

Displacement Sensor  
**CD SERIES** Laser type

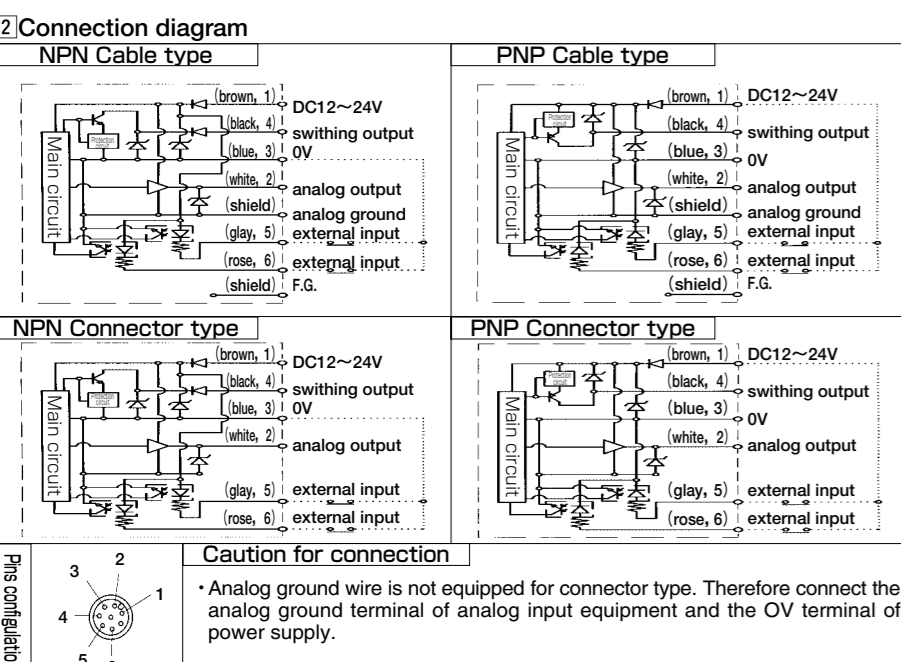
CD3-30 □ □ □ CD3-50 □ □ □  
CD3-80 □ □ □ CD3-100 □ □ □  
CD3-250 □ □ □

**INSTRUCTION MANUAL**

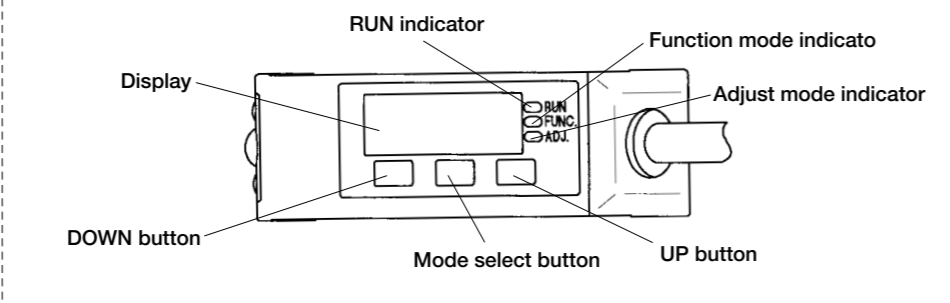
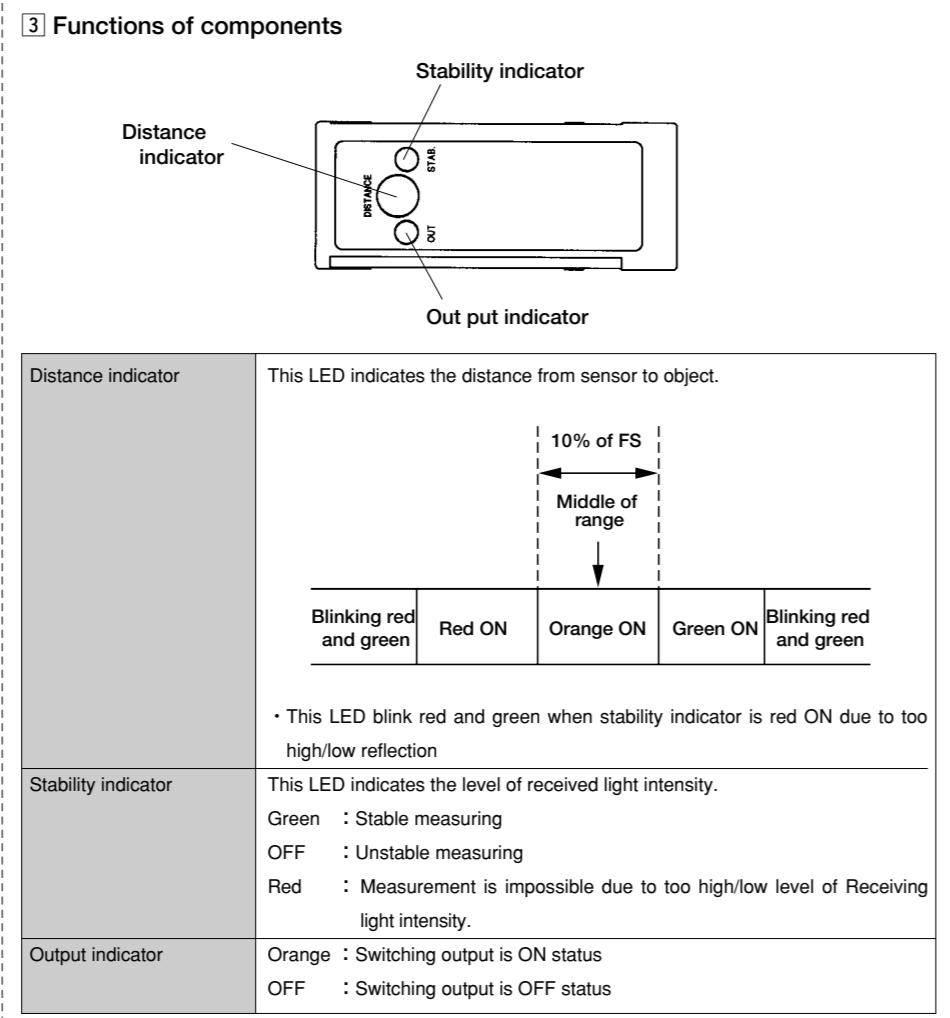
- Confirm if the item meets your needs.
- Before the use, you should first thoroughly read this manual and operate correctly as mentioned.
- You should keep this manual at hand for proper use.

