Photoelectric sensor - OSM40

Description:

Laser displacement sensor, 655nm laser source, metal housing, LED display and button settings, rich interface. Suitable for pharmaceutical, packaging, automotive, non-standard equipment and others.

Features:

- LED digital display + teaching function
- Strong resistance to ambient light, compact size
- Analog/switch dual output

Type:

Type	Distance	Beam	Output	Resolution	Connection	Wiring
OSM40-KL70CBLIU6	35...70mm	Red laser	NPN/PNP+analog mA / V	0.01mm	2m cable	Fig.1
OSM40-KL70CBLIU6Q12.1	35...70mm	Red laser	NPN/PNP+analog mA / V	0.01mm	M12 connector	Fig.1
OSM40-KL160CBLIU6	60...160mm	Red laser	NPN/PNP+analog mA / V	0.01mm	2m cable	Fig.1
OSM40-KL160CBLIU6Q12.1	60...160mm	Red laser	NPN/PNP+analog mA / V	0.01mm	M12 connector	Fig.1
OSM40-KL300CBLIU6	100...300mm	Red laser	NPN/PNP+analog mA / V	0.1mm	2m cable	Fig.1
OSM40-KL300CBLIU6Q12.1	100...300mm	Red laser	NPN/PNP+analog mA / V	0.1mm	M12 connector	Fig.1
OSM40-KL800CBLIU6	150...800mm	Red laser	NPN/PNP+analog mA / V	0.1mm	2m cable	Fig.1
OSM40-KL800CBLIU6Q12.1	150...800mm	Red laser	NPN/PNP+analog mA / V	0.1mm	M12 connector	Fig.1
OSM40-KL70CB6/485	35...70mm	Red laser	NPN/PNP+485	0.01mm	2m cable	Fig.2
OSM40-KL70CB6Q12.1/485	35...70mm	Red laser	NPN/PNP+485	0.01mm	M12 connector	Fig.2
OSM40-KL160CB6/485	60...160mm	Red laser	NPN/PNP+485	0.01mm	2m cable	Fig.2
OSM40-KL160CB6Q12.1/485	60...160mm	Red laser	NPN/PNP+485	0.01mm	M12 connector	Fig.2
OSM40-KL300CB6/485	100...300mm	Red laser	NPN/PNP+485	0.1mm	2m cable	Fig.2
OSM40-KL300CB6Q12.1/485	100...300mm	Red laser	NPN/PNP+485	0.1mm	M12 connector	Fig.2
OSM40-KL800CB6/485	150...800mm	Red laser	NPN/PNP+485	0.1mm	2m cable	Fig.2
OSM40-KL800CB6Q12.1/485	150...800mm	Red laser	NPN/PNP+485	0.1mm	M12 connector	Fig.2
OSM40-KL70CB6Q12.1/IO	35...70mm	Red laser	NPN/PNP+IO-Link	0.01mm	M12 connector	Fig.3
OSM40-KL160CB6Q12.1/IO	60...160mm	Red laser	NPN/PNP+IO-Link	0.01mm	M12 connector	Fig.3

Photoelectric sensor - OSM40

Type:

Type	Distance	Beam	Output	Resolution	Connection	Wiring
OSM40-KL300CB6Q12.1/IO	100...300mm	Red laser	NPN/PNP+IO-Link	0.1mm	M12 connector	Fig.3
OSM40-KL800CB6Q12.1/IO	150...800mm	Red laser	NPN/PNP+IO-Link	0.1mm	M12 connector	Fig.3

Technical Data:

Supply voltage	10-30VDC
Ripple voltage	≤10%
No-load current	≤150mA
Power	1.5W
Analog output	4...20mA, 0...5V or 0...10V
Switch output	NPN/PNP
Communication type	RS485，IO-Link
Light source	655nm laser source
Protection circuit	Reverse polarity protection, short circuit protection, Overload protection
Response time	1.5ms / 5ms / 10ms switchable
Repeatability	0.05mm@35...70mm; 0.1mm@60...160mm;0.5mm@150...400mm; 1mm@400...600mm; 3mm@600...800mm
Spot diameter	1mm@150mm; 2mm@600mm
Housing material	316L
Ambient temperature	-10℃-45℃
Voltage resistance	1000V/AC 50/60Hz 60s
Insulation impedence	≥50MΩ (500VDC)
Shock resistance	Complex amplitude 1.5mm 10... 50Hz (2hr X, Y,Z respectively)
Impact resistance	500m/S^2(50G) 3 times X,Y,Z respectively
Protection class	IP67
Dimensions	60.4*20*35.5mm

Interface output:

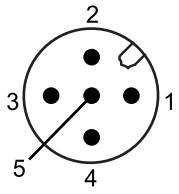


Fig.1

Serial number	Function	Core color of cable type	Core color of connector type
1	Power +	BN	BN
2	Analogue output	GY	WH
3	Power -	BU	BU
4	NPN/PNP	BK	BK
5	Enable input	PK	GY

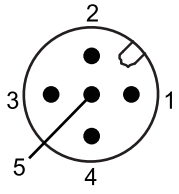


Fig.2

Serial number	Function	Core color of cable type	Core color of connector type
1	Power +	BN	BN
2	485B	GY	WH
3	Power -	BU	BU
4	NPN/PNP	BK	BK
5	485A	PK	GY

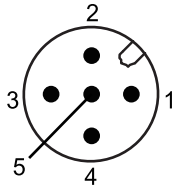
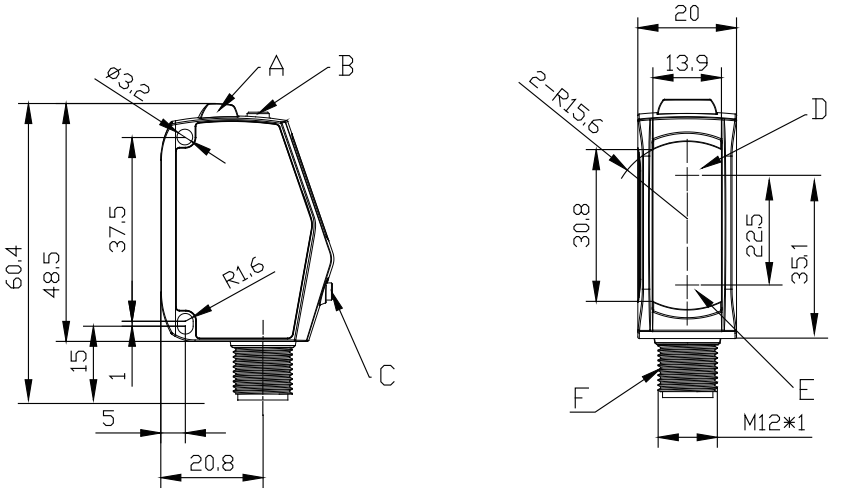
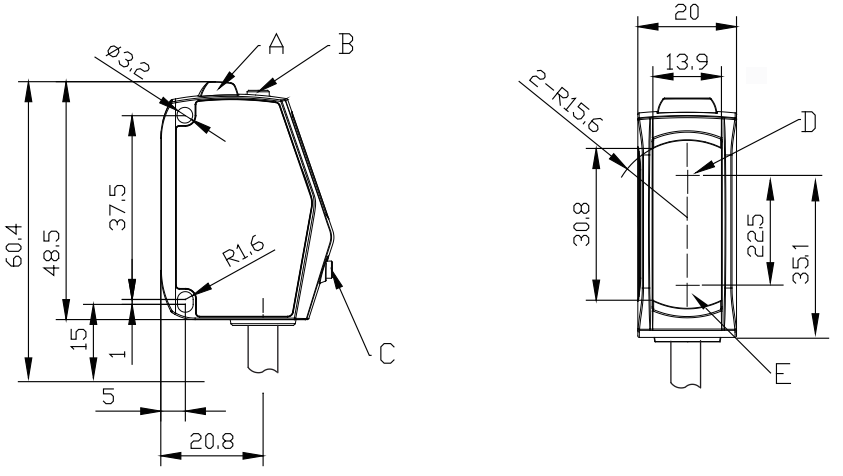


