



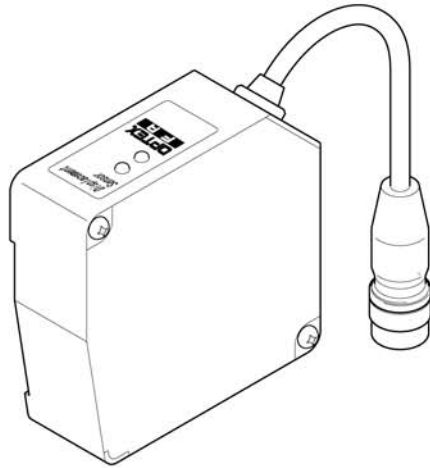
## Sensor Head Instruction Manual

# Displacement Sensor CD4 Series

**CD4-L25/CD4-30/CD4-85/CD4-350**

**Laser Type**

(Please refer to CD4 Amplifier CD4A-N, CD4A-LN, CD4A-P and CD4A-LP Instruction Manual for the amplifier.)



### **FOREWORD ..... 2**

### **SAFETY PRECAUTIONS ... 3**

Meanings of Safety Symbols .... 3

Mandatory Requirements ..... 3

Operating Precautions ..... 3

Cautions for Laser Product ..... 4

### **BASIC INFORMATION**

#### **BEFORE USE ..... 5**

Parts Identifications

of Sensor Head ..... 5

Package Descriptions ..... 5

Specifications ..... 6

### **SENSOR HEAD**

#### **INSTALLATION ..... 7**

### **DIMENSIONAL DRAWING ... 8**

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# FOREWORD

Thank you for purchasing the Displacement Sensor CD4 Series. We hope you are fully satisfied with this product and enjoy its performance. To ensure your satisfaction, please follow the instructions below.

- Carefully read this instruction manual and keep it for future reference.
- If you have any question about the instructions here or a request for replacing the lost instruction manual, contact the sales office or store where you purchased this product.
- The contents in this instruction manual are protected by copyright and all rights are reserved by OPTEX FA CO., LTD. The descriptions and information included in this manual shall not be copied nor reproduced to any other form.



This product cannot be used as a safety device to protect human body.



This products may be listed as articles to be regulated for export such as strategic materials by the Foreign Exchange and Foreign Trade Control Act. Therefore, if you intend to export these, be sure to follow the necessary procedures, such as application for an export permit from the Government.

## Warranty

Whereas all of our products are tested in accordance with the strict internal standard, a faulty unit may unexpectedly be distributed. If this is the case with your product, identify its status and contact the sales office or store where you purchased it.

- The warranty period shall be one(1) year after its delivery to the customer.
- If the failure results from a manufacturer's fault, the manufacturer will replace the product (by sending a substitute) without charge except the following cases:
  1. Failure due to any abuse or misuse
  2. Failure due to a cause other than the product
  3. Failure due to unapproved modification or repair
  4. Failure due to acts of God

This warranty is limited to the delivered product only.

This warranty shall not cover the secondary damage caused by the faulty product.

# SAFETY PRECAUTIONS

Carefully read and understand the safety precautions before operation. They provide the important information to protect your health and property. Strictly follow this instruction manual, and do not apply any other installing/operating procedure which is not described in this manual.

## Meanings of Safety Symbols



Indicates a possible hazard that may result in death or serious injury if the product is used without observing the stated instructions.



Indicates a possible hazard that may result in personal injury or property damage if the product is used without observing the stated instructions.

## Mandatory Requirements



- Do not stare into laser beam or point laser beam at eyes since it may damage the eyesight.
- This product cannot be used as a safety device to protect human body.
- Do not disassemble or modify the product since it is not designed to automatically stop the laser emission when open. Disassembling or modifying at customer's end may cause personal injury, fire or electric shock.
- Use only the special amplifier unit and extension cable to connect the sensor head. Other unit/cable may cause an accident or a damage of the product.
- Turn the power off securely before connecting/disconnecting the special amplifier.

