PSWExDG300-NS Explosion-proof infrared thermal imaging temperature detection and analysis system
Technical Specifications

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HIRDA-Ex Explosion-proof infrared thermal imaging temperature detection and analysis system technical specifications

1 Overview

In the production process of industries with explosion-proof requirements such as coal mines, coal yards, petroleum, chemicals, medicine, and light textiles, real-time temperature monitoring of electromechanical equipment, materials, and containers is required to ensure production safety on the one hand, and to finely control the production process through accurate temperature collection on the other hand .

Infrared thermal imaging thermometer is a device that detects the infrared radiation of the target and converts the target temperature distribution into a visible image and accurate temperature value by means of signal processing, photoelectric conversion, etc. The infrared thermal imaging thermometer accurately quantifies the actual detected heat and images the entire target in real time in the form of a surface, so it can accurately identify the suspected fault area that is heating up. The operator uses the image color displayed on the screen and the hot spot tracking display function to preliminarily judge the heating situation and fault location, and conducts strict analysis, thereby demonstrating high efficiency and high accuracy in confirming the problem.

The infrared thermal imaging thermometer uses advanced non-contact infrared detection technology to quickly, accurately, conveniently and intuitively display the distribution of the surface temperature field of the measured object and measure the surface temperature of the object. It can quickly test the surface temperature reading of the object without direct contact with the surface of the measured object, and can reliably measure the surface temperature of hot, dangerous or difficult-to-reach objects. The infrared thermal imager has a very fast measurement speed and can intuitively and continuously test the temperature changes on the surface of the object.

2 System Introduction

2.1 System Description

PSWExDG300-NS explosion-proof infrared thermal imaging temperature detection

and analysis system is an infrared thermal imaging product specially designed for use in gas and dust explosive environments. The system is mainly composed of infrared thermal imaging movement, infrared lens, explosion- proof protective cover, explosion-proof control box, explosion-proof image algorithm server and client software.

The system adopts full-range radiation temperature measurement technology, which can obtain multi-point temperature values at the same time; the temperature measurement range can reach up to 2000 ℃; self-developed temperature measurement algorithm, high temperature measurement accuracy; through gas explosion-proof and dust explosion-proof dual certification, the explosion-proof level can reach Ex db IIC T6 Gb / Ex tb IIIC T80 ℃ D b , applicable in the presence of explosive gas Area, 2 Areas and dust explosions A21 , A2 The protection level reaches IP68 , and it can work stably and safely in harsh working environment for a long time .

The system software can realize target infrared thermal image display, thermal data collection, storage and analysis, high and low temperature alarm

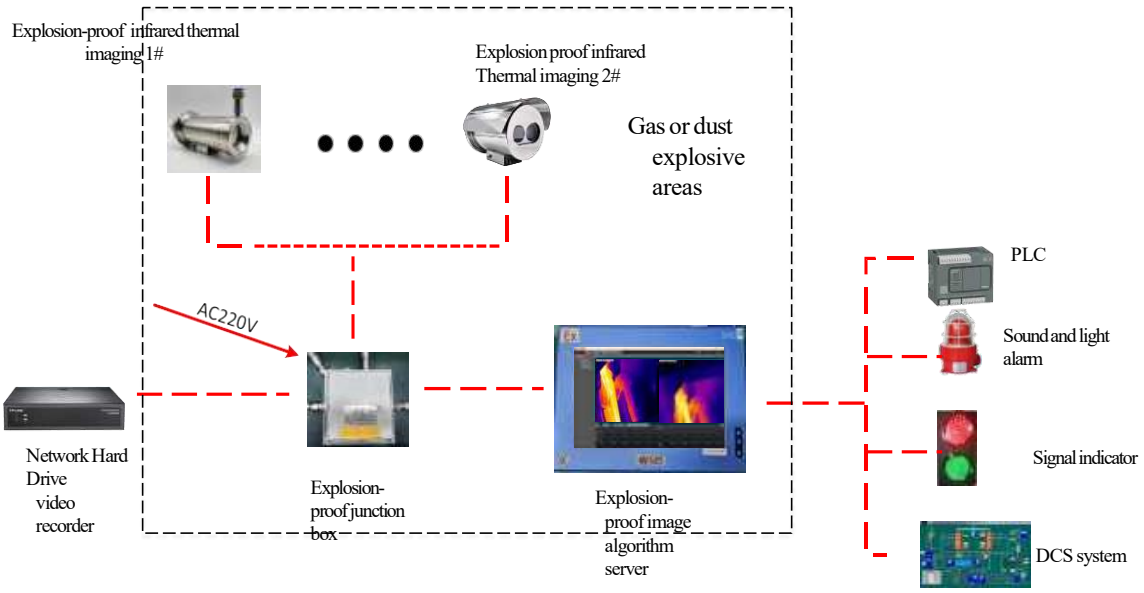
And positioning, temperature tracking and other functions.

