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**SPECIFICATION FOR PANEL C WITHOUT DIAGNOSTIC TERMINAL
FOR 3-PHASE ELECTRIC LOCOMOTIVES.**

Specification No : CLW/ES/3/0240 ALT.B

ISSUE DATE: 05.08.1998

ENCLOSURES -

1. DRAWING OF PANEL PLATE OF MEDHA
2. DRAWING OF PANEL PLATE OF BOMBARDIER
3. DRAWING OF PANEL PLATE OF ABB
4. DRAWING OF PANEL PLATE OF ARC
5. DRAWING OF PANEL PLATE OF SIEMENS

ISSUED BY:

**DY. CHIEF ELECTRICAL ENGINEER/D-II
CHITTARANJAN LOCOMOTIVE WORKS
P.O. CHITTARANJAN - 713331
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ALTERATION RECORD SHEET

Sl. No.	Date of Amendment	Page No.	Alteration No.	Reason	Authority
1.	16.06.2020	---	A	i) Specification retyped. ii) Item mentioned at page no. 05 Sl. No. 19 to 32 are added in specification which were not mentioned in last Alt. Nil. iii) One no. of extra column for specn. no. has been added in the item list table against each required item to assemble Panel C. iv) Note is included at page no. 05. v) Panel C drawing included at sheet no. 10 to 14.	Sd/-
2.	20.06.2022	5	B	In item list at sheet no. 5, S.D. Sleeve has been included vide note no. ELDD/3220/Pt. dtd. 16.06.2022.	Sd/-

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 Panel C without DIAGNOSTIC TERMINAL complete with all electrical equipments and fitting including cabling for for WAG-9 (Co-Co)/WAP-7 (Co-Co)/WAP-5 (Bo-Bo), 3-Phase 25 KV, 50 Hz AC Locomotive.

Scope of work is given below:

Manufacture, assembly and testing of Panel C without DRIVER DISPLAY UNIT fitted with all these electrical items.

ITEM LIST

Sl. No.	Item	Functional Description	Qty./ Loco	Item description	Nominal value	Location	Ident. No.	Specn. No.
1	C	PANEL DRIVER'S DESK (RIGHT DISPLAY) ## (is to be supplied by Propulsion manufacturers)	2	-----	Black anodized Aluminium Plate IS:1868 & 6651	C	-----	Drawing (sheet no. 10 to 14) is to be followed as per condition of P.O.
2	163	FAULT STATUS LAMP "LSFI"	2	PILOT LIGHT HEAD	RED LED	C	3EHP585818 P1014	CLW/ES/3/0072/Alt.latest
3	163	FAULT STATUS LAMP "LSFI"	2	PILOT LIGHT BODY	580V AC Standard	C	3EHP585819 P1010	CLW/ES/3/0072/Alt.latest
4	163	FAULT STATUS LAMP "LSFI"	2	MULTI LED BA9S	18 MA, 24V DC-RED	C	3EHP585726 P0022	CLW/ES/3/0072/Alt.latest
5	163.1	ILLUM PUSH BUTTON FAULT INDICATION/ ACKNOWLEDGE "BPFA"	2	BOOTED PUSH BUTTON HEAD	YELLOW BLACK, BEZEL	C	3EHP585818 P2151	CLW/ES/3/0072/Alt.latest
6	163.1	ILLUM PUSH BUTTON FAULT INDICATION/ ACKNOWLEDGE "BPFA"	2	ILLUM PUSH BUTTON BODY	SCHLIE SS STANDARD	C	3EHP585819 P2010	CLW/ES/3/0072/Alt.latest
7	163.1	ILLUM PUSH BUTTON FAULT INDICATION/ ACKNOWLEDGE "BPFA"	2	MULTI LED BA9S	18 MA, 24V DC YELLOW	C	3EHP585726 P0024	CLW/ES/3/0072/Alt.latest
8	238	BUZZER OVER SPEED/FIRE ALARM/VIGILANCE WARNING	2	BUZZER COMBINATION 88	1170/745/5 46 HZ-20MA	C	HBTB585528 R0101	CLW/ES/3/0078/Alt.latest

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4748630/2026/O/o WM/Design/DMW/PTA

