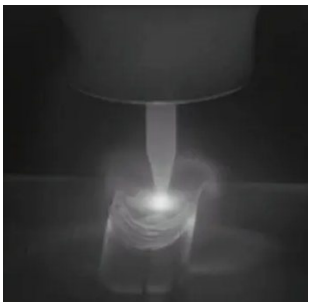
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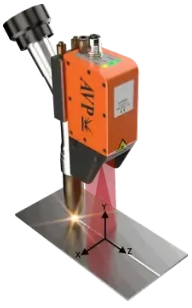
Automation Systems

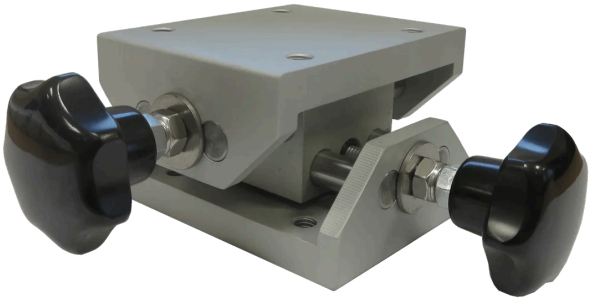
Systems that improve weld quality and automation: arc voltage control, cameras and machine vision, seam tracking and precision torch positioning.

- **5.1** AVC Arc Voltage Control **44**
- **5.2** Welding Cameras and Machine Vision **45**
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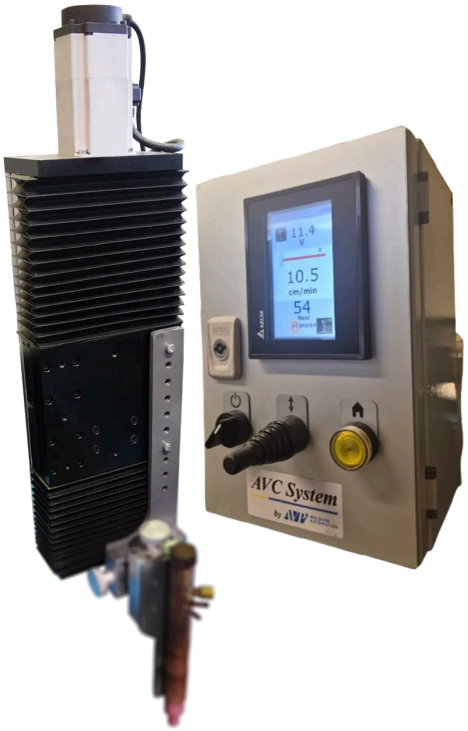




5.1 AVC Arc Voltage Control

Adjusts torch height automatically from the arc voltage – constant arc length and higher welding speeds. Mostly used with TIG, also plasma and MIG/MAG. **Standalone for Fronius or integrated in AVP machine**

Applications Repeatable welding regardless of electrode position; compensates for workpieces or clamping that are not flat.



AVC unit with control panel and servo slide

Description

AVC (arc voltage control) is a system that we integrate into AVP welding machines; it is also available as a standalone unit for Fronius welding power sources. Its main advantage is better welds: using welding information (primarily the arc voltage), the system automatically adjusts the torch height. With AVC control, higher welding speeds than usual can be reached. The torch is adjusted automatically along the vertical axis by a servo motor, according to the set parameters. The system is most often used with the TIG process, but plasma and MIG/MAG welding processes can also be controlled.

With two motorized axes (cross slides), AVC and oscillation can be used together.

Features

- Torch positioning for the ideal ignition distance (touch – retract)
- Positioning for the welding distance – precise control of arc length
- Maintains a constant and stable arc length
- Automatic detection of welding current
- Voltage sensor for monitoring arc length (AVC)
- “HF” protection
- Motorized slide (Z axis) with 50 to 300 mm stroke and limit switches
- Additional manual slides, Y and Z axis (option)

5.2 Welding Cameras

Welding Cameras and Machine Vision

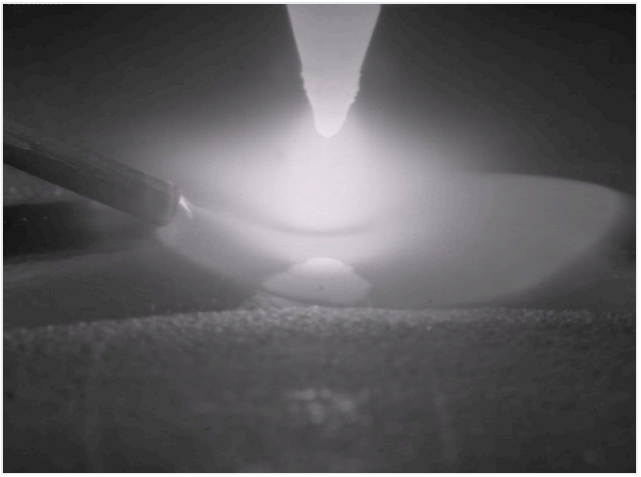
Live process monitoring on a touchscreen, without protective equipment. Integration of Cavitar, Xiris, Fronius ArcView and Seesense; machine vision also detects the start and end of the workpiece.

