

Measuring Displacement Sensor



- ◎ Adopting international advanced technology and production process.
- ◎ Non-contact detection, realizing micron-level high-precision measurement.
- ◎ Less affected by the color and material of the workpiece, good stability.



NEW!

Triangulation measuring (MLD25 Series)

- Laser triangulation principle, micrometer-level repeat accuracy
- 485 communication, can provide real-time and efficient feedback of data values
- Rich product series, multiple ranges optional

P.F-16



NEW!

TOF long range type (PX-FM series)

- Ultra-long distance measurement, detection distance 8/40/80m optional.
- Stable accuracy, and the repeatability can be guaranteed within 2mm at a long distance.
- Multiple communication modes, supporting RS485 (Modbus)/RS232/RS232+Current+Voltage output

P.F-24



NEW!

3D Laser Profiler (ESX Series)

- Laser triangulation principle for high precision measurement
- Wide range of products, 11mm-1490mm field of view available
- High resolution, 1920/2048/4096 physical contour points available

P.F-28



NEW!

Contact Displacement (MRA/MRC Series)

- Micrometer-level high-precision measurement, up to 1.4 μm
- CMOS grating measurement principle, no tracking error
- Can be selected according to different needs of driving mode (pneumatic/rebound) to complete the detection

P.F-38

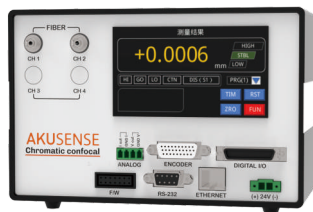


NEW!

Laser Lidar

- Time of Flight detection principle, obstacle avoidance type, navigation type optional
- Scanning range 360°, maximum scanning frequency 30Hz
- Serial port (Type-C interface) communication, online output of measurement data (including distance and light intensity data in all directions)

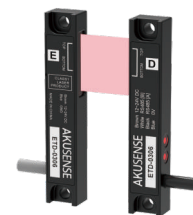
P.F-53



Color Confocal (ACC Series)

- Automated precision measurement device;
- Stable detection for any material;
- Latest non-contact optical sensing technology.

P.F-61



NEW!

Through-beam edge sensor (ETD Series)

- Edge measurement & width and pitch measurement.
- Optical axis adjustment function for easy installation.
- Compact design for easy installation.

P.F-68

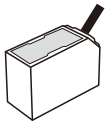
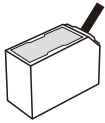
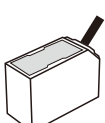
- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- AI Image
- Code Readers
- Vibration
- Temperature
- RFID
- Safety doorlock
- Pressure Switch
- Communication
- Accessories

Guidance

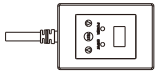
Displacement

- Triangulation
- TOF Long Range Type
- 3D Laser Profiler
- Contact Displacement
- LIDAR Scanner
- Color confocal
- Laser Alignment

Triangulation Mini Digital Display

Appearance	Type	Sensing distance	Model number			Pages
	Diffuse reflection	65~135mm	MLD21-100A-485			F-09
		120~320mm	MLD21-220A-485			
		300~700mm	MLD21-500A-485			
Appearance	Type	Sensing distance	Model number		Pages	
	Diffuse reflection	25~35mm	MLD23-30N	MLD23-30NP	F-14	
		65~135mm	MLD23-100N	MLD23-100NP		
		120~280mm	MLD23-200N	MLD23-200NP		
Appearance	Type	Sensing distance	Model number		Pages	
	Diffuse reflection	25~35mm	MLD25-30NV	MLD25-30PV	F-16	
		35~65mm	MLD25-50NV	MLD25-50PV		
		65~135mm	MLD25-100NV	MLD25-100PV		
		120~280mm	MLD25-200NV	MLD25-200PV		

TOF long range type

Appearance	Type	Sensing distance	Model number			Pages
		0.05~8m	PX-FM08-485	PX-FM08-IV-232	PX-FM08-232	F-18
		0.05~8m	PX-FM40-485	PX-FM40-IV-232	PX-FM40-232	F-19
		0.05~40m	PX-FM80-485	PX-FM80-IV-232	PX-FM80-232	F-20

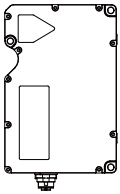
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3D Laser Profiler

Appearance	Type	Sensing distance	Model number	Pages
	Diffuse reflection	7mm	ESX-C10	F-22
		11mm	ESX-C20	
		25mm	ESX-C30	
		70mm	ESX-C100	
		200mm	ESX-C200	
		200mm	ESX-CE200	F-23
		350mm	ESX-CE300	
		490mm	ESX-CE500	
		1280mm	ESX-CE1000	
		7mm	ESX-G10	F-24
		24mm	ESX-G20	
		74mm	ESX-G100	
		192mm	ESX-GE200	F-25
		7mm	ESX-P10	
		24mm	ESX-P20	
		74mm	ESX-P100	
		191mm	ESX-P200	
		191mm	ESX-PE200	F-26
		250mm	ESX-PE300	
		6mm	ESX-H10	F-27
18mm	ESX-H20			












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Guidance



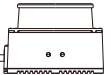
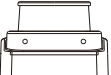




Displacement

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Magnetic Displacement

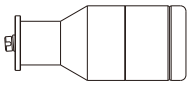
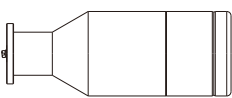
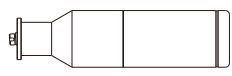
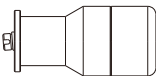
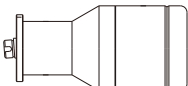

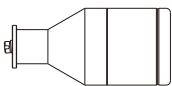

Appearance	Type	Sensing distance	Model number	Pages
	Pencil type	 2mm	MRA-R02R01XX	F-32
	Pencil type	 5mm	MRA-R05R01XX	
	Pencil type	 8mm	MRA-R08R01XX	
	Pencil type	 10mm	MRA-R10R01XX	
	Box type	 0~12.7mm	MRC-H12R0XX	F-34
	Box type	 0~25.4mm	MRC-H25R0XX	
	Box type	 0~12.7mm	MRC-H12R0XDX	F-35
	Box type	 0~12.7mm	MRC-H12Q0XX	
	Retangular	-	CM-M01	F-37
	Retangular	-	CM-M01A	

LiDAR Scanner



Appearance	Size	Sensing distance	Model number	Pages
	83.5 × 85 × 104.9(mm)	20m	AS-21C	F-41
	83.5 × 85 × 104.9(mm)	40m	AS-41C	F-41
	86 × 85 × 59.5(mm)	20m	AS-11C	F-44
	110*96.5*71.5(mm)	100m	AS-100C	F-47
	60*60*84.9(mm)	20m	AS-31C	F-50
	60*60*81(mm)	20m	AS-32C	F-50
	50*50*72(mm)	10m	AS-33C	F-51
	60*60*82.5(mm)	50m	AS-35C/CA	F-53

- Fiber Optic
- Slot Sensors
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- Laser
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- Code Readers
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- RFID
- Safety door lock
- Pressure Switch
- Communication
- Accessories
- Guidance
- Displacement
- Triangulation
- TOF Long Range Type
- 3D Laser Profiler
- Contact Displacement
- LiDAR Scanner
- Color confocal
- Laser Alignment

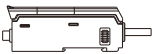

Color Confocal

Appearance	Size	Sensing distance	Model number	Pages
	Φ41*93.9(mm)	8 ± 0.2mm	ACC-008L	F-58
	Φ98*266(mm)	11 ± 1.2mm	ACC-011L	F-58
	Φ41*153.6(mm)	16 ± 1mm	ACC-016L	F-58
	Φ34*153.6(mm)	18 ± 1mm	ACC-018L	F-58
	Φ38*82(mm)	30 ± 2mm	ACC-030L	F-58
	Φ18*55(mm)	33 ± 2mm	ACC-033L	F-58
	Φ54*111.2(mm)	40 ± 4mm	ACC-040L	F-58
	Φ33*75(mm)	55 ± 3mm	ACC-055L	F-58

Through-beam Edge Sensor

Appearance	Size	Sensing distance	Model number	Pages
	Through-beam 60*10.5*8.2(mm)	Edge detection mode ±3.25mm Diameter detection mode 6mm	ETD-0306	F-64
	Through-beam 60*25*8.2(mm)	Edge detection mode ±6mm Diameter detection mode 12mm	ETD-0612	F-65

Edge Sensor Controller Communicator

Appearance	Size	Installation method	Model number	Pages
	100.78*40*38.76(mm)	DIN rail mounting	CR-M02	F-67
	94.5*29.4*40.81(mm)	DIN rail mounting	CTM01-EC	F-68

Fiber Optic
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Pressure Switch
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Accessories

Guidance

Displacement

Triangulation

TOF Long

Range Type

3D Laser

Profiler

Contact

Displacement

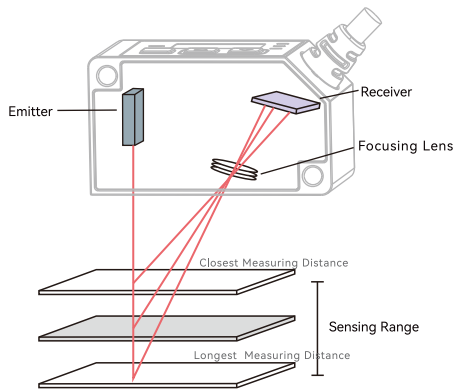
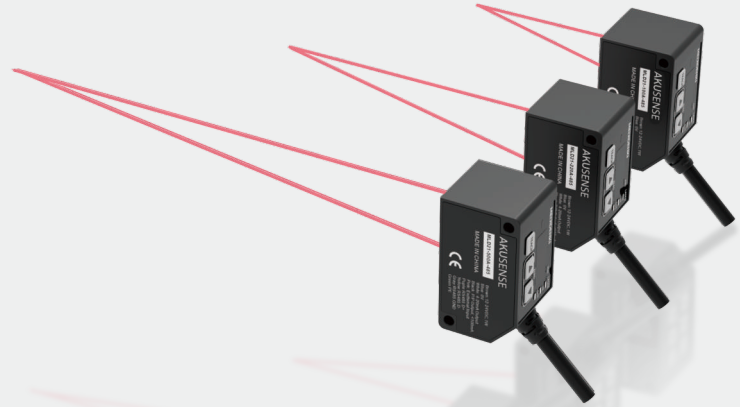
LIDAR Scanner

Color confocal

Laser Alignment

Laser Displacement Sensor

MLD21 Series ▶



CMOS sensor element Highly accurate detection achieved by triangulation principle

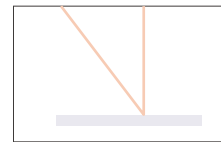
By triangulation principle, the incoming light port on the CMOS of the sensor receiver moves as the object position changes.

And the change of objects can be checked by detecting the incoming light position.

Automatic Exposure Adjustment

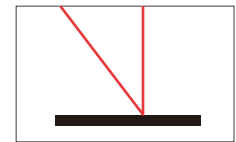
The amount of energy received can be automatically adjusted according to different applications;

Detection remains stable even the color or material of the workpiece changes.



