

TONSYNR®

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Laser gas monitoring system

System Introduction

The laser gas monitoring system integrates gas detection, video surveillance, and high-precision PTZ, enabling all-weather, all-round, fully automatic, and long-distance non-contact methane leakage monitoring. The product is suitable for high-risk industrial scenarios such as onshore oil extraction, long-distance pipelines, gathering and transmission stations, LNG receiving stations, gas filling stations, and petroleum refining. With a maximum detection distance of up to 150 meters, it significantly reduces the risk of large-scale safety production accidents.

Leveraging the proactive defense mechanism of "early detection and early response", this system has become a crucial line of defense in preventing industrial production safety accidents.

Applicable Environment

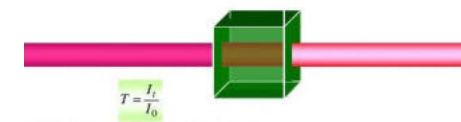
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Technical principles

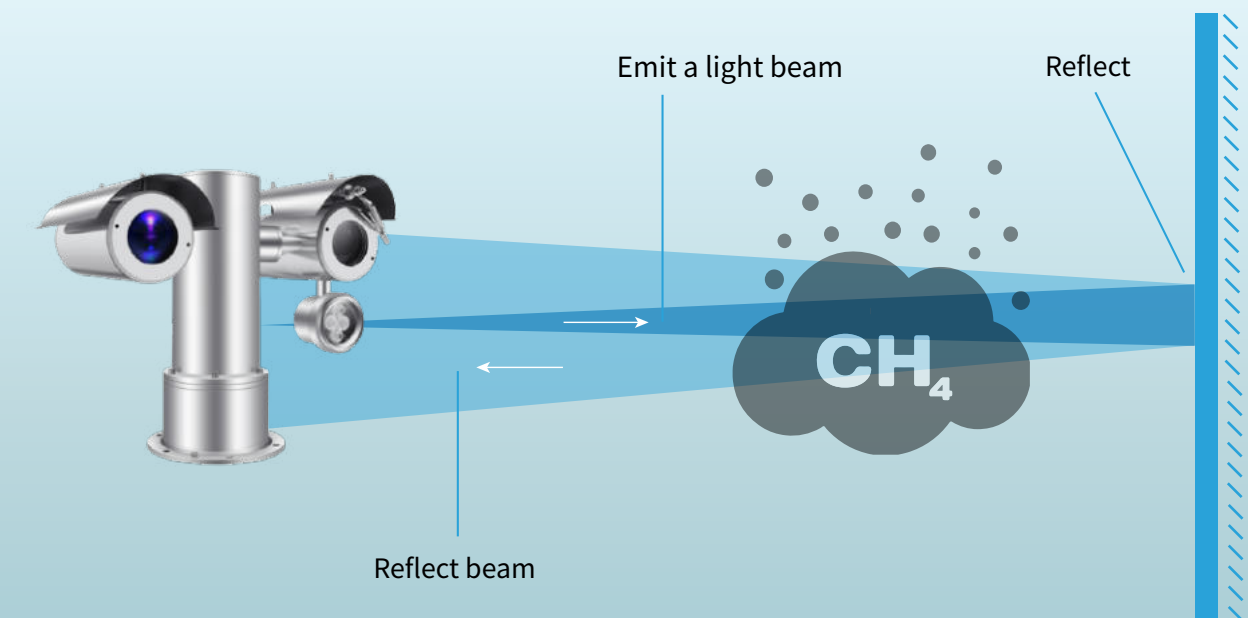
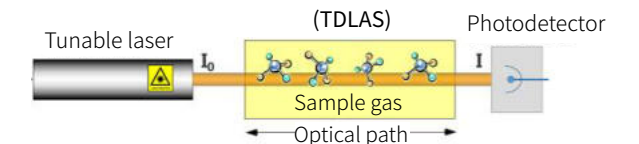
Lambert-Beer law

The absorption rate of light when passing through a gas is directly proportional to the gas concentration and the optical path length.



