

Reliable measurements for any material and surface types

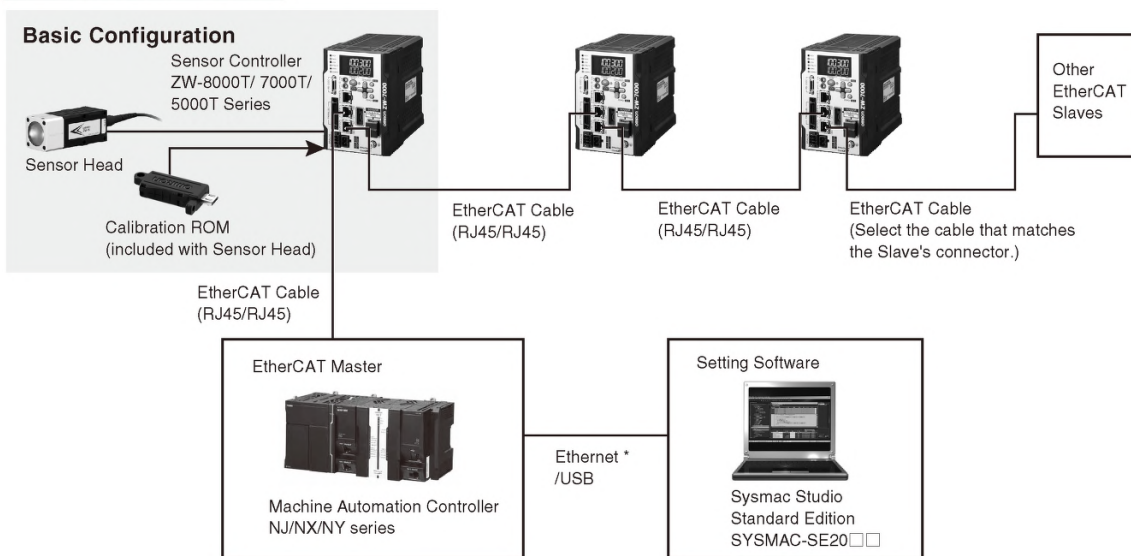
- Measuring shiny objects with an inclination of $\pm 25^\circ$
- $\pm 0.3 \mu\text{m}$ or less linearity for various materials
- Sampling rate as fast as $20 \mu\text{s}$
- Small spot diameter of $4 \mu\text{m}$ or less

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

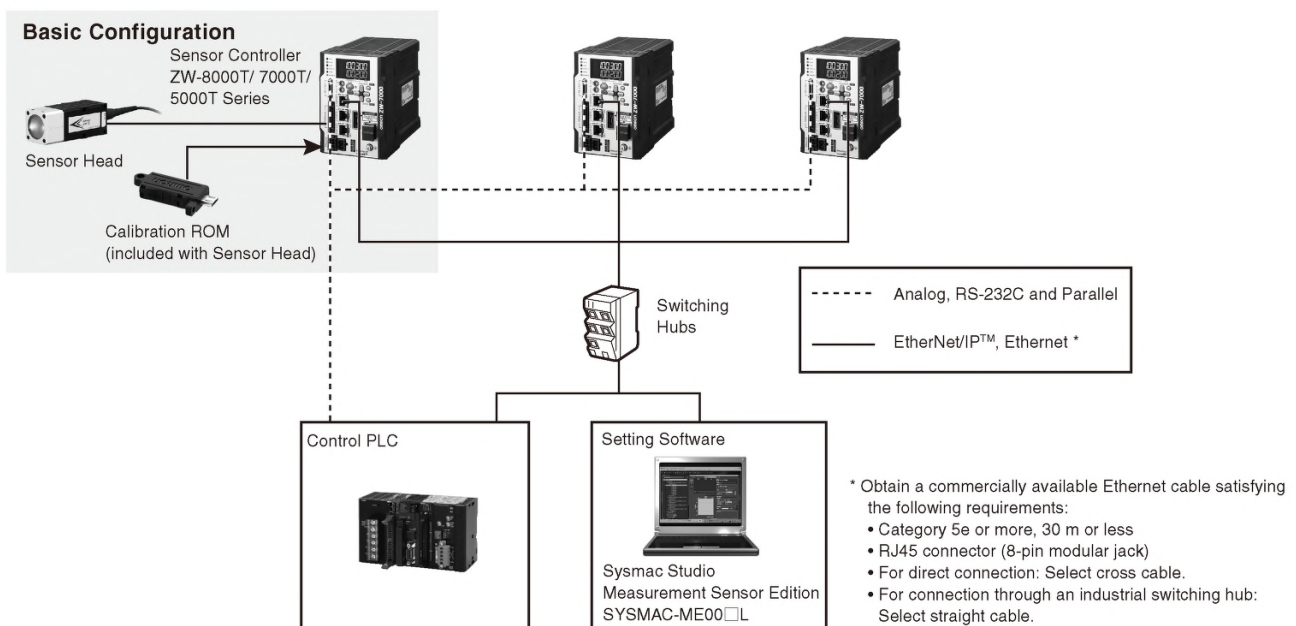


System Configuration

EtherCAT connections



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



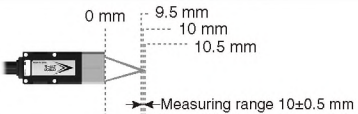
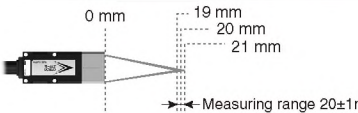
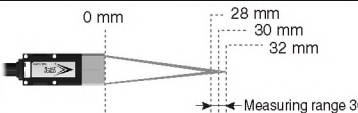
ZW-8000/7000/5000 Series

Order Information

ZW-8000

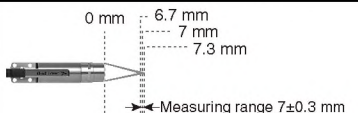
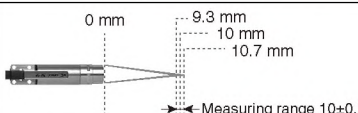
●Sensor Head

Square-shaped straight type

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

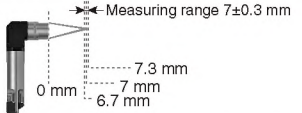
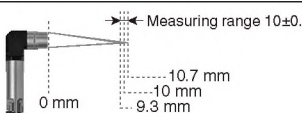
* Values when the Sensor Controller ZW-8000T is used.

