

LS

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CD4

CD33

CD3

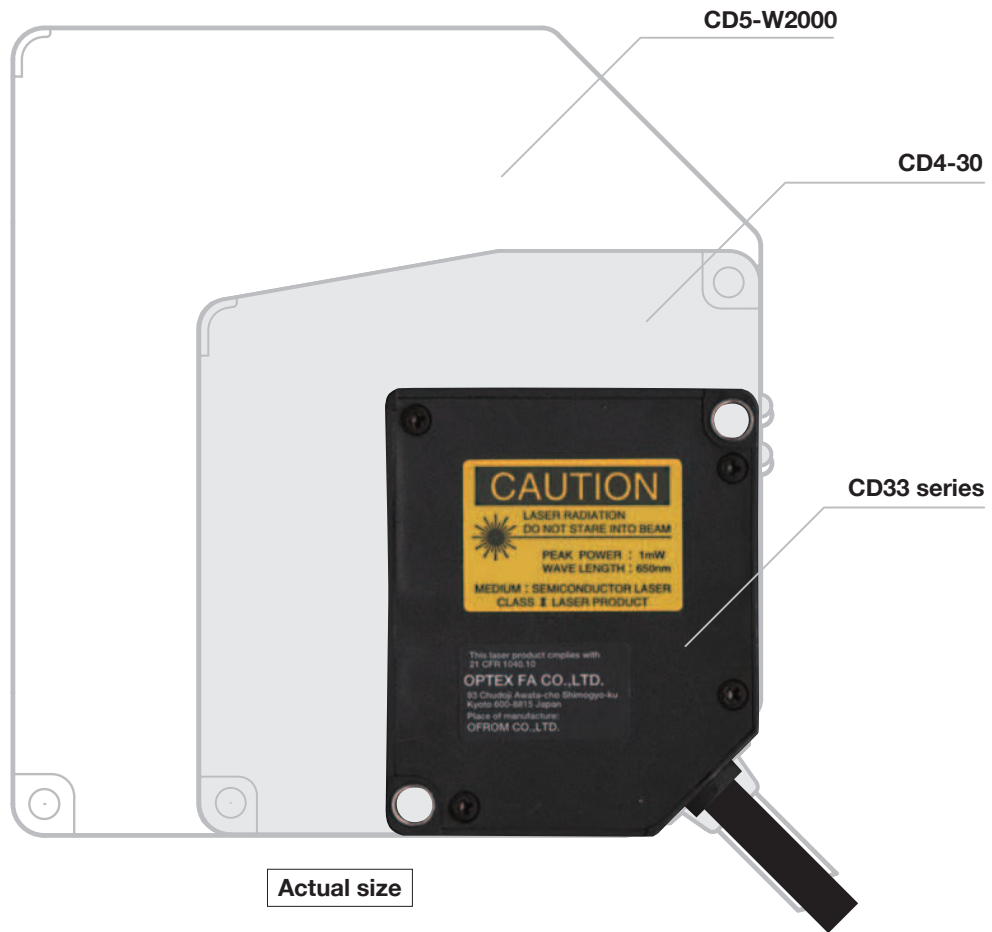
CD22

CD1

UQ1

CD33 series

CMOS sensor with $\pm 0.1\%$ F.S. linearity packed in a half-palm size, ideal for built-in use with OEM machines.



- Available is CD33-L a Specular Types for high reflection and transparent object even in RS422 serial communications.
- Just connect UQ1-02 to build data logging system to Mitsubishi PLC without any I/F, logging unit and ladder program.
- Analogue output (4-20mA or 0-10V) + 2 control outputs
Stand-alone design capable of direct operation without controller



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LINEUP

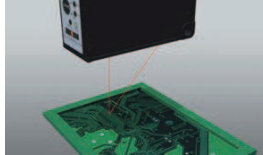
Diffuse type

CD33-30

30mm distance type

Warping / Sagging of PC board

Measurement range : 30 ±4mm
Resolution : 4 μm (Fast mode)
Linearity : ±0.1% F.S.

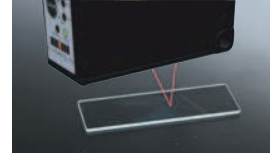


Specular type

CD33-L30

26.3mm distance type

Measurement range : 26.3 ±2mm
Resolution : 1 μm
Linearity : ±0.2% F.S.



