

Confocal Fiber Displacement Sensor

ZW-8000/7000/5000 Series





Easy-to-integrate sensor measures any material

Reliable and accurate in-line measurements



Measurement period: 20 µs

Preamplifierless & flexible fiber cable

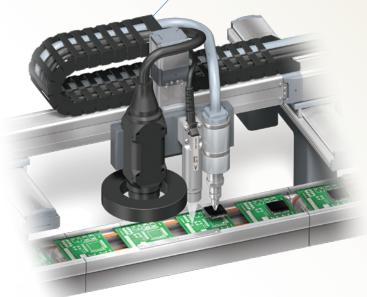
Bending radius: 20 mm

Ultra-high-speed assembly inspection of ECU boards

Linearity	±0.45 μm
Spot diameter	130 μm
Measuring range	±0.7 mm

High-precision synchronization between devices with 1 µs jitter





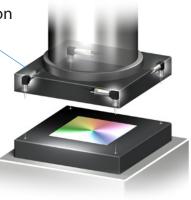
Saving space

Bonding machines

ZW-SPR5007 Pen-shaped Right Angle Sensor Head

Low installation height

27.5 mm



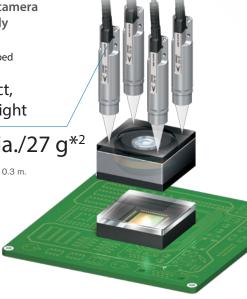
Inclination measurement for automotive camera module assembly

ZW-SP7007 Pen-shaped Straight Sensor Head

Ultra-compact, ultra-lightweight

12-mm dia./27 g*2

*2. Fiber cable length of 0.3 m.



Unsurpassed stable in-line measurement



Coaxial measurement based on color

White light confocal principle

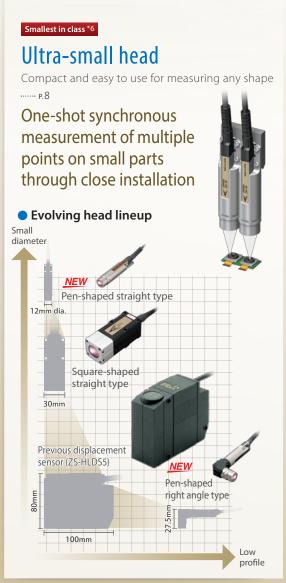
Omron is among the first in the industry to adopt the white light confocal principle when it introduced the ZW Series. This principle allows a stable moving measurement of objects in any mixed conditions such as coarse, curved, inclined or narrow areas.

*7. OCFL: Omron Chromatic Focus Lens. Refer to page 17 for details.

Principle

White light produced by the light source ((1)) is focused at different points for each color (wavelength) ((2)) using an OCFL *7 created using Omron's unique compact optical design technology. Only the light that is focused on the object is received as reflected light ((3)), and this wavelength information is converted to distance with a spectrometer ((4)), and the height is then measured. Unlike triangulation systems, as the emitted light and received light are positioned along the same axis, the measurement point remains the same at any position in the measuring range so that precise measurements can always be achieved.

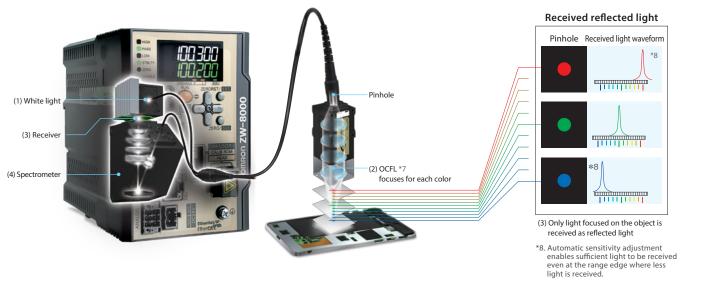




- *1/*2/*5/*6. Based on Omron investigation in July 2018.

 *3. Material setting for the Omron standard mirror surface target:
 Error from an ideal straight line when measuring on mirror surface.

 *4. Typical value of the ZW-S8010/ZW-S7010/ZW-S5010 Sensor Heads.





Controller

Solutions for any in-line measu

For measurement of rattling or inclined "transparent objects or mirror surfaces"

Ultra-high-precision, high-speed type ZW-8000

High-precision in-line measurement of rattling or inclined shiny, thin, or minute parts







Curved surfaces Transparent objects Minute objects



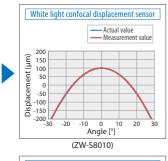
Measurement of coated plastic height

Mirror surfaces (inclined or curved surfaces)

Omron's, unique, white light confocal displacement sensor provides higher resolution measurements of angled or curved and shiny surfaces than traditional laser displacement sensors.

> Mechanism P.19 High angle characteristic

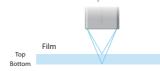
Traditional laser displacement sensor 150 100 50



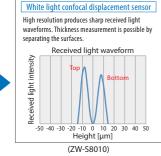


Transparent objects

The ZW-8000 Series can measure the top and bottom surfaces of a thin transparent sheet or film by separating the light reflected from both surfaces, which is difficult with conventional laser displacement sensors.



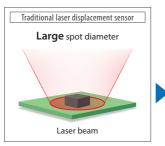
Traditional laser displacement sensor The received light waveform peak is wide, and the top surface cannot be separated from the bottom surface. Received light waveform Received light





Minute objects

Thanks to its very small spot diameter, the ZW-8000 Series can measure targets on minute objects extremely precisely, which is impossible with a conventional laser displacement sensor with a large spot diameter.





 $4 \, \mu m$

A variety of sensor heads with a small spot diameter to suit your measurement conditions

Sensor head type	Square-shaped straight		Pen-shaped straight		Pen-shaped right angle		
Model	ZW-S8010	ZW-S8020	ZW-S8030	ZW-SP8007	ZW-SP8010	ZW-SPR8007	ZW-SPR8010
Spot diameter	4-μm dia.	7-μm dia.	10-μm dia.	7-μm dia.	10-μm dia.	8-μm dia.	11-μm dia.

^{*1.} Typical value of the ZW-S8010/ZW-S7010/ZW-S5010 Sensor Heads.

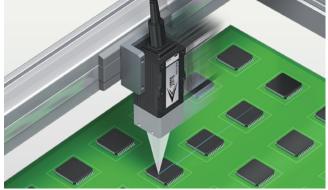
^{*2.} Typical value of the ZW-S8010 Sensor Heads when transparent objects with refractive index of 1.5 are measured. *3. Typical value of the ZW-S8010 Sensor Heads Note: The ZW-5000 standard type is available for measurements with standard precision and speed.

rement application

Measurement of "Coarse surfaces" moving at high speed

Ultra-high-speed, high-precision type ZW-7000





Measurement of height of chips on substrate during movement

Ultra high-speed, stable measurement of diffuse reflective objects during movement



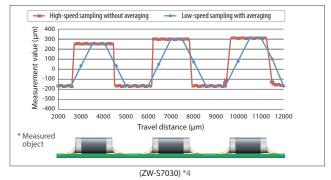


Coarse surfaces

Shape

Shape

Using conventional sensors, the measurement accuracy can be achieved by increasing the averaging times, but downside is that this lowers the profile reproduction accuracy. The ZW-7000 acquires a sharp profile by sampling as fast as 20 µs without averaging, solving this issue.

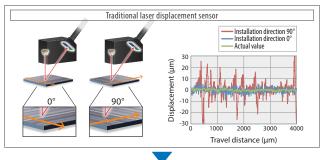


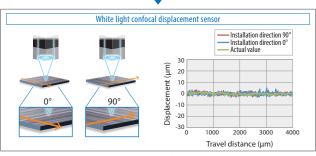


Flatness of coarse surfaces *5

Our white light confocal displacement sensors can provide accurate flatness measurement by tracing an object once without being affected by its excessive reflection, the sensor head direction, nor the material hairline direction, which are difficult to track with a conventional laser displacement sensor.

> Mechanism P.18 Stable measurements of coarse surfaces





(ZW-S7020) *7

revious principle

^{*4.} Please ask Omron sales representative for product data for other than the ZW-S7030. *5. Objects with machining marks or hairline pattern *6. ZW-S7020.

^{*7.} Please ask Omron sales representative for product data for other than the ZW-S7020.

Note: All measurement graphs represent typical examples. Measurement may be affected by the shape or material of the object being measured. Before final installation, test the sensor required for the application to validate that the desired measurements have been obtained.

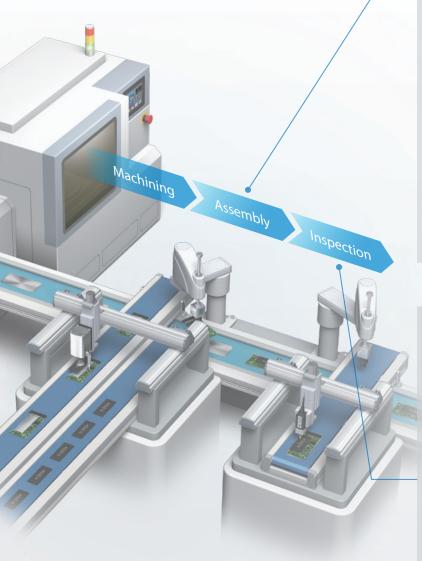
Sensor head

A wide sensor head offering for diverse integr

New ultra-small sensor heads make integration more flexible

The continued evolution of products as they have become thinner, more curved, and more compact has meant that the inspection process has also become more difficult, and this has necessitated visualization and assembly control in the upstream assembly process.

In response to this, Omron has developed a lineup including both square-shaped type sensor heads with long measurement distance, and ultra-small pen-shaped type (straight or right angle) sensor heads that can be installed in narrow spaces.



Ideal for assembly process



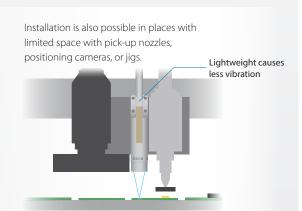


- *1. ZW-8000/ZW-7000 Series with 0.3 m fiber cable.
- *2. The 40 mm type is only available for the ZW-7000 Series.
- *The photo shows the ZW-8000 Series. This size is the same for the ZW-7000/5000 Series.

ation requirements

Installation in narrow spaces

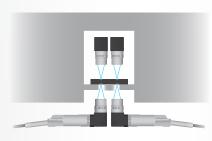




Low-profile, space-saving installation



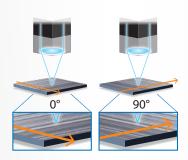
High-precision control is possible by installing a low-profile head, even in places with strict height restrictions.



Chip die count



As the heads have no orientation, there is no need to change the angle.



Usability

Reduce production cycle times through

Save Time and Money: No need to rotate the sensor

A conventional laser displacement sensor measures the height of an object based on the position of the spot on the receiver.

The machine requires an extra step to rotate the sensor according to the object shape or moving direction.

Our white light confocal displacement sensor can measure from the same installation position while moving in any direction, with no restriction on installation direction.





*1. Calculated when an object with irregular surface was measured in both the vertical and horizontal directions.

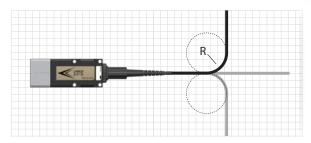
>> Mechanism
P.19 Direction free

Flexible fiber cable for easy installation

The controller connects to the sensor head through a 3 mm diameter flexible fiber cable.

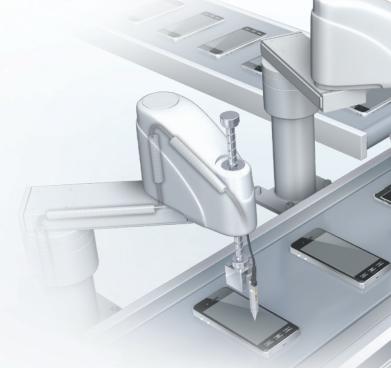
The cable has cleared a bending test consisting of 3,000,000 repetitions*2 for reliable application on moving parts.

*2. Omron's bending test condition: 3,000,000 bends to a 20 mm bending radius



Extension cables for large machines

A 30-m extension fiber cable can be used to extend the distance to up to 32 m, supporting a flexible wiring in a large machine.



Easy wiring for moving measurements

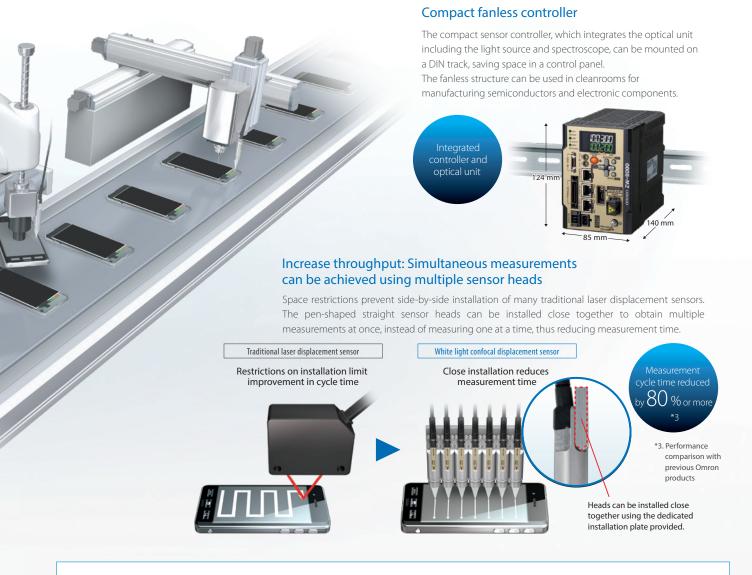
No preamplifiers or optical parts are used in the fiber cable, which makes it easy to route the cable through a cable carrier or protective conduit for moving measurements.