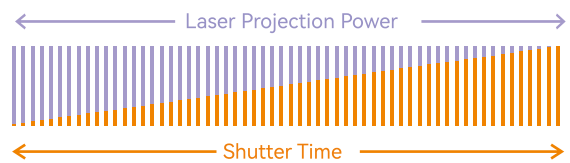
Measuring brighter objects

Laser Weakened



Measuring darker objects

Laser Enhanced



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

AI Image

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Vibration

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RFID

Safety door lock

Pressure Switch

Communication

Accessories

Guidance

Displacement

Triangulation

TOF Long

Range Type

3D Laser

Profiler

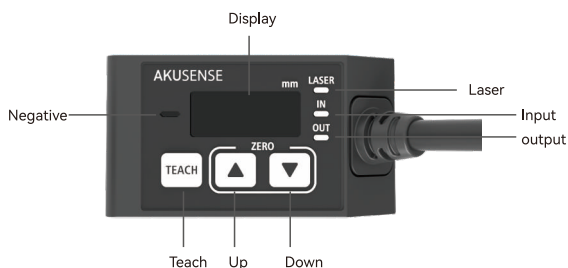
Contact

Displacement

LIDAR Scanner

Color confocal

Laser Alignment



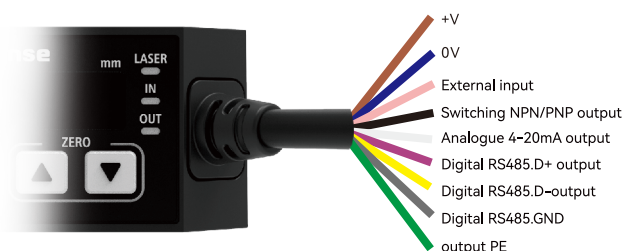
Intuitive digit display on the panel, and button function makes commissioning easy

Equipped with display and function buttons within a mini space;

The opening/closing of the laser, external trigger signal and control output signal status can be intuitively presented; most function settings can be made directly via the sensor panel.

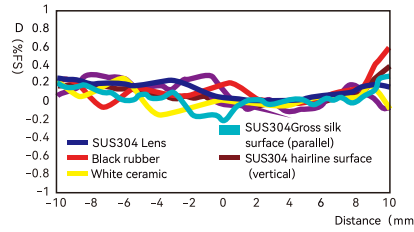
It includes parameter item setting, function item setting and threshold setting.

Integrated output methods; Switching, analogue and digital outputs all in one.

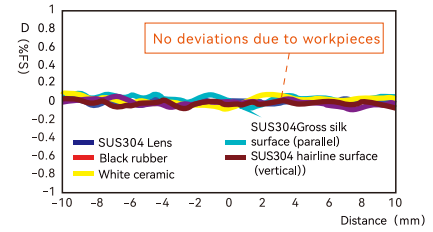


Detection remains stable even the workpiece moves

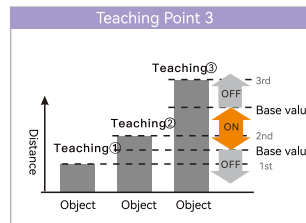
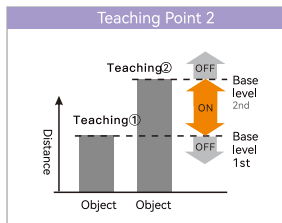
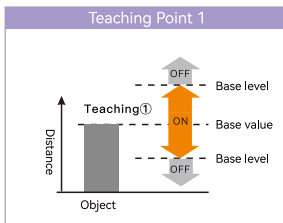
For workpieces with rough surfaces, a linear beam is used to average the amount of reflection. And the amount of light received is corrected at a highspeed of 30us for per measurement cycle to reduce the alteration of the amount of light received caused by workpiece moving. Thus the detection remains stable even when the workpiece is displaced during the pro process of measurement.



Material-based linear properties of previous products



Material-based linear properties of MLD21



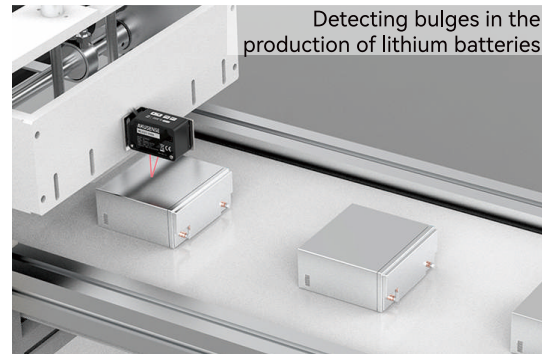
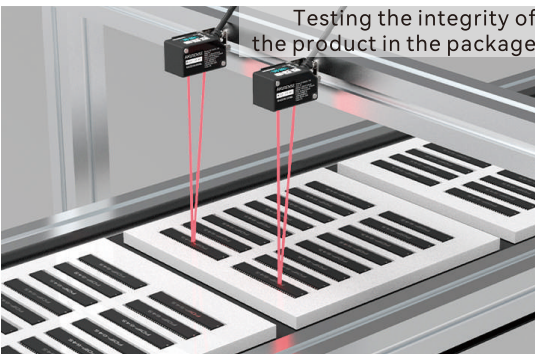
Built-in rich detection modes for greater functionality

In addition to the basic teaching settings, the following three modes have been implemented:
 Basic teaching mode for simple setting of the presence or absence of the object to be measured;
 A single-point serial comparison mode for deviations from the reference measurement surface;
 A two-point teaching serial comparison mode for precise range control.

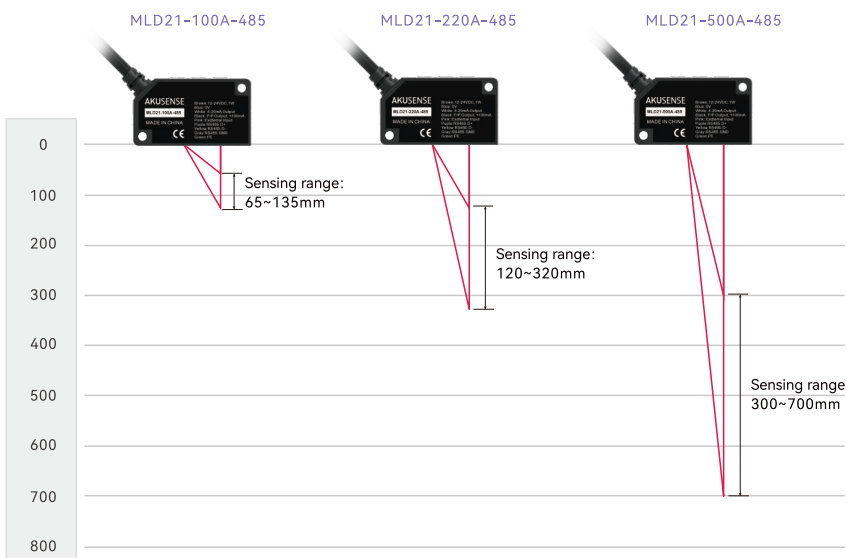
Application

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement**
- Magnetic
- Contact
- Area
- Ultrasonic
- AI Image
- Code Readers
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Guidance



Selection table



Model	MLD21-100A-485
Repeat accuracy	70μm
Linearity	±0.1%
Base distance	100mm

Model	MLD21-220A-485
Repeat accuracy	200μm
Linearity	±0.2%
Base distance	220mm

Model	MLD21-500A-485
Repeat accuracy	(300~500mm)300μm (500~700mm)600μm
Linearity	(300~500mm) ±0.2% (500~700mm) ±0.3%
Base distance	500mm

Displacement

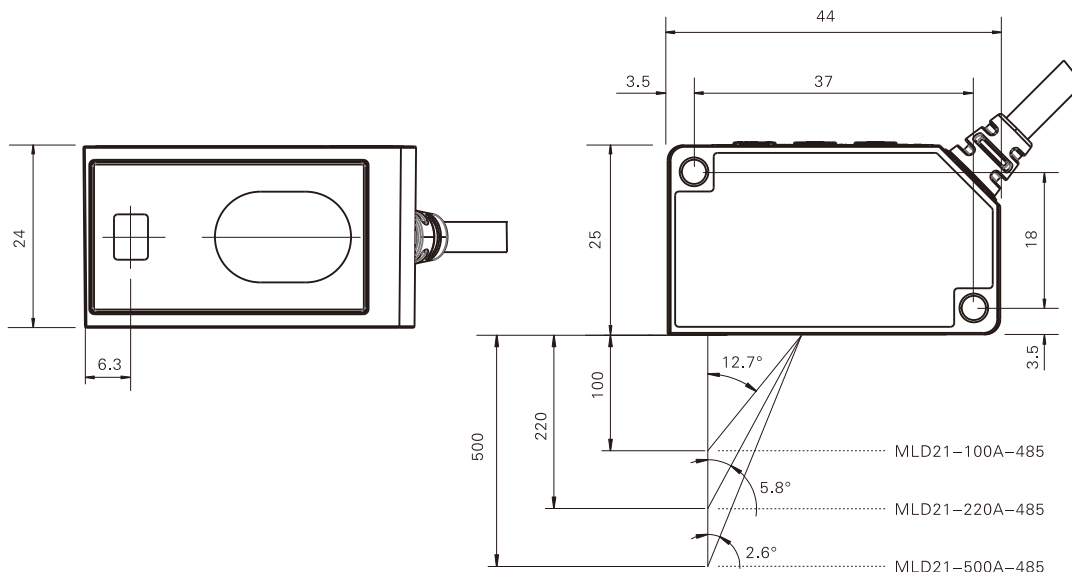
- Triangulation
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MLD21 Series



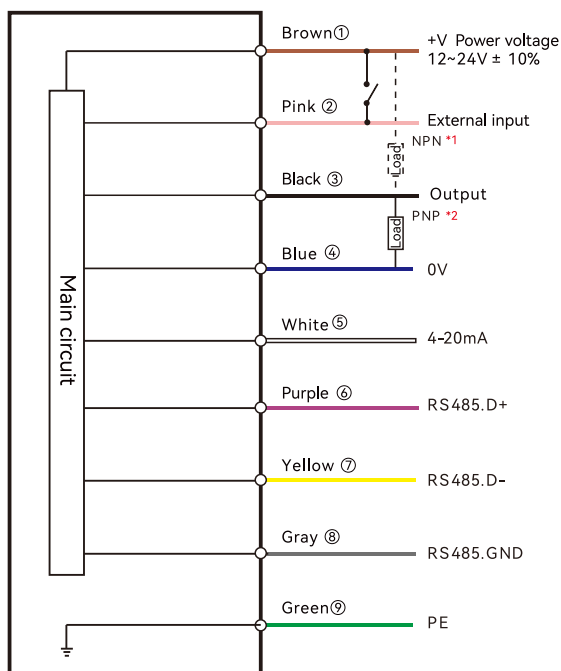
Basic Features	Working principle	Triangulation		
	Housing	Rectangular		
	Optical working principle	Diffuse reflection		
	Reference distance	100mm	220mm	500mm
	Measuring range	65~135mm	120~320mm	300~700mm
	Light source	Red laser, Class 2		
Electrical data	Spot size	0.14x0.11mm	0.29x0.24mm	0.54x0.33mm
	Switching mode	L.on/D.on		
	Output mode	NPN or PNP collector open		
	Response time	1.5ms/ 3ms/5ms (default v: ms)		
	Linearity	± 0.1%	± 0.2%	(300~500mm) ± 0.2% (500~700mm) ± 0.3%
	Repeatability	70µm	200µm	(300~500mm)300µm (500~700mm)600µm
	Temperature drift characteristics	-		
	Operating voltage	12~24VDC ± 10%		
	Current consumption	-		
	Load current	<100mA		
	Insulation resistance	≥20MΩ with 500V DC between power terminals and enclosure		
	Dielectric strength	500 VAC, 50/60 Hz for 1 min between power terminals and enclosure		
	Protection circuit	Reverse Polarity Protection/surge protection		
	Environmental conditions	Operating temperature	-10~50°C	
Operating humidity		35~85%RH		
Ambient illumination		Incandescent ≤3000 Lux		
Vibration resistance		10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions		
Enclosure rating		IP67		
Mechanical data	Connection type	2m, 9 core cable		
	Dimension	24,0x44,0x25,0mm		
	Material	Aluminum		
	Weight	0.065kg		
	Accessories	Cable		
	Model	MLD21-100A-485	MLD21-220A-485	MLD21-500A-485

