SCS-JK Intelligent AI Video Image Analysis and Warning System
BJK-□/XW□ Series Explosion-proof Behavioral Monitoring Camera

- Explosion protection to
  -CENELEC
  -IEC
- Can be used in
  Zone 1 and Zone 2
  Zone 21 and Zone 22
- Product features: intelligent control, intelligent monitoring, intelligent communication, intelligent recognition, intelligent analysis, intelligent monitoring.

Product Features - Safety Helmet Wearing Recognition

- **Protect the head from external impacts:**
  The primary function of a safety helmet is to protect the head from external injuries. In high-risk environments such as construction sites, mining operations, and factory workshops, safety helmets can effectively reduce or prevent injuries caused by impacts, collisions, and electric shocks from falling objects.
- **Enhance work efficiency and safety:** By detecting whether workers are wearing safety helmets, non-compliant behaviors can be promptly identified and corrected, reducing accidents caused by failure to wear helmets, thereby improving work efficiency and construction safety.
- **Prevent Accidents:** An intelligent safety helmet wearing detection system enables real-time monitoring of site conditions. Upon detecting instances of missing helmet usage, it immediately triggers an alarm mechanism and sends alerts to supervisors through multiple channels, ensuring timely corrective actions and preventing accidents.
- **Enhance workers' safety awareness:** Through the detection system, instances of improper safety helmet usage can be recorded, and workers who repeatedly violate safety protocols can be subjected to targeted safety education. This "detection + education" model helps improve workers' safety consciousness and their ability for self-protection.
- **Reduce false positives and false negatives:** With continuous technological advancements, intelligent safety helmet detection systems, through optimized algorithms and enhanced sensor devices, achieve higher detection accuracy and stability, thereby minimizing false positives and false negatives, ensuring the system's effectiveness and reliability.
- **Adaptability to complex environments:** Although challenging site conditions-such as variable lighting and head obstructions-may affect detection outcomes, ongoing algorithm optimization and hardware improvements enable enhanced accuracy and stability, ensuring reliable performance across diverse operational environments.

Zones 1&2; 21&22

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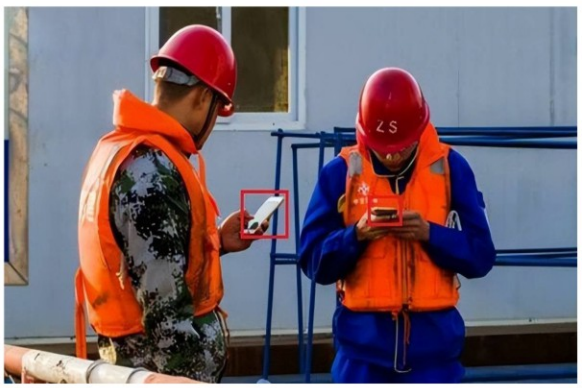
Product Features - Reflective Vest Wearing Recognitio

- **Enhance Safety:** The primary function of reflective vests is to increase the visibility of the wearer, particularly during nighttime or low-visibility conditions. The reflective properties significantly enhance driver awareness, thereby reducing the risk of traffic accidents. Furthermore, the reflective vest wearing detection system enables real-time monitoring of workers' compliance with vest-wearing protocols at operational sites. When a worker is detected without a reflective vest, the system immediately triggers an alert, enabling supervisors to take timely corrective actions and further ensuring worker safety.
- **Reduce false positives and false negatives:** The intelligent video analytics system incorporates advanced algorithms capable of filtering out interference caused by weather and environmental conditions. This effectively addresses limitations inherent in manual monitoring, significantly reducing false positives and missed detection rates. As a result, the system ensures accurate detection of reflective vest usage under diverse operational environments.
- **24/7 Operation:** The intelligent video surveillance system continuously analyzes surveillance footage around the clock (7×24 hours), greatly improving utilization efficiency of video resources and reducing workload for human monitors. This continuous operation ensures timely detection and response to instances of non-compliance with vest-wearing requirements at any time or location.
- **Improve Operational Efficiency:** The reflective vest wearing detection system can push alarm notifications to mobile devices, enabling managers to monitor and respond promptly from anywhere. Additionally, the system automatically saves alarm screenshots and video clips into a database to generate reports. Managers can then query or playback alarm records by time period, substantially enhancing control efficiency within operational zones.
- **Strengthen Corporate Image:** Reflective vests branded with corporate logos not only enhance wearer visibility but also promote corporate identity and brand recognition. This facilitates clear differentiation among personnel and supports more effective workforce management.

