



सत्यमेव जयते

भारत सरकार
Government of India

0048

उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, उपभोक्ता मामले विभाग
Ministry of Consumer Affairs, Food & Public Distribution, Department of Consumer Affairs

राष्ट्रीय परीक्षण शाला (पश्चिमी क्षेत्र)

NATIONAL TEST HOUSE (Western region)

प्लॉट सं. एफ-१०, एम.आई.डी.सी., मरोल, अंधेरी (पूर्व), मुंबई - 400 093

Plot No. F-10, M.I.D.C., Marol Andheri (E), Mumbai - 400 093



038655

TEST CERTIFICATE

INTERIM/FINAL REPORT

परीक्षण प्रमाण पत्र सं Test Certificate No NTH(WR)/EL(A)/2018/0058C	जारी होने की तिथि Date of Issue 20/03/2018	कोड नं Code No 1518087828493	पृष्ठ Page 1	पृष्ठों की संख्या No of Pages 2
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जिसे जारी करना है
Issued To : BEEKAY INDUSTRIES

पता
Address : UNIT No50/408, MOTILAL NAGAR-1, ROAD NO.12,
GOREGAON(W), MUMBAI-400104

ग्राहक का संदर्भ सं एवं दिनांक
Customer's Ref. No. : NIL Date: 08/02/2018

पंजिका सं एवं दिनांक
Register No & Date : 0058/NTH(WR)/EL(A)/09/02/2018

परीक्षण सामग्री का विवरण
Description of Test Item : flush type switch with cover & cover plate for domestic &
similar purposes, 20A, AC, pattern 1Å brand KUNDAN.

परीक्षण सामग्री का पहचान
Identification of Test Item : flush type switch with cover & cover plate for domestic &
similar purposes, 20A, AC, pattern 1,brand KUNDAN.

नमूना का विशिष्टि (यदि हों)
Product Specification (If any) : IS: 3854-1997(Amdt.1-7),

नमूना प्राप्ति की तिथि
Date of Receipt of the Test Item : 08/02/2018

कार्य सम्पादन की तिथि
Date(s) of Performance of Tests : From: 09/02/2018 To: 20/03/2018

व्यावहृत प्रणाली का पहचान
Method(s) used for Test : IS: 3854-1997(Amdt.1-7),

नमूना प्रक्रिया बही प्रासंगिक हों
Sampling Procedure where relevant : NA

Tested By

Dateep G. Desai

Scientist-SB(Electrical)

Checked By

Rane Narendra Dodhu

Scientist-SC(Electrical)

Approved By

Rane Narendra Dodhu

Scientist-SC(Electrical)



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पृष्ठों की संख्या
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Sl. No.	Test Name	Test Result	Limit
1	type tests	AS PER ANNEXURE	As per Annexure
टिप्पणी Note	1) Annexure (8 pages) forms a part of test certificate. 2) the average ambient condition inside the laboratory during the period of above test Temperature deg C :29 Relative humidity, % :75		
कैफियत Remarks	The sample complies with the requirements of the specification No IS: 3854-1997(Amdt.1 -7), in respect of test carried out.		

Tested By
Daleep G. Desai

Daleep G. Desai
Scientist-SB(Electrical)

Checked By

Rane Narendra Dodhu

Rane Narendra Dodhu
Scientist-SC(Electrical)

Approved By

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Annexure

10 nos. of flush type switch with cover & cover plate for domestic & similar purposes, 20A, AC, pattern 1, "KUNDAN" brand. 9 switches marked A, B, C...G, H & I and subjected to the following examinations, measurements and tests in accordance with IS: 3854-1997(Amdt.1-7), the result is noted below:

