

Camera Series RDF6000DN

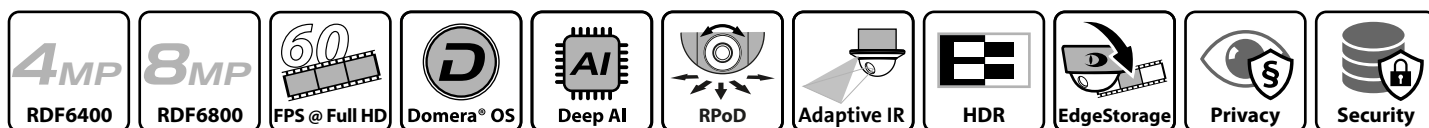
DOMERA®

High definition camera, 4/8 MP, H.265, day/night, HDR, PoE, Deep AI object classification, EdgeAnalytics AI Apps, motor-driven varifocal lens, motorized 3-axis adjustment (RPoD), variable DOMERA® mounting concept



reddot winner 2022

ONVIF | M S T



The cameras of the RDF6000DN series are designed for applications that require real-time, high-resolution images during the day and, depending on the model, in IR mode at night. The different models are offered with a resolution of 4 or 8 MP and an integrated lens in a vandal-resistant dome housing.

DOMERA® OS

The cameras are equipped with the hardened Linux operating system DOMERA® OS. In addition to a kernel with long-term support, it offers extensive security functions such as the deactivation of unused ports or the enforcement of strict passwords. In addition, DOMERA® OS supports secure network authentication (IEEE 802.1X) and encrypted data transmission (TLS 1.2/AES-256). All software components are subject to permanent monitoring, maintenance and updating, while the effectiveness of all measures is ensured by regular external penetration tests.

AI Analysis - Deep AI Object Classification

The camera is equipped with an intensively trained neural network that analyzes the captured images in high resolution and independent of movements in the background (green spaces, water areas, etc.) and reliably classifies defined objects (persons, vehicles, etc.) in real time. The captured data is sent with the video stream to the Dallmeier recording system for evaluation and storage and is available for further processing with the integrated EdgeAnalytics Apps.

AI Analysis - EdgeAnalytics Apps

The embedded EdgeAnalytics AI apps use the raw data of the Deep AI Object Classification to assess the captured operations according to the specific criteria of various use cases. The Line Crossing App, for example, detects the crossing of a defined line by a relevant object (person, vehicle, etc.) and generates a corresponding message with time and direction of movement. On the other hand, the various counting apps cyclically determine the number of persons or vehicles in a defined area and report when a set threshold value is exceeded. The generated event messages and values complete the raw data already contained in the video stream and can be displayed and evaluated with a Dallmeier client software.

Remote Positioning Dome

The camera is equipped with a motor-driven gimbal for precise lens alignment over the network (RPoD / PTRZ). Remote control is provided by the DOMERA® OS user interface and allows for simple installation and easy adjustment of the captured scene if requirements change. In addition, DOMERA® OS supports the adjustment of zoom, focus and iris of the P-Iris lens over the network. After installation and commissioning of the camera, no further measures are required on site.

Adaptive IR Illumination

The homogeneous illumination of the IR models is discreetly integrated under the permeable housing cover and can be manually or automatically adapted to the captured scene. Orientation and intensity of the illumination are dynamically determined by the position of the lens and the exposure control. In this way, disturbing side effects such as reflections from white walls next to the detection area can be avoided as far as possible. As a result, the camera delivers clear black and white images with excellent contrast even in seemingly complete darkness.

High Dynamic Range

The camera offers an HDR function for optimal recording of scenes with very bright and dark areas. Each image is captured with two special settings that are combined in real time to create a balanced result. The resulting video stream offers much more detail in both light and dark areas and is visually very close to the human eye's perception.