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9	316	SWITCH HEADLIGHTS "BLPR"	2	SWITCH	2 POLES 16A 380V AC	C	3EHP585743 R2204	CLW/ES/3/0075/ Alt.latest
10	316.1 1	SWITCH MARKER LIGHTS WITH WHITE "ZLFW"	2	SWITCH	6A 250V 1NO.	C	3EHP585604 R1201	CLW/ES/3/0075/ Alt.latest
11	316.1 2	SWITCH MARKER LIGHTS RED "ZLFR"	2	SWITCH	6A 250V 1NO.	C	HBTB585604 R1201	CLW/ES/3/0075/ Alt.latest
12	316.2	ILLUMINATED SWITCH EMERGENCY FLASH LIGHTS "BPFL"	2	SELECTOR SWITCH HEAD	YELLOW BLACK, BEZEL	C	3EHP585848 P0251	CLW/ES/3/0072/ Alt.latest
13	316.2	ILLUMINATED SWITCH EMERGENCY FLASH LIGHTS "BPFL"	2	FLASH LIGHT BODY	24V DC Standard	C	3EHP585819 P1100	CLW/ES/3/0072/ Alt.latest
14	316.2	ILLUMINATED SWITCH EMERGENCY FLASH LIGHTS "BPFL"	4	CONTACT BLOCK	1 No. Standard	C	3EHP585819 P3010	CLW/ES/3/0072/ Alt.latest
15	317	SWITCH HEAD LIGHTS INTERSITY "ZPRD"	2	SWITCH	1Pole 16A 380V AC	C	3EHP585743 R2103	CLW/ES/3/0075/ Alt.latest
16	324	SWITCH DRIVERS CAB LIGHTING "ZLC"	2	SWITCH	6A 250V 1NO.	C	HBTB58564 R1201	CLW/ES/3/0075/ Alt.latest
17	324.1	SWITCH INSTRUMENT LIGHTING "ZLI"	2	SWITCH	6A 250V 1NO.	C	HBTB58564 R1201	CLW/ES/3/0075/ Alt.latest
18	324.2 1	SWITCH DRIVERS DESK ILLUMINATION "ZLDD"	2	SWITCH	6A 250V 1NO.	C	HBTB58564 R1201	CLW/ES/3/0075/ Alt.latest
19	XK** C	SOCKET 35P/40 WITH PIN "N"	2	CONNECTOR		C	HBTB31512 R0001	CLW/ES/3/0124/ Alt.latest
20		CAB 4GKW-AX 1.5 1800V BK	60 MTS#	CABLE		C	3EHW470015 P0015	CLW/ES/3/0458/ Alt.latest
21		CAB 3GKW-0.5 FLEX	04 MTS#	CABLE		C	-----	CLW/ES/3/0458/ Alt.latest
22		FASTON LUG 6.3x0.8 CU/SN	30 NOS.#	LUG		C	GMN485104 P0155	CLW/ES/3/0643/ Alt.latest
23		JOINTING SLEEVE 6.3x0.8	10 NOS.#	SLEEVE		C	HZN452972 P002	CLW/ES/3/0643/ Alt.latest

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24		COPPER SLEEVE 1.5-8	36 NOS.#	SLEEVE		C	NB485270 P0065	CLW/ES/3/ 0205/ Alt.latest
25		CABLE LUG 1.5-2.5 M5	02 NOS.#	LUG		C	3EHP470026 P0015	CLW/ES/3/ 0130/ Alt.latest
26		BRACKET TYPE-2 SS SHEET AISI 840 GR.321##	02 NOS	BRACKET		C	3EHP431102 P0001	CLW/ES/3/ 0121/ Alt.latest
27		LOOMING BAR TYPE-4 SS TUBE 18x18 (X6CrNiTi)##	04 NOS.	LOOMING BAR		C	HBTB410024 P0002	CLW/ES/3/ 0119/ Alt.latest
28		DISTANCE BOLT M12x84 STANDARD STEEL 304##	06 NOS	BOLT		C	-----	CLW/ES/3/ 0184/ Alt.latest
29		CABLE TIE 140x3.6PA 150MM	35 NOS.#	CABLE TIE		C	NBT402938 P0002	CLW/ES/3/ 0131/ Alt.latest
30		CABLE TIE 186x4.8PA 200MM	50 NOS.#	CABLE TIE		C	NBT402938 P0003	CLW/ES/3/ 0131/ Alt.latest
31		CABLE TIE 360x4.8PA 300MM	30 NOS.#	CABLE TIE		C		CLW/ES/3/ 0131
32		SHRINK DOWN SLV DTHS 3/16		S.D. SLEEVE		C	HBT416007 P0003	CLW/ES/3/ 0154/ Alt.latest

