TEST REPORT

IEC 60884-1

Plugs and socket-outlets for household and similar purposes

Part 1: General requirements

Report reference No. ..... :	WT05060415
Date of issue ..... :	July 11, 2005
Testing laboratory ..... :	Waltek Services
Address ..... :	8C, West Tower, Aidi Building, No. 5003 Binhe Rd, Futian District, Shenzhen, China
Testing location ..... :	as above
Applicant..... :	Gembird Electronics Ltd.
Address ..... :	Room 1709, News Building, #2 Shennan Zhong Lu, Shenzhen, China
Standard..... :	IEC 60 884-1:2002
Test Report Form No. ..... :	608841
TRF modified by. ..... :	Waltek services
Master TRF ..... :	Date 05-05
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Test procedure ..... :	CCA-scheme
Procedure deviation..... :	N.A.
Non-standard test method ..... :	N.A.
National deviations..... :	French

Compiled by	: Mike wei	Approved by	: Oren Yang
(+signature)	:	(+signature)	: .....

Type of test object ..... :	Multi-socket with surge protection -outlet
Trademark ..... :	
Model and/or type reference ..... :	SPG3-B-5, SPG3-B-6, SPG3-B-10, SPG3-B-15
Manufacturer ..... :	Gembird Electronics (Zhuhai) Co., Ltd.
Rating(s) ..... :	220-250V, 10A

Test item particulars:		
Standard Sheet ..... :		CEE 7
Rated current (A) ..... :		10
Rated voltage (V) ..... :		250
Degree of protection against harmful ingress of water ..... :		ordinary
Provision for earthing ..... :		with earting contact
Method of connecting the cable ..... :		non-rewirable
Type of cable ..... :		N.A.
Nominal cross-sectional areas (mm^2) ..... :		0,75
Type of terminals ..... :		N.A.
Type of connections ..... :		soldered
Socket-outlets:		
Degree of protection against electric shock .. :		normal protection
Existence of enclosures ..... :		enclosed
Existence of shutters ..... :		without shutters
Method of application / mounting of the socket-outlet ..... :		portable type / table-type (multiple)
Method of installation ..... :		N.A.
Plugs:		
Class of equipment ..... :		I
Possible test case verdicts:		
- test case does not apply to the test object ..... :		N(.A.)
- test object does meet the requirement ..... :		P(ass)
- test object does not meet the requirement ..... :		F(ail)
Attachments:		

General remarks:

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

The test results presented in this report relate only to the object tested.

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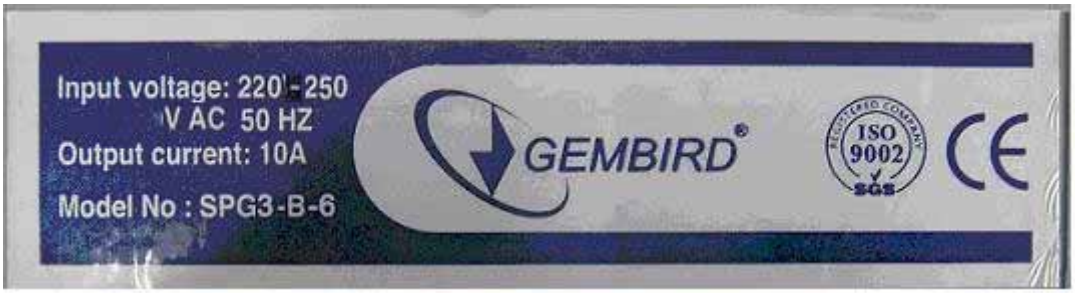
General descriptions:

Copy of marking plate:



IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
8	MARKING		P
8.1	Accessories marked with:		P
	- rated current (A) ..... :	10	
	- rated voltage (V) ..... :	220-250	
	- symbol for nature of supply..... :	~	P
	- manufacturer's or responsible vendor's name ..... :	Gembird Electronics (Zhuhai) Co., Ltd.	P
	- type reference..... :	SPG3-B-5, SPG3-B-6, SPG3-B-10, SPG3-B-15	P
	- symbol for degree of protection (first digit) ..... :	IP20	N
	- symbol for degree of protection (second digit) .... :		N
	Socket-outlets with screwless terminals marked with:		N
	- the length of insulation to be removed..... :		N
	- an indication of the suitability to accept rigid conductors only (if any) ..... :		N
8.2	Symbols used: as required in the standard		P
	Marking for the nature of supply placed next to the marking for rated current and rated voltage		P
8.3	Marking of fixed socket-outlets placed on the main part:		N
	- rated current, rated voltage and nature of supply		N
	- identification mark of the manufacturer or of the responsible vendor		N
	- length of insulation to be removed, if any		N
	- type reference		N
	Cover plates necessary for safety purposes and intended to be sold separately: marked with the manufacturer's or responsible vendor's name and type reference		N
	Symbol for the degree of protection (second digit): marked on the outside of its associated enclosure so as to be easily discernible		N
8.4	Plugs and portable socket-outlets: marking specified in 8.1, other than the type reference, easily discernible		P
	Plugs and portable socket-outlets for equipment of class II not marked with the symbol for class II construction		N
8.5	Neutral terminals: N..... :		N
	Earthing terminals: [earth symbol] ..... :		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Markings not placed on screws or other easily removable parts		P
	Terminals for conductors not forming part of the main function of the socket-outlet:		N
	- clearly identified unless their purpose is self evident, or		N
	- indicated in a wiring diagram fixed to the accessory		N
	Identification of accessory terminals may be achieved by:		N
	- their marking with graphical symbols according to IEC 147 or colours and/or alphanumeric system, or		N
	- their physical dimension or relative location		N
8.6	Fixed socket-outlets other than ordinary: marked with the IP symbol visible when the accessory is installed	Not fixed socket-outlet	N
8.7	Marking durable and easily legible. Test: 15s with water and 15s with petroleum spirit		P
8.8	Indication of which position or with which special provision the declared IP of flush-type and semi-flush type fixed socket-outlets is ensured		N
	Additional indication for socket-outlets intended only for mounting on certain types of surface		N
9	CHECKING OF DIMENSIONS		P
9.1	Accessories and surface-type mounting boxes comply with the appropriate standard sheets		P
	Insertion of plugs into fixed or portable socket-outlets ensured by their compliance with the relevant standard sheets		P
	Compliance checked by measurement and by means of gauges with manufacturing tolerances as shown in table 2		P
9.2	It shall not be possible to engage a plug with:		P
	- a socket-outlet having a higher voltage rating or a lower current rating;		P
	- a socket-outlet with a different number of live poles (exception admitted provided that no dangerous situation can arise);		P
	- a socket-outlet with earthing contact (plug for class 0 equipment).		P
	Engagement of a plug for class 0 or class I equipment with a socket-outlet designed to accept plugs for class II equipment, not possible		P

