

■キャリブレーションROMの接続

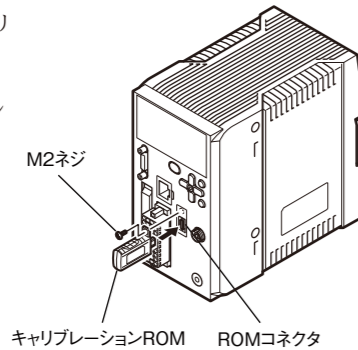
コントローラに、キャリブレーションROMを接続します。キャリブレーションROMの挿抜は、必ずコントローラの電源を切った状態で行ってください。電源ONのまま行くと故障の原因となります。

キャリブレーションROMとセンサヘッドは、各々1:1で対応しています。接続時には、キャリブレーションROMとセンサヘッドのシリアルNo.を必ず合わせてください。異なるシリアルNo.同士で動作させると、正常な測定を行いません。

(1) コントローラのROMコネクタに、キャリブレーションROMを接続します。

(2) 付属のM2ネジで、キャリブレーションROMを固定します。

締め付けトルク：0.15N・m以下

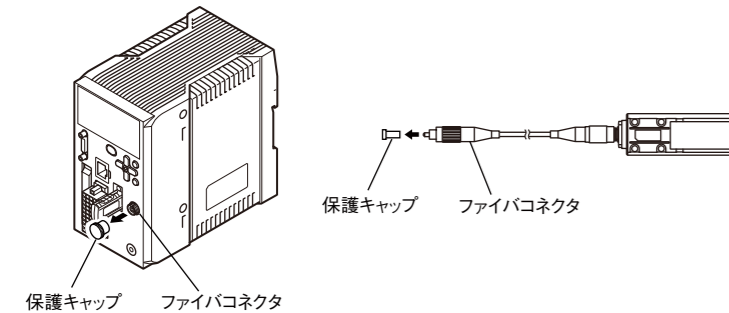


キャリブレーションROMは常に接続した状態でご使用ください。キャリブレーションROMが接続されていない場合、エラーが表示されます。

■ファイバケーブルの接続

コントローラのファイバコネクタに、センサヘッドのファイバケーブルを接続します。

(1) コントローラのファイバコネクタ、およびファイバケーブルの保護キャップを外します。



注：保護キャップは捨てずに保管してください。

(2) ファイバコネクタの溝部に、ファイバケーブルの突起部を合わせ、押し込みながらネジ部を右へ回します(図1)。

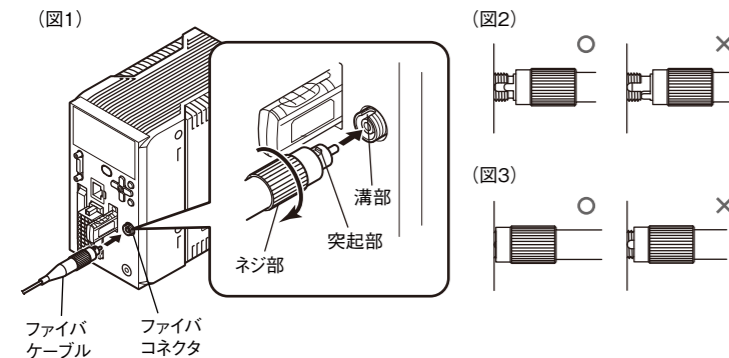
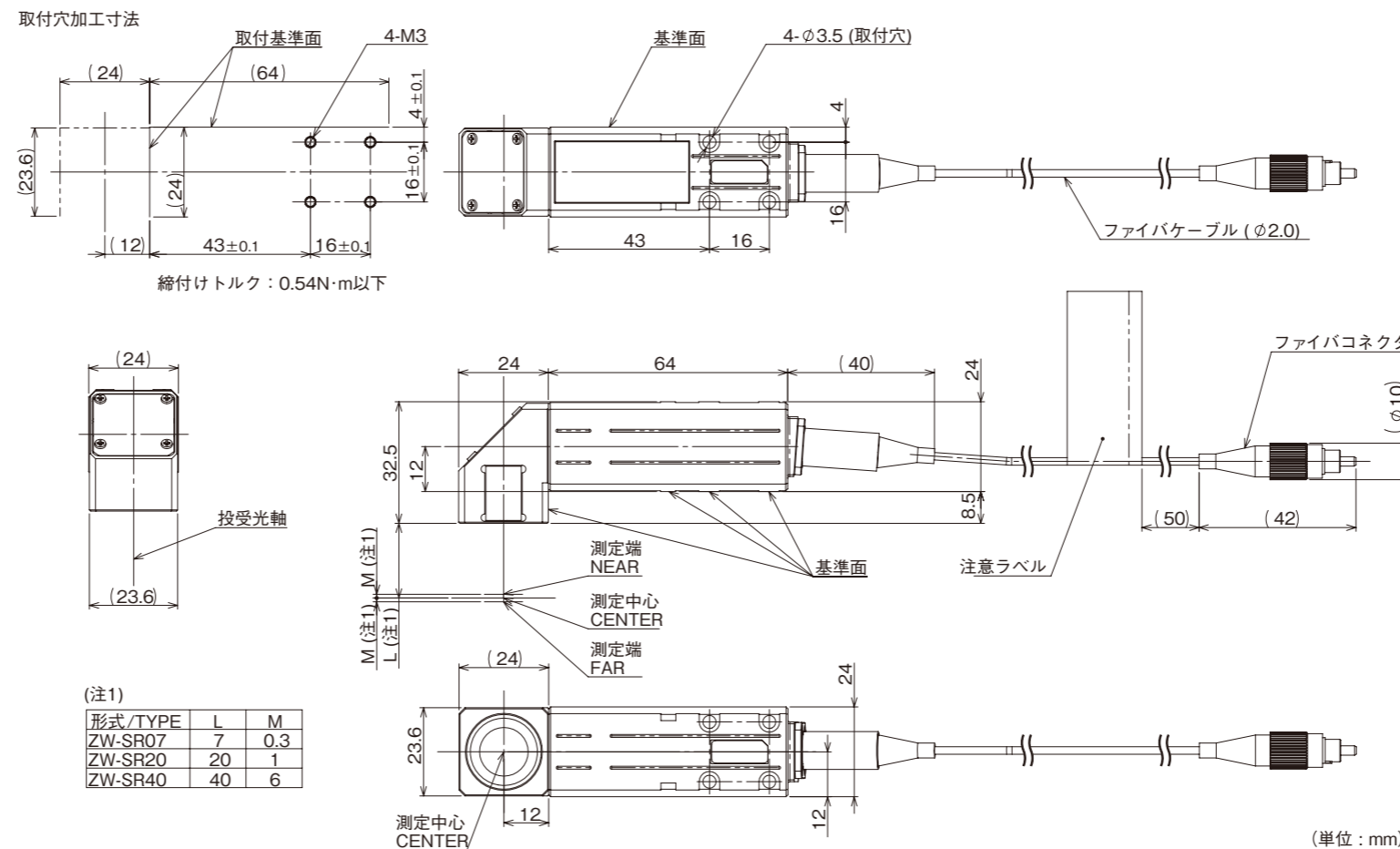