Tests

Sr.	Description of tests	Requirements	Observation		
a)	Rating (cl.6) Rated Current and Rated Voltage	Inspection of marking	A 20A ; 240V		
b)	Classification (cl.7) i. According to possible connection (cl.7.1.1) ii. According to contact opening (cl.7.1.2) iii. According to Protection against electric shock (cl.7.1.3) iv. According to harmful ingress of water (cl.7.1.4) v. According to method of activating switch (cl.7.1.5) vi. According to method of application (cl.7.1.6) vii. According to method of installation (cl.7.1.7) viii. According to type of terminal (cl.7.1.8)		Pattern No. 1 Normal gap Unenclosed Ordinary (IPX0) Rocker flush type Design B Screw type		
c)	Marking Test (cl.8) i. Marking on switch (cl.8.1) Rated Current, Amperes Rated Voltage, Volts Symbol to indicate nature of supply Manufacturer's Identification mark Country of Manufacture Any other Marking			Shall be identified by L/L1/L2 or ↑ Shall be identified by letter N Marking shall clearly indicate affect achieved by each position Shall be marked red only if it serves to open the circuit to be controlled & serves to control the auxiliary circuit Shall be legible & durable	20A 240 - AC ONLY KUNDAN MADE IN INDIA 1 On switch base & plate N/A N/A N/A N/A Legible & durable
ii.	Inspection of placement of marking (cl.8.3)				
iii.	Identification of terminal for connection of phase Conductor (cl.8.4)				
iv.	Identification of terminal intended exclusively for Neutral Conductor (cl.8.5)				
iv.	Direction of actuating movement for switch of Pattern 2/3/03 and having rated voltage exceeding 250V or rated current exceeding 16A (cl.8.6)				
v.	Inspection of push button switch (cl.8.7)				
vi.	Test for Durability & Legibility of marking (cl.8.9)				
vii.	Standard Mark on switch (cl.8.10) CML	IS	-- - - - - -		

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Annexure

Sr.	Description of tests	Requirements	Observation		
			A	B	C
d)	Protection against electric shock (cl.10)				
i.	Accessibility of live parts (cl.10.1)	Shall not be accessible			Live parts not accessible
ii.	Material of knob, operating lever, push button, rockers and the likes (Cl.10.2)	Shall be of insulating material			Made of insulating material
e)	Provision for Earthing (Cl.11)				No earthing terminal/contact provided
f)	Terminals (cl.12) (Tested after test of cl.15)				
i.	General (Cl.12.1)	Screw clamping or screwless			Provided with terminals having screw clamping
	Test for terminals with screw clamping for external copper conductor (cl.12.2)				
	Inspection/Test of terminals with screw clamping for external copper conductor (Clause 12.2.1)	Shall allow connection of copper conductor of cross section area 2.5-6mm ²			Allows connection of conductor of cross section area 2.5-6 mm ²
ii.	Inspection of terminal (Clause 12.2.2)	Shall allow conductor to be connected without special preparation			No special preparation for connection
iii.	Minimum dimension (D) of conductor space (Ref.: Fig 4)	4.0 mm Minimum		4.3	
iv.	Test for Adequacy of Mechanical Strength of Terminals with screw clamping (Clause 12.2.3)	Shall have adequate mechanical strength & shall not be of soft metal			Screw of adequate mechanical strength & not of soft material
v.	Test of terminal with screw clamping for resistance to corrosion (Clause 12.2.4)	Shall be resistant to corrosion			No sign of rust observed
vi.	Test for design of terminal (Clause 12.2.5) (Note: Range nominal diameter of terminal, mm: 3.6 to 4.1 Applicable torque as per col 3 of table 5, : 1.2Nm)	Solid conductor or any strands of conductor shall not come out or break at the terminal			No damage to conductor observed
vii.	Test for terminal with screw clamping for reliability of clamping of conductor (Clause 12.2.6)	Terminal shall be so designed that they clamp the conductor reliably and between metal surfaces			Conductor did not move noticeably in the terminal
viii.	Test for design of terminal with screw clamping for reliability of clamping of conductor (Clause 12.2.7)	Neither a rigid solid conductor nor wire of stranded conductor slip out while clamping screw are tightened			No conductor slipped out while clamping screw was tightened
ix.	Test for fixing and location of terminal with screw clamping against loosening from their fixing to switch (Clause 12.2.8)	Terminal shall not work loose from their fixing when clamping screws are fitted with 4mm ² and tightened/loosened 5 times with 1.2Nm			Terminal did not work loose and no damage to screw head slot/ thread etc. occurred.
x.	Test for Adequacy of Mechanical Strength of earthing terminals with screw clamping (Clause 12.2.9)	Shall have adequate mechanical strength & shall not be of soft metal			N/A