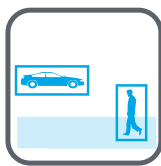
Further features

- Video compression H.264, H.265, MJPEG
- EdgeStorage and memory expansion with SD card
- Ambient light sensor and removable IR cut filter
- Automatic switching of presets for day and night
- Position sensor for automatic corridor mode integrated
- GDPR-compliant functions for data protection and security
- In-ceiling housing UL 2043 "plenum rated" compliant
- Compatible with ONVIF Profile M, Profile S and Profile T
- Network protocol MQTT supported

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The **AI Motion Detection App** analyzes the entire image content and reliably detects all movements triggered by persons or vehicles. The motion events are sent to the recording system with the video stream. Afterwards, they are available with metadata such as object type, time and position for targeted evaluation with Dallmeier client software.



The **AI Tamper Detection App** is classically used for detecting and reporting attempted tampering with the camera. The app detects a general change in the captured scene, such as typically occurs when the camera is manually rotated or tilted, and immediately issues a corresponding message.



The **AI Loitering Detection App** analyzes the movement of persons detected by the neural networks and evaluates their dwell time in a defined sensitive zone. If the set limit value of the dwell time is exceeded, a corresponding message can be displayed to the operator. At the same time, undesired attendants can be requested to leave the area by outputting a stored audio sequence.



The **AI Intrusion Detection App** allows the definition of protected zones and issues a message as soon as an object intrudes into them. The object type relevant for the message can be defined as, for example, person or vehicle. For targeted operator attention, a pre-zone can be defined for each protected zone, which can be used to escalate the messages.



The **AI Line Crossing App** issues a message as soon as a person or vehicle crosses a virtual line drawn in the image. Uninteresting crossings of the virtual lines, for example by animals, can be effectively excluded. An operator is thus less distracted and can concentrate much better on relevant observations.



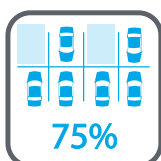
The **AI People Count App**¹⁾ analyzes the entire image content in a defined cycle and determines the number of people present in defined areas. Irrelevant objects are effectively filtered out by object classification based on a neural network to achieve the most accurate count result possible.



The **AI Vehicle Count App**¹⁾ allows the subdivision of large scenes into different zones and cyclically determines the number of objects. Based on an accurate object classification using a neural network, the number of vehicles present is output immediately.



The **AI Queueing App**¹⁾ is applied to display the fill level in defined zones. During configuration, the relevant zone and a limit for the number of people present is defined. After a cyclic analysis, the utilization is displayed and a message is issued if the limit is exceeded. This allows the initiation of targeted measures to avoid overcrowding situations or queues.



The **AI Parking App**¹⁾ was developed in particular for the effective evaluation of parking situations. It detects, verifies and counts vehicles in the defined parking zones and cyclically outputs the occupancy rate based on a defined limit. This allows an operator to get a quick overview of the parking lot occupancy at any time.



The **AI Face Detection App**¹⁾ reliably detects the faces of people in a defined area of the captured scene. In addition to the output of pure count values, the app allows filtering of the results based on the "mask" attribute. This allows the targeted notification of personnel if the wearing of a mouth and nose protection mask is mandatory in an area.