- Note :-**
- i) All the component must be procured from CLW/ RDSO approved sources only.
 - ii) # Qty/ Loco of the items are approximate.
 - iii) Standard fasteners of M/s TVS, M/s LPS, M/s UNBRAKO and spring washer of M/s FORBES make only to be used.
 - iv) ## Are to be supplied by propulsion manufacturer.

2. SERVICE CONDITION:

All climate and environmental condition:

Maximum atmospheric temperature	+70°C (in sun) & + 60°C (in shade)
Normal humidity	60%
Maximum humidity	100% saturation during rainy season
Altitude	160 m.a.s.l
Rainfall	Very heavy in certain area. The equipment should be designed in such a way as to withstand its running at 10 Km/hr in flood water level of 102 mm above rail level.

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Atmosphere during hot weather	Extremely dusty and desert terrain in certain areas.
Coastal area	Locomotive and equipment will be designed to work in coastal areas in humid and salty laden atmosphere.
Vibration	The equipment sub-system and their mounted arrangement will be designed to withstand vibrations and shocks encountered in service as specified in correspondence unless otherwise prescribed.

3. **Standard:** The relevant IEC, BS, DIN standard & India standard specification shall apply with respect to all materials used in the manufacture of Panel C complete. IS/IEC standard will be accepted internally used BBC/ABB Adtranz standard if any should be mentioned with corresponding IEC standard. Only SI Unit will be accepted.

4. **Wiring and cabling**

1. The cables for wiring in the locomotive and equipment use high grade electrolytic copper standard conductors as used in WAG-9 Loco.
2. Cable will be fire retarding type. In location where high temperature are likely to be met., special cables may be employed. Grade of insulation and sheath should be as per requirement.
3. Plugs, sockets and connectors will be used to connect pre-assembled units and to facilitate maintenance and ensure better layout.
4. No cable having a size of less than 2.5mm ordinarily be used.
5. Similar size cables for internal wiring panels control cubicles, signal wiring, consistent with the mechanical and electrical requirement may be adopted.
6. The layout of the cable should be such that contamination by oil is avoided.
7. Loading capacity of power cables should be as per relevant standard.
8. Cables for terminal connections should have crimped joints/Lug as per requirement.
9. The documents related to cabling of subject item should be submitted to this office in due course of time.

5. **Test Condition**

5.1 **Type Testing :**

- a) Material test report has to be produced during inspection. Material test report may be obtained from approved test house/supplier.
- b) Complete Panel should be electrically tested as per relevant standards.
- c) All electrical equipments procured shall be tested at assembly stage. Test certificate shall be produced for OEM components. Any change in design is required approval of Design Office and will involve complete type test.

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5.2 Routine Testing:

The panel will be used for the following routine tests:

1. Integrity and completeness.
2. Testing of inter connections and functionality of the complete panel.
3. Suitable checking fixtures are to be made for checking the dimensions of the complete assembled panels. Certificate for raw materials and fasteners to be provided.
4. Complete PANEL and electrical items to be tested as per relevant Standard.

6. INSPECTION

- a. Type test should be carried out by authorized representative of Dy.CEE/D.
- b. The complete testing to be carried out as per requirement.

7. SUPPLY OF DOCUMENTS (in addition to those indicated in bid documents of CLW)

- i) Technical details composition and characteristics of the material including fasteners to be used for manufacture of Panel C.
- ii) Source(s) of raw materials and hardwares.
- iii) Manufacturing process.
- iv) Type test plan inducing checks for vibration and welding.
- v) Routine test plan.
- vi) Details of similar items supplied for locomotives if any.
- vii) Source of the components being offered including cables.

