
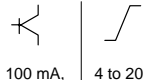


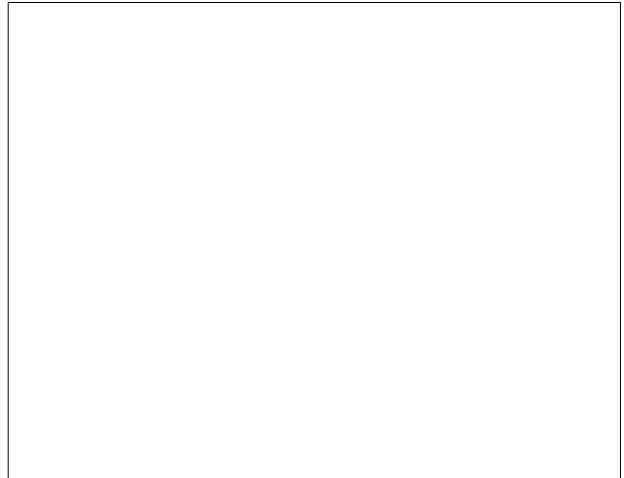
Sensing	Supply voltage	Output
 40, 100 mm	120 VAC, 50/60 Hz	 100 mA, 30 VDC 4 to 20 mA

## Laser Displacement Sensor

## 3Z4M

### High Detection Performance with High Resolution Sensor and Arithmetic Unit

- Response speed as high as 1 ms or 20 ms (switch selectable).
- Thickness or distortion of an object can be detected with the level discriminating function of the processing unit.
- Analog outputs ( $\pm 10$  V or 4 to 20 mA) can be used for control and data logging applications.



## Ordering Information

### ■ Laser Displacement Sensor

Sensor heads and controllers are ordered by specifying the appropriate set model number for the desired sensor/controller combination.

Center distance	Resolution	Cable length	Model (Sensor head + Controller)
			With distance display
40 mm	10 mm	5 m	3Z4M-J1001-801
		10 m	3Z4M-J1001-802
100 mm	50 mm	5 m	3Z4M-J1222-805
		10 m	3Z4M-J1222-806

### ■ Combination Table (Ref.)

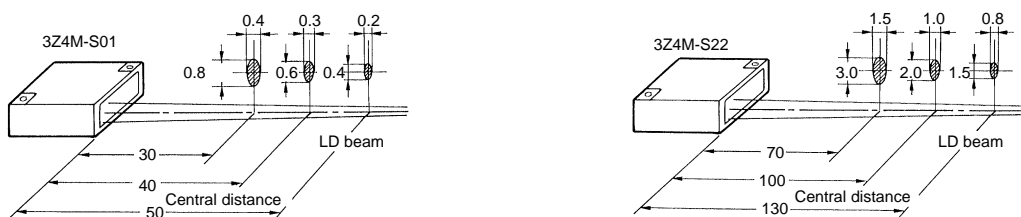
Model	Sensor head	Controller
3Z4M-J1001-801	3Z4M-S01-6	3Z4M-J10-801
3Z4M-J1001-802	3Z4M-S01-7	
3Z4M-J1222-805	3Z4M-S22-6	3Z4M-J12-805
3Z4M-J1222-806	3Z4M-S22-7	

