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14702/2024/EEMRT-ENE51

CUSTOMER : APTRANSCO Drawing approval subject to valid vendor registration

CUSTOMER REF. PO.NO : AS APPLICABLE

Suitable for conventional 220KV SS only

SUBSTATION : AS APPLICABLE

EQUIPMENT : 220kV BUS SECTION CONTROL AND RELAY PANEL

DRAWING REF. :  
 General Arrangement : 1MNS500925-AFAC  
 Bill of Material : 1MNS500925-FAC  
 Schematic Drawings : 1MNS500925-CFAC

STANDARD BAY REF. : =2KRBS

**Chief Engineer/Projects  
 APTRANSCO/VS/Vijayawada.**

STATION AUX. SUPPLY:- 220V DC

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION Control & Relay Panel Title page	Doc. kind. Circuit diagram	Ref.Des. =2KRBS	
		Approved 27.02.2024	GOURISH HEGDE		DCC EFS		
		Project APTRANSCO STANDARD DRAWING		<b>HITACHI</b> <small>Hitachi Energy India Limited</small>	Resp. dept. PG-GAS	Rev. ind. 0	Language en
Rev.	Revision note	Date	Name		Doc. no. 1MNS500925-AFAC	Sheet 1	No.sheets 85
1MYN691003-102(A3)REV01							

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Based on				Prepared 27.02.2024		MANASA ESHWAR		Title 220kV BUS SECTION		Doc. kind. List of contents		Ref.Des. =2KRBS	
				Approved 27.02.2024		GOURISH HEGDE		List of contents		DCC EAB			
				Project APTRANSCO						Resp. dept. PG-GAS		Rev. ind. 0	
				STANDARD DRAWING								Language en	
Rev. Revision note				Date		Name		HITACHI Hitachi Energy India Limited		Doc. no. 1MNS500410-AAAC		Sheet 2	
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**Chief Engineer/Projects  
APTRANSCO/VS/Vijayawada.**

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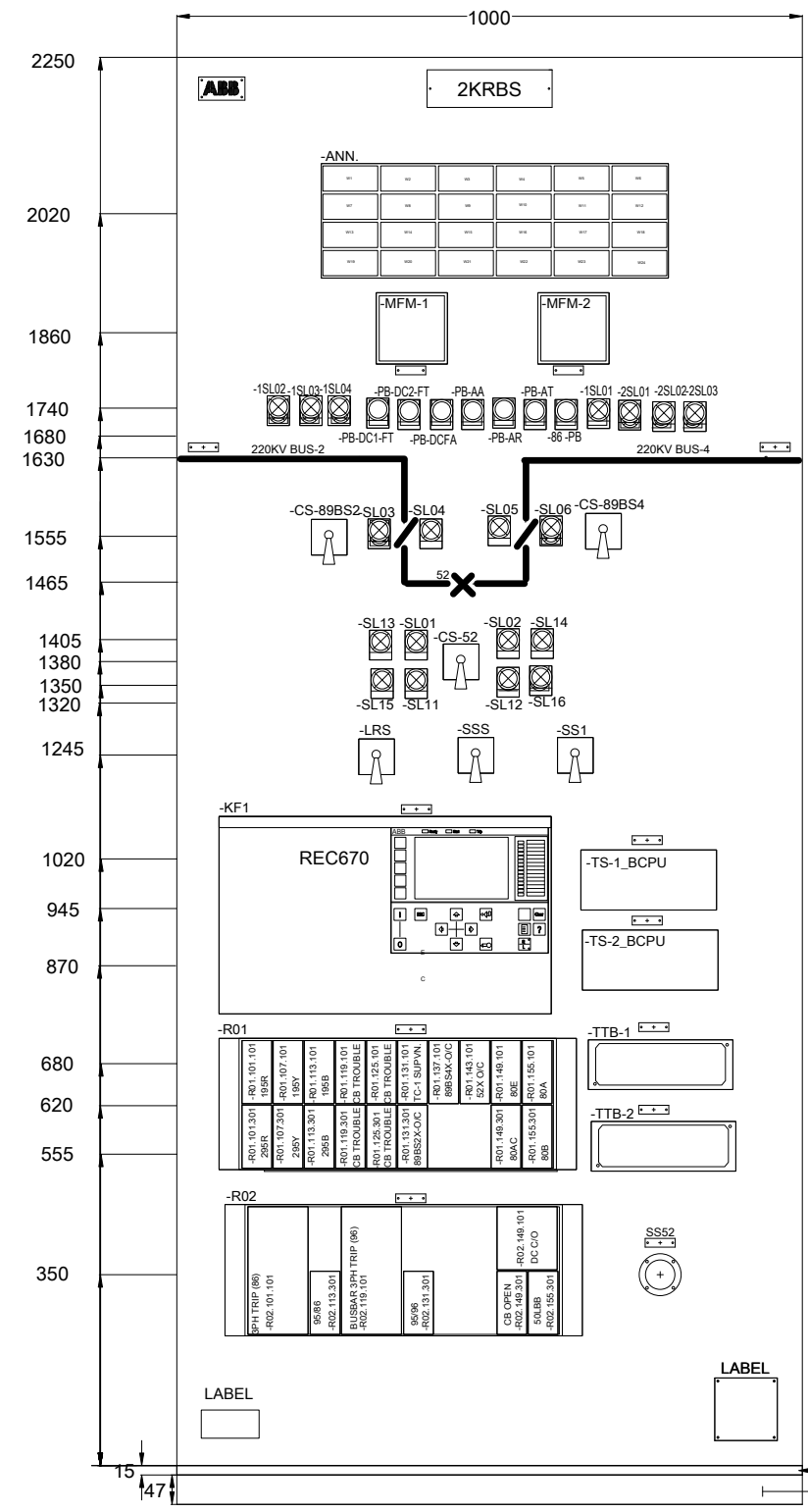
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1004	1005	Parts list	=2KR+BS		
1005	1006	Parts list	=2KR+BS		
1006	1007	Parts list	=2KR+BS		
1007	1008	Parts list	=2KR+BS		
1008	1009	Parts list	=2KR+BS		
1009	1010	Parts list	=2KR+BS		
1010	1011	Parts list	=2KR+BS		
1011	1012	Parts list	=2KR+BS		
1012	1013	Parts list	=2KR+BS		
1013	1014	Parts list	=2KR+BS		
1014	1015	Parts list	=2KR+BS		
1015		Parts list	=2KR+BS		

**Chief Engineer/Projects  
APTRANSCO/VS/Vijayawada.**

Based on		Prepared	27.02.2024	MANASA ESHWAR	Title	220kV BUS SECTION List of contents	Doc. kind.	List of contents DCC EAB	Ref.Des.	=2KRBS		
		Approved	27.02.2024	GOURISH HEGDE								
		Project			APTRANSCO STANDARD DRAWING		Resp. dept.	PG-GAS	Rev. ind.	0	Language	en
					<b>HITACHI</b> Hitachi Energy India Limited		Doc. no.		1MNS500410-AAAC		Sheet	3
											n. sheet	

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PANEL: 2KRBC	
ITEM DESIGNATION	DESCRIPTION
ANN.	ANNUNCIATOR
MFM-1	MULTI FUNCTION METER-1
MFM-2	MULTI FUNCTION METER-2
PB-DC1-FT	DC-1 SUPPLY TEST
PB-DC2-FT	DC-2 SUPPLY TEST
PB-DCFA	DCF ACCEPT
PB-AA	ALARM ACCEPT
PB-AR	ALARM RESET
PB-AT	ALARM TEST
86-PB	PUSH BUTTON FOR 86 RESET
1SL01	I/C DC SUPPLY FAIL
1SL02	BUS-1 VT R-PH
1SL03	BUS-1 VT Y-PH
1SL04	BUS-1 VT B-PH
2SL01	BUS-3 VT R-PH
2SL02	BUS-3 VT Y-PH
2SL03	BUS-3 VT B-PH
CS-52	CB CONTROL SWITCH
CS-89A	89BS2 ISOL. CONTROL SWITCH
CS-89B	89BS4 ISOL. CONTROL SWITCH
LRS	LOCAL / REMOTE SWITCH
SSS	SYNCHRONIZING SELECTOR SWITCH
SS1	SYNCHRONIZING ON/OFF SWITCH
SL01	52 CB OPEN
SL02	52 CB CLOSE
SL03	89BS2 ISOL. OPEN
SL04	89BS2 ISOL. CLOSE
SL05	89BS4 ISOL. OPEN
SL06	89BS4 ISOL. CLOSE
SL11	TC-1 HEALTHY
SL12	TC-2 HEALTHY
SL13	CB SPRING CHARGED
SL14	CB TRIPPED ON CTD
SL15	CB CAPACITOR CHARGED
SL16	CB AUTO TRIP
KF1	BAY CONTROL UNIT
SS	SYNCHRONIZING SOCKET
TTB-1	TEST TERMINAL FOR MFM-1
TTB-2	TEST TERMINAL FOR MFM-2
TS1_BCPU	TEST SWITCH FOR BCPU
TS2_BCPU	TEST SWITCH FOR BCPU

PANEL: 2KRBC	
ITEM DESIGNATION	DESCRIPTION
R01.101.101	TC-1 Supvn (195R)
R01.101.301	TC-2 Supvn (295R)
R01.107.101	TC-1 Supvn (195Y)
R01.107.301	TC-2 Supvn (295Y)
R01.113.101	TC-1 Supvn (195B)
R01.113.301	TC-2 Supvn (295B)
R01.119.101	CB POLE DISC. -152E & CB SF6 GAS PR.LOW ALARM-152A
R01.119.301	CB SF6 GAS PR. LOCK OUT-152B & CB TRIPPED ON CTD-152D
R01.125.101	CB AIR PRESSURE LOW-152C & CB TRIPPED ON CTD-152D
R01.125.301	CB SPRING CHARGED & SPARE
R01.131.101	CB TC-1 SUPVN. HEALTHY & CB TC-2 SUPVN. HEALTHY
R01.131.301	89BS2X-O & 89BS2X-C
R01.137.101	89BS4X-O & 89BS4X-C
R01.143.101	52X-O & SPARE
R01.149.101	DC SUPPLY FAIL ACCEPT RELAY
R01.149.301	AC SUPPLY SUPVN. RELAY
R01.155.101	DC-1 SUPPLY SUPVN.
R01.155.301	DC-2 SUPPLY SUPVN.
R02.101.101	86 TRIP RELAY
R02.101.313	86 TRIP RELAY SUPERVISION
R02.149.101	DC-1 C/O RELAY
R02.149.301	CB MANUAL TRIP-1/2
R02.119.101	BUSBAR TRIP RELAY
R02.131.301	BUSBAR TRIP RELAY SUPERVISION
R02.155.301	LBB RE-TRIP

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Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION Control & Relay Panel Front View	Doc. kind. Assembly drawing	Ref.Des. =2KR +BS
		Approved 27.02.2024	GOURISH HEGDE			
		Project APTRANSCO		Hitachi Energy India Limited	Resp. dept. PG-GAS	Rev. ind. 0
		STANDARD DRAWING				
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-AFAC	Sheet 11
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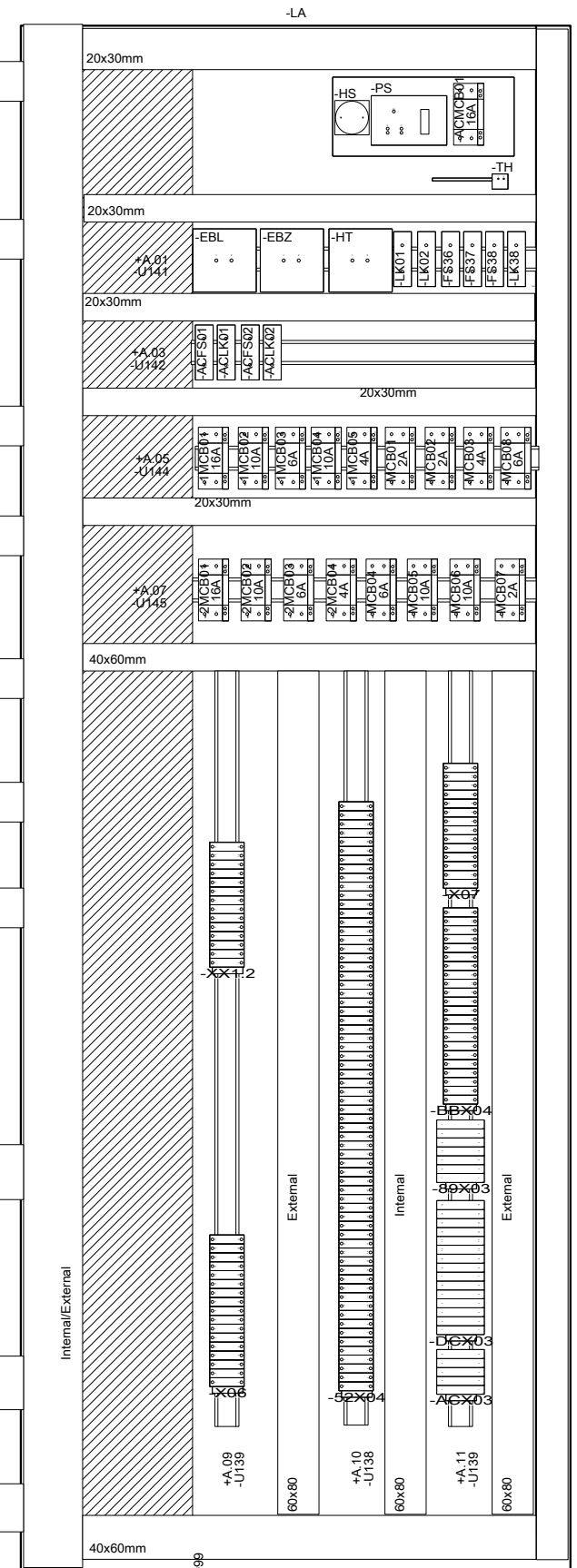
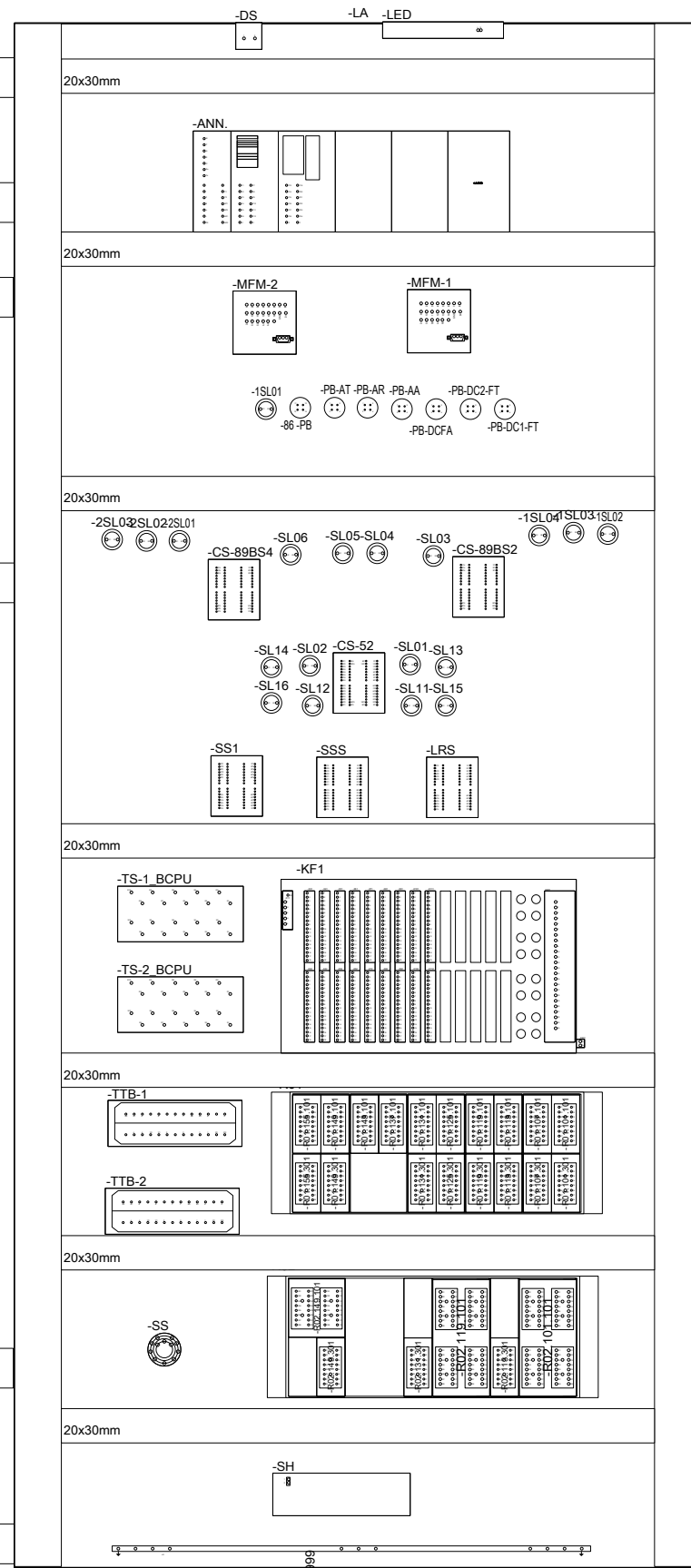
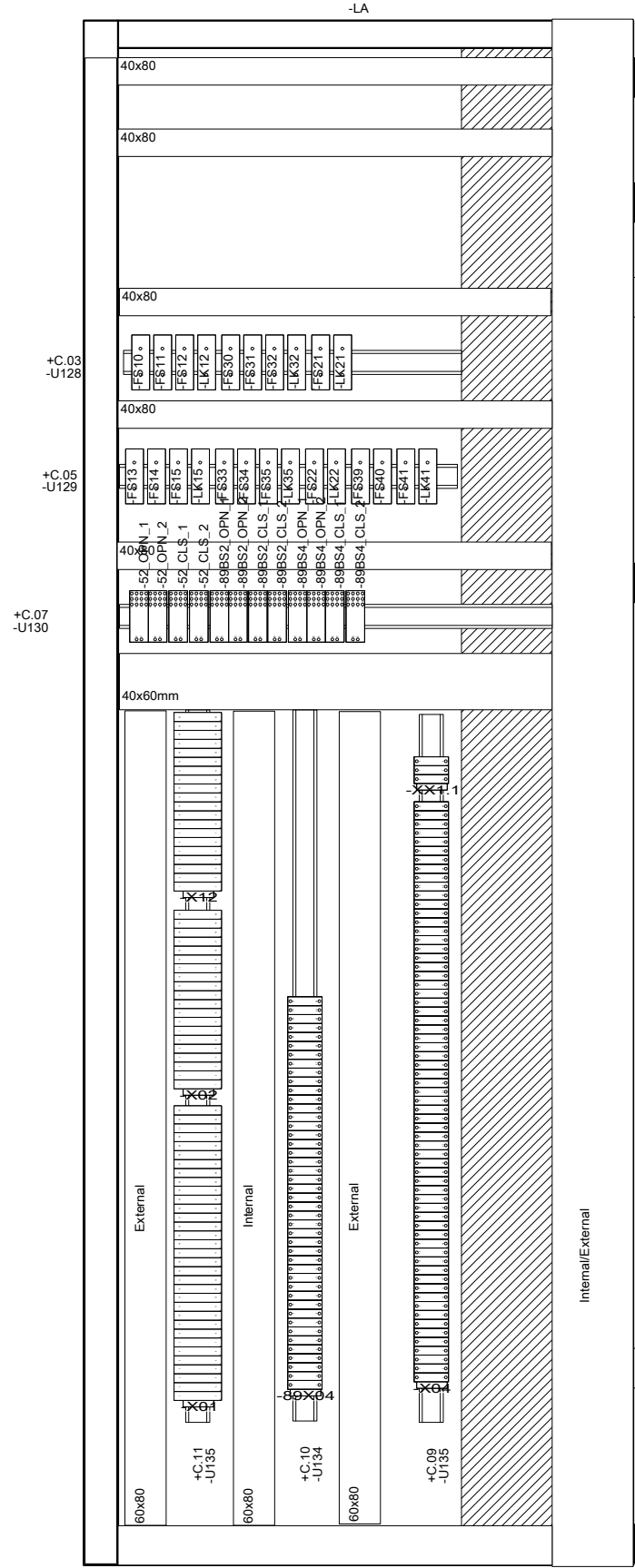
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**+C Left side**

**+B Rear plane**

**+A Right side**



**Chief Engineer/Projects**  
**APTRANSCO/VS/Vijayawada**

NOTE:  
INTERNAL VIEW IS FOR INFORMATION ONLY.  
(MAY CHANGE DURING MANUFACTURING).

Based on	Prepared	27.02.2024	MANASA ESHWAR
	Approved	27.02.2024	GOURISH HEGDE
	Project	APTRANSCO STANDARD DRAWING	
Rev.	Revision note	Date	Name
1	1MYN691003-102(A3)REV01		

Doc. kind.	Assembly drawing	Ref.Des.	=2KR +BS
	DCC ELU	Rev. ind.	0
Resp. dept.	PG-GAS	Language	en
Doc. no.	1MNS500925-AFAC		Sheet 12 n. sheet 13

Title	220kV BUS SECTION Control & Relay Panel Inside view
	HITACHI Hitachi Energy India Limited

Doc. no.	1MNS500925-AFAC
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Plane: A

Device name	Description (1)	Description (2)	Type designation
-1MCB01	DC SOURCE-1 MCB	16A	-
-1MCB02	CB TC-1 CKT	10A	-
-1MCB03	86 TRIP RELAY CKT.	6A	-
-1MCB04	SPARE MCB	10A	-
-1MCB05	ETHERNET MCB	4A	-
-2MCB01	DC SOURCE-2 MCB	16A	-
-2MCB02	CB TC-2 CKT.	10A	-
-2MCB03	SPARE MCB	6A	-
-2MCB04	ETHERNET MCB	4A	-
-ACFS01	FUSE FOR ANNUN. CKT.	2A	-
-ACFS02	FUSE FOR BELL CKT.	2A	-
-ACLK01	LINK FOR ANNUN. CKT.	15A	NL
-ACLK02	LINK FOR BELL CKT.	15A	NL
-ACMCB01	AC SOURCE MCB	16A	-
-EBL	DC Fail	--	AUH-1122
-EBZ	NON TRIP ALARM	--	Buzzer
-FS36	R-PH BUS-1 VT CORE-1	FOR IND. CKT.	-
-FS37	Y-PH BUS-1 VT CORE-1	FOR IND. CKT.	-
-FS38	B-PH BUS-1 VT CORE-1	FOR IND. CKT.	-
-HS	HEATER SWITCH	--	
-HT	TRIP ALARM	--	Hooter
-LK01	LINK FOR BUZZER	--	NL
-LK02	LINK FOR HOOTER	--	NL
-LK38	NU BUS-1 VT CORE-1	FOR IND. CKT.	NL
-MCB01	ANNUN. CKT.	2A	-
-MCB02	METERING CKT.	2A	-
-MCB03	CONT. MULTI. CKT.	4A	-

Device name	Description (1)	Description (2)	Type designation
-MCB04	BCPU CKT.	6A	-
-MCB05	CB CLS CKT	10A	-
-MCB06	ISOL. CONTROL CKT.	10A	-
-MCB07	INDICATION CKT.	2A	-
-MCB08	ISOL I/L DC	6A	-
-PS	Outlet	--	SW
-TH	Thermostat	--	TH

Plane: B

Device name	Description (1)	Description (2)	Type designation
-1SL01	I/C DC SUPPLY FAIL	--	-
-1SL02	BUS-1 VT R-PH	--	-
-1SL03	BUS-1 VT Y-PH	--	-
-1SL04	BUS-1 VT B-PH	--	-
-2SL01	BUS-3 VT R-PH	--	-
-2SL02	BUS-3 VT Y-PH	--	-
-2SL03	BUS-3 VT B-PH	--	-
-86 -PB	PB - 86		-
-ANN.	Annunciator unit	--	SAN 200 - 24 Window
-CS-52	CB CONTROL SWITCH	--	22-4-pos. contacts with 0 position, Pos1:T,Pos2:A/
-CS-89BS2	89BS2 ISOL. CONTROL SWITCH	--	6-3-pos. contacts with 0 position
-CS-89BS4	89BS4 ISOL. CONTROL SWITCH	--	6-3-pos. contacts with 0 position
-KF1	BAY CONTROL & PROTECTION UNIT	REC670	REC670
-LED	Lamp	--	LED
-LRS	LOCAL / REMOTE SWITCH	--	12-2-pos. contacts

**Chief Engineer/Projects**  
**APTRANSCO/VS/Vijayawada.**

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Assembly drawing	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Legend list	DCC ELU	+BS
		Project APTRANSCO		Legend list	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Rev. ind. 0	Language en
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-AFAC		Sheet 13
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**814702/2024/EEMRT-ENE51**

Device name	Description (1)	Description (2)	Type designation
-MFM-1	MULTI FUNCTION METER	--	Rish Master 3430
-MFM-2	MULTI FUNCTION METER	--	Rish Master 3430
-PB-AA	ALARM ACCEPT	--	-
-PB-AR	ALARM RESET	--	-
-PB-AT	ALARM TEST	--	-
-PB-DC1-FT	DC-1 SUPPLY TEST	--	-
-PB-DC2-FT	DC-2 SUPPLY TEST	--	-
-PB-DCFA	DCF ACCEPT	--	-
-R01.101.101	TC-1 Supvn (195R)	195R	TSR-B
-R01.101.301	TC-2 Supvn (295R)	295R	TSR-B
-R01.107.101	TC-1 Supvn (195Y)	195Y	TSR-B
-R01.107.301	TC-2 Supvn (295Y)	295Y	TSR-B
-R01.113.101	TC-1 Supvn (195B)	195B	TSR-B
-R01.113.301	TC-2 Supvn (295B)	295B	TSR-B
-R01.119.101	CB POLE DISCREPANCY -152E CB SF6 GAS PRESSURE LO	RXSF1	RXSF1
-R01.119.301	CB SF6 GAS PRESSURE LOCK OUT-152B CB TRIPPED ON	RXSF1	RXSF1
-R01.125.101	CB AIR PRESSURE LOW-152C SPARE	RXSF1	RXSF1
-R01.125.301	CB SPRING CHARGED SPARE	RXSF1	RXSF1
-R01.131.101	CB TC-1 SUPVN. HEALTHY	RXSF1	RXSF1
-R01.131.301	89BS2X-O	89BS2X-C	RXMM1
-R01.137.101	89BS4X-O	89BS4X-C	RXMM1
-R01.143.101	52X CLOSE CMD	SPARE	RXMM1

Device name	Description (1)	Description (2)	Type designation
-R01.149.101	DC Supply Fail Accept Relay	80E	RXMA1
-R01.149.301	AC SUPPLY SUPERVISION	80AC	RXMA1
-R01.155.101	DC-1 Supply Supervision	--	TSR-B
-R01.155.301	DC-2 Supply Supervision	--	TSR-B
-R02.101.101	86 TRIP RELAY	--	RXMVB4
-R02.113.301	3-Ph. Trip relay Supvn.	--	TSR-B
-R02.119.101	BB / LBB TRIP RELAY	--	RXMVB4
-R02.131.301	BB/LBB Trip relay Supvn.	--	TSR-B
-R02.149.101	DC-1 C/O RELAY	RXMH2	RXMH2
-R02.149.301	CB MANUAL TRIP-1	CB MANUAL TRIP-2	RXMM1
-R02.155.301	LBB RE-TRIP	LBB RE-TRIP	RXMM1
-SH	Heating	--	SPHT
-SL01	52 CB OPEN	--	-
-SL02	52 CB CLOSE	--	-
-SL03	89BS2 ISOL. OPEN	--	-
-SL04	89BS2 ISOL. CLOSE	--	-
-SL05	89BS4 ISOL. OPEN	--	-
-SL06	89BS4 ISOL. CLOSE	--	-
-SL11	TC-1 HEALTHY	--	-
-SL12	TC-2 HEALTHY	--	<b>Chief Engineer/Projects</b>
-SL13	CB SPRING CHARGED	--	<b>APTRANSCO/VS/Vijayawada.</b>
-SL14	CB TRIPPED ON CTD	--	-
-SL15	CB CAPACITOR CHARGED	--	-
-SL16	CB AUTO TRIP	--	-
-SS	Synchronizing socket	--	SS Type
-SS1	SYN ON/OFF SW	--	16-2-pos. contacts

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Assembly drawing	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Legend list	DCC ELU	+BS
		Project APTRANSCO		Legend list	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited		Language en
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-AFAC	
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						n. sheet 15

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Device name	Description (1)	Description (2)	Type designation
-SSS	Synchronizing selector switch	--	8 2-pos. contacts
-TS-1_BCPU	TS-1_BCPU	--	MPG
-TS-2_BCPU	TS-2_BCPU	--	MPG
-TTB-1	Test Terminal Block for MFM-1	--	TTB
-TTB-2	Test Terminal Block for MFM-2	--	TTB

**Plane: C**

Device name	Description (1)	Description (2)	Type designation
-52_CLS_1	CB POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-52_CLS_2	CB POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-52_OPN_1	CB POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-52_OPN_2	CB POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-89BS2_CLS_1	89BS2 ISOL. POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-89BS2_CLS_2	89BS2 ISOL. POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-89BS2_OPN_1	89BS2 ISOL. POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-89BS2_OPN_2	89BS2 ISOL. POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-89BS4_CLS_1	89BS4 ISOL. POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-89BS4_CLS_2	89BS4 ISOL. POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-89BS4_OPN_1	89BS4 ISOL. POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-89BS4_OPN_2	89BS4 ISOL. POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-FS10	R-PH BUS-1 PT CORE-1	FOR BCPU CKT.	-
-FS11	Y-PH BUS-1 PT CORE-1	FOR BCPU CKT.	-
-FS12	B-PH BUS-1 PT CORE-1	FOR BCPU CKT.	-
-FS13	R-PH BUS-3 PT CORE-1	FOR BCPU CKT.	-
-FS14	Y-PH BUS-3 PT CORE-1	FOR BCPU CKT.	-
-FS15	B-PH BUS-3 PT CORE-1	FOR BCPU CKT.	-

Device name	Description (1)	Description (2)	Type designation
-FS21	R-PH BUS-1 VT	FUSE FOR SYNC. CKT	-
-FS22	R-PH BUS-2 VT	FUSE FOR SYNC. CKT	-
-FS30	R-PH BUS-1 PT CORE-1	FOR MFM-1 CKT.	-
-FS31	Y-PH BUS-1 PT CORE-1	FOR MFM-1 CKT.	-
-FS32	B-PH BUS-1 PT CORE-1	FOR MFM-1 CKT.	-
-FS33	R-PH BUS-2 PT CORE-1	FOR MFM-2 CKT.	-
-FS34	Y-PH BUS-2 PT CORE-1	FOR MFM-2 CKT.	-
-FS35	B-PH BUS-2 PT CORE-1	FOR MFM-2 CKT.	-
-FS39	R-PH BUS-3 VT CORE-1	FOR IND. CKT.	-
-FS40	Y-PH BUS-3 PT CORE-1	FOR IND. CKT.	-
-FS41	B-PH BUS-3 PT CORE-1	FOR IND. CKT.	-
-LK12	NU BUS-1 PT CORE-1	FOR BCPU CKT.	NL
-LK15	NU BUS-3 PT CORE-1	FOR BCPU CKT.	NL
-LK21	NU BUS-1 VT	FUSE FOR SYNC. CKT	15A
-LK22	NU BUS-2 VT	FUSE FOR SYNC. CKT	15A
-LK32	NU BUS-1 PT CORE-1	FOR MFM-1 CKT.	NL
-LK35	NU BUS-2 PT CORE-1	FOR MFM-2 CKT.	NL
-LK41	NU BUS-3 VT CORE-1	FOR IND. CKT.	NL

**Chief Engineer/Projects  
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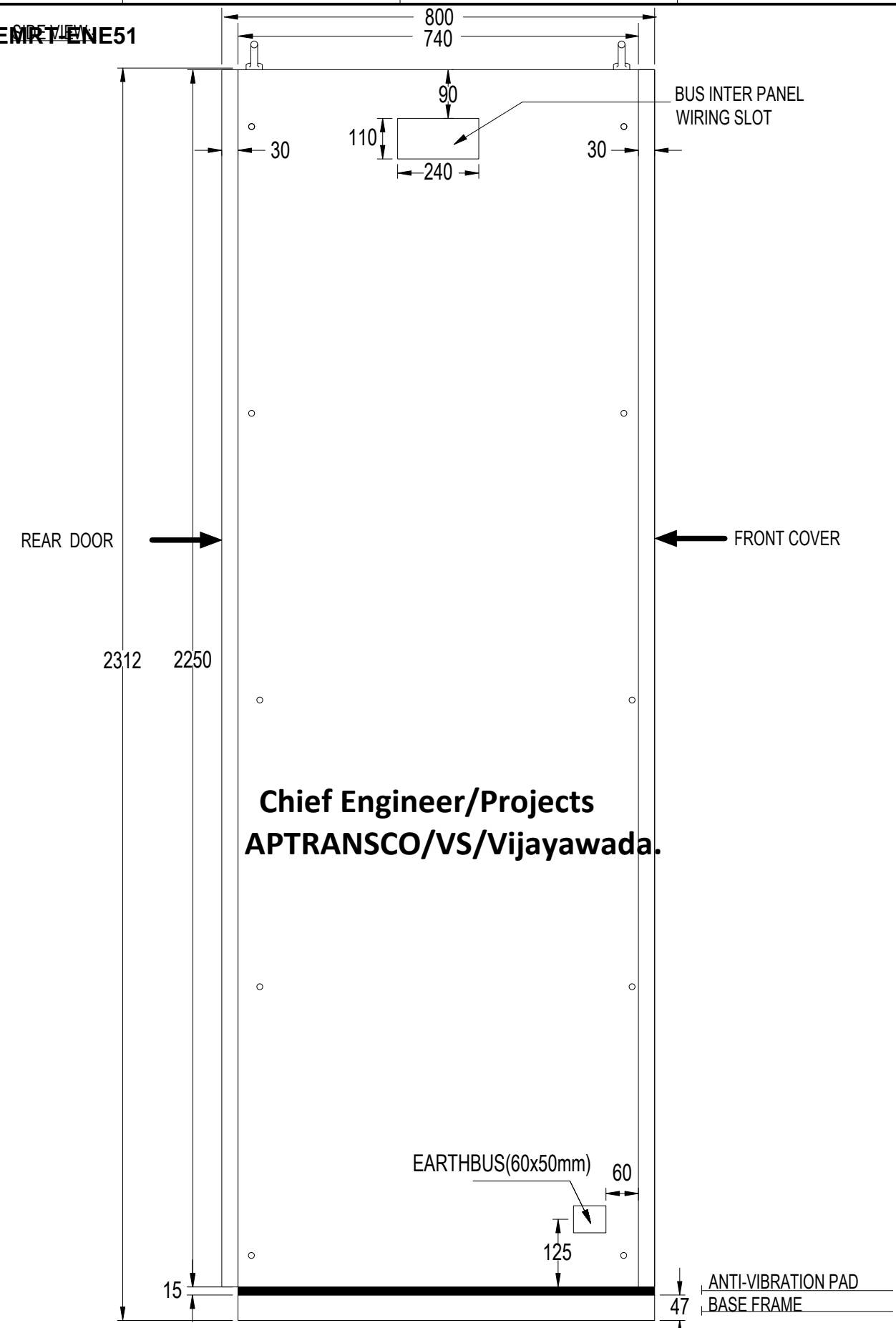
Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Assembly drawing	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Legend list	DCC ELU	+BS
		Project APTRANSCO		Legend list	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited		Language en
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-AFAC	Sheet 15
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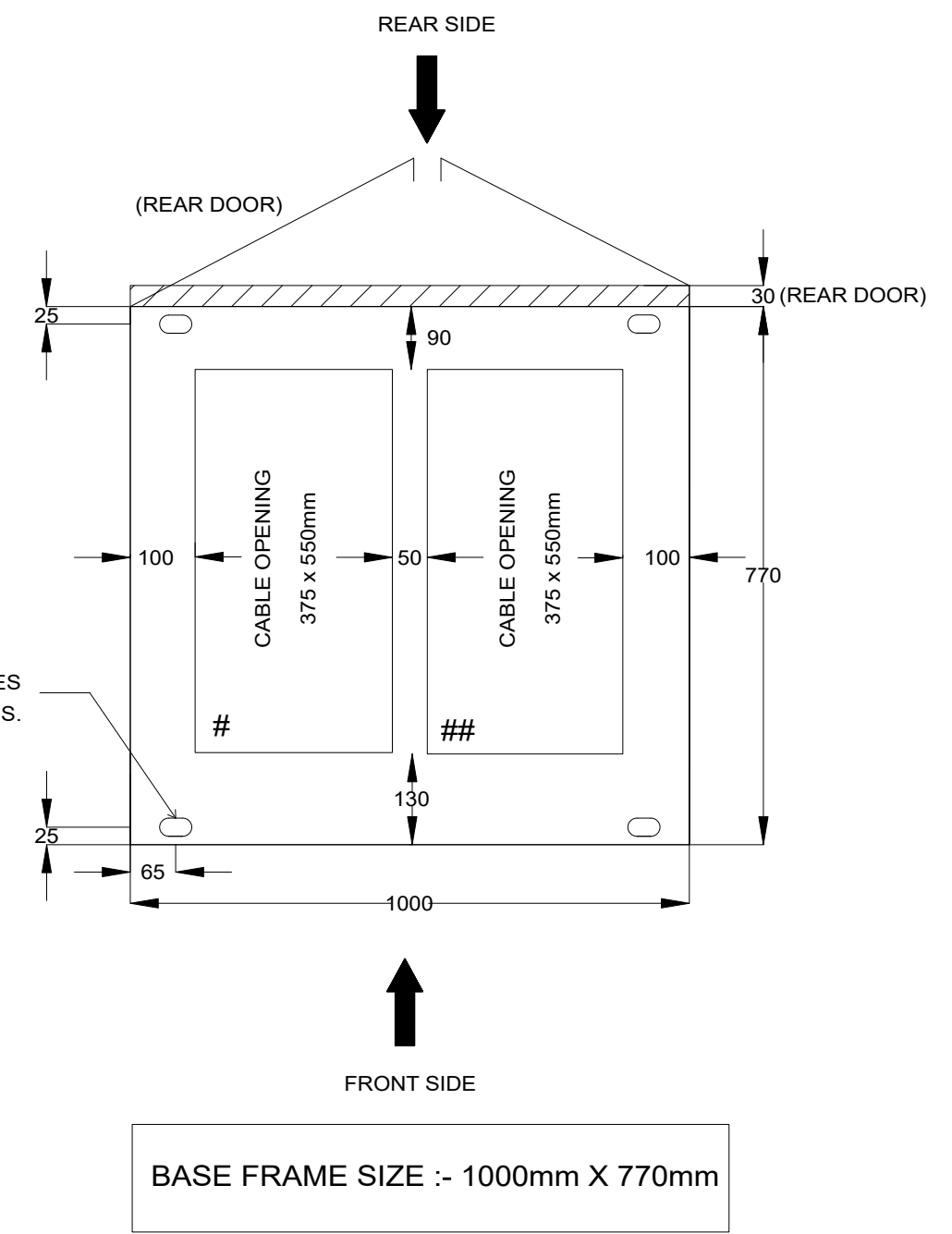
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**FOUNDATION DETAILS:-**



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APTRANSCO/VS/Vijayawada.**



**NOTES:-**

1. ALL DIMENSIONS ARE IN mm
2. COUPLING HOLE, BUS BAR CUT OUT SHALL BE AS PER STANDARD DRAWING.
3. WIRING : FRLS, MULTI STRANDED COPPER WIRE OF VOLTAGE 1100V4.
4. # GLAND PLATE WITH 21 Nos. KNOCKOUT PUNCH HOLES OF 19mm DIA. TO BE PROVIDED.
5. ## GLAND PLATE WITH 21 Nos. KNOCKOUT PUNCH HOLES OF 25mm DIA. TO BE PROVIDED.

