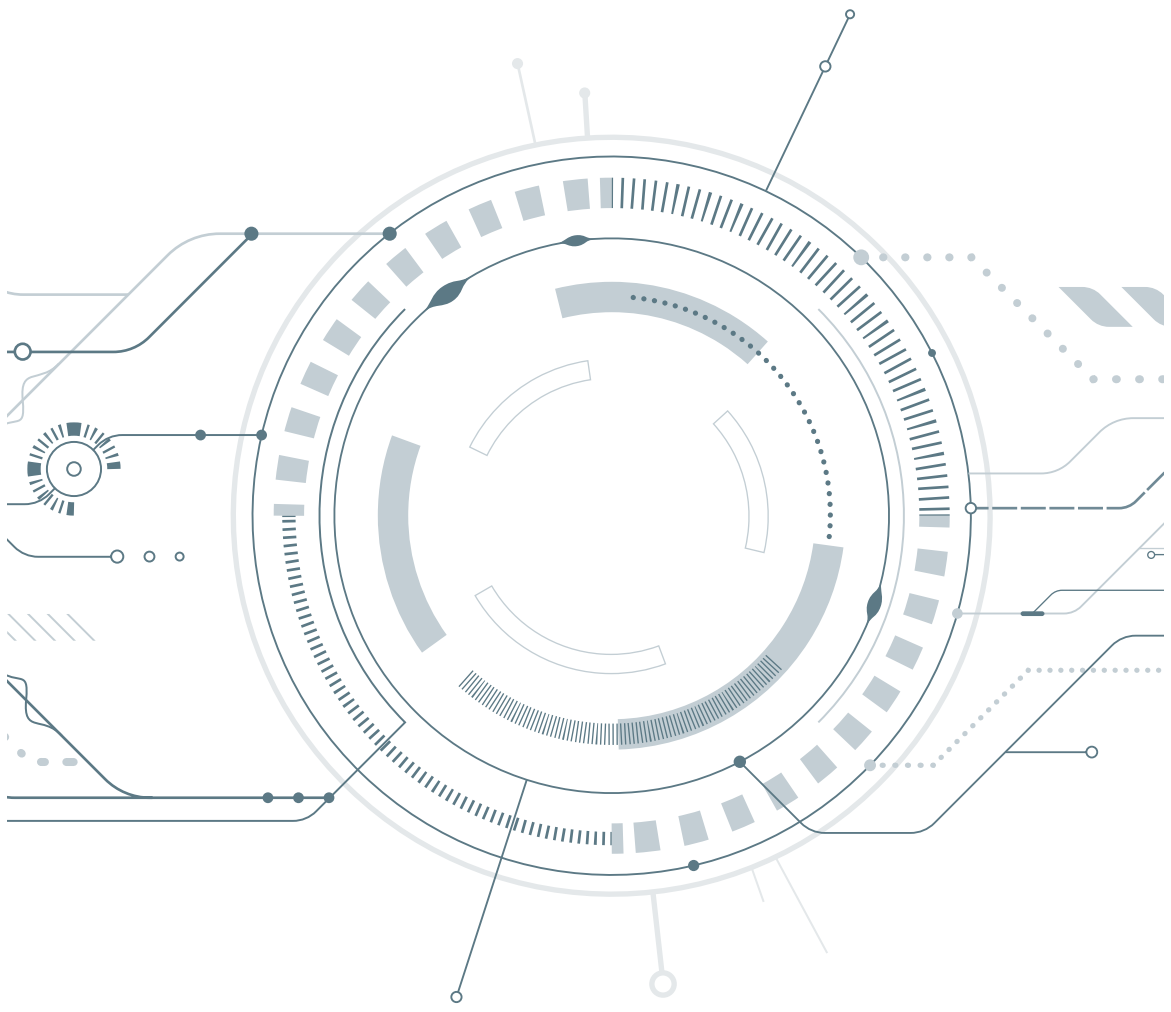




INDUSTRIAL VIDEO SURVEILLANCE SYSTEMS



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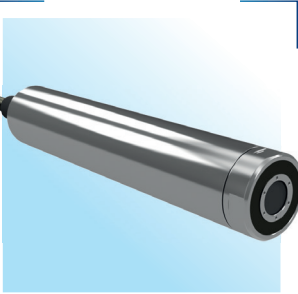
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NPP Industrial Television System



Safety class 3 and 4 according to the norms and rules NP-001-15

Industrial television systems are designed to arrange additional channels for monitoring the NPP process equipment through visual observation and early detection of abnormal and emergency situations, for search and rescue operations at the power unit, as well as for information support of the NPP operating personnel.