# Specifications

## ■ Operating Characteristics

<b>Model (with digital display)</b>		3Z4M-J1001-__	3Z4M-J1222-__
<b>Measuring range</b>		±10 mm	±30 mm
<b>Center distance of measurement (See Note 1)</b>		40 mm	100 mm
<b>Light source</b>		Semiconductor laser (oscillation center wavelength: 780 nm; max. light output: 5 mW)	
<b>Spot diameter (See Note 2)</b>		0.6 x 0.3 mm	1.0 x 2.0 mm
<b>Resolution (See Note 3)</b>		10 mm	50 mm
<b>Displays</b>	<b>Data display</b>	3 1/2 digits (with sign)	3 digits (with sign)
	<b>Alarm display</b>	LED indicators (3 LEDs: DARK, BRIGHT, RANGE)	
<b>Input</b>	<b>LD remote interlock input</b>	Laser is OFF when the circuit is open; input impedance: 30Ω max.	
<b>Outputs</b>	<b>Analog displacement output</b>	±10 V/FULL SPAN, 4 to 20 mA/FULL SPAN	
	<b>Alarm output</b>	One open-collector output (load current: 100 mA max.; max. voltage: 30 V)(shares DARK, BRIGHT, RANGE indicators)	
<b>Response speed (See Note 4)</b>		1 ms or 20 ms (switch-selectable between 2 levels)	
<b>Zero point adjustment</b>		±0.7 mm	±2 mm
<b>Sensitivity selection</b>		Switch-selectable between 2 levels	
<b>Ambient operating light intensity</b>		3,000 lx or less (white light)	
<b>Power supply</b>		120 VAC +10% -15%, 50/60 Hz	
<b>Power consumption</b>		15 VA	
<b>Ambient temperature</b>		Operating: 0° C to 50° C	
		Storage: -25° C to 65° C	
<b>Light source</b>		Semiconductor laser (oscillation center wavelength: 780 nm; max. light output: 5 mW)	
<b>Laser protection class</b>		FDA Class III b	

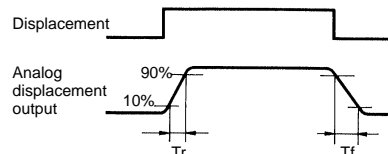
- Notes:** 1. The reference point of the displacement measurement is the distance from the sensor front surface to the object to be measured.  
2. The spot diameter changes depending on the distance as follows:



3. Peak-to-peak value of analog displacement output (object: white aluminum ceramic, response speed: 20 ms, NEAR, sensitivity: LOW).