P.28 "Order Information Cable"

efficient arrangement and movements



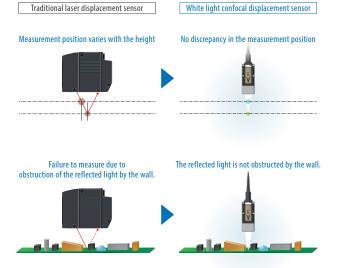
Further Benefits of White Light Confocal

No discrepancy in the measurement point

With a traditional laser displacement sensor, the measurement position and spot size vary with the height. This means there are times when the position cannot be measured with high resolution due to warping and inclination. With a white light confocal displacement sensor, the measurement point remains the same at any position in the measuring range so that precise measurements can always be made.

Measurement in narrow area and by the wall

When a traditional laser displacement sensor measures the inside of a narrow tube or the height of a small depression, the wall often obstructs the reflected light, and the orientation of the sensor and object must be adjusted many times. A white light confocal displacement sensor can measure the points in narrow spaces or small objects, without changing its installation orientation, because the emitted light and reflected light are positioned along the same axis.



Usability

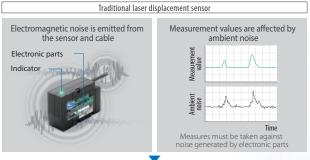
Reduce setup and tuning time

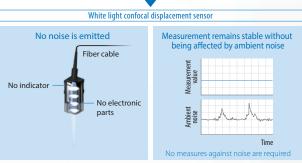
Reduced work -EMC measures and thermal design are not required

The sensor head contains no electronic parts and indicators that generate noise and heat. The sensor head design maintains stable operation in installations with electronic or magnetic noise.

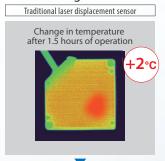
Devices in close proximity and measurement values are not affected by noise or heat from the sensor head.

EMC measures





Thermal design

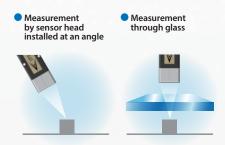


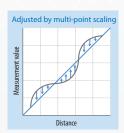


Patent pending

Multi-point scaling for stable measurements

The ZW Series measures up to 10 points to minimize measurement errors. *1 Even when the sensor head is installed at an angle or measures objects through glass, stable measurements can still be achieved, which is difficult with conventional 2-point scaling.





*1. Supported on ZW-8000 Series

No laser safety measures required

A white light source *2 eliminates the need for safety measures around the machine and safe use training for workers that are required for a laser light source.



*2. The ZW-8000 Series is categorized as Class 1

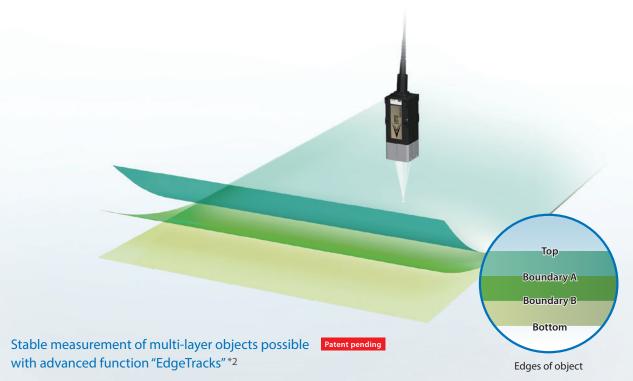
Patented

Calibration ROM ensures compatibility and precision

The sensor controller is compatible with sensor heads, which enables quick replacement and saves costs. Each sensor head has its own calibration ROM that is used to load calibration values into the sensor controller, providing compatibility and high-precision measurements.



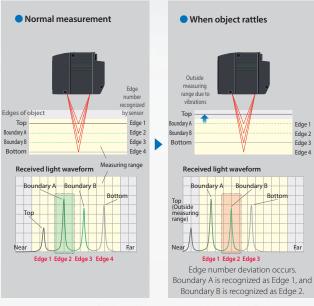
can be connected to the ZW-8000 Sensor Controller.

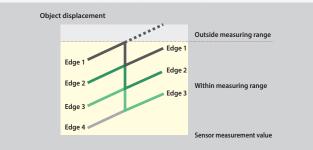


When measuring objects with multiple layers, the white light confocal displacement sensor can stably measure target edges even if the object rattles and certain of the edges cannot be measured.

Traditional laser displacement sensor

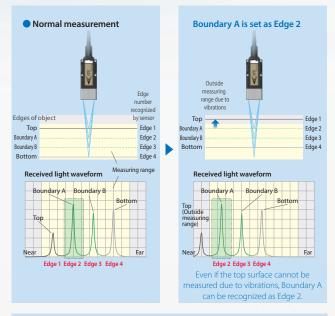
If certain of the edges are outside the measuring range (cannot be measured) due to vibrations of the object, the other edges are numbered incorrectly.

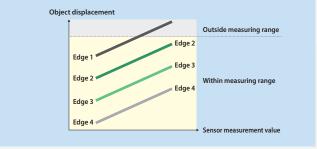




White light confocal displacement sensor

The EdgeTracks function can take stable measurements with no edge number deviation, even if certain of the edges cannot be measured.





System

Precise measurement of "target positions" through synchronous measurement with

To eliminate measurement errors due to a position offset during moving measurement, the ZW Series provides the functionality to link moving parts with measurement timing (external synchronous measurement mode).

Movement measurement linked to stage position information *1

In addition to excellent angle characteristics, synchronization with object movement is required to measure the shapes of objects with sharply curved edges (e.g., cover glass of smartphone). Moreover, the system to control vertical movement of the sensor head is required to track shapes outside the measurement range.

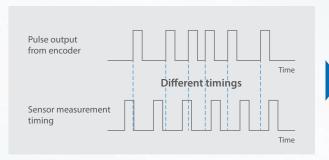
*1. This functionality is available on the firmware version 2.10 or later. If you register as a member after purchasing the product, the latest firmware for the controller is available for free.

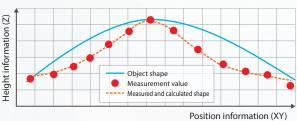
Refer to the member registration sheet that is enclosed with the product for details.

(X) Height information (Z) Position information (X)

Previous system

Sensors perform measurement within the same cycle, regardless of stage acceleration and deceleration.

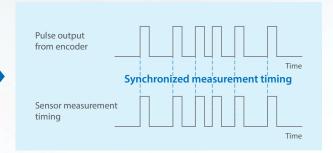


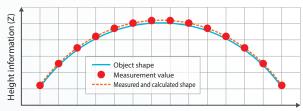


As the measurement position (XY) is not synchronized with the measurement value (Z), an accurate object shape cannot be obtained if the stage accelerates or decelerates

ZW Series

Sensors perform measurement based on encoder timing (External synchronous measurement mode)





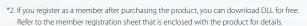
Each sensor synchronizes with pulse output from the encoder, enabling high-precision measurement linked to the XY position, regardless of stage acceleration and deceleration

DLL Quick integration into machine HMI

DLL *2 files are provided to easily display ZW Series setting screens and measurement results on a Windows/Mac OS PC used as a machine HMI.

Provided DLL

- · Settings and measurement conditions reference · Acquiring light received waveforms
- · Acquiring measurement values
- · Logging control

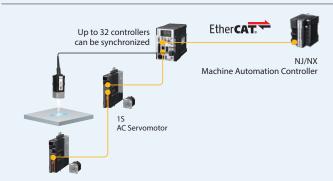




on moving objects external devices

More features Sysmac makes moving measurement easy

Easy setting and measurement through synchronization with EtherCAT



The sensors begin measurement automatically by synchronizing with periodic EtherCAT communication. This system ensures accurate synchronisation between devices with 1 µs jitter.

The sensor controller also supports **EtherNet/IP™**, analog output, and RS-232C, fitting into a wide range of machines.

Operations integrated within Sysmac Studio



Efficient setting of multiple ZW Sensors

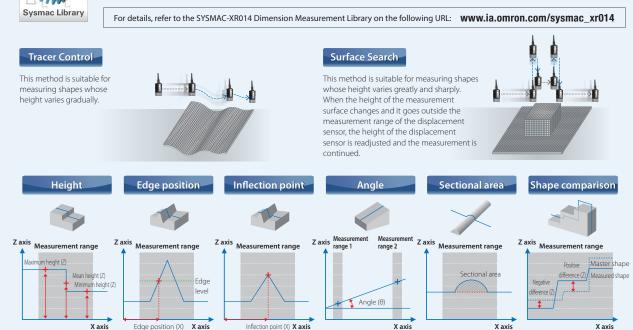
You can make settings for all of devices that are connected via EtherCAT with the Automation Software Sysmac Studio. Even when using many sensors, you can copy the setting data to effectively integrate several sensors and easily program the processing between the sensors.

Easy set-up with Function Blocks



Omron offers Function Blocks (FBs) to make programming for system link applications easier.

Rapid set-up without any programming know-how is possible with an FB which tracks object shapes, FBs used to generate 2D shape data and calculate characteristic point dimensions, and HMI screens used to specify settings and perform measurement.



Technical explanation

New technologies for in-line measurements with

NEW

New technology in ZW Series offering unsurpassed precision and speed



Ultra-high precision

Ultra High Power White Light

The long-term stable, high power white light source was adopted for the ZW-7000 Series to provide fast responses and stable measurements of low-reflective objects.

The ZW-8000 Series incorporates a newly-designed white laser for stable measurement of thin transparent sheets and minute shapes.



* Conceptual illustration

NEW

<u>NEW</u>



Ultra-high photoconductivity

Precise Core Fiber

The fibers specially designed separately for the ZW-7000 and ZW-8000 Series transmit white light to the sensor head even more efficiently and deliver the lights reflected from other layers to the controller ultra-sensitively, enabling more precise measurement.



High resolution

Advanced Spectrograph I/II

The spectroscope Advanced Spectrograph, which converts the color wavelength into the distance, offers increased waveform resolution. The ZW-8000 Series with the new Advanced Spectrograph II enables ultra-high-precision measurements.



Common technology throughout the entire series offering unsurpassed usability



25 times faster data processing speed*1

High Speed Processor

The new processor was designed to increase processing speed for high precision measurements, from white light emission through sensing and processing to data logging.



* Conceptual illustration



Large logging capacity (up to 2 million values) Mega Logging

Memory

The memory capacity was greatly increased to log, process and store up to 2,000,000 values*2 obtained by high-speed sampling.

*2. Measurement values, emitted light amounts, or received light amounts can be logged.

^{*1.} Compared to the ZW-CE Series.

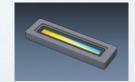
unmatched precision and speed



High sensitivity

High Sensitivity High Speed CMOS

The CMOS for the ZW-8000/7000 Series were optimized to measure any object more precisely, sensitively, and stably.



Low aberration

Advanced OCFL Module



The OCFL*3 module that controls the focal point for each wavelength of white light was further developed. Its multi-lens structure reduces aberration to 1/4*4 to provide stable, high-resolution measurements, without compromising its compact design.

- *3. OCFL: Omron Chromatic Focus Lens
- *4. Compared to the ZW-S07/-S20/-S30/-S40.
- * Advanced OCFL Module is also used for the ZW-5000 Series.



Common technology throughout the entire series offering unsurpassed ease of integration



Ultraprecise

Ultra-precision machining and mechanical design

The ultra-precision machining technology and ultra-precision mechanical design minimize the housing while giving a lens diameter sufficient for high-precision measurements.

