

Follow me!

TH6D – Guiding the way to a perfect welding seam.

The in-process optical seam tracking with TH6D paves the way towards a perfect welding seam: Components and joints are recorded using a combination of laser lines and camera, allowing the course of the welding seam to be corrected in real time. Contact free and independent of both system and process, the method is suitable for all standard seam shapes and types of material.

Universal, precise & insensitive! Find out more!



TH6D – The guide to perfect welding seams. Universal, precise & insensitive ...



Top-level jointing technology.

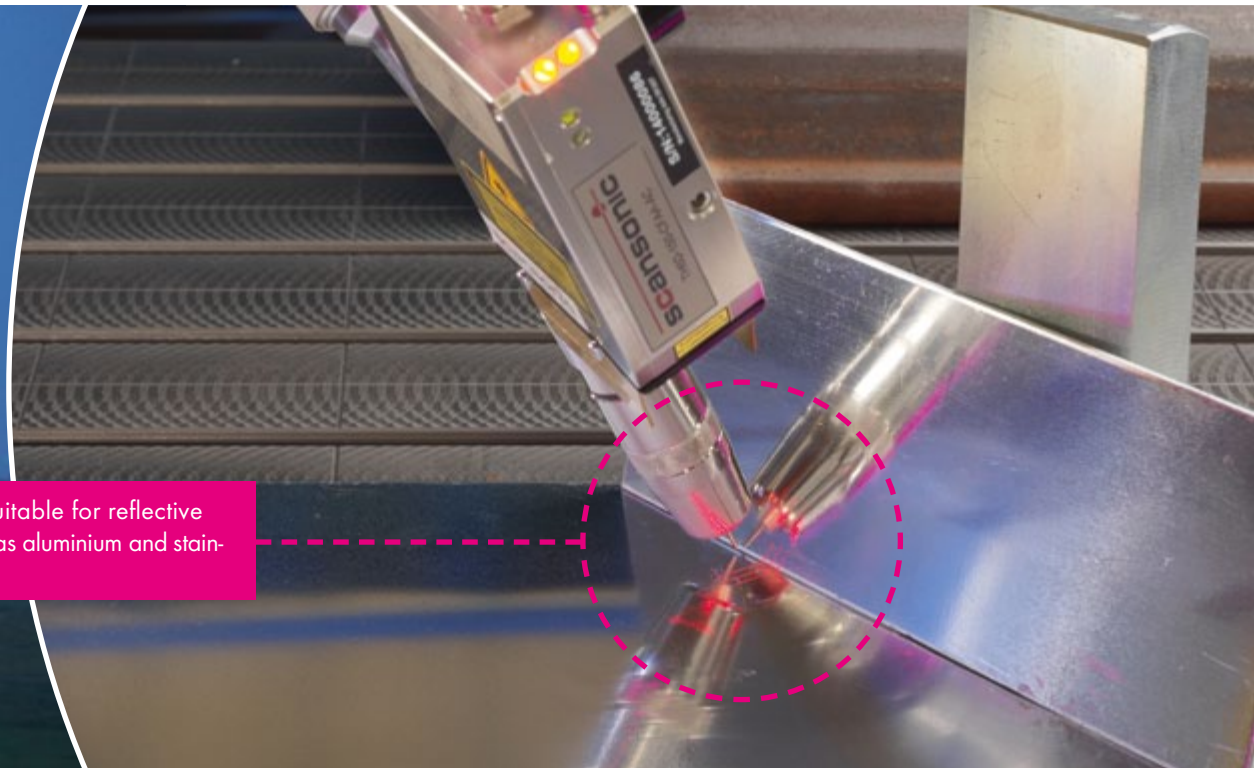
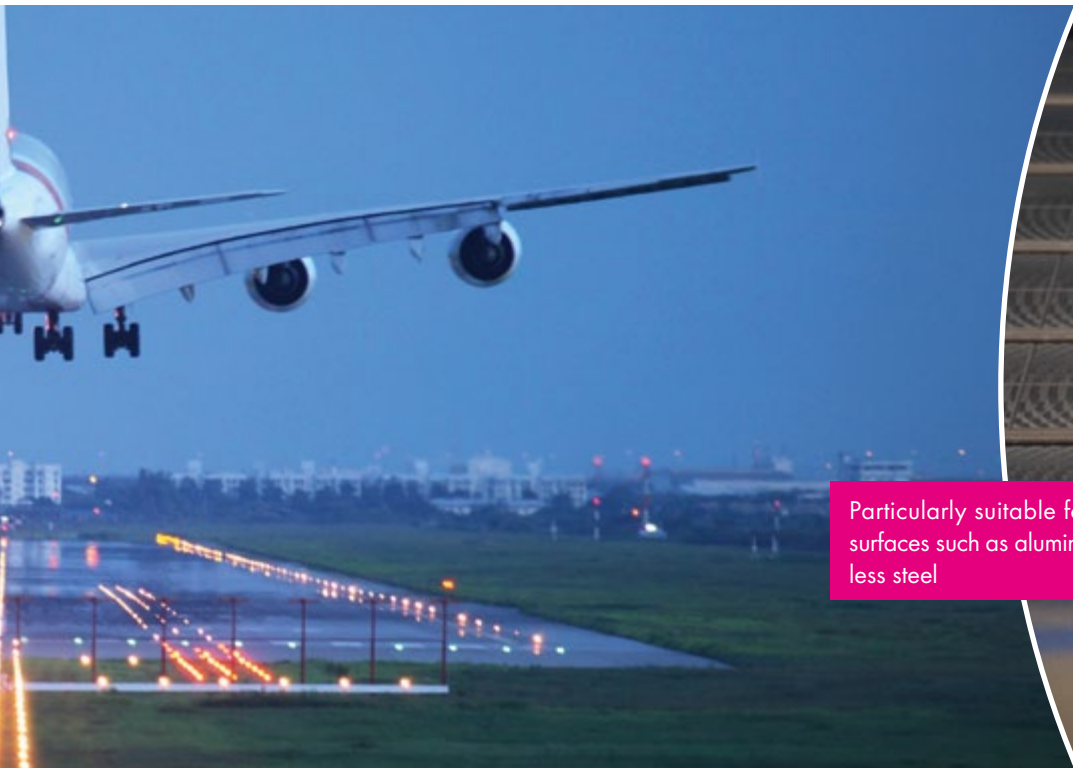
The only way to do justice to increasing product requirements, continue to work efficiently and remain competitive is to use state-of-the-art production systems.