Based on		Prepared 27.02.2024 MANASA ESHWAR	Title 220kV BUS SECTION Control & Relay Panel		Doc. kind. Assembly drawing DCC ELU	Ref.Des. =2KR +BS	
		Approved 27.02.2024 GOURISH HEGDE	Side View & Foundation Details		Resp. dept. PG-GAS	Rev. ind. 0	Language en
		Project APTRANSCO STANDARD DRAWING	Hitachi Energy India Limited		Doc. no. 1MNS500925-AFAC		Sheet 16 n. sheet 17
Rev.	Revision note	Date	Name				
1MYN691003-102(A3)REV01							

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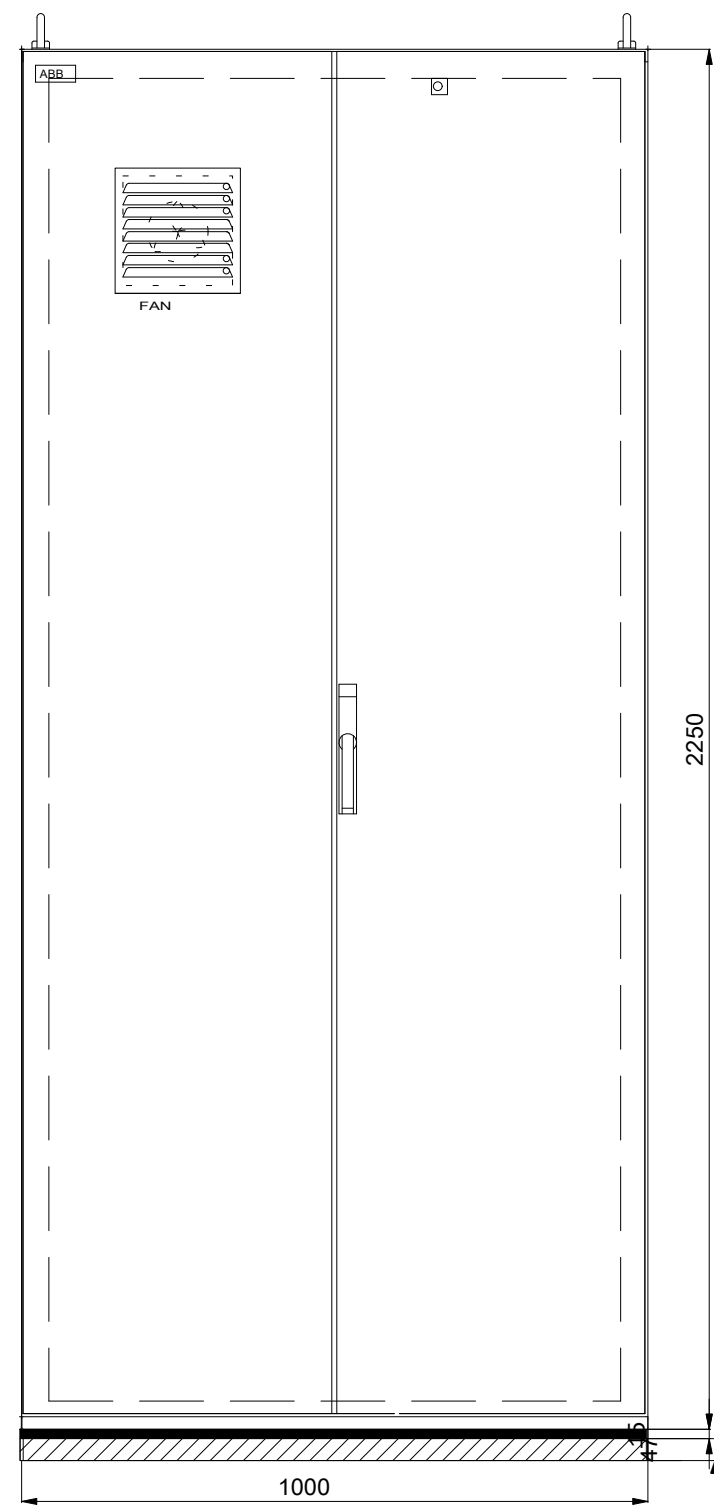
**PANEL DETAILS:-**

TYPE:- VTG - Simplex Panel, W=1000mm, D=800mm, H=2312mm (2250 + 47 (BF) + 15 (AVP))

Technical data:

Height	2312mm		
Width	1000mm		
Depth	800mm		
Weight	400 kg Approx.		
Thickness of material	: Front Cover (Load Bearing Member) 3mm : Rear door 2mm (Double leaf door with lock&1no exhaust fan) : Roof / Bottom plate 2mm : Gland plate 3mm : Side covers 2mm : Base frame 3mm		
Mimic color:	220kV:-Light Orange to shade 557 as per IS:5		
Busbar mimic (paint overlaid)	Main busbar - 12mm Aluminium strip		
	Other busbar - 10mm Aluminium strip		
Protection class	IP54		
Cubicle Illumination	9W LED lamp		
Earth Bar	Tinned Copper Strip of 25 x 6mm		
Bottom Plate	With Two opening 375mmx550mm		
Gland Plate	2 nos of plates - Fixing cable glands 415 x 590mm		
Cubicle Colour			
Powder Coating : Exterior	Light Grey to shade 631 of IS:5,Semi glossy finish		
	: Interior White Glossy finish		
	: Base frame Black Glossy		
	: Thickness 60-80 microns for powder coating		
Wires & Ferrules (FRLS)	1100V Grade PVC Insulation Multi Strand Wires		
Wire size for CT Circuits	2.5 Sqmm, Phase : RYB, Neutral : Black		
Wire size for PT Circuits	1.5mm <sup>2</sup> , Phase : RYB, Neutral : Black, 2x2.5mm <sup>2</sup> for TVM P		
Wire size for DC Circuits	1.5 Sqmm, Grey		
Wire size for Aux.AC Circuit	1.5mm <sup>2</sup> , Grey		
Wire size for Earthing	2.5mm <sup>2</sup> , Green		
<b>Ferrules</b>			
Wire directly connected to TRIP COIL	Red Coloured "T"		
All other ferrules	White Sleeve with Nos.marked in Black letters		
Terminal blocks ( 20% spare terminal blocks )	PROVIDED		
Terminal Make	Elmex		
Terminal CT / VT	Disconnecting type (CATD M4)		
Terminal AC/DC incoming	Disconnecting type (CATD M4)		
Terminal Earthing	Disconnecting type (CATD M4)		
Terminal Trip	Non-Disconnecting type (CAT M4)		
Terminal Interpanel,General	Disconnecting type, Non-Disconnecting type		
LABELS	DIMENSIONS(mm)	LETTER HEIGHT(mm)	
1:Main Label(Front)	200 x 60	10	
MATERIAL : Lamicoid	TYPE OF INSCRIPTION : Engraving-white letters on black background		
2A : Apparatus Label (Inside)	33 x 80	3	
MATERIAL : Aluminium anodised	TYPE OF INSCRIPTION :Engraving-white letters on black background		
2B : Apparatus Label (Front)	48 x 14	3	
MATERIAL : Aluminium anodised	TYPE OF INSCRIPTION : Engraving-white letters on black background		
3:Item Designation Stickers(Inside)	20 x 10	5	
MATERIAL : Self adhesive yellow stickers	TYPE OF INSCRIPTION : Engraving-white letters on black background		
4:Flag Relay Labels	29 x 29	2	
MATERIAL : Aluminium anodised	TYPE OF INSCRIPTION : Engraving-white letters on black background		
5:PB/Lamp Labels	30 x 40	3	
MATERIAL : Aluminium anodised	TYPE OF INSCRIPTION :Engraving-white letters on black background		

REAR VIEW Drawing approval subject to valid vendor registration



REAR VIEW WITH METALLIC DOUBLE DOOR CLOSED

**Chief Engineer/Projects**  
**APTRANSCO/VS/Vijayawada**

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Assembly drawing	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC ELU	+BS
		Project APTRANSCO		Panel Details & Rear Door Details	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited		Language en
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-AFAC	Sheet 17
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TERMINAL BLOCK DESIGNATION FOR EXTERNAL WIRING	
AX01, BX01, CX01,DX01	CT CIRCUITS
AX02, BX02, CX02,DX02	CVT/PT CIRCUITS
DCX03, ACX03	DC/AC INCOMING CIRCUITS
X04	CONTROL CIRCUITS
X05	INDICATION CIRCUITS
X06	ANNUNCIATION CIRCUITS
X07	SPARE CONTACTS
X08	SCADA/DAS/EVENT LOGGER CKTS
52*X04	CB CIRCUITS
89*X04	ISOLATOR CIRCUITS
BBX04	BUSBAR CIRCUIT
TRX04	TRANSFORMER TROUBLE/ RTCC/FIRE FIGHTING
PLX04	PLCC CIRCUIT
AXX1.1,AXX1.2, BXX1.1,BXX1.2	DC CIRCUITS FOR LOOPING

TERMINAL BLOCK DESIGNATION FOR INTERPANEL BUS WIRING	
AX11,BX11 CX11,DX11	CT CIRCUITS
AX12,BX12 CX12,DX12	CVT CIRCUITS
DCX13, ACX13	DC/AC INCOMING CIRCUITS
X14	CONTROL CIRCUITS
BBX14	BUSBAR CIRCUIT

TERMINAL BLOCKS	
	NON DISCONNECTING TB
	DIS CONNECTING TB
	CT/CVT JUNCTION BOX TERMINAL
	BREAKER TERMINAL
	ISOLATOR TERMINAL
	MARSHALLING KIOSK TB
	PLCC/FOTE TERMINALS
	ACDB/DCDB TERMINALS

SYMBOL LIST	
	MCB
	FUSE
	LINK
	RELAY COIL
	RELAY REVERSE FLAG
	RELAY MANUAL RESET FLAG
	PUSH BUTTON ON CONTACT
	NO CONTACT
	NC CONTACT
	EARTH
	SWITCH CONTACT
	LED LAMP
	SPACE HEATER
	DIODE
	RESISTOR
	VARISTOR

SYMBOL LIST	
	BINARY I/P
	BINARY O/P
	CHANGE OVER OUTPUT
	CT/PT INPUT
	mA INPUT
	POWER SUPPLY INPUT
	IEC61850 COMM. PORT
	RS232/485 COMM. PORT
	RJ45 COMM. PORT
	CURRENT TRANSFORMER
	CVT
	PT
	CIRCUIT BREAKER
	LIGHTNING ARRESTOR

FERRULE NOMENCLATURE		
FERRULE 'A' : CT CIRCUIT- MAIN PROTECTION	FERRULE 'B' : CT CIRCUIT- BUSBAR PROTECTION	FERRULE 'C' : CT CIRCUIT- BACKUP PROTECTION
FERRULE 'D' : CT CIRCUIT- METERING	FERRULE 'E' : PT CKTS	FERRULE 'H' : AUXILIARY AC CKTS
FERRULE 'J' : AUXILIARY DC CKTS	FERRULE 'K' : CONTROL CKTS	FERRULE 'L' : INDICATION CKTS
FERRULE 'P' : DC CKT- BUSBAR PROTECTION	FERRULE 'U' : SPARE CONTACTS	

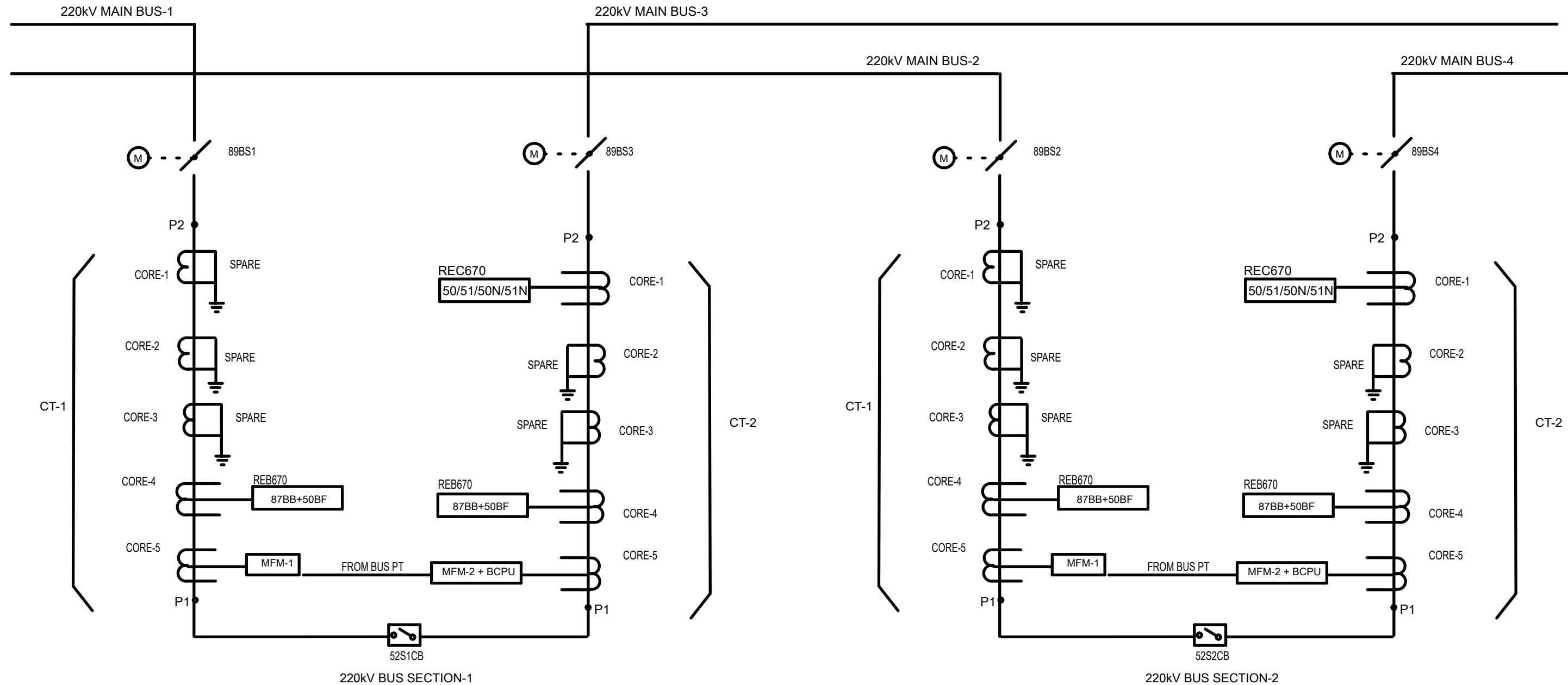
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		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		List Of Symbols	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CFAC		Sheet 21
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CT-1 DETAILS FOR 220kV BUS SECTION

APPLICATION	CORE NO.	RATIO	ACCURACY CLASS	RCT	Vk (V)	I EX (mA)
SPARE	1	1600-1200-800/1A	--	--	--	--
SPARE	2	1600-1200-800/1A	--	--	--	--
SPARE	3	1600-1200-800/1A	--	--	--	--
BUS DIFF	4	1600-1200-800/1A	--	--	--	--
METERING	5	1600-1200-800/1A	--	--	--	--

**Chief Engineer/Projects**  
**APTRANSCO/VS/Vijayawada.**

CT-2 DETAILS FOR 220kV BUS SECTION

APPLICATION	CORE NO.	RATIO	ACCURACY CLASS	RCT	Vk (V)	I EX (mA)
PROTECTION	1	1600-1200-800/1A	--	--	--	--
SPARE	2	1600-1200-800/1A	--	--	--	--
SPARE	3	1600-1200-800/1A	--	--	--	--
BUS DIFF	4	1600-1200-800/1A	--	--	--	--
METERING	5	1600-1200-800/1A	--	--	--	--

NOTE: CT RATIOS AND DETAILS TO BE FURNISHED  
ADOPTED CT RATIOS TO BE FURNISHED.

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Single Line Diagram	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CFAC	Sheet 22	n. sheet 23
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PROTECTION FUNCTION	OUTPUT	3PH (86) TRIP RELAY	BUSBAR TRIP RELAY	TO CB TRIP COIL-1	TO CB TRIP COIL-2	TO CLOSE COIL	Remark
OVERCURRENT PROTECTION (50/51)	3 Ph	(IP)					BUILT IN REC670
EARTH FAULT PROTECTION (50N/51N)	3 Ph	(IP)					BUILT IN REC670
LBB PROTECTION (50BF)	3 Ph		(IP)				BUILT IN REB670
3PH TRIP RELAY	3 Ph			(TP)	(TP)	(RS)	RXMVB4
BUSBAR / LBB TRIP RELAY	3 Ph			(TP)	(TP)	(RS)	RXMVB4(Part of BB Panel)

(IP) INDICATES INITIATION FROM PROTECTION FUNCTION    (TP) INDICATES TRIP FROM PROTECTION FUNCTION    (RS) INDICATES RESET STATUS FOR CB CLOSING

**Chief Engineer/Projects  
APTRANSCO/VS/Vijayawada.**

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION Control & Relay Panel Trip Logics	Doc. kind. Circuit diagram	Ref.Des. =2KR	
		Approved 27.02.2024	GOURISH HEGDE		DCC EFS		
		Project APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited	Resp. dept. PG-GAS	Rev. ind. 0	Language en
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC		Sheet 23 n. sheet 24
1MYN691003-102(A3)REV01							

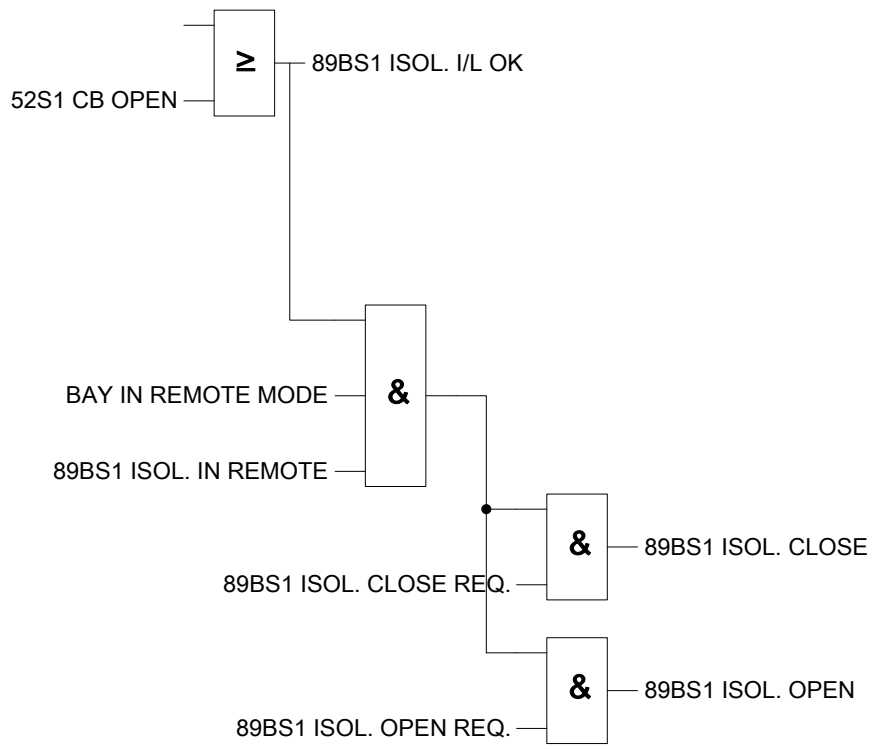
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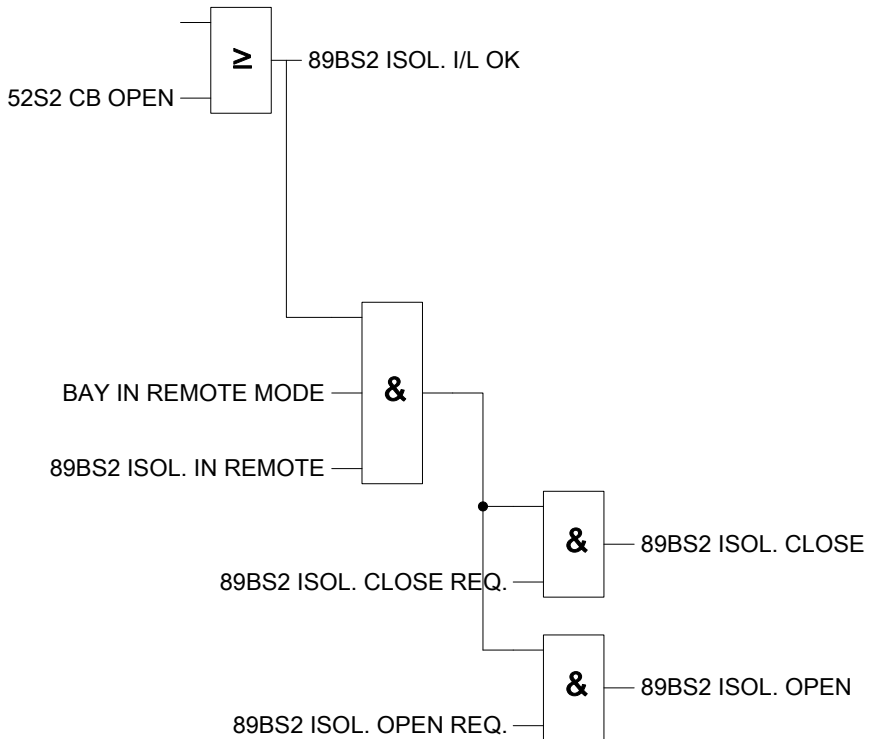
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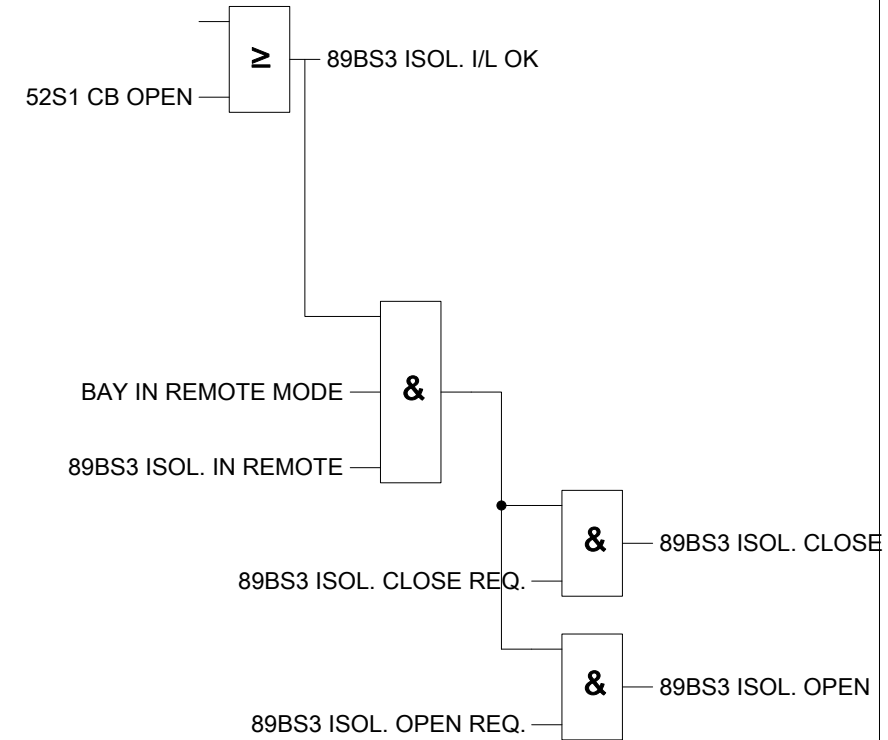
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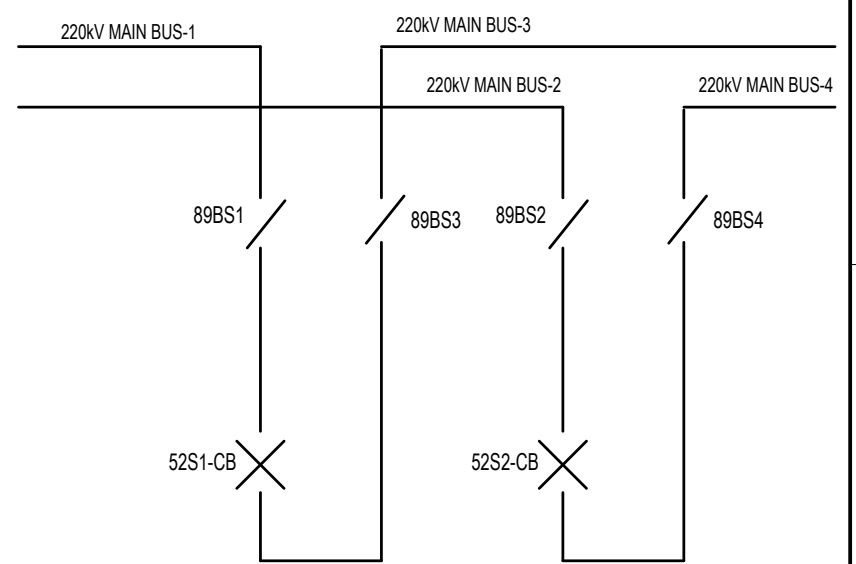
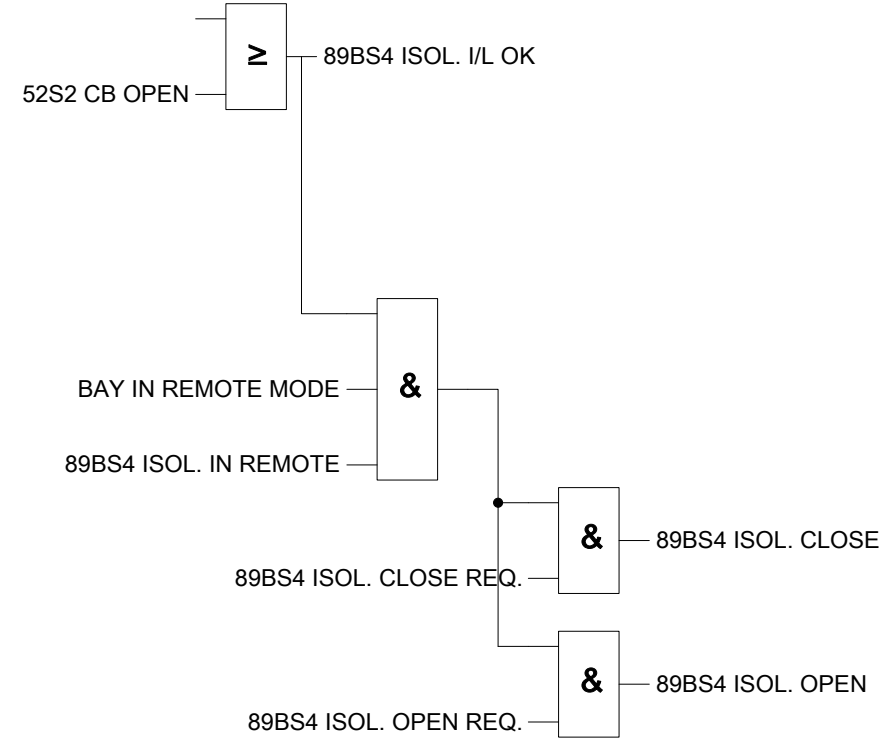
89BS2 ISOL. OPEN/CLOSE INTERLOCK



89BS3 ISOL. OPEN/CLOSE INTERLOCK



89BS4 ISOL. OPEN/CLOSE INTERLOCK



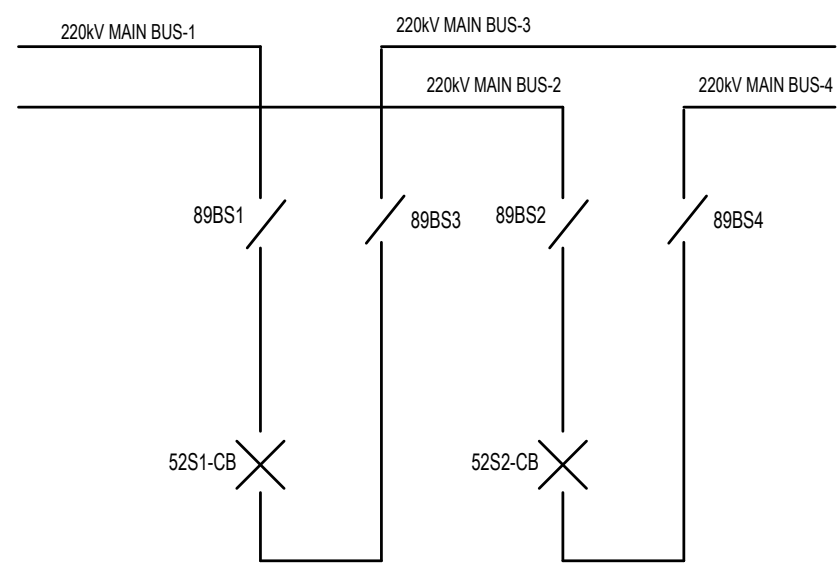
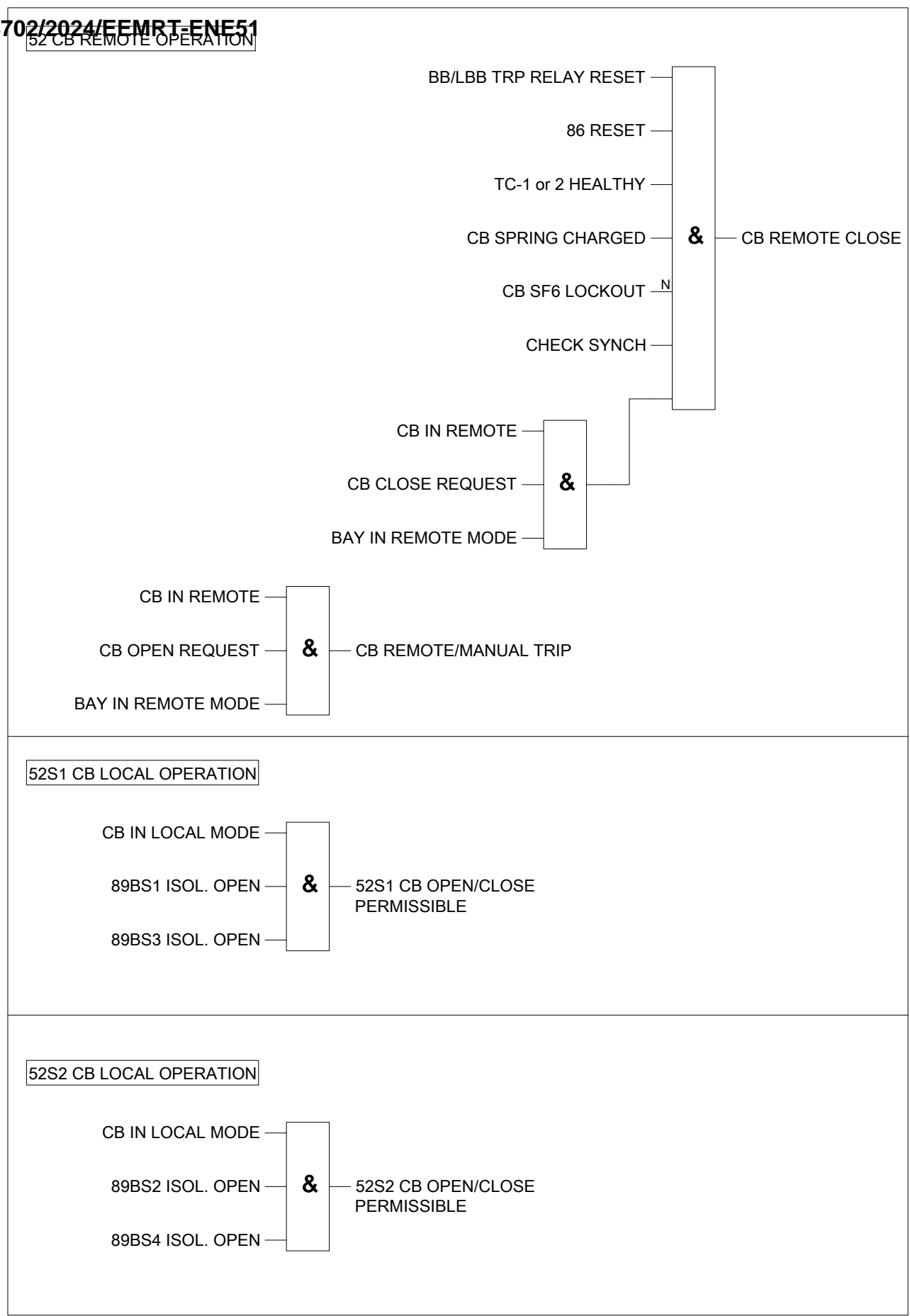
**Chief Engineer/Projects  
APTRANSCO/Vs/Vijayawada.**

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		Project APTRANSCO		Interlocking Logics	Resp. dept. PG-GAS	Rev. ind. 0
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
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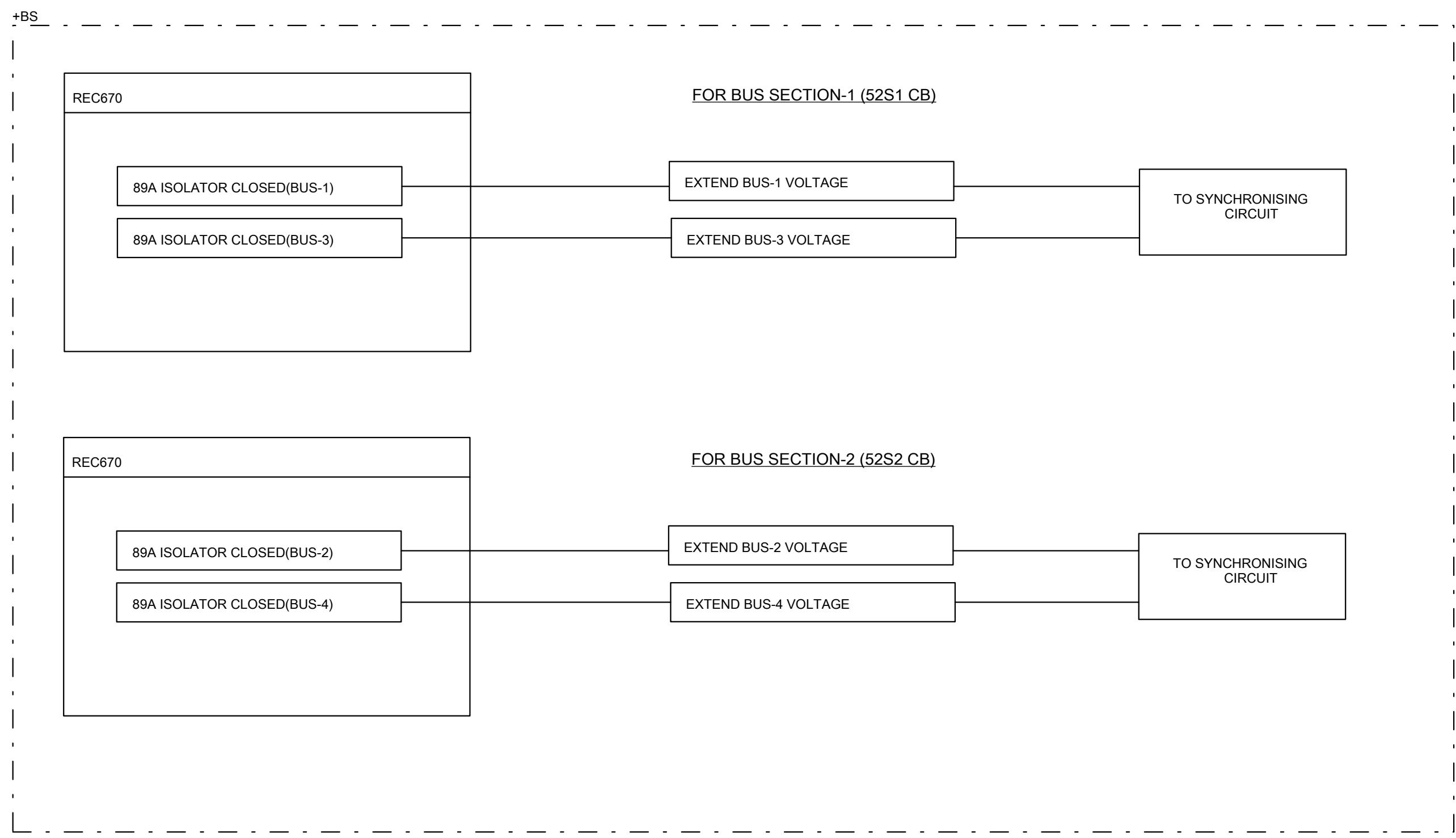
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APTRANSCO/VS/Vijayawada.**

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		Approved 27.02.2024	GOURISH HEGDE		DCC EFS		
		Project APTRANSCO STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Resp. dept. PG-GAS	Rev. ind. 0	Language en
Rev.	Revision note	Date	Name		Doc. no. 1MNS500925-CFAC	Sheet 24.1	n. sheet 25
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Drawing approval subject to valid vendor registration

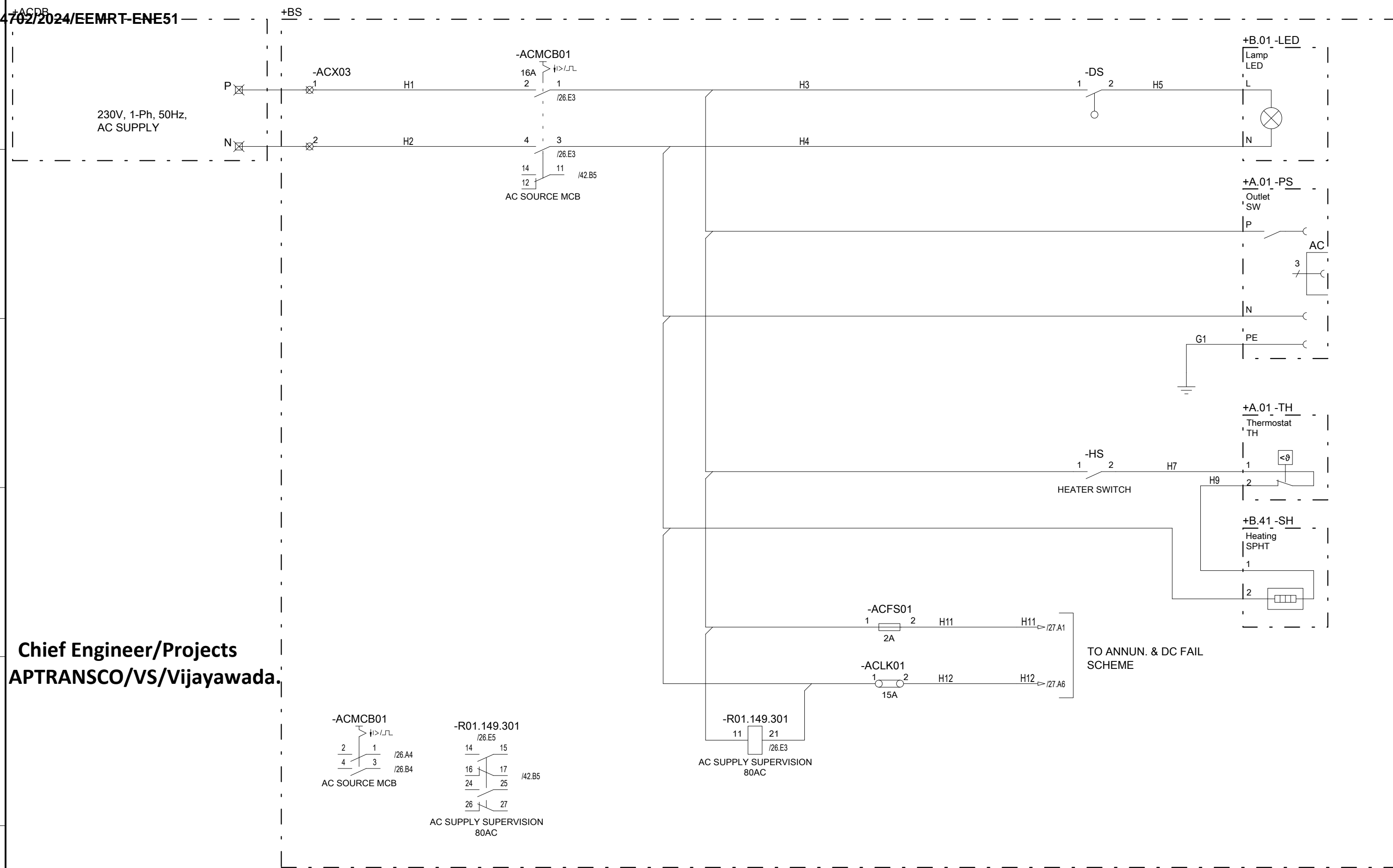
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**APTRANSCO/VS/Vijayawada.**

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		Approved	27.02.2024	GOURISH HEGDE			DCC	EFS				
		Project	APTRANSCO STANDARD DRAWING		<b>HITACHI</b> Hitachi Energy India Limited	Resp. dept.	PG-GAS		Rev. ind.	0	Language	en
Rev.	Revision note	Date	Name			Doc. no.	1MNS500925-CFAC				Sheet	25
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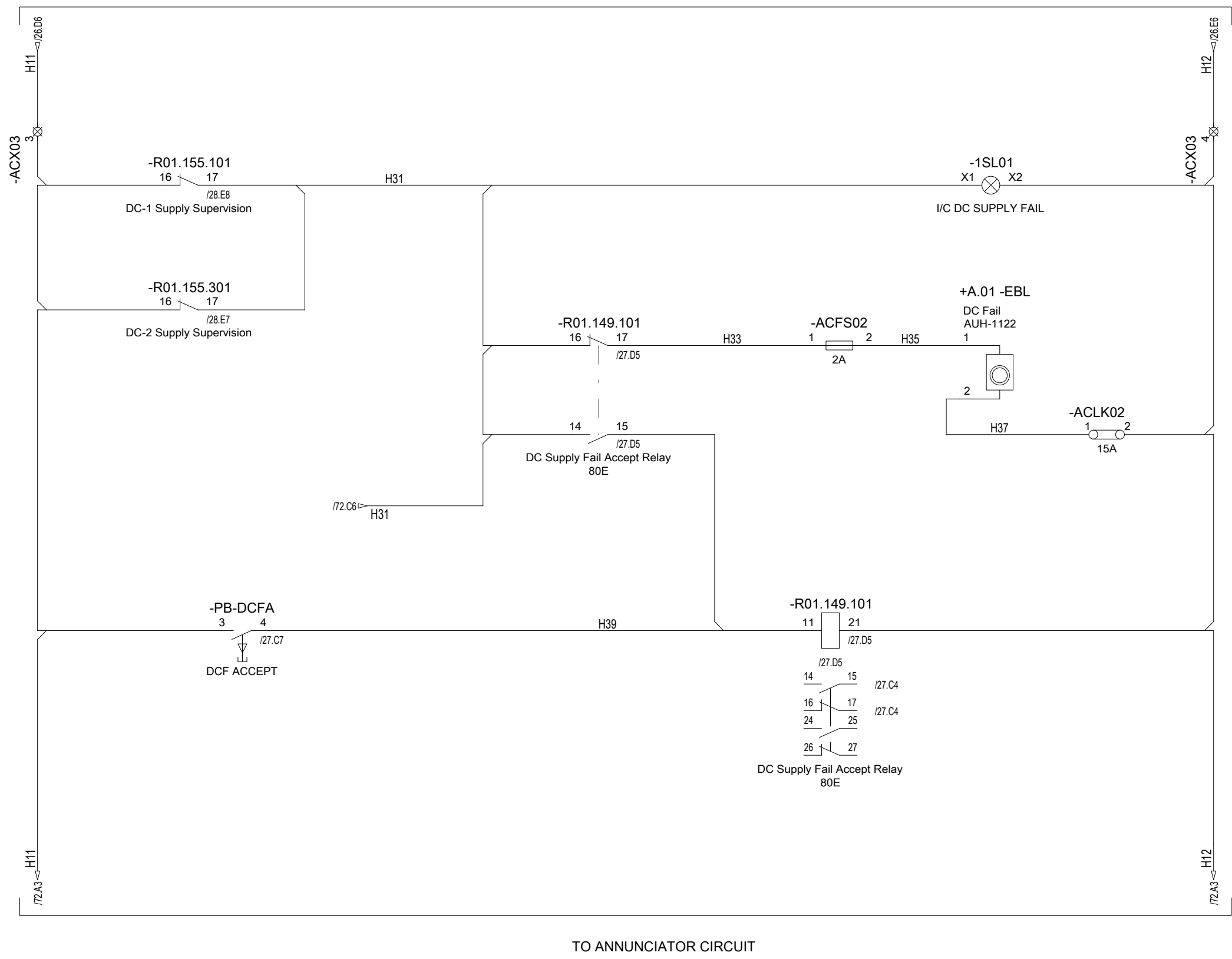


**Chief Engineer/Projects**  
**APTRANSCO/VS/Vijayawada.**

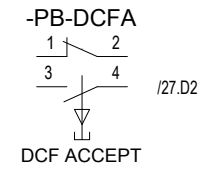
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		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		AC Distribution Circuit	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name		Doc. no. 1MNS500925-CFAC	
					Sheet 26	n. sheet 27
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FROM 230V AC SUPPLY



TO ANNUNCIATOR CIRCUIT



**Chief Engineer/Projects  
APTRANSCO/VIS/Vijayawada.**

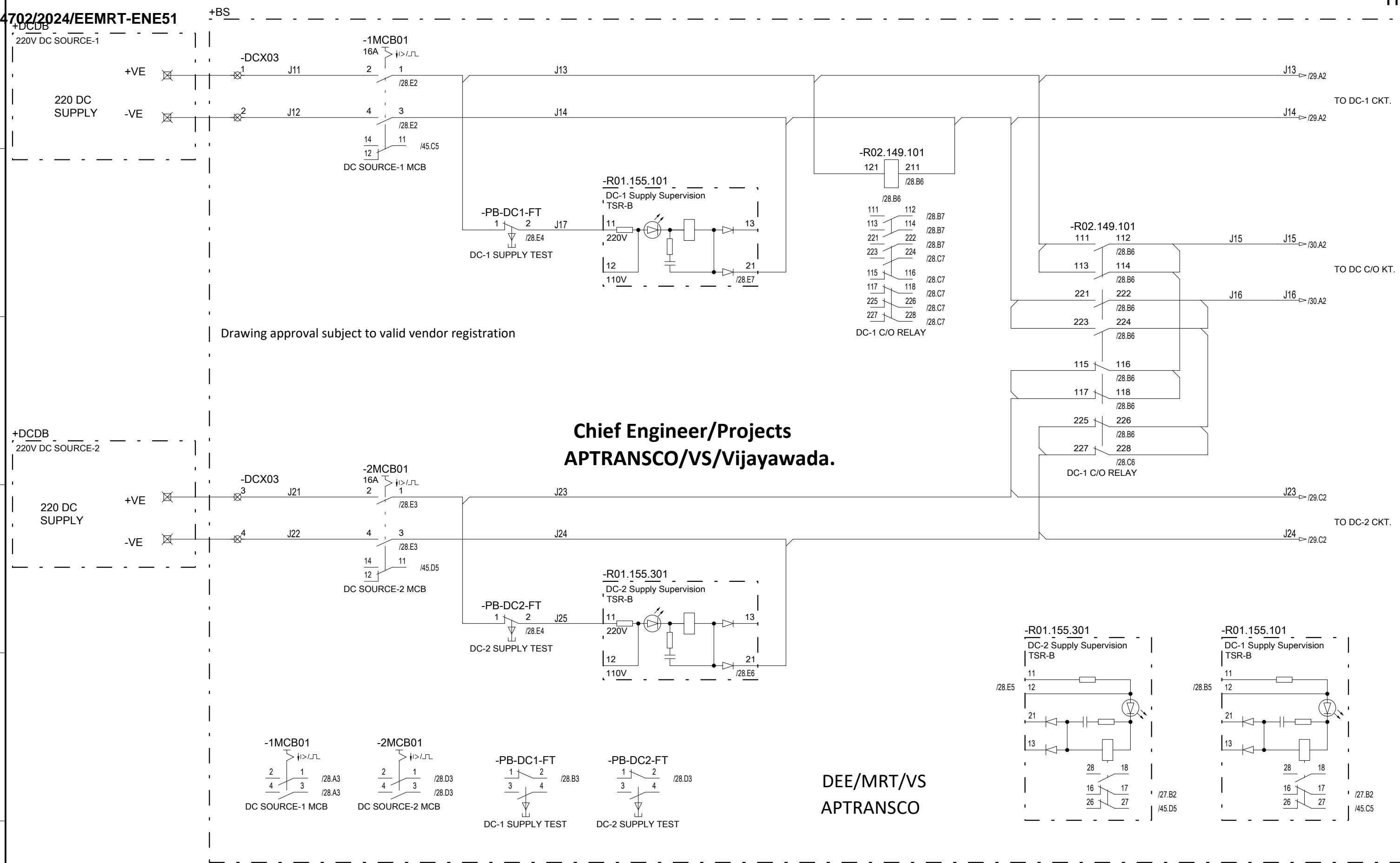
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		Approved	27.02.2024	GOURISH HEGDE				DCC	EFS			
		Project	APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited	Resp. dept.	PG-GAS		Rev. ind.	0	Language	en
Rev.	Revision note	Date	Name	<b>HITACHI</b>		Doc. no.	1MNS500925-CFAC		Sheet	n. sheet		
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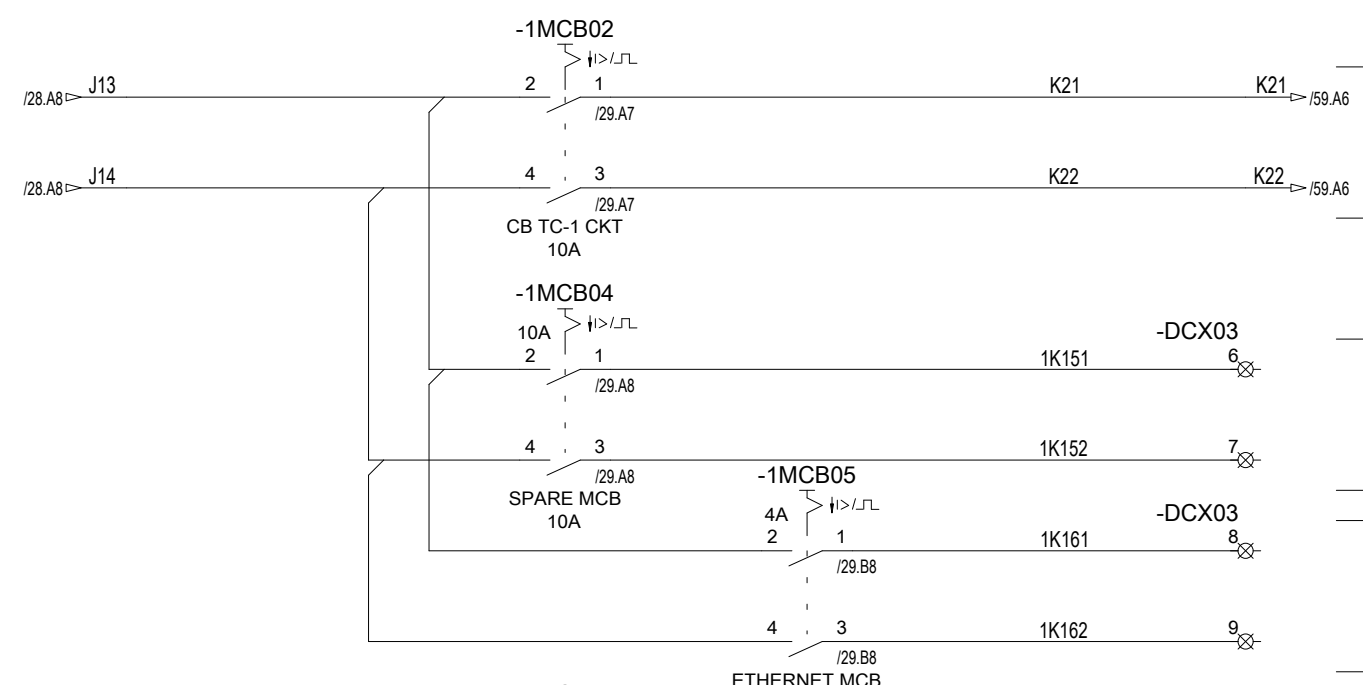