CD33-50

50mm distance type

Height of components on the board

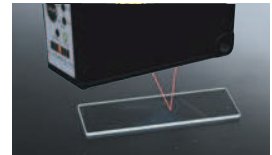
Measurement range : 50 ±10mm
Resolution : 8 μm (Fast mode)
Linearity : ±0.1% F.S.



CD33-L50

47.3mm distance type

Measurement range : 47.3 ±5mm
Resolution : 2.5 μm
Linearity : ±0.2% F.S.



CD33-85

85mm distance type

Joint of rubber sheet

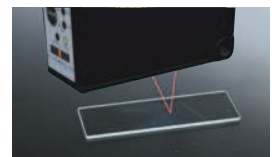
Measurement range : 85 ±20mm
Resolution : 15 μm (Fast mode)
Linearity : ±0.1% F.S.



CD33-L85

82.9mm distance type

Measurement range : 82.9 ±10mm
Resolution : 5 μm
Linearity : ±0.2% F.S.



CD33-120

120mm distance type

Loosen rubber sheet

Measurement range : 120 ±60mm
Resolution : 45 μm (Fast mode)
Linearity : ±0.1% F.S.



Application example for specular type
Measurement of glass thickness is available

CD33-250

250mm distance type

Checking tire

Measurement range : 250 ±150mm
Resolution : 100 μm (Fast mode)
Linearity : ±0.3% F.S.



Product code

- CD33-□□**NV** (N=NPN, V=0-10V)
- CD33-□□**NA** (N=NPN, A=4-20mA)
- CD33-□□**PV** (P=PNP, V=0-10V)
- CD33-□□**PA** (P=PNP, A=4-20mA)
- CD33-□□□**N-422** (N=NPN, 422=RS422 I/F)
- CD33-□□□**P-422** (P=PNP, 422=RS422 I/F)

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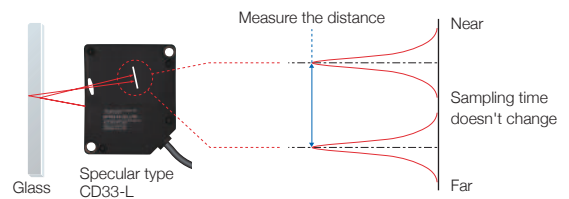
UQ1

CD33 ADVANCED TECHNOLOGY

The CD33 series is a function rich CMOS laser displacement sensor designed in an ultra-compact housing RS-422 type is available for digital connection

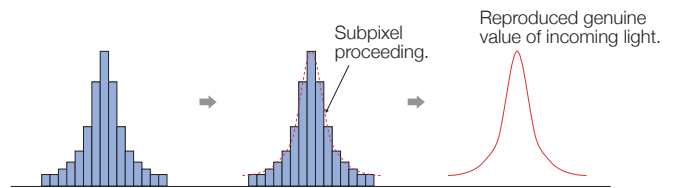
Reliable glass thickness measurement

The Specular type CD33-L** can detect both surface of glass and measure the thickness.



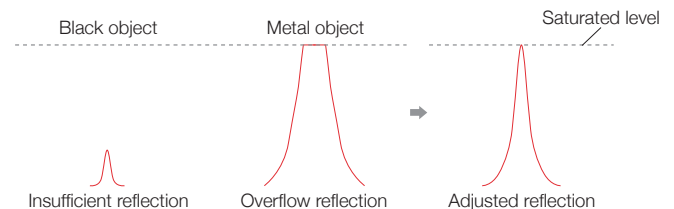
Digital subpixel processing

Subpixel processing divides one pixel into small pieces that enables accurate measurement by reproducing genuine value of incoming light.



High resolution electronic shutter

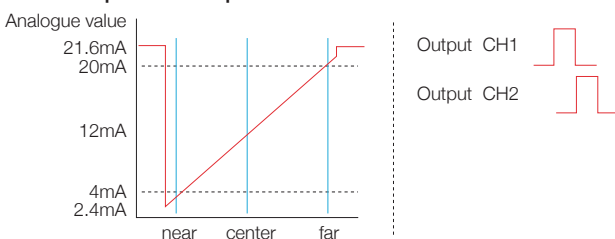
High resolution electronic shutter controls to keeps a constant level according to reflection. This function enables stable peak level detection even when unstable surface conditions exist.