Pen-shaped straight type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
	 0 mm 6.7 mm 7 mm 7.3 mm Measuring range 7±0.3 mm	7 μm dia.	0.25 μm	2 m	ZW-SP8007 2M
				0.3 m	ZW-SP8007 0.3M
	 0 mm 9.3 mm 10 mm 10.7 mm Measuring range 10±0.7mm	10 μm dia.	0.25 μm	2 m	ZW-SP8010 2M
				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 0 mm 7.3 mm 7 mm 6.7 mm	8 μm dia.	0.25 μm	2 m	ZW-SPR8007 2M
				0.3 m	ZW-SPR8007 0.3M
	 Measuring range 10±0.7mm 0 mm 10.7 mm 10 mm 9.3 mm	11 μm dia.	0.25 μm	2 m	ZW-SPR8010 2M
				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

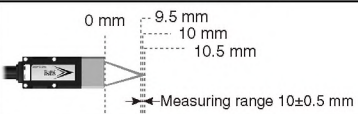
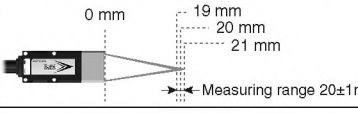
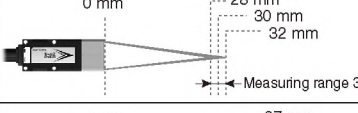
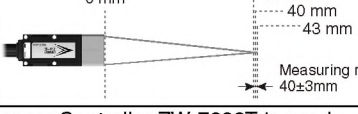
Appearance	Item	Cable length	Model
	Extension Fiber Cable (from Sensor Head to Sensor Controller), (Fiber Adapter ZW-XFCS is included)	2 m	ZW-XF8002R
		5 m	ZW-XF8005R
		10 m	ZW-XF8010R
		20 m	ZW-XF8020R
		30 m	ZW-XF8030R
	Fiber Adapter (used between Sensor Head pre-wired cable and Extension Fiber Cable)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

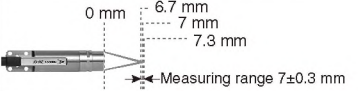
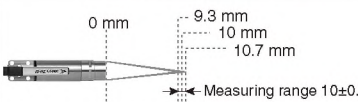
●Sensor Head

Square-shaped straight type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
	 0 mm, 9.5 mm, 10 mm, 10.5 mm Measuring range 10±0.5 mm	50 μm dia.	0.25 μm	2 m	ZW-S7010 2M
				0.3 m	ZW-S7010 0.3M
	 0 mm, 19 mm, 20 mm, 21 mm Measuring range 20±1 mm	70 μm dia.	0.25 μm	2 m	ZW-S7020 2M
				0.3 m	ZW-S7020 0.3M
	 0 mm, 28 mm, 30 mm, 32 mm Measuring range 30±2 mm	100 μm dia.	0.25 μm	2 m	ZW-S7030 2M
				0.3 m	ZW-S7030 0.3M
	 0 mm, 37 mm, 40 mm, 43 mm Measuring range 40±3 mm	120 μm dia.	0.25 μm	2m	ZW-S7040 2M
				0.3m	ZW-S7040 0.3M

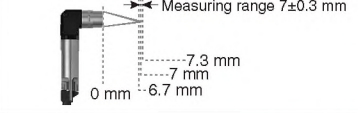
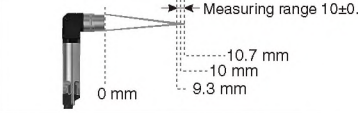
* Values when the Sensor Controller ZW-7000T is used.

Pen-shaped straight type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
	 0 mm, 6.7 mm, 7 mm, 7.3 mm Measuring range 7±0.3 mm	130 μm dia.	0.25 μm	2 m	ZW-SP7007 2M
				0.3 m	ZW-SP7007 0.3M
	 0 mm, 9.3 mm, 10 mm, 10.7 mm Measuring range 10±0.7 mm	170 μm dia.	0.25 μm	2 m	ZW-SP7010 2M
				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 0 mm, 7.3 mm, 7 mm, 6.7 mm	150 μm dia.	0.25 μm	2 m	ZW-SPR7007 2M
				0.3 m	ZW-SPR7007 0.3M
	 Measuring range 10±0.7 mm 0 mm, 10.7 mm, 10 mm, 9.3 mm	190 μm dia.	0.25 μm	2 m	ZW-SPR7010 2M
				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
	24 VDC	NPN/PNP	ZW-7000T

●Cable

Appearance	Item	Cable length	Model
	Extension Fiber Cable (from Sensor Head to Sensor Controller), (Fiber Adapter ZW-XFCM is included)	2 m	ZW-XF7002R
		5 m	ZW-XF7005R
		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

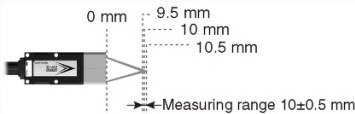
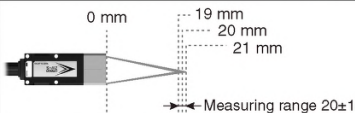
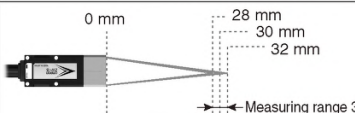
Note: Cables of 10, 20, and 30 m can be used with the firmware version 2.100 or later. If you have an old version Sensor Controller, register as a Sysmac member and download the latest firmware and tools to update your Sensor Controller. Refer to the Sysmac member registration sheet that is enclosed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

ZW-8000/7000/5000 Series

ZW-5000

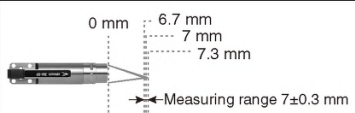
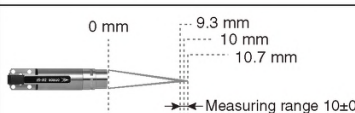
●Sensor Head

Square-shaped straight type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
	 0 mm, 9.5 mm, 10 mm, 10.5 mm Measuring range 10±0.5 mm	9 μm dia.	0.25 μm	2 m	ZW-S5010 2M
				0.3 m	ZW-S5010 0.3M
	 0 mm, 19 mm, 20 mm, 21 mm Measuring range 20±1mm	13 μm dia.	0.25 μm	2 m	ZW-S5020 2M
				0.3 m	ZW-S5020 0.3M
	 0 mm, 28 mm, 30 mm, 32 mm Measuring range 30±2mm	18 μm dia.	0.25 μm	2 m	ZW-S5030 2M
				0.3 m	ZW-S5030 0.3M

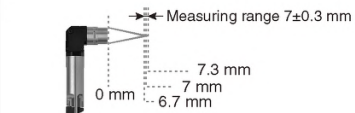
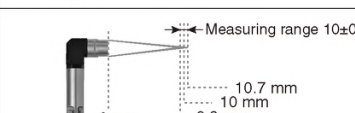
* Values when the Sensor Controller ZW-5000T is used.