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		Project APTRANSCO		DC Distribution Circuit	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	Sheet 28
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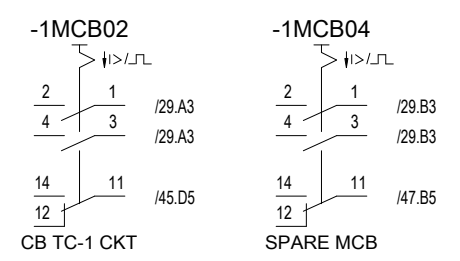
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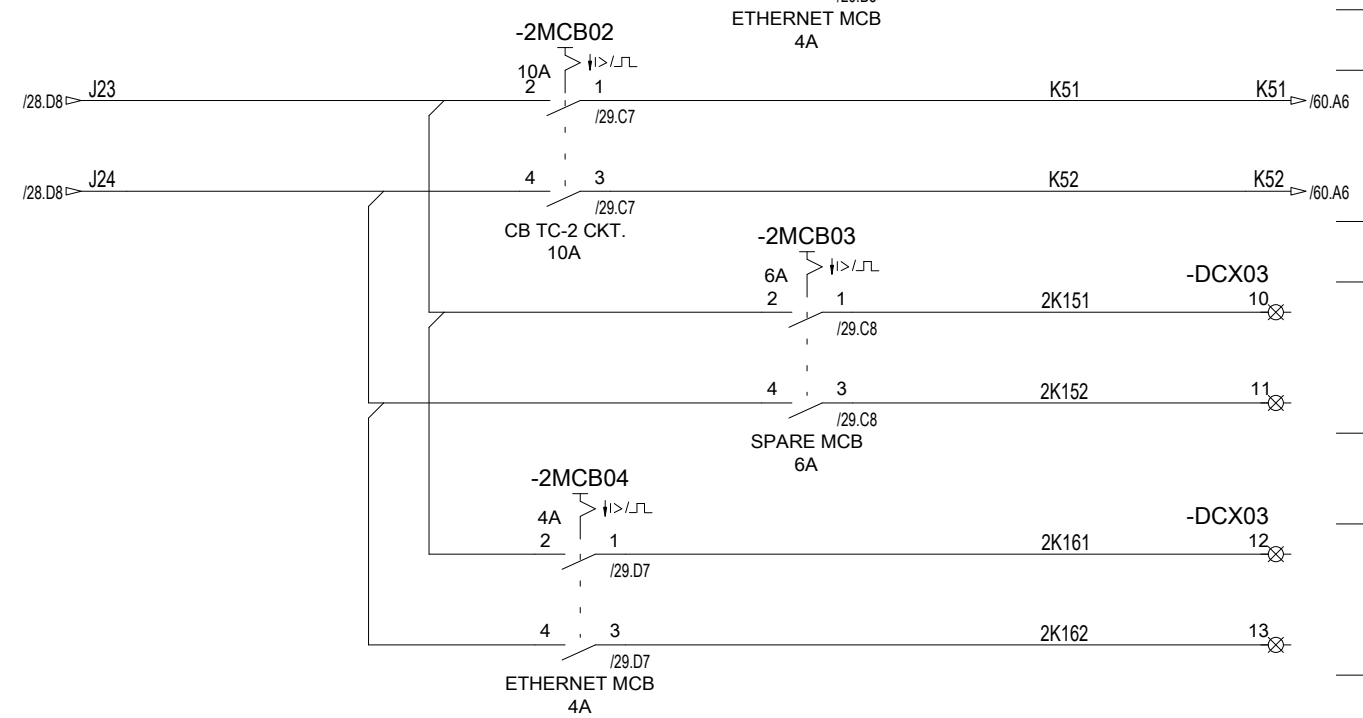
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SPARE MCB

ETHERNET MCB



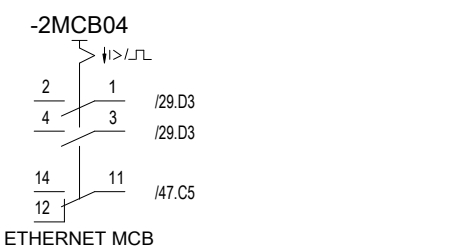
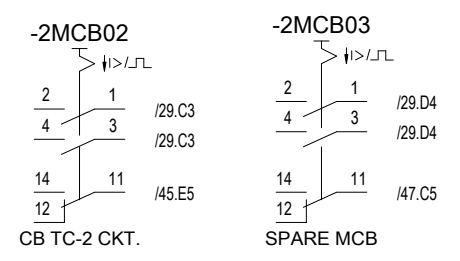
FROM DC-2 SUPPLY



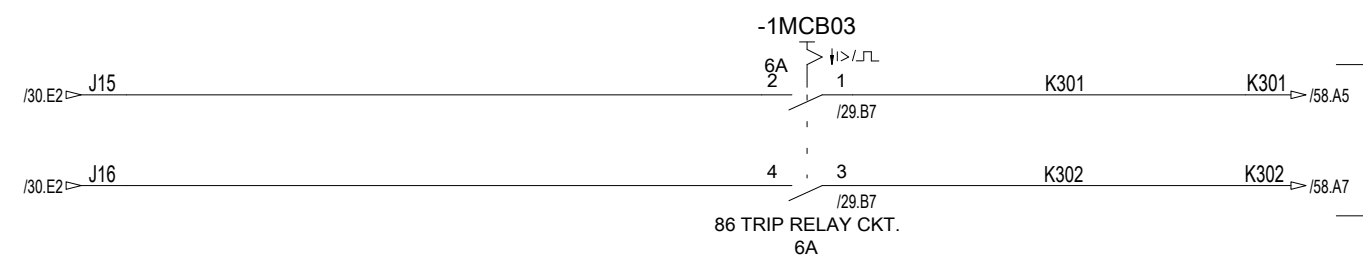
TO CB TC-2 CKT.

SPARE MCB

ETHERNET MCB



FROM DC C/O SUPPLY



TO 86 TRIP RELAY CKT.

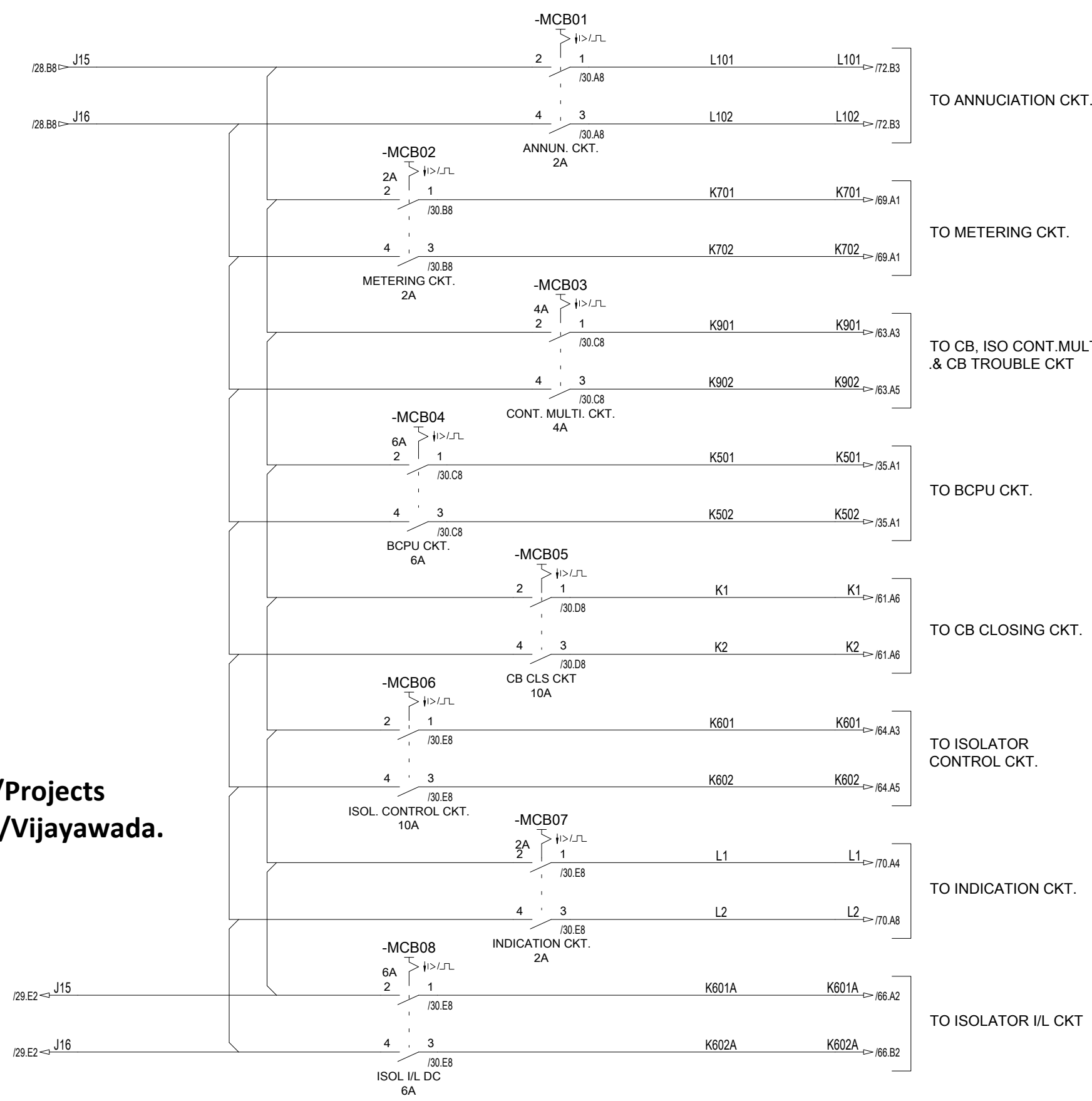
**Chief Engineer/Projects  
APTRANSCO/VS/Vijayawada.**

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		DC Distribution Circuit	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited		Language en
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	
1MYN691003-102(A3)REV01					Sheet 29	n. sheet 30

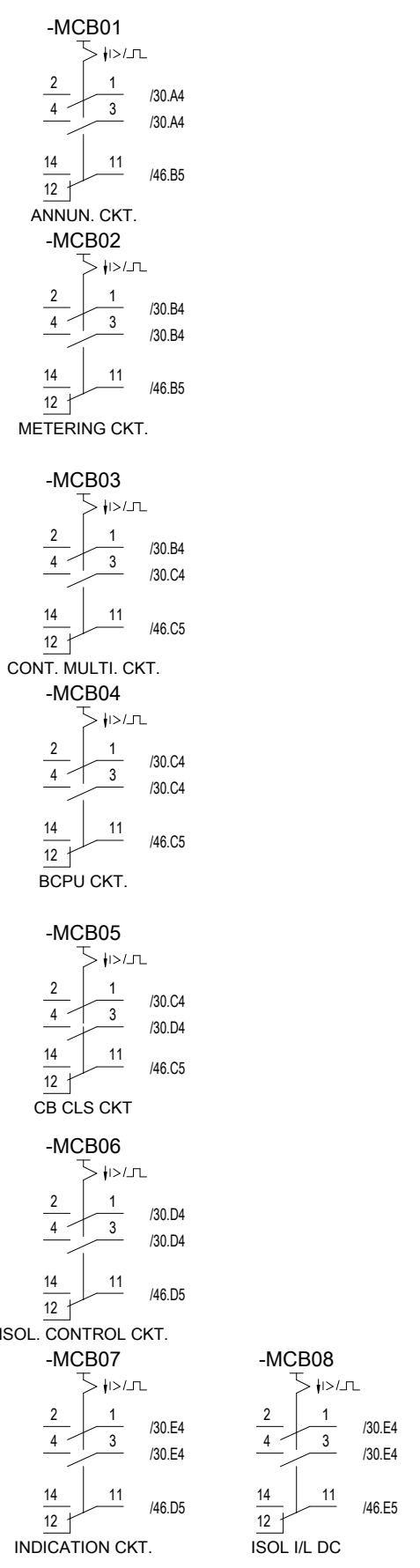
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FROM C/O DC SUPPLY



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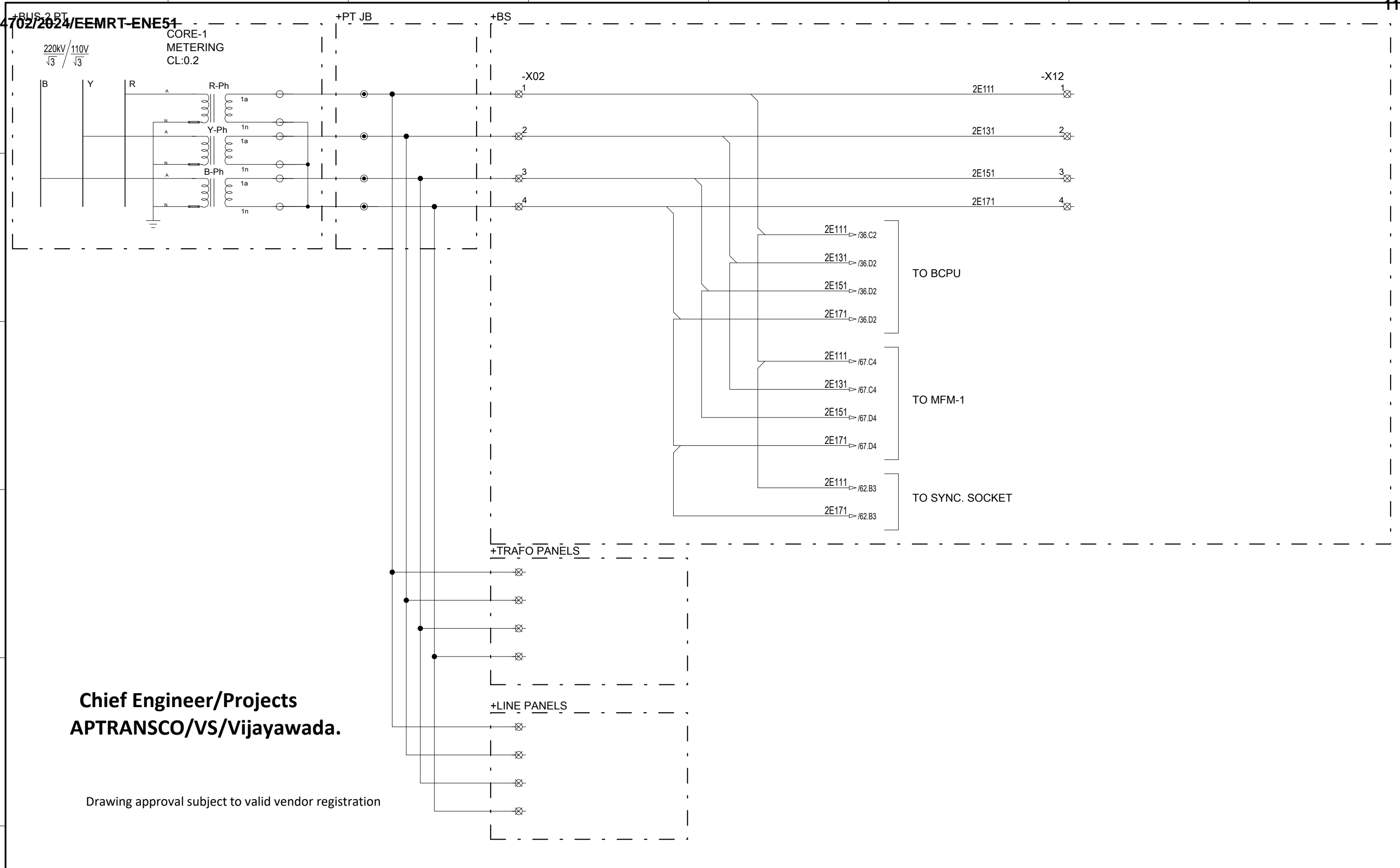
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Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	Sheet 30
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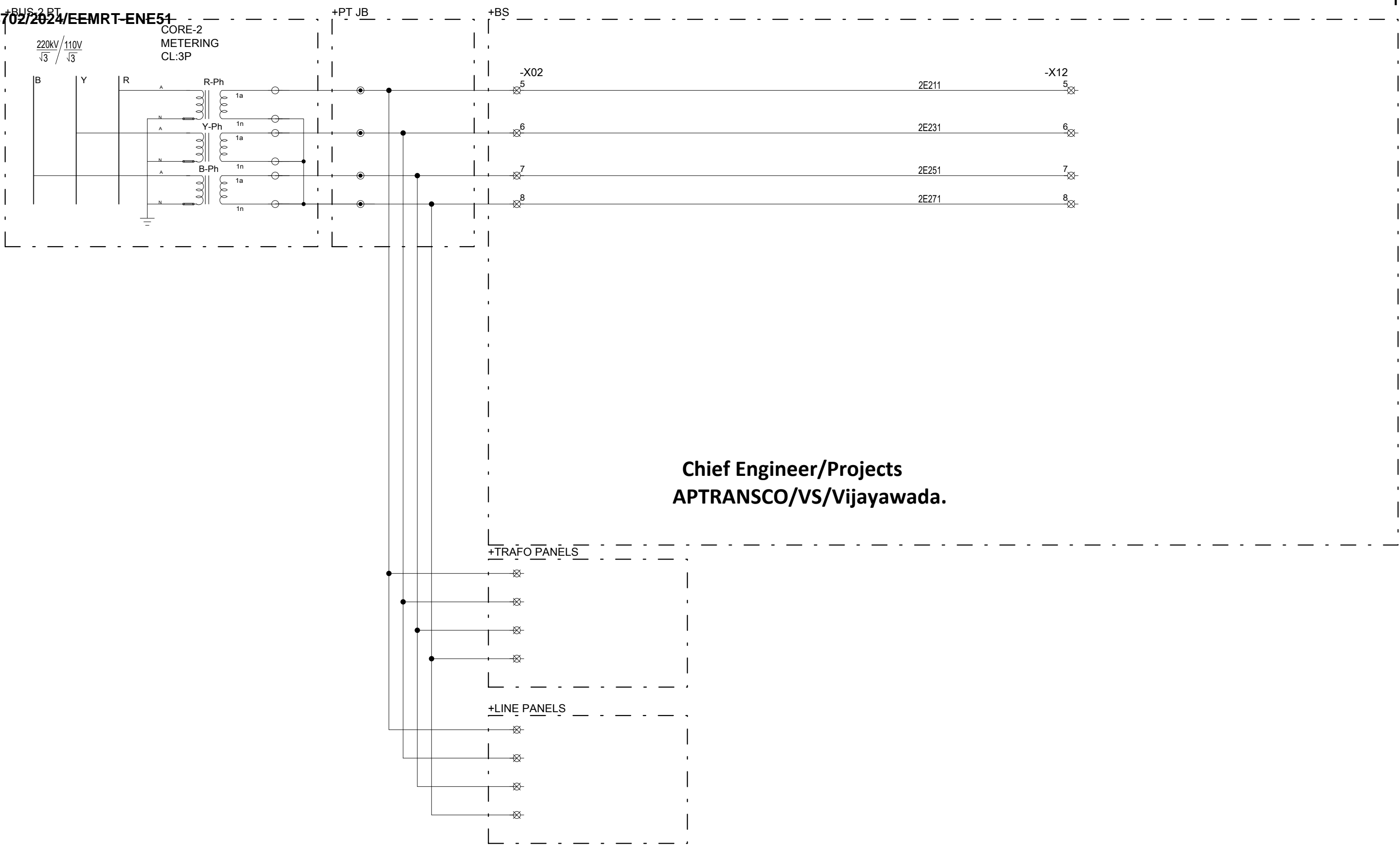
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		STANDARD DRAWING			Doc. no. 1MNS500925-CFAC	Sheet 31	n. sheet 32
Rev.	Revision note	Date	Name				
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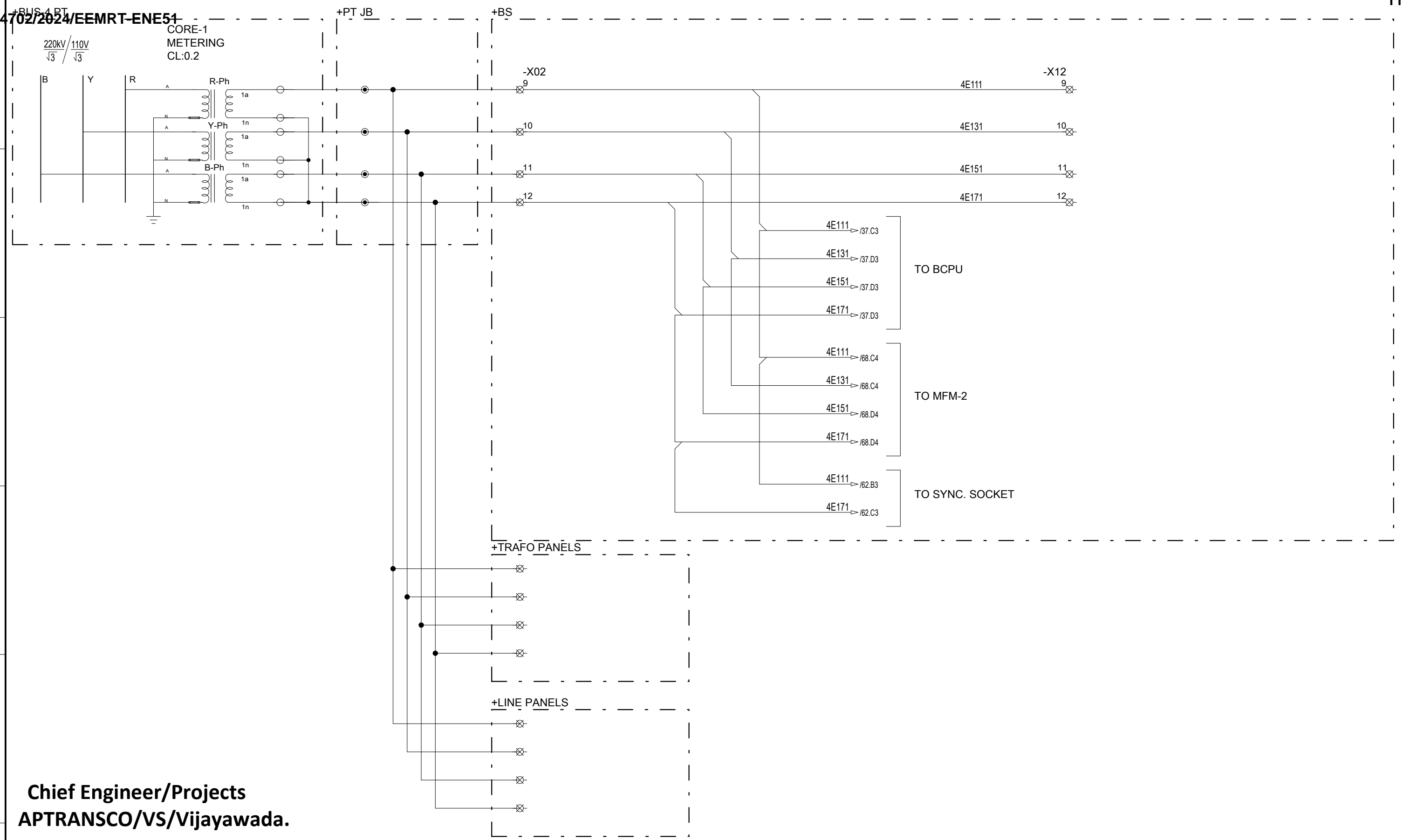
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Rev.	Revision note	Date	Name		Doc. no. 1MNS500925-CFAC	Sheet 32	n. sheet 33
1MYN691003-102(A3)REV01							

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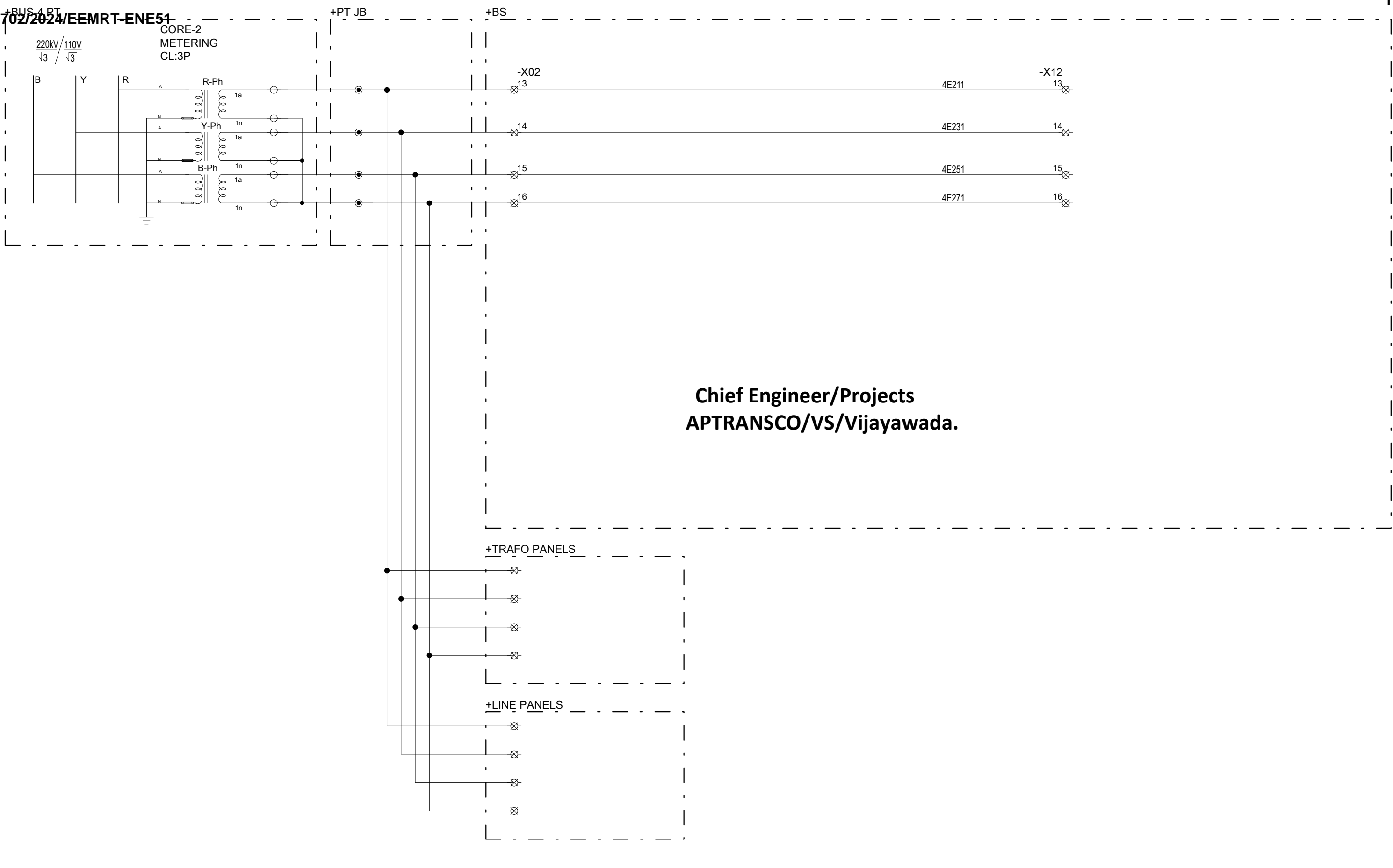
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Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC		Sheet 33
1MYN691003-102(A3)REV01							n. sheet 34

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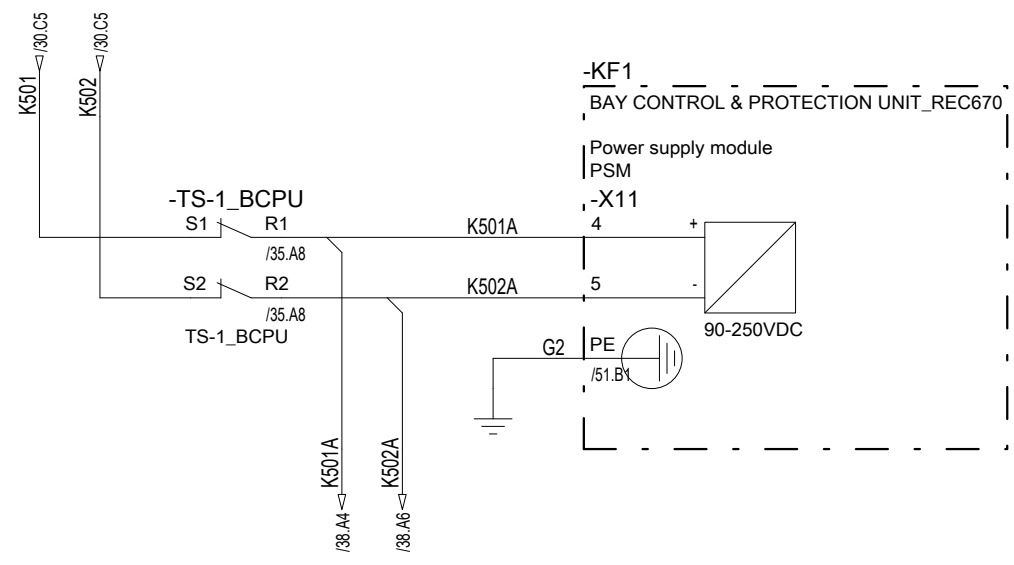
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Rev.	Revision note	Date	Name		<b>HITACHI</b>		Hitachi Energy India Limited		Doc. no.		1MNS500925-CFAC		
1MYN691003-102(A3)REV01											Sheet	34	
											n. sheet	35	

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**LIST OF FUNCTIONS AVAILABLE IN RELAY**

- Over Current Protection (50/51)
- E/F Protection (50N/51N)
- Synchrocheck,25
- Measurements
- Control
- Tripping Logic
- Local HMI
  - Integrated HMI with 4 line display
  - 15 freely configurable LEDs
  - Settings and disturbance Information
  - Front port for communication with indication

RED - TRIP SIGNALS  
 YELLOW - ALARM SIGNALS  
 GREEN - COMMUNICATION SIGNALS

**+B.25 -KF1**  
 Indication HMI LED

RED INDICATION (GR-1)

- CB OPEN
- CB CLOSE
- R-PH OC OPTD
- Y-PH OC OPTD
- B-PH OC OPTD
- E/F OPTD
- 86 OPTD
- 96 OPTD
- CB TC-1 / 2 FAULTY

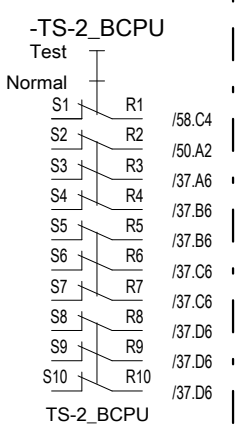
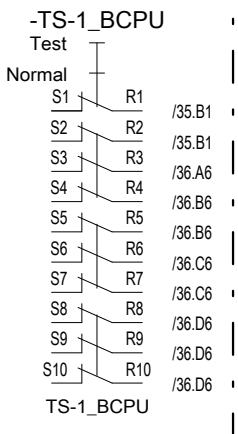
**+B.25 -KF1**  
 Indication HMI LED

YELLOW INDICATION (GR-2)

- 89BS2 OPEN
- 89BS2 CLOSE
- 89BS4 OPEN
- 89BS4 CLOSE
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE
- 89BS2 IN REMOTE
- 89BS4 IN REMOTE
- CB IN LOCAL
- CB IN REMOTE

**+B.25 -KF1**  
 Indication HMI LED

GREEN INDICATION (GR-3)



List of Functional Key Indication

- FK1. SPARE
- FK2. SPARE
- FK3. SPARE
- FK4. SPARE
- FK5. LED RESET

**Chief Engineer/Projects**  
**APTRANSCO/VS/Vijayawada.**

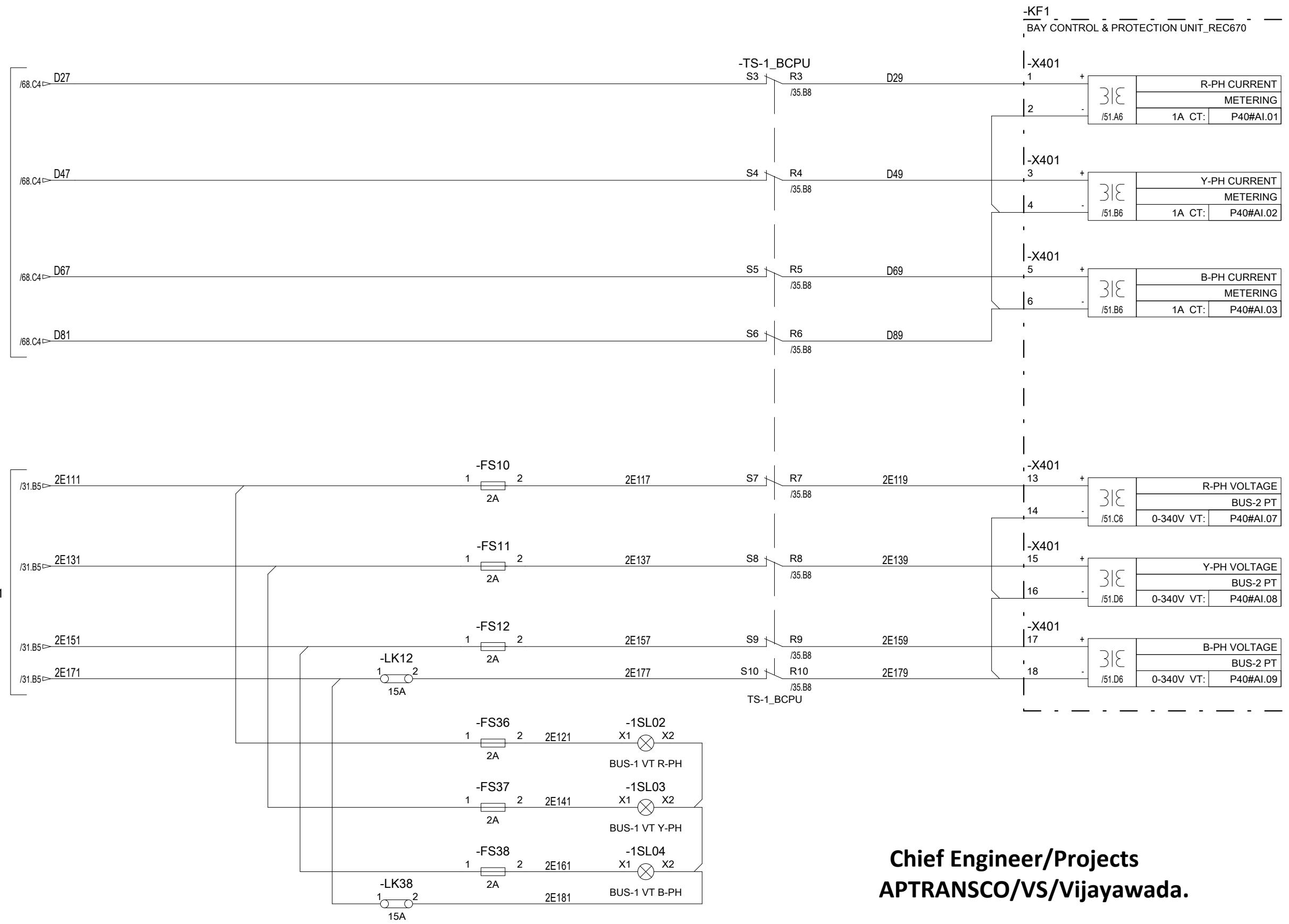
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		Project	APTRANSCO		BCPU-Power supply Circuit		Resp. dept.	PG-GAS	Rev. ind.	0	
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Rev.	Revision note	Date	Name		<b>HITACHI</b>	Doc. no.		1MNS500925-CFAC		Sheet	35
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FROM MFM CKT.  
CT-2 CORE-5

FROM  
BUS-2 PT CORE-1

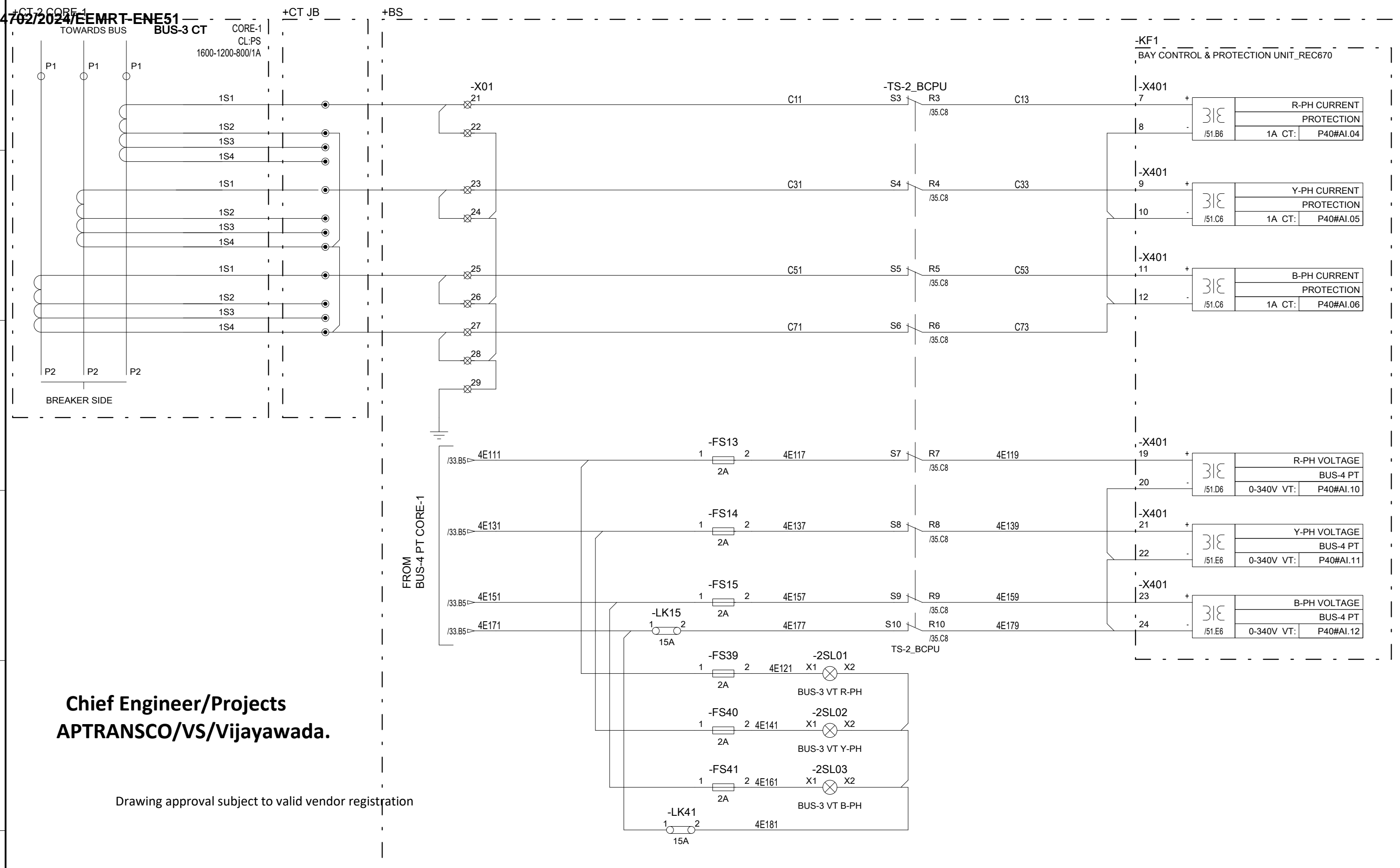


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**APTRANSCO/VS/Vijayawada.**

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		STANDARD DRAWING		Hitachi Energy India Limited	Language en	Sheet 36
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	n. sheet 37
1MYN691003-102(A3)REV01						

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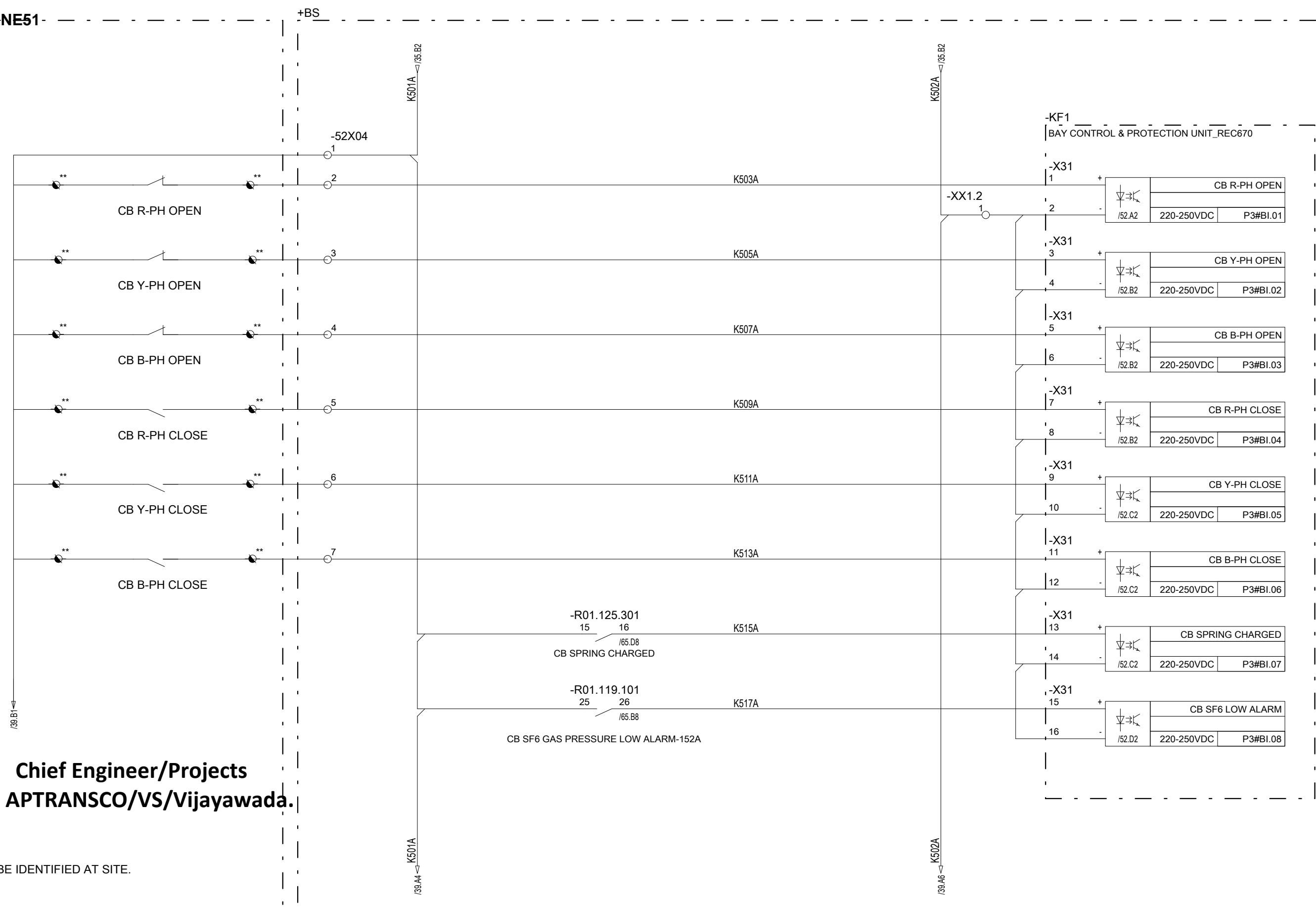
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Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
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Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	Sheet 37
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Based on		Prepared 27.02.2024 MANASA ESHWAR	Title 220kV BUS SECTION Control & Relay Panel BCPU-Binary Input Ckt.	Doc. kind. Circuit diagram	Ref.Des. =2KR
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1MYN691003-102(A3)REV01				Sheet 38	n. sheet 39