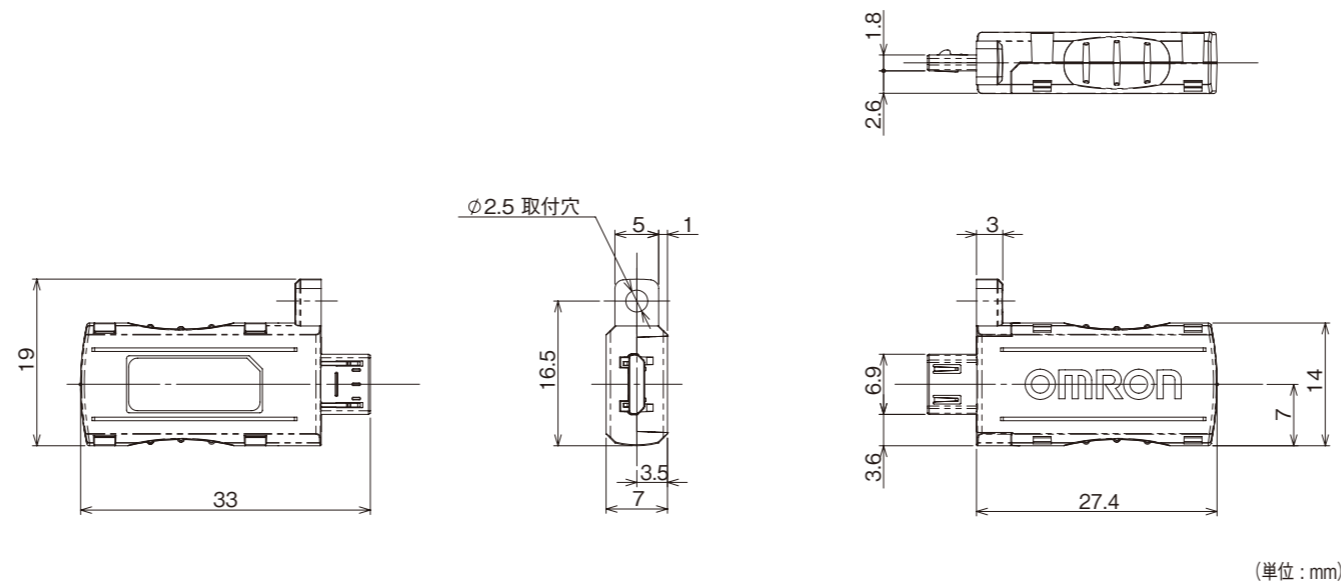
図2、図3の「×」の状態では、光信号の伝達が行えず、正しい測定ができません。必ず「○」の状態になっていることを確認してください。

■外形寸法図

センサヘッド



キャリブレーションROM



*センサヘッド(形 ZW-SR07/SR20/SR40)の同梱品です。必ず同一シリアルNo.同士のセンサヘッドとキャリブレーションROMを組み合わせてご使用ください。

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- (b) 高い信頼性が必要な用途(例:ガス・水道・電気等の供給システム、24時間連続運転システム、決済システムほか権利・財産を取扱う用途など)
- (c) 厳しい条件または環境での用途(例:屋外に設置する設備、化学的汚染を被る設備、電磁的妨害を被る設備、振動・衝撃を受ける設備など)
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●製品に関するお問い合わせ先

お客様相談室

フリーダイヤル **0120-919-066**

携帯電話・PHS・IP電話などご利用いただけませんので、下記の電話番号へおかけください。

電話 **055-982-5015** (通話料がかかります)

■営業時間：8:00～21:00 ■営業日：365日

●FAXやWebページでもお問い合わせいただけます。

FAX **055-982-5051** / www.fa.omron.co.jp

●その他のお問い合わせ

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AⒸ 2013年9月

OMRON

Model ZW-SR□□

Sensor Head for Fiber Coaxial Displacement Sensor

INSTRUCTION SHEET

Thank you for selecting OMRON product. This sheet primarily describes precautions required in installing and operating the product. Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal.

TRACEABILITY INFORMATION:

Representative in EU: Omron Europe B.V. Wegalaan 67-69 2132 JD Hoofddorp, The Netherlands	Manufacturer: Omron Corporation, Shiokoji Horikawa, Shimogyo-ku, Kyoto 600-8530 JAPAN Ayabe Factory 3-2 Narutani, Nakayama-cho, Ayabe-shi, Kyoto 623-0105 JAPAN
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The following notice applies only to products that carry the CE mark:
Notice:
This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

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PRECAUTIONS ON SAFETY

Meanings of Signal Words

WARNING

Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally, there may be significant property damage.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

Alert Statements in This Sheet

WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.



CAUTION

Looking into the LED light continuously may occasionally cause visual impairment.
Do not look directly into the LED light.



