Product Tests Report

Product name: MIC Alarm-Washer Interface Unit

Model number and description:

MIC-ALM-WAS-24 MIC Alarm-Washer Interface Unit, 24VAC

The above-mentioned Bosch Security Systems product has been tested in accordance and was found to comply with the tests listed below which were carried out during the development phase of the product. Please note that for some tests, test conditions exceed the range that Bosch recommends for effective continuous operation of the camera.

Data subject to change without notice.

ENVIRONMENTAL TEST

BS EN 50130-5:1999 Alarm systems Part 5: Environmental test methods	Specific Test Description (Temperatures stated are outside of the camera housing)	Comments	Passed
Dry heat Operational IEC 60068-2-2:1974 +A1:1993+ A2:1994	Temp. +65 °C, duration 48 hours		Yes
Dry heat Storage IEC 60068-2-2:1974 +A1:1993+ A2:1994	Temp. +75 °C, duration 4 hours		Yes
Cold operational IEC 60068-2-1:1990 +A1:1993+ A2:1994	Temp. -45 °C, duration 48 hours		Yes
Cold start test	Power off, soak overnight (8 hours) @ -45 °C, power up unit, unit must power up & function normally within < 30 minutes.		Yes
Cold Endurance IEC 60068-2-1:1990 +A1:1993+ A2:1994	Temp -45 °C, Duration 4 hours		Yes
Humidity, operational Damp heat, steady state operational IEC 60068-2-2:1988	65 °C / 95 %RH for 6 hours, 35 ^{0}C/85% RH for 16 hours. Repeat for 5 cycles total.		Yes
IEC 60529 Ingress Protection Rating (IPxx) Degrees of protection provided by enclosures (IP Code) [Dust, water ingress (operational)]	Dust tight (no dust ingress; complete protection against contact). Water immersion: 30 minutes Water depth: 1 meter	IP67	Yes
UL Type rating (similar to NEMA XX)		Type 4X Based on suppliers' specifications of enclosure and cable glands.	Yes
External Mechanical Impact IEC 60529	Part of IP67 certification.		Yes
Transportation Tests (ISTA Procedure 1A)	ISTA - Vibration 14,200 vibratory shocks - 2 axis		Yes
Transportation Tests (ISTA Procedure 1A)	ISTA - 36 inches (0.9 m) free fall drop 6 faces of box		Yes

ADDITIONAL ENVIRONMENTAL – FUNCTIONAL BOSCH TESTS

Environmental test methods	Specific Test Description	Comments	Passed
MTBF calculation of used components Based on: for electronics, MIL-HDBK-217FN1, GB, GC, 25C.	593,977 hours		
HALT (Highly Accelerating Life Test)	Ambient Operational Test: (+) 25 °C HALT LOL/UOL Voltage Test: 1- Step mains voltage down from nominal 24VAC by 2 volts every 5 minutes until operational failure and/or destruct failure. 2- Step mains voltage up from nominal 24 VAC by 2 volts every 5 minutes until operational failure and/or destruct failure. HALT LOL/UOL Temperature Test: 1- Step temperature down from (-) 40 °C by 5 °C every 4 hours (minimum) until operational failure and/or destruct failure. 2- Step temperature up from (+) 40 °C by 5 °C every 4 hours (minimum) until operational failure and/or destruct failure. HALT Vibration Test: 1- The DUT is initially vibrated at acceleration level of 5g (rms) for minimum period of at least 10 minutes. After 10 minutes exposure, the DUT is tested operationally and results are recorded. The operating vibration level is then increased by 5g (rms) and the process is repeated for the next step in the test. This sequence is repeated until the DUT fails operational testing or the test level reaches 50g (rms). COLD Start Test: 1- Set chamber temperature at (-) 45 °C. Power removed from test unit for minimum period of 5 hours, then operate the test switch to restore power. The test unit shall complete its start-up sequence and then resume operation.		Yes
NEMA TS-2 Traffic Controller Assemblies w/NTCIP Requirements	TS 2 Section 2.2.7 Transients, Temperature, Voltage, and Humidity Tests		Yes
NEMA TS-2 Traffic Controller Assemblies w/NTCIP Requirements	TS 2 Section 2.2.8 Vibration - 5-30 Hz, 0.5g, Resonant Frequency Search 1 hour endurance test		Yes
NEMA TS-2 Traffic Controller Assemblies w/NTCIP Requirements	TS 2 Section 2.2.9 Shock (Impact) Test Half sine wave 11 ms, 10g		Yes

Approvals Safety, EMC and Environmental

Specific Approval	Description	Comments	Passed
EMC Europe			**Passed**
EN 55022:2010	Information Technology Equipment- Radio disturbance characteristics Limits and Methods of measurement. Class A		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 61000-3-2:2006 + A2:2009	Mains harmonics Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)		Yes
EN 61000-3-3:2008	Voltage fluctuations Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection.		Yes
EMC USA			
CFR 47 FCC part 15 Class A	Conducted + Radiated Emission based on VERIFICATION procedure		Yes
Lightning protection EN 61000-4-5:1995	Levels ±0.5, 1 and 2kV common mode. ± 0.5 and 1kV differential mode. To ALL input / output - and supply-wiring.		Yes
Safety Europe			
IEC 60950-1:2005 (2nd Edition) + A1:2009 EN 60950-1:2006, EN 60950-1, 2nd Edition, 2007-03-27 + A12:2011	Information technology equipment – Safety – Part 1: General requirements		Yes
Safety USA + Canada			
UL 60950-1 (2nd edition dated March 27, 2007; revised December 19, 2011) CAN/CSA-C22.2 No.E60950-1 (CSA C22.2 No. 60950-1-07, R2012)	UL listing + cUL listing. Information technology equipment – Safety – Part 1: General requirements		Yes
Environmental			
Restriction of Hazardous Substances	RoHS and REACH compliant		Yes
IEC 60950-22	Part 1: General requirements		Yes

Functional and specification test

Functional tests description		Comments	Passed
Product Performance	Refer to MIC-ALM-WAS-24 datasheet.		

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