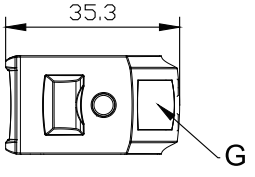
Fig.3

Serial number	Function	Core color of connector type
1	Power +	BN
2	IO-Link-DIO	WH
3	Power -	BU
4	IO-Link-C/Q	BK
5	NPN/PNP	GY

Dimensions:







A alarm indicator

B function setting button

C function adjustment button

D emitting & receiving

E M12*1 connector

F LED display

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OSM40 High Precision Laser Distance Sensor

INSTRUCTION MANUAL

1. Product features

※Short,medium and long distances are available.
※Support switch output,NPN/PNP can be set.
※Support analog output,current output/voltage output can be set.
※Support laser light source control through external input.
※Support ECO mode setting.
※Four white digital tubes,clear and bright.
※Full metal shell,sturdy and durable,better protection performence.
※Small size, small spot, high precision.
※Support multiple detection modes,multi-scene applications.

2. Model description

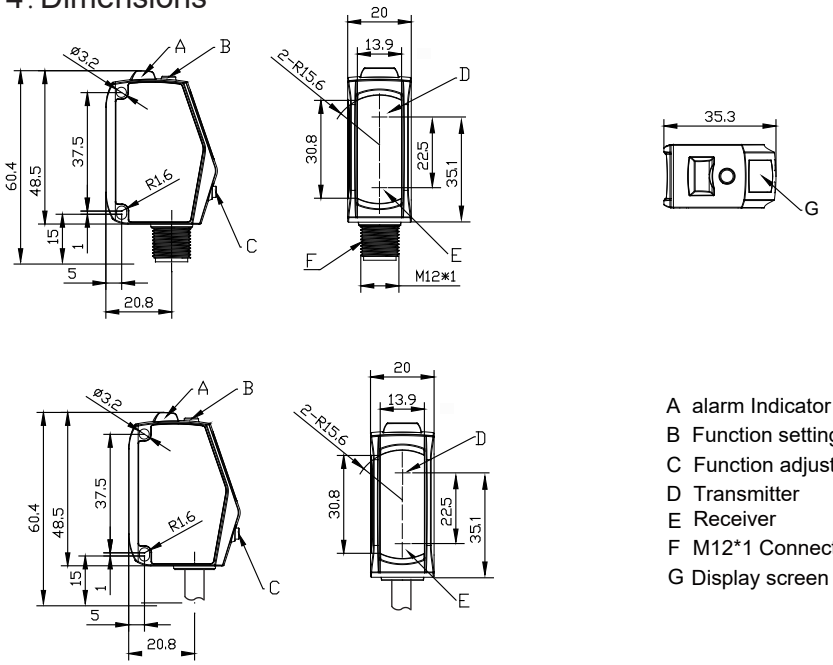
Type (connector)	OSM40-KL70CBLI6Q12.1 OSM40-KL70CBLU6Q12.1 OSM40-KL70CBLIU6Q12.1	OSM40-KL160CBLI6Q12.1 OSM40-KL160CBLU6Q12.1 OSM40-KL160CBLIU6Q12.1	OSM40-KL800CBLI6Q12.1 OSM40-KL800CBLU6Q12.1 OSM40-KL800CBLIU6Q12.1
Type (cable)	OSM40-KL70CBLI6 OSM40-KL70CBLU6 OSM40-KL70CBLIU6	OSM40-KL160CBLI6 OSM40-KL160CBLU6 OSM40-KL160CBLIU6	OSM40-KL800CBLI6 OSM40-KL800CBLU6 OSM40-KL800CBLIU6
Measurement range	35mm~70mm	60mm~160mm	150mm~800mm
Measurement type	short distance	middle distance	long distance
Measurement center distance	50mm	100mm	400mm
Beam diameter	1mm@50mm	1mm@100mm	1mm@150mm 2mm@600mm
Repeatability	30μm	70μm	0.5mm (150mm~400mm) 1mm (400mm~600mm) 3mm (600mm~800mm)
Linearity	±0.1%F.S.	±0.1%F.S.	±0.2%F.S. (150mm~400mm) ±0.3%F.S. (400mm~600mm) ±0.5%F.S. (600mm~800mm)