System advantages:

The advantage of Industrial television systems developed by West-Engineering LLC is the flexibility of configuration, the ability to integrate with various third-party Automated process control systems, as well as NPP communication systems.

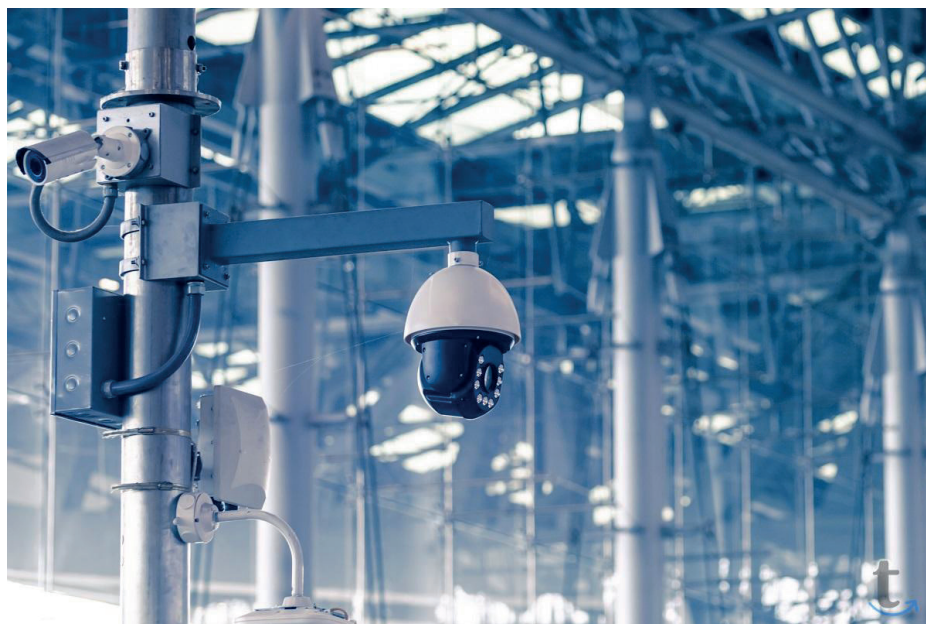
Industrial television systems in terms of video recording of actions of the operating personnel (VRAOP) fully comply with the requirements of standards of Rosenergoatom JSC 1.11.02.011.0821-2013 "Systems and equipment for internal operational communication of nuclear power plants".

System functions:

- ▶ transmission of control signals from workstations to actuating devices (selection of a video camera, aiming the video camera at the required area of the object of observation, image adjustment by controlling the lens of the video camera, turning on video camera lights, etc.);
- ▶ implementation of the algorithm of pointing, focusing and scaling of images (presets) set by the operator;
- ▶ reproduction of images on monitors of the operator's and administrator's workstations;
- ▶ transmission of video signals to the local area network (LAN) for viewing the archive by the technical support personnel on dedicated computers;
- ▶ generation and storage of video files in convenient video formats, providing for a quick search for the required video file, the ability to quickly transport it over the NPP LAN and view it in the required quality on any designated personal computer;



- ▶ integration with NPP internal communication system;
- ▶ automatic recording to the archive, synchronized with the NPP clock system;
- ▶ viewing video information previously recorded in the archive (without interruption of current video information recording);
- ▶ protection of system elements from electrical overloads;
- ▶ video image correction (color, frequency distortion, etc.);
- ▶ granting privileged rights to view and control the required cameras on designated workstations;
- ▶ software protection against unauthorized access to video archives and system software;
- ▶ the ability to back up the recorded information on an optical disc and an external drive;
- ▶ automatic detection of movement and abnormal situations (changes in the state of the facility of observation over time, steam, leaks, smoke, fire, etc.) in the field of view of video cameras with the allocation of an alarm signal individually for each camera;
- ▶ diagnostics of the receiving and transmitting equipment and the entire system as a whole with localization of the place of a fault occurrence in real time using built-in hardware and software.