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Communication
Accessories

Circuit diagram



Remark :

- 1.NPN output connection : Connect Black with Brown (+V)
- 2.PNP output connection: Connect Black with Blue (0V)

Guidance

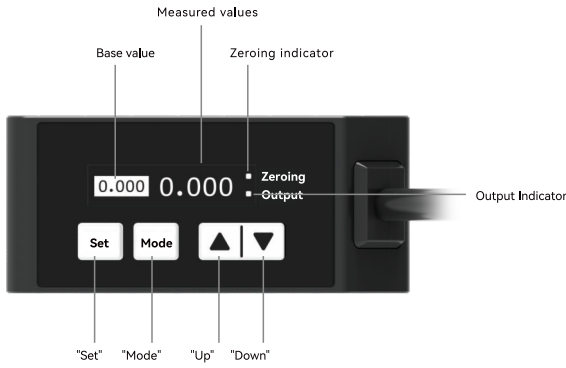
Displacement

Triangulation
TOF Long Range Type
3D Laser Profiler
Contact Displacement
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Color confocal
Laser Alignment

Laser Displacement Sensor MLD23 Series ▶



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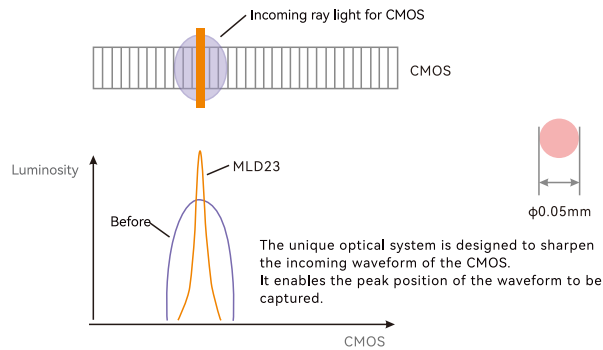


Mini Chinese Display

More Intuitive and Simple for Commissioning

Convergent harnesses for more accurate detection

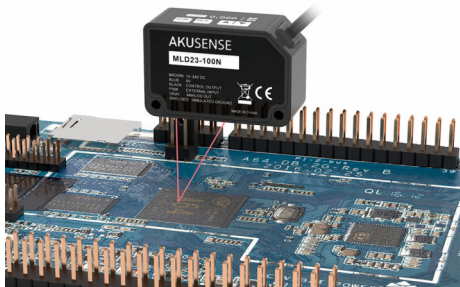
AkuseNSE has developed its own optical system to significantly converge and improve the beam to 50um; An ultra-small spot size of 0.05mm formed, which detects objects with stability and accuracy.



Guidance

Displacement

- Triangulation**
- TOF Long Range Type
- 3D Laser Profiler
- Contact Displacement
- LIDAR Scanner
- Color confocal
- Laser Alignment

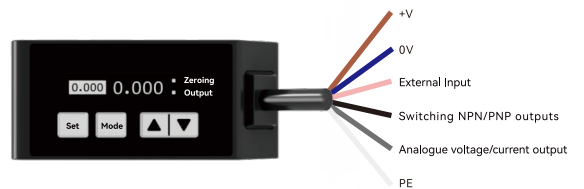


Micron-level linear accuracy

Linear accuracy reaches to 0.01mm for easy inspection with high accuracy

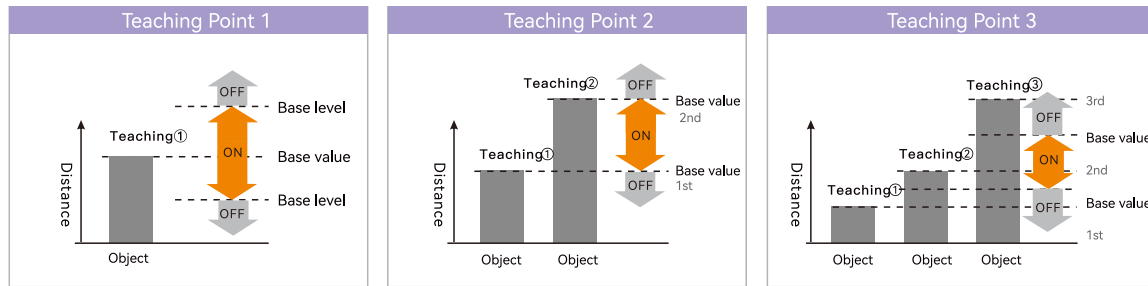
Convenient Installation

Integration of analogue voltage, analogue current and switching



Simple and flexible test patterns

Multiple teaching modes to make testing easier



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement**
- Magnetic
- Contact
- Area
- Ultrasonic
- AI Image
- Code Readers
- Vibration
- Temperature
- RFID
- Safety doorlock
- Pressure Switch
- Communication
- Accessories

Guidance

Displacement

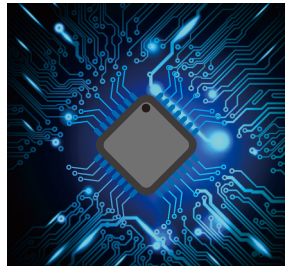
- Triangulation
- TOF Long Range Type
- 3D Laser Profiler
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- Color confocal
- Laser Alignment

Faster, more stable, more accurate

Three test modes are for option: standard, high speed and high accuracy

① Ultra-high speed computing and processing

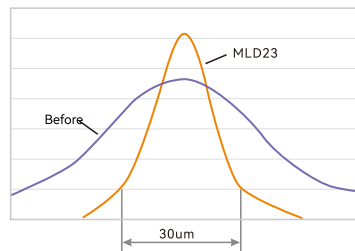
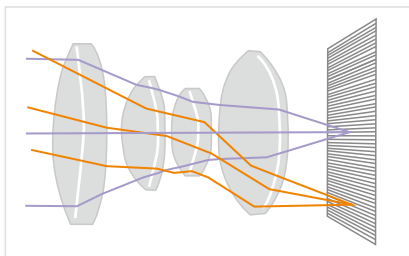
The application of Akusense's advanced IC and algorithm technology has greatly improved the sensor's detection rate and data accuracy, allowing for both high speed transmission and stable detection of measured values.



Max 1.5ms response time

Repeat accuracy up to 10um

Min ±0.1% F.S linearity

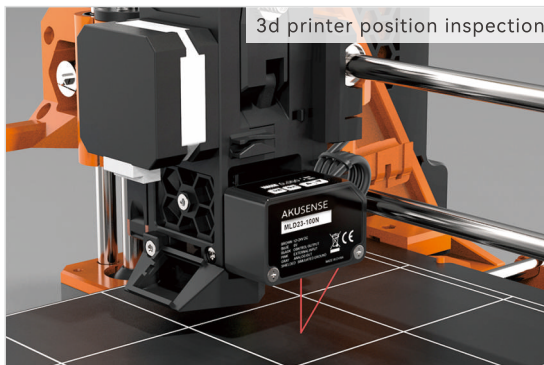


② Achieving greater precision

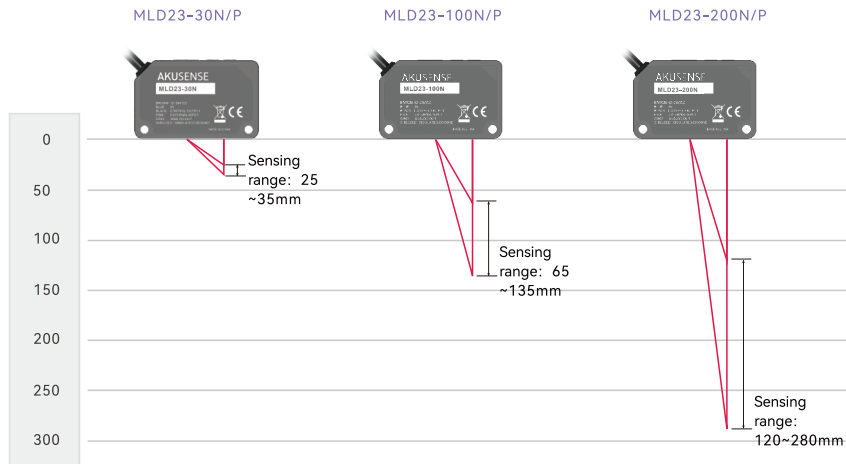
The new Akusense high-resolution lens design reduces pixel aberration and is assembled with precision.

The small spot of light at any angle can be imaged at the receiving section, resulting in a smaller waveform and higher measurement accuracy.

Application



Selection table



Model	MLD23-30N/P
Repeat accuracy	10μm
Linear accuracy	±0.1% F.S.
Base distance	30mm

Model	MLD23-100N/P
Repeat accuracy	70μm
Linear accuracy	±0.1% F.S.
Base distance	100mm

Model	MLD23-200N/P
Repeat accuracy	200μm
Linear accuracy	±0.2% F.S.
Base distance	200mm

Fiber Optic

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Accessories

Guidance

Displacement

Triangulation

TOF Long

Range Type

3D Laser

Profiler

Contact

Displacement

LIDAR Scanner

Color confocal

Laser Alignment

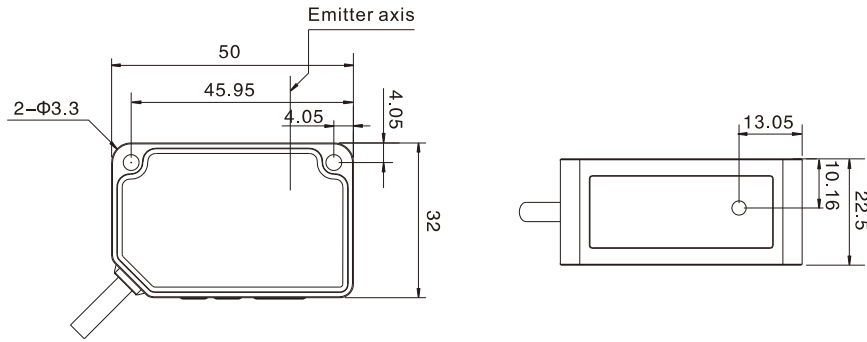


Basic Features	Working principle	Triangulation		
	Housing	Rectangular		
	Optical working principle	Diffuse reflection		
	Reference distance	30mm	100mm	200mm
	Measuring range	25~35mm	65~135mm	120~280mm
	Light source	Red laser, 655nm, Class 2		
	Spot Size	about Φ 0.05mm	about Φ 0.15mm	about Φ 0.3mm
Electrical data	Switching mode	L.on/D.on		
	Output mode	NPN or PNP collector open		
	Response time	1.5ms/5ms/50ms switchable		
	Linearity	$\pm 0.1\%$ F.S.		$\pm 0.2\%$ F.S.
	Repeatability	10 μ m	70 μ m	200 μ m
	Temperature drift characteristics	$\pm 0.03\%/^{\circ}\text{C}$		
	Operating voltage	12~24VDC $\pm 10\%$		
	Current consumption	<60mA(24VDC); <100mA(12VDC)		
	Load current	<50mA		
	Insulation resistance	$\geq 20\text{M}\Omega$ with 500V DC between power terminals and enclosure		
	Dielectric strength	< 0.1mA(1000V AC)		
	Protection circuit	Surge protection		
Environmental conditions	Operating temperature	-10~45 $^{\circ}\text{C}$ (No Freezing)		
	Operating humidity	35~85%RH(No Condensation)		
	Ambient illumination	Incandescent Lamp ≤ 3000 Lux; Sunlight ≤ 3000 Lux		
	Vibration resistance	10 to 50 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions		
	Enclosure rating	IP66		
Mechanical data	Connection type	2m, 9 core cable		
	Dimension	22.5x50.0x32.0mm		
	Material	Acrylic-based, Aluminum		
	Weight	0.065kg		
	Accessories	Cable		
Model	NPN	MLD23-30N	MLD23-100N	MLD23-200N
	NPN+PNP	MLD23-30NP	MLD23-100NP	MLD23-200NP

