TEST REPORT
EN 60950-1
Information technology equipment-Safety
Part 1: General requirements

Report

Reference No. . . . . : 18.0028/02.057

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"ЕЛПРОМ-ИЛЕП"ООД ИЛЕП ИЗПИТВАТЕЛНА ЛАБОРАТОРИЯ ЗА ЕЛЕКТРОТЕХНИЧЕСКА ПРОДУКЦИЯ

Testing laboratory

Name . . . . . : ILEP
Address . . . . . : 43 Cherny vrah Blvd., 1407 Sofia, Bulgaria
Testing location . . . . . .: as above

Client

Name . . . . . : Allterco Robotics Ltd.
Address . . . . . : 103 Cherny vrah Blvd., 1407 Sofia, Bulgaria

Test specification

Standard . . . . . : EN 60950-1:2006+A11:2009+A1:2010+A12:2011 +A2:2013+AC:2015 (IEC 60950-1:2005+A1:2009+A2:2013)

Non-standard test method . . . . . : N.A.

Test item

Description . . . . . : Shelly 1 controller
Trademark . . . . . : Shelly®
Model and/or type reference . . . . : Shelly 1
Manufacturer . . . . . : Allterco Robotics Ltd., Bulgaria
Rating(s) . . . . . : 110-240V~/24-60V⎓/12V⎓; 50/60Hz; 50mA max; Relay output 16A

Test result . . . . . : The a.m. product passed/~~failed~~

General product information:

1. The product is a Wi-Fi controller. The device is an internet connected relayed module, which could be controlled via an internet connected computer, a smartphone, or a building automation system. It is suitable for building and home installations, without the need of additional wiring. The device has automation applications such as lighting, heating, ventilation, shutters, portal and door control for the purposes of energy management, security, health care, and comfort of the user.

2. The controller is an incorporated control, intended for mounting in boxes for electrical accessories of fixed electrical installations or for flush mounting (degree of protection IP 00 in mounted position) and is suitable for indoor use.

3. The unit is intended to operate in an environment judged to be pollution degree 2 (PD2).

4. The specified ambient service temperature range is 0°C to +40°C.

5. The equipment is intended to be connected to an AC mains supply, and it is designed for Overvoltage Category II and transient voltages up to and including 2500V. In addition it is suitable to be connected and to a DC mains supply (in this case the circuitry of the unit is considered to be a secondary circuit in the meaning of EN 60950-1).

6. The controller is permanently connected equipment, intended for connection to the building installation wiring using screw terminals. This unit is intended for continuous operation.

7. The product is intended for use on TN/IT AC power distribution systems or on the DC power distribution system of the building.

8. A disconnecting device from the mains supply is not incorporated in the equipment and the installation instructions state that a means for disconnection having a contact separation in all poles that provides full disconnection under overvoltage category III conditions must be incorporated in the fixed wiring in accordance with the wiring rules.

9. The controller contains only hazardous voltage circuits, and does not contain SELV circuits, limited current and limited voltage circuits, separated from live parts by protective impedance.

10. In regard to the protection against electric shock this product is accomplished as equipment for building-in with Class II construction with external enclosure of insulating material and is intended for use in Class II equipment.

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
	1.3 EN 60950-1 Performance of equipment is in accordance with the general requirements of this standard	1.3 EN 60950-1	P	P	**P**
	1.4 EN 60950-1 Tests performed according to Cl. 1.4, e.g. nature of supply, sequence of testing, etc.	1.4 EN 60950-1	P	P	**P**
	1.5 EN 60950-1 Components	1.5 EN 60950-1			
	1.5.1 EN 60950-1 Components comply with the general safety requirements of this standard and relevant IEC standards	1.5.1 EN 60950-1	P	P	**P**
	1.5.2 EN 60950-1 Evaluation and testing of components in relation to their correct application and use in accordance with their ratings is performed in compliance with the requirements	1.5.2 EN 60950-1	P	P	**P**
	1.5.9 EN 60950-1 Surge suppressor used to bridge functional insulation conforms to the requirements	1.5.9 EN 60950-1	P	P	**P**
	1.6 EN 60950-1 Power interface	1.6 EN 60950-1			

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
	1.6.1 EN 60950-1 Equipment is intended for connection to TN/IT AC power distribution system in accordance with classification, specified in this standard	1.6.1 EN 60950-1	P	P	**P**
	1.6.2 EN 60950-1 Input current	1.6.2 EN 60950-1			
	1.6.2 EN 60950-1 Measured input current at rated voltage 99Va.c. and under normal load, mA	1.6.2 EN 60950-1	-	27,6	-
	1.6.2 EN 60950-1 Deviation of the measured input current at rated voltage 99Va.c. and under normal load from the rated input current, %	1.6.2 EN 60950-1	+10	-44,8	**P**
	1.6.2 EN 60950-1 Measured input current at rated voltage 110Va.c. and under normal load, mA	1.6.2 EN 60950-1	-	26,8	-
	1.6.2 EN 60950-1 Deviation of the measured input current at rated voltage 110Va.c. and under normal load from the rated input current, %	1.6.2 EN 60950-1	+10	-46,4	**P**
	1.6.2 EN 60950-1 Measured input current at rated voltage 240Va.c. and under normal load, mA	1.6.2 EN 60950-1	-	13,7	-
	1.6.2 EN 60950-1 Deviation of the measured input current at rated voltage 240Va.c. and under normal load from the rated input current, %	1.6.2 EN 60950-1	+10	-72,6	**P**
	1.6.2 EN 60950-1 Measured input current at rated voltage 264Va.c. and under normal load, mA	1.6.2 EN 60950-1	-	12,6	-