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Annexure

Sr.	Description of tests	Requirements	Observation		
			A	B	C
ix.	Test of earthing terminal with screw clamping for resistance to corrosion (Clause 12.2.10)	Shall be resistant to corrosion	N/A		
x.	Test for conductor space for pillar terminal only (cl.12.2.11)				
xi.	Minimum distance (g) between the clamping crew and the the end of the conductor (Ref Fig 4)	2.0 mm Minimum	N/A		
xii.	Inspection of lug terminal for use with switch (cl.12.12)	Shall be used with current rating 40A & 63A only	N/A		
xiii.	Test for screwless terminals (cl.12.13)		N/A		
g)	Constructional requirements (cl.13)				
i.	Inspection of insulating line barrier after mechanical strength test (cl.13.1)	Shall have adequate mechanical strength	N/A		
ii.	Clause 13.2: Switch shall permit Easy introduction and connection of conductor in the terminals Correct positioning of conductor		Satisfactory		
iii.	Clause 13.3 Test for effectiveness of cover/cover plate, actuating member which provide protection against electric shock				
	Clause 13.3.1: Inspection of cover, cover plate and actuating members or part of then which intend to provide protection against electric shock	Shall be held in place at least 2 points by screw. Single fixing by screw shall be permitted if they are located by another means such as shoulder			Cover plate with provision for fixing by screws
	Clause 13.3.2: Inspection of cover, cover plate and actuating members or part of them whose fixing is not dependent on screw and removal is obtained by applying force for 1minute in direction perpendicular to mounting surface (Ref cl.20.4)	Cover, cover plate and /or actuating member shall not come off when 40N is applied & shall come off when force exceeding 120N is applied			N/A As cover-plate is fixed with screw
	Clause 13.3.3: Inspection of cover, cover plate and actuating members or part of them whose fixing is not dependent on screw and removal is obtained by using tool as per manufacturer instruction (Removal of actuating plate gives access to live parts hence compliance by cl.20.4)	Covers, cover plate and actuating mechanism shall not come off when force not exceeding 120N is applied for 1 min in direction perpendicular to mounting surface			Actuating member didn't come off
iv.	Clause 13.4: Inspection of for free opening in enclosure of ordinary switches when fixed and wired as in normal use with 2.5mm ²	Shall have no opening	Satisfactory		
v.	Clause 13.5 Inspection of knobs of rotary switch		N/A		
vi.	Clause 13.6: Inspection of screw or other means of mounting the switch	Shall be easily accessible from front & serve no purpose other than fixing	Satisfactory		



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Annexure

Sr.	Description of tests	Requirements	Observation		
			A	B	C
vii.	Inspection of combination of switches and switches with socket outlet with separate base (cl.13.7)	Shall ensure correct positioning of each base	N/A		
viii.	Test for accessory combined with switches (cl.13.8)		N/A		
ix.	Test for switches other than ordinary (cl.13.9)		N/A		
x.	Installation test using conductor of 1.5mm ² for switches be fixed in a box (cl.13.10)				
xi.	Inspection of surface type switches other than ordinary (cl.13.11)		N/A		
xii.	Inspection of inlet opening in surface type switches for introduction of conduit (cl.13.12)		N/A		
xiii.	Inspection of ordinary surface type switches for back entry from conduit (cl.13.13)		N/A		
xiv.	Inspection of switches provided with membranes or the like for inlet opening (cl.13.14)	Shall be replaceable	N/A		
xv.	Test for membranes in inlet opening (cl.13.15)		N/A		
h)	Mechanism (Cl.14)				
i.	Inspection of actuating mechanism (Clause 14.1)	Actuating mechanism shall automatically take position corresponding to moving contacts	Satisfactory		
ii.	Inspection of actuating mechanism (Clause 14.2)	Moving contacts shall rest in ON /OFF position	Satisfactory		
iii.	Inspection of actuating mechanism (pattern 2 only) (Clause 14.4)	Actuating mechanism shall make & break all poles simultaneously	N/A		
iv.	Inspection of actuating mechanism (pattern 2 only) (Clause 14.5) (if cover plate removable)	Actuating mechanism of shall be independent of the presence of cover/cover plate	N/A		
j)	Resistance to ageing, to harmful ingress of water and to humidity (cl.15)				
i.	Resistance to ageing (cl.15.1) (@ 70± 2 °C -7 days & 4 days @ 45%-55%RH)	Shall show no crack(s) or stickiness	No stickiness or cracks observed		
ii.	Resistance to humidity (cl.15.3) (@ 91%-95%RH for 2 days) Insulation resistance (cl.16.1) measured by applying 500VDC for 60s between	Shall show no damage	No damage observed		
	• all terminals (1 & 2) connected together and the body with the switch in "ON" position	5 MΩ Min.	More than 5 MΩ		
	• Terminal 1 connected and body connected to terminal (2) with switch in "OFF" position	2 MΩ Min	More than 5 MΩ		
	• Terminal 2 connected and body connected to terminal (1) with switch in "OFF" position	2 MΩ Min	More than 5 MΩ		
	Electric strength (cl.16.2) of insulation tested by applying 2kV/ 50Hz for 60s between				
	• all terminals (1 & 2) connected together and the body with the switch in "ON" position	No flashover/ break-down shall occur	Satisfactory		
	• each terminal in turn and other terminal connected to the body with switch in "ON" position	No flashover/ break-down shall occur	Satisfactory		
	• terminals which are electrically connected together when the switch is in "ON" position, the switch being in "OFF" position	No flashover/ break-down shall occur	Satisfactory		