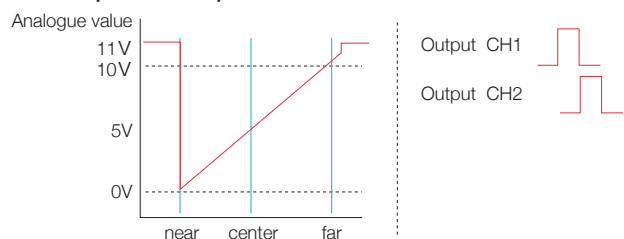
Easy-to-select models between voltage and current output.

It is common today for sensors to be very complicated requiring long set-up times and many buttons to operate. The CD33 focuses on easier set-up by separating voltage and current output models into two types.

4-20mA output + 2CH outputs



0-10V output + 2CH outputs



Ideal for robot mounting

Ideal for mounting on robot cylinder thanks to compact dimensions and the light 65g weight. IP67 water tightness is also secured.



Control unit UQ1 series to connect sensor head to PLC MELSEC-Q series directly

UQ1-02 enables easy connection of CD33 and PLC MELSEC-Q series. UQ1 setup the sensor head automatically. You don't have to have big ladder program.



2CH outputs enables individual setting of measurement range.

Highly accurate comparator output capable of identifying $12\mu\text{m}$ (with CD33-30 types). Hysteresis is just 0.15% F.S.



MF (Multi Function) input for further convenience.

The programmable remote MF input can be set to one of the following: Laser o , External teach, Hold, or One-shot trigger.