Pen-shaped straight type

Appearance	Measuring range	Spot diameter	Static resolution *	Cable length	Model
	 0 mm, 6.7 mm, 7 mm, 7.3 mm Measuring range 7±0.3 mm	13 μm dia.	0.25 μm	2 m	ZW-SP5007 2M
				0.3 m	ZW-SP5007 0.3M
	 0 mm, 9.3 mm, 10 mm, 10.7 mm Measuring range 10±0.7mm	18 μm dia.	0.25 μm	2 m	ZW-SP5010 2M
				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 0 mm, 7.3 mm, 7 mm, 6.7 mm	15 μm dia.	0.25 μm	2 m	ZW-SPR5007 2M
				0.3 m	ZW-SPR5007 0.3M
	 Measuring range 10±0.7mm 0 mm, 10.7 mm, 10 mm, 9.3 mm	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
	Extension Fiber Cable (from Sensor Head to Sensor Controller), (Fiber Adapter ZW-XFC2 is included)	2 m	ZW-XF5002R
		5 m	ZW-XF5005R
		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 cable 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 EtherCAT 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 Cable with Connectors on Both Ends (RJ45/RJ45) Wire Gauge and Number of Pairs: AWG26, 4-pair Cable Cable Sheath material: LSZH *2 Cable color: Yellow *3		OMRON	0.3	XS6W-6LSZH8SS30CM-Y
			0.5	XS6W-6LSZH8SS50CM-Y
			1	XS6W-6LSZH8SS100CM-Y
			2	XS6W-6LSZH8SS200CM-Y
			3	XS6W-6LSZH8SS300CM-Y
			5	XS6W-6LSZH8SS500CM-Y
Rugged type Cable with Connectors on Both Ends (RJ45/RJ45) Wire Gauge and Number of Pairs: AWG22, 2-pair Cable		OMRON	0.3	XS5W-T421-AMD-K
			0.5	XS5W-T421-BMD-K
			1	XS5W-T421-CMD-K
			2	XS5W-T421-DMD-K
			5	XS5W-T421-GMD-K
			10	XS5W-T421-JMD-K
Rugged type Cable with Connectors on Both Ends (M12 Straight/RJ45) Wire Gauge and Number of Pairs: AWG22, 2-pair Cable		OMRON	0.3	XS5W-T421-AMC-K
			0.5	XS5W-T421-BMC-K
			1	XS5W-T421-CMC-K
			2	XS5W-T421-DMC-K
			5	XS5W-T421-GMC-K
			10	XS5W-T421-JMC-K
Rugged type Cable with Connectors on Both Ends (M12 Right-angle/RJ45) Wire Gauge and Number of Pairs: AWG22, 2-pair Cable		OMRON	0.3	XS5W-T422-AMC-K
			0.5	XS5W-T422-BMC-K
			1	XS5W-T422-CMC-K
			2	XS5W-T422-DMC-K
			5	XS5W-T422-GMC-K
			10	XS5W-T422-JMC-K

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

●Cables / Connectors

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

Item	Appearance	Recommended manufacturer	Model
Cables	—	Hitachi Metals, Ltd.	NETSTAR-C5E SAB 0.5 × 4P CP *
	—	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

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

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

* 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
	5	None	0.22A	W4S1-05B
		Supported		W4S1-05C

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

●EtherCAT junction slaves

Appearance	Number of ports	Power supply voltage	Current consumption	Model
	3	20.4 to 28.8 VDC (24 VDC -15 to 20%)	0.08A	GX-JC03
	6		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
		Number of licenses	Media	
Sysmac Studio Standard Edition Ver.1□□ *2	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, 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.	— (Media only)	DVD	SYSMAC-SE200D
		1 license*1	—	SYSMAC-SE201L
Sysmac Studio Measurement Sensor Edition Ver.1.□□	Sysmac Studio Measurement Sensor Edition is a limited license that provides selected functions required for ZW-series Displacement Sensor settings. Because this product is a license only, you need the Sysmac Standard Edition DVD media to install it.	1 license	—	SYSMAC-ME001L
		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	Applicable Model			Contacts
			ZW-8000	ZW-7000	ZW-5000	
Fiber Connector Cleaner *1	OMRON	ZW-XCL	Yes	Yes	Yes	OMRON
NEOCLEAN-M	NTT Advanced Technology Corporation	ATC-NE-M1	No	Yes	No	*2
OPTIPOP R1		ATC-RE-01	Yes (Sensor Head only)	No	Yes (Sensor Head only)	

*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]

NTT Advanced Technology Corporation

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

Item	Specifications						
	ZW-S8010	ZW-S8020	ZW-S8030	ZW-SP8007	ZW-SP8010	ZW-SPR8007	ZW-SPR8010
Sensor controller	ZW-8000T						
Sensor head type	Square-shaped straight type			Pen-shaped straight 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 *2	±0.5 mm	±1mm	±2mm	±0.3 mm	±0.7 mm	±0.3 mm	±0.7 mm
Static resolution *3	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						
Operating ambient illumination	Illumination on object surface max.30000 Lx: (incandescent light)						
Ambient temperature range	Operation: 0 to 50°C, Storage: -15 to +60°C (No freezing and condensation)						
Ambient humidity range	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/s ² , 6 direction, 3 times each (up/down, left/right, forward/backward)						
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)	0.8 μm/°C (0.4 mm/°C)	0.8 μm/°C (0.4 mm/°C)	0.8 μm/°C (0.4 mm/°C)	0.8 μm/°C (0.4 mm/°C)
LED Safety	Risk Group 3 (IEC62471)						
Material	Chassis: aluminum die cast Fiber cable sheath: PVC Calibration ROM: PC			Chassis: SUS Fiber cable sheath: PVC Calibration ROM: PC Mounting Plate: Aluminum		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 and all terminals: 20 MΩ (by 250 VDC)						
Dielectric strength (Calibration ROM)	Between case and all terminals: 1000 VAC, 50/60 Hz, 1 min						
Weight	Fiber cable length 0.3m Approx. 170g Fiber cable length 2m Approx. 180g			Fiber cable length 0.3m Approx. 27 g Fiber cable length 2m Approx. 37 g		Fiber cable length 0.3m Approx. 31 g Fiber cable length 2m Approx. 41 g	
Accessories	Calibration ROM fixing screw (M2×5mm) × 1, Fiber cable protective cap × 1, Strap × 1, Instruction Manual, Precautions			Installation plate × 1, Unit fixing screws (M2 × 10 mm) × 4, Calibration ROM fixing screw (M2 × 5 mm) × 1, Fiber cable protective cap × 1, Strap × 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.

*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 range 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-8000/7000/5000 Series

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

Item	Specifications							
	ZW-S7010	ZW-S7020	ZW-S7030	ZW-S7040	ZW-SP7007	ZW-SP7010	ZW-SPR7007	ZW-SPR7010
Sensor controller	ZW-7000T							
Sensor head type	Square-shaped straight type				Pen-shaped straight type		Pen-shaped right angle type	
Measurement center distance *1	10 mm	20 mm	30 mm	40 mm	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							
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 measurement 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 μs							
Operating ambient illumination	Illumination on object surface max.30000 Lx: (incandescent light)							
Ambient temperature range	Operation: 0 to 50°C, Storage: -15 to +60°C (No freezing and condensation)							
Ambient humidity range	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/s ² , 6 direction, 3 times each (up/down, left/right, forward/backward)							
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)	2.1 μm/°C (1.2 μm/°C)	0.8 μm/°C (0.4 μm/°C)	0.8 μm/°C (0.4 μm/°C)	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 sheath: PVC Calibration ROM: PC Mounting Plate: Aluminum		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 and all terminals: 20 MΩ (by 250 VDC)							
Dielectric strength (Calibration ROM)	Between case and all terminals: 1000 VAC, 50/60 Hz, 1 min							
Weight	Fiber cable length 0.3m Approx. 170g Fiber cable length 2m Approx. 180g				Fiber cable length 0.3m Approx. 27 g Fiber cable length 2m Approx. 37 g		Fiber cable length 0.3m Approx. 31 g Fiber cable length 2m Approx. 41 g	
Accessories	Calibration ROM fixing screw (M2×5mm) × 1, Fiber cable protective cap × 1, Strap × 2, Instruction Manual, Precautions				Installation plate × 1, Unit fixing screws (M2 × 10 mm) × 4, 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.

