

Pelco understands that information is critical to success, which is why we are singularly focused on the development of video surveillance and security solutions that provide you the information necessary to make real-time, business-enabling decisions. From the recently introduced VideoXpert video management platform to our industry-leading selection of IP cameras and accessories, Pelco is committed to designing and delivering a broad range of high-quality, IP video security products and systems complemented with an unparalleled level of customer support and services.

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**NETWORK DOME CAMERA - ENVIRONMENTAL**

**DIVISION 28 – ELECTRONIC SAFETY AND SECURITY**

**28 20 00 Video Surveillance**

**28 21 00** **Surveillance Cameras**

 **28 21 13 IP Cameras**

**Notes to Specifier:**

1. Where several alternative parameters or specifications exist, or where, the specifier has the option of inserting text, such choices are presented in **<bold text>.**

2. Explanatory notes and comments are presented in **colored** text.

**NETWORK DOME CAMERA - ENVIRONMENTAL**

1. **GENERAL**
	1. **SUMMARY**
		1. Section includes a high-speed network dome camera, environmentally hardened, for in-ceiling or pendant mount.
		2. Product – A 2 MP or 4K high-speed network dome camera supporting H.264, H.265, and MJPEG compression, meeting Type 4X, IP66, and IP67 standards.

## Related Requirements

* + - 1. 27 15 00 Communications Horizontal Cabling
			2. 27 20 00 Data Communications
			3. 28 05 00 Common Work Results for Electronic Safety and Security
			4. 28 06 20 Schedules for Video Surveillance
			5. 28 16 15 Access Control Interfaces to Video Surveillance
			6. 28 23 00 Video Management System
			7. 28 31 31.15 Intrusion Detection Interfaces to Video Surveillance
			8. 28 51 15.13 Information Interfaces to Video Surveillance Systems
	1. **REFERENCES**
		1. Abbreviations
			1. API – Applications Programming Interface
			2. AWB - Automatic White Balance
			3. CBR – Constant Bit Rate
			4. CVBR – Constrained Variable Bit Rate
			5. DHCP - Dynamic Host Configuration Protocol
			6. DNR – Digital Noise Reduction
			7. DNS - Domain Name Server
			8. EAP – Extensible Authentication Protocol
			9. fps - frames per second
			10. FTP - File Transfer Protocol
			11. HTTP - Hypertext Transfer Protocol
			12. HTTPS – Secure Hypertext Transfer Protocol
			13. IGMP - Internet Group Management Protocol
			14. IP - Internet Protocol
			15. IR – InfraRed
			16. JPEG - Joint Photographic Experts Group
			17. MP - Megapixel
			18. MJPEG - Motion JPEG
			19. NTCIP – National Transportation Communications for ITS Protocol
			20. NTP - Network Time Protocol
			21. PoE - Power over Ethernet
			22. QoS – Quality of Service
			23. RTP - Real-Time Transport Protocol
			24. RTSP - Real-Time Streaming Protocol
			25. SMTP - Simple Mail Transfer Protocol
			26. SNMP – Simple Network Management Protocol
			27. SNR – Signal to Noise ratio
			28. SSL – Secure Sockets Layer
			29. TCP - Transmission Control Protocol
			30. UDP - User Datagram Protocol
			31. UPnP – Universal Plug and Play
			32. VBR – Variable Bit Rate
			33. VMS - Video Management System
			34. WDR – Wide Dynamic Range
		2. Reference Standards
			1. Network
				1. IEEE