System composition:

- ▶ power and digital transmission racks;
- ▶ optical power boxes;
- ▶ control and recording racks;
- ▶ video recording stands VRAOP;
- ▶ workplaces of operators;
- ▶ workstation of the administrator;
- ▶ television transmitting devices (cameras) in radiation-resistant design;
- ▶ television transmitting devices (video cameras) in general industrial design;
- ▶ set of connecting cables;
- ▶ set of service equipment;
- ▶ set of spare parts, tools, accessories.

Object of implementation:

- ▶ Leningrad NPP;
- ▶ Akkuyu NPP (Turkey) – at the implementation stage.



PTZ IP-CAMERA

HD55F-AI 5MPx



Designation

Network video camera HD55F-AI 5MPx is used in IP systems and is intended for 24-hour video surveillance.



Technical characteristics

| | |
|----------------------------------|--|
| Camera | HD55F-AI 5MPx |
| Matrix type | 1/2.8" CMOS Sony IMX335 |
| Processor | HiSilicon HI3516EV300 |
| Resolution, Mp | 5 Mp |
| Frame size (Pixel) | 2592x1944, 2592x1520, 1920x1080, 1280x960, 1280x720, 720x576, 720x480, 640x480 |
| Minimum light intensity, Lx | 0.05 Lx (color) / 0.01 Lx (black/white) |
| IR illumination, m | 100m Adaptive IR illumination (controllable on/off) |
| Video codec | H.264/H.265/MJPEG |
| Audio codec | PCM, AAC, G.711, G.726 |
| Electronic shutter | AES. Indoor / Outdoor, Manual from 1/1 to 1/8000 |
| Audio input | 1 (RCA connector), Active and Passive operation mode with a microphone |
| Signal-to-noise ratio, dB | more than 90 dB |
| Functions | |
| Day/Night | Removable IR filter, Sensor/On/Off |
| Automatic gain control | AGC, 8x~64x |
| White-balance | AWB. MWB (from 0 to 255 by R and B channels). Presets 5 pcs |
| Accumulation mode | Controllable Sens-Up 2x, 3x, 6x, 10x, 12x, 25x |
| Dynamic super loudness | D-WDR Adjustable (0-255) |
| Compensation of background light | BLC (on/off) |
| Noise suppression | 3DNR Adjustable (0-255) |
| Scintillation suppression | 50Hz,60Hz |
| Lens distortion correction | Lens Distortion Correction (on/off), Lens Shade Correction (on/off) |
| Change of quality of frame area | ROI (maximum 4 areas) |
| Motion detector | Yes, 18x22 areas |
| Event response | By schedule, by motion detector Frame or message is sent to E-mail, FTP, HTTP. |
| Picture control | Brightness, contrast, saturation, chroma, flip, mirroring. |
| Digital image stabilization | Yes (on/off) |
| Anti-fog, contrast enhancement | Yes (on/off) |