This product has been widely used in temperature monitoring in many flammable and explosive industries such as coal mines, coal yards, petroleum, and chemicals .

The product application diagram is shown in Figure 1 shown.

Picture1 HIRDA-Ex System product application

The system composition is shown in Figure 2 shown.



Picture2 HIRDA-Ex System composition block diagram

2.2 System Features

- Passed professional explosion-proof test certification, suitable for gas explosion-proof and dust explosion-proof environments;

- High protection level, the highest protection level can reach IP68;
- The window is automatically purged, eliminating the need for manual regular window cleaning;
- Full-screen real-time temperature measurement with wide coverage;
- Independent of the system platform, you can log in directly to the web page to access images and configurations, and can directly output alarm signals to PLC or alarms;
- Supports onvif protocol and can be connected to mainstream NVR;
- Temperature data can be connected to LED screen and PLC;
- Electric/automatic focus, focus operation can be performed through software at any time;
- The temperature measurement range can be customized, with a maximum support of -20℃ to2000℃;
- Temperature measurement accuracy is better than ±2℃ or ±2%;
- Supports modbus protocol and can be connected to DCS system to transmit temperature data.

2.3 System Utility Engineering Requirements

2.3.1 power supply

Field probe power supply 220VAC 50/60HZ

Power50W/ set Control

room power supply: 220VAC 50/60HZ

power 300W

2.3.2 Cooling gas

Gas type: dry compressed air or

nitrogen compressed air temperature:

≤ 35 ℃

Compressed air pressure:

0.1~0.4 Mpa Compressed air

flow: 0.1-0.2m ^{3} /Min Note:

Purge explosion-proof shield

requires

3 Application Scenario

Gas and dust explosive environments such as coal mines, coal yards, petroleum, chemicals, medicine, and textiles.

4 System composition

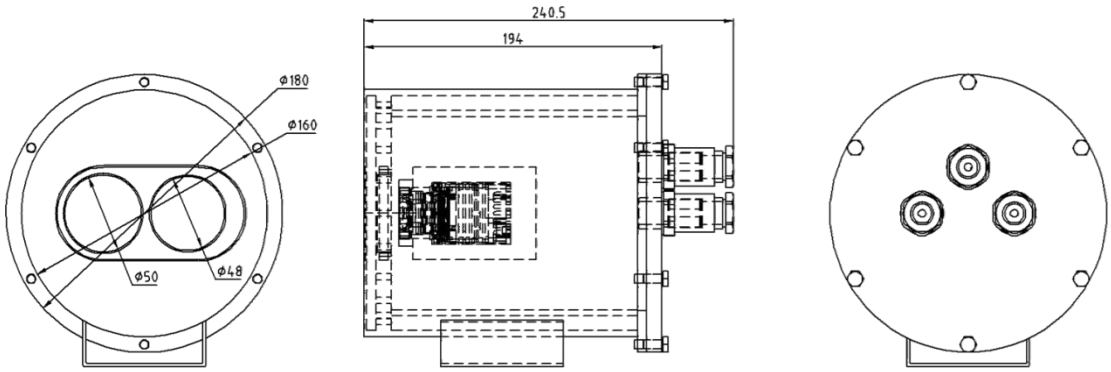
HIRDA-Ex The explosion-proof infrared thermal imaging temperature detection and analysis system is mainly composed of explosion-proof infrared thermal imaging thermometer , explosion-proof control box, explosion-proof image algorithm server, etc.

4.1 Explosion-proof infrared thermal imaging thermometer

model	PSWExDG300-NS	
Product images		
Visible resolution	–	
Visible light magnification	–	
Infrared resolution	384×288	640×480
Infrared lens option	4 , 8 , 13 , 25	9.5 , 19 , 25 , 35
Infrared field of view	60 °, 45 °, 25 °, 15 °	
Wavelength range	8 ～ 14μm	
Thermal sensitivity (NETD)	≤50mk@30 ℃	
Frame rate	25Hz	
focusing	Electric / Automatic	
Image Algorithms	Gamma correction, enhancement algorithm	
Temperature measurement accuracy	±2 ℃ or ±2%	
Temperature measurement range	Normal temperature range: -20 ℃ ～ 200 ℃ (standard) Medium temperature range: 150 ℃ ~650 ℃ (optional) High temperature range: 350 ℃ ~1600 ℃ (optional) Ultra-high temperature range: 650 ℃ ~2000 ℃ (optional)	
Network video compression format	H.264/H.265	
Data Types	H264 , H265 , 16Bit Raw temperature data	
Web Standards	Gigabit Ethernet / Adaptive 100M/1000M	
Protocol support	IPv4/IPv6 , TCP , UDP , NTP , HTTP , RTSP , RTP , ICMP , WebSocket , ONVIF	
Temperature output	Support analog 4--20ma , RS485 , Modbus TCP/RTU	
External trigger	Support RS485 Level, TTL Level	
Protection level	IP65	
size	Φ78mm×235mm	
Installation	Equipped with PTZ bracket	
weight	≤5Kg	
Operating temperature	-20 ℃ ～ + 60 ℃	

4.2 Overall size

The overall structure dimensions are shown in the figure below.



