Building Technologies

TO WHOM IT MAY CONCERN

Bosch Security Systems
Torenallee 49
5617 BA Eindhoven
The Netherlands

Product Test Report BT-VS 2022-E-007

Product

FLEXIDOME IP starlight 8000i

F.01U.404.121	NDE-8512-R	FIXED DOME 2MP HDR 3-9MM PTRZ IP66
F.01U.404.122	NDE-8512-RT	FIXED DOME 2MP HDR 10-23MM PTRZ IP66
F.01U.404.123	NDE-8513-R	FIXED DOME 6MP HDR 3.9-10MM PTRZ IP66
F.01U.404.124	NDE-8513-RT	FIXED DOME 6MP HDR 12-40MM PTRZ IP66
F.01U.404.125	NDE-8514-R	FIXED DOME 8MP HDR 3.9-10MM PTRZ IP66
F.01U.404.126	NDE-8514-RT	FIXED DOME 8MP HDR 12-40MM PTRZ IP66
F.01U.404.127	NDE-8512-RX	FIXED DOME 2MP HDR X 4.4-10MM PTRZ IP66
F.01U.404.128	NDE-8512-RXT	FIXED DOME 2MP HDR X 12-40MM PTRZ IP66
F.01U.404.129	NDE-8513-RX	FIXED DOME 4MP HDR X 4.4-10MM PTRZ IP66
F.01U.404.130	NDE-8513-RXT	FIXED DOME 4MP HDR X 12-40MM PTRZ IP66
F.01U.410.324	NDE-8514-R-K	Fixed dome 8MP HDR 3.9-10mm PTRZ IP66-K
F.01U.410.325	NDE-8512-RX-K	Fixed dome 2MP HDR X4.4-10mm PTRZ IP66-K

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

Safety approvals

Directive or standard	Description
Safety Canada	
CSA C22.2 No. 62368-1-14, 2nd Edition, 2014-12	Audio/video, Information and Communication Technology Equipment - Part 1: Safety Requirements)
CAN/CSA-C22.2 No. 60950-22:07	Information Technology Equipment - Safety - Part 22: Equipment to be Installed Outdoors
Safety EU, 2014/35/EU (LVD)	**Low Voltage Directive**
EN 62368-1:2014 /A11:2017	Audio/video, information and communication technology equipment - Part 1: Safety requirements
EN 60950-22:2006 /A11:2008	Information technology equipment - Safety - Part 22: Equipment installed outdoors
Safety USA	
UL 62368-1, 2nd Edition, 2014-12-01	Audio/video, Information and Communication Technology Equipment - Part 1: Safety Requirements)
UL 60950-22 1st Ed Issued 2007-04-23	Information Technology Equipment - Safety - Part 22: Equipment to be Installed Outdoors

EMC and Radio approvals

Directive or standard	Description
EMC EU, 2014/30/EU (EMCD)	**Electromagnetic Compatibility Directive**
EN 301 489-1 v2.2.0	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU
EN 50130-4:2011	Alarm systems - Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder, hold up, CCTV, access control and social alarm systems
EN 61000-4-2	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test *Air discharge until 8kV and contact discharge until 6kV*
EN 61000-4-3	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test *Modulation: 80% Amplitude Modulation with 1kHz sinewave* *Field strength of 10V/m for the frequency range 80MHz to 2.7GHz*
EN 61000-4-4	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test *100kHz repetition frequency, 2kV on AC ports, 1kV on other ports*
EN 61000-4-5	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test *Until 1kV Differential Mode and 2kV Common Mode*
EN 61000-4-6	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields *Modulation: 80% Amplitude Modulation with 1kHz sinewave* *Field strength of 140dBµV (10V) for the frequency range 150kHZ to 100MHz*
EN 50121-4:2015	Railway applications - Electromagnetic compatibility - Part 4: Emission and immunity of the signaling and telecommunications apparatus
EN 55016-2-1	Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements *150kHz to 500kHz: 79dBµV QP / 66dBµV AV* *500kHz to 30MHz: 73dBµV QP / 60dBµV AV*
EN 61000-4-2	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test *Air discharge until 8kV and contact discharge until 6kV*

EN 61000-4-3	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test *Modulation: 80% Amplitude Modulation with 1kHz sinewave* *Field strength of 10V/m for the frequency range 80MHz to 800MHz* *Field strength of 20V/m for the frequency range 800MHz to 1GHz* *Field strength of 10V/m for the frequency range 1.4GHz to 2GHz* *Field strength of 5V/m for the frequency range 2GHz to 2.7GHz* *Field strength of 3V/m for the frequency range 5.1GHz to 6GHz*
EN 61000-4-4	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test *5kHz repetition frequency, 2kV on all ports*
EN 61000-4-5	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test *Until 1kV Differential Mode and 2kV Common Mode*
EN 61000-4-6	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields *Modulation: 80% Amplitude Modulation with 1kHz sinewave* *Field strength of 140dBµV (10V) over the frequency range 150kHZ to 100MHz*
EMC USA	
CFR 47 FCC part 15, Class B	Code of Federal Regulations, Radio Frequency Devices, Unintentional Radiators. Radiated Emission based on verification procedure.