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Accessories

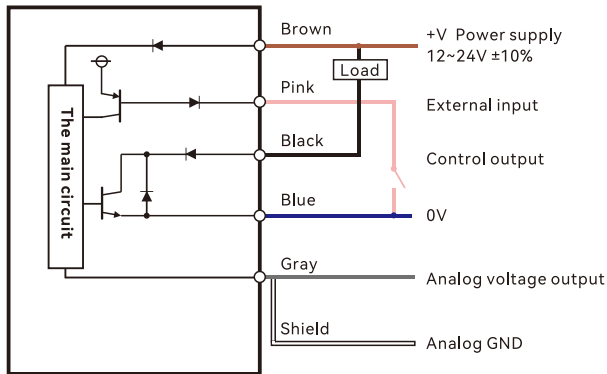
Guidance**Displacement**

Triangulation
TOF Long Range Type
3D Laser Profiler
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LIDAR Scanner
Color confocal
Laser Alignment

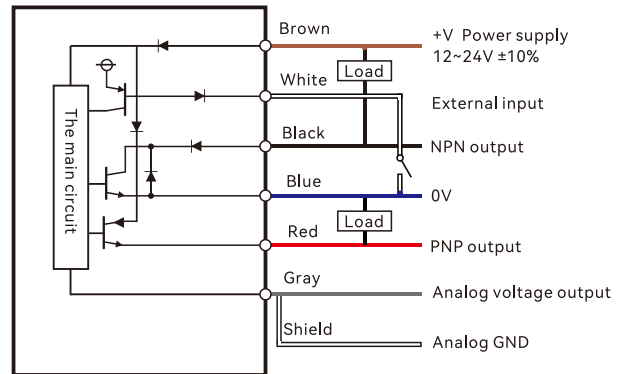


Circuit diagram

■ NPN



■ NPN+PNP



Guidance

Displacement

Triangulation

- TOF Long Range Type
- 3D Laser Profiler
- Contact Displacement
- LIDAR Scanner
- Color confocal
- Laser Alignment



Basic Features	Working principle	Triangulation			
	Housing	Retangular			
	Optical working principle	Diffuse reflection			
	Reference distance	30mm	50mm	100mm	200mm
	Measuring range	25-35mm	35-65mm	65-135mm	120-280mm
	Light source	Red laser, wavelength:655nm 1mW Class2			
	Spot Size	φ40μm	Φ50μm	Φ80μm	Φ140μm
Electrical data	Switching mode	L.on/D.on/Botton/RS-485 switch			
	Output mode	Switch output/Analog output			
	Response time	< 10ms/5ms/1.5ms			
	Linearity	± 0.1% F.S.			± 0.2% F.S.
	Repeatability	10um	30um	70um	200um
	Temperature drift characteristics	0.03%/°C F.S.			
	Operating voltage	12~24V DC ± 10%			
	Current consumption	< 65mA(12V), < 40mA(24V)			< 40mA(24V), < 80mA(12V)
	Load current	≤100mA			
	Insulation sesistance	> 500MΩ(500V DC)			
	Dielectric strength	< 0.1mA(1000V AC)			
	Protection circuit	Reverse polarity protection / short circuit protection / overload protection / surge protection			
Environmental conditions	Operating temperature	-10~+45°C(No freezing)			
	Operating humidity	35~85%RH(no condensation)			
	Ambient illumination	Ambient light: ≤10000 lux without interference; incandescent lamp: ≤3000 lux			
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions			
	Enclosure rating	IP67			
Mechanical data	Connection type	2m 7-pin composite cable			
	Dimension	20x28x45mm			
	Material	Body: die-cast aluminum; Front cover: acrylic-based			
	Weight	90g			
	Accessories	Cable			
Model	NPN	MLD25-30NV	MLD25-50NV	MLD25-100NV	MLD25-200NV
	PNP	MLD25-30PV	MLD25-50PV	MLD25-100PV	MLD25-200PV

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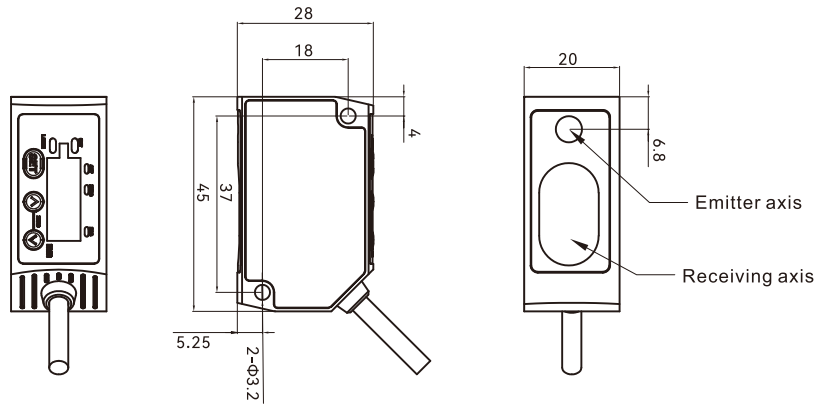
Guidance

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Triangulation

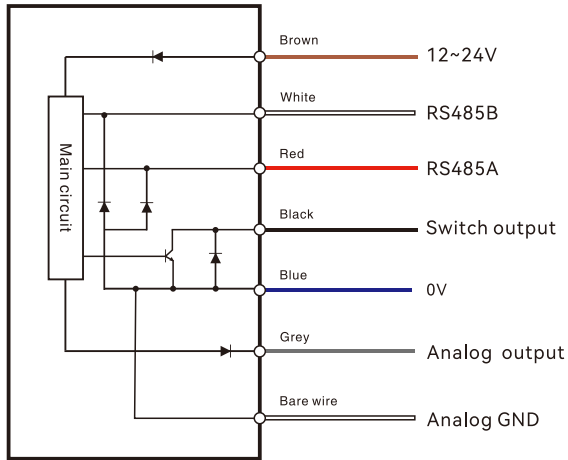
Dimensions

Unit:mm

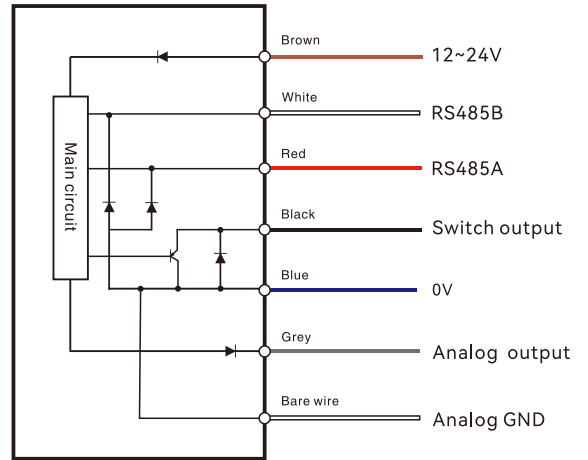


Circuit diagram

NPN Output



PNP Output



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Basic Features	Working principle	TOF principle		
	Housing	Retangular		
	Optical working principle	Diffuse reflection		
	Measuring range	0.05~8m		
	Light source	Red laser, 655nm, Class 2		
	Spot size	-		
Electrical data	Operating mode	Single measurement/Continous measurement/Quick measurement		
	Data output rate	Single measurement: 1s ,Continous measurement: 200ms ,Quick measurement: 30-100ms		
	Resolution	1mm		
	Repeatability	< ±2mm		
	Operating voltage	24VDC±10%		5VDC±10%
	Current consumption	Normal 44mA, max.65mA		Normal 50mA, max.150mA
	Residual voltage	0V		
	Load current	150mA(MAX)		
	Input voltage	12~26V DC		5V DC+10%
	Output voltage	Active low	Active low,2 channel output	Active low
	Protocol	RS485(Modbus)	RS232/4-20mA/0-10V	RS232
	Environmental conditions	Operating temperature	-10°C-40°C	
Storage temperature		-20°C-60°C		
Operating humidity		5%~95%		
Storage humidity		RH85%		
Ambient illumination		Ambient light: ≤10000 lux		
Enclosure rating		IP65		
Mechanical data	Connection type	2M cable		1M cable
	Dimension	42*61.2*23.5mm		
	Material	Aluminum alloy		
	Weight	200g		
	Accessories	-		
Model	PX-FM08-485	PX-FM08-IV-232	PX-FM08-232	

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TOF Long Range Type

PX-FM Series

Displacement



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Color confocal
Laser Alignment

Basic Features	Working principle	TOF principle		
	Housing	Rectangular		
	Optical working principle	Diffuse reflection		
	Measuring range	0.05~40m		
	Light source	Red laser, 655nm, Class 2		
	Spot Size	-		
	Electrical data	Operating mode	Single measurement/Continuous measurement/Quick measurement	
Data output rate		Single measurement: 1s, Continuous measurement: 200ms, Quick measurement: 30-100ms		
Resolution		1mm		
Repeatability		< ±2mm		
Operating voltage		12~26V DC		5V DC±10%
Current consumption		Normal 44mA, max.65mA		Normal 50mA, max.150mA
Residual voltage		0V		
Load Current		150mA(MAX)		
Input voltage		12~26V DC		5V DC±10%
Output voltage		Active low	Active low, 2 channel output	Active low
Protocol		RS485(Modbus)	RS232/4-20mA/0-10V	RS232
Environmental conditions		Operating temperature	-10°C-40°C	
	Storage temperature	-20°C-60°C		
	Operating humidity	5%~95%		
	Storage humidity	RH85%		
	Ambient illumination	Ambient light: ≤10000 lux		
	Enclosure rating	IP65		
Mechanical data	Connection type	2M cable		1M cable
	Dimension	42*61.2*23.5mm		
	Material	Aluminum alloy		
	Weight	200g		
	Accessories	-		
	Model	PX-FM40-485	PX-FM40-IV-232	PX-FM40-232



Basic Features	Working principle	TOF principle		
	Housing	Retangular		
	Optical working principle	Diffuse reflection		
	Measuring range	0.05~80m		
	Light source	Red laser, 655nm, Class 2		
	Spot Size	-		
Electrical data	Operating mode	Single measurement/Continous measurement/Quick measurement		
	Data output rate	Single measurement: 1s ,Continous measurement: 200ms ,Quick measurement: 30-100ms		
	Resolution	1mm		
	Repeatability	< ± 2mm		
	Operating voltage	24VDC±10%		5V DC±10%
	Current consumption	Normal 44mA, max.65mA		Normal 50mA, max.150mA
	Residual voltage	0V		
	Load current	150mA(MAX)		
	Input voltage	12~26V DC		5V DC+10%
	Output voltage	Active low	Active low,2 channel output	Active low
	Protocol	RS485(Modbus)	RS232/4-20mA/0-10V	RS232
	Environmental conditions	Operating temperature	-10°C-40°C	
Storage temperature		-20°C-60°C		
Operating humidity		5%~95%		
Storage humidity		RH85%		
Ambient illumination		Ambient light: ≤10000 lux		
Enclosure rating		IP65		
Mechanical data	Connection type	2M cable		1M cable
	Dimension	42*61.2*23.5mm		
	Material	Aluminum alloy		
	Weight	200g		
	Accessories	-		
Model	PX-FM80-485	PX-FM80-IV-232	PX-FM80-232	