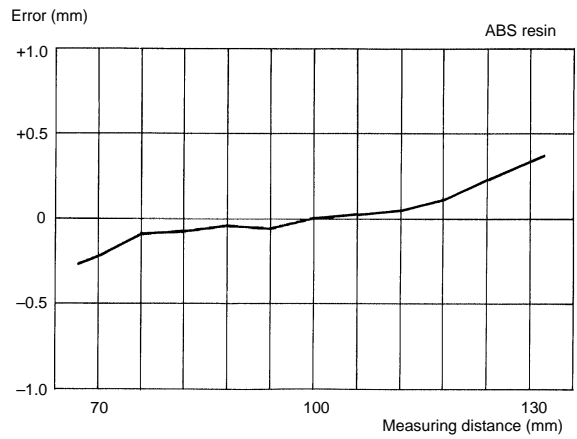
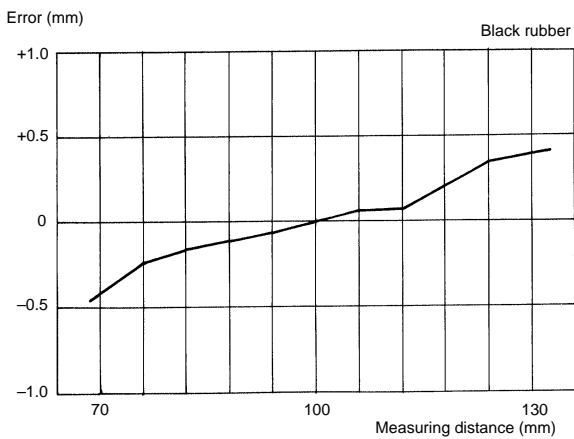
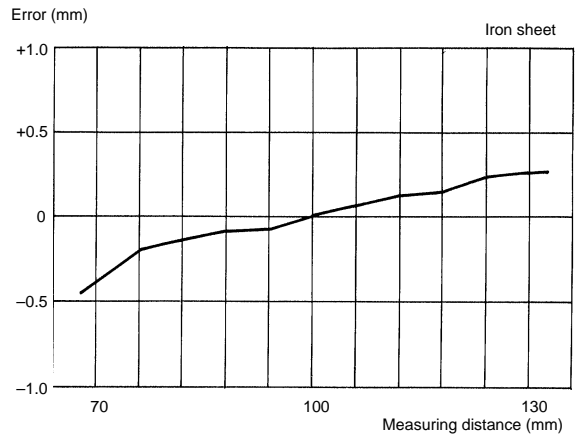
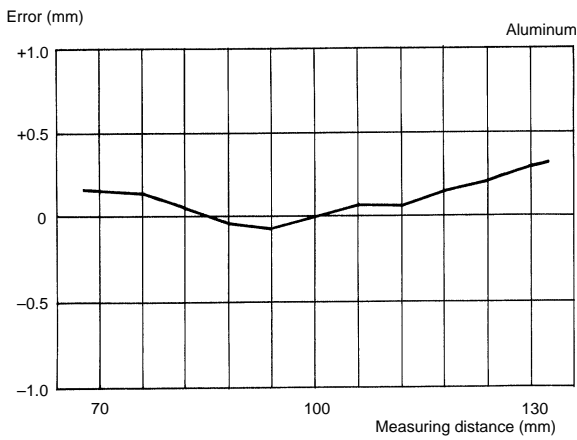
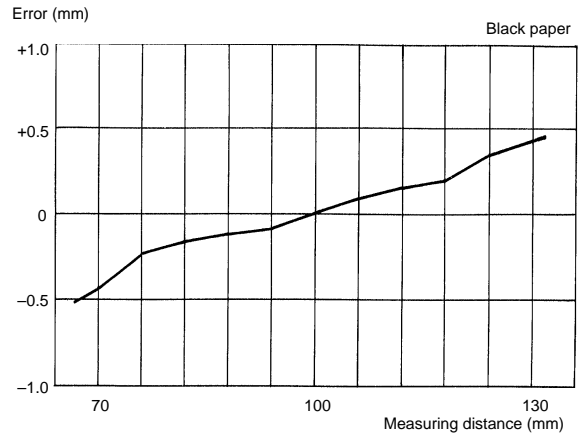
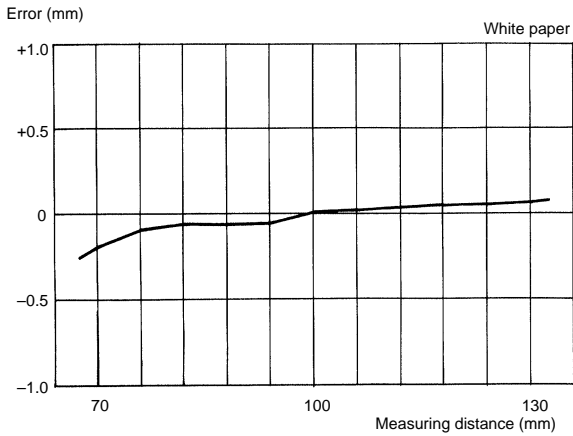
4. Rise and fall times (10% to 90%) of analog displacement output when the displacement variable changes stepwise.



