

# AXIS Q1971-E Thermal Camera

Detect and verify regardless of weather and light

Ideal for perimeter protection, this robust, halogen-free camera can detect and verify regardless of weather and light conditions even in low-contrast scenes. With five lens alternatives, it ensures optimal detection to suit specific needs. This AI-based camera enables proactive surveillance. And AXIS Perimeter Defender is available for enhanced protection. Built on a powerful platform, it supports third-party analytics. It features two I/O ports and with edge-to-edge technology you can connect, for instance, a horn speaker to enable audio alarms. Furthermore, Axis Edge Vault safeguards the device and offers FIPS 140-2 Level 2 certified key storage and operations.

- > **Reliable thermal detection 24/7**
- > **Five lens alternatives**
- > **Support for AXIS Perimeter Defender**
- > **Built-in cybersecurity with Axis Edge Vault**
- > **Compact, robust, and halogen-free**



# AXIS Q1971-E Thermal Camera

## Camera

### Variants

AXIS Q1971-E 7 mm  
AXIS Q1971-E 13 mm  
AXIS Q1971-E 19 mm  
AXIS Q1971-E 25 mm  
AXIS Q1971-E 35 mm

### Image sensor

Uncooled microbolometer 384x288 pixels, pixels size:  
17 µm.  
Spectral range: 8-14 µm

### Lens

Athermalized  
**7 mm**, F1.18  
Horizontal field of view: 55°  
Vertical field of view: 41°  
Near focus distance: 1.2 m (3.9 ft)  
**13 mm**, F1.0  
Horizontal field of view: 29°  
Vertical field of view: 22°  
Near focus distance: 4.7 m (15.4 ft)  
**19 mm**, F1.24  
Horizontal field of view: 19°  
Vertical field of view: 15°  
Near focus distance: 8.3 m (27.2 ft)  
**25 mm**, F1.0  
Horizontal field of view: 15°  
Vertical field of view: 11°  
Near focus distance: 18.2 m (60 ft)  
**35 mm**, F1.14  
Horizontal field of view: 10.5°  
Vertical field of view: 8°  
Near focus distance: 31.3 m (103 ft)

### Sensitivity

NETD <20 mK @25 °C, F1.0

## System on chip (SoC)

### Model

ARTPEC-8

### Memory

2048 MB RAM, 8192 MB Flash

## Compute capabilities

Deep learning processing unit (DLPU)

## Video

### Video compression

H.264 (MPEG-4 Part 10/AVC) Baseline, Main and High Profiles  
H.265 (MPEG-H Part 2/HEVC) Main Profile  
Motion JPEG

### Resolution

Sensor is 384x288. Image can be scaled up to 768x576.

### Frame rate

Up to 8.3 fps and 30 fps

### Video streaming

Up to 20 unique and configurable video streams<sup>1</sup>  
Axis Zipstream technology in H.264 and H.265  
Controllable frame rate and bandwidth  
VBR/ABR/MBR H.264/H.265  
Video streaming indicator

### Image settings

Contrast, brightness, sharpness, exposure zones, compression, rotation: 0°, 90°, 180°, 270° including corridor format, mirroring, dynamic text and image overlay, polygon privacy mask, electronic image stabilization, thermal palettes

### Image processing

Axis Zipstream

## Audio

### Features

Automatic gain control  
Speaker pairing  
Spectrum visualizer<sup>2</sup>

### Streaming

Configurable duplex:  
Two-way (half duplex, full duplex)

1. We recommend a maximum of 3 unique video streams per camera or channel, for optimized user experience, network bandwidth, and storage utilization. A unique video stream can be served to many video clients in the network using multicast or unicast transport method via built-in stream reuse functionality.
2. Feature available with ACAP

## Input

10-band graphic equalizer  
Input for external unbalanced microphone, optional 5 V microphone power  
Digital input, optional 12 V ring power  
Unbalanced line input

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## Output

Output via speaker pairing

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## Encoding

24bit LPCM, AAC-LC 8/16/32/48 kHz, G.711 PCM 8 kHz, G.726 ADPCM 8 kHz, Opus 8/16/48 kHz  
Configurable bitrate

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## Network

### Network protocols

IPv4, IPv6 USGv6, ICMPv4/ICMPv6, HTTP, HTTPS<sup>3</sup>, HTTP/2, TLS<sup>3</sup>, QoS Layer 3 DiffServ, FTP, SFTP, CIFS/SMB, SMTP, Bonjour, UPnP®, SNMP v1/v2c/v3 (MIB-II), DNS/DNSv6, DDNS, NTP, PTP, NTS, RTSP, RTP, SRTP/RTSPS, TCP, UDP, IGMPv1/v2/v3, RTCP, DHCPv4/v6, SSH, LLDP, CDP, MQTT v3.1.1, Secure syslog (RFC 3164/5424, UDP/TCP/TLS), Link-Local address (ZeroConf)

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## System integration

### Application Programming Interface

Open API for software integration, including VAPIX®, metadata and AXIS Camera Application Platform (ACAP); specifications at [axis.com/developer-community](https://axis.com/developer-community).