*1: This is a laser product,it should be used after warming up for ten minutes.

3. Specifications

Power supply	10...30VDC	Ambient temperature	-20℃...60℃
Power Consumption	<1W	Ambient illuminance	under 3000lux
Light source	Red semiconductor laser 2 655nm	Protection structure	IP67
Control output	NPN/PNP	Housing material	316L
Analog output (voltage and current can be set)	current: 4~20mA (beyond,0mA) voltage: 0~5V (beyond,5.2V) 0~10V (beyond,10.2V)	Windows material	GLASS
Response time	15ms/5ms/1.5ms	Connections	M12 Connector /Cable

4. Dimensions



A alarm Indicator
B Function setting key
C Function adjustment key
D Transmitter
E Receiver
F M12*1 Connector
G Display screen

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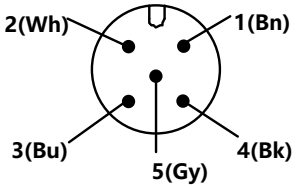
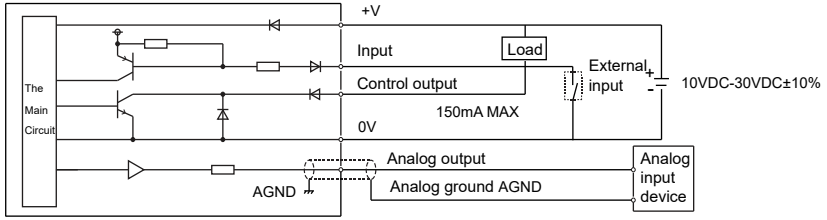
5. Interface definition and wiring diagram

	Function	Cabel Harness color	Connector Harness color
1	Positive power supply	Brown	Brown
2	Analog output	Gray	White
3	Power negative	Blue	Blue
4	NPN/PNP	Black	Black
5	External input	Pink	Gray
6	AGND	Shielded wire	None

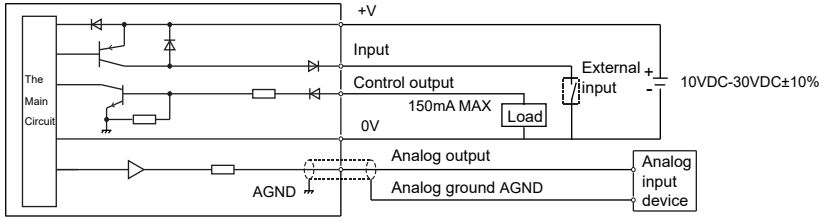
Wiring diagram



Wiring diagram（NPN）



Wiring diagram（PNP）

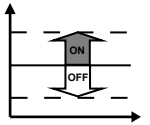


6. Teaching mode description

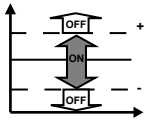
Teach

Detection mode setting description:
It is necessary to set the "Detection Mode Setting"in the menu to the curresponding function mode in advance.

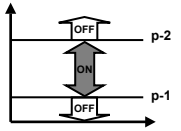
1.Normal detection mode
In the menu, select the "__|‾" mode, automatically enter the detection interface;Select the target object(*) within the effective detection distance and press the TEACH key,and prompt "GOOD" to complete the setting.The location of the target object is the judgement distance.



