

Product Guide Specification

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, based on *MasterFormat 2016* 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 21 00: Video Surveillance

Section 28 21 13: IP Cameras

Thermal Hybrid Bullet Camera

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes

1. Section 28 21 17: Video Surveillance – Surveillance Cameras – Camera Housings
2. Section 28 21 19: Video Surveillance – Surveillance Cameras – Camera Mounts
3. Section 28 27 00: Video Surveillance – Video Surveillance Sensors

B. Related Sections

1. [Section 28 33 15: Security Detection, Alarm and Monitoring – Security Monitoring and Control – Security Monitoring and Control Software].

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

1.2 REFERENCES

- A. Federal Communications Commission (FCC) (www.fcc.gov)
 - 1. (SEFD1509190-B
- B. Underwriters Laboratories, Inc. (UL) (www.ul.com)
 - 1. E234884-A60-UL
- C. CONFORMITE EUROPEENNE
 - 1. EN60950:2000
- D. HD standards
 - 1. Complies with the SMPTE 274M-2008 Standard in:
 - a. Resolution: 1920x1080
 - b. Scan: Progressive
 - c. Color representation: complies with ITU-R BT.709
 - d. Aspect ratio: 16:9
 - e. Frame rate: 25 and 30 frames/s
 - 2. Complies with the 296M-2001 Standard in:
 - a. Resolution: 1280x720
 - b. Scan: Progressive
 - c. Color representation: complies with ITU-R BT.709
 - d. Aspect ratio: 16:9
 - e. Frame rate: 25 and 30 frames/s

1.3 SYSTEM DESCRIPTION

A. Section Includes

1. Video Surveillance – Surveillance Cameras – IP Cameras

B. Performance Requirements

1. Thermal Camera:

- a. The Thermal Hybrid Bullet Camera shall be 160 x 120 VOx uncooled thermal sensor.
- b. The Thermal Hybrid Bullet Camera shall have a pixel size of 12um.
- c. The Thermal Hybrid Bullet Camera shall have a thermal sensitivity of <50mK@f/1.0.
- d. The Thermal Hybrid Bullet Camera shall have a spectral range of 7~14um.
- e. The Thermal Hybrid Bullet Camera shall have a fixed focal length of 1mm.
- f. The Thermal Hybrid Bullet Camera shall support 14 color palettes of Whitehot/Blackhot/Ironrow/Icefire/Fusion/Rainbow/Globow/Iconbow1/Iconbow2 etc.

2. Visible Camera:

- a. The Thermal Hybrid Bullet Camera shall be a full-featured 2MP unit designed for discrete video surveillance applications in indoor and outdoor environments.
- b. The Thermal Hybrid Bullet Camera shall be a 1/2.8" progressive-scan Sony CMOS sensor with 2MP resolution.
- c. The Thermal Hybrid Bullet Camera shall have an Auto (ICR) that delivers color images during daylight and automatically switches to a monochrome image as the scene darkens.
- d. The Thermal Hybrid Bullet Camera shall have a fixed focal length of 4mm.
- e. The Thermal Hybrid Bullet Camera shall support noise reduction function of Ultra DNR (2D/3D).
- f. The Thermal Hybrid Bullet Camera shall support privacy masking up to 4 areas.
- g. The Thermal Hybrid Bullet Camera shall support digital Defog function.
3. The Thermal Hybrid Bullet Camera shall support 12 VDC power supply. The following dual, redundant power options:
 - a. 12 VDC.
 - b. PoE (IEEE 802.3af).
 - c. The Thermal Hybrid Bullet Camera shall default to use power from PoE power supply, if connected.
 - d. The Thermal Hybrid Bullet Camera shall switch to the 12 VDC power supply if power from the PoE supply is lost.
4. The Thermal Hybrid Bullet Camera shall offer Wide Dynamic Range for clear images in extreme high-contrast environments.
5. The Thermal Hybrid Bullet Camera shall provide direct network connection using H.264 High profile, H.264 Main profile, H.264 Basic profile and M-JPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
6. The Thermal Hybrid Bullet Camera shall conform to the ONVIF profile S&G and CGI standards to provide interoperability with other conformant systems.