One-click cloud connection

ONVIF® Profile G, ONVIF® Profile M, ONVIF® Profile S, and ONVIF® Profile T, specifications at [onvif.org](https://onvif.org)

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### Video management systems

Compatible with AXIS Camera Station Edge, AXIS Camera Station Pro, AXIS Camera Station 5, and video management software from Axis' partners available at [axis.com/vms](https://axis.com/vms).

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### Onscreen controls

Electronic image stabilization  
Video streaming indicator  
Privacy masks  
Media clip  
Heater

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### Edge-to-edge

Speaker pairing

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## Event conditions

Audio: audio detection, audio clip playing, audio clip currently playing  
Device status: above/below/within operating temperature, IP address removed, new IP address, network lost, system ready, ring power overcurrent protection, live stream active, shock detected  
Digital audio input status  
Edge storage: recording ongoing, storage disruption, storage health issues detected  
I/O: digital input, manual trigger, virtual input  
MQTT: stateless  
Scheduled and recurring: schedule  
Video: average bitrate degradation, tampering

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## Event actions

Audio clips: play, stop  
I/O: toggle I/O once, toggle I/O while the rule is active  
MQTT: publish  
Notification: HTTP, HTTPS, TCP and email  
Overlay text  
Pre- and post-alarm video or image buffering for recording or upload  
Recordings: SD card and network share  
SNMP traps: send, send while the rule is active  
Upload of images or video clips: FTP, SFTP, HTTP, HTTPS, network share and email

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## Built-in installation aids

Pixel counter

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## Analytics

### Applications

#### Included

AXIS Video Motion Detection, AXIS Motion Guard, AXIS Fence Guard, AXIS Loitering Guard, active tampering alarm, audio detection

#### Supported

AXIS Perimeter Defender  
Support for AXIS Camera Application Platform enabling installation of third-party applications, see [axis.com/acap](https://axis.com/acap)

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## Approvals

### Product markings

CSA, UL/cUL, CE, KC

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### Supply chain

TAA compliant

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3. This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. ([openssl.org](https://openssl.org)), and cryptographic software written by Eric Young ([ey@cryptsoft.com](mailto:ey@cryptsoft.com)).

## EMC

CISPR 35, CISPR 32 Class A, EN 55035,  
EN 55032 Class A, EN 50121-4, EN 61000-3-2,  
EN 61000-3-3, EN 61000-6-1, EN 61000-6-2

Canada: ICES(A)/NMB(A)

Japan: VCCI Class A

Korea: KS C 9835, KS C 9832 Class A

USA: FCC Part 15 Subpart B Class A

Railway: IEC 62236-4

## Safety

CAN/CSA C22.2 No. 62368-1 ed. 3,  
IEC/EN/UL 62368-1 ed. 3

## Environment

IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-6,  
IEC 60068-2-14, IEC 60068-2-27, IEC 60068-2-78,  
IEC/EN 60529 IP66/IP67, IEC/EN 62262 IK10<sup>4</sup>,  
ISO 21207 Method B, MIL-STD-810H (Method 501.7,  
502.7, 505.7, 506.6, 507.6, 509.7, 510.7, 514.8, 516.8,  
521.4), NEMA 250 Type 4X, NEMA TS 2 (2.2.7-2.2.9)

## Network

NIST SP500-267

## Cybersecurity

ETSI EN 303 645, BSI IT Security Label, FIPS-140

## Cybersecurity

### Edge security

**Software:** Signed firmware, brute force delay protection, digest authentication and OAuth 2.0 RFC6749 Client Credential Flow/OpenID Authorization Code Flow for centralized ADFS account management, password protection, Axis Cryptographic Module (FIPS 140-2 level 1), AES-XTS-Plain64 256bit SD card encryption

