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Precautions on Safety






● Symbols and the meanings for safety precautions described in this manual.





In order for the product to be used safely, the following indications are used in this book to draw your attention to the cautions. The cautions with the indications describe the important contents for safety.

 Caution	Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally, there may be significant property damage.
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 Warning	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.
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● Meanings of Alert Symbols

	Indicates general prohibitions for which there is no specific symbol.
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.
	Indicates the possibility of failure and fire.
	Indicates the possibility of explosion under specific conditions.
	Indicates the possibility of LED radiation.

 Warning	
This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.	
Do not disassemble the product. Doing so may cause electric shock due to the high voltage portion. Burn also may result due to high temperature. Do not attempt to disassemble, deform by pressure, incinerate, repair, or modify this product.	
Looking into the LED light continuously may cause visual impairment. Do not look directly into the LED light.	

 Caution

Do not use it exceeding the rated voltage.
There is a possibility of failure and fire.



Do not connect amplifier units to AC power supply.
Risk of explosion.



Precautions for Safe Use

Please observe the following precautions for safe use of the products.

1. Installation Environment

- Do not use the product in environments where it can be exposed to inflammable/explosive gas.
- To secure the safety of operation and maintenance, do not install the product close to high-voltage devices and power devices.
- For adequate intake and/or exhaust, keep the Sensor Controller clear by 30 mm or more on its top, and by 10 mm or more from either side.
To secure the Sensor Head and cables connected safely, keep the front of the Sensor Controller clear by 65 mm or more.
- Always hook the upper edge of the slot on the Sensor Controller's back first onto the DIN track. After completely installing the Sensor Controller, make sure that it is securely fixed.
- When mounting the Sensor Controller using the screws, make sure the screw is tightened with a torque specified in this manual.
- Do everything possible to avoid installation in a location with vibration.
- Do not install the product near any devices that generate noise. If there is no choice but to install the product in a noisy environment, make sure to take noise prevention measures.

2. Power Supply and Wiring

- Take care when using a power supply with an overcurrent detector, because this sensor uses DC-DC converter for its power supply circuit and inrush current may activate the protective circuit for a power supply with an overcurrent detector.
Recommended power supply: S8VS-06024 (Omron, DC24 V 2.5 A 60 W)
- The supply voltage must be within the rated range (DC24 V \pm 10 %).
- Reverse connection of the power supply is not allowed.
- Unstable voltage may cause unexpected operation of the sensor controller. If such condition is anticipated, use an UPS (Uninterruptible Power Supply).
Recommended UPS: S8BA Series (OMRON)
- Open-collector outputs should not be short-circuited.
- Use the power supply within the rated load.
- High-voltage lines and power lines must be wired separately from this product. Wiring them together or placing them in the same duct may cause induction, resulting in malfunction or damage.
- Use adequate safety measures, for example fail-safe circuits.
- Use a specified-sized wire when wiring. Do not connect wires other than those of the specification to the terminal block.
- Do not connect a wire with an only twisted end directly to a terminal block.
- For a power supply, use a DC power supply unit provided with a remedy, for example, safety ultralow voltage circuit, to prevent a high voltage from being generated.
- Route so that power supply wires are as short as possible.
- Use a power supply dedicated for this product, without sharing it with other products.
- Before performing any of the following activities, be sure to turn off the product, or breakdown may result.
 - Connecting or wiring cables
 - Connecting or disconnecting connectors
 - Installing or removing Calibration ROM
- Do not apply any loads to cables and connectors when wiring.
- When inserting or removing an EtherCAT cable, do not put any stress on the calibration ROM.
- Before turning ON the power after the product is connected, make sure that the power supply voltage is correct, there are no incorrect connections (e.g. load short-circuit) and the load current is appropriate. Incorrect wiring may result in breakdown of the product.

- Handling fiber cables

Use them in compliance with the following. This may result in damage to the fiber cable.

