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**Product Guide Specification**

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, based on *MasterFormat 2004* and *The Project Resource Manual—CSI Manual of Practice. The Manufacturer is responsible for technical accuracy.*

The section must be carefully reviewed and edited by the Architect or Engineer to meet the requirements of the project and local building code. Words and sentences within brackets [ ] are choices to include or exclude a particular item or statement. Coordinate this section with other specification sections and the Drawings. Delete all “Specifier Notes” after editing this section.

**SECTION 28 23 29**

**VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS**

**Bosch FLEXIDOME IP panoramic 6000 IC indoor camera**

1. **– GENERAL**
	1. SUMMARY
		1. Section Includes
			1. Video Surveillance Remote Devices.
		2. Related Sections
			1. Section [28 23 13 – Video Surveillance Control and Management Systems].
			2. Section [28 23 16 – Video Surveillance Monitoring and Supervisory Interfaces].
			3. Section [28 23 19 – Digital Video Recorders and Analog Recording Devices].
			4. Section [28 23 23 – Video Surveillance Systems Infrastructure].

\*\*\*\*\*\*\*\*\*\*Specifier’s note: Include those standards referenced elsewhere in this SECTION.

* 1. REFERENCES

| **Standards** |  |
| --- | --- |
| Emission  | EN 50121-4:2006, +AC:2008; EN 55022: 2010, +AC (2011), Class B; CFR 47 FCC part 15:2012-10-1, Class B;  |
| Immunity  | EN 50121-4:2006, +AC:2008; EN 50130-5:2011\* |
| Safety | EN 60950-1:2006, +A11:2009, +A1:2010, +A12:2011, AC:2011; UL 60950-1, 2nd edition:2011; CAN/CSA-C 22.2 No. 60950-1-07, 2nd edition |
| Environmental tests | EN 50130-4:2011, Class II (Indoor in general, fixed equipment), Alarm systems - Part 5: Environmental test methods |
| Environmental | EN 50581 (2012) |
| Marks | CE, cULus, WEEE, PADS, RCM and China RoHS |

\* All systems where this camera is used must comply with this standard as well.

* 1. DEFINITIONS
		1. Sensitivity: refers to the minimum level of light the sensor needs to generate an acceptable video picture, and is measured in lux.
		2. Day/Night (infrared sensitive): The camera has normal color operation in situations where there is sufficient illumination (day conditions), but when there is little light available (night conditions) the sensitivity is increased.
		3. IDNR (Intelligent Dynamic Noise Reduction): The intelligent Dynamic Noise Reduction applies temporal noise filtering when no motion is detected. The filtering reduces the noise in the image and this makes the encoder step more effective.
		4. Dewarping: dewarping software transforms the circular image from a panoramic lens into several different distortion-free rectangular views.
	2. SYSTEM DESCRIPTION
		1. Video Surveillance Remote Devices
			1. NFN-60122-F1 FLEXIDOME IP panoramic 6000 IC camera 180°lens
			2. NFN-60122-F0 FLEXIDOME IP panoramic 6000 IC camera 360°lens
		2. Performance Requirements
			1. 1/2.3-inch CMOS HD with progressive scan.
			2. 180° or 360° panoramic coverage.
			3. 12MP / 30 fps sensor for fine details with smooth motion.
			4. Edge or client-side dewarping for easy integration.
			5. Full resolution circular image recording.
			6. DORI (Detect, Observe, Recognize, Identify) coverage.
			7. Essential Video Analytics on full panoramic overview.
			8. Discreet and aesthetic in-ceiling design.
			9. Easily painted for unobtrusive installation
			10. Local storage with SD card.
			11. Intelligent dynamic noise reduction to reduce bitrate by up to 50%.
			12. ONVIF conformant.
	3. SUBMITTALS
		1. Submit under provisions of Section [01 33 00].
		2. Product Data:
			1. Manufacturer’s data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.
		3. Shop Drawings; include
			1. System device locations on architectural floor plans.
			2. Full Schematic of system, including wiring information for all devices.
		4. Closeout Submittals
			1. User manual.
			2. Parts list.
			3. System device locations on architectural floor plans.
			4. Wiring and connection diagram.
			5. Maintenance requirements.
	4. QUALITY ASSURANCE
		1. Manufacturer:
			1. Minimum of [10] years experience in manufacture and design Video Surveillance Devices.
			2. Manufacturer’s quality system: Registered to ISO 9001 Quality Standard.
		2. Video Surveillance System
			1. Listed by [UL] [EN] [FCC] specifically for the required loads. Provide evidence of compliance upon request.
		3. Installer:
			1. Minimum of [5] years experience installing Video Surveillance Systems.
	5. DELIVERY, STORAGE AND HANDLING
		1. Comply with requirements of Section [01 60 00].
		2. Deliver materials in manufacture’s original, unopened, undamaged containers; and unharmed original identification labels.
		3. Protect store materials from environmental and temperature conditions following manufacturer’s instructions.
		4. Handle and operate products and systems according to manufacturer’s instructions.
		5. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.
	6. WARRANTY
		1. Provide manufacturer’s warranty covering [3] years for replacement and repair of defective equipment.
	7. MAINTENANCE
		1. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.
		2. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.
1. **– PRODUCTS**
	1. MANUFACTURERS
		1. Acceptable Manufacturer:

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* + 1. Substitutions: [Not permitted.] [Under provisions of Division 1.]
			1. [All proposed substitutions must be approved by the Architect or Engineer professional.]
			2. [Proposed substitutions must provide a line-by-line compliance documentation.]

\*\*\*\*\*\*\*\*\*\*Specifier’s note: Select Camera System Series based on project requirement.

* 1. FLEXIDOME IP panoramic 6000 IC camera
	[NFN-60122-F0], [NFN-60122-F1]
		1. General Characteristics:
			1. The camera shall offer full 180° or 360° panoramic surveillance with complete area coverage, fine details and high speeds (12MP @ 30 fps sensor).
			2. The camera shall offer full situational awareness and simultaneous E-PTZ views.
			3. The camera shall provide edge or client-side dewarping for easy integration.
			4. The camera shall use the DORI (Detect, Observe, Recognize, Identify) standard system (EN-62676-4) to distinguish persons or objects within a covered area.
			5. The camera shall utilize Intelligent Dynamic Noise Reduction technology to remove noise artifacts and reduce the bitrate by up to 50% (giving reduced bandwidth and storage requirements).
			6. The camera shall provide direct network connection using H.264 and JPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
			7. The camera shall work with Power over Ethernet IEEE 802.3af (802.3at type 1) for indoor applications with a compliant power supply source.
			8. The camera shall support AutoMDIX.
			9. The camera shall conform to the ONVIF Profile S specification.
			10. A user shall be able to view video on a PC using a Web browser, with the Bosch Video Management System, Bosch Video Client or Bosch Video Security Client.
			11. The camera shall have an Essential Video Analytics system that provides video content analysis.
			12. The camera shall provide configurable scene modes that give optimized settings for distinct applications.
			13. The camera shall provide eight independent, fully programmable privacy mask areas.
			14. The camera shall utilize pixel-by-pixel analysis to automatically compensate for bright areas of a high contrast scene without having to define a window or area.
			15. The camera shall be easily painted for unobtrusive installation.
			16. The camera shall have a discreet and aesthetic in-ceiling design.
		2. Image processing and compression
			1. The camera shall use a 1/2.3-inch CMOS image sensor.
			2. The camera shall offer a video resolution of 8MP @30fps sensor [NFN-60122-F1] and 7MP @30fps sensor [NFN-60122-F0].
			3. The camera shall use 2640 x 2640 sensor pixels [NFN-60122-F0] or 3648 x 2160 sensor pixels [NFN-60122-F1].
			4. The camera shall be fitted with a 1.6 mm, F2.8 lens with a view angle of 360° [NFN-60122-F0] or a 2.1 mm, F2.8 lens with a view angle of 180° [NFN-60122-F1].
			5. The camera shall have a dynamic range of 92 dB.
			6. The camera shall offer a minimum sensitivity of 0.55 lx in color and 0.18 lx in mono [NFN-60122-F0] or 0.46 lx in color and 0.15 lx in mono [NFN-60122-F1].
			7. The camera automatic electronic shutter shall offer a shutter speed of 1/30 to 1/15000.
			8. The camera shall be capable of capturing and storing images using the following compression standards:
				1. H.264 MP (Main Profile)
				2. M-JPEG
		3. Network Video
			1. The camera shall provide direct network connection.
			2. The camera shall allow full camera control and configuration capabilities over the network.
			3. The camera shall be capable of capturing and storing images using the following compression standards:
				1. H.264 MP (Main Profile)
				2. M-JPEG
			4. The camera shall deliver video, at rates up to 12 images per second, over a 10/100 Base-T, auto-sensing, half/full duplex, RJ45 Ethernet connection.
			5. The camera shall comply with the IEEE 802.3af Power over Ethernet standard.
			6. The camera shall conform to the ONVIF Profile S standard.
		4. Image Posting
1. The camera shall offer periodic JPEG image posting to an FTP server or a Dropbox account.
2. The camera shall offer best face detection and JPEG best face image posting to an FTP server or to a Dropbox account.
	* 1. Access Security
			1. The camera shall offer three levels of password protection.
			2. The camera shall support 802.1x authentication using a RADIUS (Remote Authentication Dial In User Service) server.
			3. The camera shall store an SSL certificate for use with HTTPS.
			4. The camera shall be capable of being independently AES encrypted with 128-bit keys.
		2. Recording and Storage Management
			1. The camera shall support iSCSI devices to allow video stream to be recorded directly to an iSCSI RAID array.
			2. The camera shall support iSCSI storage targets to enable the camera to function as a conventional DVR.
			3. The camera shall have an SD card slot that uses standard, off-the-shelf SD cards for local storage (up to 2 TB).
			4. The local storage feature shall be capable of storage for Automatic Network Replenishment (ANR).
			5. Local Recording: Continuous recording, ring recording, alarm/events/schedule recording.
		3. Alarm Handling Features:
			1. The camera shall provide the capability on alarm to display up to a 31 character, programmable alarm message.
			2. The camera shall provide email alarm messaging with optional JPEG posting.
		4. Embedded Video Content Analysis
			1. The camera shall be VCA enabled.
			2. The camera shall be capable of processing and analyzing video within the camera itself, with no extra hardware required.
			3. The camera shall be capable of detecting and sending alarms for abnormal events.
			4. The camera shall allow users to set up to 10 separate profiles and switch profiles based on a day/night or holiday schedules.
			5. The camera shall offer Essential Video Analytics that uses an Intelligent tracker to follow objects within the defined regions of interest.
			6. The camera video motion analysis that uses an algorithm based on pixel change and includes object size filtering and tamper-detection capabilities.
		5. Electrical
			1. The camera shall accept Power over Ethernet (48 VDC nominal).
			2. The camera shall conform to the IEEE 802.3af (802.3at Type 1) compliant Power over Ethernet network. Power level: Class 1.
			3. The camera shall consume typically 140 mA.
		6. Surveillance Software
			1. The camera shall be accessible from a web browser, with the Bosch Video Management System, with the free-of-charge Bosch Video Client or Video Security Client, or via third-party software.
			2. The camera shall be accessible from the Bosch Security System mobile app.
		7. Environmental
			1. The camera shall operate in a -20°C to +40°C (-4°F to 104°F) temperature range.
		8. Technical Specifications