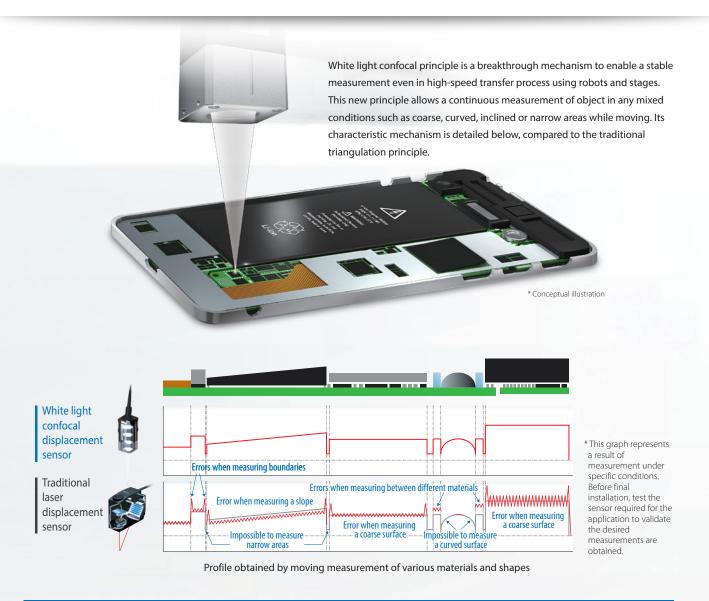
*The ultra-precision machining technology and ultra-precision mechanical design are also used for the ZW-5000 Sensor Heads



* Conceptual illustration

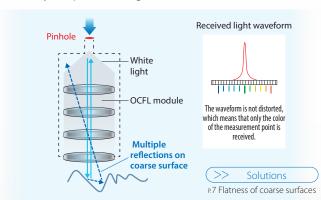
Technical explanation

White light confocal principle to achieve stable



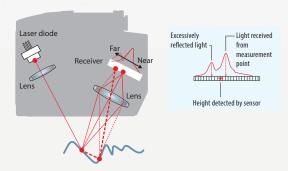
Stable measurements of coarse surfaces

Only the light reflected from the measurement point enters the pinhole even if excessive light reflected from the object changes during movement. This enables stable and precise measurement without being affected by multiple reflection light.



Laser triangulation principle

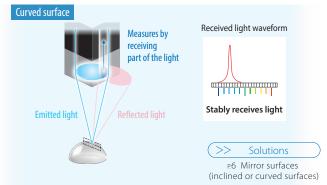
Reflected light is received on a receiver, and height is measured from the waveform of light received on the receiver. The waveform is distorted due to the effect of excessive reflection, resulting in a measurement error. The effect of excessive reflection changes during movement, which causes unstable measurements.



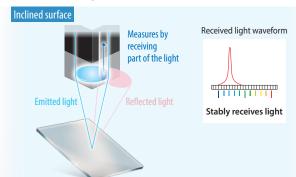
measurements during movement

High angle characteristic

Because light is emitted directly from above, the reflected light is not widely diffused. The sensor can measure by stably receiving a part of the reflected

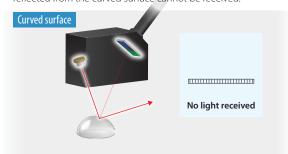


The wavelength (position) can be obtained from a part of the received light even if the reflected light amount is reduced. This enables stable height measurements.

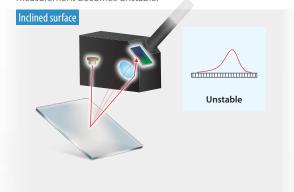


Laser triangulation principle

A laser spot beam is emitted obliquely from above. When the position of a glossy, regular-reflective object, where the beams are reflected in one direction, is shifted, the light reflected from the curved surface cannot be received.

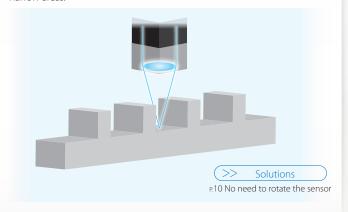


Even if the light can be received, the received light waveform is distorted due to lens aberration as a result the measurement becomes unstable.



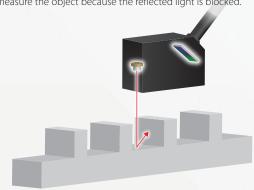
Direction free

Stable measurement is not affected by the movement direction of objects or the sensor. This is achieved by emitting and receiving a cone-shaped beam of white light. This slim beam is also suitable for measurements in narrow areas.



Laser triangulation principle

The reflected light is detected obliquely from above. Depending on the installation direction, the sensor cannot measure the object because the reflected light is blocked.



Selection

Find the right controller and sensor head

STEP1

Select controller based on measurement object and situation

Measure rattling or inclined "transparent objects or mirror surfaces" such as thin film sheets or glass



Ultra high-precision type **ZW-8000 Series**

Sensor Controller **ZW-8000T**



Measure accurate shapes of "coarse surfaces" while the sensor head is moving



Ultra high-speed type **ZW-7000 Series**

Sensor Controller **ZW-7000T**

CONTRACTOR OF THE PROPERTY OF

Cost-effectively integrate stable and reliable measurement using the white light confocal principle into production lines



Standard type **ZW-5000 Series**

Sensor Controller **ZW-5000T**





Select head based on installation space

STEP3 Select model based on distance

			-		Measuring range	Static resolution
Width is limited	i de la constante de la consta	Pen-shaped straight type	Short	ZW-SP8007	7±0.3 mm	
wiath is limited	12-mm dia.	ZW-SP80□□	Long	ZW-SP8010	10±0.7 mm	
	No.	Pen-shaped	Short	ZW-SPR8007	7±0.3 mm	
Height is limited	27.5 mm	right angle type ZW-SPR80 □□	Long	ZW-SPR8010	10±0.7 mm	0.25 μm
	100		Short	ZW-S8010	10±0.5 mm	
Precision is more important than space	76.25 mm	Square-shaped straight type ZW-S80 ☐	1	ZW-S8020	20±1 mm	
·	30 mm	244-300	Long	ZW-S8030	30±2 mm	
					Measuring range	Static resolution
		Pen-shaped straight type	Short	ZW-SP7007	7±0.3 mm	
Width is limited	12-mm dia.	ZW-SP70□□	Long	ZW-SP7010	10±0.7 mm	
	No.	Pen-shaped right angle type ZW-SPR70□□	Short	ZW-SPR7007	7±0.3 mm	
Height is limited	27.5 mm		Long	ZW-SPR7010	10±0.7 mm	0.25 μm
	7		Short	ZW-S7010	10±0.5 mm	
Precision is more important	76.25 mm	Square-shaped straight type	↑	ZW-S7020	20±1 mm	
than space		ZW-S70 □□		ZW-S7030	30±2 mm	
	30 mm		Long	ZW-S7040	40±3 mm	
					Measuring range	Static resolution
Width is limited	A STATE OF THE STA	Pen-shaped straight type	Short	ZW-SP5007	7±0.3 mm	
width is illilited	12-mm dia.	ZW-SP50□□	Long	ZW-SP5010	10±0.7 mm	
Height is limited	No. of Street,	Pen-shaped right angle type	Short	ZW-SPR5007	7±0.3 mm	
neight is limited	Height is limited 27.5 mm right angle type ZW-SPR50 □	Long	ZW-SPR5010	10±0.7 mm	0.25 μm	
Drogisian is	1		Short	ZW-S5010	10±0.5 mm	
Precision is more important than space	76.25 mm	Square-shaped straight type	1	ZW-S5020	20±1 mm	

The sensor controller is compatible with sensor heads. When the sensor head is broken, replace only the broken sensor head,

ZW-S50□□

Long

ZW-S5030

than space

Calibration ROM ensures compatibility and precision

30±2 mm

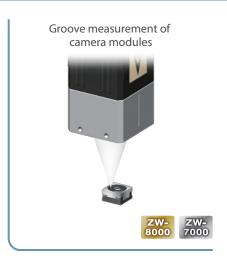
Application

ZW Series for a variety of applications

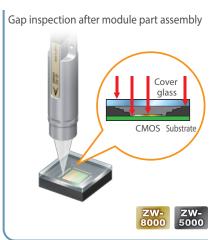
Smart phone (component process)







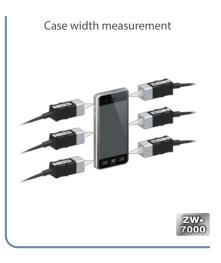






Smart phone (assembly process)

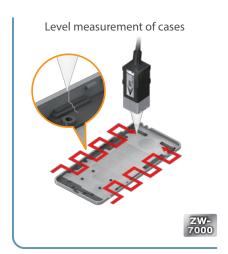


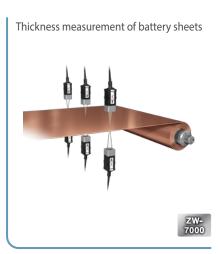


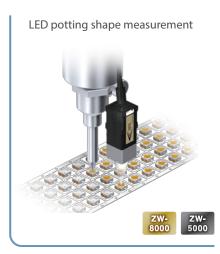


Note: The most suitable model will vary depending on the object material and surface.

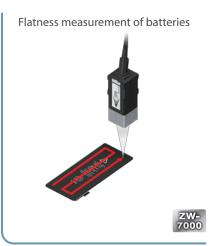
Before final installation, test the sensor required for the application to validate the desired measurements are obtained.

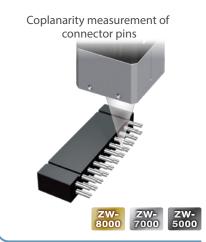








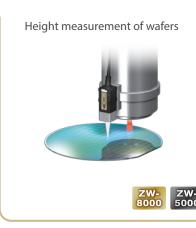






SEMI/FPD





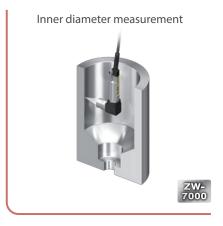


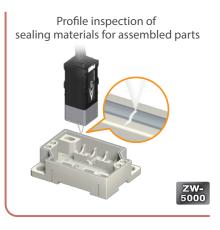






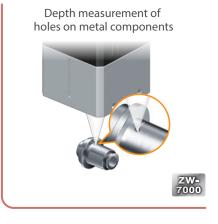
Automotive parts







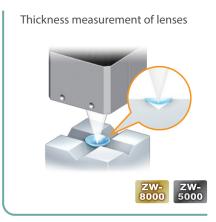






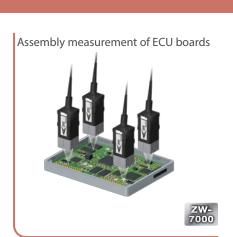
Pharmaceuticals

















MEMO

Confocal Fiber Displacement Sensor

ZW-8000/7000/5000 Series

Reliable measurements for any material and surface types

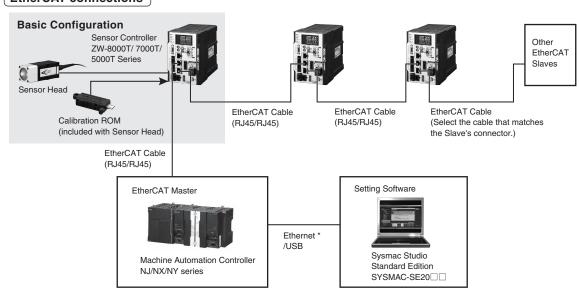
- Measuring shiny objects with an inclination of ±25°
- ±0.3 µm or less linearity for various materials
- Sampling rate as fast as 20 µs
- Small spot diameter of 4 µm or less

Note: Angle characteristic, linearity, sampling period and spot diameter given in the cover differ among models. Please ask OMRON sales representative for details.

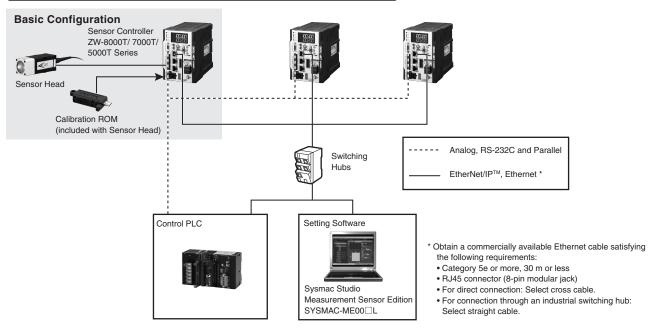


System Configuration





Analog, EtherNet/IP, Ethernet, RS-232C and Parallel connections



ZW-8000/7000/5000 Series

Order Information

ZW-8000

Sensor Head

Square-shaped straight type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
	0 mm 9.5 mm 10 mm 10.5 mm	4 um dia	4 μm dia. 0.25 μm –	2 m	ZW-S8010 2M
	→ Measuring range 10±0.5 mm	+ μπ αια.		0.3 m	ZW-S8010 0.3M
	0 mm 19 mm 20 mm 21 mm	7 µm dia.	0.25 μm	2 m	ZW-S8020 2M
	→ Measuring range 20±1mm	γ μπ αια.	0.23 μπ	0.3 m	ZW-S8020 0.3M
	0 mm 28 mm 30 mm 32 mm	10 µm dia.	0.05	2 m	ZW-S8030 2M
	→ Measuring range 30±2mm		0.25 μm	0.3 m	ZW-S8030 0.3M

^{*} Values when the Sensor Controller ZW-8000T is used.

Pen-shaped straight type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
OIL	0 mm : 6.7 mm 7 mm 7.3 mm	7 μm dia.	0.25 μm	2 m	ZW-SP8007 2M
	→ Measuring range 7±0.3 mm			0.3 m	ZW-SP8007 0.3M
	0 mm 9.3 mm 10 mm 10.7 mm	10 um dia	μm dia. 0.25 μm	2 m	ZW-SP8010 2M
	◆ Measuring range 10±0.7mm	το μπι αια.		0.3 m	ZW-SP8010 0.3M

^{*} Values when the Sensor Controller ZW-8000T is used.