## Operating Precautions

- Do not use the sensor in transient state (i.e. during warm-up time) after power on (5 minutes).
- Do not use the sensor outside or do not expose the detection surface directly to ambient light (fluorescent light, incandescent light and sunlight).
- The sensor performance may depend on the individual units.
- Wipe off dirt on the cover (glass) of the emitting/receiving parts using a soft cloth etc., at every operation since it may cause incorrect detection.



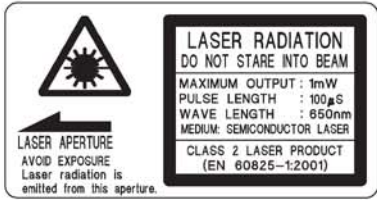
Direct impact on the cover (glass) of the emitting/receiving parts may result in damage of the product.



Use of controls or adjustments or performance of procedures other than the specified herein may result in hazardous radiation exposure.

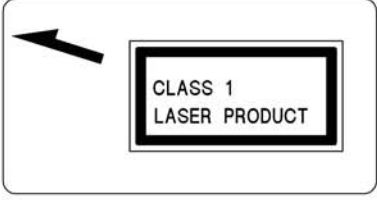
# Cautions for Laser Product

This sensor emits visible laser beam compliant with JIS C6802/IEC/FDA, laser safety standard Class 1 or Class 2 (II). The warning and description labels are attached to the side of the sensor body. For details, refer to the Sensor Head instruction manual.



### Laser type of this product

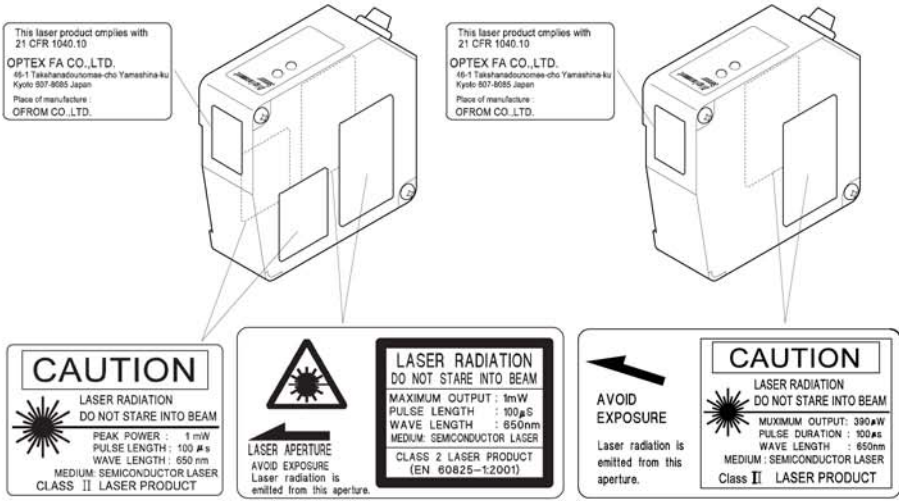
Type	Red Laser Diode
Wavelength	650 nm
Output	390 µW / 1 mW



This sensor is subject to the FDA laser standard when exported to U.S.A. The report of this sensor has been submitted to Center for Devices and Radiological Health (CDRH). Contact the manufacturer for further details.

