

TO WHOM IT MAY CONCERN

Bosch Security Systems
Torenallee 49
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The Netherlands
AR18-12-D122

Product Test report

Product name: **BOSCH FlexiDome HD Camera**

Material No / CTN / description:

F.01U.272.138	NIN-733-V03P	FLEXIDOME HD 720p60 VR 3-9mm
F.01U.272.139	NIN-733-V03IP	FLEXIDOME HD 720p60 VR 3-9mm IVA
F.01U.272.142	NIN-832-V03P	FLEXIDOME HD 1080p30 VR 3-9mm
F.01U.272.143	NIN-832-V03IP	FLEXIDOME HD 1080p30 VR 3-9mm IVA
F.01U.272.146	NIN-932-V03IP	FLEXIDOME HD 1080p30 HDR VR 3-9mm IVA
F.01U.278.622	NIN-733-V10P	FLEXIDOME HD 720p60 VR 10-23mm
F.01U.278.623	NIN-733-V10IP	FLEXIDOME HD 720p60 VR 10-23mm IVA
F.01U.278.626	NIN-832-V10P	FLEXIDOME HD 1080p30 VR 10-23mm
F.01U.278.627	NIN-832-V10IP	FLEXIDOME HD 1080p30 VR 10-23mm IVA
F.01U.278.630	NIN-932-V10IP	FLEXIDOME HD 1080p30 HDR VR 10-23mm 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

EN 50130-5:2011 Alarm systems Part 5: Environmental test methods 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. +55°C (131°F), duration 16 hrs. Tested at product performance limit: 50°C (122°F), 16h.	Yes
9) Dry heat endurance IEC 60068-2-2:1974 +A1:1993+ A2:1994	Temp. +55°C (131°F), duration 21 days. Tested at product performance limit: 50°C (122°F), 21 days.	Yes
10) Cold operational IEC 60068-2-1:1990 +A1:1993+ A2:1994	Temp. -25°C (-13°F) duration 16hrs. Tested more severe -30°C (-22°F). Cold start at -20°C (-4°F).	Yes
11) Temperature change operational IEC 60068-2-14:1984 +A1:1986	No test for fixed equipment.	n.a.
12) Damp heat, steady state operational IEC 60068-2-2:1988	No test for Class IV equipment.	n.a.
13) Damp heat, steady state endurance IEC 60068-2-3:1969+A1:1984	Temp. +40°C (104°F), Relative Humidity 93% during 21 days. Tested at higher temperature: Temp. +45°C (113°F).	Yes

14) Damp heat, cyclic operational IEC 60068-2-30:1980+A1:1985	Temp. 25°C to +55°C (77-131°F), Relative humidity >93%, 2 cycles. Tested: Max. temp. 45°C (113°F).	Yes
15) Damp heat, cyclic endurance IEC 60068-2-30:1980+A1:1985	Temp. 25°C to +55°C (77-131°F), Relative humidity >93%, 6 cycles. Tested: Max. temp. 45°C (113°F), duration 21 days.	Yes
16) Water ingress (operational) EN 60068-2-18:2001	Test for class IV equipment similar to IPX4 rating. Tested: More severe IPX6 classification according EN 60529 at 3 th party.	Yes
17) Sulphur Dioxide SO ₂ endurance IEC 60068-2-42:1982	Ability to withstand corrosive effects to SO ₂ Sulphur Dioxide (25 ppm, temperature 25°C, humidity 93%, duration 21 days) Simulated with specification check of used materials.	N.T.
18) Salt mist, cyclic endurance IEC 60068-2-52:1996	Total duration 28 days, 4 cycles. Salt mist exposure: 5%, Temp. 15 to 35°C, 2h per cycle. And Damp heat exposure: Temp. 40°C, Hum. 93%, 166h per cycle	Yes
19) Shock operational IEC 60068-2-27:1987	Tested with halve sine wave pulse 6 ms, $\pm 740 \text{ m/s}^2$ 3 perpendicular directions, 3 pulses per direction 18 pulses in total.	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. Tested with more severe level of 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 60068-2-5:1999	Procedure A. Irradiance 1120 W/m ² . Temperature +40°C duration 2 x 24 h. Simulated by heat test at +55°C (131°F).	N.T.
25) Simulated solar radiation Surface degradation	Procedure C. Irradiance 1120 W/m ² . Temperature +40°C duration 10 days. Based on theoretical assumptions.	Yes
26) Dust tightness endurance	Test for class IV equipment similar to IP6x rating. Tested: IP6x according EN 60529 at 3 th party.	Yes