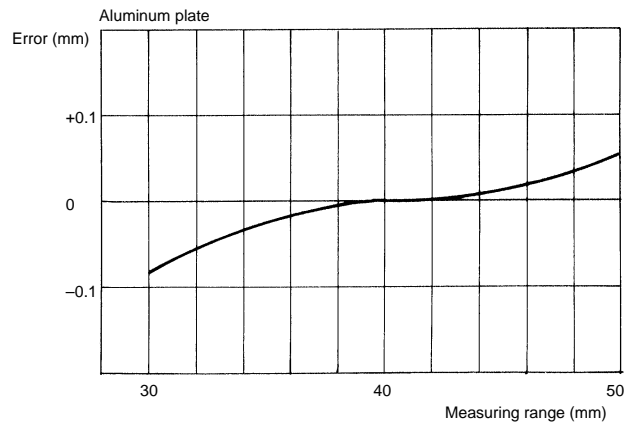
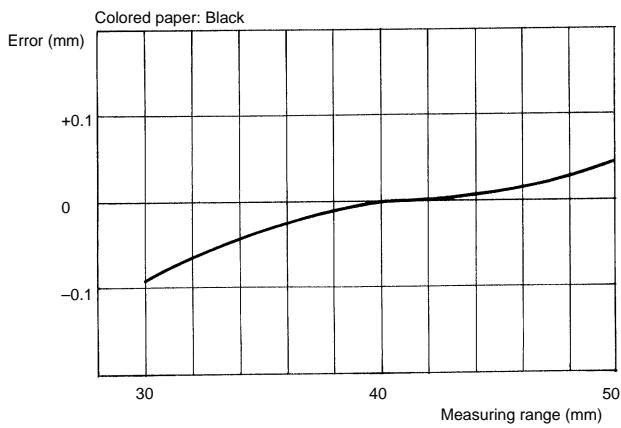
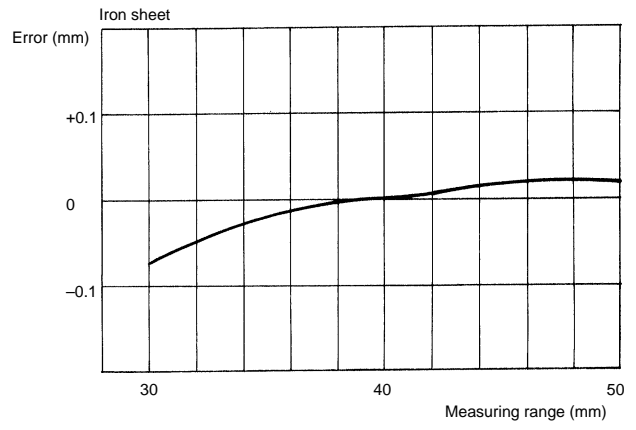
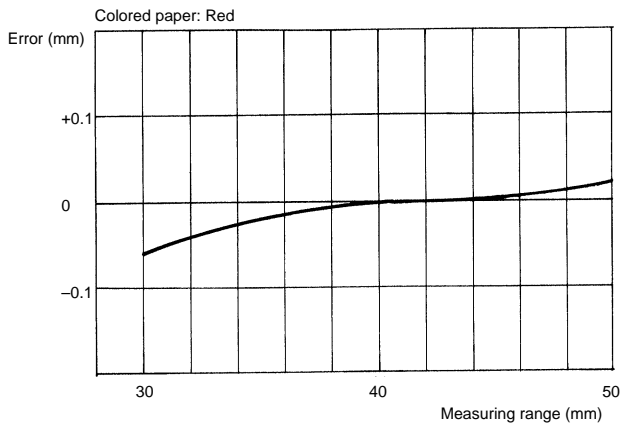
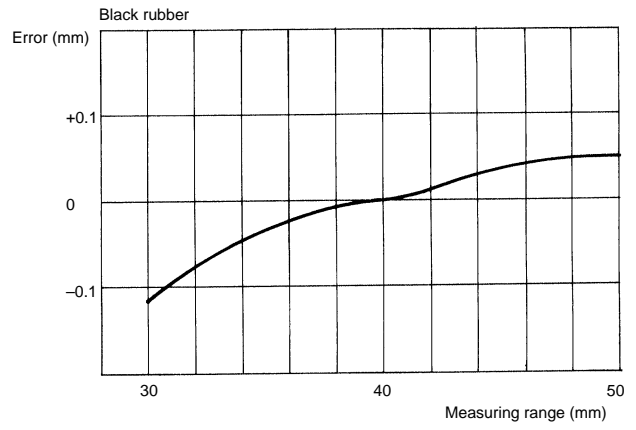
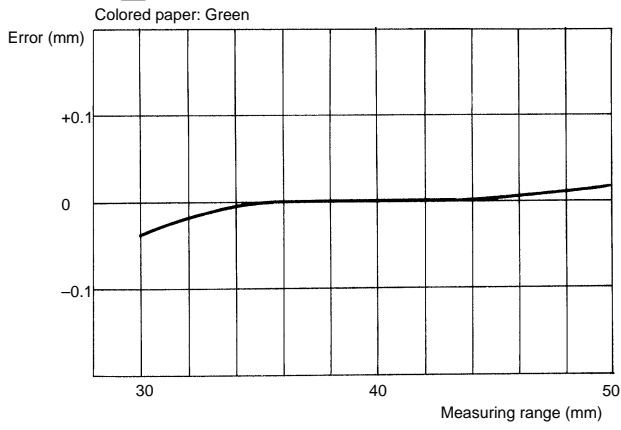
# Engineering Data