8. SUBMISSION OF TENDER QUOTATION: -

- 7.1 The tenderer shall give sufficient information to prove that his factory has adequate facilities and capacity to manufacture the complete panel to meet fully the technical requirements of the specification and quality of materials and workmanship.
- 7.2 Quotation shall not be considered complete unless all the information is furnished and are therefore liable to be rejected.

9. TECHNICAL DOCUMENTS TO BE SUPPLIED BY THE SUPPLIER:

- a) Type test report
- b) Routine test report along with each set
- c) Maintenance Manual
- d) Detailed Drawing

They should furnish the detailed drawing for approval before manufacture

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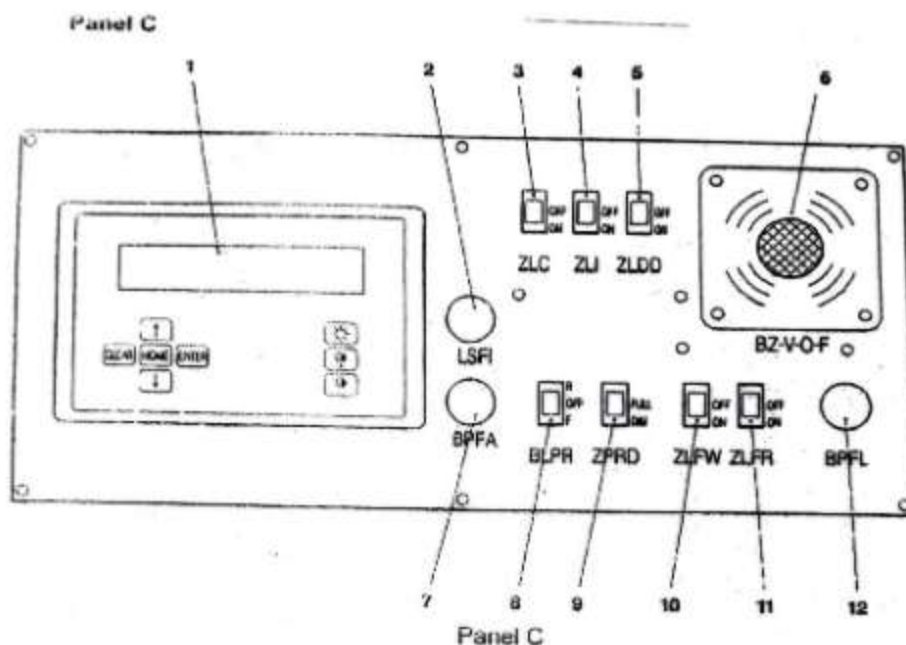
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- a) Tenderer should give their full credential for manufacture of such items without which tender will not be technically acceptable.

10. NAME PLATE

The tenderer shall fix name plate on the equipment indicating (i) Manufacturer's name (ii) Sl. No. of equipment, (iii) Month and year of manufacture.

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435	1	Screen	Display of messages / diagnosis
163	2	LSFI	Fault message, priority 1
324	3	ZLC	Driver's cab lighting
324.1	4	ZLI	Instrument lighting
324.21	5	ZLDD	Driver's desk illumination
238	6	BZ-V-O-F	Warning signal, 3 frequencies
163.1	7	BPFA	Acknowledgement all fault messages
316	8	BLPR	Headlights
317	9	ZPRD	Headlights, Intensity
316.11	10	ZLFW	Marker lights, white
316.12	11	ZLFR	Marker lights, red
316.2	12	BPFL	Emergency flash light

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SHEET 10.

Provisionally Approved

TOP VIEW

Dr. Suresh Babu
C.L.W. / Chittagong

[Handwritten signature]
cc. Mr. ATIS, p. 12/16
AEE / DGO
attch. per Mr. SMC / C-D&D
sent via Airmail - 12/17/01 Chittaranjan