**Hardware:** Axis Edge Vault cybersecurity platform TPM 2.0 (CC EAL4+, FIPS 140-2 Level 2), secure element (CC EAL 6+), system-on-chip security (TEE), Axis device ID, secure keystore, signed video, secure boot, encrypted filesystem (AES-XTS-Plain64 256bit)

### Network security

IEEE 802.1X (EAP-TLS, PEAP-MSCHAPv2)<sup>5</sup>,  
IEEE 802.1AE (MACsec PSK/EAP-TLS), IEEE 802.1AR,  
HTTPS/HSTS<sup>5</sup>, TLS v1.2/v1.3<sup>5</sup>, Network Time Security (NTS), X.509 Certificate PKI, host-based firewall

## Documentation

*AXIS OS Hardening Guide*

*Axis Vulnerability Management Policy*

*Axis Security Development Model*

AXIS OS Software Bill of Material (SBOM)

To download documents, go to [axis.com/support/cybersecurity/resources](https://axis.com/support/cybersecurity/resources)

To read more about Axis cybersecurity support, go to [axis.com/cybersecurity](https://axis.com/cybersecurity)

## General

### Casing

IP66/IP67-, NEMA 4X- and IK10-rated<sup>4</sup>

Aluminum and polycarbonate (PC)

Color: white NCS S 1002-B

For repainting instructions, go to the product's support page. For information about the impact on warranty, go to [axis.com/warranty-implication-when-repainting](https://axis.com/warranty-implication-when-repainting).

### Power

Power over Ethernet (PoE) IEEE 802.3af/802.3at Type 1 Class 3

Typical 3.5 W, max 12.95 W

12-28 V DC, typical 3.6 W, max 12.95 W

### Connectors

Network: Shielded RJ45 10BASE-T/100BASE-TX/  
1000BASE-T PoE

Audio: 3.5 mm mic/line in

Power: DC input, terminal block

I/O: Terminal block for 1 supervised alarm input and 1 output (12 V DC output, max. load 50 mA)

### Storage

Support for microSD/microSDHC/microSDXC card

Recording to network-attached storage (NAS)

For SD card and NAS recommendations see [axis.com](https://axis.com)

### Operating conditions

-40 °C to 60 °C (-40 °F to 140 °F)

Maximum temperature according to NEMA TS 2 (2.2.7):  
74 °C (165 °F)

Humidity 10-100% RH (condensing)

### Storage conditions

-40 °C to 65 °C (-40 °F to 149 °F)

Humidity 5-95% RH (non-condensing)

### Dimensions

For the overall product dimensions, see the dimension drawing in this datasheet.

Effective Projected Area (EPA): 0.022 m<sup>2</sup> (0.24 ft<sup>2</sup>)

4. Excluding front window

5. This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. ([openssl.org](https://openssl.org)), and cryptographic software written by Eric Young ([ey@cryptsoft.com](mailto:ey@cryptsoft.com)).

## Weight

1.4 kg (3.1 lb)

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## Box content

Camera, installation guide, drill template, TORX® L-keys, RESISTORX® L-key, terminal block connector, connector guard, cable gaskets, owner authentication key

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## Optional accessories

AXIS T94F01M J-Box/Gang Box Plate, AXIS T91A47 Pole Mount, AXIS T94P01B Corner Bracket, AXIS T94F01P Conduit Back Box, AXIS Weather Shield K, Axis PoE Midspans  
AXIS T8415 Wireless Installation Tool  
AXIS Surveillance Cards  
For more accessories, go to [axis.com/products/axis-q1971-e#accessories](https://axis.com/products/axis-q1971-e#accessories)

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## System tools

AXIS Site Designer, AXIS Device Manager, product selector, accessory selector, lens calculator  
Available at [axis.com](https://axis.com)

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## Languages

English, German, French, Spanish, Italian, Russian, Simplified Chinese, Japanese, Korean, Portuguese, Polish, Traditional Chinese, Dutch, Czech, Swedish, Finnish, Turkish, Thai, Vietnamese

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## Warranty

5-year warranty, see [axis.com/warranty](https://axis.com/warranty)

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## Export control

This product is subject to export control regulations, and you should always comply with all applicable national and international export or re-export control regulations.

