

Test Report No:		Page 1 of 44
Issue date		
Manufacturer:		
Test item:	Rope Lights	
Identification:	Serial No.:	
Receipt No.:	Date of receipt:	
Testing laboratory and its address:		
Test specification:	IS 10322 (Part 5/ Sec 9):2017/ IEC 60598-2-21:2014	
Test Result:	The test item passed/failed the test specification(s).	
Other Aspects:		

Tested by:	Approved by / Authorized Signatory:	Issued by:
Date:	Date:	Date:

TEST REPORT
IS 10322 (Part 5/Sec 9)
Luminaires
Part 5: Particular requirements
Section 9: Rope Lights

Report Number. :

Date of issue :

Total number of pages

Applicant's name :

Address :

Test specification:

Standard : **IS 10322 (Part 5/ Sec 9):2017/
IEC 60598-2-21:2014**

Test procedure..... : Compliance Report

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

Test Report Form No..... : BIS_LUM/EL_IS10322-5-9_V1.0

Test Report Form(s) Originator.... : Bureau of Indian Standards

Master TRF : 20/04/2020

Test item description.....:

Trade Mark.....:

Manufacturer.....:

Model/Type Reference.....:

Rating.....:

Tested by:	Approved by / Authorized Signatory:	Issued by:
Date:	Date:	Date:

Report No.:	IS 10322 (Part 5/ Sec 9):2017/ IEC 60598-2-21:2014	Page 3 of 44
Dated:		

Description	Measurement/ testing	Total No. of tests	Total no. of applicable tests/ Req.	No. of tests/ Req. passed	Page No.
Marking	Marking				
Construction	Construction				
Creepage Distances And Clearances	Creepage Distances And Clearances				
Terminals	Screw Terminals				
Terminals	Screw less Terminals				
External And Internal Wiring	External And Internal Wiring				
Protection Against Electric Shock	Protection Against Electric Shock				
Endurance Tests And Thermal Tests	Endurance Tests And Thermal Tests				
Resistance to Dust, Solid Objects And Moisture	Resistance to Dust, Solid Objects And Moisture				
Insulation Resistance And Electric Strength	Insulation Resistance And Electric Strength				
Resistance to Heat, Fire And Tracking	Resistance to Heat, Fire And Tracking				

Certificate: It is certified that the above tests were performed and found to be passing in the requirement test

.....
(Approving Authority)

Report No.:

**IS 10322 (Part 5/ Sec 9):2017/
IEC 60598-2-21:2014**

Page 4 of 44

Dated:

Copy of marking plate:

Copy of trademark:

(provided on the equipment)

Table – List of Attachments

Attachment No.	Attachment Description	No. of pages in Attachment
Attachment – 1	Photo Document	Page no.

General remarks:

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

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

Possible test case verdicts:

- test case does not apply to the test object.....: N/A
- test object does meet the requirement.....: P (Pass)
- test object does not meet the requirement.....: F (Fail)

Testing.....:

Date of receipt of test item.....:

Date (s) of performance of tests.....:

Laboratory conditions.....:

Ambient Temperature.....:

Ambient Humidity.....:

Report No.:

IS 10322 (Part 5/Sec 9): 2017/
IEC 60598-2-21:2014

Page 5 of 44

Dated:

General Product Information:-

Product Description:

Model Tested :

Sr. No.	Product description	Model	Specifications
1			

Representative Models:

Sr. No.	Product description	Model	Specifications	Variation From Family Representative
1				
2				
3				
4				
5				

Supply connections:

Condition of sample at the time of receipt :

Tested Model:

Technical Considerations:

.

Report Summary:

Report No.:

IS 10322 (Part 5/Sec 9): 2017/
IEC 60598-2-21:2014

Page 6 of 44

Dated:

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.4 (0)	GENERAL TEST REQUIREMENTS			
21.4 (0.1)	Information for luminaire design considered.....	--	Standard Yes <input type="checkbox"/> No <input type="checkbox"/>	—
21.4 (0.3)	More sections applicable.....:	--	Yes <input type="checkbox"/> No <input type="checkbox"/>	—

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.5 (2)	CLASSIFICATION OF LUMINAIRES			
21.5 (2.2)	Type of protection	--		—
21.5 (2.3)	Degree of protection.....	--		—
21.5 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces	--	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
21.5 (2.5)	Luminaire for normal use	--	Yes <input type="checkbox"/> No <input type="checkbox"/>	
	Luminaire for rough service	--	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
21.5.2 (-)	Class II or Class III	--		
21.5.3 (-)	Rope lights for outdoor use shall be IP44 or higher	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.6 (3)	MARKING			
21.6 (3.2)	Mandatory markings*	--		
	Position of the marking*	--		
	Format of symbols/text*	--		
21.6 (3.3)	Additional information*	--		
	Language of instructions*	--		
21.6 (3.3.1)	Combination luminaires*	--		
21.6 (3.3.2)	Nominal frequency in Hz*	--		
21.6 (3.3.3)	Operating temperature*	--		
21.6 (3.3.4)	Symbol or warning notice*	--		
21.6 (3.3.5)	Wiring diagram*	--		
21.6 (3.3.6)	Special conditions*	--		
21.6 (3.3.7)	Metal halide lamp luminaire – warning*	--		
21.6 (3.3.8)	Limitation for semi-luminaires*	--		
21.6 (3.3.9)	Power factor and supply current*	--		
21.6 (3.3.10)	Suitability for use indoors*	--		
21.6 (3.3.11)	Luminaires with remote control*	--		
21.6 (3.3.12)	Clip-mounted luminaire – warning*	--		
21.6 (3.3.13)	Specifications of protective shields*	--		
21.6 (3.3.14)	Symbol for nature of supply*	--		
21.6 (3.3.15)	Rated current of socket outlet*	--		
21.6 (3.3.16)	Rough service luminaire*	--		
21.6 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments*	--		
21.6 (3.3.18)	Non-ordinary luminaires with PVC cable*	--		
21.6 (3.3.19)	Protective conductor current in instruction if applicable*	--		
21.6 (3.3.20)	Provided with information if not intended to be mounted within arm's reach*	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.6 (3.3.21)	Non replaceable and non-user replaceable light sources information provided*	--		
	Cautionary symbol*	--		
21.6 (3.3.22)	Controllable luminaires, classification of insulation provided*	--		
21.6 (3.4)	Test with water	--		
	Test with hexane	--		
	Legible after test*	--		
	Label attached*	--		
21.6.2 (-)	Rope light marking	--		
	Rated voltage and wattage marked on the rope light*	--		
	Durable non-removable label if information on the cable*	--		
21.6.3 (-)	Rope light and packing marking	--		
	Marking if only for indoor use*	--		
21.6.4 (-)	Marking on the packing or instructions	--		
	Marking a) – e) *	--		
	Standard Mark is governed by the provisions of the Bureau of Indian Standards Act,1986*	--		