PRECAUTIONS FOR SAFE USE

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

- Installation Environment**
 - Do not use the product in environments where it can be exposed to inflammable/explosive gas.
 - To secure the safety of operation and maintenance, do not install the product close to high-voltage devices and power devices.
- Power Supply and Wiring**
For details on power supply and wiring, refer to PRECAUTIONS FOR SAFE USE on the Instruction Sheet of the dedicated Controller (ZW-CE1□□/ZW-C1□□□).
 - Tighten the mounting screw to the torque specified in this instruction sheet.
 - Always turn off the power of the main unit before taking the following actions. Not doing so may result in malfunction.
 - Connecting or wiring the cable
 - Mounting or removing the connector
 - Mounting or removing the Calibration ROM
- Others**
 - Do not use in safety circuits for atomic energy or that are critical for human life.
 - Do not attempt to disassemble, deform by pressure, incinerate, repair, or modify this product.
 - When disposing of the product, treat as industrial waste.
 - Connect the Sensor Head to the dedicated Controller (ZW-CE1□□/ZW-C1□□□).
 - Use of other devices may result in fire, explosion, malfunction or failure.
 - If you notice an abnormal condition such as a strange odor, extreme heating of the unit, or smoke, immediately stop using the product, turn off the power, and consult your dealer.
 - Do not drop or impose shock on the product.
 - Ensure that all components which have locking mechanisms are locked before using the product.
 - Do not cut the fiber cable. An injury may result due to the cutting area of the glass. In addition, the Sensor may fail to work properly if the cable is cut.
- Regulations and standards**
This sensor complies with EMC directive and EN standards as follows:
 - EMC directive: No.2004/108/EC
 - EN standard: EN61326

PRECAUTIONS FOR CORRECT USE

Observe the following to prevent failure, malfunctioning, and adverse effects on performance and the device.

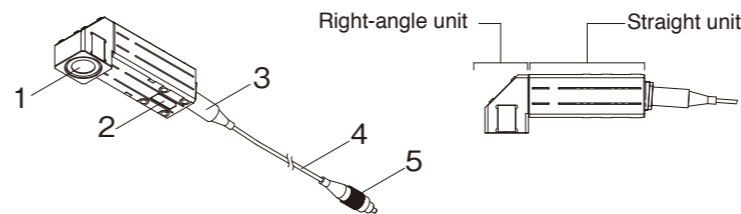
- Installation site**
Do not install in the following locations:
 - Locations where the ambient temperature exceeds the rated temperature range.
 - Locations subject to sudden temperature changes (where condensation will form).
 - Locations where the relative humidity is below or above 35 to 85% RH.
 - Locations where there are corrosive or flammable gases.
 - Locations where there is dust, salt, or iron powder.
 - Locations where the device will be subject to direct vibration or shock.
 - Locations where there is strong scattered light (laser light, arc welding light, ultraviolet light, etc.)
 - Locations exposed to direct sunlight or next to a heater.
 - Locations where there is splashing or spraying of water, oil, or chemicals.
 - Locations where there is a strong electrical or magnetic field.
- Power and cable connections**
 - When using a commercially available switching regulator, make sure that the Frame ground terminal is grounded.
 - If there are surges on your power line, connect a surge absorber as appropriate for your conditions of use.
 - Before turning on the power after the wiring is completed, verify that the power is correct, that there are no incorrect connections such as a shorted load circuit, and that the load current is suitable. Incorrect wiring may cause damage and failures.
 - Use the product with the specified voltage. Applying a voltage or AC voltage that exceed the rating may result in burning or explosion of circuit components.
 - To extend the fiber cable between the Sensor Head and Controller, an optional extension fiber cable (ZW-XF□□R) must be used. There are five fiber cable types; 2 m/5 m/10 m/20 m/30 m. The length that combines the standard fiber cable and extension fiber cable must be 32 m or shorter. Only one fiber cable can be used for extension.
 - Handling the fiber cable
Observe the following conditions.
 - Use the fiber cable with the bending radius of at least 20 mm.
 - Avoid stress being applied to the root of the fiber connector due to bending.
 - Do not forcibly pull the fiber cable.
 - Do not step on or put a heavy object on the fiber cable.
 - Use the Sensor Head and Calibration ROM of the same serial number. Operation will fail if those with different serial numbers are used.
 - When the fiber cable is not connected, be sure to attach the provided protective caps to the connectors of both the Controller and fiber cable sides. Leaving the product without the protective caps may result in malfunction caused by adhesion of a foreign material.
- Warming Up**
After turning on the power supply, allow the Controller to stand for at least 30 minutes before use. The circuits are unstable immediately after the power supply is turned on and attempting measurement may result in inconsistent measurement values.
- Maintenance**
 - Do not use thinner, benzene, acetone or kerosene to clean the Sensor Head, fiber cable or Controller. If considerable foreign matter or dust collects on the Sensor Head, fiber cable, or receiver/emitter of the Controller, use a blower brush (for camera lenses) to blow off the foreign matter. Avoid blowing it off with your breath. For a small amount of foreign matter or dust, gently wipe with a soft cloth. Do not wipe hard. If the receiver/emitter is damaged, malfunction or measurement error may result.
 - Do not touch the end face of the fiber cable. It may result in deterioration in performance. If it is touched or contaminated, wipe out contamination with a commercial fiber connector cleaner or soft cloth. Do not use a cloth containing alcohol. Doing so may cause adhesion of contamination again.