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
	1.6.2 EN 60950-1 Deviation of the measured input current at rated voltage 264Va.c. and under normal load from the rated input current, %	1.6.2 EN 60950-1	+10	-74,8	P
	1.6.2 EN 60950-1 Measured input current at rated voltage 20,4Vd.c. and under normal load, mA	1.6.2 EN 60950-1	-	34,5	-
	1.6.2 EN 60950-1 Deviation of the measured input current at rated voltage 20,4Vd.c. and under normal load from the rated input current, %	1.6.2 EN 60950-1	+10	-31,0	P
	1.6.2 EN 60950-1 Measured input current at rated voltage 24Vd.c. and under normal load, mA	1.6.2 EN 60950-1	-	30,7	-
	1.6.2 EN 60950-1 Deviation of the measured input current at rated voltage 24Vd.c. and under normal load from the rated input current, %	1.6.2 EN 60950-1	+10	-38,6	P
	1.6.2 EN 60950-1 Measured input current at rated voltage 60Vd.c. and under normal load, mA	1.6.2 EN 60950-1	-	12,5	-
	1.6.2 EN 60950-1 Deviation of the measured input current at rated voltage 60Vd.c. and under normal load from the rated input current, %	1.6.2 EN 60950-1	+10	-75,0	P
	1.6.2 EN 60950-1 Measured input current at rated voltage 72Vd.c. and under normal load, mA	1.6.2 EN 60950-1	-	8,8	-
	1.6.2 EN 60950-1 Deviation of the measured input current at rated voltage 72Vd.c. and under normal load from the rated input current, %	1.6.2 EN 60950-1	+10	-82,4	P

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
	1.6.2 EN 60950-1 Measured input current at rated voltage 10,2Vd.c. and under normal load, mA	1.6.2 EN 60950-1	-	46,9	-
	1.6.2 EN 60950-1 Deviation of the measured input current at rated voltage 10,2Vd.c. and under normal load from the rated input current, %	1.6.2 EN 60950-1	+10	-6,2	**P**
	1.6.2 EN 60950-1 Measured input current at rated voltage 12Vd.c. and under normal load, mA	1.6.2 EN 60950-1	-	43,7	-
	1.6.2 EN 60950-1 Deviation of the measured input current at rated voltage 12Vd.c. and under normal load from the rated input current, %	1.6.2 EN 60950-1	+10	-12,6	**P**
	1.6.2 EN 60950-1 Measured input current at rated voltage 14,4Vd.c. and under normal load, mA	1.6.2 EN 60950-1	-	38,6	-
	1.6.2 EN 60950-1 Deviation of the measured input current at rated voltage 14,4Vd.c. and under normal load from the rated input current, %	1.6.2 EN 60950-1	+10	-22,8	**P**
	1.6.4 EN 60950-1 Insulation of neutral conductor from the body in the equipment meets the requirements	1.6.4 EN 60950-1	P	P	**P**
	1.7 EN 60950-1 Markings and instructions	1.7 EN 60950-1			

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
1.7.1 EN 60950-1	Markings of the equipment concerning connection to a mains supply and identification of equipment conform to the requirements	1.7.1 EN 60950-1	P	P	**P**
1.7.2 EN 60950-1	Safety instructions, accompanying the equipment and marking related to safety, comply with the requirements	1.7.2 EN 60950-1	P	P	**P**
1.7.6 EN 60950-1	Fusible resistor identification is in accordance with the requirements	1.7.6 EN 60950-1	P	P	**P**
1.7.7 EN 60950-1	Markings of terminals for a.c. mains supply conductors and for d.c. mains supply conductors of equipment comply with the requirements	1.7.7 EN 60950-1	P	P	**P**
1.7.11 EN 60950-1	Markings of the equipment comply with the requirements for durability	1.7.11 EN 60950-1	P	P	**P**
1.7.12 EN 60950-1	Markings required by this standard are not placed on removable parts	1.7.12 EN 60950-1	P	P	**P**
1.7.14 EN 60950-1	Installation instructions contain a statement that equipment is intended only for installation in a restricted access location	1.7.14 EN 60950-1	P	P	**P**