Diffusely reflecting objects can be measured with high precision, but errors may occur when regularly reflecting objects or transparent objects are measured. Measurements with various types of materials are shown below. (Temperature: 23%±3% C)

## 3Z4M-J12

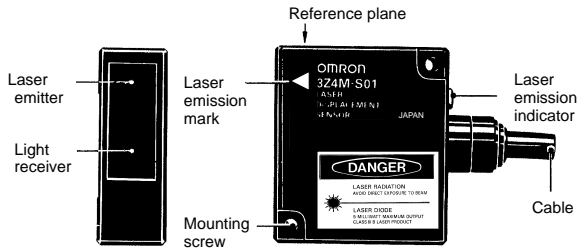


3Z4M-J10

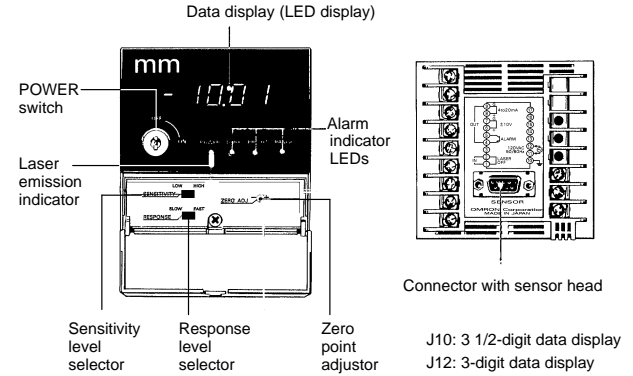


# Nomenclature

## ■ Sensor Head of Displacement Meter 3Z4M-S01 (10 μm Type)



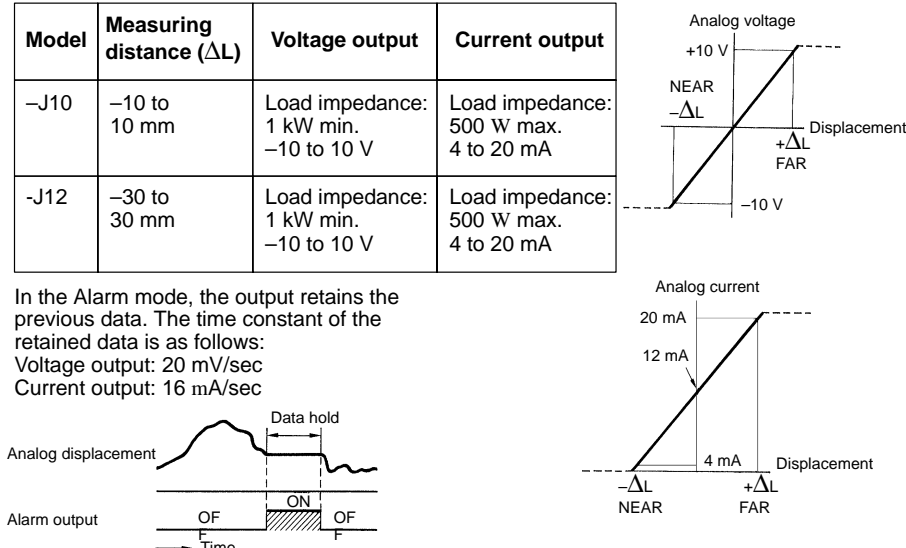
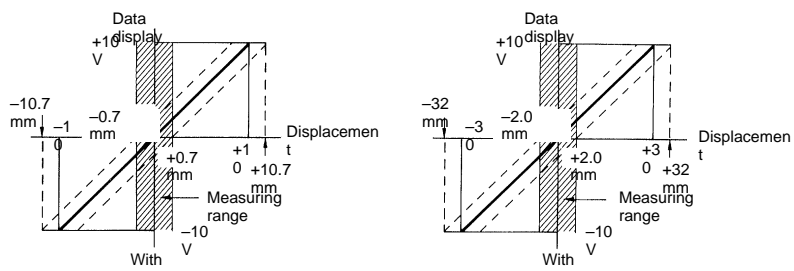
## ■ Controller of Displacement Meter 3Z4M-J10-801 (with Display); 3Z4M-J12-805



