

Sensor Selection Guide

Frequently Asked Questions

Q1. What is a robotic sensor?

A1. A robotic sensor is a system that detects variations in parts and compensates for the variation by shifting the robotic programs.

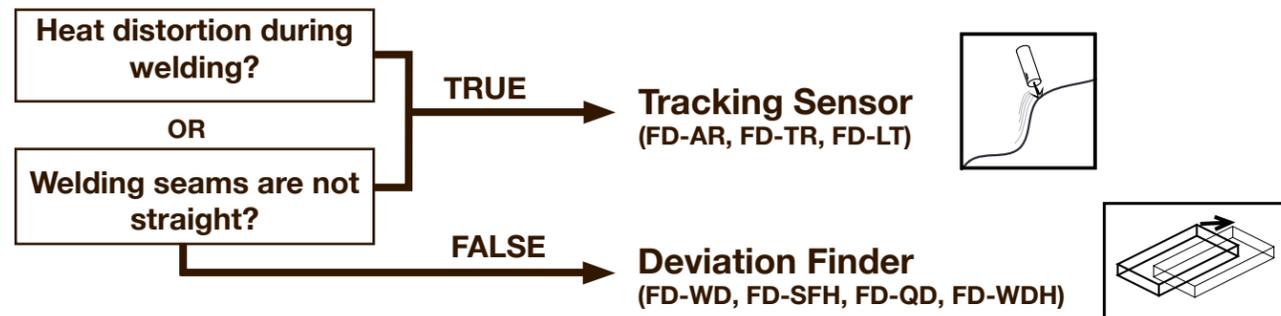
Q2. When is it effective and/or applicable?

A2. A sensor is effective when it is difficult to keep programmed points in consistent locations and there are part accuracy problems requiring the operator to frequently adjust taught robot points. When this occurs, sensors can be used to automatically shift the welding points.

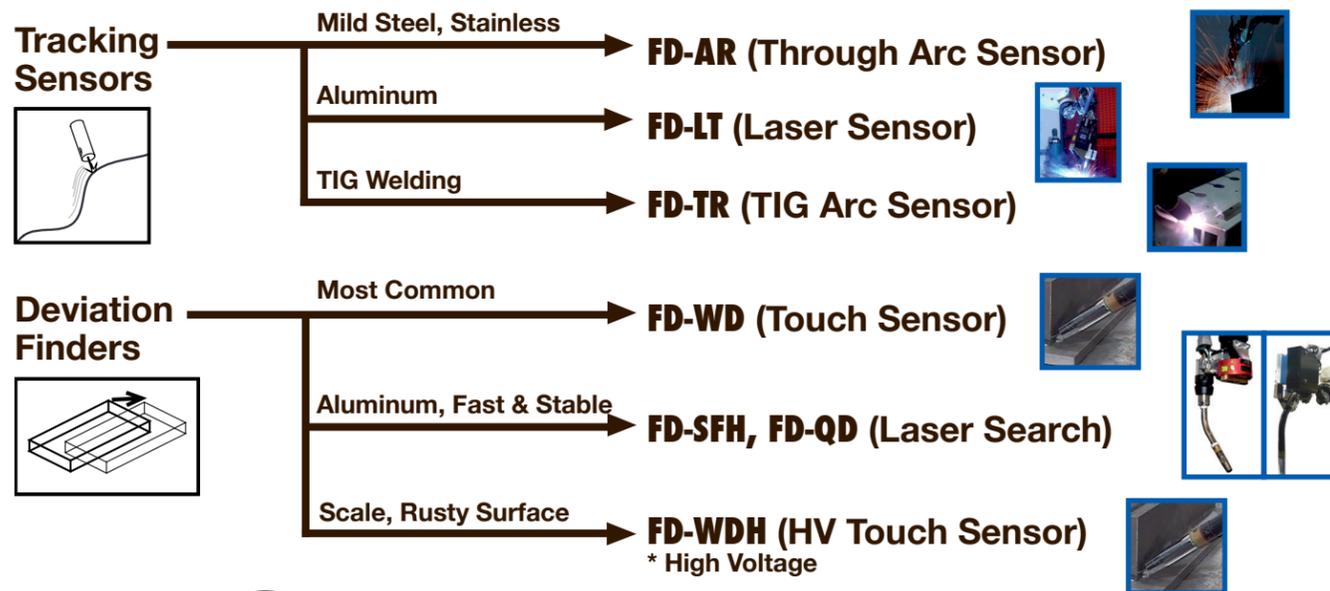
Note: Sensors cannot create teaching programs – it can only shift the current programs. Teaching an initial program is always required.

Q3. How can we determine which sensor is best?

A3. DAIHEN can provide various types of sensors for almost any situation. Please refer to the chart below to find the best sensor for your application.



