

TO WHOM IT MAY CONCERN

Bosch Security Systems
Torenallee 49
5617 BA Eindhoven
The Netherlands

Product Test Report

BT-SC 2018-E-054

Product**FLEXIDOME IP starlight 8000i**

F.01U.321.595	NDE-8502-R	Fixed dome 2MP HDR 3-9mm PTRZ IP66
F.01U.396.601	NDE-8502-R	Fixed dome 2MP HDR 3-9mm PTRZ IP66
F.01U.321.596	NDE-8502-RT	Fixed dome 2MP HDR 10-23mm PTRZ IP66
F.01U.396.602	NDE-8502-RT	Fixed dome 2MP HDR 10-23mm PTRZ IP66
F.01U.323.271	NDE-8503-R	Fixed dome 6MP HDR 3.9-10mm PTRZ IP66
F.01U.396.603	NDE-8503-R	Fixed dome 6MP HDR 3.9-10mm PTRZ IP66
F.01U.323.272	NDE-8503-RT	Fixed dome 6MP HDR 12-40mm PTRZ IP66
F.01U.321.597	NDE-8504-R	Fixed dome 8MP HDR 3.9-10mm PTRZ IP66
F.01U.396.604	NDE-8504-R	Fixed dome 8MP HDR 3.9-10mm PTRZ IP66
F.01U.384.554	NDE-8504-RT	Fixed dome 8MP HDR 12-40mm PTRZ IP66
F.01U.385.211	NDE-8502-RX	Fixed dome 2MP HDR X 4.4-10mm PTRZ IP66
F.01U.385.212	NDE-8502-RXT	Fixed dome 2MP HDR X 12-40mm PTRZ IP66
F.01U.385.213	NDE-8503-RX	Fixed dome 4MP HDR X 4.4-10mm PTRZ IP66
F.01U.385.214	NDE-8503-RXT	Fixed dome 4MP HDR X 12-40mm PTRZ IP66

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 Australia – New Zealand	
SAL-Declaration of Conformity	Compliance levels 1, 2 and 3 in Australia and Levels of Conformity 1, 2 and 3 in New Zealand as required by notices under: <ul style="list-style-type: none"> - section 182 of the Australian Radiocommunications Act 1992. - section 134 of the New Zealand Radiocommunications Act 1989. - section 407 of the Telecommunications Act 1997
EMC Canada	
ISED, RSS-247 Issue 2	Innovation, Science and Economic Development (ISED) Canada - Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
ISED, RSS-GEN Issue 4	General Requirements for Compliance of Radio Apparatus
EMC EU, 2014/53/EU (RED)	Radio Equipment Directive
EN 300 328 v2.2.0	Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised Standard for access to radio spectrum
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 301 489-3 v2.1.1	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
EN 301 489-17 v3.2.0	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
EN 62311:2008	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)
EMC EU, 2014/30/EU (EMCD)	Electromagnetic Compatibility Directive
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 <i>Air discharge until 8kV and contact discharge until 6kV</i>
EN 61000-4-3	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test <i>Modulation: 80% Amplitude Modulation with 1kHz sinewave</i> <i>Field strength of 10V/m for the frequency range 80MHz to 2.7GHz</i>

EN 61000-4-4	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test <i>100kHz repetition frequency, 2kV on AC ports, 1kV on other ports</i>
EN 61000-4-5	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test <i>Until 1kV Differential Mode and 2kV Common Mode</i>
EN 61000-4-6	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields <i>Modulation: 80% Amplitude Modulation with 1kHz sinewave</i> <i>Field strength of 140dBμV (10V) for the frequency range 150kHz to 100MHz</i>
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 <i>150kHz to 500kHz: 79dBμV QP / 66dBμV AV</i> <i>500kHz to 30MHz: 73dBμV QP / 60dBμV AV</i>
EN 61000-4-2	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test <i>Air discharge until 8kV and contact discharge until 6kV</i>
EN 61000-4-3	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test <i>Modulation: 80% Amplitude Modulation with 1kHz sinewave</i> <i>Field strength of 10V/m for the frequency range 80MHz to 800MHz</i> <i>Field strength of 20V/m for the frequency range 800MHz to 1GHz</i> <i>Field strength of 10V/m for the frequency range 1.4GHz to 2GHz</i> <i>Field strength of 5V/m for the frequency range 2GHz to 2.7GHz</i> <i>Field strength of 3V/m for the frequency range 5.1GHz to 6GHz</i>
EN 61000-4-4	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test <i>5kHz repetition frequency, 2kV on all ports</i>
EN 61000-4-5	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test <i>Until 1kV Differential Mode and 2kV Common Mode</i>
EN 61000-4-6	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields <i>Modulation: 80% Amplitude Modulation with 1kHz sinewave</i> <i>Field strength of 140dBμV (10V) over the frequency range 150kHz to 100MHz</i>
EMC Japan	
Radio Law	Article 49-20 and relevant articles of the Ordinance Regulating Radio Equipment