Product Features - Drowsiness Detection



- **Enhance production safety:** Employee mobile phone usage during production processes leads to distraction, increasing the risk of operational errors that may result in equipment damage or safety incidents. The detection system enables timely identification and intervention, ensuring production safety.
- **Improve work efficiency:** Mobile phone usage reduces work efficiency, prolongs production cycles, and increases operational costs. Monitoring systems help minimize non-work-related mobile phone use during working hours, thereby enhancing overall productivity.
- **Reduce operational errors:** Employees operating machinery while using mobile phones are prone to overlooking operational details, leading to mistakes that compromise product quality. Real-time monitoring systems can detect such behaviors and reduce errors, ensuring consistent product quality.
- **Prevent information leakage:** In production environments involving sensitive information, employees using mobile phones to take photos or videos may inadvertently leak confidential company data. Detection systems effectively prevent such incidents, safeguarding corporate information security.
- **Lower management costs:** Traditional monitoring methods require substantial human resources and are inefficient. Automated monitoring systems enable continuous 24/7 surveillance, reducing labor costs and improving management efficiency.
- **Strengthen employee discipline:** Real-time monitoring and alerting serve as deterrents, encouraging employees to comply with safety regulations voluntarily and minimizing mobile phone use on the production floor-thereby maintaining order and safety in the work environment.
- **Data analysis and management improvement:** By storing and analyzing monitoring data, enterprises can identify the frequency, high-risk areas, and peak time periods of mobile phone usage among employees. This insight provides a foundation for developing targeted safety management strategies.

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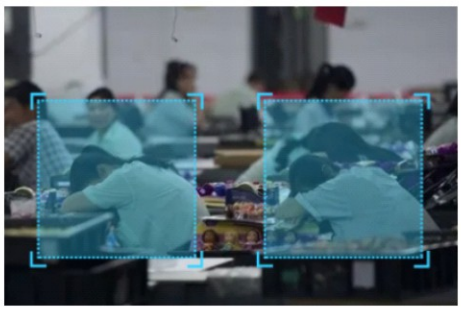
Product Features - Drowsiness Detection

