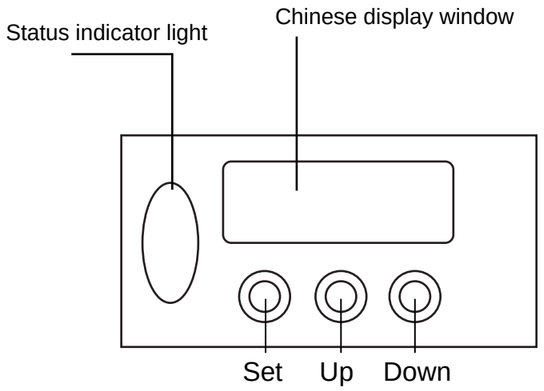
MD LASER DISPLACEMENT SENSOR

Names of components

Repeat accuracy 0.01mm of stable detection
Higher measurement accuracy ±0.1%
Ultra-fast response time max. 1.5ms
Various output modes, pure I/O type/analog type/RS-485



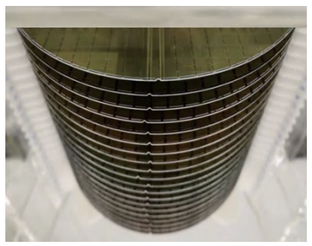
Instruction

● Product surface flatness detection

● Dispensing volume detection

● Chip presence detection

● Wafer stack detection

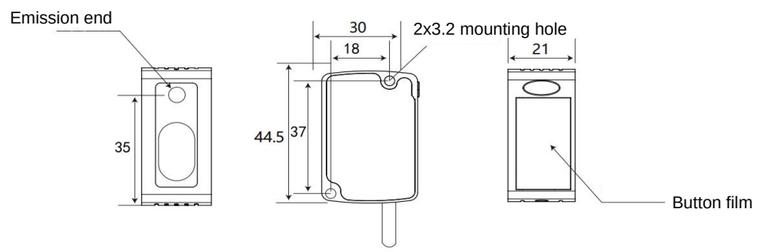


Item \ Model	Category	Micro laser displacement sensor					
		30mm type	50mm type	100mm type	200mm type	400mm type	600mm type
	NPN/PNP + analog MA/V + RS-485	MD-LS030	MD-LS050	MD-LS100	MD-LS200	MD-LS400	MD-LS600
Measurement center distance		30mm	50mm	100mm	200mm	400mm	475mm
Measurement range		±5mm	±15mm	±35mm	±80mm	±200mm	60-950mm
Repeated accuracy		10um	30um	70um	200um	300um (200~400)mm 800um (400~600)mm	600um
Measurement accuracy		±0.1%F.S			±0.2%F.S.	±0.2%F.S. (160~400)mm ±0.3%F.S. (400~600)mm	±0.3%F.S
Response frequency		1.5Ms/5ms/15ms switchable					
Light source		Red laser (655nm)					
Light point diameter		φ100um	φ100um	φ200um	φ500um	φ1mm	
Power supply voltage		12V~24V Dc±10%/ pulsation P-P 10% or below					
Light source power		<1W					
Output		Transistor output: NPN/PNP settable Analog output: 0V~5V, OV~10V, 4mA 20mA Communication output: RS-485					
Output action		ON when light-input/ON when no light-input, switchable					
Short circuit protection		Equipped					
Ambient resistance	Protection structure	IP67					
	Operating temperature	-10℃~+50℃ (caution: no condensation or icing)					
	Ambient temperature	-20℃~+60℃					
	Ambient humidity	35%RH~85%RH					
	Ambient luminance	Incandescent light: lighted surface luminance 3000lux or below					
	Voltage-resistant	1000V/AC/50Hz/60Hz 60s					
	Insulation resistance	≥50MΩ(500V DC)					
	Vibration resistant	Frequency 10~50Hz ·Double amplitude 15mm 2 hours in each direction of XYZ (when not energized)					
	Impact resistance	Acceleration 500m/s2 (approx. 50G) 3 times in each direction of XYZ (when not energized)					
Material		Housing: die-cast zinc Window: glass					
Link method		2m cable					

(Note 1) Unspecified measurement conditions are those where the ambient temperature is equal to +23. (Note 2) This product is a laser product, power up and preheat for ten minutes before use.