New developments and perfectly coordinated system solutions – like the optical seam tracking sensor TH6D and the comprehensive ABICOR BINZEL product range – contribute towards improving automated processes.

Universal, precise & insensitive ...

The optical seam tracking sensor TH6D is an innovative system solution for versatile applications in the field of automated welding. It has a very sturdy design and guarantees smooth operation even very close to the process thanks to the integrated incident light filter.

The high-performance signal evaluation ensures reliable seam guiding. Particularly on reflective surfaces.



Particularly suitable for reflective surfaces such as aluminium and stainless steel

Advantages that speak for themselves:

Universal

- Suitable for all standard seam shapes
- Suitable for all standard surfaces, particularly reflective and high-gloss ones such as aluminium or stainless steel
- Interfaces to well-known robot controls available

Precise

- Exact identification of the seam and determination of the alignment of the sensor head to the seam thanks to the use of the three-line laser
- Above-average process reliability even with demanding seam tracking
- High measuring data recording stability
- Corrections in real time

Insensitive

- Splatter protection with integrated air flushing of the protective glass and air cooling of the sensor
- Splashwater-proof housing
- Optical filter to prevent falsified measuring results
- Resistant to faults caused by electric fields

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The Functional Principle.

How does optical seam tracking work?

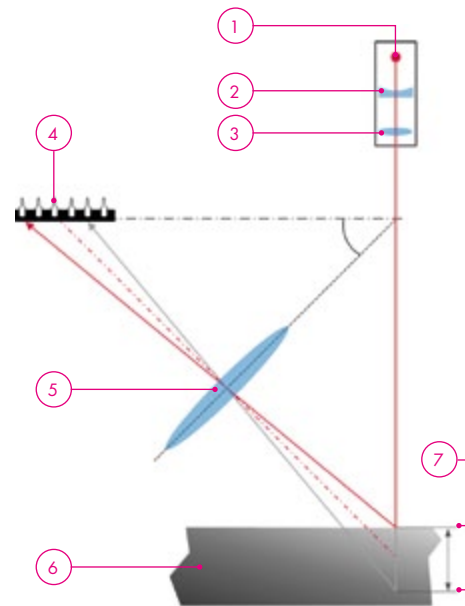
Application: The optical seam tracking sensor TH6D is used for the contact free recording and measurement of components as well as the precise positioning and tracking of the tool – in real time.

How it works: A light pattern comprising three parallel laser lines is projected onto the component surface according to the principle of laser triangulation. At the same time, the seam shape at the joint is scanned by a digital camera. The laser lines are interrupted at the joint due to the inclined projection of approx. 20° and thus mark the seam point on the joint line.

Evaluation: The current seam position, information about the gap and edge offset at the joint as well as the position of the welding tool relative to the component surface are recorded as measured values and transmitted to the TH6D process computer. This forwards the values to the robot control and thus influences the seam tracking of the tool.

The functional principle

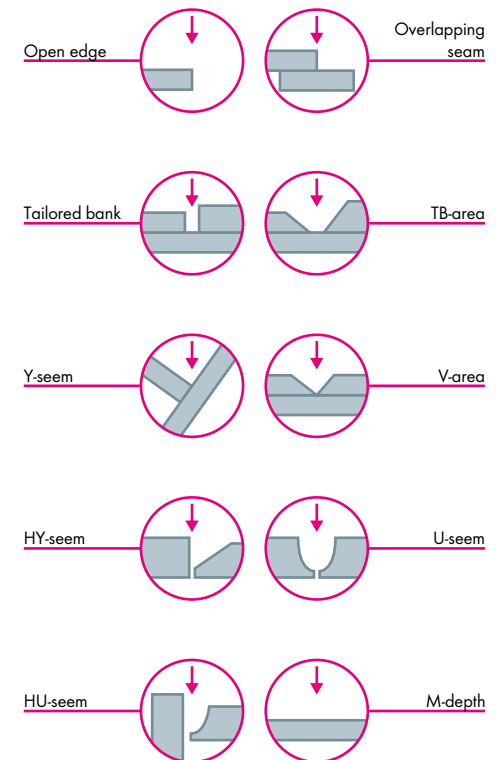
Schematic diagram of laser triangulation (= optical distance measurement) using the optical seam tracking sensor TH6D:



- Legende:**
1. Laser diode
 2. Collimator lens
 3. Projection lens
 4. Light detector
 5. Lens (receiver lens)
 6. Object to be measured (component)
 7. Measurement 1 and measurement 2

Seam shape examples

The contact free scanning of the component allows the sensor to be used for almost all seam shapes.



Navigation ...

The System Overview.

