DAIHEN PREMIUM WELDING SYSTEM
SINCE 1935

AII Series
Optional Equipment for Robot

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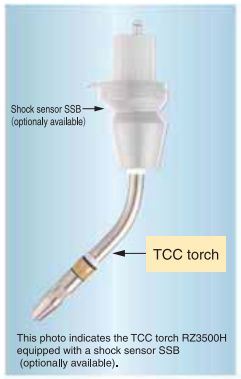
OTC DAIHEN Corporation

Achieving stable welding operation which enables prevention of welding interruption and reduction in costs of consumables

Forced pressurized power feeding torch (TCC torch)

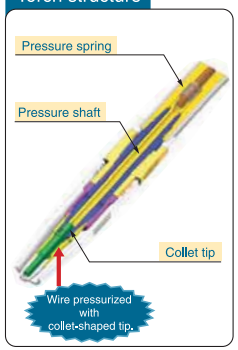


This photo indicates the TCC torch RZ3500H equipped with a shock sensor SSB (optionally available).

Model	RZ3500S	RZ3500H	RZ3500L
Shape of torch	Straight	Curved(45°)	Curved(31°)
Welding method	CO_2 (MAG) welding method		
Maximum welding current	350A (350A)		
Rated duty cycle	80% (60%)		
Applicable wire (Note 1)	Solid wire, Flux cored wire (Note 1)		
Applicable wire size	(φ0.9) (φ1.0) φ1.2 (φ1.4) (φ1.6)		
Cooling method	Air-cooled type		
Nozzle cleaning function	Not equipped		
Shock sensor	To be arranged separately		

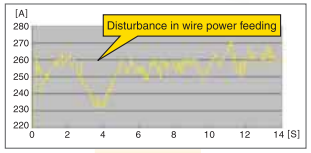
(Note 1) This torch is not compatible with stainless steel wire.

Torch structure

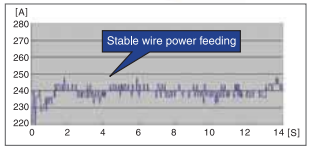


Secure power feeding realized

●Tip for standard torch



●Tip for TCC torch



Deviation of wire position prevented

●This torch improves the deviation of wire position by about 50% or more compared with the standard torch. (Less than 0.2mm)

Improved durability of the tip

●Durability of the tip holder improved about 10 times or more compared with the standard robot tip.

Improved rigidity of the torch

●Rigidity of the torch is improved by about twice compared with the former because of increased strength of the torch body by adoption of the metal jacket.

To shorten the tact time

Endless rotation torch

■Endless rotation enables reduction of useless actions, shortening of the tact time.
■Endless rotation makes wire feeding stable because of undistorted power cable.

Endless rotation portion

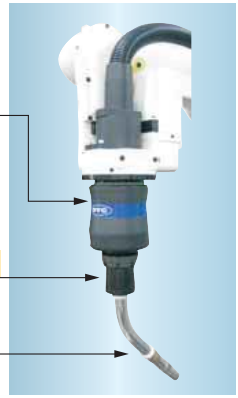
Built-in wire and shield gas path, built-in rotary joint and shock sensor

Replaceable with a single touch of the button

Realizes quick replacement of the torch body.

Improved maintainability

The liner can be replaced from the end of the torch.



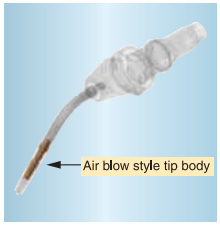
Set name	ERT3500H(NB4) (*1) ERTL3500H(NB4L)
Welding method	CO_2(MAG)welding method
Maximum welding current	350A(CO_2)、250A(MAG)
Rated duty cycle	50%
Cooling method	Air cooled type
Diameter of wire used	(φ0.9)(φ1.0)φ1.2(φ1.4)(φ1.6)
Shape of torch	Curved
Shock sensor	Built-in (*2)
Weight	4.0kg

(*1) Each set consists of a CO_2/MAG standard torch (RT3500 series), endless rotation unit, torch cable, and conversion attachment.
(*2) The shock sensor requires a separate air source (0.1 to 0.5 MPa).
(*) Only a manipulator with a built-in cable (NB4, NB4L) can be mounted to this torch.
(*) This torch is not compatible with the welding power source DL350 II.

