

# AUTODOME IP 5000i

www.boschsecurity.com



**BOSCH**

Invented for life



- ▶ 30x optical zoom that clearly identifies people (183 m / 600 ft maximum) without loss of identification details
- ▶ Excellent low-light performance
- ▶ Built-in Essential Video Analytics to trigger relevant alerts and quickly retrieve data
- ▶ Simple installation with flexible mounting options (in-ceiling or pendant mounting)

With AUTODOME IP 5000i cameras, you can capture full details of your surveillance space and identify activity details in the scene. The integrated 30x optical zoom lens allows covering large field of views from a single camera.

## Functions

### Low-light performance

The latest sensor technology combined with the sophisticated noise suppression results in an exceptional sensitivity in color. The low-light performance is so good that the camera continues to provide excellent color performance even with a minimum of ambient light.

### Pre-programmed user modes

The camera comes with 3 pre-tuned scene modes to match various lighting conditions. Users can complete the configuration without going through multiple imaging settings.

- Standard: For indoor fluorescent lighting.
- Sodium-lighting: For scenarios where the video is captured under sunlight in the day or under sodium vapor lamp at night.
- Vibrant: For enhanced contrast, sharpness, and saturation

### H.265 high-efficiency video encoding

The camera is designed on the most efficient and powerful H.264 and H.265/HEVC encoding platform. The camera is capable to deliver high-quality and high-resolution video with very low network load. With a doubling of encoding efficiency, H.265 is the new compression standard of choice for IP video surveillance systems.

### Intelligent streaming

Smart encoding capabilities, together with Intelligent Dynamic Noise Reduction technology and analytics, make the bandwidth consumption drop to extremely low levels. Only relevant information in the scene, like motion, or objects found with the analytics, need to be encoded.

The camera is capable of quad streaming which allows the camera to deliver independent, configurable streams for live viewing, recording, or remote monitoring via constrained bandwidths.

### Recording and storage management

Recording management can be controlled by the Bosch Video Recording Manager application, or the camera can use local storage and iSCSI targets directly without any recording software.

A memory card (SD, SDHC, or SDXC) up to 2 TB can be used for recording "at the edge" or for Automatic Network Replenishment (ANR) technology to improve the overall recording reliability.

Pre-alarm recording in RAM reduces bandwidth consumption on the network and extends the effective life of the memory card.

### **Essential Video Analytics on the edge**

The camera includes the latest release of Essential Video Analytics application from Bosch for use on prepositions.

The Essential Video Analytics application provides reliable video analytics for small and medium business, large retail stores, commercial buildings, and warehouses.

Advanced tasks like multiple line crossing, loitering, idle / removed object detection, crowd density estimation, occupancy and people counting are available for live alarming and forensic search. Object filters based on size, speed, direction, aspect ratio, and color can be defined.

A simplified calibration mode reduces installation time significantly, because you only need to enter the installation height once for each camera, independent of pre-positions.

After the camera is calibrated, the analytics engine can automatically classify objects as upright person, car, bike, or truck.

### **Data security**

Special measures are necessary to ensure the highest level of security for device access and data transport. On initial setup, the camera is only accessible over secure channels and enforces a password.

Web browser and viewing client access can be protected using HTTPS or other secure protocols that support state-of-the-art TLS 1.2 protocol with updated cipher suites including AES encryption with 256 bit keys. No software can be installed in the camera, and only authenticated firmware can be uploaded. A three-level password protection with security recommendations allows users to customize device access. Network and device access can be protected using 802.1x network authentication with EAP/TLS protocol. Superior protection from malicious attacks is guaranteed by the Embedded Login Firewall, on-board Trusted Platform Module (TPM) and Public Key Infrastructure (PKI) support.

The advanced certificate handling offers:

- Self-signed unique certificates automatically created when required
- Client and server certificates for authentication
- Client certificates for proof of authenticity
- Certificates with encrypted private keys

### **System integration and ONVIF conformance**

The camera conforms to the Open Network Video Interface Forum (ONVIF) Profile S and Profile G specifications. For H.265 configuration the camera also supports Media Service 2 which is part of the

future ONVIF Profile T. Compliance with these standards guarantees interoperability between network video products regardless of manufacturer. Third-party integrators can easily access the internal feature set of the camera for integration into large projects. Visit the Bosch Integration Partner Program (IPP) website ([ipp.boschsecurity.com](http://ipp.boschsecurity.com)) for more information.