BS2S25KN Structural dimensions

4.3 Explosion-proof image algorithm server

- Intel® Core™ i7-11700 processor (quad-core, 8MB, 3.60GHz)
- Memory 16GB 1600MHz DDR3 non- ECC
- Hard Drive 256G solid state + 1TB 3.5 -inch SATA (7,200 Rpm) hard drive
- Monitor 23.8 inches
- Windows 10 Professional, 64 -bit operating system

4.4 System accessories

Explosion-proof junction box

Explosion-proof electric control box

Explosion-proof flexible pipe

explosion-proof sound and light alarm

5 System Software

5.1 Software interface

The system client software interface is shown in the figure below.

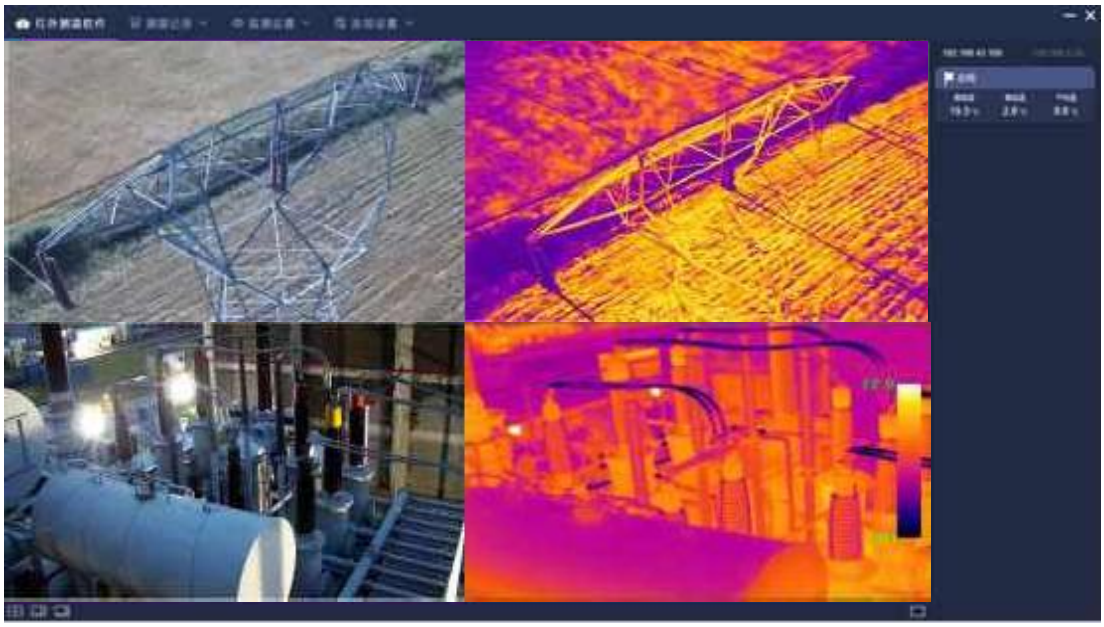


Figure3 System software interface

The basic functions of the software are as follows:

1） Real-time video display

- Real-time display of full radiation thermal images and high-definition visible light video;
- Can draw up to 32 Temperature measurement objects, such as points, lines, circles, rectangles, and polygons;
- Upto12 Medium color palette, suitable for more application scenarios;
- Maximum temperature, minimum temperature, average temperature and multi-point temperature tracking;
- Maximum support 32 Devices are online at the same time; automatically reconnect when offline;
- Adaptive display resolution, supports vertical screen display.

2） Smart Analysis

- Real-time display of temperature curve, custom display time period and temperature range, temperature data can be stored in real time;
- Record in multiple video formats and take photos at regular intervals;
- Offline analysis of videos and pictures with temperature data;
- Temperature correction can be performed by adjusting emissivity, reflected temperature, distance, secondary calibration, etc.

3） Alarm Center

- High temperature, low temperature, interval temperature, temperature rise, temperature difference and other types and levels of alarm;

- When an alarm is triggered, short videos, photos, temperature information and other logs are stored for easy query afterwards;
- IO , RS485 , Modbus And other alarm output forms;
- Customizable alarm thresholds and levels: Assist staff in assessing the urgency and development trend of potential hazards.

4） User Management

- Support multi-user login;
- User permissions can be set in different levels.