Applications Used with most welding processes.

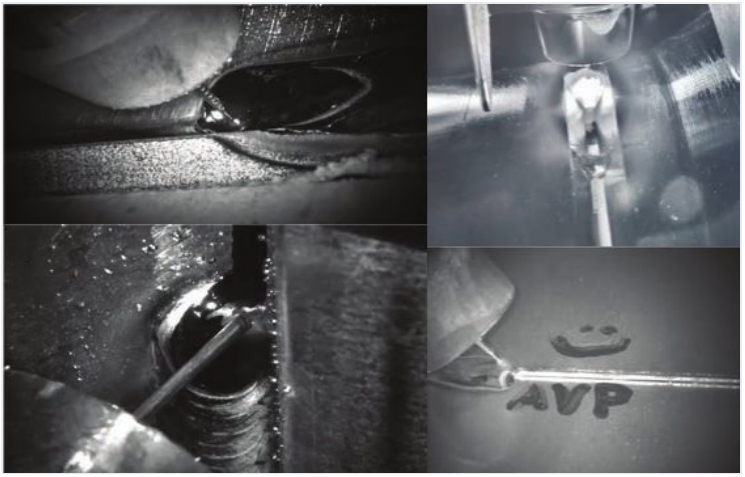


Video systems for welding processes

▶ ***Video***
Scan to watch



TIG (GTAW) welding with wire



Samples

Description

The best way to observe different welding processes is with welding cameras. They help us notice faults and defects quickly and allow safe monitoring of the welding process without protective equipment. They can be used as an aid for manual torch adjustments during welding. If desired, video recordings of the welding process can be captured and stored for later review. Welding cameras can be used with most welding processes.

Features

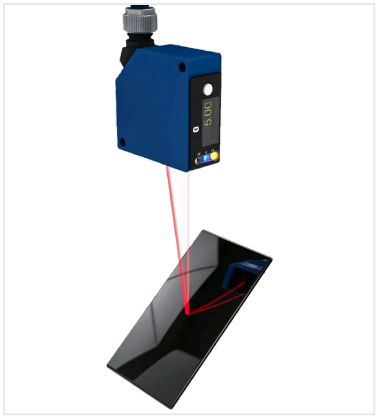
- Real-time (live) monitoring of welding
- Visual inspection of the weld joint / weld seam
- Industrial, rugged and temperature-resistant design
- Water or air cooling (optional, if needed)
- Large, bright touchscreen – 13″ to 21″
- Two welding cameras can be watched on the same screen at the same time
- Wide range of image settings (brightness, contrast, frame rate, RGB colour control …)
- Replaceable protective glass for the camera
- 3-axis arm for easy positioning of the camera

We offer integration and training for well-known brands: Cavitar, Xiris, Fronius ArcView and Seesense.

5.2 Machine Vision

Automatic start and stop detection

Machine vision also detects the start and end of the workpiece.



Laser sensor



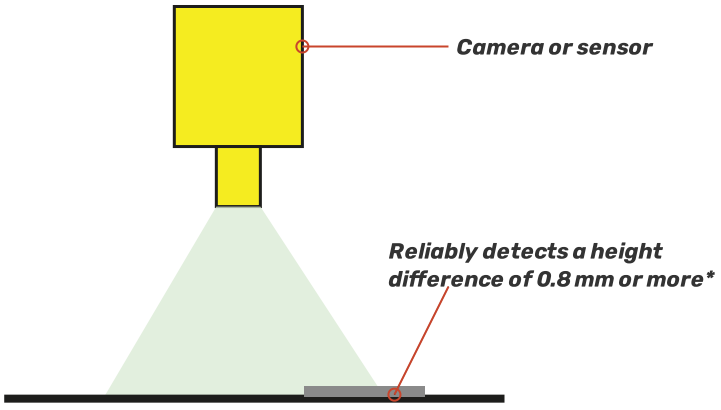
Machine vision camera

Description

We offer installation and integration of edge-detection sensors on our VSV machines. Edge detection is used to recognise the start and end of the workpiece automatically, without the need for prior scanning; detection takes place in real time during welding. This improves the automation of the welding process. Detection can be achieved with a machine vision camera or a laser distance sensor, both of which are more cost-effective than laser tracking sensors.