*Total number of Requirements to be observed / inspected =
Total No. of Applicable Requirement =
No of Requirements for which the sample passed =

Total number of tests to be conducted =
Total No. of Applicable Tests =
No. of tests for which the sample passed =

Certificate: It is certified that the above tests were performed and found to be passing in the requirement tested.

.....
(Approving Authority)

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.7 (4)	CONSTRUCTION			
21.7 (4.2)	Components replaceable without difficulty*	--		
21.7 (4.3)	Wireways smooth and free from sharp edges*	--		
21.7 (4.4)	Lamp holders			
21.7 (4.4.1)	Integral lamp holder*	--		
21.7 (4.4.2)	Wiring connection*	--		
21.7 (4.4.3)	Lamp holder for end-to-end mounting*	--		
21.7 (4.4.4)	Positioning	--		
	- Pressure test (N)	--		—
	After test the lamp holder comply with relevant standard sheets and show no damage	--		
	After test on single-capped lamp holder the lamp holder have not moved from its position and show no permanent deformation	--		
	- bending test (N)	--		—
	After test the lamp holder have not moved from its position and show no permanent deformation	--		
21.7 (4.4.5)	Peak pulse voltage	--		
21.7 (4.4.6)	Centre contact*	--		
21.7 (4.4.7)	Parts in rough service luminaires resistant to tracking	--		
21.7 (4.4.8)	Lamp connectors*	--		
21.7 (4.4.9)	Caps and bases correctly used	--		
21.7 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way	--		
21.7 (4.5)	Starter holders			
	Starter holder in luminaires other than class II*	--		
	Starter holder class II construction*	--		
	Starter can be touched with the standard test finger in class II luminaires*	--		
21.7 (4.6)	Terminal blocks			
	Tails	--		
	Unsecured blocks	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.7 (4.7)	Terminals and supply connections			
21.7 (4.7.1)	Contact to metal parts*	--		
21.7 (4.7.2)	Test 8 mm live conductor	--		
	Test 8 mm earth conductor	--		
21.7 (4.7.3)	Terminals for supply conductors	--		
21.7 (4.7.4)	Terminals other than supply connection*	--		
21.7 (4.7.5)	Heat-resistant wiring/sleeves*	--		
21.7 (4.7.6)	Multi-pole plug*	--		
21.7 (4.8)	Switches			
	- adequate rating*	--		
	- adequate fixing*	--		
	- polarized supply*	--		
	- compliance with IEC 61058-1 for electronic switches	--		
21.7 (4.9)	Insulating lining and sleeves			
21.7 (4.9.1)	Retainment*	--		
	Method of fixing.....:	--		—
21.7 (4.9.2)	Insulated linings and sleeves:			
	Resistant to a temperature > 20 °C to the wire temperature or	--		
	a) & c) Insulation resistance and electric strength	--		
	b) Ageing test. Temperature (°C).....:	--		
21.7 (4.10)	Double or reinforced insulation			
21.7 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation*	--		
	Safe installation fixed luminaires*	--		
	Capacitors and switches*	--		
	Interference suppression capacitors according to IEC 60384-14*	--		
21.7 (4.10.2)	Assembly gaps:			
	- not coincidental*	--		
	- no straight access with test probe	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.7 (4.10.3)	Retainment of insulation:			
	- fixed*	--		
	- unable to be replaced; luminaire inoperative*	--		
	- sleeves retained in position*	--		
	- lining in lampholder*	--		
21.7 (4.11)	Electrical connections and current-carrying parts			
21.7 (4.11.1)	Contact pressure*	--		
21.7 (4.11.2)	Screws:			
	- self-tapping screws*	--		
	- thread-cutting screws*	--		
21.7 (4.11.3)	Screw locking:			
	- spring washer*	--		
	- rivets*	--		
21.7 (4.11.4)	Material of current-carrying parts*	--		
21.7 (4.11.5)	No contact to wood or mounting surface*	--		
21.7 (4.11.6)	Electro-mechanical contact systems	--		
21.7 (4.12)	Screws and connections (mechanical) and glands			
21.7 (4.12.1)	Screws not made of soft metal*	--		
	Screws of insulating material*	--		
	Torque test: torque (Nm); part.....:	--		
	Torque test: torque (Nm); part.....:	--		
	Torque test: torque (Nm); part.....:	--		
21.7 (4.12.2)	Screws with diameter < 3 mm screwed into metal*	--		
21.7 (4.12.4)	Locked connections:			
	- Fixed arms; torque (Nm).....:	--		
	- Lamp holder; torque (Nm).....:	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
	- Push-button switches; torque 0,8 Nm.....:	--		
21.7 (4.12.5)	Screwed glands; force (Nm).....:	--		
21.7 (4.13)	Mechanical strength			
21.7 (4.13.1)	Impact tests:			
	- Fragile parts; energy (Nm).....:	--		
	- Other parts; energy (Nm).....:	--		
	1) live parts	--		
	2) linings	--		
	3) protection	--		
	4) covers	--		
21.7 (4.13.3)	Straight test finger	--		
21.7 (4.13.4)	Rough service luminaires			
	- IP54 or higher	--		
	a) fixed	--		
	b) hand-held	--		
	c) delivered with a stand	--		
	d) for temporary installations and suitable for mounting on a stand	--		
21.7 (4.13.6)	Tumbling barrel	--		
21.7 (4.14)	Suspensions, fixings and means of adjusting			
21.7 (4.14.1)	Mechanical load:			
	A) four times the weight	--		
	B) torque 2,5 Nm	--		
	C) bracket arm; bending moment (Nm).....:	--		
	D) load track-mounted luminaires	--		
	E) clip-mounted luminaires, glass-shelve. Thickness (mm)	--		
	Metal rod. diameter (mm)	--		
21.7 (4.14.2)	Load to flexible cables			