Pen-shaped right angle type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
	→ Measuring range 7±0.3 mm	8 μm dia.	0.25 μm	2 m	ZW-SPR8007 2M
	0 mm 7.3 mm 7 mm 6.7 mm			0.3 m	ZW-SPR8007 0.3M
	→ Measuring range 10±0.7mm	11 µm dia.	0.25 μm	2 m	ZW-SPR8010 2M
	0 mm9.3 mm		υ.23 μπ	0.3 m	ZW-SPR8010 0.3M

^{*} Values when the Sensor Controller ZW-8000T is used.

Sensor Controller with EtherCAT

Appearance	Power supply	Output type	Model
	24 VDC	NPN/PNP	ZW-8000T

●Cable

Appearance	Item	Cable length	Model
		2 m	ZW-XF8002R
	Extension Fiber Cable (from	5 m	ZW-XF8005R
	Sensor Head to Sensor Controller), (Fiber Adapter ZW-XFCS is	10 m	ZW-XF8010R
	included)	20 m	ZW-XF8020R
		30 m	ZW-XF8030R
Fiber Adapter (used between Sensor Head pre-wired cable and Extension Fiber Cable)		_	ZW-XFCS

Note: Extension Fiber Cable ZW-XF80 \ R can be used with the firmware version 3.000 or later. If you have an old version Sensor Controller, register as a Sysmac member and download the latest firmware and tools to update your Sensor Controller. Refer to the Sysmac member registration sheet that is enclosed with the Sensor Controller for details on member registration and firmware download.

ZW-7000

●Sensor Head

Square-shaped straight type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
	0 mm 9.5 mm 10 mm 10.5 mm	EQ dia	0.05	2 m	ZW-S7010 2M
	→ Measuring range 10±0.5 mm	50 μm dia.	0.25 μm	0.3 m	ZW-S7010 0.3M
	0 mm 19 mm 20 mm 21 mm	70 µm dia.	0.25 μm	2 m	ZW-S7020 2M
	→ Measuring range 20±1mm		0.23 μπ	0.3 m	ZW-S7020 0.3M
	0 mm 28 mm 30 mm 32 mm	400 di-	0.25 μm	2 m	ZW-S7030 2M
	→ Measuring range 30±2mm	100 μm dia.		0.3 m	ZW-S7030 0.3M
	0 mm		120 µm dia. 0.25 µm	2m	ZW-S7040 2M
	Measuring range → 40±3mm	120 μm dia.		0.3m	ZW-S7040 0.3M

^{*} Values when the Sensor Controller ZW-7000T is used.

Pen-shaped straight type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
	0 mm - 6.7 mm 7 mm 7.3 mm	130 μm dia.	0.25 μm	2 m	ZW-SP7007 2M
Diff.	→ Measuring range 7±0.3 mm			0.3 m	ZW-SP7007 0.3M
6	0 mm 9.3 mm 10 mm	170 μm dia.	0.05	2 m	ZW-SP7010 2M
	→ Measuring range 10±0.7mm		0.25 μm	0.3 m	ZW-SP7010 0.3M

^{*} Values when the Sensor Controller ZW-7000T is used.

Pen-shaped right angle type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
	Measuring range 7±0.3 mm	150 μm dia.	0.25 μm	2 m	ZW-SPR7007 2M
	7.3 mm 7 mm 0 mm -6.7 mm			0.3 m	ZW-SPR7007 0.3M
	→ Measuring range 10±0.7mm	190 µm dia.	0.25 μm	2 m	ZW-SPR7010 2M
	0.7 mm 0 mm 9.3 mm	190 μπ αια.		0.3 m	ZW-SPR7010 0.3M

^{*} Values when the Sensor Controller ZW-7000T is used.

Sensor Controller with EtherCAT

Appearance	Power supply	Output type	Model
TOTAL CONTROL OF THE PARTY OF T	24 VDC	NPN/PNP	ZW-7000T

●Cable

		Cable length	881.1
Appearance	arance Item		Model
		2 m	ZW-XF7002R
	Extension Fiber Cable (from	5 m	ZW-XF7005R
	Sensor Head to Sensor Controller), (Fiber Adapter ZW-XFCM is included)	10 m	ZW-XF7010R
		20 m	ZW-XF7020R
		30 m	ZW-XF7030R
	Fiber Adapter (used between Sensor Head pre-wired cable and Extension Fiber Cable)		ZW-XFCM

Note: Cables of 10, 20, and 30 m can be used with the firmware version 2.100 or later. If you have an old version Sensor Controller, register as a Sysmac member and download the latest firmware and tools to update your Sensor Controller. Refer to the Sysmac member registration sheet that is enclosed with the Sensor Controller for details on member registration and firmware download.

ZW-8000/7000/5000 Series

ZW-5000

Sensor Head

Square-shaped straight type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
	0 mm 9.5 mm 10 mm 10.5 mm	9 µm dia.	0.25 μm	2 m	ZW-S5010 2M
	→ Measuring range 10±0.5 mm	θ μπ dia.	υ.25 μπ	0.3 m	ZW-S5010 0.3M
	0 mm	13 µm dia.	0.25 μm	2 m	ZW-S5020 2M
				0.3 m	ZW-S5020 0.3M
		18 µm dia.	0.25 μm	2 m	ZW-S5030 2M
				0.3 m	ZW-S5030 0.3M

^{*} Values when the Sensor Controller ZW-5000T is used.

Pen-shaped straight type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
01	0 mm 6.7 mm 7 mm 7.3 mm	13 µm dia.	0.25 μm	2 m	ZW-SP5007 2M
	→ Measuring range 7±0.3 mm	13 μm dia.	0.25 μπ	0.3 m	ZW-SP5007 0.3M
	0 mm 9.3 mm 10 mm 10.7 mm	18 µm dia.	0.25 μm	2 m	ZW-SP5010 2M
	→ ← Measuring range 10±0.7mm			0.3 m	ZW-SP5010 0.3M

^{*} Values when the Sensor Controller ZW-5000T is used.

Pen-shaped right angle type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
	- Measuring range 7±0.3 mm 7.3 mm 7.3 mm 6.7 mm Measuring range 10±0.7mm 10 mm 0 mm 9.3 mm	15 μm dia.	0.25 μm	2 m	ZW-SPR5007 2M
				0.3 m	ZW-SPR5007 0.3M
		20 μm dia.	0.25 μm	2 m	ZW-SPR5010 2M
				0.3 m	ZW-SPR5010 0.3M

^{*} Values when the Sensor Controller ZW-5000T is used.

Sensor Controller with EtherCAT

Appearance	Power supply	Output type	Model
	24 VDC	NPN/PNP	ZW-5000T

●Cable

Appearance	Item	Cable length	Model
		2 m	ZW-XF5002R
	Extension Fiber Cable (from	5 m	ZW-XF5005R
	Sensor Head to Sensor Controller), (Fiber Adapter ZW-XFC2 is included)	10 m	ZW-XF5010R
		20 m	ZW-XF5020R
		30 m	ZW-XF5030R
	Fiber Adapter (used between Sensor Head pre-wired cable and Extension Fiber Cable)	_	ZW-XFC2

Note: Extension Fiber Cable ZW-XF50 R can be used with the firmware version 2.100 or later. If you have an old version Sensor Controller, register as a Sysmac member and download the latest firmware and tools to update your Sensor Controller. Refer to the Sysmac member registration sheet that is enclosed with the Sensor Controller for details on member registration and firmware download.

●Common cables

Appearance	Item	Cable length	Model
	Parallel caable for ZW-8000T/7000T/5000T 32-pole (included with Sensor Controller ZW-8000T/7000T/5000T)	2 m	ZW-XCP2E
	RS-232C Cable for personal computer	2 m	ZW-XRS2
	RS-232C Cable for PLC/programmable terminal	2 m	ZW-XPT2

● Recommended Ether CAT Communications Cables

Use Straight STP (shielded twisted-pair) cable of category 5 or higher with double shielding (braiding and aluminum foil tape) for EtherCAT.

●Cable with Connectors

Item	Appearance	Recommended manufacturer	Cable length(m) *1	Model
Standard type			0.3	XS6W-6LSZH8SS30CM-Y
Cable with Connectors on Both Ends			0.5	XS6W-6LSZH8SS50CM-Y
RJ45/RJ45)			1	XS6W-6LSZH8SS100CM-Y
Wire Gauge and Number of Pairs: AWG26, 4-pair Cable		OMRON	2	XS6W-6LSZH8SS200CM-Y
Cable Sheath material: LSZH *2			3	XS6W-6LSZH8SS300CM-Y
Cable color: Yellow *3			5	XS6W-6LSZH8SS500CM-Y
			0.3	XS5W-T421-AMD-K
Rugged type	-	OMRON	0.5	XS5W-T421-BMD-K
Cable with Connectors on Both Ends	N. C.		1	XS5W-T421-CMD-K
(RJ45/RJ45) Wire Gauge and Number of Pairs: AWG22, 2-pair Cable	*0		2	XS5W-T421-DMD-K
			5	XS5W-T421-GMD-K
			10	XS5W-T421-JMD-K
		OMRON	0.3	XS5W-T421-AMC-K
Rugged type			0.5	XS5W-T421-BMC-K
Cable with Connectors on Both Ends			1	XS5W-T421-CMC-K
M12 Straight/RJ45) Vire Gauge and Number of Pairs:			2	XS5W-T421-DMC-K
AWG22, 2-pair Cable			5	XS5W-T421-GMC-K
			10	XS5W-T421-JMC-K
			0.3	XS5W-T422-AMC-K
Rugged type	-		0.5	XS5W-T422-BMC-K
Cable with Connectors on Both Ends		OMBON	1	XS5W-T422-CMC-K
M12 Right-angle/RJ45) Vire Gauge and Number of Pairs:	57)	OMRON	2	XS5W-T422-DMC-K
WG22, 2-pair Cable			5	XS5W-T422-GMC-K
			10	XS5W-T422-JMC-K

● Cables / Connectors

Wire Gauge and Number of Pairs: AWG24, 4-pair Cable

Item	Appearance	Recommended manufacturer	Model	
	_	Hitachi Metals, Ltd.	NETSTAR-C5E SAB 0.5 × 4P CP *	
Cables	_	Kuramo Electric Co.	KETH-SB *	
	_	SWCC Showa Cable Systems Co.	FAE-5004 *	
RJ45 Connectors	_	Panduit Corporation	MPS588-C *	

^{*} We recommend to use above cable and connector together.

Wire Gauge and Number of Pairs: AWG22, 2-pair Cable

	, I		
Item	Appearance	Recommended manufacturer	Model
Cables	_	Kuramo Electric Co.	KETH-PSB-OMR *
Cables	_	JMACS Japan Co.,Ltd.	PNET/B *
RJ45 Assembly Connector	consecu	OMRON	XS6G-T421-1 *

Note: Connect both ends of cable shielded wires to the connector hoods.

Note: For details, refer to Cat.No.G019.

*1. Standard type cables length 0.2, 0.3, 0.5, 1, 1.5, 2, 3, 5, 7.5, 10, 15 and 20m are available.
Rugged type cables length 0.3, 0.5, 1, 2, 3, 5, 10 and 15m are available.

*2. The lineup features Low Smoke Zero Halogen cables for in-cabinet use and PUR cables for out-of-cabinet use.

*3. Cables colors are available in blue, yellow, or Green

We recommend to use above cable and connector together.

ZW-8000/7000/5000 Series

Industrial switching hubs for Ethernet

Appearance	Number of ports	Failure detection	Current consumption	Model
	3	None	0.22A	W4S1-03B
and a	E	None	0.22A	W4S1-05B
2 E	5 Supported	Supported	0.22A	W4S1-05C

Note: Industrial switching hubs are cannot be used for EtherCAT.

EtherCAT junction slaves

Appearance	e Number of ports Power supply voltage		Current consumption	Model
	3	20.4 to 28.8 VDC	0.08A	GX-JC03
Ec Cc	6	(24 VDC -15 to 20%)	0.17A	GX-JC06

Note: 1. Please do not connect EtherCAT junction slave with OMRON position control unit, Model CJ1W-NC□81/□82.

2. EtherCAT junction slaves cannot be used for EtherNet/IP™ and Ethernet.

Automation Software Sysmac Studio

Please purchase a DVD and required number of licenses the first time you purchase the Sysmac Studio. DVDs and licenses are available individually.

Each model of licenses does not include DVD.