Environmental approvals

Directive or standard	**Description**
RoHS EU, 2011/65/EU (EN IEC 63000:2018)	Restriction of the use of certain hazardous substances (RoHS)
WEEE EU, 2012/19/EU	Waste Electrical and Electronic Equipment (WEEE)
Packaging EU, 94/62/EC (amended by 2004/12/EC)	Packaging and packaging waste
N2580-1 (Bosch standard)	Central directive Bosch-Norm N 2580-1: “Prohibition and declaration of substances“ Bosch-Norm N 2580-1 regulates prohibited substances and those rated declarable in materials, and it is part of the requirements for materials.
N33 6 (Bosch standard)	Design for Environment (DfE): Design and manufacturing rules

Management system

Directive or standard	**Description**
ISO 9001:2015	Quality management systems -- Requirements Scope: Development, production, installation and sales.
ISO 14001:2015	Environmental management systems -- Requirements with guidance for use Scope: Development, Production, Sales and After Sales.

Reliability tests

According: EN 50130-5:2011 Alarm systems Part 5: Environmental test methods
Class IV, Fixed equipment, Outdoor in general

Test specification	Description
Dry heat (operational) (EN 60068-2-2:2007)	Temperature +70ºC, Duration 16 hours.
Dry heat (endurance) (EN 60068-2-2:2007)	Temperature +55℃, Duration 21 days
Cold (operational) (EN 60068-2-1:2007)	Temperature -25℃, Duration 16 hours.
Damp heat, steady state (endurance) (EN 60068-2-78:2001)	Temperature +40ºC, Relative Humidity 93%, Duration 21 days.
Damp heat, cyclic (operational) (EN 60068-2-30:2005)	Temperature +25ºC to +55ºC, Relative humidity 93%, 2 cycles.
Damp heat, cyclic (endurance) (EN 60068-2-30:2005)	Temperature +25ºC to +55ºC, Relative humidity 93%, 6 cycles.
Water ingress (operational) (EN 60068-2-18:2001)	Test procedure Ra1.1 or Rb1.2, 10min (Similar EN 60529 IPX4). *Bosch tested more severe for class **IPx6***
Sulphur dioxide (SO2) (endurance) (EN 60068-2-42:2003)	Temperature 25℃, SO2 Concentration 25x10e-6, RH 93%, Duration 21 days *Bosch tested for a more extreme exposure scenario: 2 cycles (42 days)*
Salt mist, cyclic (endurance) (EN 60068-2-52:1996)	Temperature 15ºC till 40ºC, RH 93%, 4 cycles, Duration 28 days *Bosch tested for a more extreme exposure scenario: 8 cycles (56 days)*
Shock (operational) (EN 60068-2-27:2009)	Halve sine wave pulse, duration 6ms, 3 pulses per direction, 6 directions. *Bosch tested with acceleration of 56,3G.*
Impact (operational) (EN 60068-2-75:1997 Test Ehb)	Impact energy 0.5Joule, 3 impacts per point (Similar to EN 62262 IK06 rating). *Bosch tested more severe for **IK10** rating*
Vibration, sinusoidal (operational) (EN 60068-2-6:2008)	Frequency range 10-150 Hz, 5 ms², 3 axes, sweep rate 1 octave x min^{-1}, 1 sweep cycles per axis functional mode.
Vibration, sinusoidal (endurance) (EN 60068-2-6:2008)	Frequency range 10-150 Hz, 10 m/s², 3 axes, sweep rate 1 octave x min^{-1}, 20 sweep cycles per axis.
Simulated solar radiation, surface degradation (endurance) (EN 60068-2-5:1999, procedure C)	Irradiance 1120W×m-2, Temperature 40℃, Duration 10d.
Dust tightness (endurance) (EN 60529:1991 A1:2000)	Duration 8h (similar to EN 60529 IP5X). *Bosch tested more severe for class **IP6x***

Additional reliability tests

Activity	Description
Environmental Type 4X (Raintight) UL50E, UL 60950-22, 4.2.5, 4.2.1	Type 4X Hose down Test, Gasket Tests, Impact Test at -50°C
Degrees of protection against external mechanical impacts (endurance) (EN 62262)	IK10+ housing including bubble, Impact energy 50 Joule, 3 impacts per point
Protection against foreign objects, water and access (endurance) (ISO 20653:2013)	IK6K9K
MTBF (Mean Time Between Failures)	> 85.053 h Calculation of used components according Siemens SN29500. > 800.000 h Based on current field performance of predecessor products.
Operating temperature	-50 and 60ºC
Cold start test	Guaranteed until ambient temperature -20ºC
Motorized pan, tilt, roll and zoom	Minimum 400 cycles. Operation guaranteed between -40 and 60ºC
Traffic Controller Assemblies with NTCIP Requirements NEMA TS 2-2016	Compliant to the next chapters when using a TS-2 compliant power supply: 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.1.9 and 2.1.10 Tested according chapter 2.2.7, 2.2.8 and 2.2.9
Quality (Q) and Reliability (Z) testing	Annual product compliance. Verification tests to secure that products remain compliant to the specified requirements.

Data subject to change without notice.

Eindhoven, January 2023