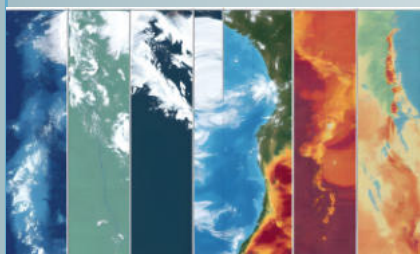
TDLAS

By adjusting the current and temperature of the laser, the absorption spectral lines of the target gas molecules are scanned. The laser spectrum after passing through the gas is analyzed to calculate the gas concentration. This technology has the characteristics of high selectivity and high resolution, and is not affected by other gases. It is suitable for the concentration measurement of various gases.



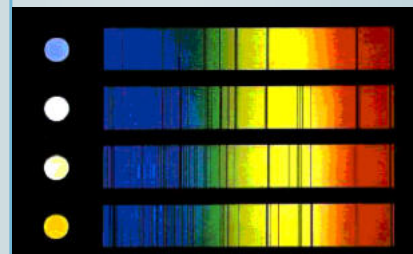
Safe and reliable, sturdy and durable

The housing of the camera is made of 316L stainless steel and formed by welding, which is structurally robust. The sealing strip of the end cover is made of high-quality NBR, featuring excellent waterproof performance, long service life and resistance to aging.



Multispectral monitoring, intuitive results

The laser methane sensor and the camera work simultaneously, providing real-time on-site images and methane concentration data. The camera uses a starlight-level high-definition core, which can still offer high-quality color images under low illumination. This enables users to observe the location of methane leakage in the fastest and most intuitive way.



Wide range, various occasions

High-precision PTZ, with a product protection level reaching IP66/IP68, enables all-round, all-time, allweather, long-distance, and largearea monitoring, meeting the usage requirements of various scenarios.



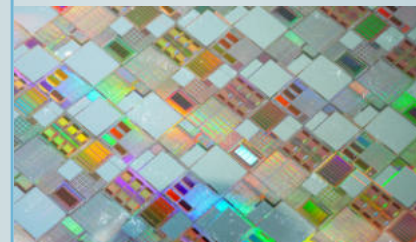
Stable performance, quick response.

It has high selectivity and sensitivity towards methane gas, and is minimally affected by other gases, water vapor, and dust. It has a wide temperature range, high sensitivity, and high response speed. In case of methane leakage, it immediately transmits the alarm signal. Truly achieving real-time supervision of production safety and environmental safety.



High-precision area coverage

High-precision electrically controlled PTZ, with an accurate angle calculation module in conjunction with a long-life closed-loop servo motor, enables continuous cruise scanning of prone to leakage areas.



High independence

The explosion-proof gas monitoring camera, explosion-proof control box and explosion-proof junction box at the front end can operate independently to scan the area, monitor the methane concentration and issue an alarm through the sound and light alarm device even when disconnected from the back end software.