# Operation

## ■ Functions

Item	Applicable model	Function									
Data display	3Z4M-J10_	Displays the position displacement from the center of the measurement in units of mm. <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Model</th> <th>Lo</th> <th>Measuring range (<math>\pm\Delta L</math>)</th> </tr> </thead> <tbody> <tr> <td>-J10</td> <td>40 mm</td> <td>-10 to 10 mm</td> </tr> <tr> <td>-J12</td> <td>100 mm</td> <td>-30 to 30 mm</td> </tr> </tbody> </table>	Model	Lo	Measuring range ( $\pm\Delta L$ )	-J10	40 mm	-10 to 10 mm	-J12	100 mm	-30 to 30 mm
	Model		Lo	Measuring range ( $\pm\Delta L$ )							
-J10	40 mm	-10 to 10 mm									
-J12	100 mm	-30 to 30 mm									
-J12_											
Alarm indication	3Z4M-J10_	The RANGE indicator (LED) lights when the object to be measured is outside the measuring range of the displacement meter. The following two LED indicators light according to the quantity of light incident on the light receiver. When the incident is excessively BRIGHT, the indicator is ON. When the incident light excessively DARK, the indicator is ON. <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Model</th> <th>Measuring distance (<math>Lo \pm \Delta L</math>)</th> </tr> </thead> <tbody> <tr> <td>-J10</td> <td>40 mm <math>\pm</math> 10 mm</td> </tr> <tr> <td>-J12</td> <td>100 mm <math>\pm</math> 30 mm</td> </tr> </tbody> </table>	Model	Measuring distance ( $Lo \pm \Delta L$ )	-J10	40 mm $\pm$ 10 mm	-J12	100 mm $\pm$ 30 mm			
	Model		Measuring distance ( $Lo \pm \Delta L$ )								
-J10	40 mm $\pm$ 10 mm										
-J12	100 mm $\pm$ 30 mm										
-J12_											