1) In preparation

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Series 6400	
	<p>008297.401 RDF6400DN High definition camera, 4 MP, H.265, day/night, Deep AI/VCA, HDR, PoE, DOMERA® RPoD in-ceiling housing, design cover black IR translucent²⁾, motor-driven varifocal lens F1.3 / 4,5 – 9,7 mm</p>
	<p>008297.402 RDF6400DN High definition camera, 4 MP, H.265, day/night, Deep AI/VCA, HDR, PoE, DOMERA® RPoD in-ceiling housing, design cover black IR translucent²⁾, motor-driven varifocal lens F1.8 / 12 – 40 mm</p>
Series 6800	
	<p>008298.401 RDF6800DN Ultra high definition camera, 8 MP, H.265, day/night, Deep AI/VCA, HDR, PoE, DOMERA® RPoD in-ceiling housing, design cover black IR translucent²⁾, motor-driven varifocal lens F1.3 / 4,5 – 9,7 mm</p>
	<p>008298.402 RDF6800DN Ultra high definition camera, 8 MP, H.265, day/night, Deep AI/VCA, HDR, PoE, DOMERA® RPoD in-ceiling housing, design cover black IR translucent²⁾, motor-driven varifocal lens F1.8 / 12 – 40 mm</p>
Illumination (series RDF6000DN and RDF5000DN, SDF6800DN)	
	<p>008406 DOMERA® Dual Matrix LED Ring Illumination for DOMERA® in-ceiling housing, five IR LEDs and five white light LEDs, event-controlled switching between IR and white light illumination, individual control of the intensity of individual LEDs or automatic adjustment to the captured scene, recommended for models with 4.5 - 9.7 mm or fisheye lens (only ex factory)</p>
Housing cover	
	<p>008408 DOMERA® Housing Cover Aluminium LED Black Aluminium housing cover for DOMERA® in-ceiling housing, can be combined with DOMERA® Surface Mount Adapter and DOMERA® Wall Bracket, black, with cut-outs for IR and white light LEDs³⁾</p>
	<p>008529 DOMERA® Housing Cover Aluminium Black Aluminium housing cover for DOMERA® in-ceiling housing, can be combined with DOMERA® Surface Mount Adapter and DOMERA® Wall Bracket, black, cannot be combined with cameras with DOMERA® Dual Matrix LED Ring</p>
	<p>008410 DOMERA® Housing Cover Aluminium White Aluminium housing cover for DOMERA® in-ceiling housing, can be combined with DOMERA® Surface Mount Adapter and DOMERA® Wall Bracket, white, cannot be combined with cameras with DOMERA® Dual Matrix LED Ring</p>
Adapter	
	<p>008407 DOMERA® Surface Mount Adapter Adapter for surface mounting a DOMERA® in-ceiling housing, safety rope included, polycarbonate, white</p>
	<p>008209 DOMERA® Wall Bracket Multifunctional bracket for mounting a DOMERA® in-ceiling housing on a wall or pole, compatible with the Mountera® Vandalproof Pole Adapter and the Mountera® Box, safety rope included, aluminum, white</p>
	<p>008508 DOMERA® Wall Bracket with Speaker Multifunctional bracket for mounting a DOMERA® in-ceiling housing on a wall or pole, compatible with the Mountera® Vandalproof Pole Adapter and the Mountera® Box, DOMERA® Speaker and NF amplifier 1.4 W included, recommended for use as intercom system, safety rope included, aluminum, white, DOMERA® Breakout Cable required (expected to be available as of Q4/2022)</p>

2) Installation without tool, IR transmission 70%, white light transmission 10%, reflection-free at tilt from 25° to 90°
3) Installation with tool, IR transmission 100%, white light transmission 100%, reflection-free at tilt from 0° to 90°

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Extensions



008421 DOMERA® Breakout Cable
Breakout cable with 1× Audio Line IN, 1× Audio Line OUT, 2× Contact IN, 2× Contact OUT, 1× power supply (expected to be available as of Q4/2022)



008423 DOMERA® Passive Heating Kit
Fan based heating by using the waste heat of the electronic components (approx. 6 W) to prevent fogging on the inside of the dome, manual remote control via DOMERA® OS user interface⁴⁾ (expected to be available as of Q4/2022, ex factory only)

Power supply



004316 PoE Midspan 30 W
Midspan power supply unit, 1× Ethernet port, 10/100/1000Base-T, 802.3at, 802.3af, 30 W

Included Support and License Interval

Camera Support and License Interval Basic

License for the use of the support services of the Support Level Basic for 60 months, license for the update of Domera® OS with updates, upgrades and security updates⁵⁾ for 12 months, license for the update of neural networks for object classification for 12 months, test function of the EdgeAnalytics AI Apps (Essentials) with object classification with a runtime of 30 days, unlimited license for the use of the VCA function, bring-in warranty for 24 months