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Impossibility of insertion checked by applying a gauge, for 1 min, with a force of:		P
	- 150 N (rated current ≤ 16A);		P
	- 250 N (rated current > 16A)		N
	Accessories with elastomeric or thermoplastic material: test carried out at 35 ºC ± 2 ºC		P
9.3	Deviations from standard sheets made only if they provide technical advantage and do not affect the purpose and safety of accessories complying with standard sheet		N
10	PROTECTION AGAINST ELECTRIC SHOCK		P
10.1	Socket-outlets: live parts not accessible		P
	Live parts of plugs: not accessible when the plug is in partial or complete engagement with a socket-outlet		P
	Test with standard test finger shown in figure 2		P
	Accessories with elastomeric or thermoplastic material: additional test carried out at 35 ºC ± 2 ºC with a straight unjointed test finger (75 N for 1 min)		P
	During the test: accessories not deform and no live parts accessible		P
	Plugs and portable socket-outlets pressed with a force of 150 N for 5 min as shown in figure 22: specimens not show deformation		P
10.2	Accessible parts (with exception of small screws and the like for fixing bases and covers or cover plates): made of insulating material		P
	Cover or cover plates of fixed socket-outlets: made of metal if the requirements of 10.2.1 or 10.2.2 are fulfilled	Not fixed socket-outlet	N
10.2.1	Metal covers or cover plates protected by supplementary insulation made by insulating linings or insulating barriers		N
	Insulating linings or insulating barriers cannot be removed without being permanently damaged		N
	Insulating linings or insulating barriers cannot be replaced in an incorrect position and, if they are omitted, accessories are rendered inoperable or manifestly incomplete		N
	There is no risk of accidental contact between live parts and metal covers or cover plates		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
10.2.2	Metal covers or cover plates automatically connected, through a low-resistance connection, to the earth during fixing		N
10.3	Connection between a pin of a plug and a live socket-contact of a socket-outlet not possible while any other pin is accessible		P
	Compliance checked by manual test and by means of gauges with tolerances as specified in 9.1		P
	Accessories with elastomeric or thermoplastic material: test carried out at 35 ºC ± 2 ºC		P
	Socket-outlets with enclosure or bodies of rubber or polyvinyl chloride: test carried out with a force of 75 N for 1 min		P
	Fixed socket-outlets provided with metal covers or cover plates: clearance of at least 2 mm required between a pin and a socket-contact when another pin(s) is(are) in contact with the metal covers or cover plates ..... :	Not fixed socket-outlet	N
10.4	External parts of plugs and portable socket-outlets made of insulating material		P
	Overall dimensions of rings around pins not exceed 8 mm concentric with respect to the pin		P
10.5	Shuttered socket-outlets: live parts not accessible, without a plug in engagement, with the gauge shown in figure 4		N
	Live contacts automatically screened when the plug is withdrawn		N
	Means cannot easily be operated by anything other than a plug and not depend upon parts which are liable to be lost		N
	Gauge applied to the entry holes corresponding to live contacts with a force up to 1 N shall not touch live parts		N
	Accessories with elastomeric or thermoplastic material: test carried out at 35 ºC ± 2 ºC		N
10.6	Earthing contacts of a socket-outlet designed that they cannot be deformed by the insertion of a plug		P
	Test plug inserted into the socket-outlet with a force of 150 N for 1 min.		P
	After this test: socket-outlet still comply with the requirements of clause 9		P
10.7	Socket-outlet with increased protection: live parts not accessible		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Gauge of figure 4 applied with a force of 1 N on all accessible surfaces shall not touch live parts		N
	Accessories with elastomeric or thermoplastic material: test carried out at 35 ºC ± 2 ºC		N
11	PROVISION FOR EARTHING		P
11.1	Earth connection made before the current-carrying contacts of the plug become live		P
	Current-carrying pins shall separate before the earth connection is broken		P
11.2	Earthing terminals of rewirable accessories comply with clause 12	Non-rewirable	N
	Earthing terminals of the same size as the corresponding terminals for the supply conductors		N
	Any additional external earthing terminals of fixed socket-outlets of size suitable for conductors of at least 6 mm^2 ..... :		N
	Earthing terminals of rewirable accessories: internal		N
	Earthing terminals of fixed socket-outlets: fixed to the base or to a part reliably fixed to the base		N
	Earthing contacts of fixed socket-outlets:		N
	- fixed to the base, or		N
	- fixed to the cover (reliably connected to the earthing terminals; contact pieces silver plated or with adequate protection)		N
	Parts of earthing circuit in one piece or reliably connected by riveting, welding, or the like		N
11.3	Accessible metal parts of fixed socket-outlets: permanently and reliably connected to the earthing terminal		N
11.4	Socket-outlets, other than ordinary, with enclosure of insulating material and more than one cable inlet, provided with an internal earthing terminal for the continuity of the earthing circuit, unless		N
	earthing terminals allows the connection of an incoming and an outgoing earthing conductor together		N
11.5	Connection between earthing terminal and accessible metal parts: of low resistance	No accessible metal part	N
	Test:		N
	Test current equal to 1,5 times the rated current or 25 A (A) ..... :		—

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Resistance not exceed 0,05 Ω (Ω) ..... :	Ω	N
12	TERMINALS		P
	All the test on terminals, with the exception of the test of 12.3 11, made after the test of clause 16		P
12.1	General		P
12.1.1	Rewirable fixed socket-outlets provided with screw-type terminals or with screwless terminals . :		N
	Rewirable plugs and portable socket-outlets provided with terminals with screw clamping ..... :		N
	Pre-soldered flexible conductors used: pre-soldered area outside the squeezed area of screw-type terminals		N
	Clamping means of terminals: not serve to fix any other components		N
12.1.2	Non-rewirable accessories provided with soldered, welded, crimped or equally effective permanent connections ..... :	Soldered	P
	Screwed or snap-on connections not used		P
	Connections made by crimping a pre-soldered flexible conductor not permitted		P
12.2	Terminals with screw clamping for external copper conductors		N
12.2.1	Accessories provided with terminals which allows the proper connection of copper conductors as shows in table 3		N
	Rated current (A); Type of accessories ..... :		—
	Type of conductor (rigid / flexible) ..... :		—
	Smallest / largest cross-sectional area (mm^2) ..... :		—
	Diameter of the largest conductor (mm) ..... :		—
	Figure of terminal ..... :		—
	Minimum diameter D (minimum dimensions) of conductor space: required (mm); measured (mm). :		N
12.2.2	Terminals allow the conductor to be connected without special preparation		N
12.2.3	Terminals have adequate mechanical strength		N
	Screws and nut for clamping the conductors have metric ISO thread or a comparable thread		N
	Screws not of soft metal such as zinc or aluminium		N
12.2.4	Terminals resistant to corrosion		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
12.2.5	Screw-type terminals clamp the conductor(s) without undue damage		N
	Test with apparatus shown in figure 32:		N
	- type of conductors ..... :		—
	- number of conductors ..... :		—
	- smallest cross-sectional area (mm²) (table 3); diameter of bushing hole (mm); height H (mm); mass (kg) ..... :		N
	- largest cross-sectional area (mm²) (table 3); diameter of bushing hole (mm); height H (mm); mass (kg) ..... :		N
	- nominal diameter of thread (mm); torque according to table 6 (Nm) ..... :		—
	During the test: conductor not slip out, no break near clamping unit and no damage		N
12.2.6	Terminals clamp the conductor reliably between metal surfaces		N
	Pull test (1min):		N
	- type of conductors ..... :		—
	- number of conductors ..... :		—
	- smallest cross-sectional area (mm²) (table 3); pull (N) ..... :		N
	- largest cross-sectional area (mm²) (table 3); pull (N) ..... :		N
	- torque (Nm) (2/3 table 6) ..... :		—
	During the test: conductor not move noticeably		N
12.2.7	Terminals designed or placed that the conductor cannot slip out while the clamping screws or nuts are tightened		N
	- largest cross-sectional area (mm²) (table 3) ..... :		—
	- number of wires and nominal diameter of wires (table 5):		N
	fixed socket-outlets: rigid solid conductors / rigid stranded conductors ..... :		—
	plugs and portable socket-outlets: flexible conductors ..... :		—
	- terminals intended for looping-in 2 or 3 conductors: permissible number of conductors..... :		—
	- torque (Nm) (2/3 table 6) ..... :		—
	After the test: no wire of the conductor escaped outside the clamping unit		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
12.2.8	Terminals not work loose from their fixing to accessories		N
	Torque test:		N
	- rigid solid copper conductor of the largest cross-sectional area (mm²) (table 3) ..... :		—
	- torque (Nm) (table 6 or appropriate figures 34, 35, 36) ..... :		—
	Screws and nuts tightened and loosened 5 times. During the test: terminals not work loose and show no damage		N
12.2.9	Clamping screws or nuts of earthing terminals: adequately locked against accidental loosening, not possible to loosen them without the aid of a tool		N
12.2.10	Earthing terminals: no risk of corrosion		N
	Body of brass or other metal no less resistant to corrosion		N
	If the body is a part of a frame or enclosure of aluminium alloy, precautions shall be taken to avoid the risk of corrosion		N
12.2.11	Pillar terminals: distance *g* no less than the value specified in figure 34: required (mm); measured (mm) ..... :		N
	Mantle terminals: distance *g* no less than the value specified in figure 37: required (mm); measured (mm) ..... :		N
12.3	Screwless terminals for external copper conductors		N
12.3.1	Screwless terminals of the type suitable for:		N
	- for rigid copper conductors only, or		N
	- for both rigid and flexible copper conductors (tests carried out with rigid and then repeated with flexible conductors)		N
12.3.2	Screwless terminals provided with two clamping units each allowing the proper connection of rigid or of rigid and flexible conductors having nominal cross-sectional areas from 1,5 up to 2,5 mm^2 (table 7)		N
	Two conductors to be connected: each conductor introduced in a separate clamping unit		N
12.3.3	Screwless terminals allow the conductor to be connected without special preparation		N
12.3.4	Parts of screwless terminals intended for carrying current of materials as specified in 26.5		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
12.3.5	Screwless terminals clamp specified conductors with sufficient contact pressure without undue damage to the conductor		N
	Conductor clamped between metal surfaces		N
12.3.6	It shall be clear how the connection and disconnection of the conductors is to be made		N
	Disconnection of a conductor require an operation, other than a pull, so that can be made manually with or without a general-purpose tool		N
	It shall not be possible to confuse the opening for the use of a tool with the opening intended for the conductor		N
12.3.7	Screwless terminals intended for the interconnection of two or more conductors:		N
	- during insertion, operation of clamping means of one of the conductors is independent of operation of that for the other conductor(s);		N
	- during disconnection, conductors can be disconnected either at the same time or separately;		N
	- each conductor introduced in a separate clamping unit.		N
	It shall be possible clamp securely any number of conductors up to the maximum as designed. Number of conductors; Nominal cross-sectional area (mm^2) ..... :		N
12.3.8	Screwless terminals of fixed socket-outlets: adequate insertion obvious and over-insertion prevented		N
12.3.9	Screwless terminals properly fixed to the socket-outlets		N
	Not work loose when conductors are connected or disconnected		N
	Self-hardening resins used to fix terminals not subject to mechanical stress		N
12.3.10	Screwless terminals withstand mechanical stresses occurring in normal use		N
	Test:		N
	Connection / disconnection 5 times: rigid solid conductor 2,5 mm^2		N
	Connection / disconnection 5 times: rigid solid conductor 1,5 mm^2		N
	Conductor subjected to a pull of 30 N for 1 min after each connection. During application of the pull conductor not come out of the terminal		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Connection / disconnection 1 time: rigid stranded conductor 2,5 mm^2		N
	Connection / disconnection 1 time: rigid stranded conductor 1,5 mm^2		N
	Conductor subjected to a pull of 30 N for 1 min after connection. During application of the pull conductor not come out of the terminal		N
	Additional test on terminals intended for both rigid and flexible conductors:		N
	Connection / disconnection 5 times: flexible conductor 2,5 mm^2		N
	Connection / disconnection 5 times: flexible conductor 1,5 mm^2		N
	Conductor subjected to a pull of 30 N for 1 min after each connection. During application of the pull conductor not come out of the terminal		N
	Additional test with apparatus shown in figure 32:		N
	- type of conductors ..... :	rigid solid / rigid stranded / flexible	—
	- number of conductors ..... :		—
	- 1,5 mm^2; diameter of bushing hole 6,5 mm; height H 260 mm; mass 0,4 kg		N
	- 2,5 mm^2; diameter of bushing hole 9,5 mm; height H 280 mm; mass 0,7 kg		N
	During the test: conductors not move noticeably in the clamping unit		N
	After these tests: neither terminals nor clamping means have worked loose and conductors show no deterioration		N
12.3.11	Screwless terminals withstand electrical and thermal stresses occurring in normal use		N
	Test a) carried out for 1 h connecting rigid solid conductors:		N
	- test current (A) (table 10) ..... :		—
	- nominal cross-sectional area (mm^2) ..... :		—
	- screwless terminal number ..... :	1 2 3 4 5	—
	- voltage drop measured (mV) (requirement: ≤ 15mV) ..... :		N
	Test b) (temperature cycles test) carried out on terminals subjected to Test a):		N
	- test current (A) (table 10) ..... :		—
	- cross-sectional area (mm^2) ..... :		—
	- screwless terminal number ..... :	1 2 3 4 5	—