*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 $1/e^2$ (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 range 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

Item	Specifications						
	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 straight 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						
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						
Operating ambient illumination	Illumination on object surface max.30000 Lx: (incandescent light)						
Ambient temperature range	Operation: 0 to 50°C, Storage: -15 to +60°C (No freezing and condensation)						
Ambient humidity range	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/s ² , 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 (0.4 μm/°C)	0.8 μm/°C (0.4 μm/°C)	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 sheath: PVC Calibration ROM: PC Mounting Plate: Aluminum		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 and all terminals: 20 MΩ (by 250 VDC)						
Dielectric strength (Calibration ROM)	Between case and all terminals: 1000 VAC, 50/60 Hz, 1 min						
Weight	Fiber cable length 0.3m Approx. 170g Fiber cable length 2m Approx. 180g			Fiber cable length 0.3m Approx. 29 g Fiber cable length 2m Approx. 39 g		Fiber cable length 0.3m Approx. 33g Fiber cable length 2m Approx. 43g	
Accessories	Calibration ROM fixing screw (M2×5mm) × 1, Fiber cable protective cap × 1, Strap × 1, Instruction Manual, Precautions			Installation plate × 1, Unit fixing screws (M2 × 10 mm) × 4, Calibration ROM fixing screw (M2 × 5 mm) × 1, Fiber cable protective cap × 1, Strap × 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.
- *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.
- *3. Material setting for the OMRON standard mirror surface target: Error from an ideal straight line when measuring on mirror surface.
- *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 range 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.

ZW-8000/7000/5000 Series

●Sensor Controller

Item			Specifications		
			ZW-8000T	ZW-7000T	ZW-5000T
Input/output type			NPN/PNP dual type		
Number of connected 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 Display	Main display		11-segment white display, 6 digits		
	Sub-display		11-segment green display, 6 digits		
LED display	Status indicators		HIGH (orange), PASS (green), LOW (orange), STABILITY (green), ZERO (green), ENABLE (green), THRESHOLD-H (orange), THRESHOLD-L (orange), RUN (green)		
	EtherCAT indicator		ECAT RUN (green), L/A IN (Link/Activity IN) (green), L/A OUT (Link/Activity OUT) (green), ECAT ERR (red)		
External I/F	Ethernet		100BASE-TX/10BASE-T, Non-procedure (TCP/UDP), EtherNet/IP		
	EtherCAT		EtherCAT exclusive protocol 100BASE-TX		
	RS-232C		Max. 115,200 bps		
	Analog output terminal block	Analog voltage output (OUT V)	-10 V to +10 V, output impedance: 100 Ω		
		Analog current output (OUT A)	4 mA to 20 mA, max. load resistance: 300 Ω		
	32-pole expansion connector	Judgment output (HIGH/PASS/LOW)	Transistor output system Output voltage: 21.6 to 30 VDC Load current: 50 mA or less Residual voltage when turning ON: 2 V or less Leakage voltage when turning OFF: 0.1 mA or less		
		Busy output (BUSY)			
		Alarm output (ALARM)			
		Enable output (ENABLE)			
		Sync flag output (SYNFLG)			
		Trigger busy output (TRIGBUSY)			
		Logging state output (LOGSTAT)			
		Logging error output (LOGERR)			
		Stability output (STABILITY)			
		Task state output (TASKSTAT)			
		LIGHT OFF input (LIGHT OFF)	DC 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 ON voltage/ON current: 5 V/1 mA or less		
		Zero reset input (ZERO)			
		Timing input (TIMING)			
		Reset input (RESET)			
		Sync input (SYNC)			
		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 ON: 2 V or less Leakage voltage when turning OFF: 0.1 mA or less		
		Bank Selection input (BANK_SEL 1 to 3)	DC 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 more OFF voltage/OFF current: 5 V/1 mA or less		

Item		Specifications		
		ZW-8000T	ZW-7000T	ZW-5000T
Main functions	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		
	Output	Scaling/Different holds/Zero reset/Logging for a measured value/Keep, Clamp		
	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 bank)		
	System	Save/Initialization/Display measured information/Communication settings/ Sensor head calibration/Key-lock/Zero reset memory/Timing input		
Rating	Power supply voltage	21.6 to 26.4 VDC (including ripple)		
	Current consumption	700 mA or less	800 mA or less	
	Insulation resistance	Across all lead wires and FG terminal: 20 MΩ (by 250 VDC)		
	Dielectric strength	Between all lead wires and FG terminal: 500 VAC, 50/60 Hz, 1 minute		
Environmental resistance	Degree of protection	IP20 (IEC60529)		
	Vibration resistance (destructive)	10 to 55 Hz (half amplitude 0.35 mm), 50 mins in each of X/Y/Z directions		
	Shock resistance (destructive)	150 m/s ² , 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%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)	
Accessories		Parallel cable (ZW-XCP2E) × 1 10 Fiber cleaners (ZW-XCL) × 1 Instruction Manual Member registration sheet Precautions		Parallel cable (ZW-XCP2E) × 1 10 Fiber cleaners (ZW-XCL) × 1 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 μ m 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 range 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).

ZW-8000/7000/5000 Series

●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 head/Cable		ZW Series	Version of Sensor Controller	Corresponding version of Sysmac Studio Standard Edition/Measurement Sensor Edition
Type	Model			
Square-shaped straight type	ZW-S80□0 □M	ZW-8000□	Version 3.000 or later	Version 1.22 or higher
Pen-shaped straight type	ZW-SP8007 □M ZW-SP8010 □M			
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	ZW-7000□	Version 2.030 or later	Version 1.15 or higher
Pen-shaped straight type	ZW-SP7007 □M ZW-SP7010 □M		Version 2.110 or later	
Pen-shaped right-angle type	ZW-SPR7007 □M ZW-SPR7010 □M		Version 2.030 or later	
Extension Fiber Cable	ZW-XF7002R ZW-XF7005R		Version 2.100 or later	
	ZW-XF7010R ZW-XF7020R ZW-XF7030R		Version 2.100 or later	
Square-shaped straight type	ZW-S50□0 □M	ZW-5000□	Version 2.100 or later	Version 1.18 or higher
Pen-shaped straight type	ZW-SP5007 □M ZW-SP5010 □M		Version 2.110 or later	
Pen-shaped right-angle type	ZW-SPR5007 □M ZW-SPR5010 □M		Version 2.100 or later	
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.