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Form No : NTH (WR)/MUM-5

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Annexure

Sr.	Description of tests	Requirements	Observation		
			A	B	C
k)	Temperature rise test(cl.17) Temperature rise when 25A is passed for 1hr, °C	45°C Max.	21	23	22
m)	Making & Breaking capacity(cl.18)				
i.	Poles connected in series (18.1) (200 operations at 15op/min @ 264V & 25A with 4s ON and 4s OFF at pf:0.3 ± 0.05)	There shall be no sustained arcing	Satisfactory		
ii.	One pole at full load (cl.18.1) (Switch of pattern 2 only) (100 operations at 7.5op/min with both poles in series @ 253V & 00A at pf:0.3 ± 0.05)	There shall be no sustained arcing	N/A		
iii.	Test as per cl.18.2 (100 operations at 15op/min with 4s ON and 4s OFF using 23 lamps of 200W)	There shall be no sustained arcing	A	B	C
			N/A		
n)	Normal operation (cl.19)				
i.	Poles connected in series (cl.19.1) (20000 operation @ 15op/min @ 240V & 20A; @p.f.0.6±0.05) with 2s ON and 6s OFF	Shall function correctly during the test	Satisfactory		
•	Electric strength test after above test (cl.16) Tested by applying 1500V/50Hz for 60s between				
•	all terminals (1 & 2) connected together and the body with the switch in "ON" position	No flashover/ break-down shall occur	No flashover/ break- down occurred		
•	each terminal in turn and other terminal connected to the body with switch in "ON" position	No flashover/ break-down shall occur	No flashover/ break- down occurred		
•	terminals which are electrically connected together when the switch is in "ON" position, the switch being in "OFF" position	No flashover/ break-down shall occur	No flashover/ break- down occurred		
•	Temperature rise test(cl.17) Temperature rise when 20A is passed for 1hr, °C	45°C Max.	28	29	29
•	Inspection of actuating mechanism (Clause 14.3) (10 operations steadily with actuating moved over 2s)	No undue arcing shall occur	Satisfactory		
ii.	One Pole at full load (cl.19.1) (Switch of pattern 2 only) (5000 operation @ 7.5op/min @ 240V & 32A; @p.f.0.6±0.05)	Shall function correctly	N/A		
•	Temperature rise test(cl.17) Temperature rise when 00A is passed for 1hr, °C	45°C Max.	-	N/A	-
•	Inspection of actuating mechanism (Clause 14.3) (10 operations steadily with actuating moved over 2s)	No undue arcing shall occur	N/A		
iii.	Fluorescent Lamp Load Test (cl.19.2)		D	E	F
•	Poles connected in series				
	Load A-5000 operation @ 15op/ min with 2s ON and 6s OFF; @ cosΦ:0.9±0.05; V _n :228V to 252V & I _n : 16A to 16.8A	No sustained arcing or permanent welding of contact shall occur	N/A		
	Load B- 100 operation @ 15 op/ min with 2s ON and 6s OFF; @ cosΦ:0.9±0.05; V _n :228V to 252V & I _n : 16A to 16.8A		N/A		

