# 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.

## Heat distortion during welding?

- **TRUE**
  - **Tracking Sensor** (FD-AR, FD-TR, FD-LT)

- **FALSE**
  - **Deviation Finder** (FD-WD, FD-SFH, FD-QD, FD-WDH)

### Giving you the best choice from a wide selection…

... for the best welding results and quality!

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| Scale, Rusty Surface | FD-WDH (HV Touch Sensor) *High Voltage* |

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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-DD / FD-SFH)
- Material: Mild Steel, Stainless (Solid or Cored Wire)
- Applicable Range: Fillet Joints, Lap Joints (1mm or more), Most other joints
- Welding Methods: CO2, MIG, MIG Pulse
- Welding Torch: DAIHEN CO2 / MAG Torch (Air Cooled / Water Cooled)
- Accuracy: ±1mm (0.04")
- Remarks: Weaving motion is required.

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 (1mm or more), Most other joints
- Accuracy: ±1mm (0.04")
- Welding Machine: All OTC DAIHEN machines
- Welding Torch: DAIHEN CO2 / MAG Torch (Air Cooled / Water Cooled)
- Combination: FD-AR2 / FD-TR2 (with probe)

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 Examples
- Motorcycle Parts
- Ship Structure

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)

Application Examples
- Pressure Tank (Flair Lap)
- Body Frame (Thin Plate Lap)

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-IT LASER TRACKING
High-end laser with real-time seam tracking sensor.
- Deviation Detection: Under Development (see 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 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.

- 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.