LS

Dimensions

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Cable type

CD4

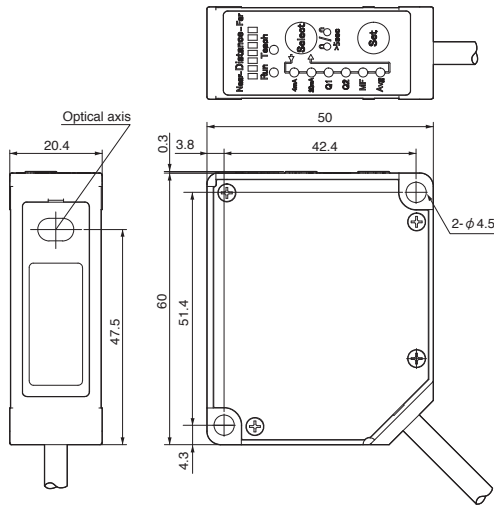
CD33

CD3

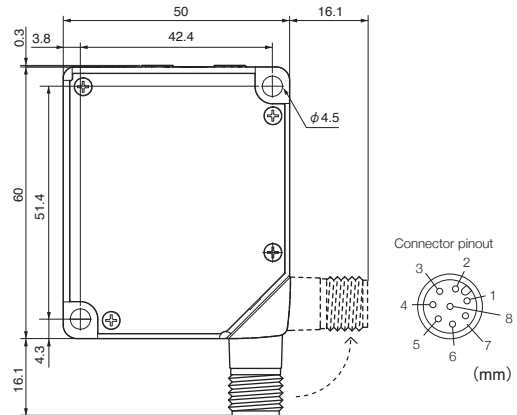
CD22

CD1

UQ1

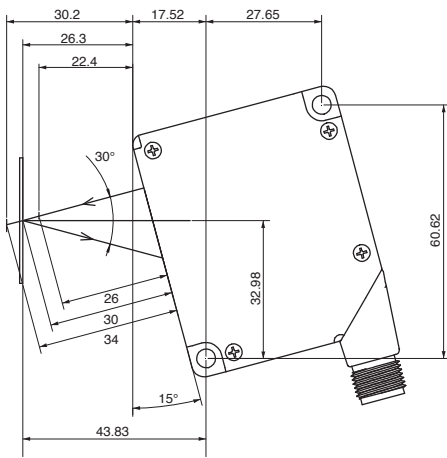


M12 Connector type

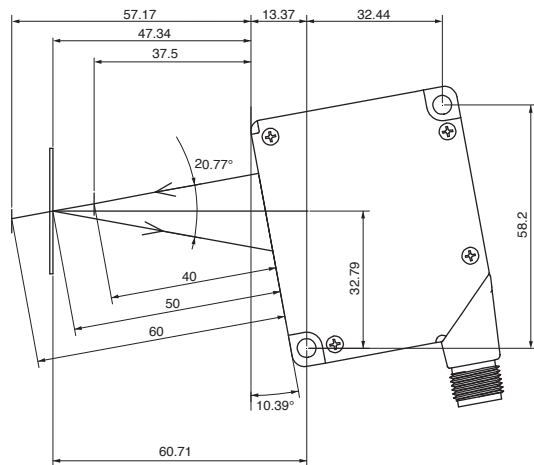


Mounting of specular type

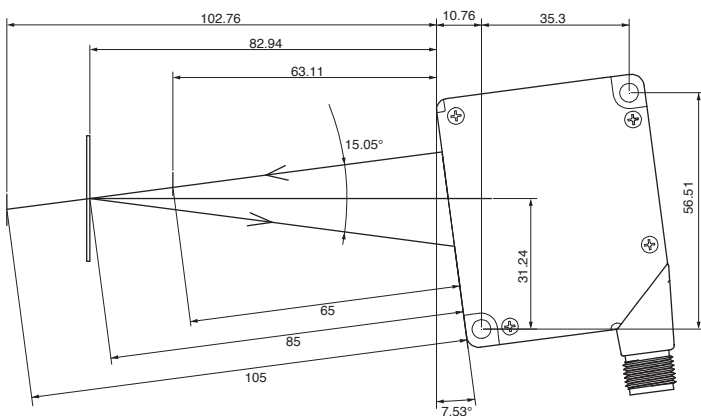
Model No. : CD33-L30



Model No. : CD33-L50



Model No. : CD33-L85



Accessories

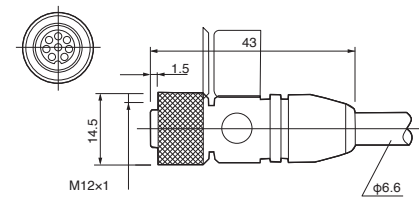
Cable

Model No. : DOL-1208-G02MF

: 2m extension cable (unbundled)

Model No. : DOL-1208-G05MF

: 5m extension cable (unbundled)



Specifications

Diffuse type

Model	Cable type	2control output	CD33-30N / P	CD33-50N / P	CD33-85N / P	CD33-120N / P	CD33-250N / P
		2control output + Analog 4-20mA	CD33-30NA / PA	CD33-50NA / PA	CD33-85NA / PA	CD33-120NA / PA	CD33-250NA / PA
Connector type	2control output + Analog 0-10V	CD33-30NV / PV	CD33-50NV / PV	CD33-85NV / PV	CD33-120NV / PV	CD33-250NV / PV	
		1control output + RS422	CD33-30N-422	CD33-50N-422	CD33-85N-422	CD33-120N-422	CD33-250N-422
Connector type	2control output + Analog 4-20mA	CD33-30P-422	CD33-50P-422	CD33-85P-422	CD33-120P-422	CD33-250P-422	
		2control output	CD33-30CN / CP	CD33-50CN / CP	CD33-85CN / CP	CD33-120CN / CP	CD33-250CN / CP
Connector type	2control output + Analog 0-10V	CD33-30CNA / CPA	CD33-50CNA / CPA	CD33-85CNA / CPA	CD33-120CNA / CPA	CD33-250CNA / CPA	
		2control output + Analog 0-10V	CD33-30CNV / CPV	CD33-50CNV / CPV	CD33-85CNV / CPV	CD33-120CNV / CPV	CD33-250CNV / CPV
Connector type	1control output + RS422	CD33-30CN-422	CD33-50CN-422	CD33-85CN-422	CD33-120CN-422	CD33-250CN-422	
		CD33-30CP-422	CD33-50CP-422	CD33-85CP-422	CD33-120CP-422	CD33-250CP-422	
Control output		N = NPN output, P = PNP output					
Measurement range		30±4mm	50±10mm	85±20mm	120±60mm	250±150mm	
Full scale		8mm	20mm	40mm	120mm	300mm	
Light source		Red laser diode (wave length 655nm)					
Peak power		1mW max.					
IEC/JIS Class		Class 2					
FDA CLASS		CLASS II					
Spot size (approx.volume) (*1)	Near	0.15×0.15mm	0.6×1.2mm	0.9×1.5mm	1.2×1.8mm	1.5×2.5mm	
	Middle	0.1×0.1mm	0.5×1.0mm	0.75×1.25mm	1.0×1.5mm	1.75×3.5mm	
	Far	0.15×0.15mm	0.4×0.9mm	0.6×1.0mm	0.5×0.8mm	2.0×4.5mm	
Linearity (*2)		±0.1% F.S.					
Resolution (*3)	Fast	4μm	8μm	15μm	45μm	100μm	
	Other	2μm	5μm	10μm	30μm	75μm	
Temp drift		±0.08%F.S. / °C					
Response time (*4)	Fast	1ms+ selecting sensitivity (averaging : 1)				1.5ms+ selecting sensitivity (averaging : 1)	
	Standard	8.5ms+ selecting sensitivity (averaging : 16)				13ms+ selecting sensitivity (averaging : 16)	
	High resolution	32.5ms+ selecting sensitivity (averaging : 64)				49ms+ selecting sensitivity (averaging : 64)	
	Selecting sensitivity	4ms max.					
Indicators	Distance indicator	bar graph LED					
	Output indicator	ON status : Orange					
Protection category		IP67					
Ambient temp / humidity		-10~+45°C / 35~85%RH (No condensation or freezing)					
Storage temp / humidity		-20~+60°C / 35~95%RH (No condensation or freezing)					
Ambient illuminance		Sun light : 10,000lx max. Incandescent lamp : 3,000lx max.					
Vibration resistance		10 to 55 Hz, Double amplitude 1.5 mm, 2 h for XYZ axis					
Shock resistance		50G (500m/s ²)					
Cable extension		Up to 10m using an optional extension cable					
Material		PBT (Case) PMMA (Front window)					
Weight	Cable type	approx.65g (without cable)					
	Connector type	approx.70g					