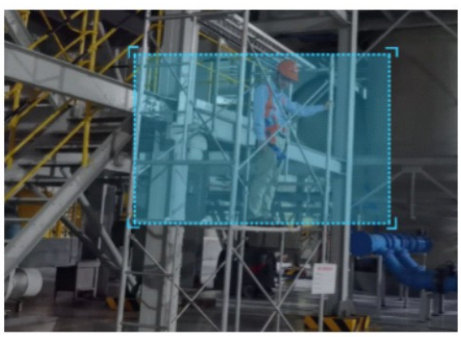


- **Enhance Production Efficiency:** By detecting whether factory employees are asleep during working hours, potential idle behaviors can be promptly identified and corrected, ensuring employees maintain high levels of work efficiency. This contributes to improved overall production efficiency and mitigates production delays and efficiency losses caused by employee naps or drowsiness.
- **Ensure Production Safety:** Detecting employee drowsiness during work hours also enhances production safety. In roles requiring continuous supervision-such as on factory production lines or in monitoring rooms-drowsy behavior can lead to frequent safety incidents. Implementing a personnel drowsiness detection system enables real-time monitoring of employee presence, timely identification of drowsiness, and early warnings, thereby preventing accidents caused by fatigue and safeguarding operational safety.
- **Improve System Accuracy:** The personnel drowsiness detection system reduces false positives and false negatives, enhancing overall system accuracy. Leveraging intelligent video analytics and deep learning algorithms, the system effectively filters out interference from environmental and climatic factors, compensating for the limitations of manual monitoring and significantly reducing false positive and false negative rates in video surveillance systems.
- **Reduce Management Costs:** Real-time monitoring of employee attendance allows enterprises to optimize human resource allocation, ensuring critical positions are always staffed while minimizing unnecessary overtime and labor waste. This leads to improved overall operational efficiency within the organization.

Product Features - Smoking Detection

- **Enhance Production Safety:** Smoking within factory premises may lead to fire hazards and other safety risks. A detection system can promptly identify and prevent smoking activities, effectively avoiding potential accidents. For instance, a smoking recognition system can continuously monitor every corner of the factory 24/7; whenever a worker attempts to smoke, the system immediately triggers an alarm and uses high-definition cameras to precisely locate the individual.
- **Protect Worker Health:** Long-term smoking in enclosed production environments not only damages the smoker's lungs but also adversely affects the health of nearby colleagues. By deploying a detection system, smoking behavior in production areas can be significantly reduced, thereby fostering a cleaner and healthier working environment.
- **Improve Work Efficiency:** The detection system is capable of automatically learning and recognizing smoking behaviors in images without human intervention, reducing the workload for management personnel and allowing them to focus on more critical tasks. Additionally, the system automatically saves screenshots and video clips captured at the time of alarms, generating detailed reports that enable managers to access and review data at any time.
- **Reduce Management Costs:** By leveraging existing surveillance cameras, there is no need for additional hardware installation, thus lowering costs. Furthermore, the system's deployment and maintenance are relatively simple, further minimizing operational expenses for enterprises.

Product Features - Safety Harness Wear Detection



- **Enhance Worker Safety:** Wearing a safety harness is a critical measure for ensuring worker safety. During elevated work operations, safety harnesses effectively prevent workers from falling due to slips or loss of balance, and reduce the impact forces on the body during a fall, thereby significantly lowering the likelihood of accidents. Furthermore, through real-time detection and alarm systems, personnel who fail to wear their harnesses can be promptly identified, enabling timely interventions to prevent potential incidents.
- **Improve Work Efficiency:** Monitoring safety harness usage contributes to enhanced operational efficiency. Traditional safety inspections typically rely on manual patrols, a method that is not only inefficient but also susceptible to human error. In contrast, an AI-powered safety harness wear detection system enables continuous, round-the-clock monitoring, swiftly identifying and responding to instances of non-compliance. This automated surveillance system ensures worker safety and health while substantially improving site safety management and minimizing errors caused by human factors.
- **Strengthen Safety Management:** Monitoring the proper use of safety harnesses enhances overall site safety management. Through real-time monitoring and alert mechanisms, supervisors can continuously track workers' status, promptly detect and rectify improper harness usage, and ensure safe execution of elevated work tasks. This intelligent management system not only increases control efficiency but also reduces operational costs, collectively fostering a safer and more reliable construction environment.