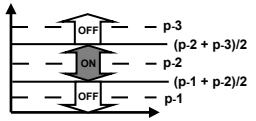
2. 1-point teaching window comparison mode
In the menu,select the "_N_.1"mode,first enter the wisdow size setting interface;The default setting value is 0.5mm,press UP/DOWN to adjust the window size setting value.Press the TEACH key to enter the measurement interface;within the effective measurement distance,select the target object(*), press TEACH key,prompt "GOOD",complete the setting.The position of the target object is the center,plus and minus setting value as window edge, and perform window mode judgement.



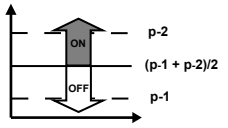
3. 2-point teaching window comparison mode
In the menu, select the "_N_.2" mode, automatically enter the measurement interface.Select the target object 1(*) within the effective detection distance and press the TEACH key,and prompt "LP1" to complete p-1 setting.Select the target object 2 (*)within the effective detection distance and press TEACH key,prompt "GOOD" to complete the p-2 setting.
Use the distance between the location of target object 1 and target object 2 as the window to determine the window mode.



4. 3-point teaching window comparison mode
In the menu, select the "_N_.3" mode, automatically enter the measurement interface.Select the target object 1(*) within the effective detection distance and press the TEACH key,and prompt "LP1" to complete p-1 setting.Select the target object 2(*) within the effective detection distance and press TEACH key,prompt "LP2" to complete the p-2 setting.Select the target object 3(*) within the effective detection distance and press TEACH key,prompt "GOOD" to complete the p-3 setting.
Take the middle distance between p-1 and p-2 as window edge 1,and the middle distance between p-2 and p-3 as window edge 2,and perform window mode judgement.



5. midpoint teaching mode
In the menu, select the "Nid" mode, automatically enter the measurement interface.Select the target object 1(*) within the effective detection distance and press the TEACH key,and prompt "LP1" to complete p-1 setting.Select the target object 2(*) within the effective detection distance and press TEACH key,prompt "GOOD" to complete the p-2 setting.
Take the middle distance between p-1 and p-2 as the judgement distance.



*Represents fine adjustment:After selecting the target object,you can fine-tune the distance of the target object with the UP/DOWN key,and then press the TEACH key to confirm.

