

IR-Camera for Blast furnace

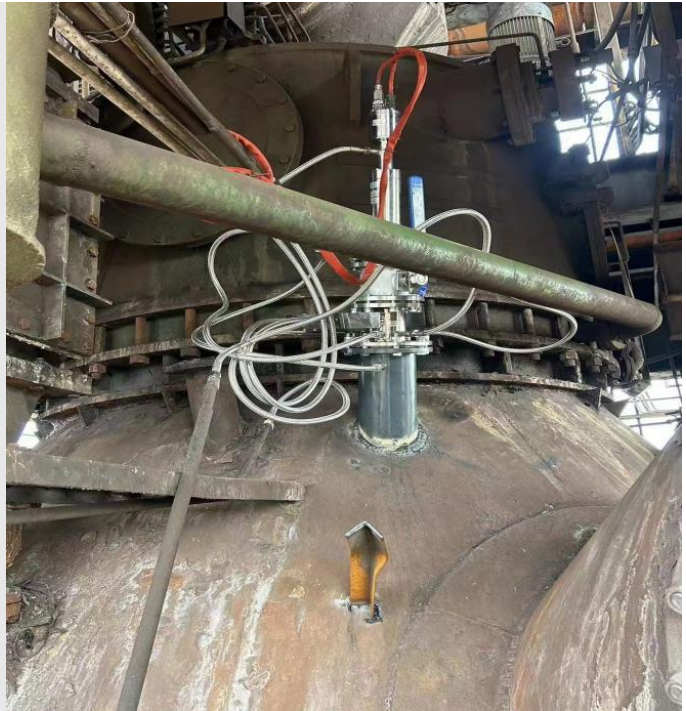
Model number: RB-IRGL

The RB-IRGL infrared camera is a high-performance device featuring a non-cooled focal plane detector, specifically designed to monitor the temperature distribution at the top of blast furnaces. The infrared focal plane detector detects the infrared radiation from the target and, through processes such as photoelectric conversion and signal processing, converts the target's distribution image into a video image.

The RB-IRGL thermal imaging camera continuously monitors the temperature distribution above the charge surface, delivering high-resolution images of gas flow dynamics, slag flow, and material distribution within the furnace. With a broad measurement range of 0–1600°C and high precision, it is specifically designed to support thermal management and operational efficiency in modern blast furnace systems.

The system features both air and water cooling mechanisms, ensuring stable operation in the harsh conditions of high temperature, pressure, dust, and humidity within the furnace. By integrating optics, mechanics, and electronics, the system allows for automatic extension and retraction inside the furnace, significantly reducing labor intensity and providing advanced visual monitoring for blast furnace operations.

The Blast Furnace Thermal Imaging Camera probe utilizes dual cooling technologies, combining water cooling and nitrogen gas cooling. Nitrogen gas creates a flow of air in front of the lens, enhancing the air curtain's coverage and preventing furnace dust from contacting the infrared lens. This ensures excellent dust resistance and effective lens cooling, enabling continuous and stable system operation.



Product Features

- The blast furnace thermal imaging camera probe can penetrate dust and thermal radiation to observe images that ordinary cameras cannot see or fail to capture clearly.
- The camera probe adopts a dual-layer water-cooled air-seal design, made entirely of stainless steel. Air is blown from inside the probe outward to form an air curtain, preventing dust accumulation at the front of the protective cover and safeguarding the lens and thermal imaging equipment. The cooling water jacket continuously cools the exterior of the thermal imager, ensuring that its temperature remains below 40°C. The unique purge design allows manual control of the dust scraping function.
- The high-resolution infrared sensor delivers more detailed and clearer images.
- The system is controlled intelligently and features automatic protection or power down functions, including automatic shutdown in case of water, gas loss, or in the event of overheating. Under abnormal conditions, the camera probe automatically

withdraws from the furnace and closes the motorized ball valve, ensuring that furnace heat and gas do not escape from the equipment openings. The software design incorporates a unique dust filtering algorithm, enhancing image depth and allowing visibility of gaps in the furnace wall.