Product Features - Personnel Fall Detection

- **Reduce fall incidents:** By monitoring workers' postures and movements in real time, the fall detection system can promptly identify potential fall risks and issue early warnings. This real-time monitoring and alert mechanism enables workers and their caregivers to take timely preventive actions, effectively avoiding fall accidents.
- **Improve rescue efficiency:** Once a fall is detected, the system immediately triggers an alarm, notifying relevant personnel or medical services for emergency response. This rapid reaction significantly reduces response time and enhances treatment effectiveness, preventing severe consequences caused by delayed rescue.
- **Ensure worker safety:** With real-time monitoring and alerts, workers can perform daily activities with greater confidence, reducing psychological stress associated with fear of falling, thereby improving both work efficiency and safety.
- **Lower labor costs:** Traditional manual monitoring and identification methods require substantial manpower, are time-consuming and labor-intensive, and are prone to oversight. In contrast, an anomaly detection system based on deep neural networks enables automated monitoring and identification, reducing labor costs while improving operational efficiency.
- **Enhance production efficiency:** By real-time monitoring and detecting falls, potential safety hazards can be identified and addressed promptly, minimizing accidents and thus improving the efficiency and stability of production processes.
- **Drive technological innovation:** The deep neural network-based anomaly detection system represents an innovative integration of artificial intelligence technology with industrial safety. It offers valuable insights and references for safety monitoring in other industries, promoting advancements and broader applications of technology.

Product Features - License Plate Recognition

- **Enhance Traffic Efficiency:** The license plate recognition system quickly identifies vehicles, minimizes manual intervention, and enables fast passage through entry and exit points. By eliminating the cumbersome process of manual registration, it significantly improves traffic flow efficiency.
- **Improve Security:** The system accurately distinguishes authorized vehicles from outsiders, effectively blocking unauthorized access and reducing potential security risks. It also maintains detailed records of all vehicles entering and exiting, enabling security traceability when needed.
- **Standardize Vehicle Management:** With license plate recognition, managers can clearly track vehicle dwell times, entry/exit frequency, and other data. This facilitates better planning and scheduling of vehicle use, enhances utilization efficiency, and reduces resource waste.
- **Reduce Management Costs:** The system lowers labor costs associated with manual management and eliminates errors or oversights common in manual registration processes-improving both accuracy and reliability in operations.
- **Enhance Corporate Image:** A modern license plate recognition system reflects the factory's advanced management standards, strengthening trust and confidence among partners and clients.
- **Integrate Information System:** The license plate recognition system can be seamlessly integrated with other factory management systems-such as attendance tracking or logistics management-enabling coordinated information sharing and boosting overall operational efficiency.
- **Theft Prevention:** In the event of vehicle theft, the system can retrieve footage from entry/exit surveillance cameras to provide valuable leads, helping authorities quickly locate stolen vehicles.

Product Features - Personnel Boundary Violation Detection

- **Enhance safety management efficiency:** Through real-time monitoring and intelligent analysis, the system promptly detects and alerts on personnel boundary violations, significantly reducing the burden of manual surveillance and greatly improving overall safety management.
- **Reduce safety incidents:** By providing early warnings and continuous monitoring, the system enables preventive actions before accidents occur, effectively avoiding safety incidents and ensuring safe factory operations.
- **Lower human resource costs:** Traditional monitoring requires substantial manpower, whereas the intelligent monitoring system automatically identifies and processes vast amounts of video footage, reducing manpower needs and lowering operational costs for enterprises.
- **Improve visual factory management:** The system stores alert screenshots and video clips in a database to generate reports, enabling easy post-event retrieval and management-greatly enhancing both operational efficiency and visual oversight of the factory.
- **Increase deterrence effect:** A key function of detecting personnel boundary violations.

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Product Features - Facial Recognition

- **Enhance Security Management:** Facial recognition technology significantly improves factory safety management. With facial recognition access control systems, employees and visitors must authenticate via facial scanning to enter the facility, greatly reducing the risk of unauthorized individuals impersonating others and strengthening overall security.

  Improve Attendance Management Efficiency: Facial recognition turnstiles can accurately and quickly identify employees' facial features, enabling seamless attendance tracking. This approach not only prevents cheating such as having someone else clock in on behalf, but also greatly enhances the efficiency and accuracy of attendance management while reducing the workload for supervisors.

  Reduce Labor Costs: Facial recognition access control systems lower manual management expenses. Automated identification and management eliminate costs associated with card production, distribution, and paper-based registration, while also minimizing security personnel's patrol duties-resulting in substantial labor cost savings.