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
2 EN 60950-1 Protection from hazards		2 EN 60950-1			
2.1 EN 60950-1 Protection from electric shock and energy hazards		2.1 EN 60950-1			
2.1.1 EN 60950-1 Protection against energy hazards, against access to hazardous live parts and against discharge of capacitors, and accomplishment of manual controls in operator access areas, specified in safety instructions, meets the requirements		2.1.1 EN 60950-1	P	P	**P**
2.1.2 EN 60950-1 Location and protection of parts at hazardous voltage in service access areas conform to the requirements for protection against unintentional contact		2.1.2 EN 60950-1	P	P	**P**
2.1.3 EN 60950-1 Protection against energy hazards, against access to hazardous live parts and against discharge of capacitors in restricted access locations meets the requirements		2.1.3 EN 60950-1	P	P	**P**
2.7 EN 60950-1 Overcurrent and earth fault protection in primary circuits		2.7 EN 60950-1			
2.7.1 EN 60950-1 Protection in primary circuits against overcurrents, short circuits and earth faults meets the basic requirements		2.7.1 EN 60950-1	P	P	**P**

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
	2.7.2 EN 60950-1 Protection against faults not simulated in 5.3.7 is provided in the building installation to which the equipment is connected	2.7.2 EN 60950-1	P	P	P
	2.7.3 EN 60950-1 Short-circuit backup protection for permanently connected equipment is provided in the building installation to which the equipment is connected	2.7.3 EN 60950-1	P	P	P
	2.7.4 EN 60950-1 Protection against overcurrents is provided by fusible resistor incorporated in equipment	2.7.4, Table 2F EN 60950-1	P	P	P
	2.7.6 EN 60950-1 Suitable marking is provided on the equipment to alert a service person to a possible electric shock hazard after operation of the fusible resistor	2.7.6 EN 60950-1	P	P	P
	2.9 EN 60950-1 Electrical insulation	2.9 EN 60950-1			
	2.9.1 EN 60950-1 The choice of insulating materials is conformable to electrical, thermal and mechanical strength, working voltage and working environment of the equipment	2.9.1 EN 60950-1	P	P	P
	2.9.2 EN 60950-1 Equipment is subjected to a humidity test in a humidity cabinet containing air with a relative humidity of (93 ± 3)% and a temperature of (25 ± 1) °C for 48h	2.9.2 EN 60950-1	P	P	P

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
	2.9.3 EN 60950-1 Grade of insulation meets the requirements	2.9.3, Table 2H EN 60950-1	P	P	**P**
	2.9.4 EN 60950-1 For separation of accessible parts from parts at hazardous voltage the Method 1 applied – by using double insulation and reinforced insulation	2.9.4 EN 60950-1	P	P	**P**
	2.10 EN 60950-1 Clearances, creepage distances and distances through insulation	2.10 EN 60950-1			
	2.10.1 EN 60950-1 Determination of clearances, creepage distances and distances through insulation conforms to the general requirements	2.10.1 EN 60950-1	P	P	**P**
	2.10.2 EN 60950-1 Determination of working voltages (up to 420Vpeak and up to 250Vrms) is carried out in accordance with the requirements of this standard	2.10.2 EN 60950-1	P	P	**P**
	2.10.3 EN 60950-1 Clearances	2.10.3 EN 60950-1			
	2.10.3.2 EN 60950-1:06 Clearances in equipment are designed for overvoltage category II as the values of mains transient voltages are taken into account	2.10.3.2, Table 2J EN 60950-1	P	P	**P**

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
2.10.3.3 EN 60950-1 Clearances in primary circuits meet the requirements		2.10.3.3 EN 60950-1	P	P	**P**
2.10.3.3 EN 60950-1 Measured clearances in primary circuits, mm, no less than:		2.10.3.3, Table 2K EN 60950-1			
	- for functional insulation		1,5	2,6	**P**
	- for reinforced insulation		4,0	6,0	**P**
2.10.3.4 EN 60950-1 Clearances in secondary circuits meet the requirements		2.10.3.4 EN 60950-1	P	P	**P**
2.10.3.4 EN 60950-1 Measured clearances in secondary circuits, mm, no less than:		2.10.3.4, Table 2M EN 60950-1			
	- for functional insulation		0,5	0,5	**P**
2.10.3.6 EN 60950-1 The values of mains transient voltages in secondary circuits are determined from the list of values in Table 2J		2.10.3.6 EN 60950-1	P	P	**P**
2.10.4 EN 60950-1 Creepage distances conform to the requirements		2.10.4 EN 60950-1	P	P	**P**

