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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 5000 MP 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** |  |
| --- | --- |
| Conformity | 2004/108/EC (EMC)  2006/95/EC (LVD)  2011/65/EU |
| Emission | EN 55022: 2010, +AC (2011)  CFR 47 FCC part 15:2012-10-1, Class B  AS/NZS CISPR 22:2009 + A1 (2010) |
| Immunity | EN 50121-4:2006, +AC:2008  EN 50130-4:2011\* |
| 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 50130-5:2011, Class II (Indoor in general, fixed equipment), Alarm systems - Part 5: Environmental test methods |
| Environmental | EN 60950-22 outdoor UL;  EN 55024;  VCCI J 55022 V2/V3;  ICES-003 Class B;  EN 50132-5-2;  IEC 62676-2-3;  EN 50581 (2012) |
| Marks | CE, cULus, WEEE, RCM and China RoHS |

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

Outdoor version (with surface mount box)

|  |  |
| --- | --- |
| Ingress protection | IP66 |
| Impact protection | IK10 |

* 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.
  2. SYSTEM DESCRIPTION
     1. Video Surveillance Remote Devices
        1. NUC-52051-F0 FLEXIDOME IP panoramic 5000 MP camera
        2. NUC-52051-F0E FLEXIDOME IP panoramic 5000 MP camera
     2. Performance Requirements
        1. 1/2.3-inch CMOS HD with progressive scan.
        2. 180° or 360° panoramic coverage.
        3. 5MP / 15 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. Motion+ basic video motion analysis.
        8. Discreet and aesthetic, low-profile design.
        9. Easy installation with pre-assembled surface mount bracket.
        10. Local storage with SD card.
        11. Intelligent dynamic noise reduction to reduce bitrate by up to 50%.
        12. ONVIF conformant.
        13. Outdoor version (IK10 and IP66 rated)
  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 5000 MP camera  
     [NUC-52051-F0], [NUC-52051-F0E]
     1. General Characteristics:
        1. The camera shall offer full 180° or 360° panoramic surveillance with complete area coverage, fine details and high speeds (5MP @ 15 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-50123-7) 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 provide MOTION+ for video content analysis.
        12. The camera [NUC-52051-F0] shall be supplied with a surface mount box (SMB) for easy indoor installation.
        13. The camera [NUC-52051-F0E] shall be supplied with an outdoor surface mount box (SMB) for easy outdoor installation.
        14. The camera shall provide configurable scene modes that give optimized settings for distinct applications.
        15. The camera shall provide eight independent, fully programmable privacy mask areas.
        16. 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.
        17. The camera shall have a discreet, low-profile, aesthetic design.
     2. Image processing and compression
        1. The camera shall use a 1/3-inch CMOS image sensor.
        2. The camera shall offer a video resolution of 5MP @15fps sensor.
        3. The camera shall offer 1792 x 1792 sensor pixels.
        4. The camera shall be fitted with a lens with a view angle of 360°.
        5. The camera shall have a dynamic range of 81 dB WDR.
        6. The camera shall offer a minimum sensitivity of 0.36 lx in color, and 0.12 lx in mono.
        7. The camera automatic electronic shutter shall offer a shutter speed of 1/12 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. Audio
        1. The camera shall offer G.711, AAC and L16 audio compression (live and recording).
        2. Signal-to-Noise Ratio: >50 dB
        3. The camera shall offer full duplex audio communication, with built-in microphone [NUC-52051-F0].
     4. 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 15 frames 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.
     5. 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 a 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 MOTION+ 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 3.6 W.
     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 +50°C (-4°F to 122°F) temperature range [NUC-52051-F0], or -30°C to +50°C (-22°F to 122°F) temperature range [NUC-52051-F0E].
        2. The camera shall be vandal resistant to IK4 [NUC-52051-F0] or IK10 standard [NUC-52051-F0E].
        3. The camera [NUC-52051-F0E] shall be weatherproof to IP66 standard.
     8. Technical Specifications

| **Power** | |
| --- | --- |
| Power Supply | 12 VDC  Power-over-Ethernet 48 VDC nominal |
| Power Consumption | 3.6 W approx. |
| PoE | IEEE 802.3af (802.3at Type 1)  Power level: Class 1 |

| **Sensor** | |
| --- | --- |
| Type | 1/3‑inch CMOS |
| Total sensor pixels | 5MP |
| Used pixels (optical circle) | 1792 x 1792 (3.2MP) |

| **Video performance - Sensitivity** | |
| --- | --- |
| (3200K, reflectivity 89%, F2.0, 30IRE) | |
| Color | 0.36 lx |
| Mono | 0.12 lx |

| **Video performance ‑ Dynamic range** | |
| --- | --- |
| Dynamic range | 81 dB WDR |