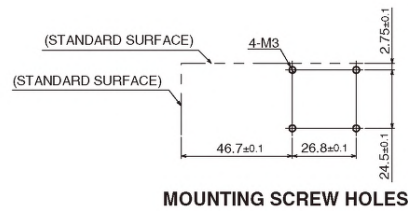
External Dimensions

(Unit: mm)

Sensor Head

Square-shaped straight type

ZW-S8010 □M/S8020 □M/S8030 □M

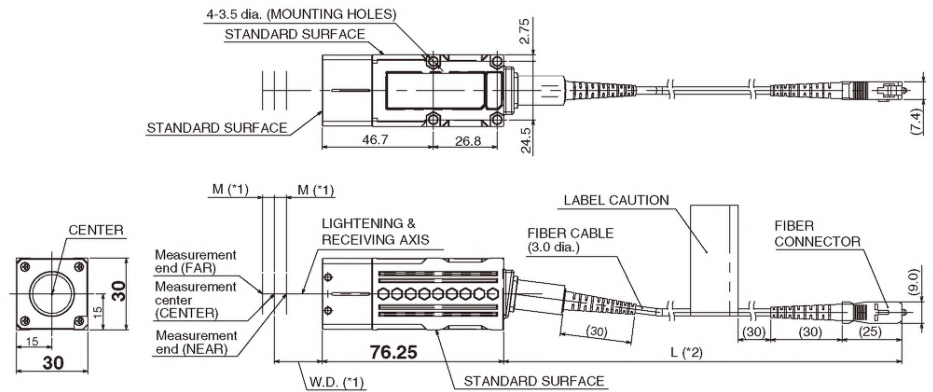


*1.

Type	W.D.	M
ZW-S8010	10	0.5
ZW-S8020	20	1
ZW-S8030	30	2

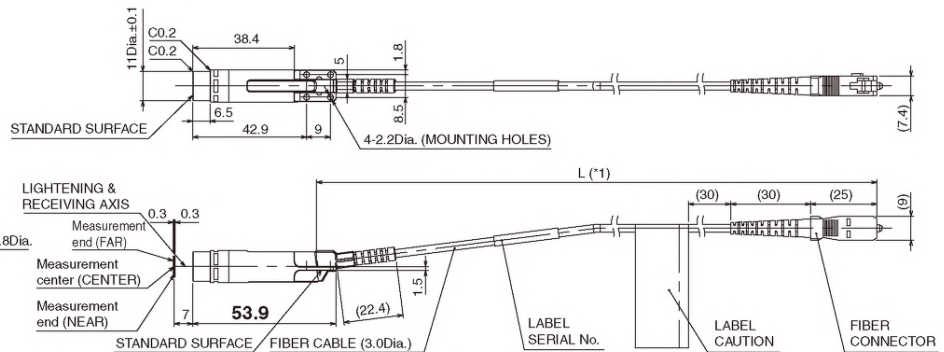
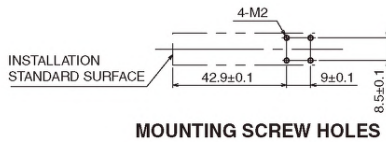
*2.

Length	L
0.3 m	(300)
2 m	(2000)



Pen-shaped straight type

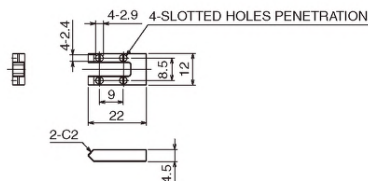
ZW-SP8007 □M



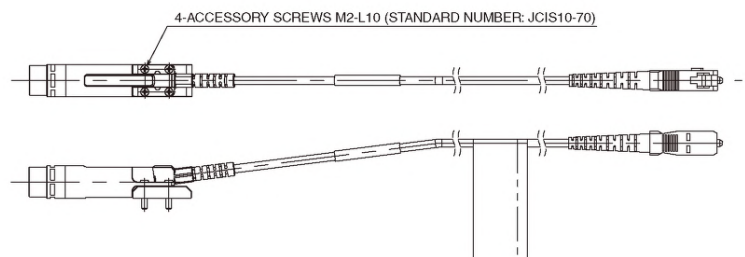
*1.

Length	L
0.3 m	(300)
2 m	(2000)

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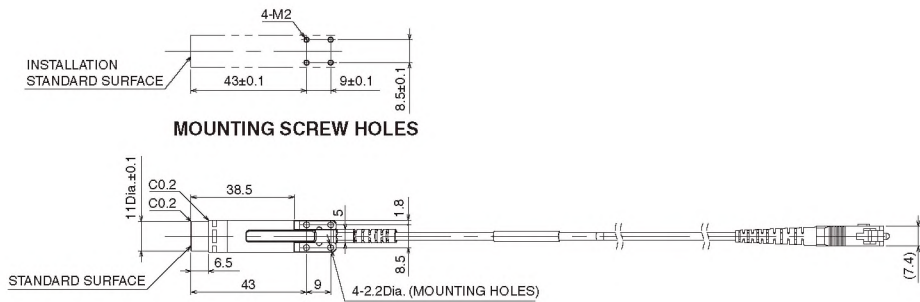


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SENSOR HEAD IS FASTENED WITH MOUNTING PLATE BY USING THE ACCESSORY SCREWS



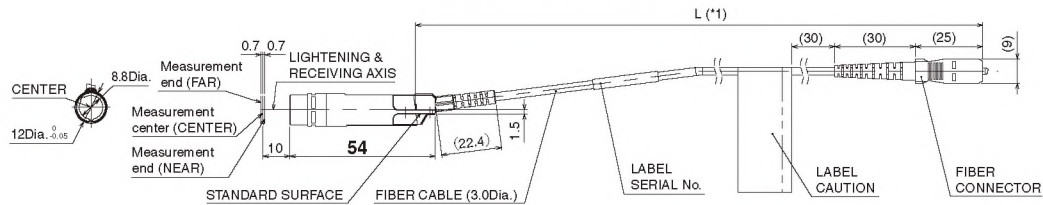
ZW-8000/7000/5000 Series

ZW-SP8010 □M

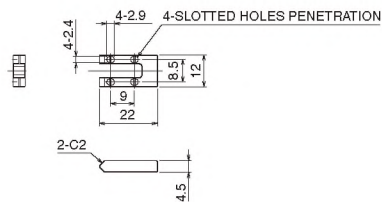


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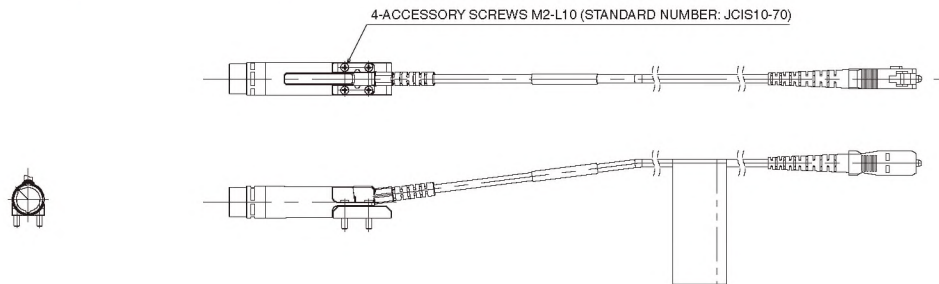
Length	L
0.3 m	(300)
2 m	(2000)