EMC USA	
CFR 47 FCC, part 15.247, 15.205, 15.207, 15.209, Class B	Code of Federal Regulations, Radio Frequency Devices, Subpart C - INTENTIONAL RADIATORS - Radiated Emission Limits, Additional Provisions - Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

Country specific approvals

	Country	Country	Country
Required EMC, Radio and safety approvals and certificates	Australia	Iran	Saudi Arabia
	Brazil	Israel	Singapore
	Belarus	Japan	South Africa
	Canada	Kazakhstan	South Korea**
	Chile*/**	Malaysia	Taiwan
	China	Mexico	Thailand
	Egypt	Morocco**	Ukraine**
	European Union	New Zealand	United Arab Emirates
	Hong Kong	Philippines*/**	United States of America
	India	Qatar	Vietnam**
	Indonesia	Russia	

* No approval for NDE-8504-RT, ** No approval for NDE-8502-RX, NDE-8502-RXT, NDE-8503-RX and NDE-8503-RXT

Environmental approvals

Directive or standard	Description
RoHS EU, 2011/65/EU (EN 50581:2012 and 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 <u>Scope:</u> Development, production, installation and sales.
ISO 14001:2015	Environmental management systems -- Requirements with guidance for use <u>Scope:</u> Development, Production, Sales and After Sales.

Reliability tests

According to: 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 +70°C, Duration 16 hours.
Dry heat (endurance) (EN 60068-2-2:2007)	Temperature +55°C, Duration 21 days
Cold (operational) (EN 60068-2-1:2007)	Temperature -25°C, Duration 16 hours.
Damp heat, steady state (endurance) (EN 60068-2-78:2001)	Temperature +40°C, Relative Humidity 93%, Duration 21 days.
Damp heat, cyclic (operational) (EN 60068-2-30:2005)	Temperature +25°C to +55°C, Relative humidity 93%, 2 cycles.
Damp heat, cyclic (endurance) (EN 60068-2-30:2005)	Temperature +25°C to +55°C, 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). <i>Bosch tested more severe for class IPx6</i>
Sulphur dioxide (SO ₂) (endurance) (EN 60068-2-42:2003)	Temperature 25°C, SO ₂ Concentration 25x10e-6, RH 93%, Duration 21 days <i>Bosch tested for a more extreme exposure scenario: 2 cycles (42 days)</i>
Salt mist, cyclic (endurance) (EN 60068-2-52:1996)	Temperature 15°C till 40°C, RH 93%, 4 cycles, Duration 28 days <i>Bosch tested for a more extreme exposure scenario: 8 cycles (56 days)</i>
Shock (operational) (EN 60068-2-27:2009)	Halve sine wave pulse, duration 6ms, 3 pulses per direction, 6 directions. <i>Bosch tested with acceleration of 56,3G.</i>
Impact (operational) (EN 60068-2-75:1997 Test Ehb)	Impact energy 0.5Joule, 3 impacts per point (Similar to EN 62262 IK06 rating). <i>Bosch tested more severe for IK10 rating</i>
Vibration, sinusoidal (operational) (EN 60068-2-6:2008)	Frequency range 10-150 Hz, 5 ms ² , 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/s ² , 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°C, Duration 10d.
Dust tightness (endurance) (EN 60529:1991 A1:2000)	Duration 8h (similar to EN 60529 IP5X). <i>Bosch tested more severe for class IP6x</i>

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 60°C
Cold start test	Guaranteed until ambient temperature -20°C
Motorized pan, tilt, roll and zoom	Guaranteed between -40 and 60°C
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, February 2022