Technical characteristics

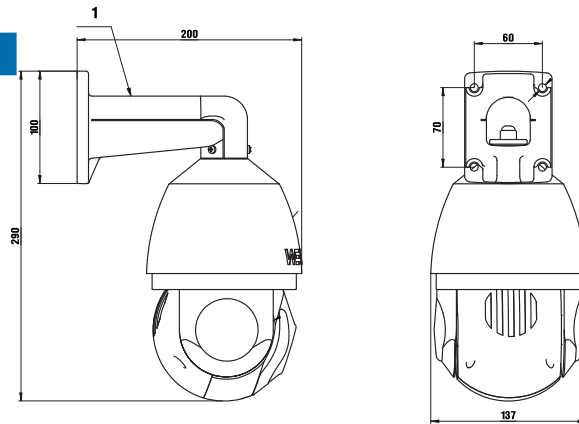
| | |
|---|--|
| Network | |
| Frame rate, f/s | 25ps 2592x1944 |
| Network streams (Number/Resolution) | 2n/2592x1944, 640x480 |
| Connection security | Password protection |
| Supported browser | IE11 |
| Network client | HCMS |
| Cloud client | Hi see |
| Data transmission channel | Ethernet, RJ45 (10/100 Base-T) |
| Protocols | TCP/IP, UDP, RTP, RTSP, HTTP, SMTP, DHCP, PPPoE, IGMP, FTP, DDNS, NTP, DNS. ONVIF compatibility. |
| Bitrate control | VBR, CBR (up to 10Mbit) |
| Lens, PTZ | |
| Focal distance, mm | 4.7 - 94 with autofocusing |
| Lens mount | Integrated |
| Optical / Digital Zoom, X | 30X |
| Aperture control | Automatic |
| Angle of view | Horizontal 51.1°~2.84°, Vertical 38.6°~2,14° |
| Tilt Speed, deg/s | 0.02-40 |
| Turning rate, deg/s | 0.02-300 |
| Turning angle, deg. | 360 |
| Tilt angle, deg. | 90 |
| Number of presets, pcs | 220 |
| Patrolling route | 3 route up to 16 points (pan-scan available) |
| General features | |
| Current consumption, max/min, A | 1.6 |
| Supply voltage, V, Power consumption, W | DC12V, up to 24W |
| PoE type, Power consumption, W | PoE (IEEE 802.3af/at), up to 20W |
| Protection degree, IPxx | IP66 |
| Operating temperature range, °C | - 40 + 60°C |
| Weight, g | 2600 |
| Dimensions, mm | 152mm (D) x 247m (H) without bracket |



Designation of components



Dimensions, mm



Serial IP camera is designed specifically for security and property protection; it is one of the outstanding digital surveillance products. The camera is equipped with an integrated LINUX operating system, which is a stable software product. Standard video compression format H.264MP and audio compression G.711A format is implemented, providing a high-quality image, small number of errors when encoding a video frame. TCP/IP technology is used, providing proper communication for the telecommunication network. IPC

(IP camera) may be used as part of a network security system (real-time surveillance). It provides good communication in the telecommunications network with professional video surveillance software. The IP camera is able to operate individually. It is used for all types of communication, required to carry out remote monitoring.

The camera housing has an IP54 protection standard, and is able to provide reliable protection against all weather conditions.



PTZ IP-CAMERA

Falcone



Operation under the influence of
ionizing radiation

with a dose rate of up to 5×10^3 rad/h
and integral dose of up to 10^5 rad.



Technical characteristics

| | |
|---|---|
| Camera | Falcone |
| Matrix type | 1 / 1.8-inch CMOS sensor |
| Processor | Sony STARVIS |
| Resolution, Mp | 4 Mp |
| Frame size (Pixel) | 4K/1080P |
| Minimum light intensity, Lx | 0.05 Lx (color) / 0.001 Lx (black/white) |
| Backlighting, m | Backlighting (Controllable On/Off) |
| Video codec | H.264/H.265/MJPEG |
| Functions | |
| Day/Night | Selectable/Automatic |
| Automatic gain control | AGC, 8x~64x |
| White-balance | AWB. MWB (from 0 to 255 by R and B channels). Presets 5 pcs |
| Lens, PTZ | |
| Focal distance, mm | 4.7 - 94 with autofocusing |
| Lens mount | Integrated |
| Optical / Digital Zoom, X | 30X |
| Aperture control | Automatic |
| Angle of view | Horizontal 51.1°~2.84°, Vertical 38.6°~2,14° |
| Tilt Speed, deg/s | 0.02-40 |
| Turning rate, deg/s | 0.02-300 |
| Turning angle, deg. | 360 |
| Tolt angle, deg. | 90 |
| Number of presets, pcs | 220 |
| Patrolling route | 3 route up to 16 points (pan-scan available) |
| General features | |
| Current consumption, max/min, A | 1.6 |
| Supply voltage, V, Power consumption, W | DC12V, up to 80W |
| Type | PoE (IEEE 802.3af/at), hybrid |
| Protection degree, IPxx | IP66 |
| Operating temperature range, °C | - 60 + 120°C |
| Weight, g | 13500 |
| Dimensions, mm | 200mm (D) x 230m (H) without bracket |

Scope

- ▶ Visual inspection/control of reactor equipment, steam generators, storage pools, radioactive waste repositories with high measurement accuracy of +/- 0.1 mm.
- ▶ Work under water at a depth of up to 50 meters.
- ▶ Operating temperature range without heating/cooling system from -30°C to +70°C, with a climate adjustment system – from 60°C to +120°C.