With a machine vision camera it is also possible to obtain information on the gap width, which gives better control over the welding process.

Detection principle



*For very thin sheets (0.4 – 0.8 mm) we recommend a camera that detects not only a change in height but also a change in contrast and shadow. Because it relies on several checks, it is more reliable.

5.3 Seam Tracking Systems

Laser seam tracking

Laser seam tracking detects joint width and depth in real time and corrects torch direction and height with motorized cross slides or on a robot. Tactile and mechanical tracking also available.

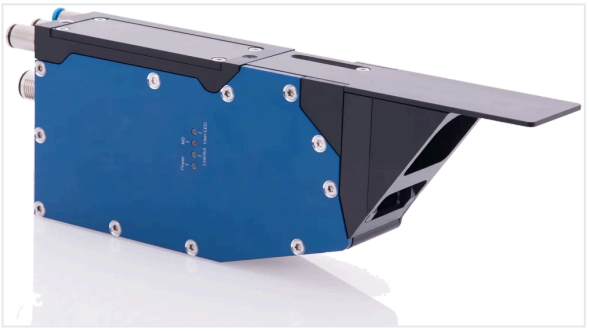
Applications Pipes, uneven workpieces and long seams.



Laser tracking sensor



Software



Laser tracking sensor

Description

The laser tracking sensor is used for reliable automatic tracking of the weld seam. It is mounted in front of the torch, which moves according to the sensor information. The lasers detect the width, depth and other parameters of the joint, and the tracking status and shape of the edge are displayed in real time in the software. The system also works on uneven workpieces (tubes and the like). The software draws the detected shape of the workpiece and the weld seam, and the sensor temperature is monitored in the software.

Tracking helps the operator achieve quality welds. During welding it corrects the torch direction and height using motorized cross slides (2 axes) or on a robot. Machine parameters and tracking can be combined on the same screen.

Bright, shiny stainless steel can limit tracking; in such cases we suggest a special type of sensor. Based on the requirements of your application we will recommend the most suitable type.

Features

- User-friendly software
- Pre-stored weld joint types with optimized parameters
- Computer-to-sensor connection, PoE power supply
- For some sensors no computer is needed, except for changing parameters

5.3 Tactile and mechanical tracking

Seam Tracking Systems

Tactile tracking (2-axis)



System controller



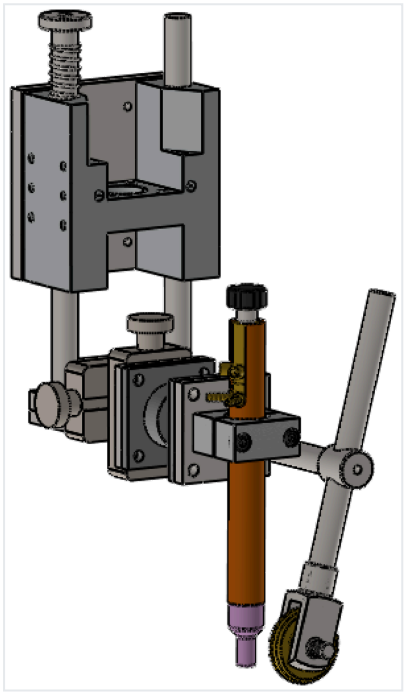
Tracking probes

The controller, together with motorized cross slides and a sensor unit (probe), forms a robust and simple tactile seam tracking system for automatic welding.

The system reduces corrections and adjustments after welding, because the torch is always in the optimal position. Welding quality is constant and uniform, and the operator does not have to concentrate on the torch and its position.

The system includes motorized servo cross slides for precise torch movement. The probe, in connection with the controller, holds the torch in the optimal position without any programming, which enables fully automatic welding, even on demanding shapes within the working range of the servo slides.

AVP mechanical tracking (1-axis)



AVP mechanical tracking

The AVP mechanical tracking solution is designed for use on AVP machines. It works without motors and tracks in the vertical axis only.