Model	2 Control output	+ Analog 4-20mA	+ Analog 0-10V	1 Control output + RS422
Supply voltage	12 - 24VDC (-5%, +10%)		18 - 24VDC (-5%, +10%)	12 - 24VDC (-5%, +10%)
Current consumption	max. 55mA (24VDC)	max. 85mA (24VDC)	max. 55mA (24VDC)	
Output	Control output 1	NPN / PNP open collector 100mA max. / 30VDC (residual voltage max. 1.8V)		—
	Control output 2	NPN / PNP open collector 100mA max. / 30VDC (residual voltage max. 1.8V)		
	Analog output	—	4-20mA	0-10V
Interface	—			RS422
Cable type	Dia : 5mm 5core 2m AWG24 (PVC)	Dia : 5mm 6core 2m AWG24 (PVC)		Dia : 5mm 8core 2m AWG24 (PVC)
Connector type	M12 8pin			

*1 Defined with center strength 1/e²(13.5%). There may be leak light other than the specified spot size. The sensor may be affected when there is a highly reflective object around the targets.

*2 Averaging : 64(High resolution), Object : white ceramic.

*3 Middle of measuring range, Object : white ceramic.

*4 Response time : response time plus selecting sensitivity time.

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UQ1

Specular type

Model	Cable type	2control output + Analog 4-20mA	CD33-L30NA / PA	CD33-L50NA / PA	CD33-L85NA / PA
		2control output + Analog 0-10V	CD33-L30NV / PV	CD33-L50NV / PV	CD33-L85NV / PV
		1control output + RS422	CD33-L30N-422 / P-422	CD33-L50N-422 / P-422	CD33-L85N-422 / P-422
	Connector type	2control output + Analog 4-20mA	CD33-L30CNA / CPA	CD33-L50CNA / CPA	CD33-L85CNA / CPA
		2control output + Analog 0-10V	CD33-L30CNV / CPV	CD33-L50CNV / CPV	CD33-L85CNV / CPV
		1control output + RS422	CD33-L30CN-422 / CP-422	CD33-L50CN-422 / CP-422	CD33-L85CN-422 / CP-422
Control output		N = NPN open collector, P = PNP open collector			
Measurement range		26.3±2mm	47.3±5mm	82.9±10mm	
Full scale		4mm	10mm	20mm	
Light source		Red laser diode, 655nm			
Peak power		390μW max.			
IEC/JIS Class		Class 1			
FDA CLASS		CLASS II			
Spot size (approx.volume) (*1)		Near	0.15×0.15mm		
		Middle	0.1×0.1mm		
		Far	0.15×0.15mm		
Linearity (*2)		±0.2% F.S.			
Resolution (*3)		1μm	2.5μm	5μm	
Temp drift		±0.08%F.S. / °C			
Response time (*4)		Fast	1ms+ selecting sensitivity (averaging : 1)		
		Standard	8.5ms+ selecting sensitivity (averaging : 16)		
		High resolution	32.5ms+ selecting sensitivity (averaging : 64)		
		Selecting sensitivity	4ms max.		
Indicators		Distance indicator	bar graph LED		
		Output indicator	ON status : Orange		
Protection category		IP67			
Ambient temp / humidity		-10~+45°C / 35~85%RH (without condensing)			
Storage temp / humidity		-20~+60°C / 35~95%RH (without condensing)			
Ambient illuminance		Incandescent lamp : 3,000lx max.			
Vibration resistance		10 to 55 Hz, Double amplitude 1.5 mm, 2 h for XYZ axis			
Shock resistance		50G (500m/s ²) XYZ 3times			
Cable extension		Up to 10m using an optional extension cable			
Material		PBT (Case) PMMA (Front window)			
Weight		Cable type	approx.65g (without cable)		
		Connector type	approx.70g		