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- voltage drop measured after the 24 cycle (requirement: ≤ 22,5 mV) ..... :		N
	- voltage drop measured (mV) after 48th cycle ..... :		N
	- voltage drop measured (mV) after 72th cycle ..... :		N
	- voltage drop measured (mV) after 96th cycle ..... :		N
	- voltage drop measured (mV) after 120th cycle .... :		N
	- voltage drop measured (mV) after 144th cycle .... :		N
	- voltage drop measured (mV) after 168th cycle .... :		N
	- voltage drop measured (mV) after 192th cycle .... :		N
	- requirement: ≤ 22,5 mV or 2 times 24th cycle value (mV) ..... :		N
	After this test: inspection show no changes		N
	Mechanical strength test according 12.3.10:		N
	Connection / disconnection 5 times: rigid solid conductor 2,5 mm^2		N
	Connection / disconnection 5 times: rigid solid conductor 1,5 mm^2		N
	Conductor subjected to a pull of 30 N for 1 min after each connection. During application of the pull conductor not come out of the terminal		N
	Connection / disconnection 1 time: rigid stranded conductor 2,5 mm^2		N
	Connection / disconnection 1 time: rigid stranded conductor 1,5 mm^2		N
	Conductor subjected to a pull of 30 N for 1 min after connection. During application of the pull conductor not come out of the terminal		N
	Additional test on terminals intended for both rigid and flexible conductors:		N
	Connection / disconnection 5 times: flexible conductor 2,5 mm^2		N
	Connection / disconnection 5 times: flexible conductor 1,5 mm^2		N
	Conductor subjected to a pull of 30 N for 1 min after each connection. During application of the pull conductor not come out of the terminal		N
	Additional test with apparatus shown in figure 32:		N
	- type of conductors ..... :	rigid solid / rigid stranded / flexible	—
	- number of conductors ..... :		—

IEC 60884-1					
Clause	Requirement – Test	Result - Remark			Verdict
	- 1,5 mm²; diameter of bushing hole 6,5 mm; height H 260 mm; mass 0,4 kg				N
	- 2,5 mm²; diameter of bushing hole 9,5 mm; height H 280 mm; mass 0,7 kg				N
	During the test: conductors not move noticeably in the clamping unit				N
	After these tests: neither terminals nor clamping means have worked loose and conductors show no deterioration				N
12.3.12	Screwless terminals: connected rigid solid conductor remains clamped, even when deflected during normal installation				N
	Deflection test (principle of test apparatus shown in figure 33 a)):				N
	- test current (A) (equal rated current) ..... :				—
	Smallest cross-sectional area (mm^2) (table 11) ..... :				—
	Force (N) (table 12) ..... :				—
	- screwless terminal number ..... :	1	2	3	—
	- starting point (X = deflection original point) ..... :	X	X+10°	X+20°	—
	- voltage drop measured (mV) (1st deflection) ..... :				N
	- voltage drop measured (mV) (2nd deflection) ..... :				N
	- voltage drop measured (mV) (3rd deflection) ..... :				N
	- voltage drop measured (mV) (4th deflection) ..... :				N
	- voltage drop measured (mV) (5th deflection) ..... :				N
	- voltage drop measured (mV) (6th deflection) ..... :				N
	- voltage drop measured (mV) (7th deflection) ..... :				N
	- voltage drop measured (mV) (8th deflection) ..... :				N
	- voltage drop measured (mV) (9th deflection) ..... :				N
	- voltage drop measured (mV) (10th deflection) ..... :				N
	- voltage drop measured (mV) (11th deflection) ..... :				N
	- voltage drop measured (mV) (12th deflection) ..... :				N
	- requirement: ≤ 25 mV				N
	Largest cross-sectional area (mm^2) (table 11) ..... :				—
	Force (N) (table 12) ..... :				—
	- screwless terminal number ..... :	1	2	3	—
	- starting point (X = deflection original point) ..... :	X	X+10°	X+20°	—
	- voltage drop measured (mV) (1st deflection) ..... :				N
	- voltage drop measured (mV) (2nd deflection) ..... :				N