Item	Specifications			Model	Standards
nem	opeomoditions -	Number of licenses	Media	Model	Otanuarus
	The Sysmac Studio is the software that provides an integrated environment for setting, programming, debugging and maintenance of machine automation controllers including the NJ/NX-series CPU Units, NY-series Industrial PC,	(Media only)	DVD	SYSMAC-SE200D	_
Standard Edition	EtherCat Slave, and the HMI. Sysmac Studio runs on the following OS. Windows 7 (32-bit/64-bit version)/Windows 8 (32-bit/64-bit version)/ Windows 8.1 (32-bit/64-bit version)/Windows 10 (32-bit/64-bit version) This software provides functions of the Measurement Sensor Edition. Refer to your OMRON website for details.	1 license*1	_	SYSMAC-SE201L	_
Sysmac Studio Measurement	Sysmac Studio Measurement Sensor Edition is a limited license that provides selected functions required for ZW-series Displacement Sensor settings.	1 license	_	SYSMAC-ME001L	_
Sensor Edition Ver.1.□□	Because this product is a license only, you need the Sysmac Standard Edition DVD media to install it.	3 license	_	SYSMAC-ME003L	_

^{*1.} Multiple licenses are available for the Sysmac Studio (3, 10, 30, or 50 licenses). *2. ZW-8000/7000/5000 is supported by Sysmac Studio version 1.22 or higher.

Fiber Cleaner

Item	Recommended manufacturer	Model		Contacts			
item	necommended manufacturer	Wodei	ZW-8000	ZW-7000	ZW-5000	Comacis	
Fiber Connector Cleaner *1	OMRON	ZW-XCL	Yes	Yes	Yes	OMRON	
NEOCLEAN-M	NITT Advanced	ATC-NE-M1	No	Yes	No		
OPTIPOP R1	NTT Advanced Technology Corporation	ATC-RE-01	Yes (Sensor Head only)	No	Yes (Sensor Head only)	*2	

^{*1.} Place orders in units of boxes (contacting 10 units).
*2. Contacts

[Request for an Estimate]
http://www.ntt-at.com/product/optical_cleaner/Distributors.html

[Request for Information]

MUZA Kawasaki Central Tower, 1310 Omiya-cho Saiwai-ku, Kawasaki-shi, Kanagawa, 212-0014, Japan TEL: +81 44 589 5894 http://www.ntt-at.com/product/optical_cleaner/

Specifications

Sensor Head

ZW-S8010/S8020/S8030/SP8007/SP8010/SPR8007/SPR8010

	Specifications									
Item	ZW-S8010	ZW-S8020	ZW-S8030	ZW-SP8007	ZW-SP8010	ZW-SPR8007	ZW-SPR8010			
Sensor controller	ZW-8000T	•	•	•	•	•	•			
Sensor head type	Square-shaped s	straight type		Pen-shaped straight type		Pen-shaped right angle type				
Measurement center distance *1	distance *1 10 mm 20 mm 30 mm		7 mm	10 mm	7 mm	10 mm				
Measuring range *2	±0.5 mm	±1mm	±2mm	±0.3 mm	±0.7 mm	±0.3 mm	±0.7 mm			
Static resolution *3	0.25 μm	0.25 μm								
Linearity *4	±0.3 µm	±0.6 µm	±1.3 µm	±0.3 µm	±0.45 μm	±0.45 μm	±0.7 μm			
Spot diameter (Total measurent range) *5	4 μm dia.	7 μm dia.	10 μm dia.	7 μm dia.	10 μm dia.	8 μm dia.	11 µm dia.			
Measurement cycle *6	60 μs to 7,500 μs	3								
Operating ambient illumination	Illumination on ol	oject surface max	.30000 Lx: (incand	escent light)						
Ambient temperature range	Operation: 0 to 5 (No freezing and	0°C, Storage: -15 condensation)	to +60°C							
Ambient humidity range	Operation/storag	Operation/storage: 35 or 85%RH (No condensation)								
Degree of protection	IP40 (IEC60529)	IP40 (IEC60529)								
Vibration resistance (destructive)	10 to 150 Hz (ha	10 to 150 Hz (half amplitude 0.35 mm), 80 mins in each of X/Y/Z directions								
Shock resistance (destructive)	150 m/s ² , 6 direc	tion, 3 times each	(up/down, left/righ	nt, forward/backwar	d)					
Temperature characteristic *7	0.6 μm/°C (0.2 μm/°C)	1.1 μm/°C (0.5 μm/°C)	1.8 μm/°C (1.0 μm/°C)							
LED Safety	Risk Group 3 (IE	C62471)								
Material	Chassis: aluminum die cast Fiber cable sheath: PVC Calibration ROM: PC			Chassis: SUS Fiber cable shea Calibration ROM Mounting Plate:	: PC	Chassis: SUS, aluminum Fiber cable sheath: PVC Calibration ROM: PC Mounting Plate: Aluminum				
Fiber cable length	0.3 m, 2 m (flex-i	resistant cable)				•				
Fiber cable minimum bend radius	20 mm									
Insulation resistance (Calibration ROM)	Between case ar	nd all terminals: 20	0 MΩ (by 250 VDC)						
Dielectric strength (Calibration ROM)	Between case ar	nd all terminals: 10	000 VAC, 50/60 Hz	z, 1 min						
Weight		h 0.3m Approx. 17 h 2m Approx. 180		Fiber cable length 0.3m Approx. 27 g Fiber cable length 2m Approx. 37 g Fiber cable length 2m Approx. 37 g Fiber cable length 2m Approx. 41 g						
Accessories	Calibration ROM fixing screw $(M2\times5mm)\times1$, Fiber cable protective cap \times 1, Strap \times 1, Instruction Manual, Precautions Installation plate \times 1, Unit fixing screws $(M2\times10 \text{ mm})\times4$, Calibration ROM fixing screws $(M2\times5 \text{ mm})\times1$, Fiber cable protective cap \times 1, Strap \times 1, Instruction Manual, Precautions) × 4,			

^{*1.} Indicates the distance from the front of the sensor head. The pen-shaped right angle type has a maximum individual difference of ±0.15 mm in the distance from the front of the sensor head.

- *2. The measurement range is higher 100 μs than measurement cycle.
- *3. Capacity value when OMRON standard mirror surface target is measured at the measurement center distance as the average of 16,384 times. The value when the Sensor Controller ZW-8000T is connected.
- *4. Material setting for the OMRON standard mirror surface target: Error from an ideal straight line when measuring on mirror surface.
- *5. Capacity value defined by 1/e² (13.5%) of the peak optical intensity of the measurement wavelength.
- *6. When an extension fiber cable of 2 m or longer is connected, the setting rage of the measurement cycle (exposure time) changes. For details, refer to Setting Measurement Cycle in the ZW-8000/7000/5000 User's Manual (Cat. No. Z362).
- *7. Actual value of the change in measurement value at the measurement center distance when fastened with an aluminum jig between the Sensor Head and the target, and with the Sensor Head and the Sensor Controller set in the same temperature environment.

 The value in parentheses is the actual value when using an SUS304 jig.

When measuring the thickness, the value is calculated from the difference between the heights of the surface and rear surface, so there is no effect on the temperature change.

ZW-S7010/S7020/S7030/S7040/SP7007/SP7010/SPR7007/SPR7010

	Specifications										
Item	ZW-S7010	ZW-S7020	ZW-S7030	ZW-S7040	ZW-SP7007	ZW-SP7010	ZW-SPR7007	ZW-SPR7010			
Sensor controller	ZW-7000T										
Sensor head type	Square-shape	d straight type			Pen-shaped st	traight type	Pen-shaped right angle type				
Measurement center distance *1	10 mm	10 mm 20 mm 30 mm 40 mm 7 i			7 mm	10 mm	7 mm	10 mm			
Measuring range *2	±0.5 mm	±1 mm	±2 mm	±3 mm	±0.3 mm	±0.7 mm	±0.3 mm	±0.7 mm			
Static resolution *3	0.25 μm	.25 μm									
Linearity *4	±0.45 μm	±0.9 µm	±2.0 μm	±3.0 µm	±0.45 μm	±0.7 μm	±0.7 μm	±1.1 µm			
Spot diameter (Total measurent range) *5	50 µm dia.	70 µm dia.	100 µm dia.	120 µm dia.	130 µm dia.	170 µm dia.	150 µm dia.	190 µm dia.			
Measurement cycle *6	20 μs to 400 μ	s									
Operating ambient illumination	Illumination on	object surface i	max.30000 Lx: (i	ncandescent lig	ht)						
Ambient temperature range		peration: 0 to 50°C, Storage: -15 to +60°C No freezing and condensation)									
Ambient humidity range	Operation/stor	Operation/storage: 35 or 85%RH (No condensation)									
Degree of protection	IP40 (IEC6052	P40 (IEC60529)									
Vibration resistance (destructive)	10 to 150 Hz (10 to 150 Hz (half amplitude 0.35 mm), 80 mins in each of X/Y/Z directions									
Shock resistance (destructive)	150 m/s², 6 direction, 3 times each (up/down, left/right, forward/backward)										
Temperature characteristic *7						0.8 μm/°C (0.4 μm/°C)	0.8 μm/°C (0.4 μm/°C)				
LED Safety	Risk Group 3 (IEC62471)	•	•		•		•			
Material	Chassis: aluminum die cast Fiber cable sheath: PVC Calibration ROM: PC				Chassis: SUS Fiber cable sh Calibration RC Mounting Plate	M: PC	Chassis: SUS, aluminum Fiber cable sheath: PVC Calibration ROM: PC Mounting Plate: Aluminum				
Fiber cable length	0.3 m, 2 m (fle	x-resistant cable	e)								
Fiber cable minimum bend radius	20 mm										
Insulation resistance (Calibration ROM)	Between case and all terminals: 20 MΩ (by 250 VDC)										
Dielectric strength (Calibration ROM)	Between case	Between case and all terminals: 1000 VAC, 50/60 Hz, 1 min									
Weight	Fiber cable length 0.3m Approx. 170g Approx. 27 g Approx. 31 g Fiber cable length 2m Approx. 180g Fiber cable length 2m Approx. 37 g Approx. 41 g						•				
Accessories	Calibration ROM fixing screw (M2×5mm) × 1, Fiber cable protective cap × 1, Strap × 2, Instruction Manual, Precautions Approx. 37 g Approx. 47 g Installation plate × 1, Unit fixing screws (M2 × 10 Calibration ROM fixing screw (M2 × 5 mm) × 1, Fiber cable protective cap × 1, Strap × 2, Instruction Manual, Precautions										

^{*1.} Indicates the distance from the front of the sensor head. The pen-shaped right angle type has a maximum individual difference of ±0.15 mm in the distance from the front of the sensor head.

- $^{\star}2.\;\;$ The measurement range is higher 28 μs than measurement cycle.
- *3. Capacity value when OMRON standard mirror surface target is measured at the measurement center distance as the average of 16,384 times. The value when the Sensor Controller ZW-7000T is connected.
- *4. Material setting for the OMRON standard mirror surface target: Error from an ideal straight line when measuring on mirror surface.
- *5. Capacity value defined by 1/e² (13.5%) of the peak optical intensity of the measurement wavelength.
- *6. When an extension fiber cable of 10 m or longer is connected, the setting rage of the measurement cycle (exposure time) changes. For details, refer to Setting Measurement Cycle in the ZW-8000/7000/5000 User's Manual (Cat. No. Z362).
- *7. Actual value of the change in measurement value at the measurement center distance when fastened with an aluminum jig between the Sensor Head and the target, and with the Sensor Head and the Sensor Controller set in the same temperature environment.

The value in parentheses is the actual value when using an SUS304 jig.

When measuring the thickness, the value is calculated from the difference between the heights of the surface and rear surface, so there is no effect on the temperature change.

ZW-S5010/S5020/S5030/SP5007/SP5010/SPR5007/SPR5010

	Specifications									
Item	ZW-S5010	ZW-S5020	ZW-S5030	ZW-SP5007	ZW-SP5010	ZW-SPR5007	ZW-SPR5010			
Sensor controller	ZW-5000T									
Sensor head type	Square-shaped straight type			Pen-shaped stra	ight type	Pen-shaped right angle type				
Measurement center distance *1	10 mm	20 mm	30 mm	7 mm 10 mm		7 mm	10 mm			
Measuring range	±0.5 mm	±1 mm	±2 mm	±0.3 mm	±0.7 mm	±0.3 mm	±0.7 mm			
Static resolution *2	0.25 μm).25 μm								
Linearity *3	±0.45 µm	±0.9 µm	±2.0 μm	±0.45 μm	±0.7 µm	±0.7 µm	±1.1 µm			
Spot diameter (Total measurent range) *4	9 μm dia.	13 µm dia.	18 µm dia.	13 µm dia.	18 µm dia.	15 µm dia.	20 µm dia.			
Measurement cycle *5	80 μs to 1,600 μs	3								
Operating ambient illumination	Illumination on ol	bject surface max.	30000 Lx: (incand	escent light)						
Ambient temperature range		Operation: 0 to 50°C, Storage: -15 to +60°C (No freezing and condensation)								
Ambient humidity range	Operation/storag	Operation/storage: 35 or 85%RH (No condensation)								
Degree of protection	IP40 (IEC60529)									
Vibration resistance (destructive)	10 to 150 Hz (half amplitude 0.35 mm), 80 mins in each of X/Y/Z directions									
Shock resistance (destructive)	150 m/s², 6 direction, 3 times each (up/down, left/right, forward/backward)									
Temperature characteristic *6	0.6 μm/°C (0.2 μm/°C)	1.1 μm/°C (0.5 μm/°C)	1.8 μm/°C (1.0 μm/°C)	0.8 μm/°C		0.8 μm/°C (0.4 μm/°C)	0.8 μm/°C (0.4 μm/°C)			
LED Safety	Risk Group 3 (IE	C62471)	•		•		•			
Material	Chassis: aluminum die cast Fiber cable sheath: PVC Calibration ROM: PC			Chassis: SUS Fiber cable shea Calibration ROM Mounting Plate:	I: PC	Chassis: SUS, aluminum Fiber cable sheath: PVC Calibration ROM: PC Mounting Plate: Aluminum				
Fiber cable length	0.3 m, 2 m (flex-	resistant cable)		'						
Fiber cable minimum bend radius	20 mm									
Insulation resistance (Calibration ROM)	Between case ar	nd all terminals: 20) MΩ (by 250 VDC)						
Dielectric strength (Calibration ROM)	Between case ar	nd all terminals: 10	000 VAC, 50/60 Hz	z, 1 min						
Weight		h 0.3m Approx. 17 h 2m Approx. 180		Fiber cable length 0.3m Approx. 29 g Fiber cable length 2m Approx. 39 g Fiber cable length 2m Approx. 39 g Fiber cable length 2m Approx. 43g						
Accessories		fixing screw (M2× ective cap × 1, Stra al, Precautions		Installation plate \times 1, Unit fixing screws (M2 \times 10 mm) \times 4, Calibration ROM fixing screw (M2 \times 5 mm) \times 1, Fiber cable protective cap \times 1, Strap \times 1, Instruction Manual, Precautions						

^{*1.} Indicates the distance from the front of the sensor head. The pen-shaped right angle type has a maximum individual difference of ±0.15 mm in the distance from the front of the sensor head.