  Enhance Employee Experience: For employees, facial recognition access systems offer a more convenient entry and exit experience. No longer required to carry access cards, employees can simply scan their faces to pass through-significantly boosting work efficiency and convenience.

  Improve Data Accuracy: Facial recognition technology enables real-time recording of employee entry and exit data, allowing statistical analysis that helps managers monitor attendance patterns and workforce movement trends-providing valuable insights for decision-making.

  Greater Compatibility and Automation: Facial recognition technology can be seamlessly integrated into existing security systems without requiring additional investment. The identification process is fast and accurate, completing identity verification in just seconds-boosting overall operational efficiency.

Product Features - Crowd Detection and Identification

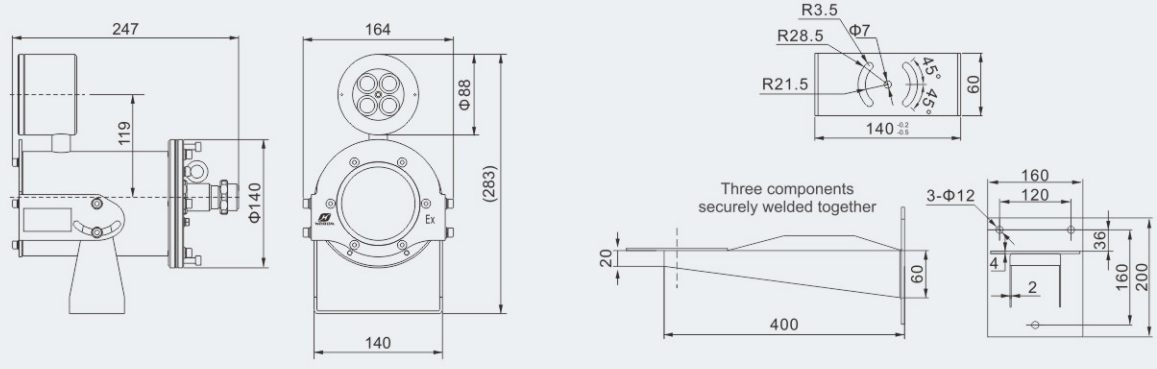
- **Enhance Safety Management Efficiency:** By monitoring crowd formations in real time, potential safety threats can be promptly identified and prevented, maintaining order and safety within the factory. Automated monitoring reduces reliance on manual labor, significantly improving the efficiency of safety management.
- **Prevent Accidents:** In industrial environments such as factories, excessive personnel clustering can lead to safety incidents. The crowd aggregation monitoring and early warning system enables timely detection of abnormal gatherings and issues alerts to prompt managers to take immediate action, thereby reducing the risk of accidents.
- **Reduce False Positives And False Negatives:** An AI-powered system for detecting abnormal crowd aggregations accurately identifies unusual behavior, greatly enhancing control over on-site production operations while lowering operational costs and minimizing false positives and false negatives.
- **Optimize Resource Allocation:** In tourist attractions and similar venues, the abnormal crowd detection system helps managers understand visitor distribution, movement patterns, and dwell times. This information supports better allocation of tourism resources, early warnings for overcrowding, improved visitor services, and an enhanced travel experience.
- **Support Data-Driven Decision:** The system can count people in real time within a designated area. When the number reaches a predefined threshold, an alarm is triggered. Alarm screenshots and video clips are saved into a database to generate reports for easy querying or playback by managers—improving overall monitoring efficiency.
- **Risk Early Warning Mechanism:** By establishing a crowd aggregation risk early warning model, the system continuously monitors potential risks at any location. It analyzes and displays the number of people gathered as well as detailed personnel lists. It records the area and duration of each gathering event and allows playback of all recorded incidents from the past month.
- **Reduce False Positives And False Negatives:** By defining silent zones and silent periods, unnecessary alerts can be minimized in specific scenarios. Visualizing crowd density further enhances risk control effectiveness.