| **Video streaming** | |
| --- | --- |
| Video compression | H.264 (MP); M- JPEG |
| Streaming | Multiple configurable streams in H.264 and M-JPEG, configurable frame rate and bandwidth. |
| Overall IP Delay | Min. 240 ms, Max. 680 ms |
| GOP structure | IP, IBP, IBBP |
| Encoding interval | 1 to 15 fps |

| **Video resolution (H x V)** | |
| --- | --- |
| 3.2 MP | 1792 x 1792 Full image circle |
| 2.4 MP | 1536 x 1536 |
| 1 MP | 1024 x 1024 |
| 0.64 MP | 800 x 800 |
| 0.23 MP | 480 x 480 |
| 0.06 MP | 240 x 240 |

| **Video functions** | |
| --- | --- |
| Adjustable picture settings | Contrast, Saturation, Brightness |
| White Balance | Four automatic modes, manual mode and measure |
| Shutter | Automatic Electronic Shutter;  Fixed shutter;  Default shutter |
| Sharpness | Sharpness enhancement level selectable |
| Backlight compensation | On/off |
| 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) |
| Privacy Masking | Eight independent areas, fully programmable |
| Video Analysis | MOTION+ |
| Other functions | Pixel counter, Video watermarking, Display stamping, Scene modes |

| **Audio streaming** | |
| --- | --- |
| Standard | G.711, 8 kHz sampling rate  L16, 16 kHz sampling rate  AAC-LC, 48 kbps at 16 kHz sampling rate  AAC-LC, 80 kbps at 16 kHz sampling rate |
| Signal-to-Noise Ratio | >50 dB |
| Audio Streaming | Full-duplex / half duplex |

| **Audio (indoor model only)** | |
| --- | --- |
| Audio input | Integrated microphone (can be permanently disabled) |

| **Local storage** | |
| --- | --- |
| Internal RAM | 10 s pre-alarm recording |
| Memory card slot | Supports up to 32 GB microSDHC / 2 TB microSDXC 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 Configuration | Via web browser or Configuration Manager |
| Firmware update | Remotely programmable |
| Software viewer | Web browser, Video Security client, Bosch Video Client, or third party software |

| **Network** | |
| --- | --- |
| Protocols | IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, ICMPv6, RTSP, FTP, Telnet, ARP, DHCP, NTP (SNTP), SNMP (V1, MIB-II), 802.1x, DNS, DNSv6, DDNS (DynDNS.org, selfHOST.de, noip. com), SMTP, iSCSI, UPnP (SSDP), DiffServ (QoS), LLDP, SOAP, Dropbox, CHAP, digest authentication |
| Encryption | TLS 1.0, SSL, DES, 3DES, AES (optional) |
| Ethernet | 10/100 Base-T, auto-sensing, half/full duplex |
| Connectivity | Auto-MDIX |
| Interoperability | ONVIF Profile S, GB/T 28181 |

| **Mechanical (indoor version)** | |
| --- | --- |
| Dimensions (H x Ø) | 50 x 105 mm (1.96 x 4.13 in) |
| Dimensions (H x Ø)  with SMB | 69 x 126 mm (2.72 x 4.94 in) |
| Weight | 270 g (9.52 oz) approx. |
| Color | RAL 9003 |
| Material | Plastic |
| Mounting options | Wall / Floor / Ceiling / Custom |

| **Mechanical (outdoor version)** | |
| --- | --- |
| Dimensions (H x Ø) | 57 x 110 mm (2.24 x 4.33 in) |
| Dimensions (H x Ø)  with indoor SMB | 76 x 114 mm (2.99 x 4.47 in) |
| Dimensions (H x Ø)  with outdoor SMB | 107 x 114 mm (4.21 x 4.47 in) |
| Weight | 340 g (11.98 oz) approx. |
| Color | RAL 9003 |
| Material | Metal |
| Mounting options | Wall / Floor / Ceiling / Custom |

| **Environmental (indoor version)** | |
| --- | --- |
| Operating Temperature | –20°C to +50°C (–4°F to 122°F) |
| Storage Temperature | –30°C to +70°C (–22°F to 158°F) |
| Operating Humidity | 0% to 95% (non-condensing) |
| Vandal proof | IK04 |

| **Environmental (outdoor version)** | |
| --- | --- |
| Operating Temperature | –30°C to +50°C (–22°F to 122°F) |
| Storage Temperature | –40°C to +70°C (–40°F to 158°F) |
| Operating Humidity | 0% to 95% (non-condensing) |
| Weatherproofing | IP66 |
| Vandal resistance | IK10 |

* 1. ACCESSORIES
     1. Mounting
        1. NDA-WMT-MICDOME Microdome Pendant Wall Mount
        2. NDA-PMT-MICDOME Microdome Pipe Mount
        3. LTC 9213/01 Pole Mount Adapter
        4. VDA-CMT-PTZDOME Corner Mount Adapter

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