

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 LINE CONTROL AND RELAY PANEL (DIFFERENTIAL PROTECTION)

DRAWING REF. :
 General Arrangement : 1MNS500925-AABA
 Bill of Material : 1MNS500925-ABA,ABB
 Schematic Drawings : 1MNS500925-CABA

STANDARD BAY REF. : =2KLA, 2RLB

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

STATION AUX. SUPPLY:- 220V DC

Based on		Prepared	05.01.2024	VINOD G	Title 220kV LINE FEEDER Control & Relay Panel Title page	Doc. kind.	Circuit diagram	Ref.Des.	=2KLA, 2RLB
		Approved	09.01.2024	GOURISH HEGDE		DCC EFS			
		Project	APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited	Resp. dept.	PG-GAS	Rev. ind.	Language en
Rev.	Revision note	Date	Name	HITACHI		Doc. no.	1MNS500925-AABA		Sheet 1 No.sheets 148
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Based on				Prepared 05.01.2024 VINOD G				Title 220KV LINE FEEDER				Doc. kind. List of contents		Ref.Des. =2KLA, 2RLB			
				Approved 09.01.2024 GOURISH HEGDE				List of contents				DCC EAB					
				Project APTRANSCO				List of contents				Resp. dept. PG-GAS		Rev. ind.			
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Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. List of contents		Ref.Des. =2KLA, 2RLB	
				Approved 09.01.2024		GOURISH HEGDE		List of contents		DCC EAB			
				Project APTRANSCO		STANDARD DRAWING		List of contents		Resp. dept. PG-GAS		Rev. ind.	
								HITACHI <small>Hitachi Energy India Limited</small>		1MNS500925-AABA		Language en	
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1002	1003	Parts list	=2KR+LA		
1003	1004	Parts list	=2KR+LA		
1004	1005	Parts list	=2KR+LA		
1005	1006	Parts list	=2KR+LA		
1006	1007	Parts list	=2KR+LA		
1007	1008	Parts list	=2KR+LA		
1008	1009	Parts list	=2KR+LA		
1009	1010	Parts list	=2KR+LA		
1010	1011	Parts list	=2KR+LA		
1011	1012	Parts list	=2KR+LA		
1012	1013	Parts list	=2KR+LA		
1013	1014	Parts list	=2KR+LA		
1014	1015	Parts list	=2KR+LA		
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1016	1017	Parts list	=2KR+LA		
1017	1018	Parts list	=2KR+LA		
1018	1019	Parts list	=2KR+LA		
1019	1020	Parts list	=2KR+LA		
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1022	1023	Parts list	=2KR+LB		
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1024	1025	Parts list	=2KR+LB		

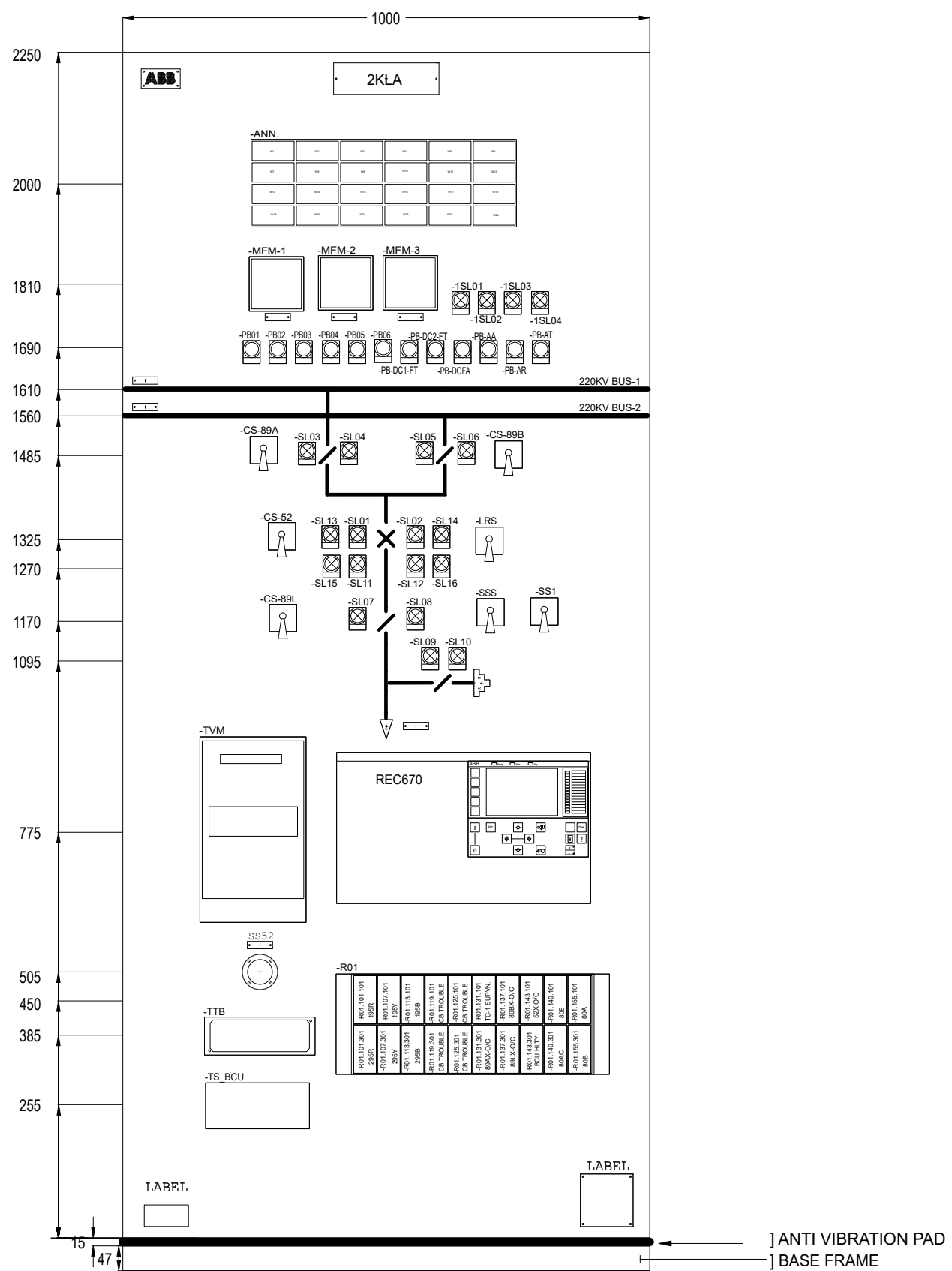
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APTRANSCO/VS/Vijayawada.**

Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER		Doc. kind.	List of contents		Ref.Des.	=2KLA, 2RLB	
		Approved	09.01.2024	GOURISH HEGDE	List of contents			DCC EAB					
		Project	APTRANSCO STANDARD DRAWING		List of contents			PG-GAS		Rev. ind.	Language		en
					HITACHI		Hitachi Energy India Limited				Sheet		4
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8814600/2024/EEMRT-ENE51



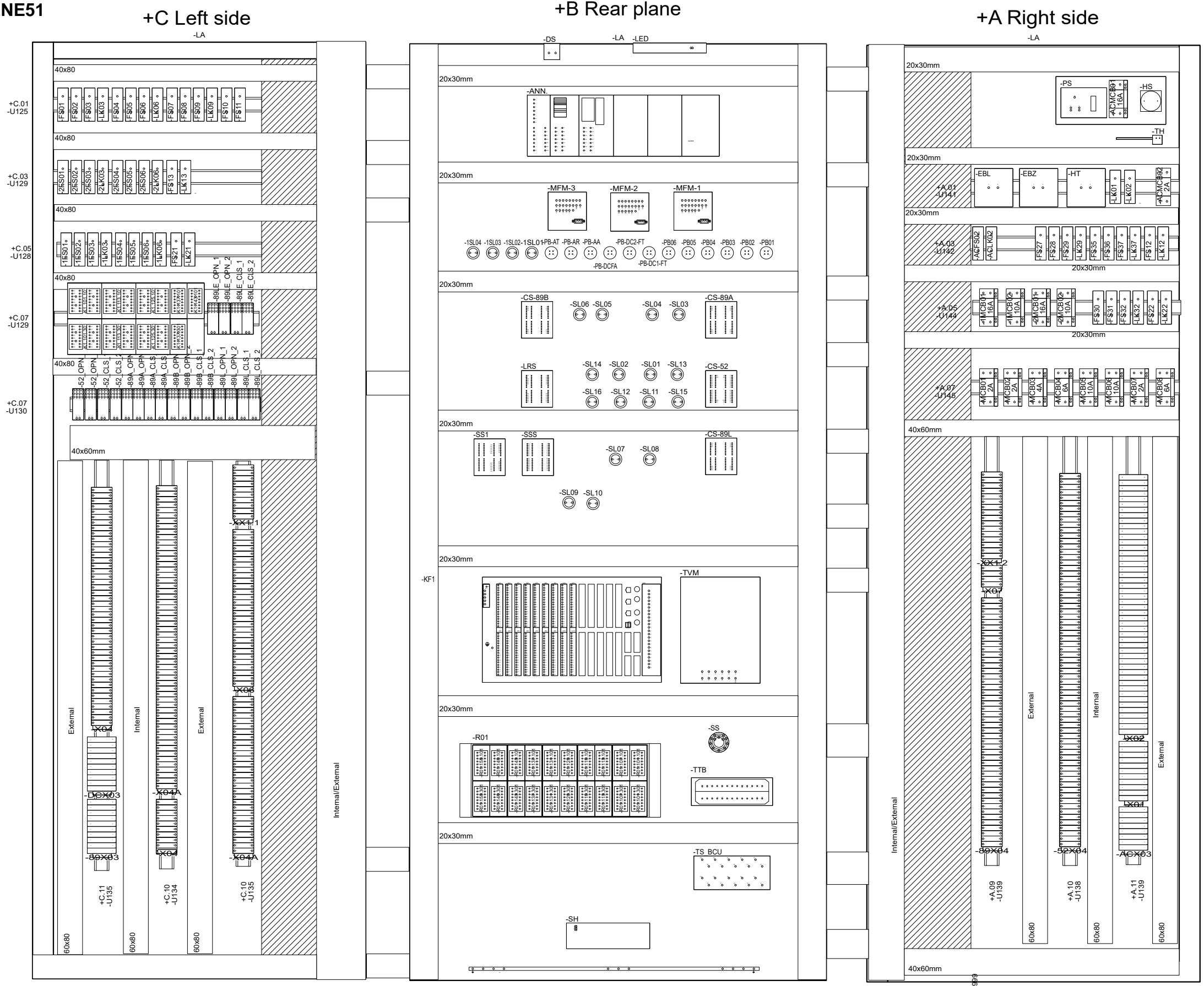
PANEL: 2KRLA	
ITEM DESIGNATION	DESCRIPTION
ANN.	ANNUNCIATOR
MFM-1	MULTI FUNCTION METER-1
MFM-2	MULTI FUNCTION METER-2
MFM-3	MULTI FUNCTION METER-3
PB01	BUS PT SET FOR 21M1
PB02	LINE PT SET FOR 21M1
PB03	LINE PT SET FOR 21M2
PB04	BUS PT SET FOR 21M2
PB05	BUS PT SET FOR METERING
PB06	LINE PT SET FOR METERING
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
1SL01	I/C DC SUPPLY FAIL
1SL02	LINE VT R-PH
1SL03	LINE VT Y-PH
1SL04	LINE VT B-PH
CS-89A	89A ISOL. CONTROL SWITCH
CS-89B	89B ISOL. CONTROL SWITCH
CS-52	CB CONTROL SWITCH
CS-89L	89L ISOL. CONTROL SWITCH
LRS	LOCAL / REMOTE SWITCH
SSS	SYNCHRONIZING SELECTOR SWITCH
SL01	52 CB OPEN
SL02	52 CB CLOSE
SL03	89A ISOL. OPEN
SL04	89A ISOL. CLOSE
SL05	89B ISOL. OPEN
SL06	89B ISOL. CLOSE
SL07	89L ISOL. OPEN
SL08	89L ISOL. CLOSE
SL09	89LE ES. OPEN
SL10	89LE ES. 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
TVM	TRI VECTOR METER
SS	SYNCHRONIZING SOCKET
SS1	SYNCHRONIZING ON/OFF SWITCH
TTB	TEST TERMINAL FOR TVM
TS_BCU	TEST SWITCH FOR BCU

PANEL: 2KRLA	
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	89AX-O & 89AX-C
R01.137.101	89BX-O & 89BX-C
R01.137.301	89LX-O & 89LX-C
R01.143.101	AC SUPPLY SUPVN. RELAY
R01.149.101	DC SUPPLY FAIL ACCEPT RELAY
R01.149.301	BCU HEALTHY
R01.149.301	52X O/C
R01.155.101	DC-1 SUPPLY SUPVN.
R01.155.301	DC-2 SUPPLY SUPVN.

Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Assembly drawing	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC ELU	+LA
		Project APTRANSCO		Front View	PG-GAS	Rev. ind.
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
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Based on	Prepared	05.01.2024	VINOD G
	Approved	09.01.2024	GOURISH HEGDE
	Project	APTRANSCO STANDARD DRAWING	
Rev.	Revision note	Date	Name
1	1MYN691003-102(A3)REV01		

Title	220kV LINE FEEDER Control & Relay Panel Inside view
Doc. kind.	Assembly drawing DCC ELU
Ref.Des.	=2KR +LA
Resp. dept.	PG-GAS
Rev. ind.	en
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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	-
-2MCB01	DC SOURCE-2 MCB	16A	-
-2MCB02	CB TC-2 CKT	10A	-
-ACFS02	FUSE FOR BELL CKT.	2A	-
-ACLK02	LINK FOR BELL CKT.	15A	NL
-ACMCB01	AC SOURCE MCB	16A	-
-ACMCB02	ANN CKT	2A	-
-EBL	DC Fail	--	AUH-1122
-EBZ	NON TRIP ALARM	--	Buzzer
-FS12	B-PH SEL. BUS/LINE PT CORE-3	FOR BCU CKT.	-
-FS22	R-PH LINE CVT	FUSE FOR SYNC. CKT	-
-FS27	R-PH SEL. BUS/LINE PT CORE-3	FOR TVM CKT.	-
-FS28	Y-PH SEL. BUS/LINE PT CORE-3	FOR TVM CKT.	-
-FS29	B-PH SEL. BUS/LINE PT CORE-3	FOR TVM CKT.	-
-FS30	R-PH SEL. BUS/LINE PT CORE-3	FOR MFM CKT.	-
-FS31	Y-PH SEL. BUS/LINE PT CORE-3	FOR MFM CKT.	-
-FS32	B-PH SEL. BUS/LINE PT CORE-3	FOR MFM CKT.	-
-FS35	R-PH LINE CVT CORE-3	FOR IND. CKT.	-
-FS36	Y-PH LINE CVT CORE-3	FOR IND. CKT.	-
-FS37	B-PH LINE CVT CORE-3	FOR IND. CKT.	-
-HS	HEATER SWITCH	--	
-HT	TRIP ALARM	--	Hooter

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

Device name	Description (1)	Description (2)	Type designation
-LK01	LINK FOR BUZZER	--	NL
-LK02	LINK FOR HOOTER	--	NL
-LK12	--	FOR BCU CKT.	NL
-LK22	NU LINE CVT	FUSE FOR SYNC. CKT	15A
-LK29	NU SEL. BUS/LINE PT CORE-3	FOR TVM CKT.	NL
-LK32	NU SEL. BUS/LINE PT CORE-3	FOR MFM CKT.	NL
-LK37	NU LINE CVT CORE-3	FOR IND. CKT.	NL
-MCB01	ANN CKT	2A	-
-MCB02	MET CKT	2A	-
-MCB03	CONT. MULTI. CKT.	4A	-
-MCB04	BCU 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	LINE VT R-PH	--	-
-1SL03	LINE VT Y-PH	--	-
-1SL04	LINE VT B-PH	--	-
-ANN.	Annunciator unit	--	SAN 200 - 24 Window
-CS-52	CB CONTROL SWITCH	--	22-4-pos. contacts with 0 position, Pos1:T, Pos2:A/T,Pos3:A/C,Pos4:C

Based on		Prepared 05.01.2024 VINOD G		Title 220kV LINE FEEDER		Doc. kind. Assembly drawing		Ref.Des. =2KR +LA	
		Approved 09.01.2024 GOURISH HEGDE		Legend list		DCC ELU			
		Project APTRANSCO		Legend list		Resp. dept. PG-GAS		Rev. ind.	
		STANDARD DRAWING		Hitachi Energy India Limited		Language en			
Rev.	Revision note	Date	Name	HITACHI		Doc. no. 1MNS500925-AABA		Sheet 12.1	
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Device name	Description (1)	Description (2)	Type designation
-CS-89A	89A ISOL. CONTROL SWITCH	--	6-3-pos. contacts with 0 position
-CS-89B	89B ISOL. CONTROL SWITCH	--	6-3-pos. contacts with 0 position
-CS-89L	89L ISOL. CONTROL SWITCH	--	6-3-pos. contacts with 0 position
-KF1	BAY CONTROL UNIT	REC670	REC670
-LED	Lamp	--	LED
-LRS	LOCAL / REMOTE SWITCH	--	12-2-pos. contacts
-MFM-1	MULTI FUNCTION METER	--	Rish Master 3430
-MFM-2	MULTI FUNCTION METER	--	Rish Master 3430
-MFM-3	MULTI FUNCTION METER	--	Rish Master 3430
-PB01	BUS PT SET FOR 21M1	--	-
-PB02	LINE PT SET FOR 21M1	--	-
-PB03	LINE PT SET FOR 21M2	--	-
-PB04	BUS PT SET FOR 21M2	--	-
-PB05	BUS PT SET FOR METERING	--	-
-PB06	LINE PT SET FOR METERING	--	-
-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

**Chief Engineer/Projects
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Device name	Description (1)	Description (2)	Type designation
-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 CB SPRING CHARGED	RXSF1	RXSF1
-R01.125.301	CB SPRING CHARGED SPARE	RXSF1	RXSF1
-R01.131.101	CB TC-1 SUPVN. HEALTHY	RXSF1	RXSF1
-R01.131.301	89AX-O	89AX-C	RXMM1
-R01.137.101	89BX-O	89BX-C	RXMM1
-R01.137.301	89LX-O	89LX-C	RXMM1
-R01.143.101	52X CLOSE CMD	52X OPEN CMD	RXMM1
-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
-SH	Heating	--	SPHT
-SL01	52 CB OPEN	--	-
-SL02	52 CB CLOSE	--	-
-SL03	89A ISOL. OPEN	--	-
-SL04	89A ISOL. CLOSE	--	-
-SL05	89B ISOL. OPEN	--	-
-R01.143.301	BCU HEALTHY	BCU HEALTHY	RXSF1

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Assembly drawing	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Legend list	DCC ELU	+LA
		Project APTRANSCO		Legend list	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-AABA	Sheet 12.2
1MYN691003-102(A3)REV01						n. sheet 12.3

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Device name	Description (1)	Description (2)	Type designation
-SL06	89B ISOL. CLOSE	--	-
-SL07	89L ISOL. OPEN	--	-
-SL08	89L ISOL. CLOSE	--	-
-SL09	89LE ES. OPEN	--	-
-SL10	89LE ES. 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	--	-
-SS	Synchronizing socket	--	SS Type
-SSS	Synchronizing selector switch	--	8 2-pos. contacts
-TS_BCU	TS_BCU	--	MPG
-TTB	Test Terminal Block for TVM	--	TTB
-TVM	Tri Vector Meter	--	Premier 300

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

Plane: C

Device name	Description (1)	Description (2)	Type designation
-1FS01	R-PH BUS-1 PT CORE-1	FOR BUS PT SEL. CKT.	-
-1FS02	Y-PH BUS-1 PT CORE-1	FOR BUS PT SEL. CKT.	-
-1FS03	B-PH BUS-1 PT CORE-1	FOR BUS PT SEL. CKT.	-
-1FS04	R-PH BUS-1 PT CORE-2	FOR BUS PT SEL. CKT.	-
-1FS05	Y-PH BUS-1 PT CORE-2	FOR BUS PT SEL. CKT.	-
-1FS06	B-PH BUS-1 PT CORE-2	FOR BUS PT SEL. CKT.	-
-1LK03	NU BUS-1 PT CORE-1	FOR BUS PT SEL. CKT.	NL
-1LK06	NU BUS-1 PT CORE-2	FOR BUS PT SEL. CKT.	NL

Device name	Description (1)	Description (2)	Type designation
-2FS01	R-PH BUS-2 PT CORE-1	FOR BUS PT SEL. CKT.	-
-2FS02	Y-PH BUS-2 PT CORE-1	FOR BUS PT SEL. CKT.	-
-2FS03	B-PH BUS-2 PT CORE-1	FOR BUS PT SEL. CKT.	-
-2FS04	R-PH BUS-2 PT CORE-2	FOR BUS PT SEL. CKT.	-
-2FS05	Y-PH BUS-2 PT CORE-2	FOR BUS PT SEL. CKT.	-
-2FS06	B-PH BUS-2 PT CORE-2	FOR BUS PT SEL. CKT.	-
-2FS07	R-PH BUS-2 PT CORE-3	FOR BUS PT SEL. CKT.	-
-2FS08	Y-PH BUS-2 PT CORE-3	FOR BUS PT SEL. CKT.	-
-2FS09	B-PH BUS-2 PT CORE-3	FOR BUS PT SEL. CKT.	-
-2LK03	NU BUS-2 PT CORE-1	FOR BUS PT SEL. CKT.	NL
-2LK06	NU BUS-2 PT CORE-2	FOR BUS PT SEL. CKT.	NL
-2LK09	NU BUS-2 PT CORE-3	FOR BUS PT SEL. CKT.	NL
-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
-89A_CLS_1	89A ISOL. POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-89A_CLS_2	89A ISOL. POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-89A_OPN_1	89A ISOL. POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-89A_OPN_2	89A ISOL. POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-89B_CLS_1	89B ISOL. POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-89B_CLS_2	89B ISOL. POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-89B_OPN_1	89B ISOL. POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-89B_OPN_2	89B ISOL. POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-89L_CLS_1	89L ISOL. POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-89L_CLS_2	89L ISOL. POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-89L_OPN_1	89L ISOL. POS. OPEN	--	REL-IR-BL/L-220DC/4X21

Based on		Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Assembly drawing		Ref.Des. =2KR +LA	
		Approved 09.01.2024		GOURISH HEGDE		Legend list		DCC ELU			
		Project APTRANSCO				Legend list		Resp. dept. PG-GAS		Rev. ind.	
		STANDARD DRAWING				Hitachi Energy India Limited				Language en	
Rev.		Revision note		Date		Name		Doc. no. 1MNS500925-AABA		Sheet 12.3	
										n. sheet 12.4	

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814600/2024/EEMRT-ENE51

Device name	Description (1)	Description (2)	Type designation
-89L_OPN_2	89L ISOL. POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-89LE_CLS_1	89LE E/SW. POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-89LE_CLS_2	89LE E/SW. POS. CLOSED	--	REL-IR-BL/L-220DC/4X21
-89LE_OPN_1	89LE E/SW. POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-89LE_OPN_2	89LE E/SW. POS. OPEN	--	REL-IR-BL/L-220DC/4X21
-FS01	R-PH LINE CVT CORE-1	FOR LINE CVT CKT.	-
-FS02	Y-PH LINE CVT CORE-1	FOR LINE CVT CKT.	-
-FS03	B-PH LINE CVT CORE-1	FOR LINE CVT CKT.	-
-FS04	R-PH LINE CVT CORE-2	FOR LINE CVT CKT.	-
-FS05	Y-PH LINE CVT CORE-2	FOR LINE CVT CKT.	-
-FS06	B-PH LINE CVT CORE-2	FOR LINE CVT CKT.	-
-FS07	R-PH LINE CVT CORE-3	FOR LINE CVT CKT.	-
-FS08	Y-PH LINE CVT CORE-3	FOR LINE CVT CKT.	-
-FS09	B-PH LINE CVT CORE-3	FOR LINE CVT CKT.	-
-FS10	R-PH SEL. BUS/LINE PT CORE-3	FOR BCU CKT.	-
-FS11	Y-PH SEL. BUS/LINE PT CORE-3	FOR BCU CKT.	-
-FS13	R-PH SEL. BUS/LINE PT CORE-3	FOR BCU CKT.	-
-FS21	R-PH SEL. BUS PT	FUSE FOR SYNC. CKT	-
-K1.101.101	BUS-1 PT SELECTION RELAY	75A	RXMVF 21
-K1.101.301	BUS-2 PT SELECTION RELAY	75B	RXMVF 21
-K1.113.101	PT SELECTION RELAY-21M1	75C	RXMVF 21
-K1.113.301	PT SELECTION RELAY-21M2	75D	RXMVF 21
-K1.125.101	PT SELECTION RELAY METERING	75E	RXMVF 21
-K1.125.301	DC-1 C/O RELAY	RXMH2	RXMH2

Device name	Description (1)	Description (2)	Type designation
-K1.137.101	CB MANUAL TRIP-1	CB MANUAL TRIP-2	RXMM1
-K1.137.301	CB SF6 GAS PRESSURE LOW ALARM-152A	CB POLE DISCREPANCY -152E	RXSF1
-K1.143.101	CB TC-1 SUPVN. HEALTHY	CB TC-2 SUPVN. HEALTHY	RXMM1
-LK03	--	FOR LINE CVT CKT.	NL
-LK06	--	FOR LINE CVT CKT.	NL
-LK09	--	FOR LINE CVT CKT.	NL
-LK13	--	FOR BCU CKT.	NL
-LK21	NU SEL. BUS PT	FUSE FOR SYNC. CKT	15A