Optional Support and License Interval

008414 AI Camera Support and License Interval Premium and Warranty (Total of 60 Months)
License for the use of the support services of the Support Level Premium for 60 months
license for the update of Domera® OS with updates, upgrades and security updates⁵⁾ for 60 months
license for the update of neural networks for object classification for 60 months
unlimited license for the use of EdgeAnalytics AI Apps (Essentials) with object classification
extension of bring-in warranty to a total of 60 months (ex factory only)

Optional Maintenance

008416 Camera Software Maintenance (Plus 12 Months)
License for the update of Domera® OS with updates, upgrades and security updates⁵⁾ for 12 months, license for the update of neural networks for object classification for 12 months.

Optional Warranty

008417 Camera Hardware Warranty (Total of 60 Months)
Extension of bring-in warranty to a total of 60 months

Optional Licenses (Functions)

008418 DLC - EdgeAnalytics AI Apps (Essentials)
Perpetual license for the use of EdgeAnalytics AI Apps (Essentials) with object classification (AI Motion Detection, AI Tamper Detection, AI Loitering Detection, AI Intrusion Detection, AI Line Crossing)

008419 DLC - Audio IN/OUT and Intercom
License for the use of the Audio Line IN/OUT interface, audio compression G.711 or AAC, recommended for use as intercom system (additional hardware required)

4) When the fan is active, the audio signal of the microphone may be superimposed.

5) Security updates for relevant CVE vulnerabilities that become known will be provided (subject to technical feasibility) for the entire runtime of the software maintenance.

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Sensor	RDF6400DN	RDF6800DN
Type	1/2" CMOS	1/1.7" CMOS
Number of sensor pixels	4MP	8MP
Light sensitivity	Models with IR illumination: 0 lux (IR LED ON) Models without IR illumination: < 0.0005 lux (F1.6, AGC ON)	Models with IR illumination: 0 lux (IR LED ON) Models without IR illumination: < 0.05 lux (F1.4, AGC ON)
Dynamic range	120 dB with HDR	120 dB with HDR
Signal to noise ration	> 50 dB	> 50 dB

Lenses	F1.3 / 4.5 - 9.7 mm	F1.8 / 12 - 40 mm
Type	Motor-driven varifocal lens	Motor-driven varifocal lens
Format / Mount	1/1.8" Board Lens	1/1.8" Board Lens
Focal length	4.5 - 9.7 mm	12 - 40 mm
Iris range	F1.3 - Closed	F1.8 - Closed
Iris control	P-Iris (motor-driven)	P-Iris (motor-driven)
Zoom / Focus control	Motor-driven	Motor-driven
Minimum object distance	0.5 m	1.5 m
IR corrected	Yes	Yes

Available angle of view RDF6400DN	F1.3 / 4.5 - 9.7 mm	F1.8 / 12 - 40 mm
Wide end (H x V) ⁶⁾	111.2° x 56.4°	36.1° x 19.9°
Tele end (H x V) ⁶⁾	47.5° x 26.2°	12.4° x 7.0°

Available angle of view RDF6800DN	F1.3 / 4.5 - 9.7 mm	F1.8 / 12 - 40 mm
Wide end (H x V) ⁶⁾	110.0° x 55.4°	35.2° x 19.3°
Tele end (H x V) ⁶⁾	47.0° x 26.2°	12.1° x 6.8°

