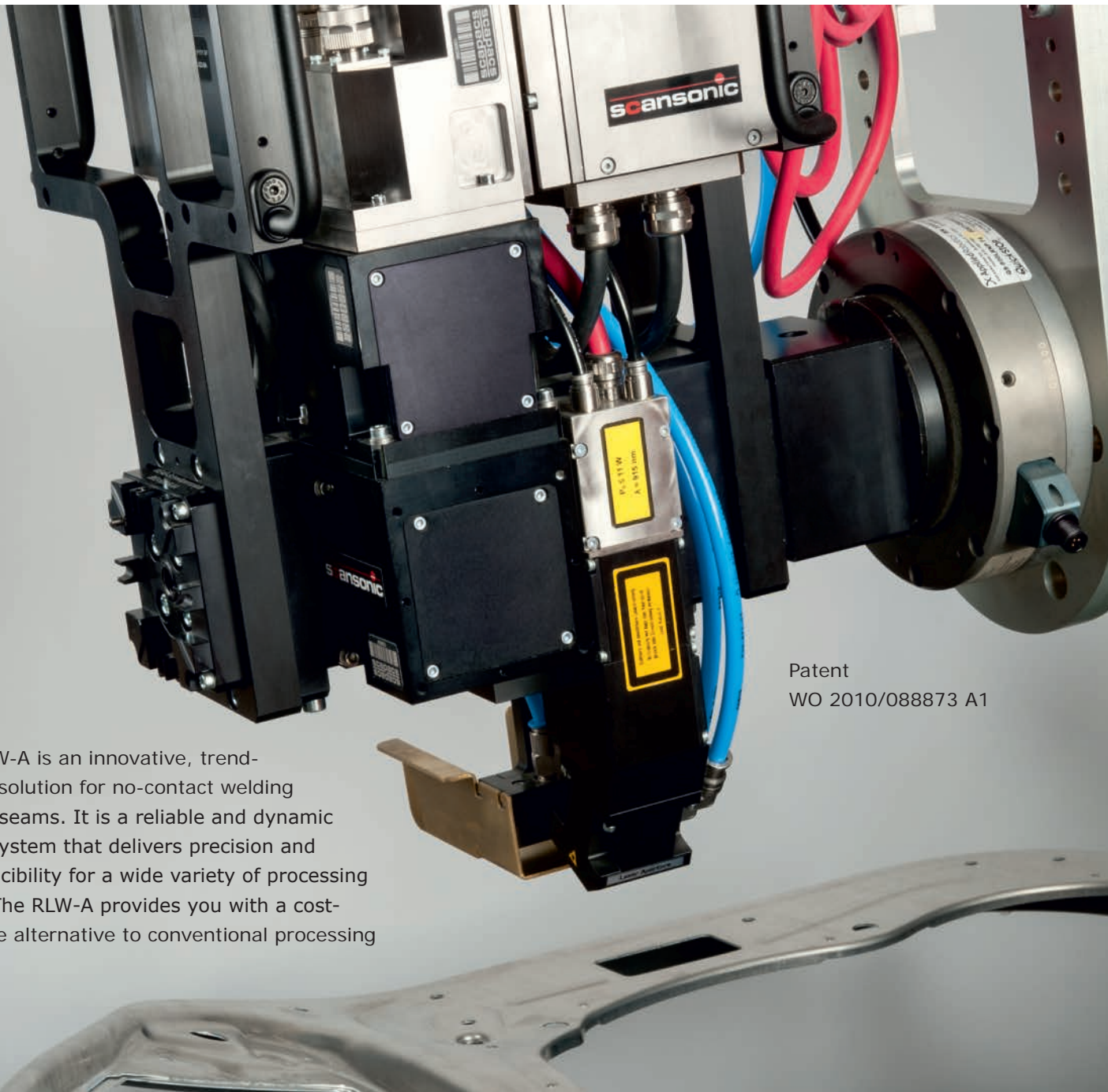


REMOTE LASER WELDING - ADAPTIVE

RLW-A



Patent
WO 2010/088873 A1

The RLW-A is an innovative, trend-setting solution for no-contact welding of fillet seams. It is a reliable and dynamic optics system that delivers precision and reproducibility for a wide variety of processing tasks. The RLW-A provides you with a cost-effective alternative to conventional processing optics.

