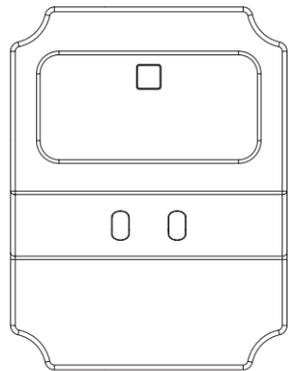


DHI-HY-BD1 Series Fire Alarm Infrared Beam Smoke Detector Installation and Use Manual (Ver1.00,2024.03)



ZHEJIANG HUAXIAO TECHNOLOGY CO.,LTD

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3 INSTALLATION

3.1 Unpacking

When opening the package, check if the product is damaged, and the specification and model are correct.

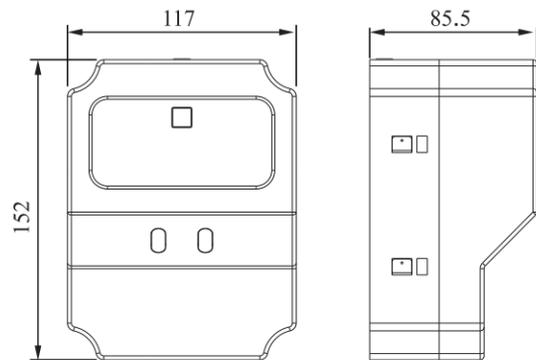


Figure 1

3.2 Installation

- 1) Before installation of beam detector, the circuit power should be cut off, and ensure that the base is installed well.
- 2) When wiring, please refer to the external wiring identification, schematic diagram of external terminals for Beam Detector, as shown in Figure 2.

Power/Bus		Fire alarm		Fault	
B1	B2	A1	A2	F1	F2

Figure 2

B1 and B2: DC24V or bus input (non-polar)
A1 and A2: Fire alarm output (passive contact DC24V/200mA)
F1 and F2: Fault output (passive contact DC24V/200mA)

3) Installation:

- a) Use a screwdriver to open the back terminal cover of beam detector, thread the wire through the threading hole from the upper (or lower) end of the terminal cover, connect the beam detector according to the wiring label.
- b) Fix the beam detector bracket onto the wall using M4 screws, according to the installation diagram in Figure 3, install the beam Detector onto the mounting bracket and secure it with M4 countersunk screws. If it can be ensured that the Beam Detector can be firmly fixed on the installation surface, installation can also be done without using the Beam Detector base.
- c) Turn on the beam detector laser for the reflector installation and auxiliary positioning, the installation position of the reflector should be opposite to the beam detector, and located on the same horizontal plane, the installation dimensions of a single reflector are shown in Figure 4(Unit: mm). When the installation distance between beam detector and reflector is 10m~40m, just need install one reflector for beam detector; when the installation distance is 40m~100m, four reflectors need to be installed, the installation diagram of the reflector is shown in Figure 5. The installation of a single reflector requires

1 INTRODUCTION

1.1 Description

Fire alarm infrared beam smoke detector (hereinafter referred to as beam detector) is a reflective linear infrared beam smoke detector. The beam detector determines whether to output an alarm signal based on the attenuation of smoke on the optical path, suitable for large spaces such as historic buildings, factories, warehouses, airports, and stations.

Beam detector emits an infrared beam, reflected back to beam detector by the reflector, the internal photosensitive components of beam detector convert optical signals into electrical signals, the singlechip samples and analyzes the processed electrical signal. When smoke particles enter the beam detector body and the reflector's optical path to reduce amount of return light, when return light is reduced to a specific threshold, beam detector will outputs alarm signal.

1.2 Features

- 1) Easy wiring: Non polarized two-wire power supply, supports DC24V or fire protection dual bus.
- 2) Easy debugging: Automatic or manual encoder triggered calibration. Laser assisted positioning installation, built in stepper motor automatically calibrates detector angle, no manual operation of mechanical structures is required.
- 3) Rich interfaces: Configurable fire alarm output and fault output.
- 4) Strong anti-interference ability: Neural network smoke recognition algorithm, immunity to interference from natural light such as sunlight.

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two plastic expansion pins to be fixed. When installing four reflectors, they should be placed tightly, there should be no gaps between reflectors.

d) Note that beam detector is unfit for the following environments:

- Places with a height of less than 1.5m, places with a height greater than 40m, uncapped premises.
- Places with a large amount of dust, dry powder, or water vapor present.
- Beam Detector is installed in places where walls or fixed objects are greatly disturbed by surrounding mechanical vibrations.
- Places with fixed or moving objects within 1m of the beam detector optical path.
- The location where the beam detector's transmitting or receiving window and reflector are directly exposed to sunlight.