Dr. CEE / D & D
CLW / Chittaranjan

4 HOLES
26.5 THRU



150-151

ELEVATION

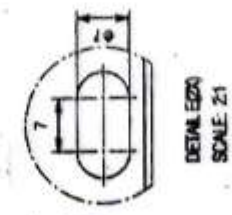
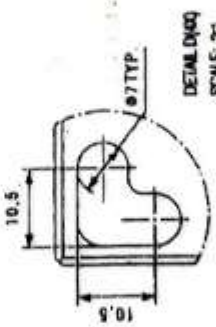
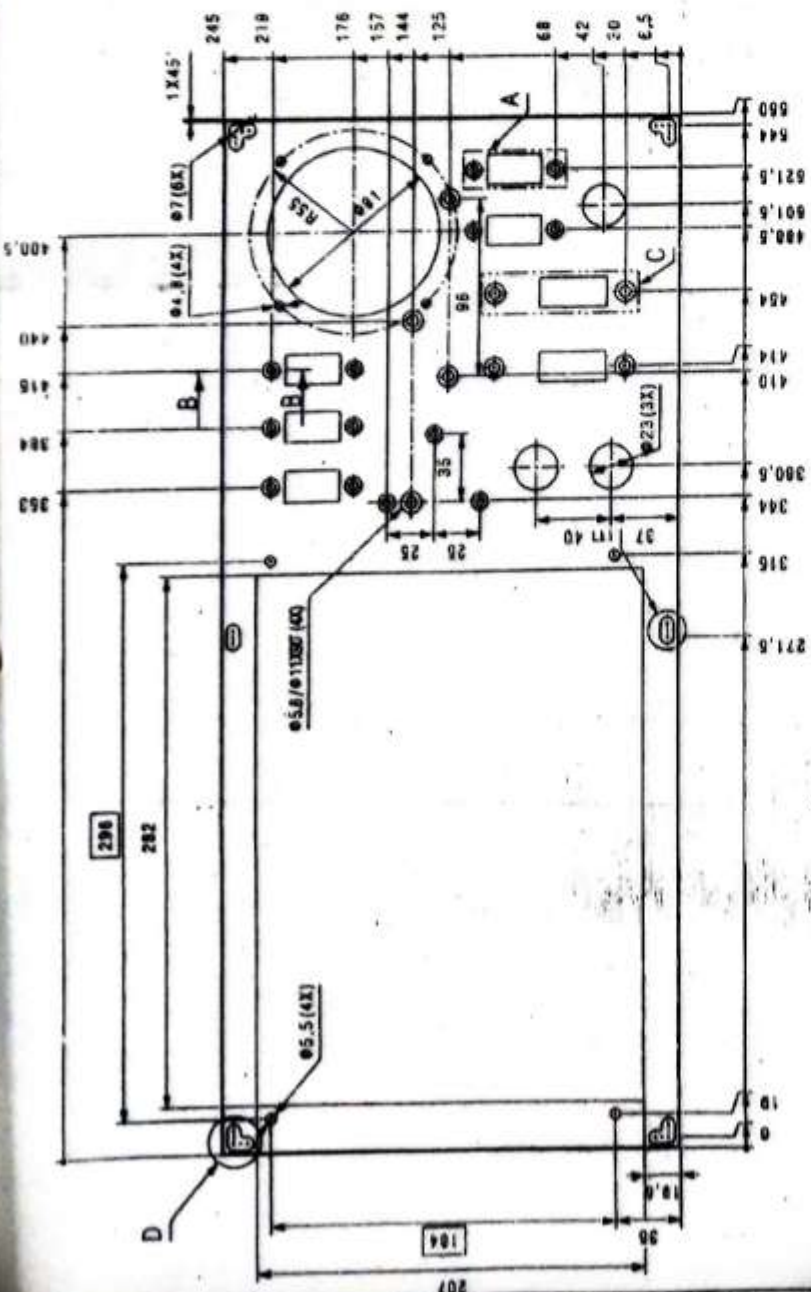
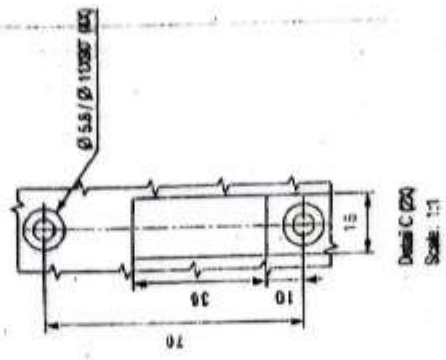
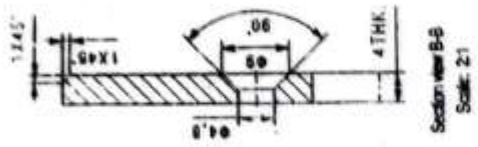
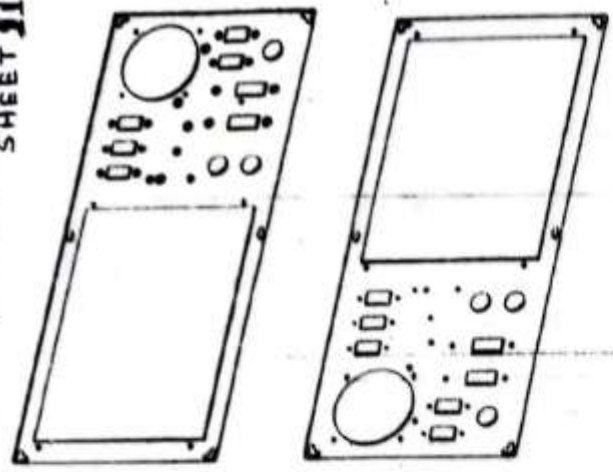
RIGHT SIDE
VIEW