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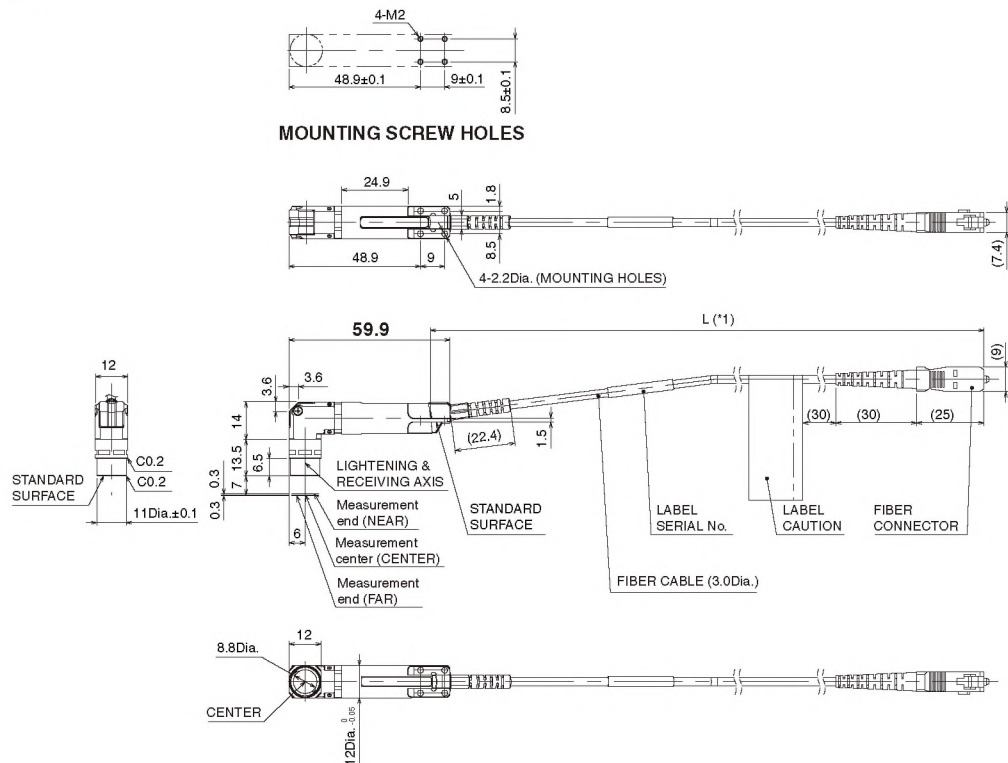


Pen-shaped right angle type ZW-SPR8007 □M

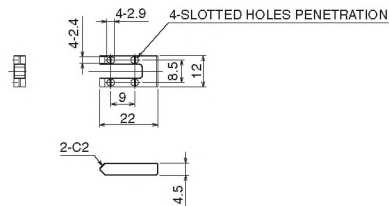


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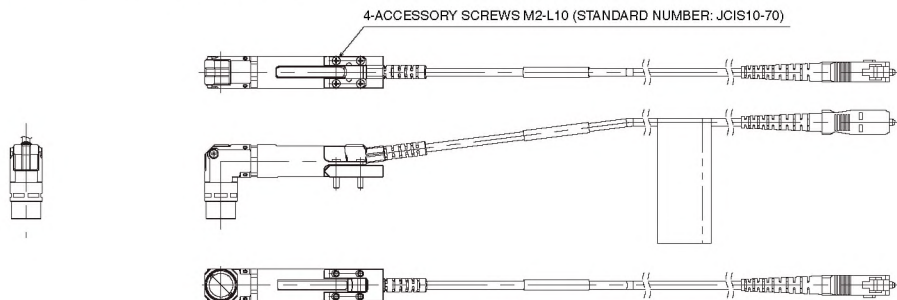
Length	L
0.3 m	(300)
2 m	(2000)



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SENSOR HEAD IS FASTENED WITH MOUNTING PLATE BY USING THE ACCESSORY SCREWS



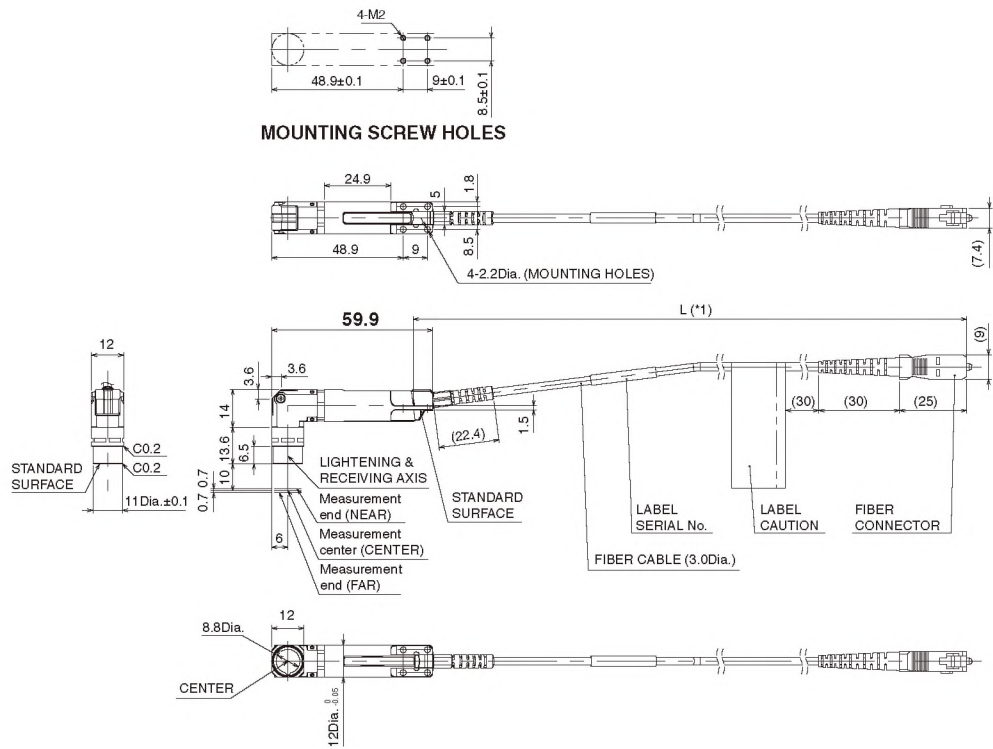
ZW-8000/7000/5000 Series

ZW-SPR8010 □M

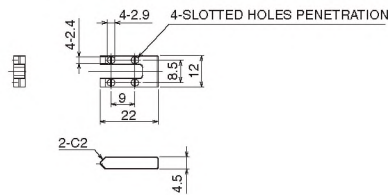


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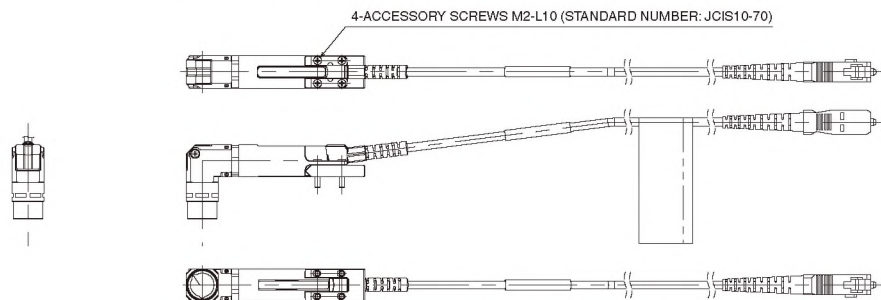
Length	L
0.3 m	(300)
2 m	(2000)