Reduced cycle times with consistently high quality

The RLW-A system combines optical seam tracking with highly dynamic scanner axes. During the robotics motion, the system measures the seam joint and actively controls the scanner mirror. Our patented coaxially guide system (of laser beam and measurement light through the same optical path) delivers outstanding measurement accuracy. The position of the laser spot on the joint is maintained with constancy and precision – so that the remote laser joining can also be used on 3-D workpieces in body in white applications.

AREAS OF APPLICATION

For all workpieces with fillet seams, like hang-on parts (e.g. doors, hoods), or car body (side panel, roof), the following joints are able to be tracked:

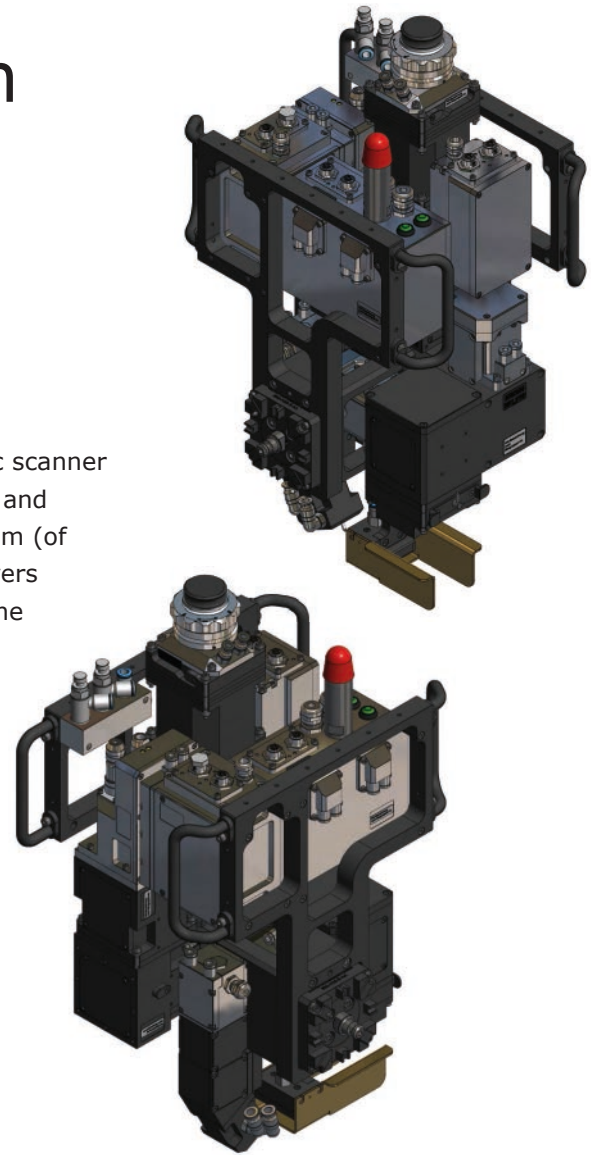
- Fillet and T-Joint
- Open edge

PROPERTIES

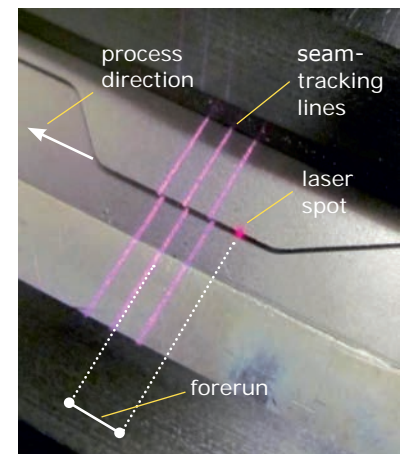
- Robust seam tracking suitable for body in white applications
- Uncomplicated parameterization of the seam tracking
- A Plug & Play processing system: An autonomous system with a simple robotics communication– no complex sensor-robot interface is required
- No relearning of path programming necessary: based on standard welding optics
- Scanner has very dynamic adjustment reactions
- Modular construction provided by Scansonic's scapacs® modular system: so you can interface with practically any optical units, fiber couplings, Fieldbus interfaces, etc.
- Easy to use GUI software for parameterization

ADVANTAGES

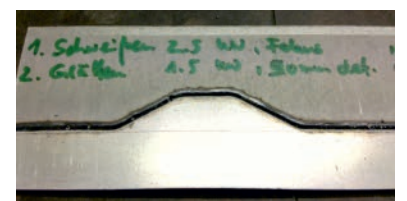