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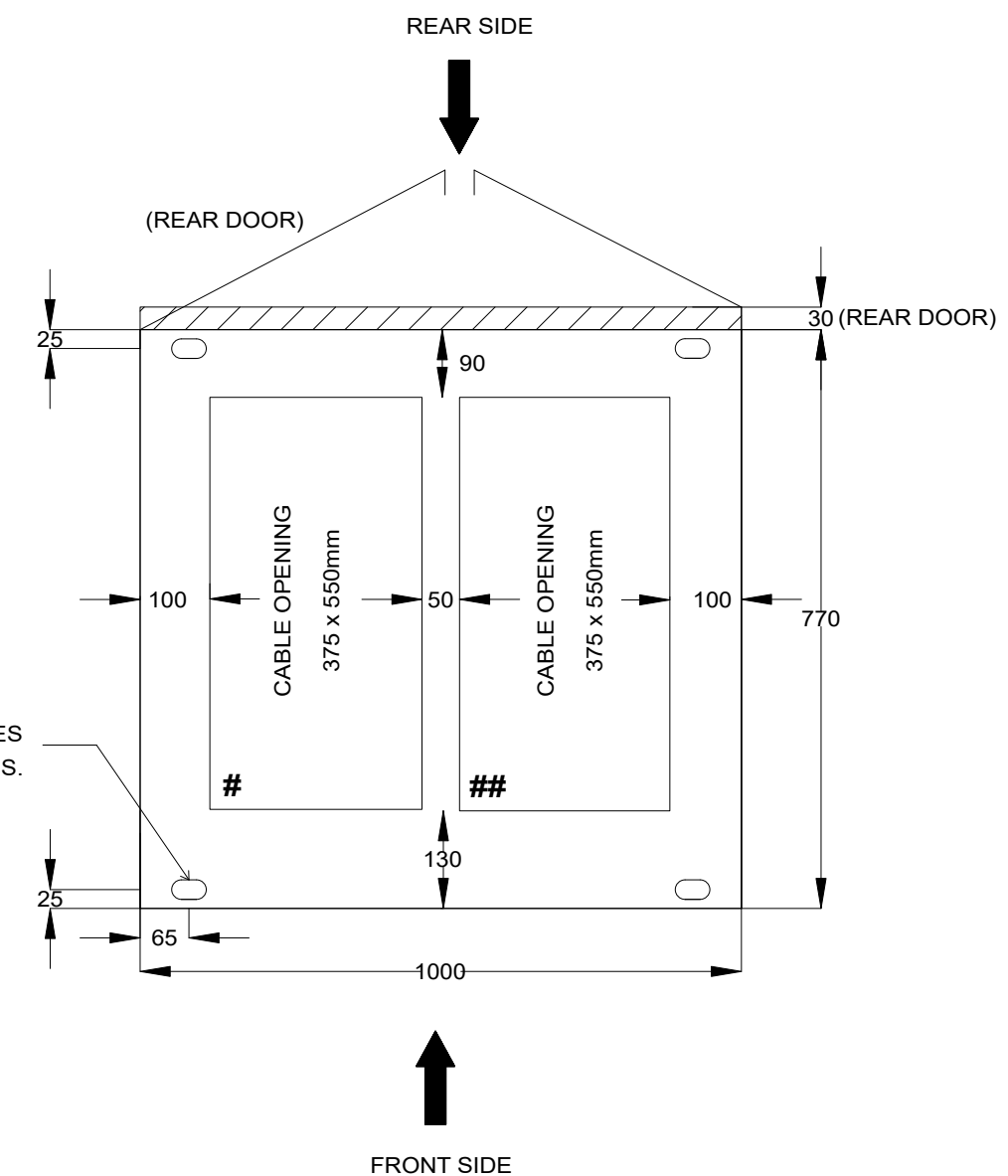
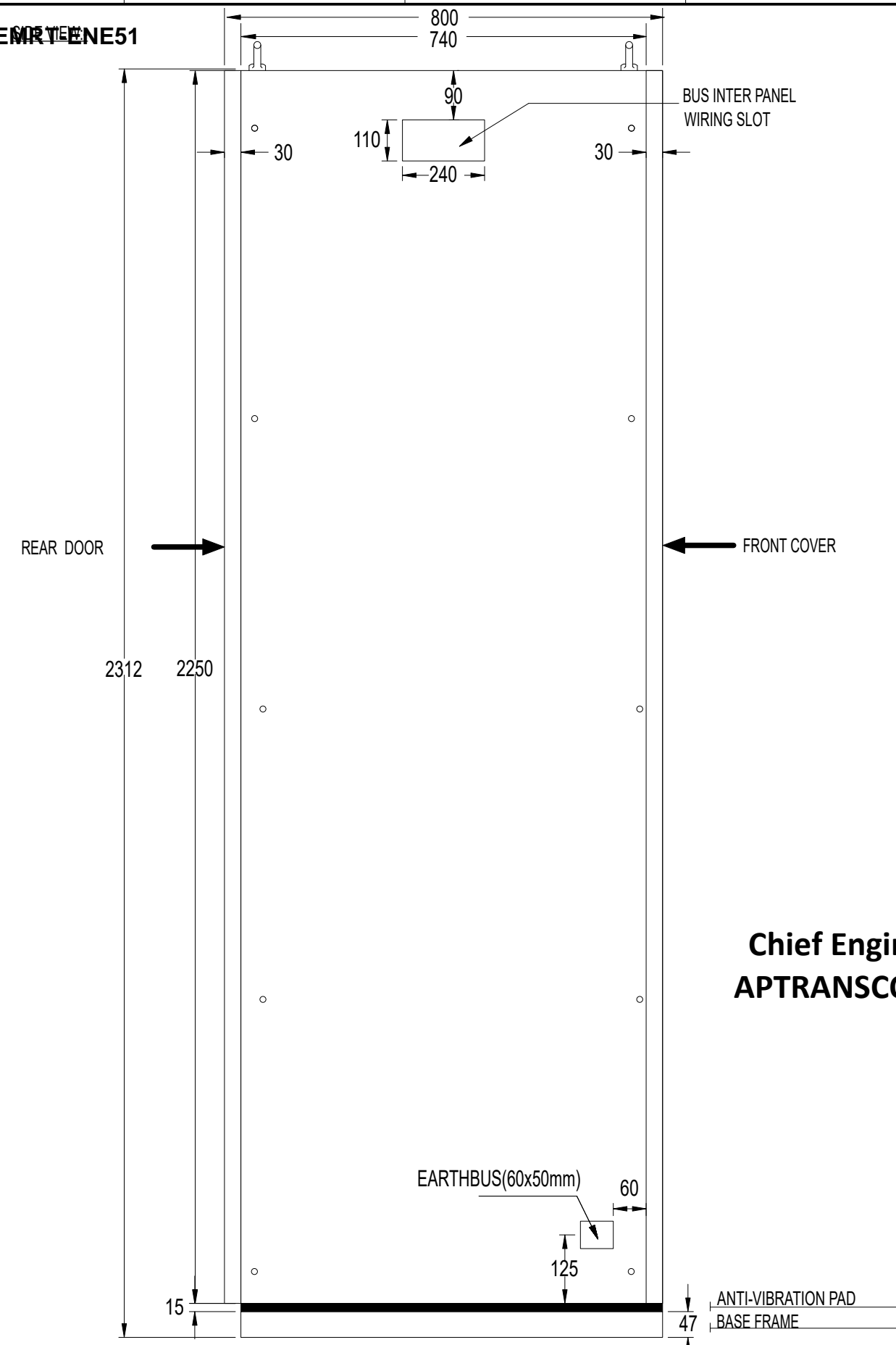
Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Assembly drawing	Ref.Des. =2KR +LA
		Approved 09.01.2024	GOURISH HEGDE	Legend list	DCC ELU	
		Project APTRANSCO STANDARD DRAWING		Legend list	Resp. dept. PG-GAS	Rev. ind. Language en
				HITACHI Hitachi Energy India Limited	Doc. no. 1MNS500925-AABA	
Rev.	Revision note	Date	Name			Sheet 12.4
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814600/2024/EEM/TYPE 51

FOUNDATION DETAILS:-



BASE FRAME SIZE :- 1000mm X 770mm

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- 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 1100V
 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 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Assembly drawing	Ref.Des.	=2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC ELU		+LA
		Project APTRANSCO		Side View & Foundation Details	PG-GAS	Rev. ind.	Language en
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Doc. no. 1MNS500925-AABA		Sheet 13
Rev.	Revision note	Date	Name			n. sheet	14
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PANEL DETAILS:-

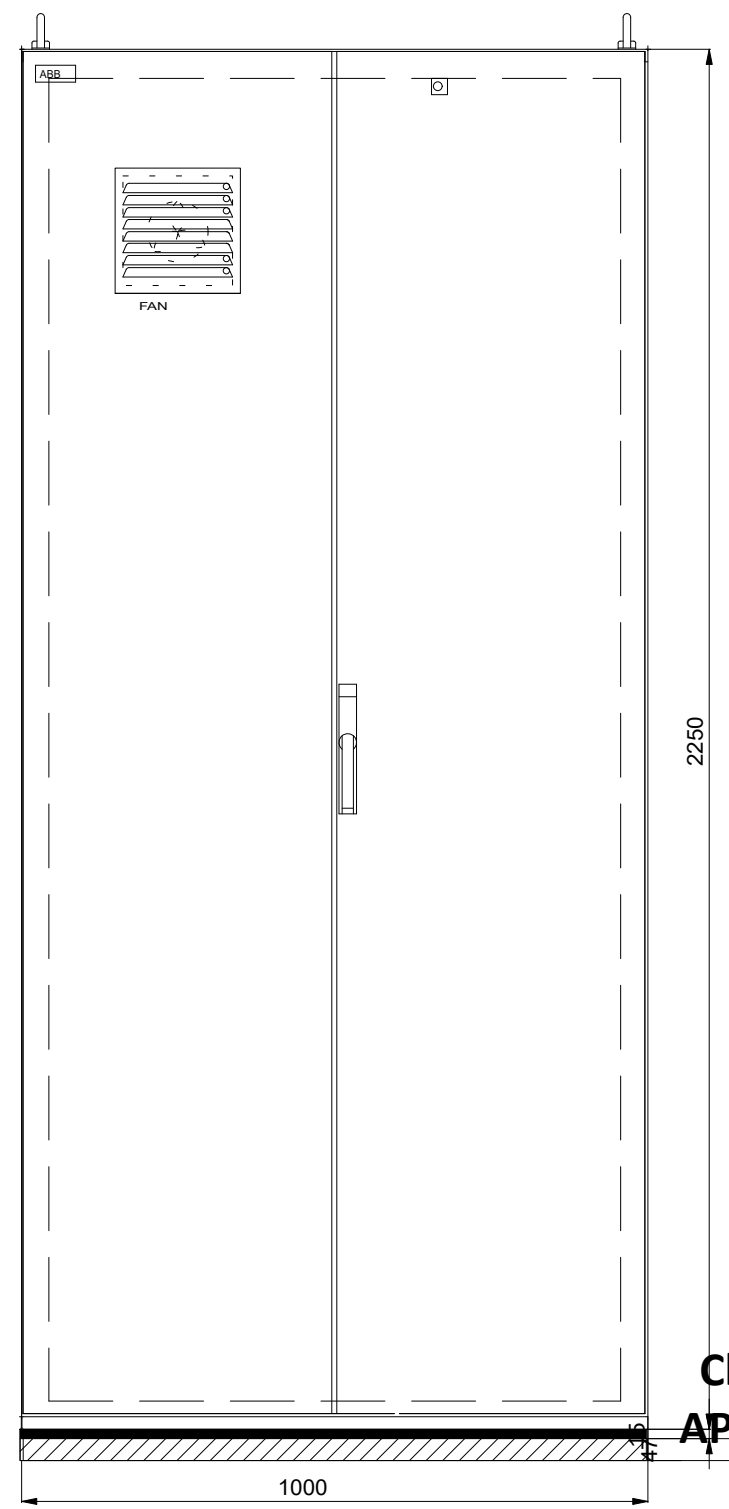
Drawing approval subject to valid vendor registration

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 ² , Phase : RYB, Neutral : Black, 2x2.5mm ² for TVM P
Wire size for DC Circuits	1.5 Sqmm, Grey
Wire size for Aux.AC Circuit	1.5mm ² , Grey
Wire size for Earthing	2.5mm ² , Green
Ferrules	
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 Desgination 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



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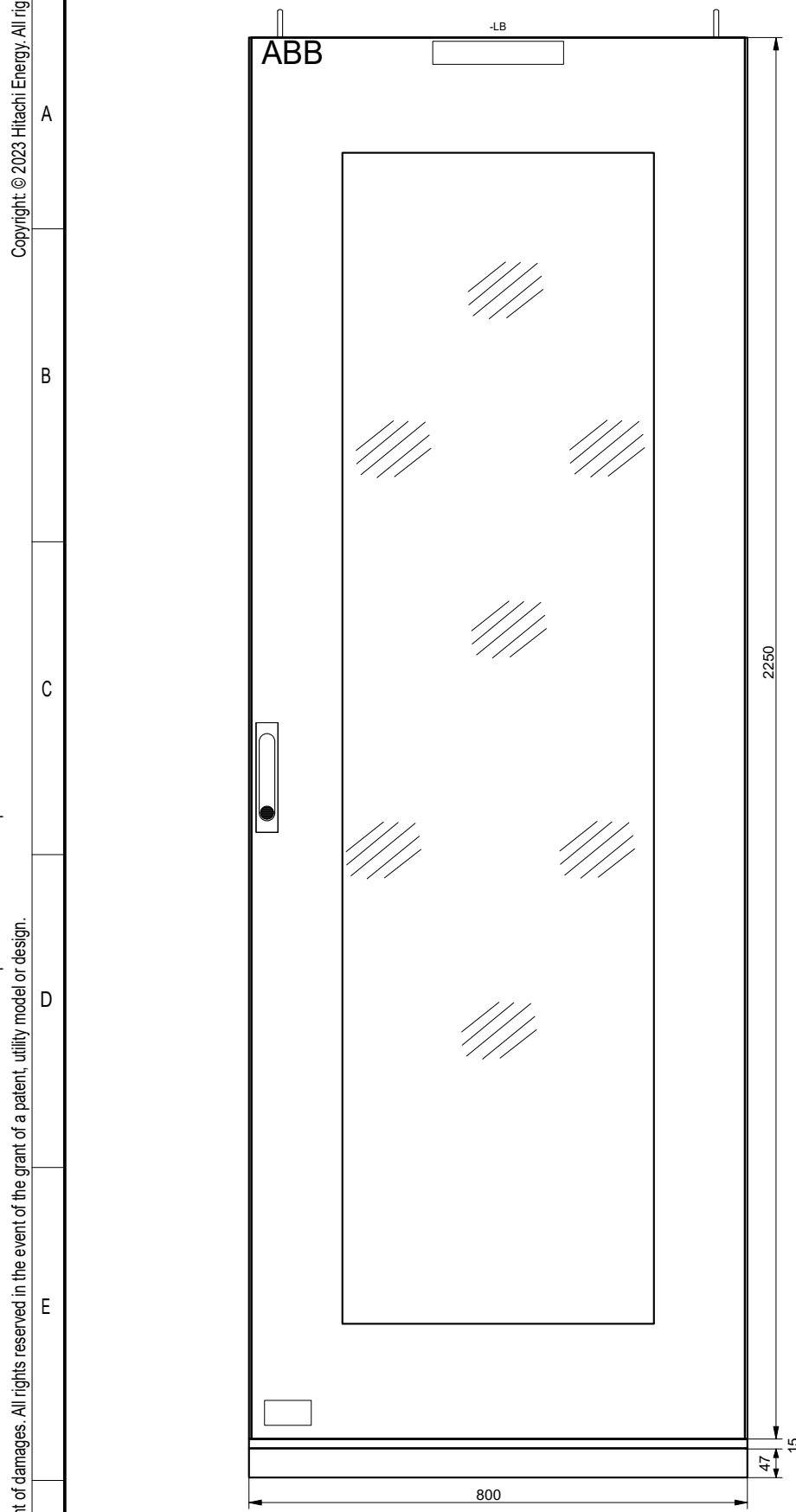
Based on	Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Assembly drawing	Ref.Des. =2KR
	Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC ELU	+LA
	Project APTRANSCO		Panel Details & Rear Door Details	Resp. dept. PG-GAS	Rev. ind. Language en
			HITACHI Hitachi Energy India Limited	Doc. no. 1MNS500925-AABA	Sheet 14
Rev.	Revision note	Date			n. sheet 16
1MYN691003-102(A3)REV01					