Technical data

Explosion-proof Behavioral Monitoring Camera (Fixed type) BJK-□/XW□

Explosion protection	
Global (IECEx)	IECEx (applied for)
Gas and dust	Ex db IIC T6 Gb Ex tb IIIC T80℃ Db
Europe (ATEX)	ATEX (applied for)
Gas and dust	Ⓔx II 2 G Ex db IIC T6 Gb Ⓔx II 2 D Ex tb IIIC T80℃ Db
Certificates	IECEx; ATEX
Conformity to standards	IEC 60079-0, IEC 60079-1, IEC 60079-31, EN 60079-0, EN 60079-1, EN 60079-31
Intelligent Analysis Function	Helmet wearing detection, reflective vest wearing detection, safety harnesses wearing detection, drowsiness detection, smoking detection, mobile phone usage detection, crowd gathering detection, facial recognition, fall detection, license plate recognition, personnel boundary violation detection
Rated voltage	176-264V AC, 24V AC, 24V DC, 12V DC
Material	304 stainless steel or 316 stainless steel
Pixels	2 million, 4 million, 8 million (optional)
Optical zoom	4x, 25x, 32x (optional)
Focal length	2.5~12mm, 4.8~120mm, 5.9~188.8mm(Optional)
Infrared function	Optional
Image sensor	1/1.8" progressive scan CMOS, 1/2.8" progressive scan CMOS(Optional)
Min. Illumination	Color: 0.0005 Lux; Monochrome: 0.0001 Lux
Signal-to-noise ratio	>52dB
White balance	Manual white balance, indoor, outdoor, daylight lamp, sodium lamp, auto white balance, auto tracking white balance, locked white balance
Day/Night mode	Auto ICR color-to-black
Video compression	H.264/H.265
Angle adjustment	Manual semi-fixed pan-tilt mount with adjustable up/down and left/right angles
Transmission method	Wired, 4G/5G/WiFi (optional)
Mounting bracket	ZJ001 wall mount bracket
Bracket materia	Q235 carbon steel, 304 stainless steel, 316 stainless steel (optional)
Protection rating	IP68
Temperature range	-40℃~+60℃
Weight	5kg

Dimension drawings (all dimensions in mm) - subject to alteration



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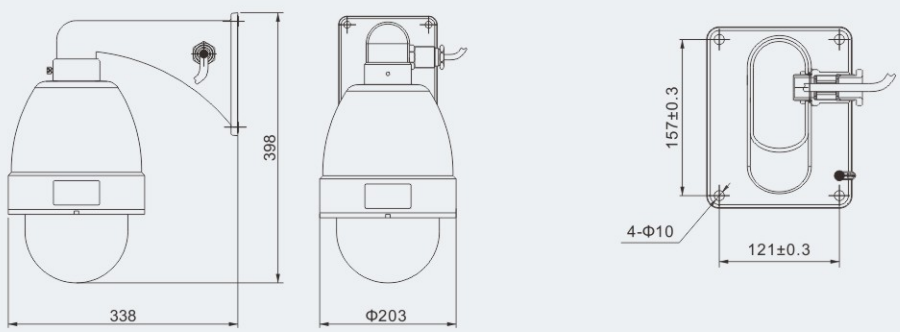
Technical data

