TO WHOM IT MAY CONCERN

Bosch Security Systems
Torenallee 49
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The Netherlands
AR18-11-D016

Product Test report

Product name: **BOSCH FLEXIDOME IP 7000 RD cameras**

Model numbers:

F.01U.269.636	NDN-733V02-P	FLEXIDOME HD 720p60 RD 1.8-3mm
F.01U.269.637	NDN-733V03-P	FLEXIDOME HD 720p60 RD 3.8-13mm
F.01U.269.638	NDN-733V09-P	FLEXIDOME HD 720p60 RD 9-40mm
F.01U.269.639	NDN-733V02-IP	FLEXIDOME HD 720p60 RD 1.8-3mm IVA
F.01U.269.640	NDN-733V03-IP	FLEXIDOME HD 720p60 RD 3.8-13mm IVA
F.01U.269.641	NDN-733V09-IP	FLEXIDOME HD 720p60 RD 9-40mm IVA
F.01U.170.533	NDN-832V02-P	FLEXIDOME HD 1080p 1.8-3mm Motion+
F.01U.170.535	NDN-832V02-IP	FLEXIDOME HD 1080p 1.8-3mm IVA
F.01U.170.536	NDN-832V03-P	FLEXIDOME HD 1080p 3.8-13mm Motion+
F.01U.170.538	NDN-832V03-IP	FLEXIDOME HD 1080p 3.8-13mm IVA
F.01U.170.539	NDN-832V09-P	FLEXIDOME HD 1080p 9-40mm Motion+
F.01U.170.541	NDN-832V09-IP	FLEXIDOME HD 1080p 9-40mm IVA
F.01U.262.487	NDN-932V02-IP	FLEXIDOME HD 1080p HDR 1.8-3mm IVA
F.01U.262.488	NDN-932V03-IP	FLEXIDOME HD 1080p HDR 3.8-13mm IVA
F.01U.262.489	NDN-932V09-IP	FLEXIDOME HD 1080p HDR 9-40mm IVA

The above mentioned Bosch Security Systems products have been tested in accordance and were found to comply with the tests listed below which were carried out during the development phase of the product.

ENVIRONMENTAL TESTS

EN50130-5:1999 Alarm systems Part 5: Environmental tests 1) till 7) is Introduction	**Specific Test description** **Class IV Outdoor in general, fixed equipment**	**Passed**
8) Dry heat Operational IEC 60068-2- 2:1974 +A1:1993+ A2:1994	Temp. +70°C (158°F), duration 16 hours. Lower spec: +50°C (122°F) for 2+IP camera's and +55°C (131°F) for 1P models	Yes
9) Dry heat endurance IEC 60068-2-2:1974 +A1:1993+ A2:1994	Temp. +70°C (158°F), duration 21 days.	Yes
10) Cold operational IEC 60068-2-1:1990 +A1:1993+ A2:1994	Temp. -25°C (77°F) during 16h more severe test executed: tested at Temp. -50°C (-58°F), duration 16h.	Yes
11) Temperature change operational IEC 60068-2-14:1984 +A1:1986	Non Operational test 5 cycles Temp. -40°C (-40°F) to +70°C (158°F) fast changes.	Yes
12) Damp heat, steady state operational IEC 60068-2-2:1988	No test but covered by test 14).	Yes
13) Damp heat, steady state endurance IEC 60068-2-3:1969+A1:1984	Temp. +40°C (104°F) during 21 days. See test 14).	Yes
14) Damp heat, cyclic operational IEC 60068-2-30:1980+A1:1985	Temp. 25°C to +55°C (77-131°F), RH >93%, 2 days (=2 cycles), 1 hour on during 25°C timeslot. More severe tested: 21 days.	Yes
15) Damp heat, cyclic endurance IEC 60068-2-30:1980+A1:1985	Temp +55°C (131°F) for 6 cycles. More severe test see test 14).	Yes
16) Water ingress (operational)	IPX6 and IPx7 by external test house see certificate.	Yes
17) Sulphur Dioxide SO_2 endurance IEC 60068-2-42:1982	Check for resistance of connectors to SO_2 Sulphur Dioxide 25 ppm, Temperature 25°C, Humidity 93%, Duration 21 days. Specification material check	Yes
18) Salt mist, cyclic endurance IEC 60068-2-52:1996	Total duration 28 days, 4 cycles. Salt mist exposure: 5% Temp. 15-35°C, Duration 2h. DH: NaCl, Temp. +40°C, Hum. 93%, duration per cycle 166h.	Yes
19) Shock operational IEC 60068-2-27:1987	Tested with pulse 6 ms, 560 m/s^2 with 3 pulses per direction (total 18 shocks).	Yes
20) Impact operational IEC 60068-2-75:1997	Impact energy 1.0 Joule, 3 impacts per point.	Yes
21) Free fall operational IEC 60068-2-32:1975 +A1:1982+ A2:1990	No test for fixed equipment.	N.A.
22) Vibration sinusoidal operational IEC 60068-2-6:1995	Freq. Range 10-150 Hz, 5 m/s^2, 3 axes, sweep rate 1 octave/m 1 sweep/axis. More severe tested at 10 m/s^2	Yes
23) Vibration sinusoidal endurance IEC 60068-2-6:1995	Freq. Range 10-150 Hz, 10 m/s^2, 3 axes, sweep rate 1 octave/min 20 sweep/axis.	Yes
24) Simulated solar radiation Temperature rise operational. IEC 60068-2-5:1975	Plastic dome is Solar radiation protected. is considered as not critical see alternative dry heat test.	N.A.
25) Simulated solar radiation Surface degradation (endurance)	Plastic dome is Solar radiation protected.	N.A.
26) Dust tightness endurance IEC 60529	IP6X. No ingress of dust. External test house certificate.	Yes