Location	Product name	Model No.	Manufacturer
Fiber connector at the Sensor Head side	OPTIPOP R1	ATC-RE-01	NTT Advanced Technology Corporation

- Use an optional ZW-XCL to clean the fiber connector of the controller side.
 - Do not leave the fiber cable and fiber connector with the protective cap removed even for a short period of time. Adhesion of contamination on the end face will occur, resulting in deterioration in performance.
 - After connection/disconnection of the fiber cable, perform calibration of the Sensor Head. For details on Sensor Head calibration, refer to the User's Manual.
- Sensing Object For Sensor Head**
The product cannot accurately measure the following types of objects: Transparent objects, objects with an extremely low reflective sensor ratio, objects smaller than the spot diameter, objects with a large curvature, excessively inclined objects, objects with thin film on the surface, etc.
 - Effects of surrounding lightings**
Avoid installing the product at a location where the emitter/receiver of the Sensor Head is exposed to strong lighting. If the workpiece has reflective surface, malfunction of the product may occur due to light reflection. Prevent it by covering the lighting.
 - Influence of air current**
Measured values may vary due to slow air current around the Sensor Head. In such case, put a cover around the Sensor Head.
 - Operation beyond the measurement range**
As this sensor is sensitive, malfunction may occur beyond the measurement range (near side). In such case, shortening the exposure time may solve the problem.
 - Coverage of fixing support**
Fixing support of component replacement by fiber breaking, lens damage and so on is not accepted.
 - Connecting the Sensor Head and extension fiber cable to the Controller**
A connection error occurs if the Controller with the word "AR" written on the label is connected to the Sensor Head without "AR" on the label and the extension fiber cable. When a connection error occurs, please consult to the branch of our company, and an office.
 - Right-angle unit**
If you make an excessive force or impact to right-angle unit(The part contains Emitter/receiver of "Part Names and Functions"), It may develop into a gap between right-angle unit and straight-unit(The part attaches serial No. of "Part Names and Functions").As a result, it may have a problem with measurement quality. Please be careful not to make excessive force or impact to right-angle unit.

Part Names and Functions

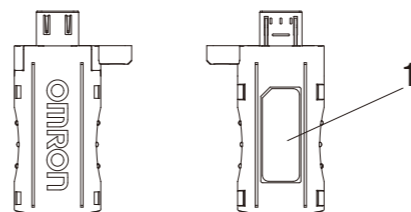
Sensor Head



No.	Name	Function
1	Emitter/receiver	Emits/receives light.
2	Serial No.	A serial number. Only the combination of the Sensor Head and Calibration ROM with the same serial number is valid.
3	Fiber joint	A joint of the Sensor Head and fiber cable. (Not detachable)
4	Fiber cable	A fiber that exchanges optical signals with the Controller.
5	Fiber connector	A connector that connects the Controller and fiber cable.

Calibration ROM

The dedicated ROM for the Sensor Head. It is included in the Sensor Head. Use it by connecting to the Controller.