System Features



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Application scenarios

Explosion-proof gas monitoring camera

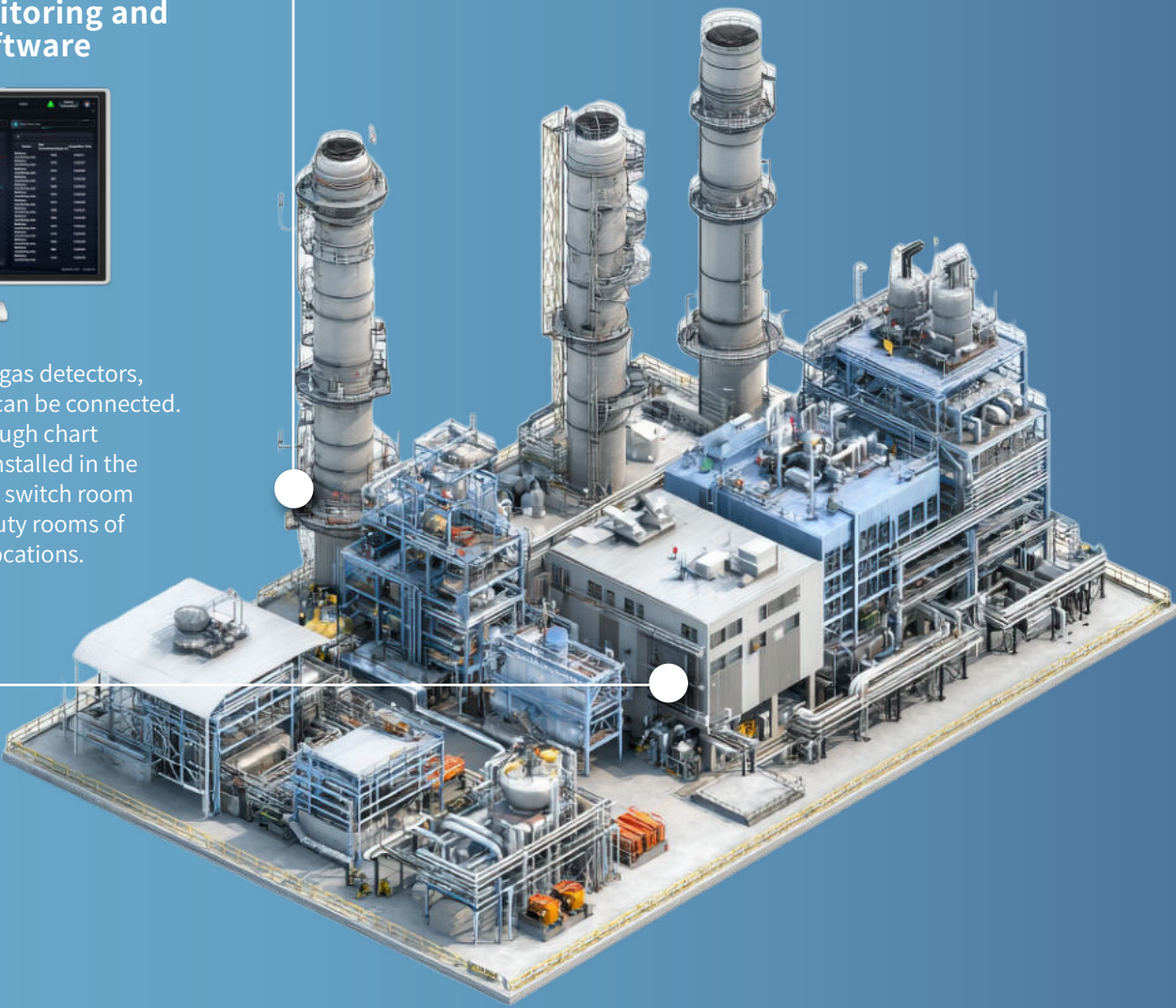


It supports real-time, wide-range online monitoring of gas leaks with a 360° and $\pm 90^\circ$ coverage, eliminating blind spots. It is commonly used in offshore platforms, chemical plants, etc. It can be installed point-to-point according to the on-site situation and supports a detection range of 0-80m.

NIOTEX Gas monitoring and management software



Receive signals identified by gas detectors, with up to 16 detectors that can be connected. Display all relevant data through chart visualization. It is generally installed in the central control room or main switch room of oil extraction platforms, duty rooms of chemical plants, and other locations.



Software System Introduction

Corporate Logo

It can be customized according to specific needs.