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Guidance

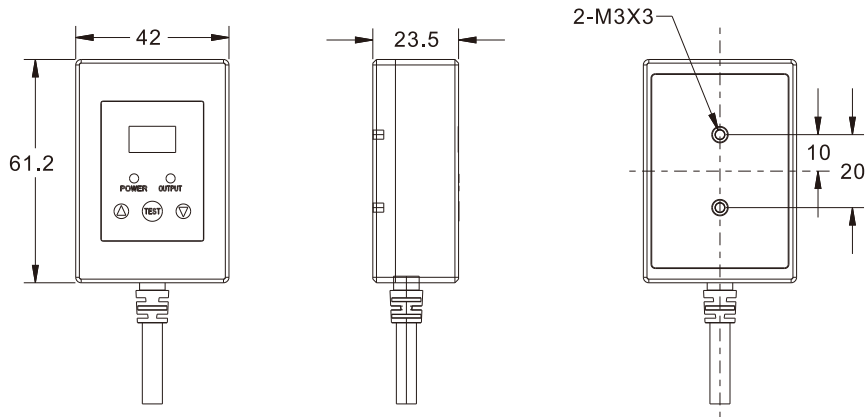
Displacement

Triangulation
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TOF Long Range Type

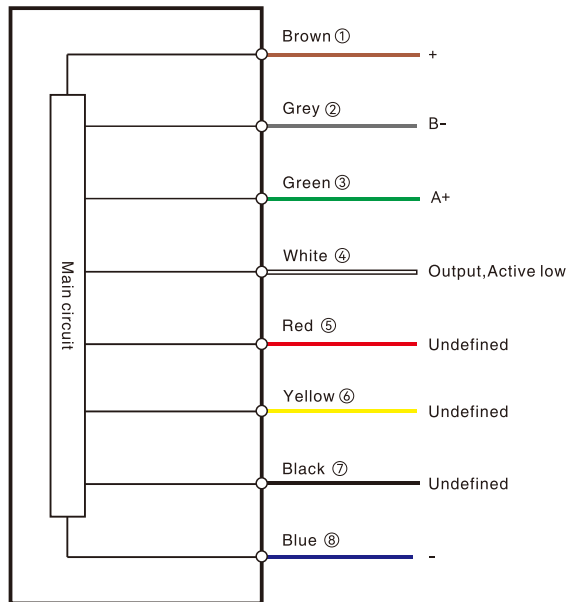
Dimensions

Unit:mm

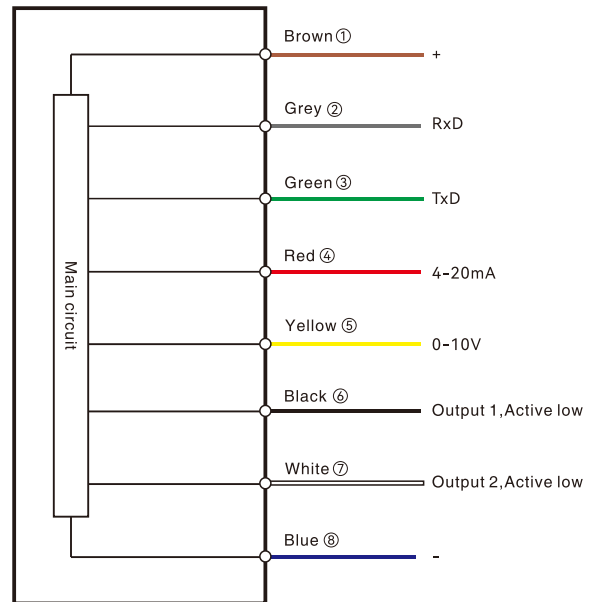


Circuit diagram

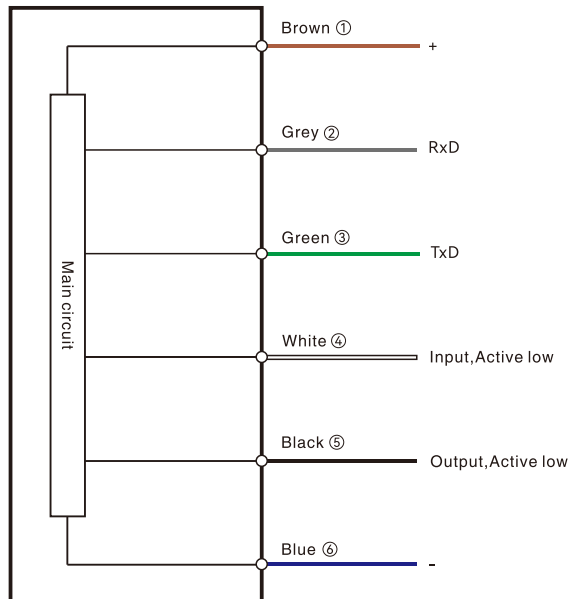
PX-FM08/40/80-485



PX-FM08/40/80-IV-232



PX-FM08/40/80-232



Fiber Optic

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3D Laser Profiler

Contact Displacement

LIDAR Scanner

Color confocal

Laser Alignment



Basic Features	Working principle	Laser 3D measurement displacement sensor						
	Housing	Retangular						
	Optical working principle	Reflection						
	Mounting distance (CD)	19mm	22mm	54mm	80mm	100mm		
	Measuring range	X-axis width	Z-axis depth of field (MR)	7mm	11mm	25mm	70mm	200mm
			Near-end FOV	11mm	16mm	28mm	54mm	110mm
			Reference distance	12mm	17mm	31mm	68mm	170mm
			Distal FOV	13mm	18mm	35mm	80mm	230mm
	Contour points	2048						
	Light source	Wavelength	405nm					
Laser class		2M/3R						
Laser output power		10mW						
Reflection angle	50°	45°	30°	30°	27°			
Electrical data	X-direction resolution	5.6 6.3µm	7.8~8.9µm	13.4~16.4µm	27.1~40.0µm	54.0~114.2µm		
	Z-axis repeatability	0.1µm	0.2µm	0.3µm	0.8µm	1.2µm		
	Z-direction linearity (+/-% of MR)	0.02%						
	Scanning speed	340 ~ 10000Hz						
	Operating voltage	24V DC±10%						
	Power consumption	11W						
	Communication interface	Gigabit network interface, 1 24V TTL input, 1 output, 2 RS485 bidirectional los						
Environmental conditions	Operating temperature	0~50°C						
	Ambient illumination	Incandescent ≤10000lux						
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions						
	Shock resistance	Peak acceleration of 15g, duration of 11ms half-sine wave shock						
	Enclosure rating	IP67						
Mechanical data	Dimension	150x90x54mm	150x100x54mm	160x105x54mm	185x100x54mm			
	Housing material	Aluminum						
	Weight	0.94kg	0.84kg	1.12kg	0.8kg			
Model	ESX-C10	ESX-C20	ESX-C30	ESX-C100	ESX-C200			

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Guidance

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3D Laser Profiler

ESX series

NEW!
CE



Basic Features	Working principle	Laser 3D measurement displacement sensor					
	Housing	Rectangular					
	Optical working principle	Reflection					
	Mounting distance (CD)	100mm	330mm	250mm	760mm		
	Measuring range	Z-axis depth of field (MR)	200mm	350mm	490mm	1280mm	
		X-axis width	Near-end FOV	110mm	195mm	230mm	700mm
			Reference distance	170mm	262mm	385mm	1095mm
			Distal FOV	230mm	330mm	540mm	1490mm
	Contour points	2048					
	Light source	Wavelength	650nm				
Laser class		2M/3R					
Laser output power		10mW					
Reflection angle	27°	23.2°	25°	27°			
Electrical data	X-direction resolution	54.0~114.2μm	92.8~164.9μm	115.5~265.1μm	338.8~731.8μm		
	Z-axis repeatability	1.2μm	2μm	6μm	15μm		
	Z-direction linearity (+/-% of MR)	0.02%					
	Scanning speed	340 ~ 10000Hz					
	Operating voltage	24V DC±10%					
	Power consumption	11W					
	Communication interface	Gigabit network interface, 1 24V TTL input, 1 output, 2 RS485 bidirectional los					
Environmental conditions	Operating temperature	0~50°C					
	Ambient illumination	Incandescent≤10000lux					
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions					
	Shock resistance	Peak acceleration of 15g, duration of 11ms half-sine wave shock					
	Enclosure rating	IP67					
Mechanical data	Dimension	185x100x54mm	285x100x52.5mm	285x100x52.5mm	690x134.5x58.4mm		
	Housing material	Aluminum					
	Weight	0.8kg	1.62kg	1.44kg	4.44kg		
	Model	ESX-CE200	ESX-CE300	ESX-CE500	ESX-CE1000		

Displacement

Fiber Optic

Slot Sensors

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Displacement

Triangulation

TOF Long

Range Type

3D Laser Profiler

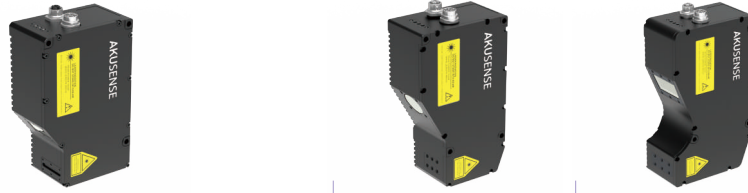
Contact

Displacement

LIDAR Scanner

Color confocal

Laser Alignment



Basic Features	Working principle	Laser 3D measurement displacement sensor					
	Housing	Retangular					
	Optical working principle	Reflection					
	Mounting distance (CD)	18mm	40mm	90mm	140mm		
	Measuring range	X-axis width	Z-axis depth of field (MR)	7mm	24mm	74mm	192mm
			Near-end FOV	14mm	30mm	55mm	100mm
			Reference distance	15mm	33mm	72mm	145mm
			Distal FOV	16mm	36mm	88mm	190mm
	Contour points	4096					
	Light source	Wavelength	405nm		650nm		
Laser class		2M/3R					
Laser output power		10mW					
Reflection angle	41°	38°	30°	24°			
Electrical data	X-direction resolution	6.9~8.4μm	14.6~20.1μm	28.8~47.1μm	51.7~99.6μm		
	Z-axis repeatability	0.2μm	0.4μm	0.6μm	1μm		
	Z-direction linearity (+/-% of MR)	0.02%					
	Scanning speed	1000 (full frame) ~20000Hz					
	Operating voltage	24V DC±10%					
	Power consumption	11W					
	Communication interface	Gigabit network interface, 1 24V TTL input, 1 output, 2 RS485 bidirectional I/O					
Environmental conditions	Operating temperature	0~50°C					
	Ambient illumination	Incandescent ≤10000lux					
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions					
	Shock resistance	Peak acceleration of 15g, duration of 11ms half-sine wave shock					
	Enclosure rating	IP67					
Mechanical data	Dimension	145x95x60mm	160x104.5x60mm	170x105x60mm	190x115x64mm		
	Housing material	Aluminum					
	Weight	1.04kg	1.24kg	1.22kg	1.56kg		
	Model	ESX-G10	ESX-G20	ESX-G100	ESX-GE200		

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3D Laser Profiler

ESX series

Displacement



NEW!
CE

Basic Features	Laser 3D measurement displacement sensor				
	Working principle	Laser 3D measurement displacement sensor			
Housing	Rectangular				
Optical working principle	Reflection				
Mounting distance (CD)	18mm	40mm	90mm		
Measuring range	Z-axis width	Z-axis depth of field (MR)	7mm	24mm	74mm
		Near-end FOV	13mm	28mm	55mm
		Reference distance	14.5mm	27mm	72mm
		Distal FOV	16mm	36mm	90mm
Light source	Contour points			1920	
	Wavelength	405nm			
	Laser class	2M/3R			
	Laser output power	10mW			
Electrical data	Reflection Angle	41°	38°	30°	
	X-direction resolution	7.0~8.6μm	14.6~20.1μm	28.8~47.1μm	
	Z-axis repeatability	0.2μm	0.4μm	0.6μm	
	Z-direction linearity (+/-% of MR)	0.02%			
	Scanning speed	2500~56000Hz			
	Operating voltage	24V DC±10%			
	Power consumption	11W			
	Communication Interface	Gigabit network interface, 1 24V TTL input, 1 output, 2 RS485 bidirectional I/Os			
	Environmental conditions	Operating temperature	0~50°C		
		Ambient illumination	Incandescent ≤10000lux		
Vibration resistance		10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions			
Shock resistance		Peak acceleration of 15g, duration of 11ms half-sine wave shock			
Enclosure rating		IP67			
Mechanical data	Dimension	145x95x60mm	160x104.5x60mm	190x115x64mm	
	Housing material	Aluminum			
	Weight	0.8kg	1.24kg	1.22kg	
Model	ESX-P10	ESX-P20	ESX-P100		

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- Guidance
- Displacement**
- Triangulation
- TOF Long Range Type
- 3D Laser Profiler
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- LIDAR Scanner
- Color confocal
- Laser Alignment



NEW!