Dimension diagram (unit: mm)

MD-LS030/050/100/200/400

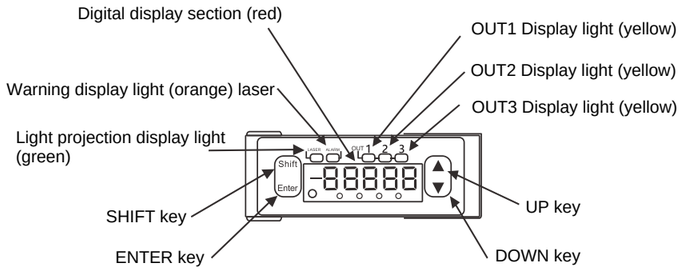


MD SERIES HIGH PRECISION LASER DISPLACEMENT SERIES

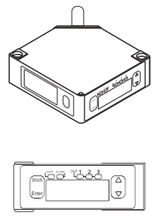
Names of components

Highly precision and stable detection, accuracy up to 0.002mm

Wide measurement range, switching, analog, communication and other output modes can be selected, suitable for more application scenarios



Category

Shape	Measuring center distance and measuring range	Resolution	Light beam diameter	Model
	30±4mm	0.5μm	0.1X1mm	MD-HL030
	50±10mm	1.5μm	0.5X1mm	MD-HL050
	85±20mm	2.5μm	0.75X1.25mm	MD-HL085
	120±60mm	8μm	1.0X1.5mm	MD-HL120
	250±150mm	20μm	1.75X3.5mm	MD-HL250

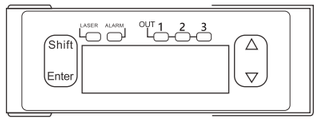
Wiring diagram

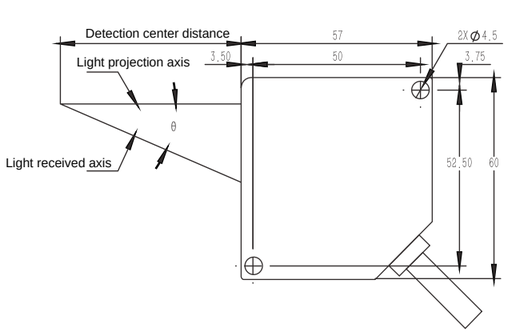
	Name	Function	Wire color	
Analog output wire	A(V)	Analog voltage output	1 core shielding	Black
	AGND	Grounding for analog		
	A(I)	Analog current output	1 core shielding	Gray
	AGND	Grounding for analog		
Input/output wire	OUT1	Judgment output 1	Black	
	OUT2	Judgment output 2	White	
	OUT3	Judgment output 3 or warning output	Gray	
	TM	Timed input	Pink	
	MI	Zeroing, reset, memory switching, demonstration, saving, each input of laser control	Purple	
	NP	NPN type/PNP type switching inputs	Pink/blue or purple*1	
	+SD	Send data	Twisted Pair	Green
	-SD	Send data		Light blue
	+RD	Receive data	Twisted Pair	Orange
	-RD	Receive data		Yellow
	SG	Grounding for signal	Shielded	
	+V	DC 24V input for power supply	Brown	
	oV	Grounding for power supply	Blue	

