# TAKEX

Wafer mapping sensor

# ASW-SG625AP Instruction Manual


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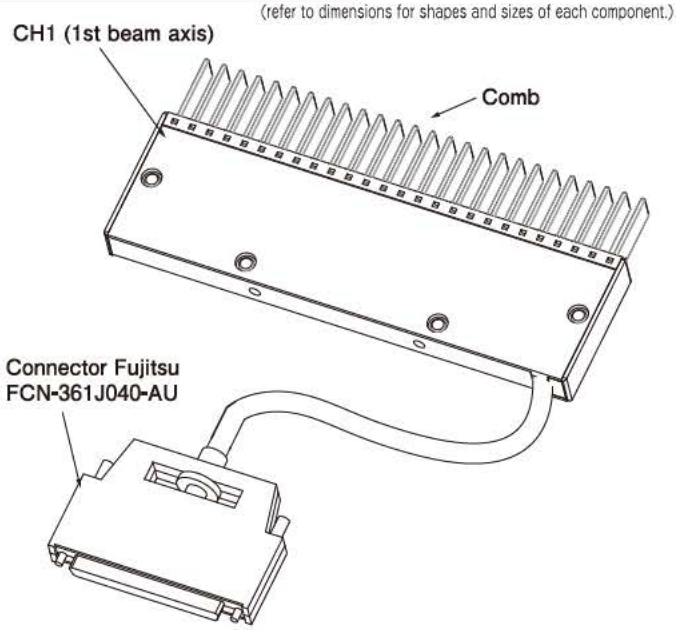
## 1 NAME OF EACH PART

(refer to dimensions for shapes and sizes of each component.)




## 2 SAFETY PRECAUTIONS

To ensure safety, be sure to follow the precautions below.

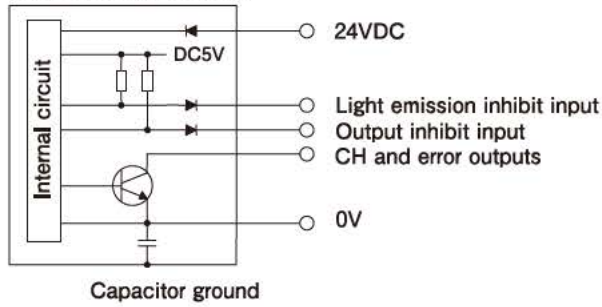
1. Do not use this product for life or safety critical applications.
2. Do not use this product when its housing or cable is damaged.
3. Do not attempt to disassemble, repair, or modify this product.
4. Do not use this product in an environment containing flammable, explosive or corrosive gas.
5. Do not use this product in an environment exposed to chemicals or oils.
6. Do not use this product in an environment exposed to water including outdoors or under the water.
7. Use this product within the product rating and specification.
8. Do not expose this product to direct sunlight.
9. Do not use this product in an environment exposed to vibration or shock.
10. Do not use organic solvent including alcohol and thinner to clean the product.
11. Perform a daily operation check, weekly periodical inspections, and prescribed maintenance procedures to ensure correct operation.
12. This product should be disposed of as an industrial waste.

## 3 PRECAUTIONS DURING USE

1. Be sure to route the sensor cables separate from any power transmission or high voltage line, or else use shielded cables. Using the same conduit or duct as high voltage or power lines will cause malfunctions or damage because of electromagnetic induction.
2. Do not apply excessive force to the cable.
3. When using a switching regulator, be sure to ground the frame ground (FG) terminal.
4. The sensor starts operation 1sec after power is supplied. Always power on the sensor prior to loads.
5. Turn off the power of the load first as this product may generate an output pulse when the power is turned off.
6. Avoid turning the power on and off consecutively.
7. Limit the current of the power supply to 2A.
8. Screws should not be screwed-in 8 ㎜ or more into the sensor when mounting. Choose a proper length of screws according to the thickness of the fixing body. The sensor may be damaged if inappropriately long screws are used.