ADDITIONAL BOSCH TESTS

Test specification	Specific Test description	Passed
FMEA (failure Mode and Effect Analysis)	Design and Process analyses based on a Bosch template	Yes
MTBF calculation of used components.	Based on: Siemens SN 29500, or FIT figures manufacturer. Theoretical MTBF = 202,659 hrs.	Yes
HALT (Highly Accelerating Life Test)	Overstress test to Fail. Determination of fail limits for: <ul style="list-style-type: none"> • Low ambient temperature • High ambient temperature • Vibration • Combination of temperature and vibration 	Yes
Decorative surface test UN-D 1235/01	25 rubbings by hand <ul style="list-style-type: none"> • 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
Hot spots on components.	With Infra red scanner at room temperature Tamb. 20 ±5 °C (59-77°F).	Yes
Temperature of Hot spots components	With thermocouples at room temperature Tamb. 20±5°C (59-77°F).	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. <ul style="list-style-type: none"> • High temperature stress • Power + temperature stress • Temperature Humidity cycling • Low random vibration + Temperature testing • Long term High temperature operating 	Yes
Bump IEC 60068-2-29:1987 Non operating	Test Eb, 10g, 16ms, 3 perpendicular directions each 1000, in total 6000 impacts.	Yes
Vandal resistance EN 62262:2002	IK 10: represents 20 Joule. Sphere R=50mm, mass 5 kg. On all touchable outside places of housing and bubble, with a steel Pendulum hammer and steel Free fall hammer, 5 impacts per test setup.	Yes
EN 50155:2007/AC:2012 Railway applications – Electronic equipment used on rolling stock	Product fulfils mandatory requirements as specified in table 12 of the standard and within the temperature limits of the product.	Yes
Outdoor environmental requirements		
IP66 IEC 60529:1989, +A1:1999.	IP 66 Certificate by external test house.	Yes
NEMA4X Enclosure type 4X : UL 50E:2007.	Enclosure Type 4X. Certificate by external test house.	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
3. Dynamic compression test of package. (Product in packaging).	Package shall be in a visible good condition and product shall be conform specification.	Yes

APPROVALS for Safety, EMC and Environmental

EMC Europe standards	Description	Passed
EN 55022:2010, +AC:2011 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, AC:2008	Railway EMC Part 4: Emission and immunity of the signaling and telecommunications apparatus	Yes
EMC USA		Passed
CFR 47 FCC part 15:2010-10, Class B	Radiated Emission based on VERIFICATION procedure.	Yes
Australian		Yes
AS/NZS CISPR 22 equal to CISPR 22	Product market with BOSCH supplier code N663.	
Safety Europe		Passed
EN 60950-1: 2006, +A11:2009, +A1:2010, +A12:2011, +AC:2011.	Information technology equipment — Safety — Part 1: General requirements.	Yes
EN 60950-22, 1 st Ed 2007	Information Technology Equipment - Safety - Part 22: Equipment to be Installed Outdoors	Yes
Safety USA + Canada		Passed
UL 60950-1, 2 nd edition, 2007 CAN/CSA-C22.2 No. 60950-1-07, 2 nd edition	Information technology equipment - Safety – Part 1: General requirements. Products marked with cULus logo.	Yes
UL 60950-22, 1 st Ed 2007 CSA C22.2 No. 60950-22-07	Information Technology Equipment - Safety - Part 22: Equipment to be Installed Outdoors	Yes
Environmental		Passed
RoHS Restriction of Hazardous Substances	Compliant according EN 50581:2011.	Yes
N2580-1 Prohibited and declarable substances in product, component, materials and preparations.	Bosch internal environmental standard.	Yes
N33.6 Design for Environment.	Bosch internal environmental standard.	Yes

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

Data subject to change without notice.
Eindhoven, June 2015.