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TECHNICAL SPECIFICATION FOR TOGGLE SWITCHES
FOR 3-PHASE ELECTRIC LOCOMOTIVES.

Specification No : CLW/ES/3/0075

ALT.C

ISSUE DATE: 21.02.1997

ENCLOSURES :
DRG NOS :-

1. CLW/ES/3/ SK-1/0075/C
2. CLW/ES/3/ SK-2/0075/C
3. CLW/ES/3/ SK-3/0075/C
4. CLW/ES/3/ SK-4/0075/C
5. CLW/ES/3/ SK-5/0075/C

TYPE :-

1. FSU9R20R20 or similar
2. SBM-F/TOU/21/22/R20 or similar
3. PS/7/9/S800A24 or similar
4. PS/0/3/S800A24 or similar
5. SBM-F/TUS0/21/22/R20 or similar

ISSUED BY :

DY.CHIEFELECTRICALENGINEER/D-II
CHITTARANJAN LOCOMOTIVE WORKS
P.O.CHITTARANJAN-713331
DIST.BARDHAMAN(WEST),WESTBENGAL (INDIA)

PREPARED BY:	CHECKED BY:	APPROVED BY;;
SSE/JE/DESIGN	AEE/DESIGN	DY.CEE/D-II

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ALTERATION RECORD SHEET

Alteration	Date of Amendment	Reason	Initial
A	31.03.2010	Modified Type Nos. of OEM for Spring loaded switch type A (six items), spring loaded switch for head light and spring loaded switch for head light intensity added . Alteration sheet no. 1/A added.	S/d-
B	01.02.2023	02 nos of Spring Loaded Switch for Hotel Load has been deleted for WAG-9 as per letter no.SSE/Testing/01dated.28.07.2022 at sheet no.4.	S/d-
C	Qty/Loco for spring loaded switch for pantograph (129), VCB (134), and AD-BLDJ is changed to 6 which mentioned at sheet no. 5	S/d-

Note:- Specifications have been digitized and all alterations have been incorporated.

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1. SCOPE :

This specification covers the manufacture and supply of spring-loaded switch of different equipment used for 3-Phase Electric Locomotives for 25 KV, 50 Hz system..

2. SERVICE CONDITION:

Climatic and environmental condition: -

Maximum atmospheric temperatures	Under Sun: +70°C. In shade.: +50°C.
Normal Humidity	60 %
Maximum Humidity	100% saturation during rainy season.
Altitude	160 m.a.s.l.
Rainfall	Very heavy in certain areas. The locomotive will be designed to permit it's running at 10 km/h in flood water level of 102 mm above rail level.
Atmosphere during hot weather	Extremely dusty and desert terrain in certain areas.
Coastal areas	Locomotive and equipment will be designed to work in coastal areas in humid and salt laden atmosphere.
Vibration.	The equipment , sub system and their mounting arrangement will be designed to withstand vibrations and shocks encountered in service as specified in corresponding unless otherwise prescribed.

3. STANDARDS

The equipment with its accessories shall comply with the Standard of IEC 60077, VDE 0115, VDE 0660. The relevant Indian standard specification shall also apply with respect to all materials used in the manufacture of switches.

Protective class :

IP00 DIN 40050



4. TECHNICAL DESCRIPTION

Contact : N/O

Shock : 500 m sec

Rating : 6A, 250 V

Mounting : Any Position

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3 position

: UP (+30 °) - Locked
: Centre (0 °) -Notched
: Down (-30 °) -Notched
: Flat tabs 6.3 mm

Connection

Weight

: 0.16 Kg (approx.)