- Reduced flange length due to the use of fillet welds leads to weight reduction and therefore to less fuel consumption and CO2 emission
- A larger working distance makes it possible to travel over clamps and fastening fixtures: so the cycle time is much shorter than for tactile systems
- The desired spot size is adjusted using the auto-focus module. It is then kept constant during the process using the seam-tracking values
- Reduced consumption costs for compressed air because of smaller safety glasses (especially compared to midfield scanner optics)



Complete views of RLW-A



Seam-tracking principle



Sample workpiece

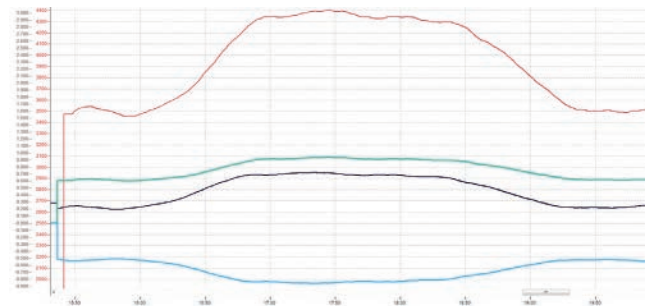
Options for your individual requirements

OPTIONAL VERTICAL GAP BRIDGING

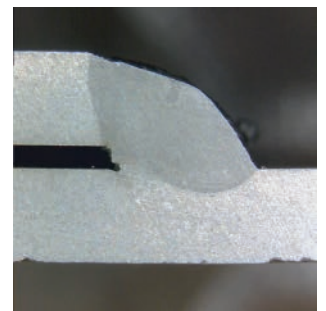
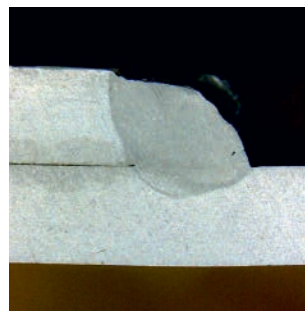
With the optical seam tracking the tolerances of positioning the parts are detected and compensated. Another influence to achieve excellent part quality is the varying gap between the workpieces. Even with a big effort in fixture design and set-up of the fixture a gap will occur. With demands on workpiece quality constantly increasing, it is crucial to measure the actual gap and compensate it online during the process.

Therefore the option v-gap bridging was implemented. The idea is to melt more material from the upper sheet to fill the gap. The seam tracking measures the gap between the workpieces and feeds the information into a process model to adapt the relevant process parameters.

