POINT TYPE INFRARED FLAME DETECTOR

SEXTANT-IR3+ Ex

Descriptive Notice

No.01-DETFLAM-NT005 V1.0

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1. Overview

The SEXTANT-IR3+ Ex point-type infrared flame detector (hereinafter referred to as flame detector), using a specially designed four-channel infrared sensor, and then through the built-in high-speed microprocessor and advanced signal processing algorithm, can effectively distinguish the true flame radiation from the interference sources, while increasing the alarm speed, greatly reducing the impact of environmental factors on the flame detector. The flame detector can be set with multiple levels of sensitivity to meet the needs of different occasions. Excellent flameproof and protective design ensures it apply to various harsh industrial environments.

2. Main Features

The product is designed according to the requirements of the relevant industrial standards and complies with the requirements of IEC/EN IEC 60079-0, IEC/EN 60079-1 and IEC/EN 60079-31 standards. Its performance is stable and reliable.

The core circuit adopts SMT technology, which has high reliability and good consistency.

Three-color indicator can display normal working status, alarm and fault status.

Multi-level sensitivity is adjustable.

Intelligent algorithm can not only realize fast alarm but also reduce false alarm rate.

Fault mode can accurately locate the fault information.

Automatic defrost function, better resistance to window condensation and frost in low temperature.

Supports self-checking of the light path, which automatically carries out the same test conducted by the maintenance personnel with test lamps, ensuring reliable detection of the fire.

Various output ports meet different application scenarios.

Enclosure adopts High-strength die-cast aluminium and sapphire glass of high quality. Explosionproof and the ingress protection rating reaches IP67 according to IEC 60529, with anti-dust, anti-moisture and the corrosion resistance characteristics.

Explosion-proof performance complies with standards:

- EN IEC 60079-0:2018 / IEC 60079-0 Ed. 7.0: Explosive atmospheres: Part 0: Equipment – General requirements
- EN 60079-1:2014 / IEC 60079-1 Ed. 7.0: Explosive atmospheres – Part 1: Equipment protection by flameproof enclosures "d", and
- EN 60079-31:2014 / IEC 60079-31 Ed. 2: Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t".

The explosion-proof marking is Ex db IIC T6 Gb / Ex tb IIIC T80 °C Db, and the product is suitable for use in Zone 1, Zone 2, Zone 21 and Zone 22 that containing explosive mixtures of flammable gases in group IIC, or dust atmospheres in group IIIC.

The flame detector has excellent anti-interference ability, and is not affected by wind and rain, high temperature, high humidity, natural artificial light source, lightning, etc., and can work well in Point type infrared flame detector in various harsh industrial sites for indoor or outdoor use.

3. Operation principle

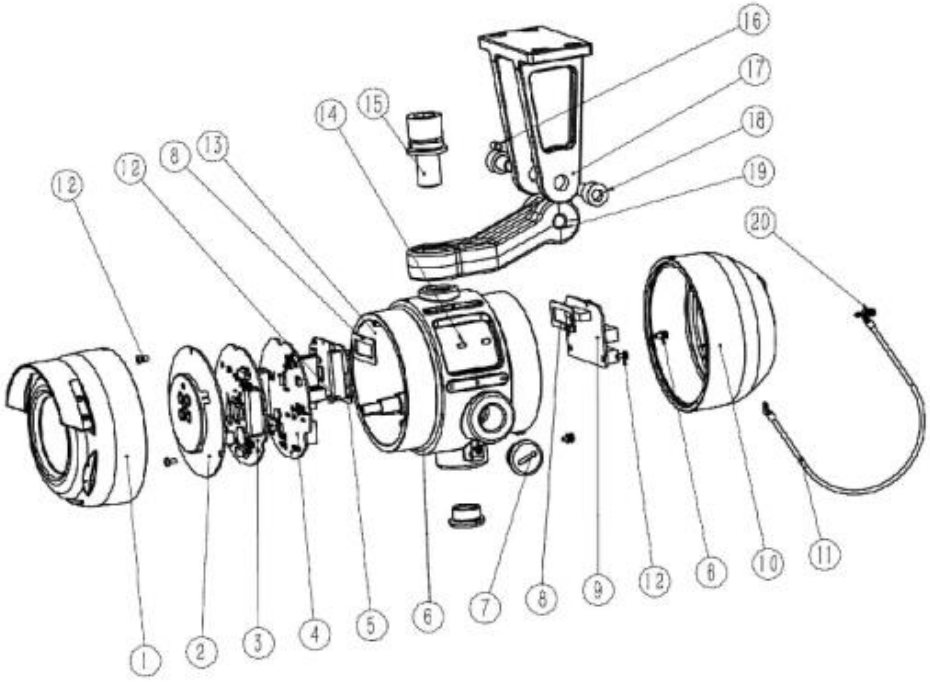
The point-type infrared flame detector is a four-waveband photosensitive fire detector.The