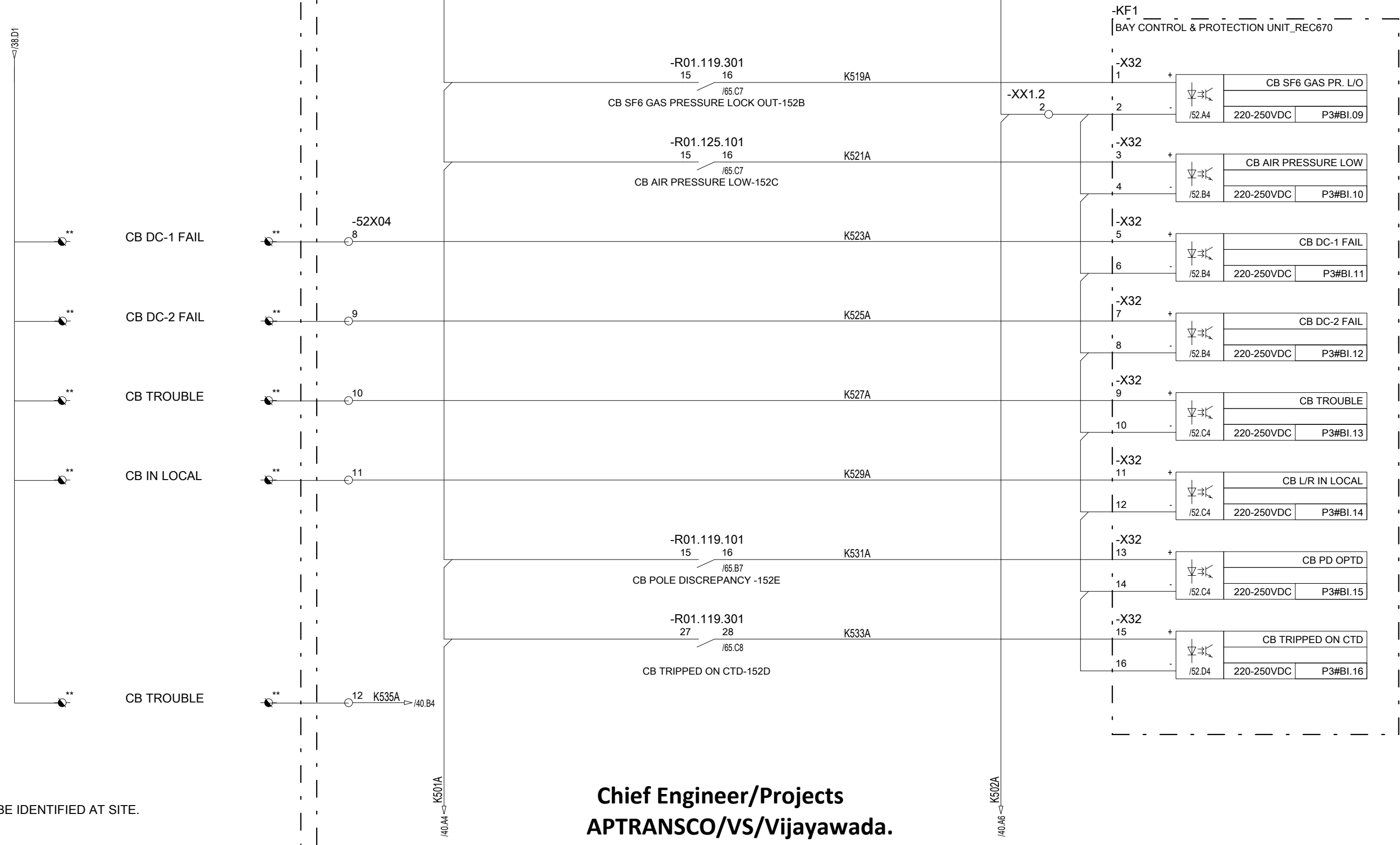
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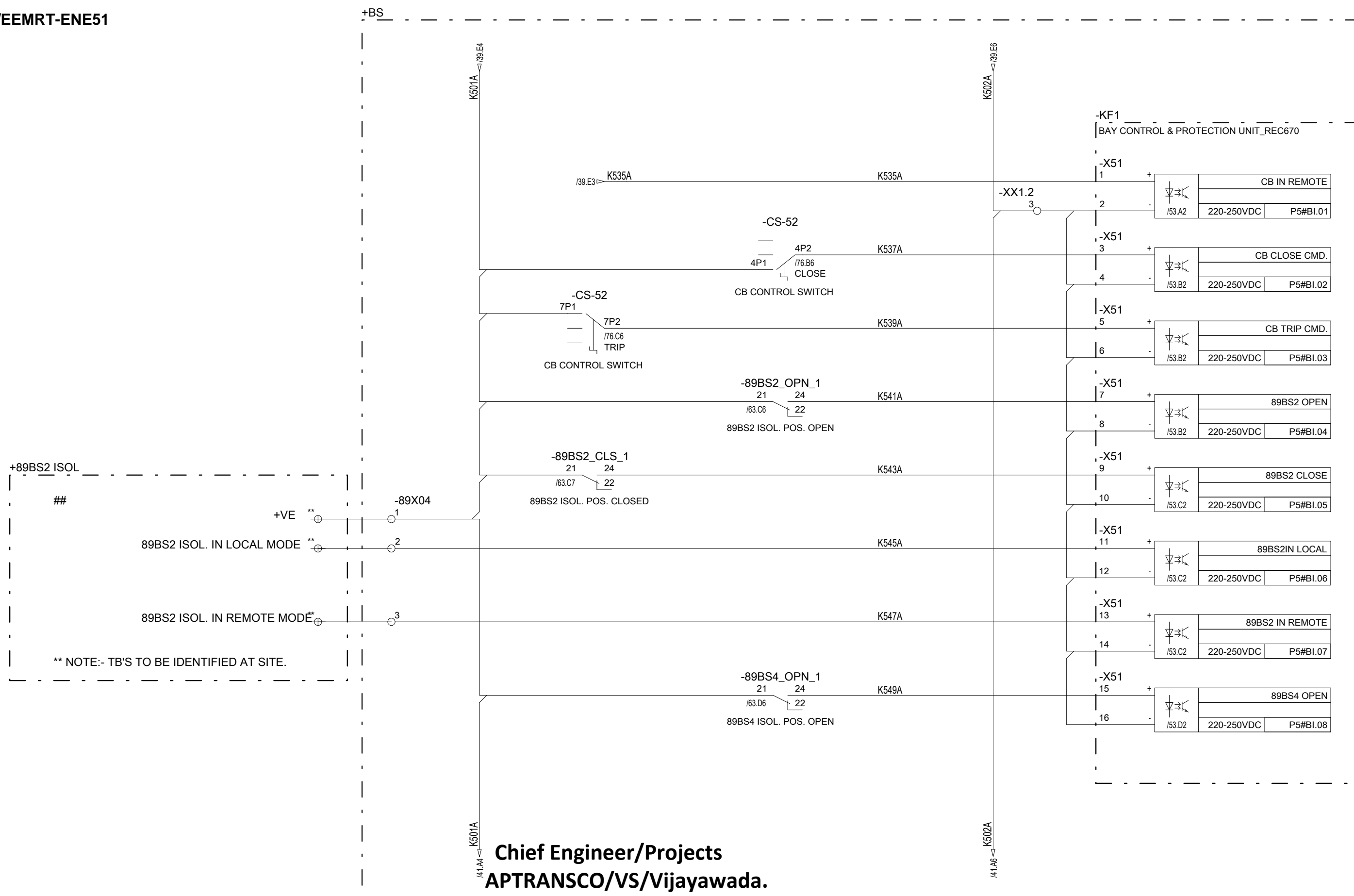


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Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	
1MYN691003-102(A3)REV01					Sheet 39	n. sheet 40

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Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	Sheet 40
1MYN691003-102(A3)REV01						n. sheet 41

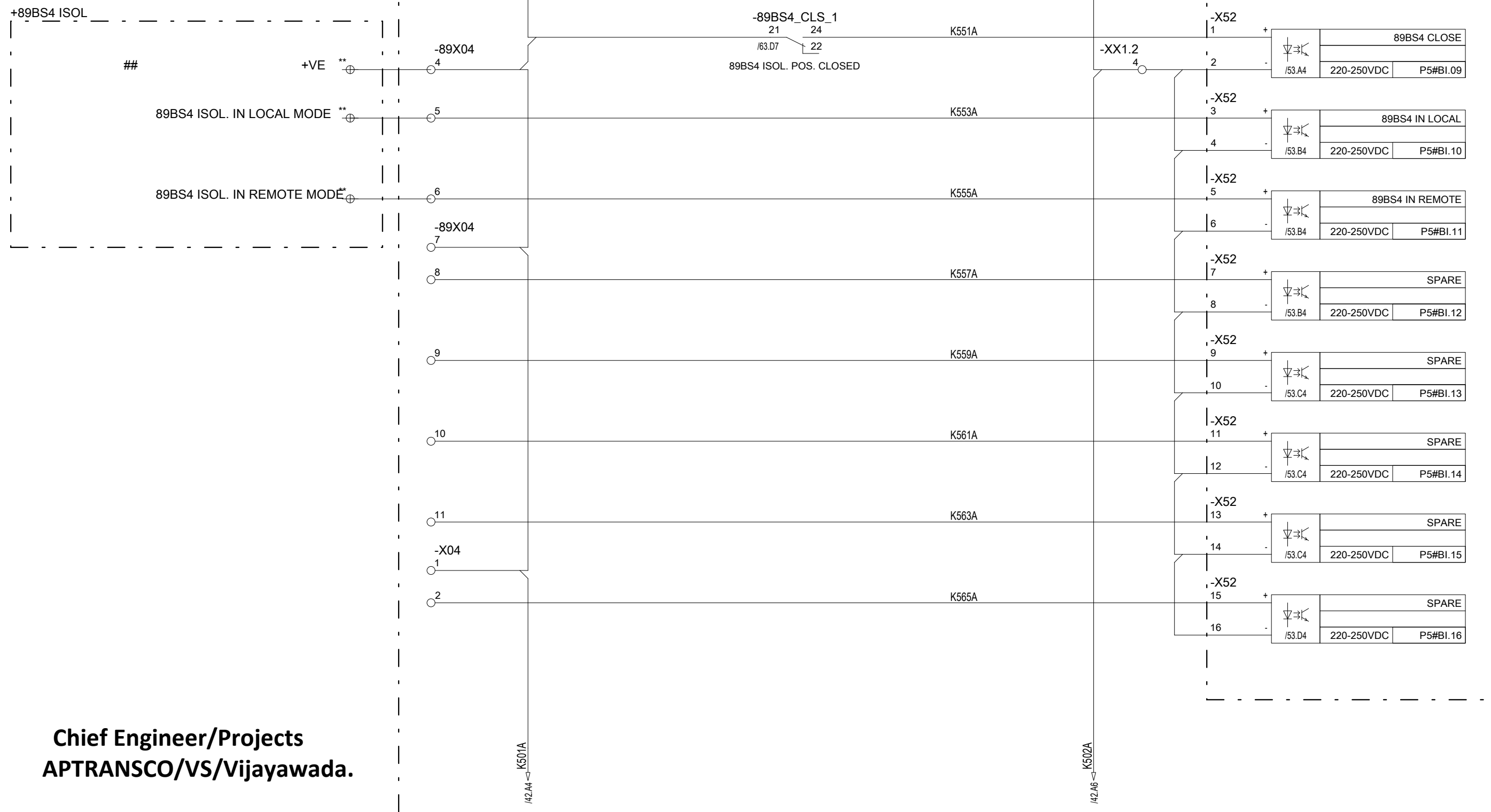
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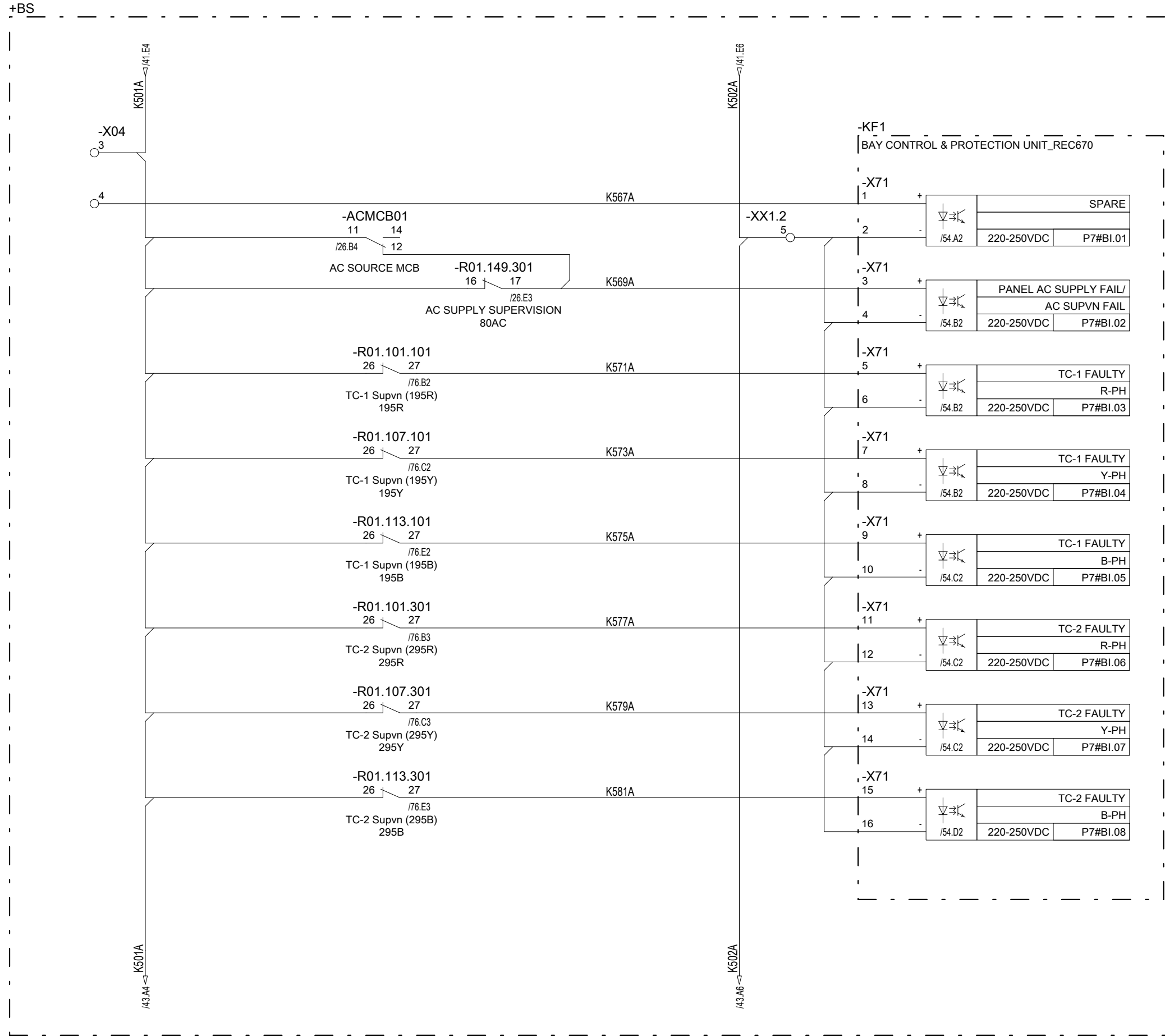
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Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CFAC	
				Sheet 41	n. sheet 42
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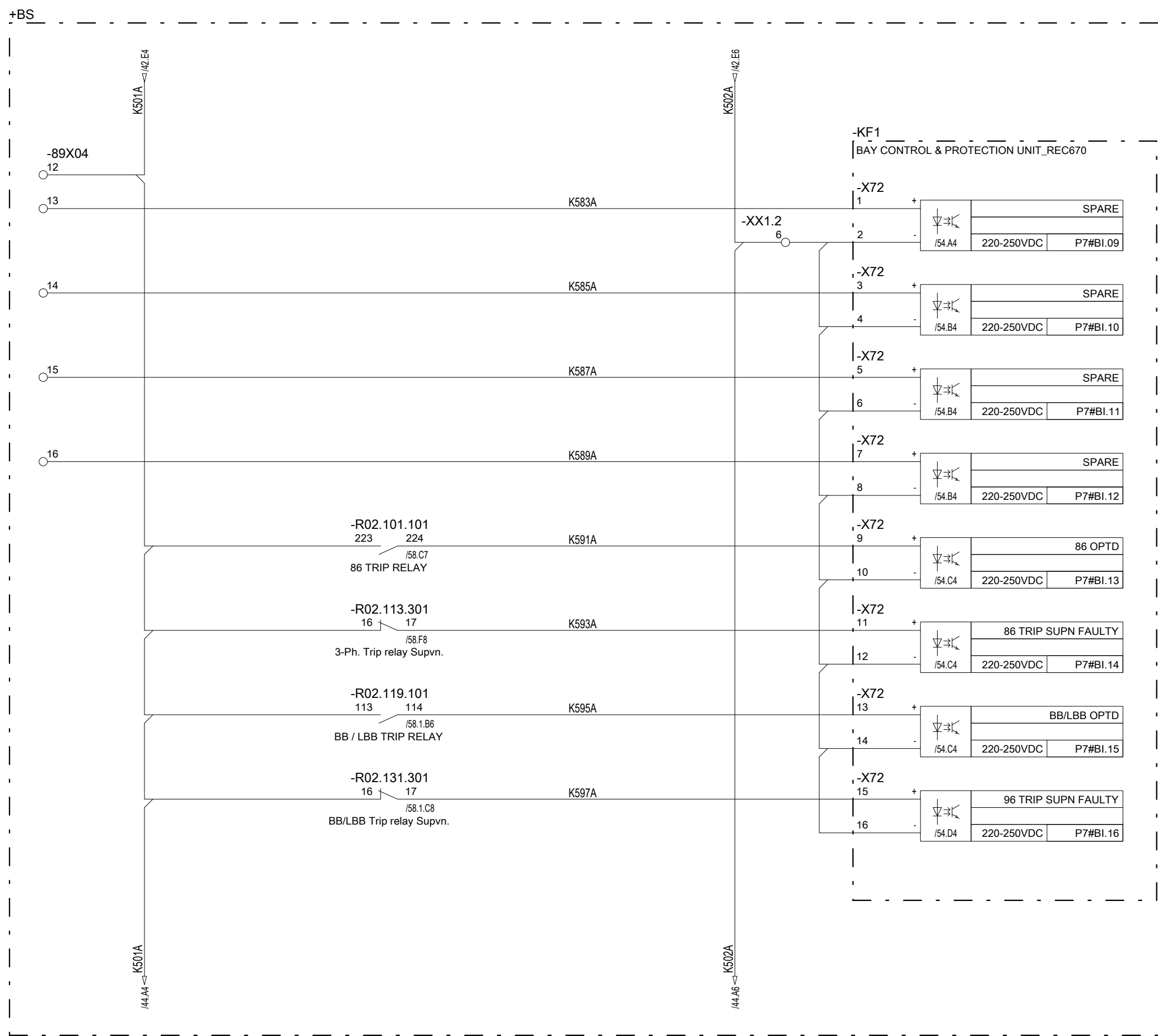
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Rev.	Revision note	Date	Name				<b>HITACHI</b>	Doc. no.	1MNS500925-CFAC		Sheet	42
1MYN691003-102(A3)REV01										n. sheet	43	

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Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	
1MYN691003-102(A3)REV01						Sheet 43
						n. sheet 44

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A

B

C

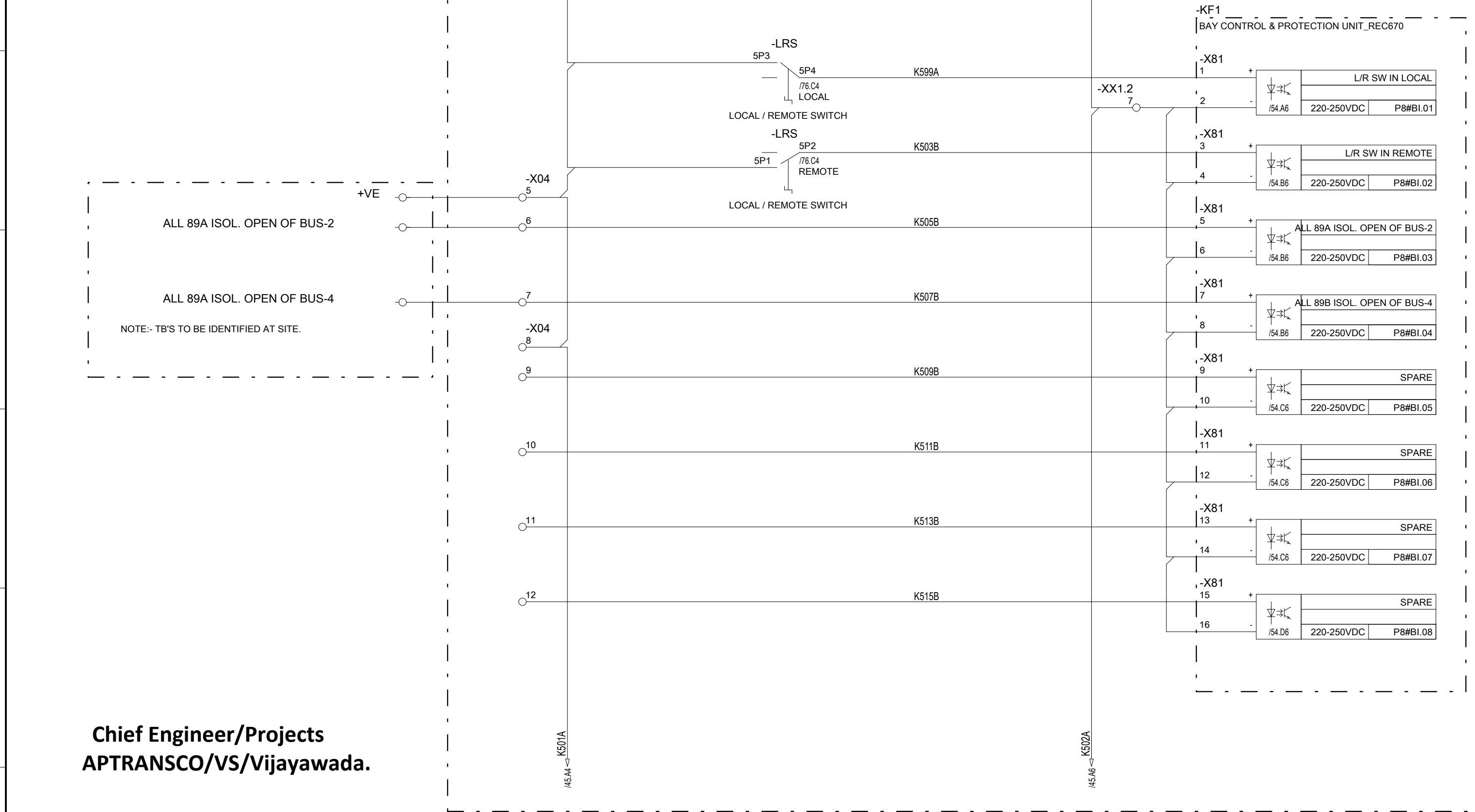
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E

F

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ALL 89A ISOL. OPEN OF BUS-2

ALL 89A ISOL. OPEN OF BUS-4

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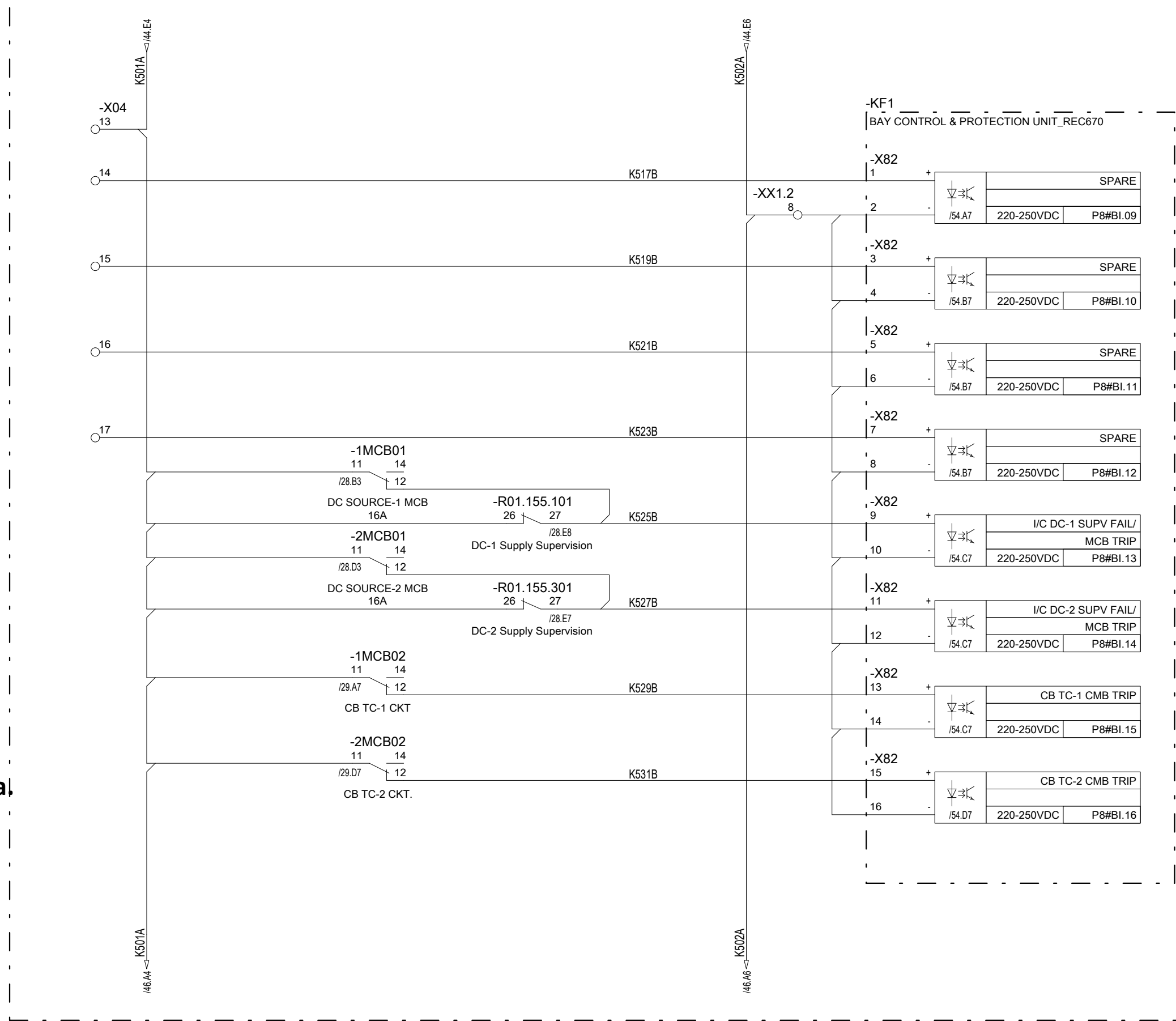
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+BS

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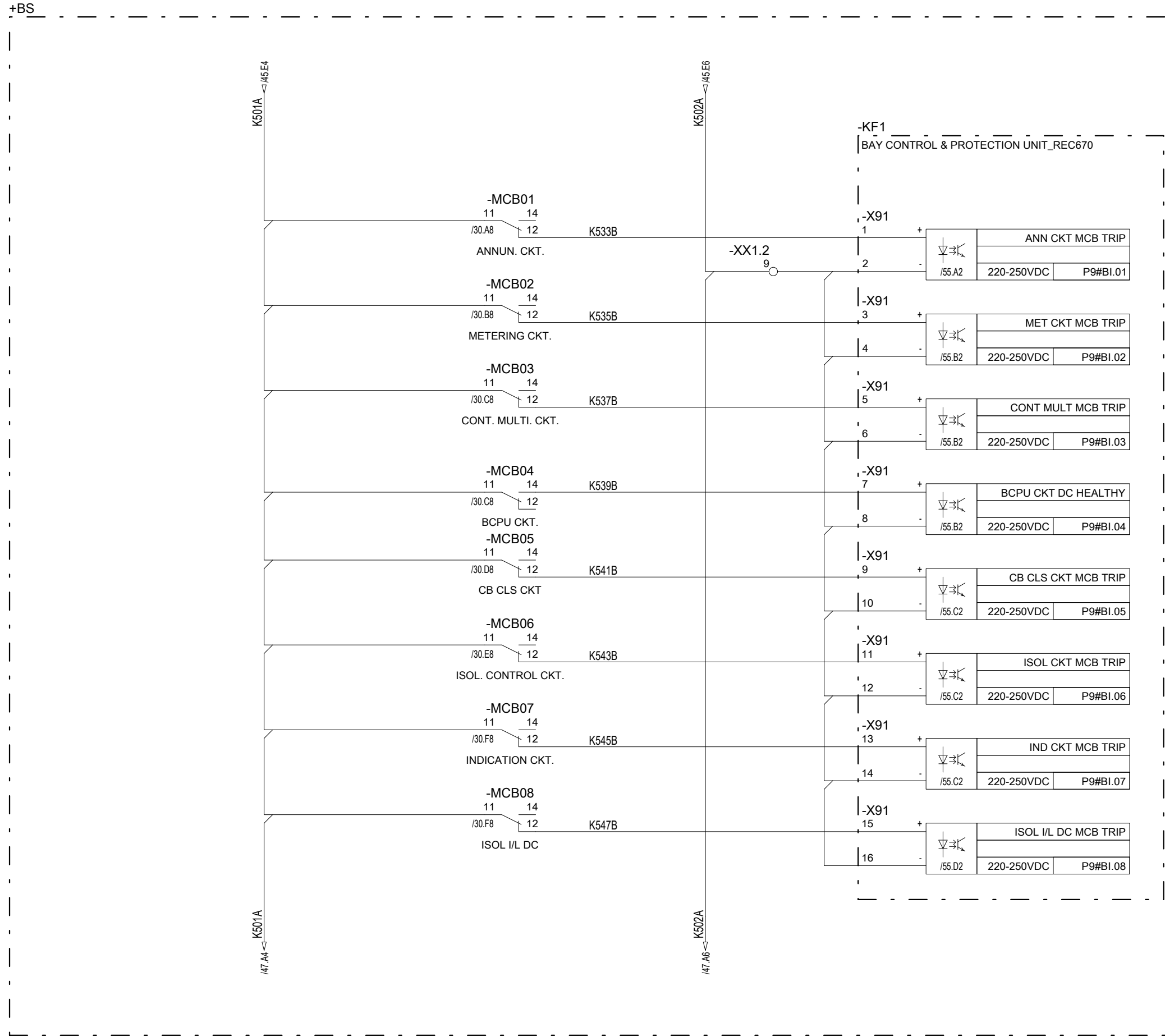
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Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	
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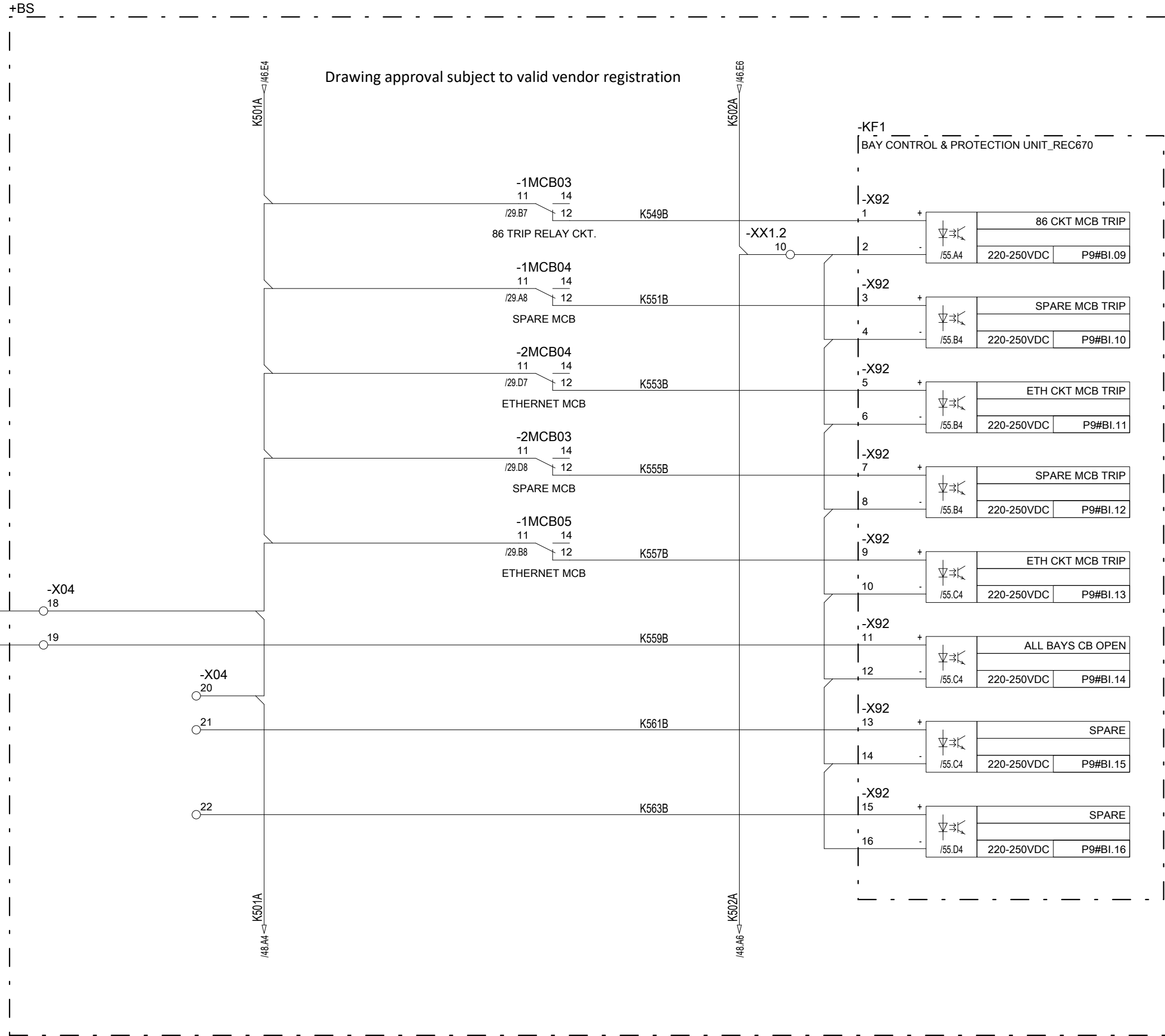
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APTRANSCO/VS/Vijayawada.**

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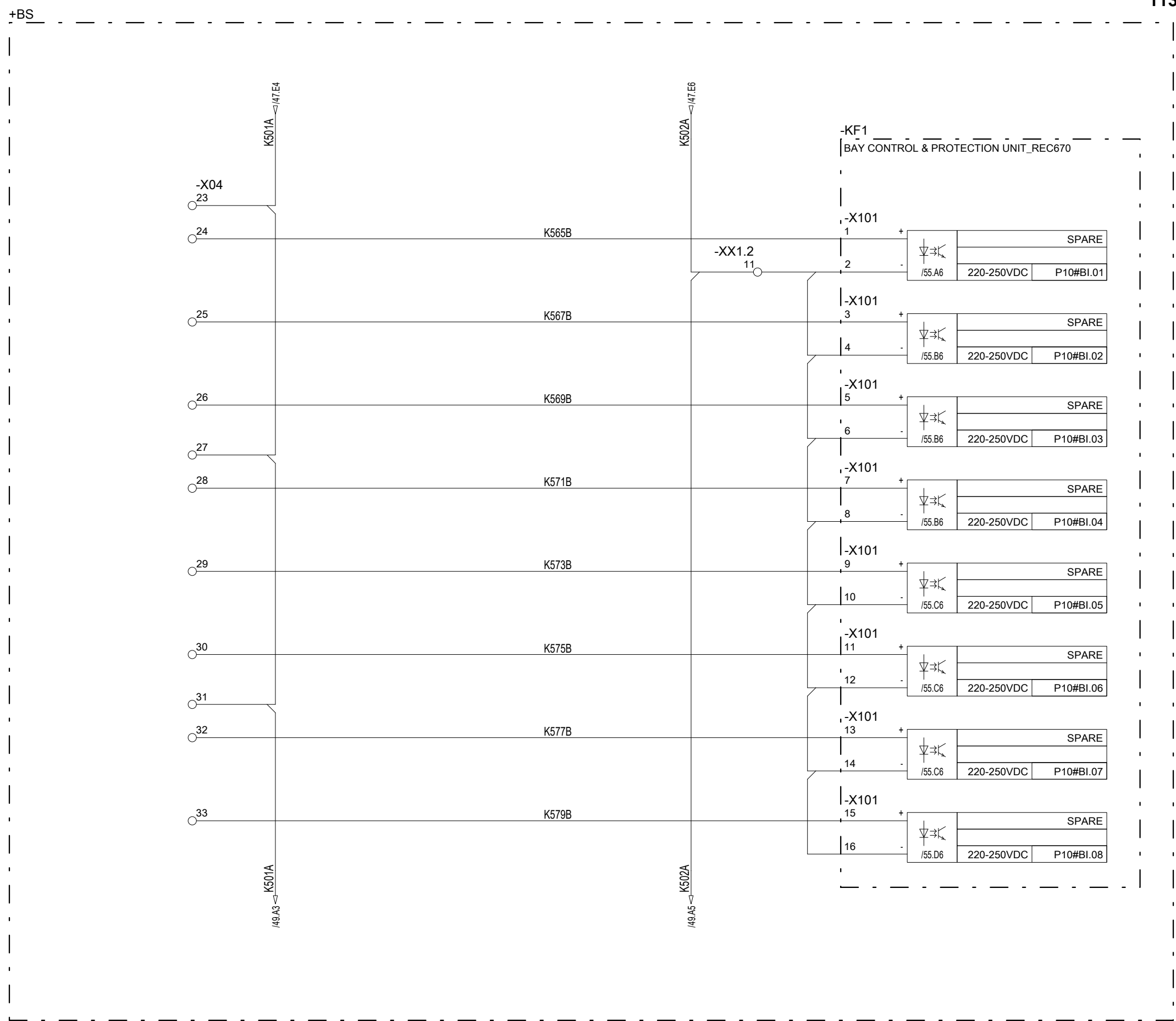
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Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	
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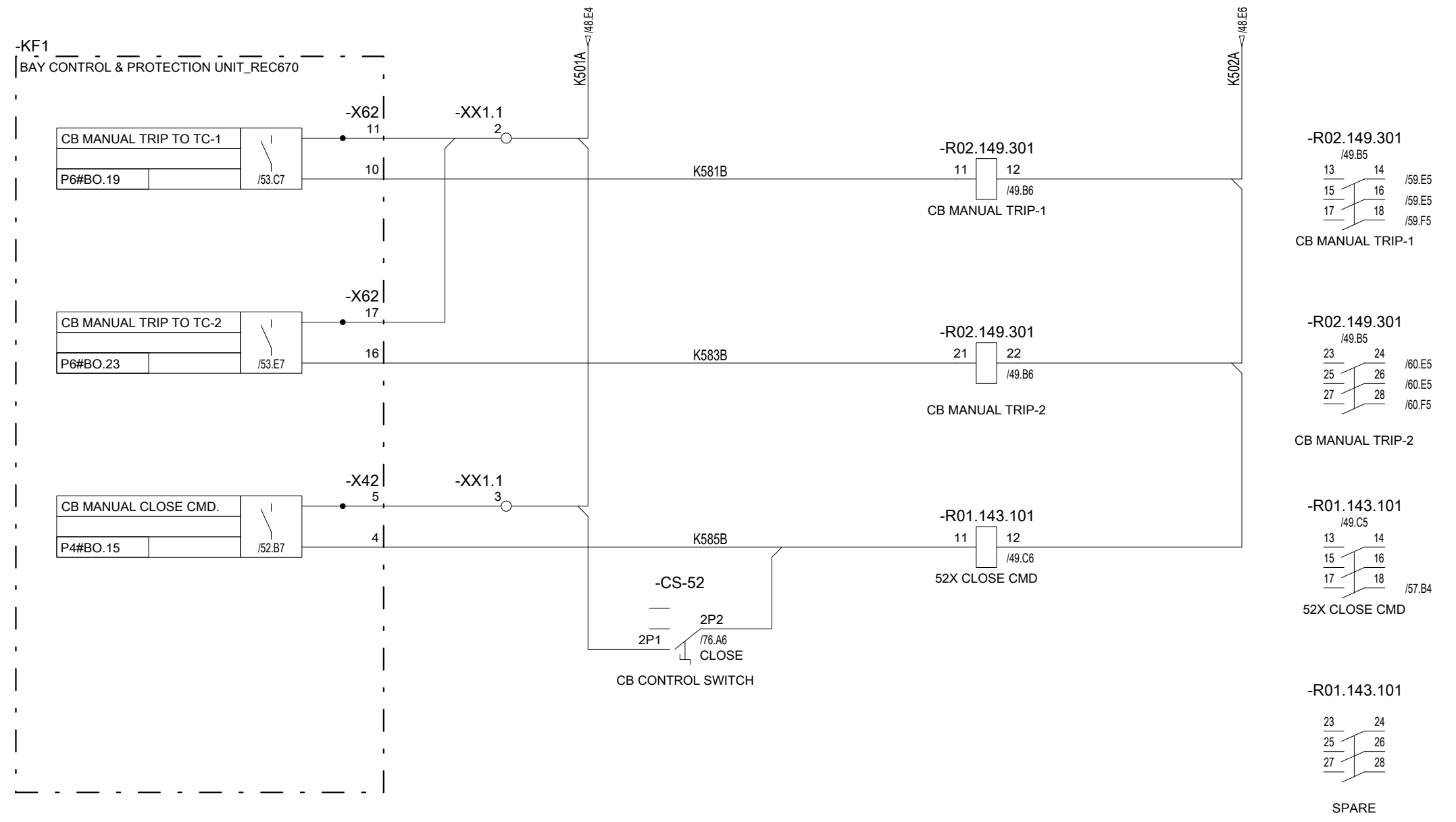
**Chief Engineer/Projects  
APTRANSCO/VS/Vijayawada.**