For automatic removal of spatters in the nozzle

Air blow kit

■Only addition of the air blow kit to CO_2/MAG standard torch enables quick-change into the air blow style tip body!



Advantages of air blow specification

● Automatic removal of spatters in the nozzle with air, prevention of welding interruption.
● Enhancement of the life of nozzle by cooling the nozzle with air, reduction in the running cost.

CO_2/MAG standard torch
● RT3500 series (350A air-cooled)
● RT5000 series (500A air-cooled)
● RTW5000 series (500A air-cooled)

+

Content of the air blow kit

Air blow style tip body | Air blow unit (Solenoid valve, etc.) | SOL power source unit (Power source for solenoid valve)

For improving welding quality

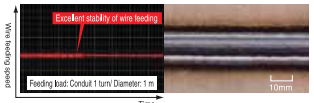
Compact servo torch

The photo indicates the full feeding unit equipped with a compact servo torch for CO_2/MAG (MTXC-3541PS).

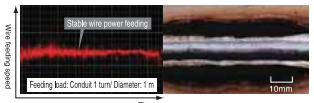
* Be sure to use the compact servo torch together with an assist feeder.
* We provide compact servo torches for CO_2/MAG and for aluminum MIG. For more information, contact our sales person.

Excellent stability of wire feeding

●Servo torch Conduit cable: 5 m



●Standard torch Conduit cable: 5 m



Welding current: 200A, Wire feeding speed: 12.6 m/min.,
Welding voltage: 24.0 V, Welding speed: 70 cm/min.,
Wire: A5356/φ1.2 mm, Base metal: A5052

Decrease in deviated wire position

The compact servo torch has realized reduction in deviated wire position to one third or lower compared with the standard torch (about 0.2 mm or less), and also reduction in welding defects such as bead deviation and burn through.

Optional software dedicated to servo torch

RS control

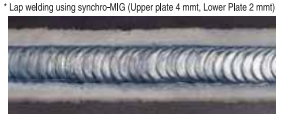
RS control realizes secure arc start by instantaneously raising the wire which makes contact with the base metal, and allows reduction of spatters at the start of welding.

* The RS control is limited in applicable robot model, welding power source, and welding mode. For more information, contact our sales person.
* This model requires optional software.

Synchro-MIG

This servo torch has realized beautiful bead appearance comparable to TIG-welding by heat input control using DAIHEN's proprietary synchro-MIG function. In addition, it enables high quality welding of complicated joints, including different plate thickness and position welding.

* Lap welding using synchro-MIG (Upper plate 4 mmt, Lower Plate 2 mmt)



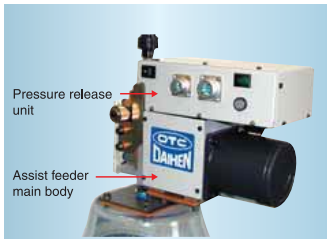
Welding current: 100 A, Welding voltage: 20 V, Welding speed: 50 cm/min.
Synchro pulse 2 Hz, Base metal: A5052, Wire: A4043 φ1.2 mm

* The optional software and extension memory (L8820L) are required for this model.

For more stable wire feeding

Assist feeder

■The assist feeder enables reduction in feeding load for the wire feeding equipment and assists wire feeding.



Assist feeder dissolves problems related to welding wire feeding.

●Incorporation of the assist feeder increases the wire feeding capability, allowing more stable wire feeding.
●The assist reader is compatible with both pack wire and reel wire.
●Adoption of the constant torque control method makes synchronized control with the wire feeding unit unnecessary, allowing combination with any wire feeding unit.
●Adoption of the AC motor realizes operation free from brush replacement, and easy maintenance.
●The assist feeder can be used for TIG filler welding as well as CO_2/MAG welding and MIG welding.