Language switch

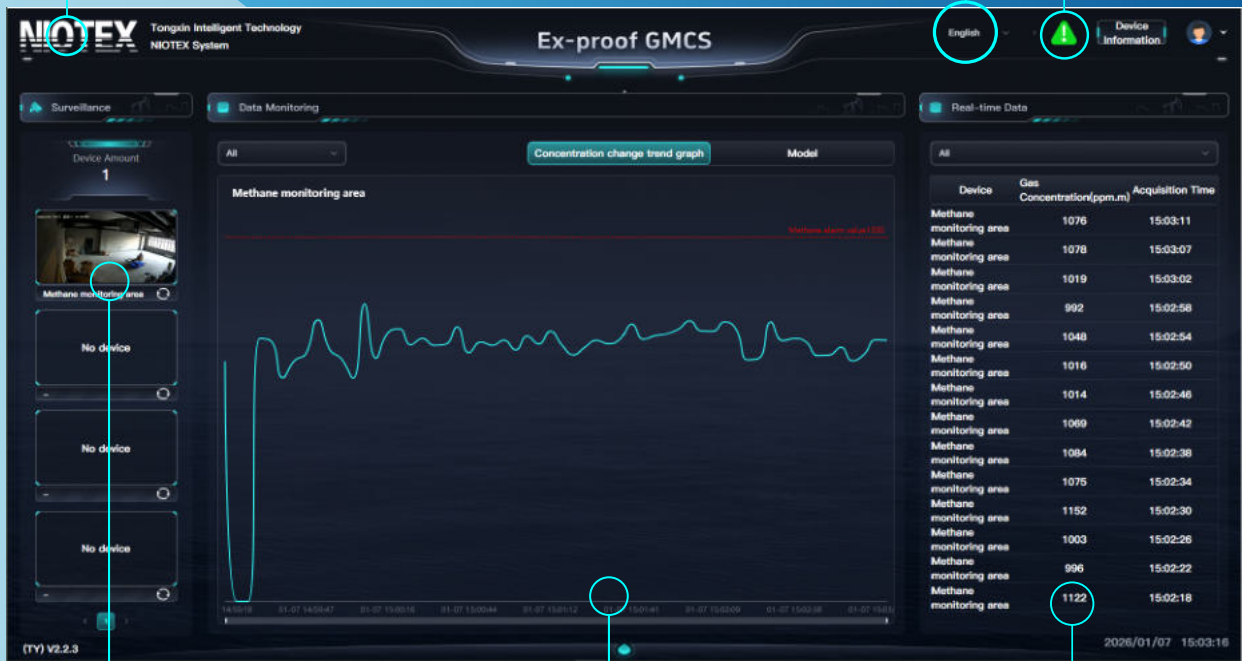
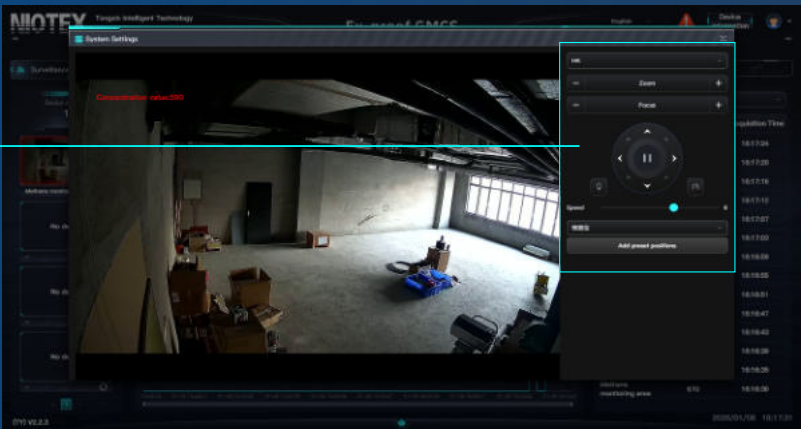
It can switch between 4 different language modes.

Alarm Flashing

When a methane gas leak is detected, this icon will turn red to provide an alarm notification.

