



INSTRUCTION MANUAL

Laser Displacement Sensor HD Series

240620

HD-INSTRUCTIONS-BA

Thank you very much for purchasing ViziFuze product, Read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference. Download the HD Series User's Manual from our Website. (<http://vizifuze.com>). Be sure to refer to the User's Manual for information before setting and using the sensor.

WARNING

- This product is intended to detect the objects and does not have the control function to ensure safety as accident prevention.
- Do not use the product as a sensing device to protect human body.
- Please use the products that comply with local laws and standards for human body protection specified by e.g., OSHA, ANSI and IEC.
- Install a fail-safe device when the products is used for the purpose that has a possibility of physical injury or serious extended damage.
- Do not use the product in the atmosphere of flammable gas, to prevent explosion.

Before use

- Before using the product, check the sensor head model and contents of packing.



- Sensor head model**
Check the model name of the product at the top of sensor head.
- Product P/N**
Please check the P/N at the side of sensor, contact the agency if the P/N is consistent with P/N outside of packing.

- Packing**
Check that all the following components are included in the package. (Chines/English)

- 1 sensor head unit
- 1 Instruction manual

1 OVERVIEW

- This product incorporates serial communications functions and can be easily controlled by host devices.
- The product has 3 measuring distances, Please select the suitable model according to specific requirements.

2 CAUTIONS ON HANDING LASER LIGHT

- In order to prevent the accidents by laser product and protect the users, IEC, JIS, GB, KS and FDA establish the following standards respectively.

IEC : IEC 60825-1-2014(EN60825-1-2014)
JIS : JIS C 6802-2014
GB : GB 7247-2012
KS : KS C IEC 60825-1-2013

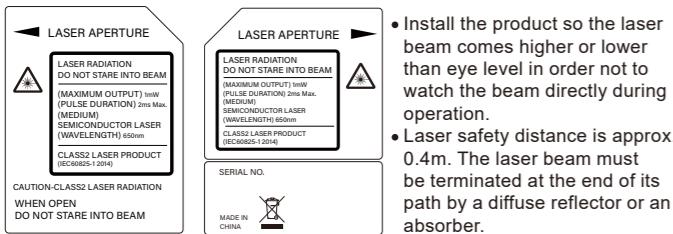
Laser hazardous class

Classification according to IEC 60825-1-2014(GB 7247.1-2012)

Class	Model	Description of hazardous evaluation
Class 2	HD all series	Visible beam, low power, Blink response of eye affords protection

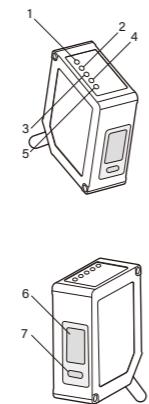
WARNING Label

<English>



- Please contact ViziFuze if the system breaks down.it is not equipped with a function that stops laser radiation automatically during disassembling the sensor head. The users therefore may be exposed to laser beam in disassembling the sensor head.
- Do not use the system in the manner other than specified in this Instruction Manual.

3 I/O BLOCK AND NOMENCLATURE



NO	Name	Functions	Wiring Color	
1	AOUT	Analog (voltage/current) output	Shield single conductor	Black/ Grey
2	AGND	Analog ground		
3	A	485 communication A line	Twisted-pair	Yellow
4	B	485 communication B line		Green
5	-	-	Twisted-pair	Violet
6	IN2	External input line		Orange
7	SG	Signal ground	Block	
8	24V	Supply +	Red	
9	GND	Supply -	Black	
10	IN1	Pulse width input	White	
11	OUT2	NPN/PNP output 2	Blue	
12	OUT1	NPN/PNP output 1	Brown	