7. The Thermal Hybrid Bullet Camera shall offer two (2) separate and configurable streams with one (1) individually configurable 2MP stream at 1 to 25/30 fps.
8. The Thermal Hybrid Bullet Camera shall offer:
 - a. IP67 environmental protection.
 - b. 6 KV lightning rating.
9. The Thermal Hybrid Bullet Camera housing shall be a durable, rugged design with a metal housing.

1.4 SUBMITTALS

- A. Submit under provisions of Section [01 33 00.]
- B. 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.
- C. Dimensional Drawings; include
 1. Overall device dimensions.
 2. Dimensions specific for installation.
- D. Closeout Submittals
 1. User manual.
 2. Parts list.
 3. Maintenance requirements.

1.5 QUALITY ASSURANCE

- A. Manufacturer:
 1. Minimum of [10] years of experience in manufacture and design Video Surveillance Devices.
- B. Video Surveillance System:
 1. List certifying bodies (UL, etc.)
 2. Provide evidence of compliance upon request.
- C. Installer:
 1. Minimum of [5] years of experience installing Video Surveillance System.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Comply with requirements of Section 01 60 00.
- B. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.
- C. Protect store materials from environmental and temperature conditions following manufacturer's instructions.
- D. Handle and operate products and systems according to manufacturer's instructions.

1.7 WARRANTY

- A. Provide manufacturer's warranty covering [2] years for replacement and repair of defective equipment. Warranty varies country to country.

1.8 MAINTENANCE

- A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.
- B. Provide factory direct technical support via phone and e-mail.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. [Acceptable Manufacturer:
Zhejiang Dahua Technology Co.,Ltd
No.1199,Bin'an Road,Binjiang District, Hangzhou
Tel: +86 571 8768-8883
Fax: +86 571 8768-8815
Email: overseas@dahuatech.com
- B. 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.]

2.2 Thermal Hybrid Bullet Camera – [DH-TPC-BF2120P], [DH-TPC-BF2120N]

- A. General Characteristics:
 - 1. Thermal Camera:
 - a. The Thermal Hybrid Bullet Camera shall be 160 x 120 VOx uncooled thermal sensor technology.
 - b. The Thermal Hybrid Bullet Camera shall have a pixel size of 12um.
 - c. The Thermal Hybrid Bullet Camera shall have a thermal sensitivity of <50mK@ f/1.0.
 - d. The Thermal Hybrid Bullet Camera shall have a spectral range of 7~14um.
 - e. The Thermal Hybrid Bullet Camera shall have a fixed focal length of 1mm.
 - f. The Thermal Hybrid Bullet Camera shall support 14 color palettes of Whitehot/Blackhot/Ironrow/Icefire/Fusion/Rainbow/Globow/Iconbow1/Iconbow2 etc.
 - 2. Visible Camera:
 - a. The Thermal Hybrid Bullet Camera shall be a full-featured 2MP unit designed for discrete video surveillance applications in indoor and outdoor environments.
 - b. The Thermal Hybrid Bullet Camera shall be a 1/2.8" progressive-scan Sony CMOS sensor with 2MP resolution.
 - c. The Thermal Hybrid Bullet Camera shall offer an Auto (ICR) that delivers color images during daylight and automatically switches to a monochrome image as the scene darkens.
 - 3. The Thermal Hybrid Bullet Camera shall support 12 VDC power supply. The following dual, redundant power options:
 - a. 12 VDC.
 - b. PoE (IEEE 802.3af).
 - c. The Thermal Hybrid Bullet Camera shall default to use power from PoE power supply, if connected.
 - d. The Thermal Hybrid Bullet Camera shall switch to the 12 VDC power supply if power from the PoE supply is lost.
 - 4. The Thermal Hybrid Bullet Camera shall offer Wide Dynamic Range for clear images in extreme high-contrast environments.