PTZ control

The preset position angle can be adjusted through the system monitoring interface, supporting a rotation range of $\pm 90^\circ$ vertically and 360° horizontally.



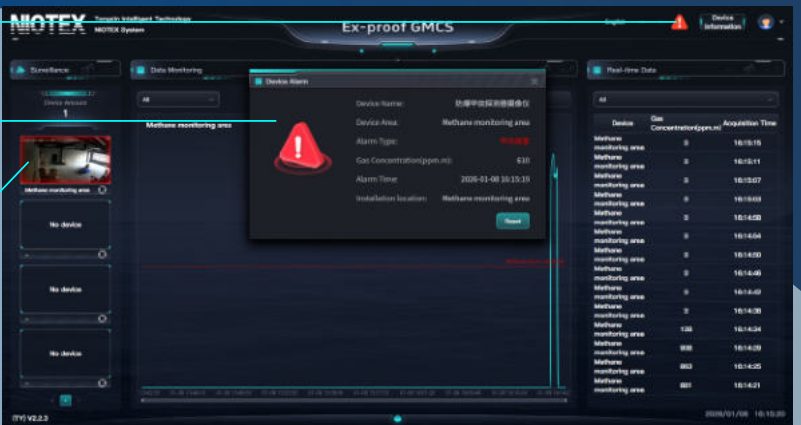
Alarm module

When the gas monitor detects methane, the system will simultaneously display three alarm prompts: an alarm pop-up prompt + audio prompt, an alarm indicator changing from green to red, and a red prompt in the alarm area monitoring window. Clicking the reset button can eliminate the alarm.

Alarm icon prompt

Alarm pop-up prompt + audible alarm

The monitoring window of the alarm area turns red



Real-time video surveillance

Browse the video footage in real-time under the monitoring of the explosion-proof gas surveillance camera.

Real-time data curve

The dynamic change trend of methane gas concentration data can be viewed in real-time.

Real-time data list

Display the concentration value data of methane gas detected by the device in real time, with an adjustable data acquisition cycle.

The Tongxin NIOTEX gas monitoring and control system has main functions such as video browsing, PTZ control, alarm query, and equipment management, and is capable of comprehensively controlling the methane monitoring situation at the front end site.

The software supports 4 language switches (Chinese, British, Russian, Arabic).

Alarm List

After triggering an alarm, users can view the alarm record information of the relevant equipment, including basic equipment information, alarm time, gas concentration, alarm snapshot images, and alarm videos.



Explosion-proof gas monitoring camera

The leakage of methane gas is monitored in real time at a distance by adopting a non-contact method. It has high sensitivity and fast response speed, and can react before the diffusion of methane gas gets out of control. The PTZ supports 360° horizontal rotation and -90° to +90° vertical rotation, providing all-weather, all-time and all-round online monitoring of methane leakage. It can meet the monitoring requirements in different application scenarios.



Product selection list

Product model	Order code	Product description
NT211-LS	D100	316L, IP66/IP68, methane detection distance≤100m, 4-megapixel camera, support infrared lighting, single wiper
NT211-LS	D150	316L, IP66/IP68, methane detection distance≤150m, 4-megapixel camera, support infrared lighting, single wiper

*Do not use in direct sunlight.