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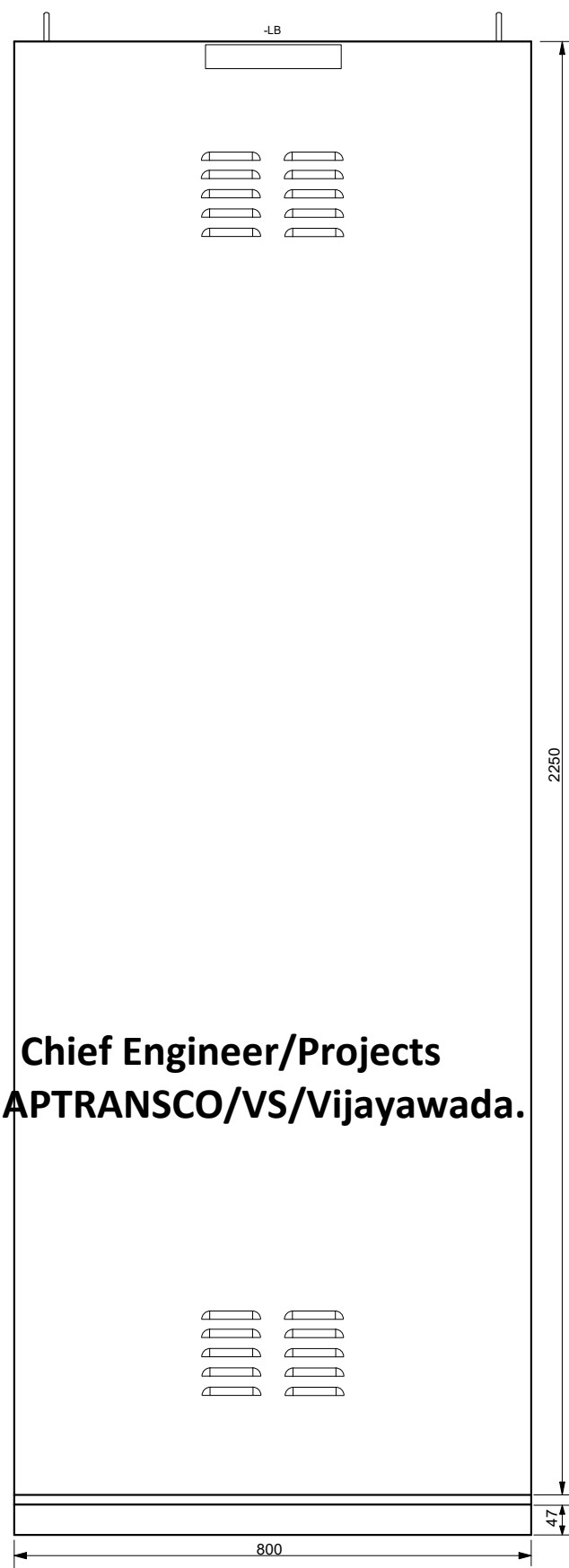
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Rear View



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CUBICLE SPECIFICATION - RELAY PANEL (SHELL TYPE)

Height	2312 (2250+15+47mm)	
Width	800mm	
Depth	800mm	
Anti-Vibration Pad	15mm	
Base frame	47mm	
Dimensional Tolerance	As per IS 2102 Part1-Medium	
Weight	400 kg Approx.	
Sheet Thickness Tolerance	As Per IS:16162 Standard	
Thickness of material		
Swing frame Assembly	2mm	
Swing frame Channel	3mm	
Rear cover, Roof plate, Bottom plate	2mm	
Mounting, Blanking plate	2mm	
Side covers	2mm	
Base frame	2mm	
Gland plate	3mm	
Gland plate	3mm	
Protection class	IP54	
Cubicle illumination	9W LED Lamp	
Earth Bar	Tinned Copper Strip of 25mm x 6mm	
Bottom Plate	With 2 openings of 275mm x 550mm	
Gland Plate	2 nos. of plates - Fixing cable glands SIZE-315mm x 590mm	
Gasket Material type	EPDM / Neoprene / XLPE / Polystyrene	
Cubicle Colour		
Power Coating : :Exterior	LIGHT GREY TO SHADE 631 OF IS-5,SEMI GLOSSY FINISH	
:Interior	Glossy white	
:Base frame	Black	
:Thickness	60-80 microns for powder coating	
Wires (FRLS)		
Wire size of CT Circuits	2.5mm ² , Phase : RYB, Neutral : Black	
Wire size of PT Circuits	1.5mm ² , Phase : RYB, Neutral : Black, 2x2.5mm ² for TVM PT	
Wire size of DC Circuits	1.5mm ² , Grey	
Wire size of Aux.AC Circuit	1.5mm ² , Grey	
Wire size of Earthing	2.5mm ² , Green	
Ferrules		
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)		
Terminal CT / VT	Disconnecting type	
Terminal AC / DC incoming	Disconnecting type	
Terminal Earthing	Disconnecting type	
Terminal Control	Non-Disconnecting type	
Terminal Interpanel, General	Non-Disconnecting & Disconnecting type	
LABELS		
	DIMENSIONS(mm)	LETTER HEIGHT(mm)
1:Main Label (Front)	200 x 60	10
MATERIAL : Acrylic	TYPE OF INSCRIPTION : Engraving-white letters on black background	
2A : Apparatus Label (Inside-MCB and Terminals)	40 x 16 and 40 x 8	3
MATERIAL : Sticker	TYPE OF INSCRIPTION : Printing-Black letters on white background	
2B : Apparatus Label (Inside-Fuses)	29 x 29	3
MATERIAL : Aluminium anodised	TYPE OF INSCRIPTION : Engraving-white letters on black background	
3 : Apparatus Label (Front)	20 x 12	3
MATERIAL : Aluminium anodised	TYPE OF INSCRIPTION : Engraving-white letters on black background	
4:Item Designation Stickers (Inside)	20 x 12	5
MATERIAL : Self adhesive yellow stickers	TYPE OF INSCRIPTION : Black letters	
5:Flag Relay Labels	29 x 29	2
MATERIAL : Aluminium anodised	TYPE OF INSCRIPTION : Engraving-white letters on black background	
6:PB / Lamp Lables	30 x 40	3
MATERIAL : Aluminium anodised	TYPE OF INSCRIPTION : Engraving-white letters on black background	

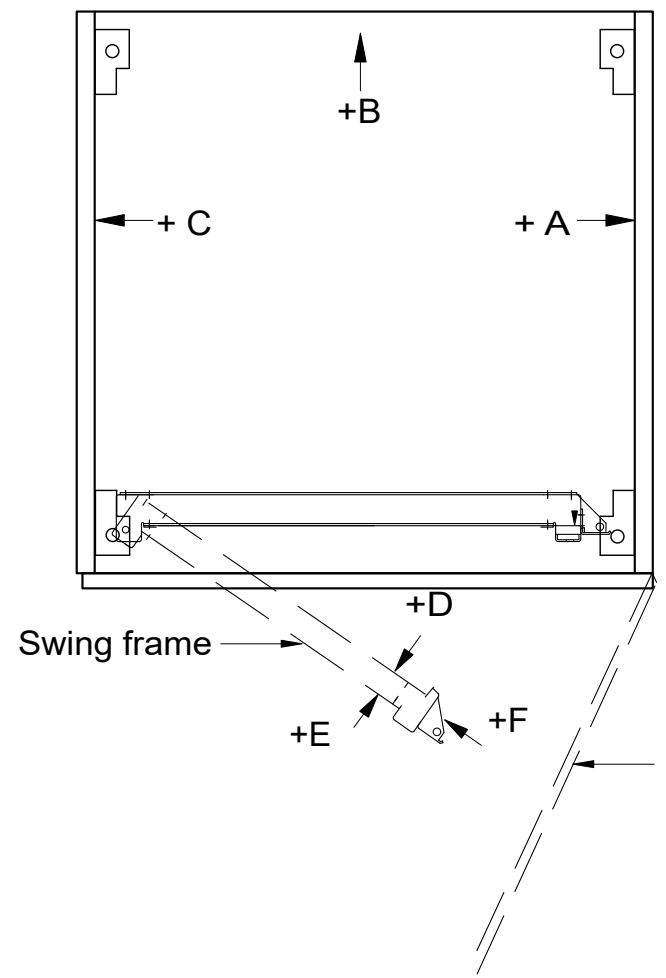
Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Assembly drawing	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC ELU	+LB
		Project APTRANSCO		Front view	Resp. dept. PG-GAS	Rev. ind. Language en
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Doc. no. 1MNS500925-AABA	
Rev.	Revision note	Date	Name			Sheet 16
						n. sheet 17
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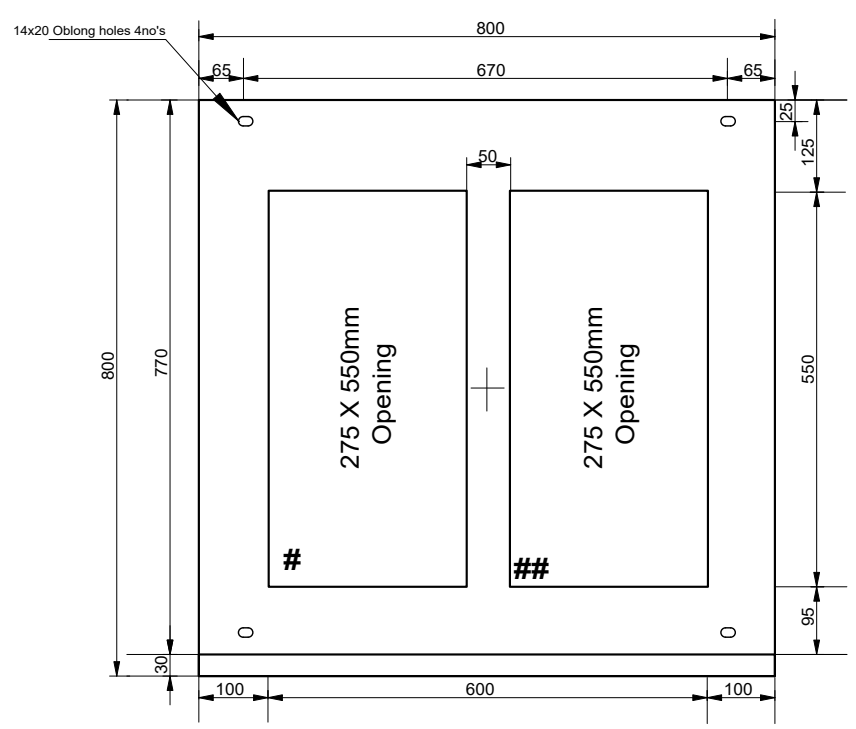
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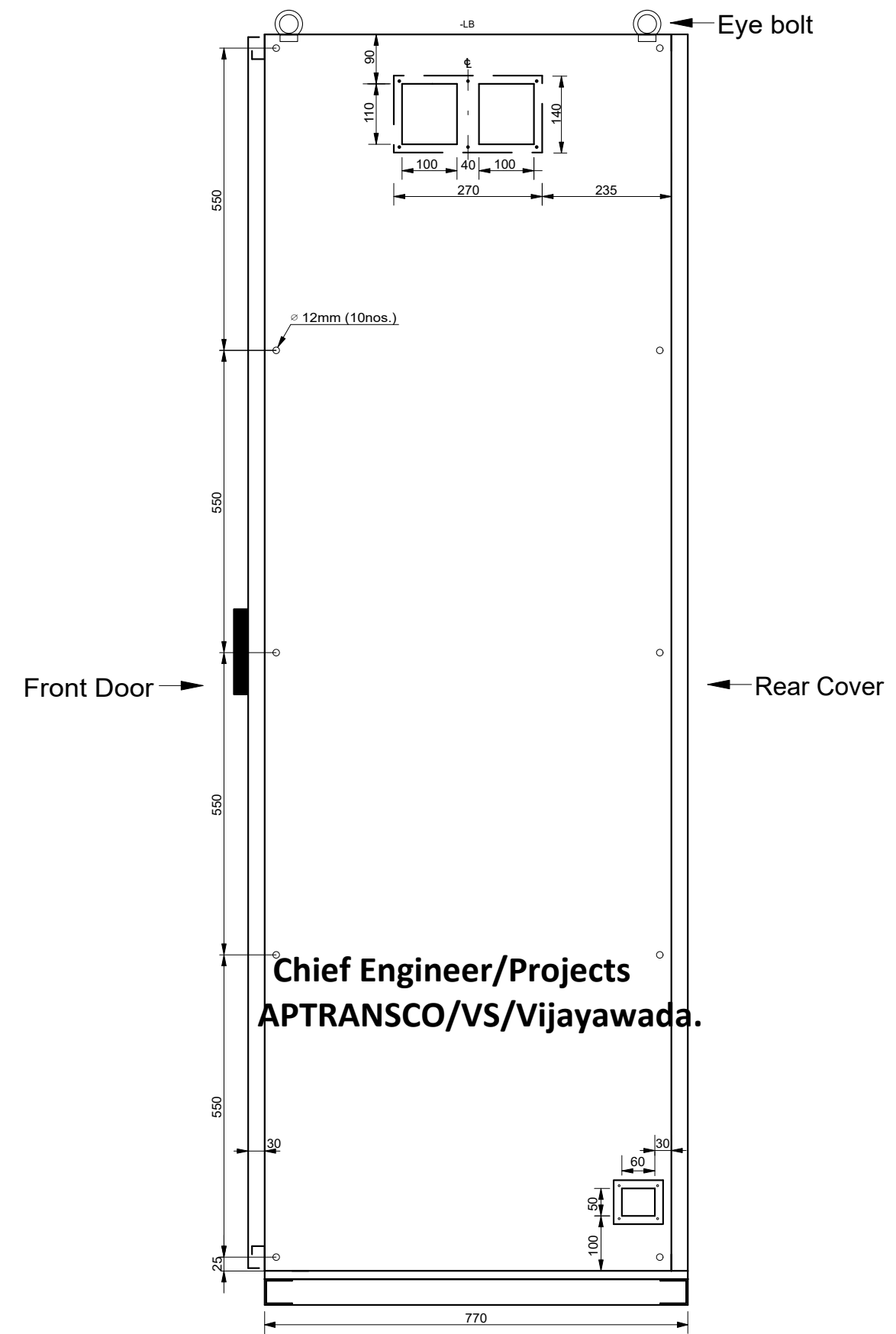
Cross sectional view



Foundation Details



Side view



Drawing approval subject to valid vendor registration

- Note :
1. All Dimensions are in mm
 2. Base frame Dimension is 800mm(W)x770mm(D)
 3. # GLAND PLATE WITH 21 Nos. KNOCKOUT PUNCH HOLES OF 19mm DIA. TO BE PROVIDED.
 4. ## GLAND PLATE WITH 21 Nos. KNOCKOUT PUNCH HOLES OF 25mm DIA. TO BE PROVIDED.

