(A) BOSCH	Product Tests Report	
Security Systems		9 April 2019
1706 Hempstead Road	TO WHOM IT MAY CONCERN	Page: 1 of 4
Lancaster, PA 17601		_

## **Product Tests Report**

Product name: AUTODOME IP starlight 5000i Camera

Model number and description:

NDP-5512-Z30 PTZ dome camera with clear bubble and indoor/outdoor pendant housing, 30x zoom, 1080p HD NDP-5512-Z30C PTZ dome camera with clear bubble and indoor in-ceiling housing, 30x zoom, 1080p HD

The above-mentioned Bosch Security Systems product has been tested in accordance and was found to comply with the tests listed below which were carried out during the development phase of the product. Please note that for some tests, test conditions exceed the range that Bosch recommends for effective continuous operation of the camera.

Data subject to change without notice.

## **ENVIRONMENTAL TEST**

EN 50130-5:2011 Alarm systems Part 5: Environmental test methods	Specific Test Description (Temperatures stated are outside of the camera housing)	Comments	Passed
Dry heat Operational IEC 60068-2-2:2007	Pendant: Temp. +60 °C, duration 16 hours In-ceiling: Temp. +45 °C, duration 16 hours		Yes
Dry heat Endurance IEC 60068-2-2:2007	Pendant: Temp. +60 °C, duration 21 days In-ceiling: Temp. +45 °C, duration 21 days		Yes
Cold operational IEC 60068-2-1:2007	Pendant: Temp40 °C, duration 16 hours In-ceiling: Temp20 °C, duration 16 hours		Yes
Cold Endurance and Cold Start test IEC 60068-2-1:2007	Power off, perform endurance test. Pendant: Temp40 °C, duration 96 hours In-ceiling: Temp20 °C, duration 96 hours Perform cold start. Unit must power up & function normally within < 30 minutes.		Yes
Humidity, operational  Damp heat, steady state operational IEC 60068-2-78:2012	40 °C / relative humidity (RH) 93%, duration 21 days.		Yes
Damp heat, cyclic operational IEC60068-2-30:2005	16h @ 60 °C /95%RH to 6h @ 35 °C /85%, 5 Cycles total		Yes
IEC 60529 Ingress Protection Rating (IP66) Degrees of protection provided by enclosures (IP Code) [Dust, water ingress (operational)]	Dust tight (no dust ingress; complete protection against contact). Water Test duration: at least 3 minutes Water volume: 100 liters per minute Pressure: 100 kN/m² at distance of 3m	IP66 (indoor/outdoor pendant model)	Yes
IEC 60529 Ingress Protection Rating (IP54) Degrees of protection provided by enclosures (IP Code) [Dust, water ingress (operational)]	Dust protected (Ingress of dust is not prevented completely, but it must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment; complete protection against contact) Water Test duration: 5 minutes Water volume: 10 liters per minute Pressure: 80-100 kPa	IP54 (in-ceiling model)	
Vibration sinusoidal operational IEC 60068-2-6:2008	Freq. Range 10-150Hz, 5m/s², 3 axes, sweep rate 1 octave/m 1 sweep/axis, (1.0g)		Yes

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EN 50130-5:2011 Alarm systems Part 5: Environmental test methods	Specific Test Description (Temperatures stated are outside of the camera housing)	Comments	Passed
Vibration sinusoidal endurance	Freq. Range 10-150Hz, 10m/s², 3 axes, sweep rate 1 octave/min 20 sweep/axis		Yes
Shock operational IEC 60068-2-27:2009	Half sine wave 6 ms, 10g, 6 number of shocks, 3 pulses per direction		Yes
Impact operational (IK10) IEC 62262:2002-02	Impact energy 20 Joule, 400mm height, free fall		Yes
Simulated solar radiation Surface degradation IEC 60068-2-5:1999	Temperature 40 °C, duration 10 days Irradiance 1120 W/m²		Yes
Flowing mixed gas corrosion test IEC 60068-2-60		Pendant model only	Yes
Solar radiation ISO 4892-2:2013, compatible to IEC 60068-2-5		Pendant model only	Yes
Sulphur Dioxide SO2 endurance EN 60068-2-42:2003	Temperature 25 °C, SO2 concentration 25ppm, Relative humidity 93%, 21 days		Yes
Salt mist, cyclic endurance EN 60068-2-52:1996	25 °C, 93%RH, 5±0.1%NaCl, PH6.5-7.2, 2 hours salt mist, 166 hours damp heat, 4 cycle		Yes
Wind speed (wind tunnel test)	150 mph for 1.0 hours without structural damage or loss of video or PTZ function (simulation calculation)		Yes