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
	Mass (kg)	--		—
	Stress in conductors (N/mm ²)	--		
	Mass (kg) of semi-luminaire	--		—
	Bending moment (Nm) of semi-luminaire	--		
21.7 (4.14.3)	Adjusting devices:			
	- flexing test; number of cycles.....	--		
	- strands broken.....	--		
	- electric strength test afterwards	--		
21.7 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors*	--		
21.7 (4.14.5)	Guide pulleys*	--		
21.7 (4.14.6)	Strain on socket-outlets*	--		
21.7 (4.15)	Flammable materials			
	- glow-wire test 650°C.....	--		
	- spacing ≥30 mm	--		
	- screen withstanding test of 13.3.1	--		
	- screen dimensions	--		
	- no fiercely burning material	--		
	- thermal protection	--		
	- electronic circuits exempted	--		
21.7 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear			
	a) construction*	--		
	b) temperature sensing control*	--		
	c) surface temperature	--		
21.7 (4.16)	Luminaires for mounting on normally flammable surfaces			
	No lamp control gear.....	--		
21.7 (4.16.1)	Lamp control gear spacing:			
	- spacing 35 mm	--		
	- spacing 10 mm	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.7 (4.16.2)	Thermal protection:			
	- in lamp control gear	--		
	- external	--		
	- fixed position	--		
	- temperature marked lamp control gear	--		
21.7 (4.16.3)	Design to satisfy the test of 12.6	--		
21.7 (4.17)	Drain holes			
	Clearance at least 5 mm	--		
21.7 (4.18)	Resistance to corrosion			
21.7 (4.18.1)	- rust-resistance	--		
21.7 (4.18.2)	- season cracking in copper	--		
21.7 (4.18.3)	- corrosion of aluminium	--		
21.7 (4.19)	Igniters compatible with ballast*	--		
21.7 (4.20)	Rough service vibration	--		
21.7 (4.21)	Protective shield			
21.7 (4.21.1)	Shield fitted if tungsten halogen lamps	--		
21.7 (4.21.2)	Particles from a shattering lamp not impair safety	--		
21.7 (4.21.3)	No direct path	--		
21.7 (4.21.4)	Impact test on shield	--		
	Glow-wire test on lamp compartment.....:	--		
21.7 (4.22)	Attachments to lamps not cause overheating or damage*	--		
21.7 (4.23)	Semi-luminaires comply Class II*	--		
21.7 (4.24)	Photobiological hazards			
21.7 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)	--		
21.7 (4.24.2)	Retinal blue light hazard Luminaires with E_{thr} :			

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
	a) Fixed luminaires	--		
	- distance x m, borderline between RG1 and RG2.....	--		
	- marking and instruction according 3.2.23	--		
	b) Portable and handheld luminaires	--		
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778	--		
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778	--		
21.7 (4.25)	Mechanical hazard			
	No sharp point or edges*	--		
21.7 (4.26)	Short-circuit protection			
21.7 (4.26.1)	Adequate means of uninsulated accessible SELV parts	--		
21.7 (4.26.2)	Short-circuit test with test chain according 4.26.3			
	Test chain not melt through	--		
	Test sample not exceed values of Table 12.1 and 12.2	--		
21.7 (4.27)	Terminal blocks with integrated screwless earthing contacts			
	Test according Annex V	--		
	Pull test of terminal fixing (20 N)	--		
	After test, resistance < 0,05 Ω	--		
	Pull test of mechanical connection (50 N)	--		
	After test, resistance < 0,05 Ω	--		
	Voltage drop test, resistance < 0,05 Ω	--		
21.7 (4.28)	Fixing of thermal sensing control			
	Not plug-in or easily replaceable type*	--		
	Reliably kept in position*	--		
	No adhesive fixing if UV radiations from a lamp can degrade the fixing*	--		
	Not outside the luminaire enclosure*	--		
	Test of adhesive fixing:			
	Max. temperature on adhesive material (°C)	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
	100 cycles between t min and t max	--		
	Temperature sensing control still in position	--		
21.7 (4.29)	Luminaires with non-replaceable light source			
	Not possible to replace light source *	--		
	Live part not accessible after parts have been opened by hand or tools	--		
21.7 (4.30)	Luminaires with non-user replaceable light source			
	If protective cover provide protection against electric shock and marked with "caution, electric shock risk" symbol:			
	Minimum two fixing means	--		
21.7 (4.31)	Insulation between circuits			
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3	--		
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3	--		
21.7 (4.31.1)	SELV circuits			
	Used SELV source	--		
	Voltage \leq ELV	--		
	Insulating of SELV circuits from LV supply	--		
	Insulating of SELV circuits from other non SELV circuits	--		
	Insulating of SELV circuits from FELV	--		
	Insulating of SELV circuits from other SELV circuits	--		
	SELV circuits insulated from accessible parts according Table X.1	--		
	Plugs not able to enter socket-outlets of other voltage systems	--		
	Socket outlets does not admit plugs of other voltage systems	--		
	Plugs and socket-outlets does not have protective conductor contact	--		
21.7 (4.31.2)	FELV circuits			
	Used FELV source	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
	Voltage \leq ELV	--		
	Insulating of FELV circuits from LV supply	--		
	FELV circuits insulated from accessible parts according Table X.1	--		
	Plugs not able to enter socket-outlets of other voltage systems	--		
	Socket outlets does not admit plugs of other voltage systems	--		
	Socket-outlets does not have protective conductor contact	--		
21.7 (4.31.3)	Other circuits			
	Other circuits insulated from accessible parts according Table X.1	--		
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:			
	- conductive parts are connected together	--		
	- test according 7.2.3	--		
	- conductive part not cause an electric shock in case of an insulation fault	--		
	- equipotential bonding in master/slave applications	--		
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires	--		
	- slave luminaire constructed as class I	--		
21.7 (4.32)	Overvoltage protective devices			
	Comply with IEC 61643-11*	--		
	External to controlgear and connected to earth:	--		
	- only in fixed luminaires*	--		
	- only connected to protective earth*	--		
21.7.2 (-)	Terminal blocks			
	Clause 4.6 of IEC 60598-1 referring to terminal blocks does not apply	--		
21.7.3 (-)	Terminals and supply connections			
	Comply with Annex A	--		