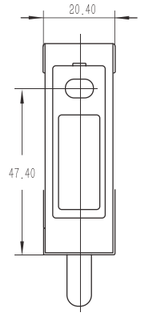
Product parameters

Product Model	MD-HL030	MD-HL050	MD-HL085	MD-HL120	MD-HL250
Measuring method	Diffuse reflective				
Measuring center distance	30mm	50mm	85mm	120mm	250mm
Measuring range	±4mm	±10mm	±20mm	±60mm	+150mm
Light source	Red semiconductor laser level 1 (JIS/EC/GB/KS/FDALaserNoticeNo.50/GB)				
	Max. output: 0.39mW, peak wavelength of light projection: 655nm				
Light beam diameter	0.1×0.1mm	0.5×1mm	0.75×1.25mm	1.0×1.5mm	1.75×3.5mm
(Note 2)	0.1×1mm				
Light received section	CMOS image sensor				
Resolution	0.5μm	1.5μm	2.5μm	8μm	20μm
Linearity	±0.1%F.S.				±0.3%F.S.
Temperature characteristics	±0.08%F.S./C				
	24V DC±10% including pulsation 0.5V(p-p)				
Current consumption	100mA or below				
Sampling period	500μs、1ms、2ms				
Voltage	Output range: 0~10.5V (normal), 11V (warning) output impedance: 100Ω				
Analog output current	Output range: 3.2~20.8mA (normal), 21.6mA (warning) Load impedance: 300Ω or below				
OUT1 OutputOUT2 OutputOUT3 Output	Judgment output or warning output (set switching type)NPN transistor open collector/PNP transistor collector parallel (switching type)				
	<When NPN action setting> ●Residual voltage: 2V or less (when inflow current is 50mA) ●Leakage current: 0.1mA or below		<When PNP action setting> ●Max. output current: 50mA ●Residual voltage: 2.8V or less (when outflow current is 50mA) ●Leakage current: 0.1mA or below		
Output action	Open when ON (output action)				
Short circuit protection	Equipped (auto-recovery)				
NP switching input	When OV connection: NPN open collector output action				
	When power supply 24V DC connection: PNP open collector output action				
Timed input	When PNP action is setting: when external power supply + is connected or when an action in connection is set (varies depending on setting).				
Multi-way input	Zeroing, reset, memory switching, demonstration, save, laser control according to input time				
	When NPN action setting: based on the time of connecting to 0V				
	When PNP action setting: based on the time of connecting to the external power supply+				
Communication interface (high-function type)	RS-422 or RS-485				
	Baud rate: 9,600/19,200/38,400/115,200bps				
	Data length 8bit, end bit length 1bit, no parity check, with BCC, data differentiation: CR				
Indicator light — Laser	Lights on when green light-emitting diode laser projection				
Indicator light — Light projection					
Indicator light — Warning	Orange light-emitting diode with insufficient light amount makes it impossible to measure				
Indicator light — Output	Yellow light-emitting diode (number of display lights: 3) light on when output action				
Digital display section	Red light emitting diode symbol and 5-digit display				
Protection structure	IP67 (except connector section)				
Contamination degree	2				
Insulation resistance	20MΩ or above at DC 250V Megger (between all terminals - housing)				
Voltage-resistant	AC 1,000V for 1 minute (between all terminals and housing)				
Vibration resistant	Endurance frequency: 10~55Hz (cycle 1 minute) double amplitude: 1.5mm 2 hours in each direction of X, Y, Z				
Impact resistance	500m/s² 3 times in each direction of X, Y, Z				
Surrounding luminance (Note 3)	3,000Ex or below (lighted surface luminance at incandescent light)				
Surrounding humidity	-10~+45°C (caution: no condensation or icing) in storage: -20~+60°C				
Ambient humidity	35~85%RH in storage: 35~85%RH				
Service height	2,000m or below				
Material	Body housing: PBT, front cover: acrylic, cable: PVC				
Cable	0.5M				

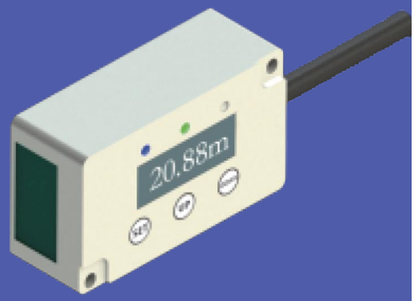
Dimension diagram (unit: mm)







MD LONG DISTANCE LASER SENSOR



Characteristics

- Short, medium and long ranges available
- Supports NPN/PNP switchable
- Supports 485 communication
- OLED Chinese digital display, clear and concise
- All-metal housing for rugged durability
- Small size, small light spot, high precision

Menu description:

Under the main menu of the menu setting interface, press and hold “ SET” for more than three seconds to exit the menu setting interface and save the parameter settings.

Note: Long press to exit operation is not available in the sub-menu of the menu settings interface

After entering the menu setting mode, press the “ UP” key or “ DOWN ” key to switch the menu up or down.

Press the “ SET” key briefly to enter the corresponding menu item.

Working mode: can be switched in standard mode, high-speed mode, high-precision mode

Normally open status: in normal detection mode, the output turns on when the received light intensity is greater than the threshold value; in area detection mode, the output turns on when the received light intensity is within the upper/lower threshold value.Normally close status : normally in detection mode, the output turns on when the received light intensity is less than the threshold value; area detection

Address: as the address code for 485 communication, can be set in the range of 1~100

Selection of outputs: High level (PNP) Low level (NPN)

Reset: initialize the device and changes all parameter settings to default values