*Giving you the best choice from a wide selection...
... for the best welding results and quality!*



For more information on **OTC** brand products from DAIHEN Inc., visit our website at www.daihen-usa.com, or send us e-mail at sales@daihen-usa.com.



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ADVANCED WELDING & ROBOTIC SYSTEMS

Sensing Solutions – Seam Tracking / Laser Search / Laser Tracking / Arc Sensor



FD-AR

Through the Arc Seam Tracking

- Simple & Easy operation.
- No additional torch components for easy maintenance.
- Most popular sensor worldwide.
- High-reliability and versatility.

FD-SFH

Laser Search Sensor

- High Speed and High Accuracy Laser Line Beam Sensor.
- Robot Teaching Assist Function that decreases teaching time.
- Full operation from teaching pendant.



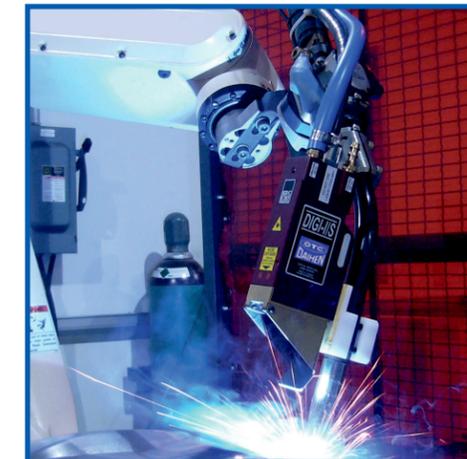
Going beyond your expectations...



FD-QD

Laser Search Sensor

- Unique sensing functions with lower costs.
- Designed for arc welding applications.
- Full operation from teaching pendant.



FD-LT

Laser Tracking Sensor

- High-end technology for high-end applications.
- Designed for arc welding environments.
- Relatively compact and low maintenance.



FD-WD (H)

Touch Sensor

- Conventional sensing with modern functions.
- Simple and easy to use maintenance.

Leading Sensing Technology...

... from the Leading Company in Welding Innovations

Basic Sensors

Conventional Concepts with improved Functionality and Operation

OTC makes welding equipment, OTC knows “what is welding”, and OTC knows “what we need to do” to ensure the highest possible quality of welding.

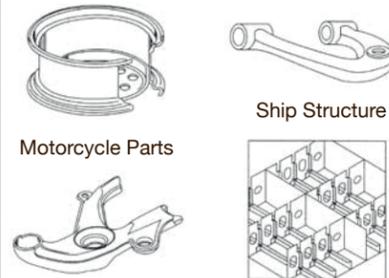
FD-AR ARC SENSOR

Real-time Seam Tracking Sensor using Through-Arc Tracking.



Deviation Detection	NO (use with FD-WD / FD-QD / FD-SFH)
Material	Mild Steel, Stainless (Solid or Cored Wire)
Applicable Range	Fillet Joints, Lap Joints (3mm or more), V-groove (First path)
Welding Methods	CO2, MAG, MAG Pulse
Welding Machine	DM350, DP400, DP500
Welding Torch	DAIHEN CO ₂ / MAG Torch (Air Cooled / Water Cooled)
Accuracy	±1mm (0.04")
Remarks	Weaving motion is required.

Application Examples



- Ideal for mid to thick plate Mild Steel and Stainless applications.
- Settings and controls in the teaching pendant are in a dedicated, user-friendly menu.
- Easy to understand & easy to use.

FD-WD (WD-H) WIRE DETECTION TOUCH SENSING

Deviation finding using the welding wire.

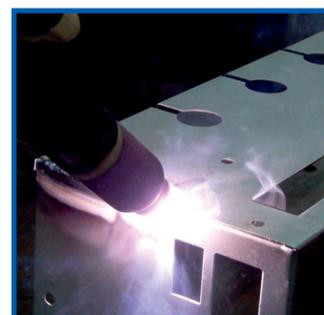


Real-time Tracking	NO (use with FD-AR / FD-TR)
Material	Mild Steel, Stainless (Not recommended for Aluminum)
Applicable Range	Lap Joints (3mm or more), Most other joints
Accuracy	±1mm (0.04")
Welding Machine	All OTC DAIHEN machines
Welding Torch	DAIHEN CO ₂ / MAG Torch (Air Cooled / Water Cooled)
Combination	FD-AR2 / FD-TR2 (with probe)

- Simple yet quite versatile.
- Various functions for many applications.
- Dedicated designed menu in teaching pendant.
- Programmable command can increase range of usability.