Report No.:

IS 10322 (Part 5/Sec 9): 2017/
IEC 60598-2-21:2014

Page 18 of 44

Dated:

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.7.4 (-)	Control units			
	Forming an integral part enclosed in non-flammable insulating material tested according 21.16	--		
	Securely fixed to the cable*	--		
	Electronic control device comply with IEC 61347-2-11*	--		
	LED driver comply with IEC 61347-2-13*	--		
21.7.5 (-)	Mechanical strength			
	a) Rigid rope lights	--		
	1) Pull test: force 60 N	--		
	2) Torque test: torque 0,15 Nm	--		
	b) Flexible rope lights			
	1) Pull test: force 60 N	--		
	2) Torque test: torque 0,15 Nm	--		
	3) Cylinder 150 mm @ 10 times at 25 °C ± 2 °C	--		
	For rope lights having an IP number over X0 Additionally: Cylinder 150 mm @ 10 times at -15 °C ± 2 °C	--		
	4) Mandrel of between 4 and 5 times the diameter of test piece	--		
	c) Impact test at low temperature of -15 °C ± 5 °C	--		

*Total number of Requirements to be observed / inspected =
 Total No. of Applicable Requirement =
 No of Requirements for which the sample passed =

Total number of tests to be conducted =
 Total No. of Applicable Tests =
 No. of tests for which the sample passed =

Certificate: It is certified that the above tests were performed and found to be passing in the requirement tested.

.....
 (Approving Authority)

Report No.:

IS 10322 (Part 5/Sec 9): 2017/
IEC 60598-2-21:2014

Page 19 of 44

Dated:

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.8 (11)	CREEPAGE DISTANCES AND CLEARANCES			
21.8 (11.2)	Creepage distances and clearances	--		—
	Working voltage (V)	--		—
	Rated pulse voltage (kV)	--		—
	Voltage form	--	Sinusoidal <input type="checkbox"/> Non-sinusoidal <input type="checkbox"/>	—
	PTI	--	< 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/>	—
	Impulse withstand category (Normal category II) (Category III Annex U)	--	Category II <input type="checkbox"/> Category III <input type="checkbox"/>	—

*Total number of Requirements to be observed / inspected =
 Total No. of Applicable Requirement =
 No of Requirements for which the sample passed =

Total number of tests to be conducted =
 Total No. of Applicable Tests =
 No. of tests for which the sample passed =

Certificate: It is certified that the above tests were performed and found to be passing in the requirement tested.

.....
 (Approving Authority)

Report No.:	IS 10322 (Part 5/Sec 9): 2017/ IEC 60598-2-21:2014	Page 20 of 44
Dated:		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.10 (14)	SCREW TERMINALS			
	Separately approved; component list.....	--	(see Annex 1)	
	Part of the luminaire	--	(see Annex 3)	

*Total number of Requirements to be observed / inspected =
 Total No. of Applicable Requirement =
 No of Requirements for which the sample passed =

Total number of tests to be conducted =
 Total No. of Applicable Tests =
 No. of tests for which the sample passed =

Certificate: It is certified that the above tests were performed and found to be passing in the requirement tested.

.....
 (Approving Authority)

Report No.:	IS 10322 (Part 5/Sec 9): 2017/ IEC 60598-2-21:2014	Page 21 of 44
Dated:		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.10 (15)	SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS			
	Separately approved; component list.....	--		
	Part of the luminaire	--		

*Total number of Requirements to be observed / inspected =
 Total No. of Applicable Requirement =
 No of Requirements for which the sample passed =

Total number of tests to be conducted =
 Total No. of Applicable Tests =
 No. of tests for which the sample passed =

Certificate: It is certified that the above tests were performed and found to be passing in the requirement tested..