		Laser type					
Type	Cable type	CD3-30 (N.P)	CD3-50 (N.P)	CD3-80 (N.P)	CD3-100 (N.P)	CD3-250 (N.P)	
	Connector type	CD3-30C (N.P)	CD3-50C (N.P)	CD3-80C (N.P)	CD3-100C (N.P)	CD3-250C (N.P)	
Measuring Range		30±4mm	50±10mm	80±15mm	100±40mm	250±150mm	
Light Source		Class 2 Red laser Diode (wave length 650nm)					
Peak Power		1mW max.					
Pulse Length		300 μs					
Pulse Repetition Rate		1kHz					
Frequency		1kHz					
Spot Size (middle of range)		φ 0.5mm	φ 0.8mm	1×1.5mm	1×1.5mm	3×1.5mm	
Supply Voltage		DC12~24V (-5% +10%)					
Current Consumption		120mA max./DC12V,		80mA max./DC24V			
		including analog output value					
Resolution 1)		4 μm	10 μm	10 μm	30 μm	150 μm	
Linearity 2)		±1%FS				≥250mm : ±1.5%FS <250mm : ±2.5%FS	
Temperature Drift		±0.08%FS/°C					
Response Time		2.2ms max. (sensitivity: fix, averaging: 1) 22.5ms max. (sensitivity: AUTO, averaging: 1)					
Outputs	Analog output	4~20mA					
	Switching output	NPN/PNP 100mA max./DC24V Residual voltage 1.8V max.					
Indicators	Distance Indicator	Near	: Red	Middle	: Orange	Far	: Green
		Out of range	: Blinking Red/Green	Too high/low reflection	: Blinking Red/Green		
	Stability Indicator	Stable	: Green	Unstable	: Indicator OFF	Too high/low reflection	: Red
	Output Indicator	ON status	: Orange				
Ambient Light		Sun light: 10,000 lx max.		Incandescent lamp: 3,000 lx max.			
Operating Temperature		-10~40°C					
Operating Humidity		35~85%RH					
Housing Material		Zinc die-cast					
Protection Category		IP67					
Weight	Cable Type	approx. 130g (without cable)					
	Connector Type	approx. 140g					