Format and Encoding	RDF6400DN	RDF6800DN
Video standard	SDTV (PAL/NTSC) HDTV (SMPTE 296M, SMPTE 274M)	SDTV (PAL/NTSC) HDTV (SMPTE 296M, SMPTE 274M)
Resolution 16:9	4 MP (2688 x 1520) @ 50/60 fps 1080p (1920 x 1080) @ 50/60 fps 720p (1280 x 720) @ 50/60 fps 640 x 480, 640 x 368, 480 x 272, 320 x 240 @ 50/60 fps	8.3 MP (3840 x 2160, 2160p) @ 25/30 fps (Ultra High Definition) 5.3 MP (3072 x 1728) @ 25/30 fps 1080p (1920 x 1080) @ 25/30 fps 720p (1280 x 720) @ 25/30 fps 480 x 272, 320 x 240 @ 25/30 fps
Video compression	H.264, H.265, MJPEG	H.264, H.265, MJPEG
Frame rate	Up to 60 fps	Up to 30 fps
Video bit rate	1 - 12 Mbps, constant or variable bit rate with priority setting for image quality ⁷⁾	1 - 50 Mbps, constant or variable bit rate with priority setting for image quality ⁷⁾
Video streaming	Up to 3 streams with different settings simultaneously	Up to 3 streams with different settings simultaneously
Audio compression ⁸⁾	G.711 (A-LAW, μ-LAW), AAC	G.711 (A-LAW, μ-LAW), AAC
Audio bit rate ⁸⁾	64 kbps (G.711), 48 - 96 kbps (AAC)	64 kbps (G.711), 48 - 96 kbps (AAC)
Live streaming transmission method	Unicast, Multicast	Unicast, Multicast
Number of live streams / clients	Up to 5 streams with up to 12 Mbps simultaneously	Up to 5 streams with up to 16 Mbps simultaneously

6) All specifications ±5%. Minor distortions (barrel-shaped) may occur at wide-angle settings greater than 90° due to the construction and do not constitute a defect.

7) Limited to 20 Mbps with EdgeAnalytics active. If the total available bit rate is not sufficient, not the image quality but the number of frames is adjusted.

8) Optional license for the use of the Audio Line IN and OUT interface required (DLC - Audio Line IN/OUT).

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Functions	
Day/Night switching	Ambient light sensing and removable IR cut filter (ICR), switching threshold level adjustable
Black-and-white mode	Automatic (at low light or in night mode), On, Off
Automatic Electronic Shutter	1/1 – 1/8000 s
Slow Shutter Limit	1/1 – 1/1000 s
Lens control	Zoom control (Tele – Wide), Focus control (Far – Near, One-Push AF), Iris control (P-Iris) via web browser
Digital flip function	Horizontal, vertical or both axes
Digital Noise Reduction	3D-DNR (adjustable by 10 levels)
Digital image optimization	High Dynamic Range (HDR) ⁹⁾
Exposure presets	Universal, Indoor, Fluorescent, Casino, Low-Light, User-Defined (with automatic day/night switching)
Exposure compensation	-2 EV (Exposure Value) to + 2 EV (adjustable by 200 levels)
Exposure metering	Average metering (light information from entire scene), center-weighted average metering, spot metering
Brightness adjustment	Automatic (ALC), Manual
Gain control	Automatic (AGC) with adjustable Gain Limit
White balance	Auto: ATW (Auto Tracking White Balance), One-Push AWB (Automatic White Balance) Fixed: 2800K, 4000K, 5000K, 6500K and 7500K
Privacy Zone Masking	Hiding/masking of up to 16 protected areas (up to 100% of the entire image)
Alarm notification	Via DaVid protocol to PGuard advance, via E-Mail and FTP image upload in preparation
Alarm trigger	Application restart, EdgeStorage status, contact input, certificate expiration, service interval
Video Content Analysis (VCA)	VCA Motion Detection, VCA Tamper Detection, VCA Intrusion Detection, VCA Line Crossing
EdgeAnalytics AI Apps (Essentials) ¹⁰⁾	AI Motion Detection, AI Tamper Detection, AI Loitering Detection, AI Intrusion Detection, AI Line Crossing
EdgeAnalytics actions	Notification via DaVid/PGuard, switching of relays and LEDs, audio output, message via MQTT/HTTP
Protocols	
Ethernet protocols	IPv4 (ARP, ICMP, IGMPv2/IGMPv3), UDP, TCP, LLDP, CDP (v1,v2), DSCP (QoS), DNS, DHCP, NTP, HTTP/HTTPS, RTSP/RTP/RTCP, SNMP (v1, v2c, v3), MQTT
Ethernet protocols in preparation	IPv6 (NDP, ICMPv6, MLDv1/MLDv2, SLAAC, RDNSS), UDPv6, TCPv6, DNSv6, DHCPv6, LDAP
Communication protocols	DaVid, DaVidS, ONVIF Profile M, ONVIF Profile S, ONVIF Profile T, SNMP (v1, v2c, v3)
Security	HTTPS encryption, SSL/TLS 1.2 (AES), network access control according to IEEE 802.1X
Connections	
Ethernet	1x RJ45, 10BASE-T/100BASE-TX PoE
Audio Line IN ^{11) 12)}	1x 3.5 mm phone jack for stereo plug Input level: max. 2.83 V _{p-p} Input impedance: 29 kΩ
Audio Line OUT ^{11) 12)}	1x 3.5 mm phone jack for stereo plug Output level at 10 kΩ load: max. 3.11 V _{p-p} Output impedance: 320 Ω
Profile M,	2x Contact IN / 2x Contact OUT
Power IN ¹¹⁾	1x Connection terminal 2 poles
LED Illumination (optional)	
Type	Five semi-covert 850 nm IR LEDs Five white light LEDs
Intensity	Individually adjustable per LED
IR Range	Up to approx. 30 m
IR Beam angle	Up to approx. 90° per LED, adaptively controlled according to focal length
Day/Night switching threshold	Adjustable