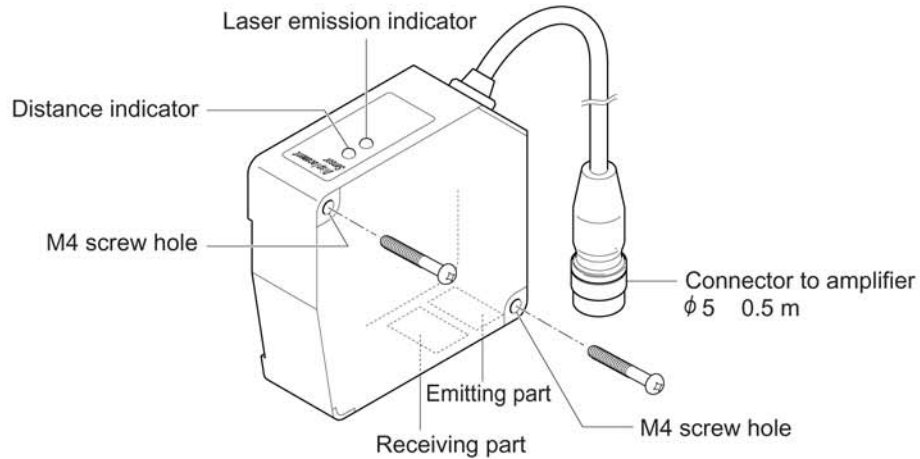
CD4-30 / CD4-85 /  
CD4-350

CD4-L25



# BASIC INFORMATION BEFORE USE

## Parts Identifications of Sensor Head



Option: Extention cable to connect the amplifier



Length(L)	Cable type
2 m	CD4CN-S-ROBOT
5 m	CD4CN-5S-ROBOT

## Package Descriptions

- Sensor Head Main Unit
- Screw x 3 pcs.
- Instruction Manual

## Specifications

Model No.	CD4-L25	CD4-30	CD4-85	CD4-350
Optical method	Regular reflection	Diffuse reflection		
Measuring range	25 ± 1 mm	30 ± 5 mm	85 ± 20 mm	350 ± 100 mm
Light source	Red Laser Diode (Wavelength 650 nm)			
	Max. output: 390 μW	Max. output 1mW		
IEC/JIS CLASS	CLASS 1	CLASS 2		
FDA CLASS	Class II			
Spot size <sup>*1</sup> (approx. volume)	25x35 μm	30x100 μm	70x290μm	300x700μm
Linearity <sup>*2</sup>	± 0.1% F.S.			
Resolution <sup>*3</sup>	0.1 μm	1 μm	3 μm	40 μm
Supply voltage	Supplied from the special amplifier unit			
Temperature drift	± 0.01 % F.S.			
Indicator	Laser emission indicator : Green (ON during laser emission)			
	Distance indicator : Red (Near) : Orange (Middle) : Green (Far) : Alternate Red/Green (Out of range or failure in measurement)			
Protection category	IP67 (excluding connector joint)			
Operating temperature	-10 to +45°C (Non-condensing) For storage: -20 to +60°C			
Operating humidity	35 to 85 % RH / For storage: 35 to 85 % RH			
Ambient light	Acceptance surface illuminance: Max. 3,000 lx (Incandescent lamp)			
Vibration resistance	10 to 55 Hz, Double amplitude 1.5 mm, 2 h for XYZ axes			
Shock resistance	50 G (500 m/s <sup>2</sup> )			
Material	Sensor head housing: Diecast Aluminum Cover of emitting/receiving parts: Glass			
Cable extension	Max. 10 m with the extension cable (option)			
Weight	250 g (including 50 cm cable)			

<sup>\*1</sup> Defined with center strength 1/e<sup>2</sup> (13.5 %) in the center of detection area. There may be leak light other than the specified spot size. The sensor may be affected when there is a highly reflective object close to the detection area.

<sup>\*2</sup> 256 times in average (using the special amplifier), object: White ceramic for the diffuse reflection type, Glass for the regular reflection type.  
The value is subject to objects.