### **Superior privacy masking**

The camera allows for a total of 24 individual privacy masks, with up to eight displayed in the same scene. These can be programmed with five corners each. Each mask changes size and shape smoothly and quickly, ensuring that the covered object cannot be seen.

### **PTZ drive and mechanism**

The camera supports 256 pre-positions and two styles of Guard Tours: Pre-position and Record/Playback. The Pre-position tour has capability for up to 256 pre-positions with a configurable dwell time between pre-positions and can be customized as to the order and the frequency that each Pre-position is visited. The camera also provides support for two (2) recorded tours, which have a total duration of 15 minutes of movements. These are recorded macros of an operator's movements, including pan, tilt, and zoom activities, and can be played back in a continuous manner.

Pan and tilt preset repeatability are accurate to within  $\pm 0.1$  degrees to ensure that the correct scene is captured every time. The camera delivers maximum pan speed of 300 degrees per second and maximum tilt speed of 200° degrees per second. The camera is capable of manual speeds (pan and tilt) of 0.1 to 120 degrees per second. The camera provides a pan range of up to 360 degrees continuous rotation.

### **Sophisticated alarm responses**

The camera supports advanced alarm control that uses sophisticated rules-based logic to determine how to manage alarms. In its most basic form, a "rule" could define which input(s) should activate which output(s). In a more complex form, inputs and outputs can be combined with pre-defined or user-specified commands to perform advanced camera functions.

### **Ease of installation and servicing**

The camera has been designed for quick and easy installation, a key feature from Bosch IP video products. All housings feature recessed screws and latches for increased tamper resistance. Bosch designed the camera with the knowledge that field cables and mounts are installed before the camera is mounted. The installation concept allows a single person to connect the cables directly to the camera without re-routing cables. The camera is easily secured to the mount with a single screw. The pendant housings are rated to provide IP66 protection and offer an operating temperature range down to -40 °C (-40 °F). The pendant camera comes

fully assembled with a sunshield and ready for wall or pipe applications with the proper mounting hardware (sold separately).

Bosch offers a full complement of hardware and accessories (sold separately) for wall, corner, mast, roof, pipe mount, and in-ceiling applications for indoor and outdoor environments, which allow the camera to be adapted easily to individual site requirements.

**DORI coverage**

DORI (Detect, Observe, Recognize, Identify) is a standard system (EN-62676-4) for defining the ability of a camera to distinguish persons or objects within a covered area. The maximum distance at which a camera/lens combination can meet these criteria is shown below:

	DORI definition	Distance	
		WIDE 1X	TELE 30X
<b>Detect</b>	25 px/m (8 px/ft)	65 m (213 ft)	1833 m (6014 ft)
<b>Observe</b>	63 px/m (19 px/ft)	26 m (85 ft)	727 m (2385 ft)
<b>Recognize</b>	125 px/m (38 px/ft)	13 m (43 ft)	367 m (1204 ft)
<b>Identify</b>	250 px/m (76 px/ft)	7 m (23 ft)	183 m (600 ft)

**Certifications and approvals**

**HD standards**

- Complies with the SMPTE 274M-2008 Standard in:
  - Resolution: 1920x1080
  - Scan: Progressive
  - Color representation: complies with ITU-R BT.709
  - Aspect ratio: 16:9
  - Frame rate: 25 and 30 frames/s
- Complies with the 296M-2001 Standard in:
  - Resolution: 1280x720
  - Scan: Progressive
  - Color representation: complies with ITU-R BT.709
  - Aspect ratio: 16:9
  - Frame rate: 25 and 30 frames/s

Marking	Applicable Standard
cULus	<ul style="list-style-type: none"> <li>UL60950-1/-22 (ed 2) (Includes CSA 22.2 No. 60950-1/-22)</li> </ul>
FCC Part 15 (USA)	<ul style="list-style-type: none"> <li>47CFR Part 15</li> <li>ICES-003 (Canada)</li> </ul>
CE (Europe)	<p><b>Electromagnetic Compatibility (EMC) Directive</b></p> <ul style="list-style-type: none"> <li>EN55032:2012/AC:2013</li> <li>EN 50130-4:2011/A1:2014</li> <li>EN 61000-3-2:2014</li> <li>EN 61000-3-3:2013</li> </ul>