.....
 (Approving Authority)

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.11 (5)	EXTERNAL AND INTERNAL WIRING			
21.11 (5.2)	Supply connection and external wiring			
21.11 (5.2.1)	Means of connection*	--		
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment	--		
21.11 (5)	Type of cable*	--		
	Nominal cross-sectional area (mm ²)*	--		
	Cables equal to IEC 60227 or IEC 60245*	--		
	Luminaire provided with socket-outlet*	--		
21.11 (5.2.3)	Type of attachment, X, Y or Z*	--		
21.11 (5.2.5)	Type Z not connected to screws	--		
21.11 (5.2.6)	Cable entries:			
	- suitable for introduction	--		
	- adequate degree of protection	--		
21.11 (5.2.7)	Cable entries through rigid material have rounded edges*	--		
21.11 (5.2.8)	Insulating bushings:			
	- suitably fixed*	--		
	- material in bushings*	--		
	- material not likely to deteriorate*	--		
	- tubes or guards made of insulating material*	--		
21.11 (5.2.9)	Locking of screwed bushings*	--		
21.11 (5.2.10)	Cord anchorage:			
	- covering protected from abrasion	--		
	- clear how to be effective	--		
	- no mechanical or thermal stress	--		
	- no tying of cables into knots etc.	--		
	- insulating material or lining	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.11 (5.2.10.1)	Cord anchorage for type X attachment:			
	a) at least one part fixed	--		
	b) types of cable	--		
	c) no damaging of the cable	--		
	d) whole cable can be mounted	--		
	e) no touching of clamping screws	--		
	f) metal screw not directly on cable	--		
	g) replacement without special tool	--		
	Glands not used as anchorage	--		
	Labyrinth type anchorages	--		
21.11 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment	--		
21.11 (5.2.10.3)	Tests:			
	- impossible to push cable; unsafe	--		
	- pull test: 25 times; pull (N).....:	--		
	- torque test: torque (Nm).....:	--		
	- displacement ≤ 2 mm	--		
	- no movement of conductors	--		
	- no damage of cable or cord	--		
	- function independent of electrical connection	--		
21.11 (5.2.11)	External wiring passing into luminaire	--		
21.11 (5.2.12)	Looping-in terminals*	--		
21.11 (5.2.13)	Wire ends not tinned*	--		
	Wire ends tinned: no cold flow*	--		
21.11 (5.2.14)	Mains plug same protection*	--		
	Class III luminaire plug*	--		
	No unsafe compatibility*	--		
21.11 (5.2.15)	Colour coded red and black*	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.11 (5.2.16)	Appliance inlets (IEC 60320)*	--		
	Appliance couplers (IEC 61535)*	--		
21.11 (5.3)	Internal wiring			
21.11 (5.3.1)	Internal wiring of suitable size and type*	--		
	Through wiring			
	- not delivered/ mounting instruction	--		
	- factory assembled	--		
	- socket outlet loaded (A)	--		
	- temperatures	--		
	Green-yellow for earth only	--		
21.11 (5.3.1.1)	Internal wiring connected directly to fixed wiring*			
	Cross-sectional area (mm ²)	--		
	Insulation thickness	--		
	Extra insulation added where necessary	--		
21.11 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device*			
	Adequate cross-sectional area and insulation thickness	--		
21.11 (5.3.1.3)	Double or reinforced insulation for class II*	--		
21.11 (5.3.1.4)	Conductors without insulation*	--		
21.11 (5.3.1.5)	SELV current-carrying parts*	--		
21.11 (5.3.1.6)	Insulation thickness other than PVC or rubber*	--		
21.11 (5.3.2)	Sharp edges etc.*	--		
	No moving parts of switches etc.*	--		
	Joints, raising/lowering devices*	--		
	Telescopic tubes etc.*	--		
	No twisting over 360°	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.11 (5.3.3)	Insulating bushings:			
	- suitable fixed*	--		
	- material in bushings*	--		
	- material not likely to deteriorate*	--		
	- cables with protective sheath*	--		
21.11 (5.3.4)	Joints and junctions effectively insulated*	--		
21.11 (5.3.5)	Strain on internal wiring*	--		
21.11 (5.3.6)	Wire carriers*	--		
21.11 (5.3.7)	Wire ends not tinned*	--		
	Wire ends tinned: no cold flow*	--		
21.11.2 (-)	Cables for rope lights			
	Type of cable.....	--		
	Cables not lighter than IEC 60227 or IEC 60245 for class II rope lights	--		
	Cables not lighter than insulation according to 5.3.1 of part 1 for class III rope lights	--		
	Nominal cross-sectional area (mm ²).....	--		
	Mechanical properties according 4.14.1 and 4.14.2 of part 1	--		
21.11.3 (-)	Cord anchorage test			
	Pull test 30 N 25 times on single-core cable	--		
21.11.4 (-)	Plugs and cable length	--		
	Splash-proof plug or permanent connection if for outdoor use	--		
	Length of the cable between the plug and the connection to the rope light not less than 1,5 m	--		
21.11.5 (-)	Maximum length of extendable class II rope lights			
	Maximum length 100 m for 0,5 mm ² cable	--		
	Maximum length 150 m for 0,75 mm ² cable	--		

*Total number of Requirements to be observed / inspected =
Total No. of Applicable Requirement =

Dated:

No of Requirements for which the sample passed =

Total number of tests to be conducted =

Total No. of Applicable Tests =

No. of tests for which the sample passed =

Certificate: It is certified that the above tests were performed and found to be passing in the requirement tested.