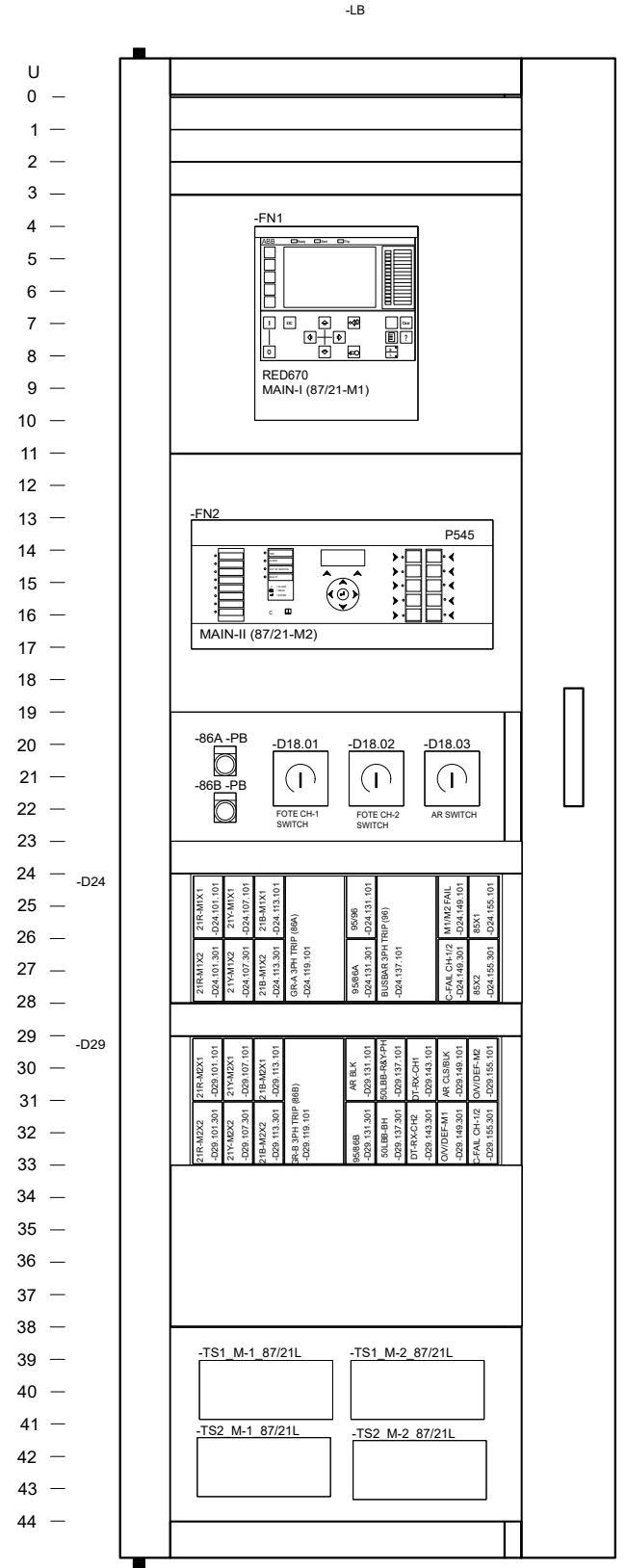
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Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Assembly drawing	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC ELU	+LB
		Project APTRANSCO		Section view incl. location designation	Resp. dept. PG-GAS	Rev. ind.
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-AABA	Sheet 17	n. sheet 18
1MYN691003-102(A3)REV01						

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+F Front view hinged frame

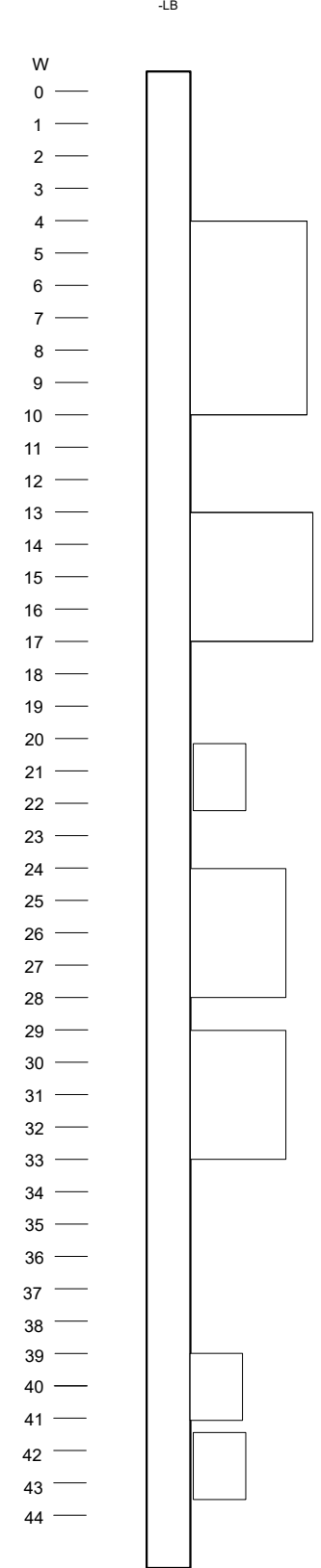


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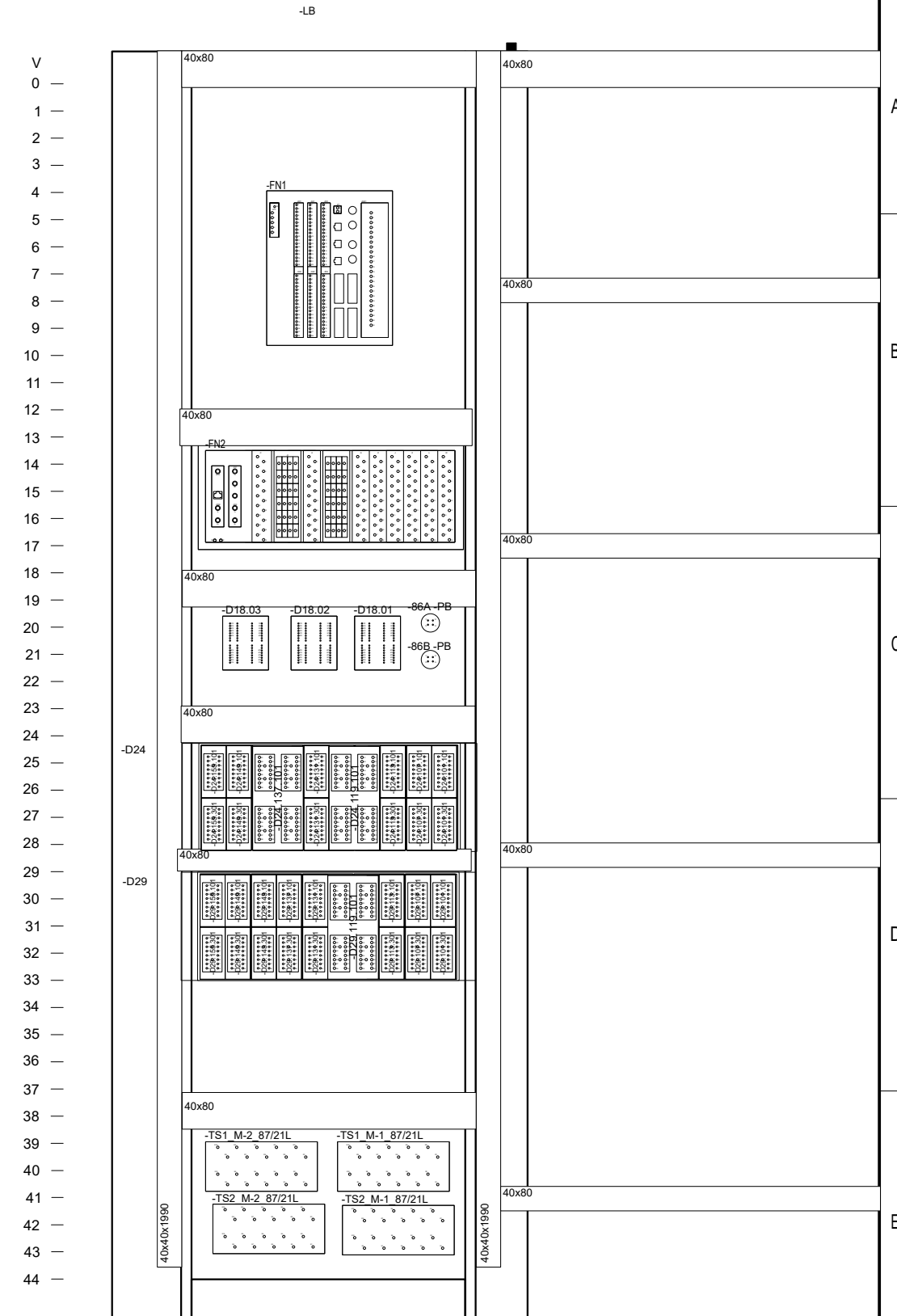
PANEL: 2KRLB

ITEM DESIGNATION	DESCRIPTION
FN1	DIFF/DIST PROTECTION M1-RELAY(REL670)
FN2	DIFF/DIST PROTECTION M2-RELAY(P545)
86A-PB	PUSH BUTTON FOR GROUP-A 86A RESET
86B-PB	PUSH BUTTON FOR GROUP-B 86B RESET
D20.01	CARRIER SELECTOR SWITCH CH-1
D20.02	CARRIER SELECTOR SWITCH CH-2
D20.03	AUTO RECLOSE SELECTOR SWITCH
D24.101.101	1PH TRIP RELAY(R-PH) 21-M1X1
D24.101.301	1PH TRIP RELAY(R-PH) 21-M1X2
D24.107.101	1PH TRIP RELAY(Y-PH) 21-M1X1
D24.107.301	1PH TRIP RELAY(Y-PH) 21-M1X2
D24.113.101	1PH TRIP RELAY(B-PH) 21-M1X1
D24.113.301	1PH TRIP RELAY(B-PH) 21-M1X2
D24.119.101	GROUP-A(86A) TRIP RELAY
D24.131.101	BUSBAR TRIP RELAY SUPERVISION
D24.131.301	GR-A TRIP RELAY SUPERVISION
D24.137.101	BUSBAR TRIP RELAY
D24.149.101	AUX. RELAY FOR M1/2 RELAY FAIL
D24.149.301	AUX. RELAY FOR CARRIER SEND CH-1
D24.155.101	AUX. RELAY FOR CARRIER SEND CH-1
D24.155.301	AUX. RELAY FOR CARRIER SEND CH-2
D29.101.101	1PH TRIP RELAY(R-PH) 21-M2X1
D29.101.301	1PH TRIP RELAY(R-PH) 21-M2X2
D29.107.101	1PH TRIP RELAY(Y-PH) 21-M2X1
D29.107.301	1PH TRIP RELAY(Y-PH) 21-M2X2
D29.113.101	1PH TRIP RELAY(B-PH) 21-M2X1
D29.113.301	1PH TRIP RELAY(B-PH) 21-M2X2
D29.119.101	GROUP-B(86B) TRIP RELAY
D29.131.101	A/R BLOCK
D29.131.301	GR-B TRIP RELAY SUPERVISION
D29.137.101	LBB RE-TRIP R-PH & Y-PH
D29.137.301	LBB RE-TRIP B-PH
D29.143.101	DT RECEIVED CH-1 RELAY
D29.143.301	DT RECEIVED CH-2 RELAY
D29.149.101	AR BLOCK RELAY
D29.149.301	AUX. RELAY OF OV/ DEF-M1
D29.155.101	AUX. RELAY OF OV/ DEF-M2
D29.155.301	AUX. RELAY FOR CARRIER FAIL CH-1/ CH-2
TS1/TS2_M-1_87/21L	TEST SWITCH FOR M-1 PROTN. RELAY
TS1/2_M-2_87/21L	TEST SWITCH FOR M-2 PROTN. RELAY

+F Side view hinged frame



+D Back view hinged frame



1No.Spare Trip relay RXMVB4 and 1No spare supervision relay TSR-B shall be supplied as loose and fixed in the panel.