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
2.10.4.3 EN 60950-1 Measured creepage distances, mm, no less than:		2.10.4.3, Table 2N EN 60950-1			
	- for functional insulation		2,5	2,6	**P**
	- for reinforced insulation		5,0	6,0	**P**
2.10.5 EN 60950-1 Solid insulation used in the equipment, meets the requirements		2.10.5 EN 60950-1	P	P	**P**
2.10.6 EN 60950-1 Construction of coated printed boards incorporated in the equipment, comply with the requirements		2.10.6 EN 60950-1	P	P	**P**
2.10.7 EN 60950-1 Components' external terminations comply with the requirements		2.10.7 EN 60950-1	P	P	**P**
3 EN 60950-1 Wiring, connections and supply		3 EN 60950-1			
3.1 EN 60950-1 General		3.1 EN 60950-1			
3.1.1 EN 60950-1 Cross-sectional areas of internal wires and protection against overcurrents and short-circuits of wires in primary circuit, comply with the requirements		3.1.1 EN 60950-1	P	P	**P**

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
3.2 EN 60950-1 Connection to a mains supply		3.2 EN 60950-1			
3.2.1 EN 60950-1 Means of connection		3.2.1 EN 60950-1			
3.2.1.1 EN 60950-1 Means of connection to the a.c. mains supply of equipment meet the requirements		3.2.1.1 EN 60950-1	P	P	**P**
3.2.1.2 EN 60950-1 Means of connection to the d.c. mains supply of equipment meet the requirements		3.2.1.2 EN 60950-1	P	P	**P**
3.2.3 EN 60950-1 Permanently connected equipment is provided with a set of terminals as specified in 3.3 and permits the connection of the supply wires after the equipment has been fixed to its support		3.2.3 EN 60950-1	P	P	**P**
3.2.9 EN 60950-1 The supply wiring space provided as part of equipment for permanent connection to the supply complies with the requirements of this standard		3.2.9 EN 60950-1	P	P	**P**
3.3 EN 60950-1 Wiring terminals for connection of external conductors		3.3 EN 60950-1			
3.3.1 EN 60950-1 Permanently connected equipment is provided with terminals in accordance with the requirements of this standard		3.3.1 EN 60950-1	P	P	**P**

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
3.3.2 EN 60950-1	The connection of conductors to the internal wiring of the equipment is accomplished by means that provide a reliable electrical and mechanical connection without exceeding the permitted temperature limits under normal load	3.3.2 EN 60950-1	P	P	**P**
3.3.3 EN 60950-1	Camping means for external conductors of screw terminals meet the requirements	3.3.3 EN 60950-1	P	P	**P**
3.3.4 EN 60950-1	Terminals are provided for conductors sizes to be connected in accordance with the requirements of this standard	3.3.4, Table 3D EN 60950-1	P	P	**P**
3.3.5 EN 60950-1	Terminals meet the requirements for minimum sizes	3.3.5, Table 3E EN 60950-1	P	P	**P**
3.3.6 EN 60950-1	Wiring terminal design complies with the requirements	3.3.6 EN 60950-1	P	P	**P**
3.3.7 EN 60950-1	AC/DC mains supply terminals of permanently connected equipment are located in proximity to each other	3.3.7 EN 60950-1	P	P	**P**
3.3.8 EN 60950-1	Terminals of equipment are guarded against accidental contact between strand of a flexible conductor and accessible conductive parts or unearthed conductive parts separated from accessible conductive parts by supplementary insulation only	3.3.8 EN 60950-1	P	P	**P**

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
3.4 EN 60950-1	Disconnection from the mains supply	3.4 EN 60950-1			
3.4.1 EN 60950-1	Suitable means for disconnection from the mains supply of the equipment are specified in instruction for use in accordance with the general requirements of this standard	3.4.1 EN 60950-1	P	P	**P**
3.4.3 EN 60950-1	Permanently connected equipment is accompanied by installation instructions in accordance with 1.7.2.1 stating that an appropriate disconnect device shall be provided external to the equipment as part of the building installation	3.4.3 EN 60950-1	P	P	**P**
3.5 EN 60950-1	Interconnection of equipment	3.5 EN 60950-1			
3.5.1 EN 60950-1	The choice of interconnection circuits at hazardous voltage is accomplished in accordance with the general requirements of this standard	3.5.1 EN 60950-1	P	P	**P**
3.5.2 EN 60950-1	The type of interconnection circuits complies with the requirements for hazardous voltage circuits	3.5.2 EN 60950-1	P	P	**P**
4 EN 60950-1	Physical requirements	4 EN 60950-1			

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
4.1 EN 60950-1	Equipment for building-in complies with the stability requirements	4.1 EN 60950-1	P	P	**P**
4.2 EN 60950-1	Mechanical strength	4.2 EN 60950-1			
4.2.1 EN 60950-1	Mechanical enclosure of the equipment provides the needed mechanical strength in accordance with the general requirements of this standard	4.2.1 EN 60950-1	P	P	**P**
4.2.2 EN 60950-1	Components and parts of equipment, other than parts serving as an enclosure, withstand the test with a steady force of 10N	4.2.2 EN 60950-1	P	P	**P**
4.2.4 EN 60950-1	External enclosures of equipment withstand the test with a steady force of 250N	4.2.4 EN 60950-1	P	P	**P**
4.2.5 EN 60950-1	External surfaces of enclosures, the failure of which would give access to hazardous parts, withstand the impact test with a steel ball	4.2.5 EN 60950-1	P	P	**P**
4.2.7 EN 60950-1	Enclosures of thermoplastic materials withstand the stress relief test	4.2.7 EN 60950-1	P	P	**P**
4.3 EN 60950-1	Design and construction	4.3 EN 60950-1			

