

TO WHOM IT MAY CONCERN

Bosch Security Systems  
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Eindhoven  
5617 BA  
The Netherlands  
AT18-Q1616

## Product Test report

Product name:

**BOSCH FLEXIDOME IP outdoor 4000 HD/IR**  
**BOSCH FLEXIDOME IP outdoor 5000 HD/MP/IR**

Model numbers:

Material No.	CTN	Description	
F.01U.296.223	NDN-41012-V3	IP Dome 720p IP66	FLEXIDOME IP outdoor 4000 HD
F.01U.296.224	NDI-41012-V3	Infrared IP Dome 720p IP66	FLEXIDOME IP outdoor 4000 IR
F.01U.296.219	NDN-50022-A3	IP Dome 1080p IP66 AVF	FLEXIDOME IP outdoor 5000 HD
F.01U.296.220	NDI-50022-A3	Infrared IP Dome 1080p IP66 AVF	FLEXIDOME IP outdoor 5000 IR
F.01U.296.221	NDN-50051-A3	IP Dome 5M IP66 AVF	FLEXIDOME IP outdoor 5000 MP
F.01U.296.222	NDI-50051-A3	Infrared IP Dome 5M IP66 AVF	FLEXIDOME IP outdoor 5000 IR

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 TEST

EN50130-5:1999 Alarm systems Part 5: Environmental test methods	Specific Test description >>class IV, outdoor in general , fixed equipment>>	Passed
1) till 7) is Introduction		
8) Dry heat (Operational) IEC60068-2-2:1974 + A1:1993 + A2:1994	Temp. +70°C (158°F), Duration 16 hours.	Yes
9) Dry heat (Endurance) IEC60068-2-2:1974 + A1:1993 + A2:1994	Temp. +70°C (158°F), Duration 21 days.	Yes
10) Cold operation (Operational) IEC60068-2-1:1990 + A1:1993 + A2:1994	Temp. -25°C (-13°F), Duration 16 hours. Note: Tested at more severe condition: -40°C (-40°F).	Yes
11) Temperature change (Operational) IEC60068-2-14:1984 + A1:1986	Only for portable equipment, no test for fixed equipment.	N.A.
12) Damp heat, steady state (Operational) IEC60068-2-2:1988	No test for class IV product.	N.A.
13) Damp heat, steady state (Endurance) IEC60068-2-3:1969 + A1:1984	Temp. +40°C (104°F), Relative humidity 93%, Duration 21 days.	Yes
14) Damp heat, cyclic (Operational) IEC60068-2-30:1980 + A1:1985	Temp. +25°C~+55°C (77°F~131°F), Relative humidity 93%, 24 hr/cycle, 2 cycles.	Yes

	Note: Tested at more severe condition: 6 cycles.	
15) Damp heat, cyclic (Endurance) IEC60068-2-30:1980 + A1:1985	Temp. +25°C~+55°C (77°F~131°F), Relative humidity 93%, 24 hr/cycle, 6 cycles. Note: Covered by 14)	Yes
16) Water ingress (Operational) IEC60529 Edition 2.2: 2013	IEC60529 IPX4 Note: Tested at more severe condition: IPX6 with an installed camera unit (mounted on a board).	Yes
17) Sulphur Dioxide SO <sub>2</sub> (Endurance) IEC60068-2-42:1982	Sulphur Dioxide 25 ppm, Temp. 25°C (77°F), Relative humidity 93%, Duration 21 days	Yes
18) Salt mist, cyclic (Endurance) IEC60068-2-52:1996	Total 28 days, 4 cycles. Salt mist exposure: NaCl 5%, Temp. +15°C~35°C(59°F~95°F), Duration 2 hr/cycle. Damp heat exposure: Temp. 40°C (-13°F), Relative humidity 93%, Duration 166 hr/cycle.	Yes
19) Shock (Operational) IEC60068-2-27:1987	Half sine wave 6 ms, Acceleration = 100G, Shock direction ±X ±Y ±Z, 3 shocks/axis.	Yes
20) Impact (Operational) IEC60068-2-75:1997	Impact energy 1.0 Joule , 3 impacts per point Note: Tested at more severe condition: IK10, 20 Joule	Yes
21) Free fall (Operational) IEC60068-2-32:1975 + A1:1982 + A2:1990	No test for Fixed equipment	N.A.
22) Vibration sinusoidal (Operational) IEC60068-2-6:1995	Freq. Range 10~150Hz, 5 m/s <sup>2</sup> , X Y Z axes, Sweep rate 1 octave/min, 1 sweep/axis Note: Tested at more severe condition: Freq. Range 10~150Hz, 10 m/s <sup>2</sup> , X Y Z axes, Sweep rate 1 octave/min, 20 sweep/axis	Yes
23) Vibration sinusoidal (Endurance) IEC60068-2-6:1995	Freq. Range 10~150Hz, 10 m/s <sup>2</sup> , X Y Z axes, Sweep rate 1 octave/min, 20 sweep/axis Note: Covered by 22)	Yes
24) Simulated solar radiation Temperature rise (Operational) IEC60068-2-5 Edition 2.0: 2010, Procedure A	Temp. +25°C~+40°C (77°F~104°F), 2 days 8 hrs irradiation & 16hrs dark per 24hrs cycle Irradiance: 1120W/m <sup>2</sup> at 300~3000nm	Yes
25) Simulated solar radiation Surface degradation (Endurance) IEC60068-2-5 Edition 2.0: 2010, Procedure C	Temp. +40°C (104°F), 10 days 24 hrs irradiation per 24hrs cycle Irradiance: 1120W/m <sup>2</sup> at 300~3000nm	Yes
26) Dust tightness (Endurance) IEC60529 Edition 2.2: 2013	IEC60529 IP6X	Yes