5. SCOPE OF SUPPLY :

TYPE	DESCRIPTION	QTY / LOCO	MANUFACTURER REF. TYPE	MODIFIED TYPE NO.
A	Spring loaded switch for banking operation (153)	2 *	SBM-F/SU/9/R20/S840 or similar	FSU9R20R20 or similar
	Spring loaded switch for max - tractive effort limitation (151.1)	2		
	Spring loaded switch for front/ tail marker light (316.11) & (316.12)	4		
	Spring loaded switch for Driver's cabin light (324)& instrument lighting (324.1)	4		
	Spring loaded switch for Driver's desk (324.21) & asst. Driver's desk illumination (324.22)	4		
	Spring loaded switch for hand lamp (337)	2		
B	Spring loaded switch for Pantograph (129) VCB(134), AD-BLDJ	6	SBM-F/TOU/21/22/R20 or similar	
	Spring loaded switch for Hotel Load(169.1)	2**		
C	Spring loaded switch for head light (316)	2	SBM-PS/7/9/S800A20 or similar	PS/7/9/S800A24 or similar
D	Spring loaded switch for head light intensity (317)	2	SBM-PS/0/3/S800A20 or similar	PS/0/3/S800A24 or similar
E	Spring loaded switch for compressor (172)	2	SBM-F/TUS0/21/22/R20 or similar	

*For WAG-9 locos only

** For WAP-5 & WAP-7 locos only.

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6. SUBMISSION OF TENDER QUOTATION :

The tenderer shall give sufficient information to prove that his factory has adequate facilities and capacity to manufacture the equipment to meet fully the technical requirements of the specification and quality of materials and workmanship.

Quotation shall not be considered complete unless all information is furnished and are therefore reliable to be rejected.

Detailed drawing of Toggle Switches.

7. TESTS :

All tests should confirm to the standards as mentioned in serial no 3. of this specification.

8. TECHNICAL DOCUMENTS TO BE SUPPLIED BY THE SUPPLIER :

- i) Type test reports.
- ii) Routine test reports along with each set.
- iii) Maintenance manual.
- iv) Detailed drawings.

9. NAME PLATE :

The tenderer shall fix name plate on the equipment including (i) manufacturer's name and also monogram / brand (ii) Range of electrical ratings in watts (iii) Max. rated voltage (iv) Month and year of manufacture (v) Sl. no. of equipment.

10. QUALITY ASSURANCE AS PER ISO 9000 :

Mechanical life : 7500000 operations
Electrical life : typical 1.3×10^6 operations



11. REFERENCES :

The specification refers to the original manufacturer of :