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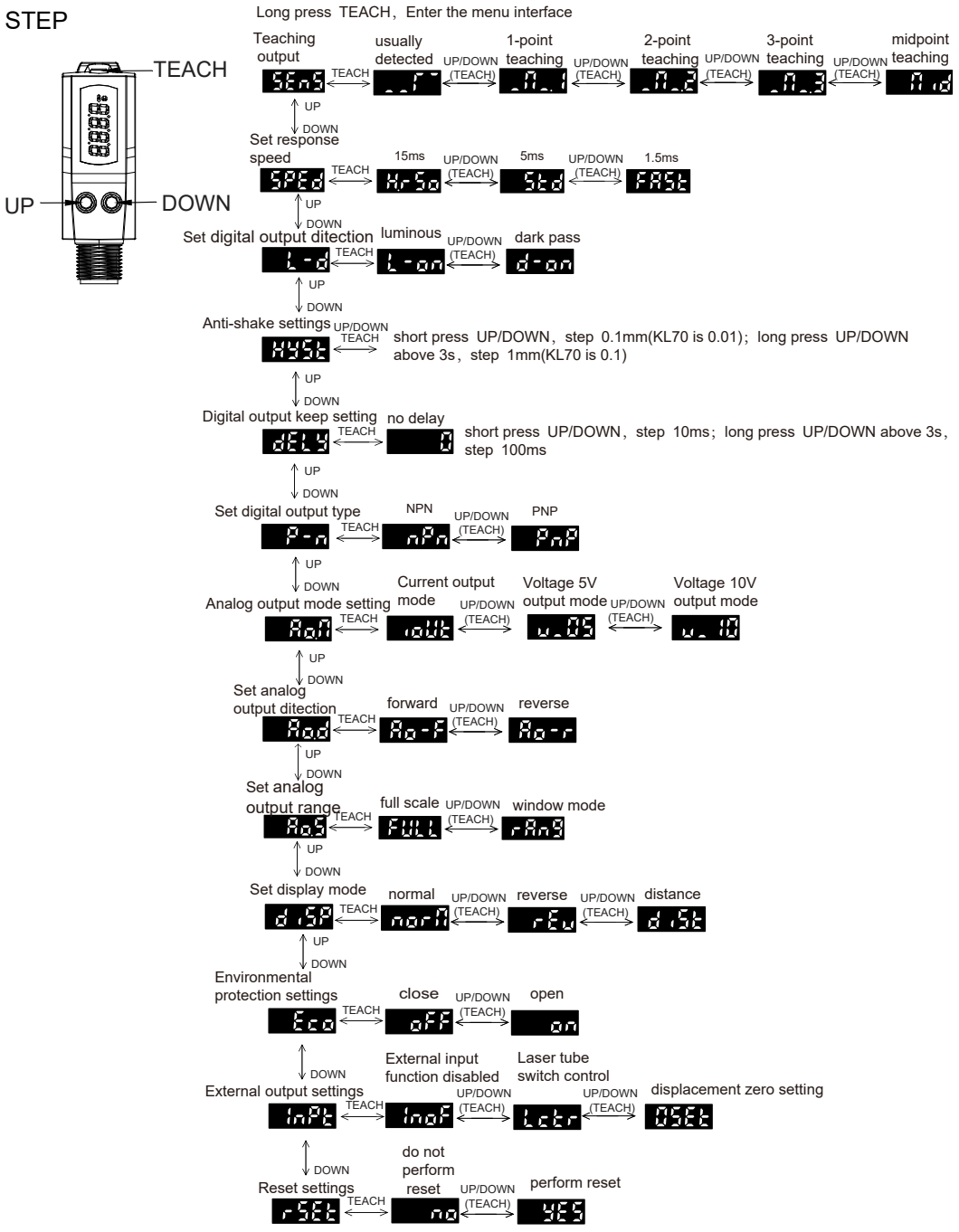
7.OPERATION GUIDE