CE



NEW!

CE

Displacement

Basic Features	Working principle	Laser 3D measurement displacement sensor			
	Housing	Retangular			
	Optical working principle	Reflection			
	Mounting distance (CD)	140mm	140mm	235mm	
	Measuring range	Z-axis depth of field (MR)	191mm	191mm	250mm
		X-axis width	Near-end FOV	100mm	192mm
			Reference distance	145mm	247mm
			Distal FOV	190mm	302mm
	Contour Points	1920			
	Light source	Wavelength	405nm	650nm	
Laser class		2M/3R			
Laser output power		10mW			
Reflection angle	24°		23.2°		
Electrical data	X-direction resolution	51.7~99.7μm	51.7~99.7μm	100.7~160.3μm	
	Z-axis repeatability	1μm	1μm	1.5μm	
	Z-direction linearity (+/-% of MR)	0.02%		0.04%	
	Scanning speed	2500~56000Hz			
	Operating voltage	24V DC±10%			
	Power consumption	11W			
	Communication interface	Gigabit network interface, 1 24V TTL input, 1 output, 2 RS485 bidirectional los			
Environmental conditions	Operating temperature	0~50°C			
	Ambient illumination	Incandescent≤10000lux			
	Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions			
	Shock resistance	Peak acceleration of 15g, duration of 11ms half-sine wave shock			
	Enclosure rating	IP67			
Mechanical data	Dimension	190x115x64mm	340x115x64.8mm		
	Housing material	Aluminum			
	Weight	1.54kg	2.08kg		
Model	ESX-P200	ESX-PE200	ESX-PE300		

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- Color confocal
- Laser Alignment

3D Laser Profiler

ESX series

Displacement



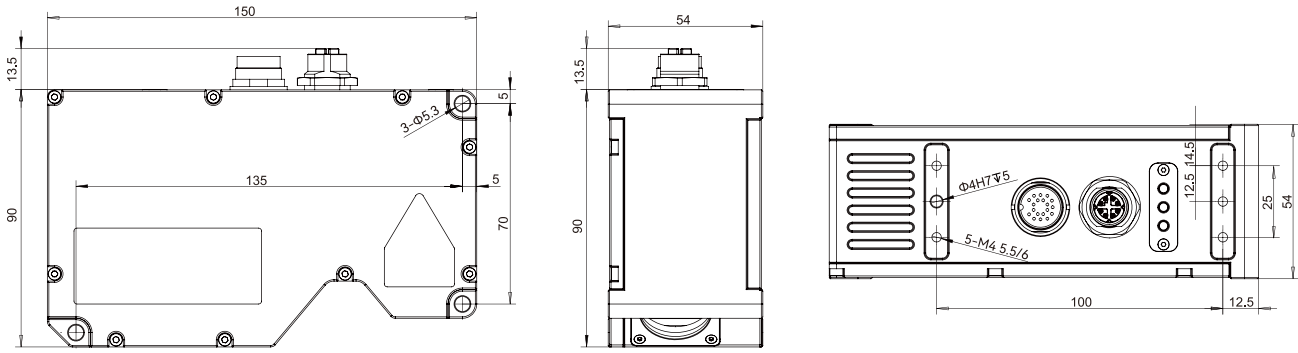
NEW!

CE

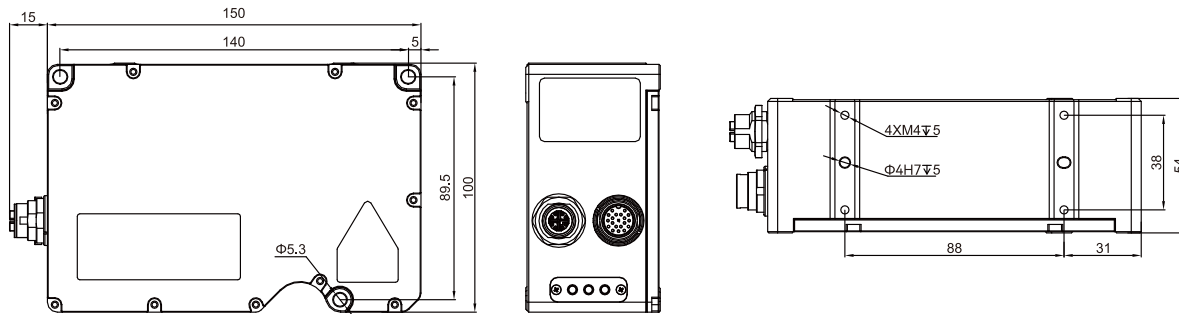
Basic Features	Working principle		Laser 3D measurement displacement sensor		
	Housing		Rectangular		
	Optical working principle		Reflection		
	Mounting distance (CD)		30mm	50mm	
	Measuring range	X-axis width	Z-axis depth of field (MR)	6mm	18mm
			Near-end FOV	20mm	45mm
			Reference distance	22mm	51mm
			Distal FOV	24mm	56mm
	Contour Points		4096		
	Light source	Wavelength		405nm	
Laser class		2M/3R			
Laser output power		10mW			
Reflection angle		50°	38°		
Electrical data	X-direction resolution		5.1~5.9μm	11.1~13.6μm	
	Z-axis repeatability		0.1μm	0.3μm	
	Z-direction linearity (+/-% of MR)		0.02%		
	Scanning speed		1200~16000Hz		
	Operating voltage		24V DC±10%		
	Power consumption		11W		
	Communication Interface		Gigabit network interface, 1 24V TTL input, 1 output, 2 RS485 bidirectional Ios		
Environmental conditions	Operating temperature		0~50°C		
	Ambient Illumination		Incandescent ≤10000lux		
	Vibration resistance		10 to 55 Hz, 1.5 mm double amplitude, 2 hours for each X, Y, and Z directions		
	Shock resistance		Peak acceleration of 15g, duration of 11ms half-sine wave shock		
	Enclosure rating		IP67		
Mechanical data	Dimension		190x115x80mm		
	Housing material		Aluminum		
	Weight		1.31kg	1.35kg	
	Model		ESX-H10	ESX-H20	

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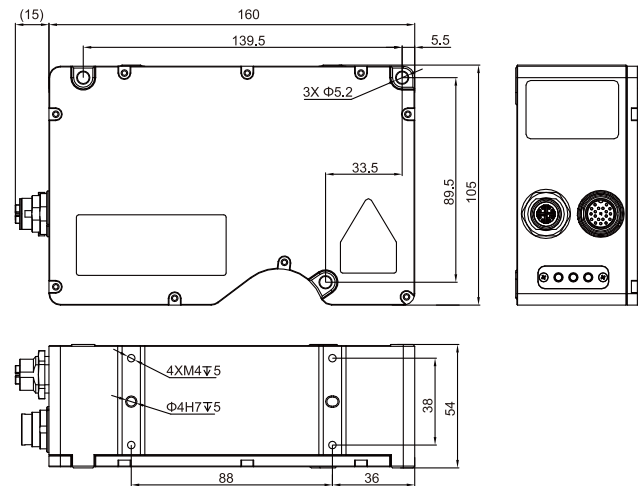
ESX-C10



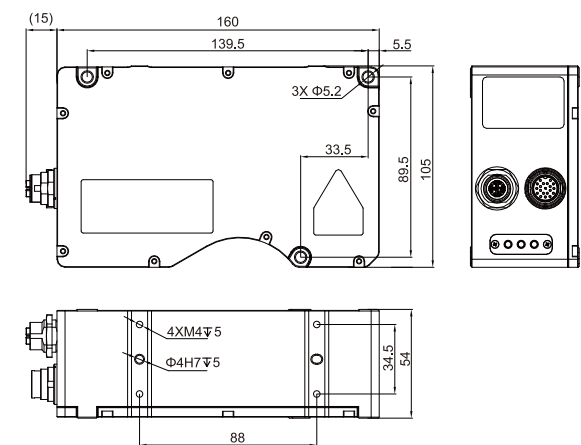
ESX-C20



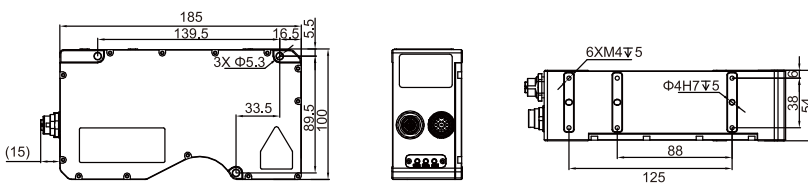
ESX-C30



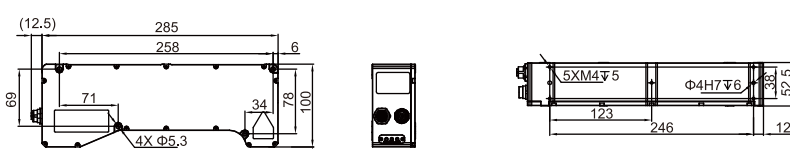
ESX-C100



ESX-C200/CE200



ESX-CE300



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- Pressure Switch
- Communication
- Accessories

Guidance

Displacement

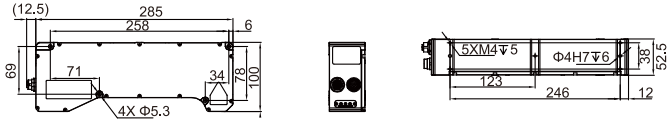
- Triangulation
- TOF Long Range Type
- 3D Laser Profiler**
- Contact Displacement
- LIDAR Scanner
- Color confocal
- Laser Alignment