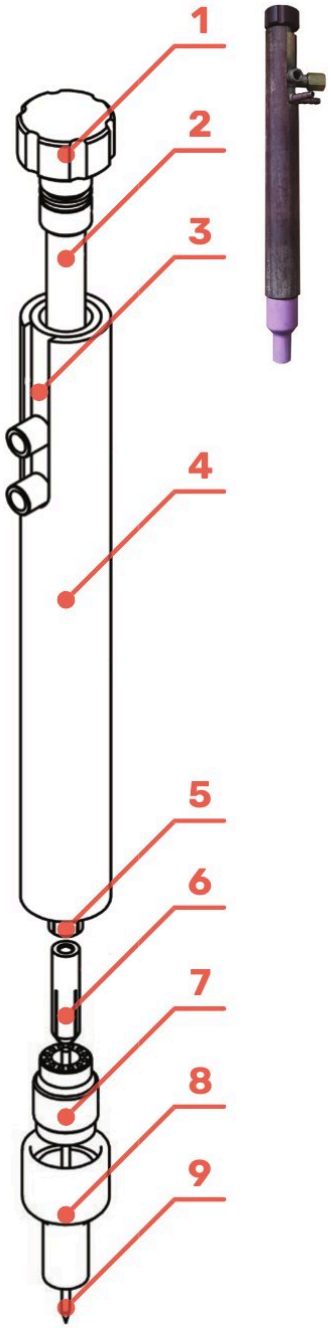
This system uses a robust spring and wheel mechanism to keep the torch at a constant height relative to the height of the workpiece. Manual cross slides with a stroke of 40 mm and tilt elements for positioning the torch before tracking are included.

5.4 Machine TIG Torches

TG 202S • TG 302S

TG 202S: air-cooled, 200 A. TG 302S: water-cooled, 300 A. Hose package 4–15 m. **Quick tungsten swap**

Applications For machine and semi-automatic welding.



	TG 202S	TG 302S
Cooling	Air	Water
Max. welding current	200 A	300 A
Length	4 – 15 m	4 – 15 m

Spare parts

No.	Article no.	Description
1	IG4601017000	Torch cap TG 202/302
2	IG5700002000	Torch tube
3A	IG4701011000	Torch body TG 202
3B	IG4701010000	Torch body TG 302
4	IG570104000	Torch insulation TG 202/302
5	IG5600355000	Centering piece TG 202/302
6A	AI0470000760	Collet TG 1.0
6B	AI0470000761	Collet TG 1.6
6C	AI0470000762	Collet TG 2.4
6D	AI0470000763	Collet TG 3.2
7	IG0TG00000RP	Gas diffuser (collet body)
8A	AI0470110300	Ceramic nozzle 6/42
8B	AI0470111064	Ceramic nozzle 9/38
8C	AI0470110302	Ceramic nozzle 9/50
8D	AI0470110303	Ceramic nozzle 11/38
8E	AI0470110304	Ceramic nozzle 13/38
9		Tungsten electrode 1; 1.6; 2.4; 3.2

5.5 Torch Positioning Elements

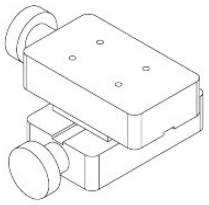
Pneumatic, manual and servo-driven slides (up to 100 kg, stroke 50–500 mm), plus tilt and swivel elements for precise torch setup.

Applications Precise torch setup on AVP welding machines and cells.



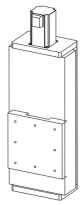
Pneumatic slide

Pneumatic sliding mechanism for moving the torch towards or away from the welding position (two positions).



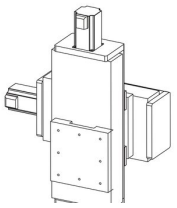
Manual cross slide

Manual slide for precise torch movement in two axes. Stroke 40 mm, maximum load 10 kg.



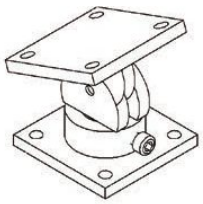
*Servo motor slide**

Motorized “heavy-duty” slide for controlled movement of the torch in one axis. Load up to 100 kg.



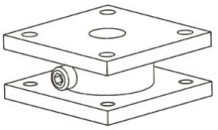
*Servo motor cross slide**

Motorized “heavy-duty” cross slide for controlled movement of the torch in two axes. Load up to 100 kg.



Tilt and swivel element

Element for manual tilt or swivel, locked with two M8 screws. Load up to 10 kg.



Swivel element

Element for swivel (rotation) around one axis. Locked with one M8 screw.

*Servo motor slides

- One- or two-axis motorized movement
- Servo system – absolute position
- Stroke 50–500 mm (customized for each order)
- Linear transmission by spindle and guides
- Industrial, rugged and enclosed design

Other equipment

- Limit switches
- DC electric motor 42 V, 90 W
- TIG torch – grounding ring