**Product Tests Report**

Product name: AUTODOME IP starlight 7000 HD Camera

Model number and description:

VG5-7230-CPT5 AUTODOME IP starlight 7000 HD 30x DN In-ceiling Tinted Bubble PTZ Camera  
VG5-7230-EPC5 AUTODOME IP starlight 7000 HD 30x Indoor/Outdoor Pendant Clear Bubble PTZ Camera

VG5-7230-EPR5 AUTODOME IP starlight 7000 HD 30x Indoor/Outdoor Pendant with IK10 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 ⁰C/85% RH for 16 hours, repeat for 5 cycles total, 110 hours total. |  | Yes |
| Condensation Temperature Test Profile | Ramp from 3 ⁰C to -45 ⁰C @ 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)]  IEC 60529 Ingress Protection Rating (IP54)  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  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 | IP66 (indoor/outdoor pendant models)  IP54 (in-ceiling models) | Yes |
| 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 |
| Vibration sinusoidal operational  IEC 60068-2-6:1995  Test Fc: 10 m/s² (1.0 g) | Freq. Range 10-150Hz, 10m/s², 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/s² (1.0 g) | Freq. Range 10-150Hz, 10m/s², 3 axes, sweep rate 1 octave/min 20 sweep/axis |  | Yes |
| Shock operational  IEC 60068-2-27:1987  Test Ea: Shock, 100 m/s² (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. |  | Yes |
| 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 |
| 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 |
| **Safety** **USA + Canada** |  |  |  |
| UL 60950-1 (2nd 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 starlight 7000 HD datasheet. |  | Yes |

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