**Product Safety: Low Voltage Directive**  
(IECEE CB scheme certificate and report are required)

- EN 60950-1:2006+A11:2009+A1:2010 +A12:2011+A2:2013 (with national differences)
- IEC 60950-1/-22 (ed 1)

Other labels / markings

- RCM, EAC, WEEE, China RoHS

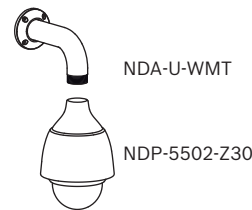
**Region Regulatory compliance/quality marks**

Europe CE

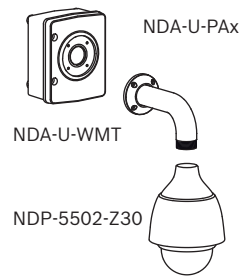
USA UL

**Installation/configuration notes**

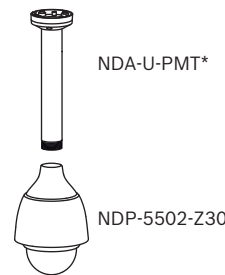
**Wall mount**



**Wall mount with surveillance cabinet (IP66)**

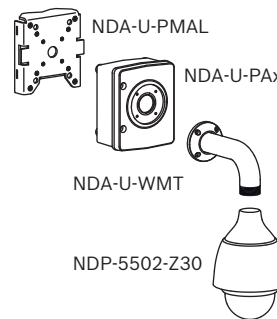


**Pendant pipe mount**

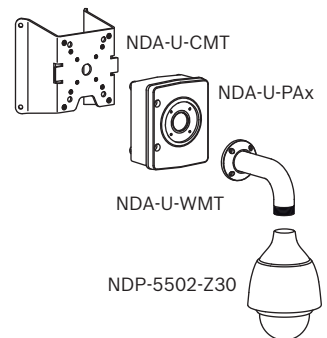


\* NDA-U-PMTE: optional 50cm / 20" extension pipe

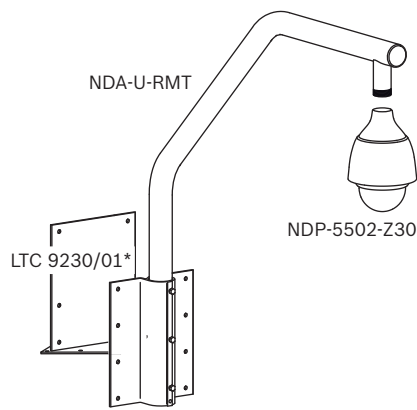
**Pole mount (IP66)**



**Corner mount (IP66)**

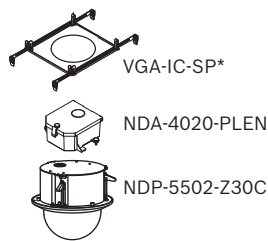


**Roof mount (IP66)**



\* optional for flat roof mount

**In-ceiling mount**



\* optional

For more options, see Quick Selection Guide: Modular camera mounts & accessories.

**Technical specifications**

Imager	1/2.8" progressive scan CMOS
Effective Picture Elements	1945 x 1097 (2.13 MP)
Lens	30x zoom 4.5 mm - 135 mm (F1.6 - F4.4)
Optical Zoom Field of View (FOV)	2.4° - 60.9°
Focus	Automatic with manual override
Iris	Automatic
Digital Zoom	16x

**Video performance - Sensitivity**

(3100K, reflectivity 89%, 1/30, F1.6, 30 IRE)

Color	0.05 lx
Mono	0.01 lx

High dynamic range	94 dB (measured according to IEC 62676 Part 5)
Electronic Shutter Speed (AES)	1/30 s to 1/15000 s (12 steps)
Signal-to-noise Ratio (SNR)	>55 dB (AGC off)
Noise Reduction	Intelligent Dynamic Noise Reduction
Backlight Compensation (BLC)	On/Off
Intelligent Defog	Automatically adjusts parameters for best picture in foggy or misty scenes (Auto/Off)
White Balance	Standard Auto, Sodium Lamp Auto, Basic Auto, Manual, Hold, Dominant Color Auto
Day/Night	Mechanical switchable IR filter (Auto/On/off) Monochrome