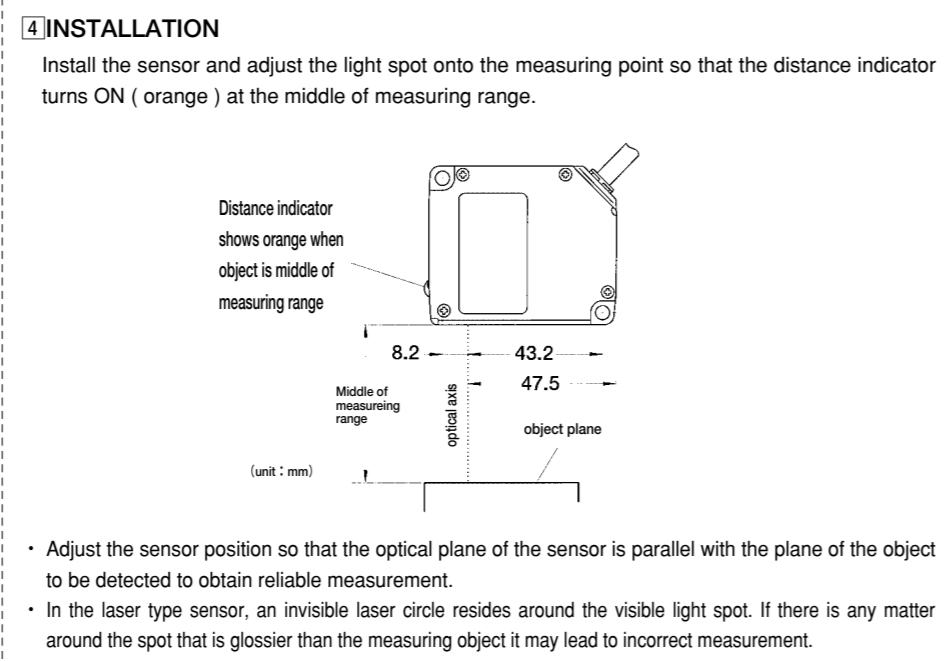
FS (Full scale) is defined as, CD3-30:8mm, CD3-50:20mm, CD3-80:30mm, CD3-100:80mm, CD3-250:300mm  
 1) Middle of measuring range, Sensitivity: AUTO, Averaging: 64, Object: white ceramic  
 2) Linearity error (sensitivity: AUTO, averaging: 64, object: white ceramic)



- Connect the lead wires correctly. The analog output wire must not be in contact with any other wire. Do not turn on any power while wiring.
- The blue wire (0V) and shield wire (analog GND) are internally connected. Use the blue wire (0V) for the power supply and use the shield wire (analog GND) for analog output.