## 4 CONNECTIONS

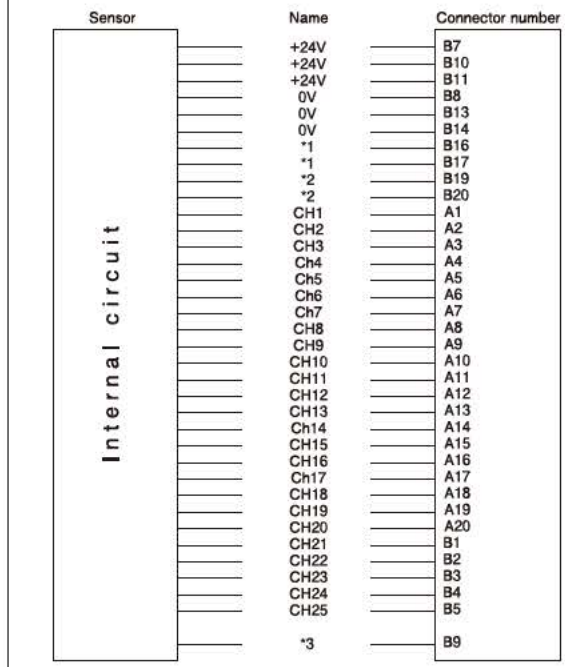
● Input/output circuit




※ For a noise prevention, a capacitor is installed between the 0V power supply and the sensor's aluminum case.

● Pin configuration diagram

External wiring and connector number




Each signal is passed from the sensor through the cable, and converted from serial to parallel in the connector. Three connector pins are used each for the power cable's +24V and 0V.

To allow the consumption and output current, connect the three in parallel.

When using the *1 and *2 light emission inhibit input and output inhibit input, connect the return wire to the connector's 0V (B8, B13, B14).

The two light emissions inhibit input and output inhibit output wires are connected in the sensor.

A Fujitsu FCN-361J040-AU connector is used.

Confirm that the connector is correctly connected before turning the power ON.

Do not used non-specified pin numbers for junction wiring, etc.

## 5 OPERATION

### ● Preparation

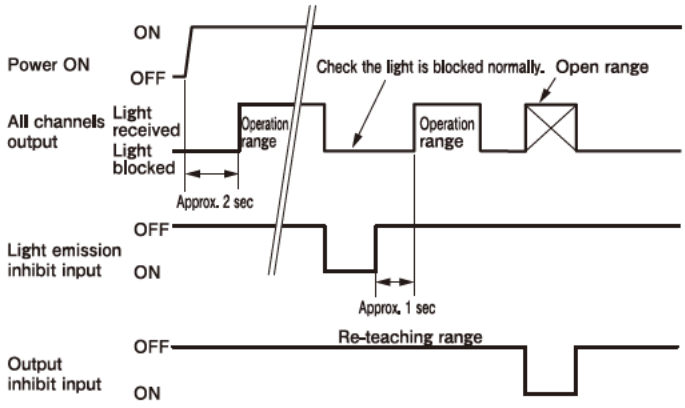
· Firmly secure the wiring connectors as described in section 4 "Connections".

(1) Turn the power ON.
※ Before turning the power ON, check again to verify that the connections are correct.
Use care because the outputs are not equipped with short-circuit protection circuits.

(2) The TEACH mode is established when the power is turned ON.
※ When in the TEACH mode, verify that nothing is blocking the light beam.

(3) Perform standard operation (see section 6 (1) "Functions").
※ Because the product has been adjusted to detect wafers which are nearly transparent, an false output could occur if the product is subjected to an impact shock or vibration while the sensor is moving or stationary.
Moreover, a malfunction could occur if the comb's tip is touched by the wafer, or by a finger.
If the comb is touched in this manner, the TEACH operation must be repeated (see section 6 (1) "Functions").
※ If the comb becomes damaged, replace it as described in section 8 "Maintenance and Inspection".

### ● Time chart




Teaching occurs at power ON and at the light emission inhibit input.
If teaching cannot be performed or a sensor malfunction is detected for some reason, the error output turns ON, and the error channel's output turns ON/OFF repeatedly.
When using the light emission inhibit input had been used to perform re-teaching, the re-teaching operation is performed after the light emission inhibit input recovery. Therefore, always wait one second or longer before starting operation.