**Video content analysis**

Analysis type	Essential Video Analytics
Configurations	Silent VCA / Profile1 - 16
Alarm rules (combinable)	Any object Object in field Crossing line Entering field Leaving field Loitering Following route Idle object Removed object Counter Occupancy Crowd detection Condition change Similarity search Tampering
Object filters	Duration Size Aspect ratio v/h Speed Direction Color Object classes (Upright persons, Bikes, Cars, Trucks)
Calibration	Automatic self-calibrating when height is set

**Mechanical**

Pan/Tilt Modes	Normal: 0.1°/s - 120°/s Turbo: Pan: 0.1°/s - 300°/s; Tilt: 0.1°/s - 200°/s
Pre-position Speed	Pan: 300°/s Tilt: 200°/s

Pan Range	360° continuous
Tilt Angle	-90° to 0°
Preposition Accuracy	± 0.1° typ.
Pre-positions	256
Tours	Two (2) types of tours: <ul style="list-style-type: none"> <li>Recorded tours: two (2), maximum total duration 15 minutes (depending on the amount of commands sent during recording)</li> <li>Pre-position tour: one (1), consisting of up to 256 scenes consecutively, and one (1), customized up to 64 scenes</li> </ul>

### Electrical

Input voltage	24 VAC and PoE+
Power consumption	14 W (heater off) / 24 W (heater on)

### Software Control

Unit discovery	IP helper
Camera Setup/ Control	Via web browser (such as Internet Explorer version 11.0 or later), Configuration Manager, Bosch VMS, or Video Client
Software	Update network firmware upload
Latest firmware and software	<a href="http://downloadstore.boschsecurity.com/">http://downloadstore.boschsecurity.com/</a>

### Network

Video compression	H.265 H.264 M-JPEG	
Streaming	Multiple configurable streams in H.265, H.264, and M-JPEG; configurable frame rate and bandwidth.	
Frame rate	60fps at all resolutions	
Resolution	1080p 720p D1 4:3 (cropped) SD (432p, 288p)	
IP delay (typical)	60 fps: 200 ms	
Bitrate	The average typical optimized bitrate in kbits/second for various frame rates is shown in the following table:	
Video compression	H.265	
IPS	1080p	720p
60	1649	1249
30	1413	1096

15	1157	902
10	1075	841
5	746	597
2	407	343

Ethernet	10/100BASE-T
Encryption	TLS 1.0, SSL, DES, 3DES, AES
Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, ICMPv6, RTSP, FTP, ARP, DHCP, APIPA (Auto-IP, link local address), NTP (SNTP), SNMP (V1, V3, 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
Interoperability	ONVIF Profile S, ONVIF Profile G; GB/T 28181

### Audio

Compression	G.711, 8kHz sampling rate L16, 16kHz sampling rate AAC, 16kHz sampling rate
Interface	1/1 Channel In/Out

### Local Storage

Memory card slot	Support a memory card with a maximum of 32 GB microSDHC / 2 TB microSDXC (user-supplied). (An SD card of Class 6 or higher is recommended for HD recording.)
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### Fiber Optic Kit (sold separately)

#### VG4-SFPCKT

Description	Fiber Optic Ethernet Media Converter kit*. Requires a small form-factor pluggable (SFP) module (sold separately).
Data Interface	Ethernet
Data Rate	10/100 Mbps IEEE 802.3 Compliant Full Duplex or Half Duplex Electrical Port Full Duplex Optical Port
Compatible Receiver	CNFE2MC
Installation	Installed inside a NDA-U-PA0, NDA-U-PA1 or a NDA-U-PA2 power supply box with supplied mounting hardware

\* Kit available separately and must be installed inside the AUTODOME power supply box.