## **ADDITIONAL CERTIFICATIONS**

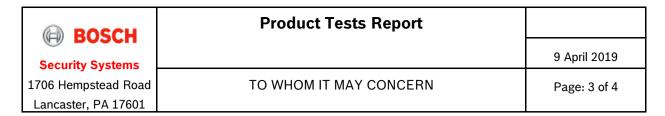
Functional tests description	Description	Comments	Passed
SMPTE 274M-2008 Standard	Resolution: 1920x1080 Scan: Progressive		Yes
1920 x 1080 Image Sample Structure, Digital	Color representation:		
Representation and Digital Timing Reference	complies with ITU-R BT.709		
Sequences for Multiple Picture Rates	Aspect ratio: 16:9 Frame rate: 25 and 30 frames/s		
SMPTE 296M-2001 Standard	Resolution: 1280x720 Scan: Progressive		Yes
1280 x 720 Progressive Image Sample	Color representation:		
Structure - Analogue and Digital Representation	complies with ITU-R BT.709 Aspect ratio: 16:9		
and Analogue Interface	Frame rate: 25, 30, 50 and 60 frames/s		
Conformant with NTCIP protocols 1205, 2301,			Yes
1101:1996, 2202:2001, 2101:2001, 2102:2003			
Conformant with Open Network Video Interface	Interoperability between network video products, regardless of manufacturer		Yes
Forum (ONVIF)			

## ADDITIONAL ENVIRONMENTAL - FUNCTIONAL BOSCH TESTS

Environmental test methods	Specific Test Description	Comments	Passed
MTBF calculation of used components	MTBF > 120,000 hours		Yes
Based on: for electronics, MIL-HDBK-217FN1,			
GB, GC, 25C.			
Design Maturity Test	Outdoor Life test - external environmental conditions		Yes
HALT (Highly Accelerating Life Test)	-60 to +80C and back to -60C with 15 min hold		Yes

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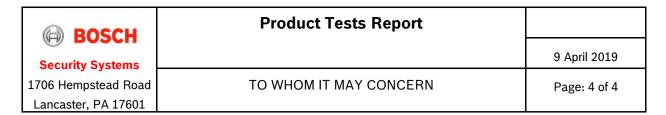
4/9/2019



Environmental test methods	Specific Test Description	Comments	Passed
	at each extreme vibration stress of 5g, 10g, 15g, 20g, 25g, 30g, 35g, 40g, 45g, 50g		
FMEA (Failure Mode and Effect Analysis)			Yes
Sound level (audible noise)	< 45 dB		Yes
Transportation Tests (ISTA Procedure 1A)	ISTA - Vibration 14,200 vibratory shocks - 2 axis		Yes
Transportation drop Tests (ISTA Procedure 1A)	12 edges, 8 corner, 6 faces, height: 1 meter		Yes

**Approvals Safety, EMC and Environmental** 

Specific Approval	Description	Comments	Passed
EMC Europe			Passed
EN 55032:2015 (Class A)	Electromagnetic compatibility of multimedia equipment. Emission Requirements. Class A		Yes
EN 50130-4:2011/A1:2014	Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder and social alarm systems.		Yes
EN 61000-3-2:2014	Mains harmonics Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)		Yes
EN 61000-3-3:2013	Voltage fluctuations Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low- voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection.		Yes
EMC USA			Passed
CFR 47 FCC part 15 Class A	Conducted + Radiated Emission based on VERIFICATION procedure		Yes
<b>Australian</b> AS/NZS CISPR 22 equal to CISPR 22	Product market with BOSCH supplier code N663		Yes
Mains Voltage Tolerance Test (Brown out supply voltage test)	Camera fully operational down to 105V (230 V PSU) and 55V (120V PSU). Below this voltage, the camera is not operational. Camera must be power- cycled for the camera block to reset.		Yes
Lightning protection EN 61000-4-5:1995	Levels ±0.5, 1, 2 and 4kV common mode. ± 0.5, 1 and 2kV differential mode. To ALL input / output - and supply-wiring.		Yes
Safety Europe			
EN 62368-1:2014/ A11:2017	Information technology equipment – Safety – Part 1: General requirements		Yes
Safety USA + Canada			
UL 62368-1 (2 <sup>nd</sup> edition for US)	UL listing + cUL listing. Information technology equipment – Safety –		Yes
CAN/CSA-C22.2 No. 62368-1 -14, 2nd ed.	Part 1: General requirements		
for Canada)			
Environmental			
Restriction of Hazardous Substances	ROHS complaint		Yes



Specific Approval	Description	Comments	Passed
Prohibited and declarable substances in	Manufacturer's declaration database based on N 2580-1		Yes
products, components, materials and	2000 1		
preparations.		<u>[</u>	

**Functional and specification test** 

Functional tests description		Comments	Passed
iCamera Periormance	Refer to AUTODOME IP starlight 5000i datasheet.		Yes

The product is produced by a manufacturing organization which is certified on **ISO9001** and **ISO14001** standards.