For automatic cleaning of the torch and wire cutting

Clean kit

■ The clean kit has realized improvement in the operation rate of welding robot and the welding quality.
◆ Automatically removes spatters in the torch nozzle. (L-10748,K-2725)
◆ Enables simultaneous operation of cleaning and application of adhesive spatter inhibitors. (L-10748,K-2725)
◆ Brushing function is added to wire cutting function (K-2726). (L-10748,K-2725)

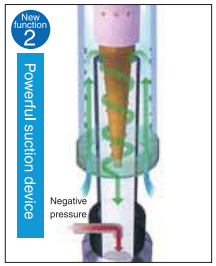
① Wire cut ② Brushing ③ Cleaning of spring
④ Soaking in liquid ⑤ Suction cleaning, application of liquid

NEW Dual cleaning function (only for L10748)

Unburdened by manual cleaning! Improved safety of operation!

Features
●The clean kit cleans the inside of the nozzle and the outer surface of the tip simultaneously by eccentric rotation.

Effects
●The eccentric spring type drill scrapes spatters away effectively in the right and left directions and downwards by rotation of the eccentric spring type drill.
●The spring type drill can move to the depth of the nozzle and scrape spatters out.



Features
●The powerful suction device allows removal of all spatters in the depth of the nozzle by suctioning, and uniform application of a proper amount of anti-deposition agent to the depth of the torch by forming mist of a small amount of the agent applied on the top of the torch by powerful suction simultaneously.

Effects
● The device can remove spatter hanging down stubbornly by suctioning with high finishing and cleaning accuracy.
● It has the nozzle cooling effect (capable of cooling the nozzle to 40 to 50℃ during cleaning) (Ratio compared with the former : 1/5) and can prevent dripping.
* Another air source is required during use of this function.

Standard specification

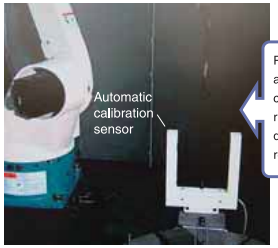
Model		NEW L-10748	K-2725	K-2726
Internal diameter of nozzle		Choice from among ϕ13, ϕ16, and ϕ19.		—
Power source		AC100V 50/60Hz		
Power consumption (W)		57		50
Air source (MPa)		0.49	Unnecessary	Unnecessary
Dimension (Total length×Total width×Total height) (mm)		438×195×233	498×188×227	132×190×143
Weight (kg)		11	9.7	4.5
Applicable wire diameter (mm)		ϕ1.6 or less		
Accessories		Guide metal fitting, Special-purpose metal fixture set, Discharge duct set	Guide metal fitting, Special-purpose metal fixture set	Special-purpose metal fixture set
Others		The spatter anti-deposition agent is optional.		—
Functions	Dual nozzle cleaning	○	—	—
	Wire cut	○	○	○
	Brushing	○	○	—

* The clean kits L-10748 and K-2725 are not compatible with the forced pressurized power feeding torch (TCC torch).

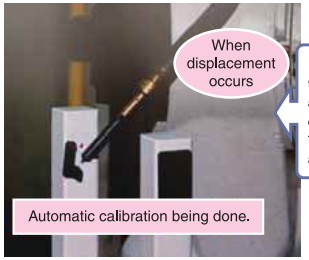
For automatic detection and calibration of the torch displacement

Automatic calibration

■Realizing teaching modification, automatic checking for torch displacement, and power saving!



Preventive maintenance against torch displacement can be performed by running the displacement detection program at regular intervals.

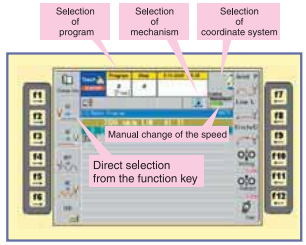


If displacement is detected, the calibration program is automatically run for correction.
The task program is automatically modified.

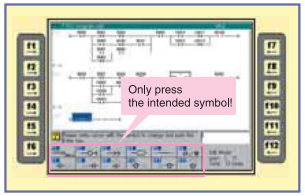
For further simplification of teaching

Touch panel

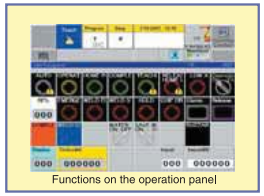
■Adoption of the touch panel for the large screen teach pendant improves the operability.



・Input by direct touch on the screen
Bothersome key operation is unnecessary!



・PLC ladder editing can be done by simplified input operation!