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MATERIAL: ALUMINUM

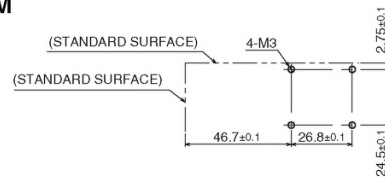


<USE SITUATION OF MOUNTING PLATE>
SENSOR HEAD IS FASTENED WITH MOUNTING PLATE BY USING THE ACCESSORY SCREWS



Square-shaped straight type

ZW-S7010 □M/S7020 □M/S7030 □M/S7040 □M



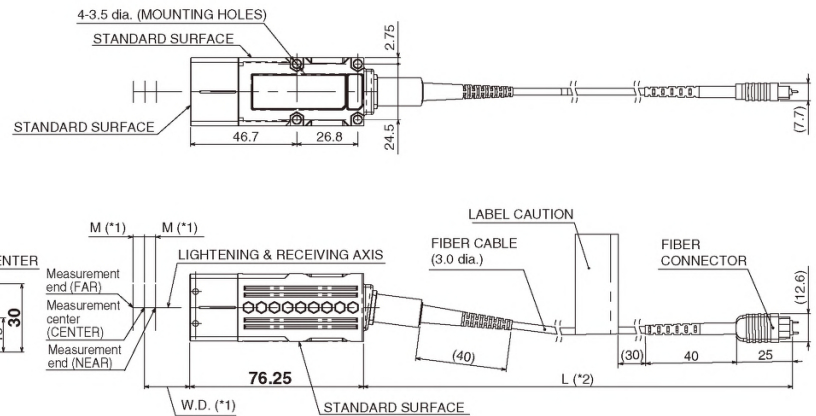
MOUNTING SCREW HOLES

*1.

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

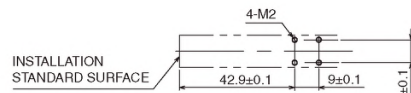
*2.

Length	L
0.3 m	(300)
2 m	(2000)

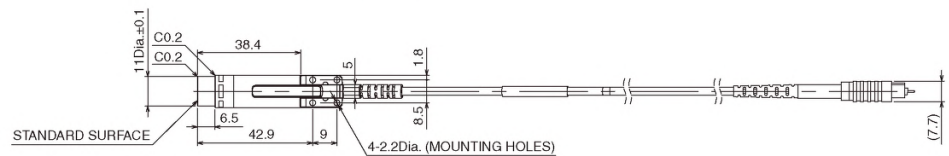


Pen-shaped straight type

ZW-SP7007 □M

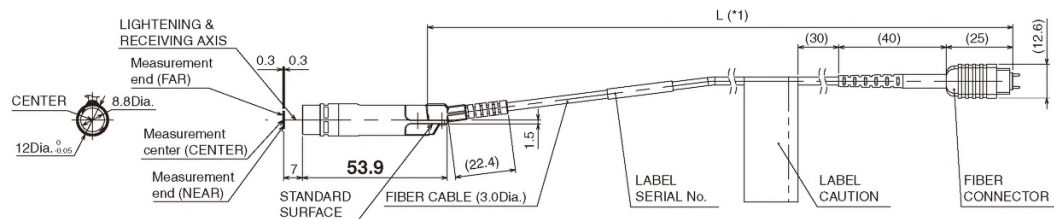


MOUNTING SCREW HOLES

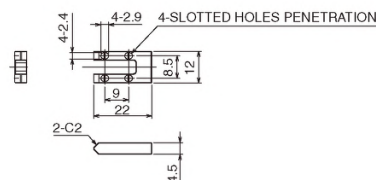


*1.

Length	L
0.3 m	(300)
2 m	(2000)

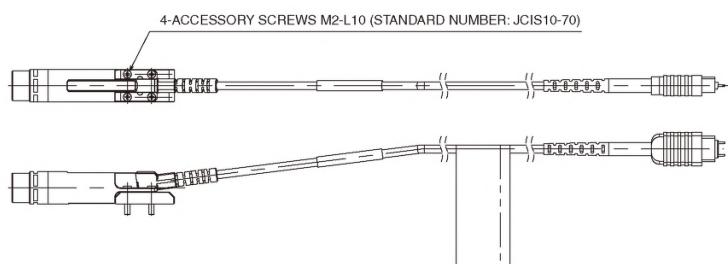


<MOUNTING PLATE>
MATERIAL: ALUMINUM



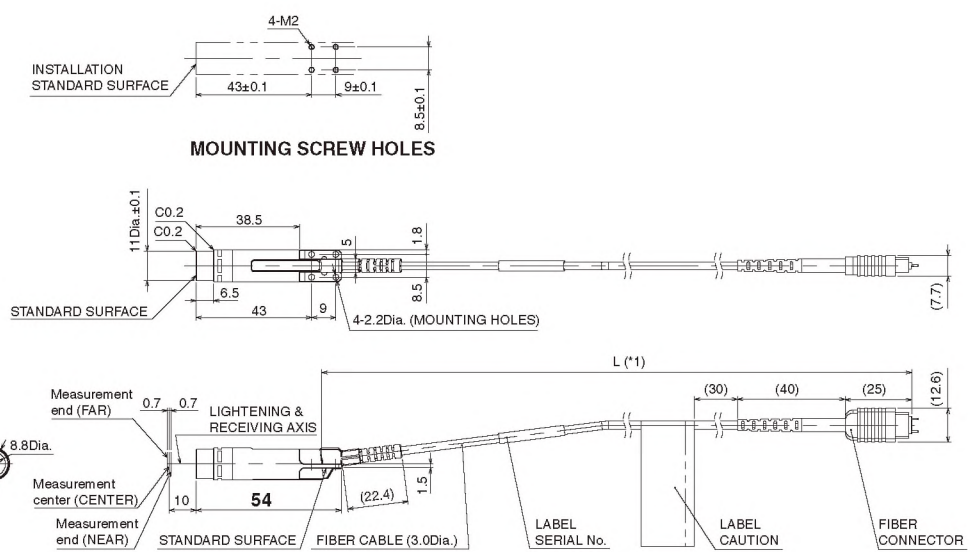
<USE SITUATION OF MOUNTING PLATE>
SENSOR HEAD IS FASTENED WITH MOUNTING PLATE BY USING THE ACCESSORY SCREWS

4-ACCESSORY SCREWS M2-L10 (STANDARD NUMBER: JCIS10-70)



ZW-8000/7000/5000 Series

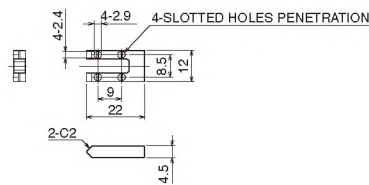
ZW-SP7010 □M



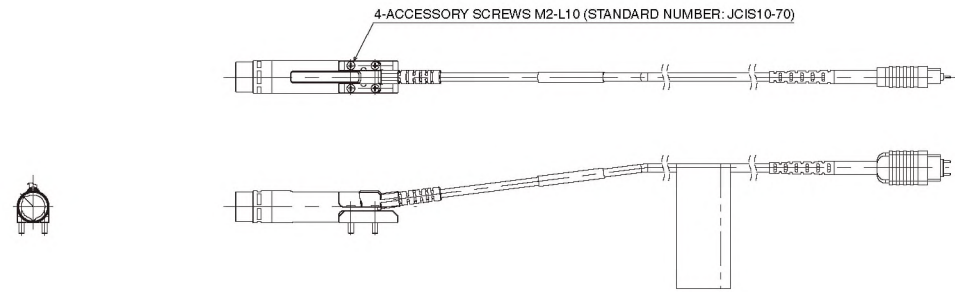
*1.