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Annexure

Sr.	Description of tests	Requirements	Observation		
			D	E	F
•	Temperature rise test(cl.17) Temperature rise when 16A is passed for 1 hour, °C	45°C Max.	-	N/A	-
iv.	One pole at full load (Switch of pattern 2 only)				
•	Load A- operation on each side @ op/ min with ON and OFF; @ $\cos\Phi:0.9\pm0.05$; V_n : & I_n :	No sustained arcing or permanent welding of contact shall occur		N/A	
•	Load B- operation on each side @ op/ min with ON and OFF; Test Voltage: & Test current:			N/A	
•	Temperature rise test(cl.17) Temperature rise when 20A is passed for 1 hour, °C	45°C Max.	-	N/A	-
p)	Mechanical strength (cl.20)				
i.	Impact test (Cl.20.1)	Shall show no damage & impair its further use		Satisfactory	
	Test for accessibility of live parts for switches provided with indicator lamp (cl.20.1)	Live parts shall not be accessible when tested with test finger		Satisfactory	
ii.	Test for base of surface type switch (cl.20.2) (Switch fitted to cylinder (Dia. 200mm Min.) of rigid steel; fixing screw tightened with 1.2Nm torque and then switch is fitted similarly to flat steel sheet.)	Base shall show no damage impairing its further use		N/A	
iii.	Test for screwed glands (cl.20.3)			N/A	
iv.	Force necessary for covers, cover plate and actuating mechanism to come off or not come off (cl.20.4) ❖ Verification of removal of covers, cover plate and actuating mechanism when force is applied for 1min (cl.20.4.1)	Covers, cover plate and actuating mechanism shall not come off.		Cover and actuating mechanism or part of them did not come off	
	❖ Verification of non-removal of covers, cover plate and actuating mechanism when force not exceeding 120N is applied (cl.20.4.2)	Actuating member shall not come off		Redundant	
v.	Test for operating member of cord operated switch (cl.20.9)			N/A	
q)	Resistance to heat (cl.21)				
i.	Test (cl.21.1) (Sample kept @ $100\pm2^\circ\text{C}$ for 1 hr.)	Marking shall remain legible		Marking legible	
ii.	Diameter of impression on part retaining current carrying part @ $125\pm2^\circ\text{C}$, mm (cl.21.2)	2 Max		1.0	
iii.	Diameter of impression parts not retaining current carrying part @ $75\pm2^\circ\text{C}$, mm (cl.21.3)	2 Max		0.5	



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Ministry of Consumer Affairs, Food & Public Distribution, Department of Consumer Affairs

राष्ट्रीय परीक्षण शाला (पश्चिमी क्षेत्र)

NATIONAL TEST HOUSE (Western region)