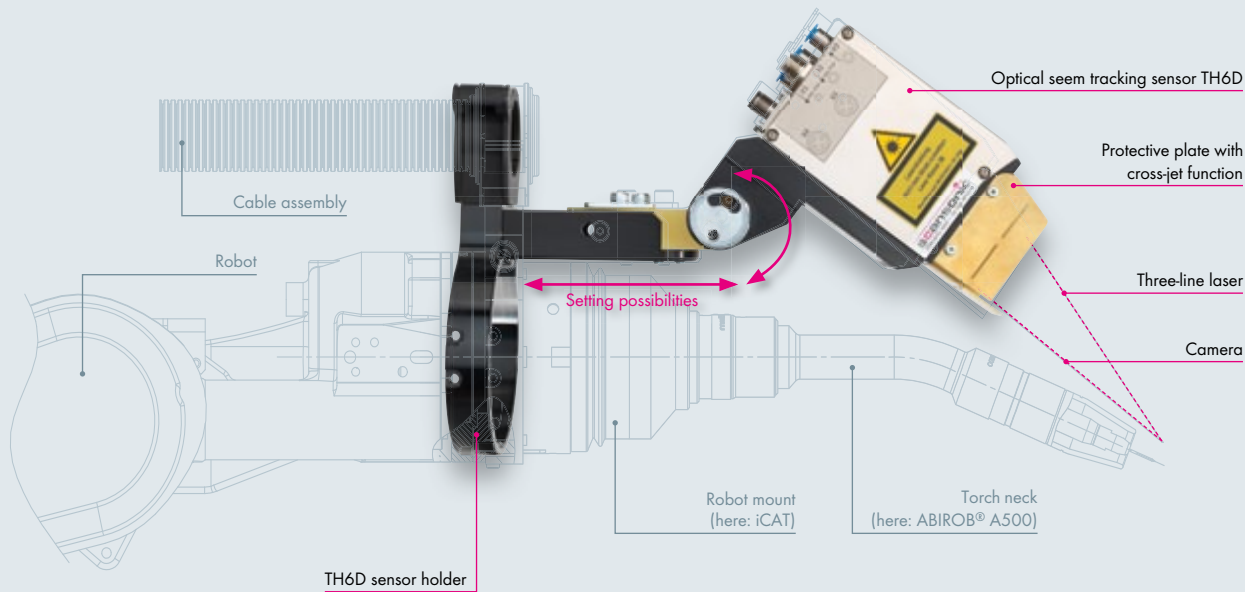


Figure 1:
Connections

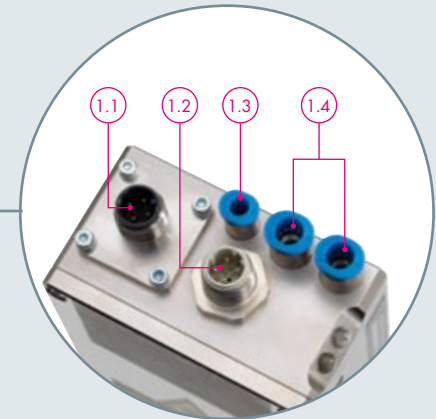
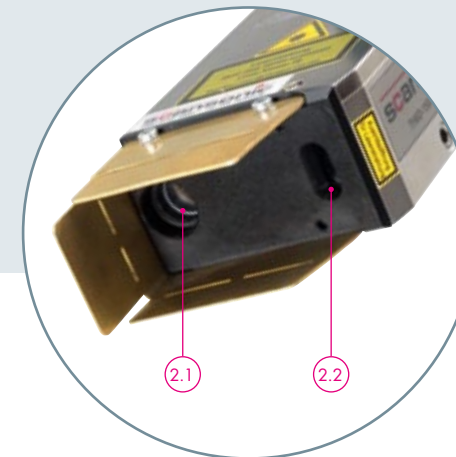


Figure 2:
TH6D detailed view



The optical seam tracking sensor TH6D is available in two different versions. These differ in resolution and measuring range and can thus be used both for thin-sheet and thick-sheet applications.

In combination with the sensor mount, the sensor is available for both iCAT and iSTM robot mounts, and thus for the welding torches of the series ROBO WH, ABIROB® A, ABIROB® W and ABIROB® GC.