IEC 60884-1					
Clause	Requirement – Test	Result - Remark			Verdict
	- voltage drop measured (mV) (3rd deflection) ..... :				N
	- voltage drop measured (mV) (4th deflection) ..... :				N
	- voltage drop measured (mV) (5th deflection) ..... :				N
	- voltage drop measured (mV) (6th deflection) ..... :				N
	- voltage drop measured (mV) (7th deflection) ..... :				N
	- voltage drop measured (mV) (8th deflection) ..... :				N
	- voltage drop measured (mV) (9th deflection) ..... :				N
	- voltage drop measured (mV) (10th deflection) ..... :				N
	- voltage drop measured (mV) (11th deflection) ..... :				N
	- voltage drop measured (mV) (12th deflection) ..... :				N
	- requirement: ≤ 25 mV				N
13	CONSTRUCTION OF FIXED SOCKET-OTLETS				N
13.1	Socket-contact assembly: sufficient resiliency				N
13.2	Socket-contact and pins of socket-outlets: resistant to corrosion				N
13.3	Insulating linings, barriers and the like: adequate mechanical strength				N
13.4	Socket-outlets constructed as to permit				N
	- easy fixing of the base to a wall or in a mounting box				N
	- easy introduction and connection of the conductors in the terminals				N
	- easy fixing of the base to a wall or in a mounting box;				N
	- easy fixing of the base to a wall or in a mounting box				N
	- correct positioning of the conductors				N
	- adequate space between the underside of the base and the surface on which the base is mounted – surface mounted				N
	- adequate space between the underside of the base and the sides of the base and the enclosure (cover or box) – flush mounted				N
	Socket-outlets classified as design A: permit easy positioning and removal of the cover or cover plate, without displacing the conductors				N
13.5	Socket-outlets designed that full engagement of associated plugs is not prevented by any projection from their engagement face				N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Gap between the engagement face of the socket-outlet and the plug: not exceed 1 mm		N
13.6	Covers provided with bushings for the entry holes for the pins: not possible to remove them from the outside or for them to become detached inadvertently from the inside when the cover is removed		N
13.7	Covers, cover-plates or parts of them intended to ensure protection against electric shock:		N
	- held in place at two or more points by effective fixings		N
	- fixed by means of a single fixing, e.g. by a screw, provided that they are located by another means (e.g. by a shoulder)		N
	Fixings of covers or cover-plates of socket-outlets of design A serve to fix the base: there shall be means to maintain the base in position, even after removal of the covers or cover-plates		N
13.7.1	Covers or cover-plates whose fixings are of the screw-type:		N
	Compliance checked by inspection only		N
13.7.2	Covers or cover-plates whose fixing is not dependent on screws and whose removal is obtained by applying a force in a direction approximately perpendicular to the mounting/supporting surface:		N
	Compliance checked, when their removal may give access, with the standard test finger:		N
	to live parts: by the test of 24.14 (verification of the non-removal and the removal)		N
	to non-earthed metal parts separated from live parts in such a way that creepage distances and clearances have the values shown in table 23: by the test of 24.15 (verification of the non-removal and the removal)		N
	only to insulating parts, or earthed metal parts, or metal parts separated from live parts in such a way that creepage distances and clearances have twice the values shown in table 23, or live parts of SEL V circuits not greater than 25 V a.c.: by the test of 24.16 (verification of the non-removal and the removal)		N
13.7.3	Covers or cover-plates whose fixing is not dependent on screws and whose removal is obtained by using a tool, in accordance with the manufacturer's information given in an instruction sheet or in a catalogue:		N
	Compliance checked, when their removal may give access, with the standard test finger:		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	to live parts: by the test of 24.14 (verification of the non-removal only)		N
	to non-earthed metal parts separated from live parts in such a way that creepage distances and clearances have the values shown in table 23: by the test of 24.15 (verification of the non-removal only)		N
	only to insulating parts, or earthed metal parts, or metal parts separated from live parts in such a way that creepage distances and clearances have twice the values shown in table 23, or live parts of SEL V circuits not greater than 25 V a.c.: by the test of 24.16 (verification of the non-removal only)		N
13.8	Cover-plate intended for a socket-outlet with earthing contact: not interchangeable with a cover-plate intended for a socket-outlet without earthing contact		N
13.9	Ordinary surface-type socket-outlets: no free openings in the enclosure		N
13.10	Screws or other means for mounting the socket-outlet on a surface in a box or enclosure: easily accessible from the front.		N
	Fixing means not serve any other fixing purpose		N
13.11	Multiple socket-outlets with a common base: provided with fixed links for the interconnection of the contacts in parallel		N
	Fixing of the links independent of the connection of the supply wires		N
13.12	Multiple socket-outlets, comprising separate bases: correct position of each base ensured		N
	Fixing of each base independent of the fixing of the combination to the mounting surface		N
13.13	Mounting plate of surface-type socket-outlets: adequate mechanical strength		N
13.14	Socket-outlets withstand the lateral strain imposed by equipment likely to be introduced into them		N
	Socket-outlets 16A 250V: test made 4 times with the socket-outlet turned through 90°, 5 N for 1 min (device shown in fig. 13)		N
	During the test: device not come out		N
	After the test:		N
	- no damage		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- socket-outlets comply with clause 22		N
13.15	Socket-outlets shall not be an integral part of lampholders		N
13.16	Socket-outlets other than ordinary: totally enclosed when fitted with screwed conduits or with polyvinyl chloride (p.v.c.) sheathed or similar type cables and without a plug in position		N
	Surface-type socket-outlets other than ordinary shall have provision for opening a drain hole of at least 5 mm in diameter, or 20 mm^2 in area with a width and a length of at least 3mm ..... :		N
	Drain hole: effective		N
	Lid springs (if any): of corrosion resistant material (bronze or stainless steel)		N
13.17	Earthing pins: adequate mechanical strength		N
	Not solid pins: compliance checked by inspection and by the test of 14.2 made after the tests of clause 21		N
13.18	Earthing contacts and neutral contacts: locked against rotation and removable only with the aid of a tool, after dismantling the socket-outlet		N
13.19	Metal strips of the earthing circuit: no burrs which might damage the insulation of the supply conductors		N
13.20	Socket-outlets to be installed in a box: designed that the conductor ends can be prepared after the box is mounted in position, but before the socket-outlet is fitted in the box		N
13.21	lnlet openings: allow the introduction of the conduit or the sheath of the cable		N
	Surface-type socket-outlets:		N
	the conduit or sheath of the cable can enter at least I mm into the enclosure		N
	inlet opening for conduit entries, or at least two of them if there are more than one, capable of accepting conduit sizes of 16, 20, 25 or 32 or a combination of at least two of any of these sizes		N
	inlet opening for cable entries capable of accepting cables having the dimensions specified in table 14 or be as specified by the manufacturer: rated current (A); Limits of external dimensions of cable min/max (mm) ..... :		N
13.22	Membranes (grommets) in inlet openings: reliably fixed and not displaced by the mechanical and thermal stresses occurring in normal use		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Test on membranes subjected to the ageing treatment specified in 16.1 and assembled in the accessories		N
	Accessories placed at 40 ºC for 2 h. Force of 30 N applied for 5 s by test finger. During the test: no deformation		N
	Membranes likely to be subjected to an axial pull: axial pull of 30 N applied for 5 s. During the test: membranes not come out		N
	After the test: no harmful deformation, cracks or similar damage		N
	Test repeated with membranes not subjected to any treatment		N
13.23	Membranes in inlet openings: introduction of the cables into the accessory permitted when the ambient temperature is low		N
	Test on membranes not subjected to the ageing treatment specified in 16.1 and assembled in the accessories		N
	Accessories kept at -15 ºC for 2 h: possibility to introduce cables of the largest diameter through membranes		N
	After the test: no harmful deformation, cracks or similar damage		N
14	CONSTRUCTION OF PLUGS AND PORTABLE SOCKET-OTLETS		P
14.1	Non-rewirable plug or non-rewirable portable socket-outlet:		P
	flexible cable cannot be separated from the accessory without making it permanently useless		P
	Accessory cannot be opened by hand or by using a general purpose tool, for example a screwdriver used as such		P
14.2	Pins of plugs and portable socket-outlets: adequate mechanical strength		P
	Test for pins not solid (made after clause 21): force of 100 N exerted on the pin for 1 min by means of a steel rod Ø 4,8 mm		P
	During the application of the force: reduction of the dimension of the pin not exceed 0,15 mm		P
	After removal of the rod: dimensions of the pin not changed by more than 0,06 mm		P
14.3	Pins of plugs:		P
	- locked against rotation		P
	- not removable without dismantling the plug		P

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- adequately fixed in the body of the plug when the plug is wired and assembled as in normal use		P
	Earthing or neutral pins or contacts of plugs: not possible to replace in an incorrect position		P
14.4	Earthing contacts and neutral contacts of portable socket-outlets:		P
	- locked against rotation		P
	- removable only with the aid of a tool, after dismantling the socket-outlet		P
14.5	Socket-contact assemblies: sufficient resiliency		P
14.6	Pins and socket-contacts: resistant to corrosion and abrasion		P
14.7	Enclosures of rewirable accessories: completely enclose terminals and ends of flexible cable.		N
	Construction of rewirable accessories:		N
	- conductors can be properly connected		N
	- cores not pressed against each other		N
	- cores of live conductor not in contact with accessible metal parts		N
	- core of earthing conductor not in contact with live parts		N
14.8	Rewirable accessories: terminal screws or nuts cannot become loose and fall out of position and establish an electrical connection between live parts and earthing terminal or metal parts		N
14.9	Rewirable accessories with earthing contact: ample space for slack of earthing (test)		N
	Non-rewirable non-moulded-on accessories with earthing contact: current-carrying conductors stressed before the earthing conductor if the flexible cable slips in its anchorage		N
14.10	Terminals of rewirable accessories and terminations of non-rewirable accessories: located and shielded that loose wires not present a risk of electric shock		N
14.10.1	Rewirable accessories: test with 6 mm free wire		N
	free wire of a conductor connected to a live terminal not touch any accessible metal part or able to emerge from the enclosure		N
	free wire of a conductor connected to an earthing terminal not touch a live part		N
14.10.2	Non-rewirable, non-moulded-on accessories: test with a free wire of length equivalent to the maximum designed stripping length declared by the manufacturer plus 2 mm		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	free wire of a conductor connected to a live termination not touch any accessible metal part or reduce creepage and clearance below 1,5 mm to the external surface		N
	free wire of a conductor connected to an earth termination not touch any live part		N
14.10.3	Non-rewirable, moulded-on accessories:		N
	Verification of means to prevent stray wires reducing the minimum distance through insulation to external accessible surface below 1,5 mm		N
14.11	Rewirable plugs and rewirable portable socket-outlets:		P
	- clear how relief from strain and prevention of twisting is intended to be effected		P
	- cord anchorage, or at least part of it, integral with or permanently fixed to one of the component parts of the plug or portable socket-outlet		P
	- makeshift methods not used		P
	- cord anchorage suitable for the different types of flexible cable which may be connected; screws, if any: not serve to fix any other component		P
	- cord anchorages: of insulating material or provided with an insulating lining fixed to the metal parts		P
	- metal parts of cord anchorages, including clamping screws: insulated from the earthing circuit		N
14.12	Insulating parts which keep live parts in position: reliably fixed together; not possible to dismantle the accessory without the aid of a tool		P
14.13	Covers of portable socket-outlets: bushings for entry holes for the pins not removable from the outside or detachable inadvertently from the inside		N
14.14	Screws intended to allow access to interior of the accessory: captive		P
14.15	Engagement face of plugs: no projections		P
14.16	Engagement face of portable socket-outlets: no projection		P
14.17	Accessories other than ordinary: provided with gland(s) or the like		N
	Plugs other than ordinary: adequately enclosed		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Portable socket-outlets other than ordinary: adequately enclosed without a plug in engagement		N
	Lid springs (if any): of corrosion resistant material (bronze or stainless steel)		N
14.18	Portable socket-outlets: means for suspension from a wall or other mounting surfaces not allow access to live parts		P
	No free openings between space intended for suspension means fixed to the wall and live parts		P
14.19	Combinations of plugs and socket-outlets with circuit-breakers or other protective devices comply with relevant standards, if any .....:		P
14.20	Portable accessories: not integral part of lampholders		n
14.21	Plugs for equipment of class II:		N
	- non-rewirable		N
	- if incorporated in a cord set: provided with a connector for equipment of class II		N
	- if incorporated in a cord extension set: provided with a portable socket-outlet for equipment of class II		N
14.22	Components (switches and fuses) incorporated in accessories: comply with the relevant IEC standard		N
14.23	Plug-in equipment: not cause overheating of the pins or impose undue strain		N
	Plugs with rating above 16 A and 250 V: not integral part of other equipment		N
	Tests for two-pole plugs, with or without earthing contact, with rating up to and including 16 A and 250 V (plug of equipment inserted into a fixed socket-outlet complying with this standard):		N
14.23.1	Socket-outlet connected to a supply voltage equal to 1,1 times the highest rated voltage of the equipment (V) .....:		—
	Temperature rise of the pins after 1 h not exceed 45 K (K) .....:		N
14.23.2	Additional torque applied to the socket-outlet to maintain the engagement face in the vertical plane not exceed 0,25 Nm (Nm) .....:		N
14.24	Plugs: can easily withdrawn by hand from the relevant socket-outlet		P