**SFP Modules**

Description	Interchangeable modules available for use with MMF or SMF optical fiber.
Data Interface	Ethernet
Data Rate	10/100 Mbps IEEE 802.3 Compliant
Weight (all SFP modules)	0.23 kg (0.05 lb)
Dimensions (LxWxH)	SFP-2, SFP-3: 55.5 x 13.5 x 8.5 mm (2.2 x 0.5 x 0.3 in.) SFP-25, SFP-26: 63.8 x 13.5 x 8.5 mm (2.5 x 0.5 x 0.3 in.)

	Type	Connector	Wavelength (transmit / receive)	Max. Distance
SFP-2	MMF	Duplex LC	1310 nm / 1310 nm	2 km (1.2 miles)
SFP-3	SMF	Duplex LC	1310 nm / 1310 nm	20 km (12.4 miles)
SFP-25	MMF	Single SC	1310 nm / 1550 nm	2 km (1.2 miles)
SFP-26	MMF	Single SC	1550 nm / 1310 nm	2 km (1.2 miles)

**Fiber Compatibility**

Optical Fiber Compatibility, MMF	50/125 µm MMF. For 50/125 µm fiber, subtract 4 dB from the specified optical budget value. Must meet or exceed fiber standard ITU-T G.651.
Optical Fiber Compatibility, SMF	8–10/125 µm SMF. Must meet or exceed fiber standard ITU-T G.652.
Optical Distance Specifications	Specified transmission distances are limited to the optical loss of the fiber and any additional loss introduced by connectors, splices, and patch panels. The modules are designed to operate over the entire optical loss budget range, so they do not require a minimum loss in order to operate.

**Miscellaneous**

Sector/Titling	16 independent sectors with 20 characters per title
Privacy Masks	24 individually configurable privacy masks
Privacy Masks pattern	Black, White, Gray, Auto (average background color)
Supported Languages	English, German, Spanish, French, Italian, Dutch, Polish, Portuguese, Russian, Japanese, Chinese (simplified)

**User Connections**

Power	RJ45 10/100 Base-T PoE+ (IEEE 802.3at, class 4 standard) 21-30 VAC, 50/60 Hz
Alarm Inputs	2
Alarm Outputs	1 relay output 32 VDC, 150 mA max.
Audio	1x mono line in, 1x mono line out
• Signal line in	94 kOhm typical, 1 Vrms max.
• Signal line out	1 kOhm typical, 1 Vrms max.

**Environmental (pendant model)**

Ingress Protection Rating/ Standard	IP66
IK Rating	IK10
Operating temperature	-40 °C to +60 °C (-40 °F to +140 °F)
Humidity	0% to 100% RH, condensing
Storage temperature	-40 °C to +60 °C (-40 °F to +140 °F)

**Environmental (in-ceiling model)**

Ingress Protection Rating/ Standard	IP51
Operating temperature	-10 °C to +60 °C (+14 °F to +140 °F)
Humidity	Up to 90% RH, non-condensing
Storage temperature	-40 °C to +60 °C (-40 °F to +140 °F)