No.	Name	Function
1	Serial No.	A serial number. Only the combination of the Calibration ROM and Sensor Head with the same serial number is valid.

Specifications

Item	Specifications		
	ZW-SR07	ZW-SR20	ZW-SR40
Measuring center distance	7 mm	20 mm	40 mm
Measuring range	±0.3 mm	±1 mm	±6 mm
Static resolution *1	0.01 μm	0.02 μm	0.08 μm
Linearity *2	±1.1 μm	±1.6 μm	±9.3 μm
Spot diameter *3	Near	20 μm dia.	45 μm dia.
	Center	18 μm dia.	40 μm dia.
	Far	20 μm dia.	45 μm dia.
Measurement cycle	500 μs to 10 ms		
Operating ambient illumination	Object surface illumination: 10000 Lx max. (incandescent light)		
Ambient temperature range	Operating: 0 to +50°C, Storage: -15 to +60°C (with no icing or condensation)		
Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)		
Degree of protection	IP40 (IEC60529)		
Vibration resistance (destructive)	10 to 150 Hz, 0.35-mm half amplitude 80 min each in X, Y, and Z directions		
Shock resistance (destructive)	150m/s ² 3 times each in six directions (up/down, left/right, forward/backward)		
Temperature characteristic *4	0.6 μm/°C (0.45 μm/°C)	1.5 μm/°C (1.0 μm/°C)	4.8 μm/°C (3.8 μm/°C)
Material	Body: Aluminum die-cast Fiber cable coating: PVC Calibration ROM: PC		
Fiber cable length	0.3 m, 2 m (Flex resistance cable)		
Fiber cable minimum bending radius	20 mm		
Insulation resistance (Calibration ROM)	Between case and all terminals: 20 MΩ (250 VDC)		
Dielectric strength (Calibration ROM)	Between case and all terminals: 1000 VAC, 50/60 Hz, 1 min.		
Weight	Approx. 130 g (total of the body and fiber cable)		
Accessories	Instruction Sheet, Calibration ROM fixing screw (M2), Precautions		

*1 An actual figure when measured an OMRON-standard mirror surface object with average count of 4096 times at the measuring center distance.
When connecting the Export Trade Control Order compatible Controller (ZW-CE1□□/ZW-C1□□□T), the minimum resolution is 0.25 μm regardless of the Sensor Head and average count.

*2 Errors for an ideal straight line when an OMRON-standard mirror surface object is measured. Reference values of the linearity when objects other than listed above are as follows:

	ZW-SR07	ZW-SR20	ZW-SR40
Glass	±1.1 μm	±1.6 μm	±9.3 μm
SUS BA	±1.2 μm	±1.8 μm	±9.3 μm
White ceramic	±1.6 μm	±1.9 μm	±11.0 μm

*3 Actual figure defined at 1/e2 (13.5%) of the center optical strength within the measuring area.
*4 A temperature characteristic at the measuring center distance when securing the gap between the Sensor Head and the object with an aluminum jig and installing the Sensor Head and Controller under the same temperature.

The figure in the parentheses indicates a converted value after deduction of the effect of expansion and shrinkage of the aluminum jig itself.

Connecting the Calibration ROM

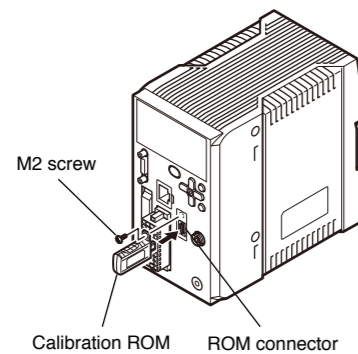
Connect the Calibration ROM to the Controller.

A Calibration ROM and a Sensor Head are paired. Be sure to match the serial numbers of the Calibration ROM and Sensor Head. Operating them with different serial numbers will cause a measurement error.

(1) Connect the Calibration ROM to the ROM connector of the Controller.

(2) Secure the Calibration ROM with the provided M2 screw.

Tightening torque: 0.15 N·m max.