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
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		Project APTRANSCO		BCPU-Binary Input Ckt.	Resp. dept. PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	Sheet 48
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	n. sheet 49
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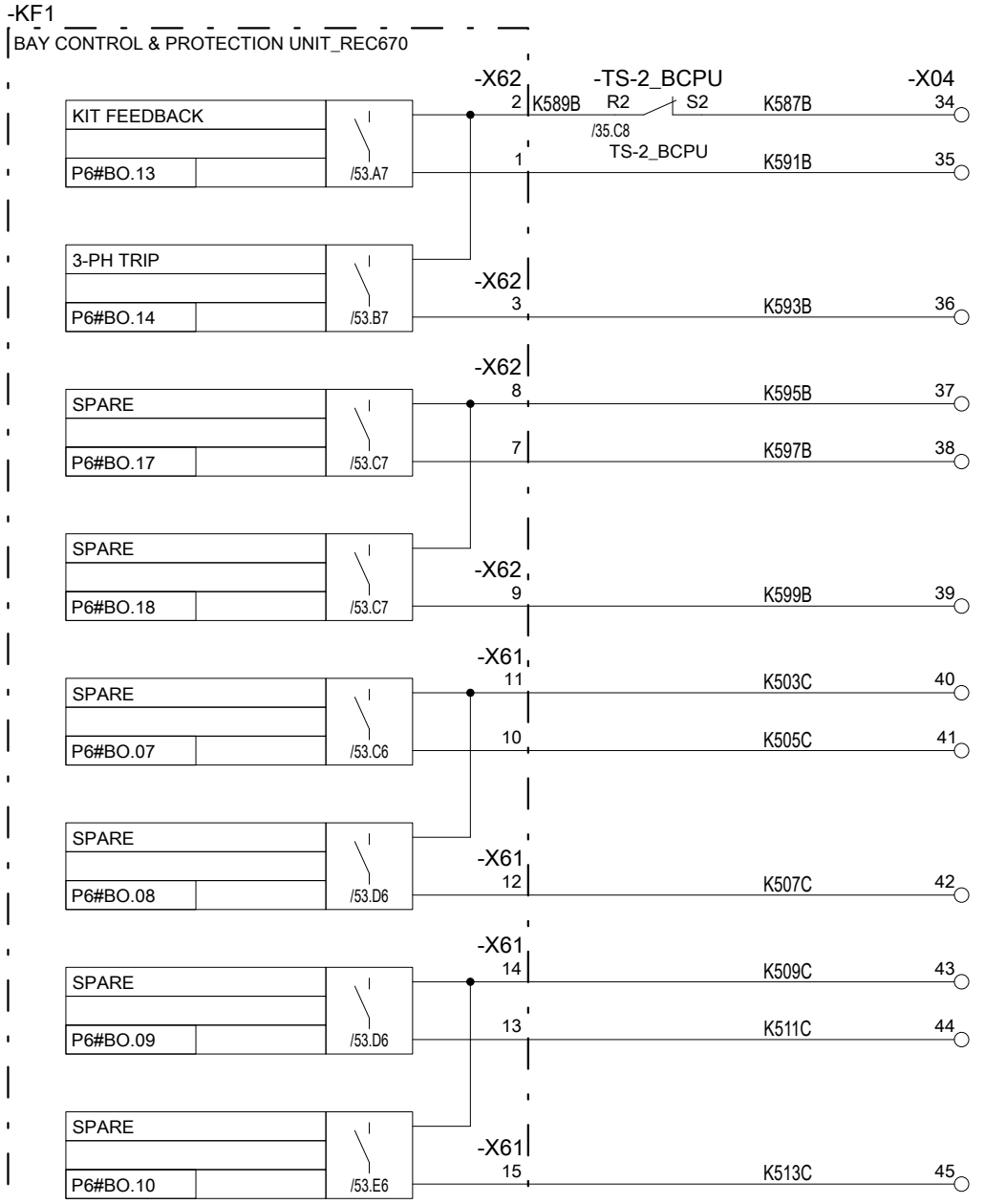
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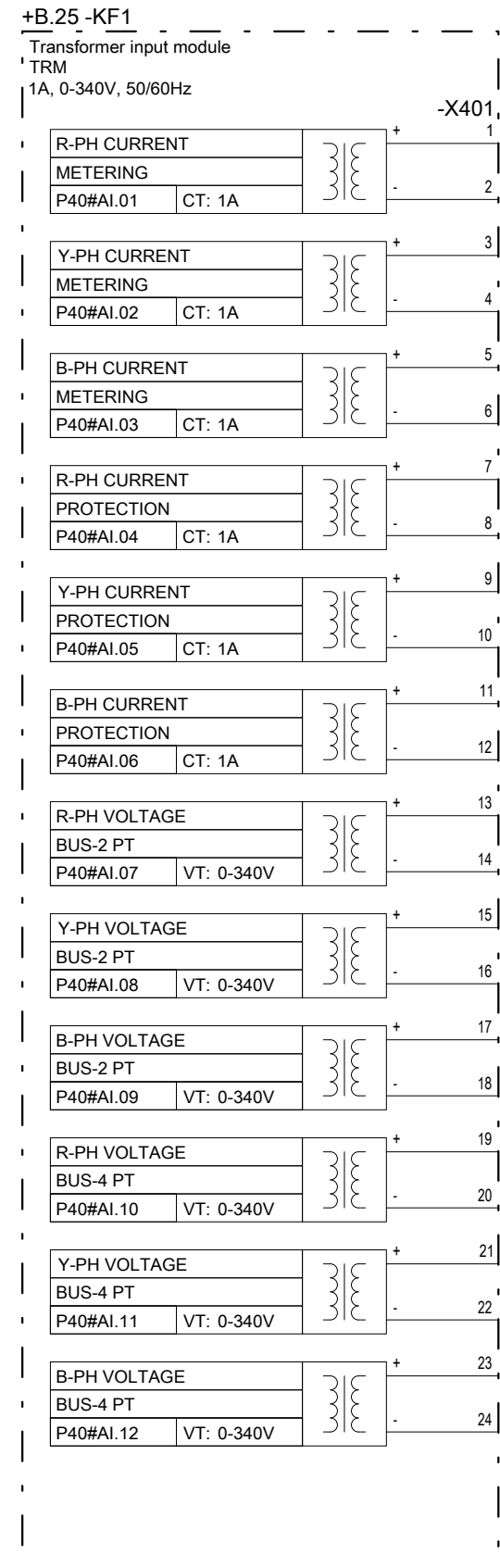
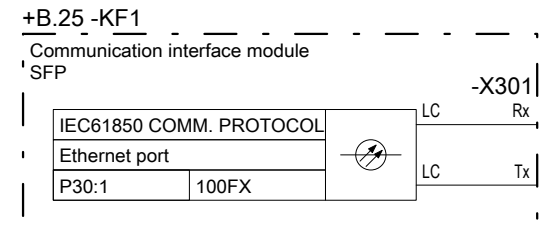
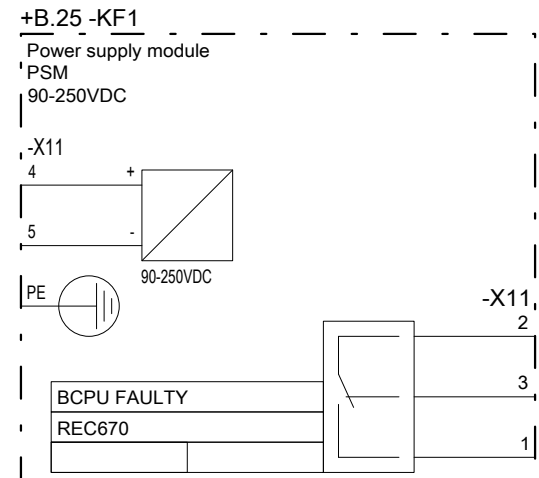
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Rev.	Revision note	Date	Name	<b>HITACHI</b>		Doc. no. 1MNS500925-CFAC	Sheet 50
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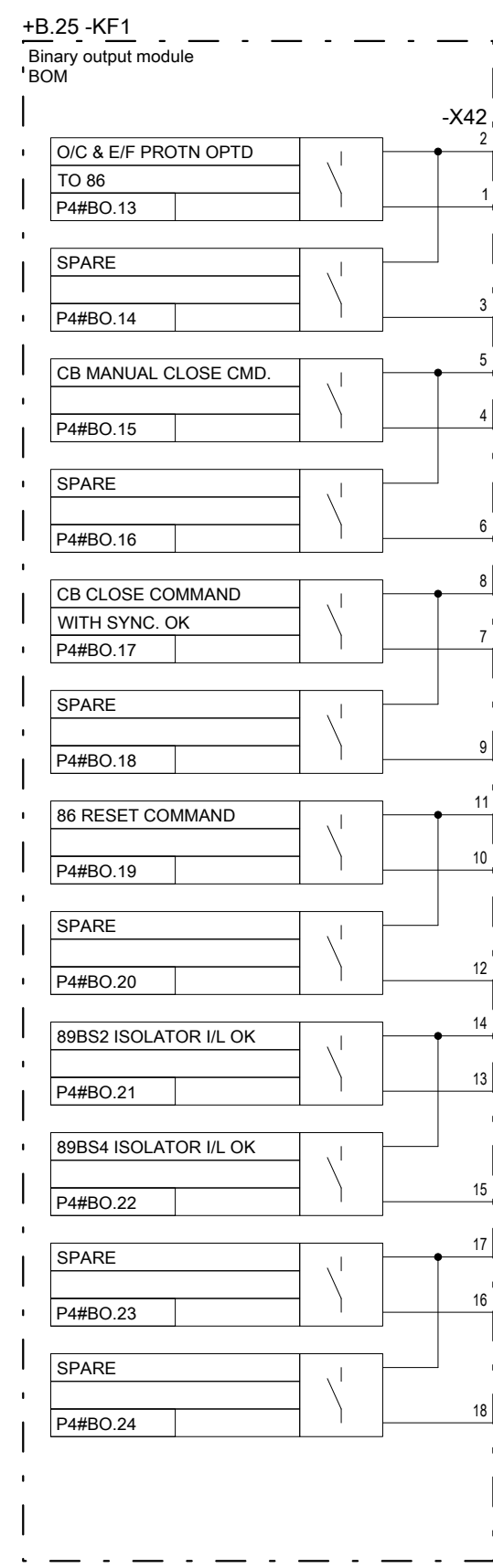
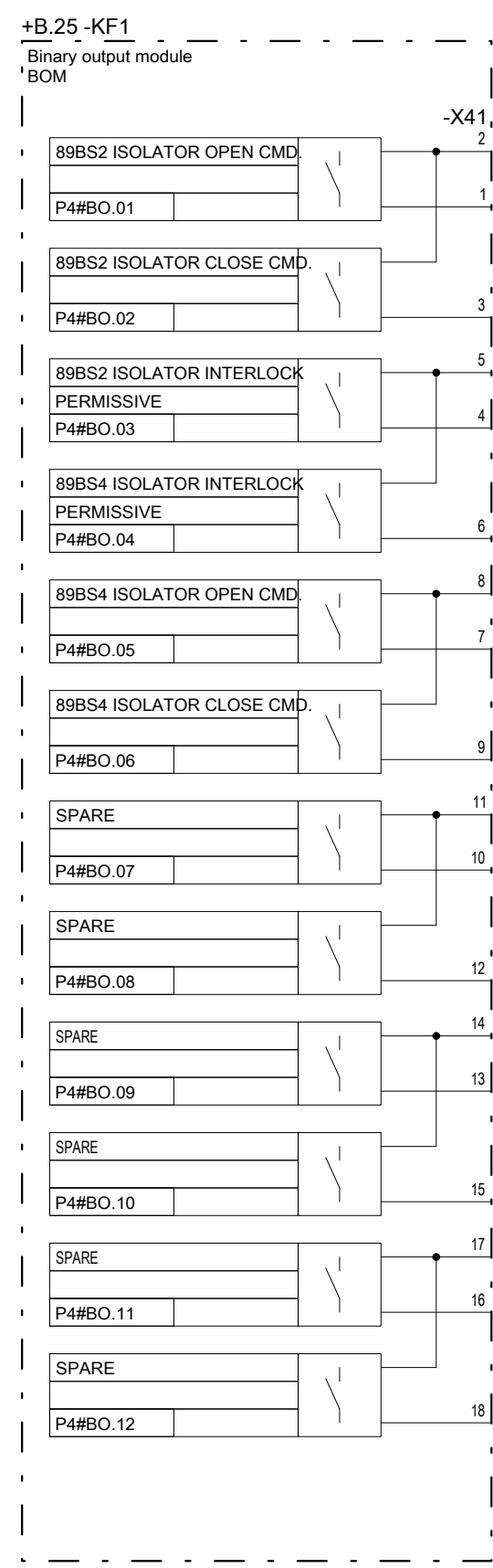
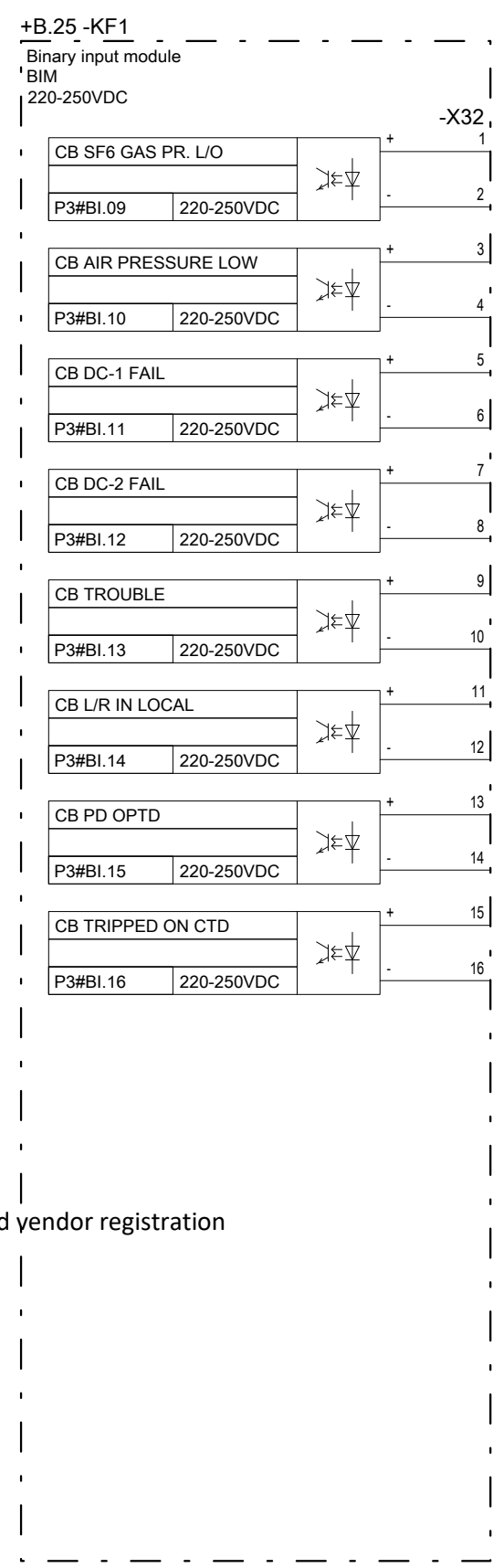
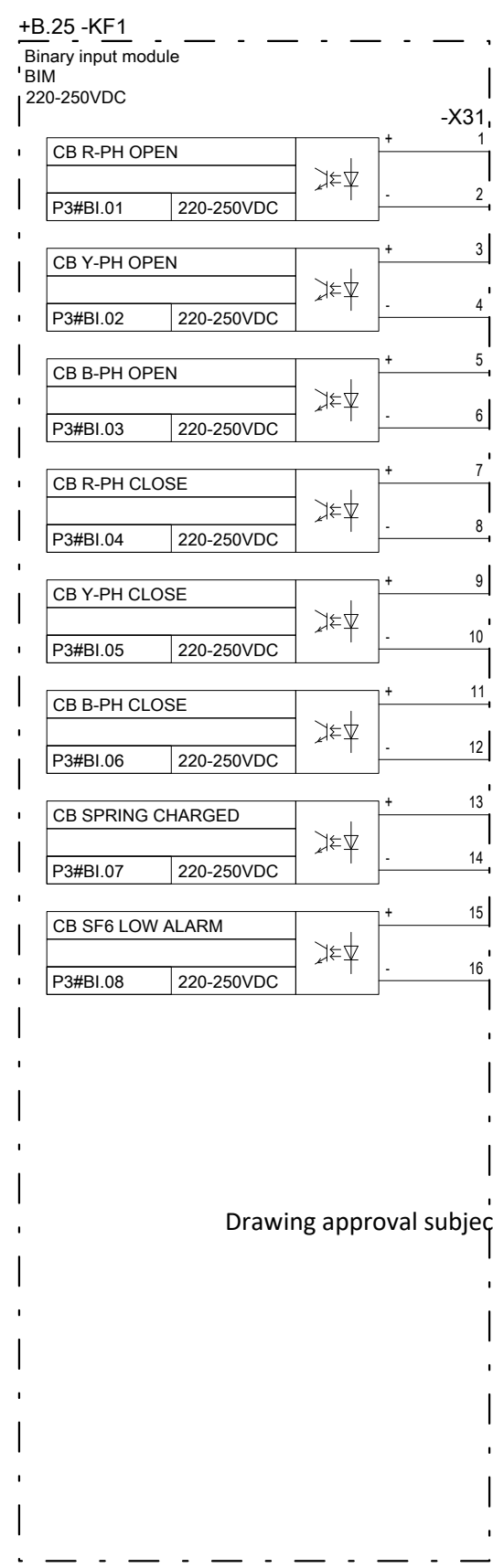
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Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	Sheet 51
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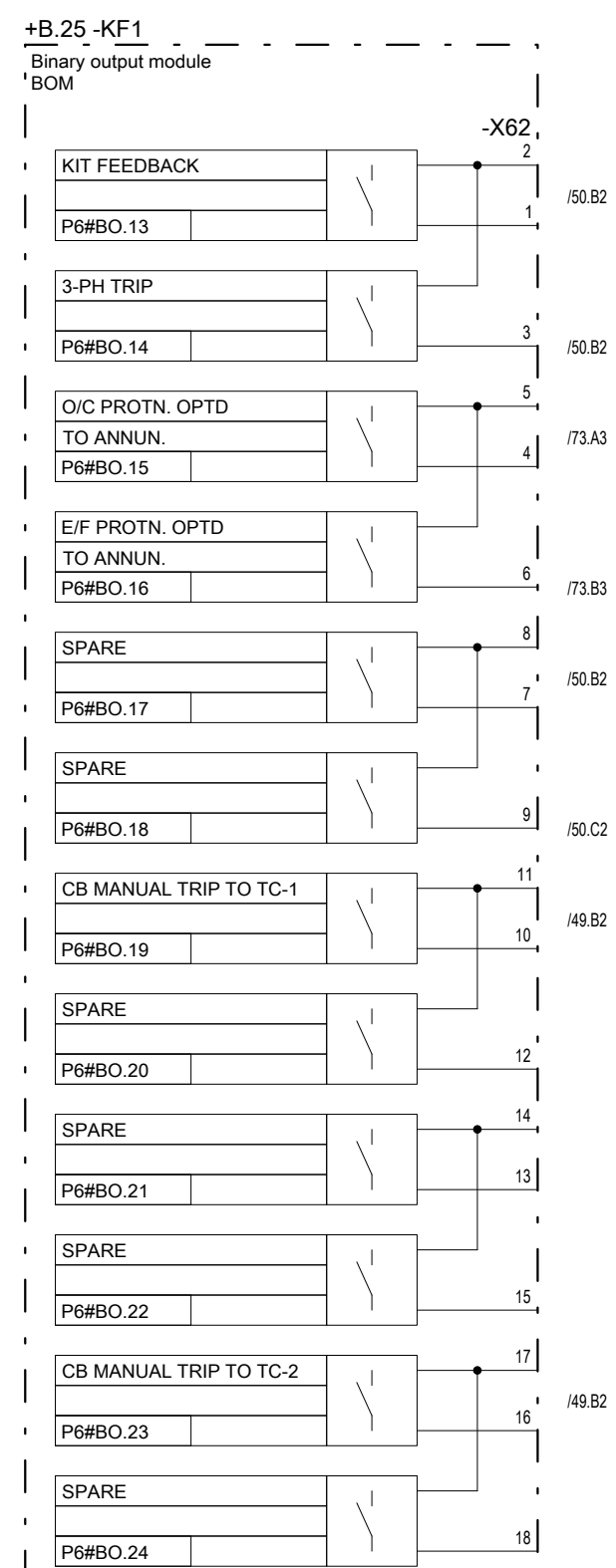
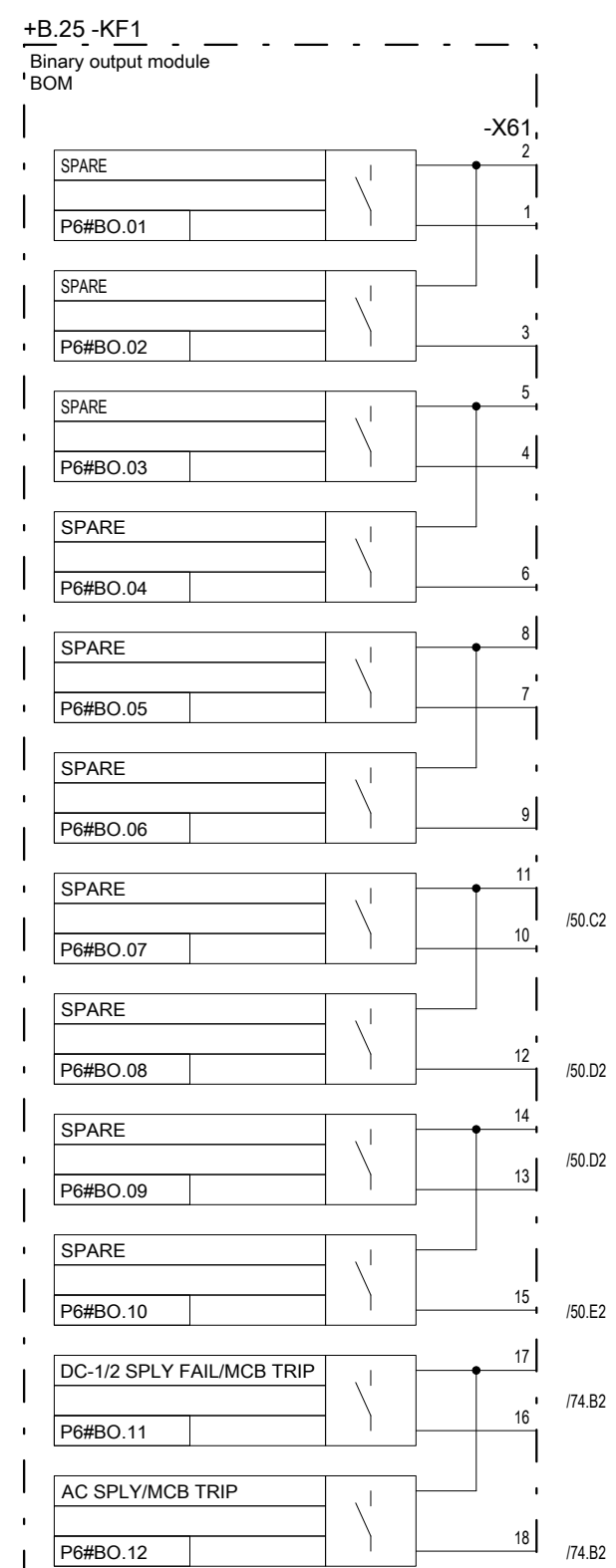
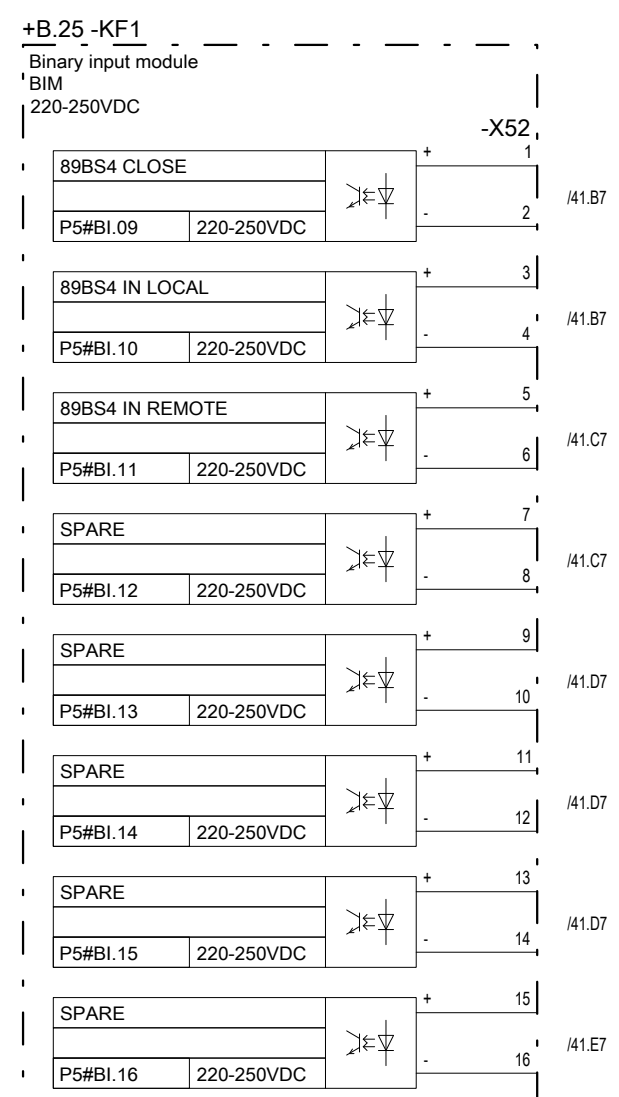
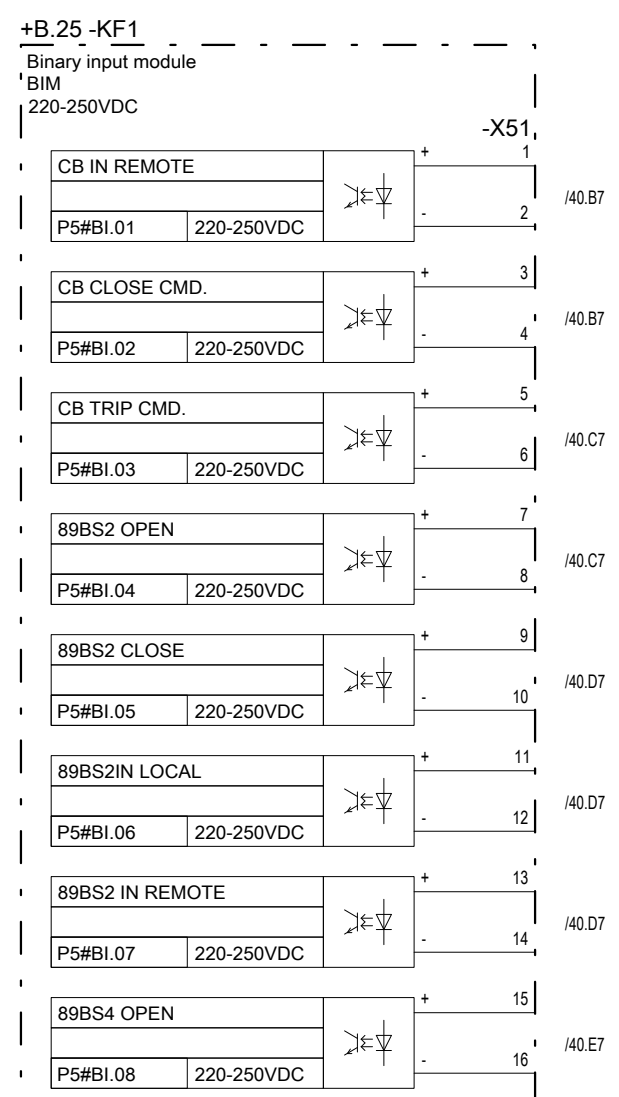
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Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	
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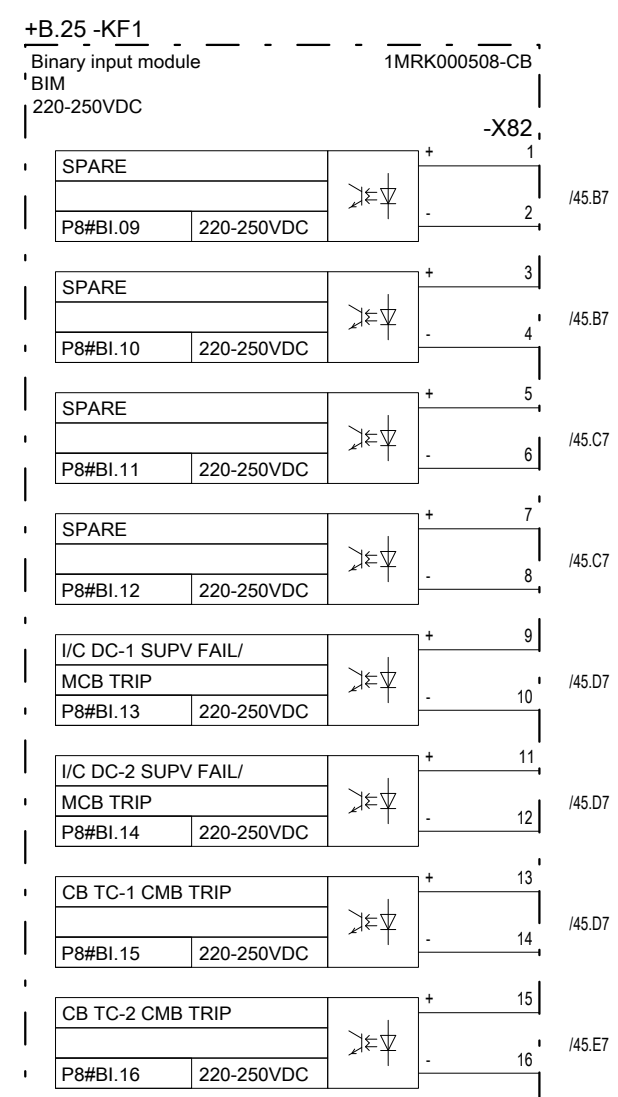
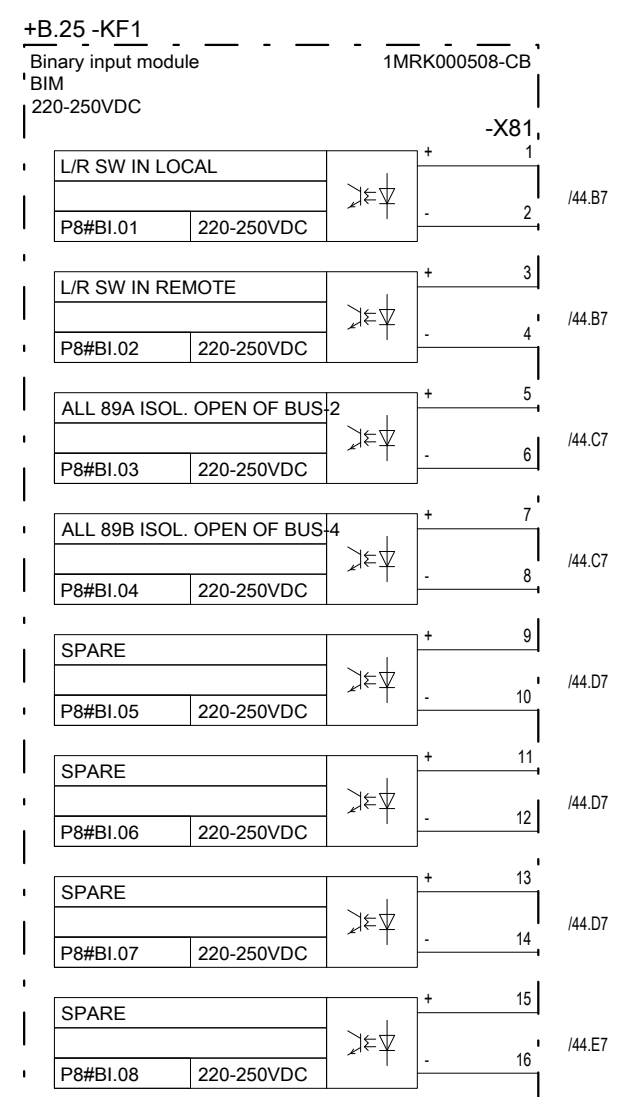
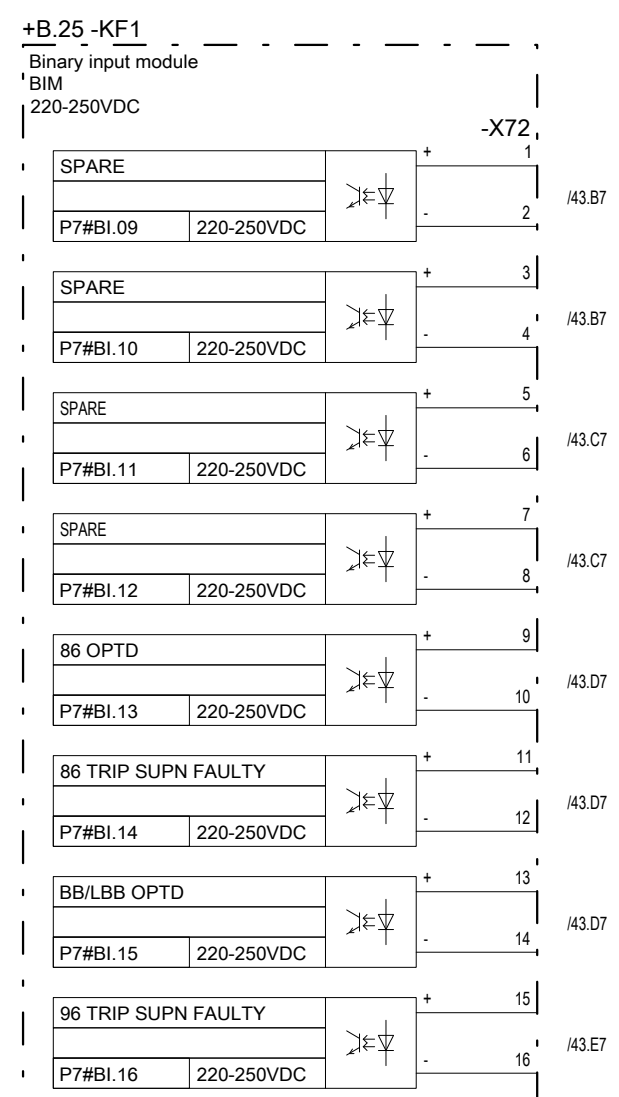
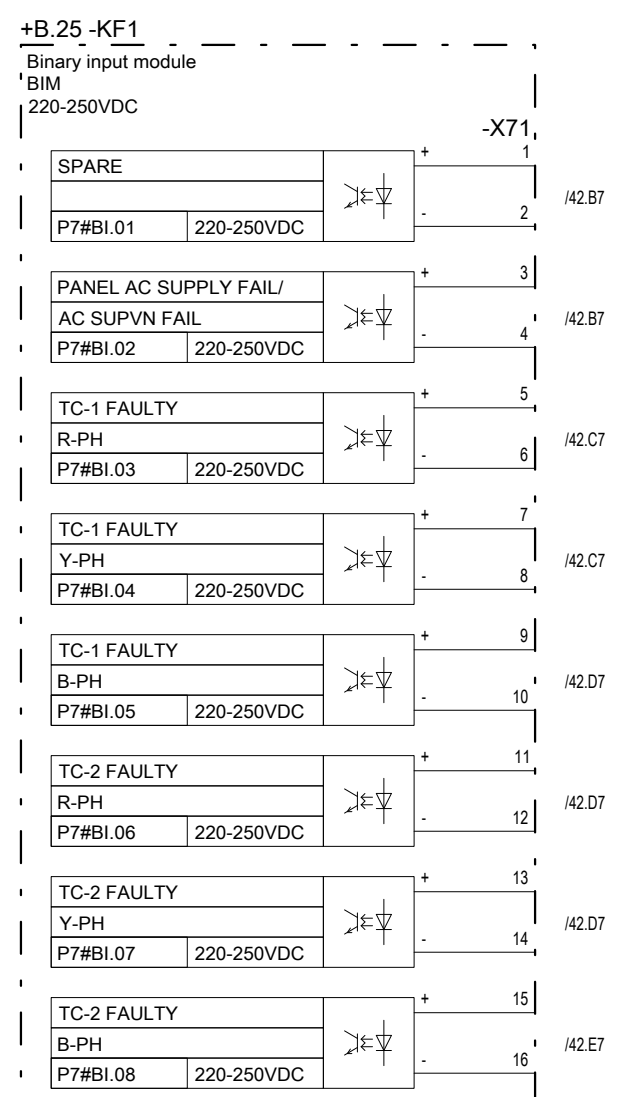
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Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	
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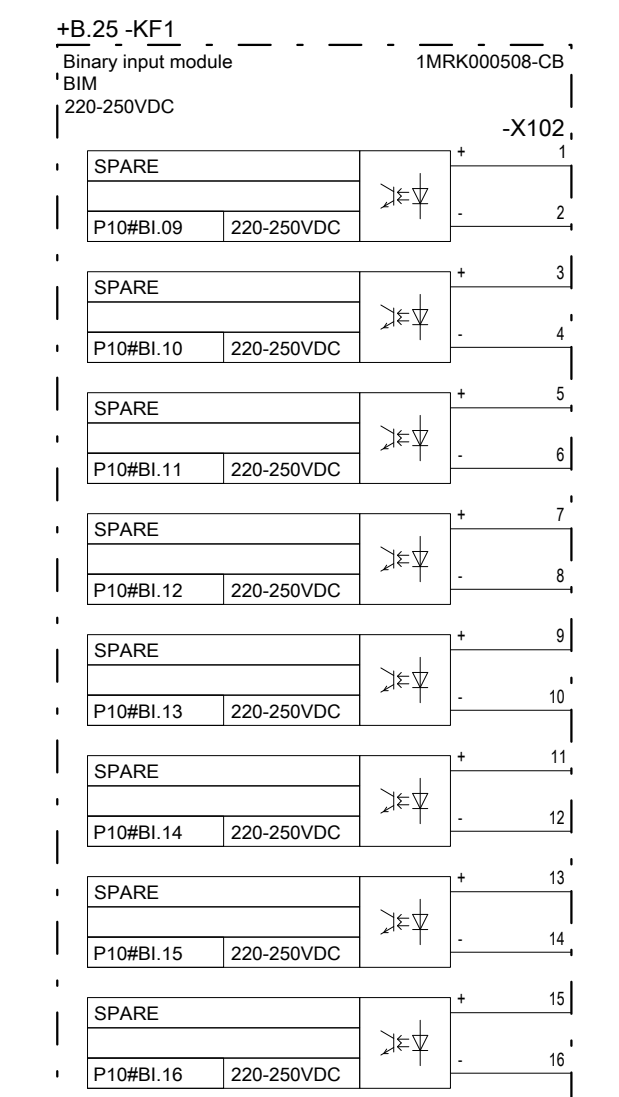
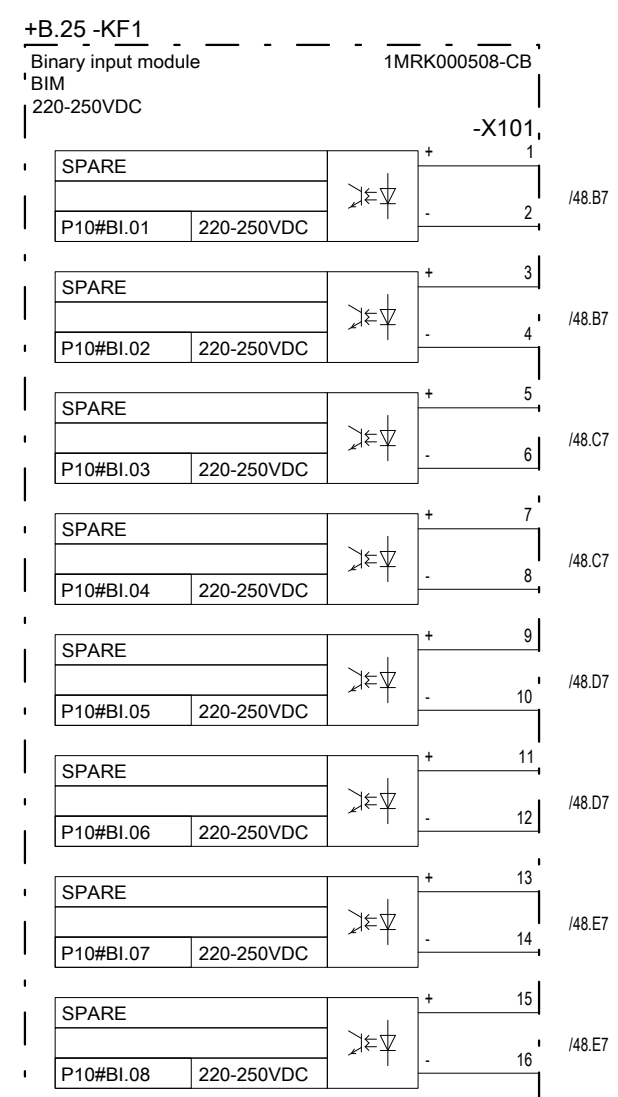
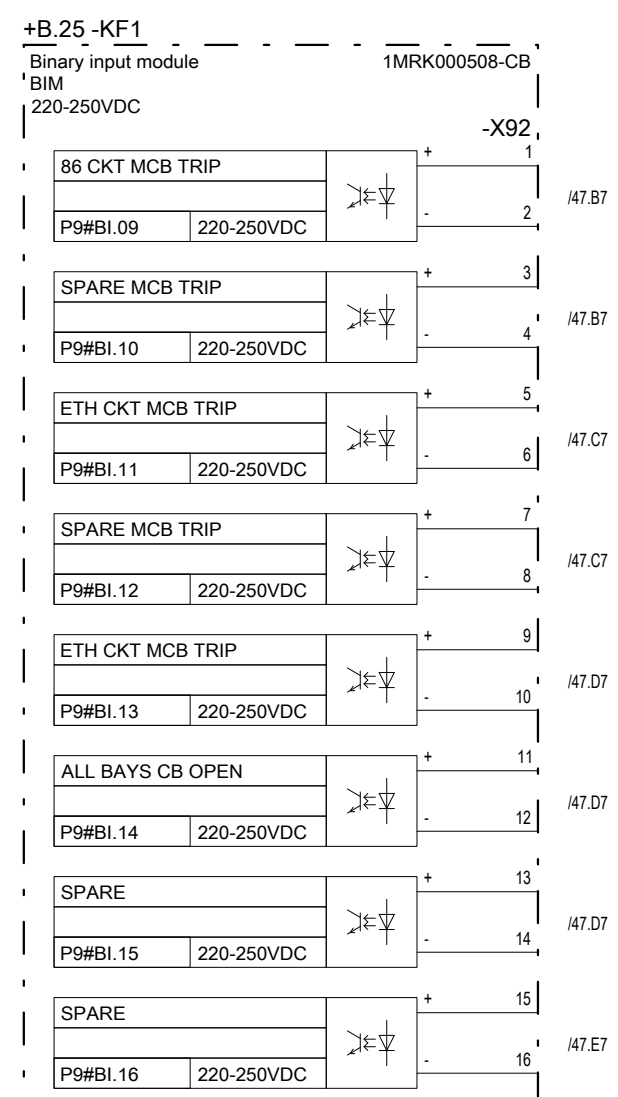
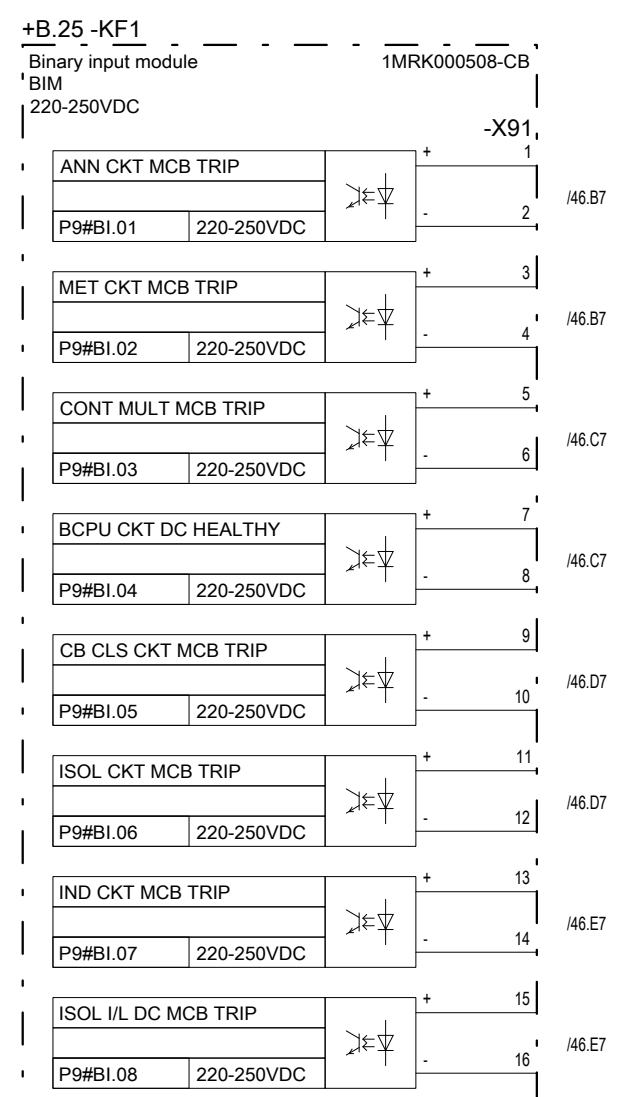
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Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	
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Rev.	Revision note	Date	Name	<b>HITACHI</b>		Doc. no. 1MNS500925-CFAC	Sheet 55
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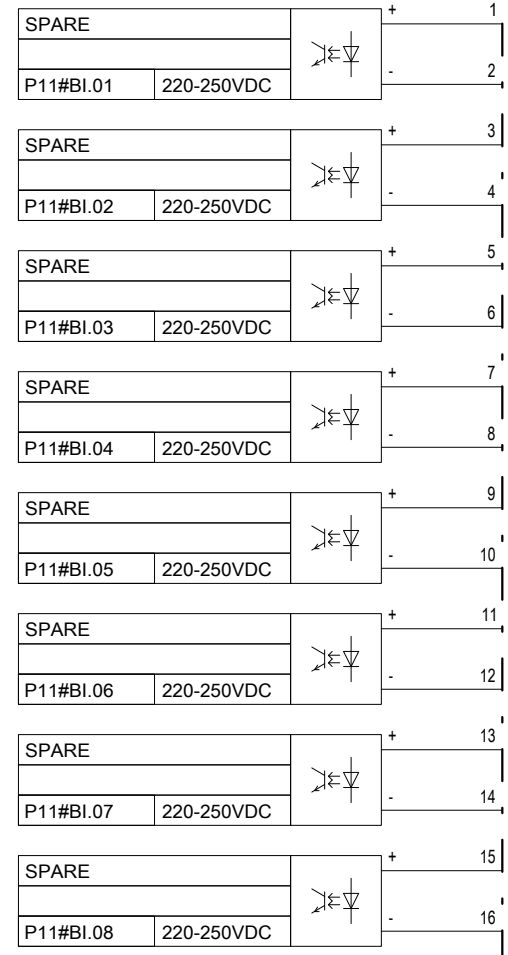
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**+B.25 -KF1**

Binary input module  
BIM  
220-250VDC

1MRK000508-CB

-X111

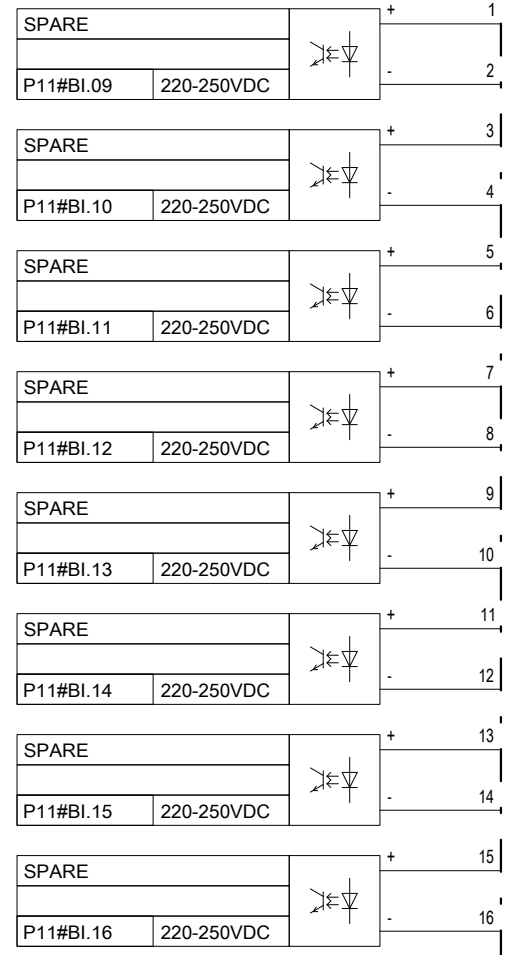


**+B.25 -KF1**

Binary input module  
BIM  
220-250VDC

1MRK000508-CB

-X112



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Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
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Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CFAC		Sheet 56
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A