**M/S. SCHALTBAU,
MUNCHEN GERMANY**

FAX. 0049 899 3005 – 350

12. Standard fasteners of M/s.TVS, M/s.LPS, M/s.UNBRAKO and spring washers of M/s.Forbes make only to be used.

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LOCKING	
YES	NO
	●

UP 30°	LOCKED * * *		
DOWN 30°			●

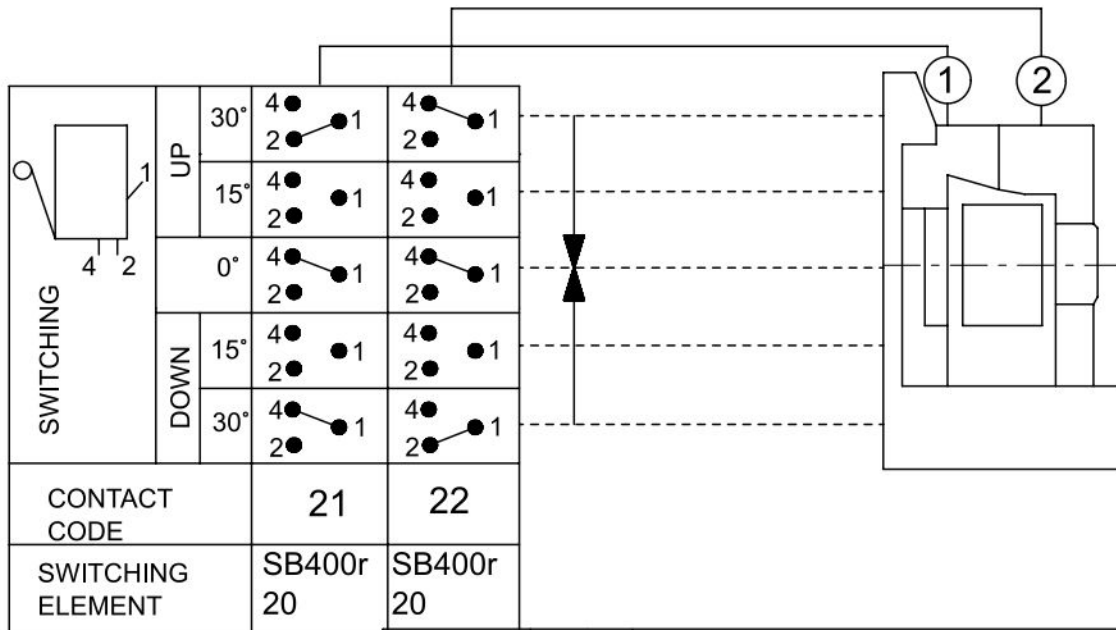