Mounting

Video camera is used both in stationary systems and mobile complexes using self-contained power. The video complex may be integrated without limitations in general industrial communication and control systems of third-party manufacturers.

Housing

The housing is made of stainless steel 08X18H10T, providing high resistance to aggressive operation environment. The camera surface is easily deactivated.

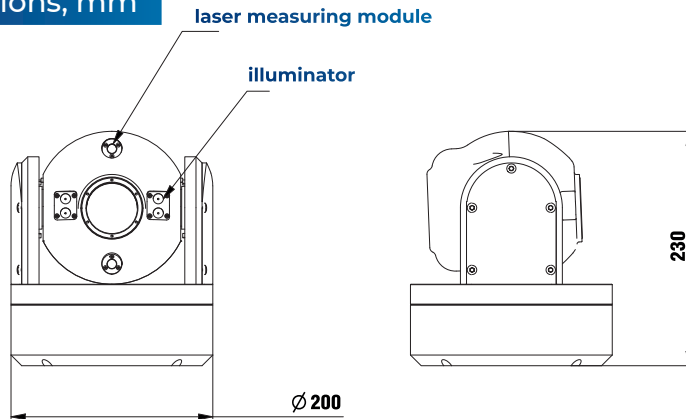
Light

Maximum light flux 4000Lm. The power of the illuminator has a wide adjustment range from 0 m to 200 m.

Automation

The system detects the presence of a person in the frame and independently accompanies him by means of a guidance device.