6 Configuration List

Serial number	name	model	unit	quantity	Remark
1	Explosion-proof infrared thermal imaging thermometer	BS2S25KN (Dual light) PSWExDG240-NS (single infrared)	tower		
2	Explosion-proof junction box	BJX-20/BAH -25	indivual		
3	Explosion-proof image algorithm service Server	YTExMTP -15.6	tower		Including hardware and software Parts, Display
4	Explosion-proof flexible pipe	G1/2 φ25	set		
5	Supporting cables	/	set		
6	Mounting accessories	HIRDA- FJ	set		Including mounting bracket, manual pan/tilt, anti-Explosion galvanized pipe, etc.

7 Explosion-proof certificate

编号：CNEx23.5604X

CNEX 国家防爆

防爆合格证

制造单位	武汉华景康光电科技有限公司 武汉东湖新技术开发区高新四路以南，佛祖岭二路以东莺洲坝太阳城第 10 幢 3 层 1 号
产品名称	双光防爆在线测温摄像机
型号规格	BS2S25KN DC12V
防爆标志	Ex db IIC T6 Gb，Ex tb IIIC T80℃ Db
产品标准	Q/HJK010-2023
总装图号	BS2S25KN.00.00

经对上述产品图样及技术文件的审查和样品检验,确认符合下列标准：
GB/T 3836.1-2021《爆炸性环境 第 1 部分：设备 通用要求》
GB/T 3836.2-2021《爆炸性环境 第 2 部分：由隔爆外壳 "d" 保护的设备》
GB/T 3836.31-2021《爆炸性环境 第 31 部分：由防粉尘点燃外壳 "t" 保护的设备》

记事:
1.外壳防护等级：IP68（水下 1m、40min）
2.环境使用温度：-40℃～+60℃
3.本产品配用已取得防爆合格证，且防爆标志不低于此认证产品的防爆填料函，使用时请严格按照其原证书及产品使用说明书的规定使用。

中心主任 颁发日期 2023 年 10 月 24 日
本证有效期 2023 年 10 月 24 日至 2028 年 10 月 23 日

Ex CQST 南阳防爆电气研究所 国家防爆电气产品质量检验检测中心

8 Division of labor between the two parties

Supplier:

1） Provide manufacturing, transportation, installation guidance and commissioning services for HIRDA-Ex explosion-proof infrared thermal imaging temperature detection and analysis systems to ensure the normal operation of the system, ensure the integrity of the system, and meet the requirements of on-site use.

2) Responsible selection of HIRDA-Ex Installation location of explosion-proof infrared thermal imaging temperature detection and analysis system equipment,

Provide equipment installation location diagram before construction.

3) HIRDA-Ex on the purchaser's personnel The training on commissioning , use, maintenance and overhaul of explosion-proof infrared thermal imaging temperature detection and analysis system enables the purchaser's personnel to master the operation skills independently.

4) Provide product certificates, inspection reports, operating and maintenance instructions and other relevant technical information .

1) HIRDA-Ex available Explosion-proof infrared thermal imaging temperature detection and analysis system equipment installation and commissioning Relevant on-site information and design drawings.

2) Undertake HIRDA-Ex Piping, wiring and fiber fusion work for cooling air, optical fiber and cables required for explosion-proof infrared thermal imaging temperature detection and analysis system equipment.

3) Make sure the site has the installation conditions required by the supplier, and notify the supplier's technical staff in advance to participate in guiding the installation and commissioning.

4) The purchaser shall assist in providing working conditions for the supplier's on-site service personnel.

9 Acceptance Criteria

1) Able to The explosion-proof infrared thermal imaging temperature detection and analysis system software interface displays the infrared thermal image of the measured target. When the cooling gas meets the use requirements, the equipment maintains a good working effect.

2) Can display the current equipment usage status and record temperature data;

3) Display the abnormal temperature area of the measured target and prompt an alarm;

4) The supplier shall provide professional training to the personnel designated by the purchaser.

10 After-sales commitment

1) HIRDA-Ex The warranty period of explosion-proof infrared thermal imaging temperature detection and analysis system is from the date of acceptance. 12 Months or 18 days after equipment arrival Months (for purchased products and servers, including internal hardware warranty period from the time the equipment arrives) Day Calculation 12 months) .

2) If the thermal imager is damaged due to improper use, the purchaser shall order spare parts in a timely manner and the supplier shall provide maintenance services.

3) HIRDA-Ex The explosion-proof infrared thermal imaging temperature detection and analysis system software is used for a long time, and the software upgrade service is provided free of charge.

4) When receiving a call from the buyer, the supplier is responsible for guiding the buyer to handle the fault; if the buyer cannot solve the problem, the supplier

The company promised to arrive at the scene to deal with it within 48 hours. The company's service phone number is: 400-080-4288 .