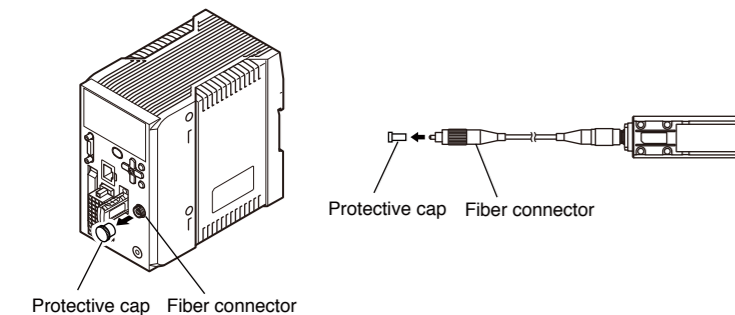


Use the Controller with the Calibration ROM always connected. An error will be displayed if the Calibration ROM is not connected.

Connecting the fiber cable

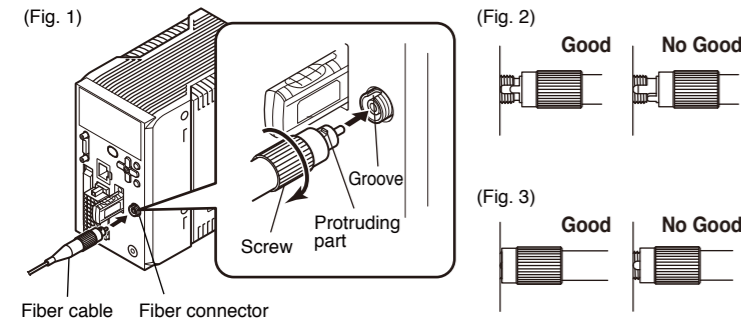
Connect the fiber cable of the Sensor Head to the fiber connector of the Controller.

(1) Remove the fiber connector of the Controller and protective cap of the fiber cable.



Note: Be sure to keep the protective cap.

(2) Align the protruding part of the fiber cable to the groove of the fiber connector, and rotate the screw to the right while pushing the end of the fiber cable (Fig. 1).