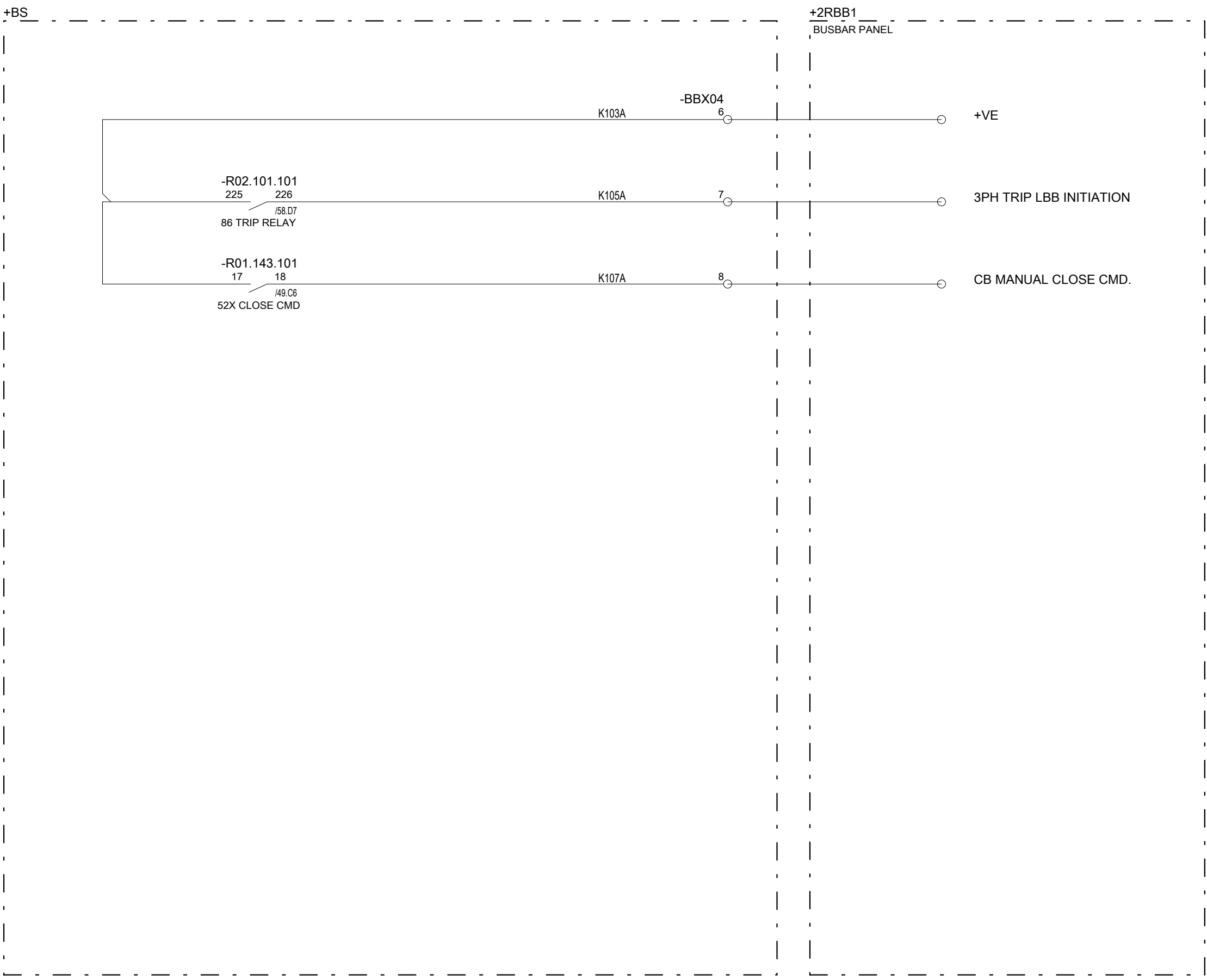
B

C

D

E

F



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		Project	APTRANSCO STANDARD DRAWING		 Hitachi Energy India Limited	Resp. dept.	PG-GAS		Rev. ind.	0	Language	en
Rev.	Revision note	Date	Name			Doc. no.	1MNS500925-CFAC				Sheet	57
1MYN691003-102(A3)REV01										n. sheet	58	

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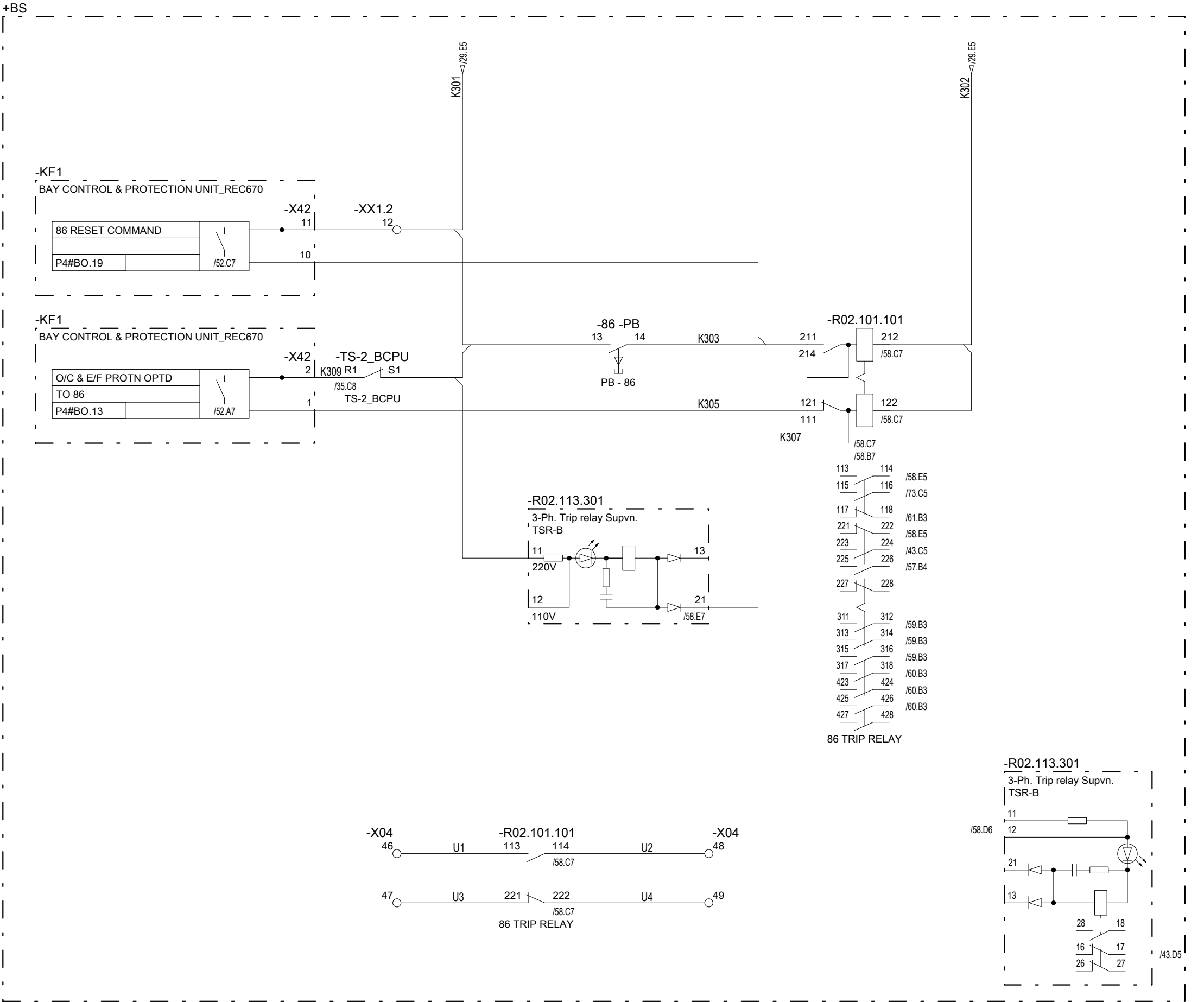
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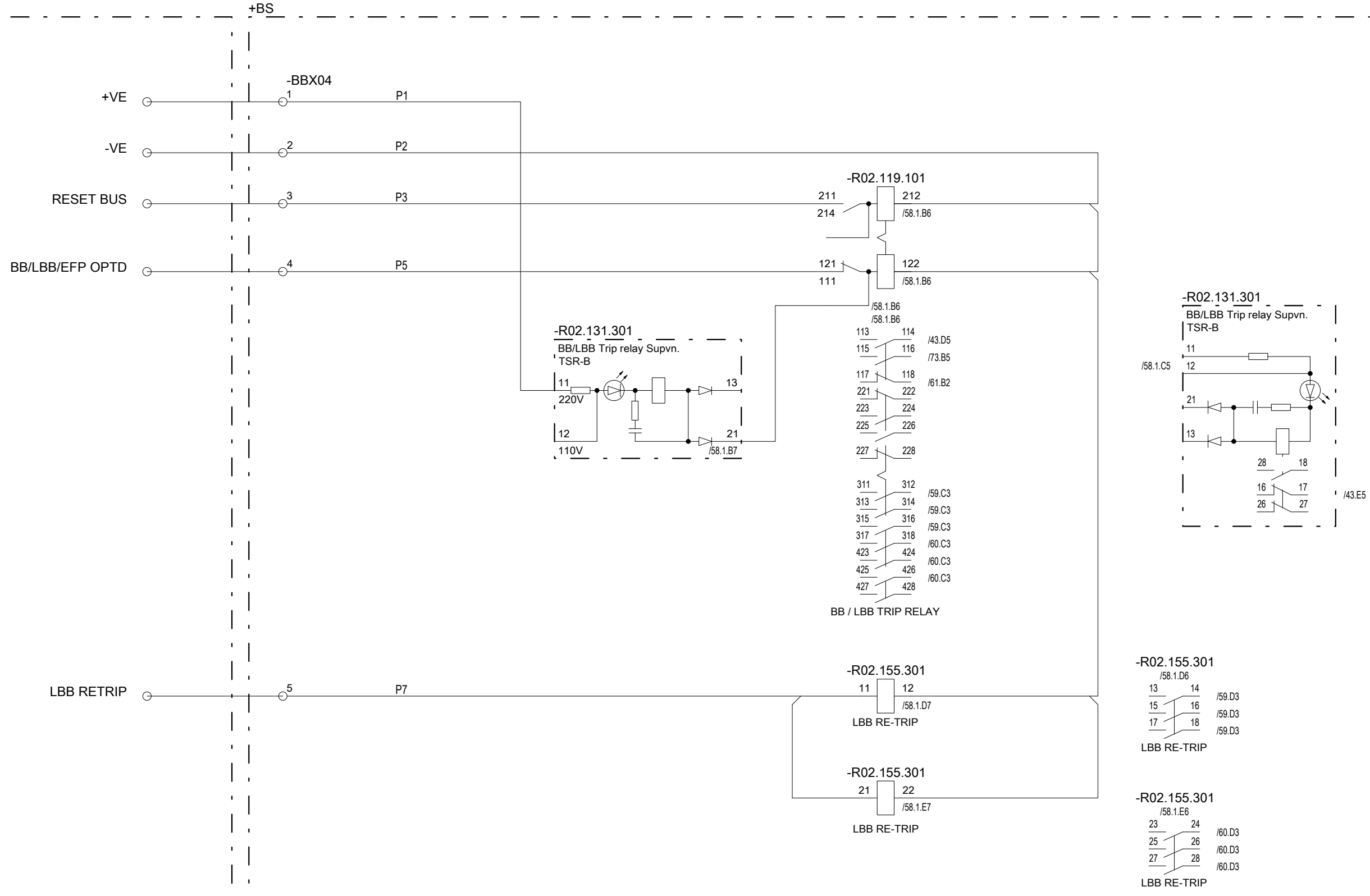


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BB  
BUSBAR PANEL



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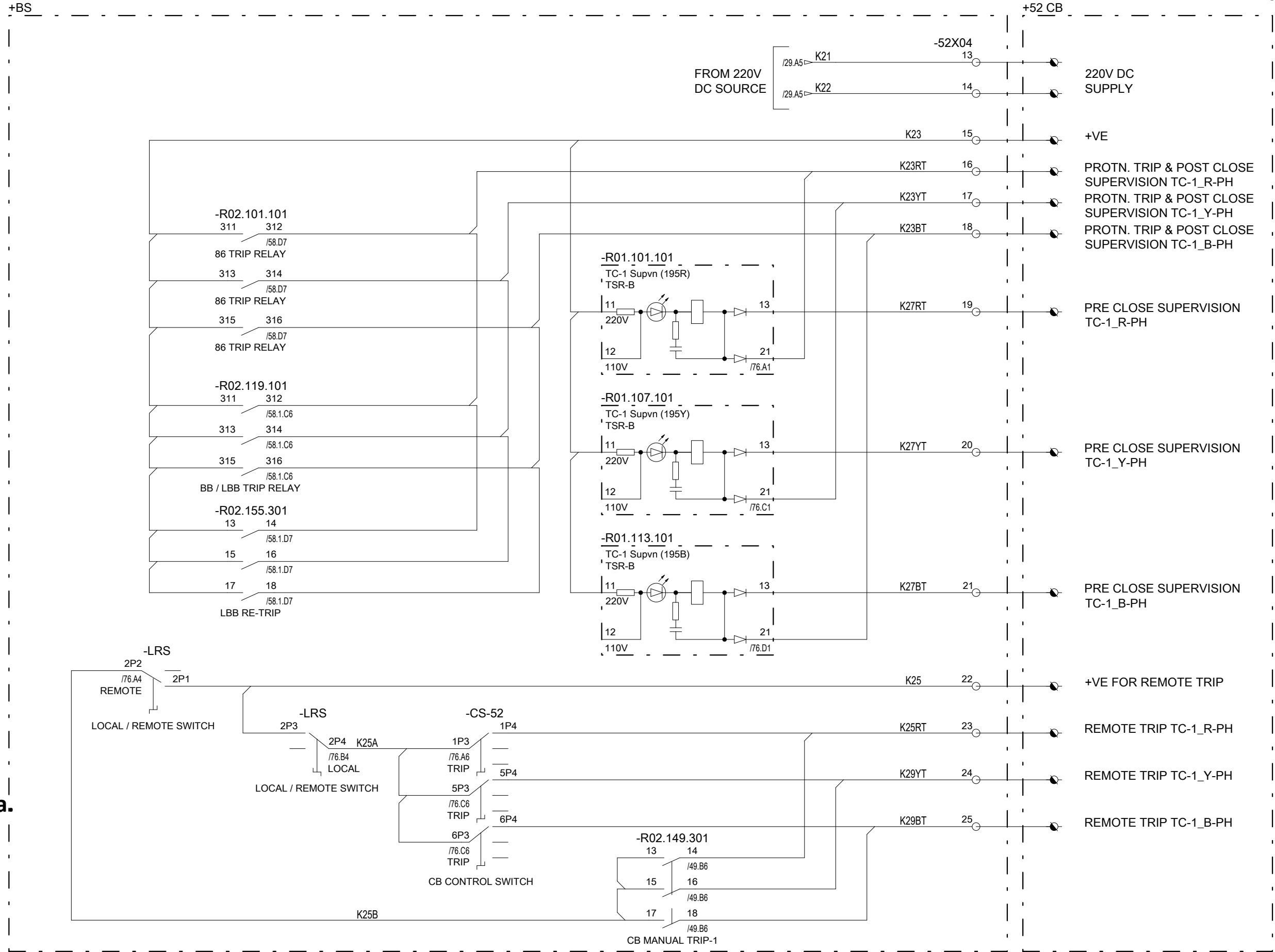
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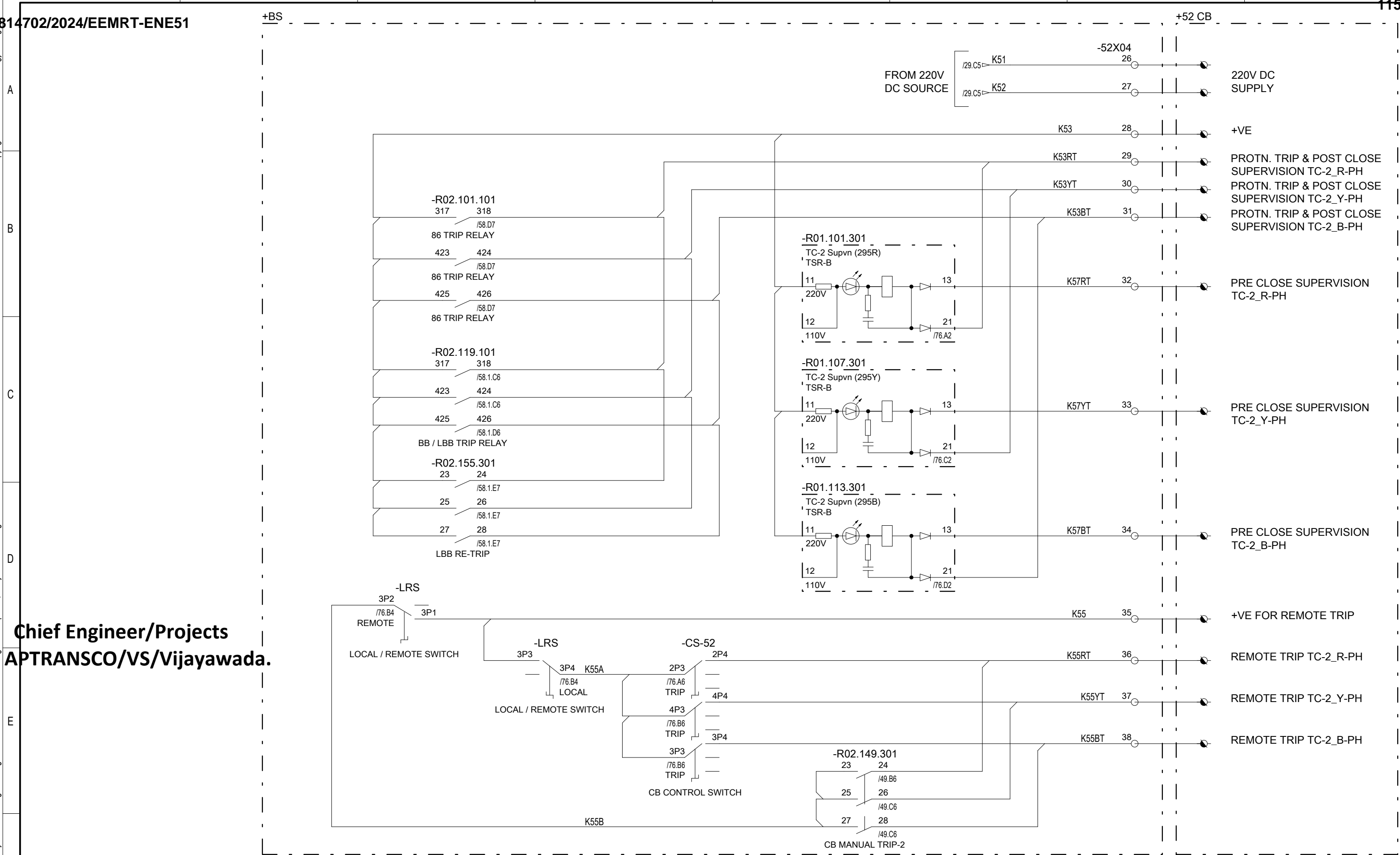


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Rev.	Revision note	Date	Name		<b>HITACHI</b>	Doc. no.	1MNS500925-CFAC		n. sheet	Sheet		59
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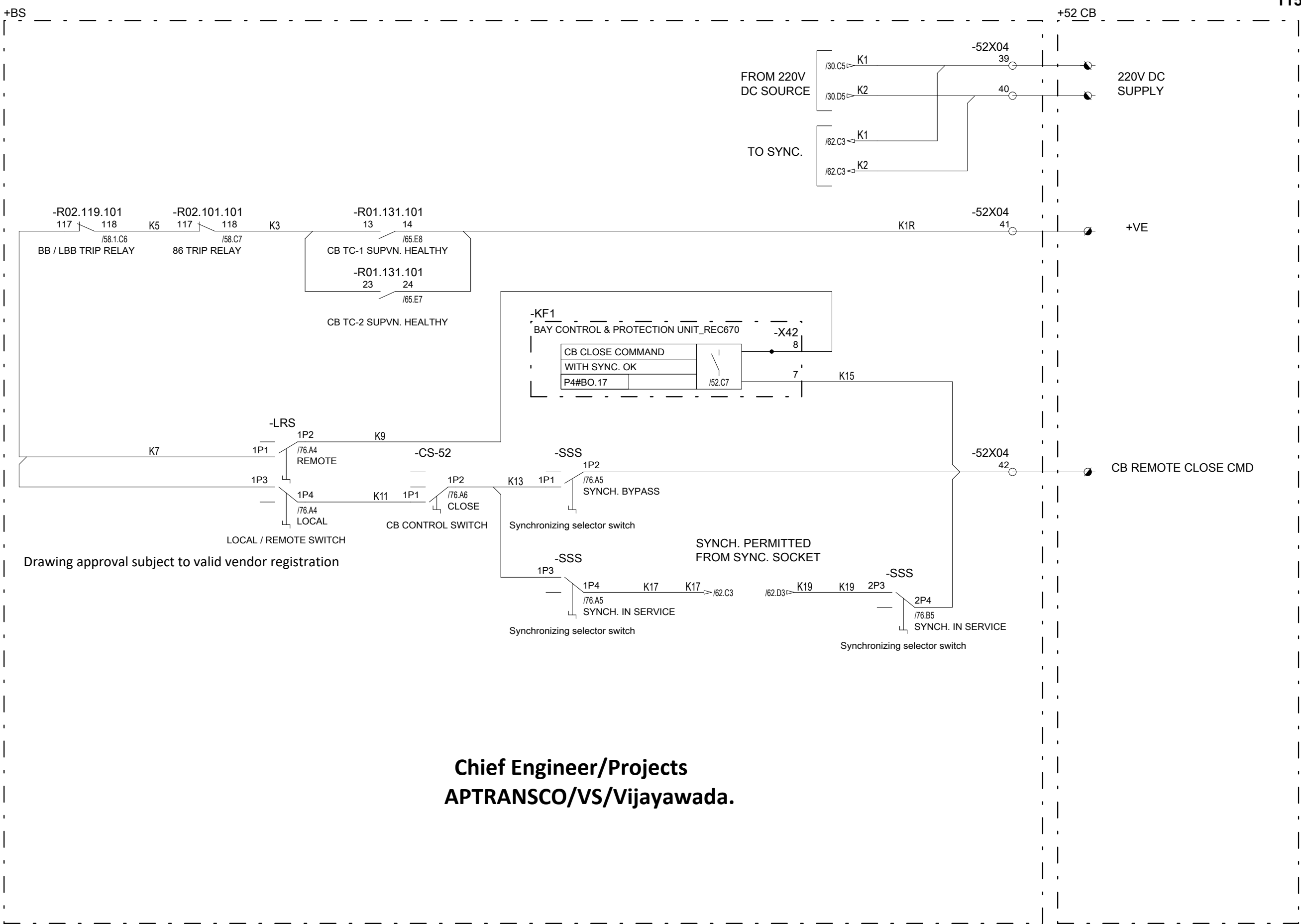
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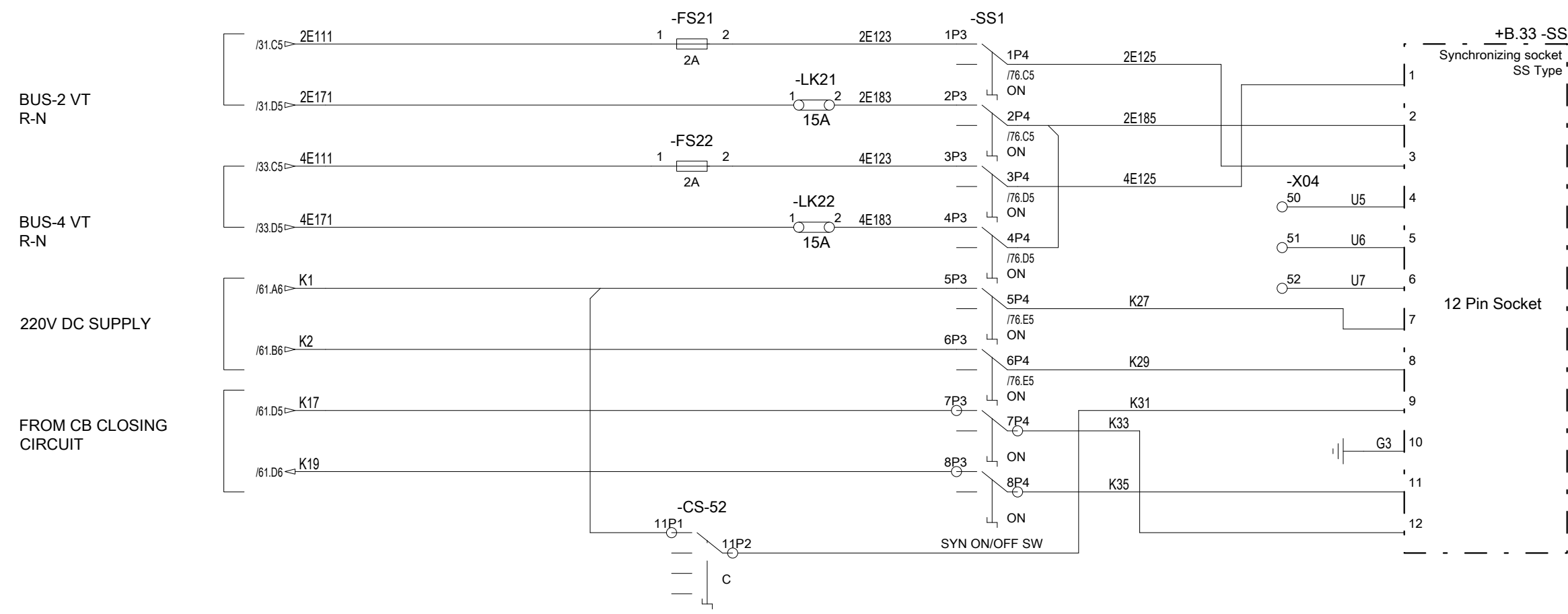
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Suitable for conventional 220KV SS only



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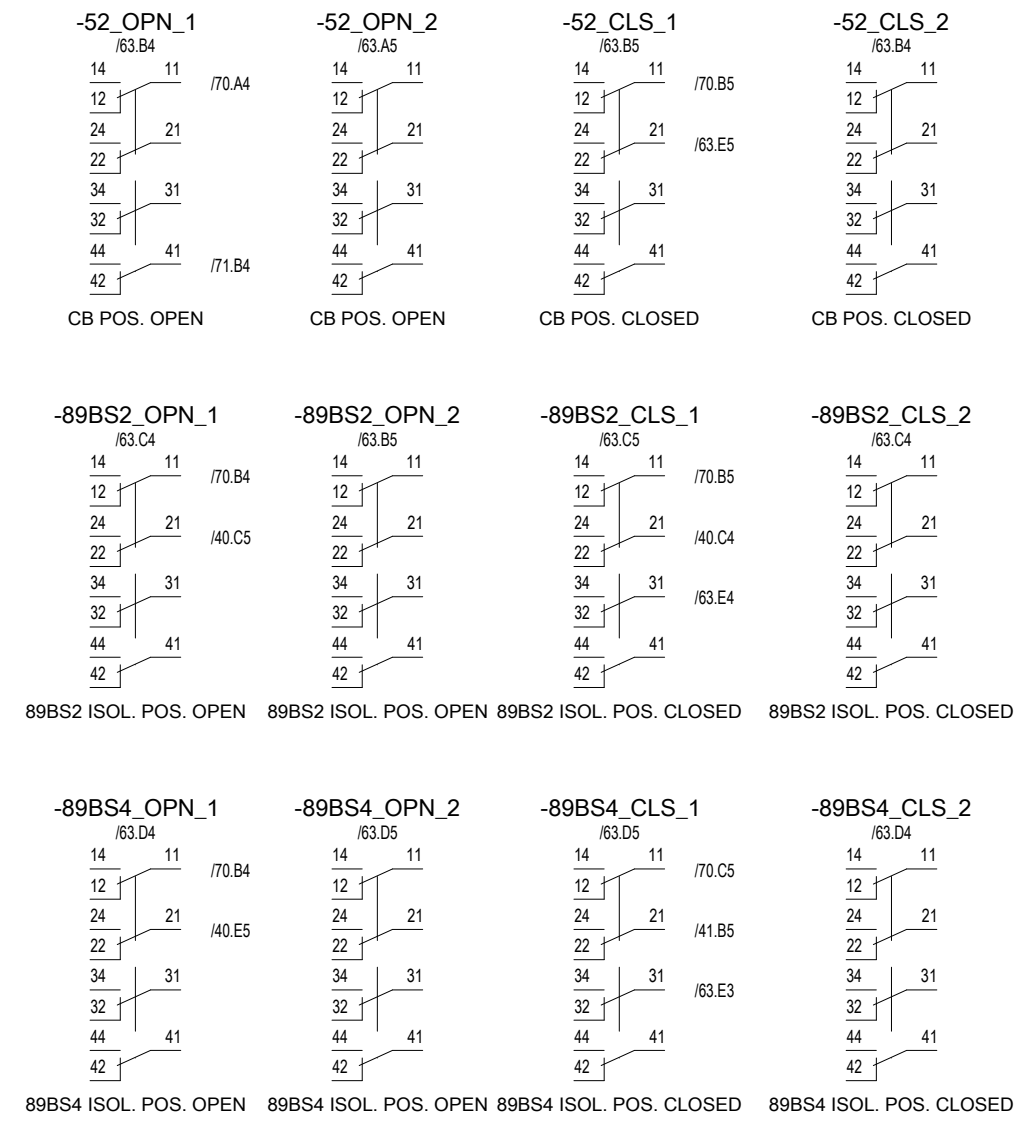
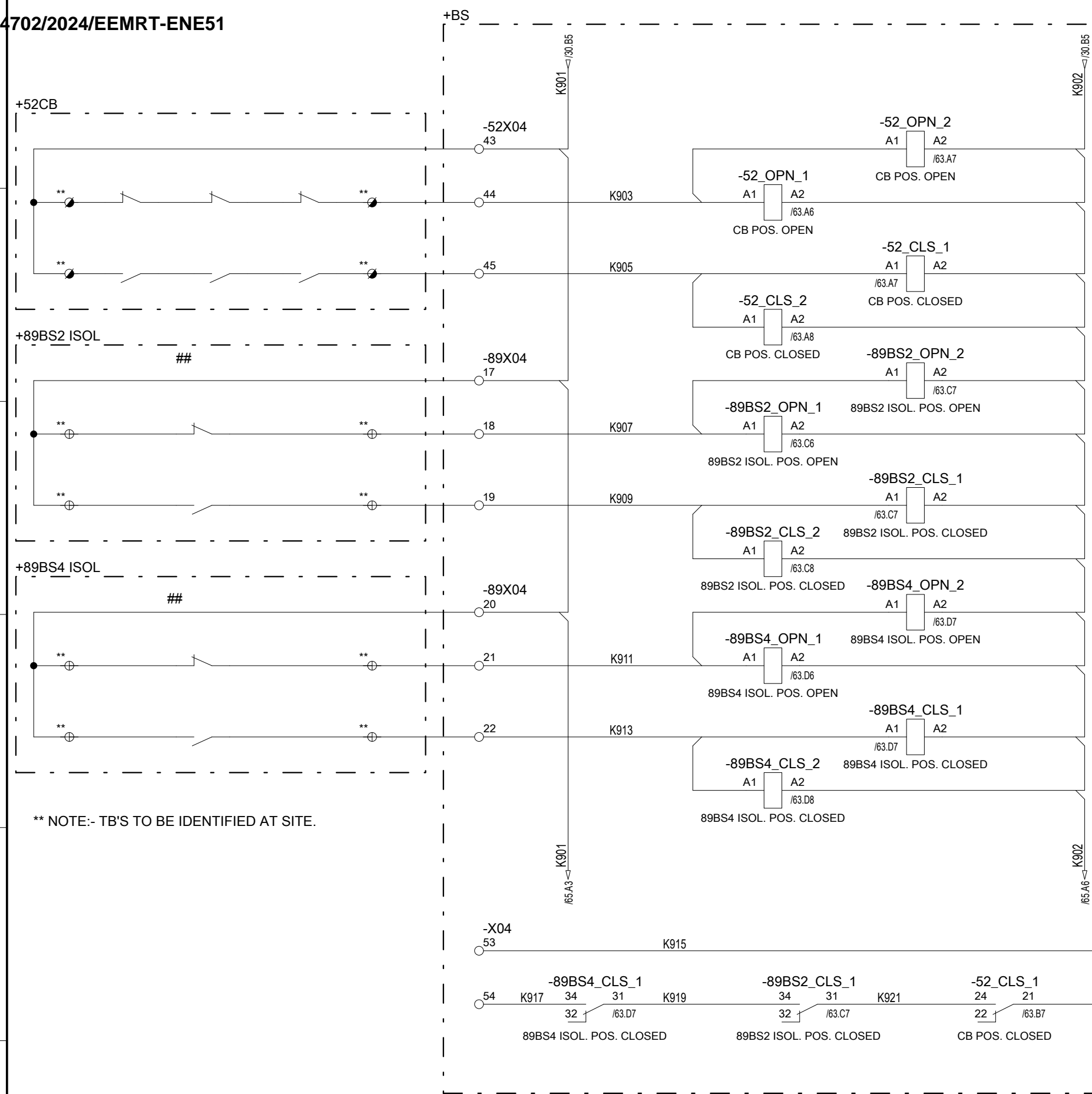
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Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CFAC	Sheet 62	n. sheet 63
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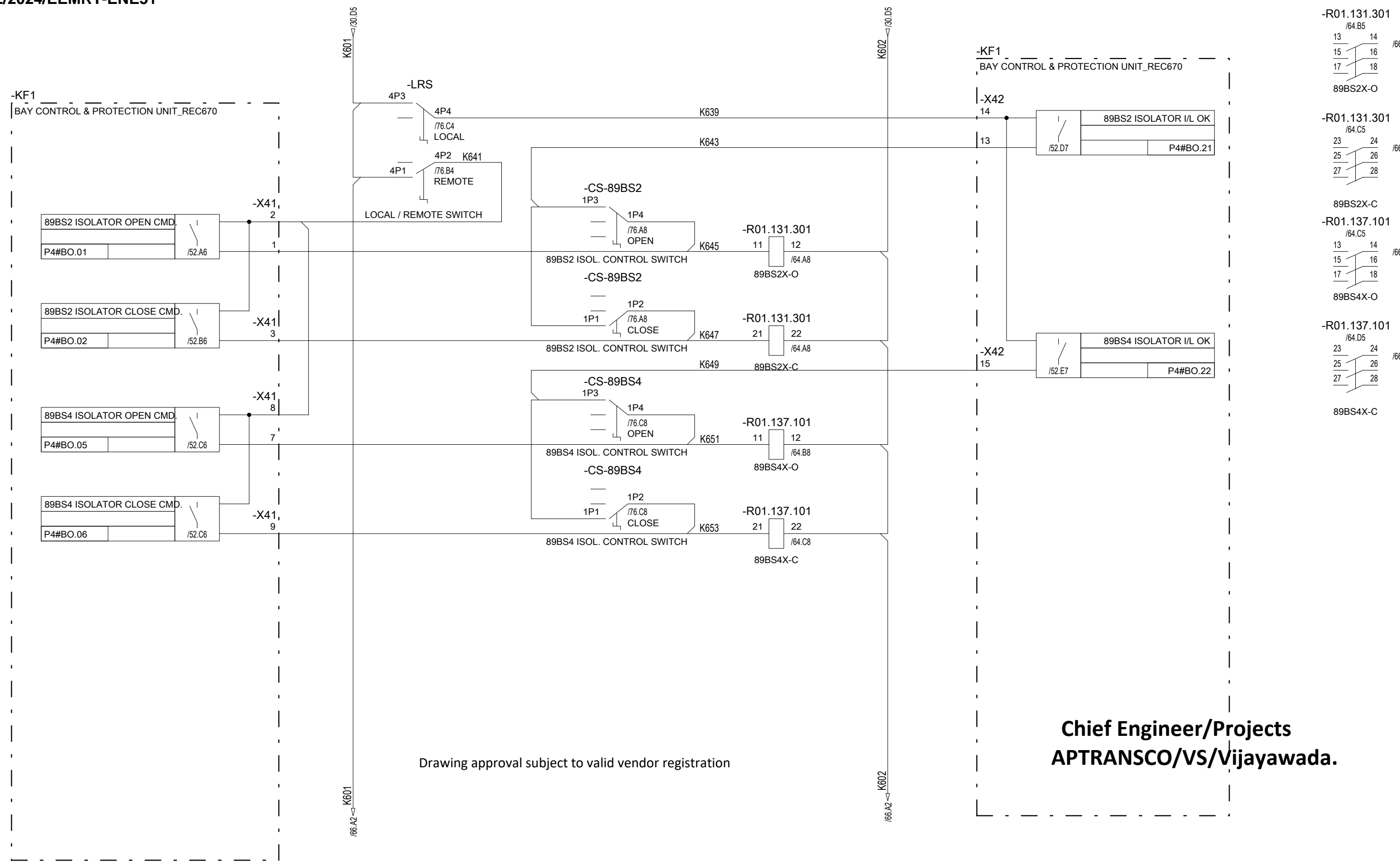


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1MYN691003-102(A3)REV01						

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Drawing approval subject to valid vendor registration

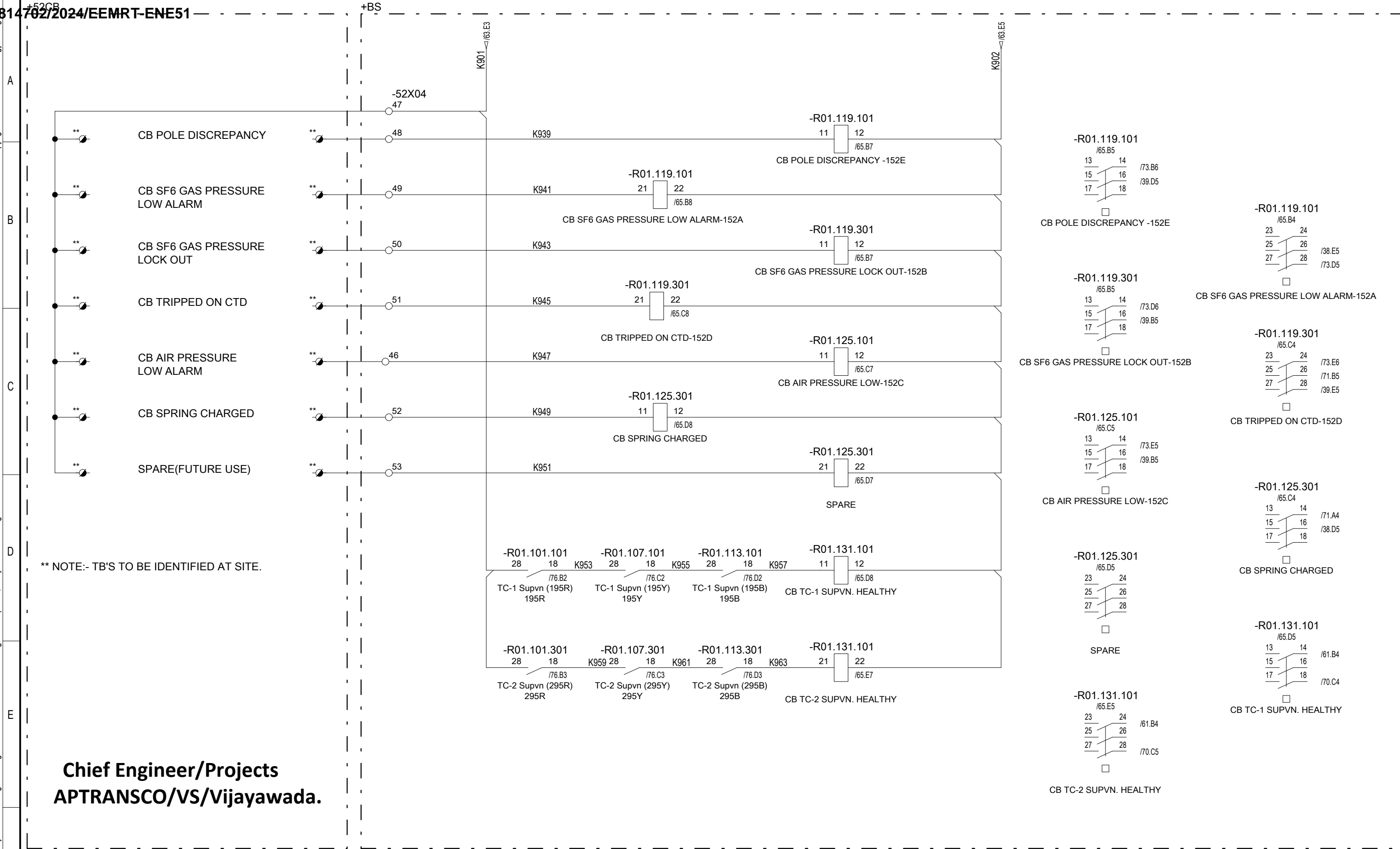
**Chief Engineer/Projects  
APTRANSCO/VS/Vijayawada.**

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Isolator Command Circuit	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name		Doc. no. 1MNS500925-CFAC	Sheet 64
1MYN691003-102(A3)REV01					n. sheet 65	

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\*\* NOTE:- TB'S TO BE IDENTIFIED AT SITE.