802.3 Ethernet Standards

802.1x – Port-based authentication

* + - 1. Video
				1. ITU H.265
				2. ISO / IEC 14496 –10, MPEG-4 Part 10 (ITU H.264)
				3. ISO / IEC 10918 – JPEG
				4. NTCIP 1205 – Object Definitions for Closed Circuit Television (CCTV) Control
				5. ONVIF – Profile S, Profile G, Profile T
			2. EMC and Safety
				1. FCC (Class A) – 47 CFR Part 15
				2. CE – EN 55032 (Class A), EN 50130-4, EN 60950-1, EN 62368-1
				3. ICES-003 (Class A)
			3. Environmental Models
				1. IEC 60529 – Degrees of Protection Provided by Enclosures – IP66, 67
				2. IK10 (20J) Impact Resistance / IEC 62262
				3. UL 50E—Type 4X
				4. NEMA TS2 para 2.2.7-2.2.9
	1. **SUBMITTALS**
		1. Informational Submittals
			1. Product Data
				1. Manufacturer’s printed or electronic data sheets
				2. Manufacturer’s installation and operation manuals
				3. Warranty documentation
			2. Password assignment plan
			3. Manufacturers Cyber Hardening Guidelines.
			4. Shop Drawings
		2. Closeout Submittals
			1. Final listing of devices and settings
			2. System test results
			3. Statement of compliance with Manufacturer Cyber Hardening Guidelines.
	2. **QUALIFICATIONS**
		1. Manufacturer shall have a minimum of five years’ experience in producing IP video equipment.
		2. Installers shall be trained and authorized by the Manufacturer to install, integrate, test, and commission the system.
	3. **DELIVERY, STORAGE AND HANDLING**
		1. Deliver the camera in the manufacturer’s original, unopened, undamaged container with identification labels intact.
		2. Store the camera in a temperature environment protected from mechanical and environmental conditions as designated by the manufacturer.
	4. **WARRANTY AND SUPPORT**
		1. Manufacturer shall provide a limited 3-year warranty for the product to be free of defects in material and workmanship.

END OF SECTION

1. **PRODUCTS**
	1. **EQUIPMENT**
		1. Manufacturer: Pelco, Inc.

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* + 1. Product Models:
			1. In-Ceiling: S7230L-YB0, S7230L-YB1 (2 MP), S7818L-YB0, S7818L-YB1 (4K)
			2. Pendant: S7230L-EW0, S7230L-EW1 (2 MP) (white back box); S7818L-EW0, S7818L-

EW1 (4K) (white back box)

S7230L-EB0, S7230L-EB1 (2 MP) (black back box); S7818L-EB0, S7818L-EB1 (4K) (black back box)

YB0, EW0, EB0 model have smoked lower domes; YB1, EW1, EB1 models have clear lower domes.

* 1. **GENERAL DESCRIPTION**
		1. The network dome camera (“Camera)” shall be an environmentally hardened dome camera with 2 MP (1920 x 1080) or 4K (3840 x 2160) resolution, designed for in-ceiling or pendant mounting.
		2. The camera shall possess the following primary characteristics:
			1. –51° to 60°C (–59.8° to 140°F) sustained operating temperature
			2. Integral heater and blower
			3. H.264 High, Main, or Base profiles, H.265 Main profile, and MJPEG
			4. Three independent IP video streams
			5. Electronic image stabilization with gyro
			6. Pan and tilt
				1. speeds to 700 degrees per second
				2. closed loop direct drive mechanism
			7. Day/night operation with IR cut filter
			8. Effective Dynamic Range: up to 130 dB
			9. Selectable 3D noise filtering
			10. Power
				1. POE IEEE 802.3bt; 24 VAC; or 48 VDC
				2. power redundancy with PoE and external voltage
			11. Analytics options:
				1. camera sabotage
				2. region-based simple motion detection
				3. abandoned object
				4. adaptive motion
				5. autotracker
				6. directional motion
				7. loitering detection
				8. object counting
				9. object removal
				10. stopped vehicle
			12. Three automatic defog options
			13. Up to 16 window blanking privacy zones
			14. Up to 5 White Balance modes
			15. Multicast capable with unlimited H.264/H.265 viewers
			16. Unicast capable with 2 guaranteed and up to 20 simultaneous viewers
			17. Local SD storage via Micro SD, SDHC or SDXC card, up to 2 TB
			18. Alarm inputs and outputs
	2. **VIDEO/CAMERA**
		1. Imaging Device: 1/2.8 inch (2 MP), 1/1.8-inch (4K)
		2. Imager Type: CMOS
		3. Zoom
			1. Optical: 30X (2 MP), 18X (4K)
			2. Digital: 12X (2 MP), 12X (4K)
		4. Electronic Shutter Range: 1/10,000 to 1 sec (2 MP), 1/10,000 ~ 1 sec (4K)
		5. Minimum illumination @ 33 msec:
			1. Color mode: .02 lux (2 MP), 0.10 lux (4K)
			2. Black & white mode: .013 lux (2 MP), 0.066 lux (4K)
		6. Scanning: Progressive
		7. Image Control Settings
			1. White balance range: 2,000º to 10,000ºK (5 modes)
			2. Privacy zone definition: up to 16 configurable windows of blanking
		8. Lens:
			1. Built-in, varifocal
			2. Focal Length: f/1.6 – f/4.7, 4.3 mm (wide) – 129.0 mm (tele) (2 MP),

f/1.5 ~ f/3.4, focal length 6.36 mm (wide) ~ 138.5 mm (tele) (4K)

* + - 1. Zoom: Remote motorized
			2. Iris: Auto-Iris with manual override
			3. Field of view: 59.8º (wide) – 2.3º (tele) (2 MP), 57.9º (wide) – 3.0º (tele) (4K)
		1. Video:
			1. Streams: Up to three simultaneous

The second and third streams are variable, based on the setup of the primary stream.