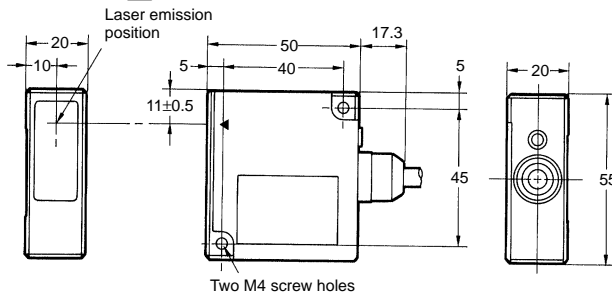
Item	Applicable model	Function												
<b>Analog displacement output</b>	3Z4M -J10__ -J12__	<p>Outputs an analog signal according to the measuring distance.</p> <table border="1" data-bbox="539 250 1142 519"> <thead> <tr> <th>Model</th> <th>Measuring distance (<math>\Delta L</math>)</th> <th>Voltage output</th> <th>Current output</th> </tr> </thead> <tbody> <tr> <td>-J10</td> <td>-10 to 10 mm</td> <td>Load impedance: 1 kW min. -10 to 10 V</td> <td>Load impedance: 500 W max. 4 to 20 mA</td> </tr> <tr> <td>-J12</td> <td>-30 to 30 mm</td> <td>Load impedance: 1 kW min. -10 to 10 V</td> <td>Load impedance: 500 W max. 4 to 20 mA</td> </tr> </tbody> </table> <p>In the Alarm mode, the output retains the previous data. The time constant of the retained data is as follows:                      Voltage output: 20 mV/sec                      Current output: 16 mA/sec</p> 	Model	Measuring distance ( $\Delta L$ )	Voltage output	Current output	-J10	-10 to 10 mm	Load impedance: 1 kW min. -10 to 10 V	Load impedance: 500 W max. 4 to 20 mA	-J12	-30 to 30 mm	Load impedance: 1 kW min. -10 to 10 V	Load impedance: 500 W max. 4 to 20 mA
Model	Measuring distance ( $\Delta L$ )	Voltage output	Current output											
-J10	-10 to 10 mm	Load impedance: 1 kW min. -10 to 10 V	Load impedance: 500 W max. 4 to 20 mA											
-J12	-30 to 30 mm	Load impedance: 1 kW min. -10 to 10 V	Load impedance: 500 W max. 4 to 20 mA											
<b>Alarm output</b>	3Z4M -J10__ -J12__	<p>When one of the RANGE, BRIGHT, and DARK alarms outputs operate, the corresponding ON signal is output from the terminal board. (These outputs are normally OFF). All these outputs are of the open-collector type (maximum load current: 100 mA; maximum voltage: 30 V).</p>												
<b>Zero point adjustment</b>	3Z4M -J10__ -J12__	<p>Minute adjustments can be performed on the zero point of the displayed value (analog displacement output) with the variable resistor (VR) on the lower side of the front panel.</p> 												
<b>Response speed selection</b>	3Z4M -J10__ -J12__	<p>The averaged time of the analog displacement output can be selected with the RESPONSE selector switch on the lower side of the front panel.</p>												
<b>Sensitivity selection</b>	3Z4M -J10__ -J12__	<p>Normally, objects with a high reflection factor as well as those with allowable reflection factor can be measured without sensitivity selection. However, when measuring an object which reflects an extremely low quantity of light, select with the SENSITIVITY selector switch on the lower side of the front panel.</p>												
<b>LD (Laser Diode) remote interlock</b>	3Z4M -J10__ -J12__	<p>Terminals 1 and 2 short-circuited: The laser emission indicator lights and the laser beam is activated two or three seconds later.                      Terminals 1 and 2 open-circuited: The laser emission indicator and the laser beam are off.</p>												

# Dimensions

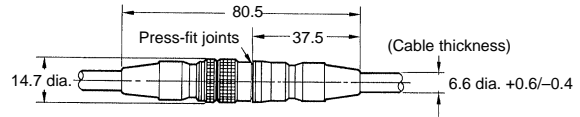
Note: All units are in millimeters unless otherwise indicated.