**Construction (pendant model)**

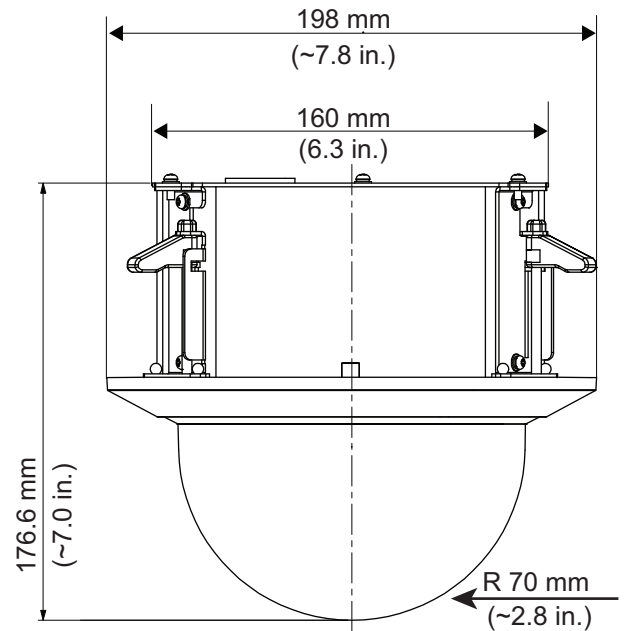
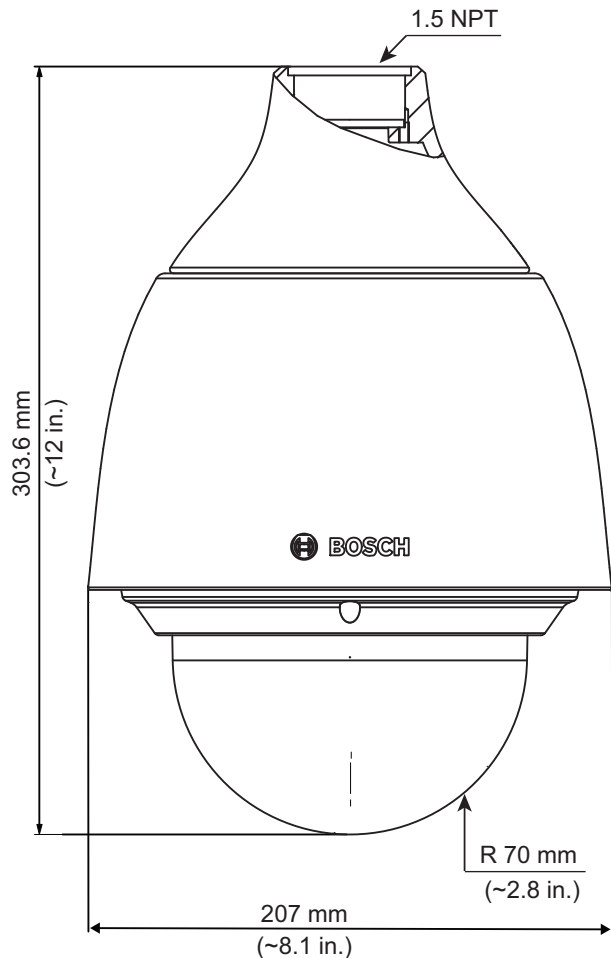
Dimensions (DIA x H)	207 mm x 303.6 mm (8.15 in x 11.95 in)
Weight	3.25 kg (7.17 lb)
Construction material	Housing: Aluminum Sunshield: Outdoor Grade Plastic Bubble: Polycarbonate
Standard color	White (RAL 9003)

**Construction (in-ceiling model)**

Dimensions (DIA x H)	198 mm x 176.6 mm (7.8 in x 6.95 in)
Weight	2.1 kg (4.63 lb)

Construction material	Housing: SPCC Trim ring: PC/ABS Bubble: Polycarbonate
Standard color	White (RAL 9003)

### Dimensional Drawings



*In-ceiling model*

### Ordering information

**NDP-5502-Z30 PTZ dome 2MP 30x clear IP66 pendant**  
IP dome camera with clear bubble and indoor/outdoor pendant housing. 30x zoom, 1080p HD. Essential Video Analytics, Intelligent Dynamic Noise Reduction, remote camera access, and dual power options.  
Order number **NDP-5502-Z30**

**NDP-5502-Z30C PTZ dome 2MP 30x clear indoor in-ceiling**  
IP dome camera with clear bubble and indoor in-ceiling housing. 30x zoom, 1080p HD. Essential Video Analytics, Intelligent Dynamic Noise Reduction, remote camera access, and dual power options.  
Order number **NDP-5502-Z30C**

### Accessories

**UPA-2450-50 PSU, 220VAC 50Hz, 24VAC 50VA out**  
Indoor power supply for camera. 220 VAC, 50 Hz in; 24 VAC, 50 VA out  
Order number **UPA-2450-50**

**UPA-2450-60 PSU, 120VAC 60Hz, 24VAC 50VA out**  
Indoor power supply for camera. 120 VAC, 60 Hz In; 24 VAC, 50 VA Out  
Order number **UPA-2450-60**

**NPD-6001B High PoE midspan**  
High PoE Midspan, 60 W, single port, AC in  
Order number **NPD-6001B**

**NDA-U-PA0 Surveillance cabinet 24VAC**  
Surveillance cabinet, 24 VAC input, 24 VAC output, IP66  
Order number **NDA-U-PA0**