- *3. Material setting for the OMRON standard mirror surface target: Error from an ideal straight line when measuring on mirror surface.
- $^{\star}4$. Capacity value defined by 1/e2 (13.5%) of the peak optical intensity of the measurement wavelength.
- *5. When an extension fiber cable of 5 m or longer is connected, the setting rage of the measurement cycle (exposure time) changes. For details, refer to Setting Measurement Cycle in the ZW-8000/7000/5000 User's Manual (Cat. No. Z362).
- *6. Actual value of the change in measurement value at the measurement center distance when fastened with an aluminum jig between the Sensor Head and the target, and with the Sensor Head and the Sensor Controller set in the same temperature environment.

 The value in parentheses is the actual value when using an SUS304 jig.

When measuring the thickness, the value is calculated from the difference between the heights of the surface and rear surface, so there is no effect on the temperature change.

^{*2.} Capacity value when OMRON standard mirror surface target is measured at the measurement center distance as the average of 16,384 times. The value when the Sensor Controller ZW-5000T is connected.

ZW-8000/7000/5000 Series

Sensor Controller

H				Specifications				
Item				ZW-8000T	ZW-7000T	ZW-5000T		
Input/output t	уре			NPN/PNP dual type				
Number of co	nnected sensor	heads		1				
Sensor head	compatibility			ZW-S80 ZW-SP80 ZW-SPR80	ZW-S70 ZW-SP70 ZW-SPR70	ZW-S50 ZW-SP50 ZW-SPR50		
LED Safety				Risk Group 3 (IEC62471)				
Segment	Main display			11-segment white display, 6 di	gits			
Display	Sub-display			11-segment green display, 6 d	igits			
LED display	Status indicat	tors			LOW (orange), STABILITY (gre D-H (orange), THRESHOLD-L (
LED display	EtherCAT ind	icator		ECAT RUN (green), L/A IN (Lin ECAT ERR (red)	nk/Activity IN) (green), L/A OUT	(Link/Activity OUT) (green),		
	Ethernet			100BASE-TX/10BASE-T, Non-	-procedure (TCP/UDP), EtherNe	et/IP		
	EtherCAT			EtherCAT exclusive protocol 1	00BASE-TX			
	RS-232C			Max. 115,200 bps				
	Analog output	Analog v	oltage output (OUT V)	-10 V to +10 V, output impedar	nce: 100 Ω			
	terminal block	Analog c	urrent output (OUT A)	4 mA to 20 mA, max. load resi	stance: 300 Ω			
			nt output ASS/LOW)					
		Busy output (BUSY)						
		Alarm output (ALARM)						
		Enable o	utput (ENABLE)	Transistor output system Output voltage: 21.6 to 30 VDC Load current: 50 mA or less				
		Sync flag	g output (SYNFLG)					
		Trigger busy output (TRIGBUSY)		Residual voltage when turning ON: 2 V or less Leakage voltage when turning OFF: 0.1 mA or less				
		Logging state output (LOGSTAT) Logging error output (LOGERR) Stability output (STABILITY) Task state output (TASKSTAT)						
External I/F								
		LIGHT O	FF input (LIGHT OFF)					
	32-pole expansion	Zero rese	et input (ZERO)	DC input system				
	connector			Input system Input voltage: 24 VDC ± 10% (21.6 to 26.4 VDC) Input current: 7 mA Type. (24 VDC) ON voltage/ON current: 19 V/3 mA or less				
			ut (SYNC)	ON voltage/ON current: 19 V/3				
		Trigger input (TRIG)		_				
		Logging	input (LOGGING)					
		Bank	Currently selected bank output (BANK_OUT 1 to 3)	Transistor output system Output voltage: 21.6 to 30 VDC Load current: 50 mA or less Residual voltage when turning Leakage voltage when turning	ON: 2 V or less			
		Zum	Bank Selection input (BANK_SEL 1 to 3)	DC input system Input voltage: 24 VDC ± 10% (Input current: 7 mA Type. (24 VON voltage/ON current: 19 V/3 OFF voltage/OFF current: 5 V/	VDC) 3 mA or more			

Item		Specifications			
		ZW-8000T	ZW-7000T	ZW-5000T	
	Exposure time	Automatic/Fixed			
	Measuring cycle *1	60 μs to 7,500 μs	20 μs to 400 μs	80 μs to 1,600 μs	
	Material setting	Standard/Mirror/Rough surfaces			
	Measurement item	Height/Thickness of transparent object/Calculation			
	Filtering	Median/Average/Differentiation/High pass/Low pass/Band pass			
Main	Output	Scaling/Different holds/Zero reset/Logging for a measured value/Keep, Clamp			
functions	Display	Measured value/Threshold value/Analog output voltage or current value/Judgment result/ Resolution/Light power/Internal logging condition/Peak amount of received light			
	Number of configurable banks		NORMAL mode: Max. 8 banks JUDGMENT mode: Max. 32 banks		
	Task process	Multi-task (up to 4 tasks per ba	Multi-task (up to 4 tasks per bank)		
	System	Save/Initialization/Display measured information/Communication settings/ Sensor head calibration/Key-lock/Zero reset memory/Timing input			
	Power supply voltage	21.6 to 26.4 VDC (including ripple)			
Datina	Current consumption	700 mA or less	800 mA or less		
Rating	Insulation resistance	Across all lead wires and FG terminal: 20 M Ω (by 250 VDC)			
	Dielectric strength	Between all lead wires and FG terminal: 500 VAC, 50/60 Hz, 1 minute			
	Degree of protection	IP20 (IEC60529)			
	Vibration resistance (destructive)	10 to 55 Hz (half amplitude 0.3	10 to 55 Hz (half amplitude 0.35 mm), 50 mins in each of X/Y/Z directions		
Environmental resistance	Shock resistance (destructive)	150 m/s², 6 direction, 3 times each (up/down, left/right, forward/backward)			
	Ambient temperature range	Operation: 0 to 40°C, Storage: -15 to +60°C (No freezing and condensation)			
	Ambient humidity range	Operation/storage: 35 to 85%	Operation/storage: 35 to 85%RH (No condensation)		
Grounding			D-type grounding (grounding resistance of 100 Ω or less) Note: For conventional Class D grounding		
Material		Chassis: PC			
Weight		Approx. 950g (main unit only), Approx. 150 g (Parallel cable) Approx. 900g (main unit only), Approx. 150 g (Parallel cable)), Approx. 150 g (Parallel cable)	
Accessories		Parallel cable (ZW-XCP2E) × 10 Fiber cleaners (ZW-XCL) × Instruction Manual Member registration sheet Precautions		Parallel cable (ZW-XCP2E) × 10 Fiber cleaners (ZW-XCL) × Fiber adapter cap × 1 Strap × 1 Instruction Manual Member registration sheet Precautions	

Note: The Export Trade Control Order compatible Sensor Controller (ZW-8000T/7000T/5000T) is available.

When using this Controller, the minimum resolution is 0.25 µm regardless of the connected Sensor Head and setting conditions.

*1. When an extension fiber cable of 2 m or longer (on the ZW-8000 series), 10 m or longer (on the ZW-7000 series) or 5 m or longer (on the ZW-5000 series) is connected, the setting rage of the measurement cycle (exposure time) changes. For details, refer to Setting Measurement Cycle in the ZW-8000/7000/5000 User's Manual (Cat. No. Z362).

EtherCAT Communications Specifications

Item	Specification
Communications standard	IEC61158 Type12
Physical layer	100BASE-TX(IEEE802.3)
Connectors	RJ45 × 2 ECAT IN: EtherCAT input ECAT OUT: EtherCAT output
Communications media	Category 5 or higher (cable with double, aluminum tape and braided shielding) is recommended.
Communications distance	Distance between nodes: 100 m max.
Process data	Variable PDO mapping
Mailbox (CoE)	Emergency messages, SDO requests, SDO responses, and SDO information
Distributed clock	Synchronization in DC mode.
LED display	L/A IN (Link/Activity IN) × 1, AL/A OUT (Link/Activity OUT) × 1, AECAT RUN × 1, AECAT ERR × 1

Automation Software Sysmac Studio

Item	Operating environment *3	
Operating system (OS) *1	Windows 7 (32-bit/64-bit version)/Windows 8 (32-bit/64-bit version)/Windows 8.1 (32-bit/64-bit version)/Windows 10(32-bit/64-bit version)	
CPU	Windows computers with Intel® Celeron® processor 540 (1.8 GHz) or faster CPU. Intel® Core™ i5 M520 processor (2.4 GHz) or equivalent or faster recommended.	
Main memory	2 GB min. 4 GB min. recommended	
Hard disk	Minimum 4.6 GB of Hard disk space is required to install. *2	
Display	XGA 1024 × 768, 16,000,000 colors WXGA 1280 × 800 dots or higher resolution is recommended.	
Disk drive	DVD-ROM drive	
Communications ports	USB port corresponded to USB 2.0, or Ethernet port *4	
Supported languages	Japanese, English, German, French, Italian, Spanish, simplified Chinese, traditional Chinese, Korean	

- *1. Note about Sysmac Studio compatible operating systems: The required system and hard disk capacity differs according to the system environment.
- *2. Separate logging memory is required to use the file logging function.
- *3. Describes System Requirements and notes of Sysmac Studio Measurement Sensor Edition.
- For details on System Requirements and notes of Sysmac Studio Measurement Sensor Edition, refer to Sysmac Studio Version 1 Operation Manual.

 *4. For information on how to connect a personal computer with the controller or other hardware and information on required cables, refer to manuals for each hardware.

●Version Information

Sensor Head/Cable, Sensor Controller, and Sysmac Studio

The applicable version of the Sensor Controller varies depending on the Sensor Head or Cable. The versions are listed below. Use the latest version of Sysmac Studio Standard Edition/Measurement Sensor Edition.

Sensor hea	d/Cable	ZW Series Version of Sensor		Corresponding version of Sysmac Studio	
Туре	Model	Zw Series	Controller	Standard Edition/Measurement Sensor Edition	
Square-shaped straight type	ZW-S80□0 □M				
Pen-shaped straight type	ZW-SP8007 □M ZW-SP8010 □M	— ZW-8000□ Version 3.000 or later V	Version 1.22 or higher		
Pen-shaped right-angle type	ZW-SPR8007 □M ZW-SPR8010 □M				
Extension Fiber Cable	ZW-XF80□□R				
Square-shaped straight type	ZW-S70□0 □M		Version 2.030 or later		
Pen-shaped straight type	ZW-SP7007 □M ZW-SP7010 □M	ZW-7000□	Version 2.110 or later	Version 1.15 or higher	
Pen-shaped right-angle type	ZW-SPR7007 □M ZW-SPR7010 □M				
	ZW-XF7002R ZW-XF7005R		Version 2.030 or later		
Extension Fiber Cable	ZW-XF7010R ZW-XF7020R ZW-XF7030R		Version 2.100 or later		
Square-shaped straight type	ZW-S50□0 □M		Version 2.100 or later		
Pen-shaped straight type	ZW-SP5007 □M ZW-SP5010 □M	71M 5000	Version 2.110 or later	Varier 1 10 ay hinhay	
Pen-shaped right-angle type	ZW-SPR5007 □M ZW-SPR5010 □M	- ZW-5000□	version 2.110 or later	Version 1.18 or higher	
Extension Fiber Cable	ZW-XF50□□R		Version 2.100 or later		

Note: Refer to the Firmware Update in the ZW-8000/7000/5000 User's Manual (Cat. No. Z362) for how to update the Sensor Controller.