प्लॉट सं. एफ-१०, एम.आई.डी.सी., मरोल, अंधरी (पूर्व), मुंबई - 400 093

038655 Plot No. F-10, M.I.D.C., Marol Andheri (E), Mumbai - 400 093



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Annexure

Sr.	Description of tests	Requirements	Observation		
			A	B	C
r)	Screws, current carrying parts & Connections (cl.22)				
i.	Test for breakage of screws or damage to heads of screw connection when screws and nuts are tightened and loosened 5 times for screws not in engagement with thread of insulating with torque 1.2Nm (clause 22.1)	No damage shall occur to screw and heads that may impair its further use			Satisfactory
ii.	Inspection of screws in engagement with the thread of insulating material which are operated during installation (cl.22.2)	Shall ensure correct introduction into hole/nut			N/A
iii.	Inspection of design of electrical connection for transmission of contact pressure through insulating material (cl.22.3)	Shall not be transmitted through material other than mica, ceramic etc			Conforms
iv.	Inspection of screws and nuts which serve electrical as well as mechanical connection (clause 22.4)	Shall be locked against loosening and rotation			Satisfactory
v.	Test for resistance to corrosion of material of current carrying parts (clause 22.5)	Shall be resistant to corrosion			Satisfactory
vi.	Inspection of metal contacts subjected to sliding action during normal use (cl.22.6)	Shall be resistant to corrosion			N/A
vii.	Inspection of screws used for the connection of current carrying parts (cl.22.7)	Thread forming screws shall not be used			Satisfactory
s)	Creepage distance & clearances (cl.23)				
i.	Creepage distance (with and without conductor)				
a.	live parts which are separated when the contacts are open	3			More than 3 mm
b.	live parts of different polarity	4			N/A
c.	live parts and				
•	accessible surfaces of pans of insulating material	3			More than 3 mm
•	earthed metal parts, including the earthing circuit	3			N/A
•	metal frames supporting the base of flush-type switches	3			N/A
•	screws or devices for fixing bases, covers or cover-plates	3			More than 3 mm
•	metal parts of the mechanism, if required to be insulated from live parts (see 10.4)				
d.	metal parts of the mechanism, if required to be insulated from accessible metal parts{ 10.5), and				
•	screws or devices for fixing bases, covers or cover-plates	3			N/A
•	metal frames supporting the base of flush-type switches	3			N/A
•	accessible metal parts				
e.	live parts and accessible unearthed metal parts, with the exception of screws and the like	6			N/A
ii.	Clearances(with and without conductor)				
a.	live parts which are separated when the contacts are open	3			More than 3
b.	live parts of different polarity	3			N/A
c.	Live parts and				
•	Accessible surfaces of insulating material	3			More than 3 mm
•	Earthed metal parts, including the earthing circuit,	3			N/A
•	not mentioned under items 9 and 11	3			N/A
•	Metal frames supporting the base of flush-type switches	3			N/A
•	Screws or devices for fixing bases, covers, or cover-plates	3			More than 3 mm

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Sr.	Description of tests	Requirements	Observation		
			A	B	C
•	Metal parts of the mechanism, if required to be insulated from live parts (see 10.4)	3	N/A		
d.	live parts and				
•	exclusively earthed metal boxes with the switch mounted in the most unfavourable position	3	N/A		
•	unearthed metal boxes, without insulating lining with the switch mounted in the most unfavourable position	4.5	N/A		
e.	metal parts of the mechanism, if required to be insulated from accessible metal parts (10.5), and				
•	screws or devices for fixing bases, covers or cover-plates	3	N/A		
•	metal frames supporting the base of flush-type switches	3	N/A		
•	accessible metal parts when the base is fixed directly on the wall	3	N/A		
f.	live parts and the surface on which the base of a surface-type switch is mounted when the base is fixed directly on the wall	6	N/A		
g.	live parts and the bottom of the space, if any, for external conductors, for surface-type switches	3	N/A		
iii.	Distances through insulating sealing compound (with and without conductor)				
a.	Between live parts covered with at least 2 mm of sealing compound and toe surface on which the base of a surface type switch is mounted.	4	N/A		
b.	Between the parts covered with at least 2 mm of sealing compound and the bottom of the space, if any, for external conductors, for surface-type switches	2.5	N/A		
t)	Resistance of Insulating Material to Abnormal Heat, to Fire and to Tracking (cl.24)				G
i.	Glow Wire Test (cl.24.1)				
•	Parts of insulating material necessary to retain current carrying parts (@ 850°C)	•	No visible flame/ sustained glowing	Flame extinguish in 8s after removal of glowwire	
•	Parts of insulating material not necessary to retain current carrying parts (@ 650°C)	•	Flame, if any, shall extinguish in 30s after glow wire is removed	No visible flame or sustained glow	
u)	Resistance to Rusting (Cl.25)	•	Surface shall show no sign of rusting	No sign of rust observed	G H I

Tested by :

 Daleep G. Desai
 Scientist-SB (Electrical)

Checked by

 Rane Narendra Dodhu.
 Scientist-SC(Electrical)

Approved by :

 Rane Narendra Dodhu.
 Scientist -SC (Electrical)