- Fiber cable bend radiuses must be at least 20 mm.
- Do not yank hard on a fiber cable.
- Do not step on a fiber cable or place anything heavy on it.
- Do not apply any twisting stress to the fiber cable.
- Do not forcefully insert, or bend, or twist in a manner that would cause stress on the fiber connector when connecting it.
- Do not let bending cause stress at the root section of a fiber connector and connection.

3. Grounding

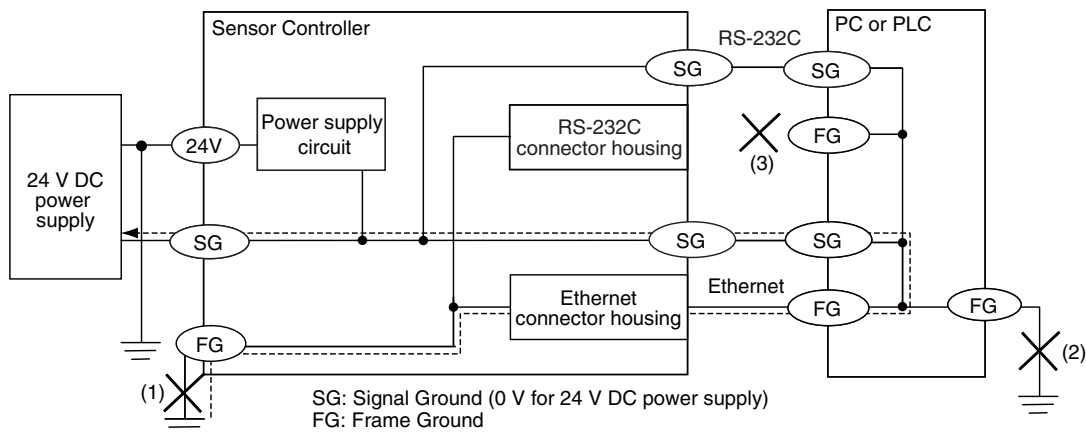
- Use a frame ground terminal of the specified size to be grounded. Do not connect a wire with an only twisted end directly to a terminal block.

Terminal screw: M4

Crimp-type terminal



- Use D-type grounding (ground resistance of 100 Ω or less). Make the ground point as close as possible and make the ground wire used as short as possible.
- Never share a ground wire with other equipment or connect to building beams to prevent the occurrence of a potential difference between grounds (between 0V).
- The power supply circuit of the Sensor Controller is not insulated from the internal circuits.
- When grounding the positive (+) terminal of the 24 VDC power supply, do not connect the Sensor Controller's frame ground terminal or PLC's frame ground terminal to ground. [(1), (2)]
The PC housing may be internally connected to the SG (0 V), in which case current will flow through the path shown below and may cause seizure.
- If there is no PC, or specifically there is no SG (0 V)/FG short-circuiting path, grounding the Sensor Controller's frame ground terminal will not cause seizure. Wire the PLC after checking the specification of your PLC.
- The dedicated RS-232C cable (ZW-XRS2/XPT2) has its cable shield isolated from the connector housing. [(3)]



4. Regulations and Standards

- EN61326-1
- Electromagnetic environment : Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)
- The following condition is applied to the immunity test of this product.
: There may be cases that current or voltage output fluctuate within ± 3%F.S. when a sensor is experienced electromagnetic interference.

- EMC directive

No.2014/30/EU

- Notice for Korea Radio Law

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5. Others

- Do not use this product for nuclear facilities, or safety circuits involving human lives.
- Do not attempt to disassemble, repair, modify, apply pressure to deform or burn up the body.
- Dispose of this product as industrial waste.
- Use exclusive devices, including a sensor head, Calibration ROM, fiber cable or RS-232C cable, to connect, or ignition, burst, false operation or breakdown may be caused.
- Do not cut fiber cable. Glass at the cut section may cause injury. Also, if cut, it will not work normally anymore.
- Whenever any trouble, including, strange odor smelled, the body overheated or smoke escaped, was found, immediately stop the operation, and consult an OMRON branch or sales office with the system shut down.
- Do not drop or make a strong impact on the unit.
- Before using any equipment provided with a lock mechanism, make sure that it has been locked.
- Do not peep directly a light-emitting.