* + - 1. Compression type: H.264 High, Main, or Base profiles, H.265 Main profile, and MJPEG
			2. Highest resolutions: 1920 x 1080 (2 MP), 3840 x 2160 (4K)
			3. Bit rate control options:
				1. constant bit rate (CBR)
				2. constrained variable bit rate (CVBR) with configurable maximum value
			4. Frame rate: 1 to 60 fps

Available frame rate dependent upon encoding, resolution, and stream configuration.

* + - 1. ONVIF: Profile S, Profile G, and Profile T conformant
			2. The camera shall provide two basic and eight enhanced user-configurable behaviors, allowing for the set-up of different scenarios for each behavior.

See section 2.02 B 10 for list of supported analytics

* + - 1. The camera shall employ intelligent compression technology to reduce bandwidth and storage requirements, including a mechanism to reduce I-frames in scenes with little motion.
			2. Low resolution JPEG stream for configuration of camera settings.
		1. Storage and Recording
			1. Local SD storage
				1. via Micro SD, SDHC or SDXC card
				2. up to 2 TB
				3. ability to be backed up to alternate media without removal of the SD card from the camera
				4. Local recording shall commence upon loss of network connectivity, continuously or based upon a pre-programmed schedule.
			2. Alarm recording: The camera shall capture selectable 1, 5, or 10 second video clips on camera sabotage, motion detection, or alarm input.
		2. Pan-Tilt
			1. Pan
				1. Manual pan speed: variable, .05° to 100°/sec
				2. Maximum speed: 700°/sec (presets)
			2. Tilt
				1. Vertical tilt: +1° to -90°
				2. Manual tilt speed: variable, .05° to 50°/sec
				3. Maximum speed: 500°/sec (presets)
		3. Presets
			1. Number: 256
			2. Accuracy: +/- .05°
			3. Tours: 32
	1. **ADDITIONAL FEATURES**
		1. Alarm: Detection of open or closed alarm state, supervised or unsupervised
			1. Inputs (4): 3.5 VDC, 3.5 mA maximum
			2. Outputs (2): Relay, +/- 32 VDC, 150 mA maximum
		2. Audio: Bidirectional
			1. Full or half duplex
			2. Input: 3-kohm differential impedance, 1Vp-p maximum signal level
			3. Output: Line level; 600-ohm differential impedance, 1Vp-p
			4. Streaming: embedded audio
		3. System Information
			1. The system settings of the camera shall be exportable as a separate file.
			2. The camera shall maintain an accessible system log.
	2. **NETWORK**
		1. Connectivity: 10/100/1000 BASE-TX Ethernet with RJ-45 connector
		2. Protocols supported
			1. Transmission Control Protocol (TCP), Internet Protocol (IP) v4 and v6, User Datagram Protocol (UDP)
			2. Configuration: Dynamic Host Configuration Protocol (DHCP)
			3. Web services: Hypertext Transfer Protocol (HTTP), Secure HTTP (HTTPS)
			4. Network services: Domain Name System (DNS), Network Time Protocol (NTP), Simple Network Management Protocol (SNMP) v2c/v3, Universal Plug and Play (UPnP)
			5. Media: Real-Time Transport Protocol (RTP), Real-Time Streaming Protocol (RTSP)
			6. Multicast: Internet Group Management Protocol (IGMP)
			7. Notifications: File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP)
			8. Security: Secure Sockets Layer (SSL), IEEE 802.1x (EAP)
			9. Quality of Service (QoS) for Differentiated Services Code Point (DSCP)
			10. NTCIP 1205 (National Transportation Communications for Intelligent Transportation System Protocol)
			11. ICMP: The Internet Control Message Protocol is an internet layer protocol used by network devices to diagnose network communication issues.
			12. ARP: The Address Resolution Protocol (ARP) is a communication protocol used for discovering the link layer address.
		3. Security
			1. Support IP address filtering whereby users can enter a list of allowed or blocked IP addresses for viewing video and configuring camera settings
			2. Support principle of least privilege with four levels of user access with password protection.
			3. Security Access: Password protection, HTTPS, IEEE 802.1X, digest authentication, IP filtering
			4. Support confidentiality—HTTPS uses TLS-based encryption configured for strong cipher suites. Support for either self-signed or external PKI signed digital certificates.
		4. Users
			1. Unicast: 2 guaranteed