**ADDITIONAL ENVIRONMENTAL – FUNCTIONAL BOSCH TESTS**

<b>Environmental test methods</b>	<b>Specific Test description</b>	<b>Passed</b>
MTBF calculation of used components	Based on: Siemens SN 29500, or FIT figures manufacturer. Theoretical MTBF = 895,533 hrs	Yes
FMEA (failure Mode and Effect Analysis)	Design and Process analyses based on Bosch template.	Yes
HALT (Highly Accelerating Life Test)	Overstress test to Fail, Operational, LOL = -40°C (-40°F), HOL = +80°C (176°F), Vibration OL > 50Grms Combined Environment Stress: Temp. -40°C~+80°C (-40°F~176°F), with 4/8/12/16/20/25 Grms for each cycle.	Yes
Type plate test	Rubbing by hand with water and 95% industrial alcohol, Duration 15s.	Yes
Hot spots on components.	With Infra red scanner at room temperature Temp. 25 ±5 °C (+77°F).	Yes
Temperature of Hot spots components	With thermocouples at room temperature Temp. 50 ±5 °C (+122°F).	Yes
Bump Non operating IEC 60068-2-27 Ea	Half sine wave, Acceleration 10G, Duration 16ms, 1 bump/sec, 1000 bumps/axis, X,Y,Z axes, total 6000 bumps	N.A.
Cold start test	At -40°C (-40°F).	Yes
<b>Transport tests acc. AV18-Q0681 ISTA-2A: 2011</b>		
1. Conditioning	Pre-conditioning: Temp. +25°C, 43%RH, Duration 6 hours. Conditioning: Temp. +38°C, 85%RH, Duration 72 hours. Temp. +60°C, 30%RH, Duration 6 hours.	Yes
2. Compression	Top to Bottom, Apply and Hold, Duration 60min. Calculated test load = 972 lbs	
3. First vibration test	Frequency 232CPM, Duration 62 min. ; Number of Impact (cycle): 14200 cycles	Yes
4. Drop test after 1 <sup>st</sup> vibration test	Height depending of weight of product. Drop height (inch): 32; drop times: 10	Yes
5. Second vibration test	Frequency 232CPM, Duration 62 min. ; Number of Impact (cycle): 14200 cycles	Yes

### Approvals Safety, EMC and Environmental

<b>EMC Europe</b>	<b>Description</b>	<b>Passed</b>
EN 55032:2012 / AC:2013 EN 55024:2010	Information Technology Equipment- Radio disturbance characteristics Limits and Methods of measurement. Class B	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	Yes
EN 61000-3-2: 2014	Mains harmonics Part 3-2: Limits - Limits for harmonic current emissions	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.	Yes
<b>EMC USA</b>		<b>Passed</b>
CFR 47 FCC part 15 Class B	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
<b>Japan</b> VCCI: V-2/2012.04 & V-3/2013.04	EMC certification for Japan.	Yes
<b>Safety Europe</b>		<b>Passed</b>
EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 EN 60950-22:2006 + A11:2008	Information technology equipment — Safety — Part 1: General requirements	Yes
IEC 62471: 2008 (Only for IR version)	Eye Safety	Yes
<b>Safety USA + Canada</b>		<b>Passed</b>
UL 60950-1 & -22 CAN/CSA-C22.2 No.E60950-1 & -22	UL listing + cUL listing. First edition dated April 1, 2003. Information technology equipment — Safety — Part1: General requirements	Yes
<b>Environmental</b>		<b>Passed</b>
Prohibited and declarable substances in products, components, materials and preparations.	Bosch internal environmental standard. Manufacturer's declaration database based on N 2580-1.	Yes
Restriction of Hazardous Substances	RoHS compliant.	Yes

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

Data subject to change without notice.

Eindhoven, February 2018.