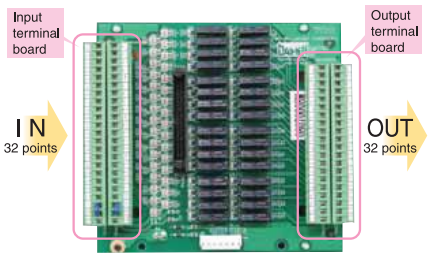


・Various indicator lamps and switches can be allocated on the touch panel.

For input/output of signals from/to external equipment

Relay unit

■The general input/output can be connected to the terminal board.
■The relay contact allows output from the general output.
■Up to 32 points per relay unit are allowed for input/output signals, respectively. Up to 64 points can be expanded for input/output, respectively, by expansion of the board.



* If a relay unit is used, an I/O circuit board is required separately.
If an expansion relay unit is used, an expansion I/O circuit board is required separately.
* The NPN input (BND common) is the standard. The unit also supports PNP input (power source common).

To start/stop welding at each station

Starting box

■The starting box allows start and stop of robot at each station.
■Up to three units can be connected to the operation box.

For backup of data

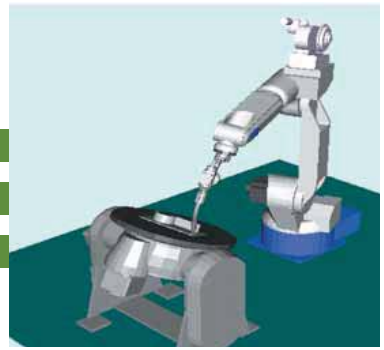
CF card

■The CF card allows backup of the data such as teaching program, PLC program file, etc.
■Selectable from among two types, standard type (64 M) and high-capacity type (256 M)
■Even if accidents such as accidental deletion of files happen, immediate recovery of the data is possible by backup at regular intervals.

For synchronized welding with peripheral jigs

Synchromotion function

■High quality welding has been realized by synchromotion control (software option) between robots and peripheral jigs (positioner, slider, etc.).



Always keeps a constant welding speed!

Always secure optimal torch posture!

Has achieved simplified teaching operation!

The DAIHEN's world first synchromotion has evolved.
A wide spectrum of synchromotion controls can be performed depending on the robot systems!

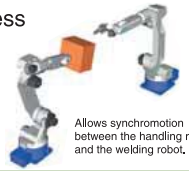
Multi

Allows synchromotion on multi stations.

Twin

Allows simultaneous synchromotion of two welding robots

Jig-less



Allows synchromotion between the handling robot and the welding robot.

* Each multi, twin, and jig-less synchromotions requires the multi unit (software option) separately.

For improvement of arc start performance

Robot RS control

■The control method to generate arc by making the wire contact with base metal at the start of arc and making the robot lift the torch is called robot RS control.

●With the robot RS control

Excellent arc start performance!

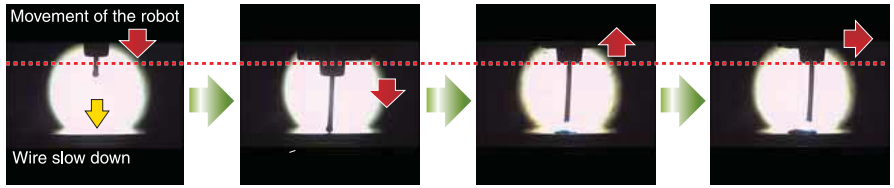
●Without robot RS control

Defective start occurs!

RS control can be easily realized by the action of robot!

Beautiful bead can be formed just from the start of welding.

The DAIHEN' s proprietary RS control is achieved by the standard 4 roll feeder and robot control.
It enables reliable arc start and reduction in spatters at the star of welding.



The robot performs wire touch action while wire slowing down.

The wire makes contact with base metal.

Arc starts just when the robot lifts the wire.

Welding starts when stable arc starts.

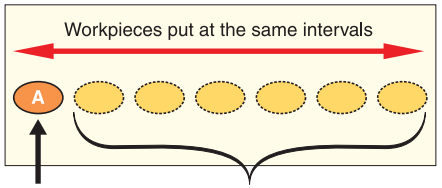
* The robot RS control is limited in applicable robot type, welding power source, and welding mode. For more information, contact our sales person.