Up to 20 simultaneous users depending on resolution settings

* + - 1. Multicast: Unlimited users H.264/H.265
		1. Software Interface: Web browser view and setup
	1. **INTEGRATION AND INTERFACE**
		1. Pelco: VideoXpert; Endura 2.0 (or later); Digital Sentry 7.3 (or later),

Pelco Mobile Application

* + 1. Open API: Third-party VMS through Pelco API, ONVIF Profile S, Profile G,

Profile T

* + 1. Camera Discovery: VX Toolbox
		2. Firmware Upgrade: Web UI or VX Toolbox
		3. Multilingual User Interface: English, French, German, Italian, Portuguese, Russian,

Spanish, Turkish, Korean, Simplified Chinese

* 1. **ELECTRICAL**
		1. Power Input:
			1. 24 VAC
			2. 48 VDC
			3. IEEE 802.3bt PoE, 90 W
		2. Failover – The camera, if powered by both PoE and external AC or DC power, shall automatically switch to external power upon loss of network provided power.
		3. Maximum Power Consumption:
			1. 24 VAC: 2A (30 VA) maximum without heater; 4.8A (71 VA) maximum with heater
			2. 48 VDC: 1A (40 W) maximum without heater; 1.9A (80 W) maximum with heater
			3. PoE 802.3bt): .7 A (32 watts) maximum without heater; 1.3 A (70 watts) maximum with heater
	2. **MECHANICAL AND ENVIRONMENTAL**
		1. Construction Material: Aluminum; polycarbonate bubble (2 MP) or nylon bubble (4K)
		2. Dome color options: Smoked, clear

Note: smoked bubble creates .5 dB light loss.

* + 1. Finish options: White back box, black trim ring (Pendant, Environmental 2 MP and 4K),

Black back box, black trim color (In-ceiling, Environmental 2 MP and 4K),

Black back box, black trim color (Pendant, Environmental 2 MP and 4K)

* + 1. Impact Resistance: IK10 (20J)
		2. Dimensions (D x H):
			1. In Ceiling (2 MP): 22 cm (8.66 in) x 23.9 cm (9.4 in)

Exposed height: 14.7 cm (5.8 in)

* + - 1. In Ceiling (4K): 22 cm (8.66 in) x 25.22 cm (9.93 in)

Exposed height: 16.03 cm (6.31 in)

* + - 1. Pendant (2 MP): 22.8 cm (9.0 in) x 27.4 cm (10.8 in)

Exposed height: 9.86 cm (3.88 in)

* + - 1. Pendant (4K): 22.76 cm (8.96 in) x 28.73 cm (11.31 in)

Exposed height: 11.23 cm (4.42 in)

* + 1. Cable Entry:
			1. In Ceiling: .75 inch conduit fitting
			2. Pendant: through 1.5 inch NPT pendant mount
		2. Temperature:
			1. Sustained Operating: –51° to 60°C (–59.8° to 140°F)
			2. Storage: -20°C to 65ºC (-4°F to 149ºF)
		3. Operating Humidity: 10 to 100% RH
		4. Ingress Protection: IP66, IP67, Type 4X
		5. Mounting: In-ceiling or pendant

Pendant mount options include wall mount, parapet wall/roof mount, compact wall mount.

See Section 2.01 B for model numbers.

END OF SECTION

1. **EXECUTION**
	1. **INSTALLERS**
		1. Contractor personnel shall comply with all applicable state and local licensing requirements.
	2. **PREPARATION**
		1. The network design and configuration shall be verified for compatibility and performance with the camera(s).
		2. Network configuration shall be tested and qualified by the Contractor prior to camera installation.
		3. Before permanent installation of the system, the Contractor shall test the system in conditions simulating the final installed environment.
	3. **INSTALLATION**
		1. The contractor shall follow all Manufacturer-published guidance on proper installation, configuration and cyber hardening of the installed cameras.
		2. The Contractor shall test the system in conditions simulating the final installed environment
		3. Reports:
			1. System test results
			2. System network addressing and device settings
	4. **STORAGE**
		1. Products shall be stored in an environment where temperature and humidity are in the range specified by the Manufacturer.

END OF SECTION