3D Laser Profiler

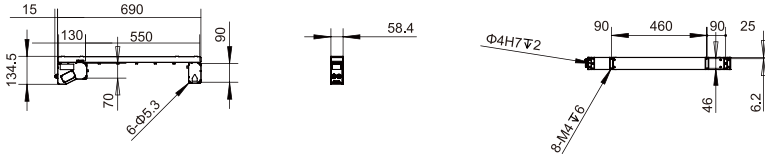
Dimensions

Unit:mm

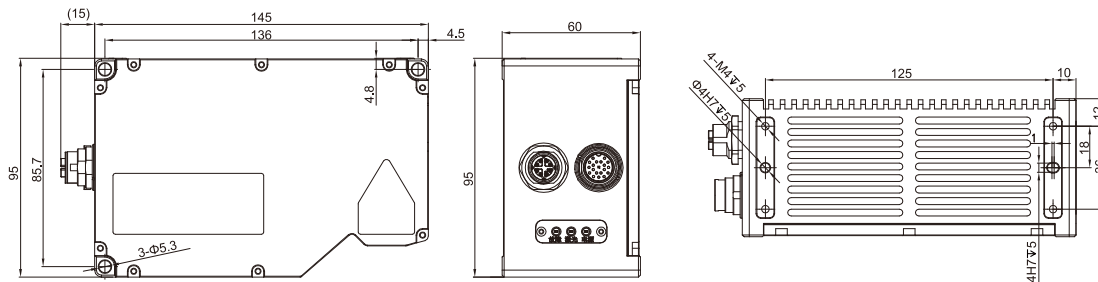
ESX-CE500



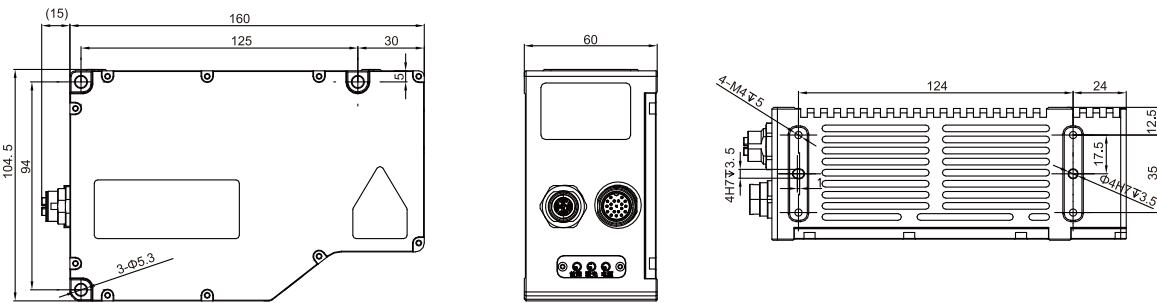
ESX-CE1000



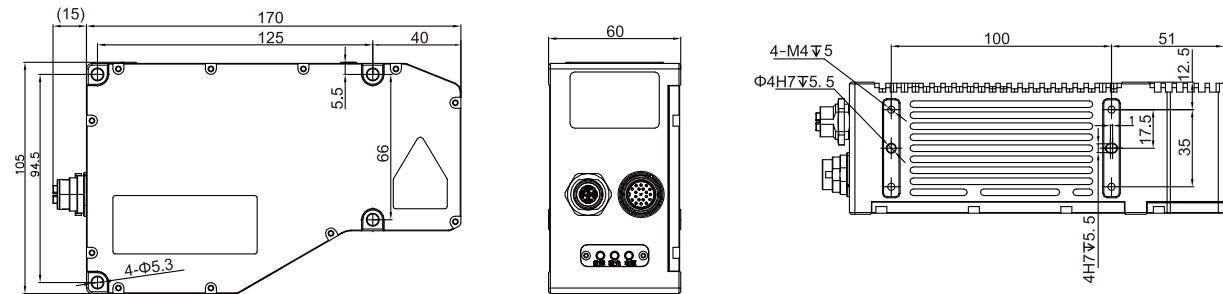
ESX-G10 ESX-P10



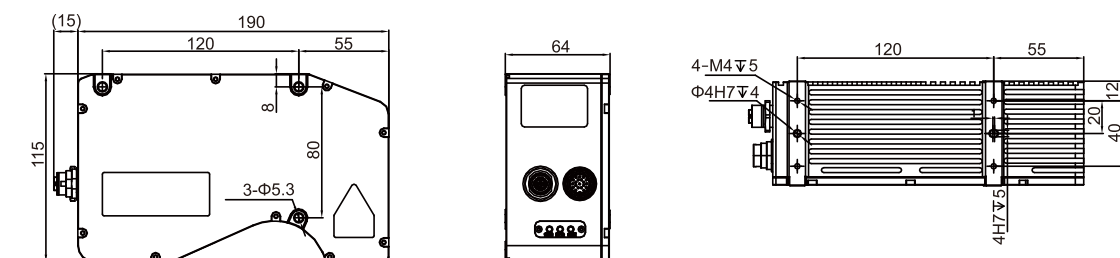
ESX-G20 ESX-P20



ESX-G100



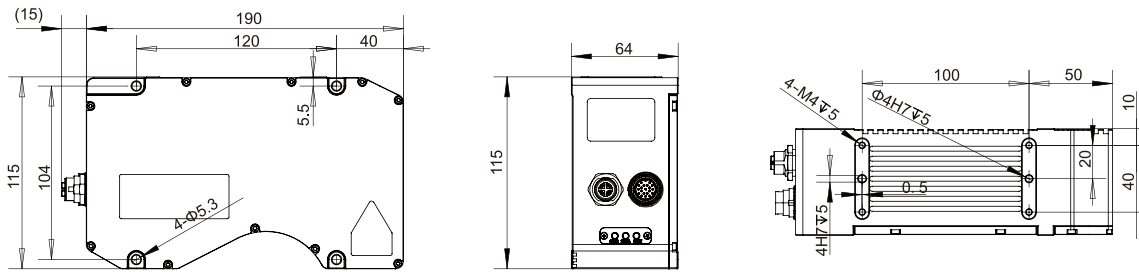
ESX-GE200



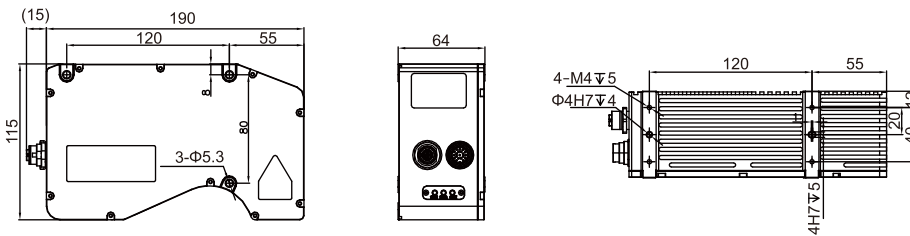
- Fiber Optic
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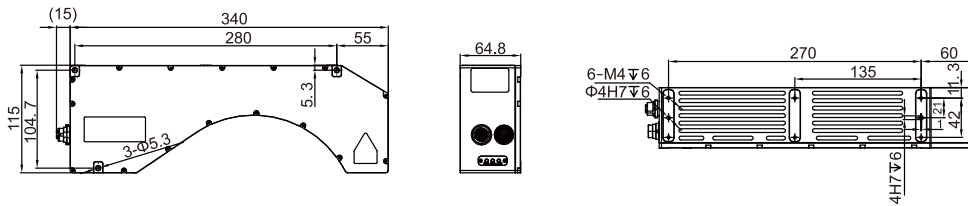
ESX-P100



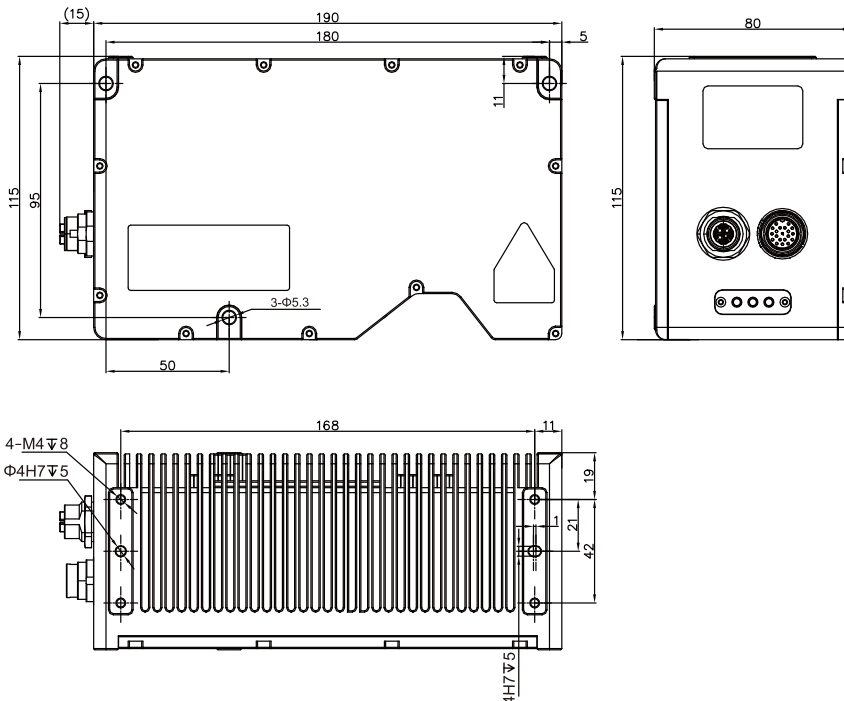
ESX-P200 ESX-PE200



ESX-PE300



ESX-H10 ESX-H20



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Guidance

Displacement

- Triangulation
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- Range Type
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Interface Definitions

Circular connecting pins	Signal definition	Cable color	Feature
C	DIO2+	Orange	Multifunctional difference I/O2
B	DIO2-	Orangish and white	
D	INDEX+	Yellow	Encoder Z-phase input
E	INDEX-	Yellowish and white	
I	A+	Gray	Encoder A-phase input
S	A-	Grayish	
H	B+	Purple	Encoder B-phase input
G	B-	Pure white	
T	DIO1+	Pink	Multifunctional difference I/O2
K	DIO1-	Pink and white	
U	OUT+	Blue	Single-ended output
M	OUT-	Blue and white	
O	TRIG_EN+	Brown	Trigger enable
N	TRIG_EN-	Brown and white	
R	IN+	Green	Single-ended output
P	IN-	greenish white	
A	+24V	Red+red and white two wires	Camera Power
L	GND	Black+black and white two wires	Power ground
F	EARTH_GND	Silver	Grounding

Fiber Optic

Slot Sensors

Photoelectric

Laser

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Contact

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Ultrasonic

AI Image

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TOF Long

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LIDAR Scanner

Color confocal

Laser Alignment



Basic Features	Working principle	Differential transformer			
	Housing	Pencil type			
	Drive mode	Rebound			
	Measuring range	2mm	5mm	8mm	10mm
Electrical data	Linearity	±0.25% F.S.			
	Resolution	≤0.1μm, Communication output 16 bit			
	Response time	100ms			
	Sampling frequency	10Hz			
	Operating voltage	9~28V DC(0~5V Analog output)			
		9~29V DC(0~10V Analog output)			
		2-wire, 15~28V DC (4~20mA Analog output)			
9~12V DC (RS485 output)					
Current consumption	< 15mA				
Communication protocol	Modbus RTU				
Environmental conditions	Operating temperature	-25°C~+85°C(No Freezing)			
	Operating humidity	10~80% RH(No Condensation)			
	Enclosure rating	IP64			
Mechanical data	Connection type	φ14/5-pin signal transmitter			
	Dimension	φ8x85.1mm	φ8x138.3mm	φ8x151.3mm	φ8x151.3mm
	Material	Stainless steel			
	Weight	130g			
	Accessories	Mounting bracket			
Model	Analog voltage 0~5V	MRA-P02R01V1	MRA-P05R01V1	MRA-P08R01V1	MRA-P10R01V1
	Analog voltage 0~10V	MRA-P02R01V2	MRA-P05R01V2	MRA-P08R01V2	MRA-P10R01V2
	Analog current 4~20mA	MRA-P02R01A	MRA-P05R01A	MRA-P08R01A	MRA-P10R01A
	RS485 communication	MRA-P02R01M1	MRA-P05R01M1	MRA-P08R01M1	MRA-P10R01M1

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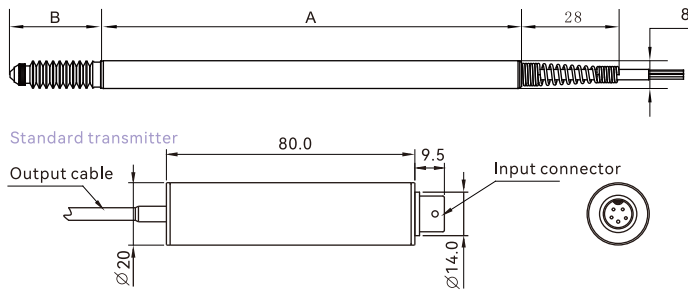
Guidance