## 6 SETTING

(1) Functions

### ● Power ON and TEACH operation

When power is turned ON in the standard operation mode, the internal circuit's operation is checked, and an initial TEACH operation occurs.
Be sure that nothing is blocking the light at power ON.
If teaching cannot be perfomed for some reason (light is blocked, comb is missing or damaged, etc.), the error output turns ON, and the error channel's output turns ON/OFF repeatedly.

### ● Output inhibit input

Turns each channel's open collector output OFF regardless of the sensor operation status.
This function can be used when the outputs of multiple sensors are connected in parallel to a PLC.
This function inhibits the outputs of unnecessary sensors which is are connected to the PLC.

### ● Light emission inhibit input

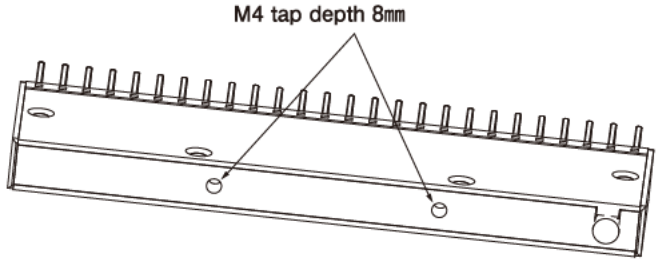
When this input is turned ON, a "light blocked" and "output ON" status occurs at all channels.
When this input is turned OFF, a re-teaching operation occurs.
Perform this re-teaching operation while the sensor remains stationary.
Do not perform a re-teaching operation while the sensor is in motion.
The re-teaching operation is completed within approximately 1sec after the light emission inhibit input is turned OFF.
After 1sec elapses, perform a motion operation.
To obtain optimal detection, turn the light emission inhibit input ON → OFF while the sensor is in a standby status (before proceeding to the wafer detection operation) in order to perform re-teaching.

### ● Error output

An error output is issued at power ON if an operational problem exists (abnormal channel condition, insufficient light reception, light abnormality due to a damaged comb, malfunction due to ambient light interference, etc.).
When the error output turns ON, the error channel's output turns ON/OFF repeatedly.

## 7 MOUNTING INSTRUCTION

M4 tap mounting holes are provided as shown below.
(Refer to the Outline Dimensions for details.)

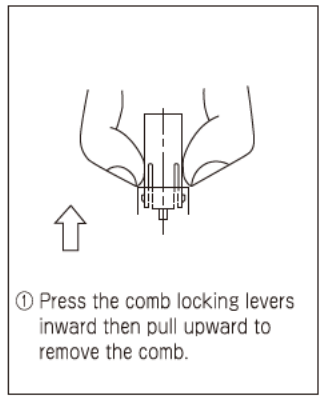



Note : Screws should not be screwed-in 8 ㎜ or more into the sensor when mounting. Choose a proper length of screws according to the thickness of the fixing body. The sensor may be damaged if inappropriately long screws are used.

## 8 MAINTENANCE AND INSPECTION

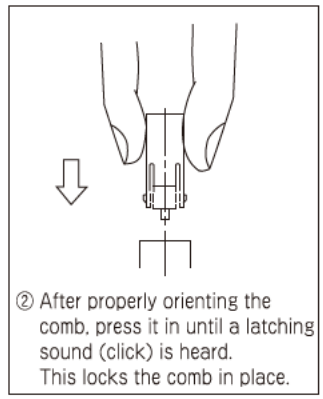
After replacing a damaged comb, be sure to perform re-teaching.
* Do not interchange the comb positions.

**Detaching a comb**



① Press the comb locking levers inward then pull upward to remove the comb.

**Attaching a comb**



② After properly orienting the comb, press it in until a latching sound (click) is heard.
This locks the comb in place.

