Visual Weld Inspection Solution

Bead Eye

Easy

Advanced

Practical

Inspection automation!

Achieved by
AI Engine x Master Compare

Labor-saving and traceability are enhanced by automating the manual visual inspection.
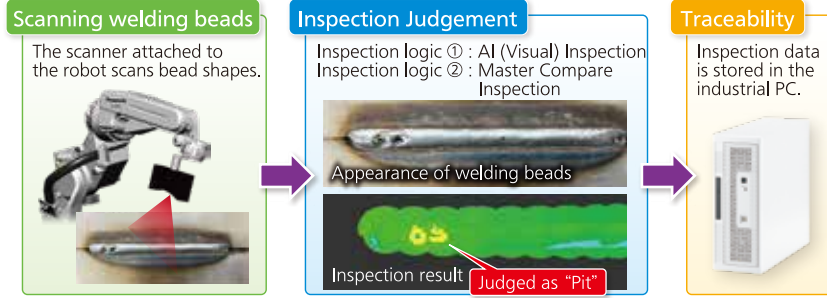
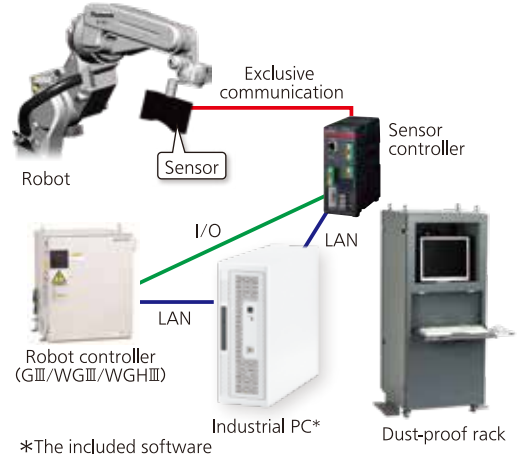|	
Labor-saving ❯	Automating operator-performed visual check and reducing operators burden
Enhancing traceability ❯	The newly developed AI engine judges bead shapes to specify detailed factor causing the defect and accumulates the inspection data.

■System outline

Scanning welding beads	Inspection Judgement	Traceability
The scanner attached to the robot scans bead shapes.	Inspection logic ① : AI (Visual) Inspection Inspection logic ② : Master Compare Inspection Appearance of welding beads Inspection result — Judged as "Pit"	Inspection data is stored in the industrial PC.

■System configuration

Robot — Exclusive communication — Sensor — Sensor controller

I/O — LAN

Robot controller (GⅢ/WGⅢ/WGHⅢ) — LAN — Industrial PC* — Dust-proof rack

＊The included software

■Inspection logic

Inspection logic ＼ Defect	Master Compare	Chipping of the bead	Bead deviation	Hole	Pit	Undercut	Spatter
① AI inspection ② Master Compare inspection	◯	◯	◯	◯	◯	◯	◯

Threshold of defect can be specified by setting the concordance rate, defect size (height, length, width) and the number of defects.

■System configuration example of TM-1400GⅢ

No	Name	Part No.	Qty	Remarks
❶	Robot	YA-1VAR61T00	1	
❷	Cable unit (Between M and C)	AWU03837L5M	1	
❸	Robot data access function	YA-1UPXE1	1	Optional for robot controller
❹	Visual Weld Inspection Solution	YA-1VPXH1T01	1	(see sub-table below)

Sub-table for ❹ Visual Weld Inspection Solution:

Name	Qty	Remarks
4-1) Operating instructions	1	
4-2) OSS license CD	1	OSS
4-3) Sensor	1	Manufacturer's part No.:LJ-X8200
4-4) Sensor controller	1	Manufacturer's part No.:LJ-X8000A
4-5) Sensor connecting cable	1	Manufacturer's part No.:CB-B10　10 m
4-6) Bending resistance sensor connecting cable	1	Manufacturer's part No.:CA-CH3BE　3 m
4-7) Personal computer (Industrial PC)	1	Master Compare inspection software, AI inspection software, Preinstalled
4-8) USB license key 1	1	Master Compare inspection software license authentication
4-9) USB license key 2	1	AI inspection software license authentication
4-10) Calibration plate	1	Needed at calibration
4-11) 24 V supply connector	1	Needed at wiring with sensor controller
4-12) Other accessories		See the operating instructions

Applicable models: TS/TM/TL/LA-series robots connected to GⅢ or TAWERS (WGⅢ/WGHⅢ) controller

■Customer preparation items

No	Name	Qty	Remarks
1	Power cable for PC	1	Make sure to use the power cable that conforms to the national and local safety standards and that displays the indication labels required by the law. For details, see "Safety Guidelines".
2	LAN cable	2	It is to connect the industrial PC with the robot controller and with the sensor controller. Use a cable with 10 m or less in length. Recommend category 6 A or higher. If used in an environment having strong noise, use STP (Shielded Twist Pair) cables with noise control measures provided.
3	I/O signal wire	1	It is to connect the robot controller with the sensor controller. Prepare one having 7 wires or more of AWG20 to AWG28 in size. In an environment having strong noise, use of shielded wire is recommended.
4	24 V power source	1	For sensor controller. It should be 150 W or more in capacity with supply voltage 24 V DC ±10 %. Note: 24 V power in the robot controller is not applicable due to insufficient capacity.
5	Power cable for 24 V	2	It is to connect the sensor controller with the 24 V power source. Use two power cables having either round or Y-type terminal of 5.8 mm or less in width and AWG14 to AWG22 in size.
6	Monitor for industrial PC	1	For the industrial PC video output. Use one with VGA or DVI-D input terminal.
7	Mouse/Keyboard	1	For the industrial PC operation. Select one suitable to the use environment.
8	Dust-proof rack	1	A rack to protect the personal computer, peripheral equipment for the industrial PC, sensor controller and so on from dust. Select one whose dust-proof performance is IP5X or higher. Make sure to keep the temperature of the dust-proof rack within the operation range of the industrial PC and the sensor controller. Recommendation: A dust-proof of SDS Co., LTD. ·E66H (Heat exchange type): For 10 ℃ to 30 ℃ environment. ·E66C-01 (Cooler type): For 10 ℃ to 40 ℃ environment
9	Sensor bracket	1	A bracket to install the sensor to our manipulator. Please prepare a mechanism to protect the sensor from spatter, welding fume, oil mist, dust and the like of the customer's environment.
10	Dummy tool	1	If welding torch is not available, use the dummy tool as a tool.

■Limitation

1) This inspection function is only to inspect welding beads of CO2/MAG welding using mild solid wire. It is not applicable to other purposes, such as inspection for TIG welding and laser welding.　2) It is possible to install a work for measurements on a positioner or the like only if the positioner or the like is in a still state. It is not possible to perform inspection if the harmonic movement function is used.　3) It is not possible to detect defects that are not identifiable from the welding bead shape, such as internal defect and insufficient penetration.　4) This inspection function is capable of performing ideal inspection by conducting various settings and teaching suitable to the applied work, processing conditions and production facilities. This product does not guarantee the quality of the inspected work. User of this product should guarantee the final quality of the work. 5) It cannot be used in an environment where strong ambient light, such as CO2/MAG/ MIG/TIG welding, exists in the same work area.　6) This function requires to examine applicability to the user's works at our Process Engineering Center prior to introducing the function. (Only pre-confirmed works and defects are the scope of guarantee.)

⚠ **Safety precautions** ● Before attempting to use any welding product, always read the manual to ensure correct use.

This product uses a sensor that emits class 2M laser beam defined by JIS C6802-2014/2018. Make sure to provide safety measures.

●Specifications are subject to change without notice.

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