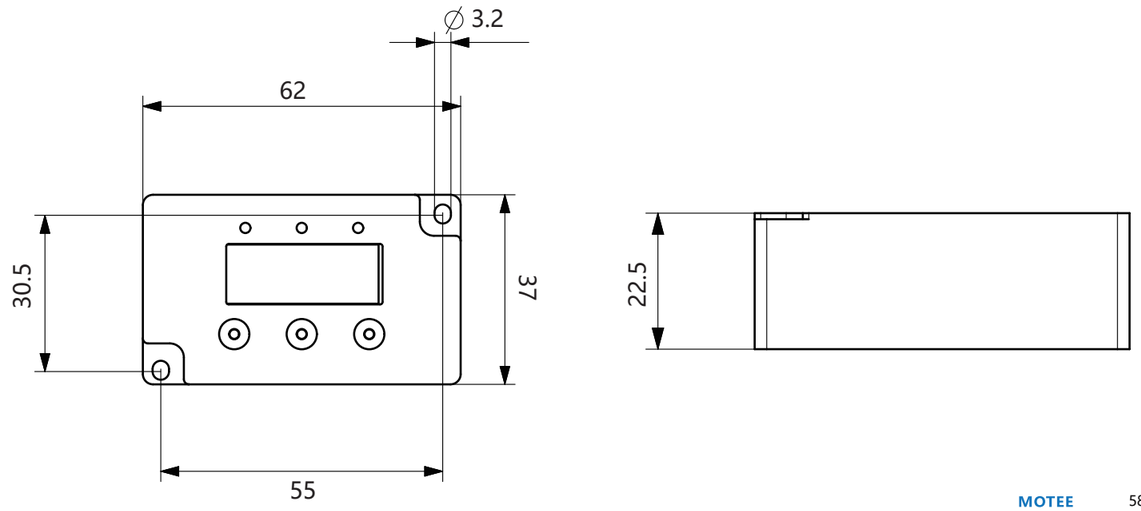
Wiring diagram

Cable number	Function	Outgoing wire core color
1	NPN/PNP	Black
2	Power supply positive	Brown
3	Power supply negative	Blue
4	485A	Yellow
5	485B	Green
6	External input	White

Product parameters

Category	Switching communication type	Switching communication type	Switching communication type	Switching communication type
Model	MD-LG05	MD-LG10	MD-LG20	MD-LG40
Detection range	30mm-5M	30mm-10M	30mm-20M	30mm-40M
Repeated accuracy	±1.5mm	±1.5mm	±2mm	±2.5mm
Output category	NPN output/PNP selectable			
Output method	Dual switching, RS485 Answer type digital quantity			
Communication method	RS485 (supports multi-site output)			
Light beam diameter	Approx. 5mm			
Power supply voltage	12V-24V DC±10% pulsation P-P10%			
Current consumption	100mA or below			
Light source	Red semiconductor laser class 2, Max. output: 1mW, light beam wavelength: 620-650mm			
Short circuit protection	Equipped (auto-recovery type)			
Response frequency	5-20HZ			
Protection structure	IP65(IEC)			
Service ambient temperature	-10°c-+40°c (caution: no condensation or freezing)			
Service ambient humidity	35%-85%RH (no condensation)			
Service ambient luminance	Incandescent light: lighted surface luminance 3,000lx or below			
Cable	Outer diameter 5mm 6-core composite cable 2m/cable length can be customized			
Material	Body housing: aluminum casting part			
Weight	Approx. 35g (without cable) Approx. 85g (with cable)			
Product Size	62*37*23mm			
Applicable specifications	Complies with MC command			

Dimension diagram (unit: mm)

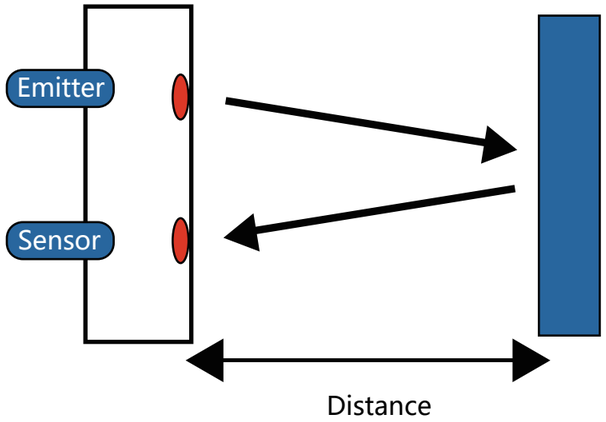


MD TOF LONG DISTANCE LASER SENSOR

Characteristics

TOF (Time-of-Flight), laser distance sensors work on the principle of time-of-flight based ranging technology by emitting laser pulses of a specific wavelength and measuring the time it takes for the pulses to be emitted and reflected back to the sensor, so that the distance can be calculated by measuring the time-of-flight of the pulses.