Dimensions, mm



PTZ IP-CAMERA

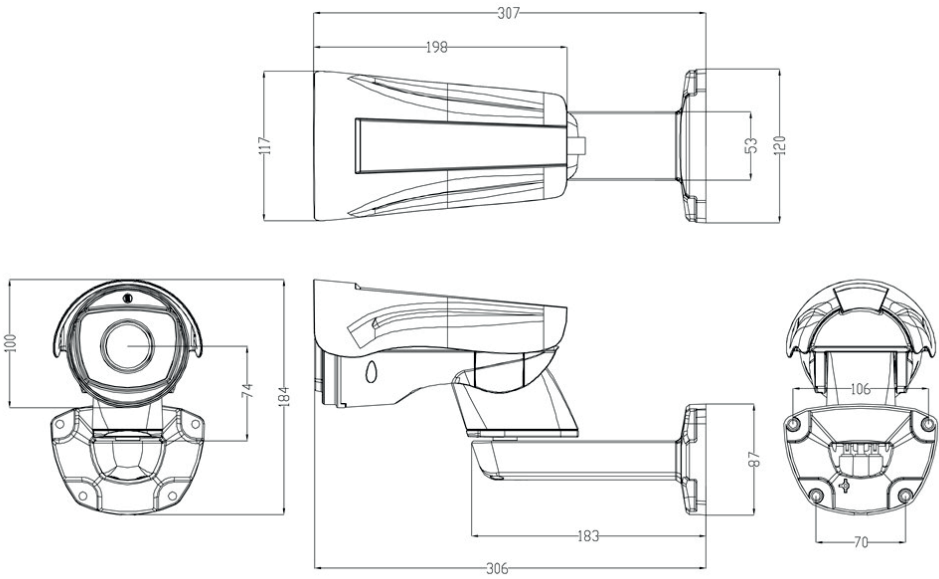
Visco West-E PTZ



Technical characteristics

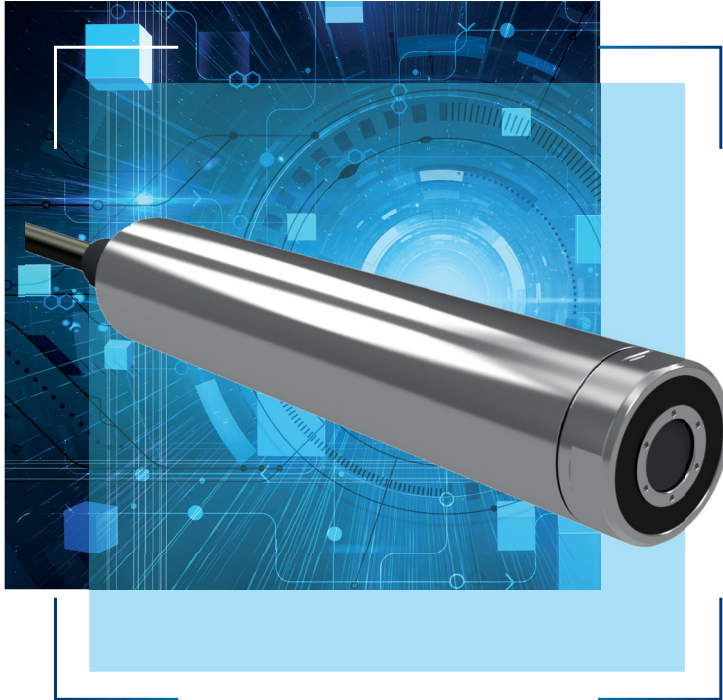
| | |
|-----------------------------------|---|
| Camera | Visco West-E PTZ |
| Resolution | 5Mp |
| IP video camera processor | Hi3516E |
| Matrix | 1/2.8" SONY STARVIS IMX335 |
| Video compression standard | H.265, H.264, MJPEG |
| Sensitivity | contrast, saturation, brightness, mirroring, white balance, FLK, configurable via software or browser |
| Signal-to-noise ratio | ≥50 dB |
| Preset view points | 220 |
| Patrolling | 3 route rounds, up to 16 points in the route |
| Turning range | 0° ~ 200° |
| Turning rate | 30 °/s |
| Tilt range | 0° ~ 200° |
| Tilt rate | 25 °/s |
| Focal distance | Motorized 2.8-12 mm (×4) with automatic iris control, autofocus, angle of view remote control |
| Optical magnification | ×4 |
| IR illumination | 50 m, automatic control |
| «Day/Night» mode | mechanical IR filter (ICR) |
| Motion detector | Yes, 16×12 areas |
| Private areas | 4 areas, adjustable |
| Functions | DWDR, 3D DNR, BLC |
| Network interface | 1 RJ45 (moisture-proof) 10M/100M Ethernet |
| LAN/WAN connection | static IP address, DHCP, P2P cloud service (P6SLite) |
| Protocols | TCP/IP, HTTP, HTTPS, UDP, DHCP, DNS, DDNS, RTP, RTSP, ARP, NTP, SMTP, IGMP, P2P |
| PoE (Power over Ethernet) support | Yes, IEEE 802.3af |
| Network storage | NVR, CMS, NAS, Web |
| Compatibility | ONVIF 2.4 (Profile S) |
| Operation conditions | 40 ... +60 °C |
| Protection class | IP66 |
| IP video camera power supply | DC12B±10% / 1,5A, PoE (802.3af) |
| Power consumption | 15 W |
| IP video camera dimensions | 137 x 130 x 265 mm |
| Weight (netto) | 1.32 kg |
| IP video camera housing | metal |