For workpieces of the same shape

Pitch copy and shift function

This function is effective only when many workpieces of the same shape are put at the same intervals.

■The pitch copy and shift function enables the reference program to be shifted at the designated pitch interval and by the number of times.



Reference program

The reference program is copied at one time.

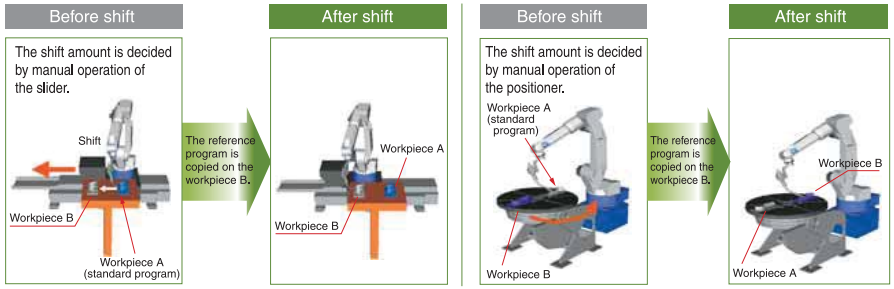
Applicable to the external axis

The external axis can be shifted at the designated interval by designated number of times.

For workpieces of the same shape for which the external axis is used

External axis shift function

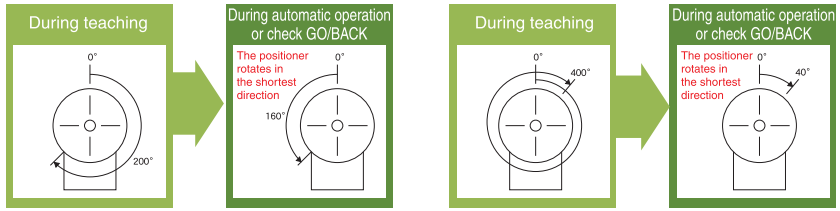
■The external axis shift function is a function to shift the positions of the slider and positioner in the task program.



For reduction of the tact time for the positioner

Endless rotation function

■Use of this function always rotates the positioner to the shortest direction.
Unnecessary rotation from the end position to the start position can be eliminated.



Offers offline teaching beyond simulator

Offline teaching system AII-ST

■High-accuracy/high-performance teaching & simulation achieved by the same operation as that of AII robot!

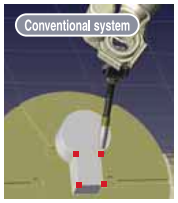
Fully compatible with the controller AX21

This teaching system can be operated by the same operation of the robot controller AX21. If DAIHEN standard robot system is provided, the setup can be completed only by reading the backup data.

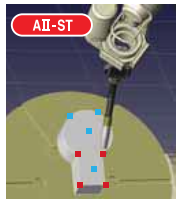
New function realizing simplified operation!

Snap function at any point [NEW!]

The snapping operation can be done anywhere on the surface of 3D model.



・Snapping is possible only at the end points.
・Direct designation is impossible at the points other than end points.



・Designation is possible at the end points, edge lines, and any points on the plain surface.

Equipped with easily understandable operate handle [NEW!]

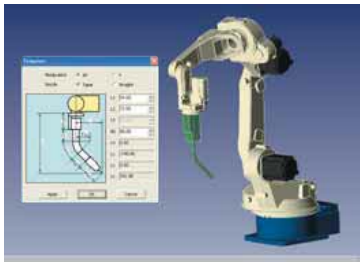
Intuitive operation of 3D model is possible.

Automatically creates the welding pass on any edge line on the 3D work model. [NEW!]

* In preparing the 3D workpiece model, 3D CAD is required separately.

Torch template installed.

The torch model of different length can be made with a single touch of the button.



High-accuracy tact time prediction realized.

Use of the robot control software realizes high-accuracy tact simulation.