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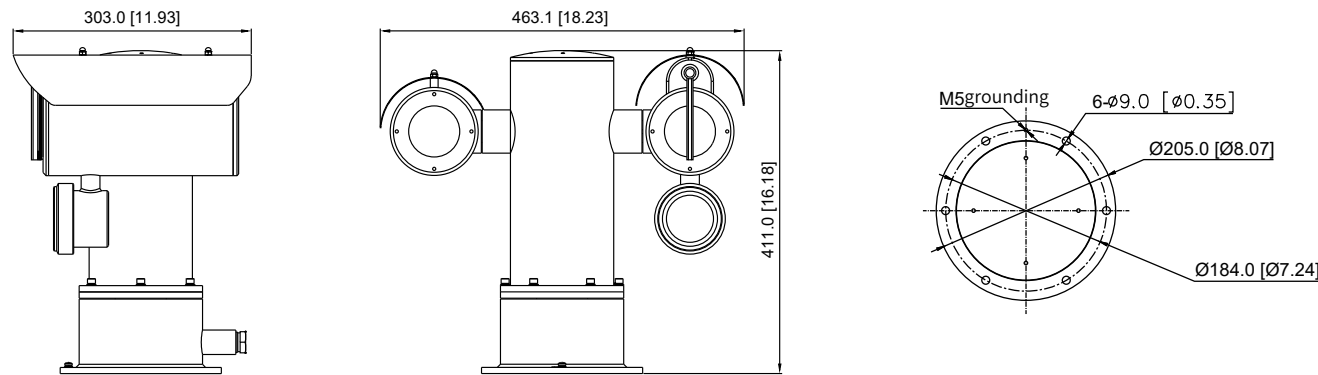
Technical specification

GB Ex Mark:	Ex db II C T6 Gb
IECEX Ex Mark:	Ex db IIC T6 Gb, Ex tb IIIC T80°C Db
ATEX Ex Mark:	Ex II 2G Ex db IIC T6 Gb, II 2D Ex tb IIIC T80°C Db
Ambient Temperature:	-40°C~+60°C
IP Rating:	IP66/IP68 (Water depth: 2 meters, duration: 2 hours)
Rated Voltage:	AC220V
Weight:	30kg
Product Materia:	316L
Internal space dimensions:	Length, width and height:463×303×411mm
Measurement Range:	50-100000ppm.m
Detection Distance:	≤100m/≤150m (Optional)
Detect laser wavelength:	1653~1654nm
Response Time:	0.1s
Sensitivity:	5ppm.m
Basic Error:	±10%
Detect laser power:	<10mW
Detecting laser safety:	Category 1
Imaging Device:	1/1.8" CMOS
Focal Length:	5.4mm-135mm
Minimum Illumination:	Color:0.001Lux@F1.6; Black and white:0.0001Lux@F1.60Lux(Infrared light on)
Effective Pixel:	4 million

Product Parameters

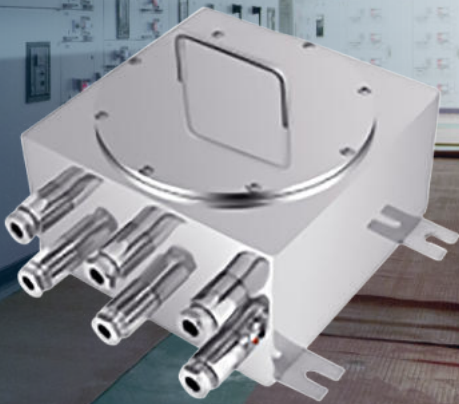
Horizontal and vertical range:	Horizontal360°, vertical-90°~ +90°
Vertical Velocity:	0.1°- 40°/s
Horizontal Velocity:	0.1°- 40°/s
Number of preset positions:	255
Automatic Cruise:	Support
Alarm Output:	Optional explosion-proof sound and light alarm
Alarm Linkage:	Support alarm upload to the background management software
Network Interface:	RJ45 network port, supporting 10M/100M network data