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Gripping surfaces: so designed that the plug can be withdrawn without pull on the flexible cable		P
14.25	Membranes in inlet openings: meet the requirements of 13.23 and 13.24		N
15	INTERLOCKED SOCKET-OUTLETS		N
	Socket-outlet interlocked with a switch:		N
	plug cannot be inserted into or completely withdrawn from the socket-outlet while the socket-contacts are live		N
	Socket-contacts cannot be made live until a plug is almost completely in engagement		N
16	RESISTANCE TO AGEING, TO HARMFUL INGRESS OF WATER AND TO HUMIDITY		P
16.1	***1.1.1.1.1 Resistance to ageing***		P
	Accessories shall be resistant to ageing		P
	Accessories subjected to a test in a heating cabinet at 70 ºC ± 2 ºC for seven days (168 h)		P
	After the tests, samples shall show:		P
	- no crack visible with normal or corrected vision without additional magnification		P
	- no sticky or greasy material		P
	- no trace of cloth (forefinger pressed with 5 N)		P
	- no damage		P
16.2	Resistance to harmful ingress of water		N
	Enclosure of accessories other than ordinary shall provide a degree of protection against harmful ingress of water in accordance with the classification		N
16.2.1	Flush-type and semi flush-type socket-outlets fixed:		N
	- in a test wall using an appropriate box in accordance with the manufacturer's instructions		N
	- in a test wall according to figure 41		N
	Portable socket-outlets tested on a plain, horizontal surface in a position as in normal use and fitted with flexible cables according to table 17 having the largest and smallest cross-sectional area given in table 3:		N
	- largest cross-sectional area (mm^2); type of cable (table 27) .....:		—

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- smallest cross-sectional area (mm^2); type of cable (table 27) ..... :		—
	Mounting screws tightened with a torque equal to 2/3 of the torque given in table 6 (Nm) ..... :		—
	Glands tightened with a torque equal to 2/3 of the torque applied during the test of 24.6 (Nm) ..... :		—
	Fixed and portable socket-outlets tested without a plug in engagement		N
	Plugs tested with in full engagement with:		N
	- a fixed socket-outlets		N
	- a portable socket-outlets		N
	of the same system and with the same degree of protection against water		—
16.2.2	Splash-proof accessories subjected to the test IPX4 according to IEC 529		N
16.2.3	Jet-proof accessories subjected to the test IPX5 according to IEC 529		N
16.2.4	Specimens withstand an electric strength test specified in 17.2 which is started within 5 min after the IP test		N
16.3	***1.1.1.1.2 Resistance to humidity***		P
	Accessories proof against humidity which may occur in normal use		P
	Compliance checked by a humidity treatment carried out in a humidity cabinet containing air with relative humidity maintained between 91 % and 95 %		P
	Specimens kept in the cabinet for:		P
	- two days (48 h) for ordinary accessories		P
	- seven days (168 h) for accessories other than ordinary		N
	After this treatment the specimens show no damage		P
17	INSULATION RESISTANCE AND ELECTRIC STRENGTH		P
17.1.1	For socket-outlets: insulation resistance (500 V d.c. for 1 min):		P
	a) between all poles connected together and the body, with a plug in engagement ≥ 5 MΩ ..... :	> 100MΩ	P
	b) between each pole in turn and all others connected to the body, with a plug in engagement ≥ 5 MΩ ..... :	> 100MΩ	P

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	c) between any metal enclosures and metal foil in contact with the inner surface of its insulating linings, if any ≥ 5 MΩ ..... :	Not metal enclosure	N
	d) between any metal part of the cord anchorage, including clamping screws, and earthing terminal or earthing contact, if any, of portable socket-outlets ≥ 5 MΩ ..... :	Not such metal part	N
	e) between any metal part of the cord anchorage of portable socket-outlets and a metal rod of the maximum diameter of the flexible cable inserted in its place ≥ 5 MΩ ..... :		N
17.1.2	For plugs: insulation resistance (500 V d.c. for 1 min):		N
	a) between all poles connected together and the body ≥ 5 MΩ ..... :		N
	b) between each pole in turn and all others connected to the body ≥ 5 MΩ ..... :		N
	c) between any metal part of the cord anchorage, including clamping screws, and earthing terminal or earthing contact, if any ≥ 5 MΩ ..... :		N
	d) between any metal part of the cord anchorage and a metal rod of the maximum diameter of the flexible cable inserted in its place ≥ 5 MΩ ..... :		N
17.2	Socket-outlets: electric strength, test voltage (a.c., for 1 min):		P
	a) test voltage (V) ..... :	2000 V	P
	b) test voltage (V) ..... :	2000 V	N
	c) test voltage (V) ..... :		N
	d) test voltage (V) ..... :		N
	e) test voltage (V) ..... :		N
	Plugs: electric strength, test voltage (a.c., for 1 min):		N
	a) test voltage (V) ..... :		N
	b) test voltage (V) ..... :		N
	c) test voltage (V) ..... :		N
	d) test voltage (V) ..... :		N
	During the test no flashover or breakdown		P
18	OPERATION OF EARTHING CONTACTS		P
	Earthing contacts provide adequate contact pressure and not deteriorate in normal use	***1.1.1.1.3***	P
	Compliance checked by the tests of clauses 19 and 21	***1.1.1.1.4***	P

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Force exerted measured in side earthing contacts not less than 5 N (CEE 7 clause 18) ..... :		P
19	TEMPERATURE RISE		P
	Non-rewirable accessories tested as delivered:		***1.1.1.1.5***
	- type of flexible cable; number of conductors and nominal cross-sectional area (mm^2)..... :		—
	Rewirable accessories fitted with polyvinyl chloride insulated conductors having a nominal cross-sectional area as show in table 15:		N
	- rated current of accessory ..... :		—
	- nominal cross-sectional area (mm^2) ..... :		—
	- type of conductors ..... :	rigid solid / rigid stranded / flexible	—
	Terminal screws or nuts tightened with a torque equal to 2/3 of that specified in 12.2.8 (Nm) ..... :		—
	Socket-outlets tested using a test plug with brass pins having the minimum specified dimensions		P
	Plugs tested using a fixed socket-outlet complying with the standard and having as near to average characteristics, but with minimum size of the earthing pin, if any		N
	Test current as specified in table 20 passed for 1 h (A) ..... :	10A	—
	Temperature rise of terminals not exceed 45 K (K) ..... :	33.5K	P
	Separate tests made passing the current through:		N
	- the neutral contact, if any, and the adjacent phase contact (K) ..... :		N
	- the earthing contact, if any, and the nearest phase contact (K) ..... :		N
	Temperature rise of external parts of insulating material not necessary to retain current-carrying parts and parts of the earthing circuit in position (K) ..... :		N
20	BREAKING CAPACITY		P
	Accessories shall have adequate breaking capacity		P
	Compliance checked by testing:		P
	- socket-outlets;		P
	- plugs with pins which are not solid		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Test conditions:		P
	- 100 strokes; rate of operation ..... :	30 strokes per minute	—
	- test voltage (1,1 Vn) ..... :	1,1X250	—
	- test current (1,25 In) (power factor 0,6) ..... :	1.25X10	—
	Multiple socket-outlets: test carried out on one socket-outlet of each type and current rating		P
	During the test: no sustained arcing occur		P
	After the test:		P
	- specimens show no damage impairing their further use;		P
	- entry holes for the pins not show any damage which may impair the safety		P
21	NORMAL OPERATION		P
	Accessories shall withstand without excessive wear or other harmful effect, the mechanical, electrical and thermal stresses occurring in normal use		P
	Compliance checked by testing:		P
	- socket-outlets;		P
	- plugs with resilient earthing socket-contacts;		N
	- plugs with pins which are not solid		N
	Test performed on:		P
	- complete shuttered socket-outlets		N
	- specimens prepared by the manufacturer without shutters (with current flowing). Number of strokes:		P
	- specimens with shutters (without current flowing)		N
	- complete shuttered socket-outlets with operations made by hand as in normal use		N
	Test conditions:		P
	- 10000 strokes; rate of operation ..... :	30 strokes per minute	—
	- test voltage Vn (V) ..... :	1,1X250	—
	- test current (as specified in table 20) (A) (power factor 0,8) ..... :		—
	Test current passed:		P
	- during each insertion and withdrawal of the plug (In ≤ 16A)		P