1.Ranging diaplay
Measurement interface：Show actual measurement distance，resolution is 0.1mm(KL70 is 10μm)，when the distance is out of detected distance,it diaplays“----”。
Display description:Take the center distance as 0 point,the distance less than the center is positive,the distance greater than the center is negative,and the displayed value is the offset value.
2.Menu and key operation
2.1 Enter the menu：Long pressTEACH above 3s when it is in the measurement interface，enter the menu interface；
Exit menu：Long pressTEACH above 3s when it is in the menu interface，or no key operation for 20s，return to measurement interface。
2.2 Menu operation
Enter the menu interface,diaplay the main menu,switch the menu options by pressing the up/down key.
On the main menu interface,enter the submenu options by short pressing TEACH key.Unter the submenu,short press up/down to select the parameter.Short press the TEACH key to confirm and return to the previous main menu.
1)Teaching output
The main menu shows“SEnS”，press TEACH to enter the submenu;
Submenu items：“__|‾‾”usually detected mode（default）；“_N_.1”1-point teaching window comparison mode；
“_N_.2”2-point teaching window comparison mode；“_N_.3”3-point teaching window comparison mode。“nid”midpoint teaching mode.
The above teaching modes are detailed in 6.Teaching mode description.
2)Set response speed:
The main menu shows“SPEd”，press TEACH to enter the submenu;
Submenu items：“H.rSo”high precision 15ms;“Std”standard 5ms（default）；“FASt”high speed 1.5ms；
3)Set digital output ditection
The main menu shows“ L-d”，press TEACH to enter the submenu;
Submenu items：“ L-on”luminous（default）；“d-on”dark pass;
4)Anti-shake settings
The main menu shows“HySt”，press TEACH to enter the submenu;
Submenu initial diaplay“ 0.1”,0.1mm is hysteresis distance，short press UP/DOWN，step 0.1mm(KL70 is 0.01mm)；long press UP/DOWN above 3s，step 1mm(KL70 is 0.1mm)。Setting range is 0~5mm，initial value is 1mm(KL70 is 0.1mm)。
5)Digital output keep setting
The main menu shows“dELy”，press TEACH to enter the submenu;
Submenu initial diaplay“ 0”,no delay，short press UP/DOWN，step 10ms；long press UP/DOWN above 3s，step 100ms。
Setting range is 0~1000ms，initial value is 0ms。
6)Set digital output type
The main menu shows“ P-n”，press TEACH to enter the submenu;
Submenu items：“ nPn”NPN output mode（default）；“ PnP”PNP output mode.
7)Analog output mode setting
The main menu shows“ Ao.N”，press TEACH to enter the submenu;
Submenu items：“ioUt”current output mode（default）；“v_5v”voltage 5v output mode;“v_10v”voltage 10v output mode.
8)Set analog output ditection
The main menu shows“Ao.d”，press TEACH to enter the submenu;
Submenu items：“Ao-F”forward（default）；“Ao-r”reverse。
Forward direction:short distance corresponds to small current/voltage,long distance corresponds to large current/voltage.The reverse is the opposite.
9)Set analog output range
The main menu shows“Ao.S”，press TEACH to enter the submenu;
Submenu items：“FULL”full scale mode（default）；“rAng”window mode。
When set to window mode,the analog output range can be set through the two-point teaching mode.
10)Set display mode
The main menu shows“diSP”，press TEACH to enter the submenu;
Submenu items：“norN”normal displacement mode（default）；“rEv”reverse displacement mode；“dist”distance mode.
11)Environmental protection settings
The main menu shows“ Eco”，press TEACH to enter the submenu;
Environmental protection function note：After the function is turned on,the LED will automatically turn off the display in 30s without any button.
12)External output settings
The main menu shows“InPt”，press TEACH to enter the submenu;
Submenu items：“InoF”External input function disabled；“Lctr”laser tube switch control（default）,turn on emission when there is no external input,and stop emission when the external input is low；“0SEt”displacement zero setting，external input trigger once，the current detection position is set as the displacement zero point,and the restoration of the displacement zero point is triggered again,the indicator light is always on in this mode.
13)Reset settingsthe
The main menu shows“rSEt”，press TEACH to enter the submenu;
Submenu items：“ no”do not perform reset；“ yES” perform reset，restore default settings.
2.3 Key lock function
Turn on key lock:In the measurement interface，press the UP and DOWN keys at the same time for more than 3s，the interface displays “Lc.on”，and the menu function is invalid at this time.
Turn off the key lock:After the key lock is turned on,press the UP and DOWN keys at the same time for more than 3s，the interface displays “Lc.FA”，press the UP and DOWN keys at the same time for more than 3s again，the interface displays “Lc.oF” and the key function are restored.

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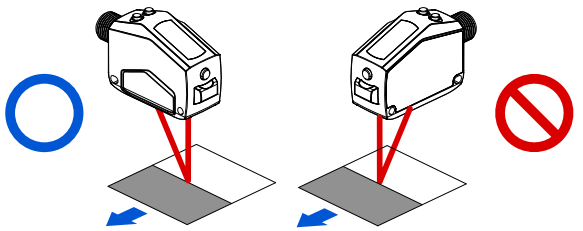
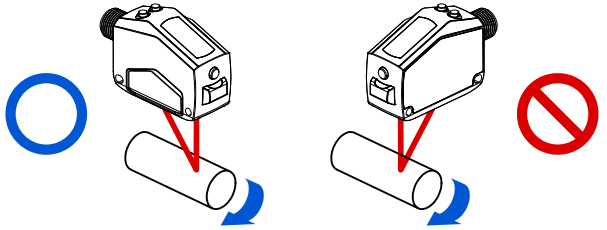
8.Digital tube diaplay interpretation