SHAPE OF HANDLE			
●			

SWITCH CAM FOR ELEMENT ②

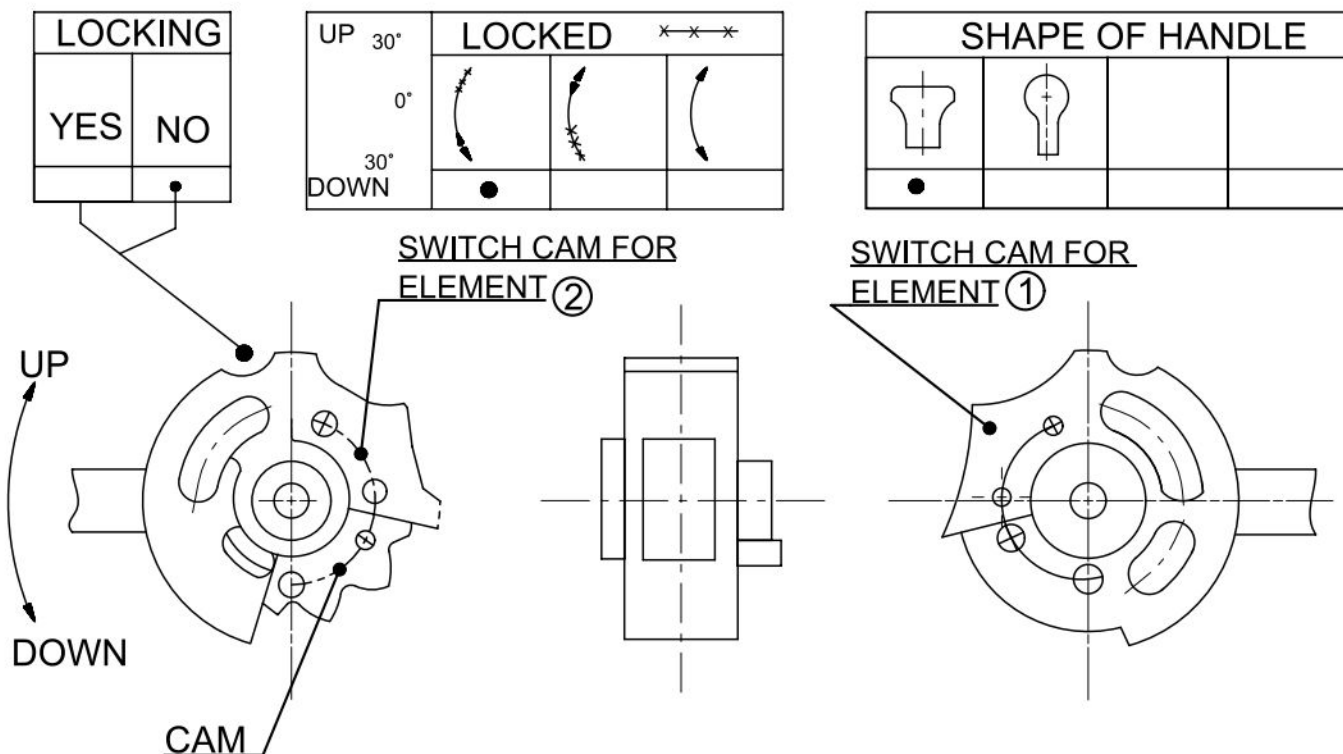
SWITCH CAM FOR ELEMENT ①

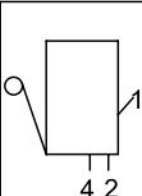


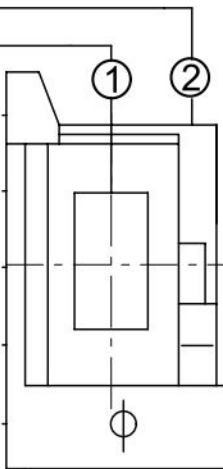








UP
DOWN

CAM

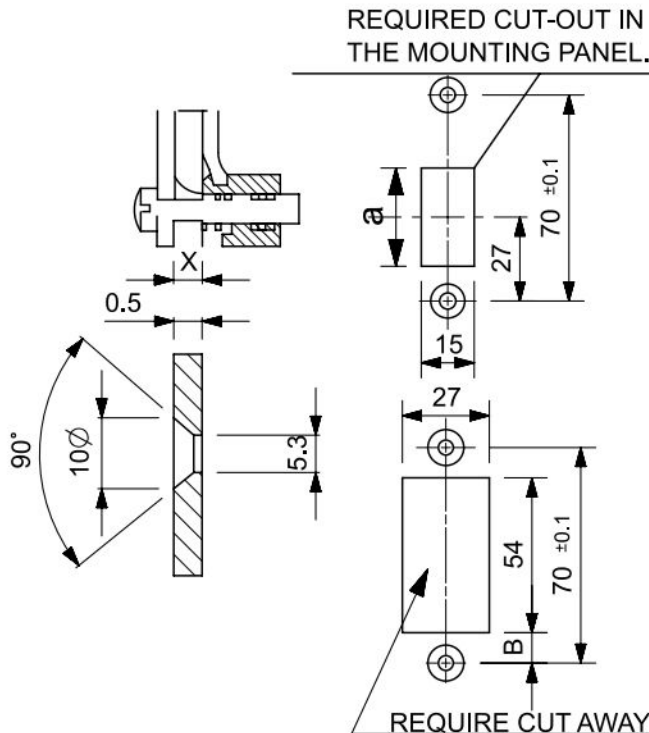
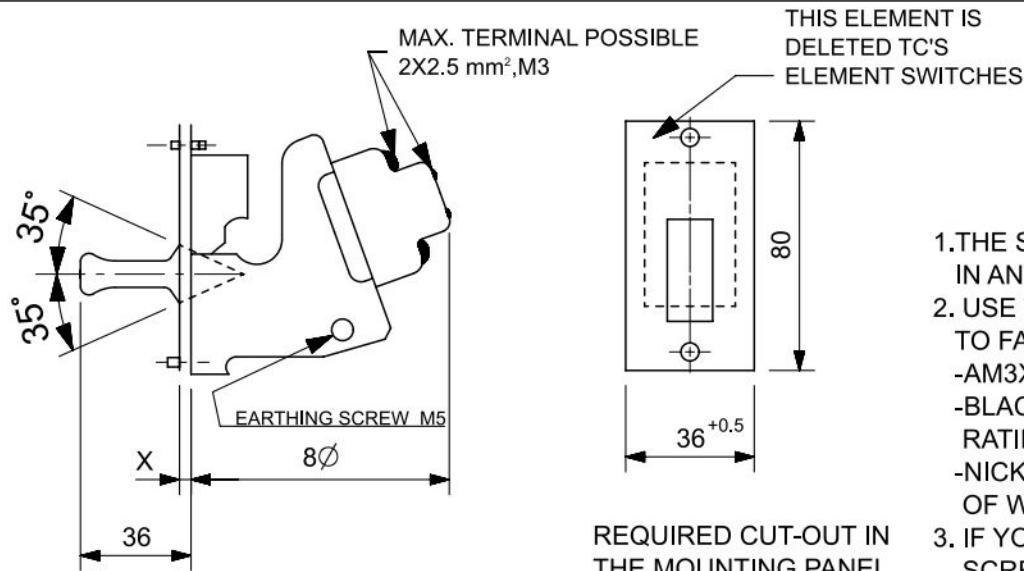