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- during alternate insertion and withdrawal, the other insertion and withdrawal being made without current flowing (In > 16A)		N
	Multiple socket-outlets: test carried out on one socket-outlet of each type and current rating		P
	During the test: no sustained arcing occur		P
	After the test the specimens shall not show:		P
	- wear impairing their further use;		P
	- deterioration of enclosures, insulating lining or barriers;		P
	- damage to the entry holes for the pins, that might impair proper working;		P
	- loosening of electrical or mechanical connections;		P
	- seepage of sealing compound		P
	Shuttered socket-outlets: the following gauges not touch live parts when they remain under the relevant forces:		N
	- gauges of figure 3 applied with a force up to 20N		N
	- steel gauge of figure 4 applied with a force up to 1 N		N
	Temperature-rise test (requirements of clause 19):		P
	Test current as required for the normal operation test, given in table 20, passed for 1 h (A) ..... :	10A	—
	Temperature rise of terminals not exceed 45 K (K) ..... :	33.5K	P
	1.1.1.1.6 Separate tests made passing the current through:		N
	- the neutral contact, if any, and the adjacent phase contact (K) ..... :		N
	- the earthing contact, if any, and the nearest phase contact (K) ..... :		N
	Socket-outlets: electric strength (sub-clause 17.2), test voltage (a.c., for 1 min):		N
	a) test voltage (V) ..... :	1500 V	***1.1.1.1.7***
	b) test voltage (V) ..... :	1500 V	***1.1.1.1.8***
	c) test voltage (V)..... :		N
	d) test voltage (V) ..... :		N
	e) test voltage (V) ..... :		N
	Plugs: electric strength (sub-clause 17.2), test voltage (a.c., for 1 min):		N
	a) test voltage (V) ..... :		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	b) test voltage (V) ..... :		N
	c) test voltage (V)..... :		***1.1.1.1.9***
	d) test voltage (V) ..... :		***1.1.1.1.10***
	During the test: no flashover or breakdown		P
	Fixed socket-outlets: test according to 13.1		N
	Pins of plugs and portable socket-outlets: test according to 14.2		P
	Force exerted measured in side earthing contacts not less than 60 % or 5 N (CEE 7 clause 18) ..... :		P
22	FORCE NECESSARY TO WITHDRAW THE PLUG		P
	Construction of accessory shall allow the easy insertion and withdrawal of the plug, and prevent the plug from working out of the socket-outlet in normal use		P
	Rated current (A) ..... :	10	P
	Number of poles ..... :	2P+⏚	P
22.1	Verification of the maximum withdrawal force (multi-pin gauge)		P
	- Maximum withdrawal force (N) ..... :	35N	—
	The plug not remain in the socket-outlet		P
22.2	Verification of the minimum withdrawal force (single-pin gauge)		N
	- Minimum withdrawal force (N) ..... :	N	—
	The plug not fall from each individual contact-assembly within 30 s		P
23	FLEXIBLE CABLES AND THEIR CONNECTION		P
23.1	Plugs and portable socket-outlets provided with a cord anchorage such that the conductors are relieved from strain and that their covering is protected from abrasion		P
	Sheath of flexible cable clamped within the cord anchorage		P
23.2	Pull and torque test		P
	Non-rewirable accessories:		P
	- rating of accessory ..... :	250V, 10A	—
	- type of flexible cable; number of conductors and nominal cross-sectional area (mm^2) ..... :	3X0,75	—

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- pull (100 times) (N) ..... :		P
	- torque (1 min) as specified in table 18 (Nm) ..... :		P
	After the test:		P
	Displacement ≤ 2 mm ..... :		P
	No break in the electrical connections		P
	Rewirable accessories:		N
	- rating of accessory ..... :		—
	- clamping screws, if any, tightened with a torque equal to 2/3 of that specified in 12.2.8 (Nm) ..... :		—
	- type of flexible cable; number of conductors and smallest nominal cross-sectional area (mm^2) as show in table 17 ..... :		—
	- pull (100 times) (N) ..... :		N
	- torque (1 min) as specified in table 18 (Nm) ..... :		N
	After the test:		N
	Displacement ≤ 2 mm ..... :		N
	End of conductors not have moved noticeably in the terminals		N
	- type of flexible cable; number of conductors and largest nominal cross-sectional area (mm^2) as show in table 17 ..... :		—
	- pull (100 times) (N) ..... :		N
	- torque (1 min) as specified in table 18 (Nm) ..... :		N
	After the test:		N
	Displacement ≤ 2 mm ..... :		N
	End of conductors not have moved noticeably in the terminals		N
	Rewirable accessories having rated current up to and including 16 A:		N
	Suitable for fitting with the appropriate cable as shown in table 19		N
	Type of flexible cable; number of conductors and nominal cross-sectional area (mm^2)..... :		—
23.3	Non-rewirable plugs and non-rewirable portable socket-outlets: provided with a flexible cable complying with IEC 227 or IEC 245		P
	Flexible cables have the same number of conductors as there are poles in the plug or socket-outlet		P
	Conductor connected to the earthing contact: identified by the colour combination green/yellow		P

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
23.4	Non-rewirable plugs and non-rewirable portable socket-outlets: designed that the flexible cable is protected against excessive bending		P
	Guards shall be of insulating material and fixed in reliable manner		P
	Flexing test (10.000 flexings):		P
	- type of flexible cable and nominal cross-sectional area (mm^2) ..... :	0,75	—
	- test current (A) ..... :	10	—
	- mass (N) ..... :	10	—
	During the test: no interruption of the test current and no short-circuit between conductors		P
	Voltage drop test: test current (A); voltage drop (≤ 10 mV) ..... :	0.3mA	P
	After the test: guard no separated from the body, insulation shows no sign of abrasion or wear, broken strands become no accessible		P
24	MECHANICAL STRENGTH		P
	Accessories, surface mounting boxes and screwed glands have adequate mechanical strength		P
24.1	Fixed socket-outlets, portable multiple socket-outlets and surface mounting boxes: impact test (apparatus shown in fig. 22, 23, 24 and 25)		P
	After the test: no damage, live parts no become accessible		P
24.2	Portable single socket-outlets and plugs: tumbling barrel test; number of falls ..... :	> 200g, 100	P
	After the test:		P
	No part become detached or loosened;		P
	Pins no become so deformed that the plug cannot be introduced into a socket-outlet and also fails to comply with the requirements of 9.1 and 10.3;		P
	Pins no turn when a torque of 0,4 Nm is applied for 1 min in each direction		P
24.3	Ordinary surface type socket-outlets: first fixed to a cylinder of rigid steel sheet and then fixed to a flat steel sheet		N
	During and after the test: no damage		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
24.4	Portable single socket-outlets, multiple socket-outlets and plugs (elastomeric or thermoplastic material): impact test, weight 1000 g, height 100 mm (apparatus shown in fig. 27)		P
	Specimens placed in a refrigerator at –15 ºC ± 2 ºC for at least 16 h		P
	After the test: no damage		P
24.5	Portable single socket-outlets and plugs (elastomeric or thermoplastic material): compression test, 300 N for 1 min, position a) and b) (apparatus shown in fig. 8)		P
	After the test: no damage		P
24.6	Screwed glands of accessories other than ordinary: torque test (1 min)		N
	- diameter of test rod (mm) .....:		—
	- type of material .....:	metal / moulded material	—
	- torque (Nm) .....:		—
	- type of material .....:		—
	After the test: no damage of glands and enclosure of the specimens		N
24.7	Plug pins provided with insulating sleeves: 20000 movements, 4 N (apparatus shown in fig. 28)		N
	After the test: no damage of pins, insulating sleeve not have punctured or rucked up		N
24.8	Shuttered socket-outlets: mechanical test carried out on specimens submitted to the normal operation test according to clause 21		N
	Force applied for 1 min against the shutter of an entry hole by means of one pin .....:		—
	Pin not come in contact with live parts		N
	After the test: no damage		N
24.9	Multiple portable socket-outlet: mechanical test		N
	Rewirable multiple socket-outlets: flexible cable of the smallest cross-sectional area specified in table 3 .....:		—
	8 falls on concrete floor with the specimens arranged as shown in figure 24		N
	After the test: no damage, no part have become detached or loosened		N
	Accessories other than ordinary submitted again to the test as specified in 16.2		N
24.10	Plugs: pull test to verify the fixation of pins in the body of the plug (new specimens)		P