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
4.3.1 EN 60950-1	Protection of operator is provided against contact with edges and corners, which may cause a hazard	4.3.1 EN 60950-1	P	P	**P**
4.3.2 EN 60950-1	Requirements for reliably fixing of manual controls are specified in instructions for use	4.3.2 EN 60950-1	P	P	**P**
4.3.3 EN 60950-1	The device for selection of different mains supply voltages requires the use of a tool if incorrect setting might create a hazard	4.3.3 EN 60950-1	P	P	**P**
4.3.4 EN 60950-1	Fixing parts withstand mechanical stresses in normal use and clearances and creepage distances are not reduced below the values, specified in 2.10 as a result of wear	4.3.4 EN 60950-1	P	P	**P**
4.5 EN 60950-1	Thermal requirements	4.5 EN 60950-1			
4.5.2 EN 60950-1	Measured temperatures under normal load of the equipment, do not exceed safe values in accordance with the requirements of this standard	4.5.2 EN 60950-1	P	P	**P**
4.5.3 EN 60950-1	Temperature limits for materials	4.5.3 EN 60950-1			

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
	Temperature measurements at supply voltages 99Va.c. and 10,2Vd.c. and at t_{amb1}=23,9 °C and t_{amb2}=24,8 °C and recalculated for t_{amb}=40 °C, no more than:				
	- Winding of relay RL1 (Cl. F), °C	4.5.3, Table 4B EN 60950-1	140	127,2	P
	- Outer surface of choke L1 (T 100), °C		100	68,7	P
	- Outer surface of inductor L2 (T 130), °C		130	78,4	P
	- Outer surface of electrolytic capacitor C9 (T 105), °C		105	89,5	P
	- Outer surface of electrolytic capacitor C6 (T 105), °C		105	88,5	P
	- Varistor VR1, °C		105	59,7	P
	- ESCP U5, °C		125	85,5	P
	- Converter U1, °C		150	74,1	P
	- DC-DC converter U2, °C		85	82,7	P
	- Flash memory U4, °C		85	83,9	P
	- Crystal unit Y1, °C		75	73,8	P
	- Insulation of supply wiring PVC (T 105), °C		105	61,0	P

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
- Insulation of output wiring PVC (T 105), °C			105	86,5	P
- Input terminals, °C			105	83,3	P
- Output terminals, °C			105	101,6	P
- Printed circuit board, °C			145	107,3	P
- External enclosure of PC/ABS, °C			125	99,6	P
- Supporting surface, °C			-	99,6	-
4.5.5 EN 60950-1 Parts of thermoplastic materials on which parts at hazardous voltage are directly mounted, withstand the ball pressure test of resistance to abnormal heat according to IEC 60695-10-2 at temperature (125 ± 2) °C		4.5.5 EN 60950-1	P	P	P
- diameter of impression, mm, no more than			2,0	1,1	P
4.6 EN 60950-1 Openings in enclosures		4.6 EN 60950-1			

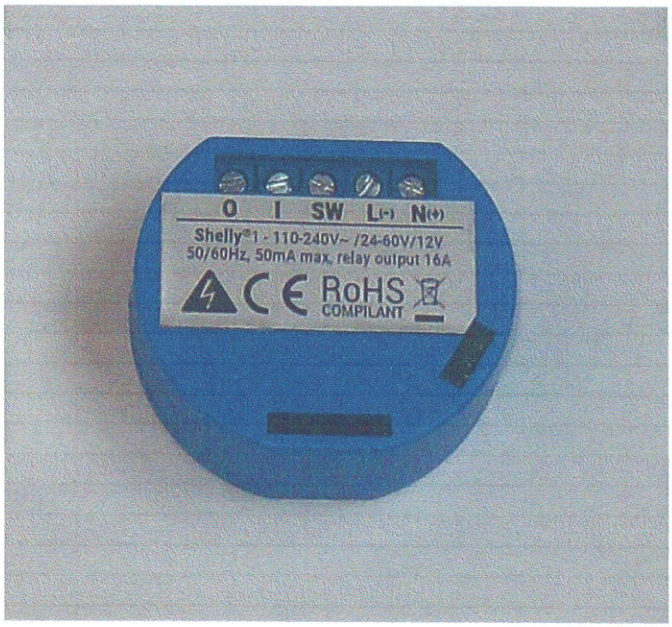
Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
4.6.1 EN 60950-1	Protection of openings in the top and sides of enclosures against access of external objects to bare conductive parts is provided during building-in of equipment in accordance with the installation instructions	4.6.1 EN 60950-1	P	P	**P**
4.6.2 EN 60950-1	The bottom of a fire enclosure does not contain openings as protection against ignition of supporting surface under fault conditions is provided during building-in of equipment in accordance with the installation instructions	4.6.2 EN 60950-1	P	P	**P**
4.7 EN 60950-1	Resistance to fire	4.7 EN 60950-1			
4.7.1 EN 60950-1	Measures taken to reduce the risk of ignition and spread of flame are in accordance with the methods described in this standard	4.7.1 EN 60950-1	P	P	**P**
4.7.2 EN 60950-1	Protection of parts requiring a fire enclosure is provided during building-in of equipment	4.7.2 EN 60950-1	P	P	**P**
4.7.3 EN 60950-1	Materials for enclosures of the equipment for building-in and materials for components and other parts located inside the enclosures, under and against openings in the enclosures, conform to the requirements	4.7.3 EN 60950-1	P	P	**P**