※ Replacement sensor unit Model : ASW−F2500

## 9 SPECIFICATIONS

| Type | ASW−SG625AP |
|---|---|
| Wafer types | 6-inch wafer<br>(transmittance of 30% or less ) |
| Number of channels | 25ch |
| Pitch | 4.76㎜ |
| Detection method | Through beam |
| Comb | Detachable type |
| Power supply | 24VDC ±10%, ripple 10% or less |
| Current consumption | 250mA or less |
| Output mode | NPN open collector output<br>Rating: sink current 30VDC or less, 30mA or less |
| Operation mode | Dark-ON<br>ON at error output |
| Response time | 10ms or less |
| Light source (wavelength) | Infrared LED (830nm) |
| Light emission inhibit input re-teaching | Open collector input or contact input<br>Light emission inhibit ON: 1.5V or less; OFF: 4V or more |
| Output inhibit input | Open collector or contact input<br>Output inhibit ON: 1.5V or less; OFF: 4V or more |
| Material | Sensor unit: Polycarbonate; Housing: Aluminum |
| Connection | Attached cable with connector<br>(Fujitsu FCN-361J040-AU) |
| | Cable length: 3m |
| Weight | Approx. 330g |
| Accessories | Instruction manual |

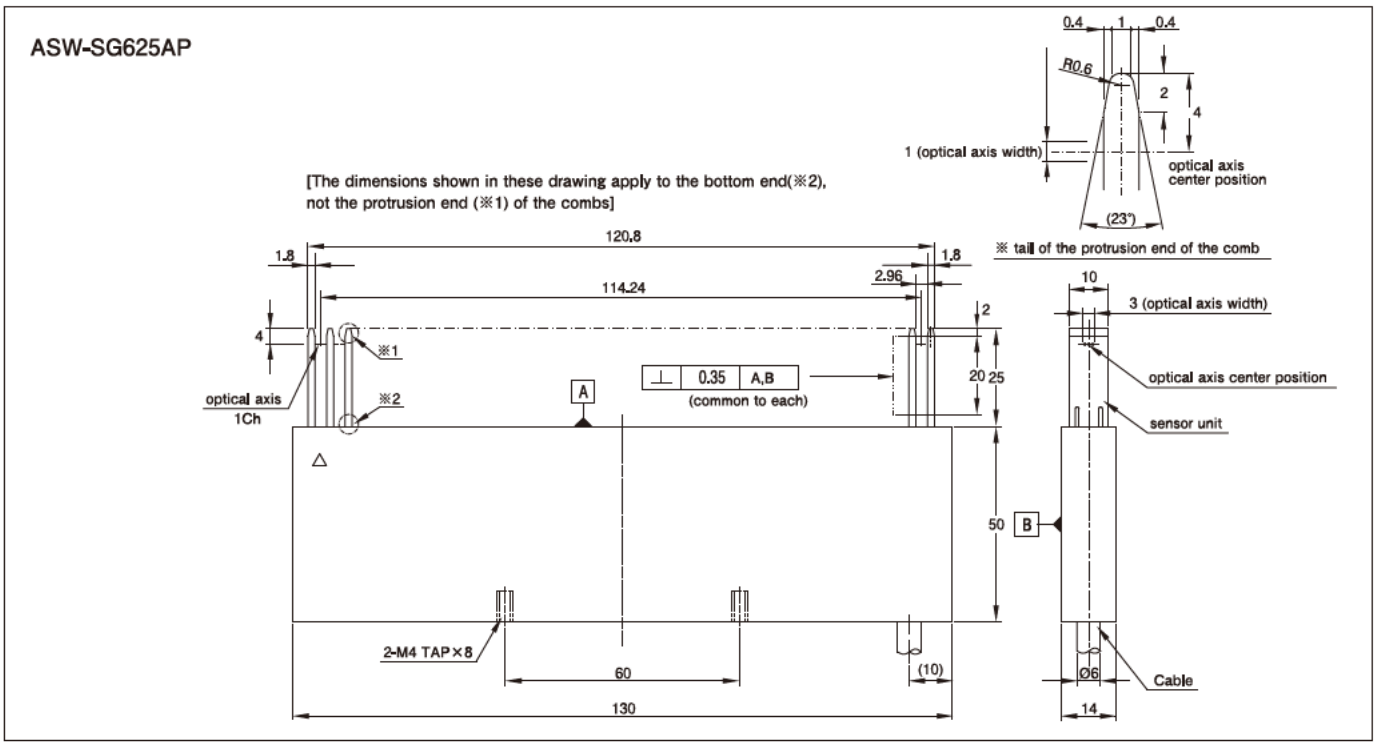
## ENVIRONMENT SPECIFICATION

| Ambient light | 1,500 lx or less |
|---|---|
| Ambient temperature | −10 to +55℃ (non-freezing) |
| Ambient humidity | 35 to 85%RH (non-condensation) |
| Protective structure | I P40 |

※ For noise prevention, a capacitor is installed between the 0V power supply and the sensor's aluminum case.