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Assembly drawing	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC ELU	+LB
		Project APTRANSCO		Hinged frame view	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-AABA	Sheet 18
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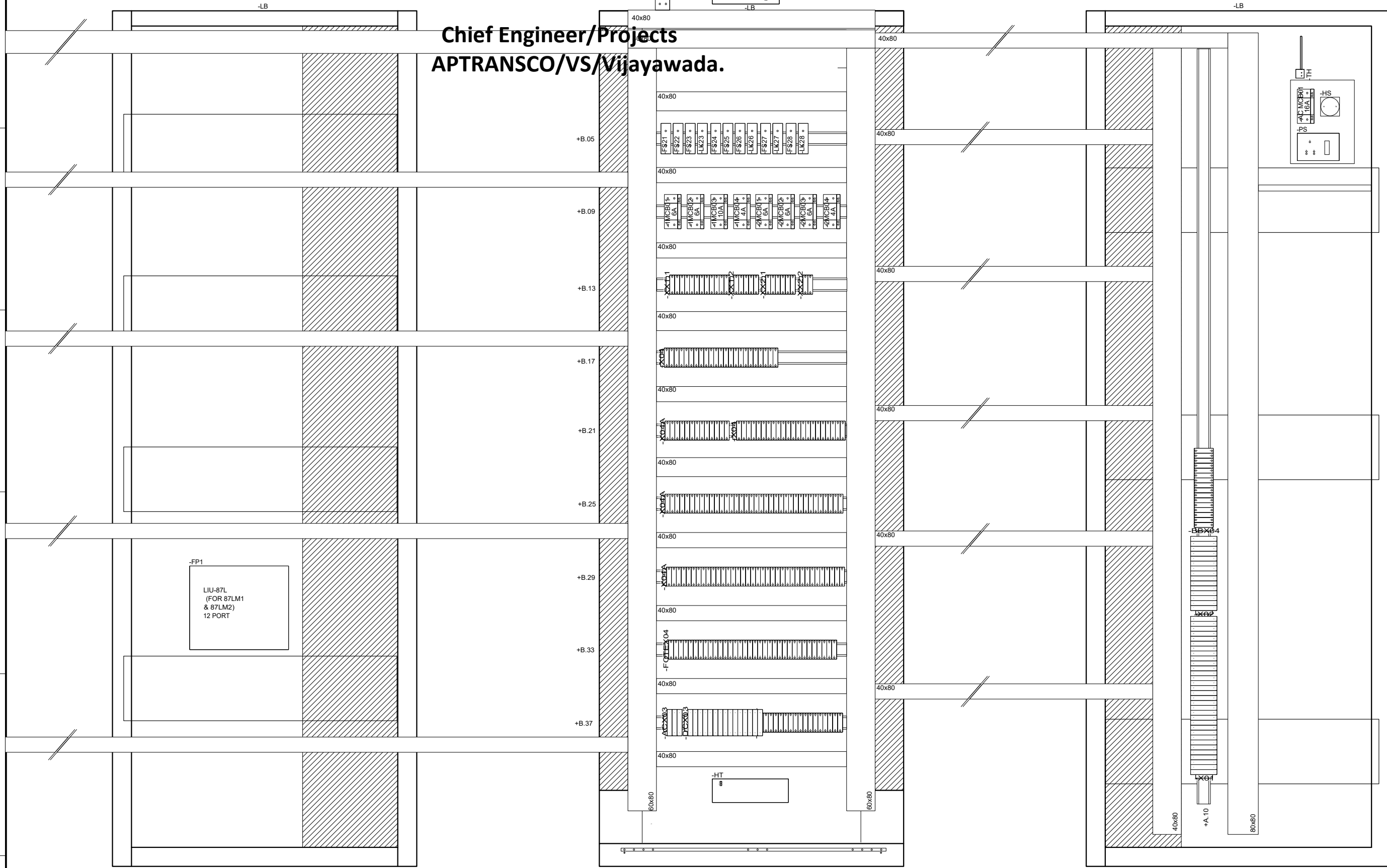
+C Left side

+B Rear plane

+A Right side

Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

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

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Assembly drawing	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC ELU	+LB
		Project APTRANSCO		Inside view	PG-GAS	Rev. ind.
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	Sheet 19
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-AABA	n. sheet 19.1	
1MYN691003-102(A3)REV01						

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Device name	Description (1)	Description (2)	Type designation
-AC MCB01	AC SOURCE MCB	16A	-
-HS	HEATER SW	--	
-PS	Outlet	--	SW
-TH	Thermostat	--	TH

Plane: B

Device name	Description (1)	Description (2)	Type designation
-1MCB01	M-1 PROTN CKT	6A	-
-1MCB02	86A TRIP RELAY CKT.	6A	-
-1MCB03	SPARE MCB	10A	-
-1MCB04	ETHERNET SW MCB	4A	-
-2MCB01	M-2 PROTN CKT	6A	-
-2MCB02	86B TRIP RELAY CKT.	6A	-
-2MCB03	SPARE MCB	6A	-
-2MCB04	ETHERNET SW MCB	4A	-
-FS21	R-PH SEL. BUS PT/LINE CVT	FOR M-1 PROTN. RELAY	-
-FS22	Y-PH SEL. BUS PT/LINE CVT	FOR M-1 PROTN. RELAY	-
-FS23	B-PH SEL. BUS PT/LINE CVT	FOR M-1 PROTN. RELAY	-
-FS24	R-PH SEL. BUS PT/LINE CVT	FOR M-2 PROTN. RELAY	-
-FS25	Y-PH SEL. BUS PT/LINE CVT	FOR M-2 PROTN. RELAY	-
-FS26	B-PH SEL. BUS PT/LINE CVT	FOR M-2 PROTN. RELAY	-
-FS27	R-PH SEL. BUS PT/LINE CVT	FOR M-2 PROTN. RELAY	-
-FS28	R-PH SEL. BUS PT/LINE CVT	FOR M-1 PROTN. RELAY	-
-HT	Heating	--	SPHT

Device name	Description (1)	Description (2)	Type designation
-LED	Lamp	--	LED
-LK23	NU SEL. BUS PT/LINE CVT	FOR M-1 PROTN. RELAY	NL
-LK26	NU SEL. BUS PT/LINE CVT	FOR M-2 PROTN. RELAY	NL
-LK27	NU SEL. BUS PT/LINE CVT	FOR M-2 PROTN. RELAY	NL
-LK28	NU SEL. BUS PT/LINE CVT	FOR M-1 PROTN. RELAY	NL

Plane: D

Device name	Description (1)	Description (2)	Type designation
-86A -PB	PB - 86A	--	-
-86B -PB	PB - 86B	--	-
-D18.01	FOTE SW CH-1	--	12-2-pos. contacts
-D18.02	FOTE SW CH-2	--	12-2-pos. contacts
-D18.03	AR SEL. SW.	--	12-2-pos. contacts
-D24.101.101	1PH TRIP R-PH	21R-M1X1	RXME18
-D24.101.301	1PH TRIP R-PH	21R-M1X2	RXMS1
-D24.107.101	1PH TRIP Y-PH	21Y-M1X1	RXME18
-D24.107.301	1PH TRIP Y-PH	21Y-M1X2	RXMS1
-D24.113.101	1PH TRIP B-PH	21B-M1X1	RXME18
-D24.113.301	1PH TRIP B-PH	21B-M1X2	RXMS1
-D24.119.101	GR-A TRIP RELAY	86A	RXMVB4
-D24.131.101	BB/LBB Trip relay Supvn.	--	TSR-B
-D24.131.301	3-Ph. GR-A Trip relay Supvn.	--	TSR-B
-D24.137.101	BB / LBB TRIP RELAY	--	RXMVB4
-D24.149.101	M1 RELAY HEALTHY	M2 RELAY HEALTHY	RXSF1
-D24.149.301	C-FAIL CH-1	C-FAIL CH-2	RXSF1

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Assembly drawing	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Legend list	DCC ELU	+LB
		Project APTRANSCO		Legend list	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-AABA	Sheet 19.1
1MYN691003-102(A3)REV01						n. sheet 19.2

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Device name	Description (1)	Description (2)	Type designation
-D24.155.101	85X1-CODE-1	85X1-CODE-2	RXSF1
-D24.155.301	85X2-CODE-1	85X2-CODE-2	RXSF1
-D29.101.101	1PH TRIP R-PH	21R-M2X1	RXME18
-D29.101.301	1PH TRIP R-PH	21R-M2X2	RXMS1
-D29.107.101	1PH TRIP Y-PH	21Y-M2X1	RXME18
-D29.107.301	1PH TRIP Y-PH	21Y-M2X2	RXMS1
-D29.113.101	1PH TRIP B-PH	21B-M2X1	RXME18
-D29.113.301	1PH TRIP B-PH	21B-M2X2	RXMS1
-D29.119.101	GR-B TRIP RELAY	86B	RXMVB4
-D29.131.101	A/R BLOCK	--	RXMS1
-D29.131.301	3-Ph. GR-B Trip relay Supvn.	--	TSR-B
-D29.137.101	LBB RE-TRIP RPH	LBB RE-TRIP YPH	RXMM1
-D29.137.301	LBB RE-TRIP BPH	SPARE	RXMM1
-D29.143.101	DT Receive Ch-1	--	RXMS1
-D29.143.301	DT Receive Ch-2	--	RXMS1
-D29.149.101	AUTO RECLOSE CMD	AUTO RECLOSE BLOCK	RXMM1
-D29.149.301	OV_DEF_M1	--	RXMS1
-D29.155.101	OV_DEF_M2	--	RXMS1
-D29.155.301	C-FAIL CH-1	C-FAIL CH-2	RXSF1
-FN1	Main-1 Differential/Distance Protn	RED670	RED670
-FN1	Transformer input module	--	TRM
-FN2	Main-2 Differential/Distance Protn	--	Micom P545
-TS1_M-1_87/21L	TS_M-1_87/21L	--	MPG
-TS1_M-2_87/21L	TS_M-2_87/21L	--	MPG
-TS2_M-1_87/21L	TS_M-1_87/21L	--	MPG

Device name	Description (1)	Description (2)	Type designation
-TS2_M-2_87/21L	TS_M-2_87/21L	--	MPG

Drawing approval subject to valid vendor registration

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

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Assembly drawing	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Legend list	DCC ELU	+LB
		Project APTRANSCO		Legend list	Resp. dept. PG-GAS	Rev. ind.
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-AABA		Sheet 19.2
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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	

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

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		List Of Symbols	PG-GAS	Rev. ind.
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CABA	Sheet 21	n. sheet 22
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165

A

B

C

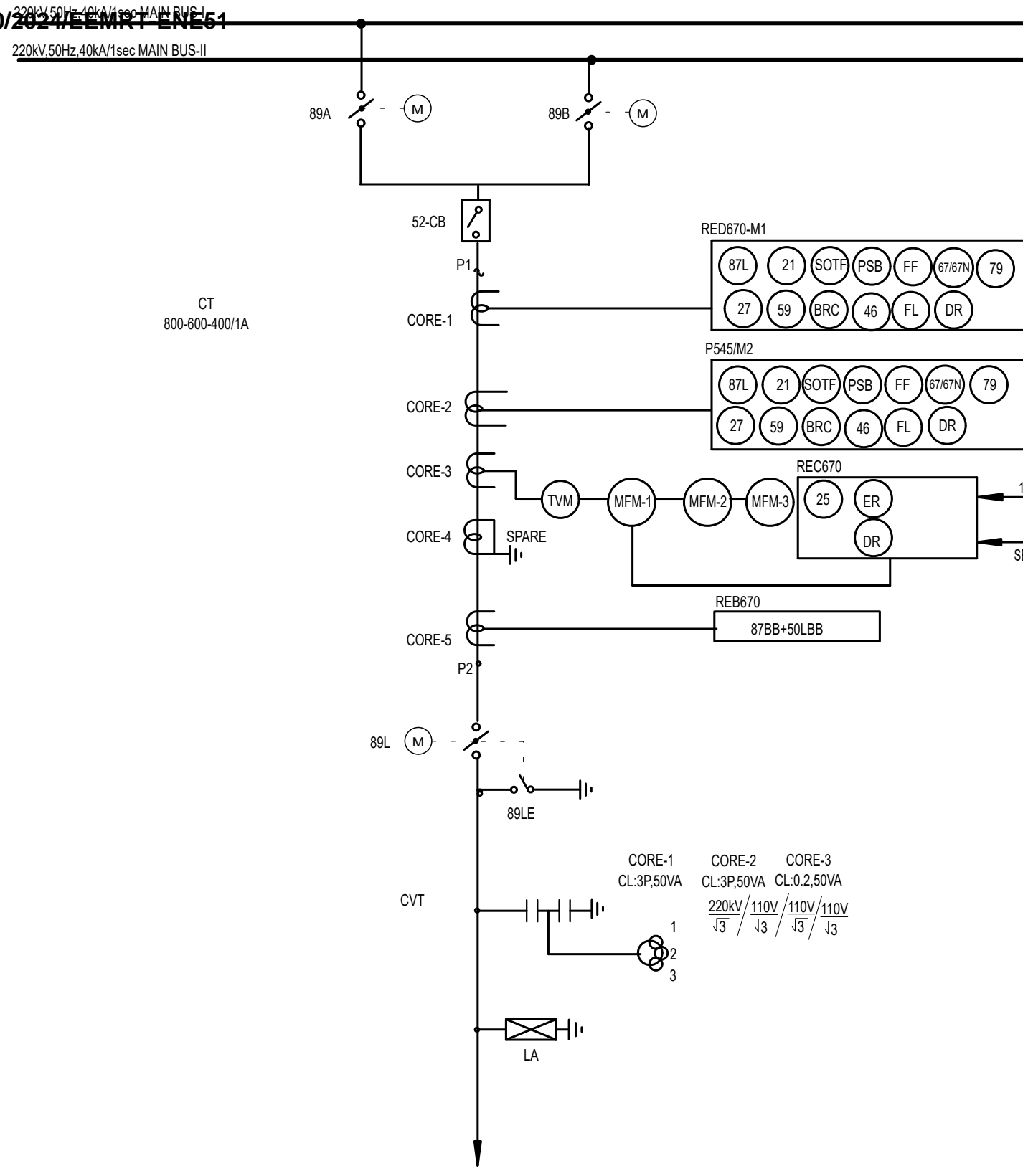
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E

F

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Drawing approval subject to valid vendor registration

220kV CT DETAILS FOR LINE FEEDER

APPLICATION	CORE NO.	RATIO	OUTPUT	ACCURACY CLASS	Vk (V)	Iext @ Vk/2 (mA)
PROTECTION	1	800-600-400/1A	-	-	-	-
PROTECTION	2	800-600-400/1A	-	-	-	-
METERING	3	800-600-400/1A	-	-	-	-
SPARE	4	800-600-400/1A	-	-	-	-
BUS DIFF	5	800-600-400/1A	-	-	-	-

- NOTE:
- 87L- DIFFERENTIAL PROTN.
 - 21L- DISTANCE PROTN.
 - 25- CHECK SYNCH.
 - 79- AUTORECLOSURE
 - SOTF- SWITCH ON TO FAULT
 - 50LBB- LOCAL BREAKER BACKUP
 - 85- WEAK END INFEEED & CURRENT REVERSAL
 - 67- DIRECTIONAL OVER CURRENT
 - 67N- DIRECTIONAL EARTH FAULT
 - 87BB- BUSBAR DIFFERENTIAL
 - 50/51- IDMT/INST. OVERCURRENT
 - 50N/51N- IDMT/INST. EARTH FAULT
 - 78- POWER SWING BLOCK
 - 27- UNDERVOLTAGE PROTN
 - 59- OVERVOLTAGE PROTN
 - BRC- BROKEN CONDUCTOR PROTN
 - DR- DATA RECORDER
 - FL- FAULT LOCATER
 - ER- EVENT RECORDER

NOTE: CT, PT, CVT RATIOS AND DETAILS TO BE FURNISHED
ADOPTED CTR TO BE FURNISHED

Chief Engineer/Projects
APTRANSCO/VIS/Vijayawada.