9) In combination with the HDR function, frame rates of up to 30 fps can be used.

10) Optional license DLC - EdgeAnalytics AI Apps (Essentials) or AI Camera Support and License Interval Premium required.

11) Available only in connection with the optional DOMERA® Breakout Cable.

12) Optional license DLC - Audio IN/OUT and Intercom required.

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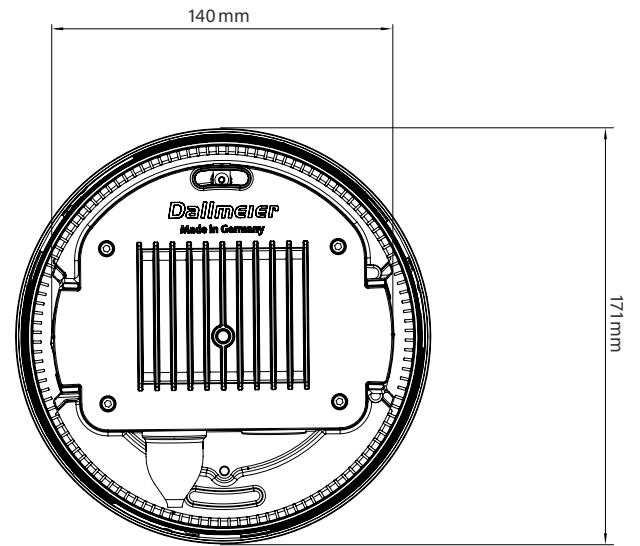
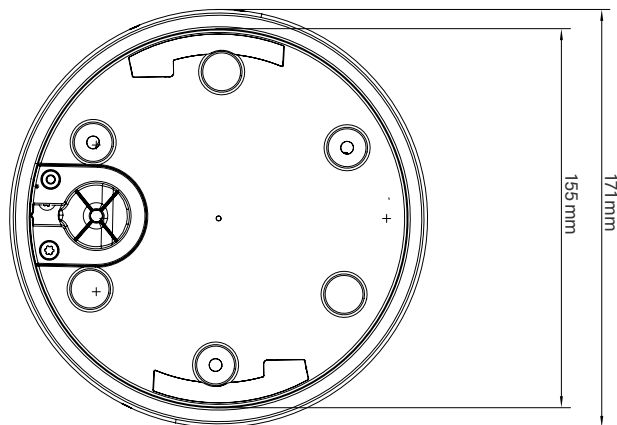
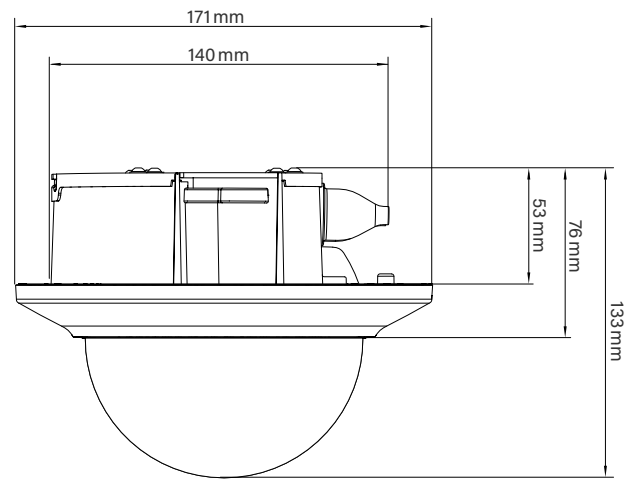
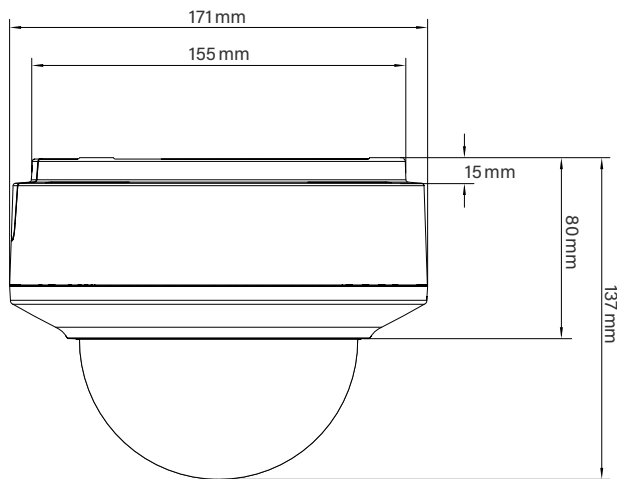
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Electrical Data	
Voltage supply	PoE (Class 0) 24 V DC - 48 V DC ±5% (with DOMERA® Breakout Cable)
PoE standard	IEEE 802.3af
Power consumption	Max. 12 W
Mechanical Data	
Dimensions	Approx. Ø 171 × H 133 mm (H 137 with surface mount adapter) Ø 6.7 × H 5.2 inches (H 5.4 with surface mount adapter)
Weight	Approx. 1.2 kg (1.4 kg with surface mount adapter) 2.6 lb (3.0 lb with surface mount adapter)
Adjustment	3-axes (remote positioning over network)
Bubble	Clear
Vandal-resistant	Yes
IK protection	IK10