Currently there are two main algorithms for industrial use, one is pulsed ranging (dTOF) and the other is phase difference ranging (iTOF). Pulsed ranging (dTOF) directly measuring the time-of-flight difference between the emission and reception of light pulses to calculate the distance, relatively easy for circuit implementation, fast measurement frequency, accuracy of about 2-3mm

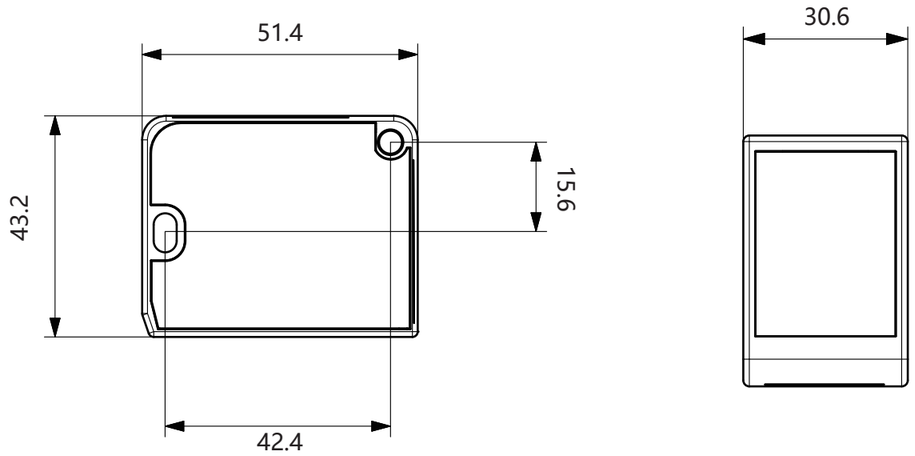


Distance L = Measured Distance = Time T/2 = Photon Travel Time/2 X Speed of light = Speed of light

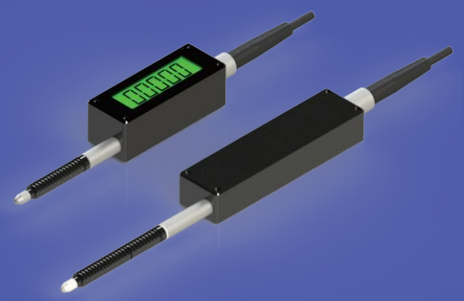
Product parameters

Category / Model	MD-LTB2000	MD-LTB5000
Detection range	30-2000	30-5000
Repeated accuracy	2mm	2mm
Output category	NPN output/PNP selectable	
Output method	Dual switching, RS485Answer type digital quantity	
Communication method	RS485 (supports multi-site output)	
Light beam diameter	Approx. 5mm	
Power supply voltage	12V-24V DC±10% pulsation P-P10%	
Current consumption	100mA or below	
Light source	Red semiconductor laser class 2, Max. output: 1mW, light beam wavelength: 620-650mm	
Short circuit protection	Equipped (auto-recovery type)	
Response frequency	20-1000HZ	
Protection structure	IP65(IEC)	
Service ambient temperature	-10°c-+40°c (caution: no condensation or freezing)	
Service ambient humidity	35%-85%RH (no condensation)	
Service ambient luminance	Incandescent light: lighted surface luminance 3,000lx or below	
Cable	Outer diameter 5mm 6-core composite cable 2m/cable length can be customized	
Material	Body housing: aluminum casting part	
Weight	Approx. 35g (without cable) Approx. 85g (with cable)	
Product Size	62*37*23mm	
Applicable specifications	Complies with MC command	

Dimension diagram (unit: mm)



MD
GRATING
DISPLACEMENT
SENSOR



Grating displacement sensor

Product

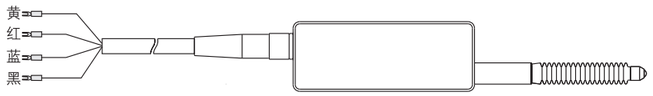
10 million times rebound test
RS485 communication output, accuracy up to 0.002mm
CMOS Grating measurement principle
High-speed readout via CMOS sensor resolves temperature and tracking errors

Product parameters

Product name	Model	Measurement range (mm)	Whole process accuracy	Resolution	Waterproof grade
Standard grating displacement sensor	MD-LV1050	0-12.7	≤10μm	5μm	IP65
	MD-LV1010		±2μm	1μm	
	MD-LV1005		≤2μm	0.5μm	
Digital display grating displacement sensor	MD-LV1050D		≤10μm	5μm	
	MD-LV1010D		±2μm	1μm	
	MD-LV1002D		≤1.4μm	0.2μm	