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## Part numbers

Available at [axis.com/products/axis-q1971-e#part-numbers](https://axis.com/products/axis-q1971-e#part-numbers)

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## Sustainability

### Substance control

PVC free, BFR/CFR free in accordance with JEDEC/ECA Standard JS709  
RoHS in accordance with EU RoHS Directive 2011/65/EU/ and EN 63000:2018  
REACH in accordance with (EC) No 1907/2006. For SCIP UUID, see [echa.europa.eu](https://echa.europa.eu)

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## Materials

Screened for conflict minerals in accordance with OECD guidelines  
To read more about sustainability at Axis, go to [axis.com/about-axis/sustainability](https://axis.com/about-axis/sustainability)

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## Environmental responsibility

[axis.com/environmental-responsibility](https://axis.com/environmental-responsibility)  
Axis Communications is a signatory of the UN Global Compact, read more at [unglobalcompact.org](https://unglobalcompact.org)

## Detect, Recognize, Identify (DRI)

AXIS Q1971-E (7 mm lens)		
	Definition	Distance
Detect	1.5 pixels	Human: 200 m (656 ft) Vehicle: 610 m (2000 ft)
Recognize	6 pixels	Human: 50 m (164 ft) Vehicle: 153 m (502 ft)
Identify	12 pixels	Human: 25 m (82 ft) Vehicle: 76 m (250 ft)

AXIS Q1971-E (13 mm lens)		
	Definition	Distance
Detect	1.5 pixels	Human: 393 m (1290 ft) Vehicle: 1205 m (3952 ft)
Recognize	6 pixels	Human: 98 m (320 ft) Vehicle: 301 m (987 ft)
Identify	12 pixels	Human: 49 m (160 ft) Vehicle: 151 m (495 ft)

AXIS Q1971-E (19 mm lens)		
	Definition	Distance
Detect	1.5 pixels	Human: 567 m (1860 ft) Vehicle: 1739 m (5703 ft)
Recognize	6 pixels	Human: 142 m (465 ft) Vehicle: 435 m (1425 ft)
Identify	12 pixels	Human: 71 m (230 ft) Vehicle: 217 m (712 ft)

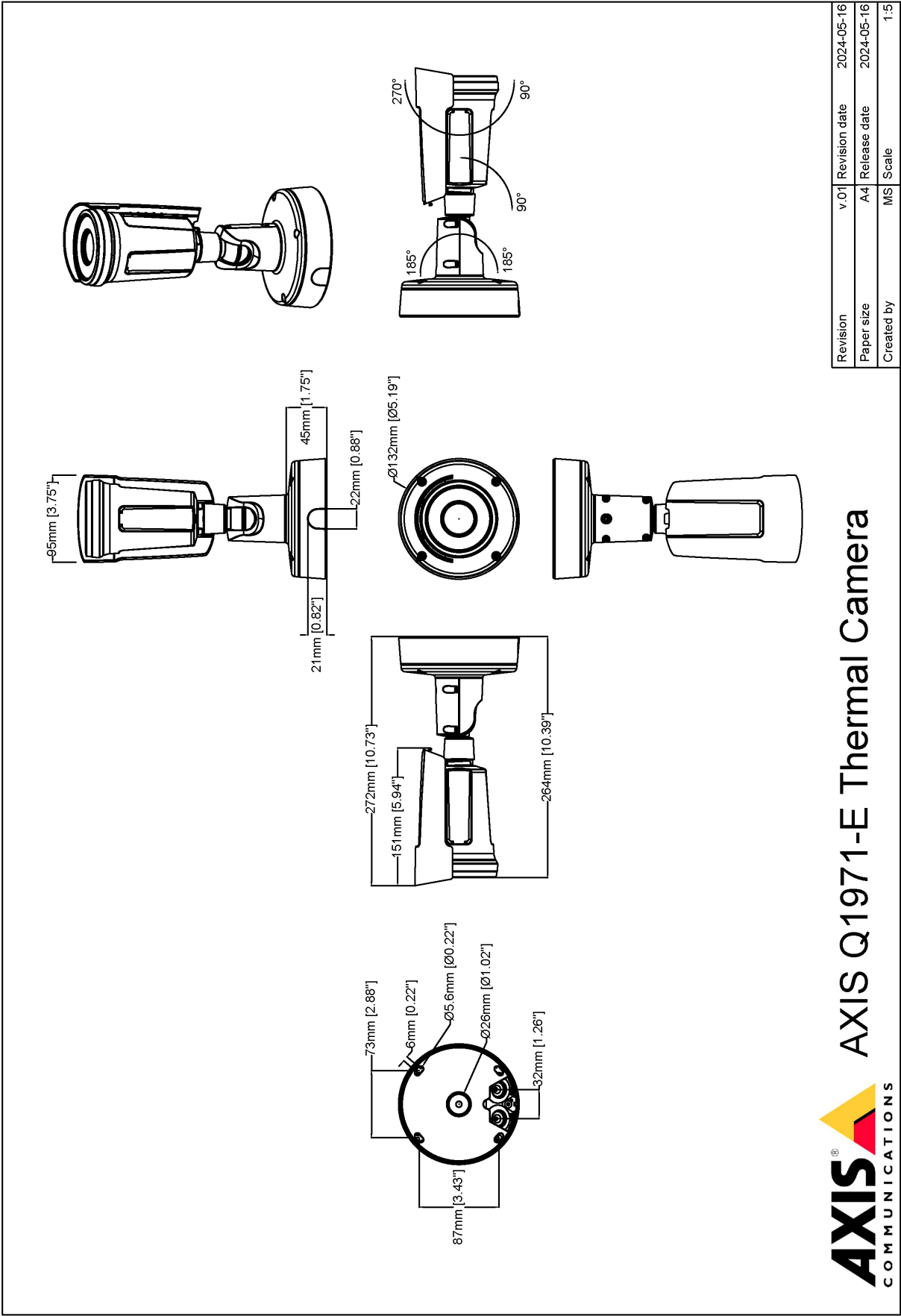
AXIS Q1971-E (25 mm lens)		
	Definition	Distance
Detect	1.5 pixels	Human: 687 m (2250 ft) Vehicle: 2256 m (7399 ft)
Recognize	6 pixels	Human: 172 m (564 ft) Vehicle: 564 m (1850 ft)
Identify	12 pixels	Human: 86 m (280 ft) Vehicle: 282 m (924 ft)