Product dimension diagram



Explosion-proof control box

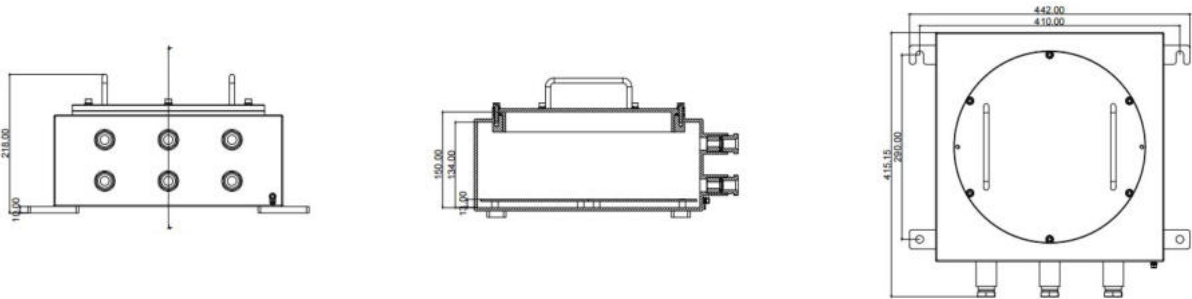
The product holds dual certifications for gas and dust explosion protection, making it suitable for use in Zone 1 and Zone 2 explosive gas environments, as well as Zone 21 and Zone 22 flammable dust environments. The enclosure design includes an independent grounding device. Cables are connected to the interior of the enclosure via explosion-proof connectors. It can be equipped with electrical devices such as air switches, fiber optic transceivers, fiber optic terminal boxes, and switching power supplies. An external explosion-proof audible and visual alarm can also be connected. When fiber optic transmission and on-site alarming are required, it can be used in conjunction with an explosion-proof gas monitoring camera.



Product specification

GB Ex Mark:	Ex db II C T6 Gb/Ex tb IIIC T80°C Db
IECEX Ex Mark:	Ex db IIC T6 Gb; Ex tb IIIC T80°C Db
ATEX Ex Mark:	Ⓔ II 2 GD Ex db IIC T6 Gb Ex tb IIIC T80°C Db
Ambient Temperature:	-40°C~+60°C
IP Rating:	IP68 (Water depth: 2 meters, duration: 2 hours)
Accessory Material:	Stainless steel 316L
Internal space dimensions:	350×350×150mm
Cable Entry:	Up to 6*M20 or M25 outlet can be selected, all are down exits
Installation Method:	Wall, fixed bracket, column, platform
Function:	Support lightning protection and surge protection functions

Product dimension diagram



Explosion-proof junction box

Suitable for use in explosion-proof areas Zone 1, Zone 2, Zone 21, and Zone 22. make, do, create, compose, write, etc. For application expansion, users can choose between bar-type wiring terminals or mounting plates with guide rails. The equipment is installed inside the junction box by connecting individual components in a coordinated manner. The maximum cross-sectional area of the cable can reach 6mm (for cylindrical cables) or 10mm² (for guide rail cables). cable. It is connected to the inside of the junction box through a conduit or an explosion-proof connector, and the box body is designed externally with Independent grounding device.

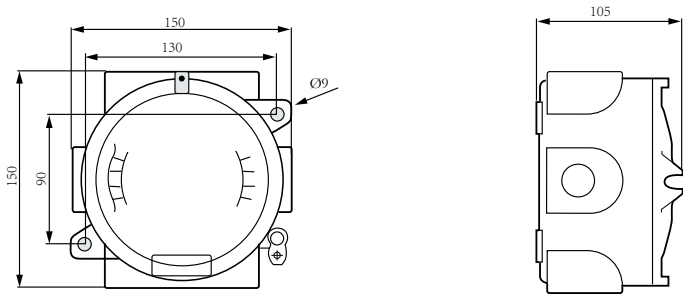


Product specification

GB Ex Mark:	Ex d IIC T6, DIP A21 TA, T6 IP67
IECEX Ex Mark:	Ex d IIC T6, Ex tD A21 IP67 T85°C
ATEX Ex Mark:	Ⓔ II 2 GD Exd IIC T6 Ex tD A21 T85°C
Ambient Temperature:	-22°C~+55°C
IP Rating:	IP67
Rated Voltage:	Max. 750V
Shell Material:	Stainless steel 316L
Wiring Method:	4×M25
Terminal Block:	Weidmuller 2.5mm ² ×6, with a guide rail size of 110mm