- The ultra-wide temperature measurement range can accommodate furnace temperatures of up to 1600°C.
- Equipped with crosshair radar temperature measurement functionality, it enables coordinate-based radar chart displays within the furnace.
- **Equipment Replacement or Maintenance:** Maintenance personnel only need to press the "Camera Probe Retraction" button on the local control cabinet. The PLC control system will operate the actuator to retract the camera probe from the furnace. During retraction, the intelligent controller system will automatically close the high-temperature ball valve and isolate the probe from the furnace interior before it is fully withdrawn. This prevents furnace gas and heat from escaping through the equipment openings.

Product Selection:RB-IRGL

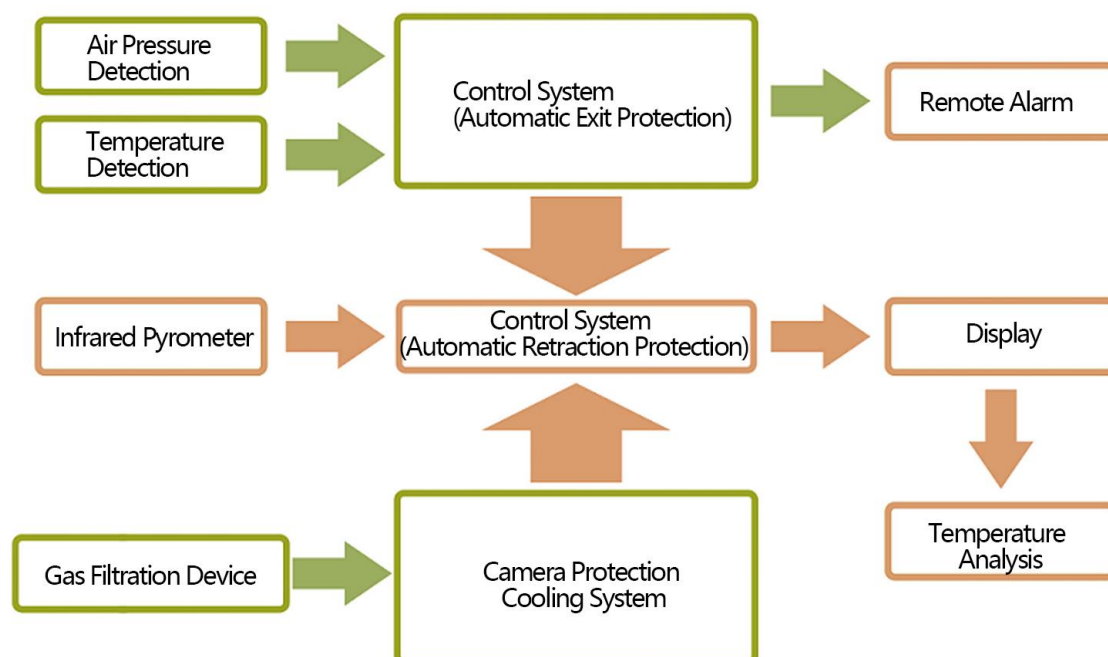
1、 Usage Conditions and Performance Indicators:

Compressed Nitrogen requirements	
Compressed Nitrogen Inlet Pressure	0.3MPa–0.7 MPa
Inlet Pipe Diameter	DN32
Nitrogen Inlet Temperature	≤35℃
Nitrogen Flow Rate	30 m³/h

Cooling water requirements	
Water inlet pressure	≥0.3MPa
Water Flow Rate	2.5 m³/h
Water Temperature	≤60℃

Furnace Temperature	≤60℃
Power Consumption	120W
Power Supply Voltage	AC220V
Protection Rating	IP65

2、 System Components



3、Product Technical Specifications

Detector	
Detector Type	Uncooled Focal Plane Microbolometer
Number of Pixels	640×480
Pixel Pitch	17μm
Wavelength Range	8–14μm
Thermal Sensitivity (NETD)	≤50mK@30°C
Frame Rate	≤50Hz (Configurable)
Temperature Accuracy	±2°C or ±2%
Temperature Range	50°C~1600°C