DISPLAY UNIT CUT-OUT AND FIXING DETAILS

04	SOC. HEAD CAP SCREW, M6 X 20LG PLAIN WASHER, SPRING WASHER AND HEX. NUT SS	4 SETS	
03	PAN HD. SCREW M6 X 18LG, PLAIN WASHER, SS	6 SETS	
02	DISPLAY UNIT	1	
01	DISPLAY UNIT MTG. PANEL	1	
SL NO.	DESCRIPTION	DRG NO.	QTY.

REV NO	REVISION		DATE	CHG'D	APP'D
TITLE	<p>PROPOSED G.A. LAY-OUT OF DISPLAY UNIT FOR ELEC. LOCO</p> <p>ORIG. NO. B = E628 - 19722</p>				
GENERAL TOLERANCES	ALL DIMENSIONS ARE IN MM				
MACHINED	FABRICATED	PROJECTION	SCALE		
X : ±0.6				NTS.	
0.X : ±0.1					
0.XX : ±0.05					
 MEDHA MEDHA SERVO DRIVES PVT. LTD. P-438, D/A, NAGINABAI, HYDERABAD - 500 014 SF 0085077			DRWING CHARGED VARTT 17.07.2012 CHG'D CHARGED VARTT 17.07.2012 APP'D. RAMASAJU 17.07.2012		