| **Power** |
| --- |
| Power Supply | Power-over-Ethernet 48 VDC nominal |
| Power Consumption | 140 mA |
| PoE  | IEEE 802.3af (802.3at Type 1)  |

| **Sensor** |
| --- |
| Type | 1/2.3‑inch CMOS |
| Total sensor pixels  | 12MP |
| Used pixels (180° version) | 3648 x 2160 (8MP) |
| Used pixels (360° version) | 2640 x 2640 (7MP) |

| **Video performance – Sensitivity – 360° lens** |
| --- |
| (3100K, reflectivity 89%, F2.8, 30IRE) |
| Color | 0.55 lx  |
| Mono  | 0.18 lx  |

| **Video performance – Sensitivity – 180° lens** |
| --- |
| (3100K, reflectivity 89%, F2.8, 30IRE) |
| Color | 0.46 lx  |
| Mono  | 0.15 lx  |

| **Video performance – Dynamic range** |
| --- |
| Dynamic range | 92 dB WDR (+16 dB with IAE) |

| **Video streaming** |
| --- |
| Video compression | H.264 (MP); M- JPEG |
| Streaming | Multiple configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth. Multiple channels with edge dewarping. Regions of Interest (ROI) |
| Overall IP Delay | Min. 120 ms, Max. 340 ms |
| Encoding interval | 1 to 25 [30] ips |
| Encoder regions | Eight independent areas for setting encoder quality to optimize bitrate. |

| **Video resolution (H x V) – 180° version** |
| --- |
| Video 1 channel | Image circle  | 3640 x 2160 |
| Video 2 channel | Panoramic | 2688 x 800 |
|  | E-PTZ | 2048 x 1152 |
|  | Corridor | 1600 x 1200 |
| Video 3 channel | E-PTZ | 1280 x 720 |

| **Video resolution (H x V) – 360° version** |
| --- |
| Video 1 channel | Full image circle  | 2640 x 2640 |
| Video 2 channel | Full panoramic | 3584 x 504 |
|  | E-PTZ | 1536 x 864 |
|  | Quad | 1536 x 864 |
|  | Panoramic | 2688 x 800 |
|  | Double panoramic | 1920 x 1080 |
|  | Corridor | 1600 x 1200 |
| Video 3 channel | E-PTZ | 1280 x 720 |