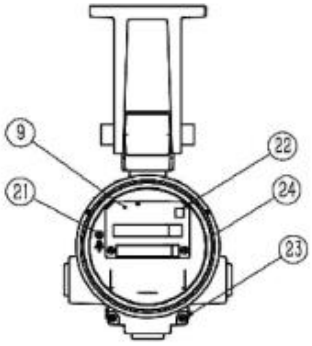
infrared light emitted by the combustibles is receivedthrough thefour-channel infrared sensor (generally combustibles emitting infrared light arehydrocarbons), and then the detector according to the different technical features of the four wavebands andusingalarm algorithms reportsaccurate fire alarm.

4. Applied Situations.

The flame detector is mainly suitable for oil depots, alcohol depots, aircraft hangars, area with chemical equipment, liquefied gas stations and other flammable and explosive industrial fields, and places where there would be no or little smouldering stage, directly producing open flames. Notes: This type of product is not suitable for detecting fire in hydrogen or metal combustion occasions.

5. Exploded views





No.	Name	Model	Quantity	Remarks
1	Components of front shell		1	Product shell
2	Drive circuit board	JBF4384SB-THT	1	Circuit board
3	Main control board	JBF4385MB-SMD	1	Circuit board
4	Power boards	JBF4385PT-THT	1	Circuit board
5	Terminal board II	JBF4385TB2-THT	1	Circuit board
6	Red silicon O-ring		2	Used for sealing between the middle shell and the front shell, and between the middle shell and the rear shell
7	Waterproof plug （black）	PG13.5-M20X1.5	3	The product is used for temporary plugging, and does not meet the corresponding explosion-proof requirements. It must be replaced with M20X1.5 explosion-proof entry devices. The explosion-proof entry devices are not included, and users need to purchase them by themselves.
8	Insulation backing		2	Used for insulation between circuit board and housing
9	Terminal board I	JBF4385TB1-THT	1	Circuit board
10	Components of rear shell		1	Product shell
11	Connecting rope		1	Prevent the rear shell from falling off when unscrewing
12	Screws M3×6 A2-70	ISO 7092 – 2000 3 A2-70 ISO 7045 – 2011 M3X6 A2-70 NF E 25-515 3 A2-70	10	A combination of M3X6 screws and a 3 diameter flat washer and a 3 diameter spring washer to fix the PCB and ground wire to the middle housing
13	Components of Medium shell		1	Product shell
14	Screws M2×4 A2-70	ISO 7045 – 2011 M2X4	4	Acting as a fastener on the thread to avoid thread relative movement during use
15	Screws for fixing the mounting rack M16	ISO 4762 – 2004 M16X35 A2-70 NFE 25-515 16 A2-70 ISO 7092 – 2000 16 A2-70	1	Work with Hexagon socket set screws with flat point M16X35 304, Plain Washers—Small Series—Product Grade A 16 and Spring Lock Washers 16 304 to fix the mounting bracket with the product (top of No.13).

No.	Name	Model	Quantity	Remarks
16	Hexagon socket set screws with flat point M6×8	ISO 4026 – 2003 M6×8 A2-70	1	Lock Mounting member A and Mounting member B avoid thread relative movement during use
17	Mounting member B		1	Cooperate with Mounting member A to realize the lifting and wall installation of the product
18	Hexagon socket head screw M10×16 304	ISO 4762 - 2004	2	Connect mounting part A and mounting part B
19	Mounting member A		1	Cooperate with Mounting member B to realize the lifting and wall installation of the product
20	With knurled tight anti-ejection screws	M3×10 Stainless steel 304	1	Used to secure Connecting rope to the Components of rear shell
21	Internal grounding position and screws	M3	1	It is used for grounding cables inside the product. The screw is M3. See No. 12 for details
22	Button		1	For sensitivity settings
23	External grounding position and screws	M3	1	It is used for the external grounding of the product, equipped with M3 screws, see No. 12 for details