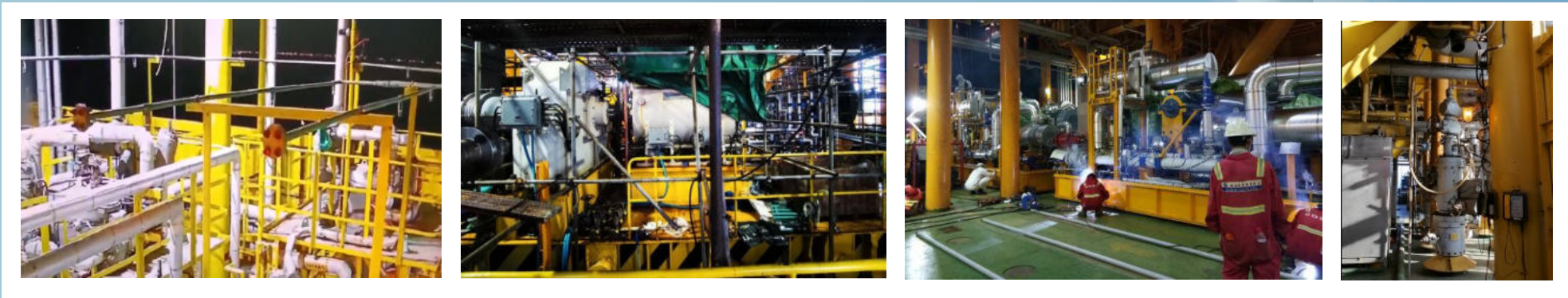
*The standard product is designed to operate at a minimum ambient temperature of -20°C. We can also provide certified products that are suitable for use in environments with a minimum ambient temperature of up to -50°C. However, special requirements must be confirmed with our sales team during the inquiry and ordering process.

Product dimension diagram

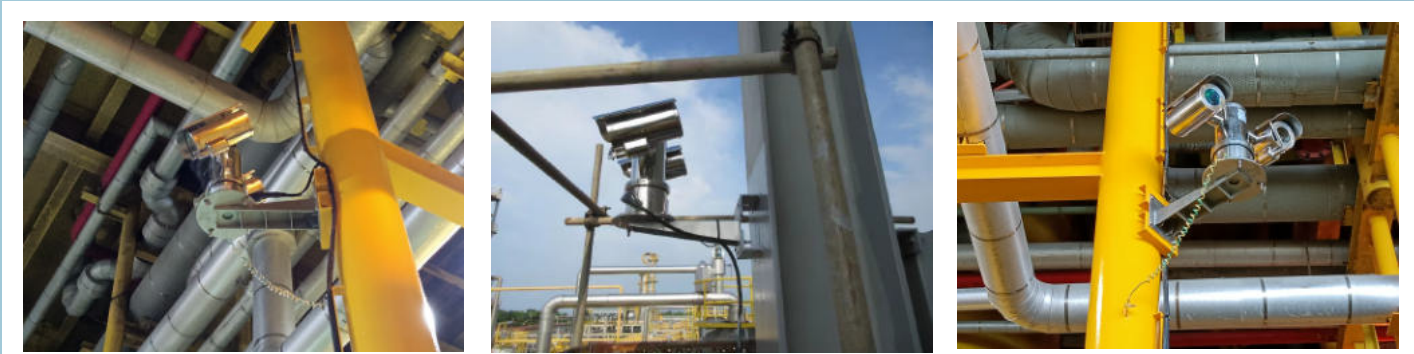


Project Case

Methane leakage monitoring on offshore platforms



Methane leakage monitoring at onshore natural gas stations



Note: Our company reserves the final interpretation right of this document and will strive to provide standard and comprehensive information, but we will not be responsible for any errors or omissions in the information. Product updates may occur without further notice. Product images are for reference only and are subject to actual products.



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