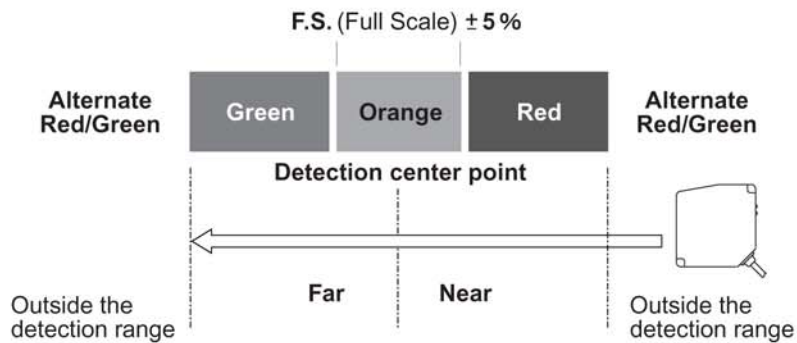
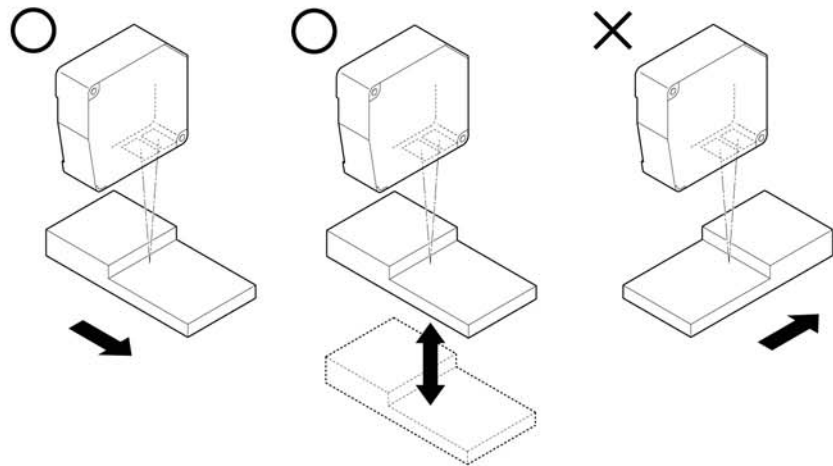
<sup>\*3</sup> The typical value in the conditions of 256 times in average (using the special amplifier), object: White Ceramic, distance range: Middle. The value is subject to objects.

# SENSOR HEAD INSTALLATION



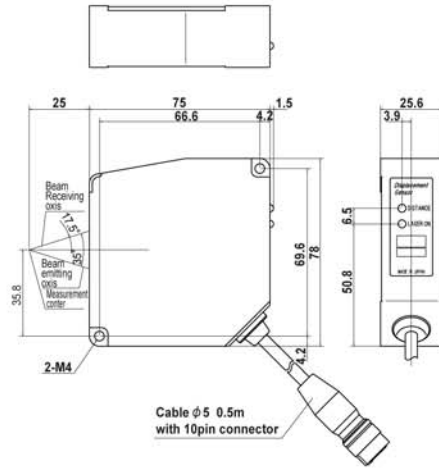
- Avoid the operator's eye height for sensor head installation.
- Install the sensor head before connecting the special amplifier. (Turn the power off before starting installation work.)

The detection surface (the side of the emitting/receiving parts) should be parallel to the target object. Adjust the spot to conform to the detection point. Ensure that the distance indicator turns orange when the detection point (the center of displacement) passes the spot point.

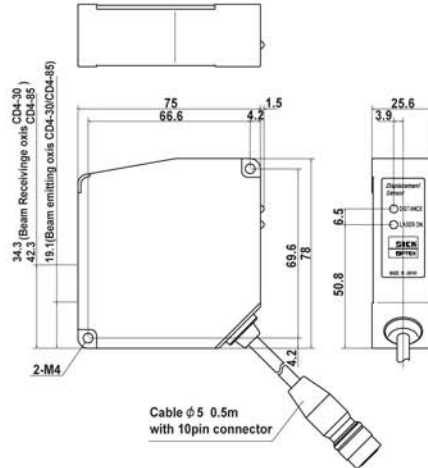


# DIMENSIONAL DRAWING

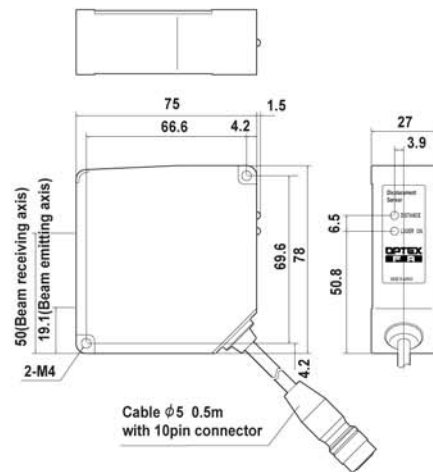
CD4-L25



CD4-30 / CD4-85



CD4-350



Unit: mm