5. The Thermal Hybrid Bullet Camera shall provide direct network connection using H.264 High profile, H.264 Main profile, H.264 Basic profile and M-JPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
6. The Thermal Hybrid Bullet Camera shall conform to the ONVIF profile S&G and CGI standards to provide interoperability with other conformant systems.
7. The Thermal Hybrid Bullet Camera shall offer two (2) separate and configurable streams with one (1) individually configurable 2MP stream at 1 to 25/30 fps.
8. The Thermal Hybrid bullet camera shall offer:
 - a. IP67 environmental protection.
 - b. 6 KV lightning rating.
9. The Thermal Hybrid Bullet Camera housing shall be a durable, rugged design with a metal housing.

B. Imaging

1. Thermal Camera:
 - a. The Thermal Hybrid Bullet Camera shall offer a long life uncooled VOx microbolometer sensor.
 - b. The Thermal Hybrid Bullet Camera shall offer an effective number of pixels of 160 x 120 effective picture elements.
 - c. The Thermal Hybrid Bullet Camera shall offer a pixel size of 12um.
 - d. The Thermal Hybrid Bullet Camera shall have a thermal sensitivity of <50mK@ f/1.0.
 - e. The Thermal Hybrid Bullet Camera shall have a spectral range of 7~14um.
 - f. The Thermal Hybrid Bullet Camera shall offer a fixed focal length of 2mm.
 - g. The Thermal Hybrid Bullet Camera shall have a [56°*44°] field of view
 - h. The Thermal Hybrid Bullet Camera shall offer 14 color palettes of Whitehot/Blackhot/Ironrow/Icefire/Fusion/Rainbow/Globow/Iconbow1/Iconbow2 etc.
2. Visible Camera:
 - a. The Thermal Hybrid Bullet Camera shall offer a 1/2.8" progressive-scan Sony CMOS imager.
 - b. The Thermal Hybrid Bullet Camera shall offer an effective number of pixels of 1920 x 1080 effective picture elements.
 - c. The Thermal Hybrid Bullet Camera shall offer a 16:9 aspect ratio.
 - d. The Thermal Hybrid Bullet Camera shall offer a fixed focal length of 3.6mm.
 - e. The Thermal Hybrid Bullet Camera shall have a [74.8°*44.7°] field of view.
 - f. The Thermal Hybrid Bullet Camera shall offer a maximum aperture of F1.8.
 - g. The Thermal Hybrid Bullet Camera shall produce a color image with a minimum scene illumination of 0.005 lux at F1.8 and a monochrome image, when in the night mode, with a minimum illumination of 0.0005 lux at F1.8.
 - h. The Thermal Hybrid Bullet Camera shall produce an image at 0 lux when in IR mode.

C. Video Characteristics

1. Thermal Camera:

- a. The Thermal Hybrid Bullet Camera shall offer 14 color palettes of Whitehot/Blackhot/Ironrow/Icefire/Fusion/Rainbow/Globow/Iconbow1/Iconbow2 etc.
- b. The Thermal Hybrid Bullet Camera shall offer region of interest and custom areas setting.

2. Visible Camera:

- a. The Thermal Hybrid Bullet Camera shall offer BLC, HLC, and WDR modes of backlight compensation.
- b. The Thermal Hybrid Bullet Camera shall offer Auto and Manual white balance modes.
- c. The Thermal Hybrid Bullet Camera shall offer 2D/3D Ultra DNR noise reduction.
- d. The Thermal Hybrid Bullet Camera shall offer 4 privacy masking areas.
- e. The Thermal Hybrid Bullet Camera shall offer digital Defog function.