Figure 1:
Connections

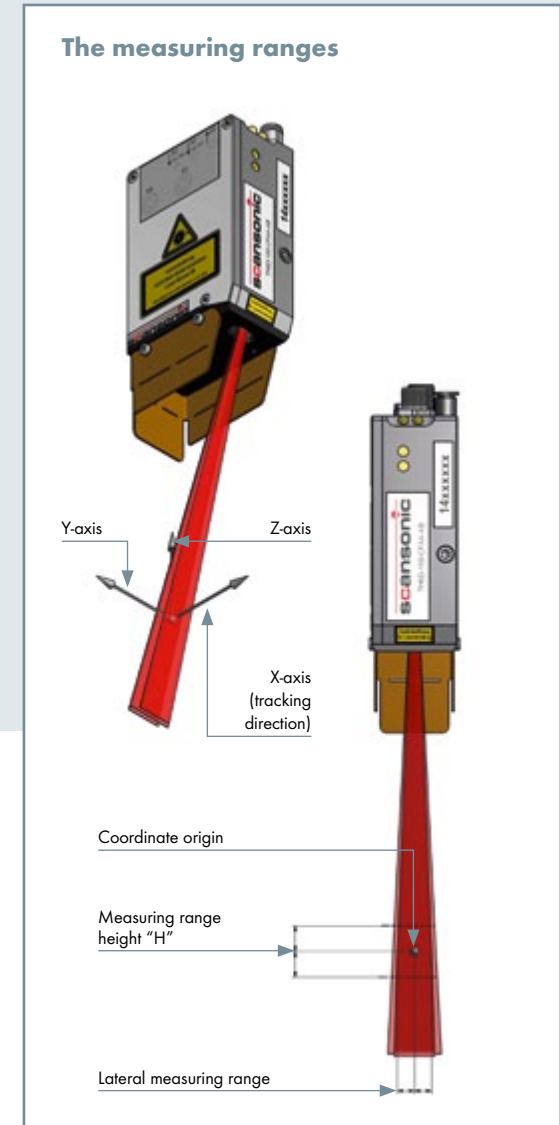
- 1.1 Electrical power supply connection
- 1.2 Connection for process computer
- 1.3 Cross-jet
- 1.4 Air cooling

Figure 2:
TH6D detailed view

- 2.1 Camera lens
- 2.2 Three-line laser

In Detail: Connection Sketch & Technical Data.

Schematic diagram of the data flow:



Technical data

General

Measuring lines:	3
Working distance:	150 mm
Measuring rate:	60 - 240 Hz
Dimensions (WxHxD):	70 x 40 x 100 mm
Operating temperature:	10°C to 45°C

Version TH6D-150-CFAA-AB for thin-sheet applications

Measuring range (W,H):	±8 mm, ±12 mm
Resolution (WxH):	0.03 x 0.07 mm

Version TH6D-150-KFAA-AB for thick-sheet applications

Measuring range (W,H):	±22 mm, ±40 mm
Resolution (WxH):	0.08 x 0.12 mm

In Detail:

Interfaces & Conditions

Robot manufacturer	Interface	Robot conditions			Calibration with
		Hardware	Software	Data connection sensor – robot	
ABB	Ethernet	- Controller iRC5	- Robot system software 5.15 - „Optical tracking Arc 660-1“	Ethernet	Scansonic or ABB Calibration plate
	Serial			Serial RS-232	
Fanuc	Ethernet	- Controller R-J3iC - Controller R-30iA - Controller R-30iB - Ethernet port #2 must be free	- Operation System Fanuc „Arc Tool“ - Universal sensor interface (R691) - User socket messaging (R648)	Ethernet	10 point method (Option: Fanuc calibration plate)
KUKA	RSI Interface	KR C2 Edition 05 - Network card 3Com 3C905CX-TX-M or Ethernet 100Mbit PCI	KUKA System Software (KSS) 5.4; 5.5 or 5.6 Software Moduls: - RSI interface - XML protocol - InLine standard form	Ethernet	Scansonic calibration plate
		KR C4 Standard ethernet port	- KUKA system software 8.2.20 or higher - KUKA.RobotSensorInterface 3.1.3 - KUKA.ethernet KRL 2.1.3		
	Seam tech interface	KR C2 edition 05 - Network card 3Com 3C905CX-TX-M or ethernet 100Mbit PCI	KUKA system software (KSS) 5.4; 5.5 or 5.6 Software Module: - SeamTech tracking (containing RSI Interface) - XML protocol - InLine standard form	Ethernet	
		KR C4 Standard ethernet port	- KUKA system software 8.2.20 or higher - KUKA.RobotSensorInterface 3.1.3 - KUKA.Ethernet KRL 2.1.3		
Reis	Serial	IPC with RS422 Interface refit	- RoboStar V - Software-Version 20.0 or higher (proprietary protocol)	Serial RS-422	Reis calibration plate
	Ethernet	Standard	Software version 24 or higher	Ethernet	
Yaskawa	D/A Interface	- Controller DX100 - General-Sensor DX100 with sensor board - XO102-card	Robot system software DS2.05.00A (-)00	D/A Signals	Golden Seam reference path
	Ethernet	Controller DX100	- Robot system software DS1.61.00A-27 - Tip: Port 5020 has to be addressed in robot settings	Ethernet	Yaskawa calibration plate
Universally applicable	D/A Interface	Analogue input for measurements - side (y) - height (z) in the range of $\pm 10V / 4-20mA$	SPS	D/A Interface	-
	Universal XML Interface	Protocol of XML communication is based on the principles of ISO-OSI reference model		Ethernet	-