.....
(Approving Authority)

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.12 (8)	PROTECTION AGAINST ELECTRIC SHOCK			
21.12 (8.2.1)	Live parts not accessible*	--		
	Basic insulated parts not used on the outer surface without appropriate protection*	--		
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires	--		
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires	--		
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements*	--		
	Basic insulation only accessible under lamp or starter replacement*	--		
	Protection in any position*	--		
	Double-ended tungsten filament lamp*	--		
	Insulation lacquer not reliable*	--		
	Double-ended high pressure discharge lamp*	--		
	Relevant warning according to 3.2.18 fitted to the luminaire*	--		
21.12 (8.2.2)	Portable luminaire adjusted in most unfavourable position*	--		
21.12 (8.2.3.a)	Class II luminaire:			
	- basic insulated metal parts not accessible during starter or lamp replacement*	--		
	- glass protective shields not used as supplementary insulation*	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.12 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed*	--		
21.12 (8.2.3.c)	SELV circuits with exposed current carrying parts:			
	Ordinary luminaire:			
	- touch current	--		
	- no-load voltage	--		
	Other than ordinary luminaire:			
	- nominal voltage	--		
21.12 (8.2.4)	Portable luminaire have protection independent of supporting surface*	--		
21.12 (8.2.5)	Compliance with the standard test finger or relevant probe	--		
21.12 (8.2.6)	Covers reliably secured*	--		
21.12 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$	--		
	Portable plug connected luminaire with capacitor	--		
	Other plug connected luminaire with capacitor	--		
	Discharge device on or within capacitor	--		
	Discharge device mounted separately	--		

*Total number of Requirements to be observed / inspected =
 Total No. of Applicable Requirement =
 No of Requirements for which the sample passed =

Total number of tests to be conducted =
 Total No. of Applicable Tests =
 No. of tests for which the sample passed =

Certificate: It is certified that the above tests were performed and found to be passing in the requirement tested.

.....
 (Approving Authority)

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.13 (12)	ENDURANCE TEST AND THERMAL TEST			
21.13.1 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 21.14			
21.13 (12.3)	Endurance test:	--		
	- mounting-position.....:	--		—
	- test temperature (°C).....:	--		—
	- total duration (h).....:	--		—
	- supply voltage: Un factor; calculated voltage (V).....:	--		—
	- lamp used.....:	--		—
21.13 (12.3.2)	After endurance test:	--		
	- no part unserviceable*	--		
	- plastic ES lampholder not deformed*	--		
	- luminaire not unsafe*	--		
	- no damage to track system*	--		
	- marking legible*	--		
	- no cracks, deformation etc. *	--		
21.13 (12.4)	Thermal test (normal operation)	--		
21.13 (12.5)	Thermal test (abnormal operation)	--		
21.13 (12.6)	Thermal test (failed lamp control gear condition):			
21.13 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)	--		—
	- case of abnormal conditions.....:	--		—
	- electronic lamp control gear	--		
	- measured winding temperature (°C): at 1,1 Un	--		—
	- measured mounting surface temperature (°C) at 1,1 Un.....:	--		
	- calculated mounting surface temperature (°C):	--		
	- track-mounted luminaires	--		
21.13 (12.6.2)	Temperature sensing control	--		

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
	- case of abnormal conditions.....:	--		—
	- thermal link	--		
	- manual reset cut-out	--		
	- auto reset cut-out	--		
	- measured mounting surface temperature (°C):	--		
	- track-mounted luminaires	--		
21.13 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):			
21.13 (12.7.1)	Luminaire without temperature sensing control			
21.13 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W			
	Test method 12.7.1.1 or Annex W	--		—
	Test according to 12.7.1.1:			
	- case of abnormal conditions.....:	--		—
	- Ballast failure at supply voltage (V)	--		—
	- Components retained in place after the test	--		
	- Test with standard test finger after the test	--		
	Test according to Annex W:			
	- case of abnormal conditions.....:	--		—
	- measured winding temperature (°C): at 1,1 Un..	--		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un	--		—
	- calculated temperature of fixing point/exposed part (°C)	--		—
	Ball-pressure test.....	--		
21.13 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA			
	- case of abnormal conditions.....:	--		
	- measured winding temperature (°C): at 1,1 Un..	--		
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un	--		
	- calculated temperature of fixing point/exposed part (°C)	--		
	Ball-pressure test.....	--		

Report No.:

IS 10322 (Part 5/Sec 9): 2017/
IEC 60598-2-21:2014

Page 30 of 44

Dated:

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.13 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA	--		
	- case of abnormal conditions.....	--		
	- Components retained in place after the test	--		
	- Test with standard test finger after the test	--		
21.13 (12.7.2)	Luminaire with temperature sensing control	--		
	- thermal link.....	--	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- manual reset cut-out.....	--	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- auto reset cut-out.....	--	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- case of abnormal conditions.....	--		—
	- highest measured temperature of fixing point/ exposed part (°C).....	--		—
	Ball-pressure test.....	--		
21.13.2 (-)	Test voltage			
	Provision of 12.3.1 d) of part 1 and if class III rope lights 1,1 x rated voltage of transformer/convertor	--		—
	Provision of 12.4.1 d) of part 1 and if class III rope lights 1,06 x rated voltage of transformer/convertor	--		—
21.13.3 (-)	Short-circuit test of rectifier			
	No emission of flames or molten material or production of flammable gases and no live parts accessible when short-circuit output of the rectifier	--		

*Total number of Requirements to be observed / inspected =
 Total No. of Applicable Requirement =
 No of Requirements for which the sample passed =

Total number of tests to be conducted =
 Total No. of Applicable Tests =
 No. of tests for which the sample passed =

Certificate: It is certified that the above tests were performed and found to be passing in the requirement tested.