Precautions for Correct Use

Please observe the following precautions to prevent failure to operate, malfunctions, or undesirable effects on product performance.

1. Installation Site

Do not install the product in locations subjected to the following conditions:

- Ambient temperature outside the rating
- Rapid temperature fluctuations (causing condensation)
- Relative humidity outside the range of 35 to 85 %
- Presence of corrosive or flammable gases
- Presence of dust, salt, or iron particles
- Direct vibration or shock
- Reflection of intense light (such as other laser beams, electric arc-welding machines or ultraviolet shine)
- Direct sunlight or near heaters
- Water, oil, or chemical fumes, spray or mist atmospherics
- Strong magnetic or electric field

2. Power Supply and Wiring

- When using a commercially available switching regulator, make sure that the FG terminal is grounded.
- If surge currents are present in the power lines, connect surge absorbers that suit the operating environment.
- Use the specified voltage. If voltage exceeding the rating or AC voltage is applied, circuit parts may be burnt or rupture.
- Cannot remove the Fiber interface of Sensor Head.

If you accidentally remove it, need to repair.

Use the optional extension fiber cable ZW-XF70□□R is suitable for the ZW-7000 series, and ZW-XF50□□R for the ZW-5000 series. Only one cable can be extended.

- Be sure to use a Sensor Head and Calibration ROM with the same serial number. A pair with different serial numbers cannot operate normally.
- Use the configuration software with the combination specified in this manual, or the system may operate faultily.
- Do not shut down the power supply when saving any data into the memory built in the Sensor Controller, or the data may be corrupted.
- While a fiber cable is not in use, be sure to attach the included protective cap to the connector of the fiber cable. Leaving it with the protective cap not attached may result in a malfunction due to the adhesion of foreign matter.
- Make sure to initialize the Sensor Controller when connecting a different type Sensor Head from that which was connected the previous time the Sensor Controller was launched.

3. Warming Up

After turning ON the power supply, allow the product to stand for at least 30 minutes before use. The circuits are still unstable immediately after the power supply is turned ON, so measured values may fluctuate gradually.

4. Maintenance and Inspection

- Do not use thinner, benzene, acetone or kerosene to clean the Sensor Head, fiber cable and Sensor Controller. If large dust particles adhere to the emitter/receiver of the Sensor Head or Sensor Controller, use a blower brush (used to clean camera lenses) to blow them off. Do not blow the dust particles with your mouth.

To remove smaller dust particles, dirt, oil, and fat, wipe gently with a soft cloth (for cleaning lenses). Do not use excessive force to wipe off dust particles. Scratches on the emitter/receiver may cause false operations or measuring errors.

- Do not touch the end surface of a fiber cable, or the cable may be degraded in performance. Should the end surface be touched or soiled, wipe the dirt away using a commercially available cleaner exclusive for fiber or dry and soft cloth. Do not use a cloth moistened with alcohol, or the dirt may be reattached.
- Use the optional ZW-XC when cleaning the controller fiber connector. For ZW-7000, use a commercially available fiber cleaner. For how to clean the fiber connector using ZW-XCL, refer to the Cleaning the fiber connector and fiber cable using ZW-XCL (p.60).
- If you frequently insert and extract the Sensor Head, recommend to use the commercially available fiber cleaner which can use repeatedly. For commercially available fiber cleaner, refer to the p.59 on this manual.
- Clean the ventilation port periodically to prevent any build up of dirt and dust. If the ventilation port is blocked, heat builds up inside and can cause breakdown.


5. Sensing Objects

The product sometimes cannot accurately measure the following types of objects:

Transparent objects, objects with a low reflection factor, objects smaller than the spot diameter, objects with a large curvature, excessively inclined objects, target objects with a thin film on the surface etc.

