 BOSCH Security Systems 850 Greenfield Road Lancaster, PA 17601	Product Tests Report	
	TO WHOM IT MAY CONCERN	9 October 2014 Page: 1 of 4

Product Tests Report

Product name: AUTODOME IP dynamic 7000 HD Camera

Model number and description:

VG5-7230-CPT4 AUTODOME IP dynamic 7000 HD 30x DN In-ceiling Tinted Bubble PTZ Camera

VG5-7230-EPC4 AUTODOME IP dynamic 7000 HD 30x Indoor/Outdoor Pendant Clear Bubble PTZ Camera

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

BS EN 50130-5:1999 Alarm systems Part 5: Environmental test methods	Specific Test Description (Temperatures stated are outside of the camera housing)	Comments	Passed
Dry heat Operational IEC 60068-2-2:1974 +A1:1993+ A2:1994	Pendant: Temp. +60 °C, duration 48 hours In-ceiling: Temp. +45 °C, duration 48 hours		Yes
Dry heat Storage IEC 60068-2-2:1974 +A1:1993+ A2:1994	Temp. +65 °C, duration 4 hours		Yes
Cold operational IEC 60068-2-1:1990 +A1:1993+ A2:1994	Pendant: Temp. -50 °C, duration 48 hours In-ceiling: Temp. -15 °C, duration 48 hours		Yes
Cold start test	Power off, soak overnight (12 hours) @ -45 °C, power up unit, unit must power up & function normally within < 30 minutes.		Yes
Cold Endurance IEC 60068-2-1:1990 +A1:1993+ A2:1994	Temp -45 °C, Duration 4 hours		Yes
Humidity, operational Damp heat, steady state operational IEC 60068-2-2:1988	60 °C / 95 %RH for 6 hours, 35 ℓC/85% RH for 16 hours, repeat for 5 cycles total, 110 hours total.		Yes
Condensation Temperature Test Profile	Ramp from 3 °C to -45 °C @ 5 °C/hour	No condensation observed	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 ² at distance of 3m	IP66 (indoor/outdoor pendant models)	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 models)	
NEMA XX	(Indoor/outdoor pendant models) Watertight (weatherproof), corrosion-resistant. Excludes at least 65 GPM of water from 1-inch nozzle delivered from a distance not less than 10 ft for 5 min.	NEMA 4X	Yes

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Template: AT18-Q1616 Product Test Report

10/9/2014

 BOSCH Security Systems 850 Greenfield Road Lancaster, PA 17601	Product Tests Report	
		9 October 2014
	TO WHOM IT MAY CONCERN	Page: 2 of 4


BS EN 50130-5:1999 Alarm systems Part 5: Environmental test methods	Specific Test Description (Temperatures stated are outside of the camera housing)	Comments	Passed
Vibration sinusoidal operational IEC 60068-2-6:1995 Test Fc: 10 m/s ² (1.0 g)	Freq. Range 10-150Hz, 10m/s ² , 3 axes, sweep rate 1 octave/m 1 sweep/axis, (1.0g)		Yes
Vibration sinusoidal endurance IEC 60068-2-6:1995 Test Fc: 10 m/s ² (1.0 g)	Freq. Range 10-150Hz, 10m/s ² , 3 axes, sweep rate 1 octave/min 20 sweep/axis		Yes
Shock operational IEC 60068-2-27:1987 Test Ea: Shock, 100 m/s ² (10.0 g)	Half sine wave 11 ms, 10g, 6 number of shocks, 3 pulses per direction		Yes
Impact operational IEC 60068-2-75:1997	Impact energy 1.0 Joule, 3 impacts per point		Yes
Wind speed (150mph wind tunnel test)	Wind Tunnel Test 150mph for 1.0 hours.		
Sound level (audible noise)	< 45 dB		Yes
Transportation Tests (ISTA Procedure 1A)	ISTA - Vibration 14,200 vibratory shocks - 2 axis		Yes
Transportation Tests (ISTA Procedure 1A)	ISTA - 36 inches (0.9 m) free fall drop 6 axes @ 1 drop / axis		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	For HD cameras	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	For HD cameras	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 > 115,195 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

 BOSCH Security Systems 850 Greenfield Road Lancaster, PA 17601	Product Tests Report	
		9 October 2014
	TO WHOM IT MAY CONCERN	Page: 3 of 4

Environmental test methods	Specific Test Description	Comments	Passed
FMEA (Failure Mode and Effect Analysis)			Yes
Temperature of Hot spots on components	With thermocouples at T = 20 °C, 55 °C, using Bosch Derating Guidelines		Yes
NEMA TS-2 Traffic Controller Assemblies w/NTCIP Requirements	TS 2 Section 2.2.7 Transients, Temperature, Voltage, and Humidity Tests		Yes
NEMA TS-2 Traffic Controller Assemblies w/NTCIP Requirements	TS 2 Section 2.2.8 Vibration - 5-30 Hz, 0.5g, Resonant Frequency Search		Yes
NEMA TS-2 Traffic Controller Assemblies w/NTCIP Requirements	TS 2 Section 2.2.8 Vibration - Endurance 5-30 Hz, 0.5g, @ Resonant Freq for 1 hour		Yes
NEMA TS-2 Traffic Controller Assemblies w/NTCIP Requirements	TS 2 Section 2.2.9 Shock (Impact) Test Half sine wave 11 ms, 10g, 6 number of shocks, 3 pulses per direction		Yes

Approvals Safety, EMC and Environmental

Specific Approval	Description	Comments	Passed
EMC Europe			Passed
EN 55022:2010	Information Technology Equipment- Radio disturbance characteristics Limits and Methods of measurement. Class A		Yes
EN 50130-4:2011	Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder and social alarm systems.		Yes
EN 61000-3-2:2006 + A2:2009	Mains harmonics Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)		Yes
EN 61000-3-3:2008	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
EN 50121-4:2006	Railway applications		Yes
EMC USA			Passed
CFR 47 FCC part 15 Class A	Conducted + Radiated Emission based on VERIFICATION procedure		Yes
Australian 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			
IEC 60950-1:2005 (2nd Edition) + A1:2009 EN 60950-1:2006, EN 60950-1, 2nd Edition, 2007-03-27 + A12:2011	Information technology equipment – Safety – Part 1: General requirements		Yes

 BOSCH Security Systems 850 Greenfield Road Lancaster, PA 17601	Product Tests Report	
		9 October 2014
	TO WHOM IT MAY CONCERN	Page: 4 of 4

Specific Approval	Description	Comments	Passed
Safety USA + Canada			
UL 60950-1 (2 nd 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
Environmental			
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

Functional and specification test

Functional tests description		Comments	Passed
Camera Performance	Refer to AUTODOME IP dynamic 7000 HD datasheet.		Yes

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