.....
 (Approving Authority)

TRF No. BIS_LUM/EL_IS10322-5-9_V1.0

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.14 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE			
21.14 (-)	If IP > IP 20 the order of tests as specified in clause 21.13			
21.14 (9.2)	Tests for ingress of dust, solid objects and moisture:	--		—
	- classification according to IP.....:	--		—
	- mounting position during test.....:	--		—
	- fixing screws tightened; torque (Nm).....:	--		—
	- tests according to clauses.....:	--		—
	- electric strength test afterwards	--		
	a) no deposit in dust-proof luminaire	--		
	b) no talcum in dust-tight luminaire	--		
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard	--		
	d) i) For luminaires without drain holes – no water entry	--		
	d) ii) For luminaires with drain holes – no hazardous water entry	--		
	e) no water in watertight luminaire	--		
	f) no contact with live parts (IP 2X)	--		
	f) no entry into enclosure (IP 3X and IP 4X)	--		
	f) no contact with live parts (IP3X and IP4X)	--		
	g) no trace of water on part of lamp requiring protection from splashing water	--		
	h) no damage of protective shield or glass envelope	--		
21.14 (9.3)	Humidity test 48 h	--		

Report No.:

IS 10322 (Part 5/Sec 9): 2017/
IEC 60598-2-21:2014

Page 32 of 44

Dated:

*Total number of Requirements to be observed / inspected =
Total No. of Applicable Requirement =
No of Requirements for which the sample passed =

Total number of tests to be conducted =
Total No. of Applicable Tests =
No. of tests for which the sample passed =

Certificate: It is certified that the above tests were performed and found to be passing in the requirement tested.

.....
(Approving Authority)

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.15 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH			
21.15 (10.2.1)	Insulation resistance test	--		
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø	--		—
	Insulation resistance (MΩ).....	--		—
	SELV	--		
	- between current-carrying parts of different polarity	--		
	- between current-carrying parts and mounting surface	--		
	- between current-carrying parts and metal parts of the luminaire.....	--		
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	--		
	- Insulation bushings as described in Section 5 ..	--		
	Other than SELV	--		
	- between live parts of different polarity	--		
	- between live parts and mounting surface	--		
	- between live parts and metal parts	--		
	- between live parts of different polarity through action of a switch.....	--		
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	--		
	- Insulation bushings as described in Section 5 ..	--		
21.15 (10.2.2)	Electric strength test	--		
	Dummy lamp	--		
	Luminaires with ignitors after 30 h test	--		
	Luminaires with manual ignitors	--		
	Test voltage (V).....	--		
	SELV	--		
	- between current-carrying parts of different polarity	--		

Report No.:

IS 10322 (Part 5/Sec 9): 2017/
IEC 60598-2-21:2014

Page 34 of 44

Dated:

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
	- between current-carrying parts and mounting surface	--		
	- between current-carrying parts and metal parts of the luminaire.....	--		
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	--		
	- Insulation bushings as described in Section 5 ..	--		
	Other than SELV	--		
	- between live parts of different polarity	--		
	- between live parts and mounting surface	--		
	- between live parts and metal parts	--		
	- between live parts of different polarity through action of a switch.....	--		
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	--		
	- Insulation bushings as described in Section 5 ..	--		
21.15 (10.3)	Touch current or protective conductor current (mA)	--		

*Total number of Requirements to be observed / inspected =
Total No. of Applicable Requirement =
No of Requirements for which the sample passed =

Total number of tests to be conducted =
Total No. of Applicable Tests =
No. of tests for which the sample passed =

Certificate: It is certified that the above tests were performed and found to be passing in the requirement tested.

.....
(Approving Authority)

Report No.:

IS 10322 (Part 5/Sec 9): 2017/
IEC 60598-2-21:2014

Page 35 of 44

Dated:

Clause No	Test / Requirement name	Code	Test result/ observation	Verdict
21.16 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING			
21.16 (13.2.1)	Ball-pressure test.....	--		
21.16 (13.3.1)	Needle-flame test (10 s)	--		
21.16 (13.3.2)	Glow-wire test (650°C).....	--		
21.16 (13.4)	Proof tracking test (IEC 60112)	--		
20.16 (-)	Flexible pipes of rope lights in compliance with IEC 60811-508	--		

*Total number of Requirements to be observed / inspected =
Total No. of Applicable Requirement =
No of Requirements for which the sample passed =

Total number of tests to be conducted =
Total No. of Applicable Tests =
No. of tests for which the sample passed =

Certificate: It is certified that the above tests were performed and found to be passing in the requirement tested.

.....
(Approving Authority)

Dated:

21.8 (11.2)	TABLES: Creepage distances and clearances						
Table 11.1	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						
RMS working voltage (V) not exceeding		50	150	250	500	750	1000
Creepage distances							
Required basic insulation, PTI ≥ 600		0,6	0,8	1,5	3	4	5,5
Measured							
Required basic insulation, PTI < 600		1,2	1,6	2,5	5	8	10
Measured							
Required supplementary insulation PTI ≥ 600		-	0,8	1,5	3	4	5,5
Measured							
Required supplementary insulation PTI < 600		-	1,6	2,5	5	8	10
Measured							
Required reinforced insulation		-	3,2	5	6	8	11
Measured							
Clearances							
Required basic insulation		0,2	0,8	1,5	3	4	5,5
Measured							
Required supplementary insulation		-	0,8	1,5	3	4	5,5
Measured							
Required reinforced insulation		-	1,6	3	6	8	11
Measured							
Table 11.2	Minimum distances (mm) for non-sinusoidal pulse voltages						
Rated pulse voltage (peak kV)		2,0	2,5	3,0	4,0	5,0	8,0
Required clearances		1,0	1,5	2	3	4	5,5
Measured							
Rated pulse voltage (peak kV)		10	12	15	20	25	40
Required clearances		11	14	18	25	33	60
Measured							
Rated pulse voltage (peak kV)		50	60	80	100	-	-
Required clearances		75	90	130	170	-	-
Measured							