Additional BOSCH Tests

Test specification	Specific Test description	Passed
FMEA	Design and Process analyses based on a Bosch template	Yes
MTBF calculation of used components	Based on Siemens SN29500, or FIT figures manufacturer. NDN-832x : Calculated MTBF = 137,414 hrs. NDN-733x/932x : Calculated MTBF = 143,268 hrs.	Yes
Hot spots on components.	With Infra red scanner at ambient temperature Tamb. 20 ±5°C (±68°F).	Yes
Temperature of components	With thermocouples at room temperature Tamb. 20±5°C (±68°F) and + 55 °C (131°F).	Yes
HALT (Highly Accelerating Life Test)	Determination of fail limits for: • Low ambient temperature • High ambient temperature • Vibration • Combination of Temperature and vibration • Cold start test	Yes
Vandalism proof test IEC 60068-2-75	Energy 20 J tested with: • Sphere, mass 10 kg. On all touchable outside places of housing and bubble. Equivalent of EN 62262, IK10 rating.	Yes
Bump Non operating IEC 60068-2-29 test Eb	Pulse 10g, 16 ms, 3 x 1000 times.	Yes
Cold start test	Verify proper start up behavior at low ambient temperature at T ambient – 30°C (-22°F).	
Decorative surface test UN-D 1235/01	25 rubbings by hand • Boiling point spirit 100- 140°C (212-284°F) • Ethanol 96 % with 5% methanol.	Yes
Type plate test IEC 60950-1 Par. 1.7.13.	Rubbing by hand with water+ Petroleum spirit during 15s.	Yes
ALT (Accelerated Life Test)	Reliability test in which a moderate number of products are stressed at elevated, but non destructive stress levels for a longer period of time to: • Low temperature stress • High temperature stress • Temperature shock testing • Humidity test • Vibration stress • Power cycling	Yes
Transport tests acc. AV18-Q0681		
1. Vibration test	Freq. 7Hz, 5.3 mm (= 1.05g), 30 min each side, 3 directions.	Yes
2. Drop test after vibration test 10 drops.	Height depending of weight of product.	Yes
Outdoor environmental requirements		
IP66 IEC 60529:1989+A1:1999 IPx7 IEC 60529:1989 +A1:1999	IP 66 Certificate by external test house IP x7 Certificate by external test house	Yes
Enclosure type 4X UL50E:2007	Enclosure Type 4X Certificate by external test house	Yes

Approvals Safety, EMC and Environmental

Test specification	Description	Passed
EMC Europe standards		
EN 55022:210, +AC2011. Class B	Information technology equipment — Radio disturbance characteristics — Limits and methods of measurement CISPR 22:2005 (Modified).	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 50121-4:2006,	EMC Railway EMC Part 4: Emission and immunity of the signaling and telecommunications apparatus.	Yes
EMC USA		
CFR 47 FCC part 15:2009, Class B	Radiated Emission based on VERIFICATION procedure.	Yes
EMC Australia		
AS/NZS CISPR 22 equal to CISPR 22	Product marked with RCM logo.	Yes
Safety Europe		
EN 60950-1:2006, +A11:2009, +A1:2010, +A12:2011, +AC:2011.	Information technology equipment — Safety — Part 1: General requirements.	Yes
Safety USA + Canada		
UL 60950-1, 2nd Edition 2007-03-27. CAN/CSA-C22.2 No.E60950-1-07	Information technology equipment - Safety – Part 1: General requirements. Products marked with cULus logo.	Yes
UL 60950-22, 1st Ed 2007 CSA C22.2 No. 60950-22-07	Information Technology Equipment - Safety - Part 22: Equipment to be Installed Outdoors	Yes
Environmental		
Restriction of Hazardous Substances	RoHS compliant.	Yes
N 2580-1 Prohibited and declarable substances in product, component, materials and preparations.	Bosch internal environmental standard.	Yes

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

Data subject to change without notice.

Eindhoven, May 2015.