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ARC-EYE CSS





ARC-EYE is the branded name from Valk Welding for their optical sensors. The ARC-EYE CSS is part of this. The ARC-EYE CSS sensors, both hardware and software solutions, are developed and produced in-house. In this way, Valk Welding guarantees optimal integration of the sensor in the Panasonic robot system. Valk Welding also provides full service.



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What's in it for you? ARC-EYE CSS:

- Delivers a correctly positioned weld seam
- No manual program corrections
- No complex welding jigs
- Increases process speed
- Increases process accuracy
- Prevents unnecessary interruption

ARC-EYE CSS

ARC-EYE CSS (Circular Scanning Sensor) is a laser sensor system that ensures that the welding robot follows the welding seam exactly during the welding process. The ARC-EYE CSS laser sensor registers every dimension or deviation that lies within the scanning range of the laser sensor.

Because the sensor registers the deviations, it is no longer necessary to measure dimensional deviations in advance and manually correct them in the robot welding program. The ARC-EYE CSS laser sensor searches for welding points and guides the robot during welding. This makes automated welding more attractive, even for companies dealing with product tolerances that normally make automated welding impossible. In addition, the number of rejected products will decrease so the welding quality will increase.

Products that are presented to the welding robot in an exact fit can, in theory, be welded one on one by the robot. In practice, the material can deform as a result of the one-sided heat input. This can cause weld seams to deviate during the welding process. Complex shapes also often require corrections in a robotized welding process.

The strength of the ARC-EYE CSS laser sensor is mainly that welds and materials can be welded with a welding robot, which is not always possible with the classic weld seam tracking system. Think for example of aluminium, copper and galvanized steel products with a high reflection or small welds such as overlap seams, I-seams, small V-grooves or welds with varying openings.



3D Seam-Analysis: the weld seam is analyzed and checked in 3D view.



3D Seam-Tracking: during the weld seam tracking, the robot is guided through a 3D scanned landscape.



3D Seam-Finding: the vertex is searched and found in one search.



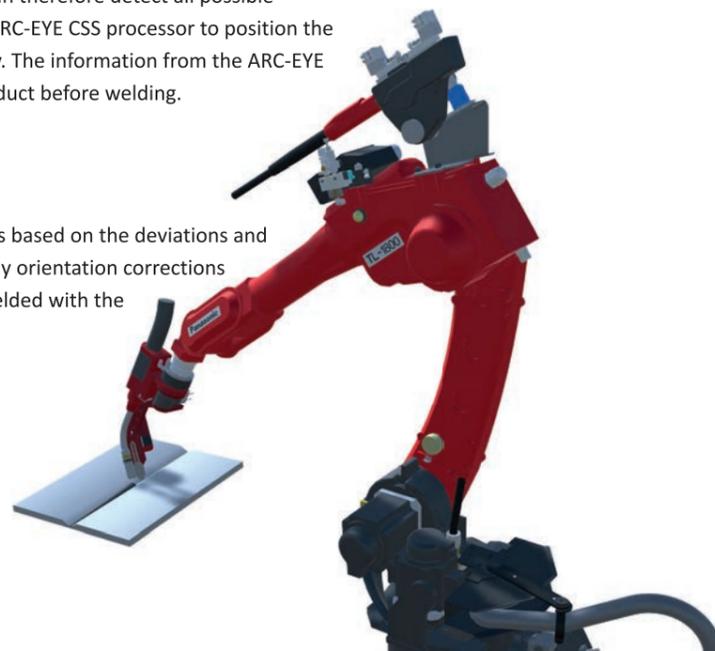
3D Seam-Finding (start of a weld seam): in the above image, the starting point, direction and dimensions of the V-groove are searched and found in one query.

Seam-Finding

Prior to the welding process, the ARC-EYE CSS laser sensor creates a 3D image. Based on this image, a welding spot, including orientation and geometric information, can then be measured. This data can be used in the robot program. The ARC-EYE CSS laser sensor scans the weld seam circularly and can therefore detect all possible deviations in contrast to many other cameras. The data is processed by the ARC-EYE CSS processor to position the robot at the correct start position, with the correct orientation and geometry. The information from the ARC-EYE CSS can also be used for other applications such as quality control of the product before welding.

Seam-Tracking

The trajectory of the robot is adjusted in real time during the welding process based on the deviations and distortions measured by the laser sensor. This includes position and optionally orientation corrections during welding. Products with complex shapes and deviations can now be welded with the robot without manual corrections or search routines beforehand.



“ARC-EYE CSS features includes integration with the Panasonic robot, a high signal-to-noise ratio and a safe laser class.”

Specifications ARC-EYE CSS laser sensor

Sensor diameter	45 mm
Sensor length	135 mm
Weight	500 grams
Operational temp*	+5°C - +40°C
Ambient temperature*	-10°C - +60°C
Cooling	with dry, clean air of +10°C - +30°C
Welding type	most common
Maximum speed	depending on welding process
Scan speed	4000 measurements per second
Detection	linear CMOS
Resolution depth	25µm / 60µm / 125µm
Lateral resolution	45µm / 80µm / 175µm
Visible field	12mm-18mm / 20mm-34mm / 38mm-76mm
Visible depth	30mm-50mm / 45mm-115mm / 75mm-165mm
Nominal distance	40mm / 80mm / 120mm
Laser output	670 nm, 4.5 mW, class 3R

* The Arc-Eye-CSS laser sensor is equipped with a sensor that automatically shuts down the system when the indoor temperature exceeds 80°C. A coolpack is available as an option.

watch our videos



Adaptive Welding

The optional ARC-EYE CSS Adaptive Welding plug-in is a software option in which the robot is able to adjust the welding and weaving parameters to changes in the weld geometry. The Adaptive Welding function can be active at the same time as the ARC-EYE CSS welding seam tracking. This ensures the optimal position and orientation of the welding torch and its parameters.

ARC-EYE CSS Adaptive Welding can adjust the following for you in real time:

- Welding speed
- Welding current
- Welding voltage
- Weaving amplitude
- Torch orientations in both dimensions
- Waiting times during the shuttle at the outward points and in the middle of the weld.



The strong connection



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