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Maximum withdrawal force (table 16) applied for 1 min on each pin in turn, after the specimen has been placed at 70 ºC for 1 h ..... :	50N	—
	After the test: displacement of pins in the body of the plug ≤ 1 mm ..... :	0 mm	P
24.11	Barriers of portable socket-outlets having means for suspension on a wall:		P
	Force applied for 10 s against the barrier by means of a cylindrical steel rod (1,5 times the maximum plug withdrawal force specified in table 16) (N) ..... :	50N	—
	Rod not pierce the barrier		P
24.12	Portable socket-outlets having means for suspension on a wall (pull test):		N
	Pull applied to the supply flexible cable for 10 s (force prescribed in 23.2 for checking the flexible cable anchorage) (N) ..... :		—
	During the test: no break of the means for suspension on a wall		N
24.13	Portable socket-outlets having means for suspension on a wall (pull test):		N
	Pull applied to the engagement face of the socket-outlet for 10 s (maximum withdrawal force specified, for the corresponding plug, in table 16) (N) ..... :		—
	During the test: no break of the means for suspension on a wall		N
24.14	Force necessary for covers or cover-plates to come off or not to come off (accessibility with the test finger to live parts)		N
24.14.1	Verification of the non-removal of covers or cover-plates		N
	Force applied for 1 min in direction perpendicular to the mounting surface ..... :		—
	Covers or cover-plates not come off		N
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 8)		N
	Covers or cover-plates not come off		N
	After the test: no damage		N
24.14.2	Verification of the removal of covers or cover-plates		N
	Force not exceeding 120 N applied 10 times in direction perpendicular to the mounting / supporting surface: covers or cover-plates come off		N
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 8)		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Covers or cover-plates come off		N
	After the test: no damage		N
24.15	Force necessary for covers or cover-plates to come off or not to come off (accessibility with the test finger to non-earthed metal parts separated from live parts by creepage distances and clearances according to table 23)		N
24.14.1	Verification of the non-removal of covers or cover-plates		N
	Force applied for 1 min in direction perpendicular to the mounting surface ..... :		—
	Covers or cover-plates not come off		N
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 8)		N
	Covers or cover-plates not come off		N
	After the test: no damage		N
24.14.2	Verification of the removal of covers or cover-plates		N
	Force not exceeding 120 N applied 10 times in direction perpendicular to the mounting / supporting surface: covers or cover-plates come off		N
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 8)		N
	Covers or cover-plates come off		N
	After the test: no damage		N
24.16	Force necessary for covers or cover-plates to come off or not to come off (accessibility to insulating parts, earthed metal parts, live parts of SELV $\leq$ 25 V a.c. or metal parts separated from live parts by creepage distances twice those according to table 23)		N
24.14.1	Verification of the non-removal of covers or cover-plates		N
	Force 10 N applied for 1 min in direction perpendicular to the mounting surface: covers or cover-plates not come off		N
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 8)		N
	Covers or cover-plates not come off		N
	After the test: no damage		N
24.14.2	Verification of the removal of covers or cover-plates		N
	Force not exceeding 120 N applied 10 times in direction perpendicular to the mounting / supporting surface: covers or cover-plates come off		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Test repeated on new specimens with a sheet of hard material, 1 mm ± 0,1 mm thick, fitted around the supporting frame (fig. 8)		N
	Covers or cover-plates come off		N
	After the test: no damage		N
24.17	Test with gauge of figure 33 applied according to figure 9 for verification of the outline of covers or cover-plates: distances between face C of gauge and outline of side under test, not decrease ..... :		—
24.18	Test with gauge according to figure 5 applied as shown in figure 35 (1 N): gauge not enter more than 1mm ..... :		—
25	RESISTANCE TO HEAT		P
25.1	Fixed and portable accessories: heating cabinet 100 ºC for 1 h		P
	During the test: no change impairing their further use and sealing compound, if any, not flow		P
	After the test: markings still legible		P
25.2	Parts of insulating material of fixed socket-outlets necessary to retain current-carrying parts and parts of the earthing circuit in position, and parts of the front surface zone of 2 mm width surrounding the phase and neutral pin entry holes: ball-pressure test (1 h, 125 ºC)		N
	After the test: diameter of impression ≤ 2 mm ..... :		N
25.3	For parts not necessary to retain current-carrying parts and parts of the earthing circuit in position, even though in contact with them: ball-pressure test (1 h)		P
	Test temperature (ºC) ..... :	70 ºC	P
	After the test: diameter of impression ≤ 2 mm ..... :		P
25.4	Portable accessories: compression test (20 N, 1 h, 80 ºC) by means of the apparatus shown in figure 38		P
	After the test: no damage		P
26	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		P
26.1	Connections withstand mechanical stresses		P
	Thread-forming or thread-cutting screws used only if supplied together with the piece in which they are intended to be inserted		N
	Thread-cutting screws intended to be used during installation: captive		N
	Screws and nuts which transmit contact pressure: in engagement with a metal thread		N
	Test:		P

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- 10 times for screws in engagement with a thread of insulating material and for screws of insulating material		P
	- 5 times for all other cases		N
	- terminals: screw diameter (mm); torque (Nm); times .....:		—
	- earthing terminals: screw diameter (mm); torque (Nm); times .....:		—
	- assembly screws: screw diameter (mm); torque (Nm); times .....:	3,0mm 0,5Nm	—
	- cord anchorage: screw diameter (mm); torque (Nm); times .....:		—
	- other screws or nuts: diameter (mm); torque (Nm); times .....:		—
	During the test: no damage impairing the further use of the screwed connectons		P
26.2	Screws in engagement with a thread of insulating material: correct introduction into the screw hole or nut ensured		P
26.3	Contact pressure: not transmitted through insulating material other than ceramic, pure mica or other material no less suitable unless there is sufficient resiliency in metallic parts		N
	Connections made by insulation piercing of tinsel cord reliable		N
26.4	Screws and rivets locked against loosening and/or turning		N
26.5	Current-carrying parts of metal having mechanical strength, electrical conductivity and resistance to corrosion adequate:		N
	- copper;		N
	- alloy with at least 58 % copper for parts made from cold-rolled sheet or with at least 50 % copper for other parts;		N
	- stainless steel with at least 13 % chromium and not more than 0,09 % carbon		N
	- steel with electroplated coating of zinc (ISO 2081), with thickness of at least:		N
	5 µm, service condition ISO no. 1, for ordinary equipment		N
	12 µm, service condition ISO no. 2, for splash-proof equipment		N
	25 µm, service condition ISO no. 3, for jet-proof equipment		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- steel with electroplated coating of nickel and chromium (ISO 1456), with thickness of at least:		N
	20 µm, service condition ISO no. 2, for ordinary equipment		N
	30 µm, service condition ISO no. 3, for splash-proof equipment		N
	40 µm, service condition ISO no. 4, for jet-proof equipment		N
	- steel with electroplated coating of tin (ISO 2093), with thickness of at least:		N
	12 µm, service condition ISO no. 2, for ordinary equipment		N
	20 µm, service condition ISO no. 3, for splash-proof equipment		N
	30 µm, service condition ISO no. 4, for jet-proof equipment		N
	Current-carrying parts subjected to mechanical wear: not of steel with electroplated coating		N
	Metals having a great difference of electrochemical potential: not used in contact with each other		N
26.6	Contacts subjected to a sliding action: of metal resistant to corrosion		N
26.7	Thread-forming screws and thread-cutting screws not used for the connection of current-carrying parts		P
	Thread-forming screws and thread-cutting screws used to provide earthing connection: not necessary to disturb the connection and at least two screws are used for each connection		P
27	CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND		P
27.1	Creepage distances, clearances and distances through sealing compound no less than the values shown in table 23		P
	Creepage distances (cr):		P
	1) between live parts of different polarity ≥ 4(3)mm ..... :	4.2mm	P
	2) between live parts and:		P
	- accessible insulating and earthed metal parts ≥ 3mm ..... :	7,0mm	P
	- parts of earthing circuit ≥ 3mm ..... :		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	- metal frames supporting the base of flush-type socket-outlets ≥ 3mm ..... :		N
	- screws or devices for fixing bases, covers or cover-plates of fixed socket-outlets ≥ 3mm ..... :		N
	- external assembly screws, other than screws which are on the engagement face of plugs and are isolated from the earthing circuit ≥ 3mm ..... :		P
	3) between pins of plugs and metal parts connected to them, when fully engaged, and a socket-outlet of the same system having accessible unearthed metal parts ≥ 6(4,5)mm ..... :		N
	4) between the accessible unearthed metal parts of a socket-outlet and a fully engaged plug of the same system having pins and metal parts connected to them ≥ 6(4,5)mm ..... :		N
	5) between live parts of a socket-outlet (without a plug) and its accessible unearthed metal parts ≥ 6(4,5)mm ..... :		N
	Clearances (cl):		P
	6) between live parts of different polarity ≥ 3mm ... :	4.2mm	
	7) between live parts and:		P
	- accessible insulating and earthed metal parts not mentioned under 8 and 9 ≥ 3mm ..... :	7,0mm	
	- parts of earthing circuit ≥ 3mm ..... :		N
	- metal frames supporting the base of flush-type socket-outlets ≥ 3mm ..... :		N
	- screws or devices for fixing bases, covers or cover-plates of fixed socket-outlets ≥ 3mm ..... :		N
	- external assembly screws, other than screws which are on the engagement face of plugs and are isolated from the earthing circuit ≥ 3mm ..... :		P
	8) between live parts and:		P
	- exclusively earthed metal boxes ≥ 3mm ..... :		N
	- unearthed metal boxes, without insulating lining ≥ 4,5 mm ..... :		N
	9) between live parts and the surfaces on which the base of a socket-outlet for surface mounting is mounted ≥ 6mm..... :		N
	10) between live parts and the bottom of any conductor recess, if any, in the base of a socket-outlet for surface mounting ≥ 3mm ..... :		N
	Distance through insulating sealing compound:		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	11) between live parts covered with at least 2 mm of sealing compound and the surfaces on which the base of a socket-outlet for surface mounting is mounted ≥ 4(3)mm ..... :		N
	12) between live parts covered with at least 2 mm of sealing compound and the bottom of any conductor recess, if any, in the base of a socket-outlet for surface mounting ≥ 2,5mm ..... :		N
27.2	Insulating sealing compound: not protrude above the edge of the cavity in which it is contained		N
27.3	Ordinary surface-type socket-outlets: no bare current-carrying strips at the back		N
28	RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT, TO FIRE AND TO TRACKING		P
28.1	Resistance to abnormal heat and to fire		P
28.1.1	***1.1.1.1.10.1 Glow-wire test***		P
	For parts of fixed accessories necessary to retain current-carrying parts and parts of the earthing circuit in position: test temperature 850 °C		N
	No visible flame and no sustained glowing		N
	Flame and glowing extinguish within 30 s ..... :		N
	No ignition of the tissue paper		N
	For parts of fixed accessories needed to retain the earth terminal in position in a box: test temperature 650 °C		N
	No visible flame and no sustained glowing		N
	Flame and glowing extinguish within 30 s ..... :		N
	No ignition of the tissue paper		N
	For parts of portable accessories necessary to retain current-carrying parts and parts of the earthing circuit in position: test temperature 750 °C		P
	No visible flame and no sustained glowing		P
	Flame and glowing extinguish within 30 s ..... :		P
	No ignition of the tissue paper		P
	For parts not necessary to retain current-carrying parts and parts of the earthing circuit in position, even though in contact with them: test temperature 650 °C		P
	No visible flame and no sustained glowing		P
	Flame and glowing extinguish within 30 s ..... :		P
	No ignition of the tissue paper		P
28.1.2	Plugs with pins provided with insulating sleeves:		N
	Test temperature maintained for 3 h by means of the apparatus shown in figure 40 ..... :	180 ºC	—