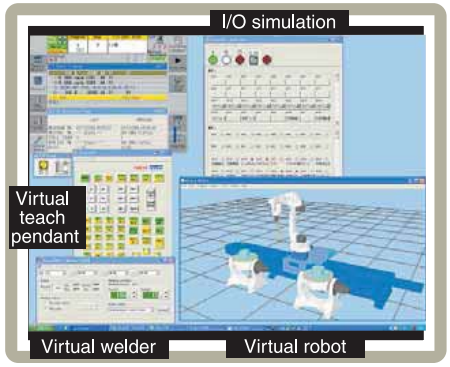
Other various functions

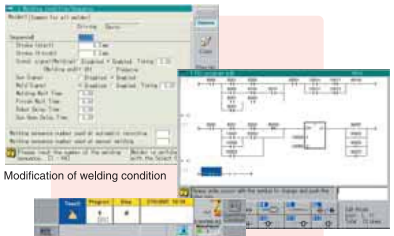
・Interference check function
・Robot taught path display
・This system includes the template for DAIHEN standard machines as standard equipment.

Best suited as a support tool after installation of robot

Robot simplified simulation tool AII on desk

■Enables editing of the welding condition and PLC program as well as the task program by the same operation procedure of AII robot.





* In transferring of the data from/to AX21 controller, either optional CF card or AII-PM is required separately.

Welding quality control by PC

PC arc monitor AII-AM

Visual display of welding condition

This monitor displays the welding current, welding voltage, and wire feeding load graphically. It can also display detailed welding start condition and state of robot controller.

Monitoring accuracy improved

The sampling frequency is increased 10 times compared with the conventional method, allowing detection of in stantaneous arc outage or arc outage in short tack welding.

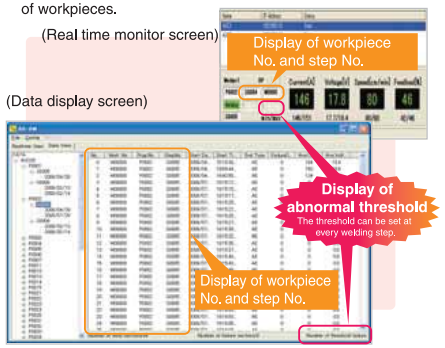
Welding condition can be saved.

The number of times of welding, number of occurrence of failures, task program number, welding time, and average current can be saved.

* The storable capacity depends on the capacity of hard disk of your PC.

Quality control for every workpiece

An alarm output or abnormal threshold can be identified for each workpiece by inputting the workpiece number in the robot controller. This monitor supports detection of failure of workpieces.

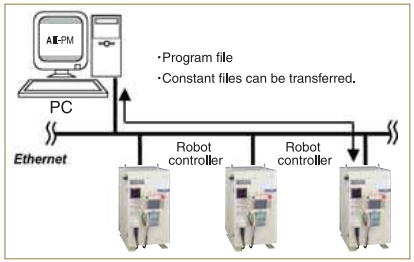


* LAN equipment connecting robot and PC is not included in this product.

Backup tool for task program

PC external storage software AII-PM

■Various files such as task program and PLC program can be saved or loaded between PC and robot controller.
■Centralized control using only one PC is possible by connecting plural robots to LAN.



* LAN equipment connecting robot and PC is not included in this product.

For editing task program using a PC

PC editing system AII-ED

■Realizes editing operation of task program and welding condition file on PC.
■Enables transfering the files to the robot controller without regard to the use condition of the robot even when automatic operation or teaching operation is being done.
(* provided that the files used for automatic operation or teaching are excluded)
■Enables centralized control using only one PC by connecting plural robots to LAN.

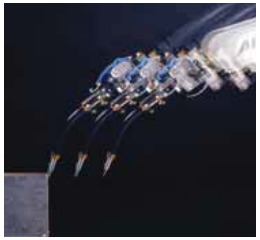
* LAN equipment connecting robot and PC is not included in this product.

Workpiece position detection sensor

Touch sensor AII-WD

■Workpiece position detection sensor by touching the welding wire

- ●Applicable to all the workpieces with a medium thickness or thicker
- ●Most inexpensive among all workpiece position detection sensors.
- ●Requires no separate sensor unit because this sensor has a built-in controller.
- ●Allows high-speed search at up to 360 cm/min.
- ●A separate sensor unit (optional) is ready for hardly energized surfaces such as rust and black scale.