**NDA-U-PA1 Surveillance cabinet 120VAC**

Surveillance cabinet, 100 - 120 VAC 50/60 Hz input, 24 VAC output, IP66  
Order number **NDA-U-PA1**

**NDA-U-PA2 Surveillance cabinet 230VAC**

Surveillance cabinet, 230 VAC input, 24 VAC output, IP66  
Order number **NDA-U-PA2**

**NDA-U-CMT Corner mount adapter**

Universal corner mount, white  
Order number **NDA-U-CMT**

**NDA-U-PMAL Pole mount adapter large**

Universal pole mount adapter, white; large  
Order number **NDA-U-PMAL**

**NDA-U-PMAS Pole mount adapter small**

Pole mount adapter small  
Universal pole mount adapter, white; small.  
Order number **NDA-U-PMAS**

**NDA-U-PMT Pendant pipe mount, 12" (31cm)**

Universal pipe mount for dome cameras, 31 cm, white  
Order number **NDA-U-PMT**

**NDA-U-PMTE Pendant pipe extension, 20" (50cm)**

Extension for universal pipe mount, 50 cm, white  
Order number **NDA-U-PMTE**

**NDA-U-PSMB Pendant wall/ceiling mount SMB**

Surface mount box (SMB) for wall mount or pipe mount.  
Order number **NDA-U-PSMB**

**NDA-U-WMP Wall mount plate**

Back plate for universal wall mount, corner mount and pole mount, white, IP66  
Order number **NDA-U-WMP**

**NDA-U-WMT Pendant wall mount**

Universal wall mount for dome cameras, white  
Order number **NDA-U-WMT**

**NDA-U-RMT Pendant parapet mount**

Universal roof mount for dome cameras, white  
Order number **NDA-U-RMT**

**LTC 9230/01 Roof mount adapter**

Flat Roof Mount Adapter for mounting a unit in an upright position on a flat surface.  
Order number **LTC 9230/01**

**VGA-IC-SP Suspended ceiling support kit,7"**

Suspended ceiling support kit for dome cameras. Aperture Ø177 mm (Ø7 in). Maximum supported weight 11.3 kg (25 lb).  
Order number **VGA-IC-SP**

**MNT-ICP-ADC Drop ceiling support kit for AUTODOME**

Suspension ceiling support kit for AUTODOME IP 4000/5000/7000 AND VG5-100/600 series in-ceiling cameras  
Order number **MNT-ICP-ADC**

**NDA-4020-PLEN Plenum box for PTZ dome**

In-ceiling housing for plenum spaces for AUTODOME IP 4000i and AUTODOME IP 5000i cameras. Available in specific regions only.  
Order number **NDA-4020-PLEN**

**NDA-5020-PTBL Tinted bubble for PTZ dome**

Tinted bubble for pendant models of AUTODOME IP 5000i cameras.  
Order number **NDA-5020-PTBL**

**NEZ-A5-BUB-CTIP Bubble, tinted, for in-ceiling model**

Tinted bubble for in-ceiling models of AUTODOME IP 5000i cameras.  
Order number **NEZ-A5-BUB-CTIP**

**VG4-SFPSCKT ETHERNET TO SFP INTERFACE KIT**

Ethernet media converter video transmitter/data receiver fiber optic kit for AUTODOME cameras and for MIC-IP-PSU for MIC analog cameras.  
Order number **VG4-SFPSCKT**

**SFP-2 Fiber module, multimode, 1310nm, 2LC**

SFP Fiber Optic Module, 2 km (1.2 miles), 2 LC connectors.  
Multi-mode  
1310 nm  
Order number **SFP-2**

**SFP-3 Fiber module, single-mode, 1310nm, 2LC**

SFP Fiber Optic Module, 20 km (12.4 miles), 2 LC connectors.  
Single-mode  
1310 nm  
Order number **SFP-3**

**SFP-25 Fiber module, 1310/1550nm, 1SC**

SFP Fiber Optic Module, 2 km (1.2 miles), 1 SC connector  
Multi-mode  
1310/1550 nm  
Order number **SFP-25**

**SFP-26 Fiber module, 1550/1310nm, 1SC**

SFP Fiber Optic Module, 2 km (1.2 miles), 1 SC connector  
Multi-mode  
1550/1310 nm  
Order number **SFP-26**



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