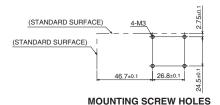
External Dimensions

(Unit: mm)

Sensor Head

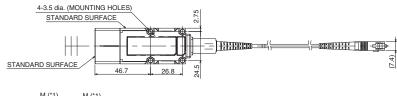
Square-shaped straight type ZW-S8010 □M/S8020 □M/S8030 □M

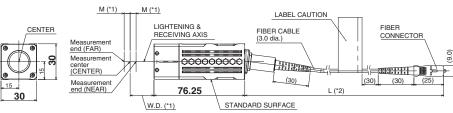




Туре W.D. М 10 0.5 ZW-S8020 20 1 ZW-S8030 30 2

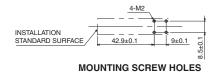
*2. Length 0.3 m (300) 2 m (2000)





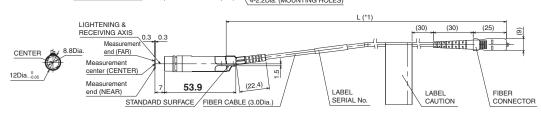
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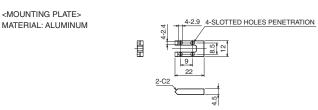


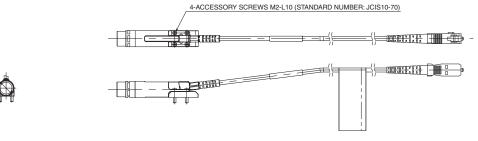




*1.		
L		
(300)		
(2000)		

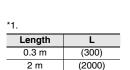


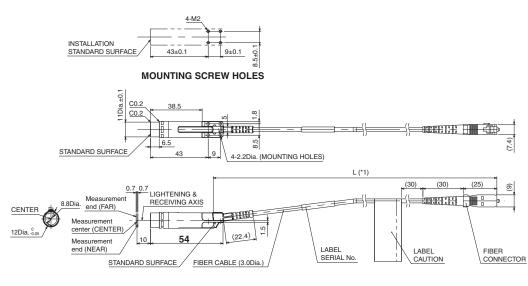


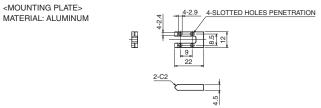


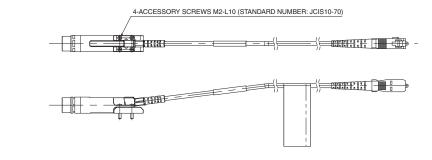
ZW-SP8010 □M

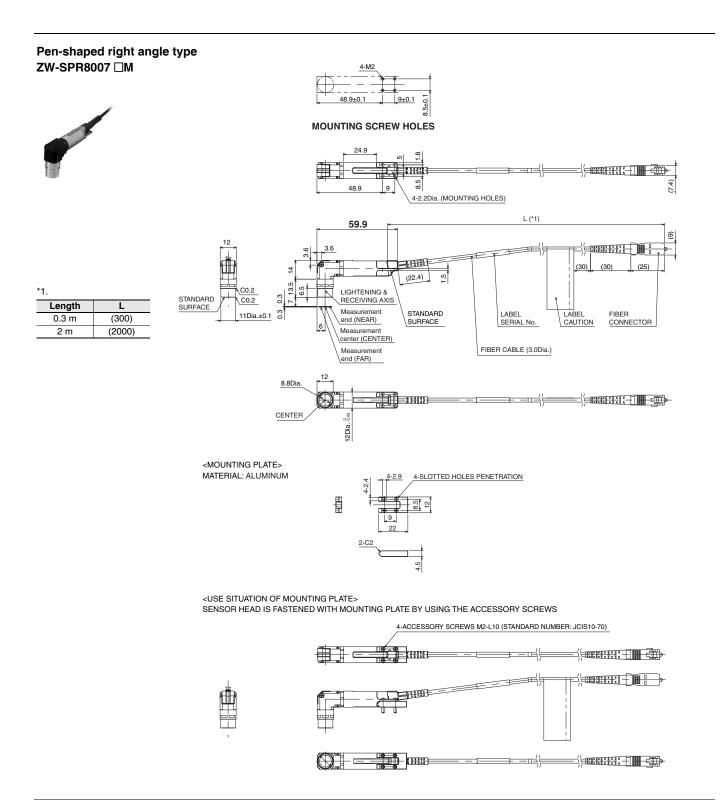


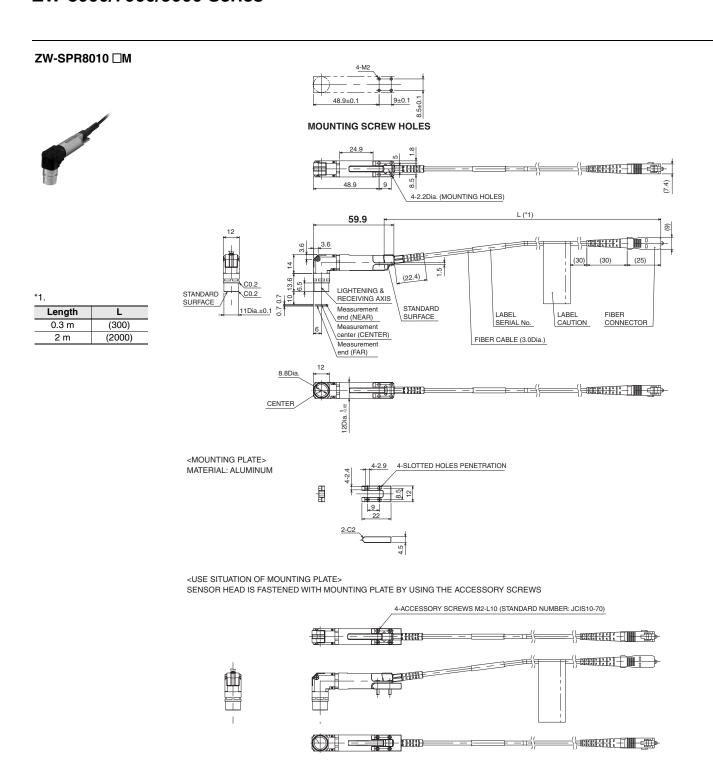






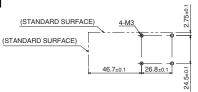






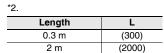
Square-shaped straight type

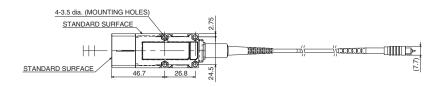


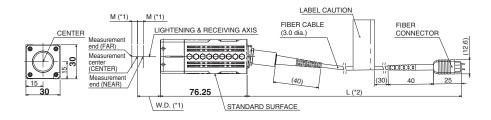


MOUNTING SCREW HOLES

1.		
Type	W.D.	M
ZW-S7010	10	0.5
ZW-S7020	20	1
ZW-S7030	30	2
ZW-S7040	40	3





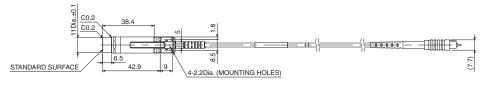


Pen-shaped straight type ZW-SP7007 □M

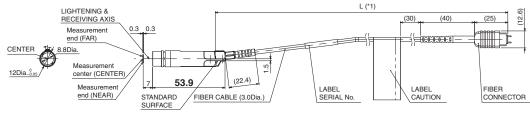




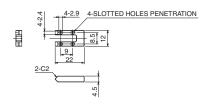
MOUNTING SCREW HOLES

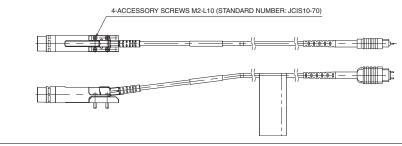




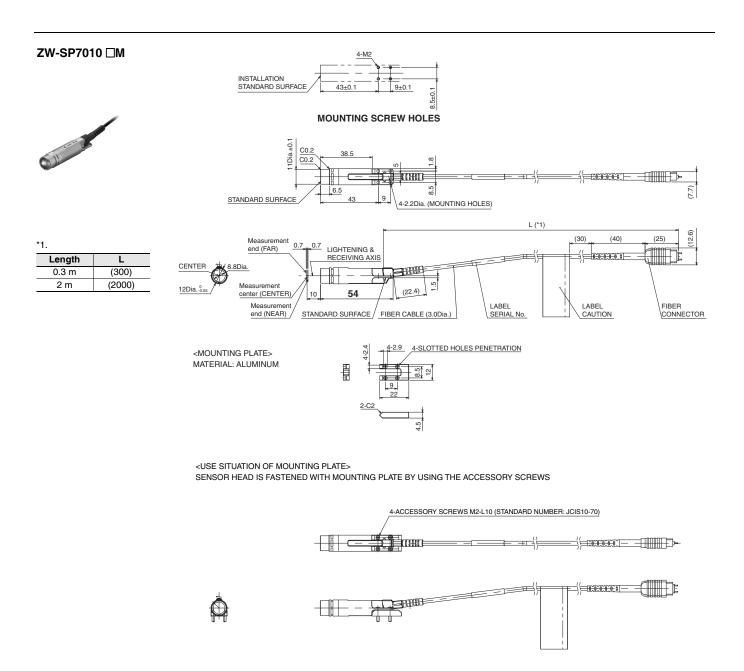


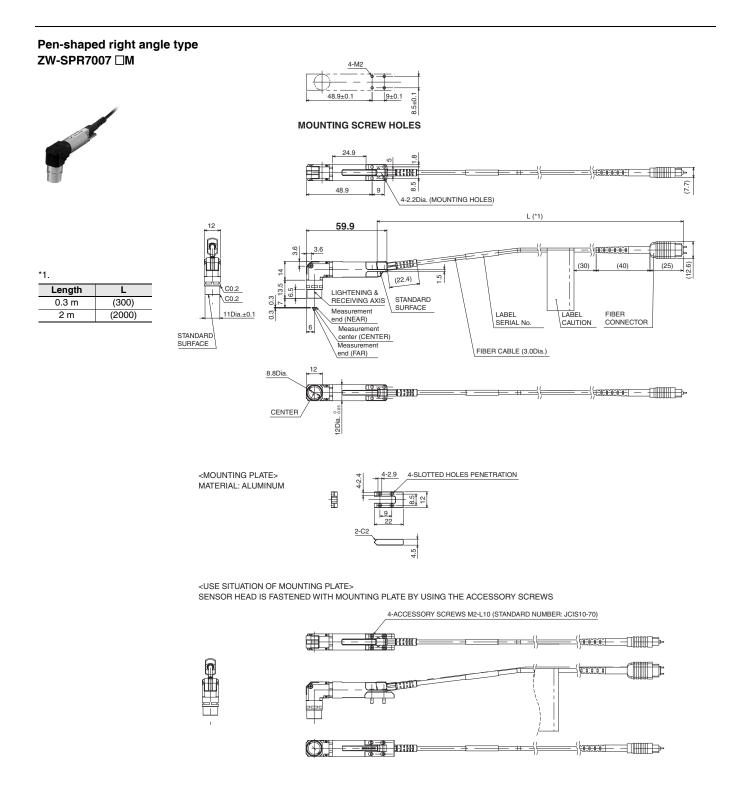


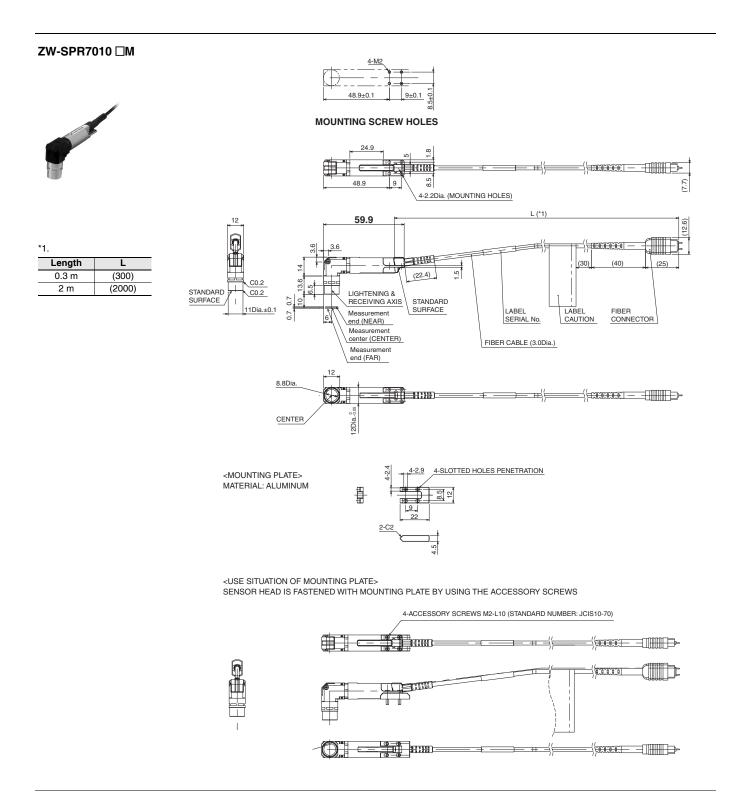






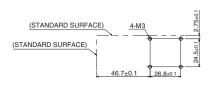




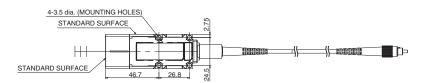


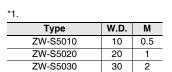
Square-shaped straight type ZW-S5010 □M/S5020 □M/S5030 □M