IP rating	IP55 (in-ceiling mount or in connection with DOMERA® Surface Mount Adapter) IP66 (in connection with DOMERA® Wall Bracket)
Color	In-ceiling housing black Housing cover black
Environmental Conditions	
Operating temperature	-40°C to +50°C (-40°F to +122°F) (peak up to +65°C (+149°F), not permanent)
Start-up temperature	-25°C to +50°C (-13°F to +122°F)
Relative humidity	0% - 90% RH, non-condensing
Compatibility	
Recording	SMAVIA Recording Server V8.x.x SMAVIA Recording Server V9.x.x SeMSy® Recording Server V10.x.x
Evaluation	SMAVIA Viewing Client SeMSy® Workstation Software SeMSy® Compact
Miscellaneous	
Ambient light sensor	Integrated
Position sensor	Integrated
Microphone	Integrated in DOMERA® Dual Matrix LED Ring
Local memory	50 MB RAM memory
Memory extension	microSDXC 32/64 GB, Class 10, UHS-I (optional)
Configuration and live video	Via web browser (all major platforms)
Languages	German, English
Programming interface	Open platform for integration into 3rd party systems using API
ONVIF compliance	Profile M, Profile S, Profile T
GDPR compliance	Supported
Approvals/Certifications	
Type	CE, FCC, RCM, EAC, UL, IEC/EN 62471 and UL2043 compliant

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