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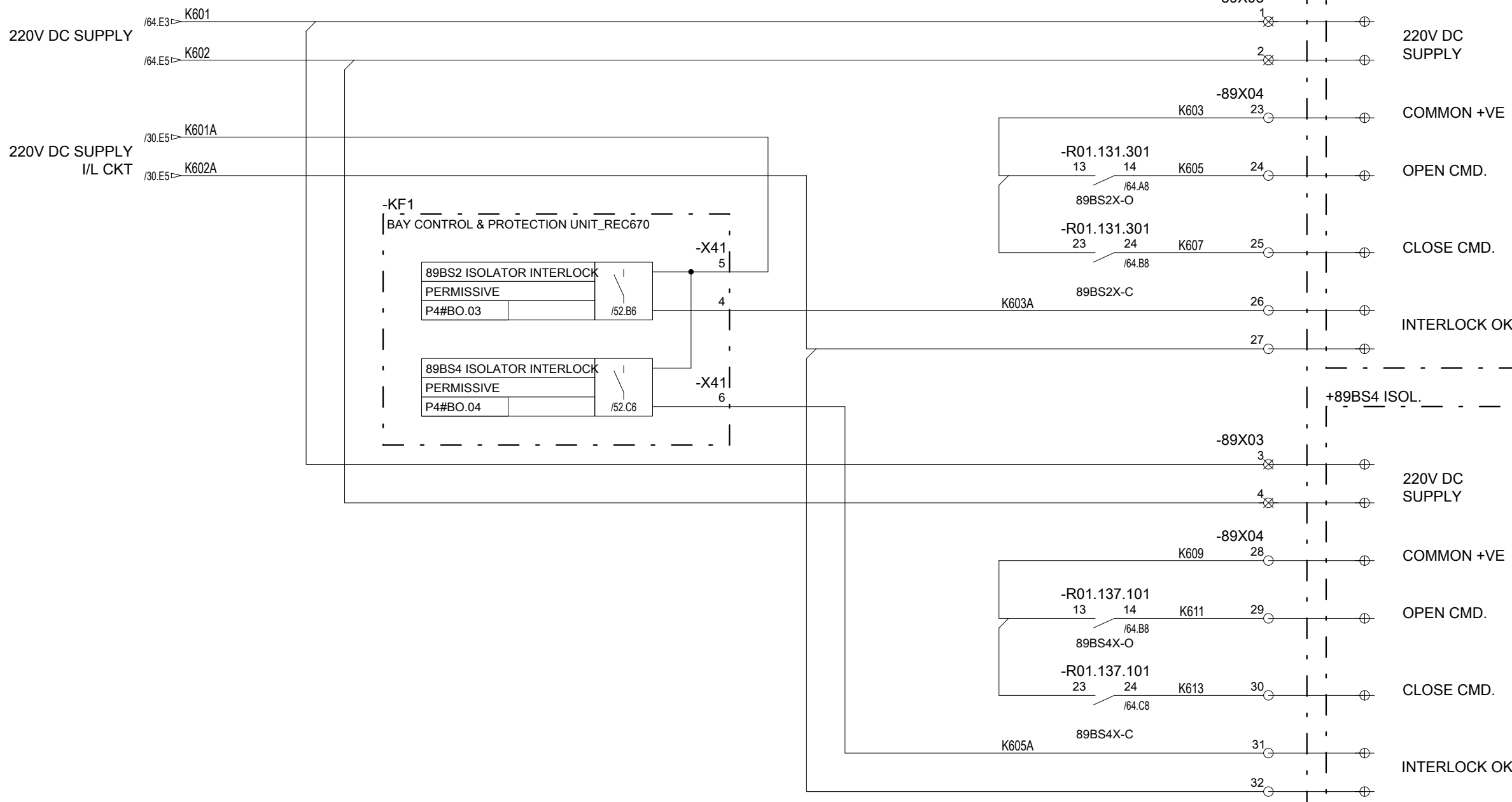
Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		CB Trouble multpn Circuit	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	Sheet 65
1MYN691003-102(A3)REV01						n. sheet 66

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Suitable for conventional 220KV SS only

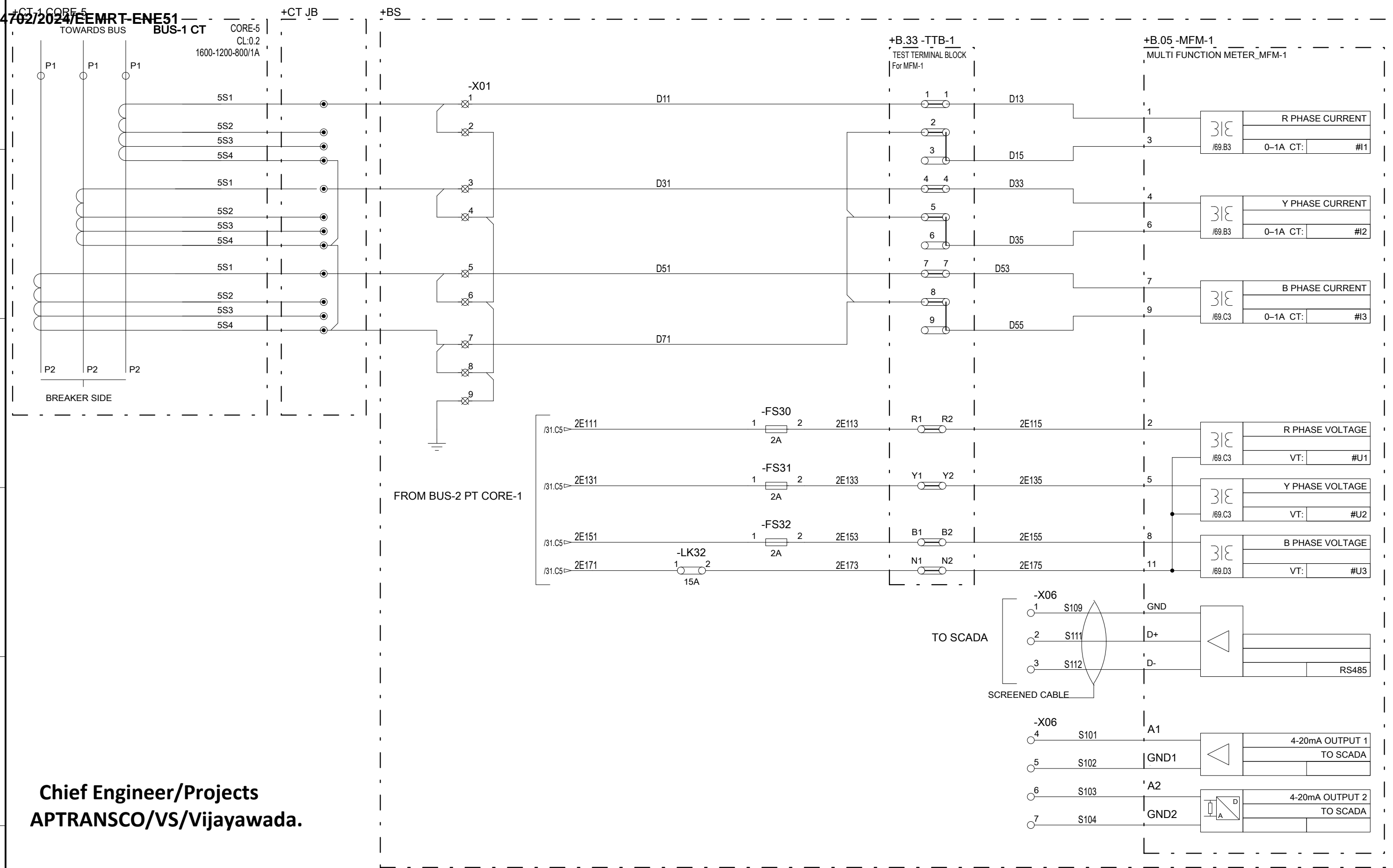
**Chief Engineer/Projects  
APTRANSCO/VS/Vijayawada.**

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		89A, 89B Isol. Control Circuit	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CFAC	Sheet 66	n. sheet 67
1MYN691003-102(A3)REV01						

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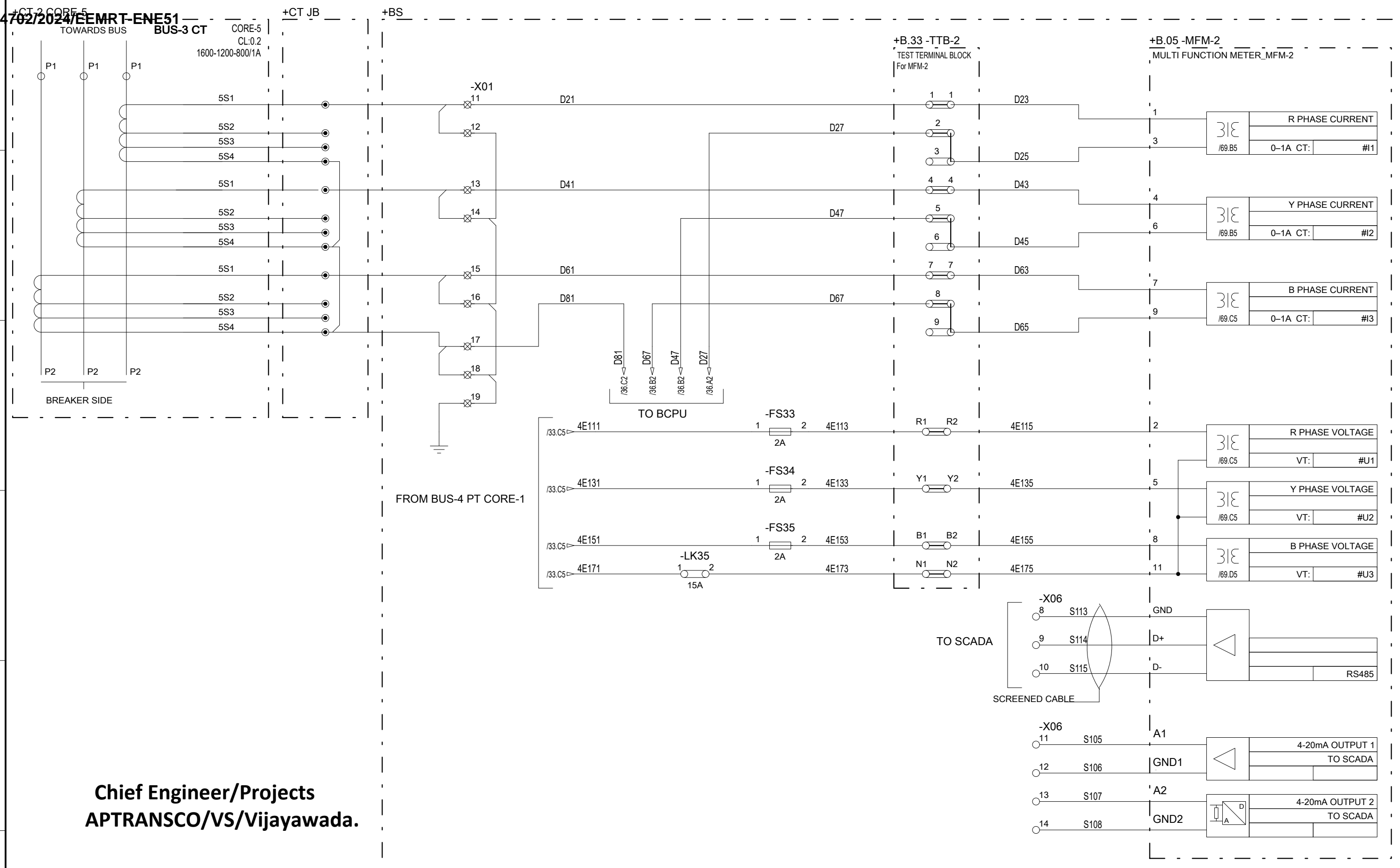


**Chief Engineer/Projects**  
**APTRANSCO/VS/Vijayawada.**

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Metering Circuit- MFM-1	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	Sheet 67
1MYN691003-102(A3)REV01						n. sheet 68

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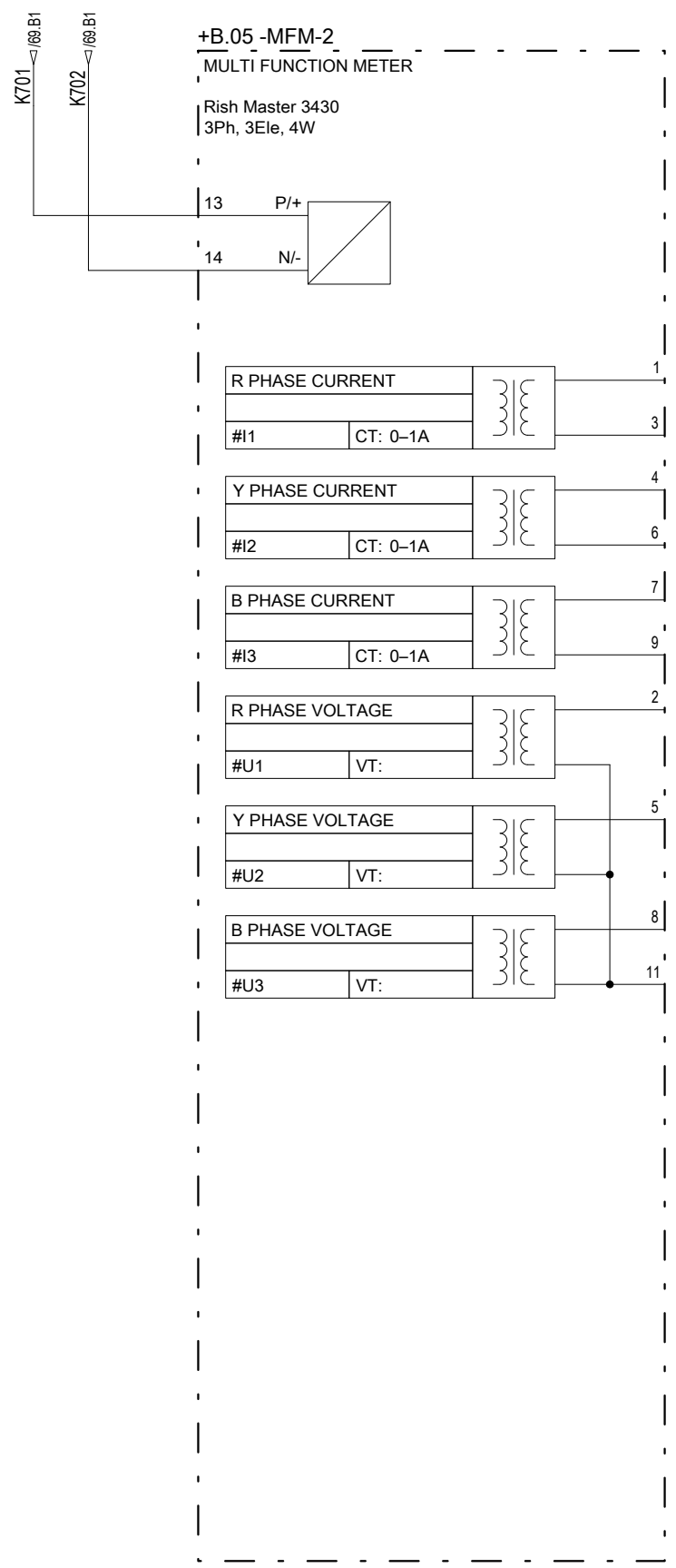
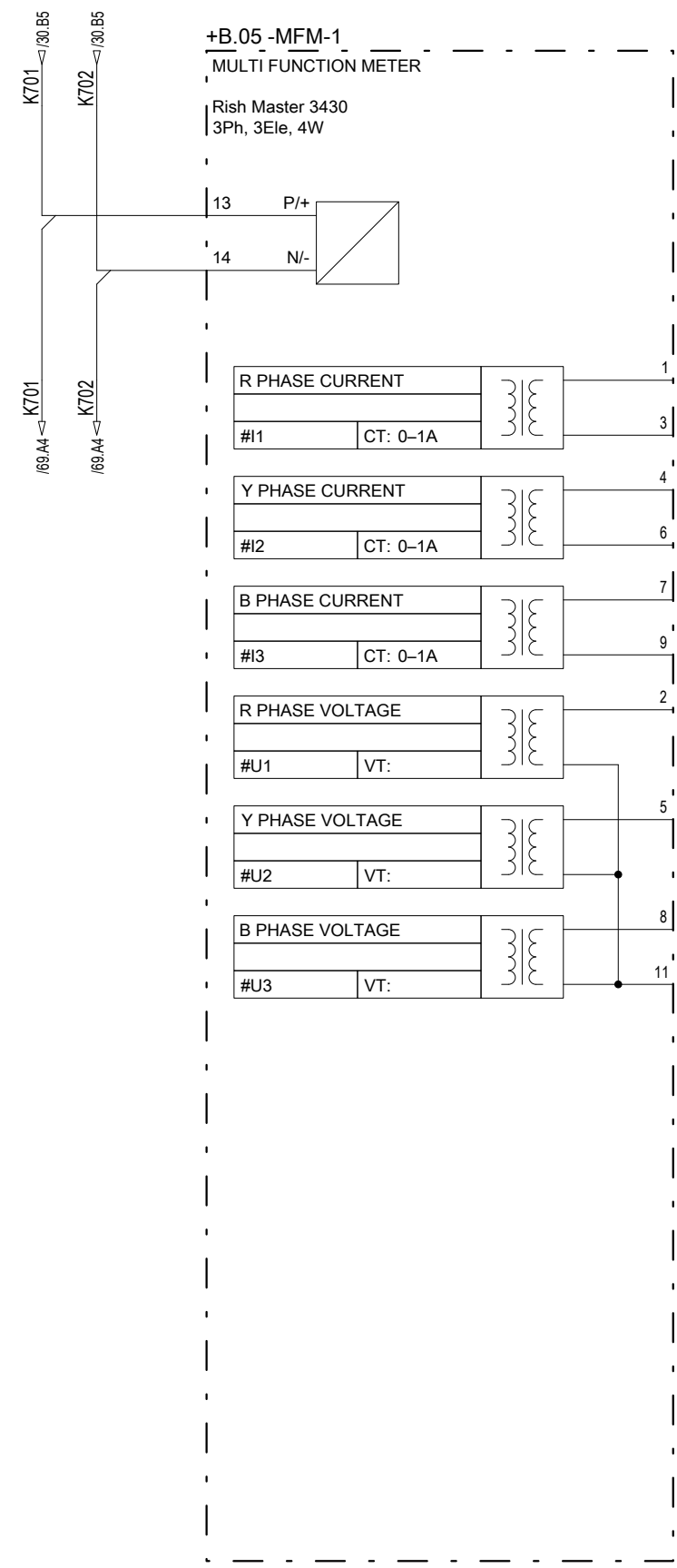


**Chief Engineer/Projects**  
**APTRANSCO/VS/Vijayawada.**

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Metering Circuit- MFM-2	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	Sheet 68
1MYN691003-102(A3)REV01						n. sheet 69

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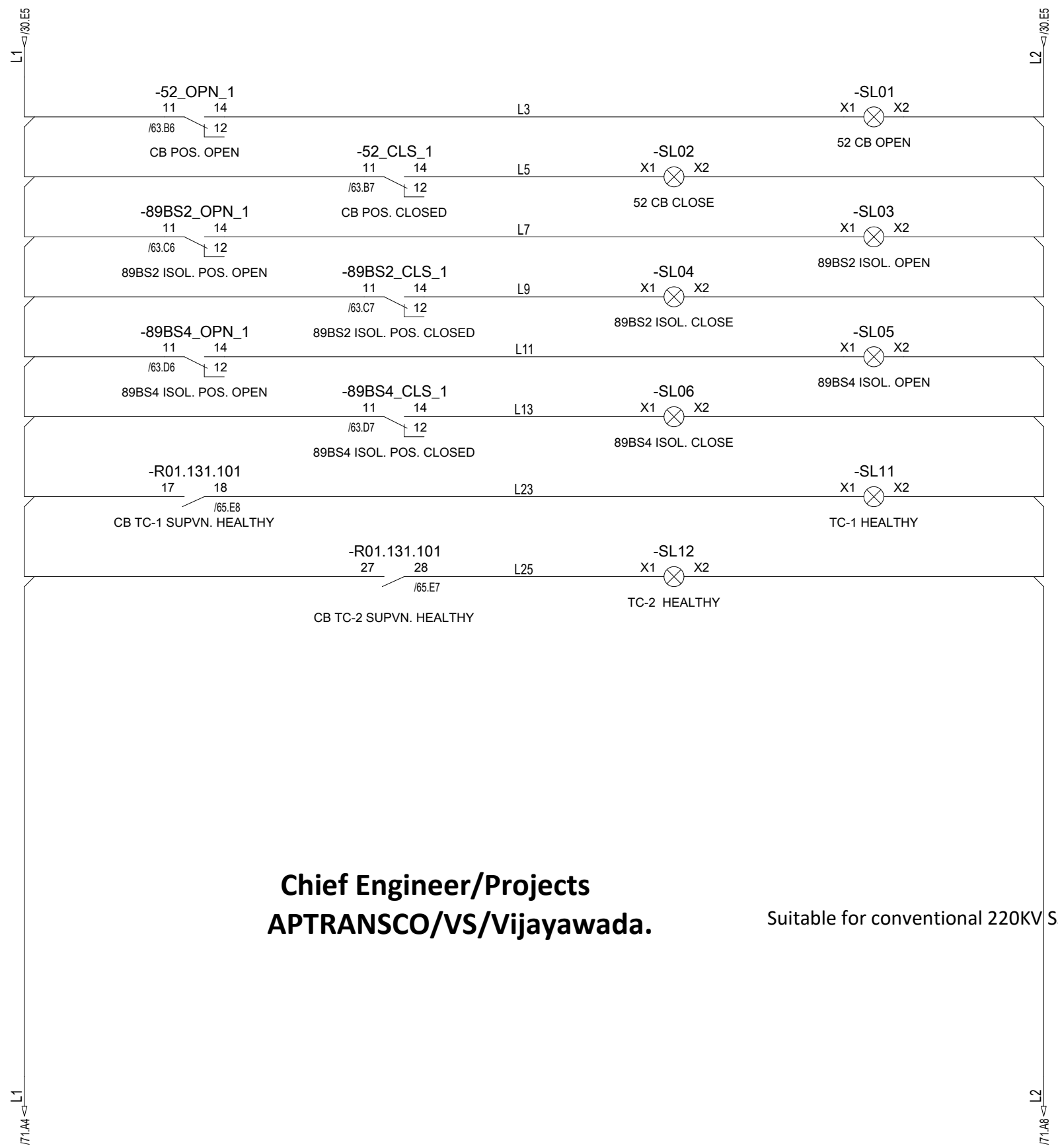
Drawing approval subject to valid vendor registration

**Chief Engineer/Projects  
APTRANSCO/VS/Vijayawada.**

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Metering Circuit- MFM	Resp. dept. PG-GAS	Rev. ind. 0
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CFAC	Sheet 69	n. sheet 70
1MYN691003-102(A3)REV01						

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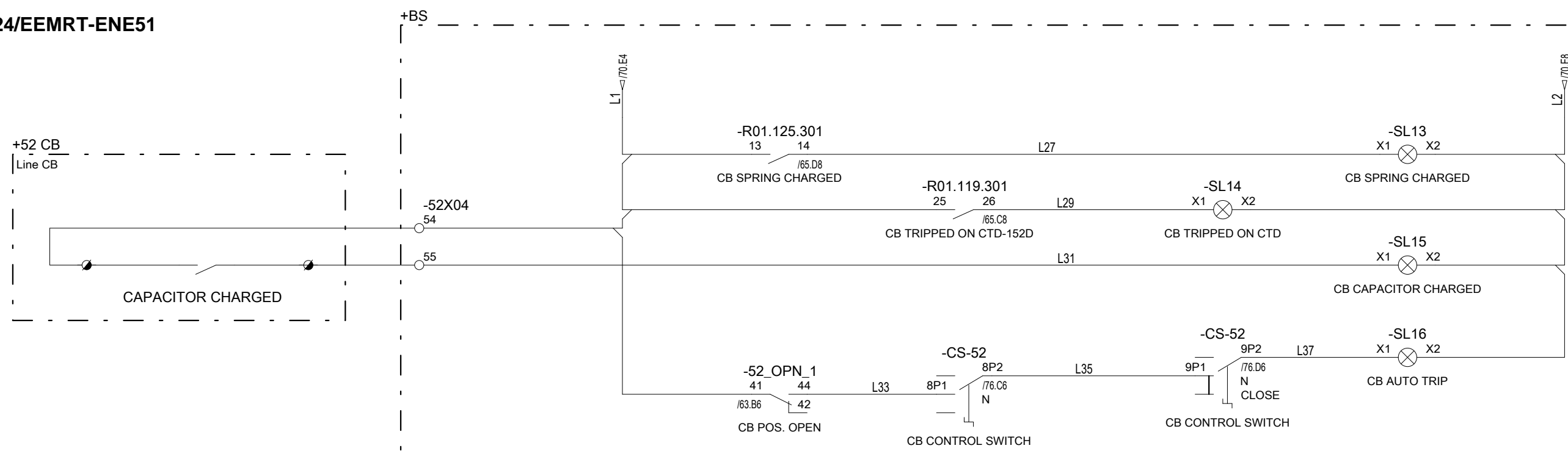
Suitable for conventional 220KV SS only

Based on		Prepared	27.02.2024	MANASA ESHWAR	Title	220kV BUS SECTION		Doc. kind.	Circuit diagram		Ref.Des.	=2KR
		Approved	27.02.2024	GOURISH HEGDE	Control & Relay Panel		DCC EFS					
		Project	APTRANSCO		Indication Circuit		Resp. dept.	PG-GAS	Rev. ind.	0	Language	en
		STANDARD DRAWING			Hitachi Energy India Limited		1MNS500925-CFAC				Sheet	70
Rev.	Revision note	Date	Name		<b>HITACHI</b>		Doc. no.				n. sheet	71
1MYN691003-102(A3)REV01												

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Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Indication Circuit	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited		Language en
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	Sheet 71
1MYN691003-102(A3)REV01						n. sheet 72

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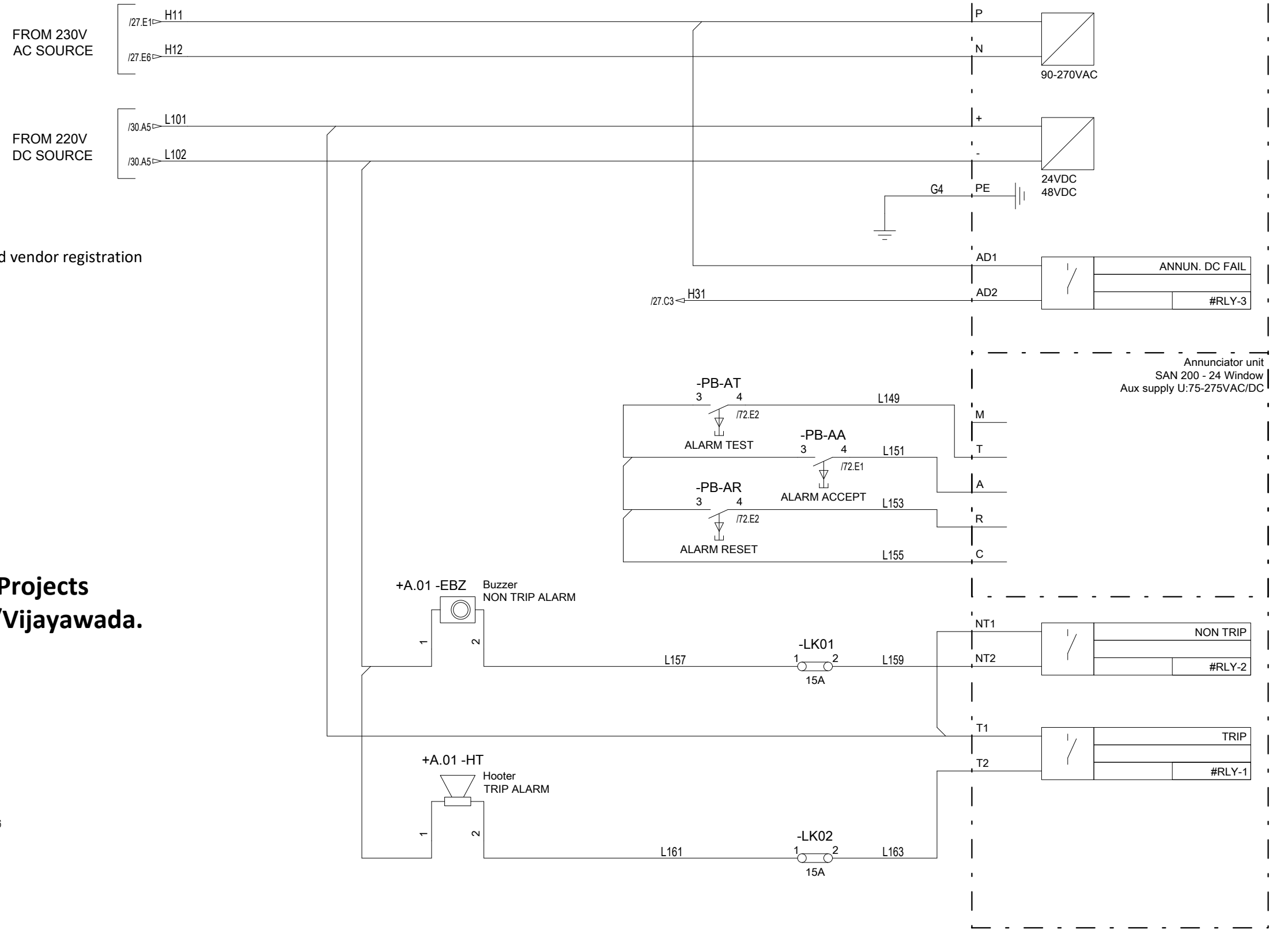
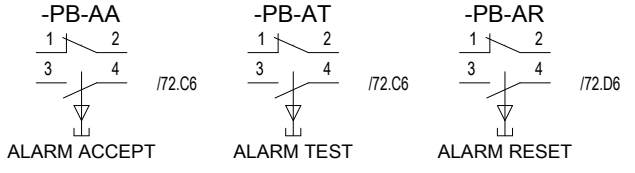
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**APTRANSCO/VS/Vijayawada.**



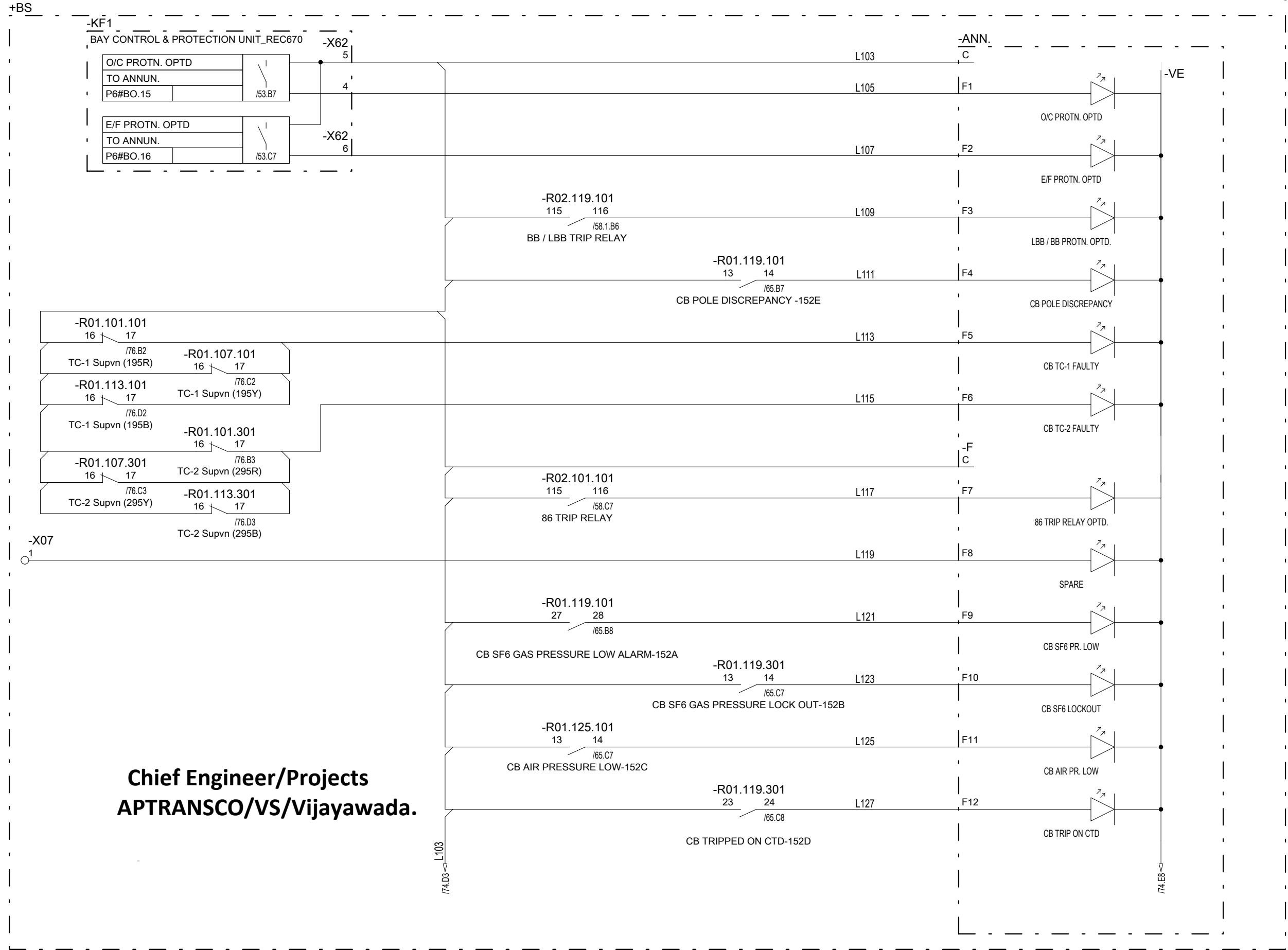
Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Annunciation Circuit	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name		Doc. no. 1MNS500925-CFAC	Sheet 72
1MYN691003-102(A3)REV01					n. sheet 73	

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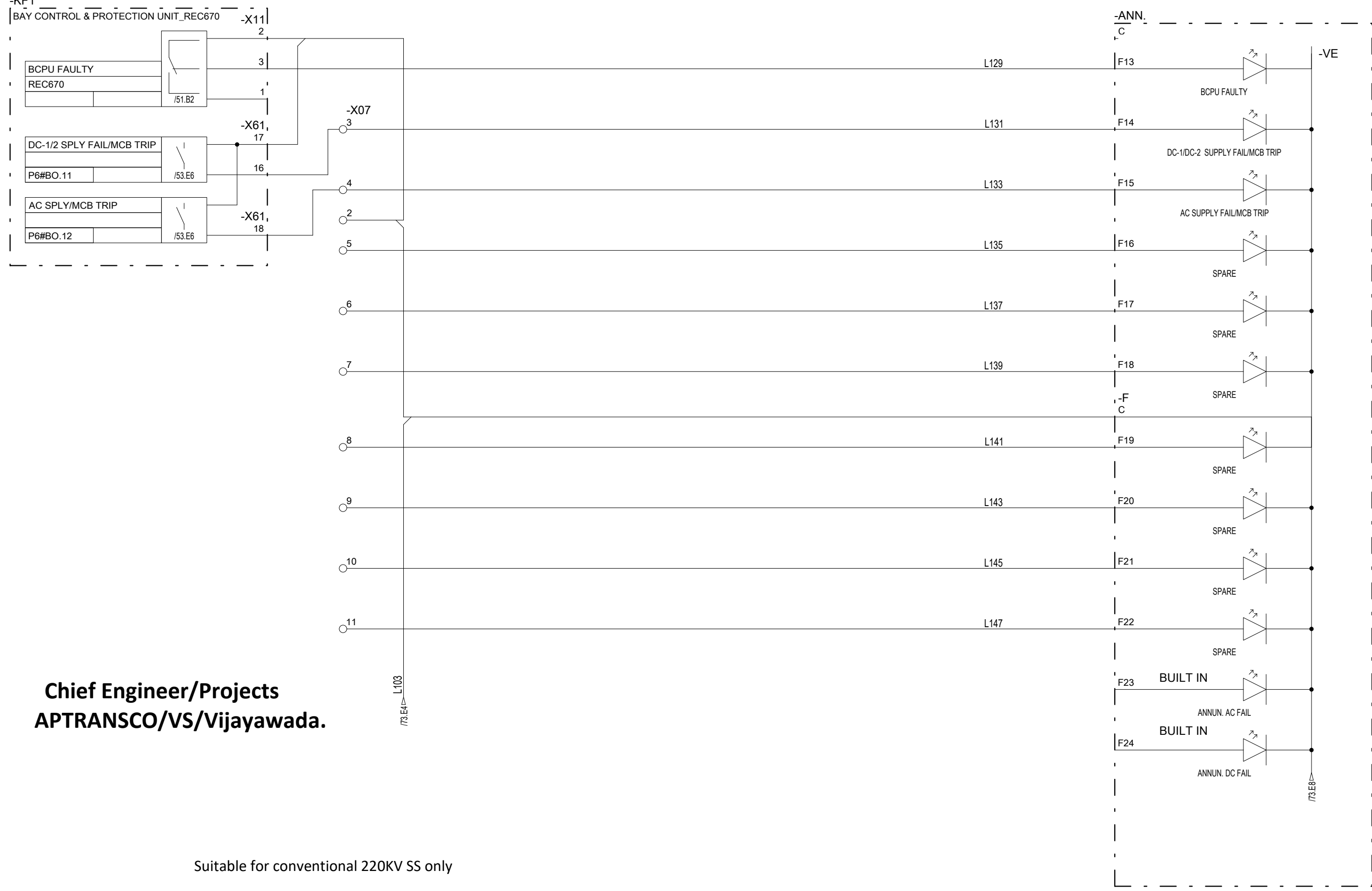
Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Annunciation Circuit	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	Sheet 73
1MYN691003-102(A3)REV01						n. sheet 74

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**Chief Engineer/Projects  
APTRANSCO/VS/Vijayawada.**

Suitable for conventional 220KV SS only

Based on		Prepared 27.02.2024 MANASA ESHWAR	Title 220kV BUS SECTION Control & Relay Panel Annunciation Circuit	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024 GOURISH HEGDE	HITACHI Hitachi Energy India Limited	DCC EFS	
		Project APTRANSCO STANDARD DRAWING		Resp. dept. PG-GAS	Rev. ind. 0
Rev.	Revision note	Date		Doc. no. 1MNS500925-CFAC	
1MYN691003-102(A3)REV01				Sheet 74	n. sheet 75

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Drawing approval subject to valid vendor registration

**ANNUNCIATION INSCRIPTION DETAILS**

ANN.

1 O/C PROTN. OPTD T	2 E/F PROTN. OPTD T	3 LBB / BB PROTN. OPTD. T	4 CB POLE DISCREPANCY NT	5 CB TC-1 FAULTY NT	6 CB TC-2 FAULTY NT
7 86 TRIP RELAY OPTD. T	8 SPARE T	9 CB SF6 PR. LOW NT	10 CB SF6 LOCKOUT NT	11 CB AIR PR. LOW NT	12 CB TRIP ON CTD T
13 BCPU FAULTY NT	14 DC-1/DC-2 SUPPLY FAIL/ MCB TRIP NT	15 AC SUPPLY FAIL/ MCB TRIP NT	16 SPARE NT	17 SPARE NT	18 SPARE NT
19 SPARE NT	20 SPARE NT	21 SPARE NT	22 SPARE NT	23 ANNUN. AC FAIL NT	24 ANNUN. DC FAIL NT

**Chief Engineer/Projects  
APTRANSCO/VIS/Vijayawada.**

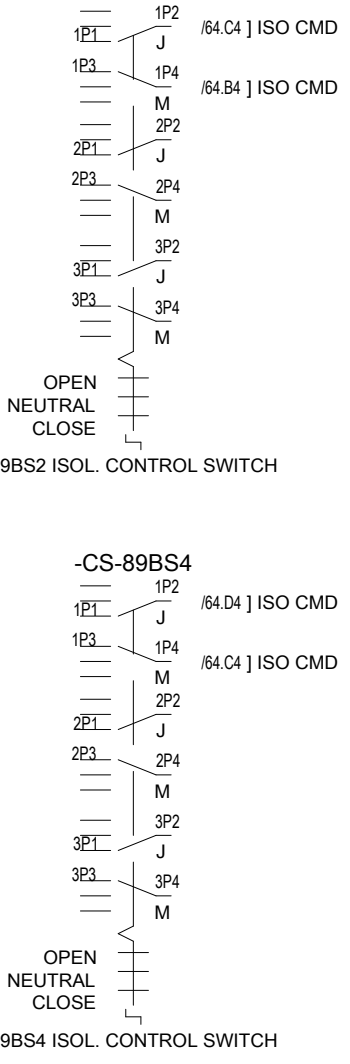
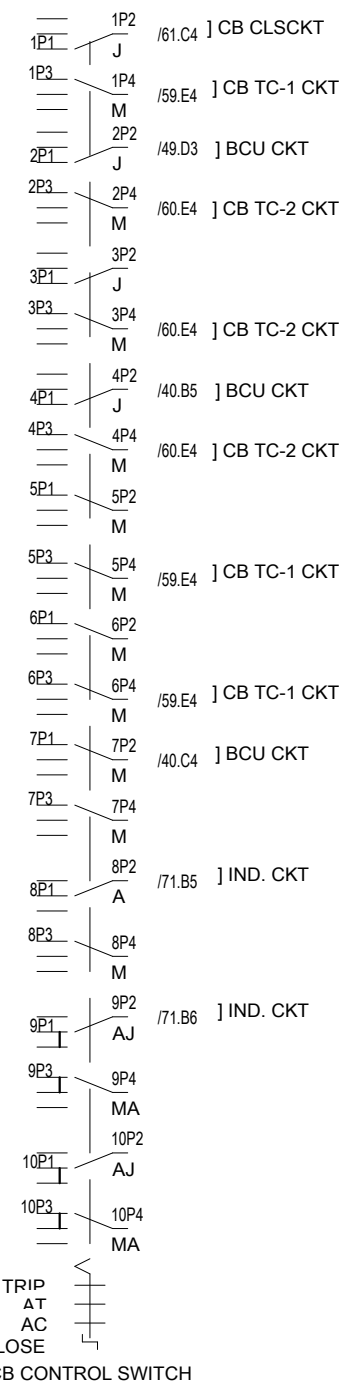
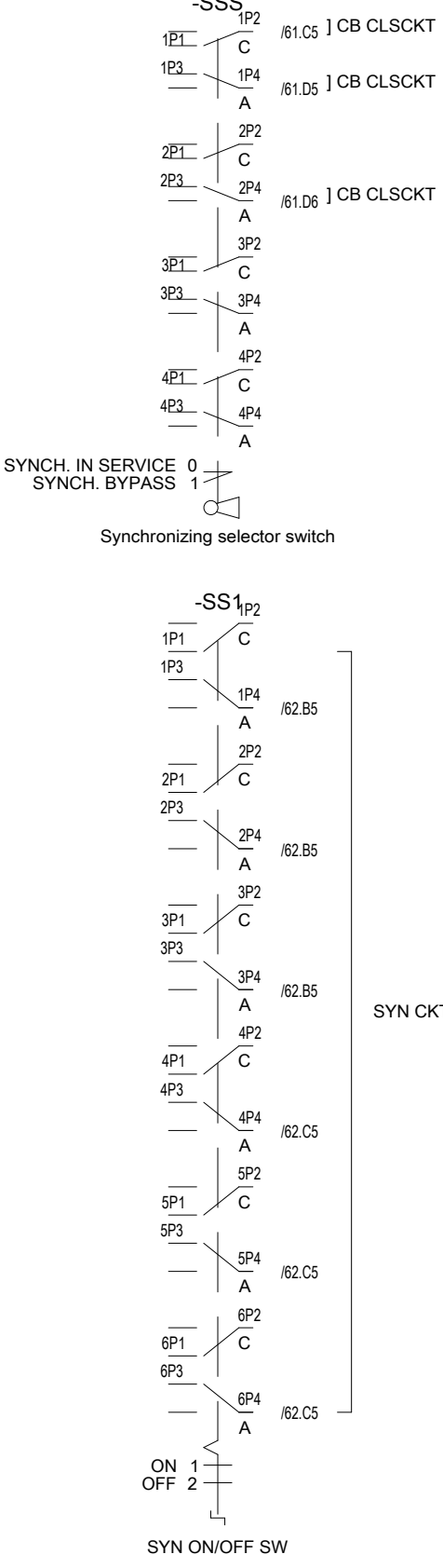
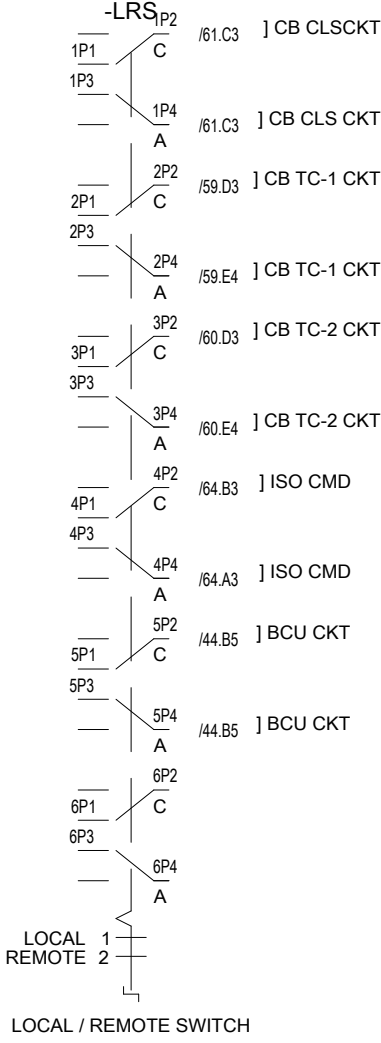
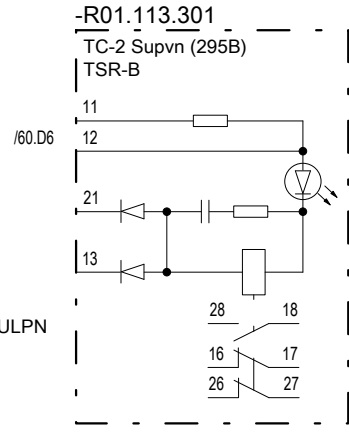
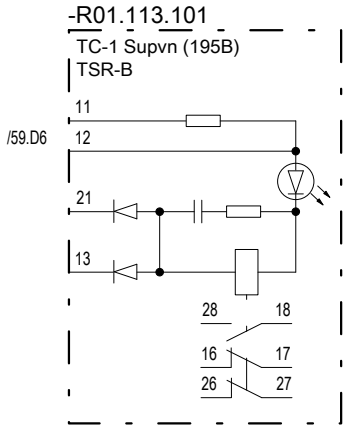
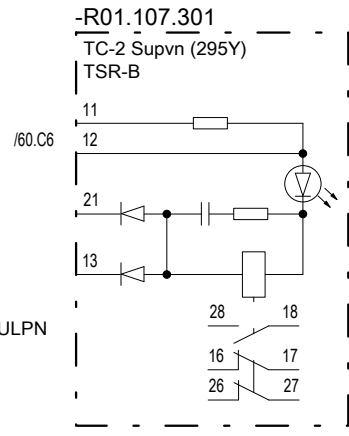
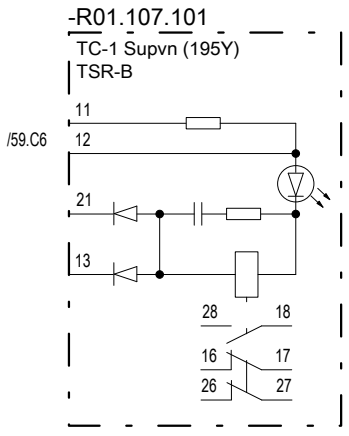
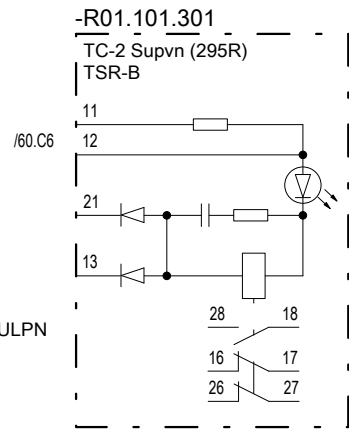
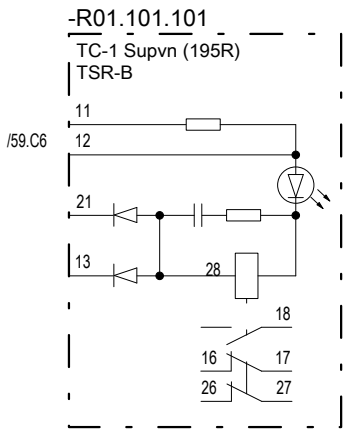
NOTE:-