AXIS Q1971-E (35 mm lens)		
	Definition	Distance
<b>Detect</b>	1.5 pixels	Human: 1028 m (3372 ft) Vehicle: 3153 m (10340 ft)
<b>Recognize</b>	6 pixels	Human: 257 m (843 ft) Vehicle: 788 m (2580 ft)
<b>Identify</b>	12 pixels	Human: 129 m (423 ft) Vehicle: 394 m (1290 ft)

We used Johnson's criteria to calculate the theoretical values shown in the table. Human and vehicle sizes were assumed to be 1.8 x 0.5 m and 4.0 x 1.5 m, respectively.

Thoroughly evaluate your scene using, for example, AXIS Site Designer. Consider factors like weather conditions when determining actual detection distances.

Dimension drawing





## Highlighted capabilities

### Axis Edge Vault

Axis Edge Vault is the hardware-based cybersecurity platform that safeguards the Axis device. It forms the foundation that all secure operations depend on and offer features to protect the device's identity, safeguard its integrity and protect sensitive information from unauthorized access. For instance, **secure boot** ensures that a device can boot only with **signed OS**, which prevents physical supply chain tampering. With signed OS, the device is also able to validate new device software before accepting to install it. And the **secure keystore** is the critical building-block for protecting cryptographic information used for secure communication (IEEE 802.1X, HTTPS, Axis device ID, access control keys etc.) against malicious extraction in the event of a security breach. The secure keystore and secure connections are provided through a Common Criteria or FIPS 140 certified hardware-based cryptographic computing module.

Furthermore, signed video ensures that video evidence can be verified as untampered. Each camera uses its unique video signing key, which is securely stored in the secure keystore, to add a signature into the video stream allowing video to be traced back to the Axis camera from where it originated.

To read more about Axis Edge Vault, go to [axis.com/solutions/edge-vault](https://axis.com/solutions/edge-vault).

information is identified, recorded, and sent in full resolution and frame rate.

For more information, see [axis.com/glossary](https://axis.com/glossary)

### Electronic image stabilization

Electronic image stabilization (EIS) provides smooth video in situations where a camera is subject to vibrations. Built-in gyroscopic sensors continuously detect the camera's movements and vibrations, and they automatically adjust the frame to ensure you always capture the details you need. Electronic image stabilization relies on different algorithms for modeling camera motion, which are used to correct the images.

### Thermal palettes

A mode that allows the user to select a color range to show relative temperature differences in a scene. The user can choose between black-and-white ranges, color ranges, or a mix between the two. The same input (measured thermal radiation) can result in different visual appearance depending on how each pixel value is mapped to a color range.

### Zipstream

The Axis Zipstream technology preserves all the important forensic in the video stream while lowering bandwidth and storage requirements by an average of 50%. Zipstream also includes three intelligent algorithms, which ensure that relevant forensic