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Impact test according to sub-clause 30.4 (mass 100 g, height 100 mm, 4 impacts): no cracks of the insulating sleeves		N
28.2	***1.1.1.1.10.2 Resistance to tracking***		N
	Parts of insulating material retaining live parts in position of accessories other than ordinary: test voltage 175 V, 50 drops, solution A of IEC 112		N
	No flashover or breakdown		N
29	RESISTANCE TO RUSTING		P
	Ferrous parts protected against rusting		P
	No signs of rust after 10 min in carbon tetrachloride, trichloroethane or equivalent degreasing agent, 10 min 10 % solution of ammonium chloride, 10 min in a box with air saturated with moisture and 10 min at 100 ºC		P
30	ADDITIONAL TESTS ON PINS PROVIDED WITH INSULATING SLEEVES		N
30.1	***1.1.1.1.10.3 Pressure test at high temperature***		N
	Apparatus shown in figure 29, with the test specimen in position, maintained for 2 h at 200 ºC. Force applied through the blade: 2,5 N		N
	Thickness of insulation measured: before the test (mm); after the test (mm) ..... :		—
	Thickness within the area of impression ≥ 50 % of the thickness measured before the test: percent value (%) ..... :		N
30.2	***1.1.1.1.10.4 Static damp heat test***		N
	Set of 3 specimens submitted to two damp heat cycles in accordance with IEC 68-2-30		N
	After the test:		N
	Insulation resistance and electric strength test (clause 17)		N
	Abrasion test (sub-clause 24.7)		N
30.3	***1.1.1.1.10.5 Test at low temperature***		N
	Set of 3 specimens maintained at –15 ºC ± 2ºC for 24 h		N
	After the test:		N
	Insulation resistance and electric strength test (clause 17)		N
	Abrasion test (sub-clause 24.7)		N

IEC 60884-1			
Clause	Requirement – Test	Result - Remark	Verdict
30.4	***1.1.1.1.10.6 Impact test at low temperature***		N
	Specimens maintained at –15 ºC ± 2 ºC for 24 h subjected to 4 impacts (mass 100 g, height 100 mm) by means of the apparatus shown in figure 30 rotating the specimen through 90° between impacts		N
	After the test: no crack of the insulating sleeves		N

IEC 60884-1

Photo documentation

Photo 1

View:

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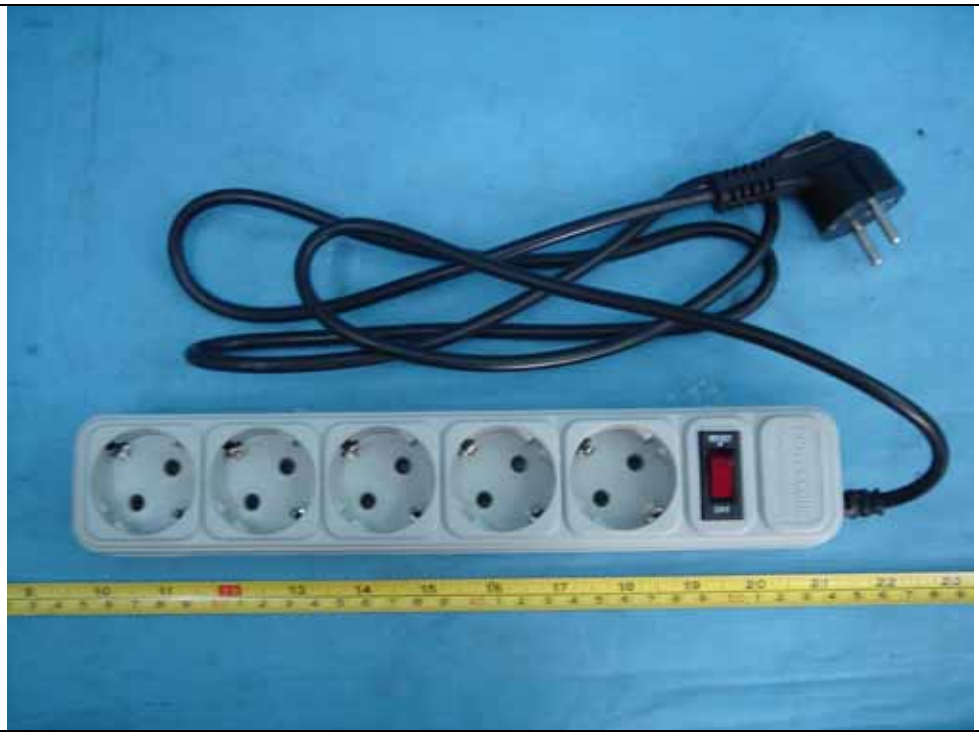

Photo 2

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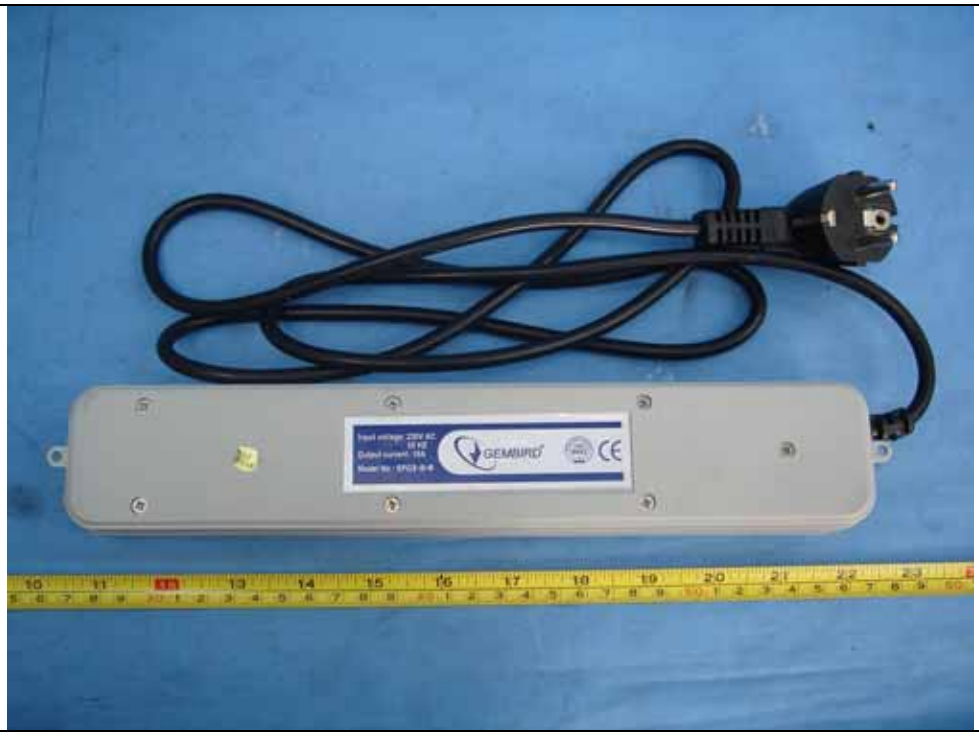

IEC 60884-1

Photo documentation

Photo 3

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