Displacement

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Dimensions

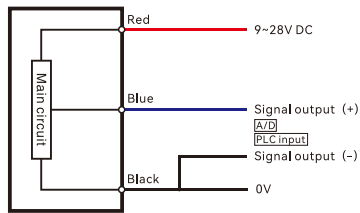
Unit:mm



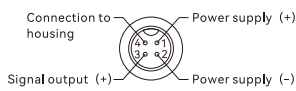
Parameters	Rebound			
	2	5	8	10
Measuring range(mm)	2	5	8	10
Length of A(mm)	65.5	115	121	121
Length of guide rob B(mm)	19.6	23.3	30.3	30.3

Circuit diagram

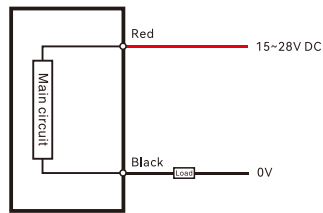
Voltage Output



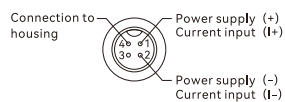
Analog voltage signal output



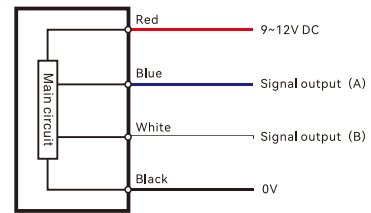
2-wire current output



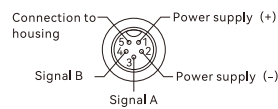
Analog current signal output



Digital Output



Digital RS485 signal output



Guidance

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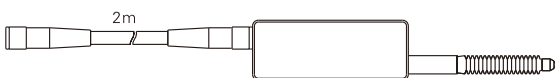
Basic Features	Working principle	CMOS encoder measurement (no tracking error)							
	Housing	Box type							
	Drive mode	Rebound							
	Measuring range	0~12.7mm				0~25.4mm			
Electrical data	Linearity	≤1.4μm	≤2μm	±2μm	≤10μm	≤1.8μm	≤3μm	±3μm	≤10μm
	Resolution	0.2μm	0.5μm	1μm	5μm	0.2μm	0.5μm	1μm	5μm
	Response time	50ms							
	Sampling frequency	40ms							
	Operating voltage	5V DC							
	Current consumption	< 50mA							
	Communication protocol	Modbus RTU							
Environmental conditions	Operating temperature	-10~50°C(No Freezing)							
	Operating humidity	35~80% RH(No Condensation)							
	Enclosure rating	IP65							
Mechanical data	Measuring force	1.1-1.2N				1.6-1.8N			
	Connection type	M8 4pin cable							
	Dimension	146.9x26.2x18mm				206.9x26.2x18mm			
	Material	Body: Aluminum alloy; Dust cover: Viton; Sensor head: Tungsten carbide							
	Weight	about 71.7g				about 91.5g			
	Accessories	M8 4pin cable							
Model	Connector type* ¹	MRC-H12R04S	MRC-H12R02S	MRC-H12R12S	MRC-H12R10S	MRC-H25R08S	MRC-H25R03S	MRC-H25R13S	MRC-H25R10S
	Pre-wired type* ²	MRC-H12R04W	MRC-H12R02W	MRC-H12R12W	MRC-H12R10W	MRC-H25R08W	MRC-H25R03W	MRC-H25R13W	MRC-H25R10W

*1: standard CA08FF-S4F2C M8 dual female connecting cable, need to be used with digital display control module.

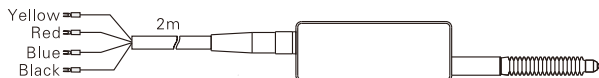
1 sensor head needs to match 1 CA08FF-S4F2C, 1 digital display control module can be connected to 4 sensor heads.

*2: standard M8 four-core cable, does not support the use of digital display control module, if you need to use with the digital display control module, please select the connector type

Dimensions



(0-12.7mm) Aviation plug type



(0-12.7mm) Lead Type



(0-25.4mm) Aviation plug type



(0-25.4mm) Lead Type

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Contact Displacement Sensor

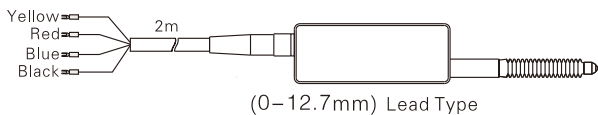
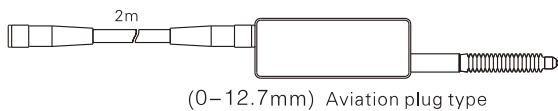
MRC-H Series



Basic Features	Working principle	CMOS encoder measurement (no tracking error)							
	Housing	Box type							
	Drive mode	Rebound				Air push			
	Measuring range	0~12.7mm				0~12.7mm			
Electrical data	Linearity	≤1.4μm	≤2μm	±2μm	≤10μm	≤1.4μm	≤2μm	±2μm	≤10μm
	Resolution	0.2μm	0.5μm	1μm	5μm	0.2μm	0.5μm	1μm	5μm
	Response time	50ms							
	Sampling frequency	40ms							
	Operating voltage	5V DC							
	Current consumption	< 50mA							
	Communication protocol	Modbus RTU							
Environmental conditions	Operating temperature	-10~50°C(No Freezing)							
	Operating humidity	35~80% RH(No Condensation)							
	Enclosure rating	IP65							
Mechanical data	Measuring force	1.1-1.2N				2.4-3.4N			
	Pressure range	-				0.16~0.2Mpa			
	Connection type	M8 4pin cable							
	Dimension	146.9x26.2x24mm				149.6 x34x20mm			
	Material	Body: Aluminum alloy; Dust cover: Viton; Sensor head: Tungsten carbide							
	Weight	about 90.5g				about 99.2g			
	Accessories	M8 4pin cable							
	Model	Connector type*1	MRC-H12R04DS	MRC-H12R02DS	MRC-H12R12DS	MRC-H12R10DS	MRC-H12Q04S	MRC-H12Q02S	MRC-H12Q12S
Pre-wired type*2		MRC-H12R04DW	MRC-H12R02DW	MRC-H12R12DW	MRC-H12R10DW	MRC-H12Q04W	MRC-H12Q02W	MRC-H12Q12W	MRC-H12Q10W

*1: standard CA08FF-S4F2C M8 dual female connecting cable, need to be used with digital display control module.
 1 sensor head needs to match 1 CA08FF-S4F2C, 1 digital display control module can be connected to 4 sensor heads.
 *2: standard M8 four-core cable.

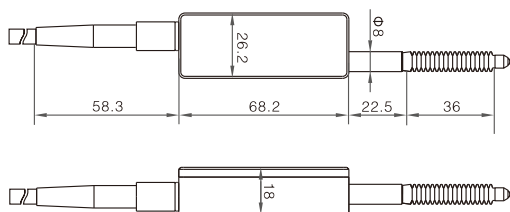
Dimensions



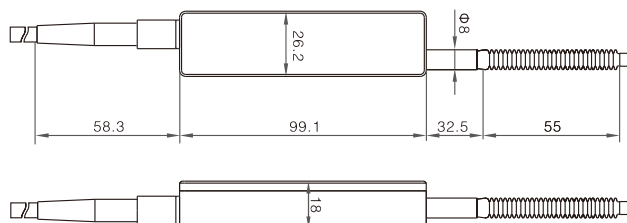
Dimensions

Unit: mm

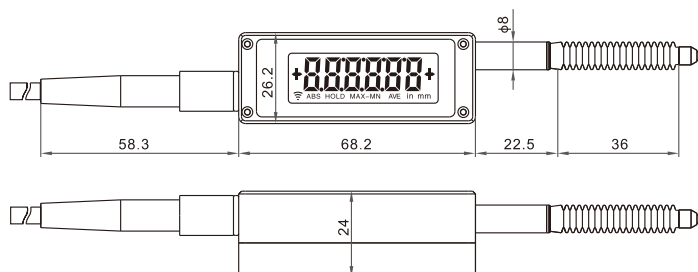
MRC-H12R



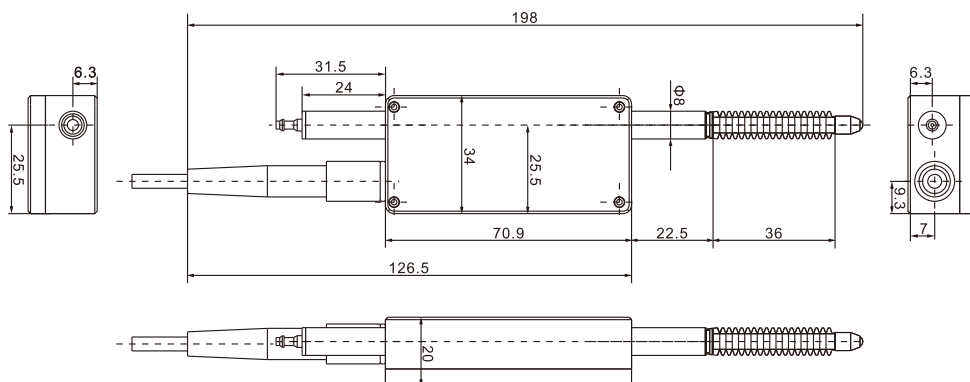
MRC-H25R



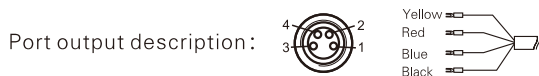
MRC-H12RD



MRC-H12Q



Circuit diagram



Aviation plug type	
Pin No.	Description
1	DC 5V(Power)
2	RXD
3	TXD
4	GND

RS232 Lead type	
Pin No.	Description
Blue	RXD
Black	TXD
Yellow	DC 5V(Power)
Red	GND

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement**
- Magnetic
- Contact
- Area
- Ultrasonic
- AI Image
- Code Readers
- Vibration
- Temperature
- RFID
- Safety doorlock
- Pressure Switch
- Communication
- Accessories

Guidance

Displacement

- Triangulation
- TOF Long
- Range Type
- 3D Laser
- Profiler
- Contact Displacement**
- LIDAR Scanner
- Color confocal
- Laser Alignment

Contact Displacement Sensor

MRC-H controllers and accessories



NEW!

Basic Features	Housing	Rectangular	
	Display range	-199.9999~199.9999	
	Display resolution	5μm/1μm/0.5μm/0.2μm(Displayed according to the type of sensor head)	
Electrical data	Operating voltage	12~24VDC	
	Power consumption	≤240mW(without sensor and subcontrol module connected)	≤100mW(without sensor)
	Response time	50/100/500/1000ms(Changed in function parameter setting)	
	Control input	Timer, preset, reset, channel input, no voltage input	
	Control output	NPN output, max. 20mA	
	Communication protocol	Modbus RTU	-
	Communication interface	RS232/RS485	-
Environmental conditions	Operating temperature	-10~60°C(No Freezing)	
	Operating humidity	35~80% RH(No Condensation)	
Mechanical data	Expandable	1 main control module, up to 4 sub-control modules can be extended	-
	Number of connectable sensors	4	
	Dimension	Main control module&Sub-control module:78.3x87.3x51.4mm	
	Material	Body: ABS Key: ABS Panel: MMA Cable: PVC	
	Weight	Main control module approx. 201.6g	Sub-control module approx. 168.3g
	Accessories	The main controller can be paired with up to 4 sub-controllers, up to 20 sensor heads, each sensor head needs to be matched with 1pc of CA08FF-S4F2C to use	
Model	CR-M01	CR-M01A	

Dimensions

Unit: mm

Main control module CR-M01

Sub-control module CR-M01A