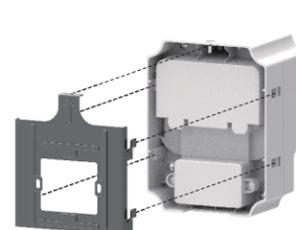


Figure 3

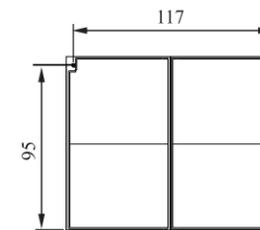


Figure 4

- 5) Ultra low power consumption: Ultra low monitoring current and alarm current.
- 6) Adjustable sensitivity: Three levels sensitivity, suitable for different sensitivity locations.
- 7) Easy maintainance: Adopt a multi-level drift compensation algorithm for dust accumulation.

2 SPECIFICATION

Supply Voltage	DC 16~28V
Supply Current	Alarm status: 0.9 mA Monitoring status: 0.5 mA
Operating Temperature Range	-10℃ to 55℃ (14℉ to 131℉)
Operating Humidity	≤95% RH Non-condensing
Ingress Protection Rating	IP65
Calibration mode	Automatic by sensor or Encoder
Optical path length	10 to 100 m
Maximum Angular Misalignment	± 0.5° in optical path direction
Alarm Sensitivity Levels	Level 1 (default), level 2, and level 3
Dimensions (mm)	117H×152W×85.5D
Shell color code	PANTONE 7527 U

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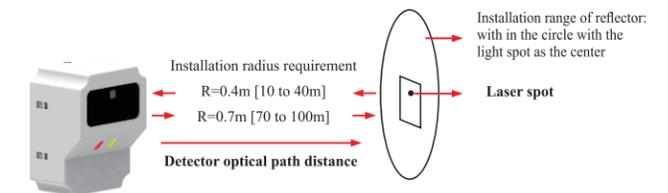


Figure 5

4 DEBUGGING

- 1) All products have been installed, after confirming that the installation and wiring are correct, only then can we continue debugging.
- 2) Before debugging, the protective film on the surface of the reflector needs to be applied, carefully remove the protective film covering the beam detector, be careful not to damage the surface of the reflector and beam detector.
- 3) Debugging process:

Automatic debugging

- a) After the beam detector is powered on, if no bus inspection command is received within 4 seconds, automatically determine as non coding mode. In this mode, beam detector will perform calibration determination, determine whether the calibration has been successful before, if so, enter normal working mode; if not, proceed with the automatic calibration process.

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b)After entering the automatic calibration process, beam detector, automatically turn on the laser. At this point, the angle of the corresponding reflector and beam detector can be fixed and installed according to the position of the laser irradiation, ensure that they are on the same optical path. During this process, beam detector will not immediately enter calibration, to prevent calibration fluctuations caused by incomplete installation of Beam Detector and reflector. This process lasts for 40 seconds.

c)Beam detector starts automatic optical path calibration after 40 seconds□the yellow fault light flashes once every 2 seconds, to indicate that calibration is in progress. This process does not require any human operation, the duration varies depending on the length of the light path and the installation angle of the beam detector and reflector, generally, it takes from more than 30 seconds to 5 minutes.

d)After successful automatic calibration, the yellow fault light is no longer flashing, beam detector enters normal monitoring mode; if the adjustment fails, the yellow fault light is constantly on, after adjusting the position of the detector or reflector again, debugging again.

Manual debugging

a)Set the sensitivity level and detection distance of beam detector through encoder or controller, the detection distance should be set based on the horizontal installation distance between the beam detector and the reflector.

b)After the beam detector is powered on, online device registration of beam detector through controller, check if the number of installed beam detectors matches the number of detectors registered with the controller.

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7 TROUBLESHOOTING

1)Communication fault: Check if the wiring is normal, is the controller in a normal state.

2)Functional testing failed: Have the protective film on the reflector surface, the protective film on the Beam Detector cover, and the protective film on the test board been removed before testing; whether there are stains on the surface of the reflector and Beam Detector that affect the operation of the detector.

3)False alarm of fire alarm: After confirming whether there is any interference source on site, whether the beam detector light path angle has changed, and checking whether the detector surface and reflector surface are clean, and debug again.

4)Debugging failed: Confirm if the detection distance parameter settings are correct; ensure that the reflector is installed in a position opposite to the beam detector and at the same horizontal plane; ensure that there are no obstructions on the emission and reflection paths of the beam detector.

5)Report a fault: Check for loose installation of beam detector and reflector; check if the surface of beam detector and reflector are clean, and debug again.

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c)Issue debugging commands to beam detector through the controller, during the adjustment period, the yellow fault light flashes every 2 seconds. After successful debugging, the red alarm light flashes slowly (with a cycle of about 6 seconds), beam detector enters normal monitoring mode; if the adjustment fails, the yellow fault light is constantly on, after adjusting the position of the beam detector or reflector again, debugging again.