## ■ Sensors

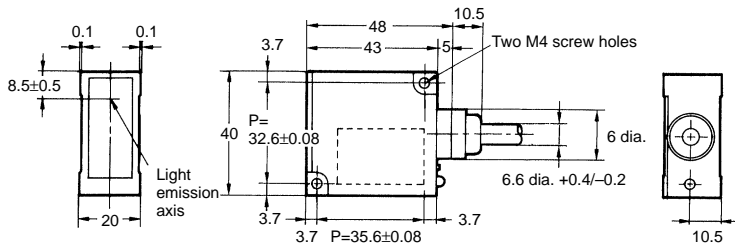
### 3Z4M-S01-\_\_



### Intermediate Connector of Sensor Cable

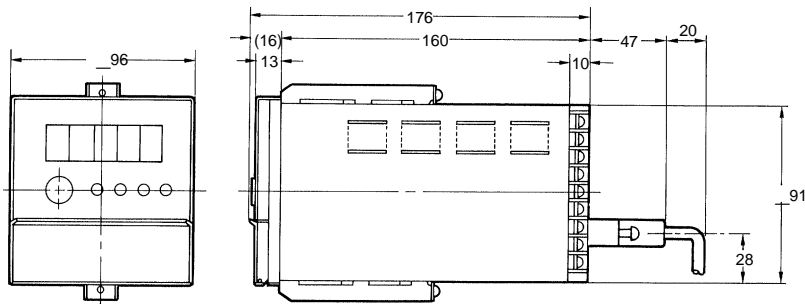


### 3Z4M-S22-\_\_



## ■ Controllers

### 3Z4M-J10-801; 3Z4M-J12-805



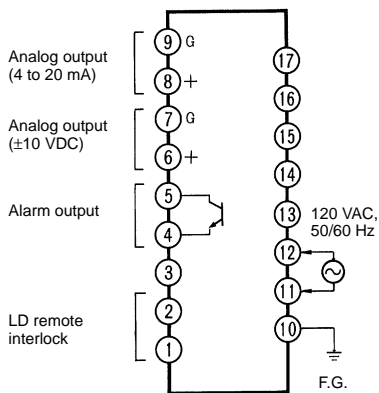
Display digits  
J10: 3 1/2 digits  
J12: 3 digits

# Installation

## ■ Wiring

### Terminal Arrangement

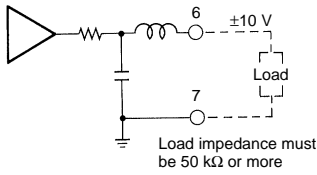
#### 3Z4M-J10 \_\_ ; 3Z4M-J12 \_\_



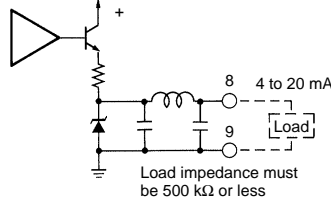
**Input/Output I/F**

**Outputs of Displacement Meter Controller**

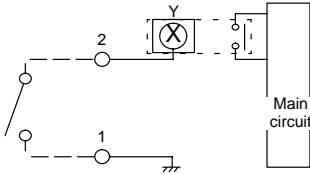
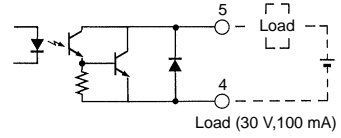
**Analog Voltage Output**



**Analog Current Output**



**Digital Output (Alarm Output)**



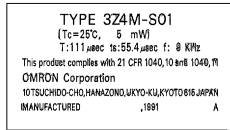
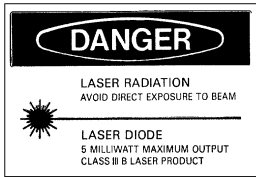
**LD Remote Interlock**

**Precautions**

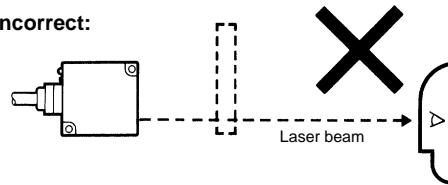
**Label**

Three convention laser radiation, warning, and explanation labels are located on the sensor head of the 3Z4M.

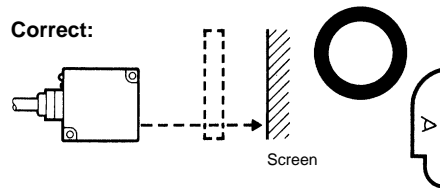
When using the 3Z4M, install the sensor head at a proper angle so that the labels can be viewed easily.



**Incorrect:**



**Correct:**



The laser radiation emitted by the 3Z4M is invisible. Avoid eye and body contact with the beam. In particular, do not look directly at the beam.

**Maintenance**

Users should not try to carry out repairs or maintenance on the 3Z4M, which contains no user servicable parts. Refer all servicing to an authorized OMRON agent.

Never disassemble the unit.

**Sensor Cable**

The sensor cable must not be connected to, nor disconnected from, the 3Z4M when the controller is switched ON.

**LD Remote Interlock**

Remove the short from terminals 1 and 2 before attempting control of the LD sensor from a remote device.

**Installation**

Install the sensor head in a location where the laser beam will not enter the operator's eyes directly or from reflection by a mirror surface. Also, mount the operation indicator (LED) in an easily visible position.

Do not install the sensor head in a location where there is the possibility of the laser beam entering the operator's eyes directly due to the the passage or disappearance of the measurement object, as shown in the diagram below.

When installation in a location such as that mentioned above cannot be avoided, use a screen or another item to guard the laser beam from leaking to the outside.