SEnS	sens	teaching output
__m	__m	usually detected
_m_1	_m_1	1-point teaching
_m_2	_m_2	2-point teaching
_m_3	_m_3	3-point teaching
mid	_mid	midpoint teaching
SPEd	sped	set response speed
hr-So	h.ros	high precision 15ms
Std	std	standard 5ms
FASt	fast	high speed 1.5ms
L-d	l-d	set switch output ditection
L-on	l-on	luminous
d-on	d-on	dark pass
HYSt	hyst	anti-shake settings
dELY	dely	switch output keep settings
0	0	no delay
P-n	p-n	set switch output
nPn	npn	NPN
PnP	pnp	PNP
AoM	rom	set analog output mode
oUt	iout	current output mode
v_05	v-5V	voltage 5V output mode
v_10	v-10V	voltage 10V output mode
Aod	rod	set analog output direction
Ao-F	ao-f	reverse
Ao-r	ao-r	forward
AoS	aos	set analog output range
FULL	full	full scale
rAnG	rang	window mode(corresponding to two-point teaching mode)
diSP	disp	set diaplay mode
norM	norm	normal displacement mode
rEv	rev	reverse displacement mode
diSt	dist	distance mode
Eco	eco	environmental protection settings
oFF	off	environmental protection close
on	on	environmental protection open
InPt	inpt	external output settings
InoF	inof	external input function disabled
Lctr	lctr	laser tube switch control
0SEt	0set	displacement zero setting
rSEt	rest	reset settings
no	no	do not perform reset
YES	yes	perform reset

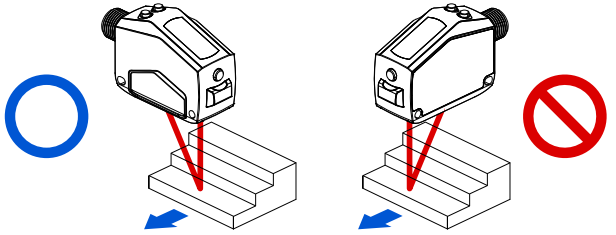
9.Installaton diagram



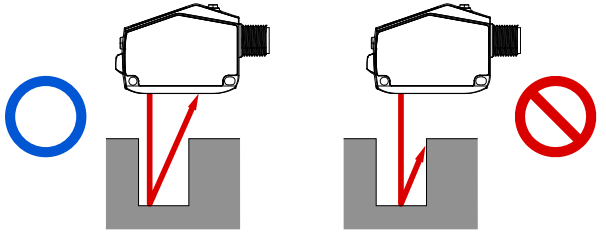
1.In the case of color or material difference
When the material or color of moving object is extremely diffetent,install it in the direction shown on the left to keep the measurement error to a minimum.



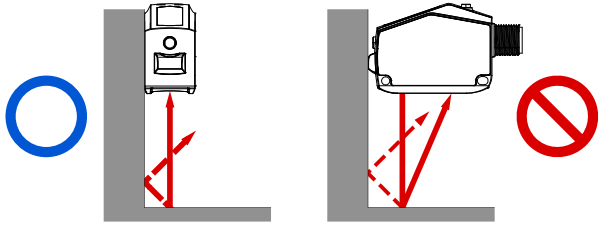
2.Detect rotating objects
When detecting a rotating object, install it in the direction shoen on the left,which can suppress the influence of the object's vertical vibration and position shift.



3.When there is a step
If there is a step in the moving detection object,install it according to the method shown on the left,so as to suppress the influence of the step edge during measurement.



4.Measure in narrow places and recessed parts
In the case of measuring in a narrow place or hole,please be careful not to block the light psth from the light emitting part to the light receiving part when installing.



5.When installed on the wall
Please install according to the method shown on the left to avoid the multiple reflected light from the wall entering the light receiving part.

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