5 TESTING

1)When beam detector is in normal inspection state, use the fire alarm testing area of the test board to block the beam detector's transmission or reception window (as shown in **Figure 6**), beam detector should sound an alarm within 30 seconds. The red alarm light remains on after the beam detector alarm, simultaneously issue alarm messages. Remove the sunshade, reset beam detector on the controller, the beam detector indicator light should enter the normal inspection state.

2)When beam detector is in normal inspection state, use the fault testing area of the test board to block the beam detector's transmission or reception window (as shown in **Figure 6**), the beam detector should send out a fault message within 30 seconds and the yellow fault light should remain on. Remove the sunshade, reset beam detector on the controller, the beam detector indicator light should enter the normal inspection state.

3)After the test is completed, beam detector should be in normal inspection state, and notify the relevant management department to restore the system to normal.

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8 MAINTENANCE

1)Beam detector should be installed before debugging, proper storage should be carried out before installation, corresponding dust, moisture, and corrosion prevention measures should be taken.

2)If testing or maintenance is required after the installation of beam detector is completed, relevant departments should be notified first, to avoid unnecessary alarm linkage.

3)Beam detector should conduct regular simulated fire alarm tests, test if beam detector is working properly.

4)Regular cleaning of beam detector and reflector is required for dusty environments.

9 OTHER

9.1 Quality assurance

- 1)The products produced by our company come with a free 2-year warranty.
- 2)If the product failure is caused by human damage, improper use, or self modification or disassembly, not covered by warranty, we will not be held responsible for any consequences resulting from this.

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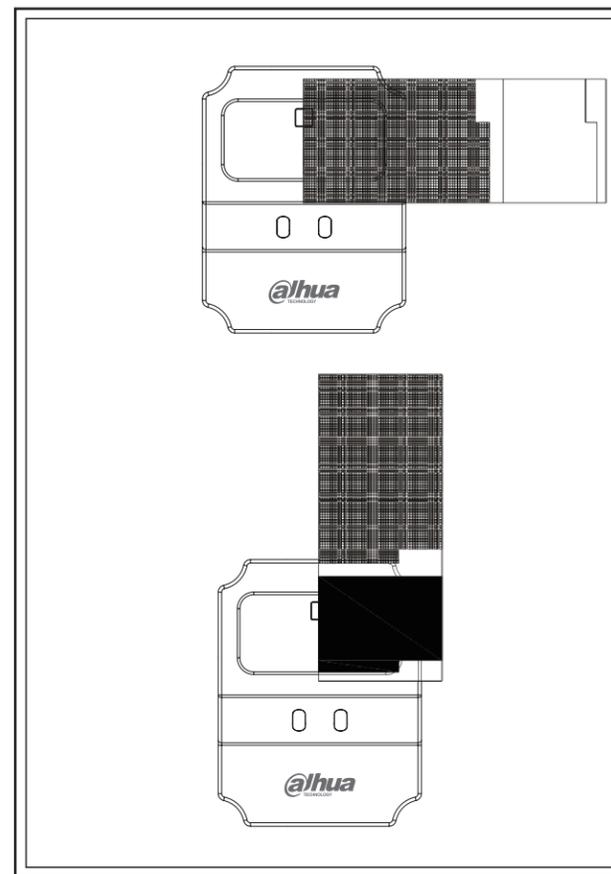


Figure 6

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6 OPERATION

6.1 Parameter Settings

Connect the beam detector to the electronic encoder, you can write or read the product information of beam detector. The beam detector product information includes the following content:

Product Information	Write In	Read Out
Equipment LA	√	√
Sensitivity level	√	√
Laser Active stop	√	—

For detailed operation of the electronic encoder, please refer to its manual.

6.2 Mode Description

- 1) Inspection mode: The red warning light flashes (with a cycle of about 6 seconds).
- 2) Debugging mode: The yellow indicator light flashes (with a cycle of about 2 seconds).
- 3) Alarm mode: The red alarm light is always on.
- 4) Fault mode: The yellow fault light is constantly on.

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9.2 Precautions

- 1) Beam Detector must be tested after installation or after each regular maintenance.
- 2) Laser can cause damage to the human eye, it is strictly prohibited to look directly at the laser light source.

9.3 Transportation and Storage

- 1)Generally, thick cardboard boxes are used for packaging during transportation, separate the cardboard box with partitions, for long-distance travel or export, wooden boxes should be packed in addition to cardboard boxes, can be transported by common modes of transportation, and take measures to prevent moisture and rain, the packaging box cannot be inverted.
- 2)Should be stored in a ventilated and dry warehouse, no corrosive gases such as acid and alkali, avoid strong vibration impact and strong electromagnetic field effects.

9.4 Environmental Impact

The shell of this product is made of plastic injection molding, pollution-free.

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