6. Technical parameters

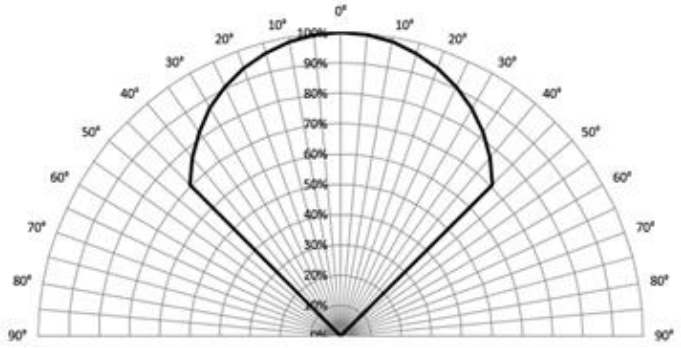
6.1 Technical parameters

Content	Technical Parameters
Electrical characteristics	
Rated voltage	DC24V
Working voltage range	DC18.5～30V
Monitor current	17mA～27mA (DC24V)
Alarm current	28mA～40mA (DC24V)
Heating current	130mA～220mA (DC24V)
Power-on start time	30sec. (System self-check)
Relay contact capacity	2A @ 30VDC
Surface resistance	≤1GΩ (23 °C， 50% RH)
Mechanical properties	
Appearance	RAL3001 signal red
Material	Die-casting aluminum
Threaded entries	3 × M20 × 1.5mm
Ingress protection ratings	IP67 (according to IEC 60529) IP6X (according to IEC 60079-0 and IEC 60529)
Dimensions	L 133 mm × W 130 mm × H 182 mm (without mounting bracket)
Weight	2.5kg (including mounting bracket)
Mechanical impact resistance	7 J on the metal casing 4 J on the glass

Environmental characteristics	
Ambient temperature	-40 °C～+75 °C
Relative humidity	≤ 95% (no condensation)
Storage temperature	-40 °C～+75 °C
Explosion-proof characteristics	
Explosion-proof marking	Ex db IIC T6 Gb Ex tb IIIC T80 °C Db
ATEX Directive	2014/34/EU
Hazardous areas	Zone 1, Zone 2, Zone 21, Zone 22
Applied standards	
Applied EN standards	EN IEC 60079-0:2018 ; EN 60079-1:2014 ; EN 60079-31:2014
Applied IEC standards	IEC 60079-0:2017 Ed. 7.0 ; IEC 60079-1:2014 Ed. 7.0 ; IEC 60079-31:2013 Ed. 2