1 Power Indicator

2 Laser Indicator

3 OUT 1 Indicator

4 OUT 2 Indicator

5 Alarm Indicator

6 Receiver

7 Emitter

4 SPECIFICATIONS

e.g. : HD-□□□-□□□

1 2 3 4 5

1 Measurement Range: 035:5mm 065:65±20mm 100:100±40mm

4 Spot Type: P:Point type L:Line type

2 Analog Output Signal Type: V:Voltage type I:Current type

5 Output Type: N:NPN P:PNP

3 Serial Communication Type: E:RS485

Model	HD-035	HD-065	HD-100
Reference distance	35mm	65mm	100mm
Measuring range	30 to 40mm	45 to 55mm	60 to 140mm
Light source	Visible light semiconductor laser (Wavelength 650nm, below 1mW, JIS2 level, IEC61 Class2, FDA Class2)		
Spot type ^①	Point Line	Point Line	Point Line
Spot size ^②	≤75μm 65x1600μm	≤150μm 120x1600μm	≤270μm 180x1600μm
Optical receiving device	CMOS image sensor		
Supply voltage	Current type: 12-24V DC±10%, ripple 0.5%; Voltage type: 18-24V DC±10%, ripple 0.5%		
Current consumption	When the power supply voltage is 24V, the current consumption is below 100mA		
Input(Switchable)	Pulse width input According to the input time, there are zero setting, ZERO OFF, reset, teaching, laser control, and memory switching In case of using NPN output: 0 depends on the time it is connected to 0V; In case of using PNP output: it depends on the time it is connected to the external power supply +pole is connected		
Judgment output(Switchable)	External input In case of using NPN output: Actions when external power supply +pole is connected In case of using PNP output: Actions <NPIN type> 2 channels, maximum current: 50mA, applied voltage 3-24VDC; Leakage current: below 0.1mA <NPIN type> 2 channels, maximum current: 50mA; Leakage current: below 0.1mA		
Analog output(Switchable)	4-20mA (Load impedance: below 300Ω), 0-10V (Output Impedance: 100Ω)		
Communication interface	RS485 modbus RTU, RS422		
Output operation	Open when the output is ON		
Short circuit protection	Incorporated (automatic restoration)		
Linearity ^③	±0.1%F.S.	±0.1%F.S.	±0.1%F.S.
Repeatability ^④	1μm	4μm	8μm
Sampling frequency	2000Hz, 1000Hz, 500Hz, 200Hz adjustable		
Action indicator light	Power Green LED; Lasers, OUT1, OUT2, warning yellow LED		
Temperature characteristics	0.05%F.S./°C		
Use ambient illuminance	Illumination of lighted surface Incandescent lamp 1000 Lux		
Ambient temperature range	Working hours: 0-50°C, when saving: -15% to 70°C		
Ambient humidity range	When working, when saving: 35 to 85%RH (No condensation)		
Voltage withstandability	AC 1000V 50/60Hz 1min		
Vibration (durable)	10-150Hz Dual amplitude 0.7mm 3-axis each direction 80min		
Impact (durable)	300m/s ² 3 times in each of 6 directions (up and down, left and right, front and back)		
Protection level	IP67		
Connection method	PVC cable 14PIN shielded cable, standard length 50mm, extension cables are available separately.		
Material	Body housing PBT, optical mount PPS, cable PVC		
Notes	① This value is the value at the detection center distance and is defined based on the center light intensity of 1/c2 (13.5%). Detection errors may be sent when there is light leakage outside the defined area and when the reflection ratio around the target object is higher than that of the target object. It may not be possible to accurately measure workpieces smaller than the spot size. ② 3 indicates the error relative to the ideal straight line of the displacement output when measuring our standard object. Linearity and measurement values vary depending on the object. F.S. indicates the entire measuring range. (HD-035: 10mm) ③ 4 The maximum range of fluctuation of the measured value when detecting the measured object in a completely stationary state. ④ 5 It is scheduled to be classified as diffuse-reflective type Class 2 according to IEC60825-1 in accordance with Laser Notice No. 50 of the FDA standard, and has been declared CDRH.		

5 CAUTIONS

CONNECTION

- Be sure to turn off the power supply before connecting or disconnecting any connectors.
- When connecting or disconnecting the connectors, be sure to hold the connector area not to apply extra force to cable.
- Be careful not to touch terminals or to let foreign objects get in the connector after disconnecting connectors.

- Be careful not to apply force to around the connector of sensor head cable and extension cable. Do not bend the cables near connectors, which causes disconnection of cable.

WIRING

- Do not roll up the sensor cable (bundle in parallel) with other wirings. Keep it at least 100mm away from other wires. Cables should be separated from high voltage and power circuit lines. If it is unavoidable, shield it by running through a conductive material such as grounded electrical conduit.
- Install the product as far away as possible from noise source such as high-voltage lines, high-voltage device, power lines, power device, machines which generate a large starting and stopping surge, welding machines and inverter motor.
- Do not pull the cable with a force of 30 N or greater. When bending the cable, bend it at least 20 mm away from the cable lead-out part

WARMING UP

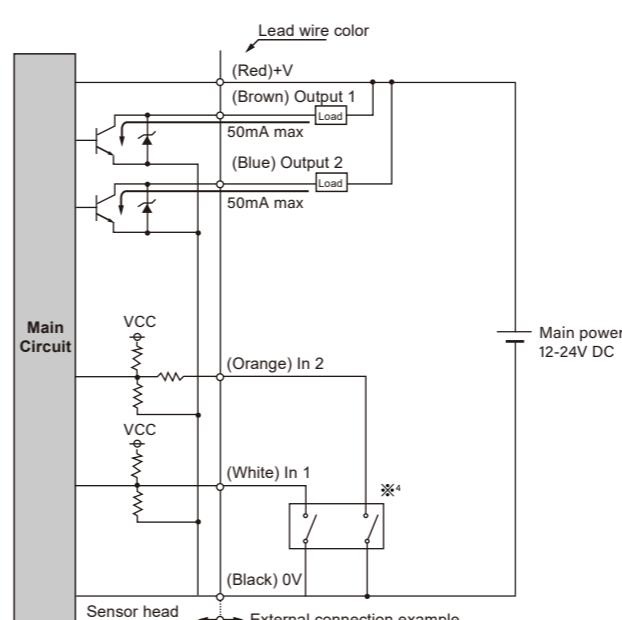
- Allow at least 30 minutes of warming up after turning on the power to ensure the performance of the product.