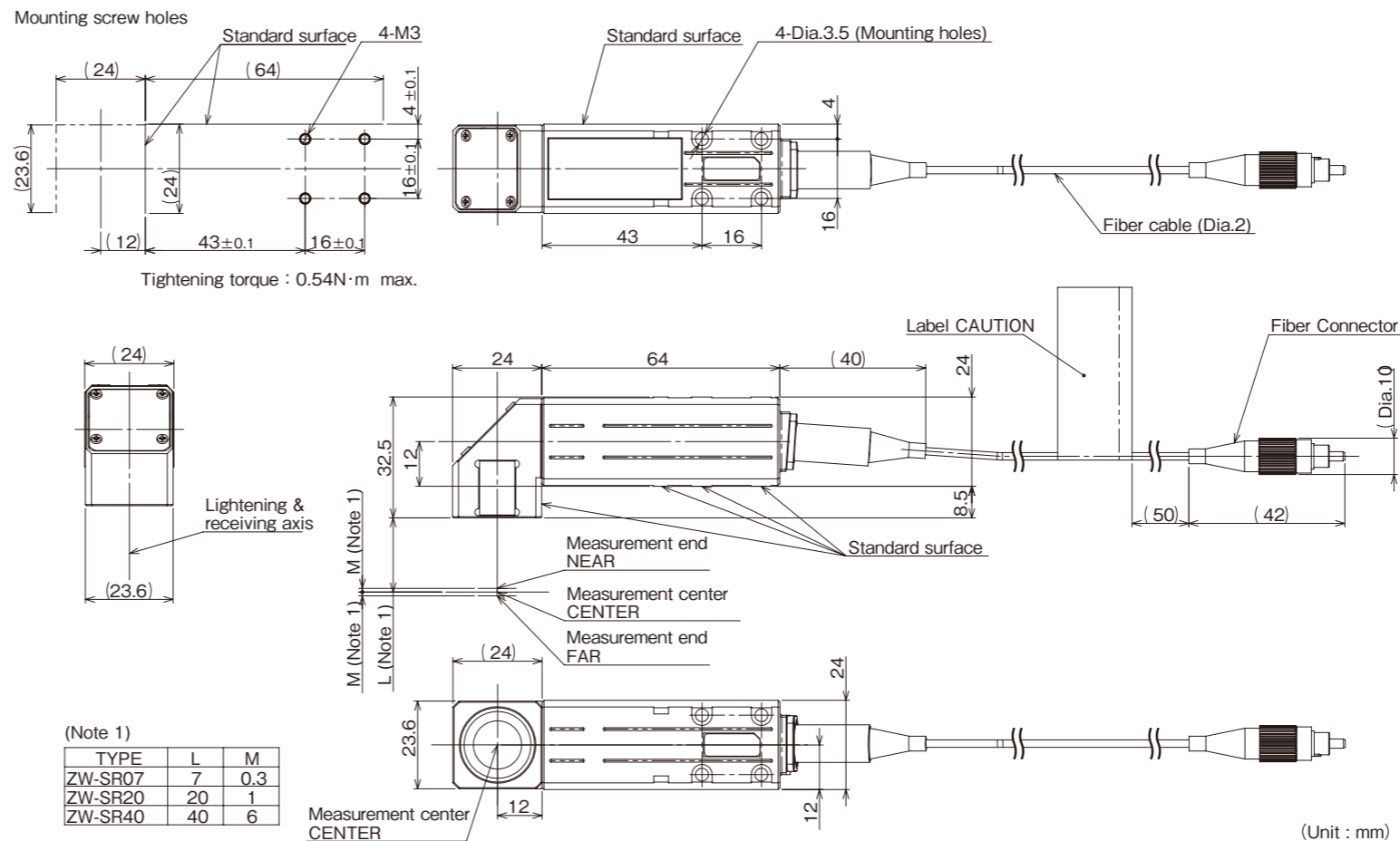


Optical signal transmission will fail with "No Good" connections as shown in Fig. 2 and Fig. 3.

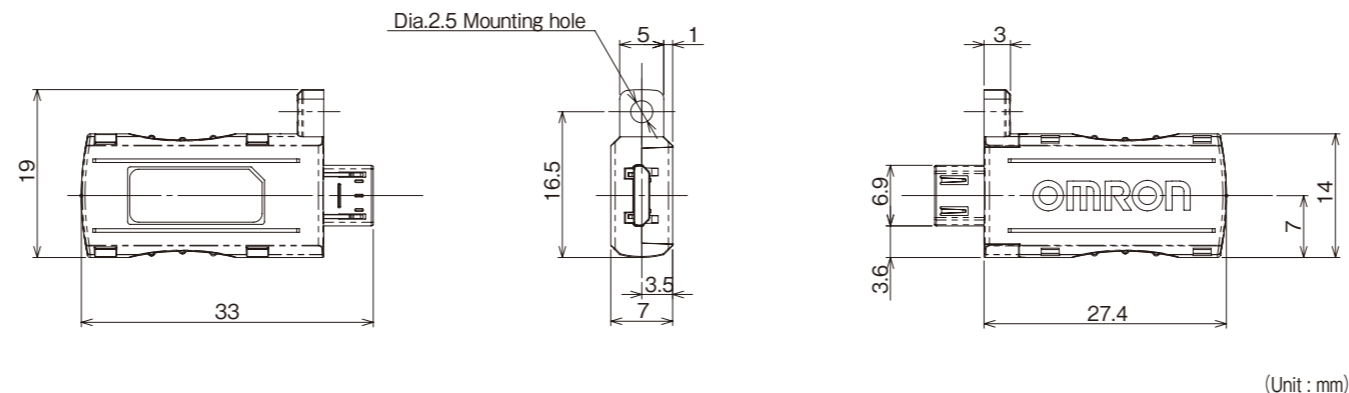
Make sure that the fiber cables are connected in "Good" connections as shown in Fig. 2 and Fig. 3.

Dimensions

Sensor Head



Calibration ROM



* Included in the Sensor Head (ZW-SR07/SR20/SR40). Be sure to use the Sensor Head and Calibration ROM of the same serial numbers.

Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

See also Product catalog for Warranty and Limitation of Liability.

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