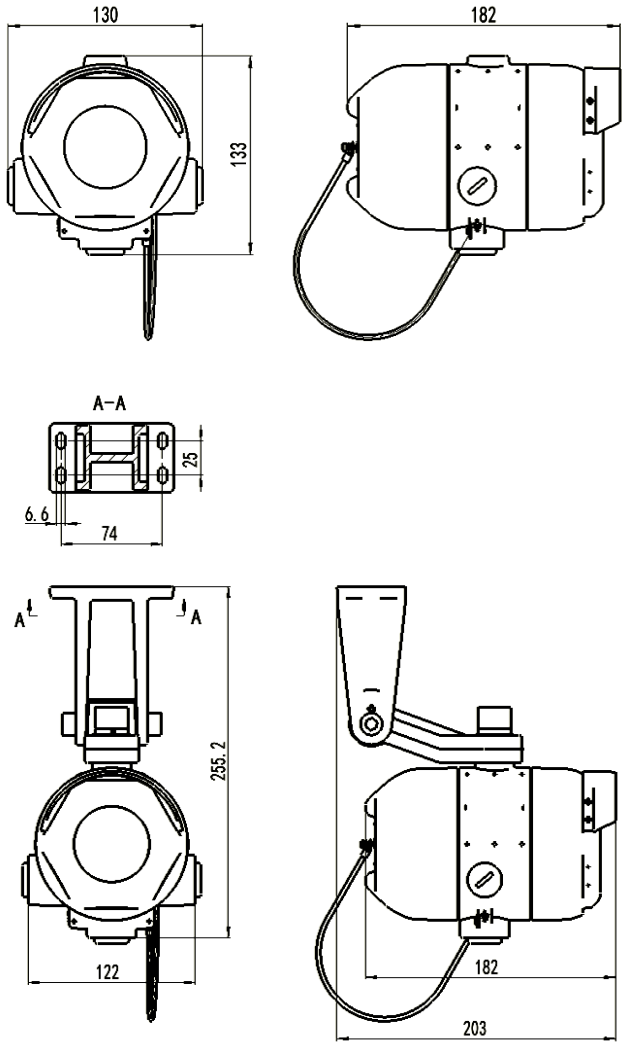
6.2 Detection characteristics

Field of view ≤ 90 °; Sensitivity level: Ⅰ (under standard test conditions, detection distance ≥ 25m)



