 <b>BOSCH</b> <b>Security Systems</b> 1706 Hempstead Road Lancaster, PA 17601	<b>Product Tests Report</b>	
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## Product Tests Report

Product name: AUTODOME IP starlight 5000i IR Camera

Model number and description:


NDP-5512-Z30L PTZ dome camera with outdoor pendant housing and integrated IR illumination, 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	Temp. +60 °C, duration 16 hours		Yes
Dry heat Endurance IEC 60068-2-2:2007	Temp. +60 °C, duration 21 days		Yes
Cold operational IEC 60068-2-1:2007	Temp. -40 °C, duration 16 hours		Yes
Cold Endurance and Cold Start test IEC 60068-2-1:2007	Power off, perform endurance test. Temp. -40 °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 IEC 60068-2-30:2005	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/m <sup>2</sup> at distance of 3m		Yes
Vibration sinusoidal operational IEC 60068-2-6:2008	Freq. Range 10-150Hz, 5m/s <sup>2</sup> , 3 axes, sweep rate 1 octave/m 1 sweep/axis, (1.0g)		Yes
Vibration sinusoidal endurance IEC 60068-2-6:2008	Freq. Range 10-150Hz, 10m/s <sup>2</sup> , 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
Simulated solar radiation Surface degradation IEC 60068-2-5:1999	Temperature 40 °C, duration 10 days Irradiance 1120 W/m <sup>2</sup>		Yes
Solar radiation ISO 4892-2:2013, compatible to IEC 60068-2-5			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
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 1920 x 1080 Image Sample Structure, Digital Representation and Digital Timing Reference Sequences for Multiple Picture Rates	Resolution: 1920x1080 Scan: Progressive Color representation: complies with ITU-R BT.709 Aspect ratio: 16:9 Frame rate: 25 and 30 frames/s		Yes
SMPTE 296M-2001 Standard 1280 x 720 Progressive Image Sample Structure - Analogue and Digital Representation and Analogue Interface	Resolution: 1280x720 Scan: Progressive Color representation: complies with ITU-R BT.709 Aspect ratio: 16:9 Frame rate: 25, 30, 50 and 60 frames/s		Yes
Conformant with NTCIP protocols 1205, 2301, 1101:1996, 2202:2001, 2101:2001, 2102:2003			Yes
Conformant with Open Network Video Interface Forum (ONVIF)	Interoperability between network video products, regardless of manufacturer		Yes


#### ADDITIONAL ENVIRONMENTAL - FUNCTIONAL BOSCH TESTS

Environmental test methods	Specific Test Description	Comments	Passed
MTBF calculation of used components Based on: for electronics, MIL-HDBK-217FN1, GB, GC, 25C.	MTBF > 120,000 hours		Yes
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 at each extreme vibration stress of 5g, 10g, 15g, 20g, 25g, 30g, 35g, 40g, 45g, 50g		Yes
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

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Specific Approval	Description	Comments	Passed
<b>EMC Europe</b>			<b>Passed</b>
EN 55022:2012/AC:2013 (Class B)	Information Technology Equipment- Radio disturbance characteristics Limits and Methods of measurement. 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 $\leq 16$ A per phase and not subject to conditional connection.		Yes
<b>EMC USA</b>			<b>Passed</b>
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 $\pm 0.5$ , 1, 2 and 4kV common mode. $\pm 0.5$ , 1 and 2kV differential mode. To ALL input / output - and supply-wiring.		Yes
<b>Safety Europe</b>			
EN 60950-1:2006/ A1:2010/ A11:2009/ A12:2011/ A2:2013	Information technology equipment – Safety – Part 1: General requirements		Yes
IEC 62471:2006	Photobiological safety of lamps and lamp systems		Yes
<b>Safety USA + Canada</b>			
UL 60950-1 (2 <sup>nd</sup> edition dated March 27, 2007; revised December 19, 2011) CAN/CSA-C22.2 No.E60950-1 (CSA C22.2 No. 60950-1-07, R2012)	UL listing + cUL listing. Information technology equipment – Safety – Part 1: General requirements		Yes
<b>Environmental</b>			
Restriction of Hazardous Substances	ROHS complaint		Yes
Prohibited and declarable substances in products, components, materials and preparations.	Manufacturer's declaration database based on N 2580-1		Yes
UL 60950-22 EN / IEC 60950-22 (1st edition)	Information technology equipment - Safety - Part 22: Equipment to be installed outdoors		Yes

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**Functional and specification test**

Functional tests description		Comments	Passed
Camera Performance	Refer to AUTODOME IP starlight 5000i IR datasheet.		Yes

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