Explosion-proof Behavioral Monitoring Camera (PTZ type) BJK-□/XW□

Explosion protection	
Global (IECEx)	IECEx (applied for)
Gas and dust	Ex db IIC T6 Gb Ex tb IIIC T80℃ Db
Europe (ATEX)	ATEX (applied for)
Gas and dust	Ⓔx II 2 G Ex db IIC T6 Gb Ⓔx II 2 D Ex tb IIIC T80℃ Db
Certificates	IECEx; ATEX
Conformity to standards	IEC 60079-0, IEC 60079-1, IEC 60079-31, EN 60079-0, EN 60079-1, EN 60079-31
Intelligent Analysis Function	Helmet wearing detection, reflective vest wearing detection, safety harnesses wearing detection, drowsiness detection, smoking detection, mobile phone usage detection, crowd gathering detection, facial recognition, fall detection, license plate recognition, personnel boundary violation detection
Rated voltage	176-264V AC, 24V AC
Material	304 stainless steel or 316 stainless steel
Pixels	2 million, 4 million, 8 million (optional)
Optical zoom	25x, 32x (optional)
Focal length	4.8~120mm, 5.9~188.8mm(Optional)
Infrared function	Optional
Image sensor	1/1.8" progressive scan CMOS, 1/2.8" progressive scan CMOS(Optional)
Min. Illumination	Color: 0.0005 Lux; Monochrome: 0.0001 Lux
Signal-to-noise ratio	>52dB
White balance	Manual white balance, indoor, outdoor, daylight lamp, sodium lamp, auto white balance, auto tracking white balance, locked white balance
Day/Night mode	Auto ICR color-to-black
Video compression	H.264/H.265
Angle adjustment	Pan: 0°~360°, Tilt: -20°~+90°, Auto flip 180° for continuous monitoring
Horizontal rotational velocity	Pan speed (key control): 0.1°~160°/s, Pan preset speed: 160°/s
Vertical rotational velocity	Tilt speed (key control): 0.1°~120°/s, Tilt preset speed: 120°/s
Transmission method	Wired, 4G/5G/WiFi (optional)
Mounting bracket	ZJ003 wall mount bracket
Bracket materia	304 stainless steel, 316 stainless steel (optional)
Protection rating	IP68
Temperature range	-40℃~+60℃
Weight	13.5kg

Dimension drawings (all dimensions in mm) - subject to alteration



Technical data

Explosion-proof Behavioral Monitoring Camera (Integrated type) BJK-□/XW□

Explosion protection	
Global (IECEx)	IECEx (applied for)
Gas and dust	Ex db IIC T6 Gb Ex tb IIIC T80℃ Db
Europe (ATEX)	ATEX (applied for)
Gas and dust	Ⓔx II 2 G Ex db IIC T6 Gb Ⓔx II 2 D Ex tb IIIC T80℃ Db
Certificates	IECEx; ATEX
Conformity to standards	IEC 60079-0, IEC 60079-1, IEC 60079-31, EN 60079-0, EN 60079-1, EN 60079-31
Intelligent Analysis Function	Helmet wearing detection, reflective vest wearing detection, safety harnesses wearing detection, drowsiness detection, smoking detection, mobile phone usage detection, crowd gathering detection, facial recognition, fall detection, license plate recognition, personnel boundary violation detection
Rated voltage	176-264V AC, 24V AC
Material	304 stainless steel or 316 stainless steel
Pixels	2 million, 4 million, 8 million (optional)
Optical zoom	25x, 32x (optional)
Focal length	4.8~120mm, 5.9~188.8mm(Optional)
Infrared function	Optional
Image sensor	1/1.8" progressive scan CMOS, 1/2.8" progressive scan CMOS(Optional)
Min. Illumination	Color: 0.0005 Lux; Monochrome: 0.0001 Lux
Signal-to-noise ratio	>52dB
White balance	Manual white balance, indoor, outdoor, daylight lamp, sodium lamp, auto white balance, auto tracking white balance, locked white balance
Day/Night mode	Auto ICR color-to-black
Video compression	H.264/H.265
Angle adjustment	Pan: 360° continuous rotation, Tilt: -90° to +90°
Horizontal rotational velocity	0.1°/s~42°/s
Vertical rotational velocity	0.1°/s~42°/s
Transmission method	Wired, 4G/5G/WiFi (optional)
Mounting bracket	ZJ002 wall mount bracket
Bracket materia	Q235 carbon steel, 304 stainless steel, 316 stainless steel (optional)
Protection rating	IP68
Temperature range	-40℃~+60℃
Weight	≤33kg

Dimension drawings (all dimensions in mm) - subject to alteration