3. The Thermal Hybrid Bullet Camera shall offer CBR/VBR bit rate control.

4. The Thermal Hybrid Bullet Camera shall offer the following video compression protocols:

- a. H.264 High profile
- b. H.264 Main profile
- c. H.264 Basic profile
- d. M-JPEG

D. Streaming Capability

1. The Thermal Hybrid Bullet Camera shall generate 2MP resolution using H.264 compression.

2. The Thermal Hybrid Bullet Camera shall offer Unicast and Multicast streaming methods.

3. The Thermal Hybrid Bullet Camera shall offer the following resolution streams:

- a. Thermal Camera:
 - 1.3M (1280 x 960 pixels)
 - 720P (1280 x 720 pixels)
- b. Visible Camera:
 - 1080P (1920 x 1080 pixels)
 - 720P (1280 x 720 pixels)
 - D1 (704 x 576 pixels)

4. The Thermal Hybrid Bullet Camera shall generate two (2) streams at the following maximum resolutions:

- a. Thermal Camera:
 - Main Stream: 1.3M at 25/30 fps
 - Sub Stream: VGA at 25/30 fps
- b. Visible Camera:
 - Main Stream: 1080P at 25/30 fps
 - Sub Stream: D1 at 25/30 fps

E. IP Connectivity

1. The Thermal Hybrid Bullet Camera shall allow full camera control and configuration capabilities via a TCP/IP network.

2. The Thermal Hybrid Bullet Camera shall deliver 2 MP video, at rates up to 25/30 frames per second via TCP/IP over an RJ-45 (10/100 Base-T) connection.
3. The Thermal Hybrid Bullet Camera shall conform to the ONVIF Profile S&G and the CGI standard.
4. The Thermal Hybrid Bullet Camera shall offer Quality of Service (QoS) configuration options.
5. The Thermal Hybrid Bullet Camera shall support the IPv6 internet-layer protocol for packet switched internetworking across multiple IP networks.
6. The Thermal Hybrid Bullet Camera shall support the following protocols: IPv4/IPv6, HTTP, HTTPS, SSL, TCP/IP, UDP, UPnP, ICMP, IGMP, SNMP, RTSP, RTP, SMTP, NTP, DHCP, DNS, PPPOE, DDNS, FTP, IP Filter, QoS, Bonjour, 802.1x.
7. The Thermal Hybrid Bullet Camera shall support the Smart PSS and DSS management software.
8. The Thermal Hybrid Bullet Camera shall support the Android and the IOS mobile operating systems.

F. Installation Requirements

1. The Thermal Hybrid Bullet Camera shall be capable of operating in an outdoor environment within a temperature range of -30°C to $+55^{\circ}\text{C}$ (-22°F to 131°F).
2. The Thermal Hybrid Bullet Camera shall accept power, transmit video, and accept control via a TCP/IP connection.
3. The Thermal Hybrid Bullet Camera shall support 12 VDC power supply. The following dual, redundant power options:
 - a. 12 VDC.
 - b. PoE (IEEE 802.3af).
 - c. The Thermal Hybrid Bullet Camera shall default to use power from PoE power supply, if connected.
 - d. The Thermal Hybrid Bullet Camera shall reboot and switch to the 12 VDC power supply if power from the PoE supply is lost.

G. Housing Options

1. The Thermal Hybrid Bullet Camera shall be offered in a metal housing.
2. The Thermal Hybrid Bullet Camera housing shall conform to the IP67 standard for a weather-resistant package.

2.3 ACCESSORIES

- A. The Thermal Hybrid bullet camera shall offer the following optional accessories:
1. Optional mounting hardware:
 - a. [Junction box]
 - b. [Corner mount bracket]

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
- B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Protect devices from damage during construction.

3.3 INSTALLATION

- A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.
- B. Perform installation with qualified service personnel.
- C. Install devices in accordance with the National Electrical Code or applicable local codes.
- D. Ensure selected location is secure and offers protection from accidental damage.
- E. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

- A. Test snugness of mounting screws of all installed equipment.
- B. Test proper operation of all video system devices.
- C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

- A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.
- B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMONSTRATION

- A. Demonstrate at final inspection that video management system and devices functions properly.

END OF SECTION