Dimensions, mm



IP-CAMERA

Inspector 60

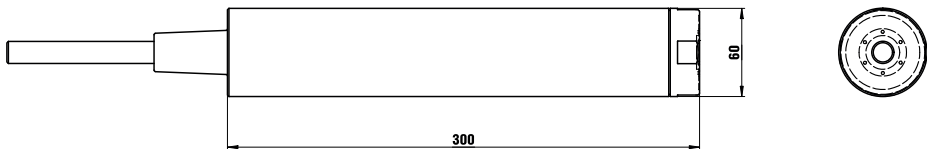


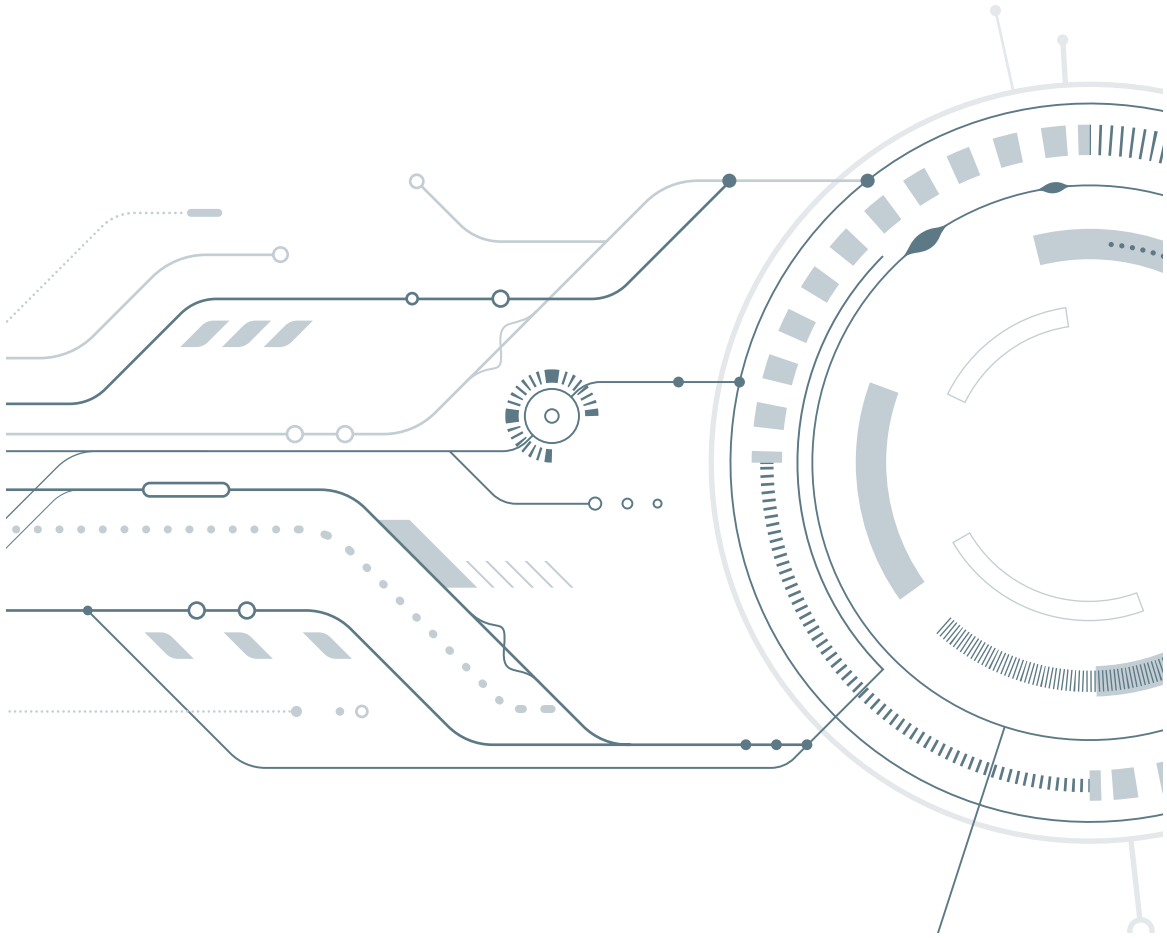
The network IP camera has small dimensions for its protection class, only 60 mm in diameter and with the length of 310 mm, it is provided with a protection from ionizing radiation 10^6 Rad/h and integral absorption dose of 2×10^8 Rad.

Technical characteristics

- ▶ The video camera is based on a vidicon;
- ▶ Video frame resolution is 600 lines;
- ▶ The housing provides operation at a depth of up to 300 meters under water;
- ▶ High sensitivity of the camera and powerful luminous flux from the integrated illuminator will provide a high-quality video image in complex shooting modes;
- ▶ The scope of delivery may include different tips for the provision of required viewing angles (90 deg, 45 deg, 15 deg);
- ▶ The housing is made of stainless steel 08X18H10T, providing high resistance to aggressive operation environment. The camera surface is easily deactivated;
- ▶ The distance to the subject is from 10 mm ad inf.;
- ▶ Temperature mode - from -30°C to +70°C;
- ▶ The system provides various integration into the complex control systems, and there is also a mobile version with self-contained power.

Dimensions, mm







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