ENVIRONMENT

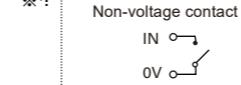
- Mount the sensor head to an aluminum or steel plate with a minimum surface area of 200cm² if the ambient temperature is 40°C or higher. In the case of installing two or more sensor heads in parallel, mount each sensor head to an aluminum or steel plate with a minimum surface area of 200cm² and make sure that the ambient temperature does not exceed 40°C.
- The life of the semiconductor laser depends on the ambient temperature during use. When using the product near a heat source, take measures to keep the ambient temperature of the sensor head as lower as possible. Mount the sensor on a device having good heat radiation because the sensor itself also generates heat.
- Keep the emitter surface and the receiver surface clean, not to attach light refractors such as water, oil and fingerprints, or light blockers such as dust and dirt. When cleaning these parts, wipe them off using a soft lint-free cloth or lens cleaning paper.
- Install the sensor head at where extraneous light (such as sunlight or light which has the same wavelength as laser beam) do not enter the receiver. If high accuracy is required, install a light shield plate or the like on the sensor head.
- The sensor head has protection against immersion, while the connectors are not structurally dustproof, waterproof, or corrosion-resistant. Do not use the product underwater or in the rain.
- Do not use the product in dusty places or that exposed to flammable or corrosive gases, droplet, direct sunlight, severe vibration or impact.

7 I/O circuit

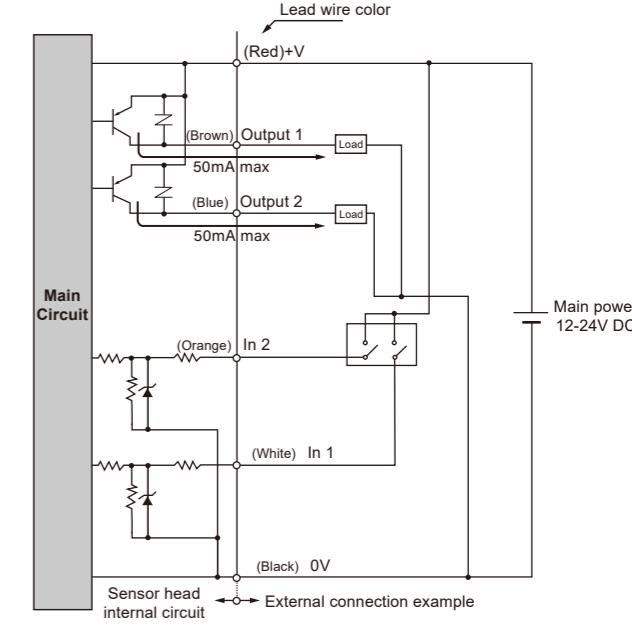
• HD-035/065/100-※1※2※3P(PNP)



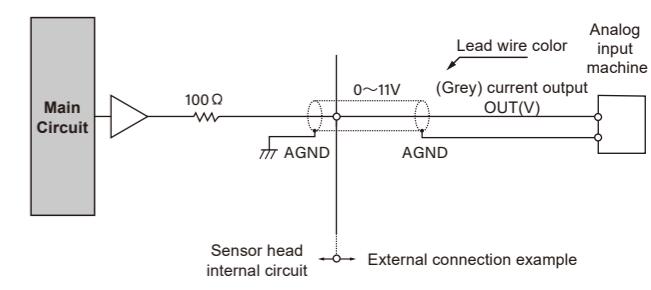
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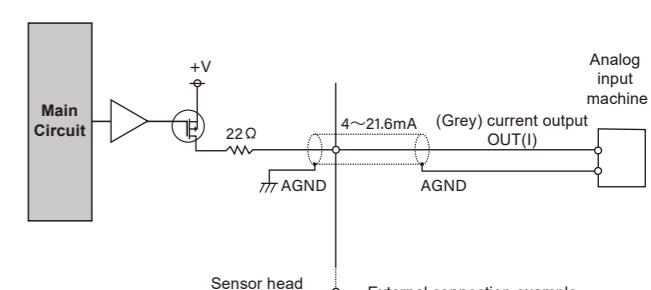
• HD-035/065/100-※1※2※3P(PNP)



• Voltage type



• Current type



Manufacturer: VIZIFUZE

ViziFuze
INDUSTRIAL LASER SENSOR

PRINTED IN CHINA

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