Length	L
0.3 m	(300)
2 m	(2000)

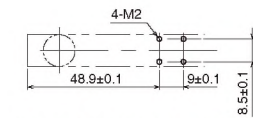
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MATERIAL: ALUMINUM



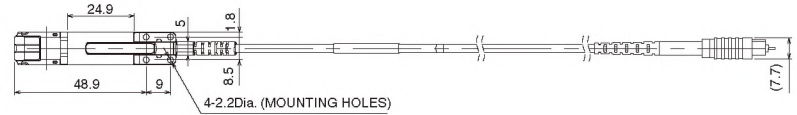
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SENSOR HEAD IS FASTENED WITH MOUNTING PLATE BY USING THE ACCESSORY SCREWS



Pen-shaped right angle type ZW-SPR7007 □M

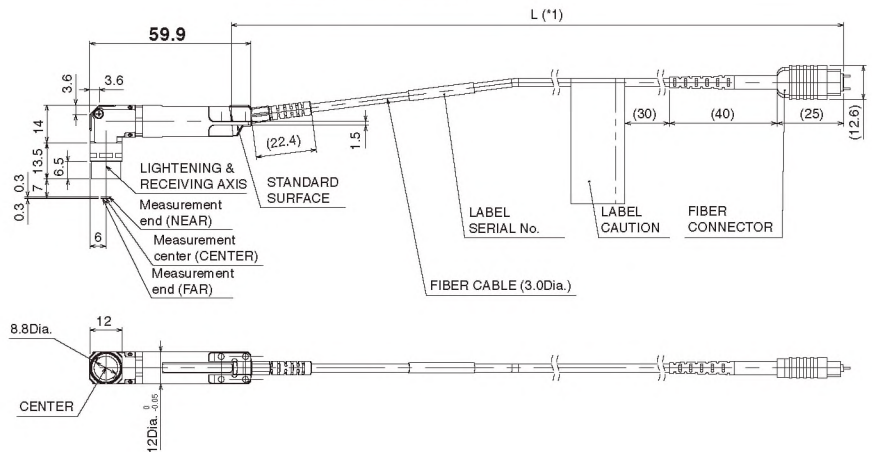
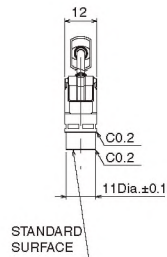


MOUNTING SCREW HOLES

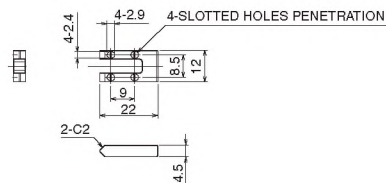


*1.

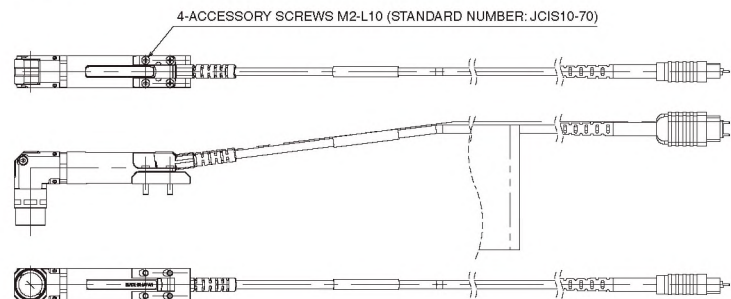
Length	L
0.3 m	(300)
2 m	(2000)



<MOUNTING PLATE>
MATERIAL: ALUMINUM



<USE SITUATION OF MOUNTING PLATE>
SENSOR HEAD IS FASTENED WITH MOUNTING PLATE BY USING THE ACCESSORY SCREWS



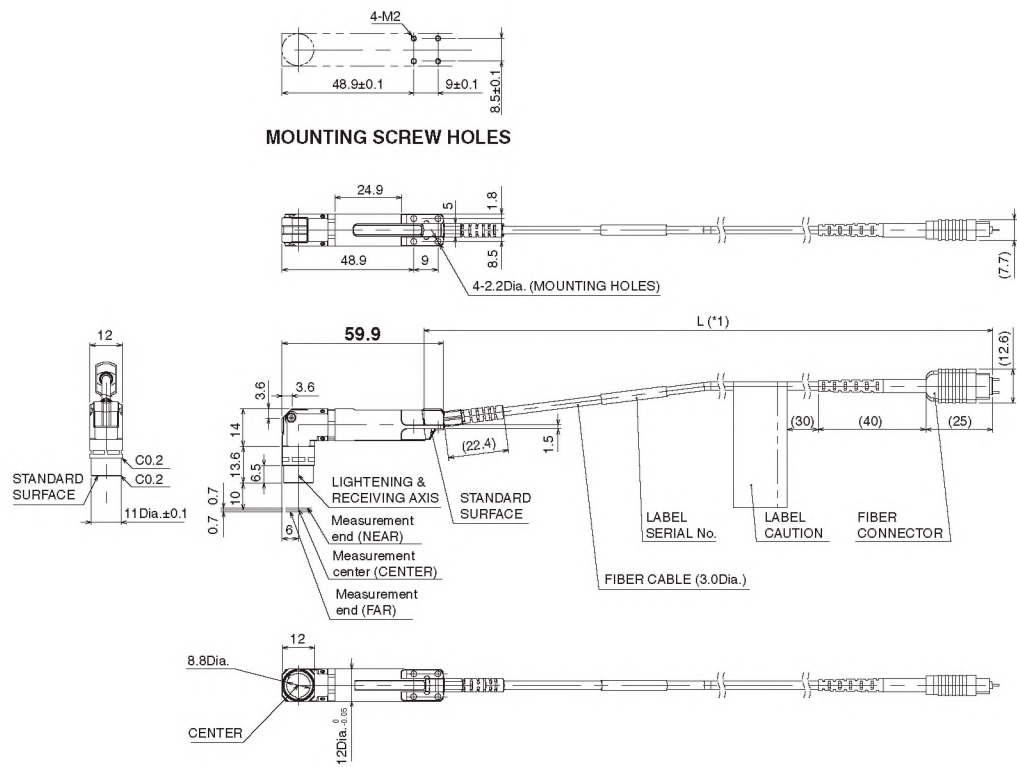
ZW-8000/7000/5000 Series

ZW-SPR7010 □M

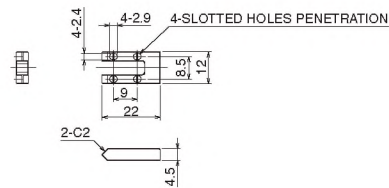


*1.

Length	L
0.3 m	(300)
2 m	(2000)



<MOUNTING PLATE>
MATERIAL: ALUMINUM



<USE SITUATION OF MOUNTING PLATE>
SENSOR HEAD IS FASTENED WITH MOUNTING PLATE BY USING THE ACCESSORY SCREWS