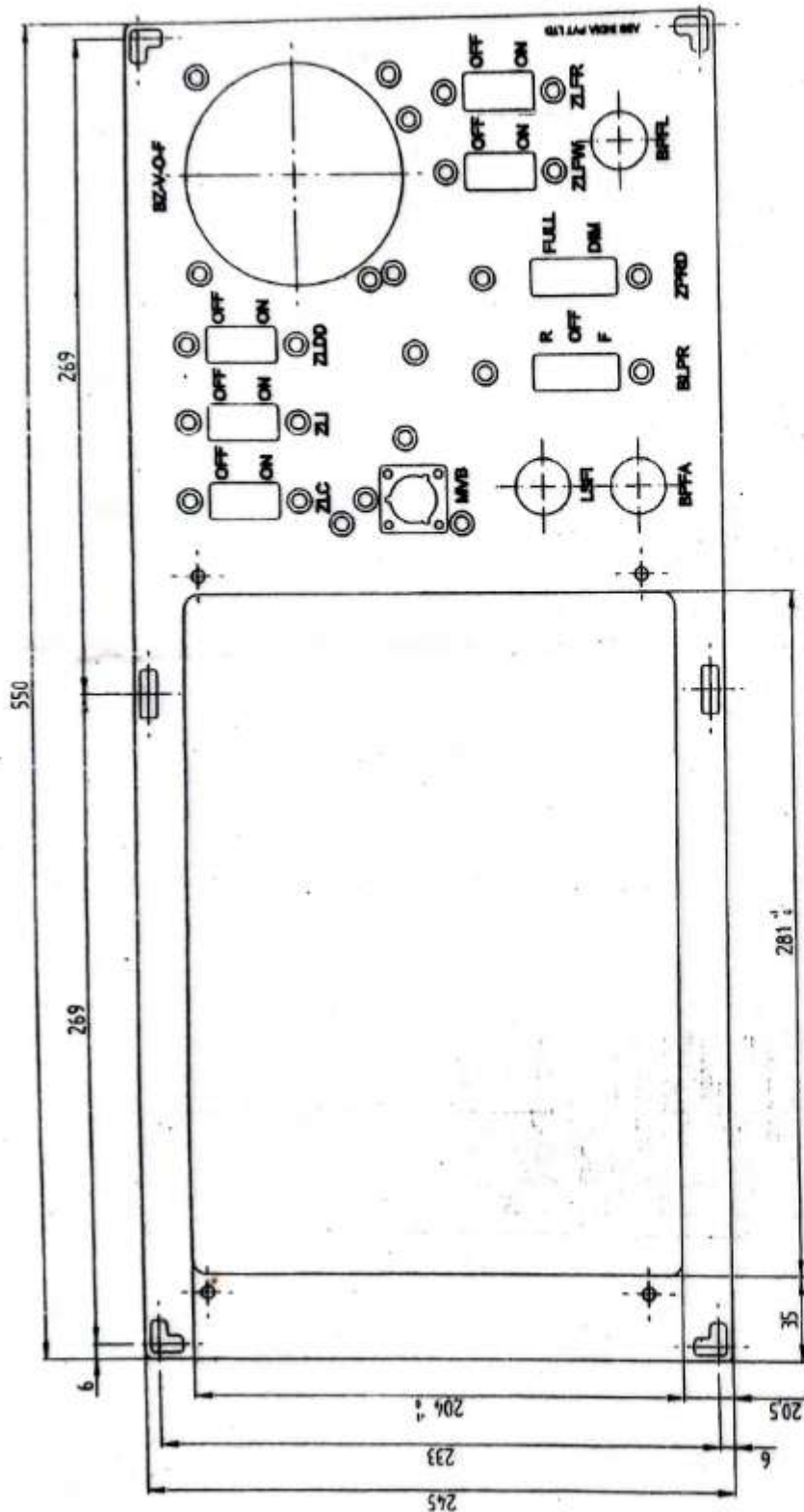
SHEET 11



Provisionally Approved

Drawing description and title		Scale	
HMI mounting plate		Scale 1:1	
Part C		Scale 1:1	
Sheet		3EYP200120-0001	
Revision		1.0	
Date		12/01/2026	
Drawing		1.0	
Scale		1:1	
Material		3EYP200120-0001	
Drawing		1.0	
Date		12/01/2026	
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SHEET 12



General information for the user and supplier dimensions indicated by sectioning standardized parts -... Standardized "standard" dimensions indicated by sectioning corresponding to ISO 1781-1	Prepared:		28/07/2017	Based on:	28/07/2017	Scale:	1:100	Sheet:	28/07/2017	Rev:	1
	Reviewed:		28/07/2017	Temp. dep:	ATP	DDU MOUNTING PLATE					
	Approved:		28/07/2017	Take over dep:	ATP						
	Revision:										
ABB India Ltd.											
28/07/2017											

NOTE:

1. ALL DIMENSIONS ARE IN mm.
2. REMOVE ALL BURR & SHARP EDGES.
3. FONT SIZE : 5mm
FONT STYLE : Arial
DEPTH : 0.1 mm

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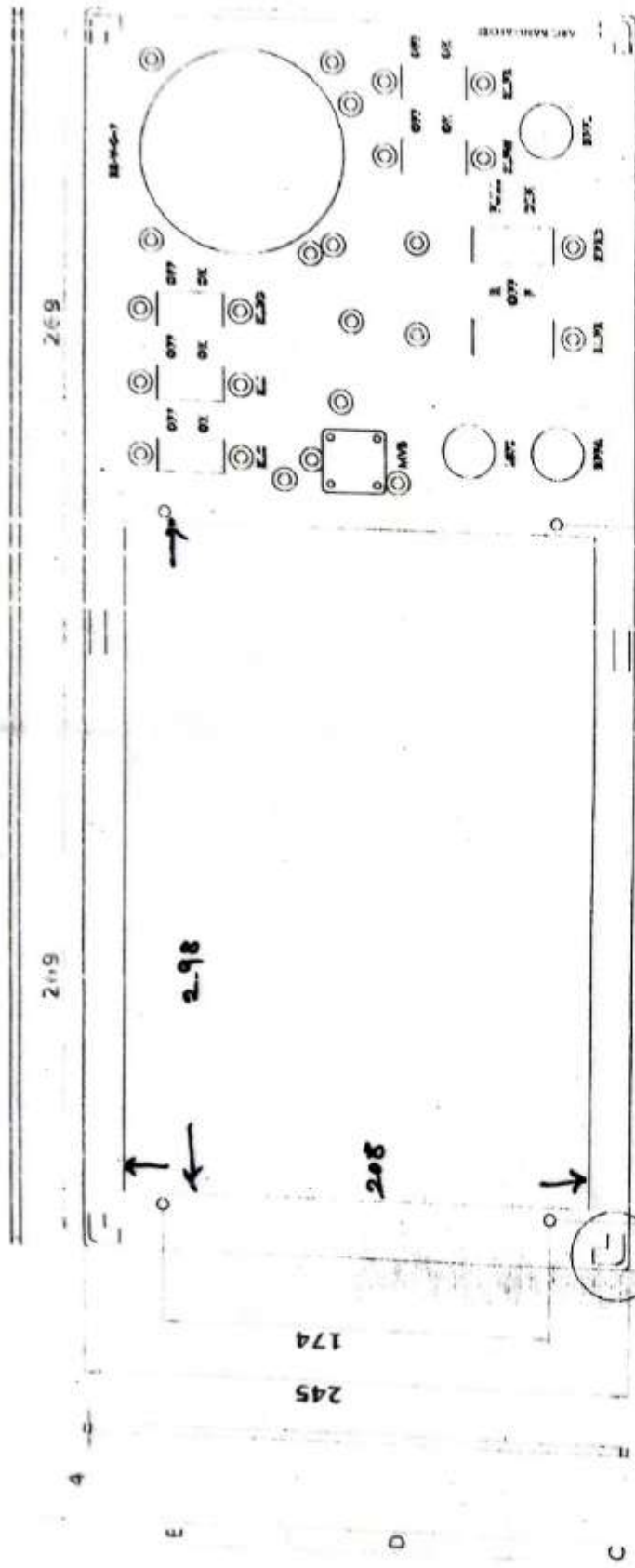
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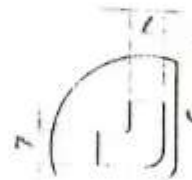
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DETAIL A
SCALE 1:1

ADVANCED RAIL CONTROLS PVT LTD.
ISO 9001 : 2015 CERTIFIED



Advanced Rail Controls (F) Ltd
No.59, 1st floor, 'G' block,
Above Bank of India,
60 Feet Main Road,
Sahakar Nagar,
Chennai-600 095
T: 044-26222222
www.aarlcontrols.com

ARC STANDARD

PROPERTY AND CONFIDENTIAL

C PANEL

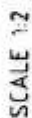
C PANEL

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213M
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 9. **E-MAIL** _____
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Provisionally Approved

NOTE : EXCEPT DRIVER DISPLAY CUTOUT. DIMENSIONS OF OTHER COMPONENTS ARE AS PER ABB DRG No. 3EHP330229

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Tolerance IS 2102 (MEDIUM)		A3 1/2	
Surface Finish BLACK ANODIZING UPTO 0-20 MICRON		Material ALUMINIUM ALLOY HE30	
Unless specified all dimensions are in mm		DUU Plate	
0.68 KG		Dest.	
Project		SUDHER	
WAG9 (U)		DHARMINDER	
		Date	
		Name	
		1st Language EN	
		Dwg no	
		1808P:003	
		SIEMENS	
Index		Revision no	
1.2		Prepared 12.03.2019	
		Checked 27.03.2019	
		Approved 28.03.2019	
		Date	
		Name	
		1st Language EN	
		Dwg no	
		1808P:003	
		SIEMENS	

स. वि. अपि. / एड्ड डी.
AEE/D&D
अपि. एवं वि. केन्द्र / C-D&D
विशेषज्ञा/चित्तमंजव/CIWIT/Thiruvananthapuram

वि.रे.का./चित्ररंजन
Sr. Section Engr. (D & D)
C.L.W./Chittaranjan