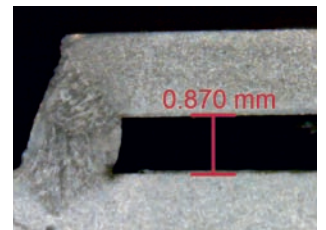
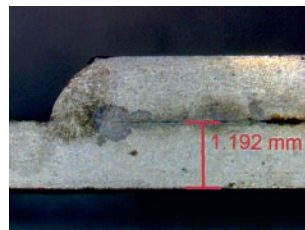
- Workpieces with consistently high quality even with varying gaps
- Suitable for demanding materials like aluminum
- Online gap measurement and compensation without any teach cycles (golden parts)
- Reduced effort to adjust the fixtures to achieve a zero gap situation
- Complexity of the fixture can be cut down
- Gaps to 40% of upper sheet thickness can be compensated



Automated process adaptation

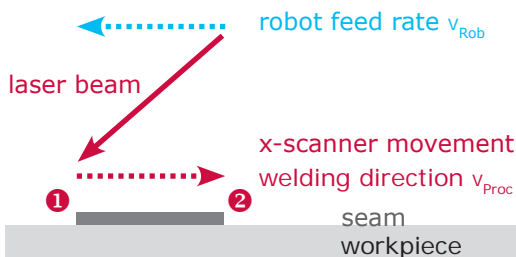


Process at zero gap and 0,5 mm gap material AW5182, thickness 1,5 mm



Process at zero gap and 0,9 mm gap material St DC05, thickness 1,2 mm

OPTIONAL ON-THE-FLY SEAM TRACKING



The laser remote process is the solution for achieving lower cycles times and increased production flexibility at the same time. Minimized cycle times can be achieved with the on-the-fly welding heads. Using the X-scanner, the robot speed is decoupled from the process speed. This principle was adapted in the optional on-the-fly seam tracking function.

- Approx. 25% reduced cycle time compared to static seam tracking (depending on amount and length of laser stitches)
- Optimized cost-effective laser technology
- Simple programming sequence on the workpiece

RLW-A TECHNICAL SPECIFICATIONS

Wavelength	1030 – 1080 nm
Laser power	max. 8 kW
Optical ratio	1:2.9
Beam parameter product (BPP)	≤ 25 mm mrad (86%)
Total angle of acceptance	250 mrad (99 % power capacity)
Focal distance	f = 500 mm
Scanning field of operations	X = 64 mm / Y = 33 mm / Z = 20 mm
Seam tracking area	Y = ±16.5 mm, Z = ± 5 mm
Positional accuracy with seam tracking	Y = ±0.1 mm / Z = ±0.5 mm
Operating clearance	194 mm to lower edge of cross jet
Type of liquid coolant	suitable for DI water (stainless steel design)
Coolant flow rate	required 1.4 l/min
Ambient temperature range	+10°C to +45° C (operating, non-condensing)
Laser protection class seam tracking	4 (12W maximal)
Wave length seam tracking projection	915 nm (invisible)
Power supply	400V / 6A (external); 24V / 55A (internal)
IP protection degree	Processing head: IP64 (with sealed fiber coupling) Control boxes: IP64
Weight	Processing head: approx. 26 kg (robot-mounted) Power supply box: approx. 23 kg (stationary installation) Control box: approx. 32 kg (stationary installation)
Dimensions	Processing head: depending on configuration Power supply box: 60 x 38 x 22 (cm) Control box: 60 x 38 x 22 (cm)
Miscellaneous	Modules are protected against inductive and electromagnetic interference

FEATURES

- Fiber couplings for the following types of fiber optic cables: Trumpf-B, Trumpf-D, Optoskand
- QBHfieldbus types: Profibus, Interbus, Profinet, Devicenet, Ethernet/IP
- Interface laser power: Current and voltage interface

OPTIONS

- Integration of the Scansonic SCeye quality system is in development
- An extension for a 2-D modulation scanner system is in development
- Observation camera
- Complete head enclosure

If these features do not meet your requirements exactly, contact us regarding individual solutions.



All product details are also available on our website

CONTACT

Scansonic IPT GmbH
Rudolf-Baschant-Strasse 2
D-13086 Berlin, Germany

phone +49-30-91 20 74-10
fax +49-30-91 20 74-29
e-mail info@scansonic.de
web www.scansonic.de