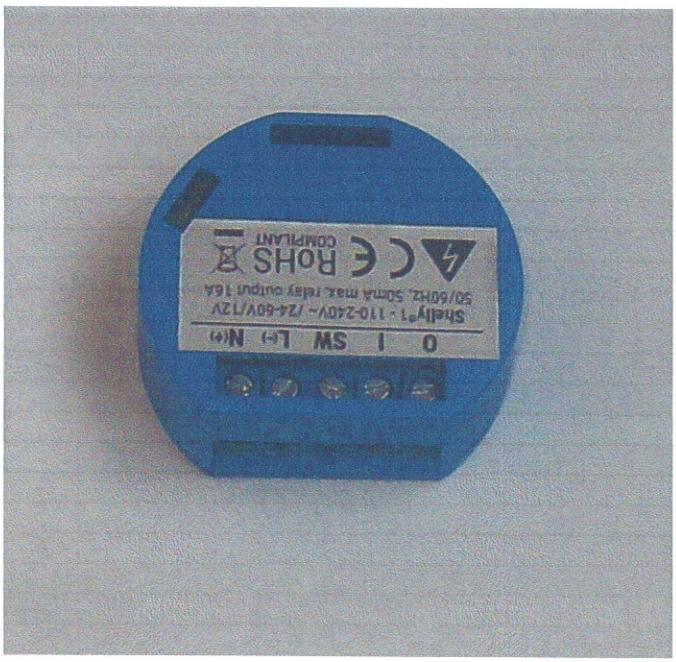
Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
5 EN 60950-1	Electrical requirements and simulated abnormal conditions	5 EN 60950-1			
5.1 EN 60950-1	Touch current and protective conductor current	5.1 EN 60950-1			
5.1.6 EN 60950-1	Measured touch current between accessible parts and circuits not connected to protective earth circuit and earth using measuring instrument according Figure D.1, mA, no more than:	5.1, Table 5A EN 60950-1			
	- from enclosure in contact with metal foil, in position L		0,25	0,003	**P**
	- from enclosure in contact with metal foil, in position N		0,25	0,003	**P**
5.2 EN 60950-1	Electric strength test with a voltage of substantially sinusoidal waveform having a frequency of 50Hz for 1 min:	5.2, Table 5B Part 1 EN 60950-1			
	- between parts of primary circuit and the body of equipment for reinforced insulation, Va.c.		3000	no breakdown	**P**
	- between separate parts in primary circuit for functional insulation, Va.c.		1500	no breakdown	**P**

Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
5.3 EN 60950-1 Abnormal operating and fault conditions		5.3 EN 60950-1			
5.3.1 EN 60950-1 Design of the equipment provides the safety of operator after abnormal operation and fault condition		5.3.1 EN 60950-1	P	P	**P**
5.3.4 EN 60950-1 Functional insulation complies with the clearances and creepage distances requirements, specified in 2.10		5.3.4 EN 60950-1	P	P	**P**
5.3.5 EN 60950-1 Locked mechanical movement of electromechanical component does not create a hazard due to excessive temperatures		5.3.5 EN 60950-1	P	P	**P**
5.3.7 EN 60950-1 The equipment complies with the requirements under fault conditions simulation of components and circuits, specified in this standard		5.3.7 EN 60950-1	P	P	**P**
5.3.9 EN 60950-1 Compliance criteria for abnormal operating and fault conditions		5.3.9 EN 60950-1			
5.3.9.1 EN 60950-1 During the test it is not observed occurrence or propagation of fire beyond the enclosures of equipment and enclosures do not deform		5.3.9.1 EN 60950-1	P	P	**P**