Workpiece position detection	○ (The maximum two-way displacement detection rate per site is about 5 seconds.)
Seam tracking	×
Recognition of groove shape	×
Combination with other sensors	This sensor can be used together with an arc sensor or TIG arc sensor.
Applicable workpieces	Plate thickness: 3.2 mm or more
Accuracy	±1.0mm (provided that the bend of wire does not change)
Workpiece material	All the materials and surfaces to be energized

Tracking sensor for CO_2/MAG welding

Arc sensor AII-AR

■Automatic seam tracking by weaving

- ●This sensor allows correction of curved workpiece or thermal distortion which can't be corrected only by detecting workpiece position.
- ●Applicable to workpieces with medium thickness or thicker
- ●Most inexpensive among all the tracking sensors.
- ●Easy to use from the viewpoints of interference of workpieces and maintenance because this sensor requires no additional parts around the torch.

* Can't be used for tracking on aluminum.

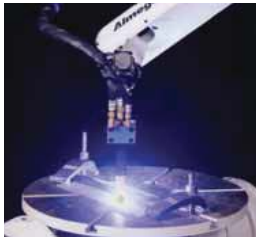
Workpiece position detection	×
Seam tracking	○
Recognition of groove shape	×
Combination with other sensors	Combination use of the touch sensor and laser sensor is possible.
Applicable workpieces	Plate thickness: 3.2 mm or more
Accuracy	±1.0mm (provided that arc and pool are stable)
Workpiece material	Iron system, stainless steel system

Tracking sensor for TIG welding

TIG arc sensor AII-TR

■Automatic seam tracking in TIG welding

- ●Allows arc length constant control (vertical tracking) in TIG.
- ●Allows stable execution of welding by keeping the arc length constant to the thermal distortion of thin plate.
- ●Allows high-accuracy tracking even in pulse TIG welding.
- ●Easy to use from the viewpoints of interference of workpieces and maintenance, because it requires no additional parts around the torch.



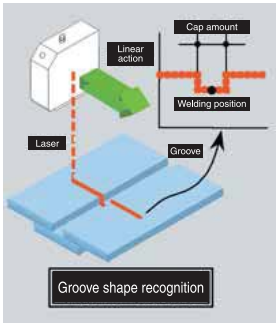
Workpiece position detection	×
Seam tracking	○ (only vertical tracking)
Recognition of groove shape	×
Combination with other sensors	Combination use of the touch sensor and laser sensor is possible.
Applicable workpieces	(Plate thickness: 1.0 mm or more)
Accuracy	±0.5mm (when the electrode is not worn)
Workpiece material	All the materials which can be welded

Laser start point detection sensor

Laser search AII-QD

■High-accuracy workpiece position detection sensor using laser

- ●Realizes higher speed and higher accuracy than those of the touch sensor.
- ●Allows high accuracy detection for a wide spectrum of applications from thin plate to medium thickness plate
- ●Allows recognition of various welding joints by easy operation.
- ●Allows visual check of the recognition result using a teach pendant.
- ●Enables automatic change of the welding condition based on the recognition result.
- ●Can be used for applications other than welding.



Workpiece position detection	○ (The maximum two-way displacement detection rate per site is about 2 seconds)
Seam tracking	×
Recognition of groove shape	○
Combination with other sensors	This sensor can be used together with an arc sensor or TIG arc sensor.
Applicable workpieces	(Plate thickness: 1.0 mm or more)
Accuracy	±0.5mm (Search speed 100 cm/ or less. For stand-alone robot)
Workpiece material	The surface shall not be glossy (nonmetal is permitted).

Laser tracking sensor

Laser sensor AII-LT series

■High-accuracy automatic seam tracking sensor using laser

- ●Adoption of high accuracy three dimensional tracking function enables welding of workpieces of complicated shape.
- ●The sensor automatically adjusts the torch to the optimum position by simplified teaching.
- ●The sensor can detect the workpiece position.
- ●Applicable to thin plates and high accuracy uses.
- ●Adaptive control allows real time change of the welding current, weaving condition, etc. (option)

Workpiece position detection	○
Seam tracking	○
Recognition of groove shape	○
Combination with other sensors	Unnecessary (Both automatic tracking and position detection are possible.)
Applicable workpieces	(Plate thickness: 1.0 mm or more)
Accuracy	±0.5mm
Workpiece material	The surface shall not be glossy (nonmetal is permitted).