## 10 DIMENSIONS (in ㎜)

ASW-SG625AP



## 11 WARRANTY

The product is covered by a warranty based on the Quality Regulations of Takenaka Electronic Industrial Co., LTD. (Takenaka). Regarding the warranty, please feel free to ask any questions to Takenaka, Takex sales office or authorized distributors.

**1 《Warranty period》**

The warranty period is one (1) year after delivery to a designated location. This warranty does not apply to expendable supplies like batteries or relays, and products of other manufacturers which Takenaka markets.

**2 《Scope of warranty》**

If any defect is found during the warranty period. Takenaka will, at its option, repair or replace the defective product at the location of delivery. This warranty is void and of no effect if the product is subject to improper use or handling, improper maintenance, modification, repair made by persons not authorized by Takenaka or a lack of reasonable care. The warranty does not cover defects caused by the other product, reason including fire, flood, earthquake, lighting surge and other natural disasters.

① If the product is used inappropriately or used under inappropriate conditions that are not described in the instruction manual or specifications.
② If the defect is caused by improper maintenance, including a failure to replace consumable or periodical parts as described in the instruction manual or specifications.
③ If the defect is not directly caused by the warrantied product.
④ If the products is modified or repaired by persons not authorized by Takenaka.
⑤ If the defect is caused by rough handling, dropping, or collision after the product is delivered.
⑥ If the defect could not be predicted from a technical viewpoint at the time Takenaka made the agreement for, manufactured, or installed the product.
⑦ If the defect is caused by a natural disaster such as a fire, flood, earthquake, lightning (including a lightning surge) and so on, or an accident such as an abnormal voltage that Takenaka is not responsible for.

The warranty provided here is only for the Takenaka product and does not cover any secondary damage caused by problems related to the product.

**3 《Target of Warranty》**

(1) In case that the product is used in combination with other products or as a part of a system, Buyer should confirm the compatibility of the product to the application by relevant laws, decrees, standards and regulations.

(2) This product is designed and manufactured for use in general industries. This warranty does not cover the application of the product to:

① Nuclear power facilities including power station, incineration plant, public utilities including railway, vehicle and airway facilities, medical devices, amusement machines, safety devices and facilities that are governed by regulation of government or industrial organization.
② Facilities that may cause danger or serious effects on human life and assets.
③ Utilities like electricity, gas or water facilities. Facilities that are required 24 hour continuous operation.
④ Outdoor use or use in improper conditions or enviroment.
⑤ Other facilities which requires broad and detailed consideration concerning safety and reliability equivalent to the above.

This warranty may cover these application in case that Takenaka is notified about the application of the product before sale and Buyer approves the compatibility and the specifications of the product by written agreement and / or by providing required safety measures.

## 12 DISCLAIMER

- This product is designed to detect a presence or passage of an object. This product does not have any function to prevent accidents, death or injuries.
  Takenaka will assume no responsibility for damages or losses resulting from accidents or disasters caused by a failure of the product, complete wiring or installation or any act that does not follow the instruction manual.
- Earthquakes, lightning (including lightning surges), fires that we are not responsible for, acts or incidents caused by third parties, intentional or accidental misuse, or usage under other abnormal conditions.
- Any secondary damage caused by the usage, faulty operation, or malfunction of the product like suspended operation or malfunction of a connected device or system, damage to a device, loss of profit, interruption of business, corruption or loss of memory contents, cost of restoration, etc.
- Misuse, failure related to maintenance, installation or deinstallation, or failure to follow the contents of the instruction manual.
- Any malfunction (including false alarm or lost alarm) caused by the combination with a connected device or software over that we have no control.
- The responsibility of Takenaka is limited to the extent of repair or replacement of the product. The expenses we are liable for will not exceed the original product cost.