- 1) NUMBERS FROM 1 TO 24 ARE FOR WINDOW IDENTIFICATION.
- 2) T :- TRIP ALARM WITH RED COLOUR LED WINDOW
- 3) NT :- NON TRIP ALARM WITH WHITE COLOUR LED WINDOW

Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION Control & Relay Panel Annunciation Incriptions	Doc. kind. Circuit diagram	Ref.Des. =2KR	
		Approved 27.02.2024	GOURISH HEGDE		DCC EFS		
		Project APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited	Resp. dept. PG-GAS	Rev. ind. 0	Language en
Rev.	Revision note	Date	Name		Doc. no. 1MNS500925-CFAC	Sheet 75	n. sheet 76
1MYN691003-102(A3)REV01							

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Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Contact Distribution Circuit	PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	<b>HITACHI</b>	Doc. no. 1MNS500925-CFAC	Sheet 76
1MYN691003-102(A3)REV01						n. sheet 77

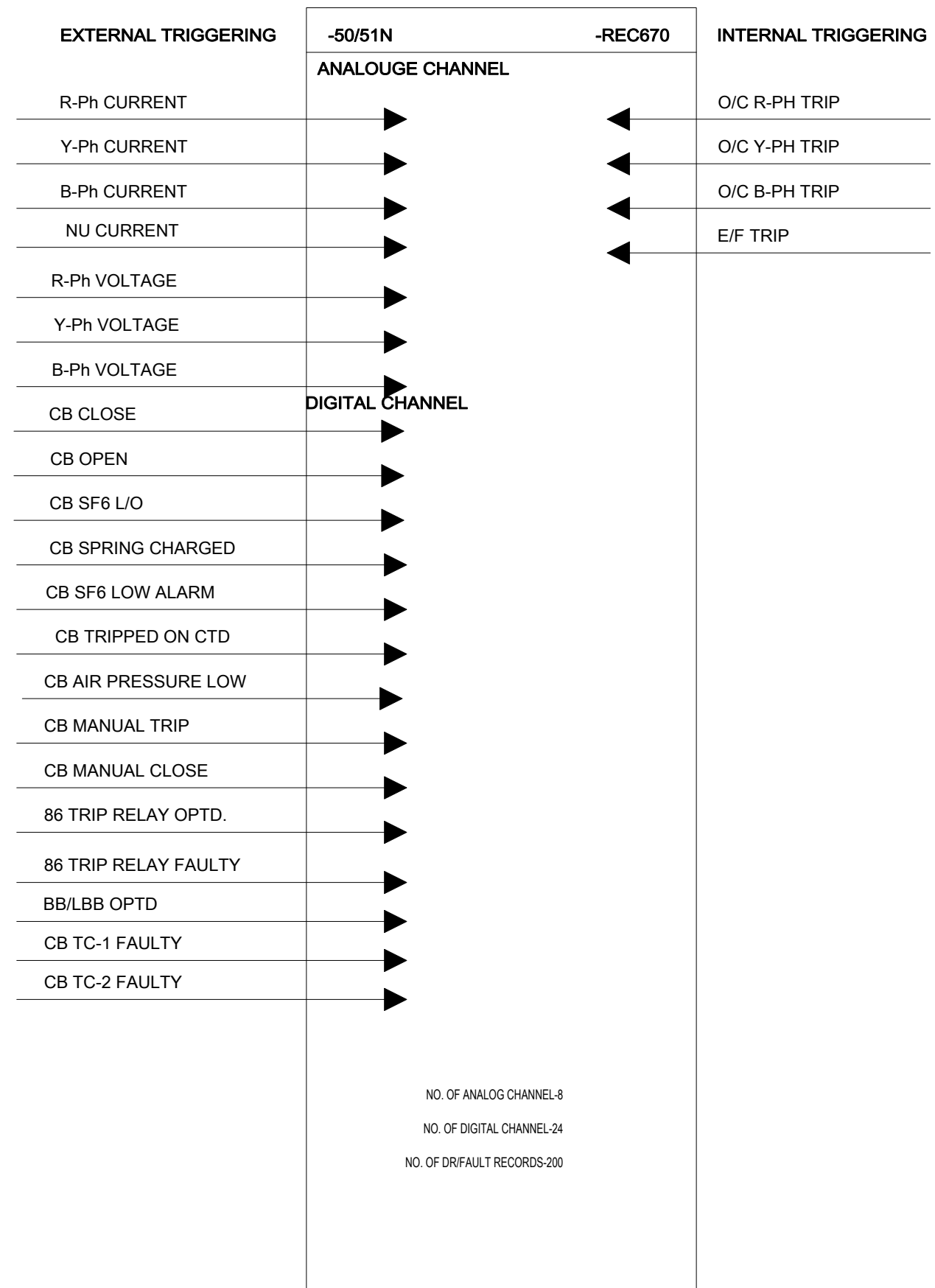
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**DISTURBANCE / EVENT RECORDED SIGNALS**



NO. OF ANALOG CHANNEL-8  
 NO. OF DIGITAL CHANNEL-24  
 NO. OF DR/FAULT RECORDS-200

**Chief Engineer/Projects  
 APTRANSCO/VS/Vijayawada.**

Based on		Prepared	27.02.2024	MANASA ESHWAR	Title	220kV BUS SECTION Control & Relay Panel Disturbance Recorder	Doc. kind.	Circuit diagram	Ref.Des.	=2KR
		Approved	27.02.2024	GOURISH HEGDE			DCC EFS			
		Project	APTRANSCO STANDARD DRAWING		Resp. dept.	PG-GAS	Rev. ind.	0	Language	en
Rev.	Revision note	Date	Name	<b>HITACHI</b> Hitachi Energy India Limited		Doc. no.	<b>1MNS500925-CFAC</b>		Sheet	77
1MYN691003-102(A3)REV01									n. sheet	78

**-X01**

Used: 27  
(20%)Spare: 6  
Total: 33

10~~⊗~~ 20~~⊗~~ 30~~⊗~~ 31~~⊗~~ 32~~⊗~~ 33~~⊗~~

**-X02**

Used: 16  
(20%)Spare: 4  
Total: 20

17~~⊗~~ 18~~⊗~~ 19~~⊗~~ 20~~⊗~~

**-BBX04**

Used: 18  
(20%)Spare: 4  
Total: 22

19○ 20○ 21○ 22○

**-52X04**

Used: 55  
(20%)Spare: 11  
Total: 66

56○ 58○ 60○ 62○ 64○ 65○ 66○  
57○ 59○ 61○ 63○

**-XX1.1**

Used: 2  
(20%)Spare: 1  
Total: 3

4○

**-X04**

Used: 52  
(20%)Spare: 11  
Total: 63

55○ 57○ 59○ 61○ 63○ 64○ 65○  
56○ 58○ 60○ 62○

**-89X04**

Used: 60  
(20%)Spare: 12  
Total: 72

33○ 35○ 37○ 39○ 41○ 43○ 44○  
34○ 36○ 38○ 40○ 42○

**-XX1.2**

Used: 11  
(20%)Spare: 3  
Total: 14

13○ 14○

**-X07**

Used: 11  
(20%)Spare: 3  
Total: 14

12○ 13○ 14○

**-DCX03**

Used: 12  
(20%)Spare: 3  
Total: 15

5~~⊗~~ 14~~⊗~~ 15~~⊗~~

**-X06**

Used: 14  
(20%)Spare: 3  
Total: 17

15○ 16○ 17○

**-ACX03**

Used: 4  
(20%)Spare: 1  
Total: 5

5~~⊗~~

**-X12**

Used: 16  
(20%)Spare: 4  
Total: 20

17~~⊗~~ 18~~⊗~~ 19~~⊗~~ 20~~⊗~~

**-89X03**

Used: 12  
(20%)Spare: 3  
Total: 15

5~~⊗~~ 6~~⊗~~ 7~~⊗~~

Drawing approval subject to valid vendor registration

Suitable for conventional 220KV SS only

**Chief Engineer/Projects  
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Based on		Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION		Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 27.02.2024	GOURISH HEGDE	SPARE TERMINALS		DCC EFS	+BC
		Project APTRANSCO		SPARE TERMINALS		Resp. dept. PG-GAS	Rev. ind. 0
		STANDARD DRAWING		Hitachi Energy India Limited		Language en	Sheet 78
Rev.	Revision note	Date	Name	<b>HITACHI</b>		Doc. no. 1MNS500925-CFAC	n. sheet 1001
1MYN691003-102(A3)REV01							

8814702/2024/EEMRT-ENE51	1	2	3	4	5	6	7	8	1171						
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet				
A	+A.01	-ACMCB01	Miniature circuit breaker	-	16A	240VAC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/26				
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/26,42				
B	+A.01	-EBZ	Electronic buzzer for Non-Trip Alarm	Buzzer	160-280V AC/DC	96x96mm	1MYN593002-006	Alan electronic systems pvt.ltd		1	1MNS500925-CFAC/72				
C	+A.01	-FS36	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/36				
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1					
D	+A.01	-FS37	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/36				
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1					
E	+A.01	-FS38	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/36				
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1					
F	+A.01	-HS	On/off Switch		1-2 pos on/off switch, 5A, Flush mounting		1MYN533014-001	Switron		1	1MNS500925-CFAC/26				
	+A.01	-HT	Hooter for Trip alarm	Hooter	220VDC		1MYN593002-004		1MYN593002-004	1	1MNS500925-CFAC/72				
G	+A.01	-LK01	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1					
			Neutral link	NL	15A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/72				
H	+A.01	-LK02	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1					
			Neutral link	NL	15A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/72				
<b>Chief Engineer/Projects APTRANSCO/VS/Vijayawada.</b>															
Based on				Prepared	27.02.2024	MANASA ESHWAR	Title		220kV BUS SECTION	Doc. kind.	Parts list	Ref.Des.	=2KR +BS		
				Approved	27.02.2024	GOURISH HEGDE	Parts list		=2KR+BS	DCC EPB					
				Project	APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited		PG-GAS		Rev. ind.	0	Language	en	
Rev.	Revision note			Date	Name			<b>HITACHI</b>		Doc. no.		1MNS500925-FAC		Sheet	1001
1MYN691003-102(A3)REV01													n. sheet	1002	

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Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
A	+A.01	-LK38	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
			Neutral link	NL	15A		ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/36	
B	+A.01	-PS	AC Socket with Switch	SW	230VAC, 05-15A	Box type, Indian standard	1MYN538103-001	Anchor		1	1MNS500925-CFAC/26
B	+A.01	-TH	Thermostat	TH	230VAC, 15A, 50 Hz	Range : 25-85°C	IN7635-3001	GIRISH EGO		1	1MNS500925-CFAC/26
C	+A.03	-ACFS01	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/26
			Control Fuse Base	-	32A		ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
C	+A.03	-ACFS02	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/27
			Control Fuse Base	-	32A		ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
D	+A.03	-ACLK01	Control Fuse Base	-	32A	<b>Chief Engineer/Projects APTRANSCO/VS/Vijayawada.</b>	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
			Neutral link	NL	15A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/26
D	+A.03	-ACLK02	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
			Neutral link	NL	15A		ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/27	
E	+A.05	-1MCB01	Miniature circuit breaker	-	16A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CFAC/28
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CFAC/28,45
E	+A.05	-1MCB02	Miniature circuit breaker	-	10A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CFAC/29
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CFAC/29,45

Based on				Prepared	27.02.2024	MANASA ESHWAR	Title	220kV BUS SECTION		Doc. kind.	Parts list		Ref.Des.	=2KR	
				Approved	27.02.2024	GOURISH HEGDE	Parts list		DCC EPB						+BS
				Project APTRANSCO			=2KR+BS		PG-GAS		Rev. ind.	0	Language		en
				STANDARD DRAWING			Hitachi Energy India Limited						Sheet		1002
Rev.	Revision note			Date	Name		<b>HITACHI</b>		Doc. no.		1MNS500925-FAC		n. sheet		1003

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Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
A	+A.05	-1MCB03	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/29
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/29,47
B	+A.05	-1MCB04	Miniature circuit breaker	-	10A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/29
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/29,47
C	+A.05	-1MCB05	Miniature circuit breaker	-	4A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/29
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/29,47
D	+A.05	-MCB01	Miniature circuit breaker	-	2A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30,46
E	+A.05	-MCB02	Miniature circuit breaker	-	2A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30,46
F	+A.05	-MCB03	Miniature circuit breaker	-	4A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30,46
G	+A.05	-MCB08	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30,46
H	+A.07	-2MCB01	Miniature circuit breaker	-	APTRANSCO/Vs/Vijayawada.	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/28
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/28,45
I	+A.07	-2MCB02	Miniature circuit breaker	-	10A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/29
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/29,45

**Chief Engineer/Projects**  
**APTRANSCO/Vs/Vijayawada.**

Based on				Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION		Doc. kind. Parts list	Ref.Des. =2KR	
				Approved 27.02.2024	GOURISH HEGDE	Parts list =2KR+BS		DCC EPB		+BS
				Project APTRANSCO		Hitachi Energy India Limited		Resp. dept. PG-GAS	Rev. ind. 0	Language en
				STANDARD DRAWING		<b>HITACHI</b>		Doc. no. 1MNS500925-FAC		Sheet 1003
Rev.	Revision note	Date	Name							n. sheet 1004
1MYN691003-102(A3)REV01										

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Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
29	+A.07	-2MCB03	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/29
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/29,47
30	+A.07	-2MCB04	Miniature circuit breaker	-	4A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/29
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/29,47
31	+A.07	-MCB04	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30,46
32	+A.07	-MCB05	Miniature circuit breaker	-	10A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30,46
33	+A.07	-MCB06	Miniature circuit breaker	-	10A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30,46
34	+A.07	-MCB07	Miniature circuit breaker	-		220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CFAC/30,46
35	+A.09	-X06	Feed-through terminal	CAT M4	800V, 45A	2.5-6mm <sup>2</sup> , grey	IN2662-3001-3	Elmex		17	1MNS500925-CFAC/67,68,78
36	+A.09	-XX1.2	Feed-through terminal	CAT M4	800V, 45A	2.5-6mm <sup>2</sup> , grey	IN2662-3001-3	Elmex		14	1MNS500925-CFAC/38,39,40,41,42,43,44,45,46,47,48,58,78
37	+A.10	-52X04	Feed-through terminal	CAT M4	800V, 45A	2.5-6mm <sup>2</sup> , grey	IN2662-3001-3	Elmex		66	1MNS500925-CFAC/38,39,59,60,61,63,65,71,78
38	+A.11	-89X03	Disconnect terminal	CATD M4	800V, 41A	2.5-6mm <sup>2</sup>	1MYN266003-002	Elmex		7	1MNS500925-CFAC/66,78
39	+A.11	-ACX03	Disconnect terminal	CATD M4	800V, 41A	2.5-6mm <sup>2</sup>	1MYN266003-002	Elmex		5	1MNS500925-CFAC/26,27,78
40	+A.11	-BBX04	Feed-through terminal	CAT M4	800V, 45A	2.5-6mm <sup>2</sup> , grey	IN2662-3001-3	Elmex		22	1MNS500925-CFAB/58.1 1MNS500925-CFAC/57,78
41	+A.11	-DCX03	Disconnect terminal	CATD M4	800V, 41A	2.5-6mm <sup>2</sup>	1MYN266003-002	Elmex		15	1MNS500925-CFAC/28,29,78
42	+A.11	-X07	Feed-through terminal	CAT M4	800V, 45A	2.5-6mm <sup>2</sup> , grey	IN2662-3001-3	Elmex		14	1MNS500925-CFAC/73,74,78

Chief Engineer/Projects  
APTRANSCO/Vs/Vijayawada.

Based on				Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION		Doc. kind. Parts list		Ref.Des. =2KR	
				Approved 27.02.2024	GOURISH HEGDE	Parts list =2KR+BS		DCC EPB		+BS	
				Project APTRANSCO		Hitachi Energy India Limited		Resp. dept. PG-GAS		Rev. ind. 0	
				STANDARD DRAWING		<b>HITACHI</b>		Language en		Sheet 1004	
Rev.	Revision note	Date	Name					Doc. no. 1MNS500925-FAC		n. sheet 1005	
1MYN691003-102(A3)REV01											

8814702/2024/EEMRT-ENE51		1	2	3	4	5	6	7	8	1175			
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet		
A	43	+B.01	-DS	Door limit switch	DLS	230V AC, 5A	Single pole, 1NO, Cover for Insulation	IIN5374-3001-1	Kaycee	1	1MNS500925-CFAC/26	A	
	44	+B.01	-LED	LED Lamp	LED	240VAC, 9.08W		SPECTRUM TECHVISION (P) LTD		1	1MNS500925-CFAC/26		
	45	+B.03	-ANN.	MICRO PROCESSOR BASED ANN.	SAN 200 - 24 Window	Aux supply U:75-275VAC/DC	without multi tone, Size:34x74mm, 6N case	1MYN900017-723	Seco	1	1MNS500925-CFAC/72,73,74		
B	46	+B.05	-MFM-1	MULTI FUNCTION METER_MFM-1	Rish Master 3430	3Ph, 3Ele, 4W; 4-20mA Output-2nos	CTR: TO BE DEFINED; ADOPTED CTR:TO BE DEFINED, PTR: 220kV/110V;CL:0.2 RS485 PORT	1MNS500925-MAAA	Rishab	1	1MNS500925-CFAC/67,69	B	
	47	+B.05	-MFM-2	MULTI FUNCTION METER_MFM-2	Rish Master 3430	3Ph, 3Ele, 4W; 4-20mA Output-2nos	CTR: TO BE DEFINED; ADOPTED CTR:TO BE DEFINED, PTR: 220kV/110V;CL:0.2 RS485 PORT	1MNS500925-MAAA	Rishab	1	1MNS500925-CFAC/68,69	C	
	48	+B.09	-1SL01	Indicator light	-	230V AC, 7mA	WHITE	-	ABB/L&T/Teknic/Schneider/SECO	1	1MNS500925-CFAC/27		
	49	+B.09	-86 -PB	Push button	-	1NO, 1NC	Green, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	1	1MNS500925-CFAC/58		
	50	+B.09	-PB-AA	Push button	-	1NO, 1NC	Red, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	1	1MNS500925-CFAC/72		
D	51	+B.09	-PB-AR	Push button	-	1NO, 1NC	Black, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	1	1MNS500925-CFAC/72	D	
	52	+B.09	-PB-AT	Push button	-	1NO, 1NC	Yellow, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	1	1MNS500925-CFAC/72		
	53	+B.09	-PB-DC1-FT	Push button	-	1NO, 1NC	Yellow, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	1	1MNS500925-CFAC/28		
	54	+B.09	-PB-DC2-FT	Push button	-	1NO, 1NC	Yellow, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	1	1MNS500925-CFAC/28	E	
	55	+B.09	-PB-DCFA	Push button	-	1NO, 1NC	Red, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	1	1MNS500925-CFAC/27		
	56	+B.15	-1SL02	Indicator light	-	60VDC/60VAC, 7mA	RED	-	ABB/L&T/Teknic/Schneider/SECO	1	1MNS500925-CFAC/36		
<b>Chief Engineer/Projects APTRANSCO/VS/Vijayawada.</b>													
Based on				Prepared 27.02.2024		MANASA ESHWAR		Title 220kV BUS SECTION		Doc. kind. Parts list		Ref.Des. =2KR	
				Approved 27.02.2024		GOURISH HEGDE		Parts list =2KR+BS		DCC EPB		+BS	
				Project APTRANSCO		STANDARD DRAWING		Hitachi Energy India Limited		Resp. dept. PG-GAS		Rev. ind. 0	
								<b>HITACHI</b>		Doc. no. 1MNS500925-FAC		Language en	
Rev. Revision note				Date		Name						Sheet 1005	
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8814702/2024/EEMRT-ENE51	1	2	3	4	5	6	7	8	1176						
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet				
A	57	+B.15	-1SL03	Indicator light	-	60VDC/60VAC, 7mA	YELLOW	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/36	A		
	58	+B.15	-1SL04	Indicator light	-	60VDC/60VAC, 7mA	GREEN	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/36			
	59	+B.15	-2SL01	Indicator light	-	60VDC/60VAC, 7mA	RED	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/37			
B	60	+B.15	-2SL02	Indicator light	-	60VDC/60VAC, 7mA	YELLOW	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/37	B		
	61	+B.15	-2SL03	Indicator light	-	60VDC/60VAC, 7mA	GREEN	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/37			
	62	+B.15	-CS-52	CB Control Switch	22-4-pos. contacts with 0 position, Pos1:T, Pos2:A/T, Pos3:A/C, Pos4:C	32A, 660V	Spring return & lost motion device with Pistol grip handle 45 degree Switching	1MNS500925-NAAA	Switron	1MNS500925-NAAA	1	1MNS500925-CFAC/40,49,59,60,61,71,76			
C	63	+B.15	-CS-89BS2	Rotary Switch	6-3-pos. contacts with 0 position	32A, 660V	Spring return with Pistol grip handle 45 degree Switching	1MYN910008-AAAA	Switron	1MYN910008-AAAA	1	1MNS500925-CFAC/64,76	C		
	64	+B.15	-CS-89BS4	Rotary Switch	6-3-pos. contacts with 0 position	32A, 660V	Spring return with Pistol grip handle 45 degree Switching	1MYN910008-AAAA	Switron	1MYN910008-AAAA	1	1MNS500925-CFAC/64,76			
	65	+B.15	-SL01	Indicator light	-	220VDC, 7mA	GREEN	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/70			
D	66	+B.15	-SL02	Indicator light	-	220VDC, 7mA	RED	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/70	D		
	67	+B.15	-SL03	Indicator light	-	220VDC, 7mA	GREEN	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/70			
	68	+B.15	-SL04	Indicator light	-	220VDC, 7mA	RED	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/70			
	69	+B.15	-SL05	Indicator light	-	220VDC, 7mA	GREEN	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/70			
E	70	+B.15	-SL06	Indicator light	-	220VDC, 7mA	RED	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/70	E		
	71	+B.15	-SL11	Indicator light	-	220VDC, 7mA	WHITE	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/70			
	72	+B.15	-SL12	Indicator light	-	220VDC, 7mA	WHITE	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/70			
Based on				Prepared	27.02.2024	MANASA ESHWAR	Title	220kV BUS SECTION		Doc. kind.	Parts list		Ref.Des.	=2KR	
				Approved	27.02.2024	GOURISH HEGDE	Parts list		DCC EPB				+BS		
				Project	APTRANSCO		=2KR+BS		Resp. dept.	PG-GAS		Rev. ind.	0	Language	en
				STANDARD DRAWING		HITACHI		Hitachi Energy India Limited		Doc. no.		1MNS500925-FAC		Sheet	1006
Rev.	Revision note		Date	Name								n. sheet	1007		
1MYN691003-102(A3)REV01															
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Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet														
73	+B.15	-SL13	Indicator light	-	220VDC, 7mA	BLUE	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/71														
74	+B.15	-SL14	Indicator light	-	220VDC, 7mA	AMBER	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/71														
75	+B.15	-SL15	Indicator light	-	220VDC, 7mA	WHITE	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/71														
76	+B.15	-SL16	Indicator light	-	220VDC	AMBER	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CFAC/71														
77	+B.17	-LRS	Cam Switch	12-2-pos. contacts	32A, 660V	Stay put with Pistol grip handle, lockable and key removable in both pos. with 90D Switching angle	1MYN910009-AAAG	Switron	1MYN910009-AAAG	1	1MNS500925-CFAC/44,59,60,61,64,76														
78	+B.17	-SS1	Rotary Switch	16-2-pos. contacts	32A, 660V	Wing knob type stayput with 90 Degree switching angle	1MNS500925-NAAB	Switron	1MNS500925-NAAB	1	1MNS500925-CFAC/62,76														
79	+B.17	-SSS	Rotary Switch	8 2-pos. contacts	32A, 660V	Stayput, Lever Handle, Key removable in both positions, 90D Switching angle	1MYN533019-001	Switron		1	1MNS500925-CFAC/61,76														
80	+B.25	-KF1	Numerical bay control IED	REC670	90-250VDC 220-250VDC	50/60Hz 16 inputs	1MNS500925-XCAE	ABB	1MNS500925-XCAE	1	1MNS500925-CFAC/35														
			Power supply module	PSM							24 output relays	ABB	1	1MNS500925-CFAC/35,51,74											
			Binary input module	BIM										Version 2.2	ABB	7	1MNS500925-CFAC/38,39,40,41,42,43,44,45,46,47,48,52,53,54,55,56								
			Binary output module	BOM													6I+6U	ABB	2	1MNS500925-CFAC/49,50,52,53,58,61,64,66,73,74					
			Ethernet module	SFP																Normal size, Rex670 V2.2	ABB	1	1MNS500925-CFAC/51		
			Transformer input module	TRM																			1A, 0-340V, 50/60Hz	ABB	1
Rack casing	1/1x19" rack casing	14xI/O, 1xTRM	ABB	1	1MNS500925-CFAC/35																				
15 LED indication module	LED						ABB	3																	
81	+B.25									-TS-1_BCPU	Test block	MPG	10NC		1MNS500925-NXAA	GE									
82	+B.25									-TS-2_BCPU	Test block	MPG	10NC		1MNS500925-NXAA	GE	1MNS500925-NXAA	1	1MNS500925-CFAC/35,37,50,58						

Based on				Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION		Doc. kind. Parts list		Ref.Des. =2KR	
				Approved 27.02.2024	GOURISH HEGDE	Parts list =2KR+BS		DCC EPB		+BS	
				Project APTRANSCO		Hitachi Energy India Limited		Resp. dept. PG-GAS		Rev. ind. 0	
				STANDARD DRAWING		<b>HITACHI</b>		Language en		Sheet 1007	
Rev.	Revision note	Date	Name					Doc. no. 1MNS500925-FAC		n. sheet 1008	
1MYN691003-102(A3)REV01											

8814702/2024/EEMRT-ENE51												1178																																																																																					
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet																																																																																						
A	+B.33	-R01	Terminal base	RX4	4U12C	Rack mounting	5619499-A	ABB	5619499-A	5	1MNS500925-CFAC/ 42,59,65,73,76																																																																																						
		-R01.101.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1																																																																																							
		-R01.101.301	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1																																																																																							
		-R01.107.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1																																																																																							
		-R01.107.301	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1																																																																																							
		-R01.113.101	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1																																																																																							
		-R01.113.301	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1																																																																																							
		-R01.119.101	Auxiliary relay	RXSF1	220-250VDC	6NO	RK271-018-AS	ABB	RK271-018-AS	1																																																																																							
		-R01.119.301	Auxiliary relay	RXSF1	220-250VDC	6NO	RK271-018-AS	ABB	RK271-018-AS	1																																																																																							
		-R01.125.101	Auxiliary relay	RXSF1	220-250VDC	6NO	RK271-018-AS	ABB	RK271-018-AS	1																																																																																							
		-R01.125.301	Auxiliary relay	RXSF1	220-250VDC	6NO	RK271-018-AS	ABB	RK 271018-AS	1																																																																																							
		-R01.131.101	Auxiliary relay	RXSF1	220-250VDC	6NO	RK271-018-AS	ABB	RK 271018-AS	1																																																																																							
		-R01.131.301	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214-003-AS	ABB	RK214-003-AS	1																																																																																							
		-R01.137.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214-003-AS	ABB	RK214-003-AS	1																																																																																							
		-R01.143.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214-003-AS	ABB	RK214-003-AS	1																																																																																							
		-R01.149.101	Auxiliary relay	RXMA1	230VAC, 50-60Hz	2NO, 2NC	RK 211052-BS	ABB	RK 211052-BS	1																																																																																							
		-R01.149.301	Auxiliary relay	RXMA1	230VAC, 50-60Hz	2NO, 2NC	RK 211052-BS	ABB	RK 211052-BS	1																																																																																							
		-R01.155.101	DC-1 Supervision Relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1																																																																																							
-R01.155.301	DC-2 Supervision Relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1																																																																																									
D	+B.33	-R02	Terminal base	RX4	4U12C	Rack mounting	5619499-A	ABB	5619499-A	3	1MNS500925-CFAC/ 43,57,58,59,60,61,73																																																																																						
		-R02.101.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1																																																																																							
		-R02.113.301	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1																																																																																							
		-R02.119.101	Bistable relay	RXMVB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1																																																																																							
		-R02.131.301	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1																																																																																							
		-R02.149.101	Auxiliary relay	RXMH2	220VDC	4NO, 4NC, without flag	RK 223069-AS	ABB	RK 223069-AS	1																																																																																							
-R02.149.301	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214-003-AS	ABB	RK214-003-AS	1																																																																																									
-R02.155.301	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214-003-AS	ABB	RK214-003-AS	1																																																																																									
85	+B.33	-SS	Synchronizing socket	SS Type	500VAC/DC	Panel mounting socket	IN 5381 3001-1	BCH Electric limited		1	1MNS500925-CFAC/62																																																																																						
86	+B.33	-TTB-1	Test Terminal Block for MFM-1	TTB	1100V, 50A	Compact, Flush mounting	1MYN266015-003	Deepl		1	1MNS500925-CFAC/67																																																																																						
<table border="1"> <tr> <td colspan="4">Based on</td> <td>Prepared</td> <td>27.02.2024</td> <td>MANASA ESHWAR</td> <td colspan="2">Title</td> <td>220kV BUS SECTION</td> <td>Doc. kind.</td> <td>Parts list</td> <td>Ref.Des.</td> <td>=2KR</td> </tr> <tr> <td colspan="4"></td> <td>Approved</td> <td>27.02.2024</td> <td>GOURISH HEGDE</td> <td colspan="2">Parts list</td> <td>=2KR+BS</td> <td colspan="2">DCC EPB</td> <td colspan="2">+BS</td> </tr> <tr> <td colspan="4"></td> <td>Project</td> <td colspan="2">APTRANSCO</td> <td colspan="2">Hitachi Energy India Limited</td> <td>Resp. dept.</td> <td>PG-GAS</td> <td>Rev. ind.</td> <td>0</td> <td>Language</td> <td>en</td> </tr> <tr> <td colspan="4"></td> <td colspan="4">STANDARD DRAWING</td> <td colspan="2"><b>HITACHI</b></td> <td colspan="2">Doc. no.</td> <td colspan="2">1MNS500925-FAC</td> <td>Sheet</td> <td>1008</td> </tr> <tr> <td>Rev.</td> <td colspan="3">Revision note</td> <td>Date</td> <td colspan="2">Name</td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td>n. sheet</td> <td>1009</td> </tr> <tr> <td colspan="12">1MYN691003-102(A3)REV01</td> </tr> </table>												Based on				Prepared	27.02.2024	MANASA ESHWAR	Title		220kV BUS SECTION	Doc. kind.	Parts list	Ref.Des.	=2KR					Approved	27.02.2024	GOURISH HEGDE	Parts list		=2KR+BS	DCC EPB		+BS						Project	APTRANSCO		Hitachi Energy India Limited		Resp. dept.	PG-GAS	Rev. ind.	0	Language	en					STANDARD DRAWING				<b>HITACHI</b>		Doc. no.		1MNS500925-FAC		Sheet	1008	Rev.	Revision note			Date	Name								n. sheet	1009	1MYN691003-102(A3)REV01											
Based on				Prepared	27.02.2024	MANASA ESHWAR	Title		220kV BUS SECTION	Doc. kind.	Parts list	Ref.Des.	=2KR																																																																																				
				Approved	27.02.2024	GOURISH HEGDE	Parts list		=2KR+BS	DCC EPB		+BS																																																																																					
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Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
87	+B.33	-TTB-2	Test Terminal Block for MFM-2	TTB	1100V, 50A	Compact, Flush mounting	1MYN266015-003	Deepl		1	1MNS500925-CFAC/68
88	+B.41	-SH	Heating	SPHT	230V AC, 50W		IN6677-3001-2	KWK RESISTORS / TGS		1	1MNS500925-CFAC/26
89	+C.03	-FS10	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/36
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
90	+C.03	-FS11	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/36
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
91	+C.03	-FS12	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/36
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
92	+C.03	-FS21	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/62
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
93	+C.03	-FS30	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/67
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
94	+C.03	-FS31	Fuse	-	2A	<b>Chief Engineer/Projects APTRANSCO/Vs/Vijayawada.</b>	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/67
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
95	+C.03	-FS32	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/67
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	

Based on				Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Parts list	Ref.Des. =2KR	
				Approved 27.02.2024	GOURISH HEGDE	Parts list =2KR+BS	DCC EPB	+BS	
				Project APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited	Resp. dept. PG-GAS	Rev. ind. 0	Language en
Rev.	Revision note	Date	Name				Doc. no. 1MNS500925-FAC	Sheet 1009	n. sheet 1010

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Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
96	+C.03	-LK12	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
			Neutral link	NL	15A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/36	
97	+C.03	-LK21	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
			Neutral link	15A	15A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/62	
98	+C.03	-LK32	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
			Neutral link	NL	15A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/67	
99	+C.05	-FS13	Fuse	-	2A	<b>Chief Engineer/Projects APTRANSCO/VS/Vijayawada.</b>	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/37
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
100	+C.05	-FS14	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/37
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
101	+C.05	-FS15	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/37
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
102	+C.05	-FS22	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/62
			Control Fuse Base	-	32A	Suitable for conventional 220KV SS only	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	

Based on				Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION	Doc. kind. Parts list	Ref.Des. =2KR	
				Approved 27.02.2024	GOURISH HEGDE	Parts list =2KR+BS	DCC EPB	+BS	
				Project APTRANSCO		Hitachi Energy India Limited	Resp. dept. PG-GAS	Rev. ind. 0	Language en
				STANDARD DRAWING			Doc. no. 1MNS500925-FAC	Sheet 1010	
Rev.	Revision note	Date	Name					n. sheet 1011	

Pos.		Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet				
A	103	+C.05	-FS33	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/68				
				Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1					
B	104	+C.05	-FS34	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/68				
				Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1					
C	105	+C.05	-FS35	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/68				
				Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1					
C	106	+C.05	-FS39	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/37				
				Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1					
D	107	+C.05	-FS40	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/37				
				Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1					
E	108	+C.05	-FS41	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/37				
				Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1					
E	109	+C.05	-LK15	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1					
				Neutral link	NL	15A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CFAC/37				
<b>Chief Engineer/Projects APTRANSCO/VIS/Vijayawada.</b>																
Based on					Prepared	27.02.2024	MANASA ESHWAR	Title			220kV BUS SECTION	Doc. kind.	Parts list	Ref.Des.	=2KR	
					Approved	27.02.2024	GOURISH HEGDE	Parts list			=2KR+BS	DCC EPB		+BS		
					Project			APTRANSCO			Resp. dept.	PG-GAS	Rev. ind.	0	Language	en
					STANDARD DRAWING			HITACHI			Hitachi Energy India Limited			Doc. no.		1MNS500925-FAC
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Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
110	+C.05	-LK22	Control Fuse Base	-	32A			ABB/EATON(cooper Bussmann) /Schneider/L&T		1	1MNS500925-CFAC/62
			Neutral link	15A	15A					1	
111	+C.05	-LK35	Control Fuse Base	-	32A			ABB/EATON(cooper Bussmann) /Schneider/L&T		1	1MNS500925-CFAC/68
			Neutral link	NL	15A					1	
112	+C.05	-LK41	Control Fuse Base	-	32A			ABB/EATON(cooper Bussmann) /Schneider/L&T		1	1MNS500925-CFAC/37
			Neutral link	NL	15A					1	
113	+C.07	-52_CLS_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CFAC/63,70
			Diode module	DP-12-220 DC	6-230VDC	-	1MNS500579-CRMC	Phoenix contact	2907517	1	
			Relay Socket	ECOR-2-BSC3/4X21 (Screw connection & DIN rail mounting)	-	1MNS500579-CRMB	Phoenix contact	2907521	1		
			Retaining bracket	ECOR-RH-2L	-	1MNS500579-CRMD	Phoenix contact	1051972	1		
114	+C.07	-52_CLS_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CFAC/63
			Diode module	DP-12-220 DC	6-230VDC	-	1MNS500579-CRMC	Phoenix contact	2907517	1	
			Relay Socket	ECOR-2-BSC3/4X21 (Screw connection & DIN rail mounting)	-	1MNS500579-CRMB	Phoenix contact	2907521	1		
			Retaining bracket	ECOR-RH-2L	-	1MNS500579-CRMD	Phoenix contact	1051972	1		
115	+C.07	-52_OPN_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CFAC/63,70,71
			Diode module	DP-12-220 DC	6-230VDC	-	1MNS500579-CRMC	Phoenix contact	2907517	1	
			Relay Socket	ECOR-2-BSC3/4X21 (Screw connection & DIN rail mounting)	-	1MNS500579-CRMB	Phoenix contact	2907521	1		

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Based on				Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION		Doc. kind. Parts list	Ref.Des. =2KR	
				Approved 27.02.2024	GOURISH HEGDE	Parts list =2KR+BS		DCC EPB		+BS
				Project APTRANSCO		Hitachi Energy India Limited		Resp. dept. PG-GAS	Rev. ind. 0	Language en
				STANDARD DRAWING		<b>HITACHI</b>		Doc. no. 1MNS500925-FAC		Sheet 1012
Rev.	Revision note	Date	Name							n. sheet 1013

8814702/2024/EEMRT-ENE51		1	2	3	4	5	6	7	8	1183				
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet			
A	+C.07	-52_OPN_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CFAC/63			
			Diode module	DP-12-220 DC	6-230VDC	-	1MNS500579-CRMC	Phoenix contact	2907517	1				
			Relay Socket	ECOR-2-BSC3/4X21 (Screw connection & DIN rail mounting)	-	1MNS500579-CRMB	Phoenix contact	2907521	1					
			Retaining bracket	ECOR-RH-2L	-	-	1MNS500579-CRMD	Phoenix contact	1051972	1				
B	+C.07	-89BS2_CLS_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CFAC/40,63,70			
			Diode module	DP-12-220 DC	6-230VDC	-	1MNS500579-CRMC	Phoenix contact	2907517	1				
			Relay Socket	ECOR-2-BSC3/4X21 (Screw connection & DIN rail mounting)	-	1MNS500579-CRMB	Phoenix contact	2907521	1					
			Retaining bracket	ECOR-RH-2L	-	-	1MNS500579-CRMD	Phoenix contact	1051972	1				
C	+C.07	-89BS2_CLS_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CFAC/63			
			Diode module	DP-12-220 DC	6-230VDC	-	1MNS500579-CRMC	Phoenix contact	2907517	1				
			Relay Socket	ECOR-2-BSC3/4X21 (Screw connection & DIN rail mounting)	-	1MNS500579-CRMB	Phoenix contact	2907521	1					
			Retaining bracket	ECOR-RH-2L	-	-	1MNS500579-CRMD	Phoenix contact	1051972	1				
D	+C.07	-89BS2_OPN_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CFAC/40,63,70			
			Diode module	DP-12-220 DC	6-230VDC	-	1MNS500579-CRMC	Phoenix contact	2907517	1				
			Relay Socket	ECOR-2-BSC3/4X21 (Screw connection & DIN rail mounting)	-	1MNS500579-CRMB	Phoenix contact	2907521	1					
			Retaining bracket	ECOR-RH-2L	-	-	1MNS500579-CRMD	Phoenix contact	1051972	1				
E	+C.07	-89BS2_OPN_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CFAC/63			
			Diode module	DP-12-220 DC	6-230VDC	-	1MNS500579-CRMC	Phoenix contact	2907517	1				
			Relay Socket	ECOR-2-BSC3/4X21 (Screw connection & DIN rail mounting)	-	1MNS500579-CRMB	Phoenix contact	2907521	1					
			Retaining bracket	ECOR-RH-2L	-	-	1MNS500579-CRMD	Phoenix contact	1051972	1				
<b>Chief Engineer/Projects APTRANSCO/VS/Vijayawada.</b>														
Based on				Prepared	27.02.2024	MANASA ESHWAR	Title		220kV BUS SECTION	Doc. kind.	Parts list	Ref.Des.	=2KR	
				Approved	27.02.2024	GOURISH HEGDE	Parts list		=2KR+BS	DCC EPB		+BS		
				Project	APTRANSCO		Hitachi Energy India Limited		Resp. dept.	PG-GAS	Rev. ind.	0	Language	en
				STANDARD DRAWING		<b>HITACHI</b>		Doc. no.		1MNS500925-FAC		Sheet	1013	
Rev.	Revision note		Date	Name								n. sheet	1014	
1MYN691003-102(A3)REV01														
1	2	3	4	5	6	7	8							

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8814702/2024/EEMRT-ENE51	1	2	3	4	5	6	7	8	1184						
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet				
A	121	+C.07	-89BS4_CLS_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CFAC/41,63,70				
				Diode module	DP-12-220 DC	6-230VDC	-	Phoenix contact	2907517	1					
				Relay Socket	ECOR-2-BSC3/4X21 (Screw connection & DIN rail mounting)	-	Phoenix contact	2907521	1						
			Retaining bracket	ECOR-RH-2L	-	1MNS500579-CRMD	Phoenix contact	1051972		1					
B	122	+C.07	-89BS4_CLS_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CFAC/63				
				Diode module	DP-12-220 DC	6-230VDC	-	Phoenix contact	2907517	1					
				Relay Socket	ECOR-2-BSC3/4X21 (Screw connection & DIN rail mounting)	-	Phoenix contact	2907521	1						
			Retaining bracket	ECOR-RH-2L	-	1MNS500579-CRMD	Phoenix contact	1051972		1					
C	123	+C.07	-89BS4_OPN_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CFAC/40,63,70				
				Diode module	DP-12-220 DC	6-230VDC	-	Phoenix contact	2907517	1					
				Relay Socket	ECOR-2-BSC3/4X21 (Screw connection & DIN rail mounting)	-	Phoenix contact	2907521	1						
			Retaining bracket	ECOR-RH-2L	-	1MNS500579-CRMD	Phoenix contact	1051972		1					
D	124	+C.07	-89BS4_OPN_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CFAC/63				
				Diode module	DP-12-220 DC	6-230VDC	-	Phoenix contact	2907517	1					
				Relay Socket	ECOR-2-BSC3/4X21 (Screw connection & DIN rail mounting)	-	Phoenix contact	2907521	1						
			Retaining bracket	ECOR-RH-2L	-	1MNS500579-CRMD	Phoenix contact	1051972		1					
E	125	+C.09	-X04	Feed-through terminal	CAT M4	800V, 45A	2.5-6mm <sup>2</sup> , grey	Elmex		65	1MNS500925-CFAC/41,42,44,45,47,48,50,58,62,63,78				
	126	+C.09	-XX1.1	Feed-through terminal	CAT M4	800V, 45A	2.5-6mm <sup>2</sup> , grey	Elmex		3	1MNS500925-CFAC/49,78				
	127	+C.10	-89X04	Feed-through terminal	CAT M4	800V, 45A	2.5-6mm <sup>2</sup> , grey	Elmex		44	1MNS500925-CFAC/40,41,43,63,66,78				
	128	+C.11	-X01	Disconnect terminal	CATD M4	800V, 41A	2.5-6mm <sup>2</sup>	Elmex	<b>Chief Engineer/Projects APTRANSCO/Vs/Vijayawada.</b>	33	1MNS500925-CFAC/37,67,68,78				
	129	+C.11	-X02	Disconnect terminal	CATD M4	800V, 41A	2.5-6mm <sup>2</sup>	Elmex		20	1MNS500925-CFAC/31,32,33,34,78				
Based on				Prepared	27.02.2024	MANASA ESHWAR		Title	220kV BUS SECTION		Doc. kind.	Parts list		Ref.Des.	=2KR
				Approved	27.02.2024	GOURISH HEGDE		Parts list			DCC EPB				+BS
				Project	APTRANSCO		=2KR+BS		Resp. dept.		PG-GAS	Rev. ind.	0	Language	en
				STANDARD DRAWING		HITACHI		Hitachi Energy India Limited		Doc. no.		1MNS500925-FAC		Sheet	1014
Rev.	Revision note		Date	Name								n. sheet	1015		
1MYN691003-102(A3)REV01															
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Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
A 130	+C.11	-X12	Disconnect terminal	CATD M4	800V, 41A	2.5-6mm <sup>2</sup>	1MYN266003-002	Elmex		20	1MNS500925-CFAC/ 31,32,33,34,78

Drawing approval subject to valid vendor registration

Suitable for conventional 220KV SS only

**Chief Engineer/Projects  
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Based on				Prepared 27.02.2024	MANASA ESHWAR	Title 220kV BUS SECTION Parts list =2KR+BS	Doc. kind. Parts list	Ref.Des. =2KR +BS	
				Approved 27.02.2024	GOURISH HEGDE		DCC EPB		
				Project APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited	Resp. dept. PG-GAS	Rev. ind. 0	Language en
Rev.	Revision note	Date	Name					Doc. no. 1MNS500925-FAC	Sheet 1015
1MYN691003-102(A3)REV01									

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