परिवर्तन संख्या ALT.NO.		प्राधिकार AUTHY		वर्णन DESCRIPTION		दिनांक बाह्य DATED INITIAL		समीक्षित स.वि.अ. / व.वि.अ. REVIEWED AEE / SEE		पदार्थ MATL		प्रति भार कि. ग्रा. WT. EACH IN KG	
सतह — रूखाता का मान भा. मा. 3073 / अ. मा. सं. 1302 SURFACE ROUGHNESS VALUE TO IS:3073 / ISO:1302		अनिर्दिष्ट सह — सीमा भा. मा. : 2102 / अ. मा. सं. : 2768 UNSPECIFIED TOLERANCE TO IS : 2102 / ISO : 2768		धातु-वेल्डिंग चिह्न भा. मा. : 813 / अ. मा. सं. : 2553 WELDING SYMBOLS TO IS:813 / ISO:2553		TOL. CLS.		अनुमोदित उ.मु.वि.अ. APPROVED DYCEE		विशिष्ट SPECN		वर्णन DESCRIPTION	
पदांक GRADE NO.		सं1 N1	सं2 N2	सं3 N3	सं4 N4	सं5 N5	सं6 N6	सं7 N7	सं8 N8	सं9 N9	सं10 N10	सं11 N11	सं12 N12
Rz		0.16-0.3	0.5-0.7	0.9-1.1	1.5-2.0	2.5-3.0	5.0-6.3	9.0-12	16-25	30-40	50-63	75-100	160-250
Ra μ m		0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50
चिह्न SYMBOL													



 SWITCHING	UP	30°			
		15°			
	0°				
	DOWN	15°			
		30°			
	CONTACT CODE		9	%	
SWITCHING ELEMENT		SB40 OR 20	X		

												अभिलेखित DGN			चितरंजन रेलइंजन कारखाना CHITTARANJAN LOCOMOTIVE WORKS, INDIA				
												जॉचा व.अ.अ. CHD SSE			पदार्थ MATL	प्रति चार कि. ग्रा. WT. EACH IN KG			
परिवर्तन संख्या ALT.NO.		प्राधिकार AUTHY		वर्णन DESCRIPTION						दिनांकित आधार DATED INITIAL		समीक्षित स.वि.अ. / व.वि.अ. REVIEWED AEE / SEE		विशिष्ट SPECN					
सतह - रुखा का मान भा. मा. 3073 / अ. मा. सं. 1302 SURFACE ROUGHNESS VALUE TO IS:3073 / ISO:1302		अनिर्दिष्ट सह - सीमा भा. मा. : 2102 / अ. मा. सं. : 2708 UNSPECIFIED TOLERANCE TO IS : 2102 / ISO : 2708						TOL. CLS.		अनुमोदित च.मु.वि.अ. APPROVED DYCEE		वर्णन DESCRIPTION		TOGGLE SWITCHES					
		धातु-वेल्डन चिह्न भा. मा. : 813 / अ. मा. सं. : 2883 WELDING SYMBOLS TO IS:813 / ISO:2553								दिनांक DATE									
पदांक GRADE NO.	सं1 N1	सं2 N2	सं3 N3	सं4 N4	सं5 N5	सं6 N6	सं7 N7	सं8 N8	सं9 N9	सं10 N10	सं11 N11	सं12 N12							
Rz	0.16-0.3	0.5-0.7	0.9-1.1	1.5-2.0	2.5-3.8	5.0-6.3	9.0-12	16-25	30-40	50-63	75-100	160-250							
Ra μm	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50							
चिह्न SYMBOL																			
संदर्भ / REF.												NTS		आरेखण संख्या DRAWING NO.		CLW/ES/3/SK-210075/C			
ALT. -														परिवर्तन संख्या ALTERATION. NO.		पर्ण SHEET		OF A4	