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Single Line Diagram	PG-GAS	Rev. ind.
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited		Language en
Rev.	Revision note	Date	Name		Doc. no. 1MNS500925-CABA	Sheet 22
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PROTECTION FUNCTION	OUTPUT	START AUTO RECLOSE MAIN CB	BLOCK AUTO RECLOSE MAIN CB	3PH MASTER TRIP RELAY GROUP-A, MAIN CB	3PH MASTER TRIP RELAY GROUP-B, MAIN CB	DIREC TRIP SEND CHANNEL-1	DIREC TRIP SEND CHANNEL-2	FOTE CHANNEL-1	FOTE CHANNEL-2	BUSBAR PROTECTION	BREAKER FAIL PROT N MAIN CB	TO CB TRIP COIL-1	TO CB TRIP COIL-2	CLOSE CB	1Ø TRIPPING RELAY M1	1Ø TRIPPING RELAY M2	9Ø TRIPPING RELAY	Remark
DIFFERENTIAL/DISTANCE PROTECTION TRIP(PDIF/PDIS,87/21)-MAIN 1	1 Ph	IP						TP	TP		IP				TP			BUILT IN MAIN-1 RED670
DIFFERENTIAL/DISTANCE PROTECTION TRIP(PDIF/PDIS,87/21)-MAIN 1	3 Ph		IP	IP	IP													BUILT IN MAIN-1 RED670
DIRECTIONAL EARTH FAULT(PDEF,67N)-MAIN 1	3 Ph			IP	IP	TP	TP											BUILT IN MAIN-1 RED670
OVERVOLTAGE PROTECTION TRIP(PTOV,59)-MAIN 1	3 Ph			IP	IP	TP	TP											BUILT IN MAIN-1 RED670
CH-1 CARRIER FAIL & CH-2 CARRIER FAIL			IP															
DIFFERENTIAL/DISTANCE PROTECTION TRIP(PDIF/PDIS,87/21)-MAIN 2	1 Ph	IP						TP	TP		IP					TP		BUILT IN MAIN-2 P545
DIFFERENTIAL/DISTANCE PROTECTION TRIP(PDIF/PDIS,87/21)-MAIN 2	3 Ph		IP	IP	IP													BUILT IN MAIN-2 P545
DIRECTIONAL EARTH FAULT(PDEF,67N)-MAIN 2	3 Ph			IP	IP	TP	TP											BUILT IN MAIN-2 P545
OVERVOLTAGE PROTECTION TRIP(PTOV,59)-MAIN 2	3 Ph			IP	IP	TP	TP											BUILT IN MAIN-2 P545
BREAKER FAIL PROTECTION(RBRF,50BF)MAIN CB	3 Ph									IP							TP	BUILT IN REB670
BUSBAR PROTECTION (PBDF, 87B)	3 Ph		IP			TP	TP				IP	TP	TP	RS			TP	BUILT IN REB670
LBB RE-TRIP	3 Ph											TP	TP					
DIRECT TRIP RECEIVE CHANNEL-1	3 Ph			IP	IP													BUILT IN RXMS
DIRECT TRIP RECEIVE CHANNEL-2	3 Ph			IP	IP													BUILT IN RXMS
3PH MASTER TRIP RELAY, GROUP-A, MAIN CB	3 Ph		IP								IP	TP	TP	RS				
3PH MASTER TRIP RELAY, GROUP-B, MAIN CB	3 Ph		IP								IP	TP	TP	RS				
AUTO RECLOSE(RREC,79)	1/3 Ph													IP				BUILT IN M1/M2 RELAY
CHECK SYNCHRONISING(RSYN, 25)																		BUILT IN REC670 RELAY
BAY CONTROLLER, REC670												TP	TP	TP				BUILT IN REC670 RELAY
CB TROUBLES TO BAY CONTROLLER																		BUILT IN REC670 RELAY
1Ø TRIPPING RELAY M1	1 Ph	IP									IP	TP	TP					
1Ø TRIPPING RELAY M2	1 Ph	IP									IP	TP	TP					
MANUAL TRIP MAIN CB (BCU/TNC)	3 Ph					TP	TP					TP	TP					

NOTE: LBB FUNCTION FIRST ISSUES RE-TRIP COMMAND TO ITS OWN BREAKER AFTER 100ms & THEN BACK-UP TRIP COMMAND IS ISSUED TO TRIP ADJ BREAKER & INITIATE BUS-BAR ** SINGLE PHASE TRIPS ONLY FOR ZONE-1, THREE PHASE TRIP FOR ZONE-2, 3.

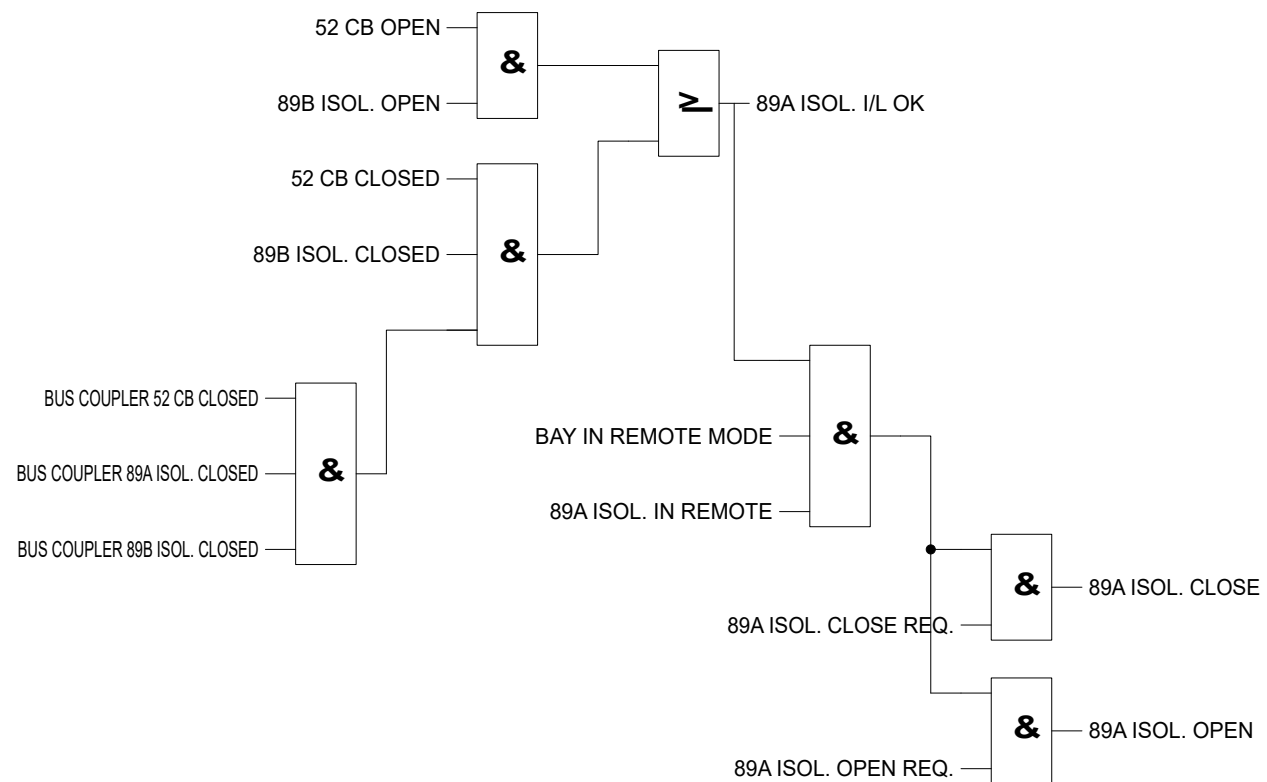
IP INDICATES INITIATION FROM PROTECTION FUNCTION TP INDICATES TRIP FROM PROTECTION FUNCTION RS INDICATES RESET STATUS FOR CB CLOSING

Based on		Prepared 05.01.2024 VINOD G		Title 220kV LINE FEEDER		Doc. kind. Circuit diagram		Ref.Des. =2KR	
		Approved 09.01.2024 GOURISH HEGDE		Control & Relay Panel		DCC EFS			
		Project APTRANSCO		Trip Logics		PG-GAS		Rev. ind.	
		STANDARD DRAWING		Hitachi Energy India Limited		Language en			
Rev. Revision note		Date Name		HITACHI		Doc. no. 1MNS500925-CABA		Sheet 23	
								n. sheet 24	

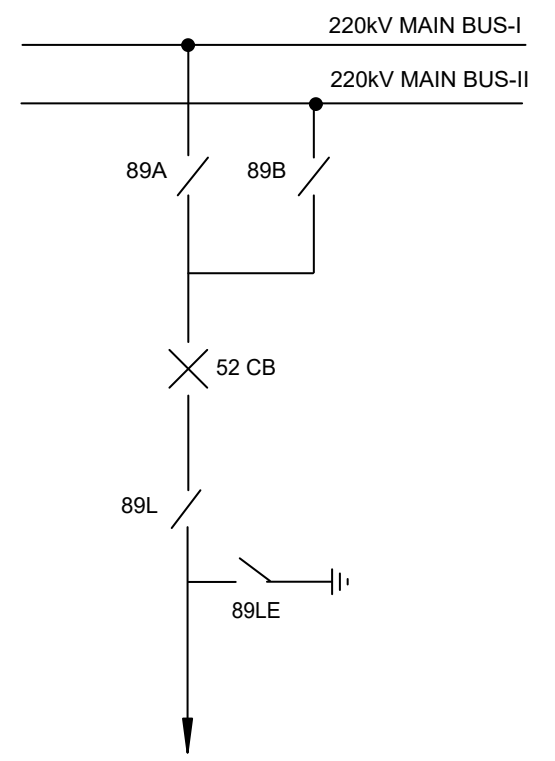
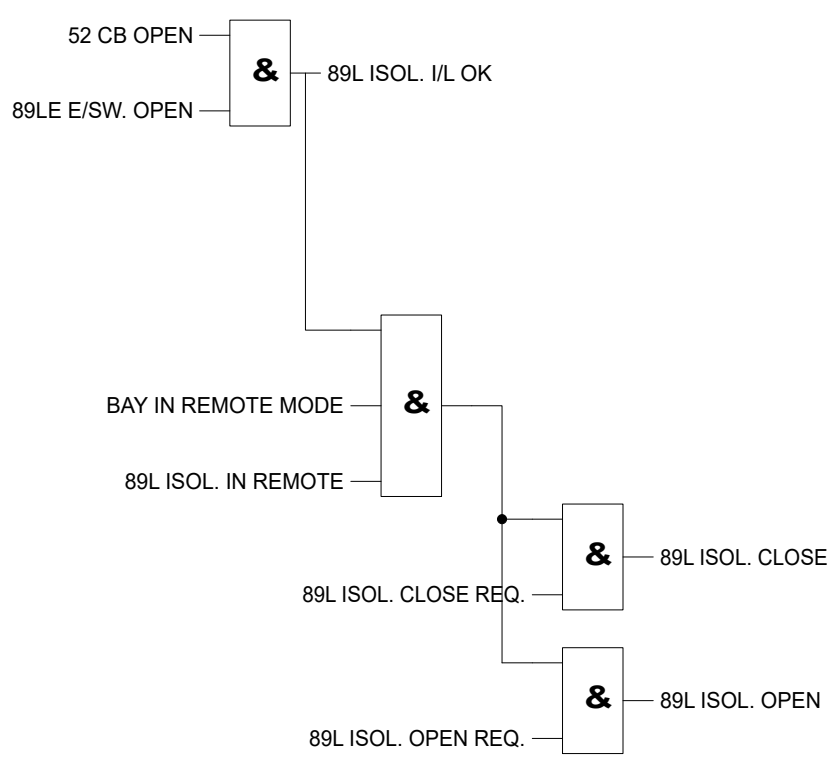
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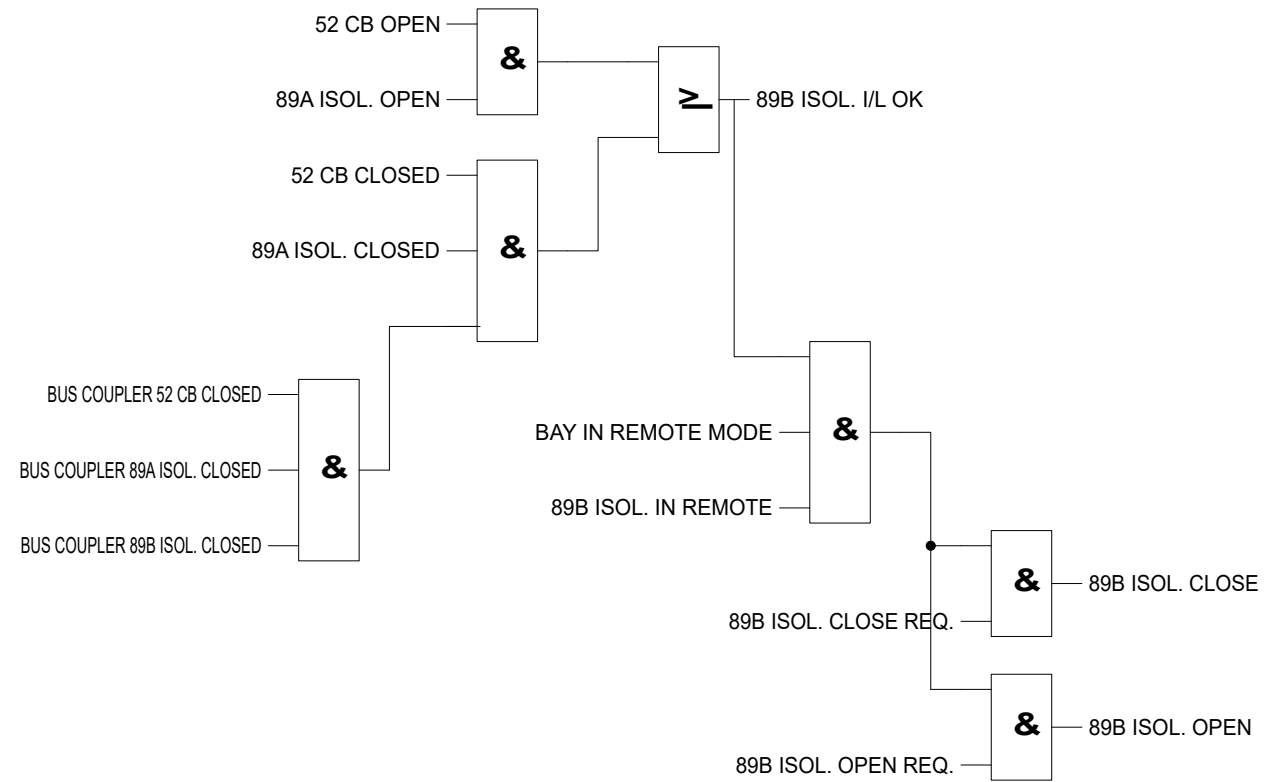
89A ISOL. OPEN/CLOSE INTERLOCK