Detection system	Grating measurement system, image sensor
Operating voltage	DC5V
Operating current	<50mA
Data update speed	50ms
Lead wire length	2m

Wiring diagram

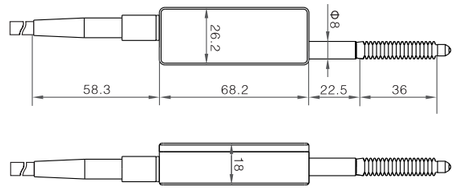


(0-12.7mm) Lead wire type

RS485 Lead wire type	
Pin number	Function
Blue	B
Black	A
Yellow	DC5V (power supply)
Red	GND (ground)

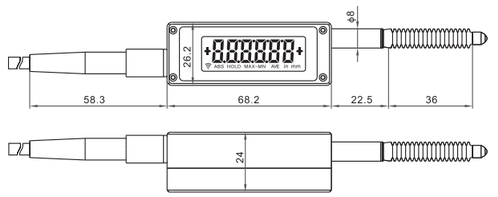
Dimension diagram

MD-LV1050/1010/1005/1002



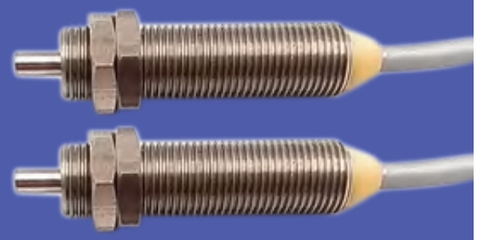
0–12.7mm

MD-LV1050D/1010D/1005D/1002D



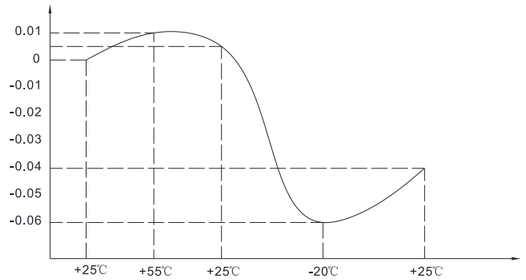
0–12.7mm

MD
CONTACT SENSOR



Product

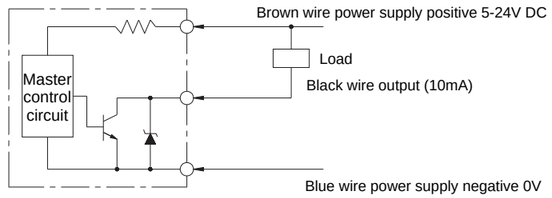
High and low temp. change test curve



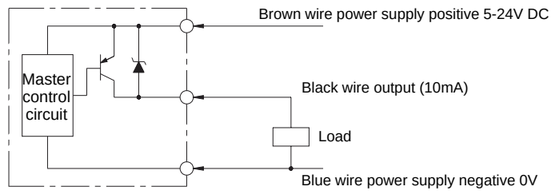
This product is only a general object detection sensor, please do not use for security detection

Wiring diagram

NPN output



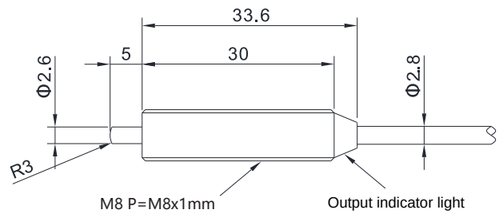
PNP output



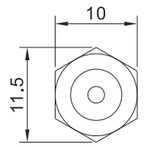
Product parameters

Model	MD-LV83BN	MD-LV83BP
Output	NPN.NO	PNP.NO
Operating voltage	5~24VDC	
Connection method	3-core cable diameter 2.8mm; cable length 3 meters	
Position repeated accuracy	±0.001mm	
Travel	3mm	
Operating force	0.6 N	
Moving PT before action	0.5~0.9 mm	
Hysteresis MD	0.1mm or below	
Action frequency	120 times/min	
Output current	10mA	
Current consumption	≤10mA	
Indicator light	Light on at output	
Pressure resistant strength	AC 1000V for 1 min	
Insulation strength	250V DC≥20MΩ	
Ambient temperature/humidity	20℃~+85℃ (non-freezing) 20%~95%RH (no condensation)	
Installation	M8 nut mounting torque 5N·m	
Protection level	IP67	

Wiring diagram



Unit:mm



Nut thickness 2.5mm