6. Effect caused by peripheral lights

Do not install the Sensor Head in a place where strong light hits the laser emitter/receiver section of the Sensor Head. Also, if an object has a shiny surface, the light from the lighting will be reflected and a malfunction may occur. In such a case, prevent reflection by, for example, covering the light to stop reflection.

 Basic precautions for installation p.49

7. Influence by Air Turbulences

Slow air turbulences around the Sensor Head may disperse measured values.

To avoid these possible air turbulences, wrap the Sensor Head with an appropriate cover.

8. Operations Outside Measurement Range

Since this Sensor is highly sensitive, the measurement value may be beyond the limits of measurement range. In such a case, shorten the measurement cycle; Exposure time.

9. Maximum Number of Allowed Writes to EPROM in Sensor Controller

When Zero-Reset Memory mode is set to ON, the zero reset is written to EEPROM (non-volatile memory) in the Sensor Controller each time a zero reset is performed. The EEPROM can be written a maximum of 1,000,000 times. Pay attention to the maximum number of writes allowed when this is set to "ON."

 Setting the Zero Reset Memory p.157

Editor's Note

● Meaning of Symbols

Menu items that are displayed on the main or sub-display, and windows, dialog boxes and other GUI elements displayed on the personal computer are indicated enclosed by brackets [].

● Visual Aids

Important

Indicates points that are important to achieve the full product performance, such as operational precautions.

Note

Indicates application procedures.



Indicates pages where related information can be found.

Optional

Indicates that the setting is optional in a configuration procedure.

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- If you do so, please also tell us the manual number, which is found at the end of the manual.

Relevant Manuals

The following table provides the relevant manuals for the ZW-7000/5000 series Confocal Fiber Type Displacement Sensor.

Read all of the manuals that are relevant to your system configuration and application before you use the ZW-7000/5000 series Confocal Fiber Type Displacement Sensor.

Most operations are performed from the Sysmac Studio Automation Software. Refer to the Sysmac Studio Version 1 Operation Manual (Cat. No. W504) for information on the Sysmac Studio.

Purpose of use	Manual	
	ZW-7000/5000 series Confocal Fiber Type Displacement Sensor User's Manual	ZW-7000/5000 series Confocal Fiber Type Displacement Sensor User's Manual for Communications Settings
Overview of ZW-7000/5000 series	●	
Setup and Wiring	●	
Basic Operation	●	
Function Setting	●	
Offline Setting	●	
Confirm the Menu List	●	
Connecting to the Sensor Controller	●	
Connecting to the Sensor Controller for Communication Settings		●
Overview of Communication Specifications		●
Parallel I/O		●
EtherCAT		●
EtherNet/IP		●
No-protocol		●
Specifications and External Dimensions	●	
Processing Item List	●	
System Data List		●
Object Dictionary		●
Update the Firmware		●
Troubleshooting	●	
Error Messages		●

Related Manuals

The following manual is related to Controllers. Use this manual for reference.

Manual name	Cat. No.	Model numbers	Application	Description
Sysmac Studio Version 1 Operation Manual	W504	SYSMAC-SE2□□□	Learning about the operating procedures and functions of the Sysmac Studio.	Describes the operating proce- dures of the Sysmac Studio.
Confocal Fiber Type Displacement Sensor ZW-7000/5000 series User's Manual (This man- ual)	Z362	ZW-7000□ ZW-5000□	To learn how to set-up of Con- focal Fiber Type Displacement Sensor of ZW-7000/5000 series.	Describes how to set-up of Confocal Fiber Type Displacement Sensor of ZW- 7000/5000 series.
Confocal Fiber Type Displacement Sensor ZW-7000/5000 series User's Manual for Com- munication Settings	Z363	ZW-7000□ ZW-5000□	To learn how to use communi- cation settings of Confocal Fiber Type Displacement Sensor of ZW- 7000/5000 series.	Describes how to use commu- nication settings of Confocal Fiber Type Displacement Sensor of ZW- 7000/5000 series.