ANNEX A	Requirements for interconnecting connectors for use in rope lights		
	This Annex A consist relevant requirements and modifications of IEC 61984		
5.2	Classification according to protection against electric shock		
	Only enclosed connectors		
5.3	Classification according to the style of connector		
	Only free connectors		
5.4	Classification according to additional characteristics of connectors		
	According b), d), e), f), h), and j)		
6.2.1	Identification		
	According a) and b)		
6.4.1	Non accessibility of live parts		
	Test with test finger on class II rope lights		
6.9.1	Polarisation		
	Improper connection of mating parts is prevented		
	No unsafe compatibility between connectors for class II and class III rope lights of the same manufacturer		
	Male part of class III rope lights not make contact in the female contact of low voltage connectors (e.g. IEC 60320)		
	Manufacturer designed connectors, no unsafe compatibility with systems according IEC 60320 and IEC 60906 and national domestic plug and socket-outlet systems in the country where the rope light is placed on the market		
6.9.3	Connection of conductors		
	Cross sectional area of the contact making part of the interconnecting coupler not less than the corresponding conductor in the interconnected cable		
6.10	Design of a CBC		
	Adequate breaking capacity		
	Female part at the end of the rope light, other than ordinary, provided with sealing device securely fixed to the coupler		
6.13	Dielectric strength		
	Test according clause 21.15 of this standard		
6.14.2	Electrical endurance (CBC)		
	Meet the specified breaking capacity		
	Number of cycles 50		—

Dated:

	Test according 7.3.5		
6.14.3	Bendings (non-rewirable connectors)		
	Meet the specified number of bendings		
	Number of cycles 1000		—
	Test according 7.3.10		
6.17	Cable clamp		
	Test according clause 21.11.3 of this standard		

Dated:

ANNEX 1		TABLE: Critical components information					
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
Description:							
Description:							
Description:							

Supplementary information:

¹⁾ Provided evidence ensures the agreed level of compliance. See OD-CB2039.

The codes above have the following meaning:

A - The component is replaceable with another one, also certified, with equivalent characteristics

B - The component is replaceable if authorised by the test house

C - Integrated component tested together with the appliance

D - Alternative component

Report No.:

IS 10322 (Part 5/Sec 9): 2017/
IEC 60598-2-21:2014

Page 40 of 44

Dated:

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12					
	Type reference			—		
	Lamp used			—		
	Lamp control gear used			—		
	Mounting position of luminaire			—		
	Supply wattage (W)			—		
	Supply current (A)			—		
	Calculated power factor			—		
	Table: measured temperatures corrected for $t_a =$					
	- abnormal operating mode			—		
	- test 1: rated voltage			—		
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage			—		
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage			—		
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage			—		
Temperature measurements, (°C)						
Part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Supplementary information:						

ANNEX 3	Screw terminals (part of the luminaire)	
(14)	SCREW TERMINALS	
(14.2)	Type of terminal	—
	Rated current (A)	—
(14.3.2.1)	One or more conductors	
(14.3.2.2)	Special preparation	
(14.3.2.3)	Terminal size	
	Cross-sectional area (mm ²)	—
(14.3.3)	Conductor space (mm)	
(14.4)	Mechanical tests	
(14.4.1)	Minimum distance	
(14.4.2)	Cannot slip out	
(14.4.3)	Special preparation	
(14.4.4)	Nominal diameter of thread (metric ISO thread).....	
	External wiring	
	No soft metal	
(14.4.5)	Corrosion	
(14.4.6)	Nominal diameter of thread (mm)	
	Torque (Nm).....	
(14.4.7)	Between metal surfaces	
	Lug terminal	
	Mantle terminal	
	Pull test; pull (N).....	
(14.4.8)	Without undue damage	

Dated:

ANNEX 4	Screwless terminals (part of the luminaire)		
(15)	SCREWLESS TERMINALS		
(15.2)	Type of terminal..... :		—
	Rated current (A)		—
(15.3.1)	Material		
(15.3.2)	Clamping		
(15.3.3)	Stop		
(15.3.4)	Unprepared conductors		
(15.3.5)	Pressure on insulating material		
(15.3.6)	Clear connection method		
(15.3.7)	Clamping independently		
(15.3.8)	Fixed in position		
(15.3.10)	Conductor size		
	Type of conductor		
(15.5)	Terminals and connections for internal wiring		
(15.5.1)	Mechanical tests		
(15.5.1.1.1)	Pull test spring-type terminals (4 N, 4 samples)		
(15.5.1.1.2)	Pull test pin or tab terminals (4 N, 4 samples)		
	Insertion force not exceeding 50 N		
(15.5.1.2)	Permanent connections: pull-off test (20 N)		
(15.5.2)	Electrical tests		
	Voltage drop (mV) after 1 h (4 samples)		
	Voltage drop of two inseparable joints		
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples)		
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples)		
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples)		
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples)		
(15.6)	Terminals and connections for external wiring		
(15.6.1)	Conductors		
	Terminal size and rating		

Dated:

15.6.2	Mechanical tests	
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N)	
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N)	
(15.6.3)	Electrical tests	
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1	

(15.6.3.1) (15.6.3.2)	TABLE: Contact resistance test / Heating tests										
	Voltage drop (mV) after 1 h										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop of two inseparable joints										
	Voltage drop after 10th alt. 25th cycle										
	Max. allowed voltage drop (mV) :										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop after 50th alt. 100th cycle										
	Max. allowed voltage drop (mV) :										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 10th alt. 25th cycle										
	Max. allowed voltage drop (mV) :										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 50th alt. 100th cycle										
	Max. allowed voltage drop (mV) :										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
Supplementary information:											

Report No.:

IS 10322 (Part 5/Sec 9): 2017/
IEC 60598-2-21:2014

Page 44 of 44

Dated:

Attachment -1

Photo Document

***** END OF TEST REPORT *****