| **Video functions** |
| --- |
| Day/Night | Color, Monochrome, Auto (adjustable switchover points) |
| Adjustable picture settings | Contrast, Saturation, Brightness |
| White Balance | 2500 to 10000K, 4 automatic modes (Basic, Standard, Sodium vapor, Dominant color), Manual mode and Hold mode |
| Shutter  | Automatic Electronic Shutter (AES)Fixed (1/30 [1/25] to 1/15000) selectableDefault shutter |
| Sharpness  | Sharpness enhancement level selectable |
| Backlight compensation  | Off / On  |
| Contrast enhancement  | On/off |
| Noise reduction  | Intelligent Dynamic Noise Reduction with separate temporal and spatial adjustments |
| Intelligent defog | Intelligent Defog automatically adjusts parameters for best picture in foggy or misty scenes (switchable)  |
| Exposure region | Multiple selectable regions |
| Privacy Masking | Eight independent areas, fully programmable |
| Video Motion Analysis | Essential Video Analytics  |
| Pre-positions | Six independent sectors |
| Display stamping | Individual names and stamps for all video channels |
| Other functions | Pixel counter, Video watermarking, Location |

| **Optical** |
| --- |
| Lens (180° version) | 2.1 mm fixed-focus lens (IR corrected), F2.8 |
| Lens (360° version) | 1.6 mm fixed-focus lens (IR corrected), F2.8 |
| Lens mount  | Board mounted |
| Iris control | Fixed iris  |
| Field of view (180° version) | 180° (H) x 93° (V) |
| Field of view (360° version) | 180° (H) x 180° (V) |
| Minimum object distance | 0.1 m |
| Day/Night | Switched mechanical IR filter |

| **Local storage** |
| --- |
| Internal RAM | 10 s pre-alarm recording |
| Memory card slot | Supports up to 32 GB SDHC / 2 TB SDXC card. (An SD card of Class 6 or higher is recommended for HD recording) |
| Recording | Continuous recording, ring recording. alarm/events/schedule recording |

| Software |
| --- |
| Unit discovery | IP Helper |
| Unit configuration | Via web browser or Configuration Manager |
| Firmware update | Remotely programmable |
| Software viewing | Web browser;Video Security Client;Video Security App;Bosch Video Management System;Bosch Video Client;or third party software |
| Latest firmware and software | http://downloadstore.boschsecurity.com/ |

| **Network** |
| --- |
| Protocols | IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, ICMPv6, RTSP, FTP, Telnet, ARP, DHCP, APIPA (Auto-IP, link local address), NTP (SNTP), SNMP (V1, MIB-II), 802.1x, DNS, DNSv6, DDNS (DynDNS.org, selfHOST.de, no-ip.com), SMTP, iSCSI, UPnP (SSDP), DiffServ (QoS), LLDP, SOAP, Dropbox, CHAP, digest authentication |
| Encryption | TLS 1.0, SSL, DES, 3DES |
| Ethernet | 10/100 Base-T, auto-sensing, half/full duplex  |
| Connectivity | Auto-MDIX |
| Interoperability | ONVIF Profile S;GB/T 28181 |

| **Mechanical** |
| --- |
| Dimensions camera | Ø195 x 68.2 mm (7.68 x 2.68 in) |
| Dimensions flush profile | Ø195 x 7 mm (7.68 x 0.28 in) |
| Weight  | 761 g (1.68 lb)  |

| **Environmental** |
| --- |
| Operating Temperature  | -20°C to +40°C (-4°F to 104°F) |
| Storage Temperature | -20°C to +60°C (-4°F to 140°F) |
| Operating humidity | 20% to 93% RH |
| Storage humidity | up to 98% RH |

* 1. ACCESSORIES
		1. Mounting

VDA-PLEN-DOME In-ceiling Housing for Plenums

1. **– EXECUTION**
	1. EXAMINATION
		1. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
		2. Do not begin installation until unacceptable conditions are corrected.
	2. PREPARATION
		1. Protect devices from damage during construction.
	3. INSTALLATION
		1. Install devices in accordance with manufacturer’s instruction at locations indicated on the floor drawings plans.
		2. Ensure selected location is secure and offers protection from accidental damage.
		3. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.
	4. FIELD QUALITY CONTROL
		1. Test snugness of mounting screws of all installed equipment.
		2. Test proper operation of all video system devices.
		3. Determine and report all problems to the manufacturer’s customer service department.
	5. ADJUSTING
		1. Make proper adjustment to video system devices for correct operation in accordance with manufacturer’s instructions.
		2. Make any adjustment of camera settings to comply with specific customer’s need.
	6. DEMONSTRATION
		1. Demonstrate at final inspection that video management system and devices function properly.

END OF SECTION