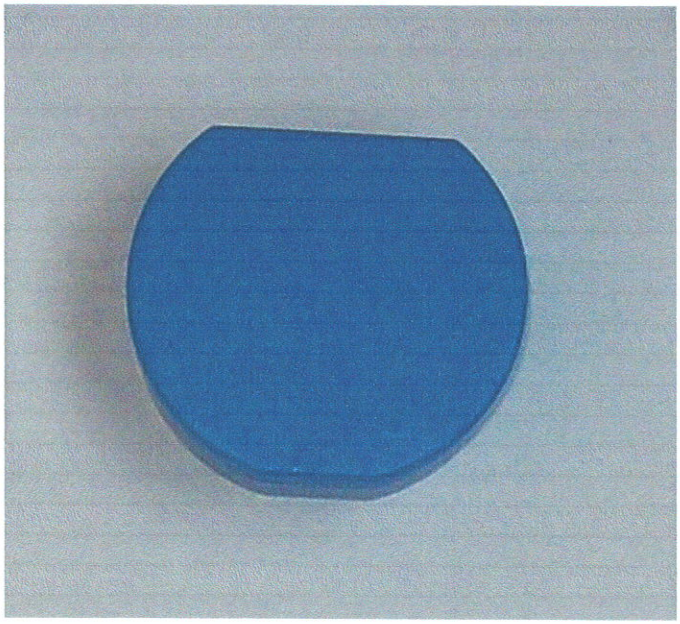
Method of testing according to clause	Brief of test/requirement	Requirement according to clause	Norm / Prescript	Result Measurement/ Control	Verdict: P/F
1	2	3	4	5	6
5.3.9.2 EN 60950-1	Electric strength test with a voltage of substantially sinusoidal waveform having a frequency of 50Hz for 1 min after the test of abnormal operating and fault conditions:	5.3.9.2 and Table 5B Part 1 EN 60950-1			
	- between parts of primary circuit and the body of equipment for reinforced insulation, Va.c.		3000	no breakdown	**P**
Annexes	The equipment conforms to the requirements as specified in the annexes of this standard	Annexes	P	P	**P**

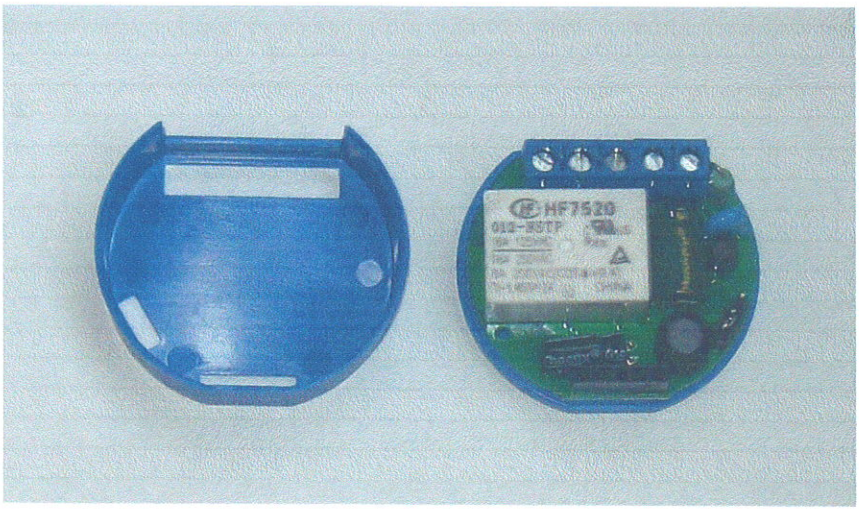
Photographs






O I SW L N
Shelly 1 - 110-240V~ /24-60V/12V
50/60Hz, 50mA max, relay output 16A
RoHS
COMPLIANT