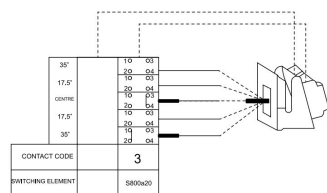
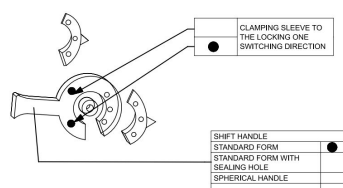
1. THE SWITCHES CAN BE MOUNTED IN ANY POSITIONS.
2. USE THE FOLLOWING SCREWS TO FASTEN THE RATING PLATE:
-AM3X10 DIN 85
-BLACK IN CASE OF BLACK RATING PLATE
-NICKLE-PLATED IN CASE OF WHITE RATING PLATE.
3. IF YOU REQUIRED AN EARTHING SCREW IT MUST BE INDICATED IN THE ORDERS.
- EARTHING SCREW M5.
4. THE CONSECUTIVE POSITIONS OF THE SWITCH ARE NUMBERED CLOCK -WISE.
5. WEIGHT OF THE SWITCH WITH ONE ELEMENT:-0.2 KG.
WEIGHT OF THE SWITCH WITH TWO ELEMENTS:- 0.24 KG.

ALL DIMENSIONS ARE IN mm.

THICKNESS OF THE MOUNTING PLATE INCL. COATING	CUT OUT IN THE MOUNTING PLATE	CUT OUT IN THE RATING PLATE	INDICATION WHEN ORDERING THE RATING PLATES.
UPTO 2.5 MM	32X15	33X14.5	PLATE FOR 2.5 MM PLATE.
OVER 2.5 MM TO 3.5 MM	35X15	36X14.5	WITHOUT INDICATING THIS PLATES.
OVER 3.5 MM TO 6 MM	39X15	41X14.5	PLATE FOR 6 MM PLATE.


INSULATION :- FOR 440V DC OR 380V
ACCORDING TO
VDE 0110 GROUP C.
PROTECTION:- P00DIN40050

परिवर्तन संख्या ALT. NO.		प्राधिकार AUTHY		वर्णन DESCRIPTION		दिनांक बाधक DATED INITIAL		अभिलेखित DGN		समीक्षित स.वि.अ. / व.वि.अ. REVIEWED AEE / SEE		अनुमोदित स.नु.वि.अ. APPROVED DYCEE		दिनांक DATE		रेखिक अनुपात SCALE		संदर्भ / REF.		ALT.		परिवर्तन संख्या ALTERATION. NO.		पृष्ठ SHEET		OF		A4	
सतह - रूखाता का मान वा. मा. 3073 / अ. मा. सं. 1302		अनिर्दिष्ट सतह - सीमा वा. मा. : 2102 / अ. मा. सं. : 2708		UNSPECIFIED TOLERANCE TO IS : 2102 / ISO : 2708		TOL. CLS.		वातु-रेखन चिह्न वा. मा. : 013 / अ. मा. सं. : 2563		WELDING SYMBOLS TO IS:813 / ISO:2553		N.T.S		N.T.S		N.T.S		N.T.S		N.T.S		N.T.S		N.T.S		N.T.S		N.T.S	
पदार्थ MATL		प्रति भार कि. ग्रा. WT. EACH IN KG		वर्णन DESCRIPTION		TOGGLE SWITCHES		आरेखन संख्या DRAWING NO.		CLW/ES/3/SK-3/0075/C		परिवर्तन संख्या ALTERATION. NO.		पृष्ठ SHEET		OF		A4		A4		A4		A4		A4		A4	



TYPE-D
MANUFACTURERS'S REF TYPE:-
SRM-PS/0/3/S800A20



क्रमांक/पृष्ठ D08			वितरण रेलइंजन कारखाना CHITTARANJAN LOCOMOTIVE WORKS, INDIA	
आवृ. क्र.सं. NO. 123			नाम / जी.स. नं. रेल. / एल.स. नं. रेल.	
वर्गीकरण / संकेत एल.स. / एल.स. / एल.स.		वर्ग / संकेत / स्पेस		
संशोधन संकेत APPROVED CODE		टॉगल स्विच		
विवरण DESCRIPTION		TOGGLE SWITCHES		
चित्र संख्या N.T.S.		कारखाना संख्या DRAWING NO.	CLW/3/SK-5/0075/C	
वर्ष / REF. / ALT.		परिवर्तन संख्या ALTERATION NO.	ड्राईंग SHEET	A2
		