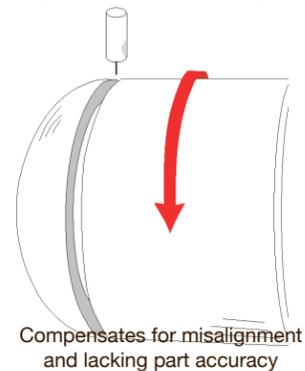
FD-TR TIG ARC SENSOR

Real-time height tracking sensor for TIG applications.



Deviation Detection	NO (use with FD-WD)
Material	Mild Steel, Stainless, Aluminum (Other materials available)
Applicable Range	Fillet, Lap, Corner, Butt Welds
Accuracy	±0.5mm (0.02")
Welding Machine	All OTC DAIHEN TIG machines
Welding Torch	DAIHEN TIG Torch (Air Cooled / Water Cooled)
Combination	FD-WD (with probe)

Application Example



- 100% control from the teaching pendant via a dedicated menu.
- Simple configuration that can be connected to any type of OTC DAIHEN TIG machine.
- Stable and accurate tracking.

Advanced Sensors with Laser Technologies

New Sensing Possibilities with Laser Technologies

Got an application that requires the highest degree of accuracy? OTC DAIHEN's advanced laser technologies are the ultimate solution for ensuring the best weld quality & part consistency.

FD-SFH SUPER FAST LASER SEARCH

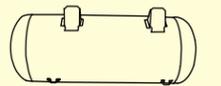
Extremely fast and accurate, stable deviation detector via laser beam.



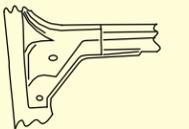
Real-Time Tracking	NO (use with FD-AR)
Material	Mild Steel, Stainless, Aluminum (Other materials available)
Applicable Range	Lap Joints, (1mm or more), Fillet Joint, Corner Joint and many more. *Not applicable for mirrored surfaces.
Accuracy	±0.2mm (0.008")
Welding Machine	All OTC Machines
Welding Torch	350A Air Cooled MAG Torch (Other torches are available by special order)
Basic Functions	Laser Probe, Groove Data Acquisitions
Combination	FD-AR (for Tracking)

- Joint detection as low as .5 sec, reducing cycle time compared to the FD-QD.
- Adaptive technology with gap recognition.
- Mounting position leaves much room for torch accessibility in the production environment.

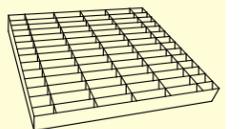
Laser Application Examples



Pressure Tank (Flair Lap)



Body Frame (Thin Plate Lap)



Gutter Plate (Inconsistent Fit-up)

FD-QD QUICK DETECT LASER SEARCH

High-speed, stable deviation detector via laser beam.



Real-Time Tracking	NO (use with FD-AR)
Material	Mild Steel, Stainless, Aluminum (Other materials available)
Applicable Range	Lap Joints, (1mm or more), Fillet Joint, Corner Joint and many more. *Not applicable for mirrored surfaces.
Accuracy	±1mm (0.04")
Welding Machine	All OTC Machines
Welding Torch	350A Air Cooled MAG Torch (Other torches are available by special order)
Basic Functions	Laser Probe, Groove Data Acquisitions
Combination	FD-AR (for Tracking)

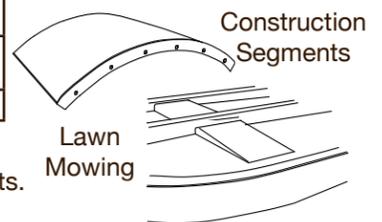
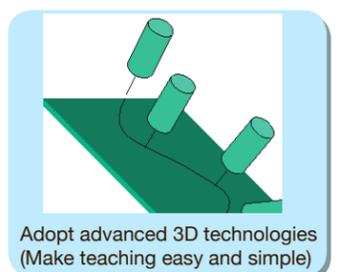
- Unique concept sensing system with better versatility for deviation detection
- Simple usage: similar with wire touch sensor but obtains better results using laser technology.
- Fully integrated functions developed by DAIHEN.

FD-LT LASER TRACKING

High-end laser with real-time seam tracking sensor.



Deviation Detection	Under Development (Ask for details)
Material	Mild Steel, Stainless, Aluminum (Other materials available)
Applicable Range	Lap Joints, (1mm or more), Fillet Joint, Corner Joint and many more. *Not applicable for mirrored surfaces.
Accuracy	±0.5mm (0.02")
Welding Machine	All OTC Machines
Welding Torch	350A Air Cooled MAG Torch (Other torches are available by special order)
Basic Functions	Start, End Point Search 3D Seam Tracking
Combination	FD-AR (for Tracking)



- Dedicated menu can provide user-friendly and easy to use operation.
- Advanced 3D tracking technologies can provide stable and accurate tracking results.
- Full support of equipment (Robot, Welder and sensor) from one company.