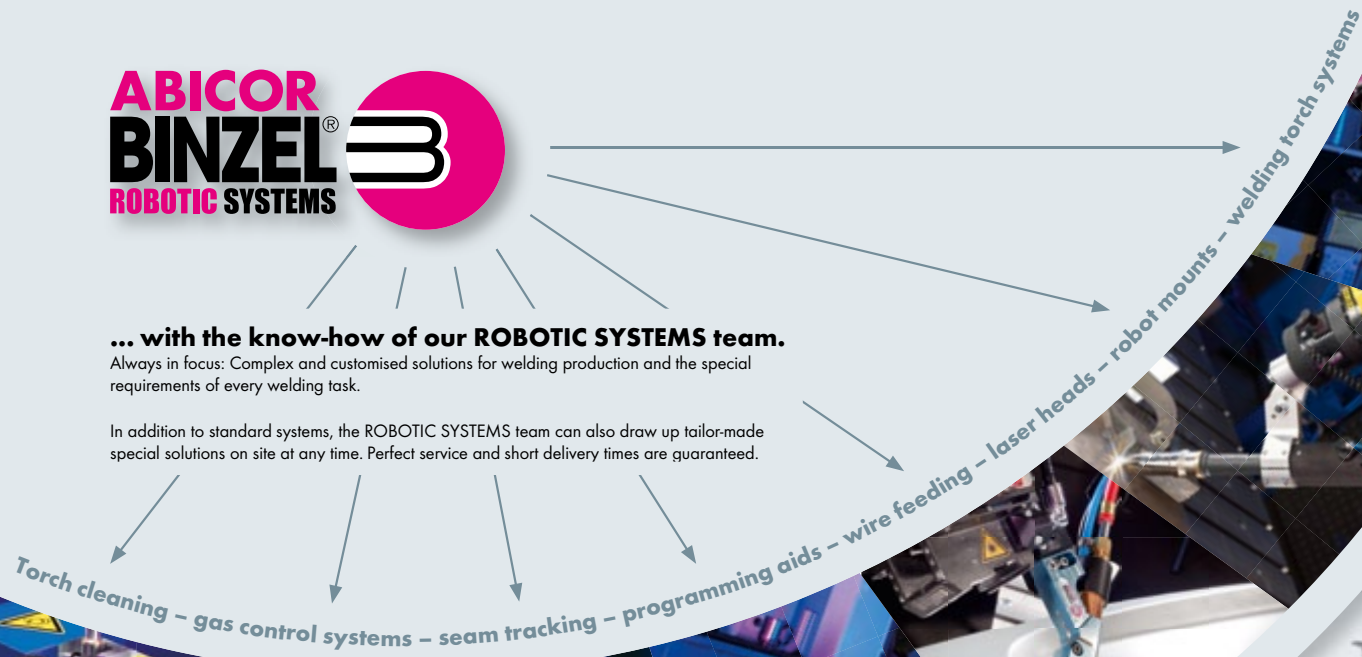
Business Class: Welding Robot System Solutions ...



... with the know-how of our ROBOTIC SYSTEMS team.

Always in focus: Complex and customised solutions for welding production and the special requirements of every welding task.

In addition to standard systems, the ROBOTIC SYSTEMS team can also draw up tailor-made special solutions on site at any time. Perfect service and short delivery times are guaranteed.



Alexander Binzel Schweißtechnik
GmbH & Co. KG
P.O. Box 10 01 53 · D-35331 Gießen
Phone: +49 (0) 64 08 / 59-0
Fax: +49 (0) 64 08 / 59-191
Email: info@binzel-abicor.com

www.binzel-abicor.com