*1 Defined with center strength 1/e²(13.5%). There may be leak light other than the specified spot size. The sensor may be affected when there is a highly reflective object around the targets.

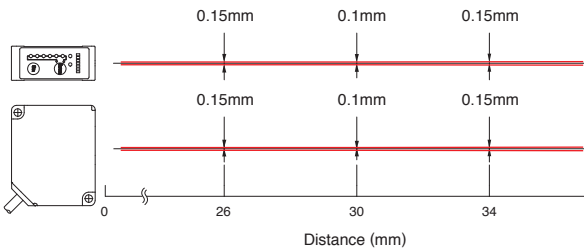
*2 Averaging : 64(High resolution), Object : evaporated aluminum mirror.

*3 Middle of measuring range, Object : evaporated aluminum mirror.

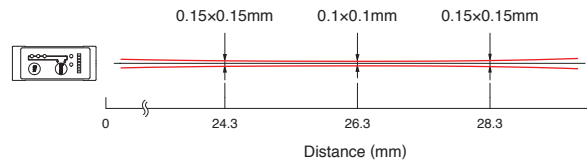
*4 Response time : response time plus selecting sensitivity time.

Spot size

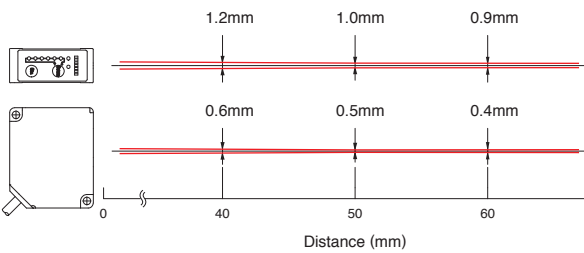
Model No. : CD33-30N□



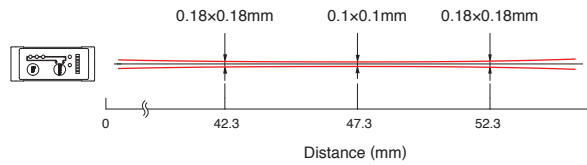
Model No. : CD33-L30N-422



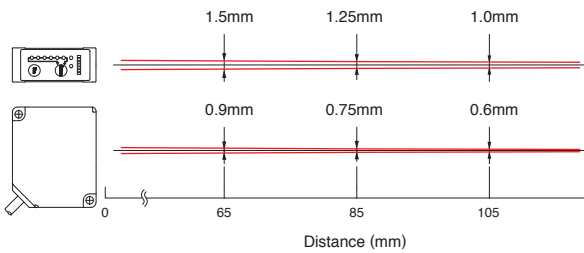
Model No. : CD33-50N□



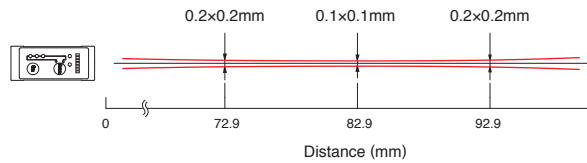
Model No. : CD33-L50N-422



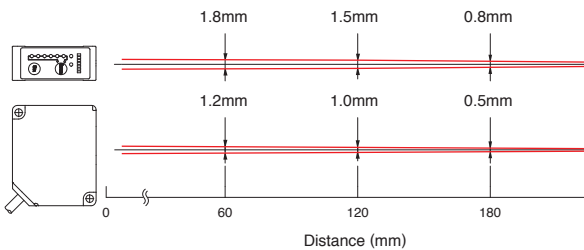
Model No. : CD33-85N□



Model No. : CD33-L85N-422



Model No. : CD33-120N□



Model No. : CD33-250N□