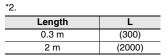


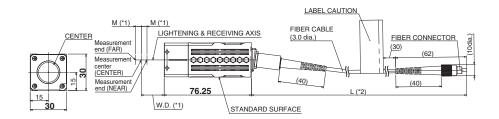


MOUNTING SCREW HOLES









Pen-shaped straight type ZW-SP5007 □M



Length

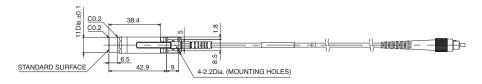
0.3 m

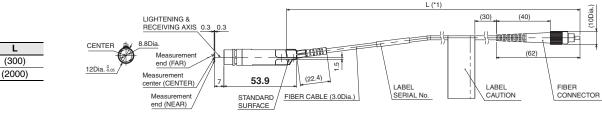
2 m



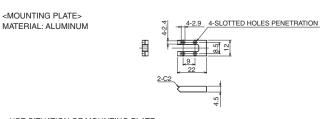
4-M2	
INSTALLATION	†
OTANDADD CUDEACE	8.5±0.1
MOUNTING COREW HOLE	

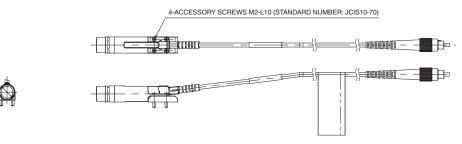
MOUNTING SCREW HOLES

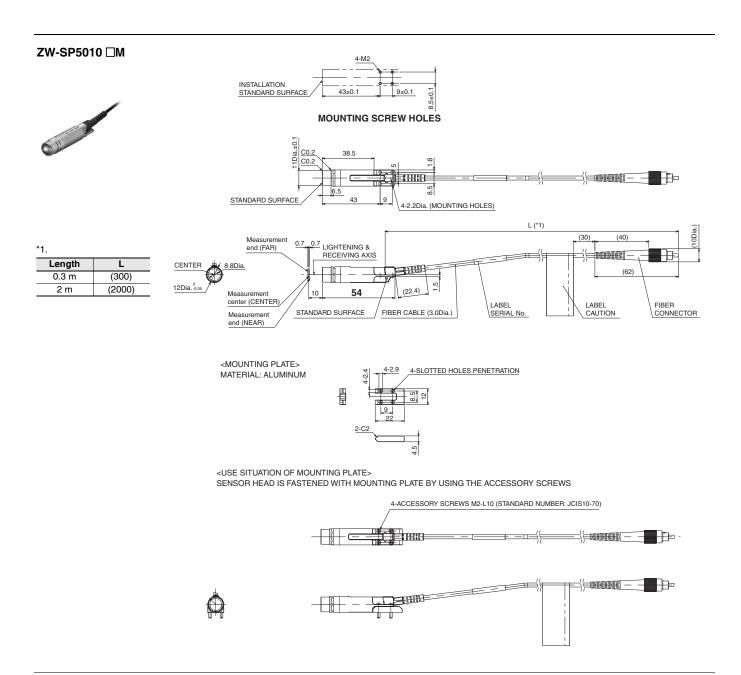


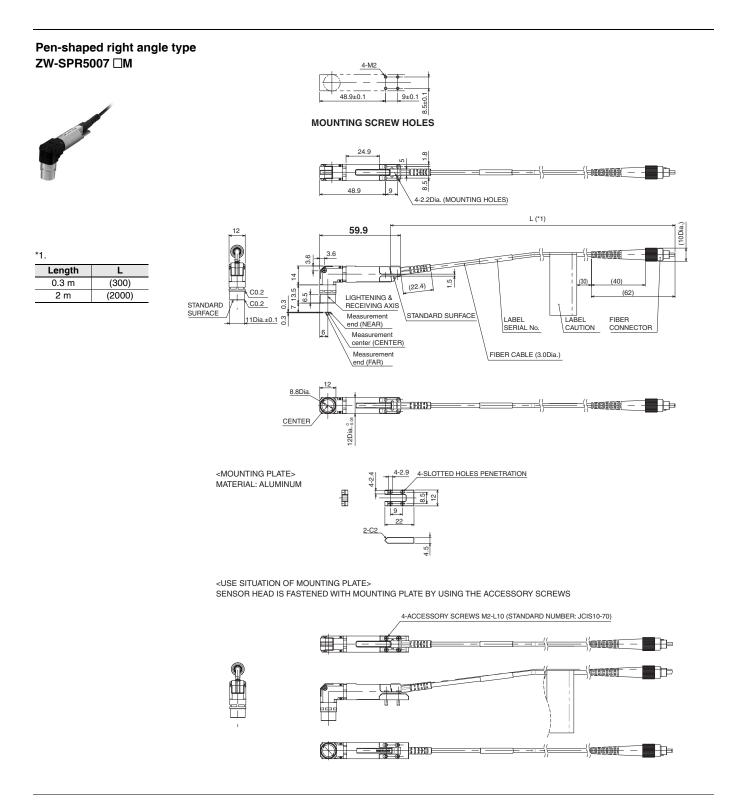


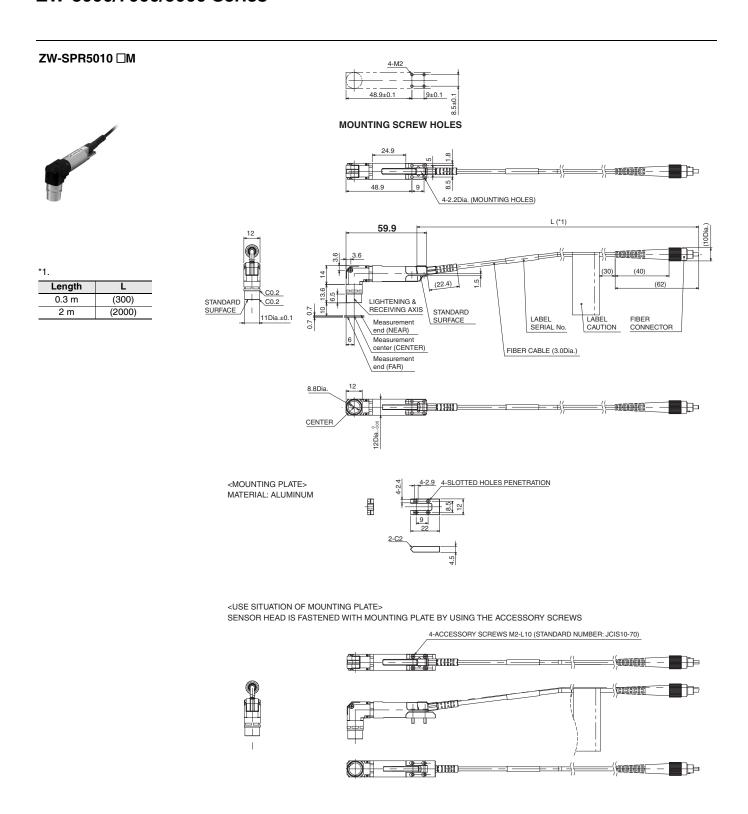








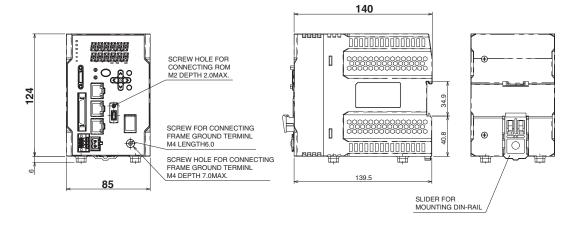


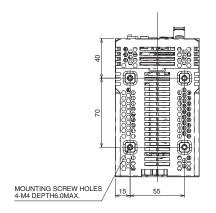


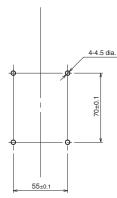
Sensor Controller

ZW-8000T







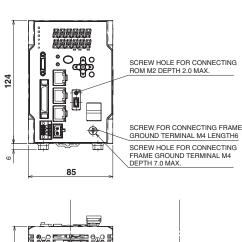


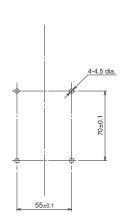
MOUNTING SCREW HOLES

ZW-7000T

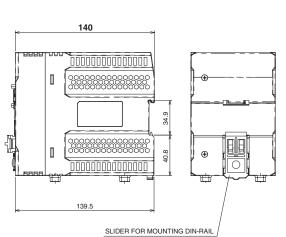


MOUNTING SCREW HOLES 4-M4 DEPTH6.0MAX.

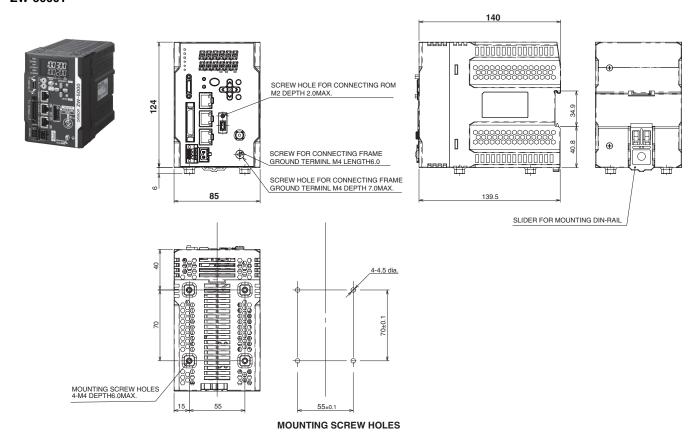




MOUNTING SCREW HOLES



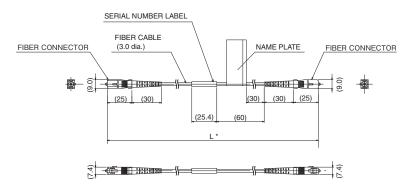
ZW-5000T

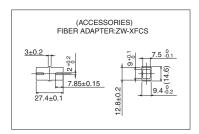


Extension Fiber Cable

ZW-XF8002R/XF8005R/XF8010R/XF8020R/XF8030R





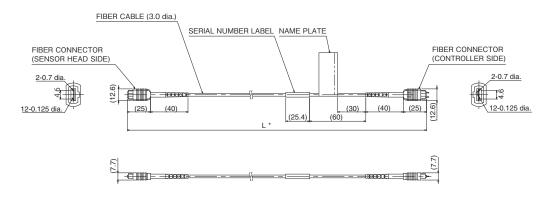


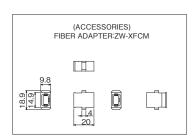
* The following table lists cable lengths per models.

-			
	Туре	Specification	L
	ZW-XF8002R	2 m	2000+40/0
	ZW-XF8005R	5 m	5000+100/0
	ZW-XF8010R	10 m	10000+200/0
	ZW-XF8020R	20 m	20000+400/0
•	ZW-XF8030R	30 m	30000+600/0

ZW-XF7002R/XF7005R/XF7010R/XF7020R/XF7030R





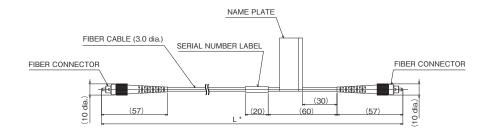


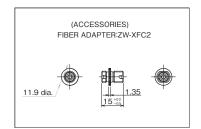
* The following table lists cable lengths per models.

Туре	Specification	L
ZW-XF7002R	2 m	2000+40/0
ZW-XF7005R	5 m	5000+100/0
ZW-XF7010R	10 m	10000+200/0
ZW-XF7020R	20 m	20000+400/0
ZW-XF7030R	30 m	30000+600/0

ZW-XF5002R/XF5005R/XF5010R/XF5020R/XF5030R







* The following table lists cable lengths per models.

Туре	Specification	L
ZW-XF5002R	2 m	2000+200/0
ZW-XF5005R	5 m	5000+200/0
ZW-XF5010R	10 m	10000+200/0
ZW-XF5020R	20 m	20000+500/0
ZW-XF5030R	30 m	30000+500/0

Related Manuals

Man.No.	Model number	Manual
Z362	ZW-8000□/7000□/5000□	Displacement Sensor ZW-8000/7000/5000 User's Manual
Z363	ZW-8000□/7000□/5000□	Displacement Sensor ZW-8000/7000/5000 User's Manual for Communications Settings
W504	SYSMAC-SE2	Sysmac Studio Version 1 Operation Manual

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- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

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