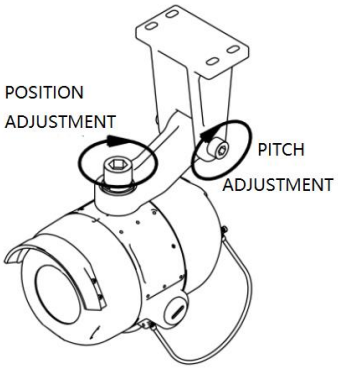
Schematic diagram of detection area

7. Product size

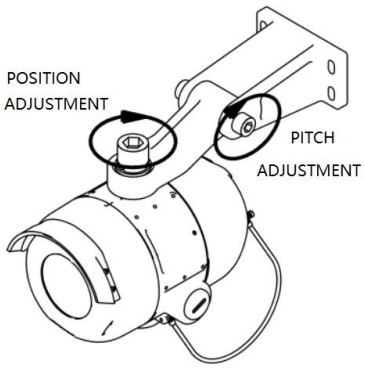


Product size

8. Type of mounting

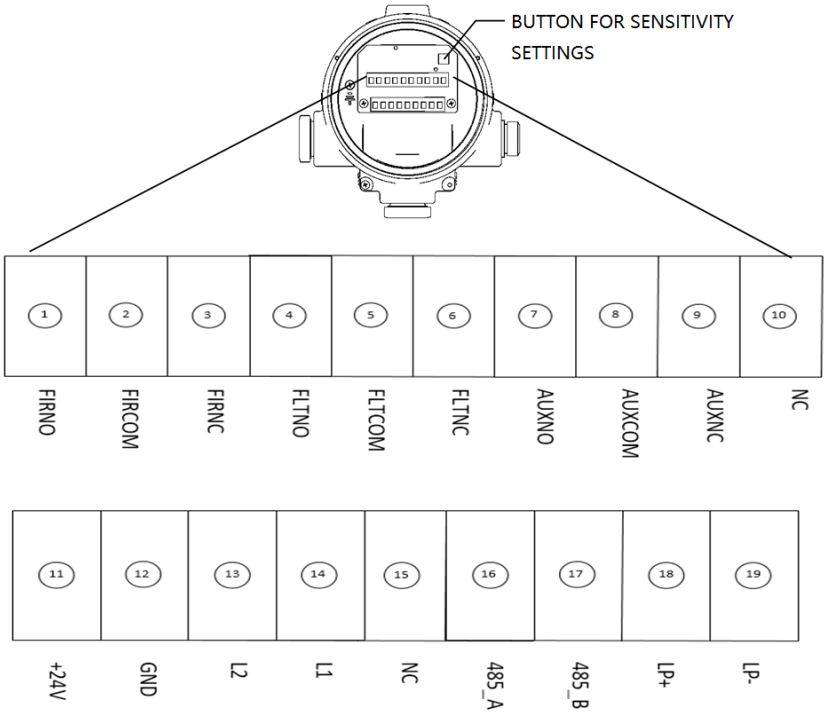


Ceiling-mounted installation



Wall-mounted installation

9. Terminal wiring diagram



Serial number	Name	Description
1	FIRNO	Normally open relay; the contact is closed when the flame detector reports fire alarm
2	FIRCOM	Common terminal of fire alarm relay
3	FIRNC	Normally closed relay; the contact is open when the flame detector reports fire alarm
4	FLTNO	Normally open relay; the contact is closed when powered on. The contact is open when the detector has fault. If the detector reports fire alarm at this time, the contact remains open.
5	FLTCOM	Common terminal of fault relay
6	FLTNC	Normally closed relay; the contact is open when powered on. The contact is closed when the detector has fault. If the detector reports fire at this time, the contact remains closed
7	AUXNO	Auxiliary relay, normally open, contact closed when flame detector reports fire. [1]
8	AUXCOM	Common terminal of auxiliary relay [1]
9	AUXNC	Normally closed auxiliary relay; the contact is disconnected when the flame detector reports fire. [1]
1 0	NC	Empty pin
1 1	+24V	DC 24V power input, polarity-free
1 2	GND	DC 2 4V power input, polarity-free
1 3	L2	Not used
14	L1	Not used
15	NC	Empty pin
16	485_A	RS 485 bus A, RS485 +, used to configure flame detector
17	485_ B	RS485 bus B, RS485- , used to configure flame detector

Serial number	Name	Description
18	LP +	4-20m A current loop +
19	LP-	4-20mA current loop-

Note 1 : The auxiliary relay is connected according to the actual needs of customers, and it can provide voltage-free normally open / normally closed contacts with the capacity of 2A@30VDC . External devices or loads should not exceed the contact capacity of the auxiliary relay.

10. WARNING MARKINGS

WARNING – DO NOT OPEN WHEN ENERGIZED

WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.

11. Specifications of materials of non-metallic parts of enclosure

Part	Material	Reference	Manufacturer	COT	Colour	Other characteristics
O-ring	Nitrile rubber (NBR)	Nancar® 4155	Ningbo Zhuangda Plastic Industry Co., Ltd	-55 °C to +150 °C	Red	
Cement of glass window	RTV room temperature curing silicone rubber	Nanda 705 silicone	Liyang Kangda New Material Co .,Ltd.	-55 °C to +200 °C	Transparent	Surface curing time: 3～30min

References of polyester powder coatings on the external metallic surfaces:

- For Front Shell, Middle Medium Shell and Rear Shell: Red powder coating “Interpon 600 ESD”.
- For mounting bracket (mounting members A and B): Black powder coating “Interpon 600 CD”.

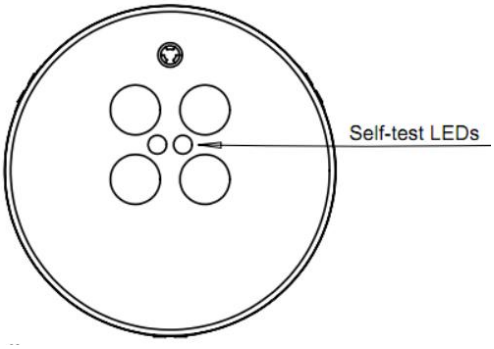
12. Grease on flameproof joints surface.

-In accordance with clause 5.1 of IEC/EN 60079-1, corrosion inhibiting grease, such as petrolatum or soap-thickened mineral oils, may be applied to joint surfaces before assembly. The grease, if applied, shall be of a type that does not harden because of ageing, does not contain an evaporating solvent, and does not cause corrosion of the joint surfaces. Verification of suitability shall be in accordance with the grease manufacturer's specifications.

13. Options

13.1 Defrosting function: This function is configurable with configuration software. When activated, it is activated between -5°C and +5°C.

14. Infrared sensor self-test



Self-test LEDs

The LEDs in the figure are used for self-test of the product infrared sensor, the two LEDs are redundant design, normally only one of them will be lit, when the self-test fails, it will be switched to another LED light. The light source technology is divergent.

Self-test is divided into manual self-test and automatic self-test in two ways:

Manual self-test: Under normal operation, press and hold the button for sensitivity setting more than 10 seconds and less than 20 seconds, the product will enter the self-test program and one of the self-test LEDs will light up, and the self-test will be stopped automatically after it passes, and the self-test process will take about 5 seconds. If the self-test fails and the detector's self-test fault is set to Allow Reporting (set via the Configuration Tool), a fault will be generated after approximately 20 seconds.

Automatic self-test: Under normal operation, the product will automatically enter the self-test program every 24 hours with one of the self-test LEDs illuminated, and will automatically stop when the self-test passes, which will take approximately 5 seconds. If the self-test fails and the detector's self-test fault is set to Allow Reporting (set via the Configuration Tool), a fault will be generated after approximately 20 seconds.