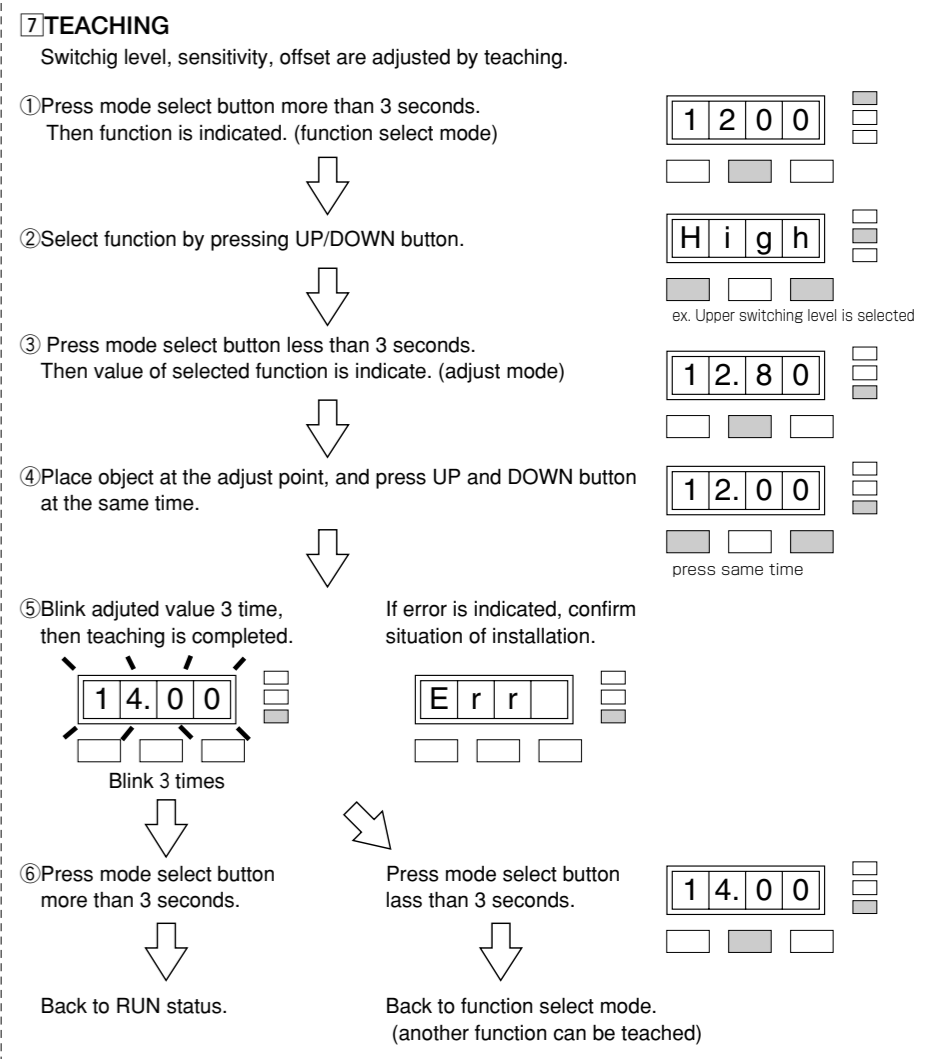
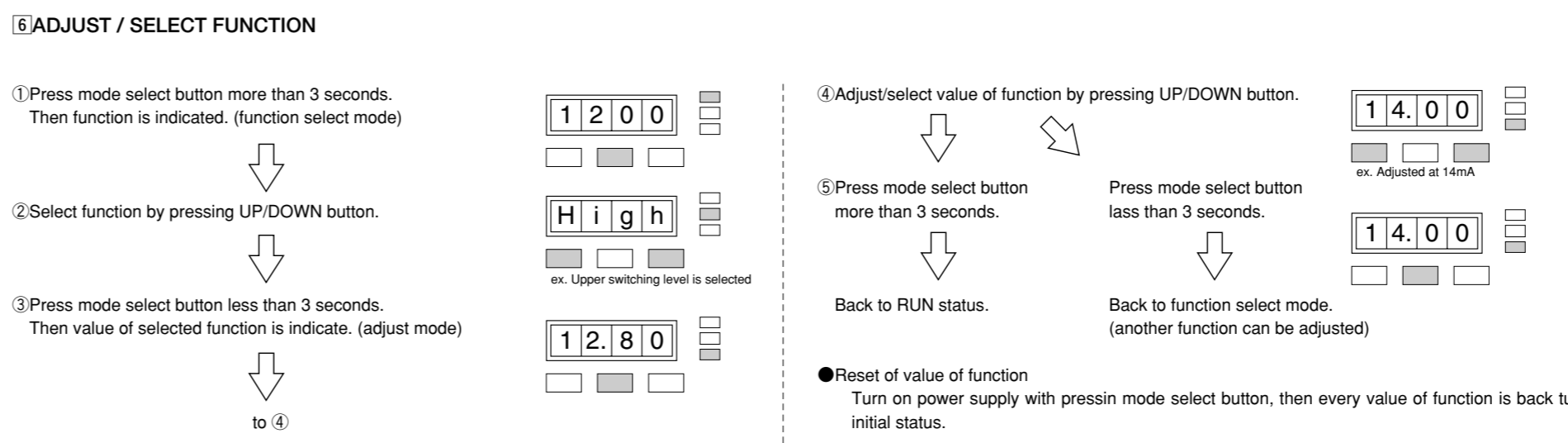


RUN indicator	This LED indicates RUN mode.
Function mode indicator	This LED indicates function select mode.
Adjust mode indicator	This LED indicates adjust mode of function.
Display	RUN indicator ON : Indicate distance from sensor to object. Function mode indicator ON : Indicate function. Adjust mode indicator ON : Indicate value of selected function.
Mode select button	Mode is changed by this button.
UP/DOWN button	RUN mode : no effect Function select mode : Select function Adjust mode : Adjust value of function