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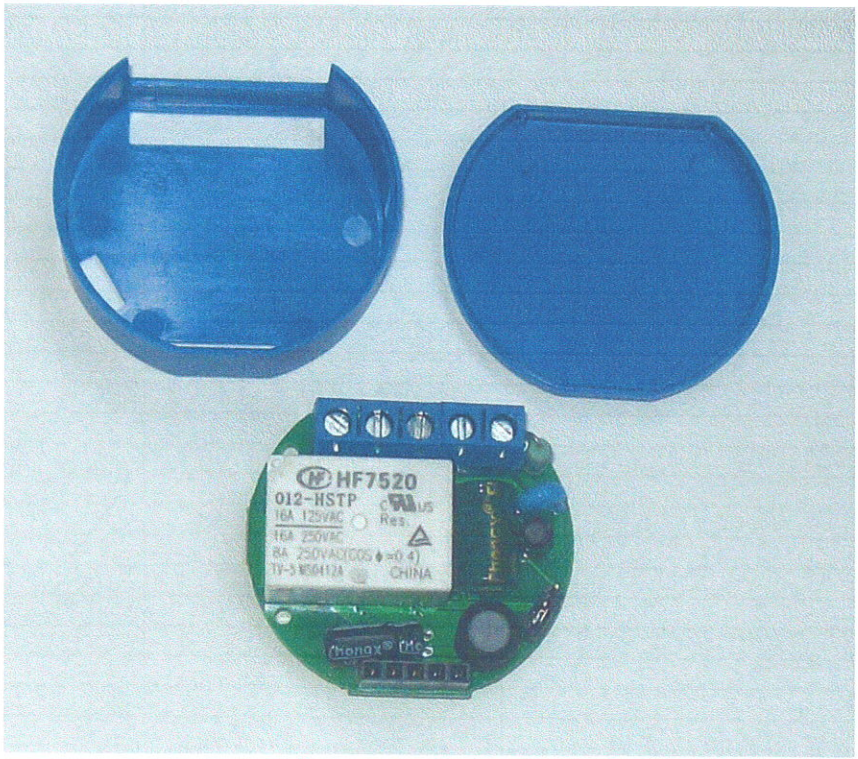
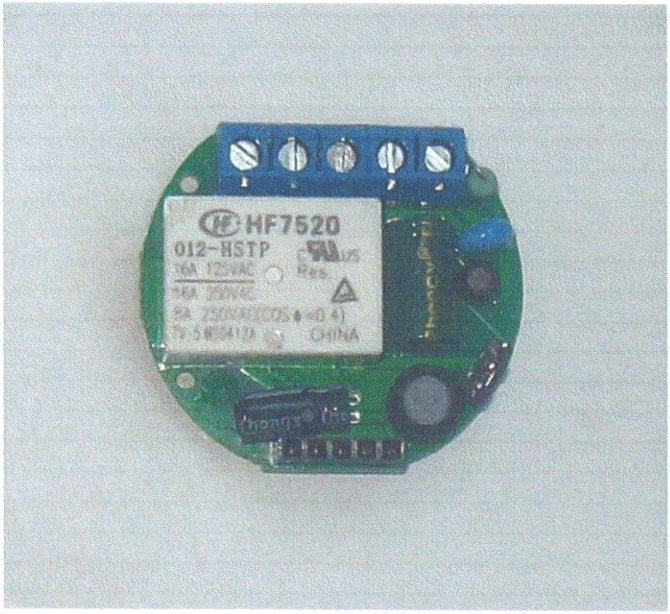
012-HSTP


HF7520
012-HSTP
16A 125VAC
16A 250VAC
8A 250VAC(COSφ=0.4)
CHINA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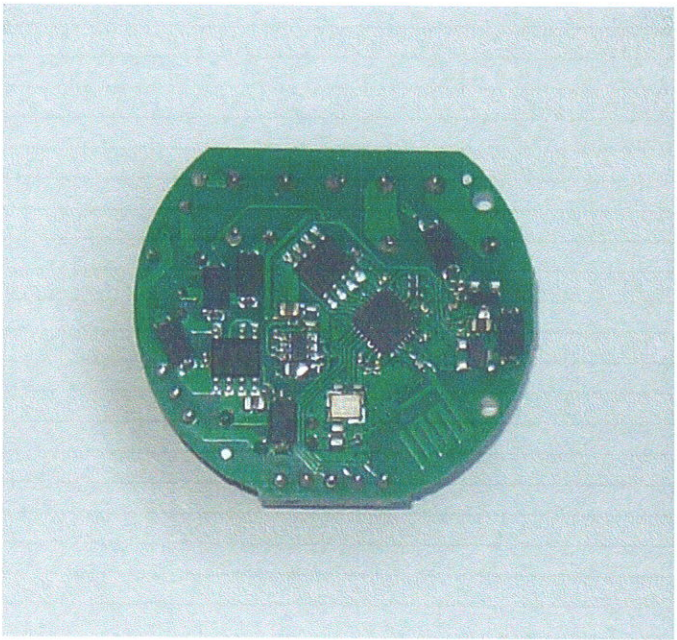
012-HSTP
CHINA



List of utilized measurement and testing equipment:

Equipment, type, model	Identification number	Date of last calibration	Next calibration
Digital multimeter LAMAR type MY 65	111002700	11.2016	11.2019
Digital multimeter FLUKE type 8840A	3798174	11.2016	11.2019
Digital multimeter MERATRONIK type V560	9256	03.2017	03.2020
Measuring set for current, voltage and power measurement in single-phase and three-phase electrical circuits type K 506	158	08.2017	08.2020
Digital multimeter FLUKE type FLUKE-289	24360163/ Jun 2013	12.2016	12.2019
Digital thermo-hygrometer Testo 608 – H1	30114861	09.2016	09.2019
Digital thermometer (logger) Testo 174	37452302	03.2016	03.2019
Digital thermometer	Testo 922 33600721/507	03.2016	03.2019
Digital thermometer Testo 922	4110290313	11.2015	11.2018
Climatic chamber ILKA type 3522/51	197/86	03.2016	03.2019
Electronic stopwatch CASIO HS-3(V)	21,001Q	04.2017	04.2020
High-voltage equipment SIP – 010	740235	05.2017	05.2020
Digital calipers Mitutoyo ABSOLUTE DIGIMATIC code No. 500-181 model No. CD-15CP	04210163	10.2017	10.2020
Tape-measure STABILA BMT-3	Conventional No. P – 01	10.2017	10.2020