**5 FUNCTION**

Function	Function mode indicate	Adjust mode indicate	Adjust/Select item	Teaching	Initial value
Upper switching level	High	4.00...20.00 (mA) current indicate/indication off relative distance -9999...9999 (mm) 30mmtype, distance indicate -4.00...4.00 (mm) 50mmtype, distance indicate -10.00...10.00 (mm) 80mmtype, distance indicate -15.00...15.00 (mm) 100mmtype, distance indicate -40.00...40.00 (mm) 100mmtype, distance indicate -150.0...150.0 (mm) 250mmtype, distance indicate	Upper switching level can be adjusted without object.	Possible	Middle of measuring range +5%(FS)
Lower switching level	Lo	same as above	Lower switching level can be adjusted without object.	Possible	Middle of measuring range -5%(FS)
Output style (Timmer)	OtyP	only, oFdy, onEs, oFF	Timmer mode can be selected. only : on delay oFdy : off delay onEs : one shot oFF : without timmer		oFF
Timmer period	tlEr	0...999, 1 S...10 S (ms)	Timmer period can be adjusted. 0...999ms: every 1ms 1...10S: every 1S		0
Hysteresis	HySt	0.00...1.99 (mA) current indicate/indication off relative distance 0.00...1.00 (mm) 30mmtype, distance indicate 0.00...2.49 (mm) 50mmtype, distance indicate 0.00...3.75 (mm) 80mmtype, distance indicate 0.00...10.00 (mm) 100mmtype, distance indicate 0.00...37.50 (mm) 250mmtype, distance indicate	Hysteresis of switching output can be adjusted.		0.15%(FS)
Averaging	Arg	1, 4, 16, 64, 256, 1024	Averaging times of output can be selected.		64
Sensitivity	SEnS	1...20 AUTO	Sensitivity can be selected. 1 (low)~20 (high) : Sensitivity can be fixed at selected sensitivity. AUTO : Sensitivity is adjusted automatically. Offset can be adjusted ±50% compare to initial value.	Possible	AUTO
Offset	OFSr	-50.0P...50.0P	Span of analog output can be adjusted ±50% compare to initial value.	Possible	0.0P
Span	SPAn	-50P...50P	Analog output can be selected when reflection is too high/low. Hold : Analog output is held just before reflection becomes too high/low. CLp : aAnalog output is fixed at 24mA.		CLp
Analog output when reflection is too high/low	EoUt	Hold, CLp	Display style during RUN status 4-20 : Current indicate (4-20mA) diSt : Distance indicate (mm) -4.000...4.000 30mm type -10.00...9.999...9.999, 10.00 50mm type -15.00...-10.00, -9.999...9.999, 10.00...15.00 80mm type -40.00...-10.00, -9.999...9.999, 10.00...40.00 100mm type -150.0...-100.0, -99.99...99.99, 100.0...150.0 250mm type 0-99 : Relative distance within range (-9999~9999) off : Display off rdIS : Reverse plus and minus when distance displayed.		diSt
Bank	Ban	0, 1, 2, 3	4 pattern of function can be memorized (Except for external input customization and inside memory ON/OFF)		0
External input customize	InPt	A Type A b Type B c Type C d Type D	Two external input (Rose wire and Grey wire) can be divided into four types. Type A Type B Type C Type D		A
Interior memory ON/OFF	EEP	On, OFF	1. Choose OFF if you wish to keep operation without writing date of results into interior memory (Operation by external input only). 2. Choose OFF for the lifetime of interior memory (Limits: hundred thousand times). * 1. Change setting by button operation will be written on the memory. * 2. Information which are not written on interior memory will be cleared when switched off.		oN



**8 Warnings and cautions**

**Warnings**

- Laser beam
  - This item utilizes visible light laser beam and is subject to safety standard class 2 of JIS C6802 as well as IEC and FDA regulations.
  - DO NOT stare into the beam, or reflect the beam with a mirror.
  - DO NOT disassemble the unit. Sensor are not equipped with auto-laser-off function.

**Cautions**

- DO NOT allow dust, oil, water, etc. to accumulate on the sensor face. It degrades the sensor function, if pollution, just wipe clean using a dry cloth.
- When a switching regulator is to be used with a power supply, make sure to ground the frame ground terminal.
- DO NOT use the sensor in a transient state at power on (Approx. 30min. warm-up time).
- DO NOT run the sensor cable near a high-voltage lines, or power lines or put them together in the same raceway. This warning should be strictly observed to prevent malfunctions caused by inductive interference.
- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- Sensors equipped on machinery are under FDA of American laser regulation. CD3 series have already been registered with CDRH (Center for Devices and Radiological Health).