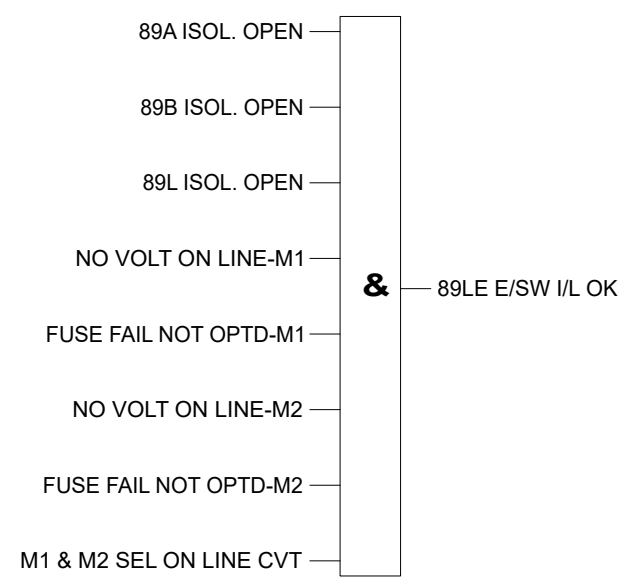
89L ISOL. OPEN/CLOSE INTERLOCK



89B ISOL. OPEN/CLOSE INTERLOCK



89LE E/SW. OPEN/CLOSE INTERLOCK



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

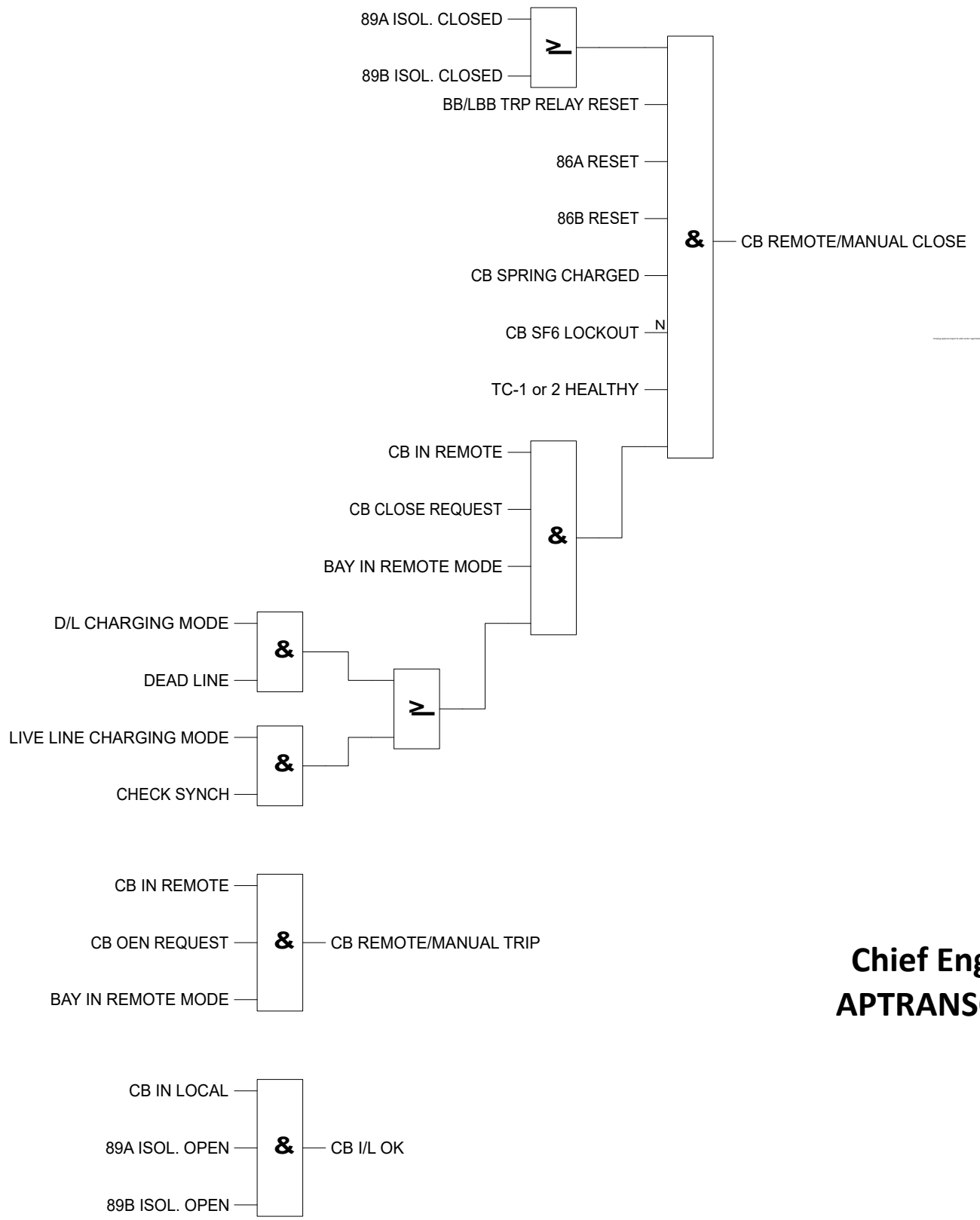
Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER		Doc. kind.	Circuit diagram		Ref.Des.	=2KR
		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel Interlocking Logics			DCC EFS				
		Project	APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited			Resp. dept.	PG-GAS	Rev. ind.	Language	en
Rev.	Revision note	Date	Name	HITACHI			Doc. no.		1MNS500925-CABA		Sheet	24
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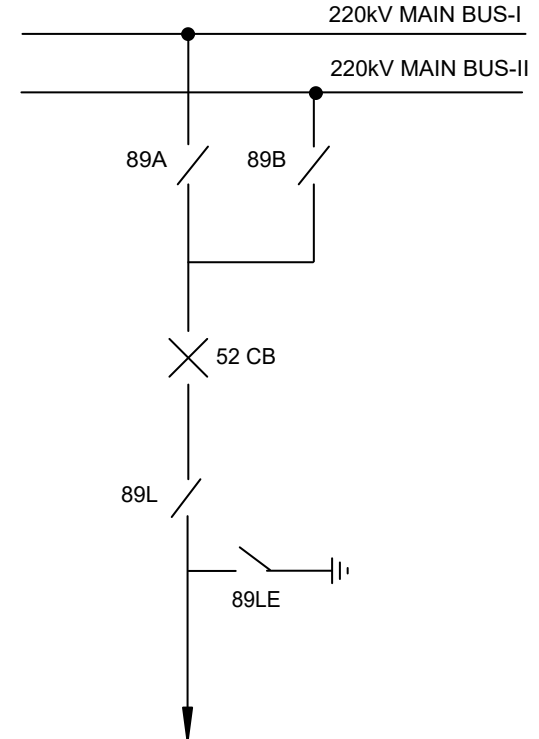
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52 CB TRIP/CLOSE INTERLOCK



Drawing approval subject to valid vendor registration

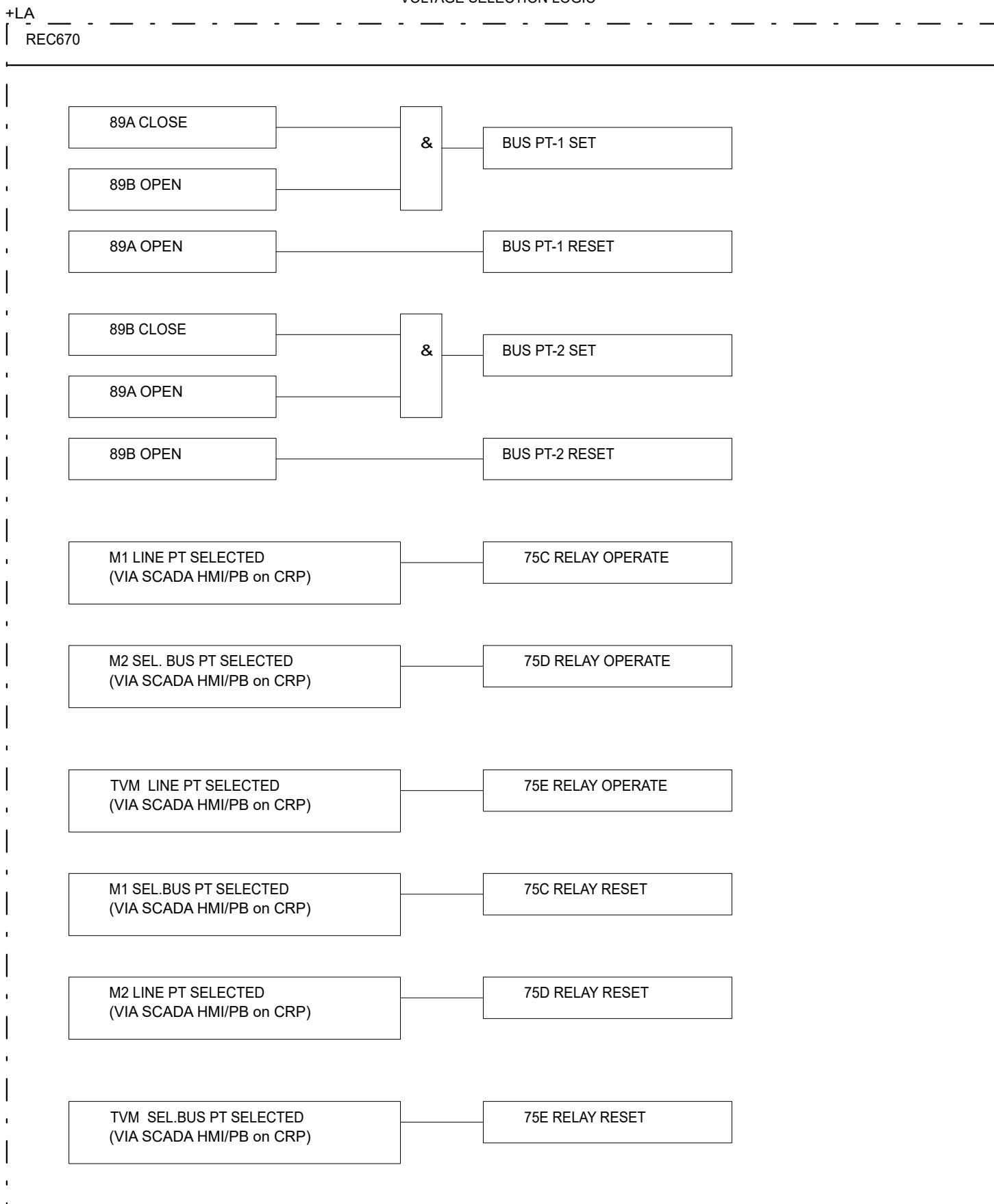
**Chief Engineer/Projects
APTRANSCO/VIS/Vijayawada.**



Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Interlocking Logics	Resp. dept. PG-GAS	Rev. ind. Language en
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Doc. no. 1MNS500925-CABA	
Rev.	Revision note	Date	Name			Sheet 25
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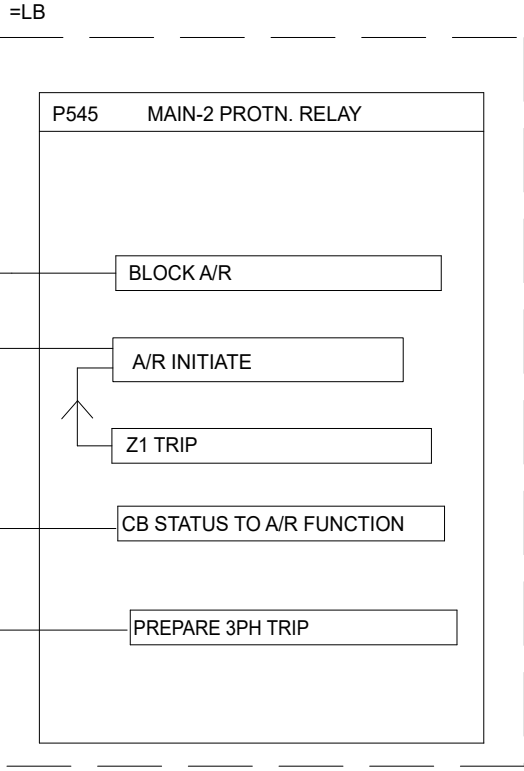
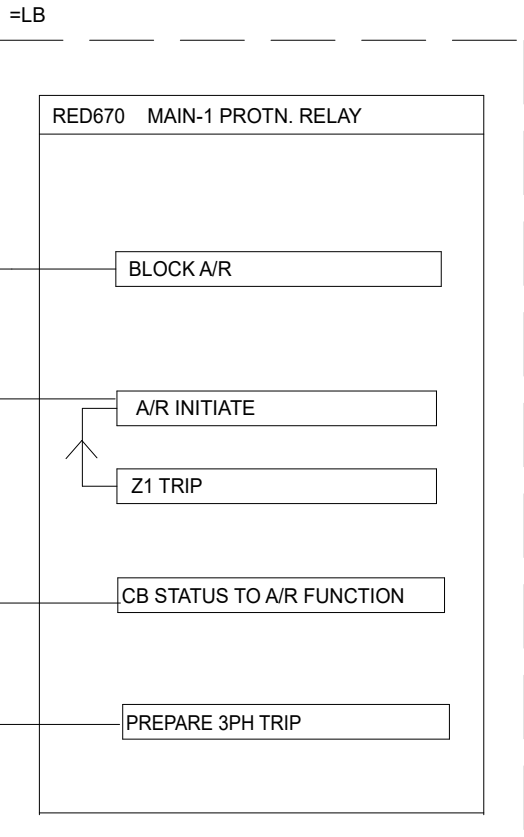
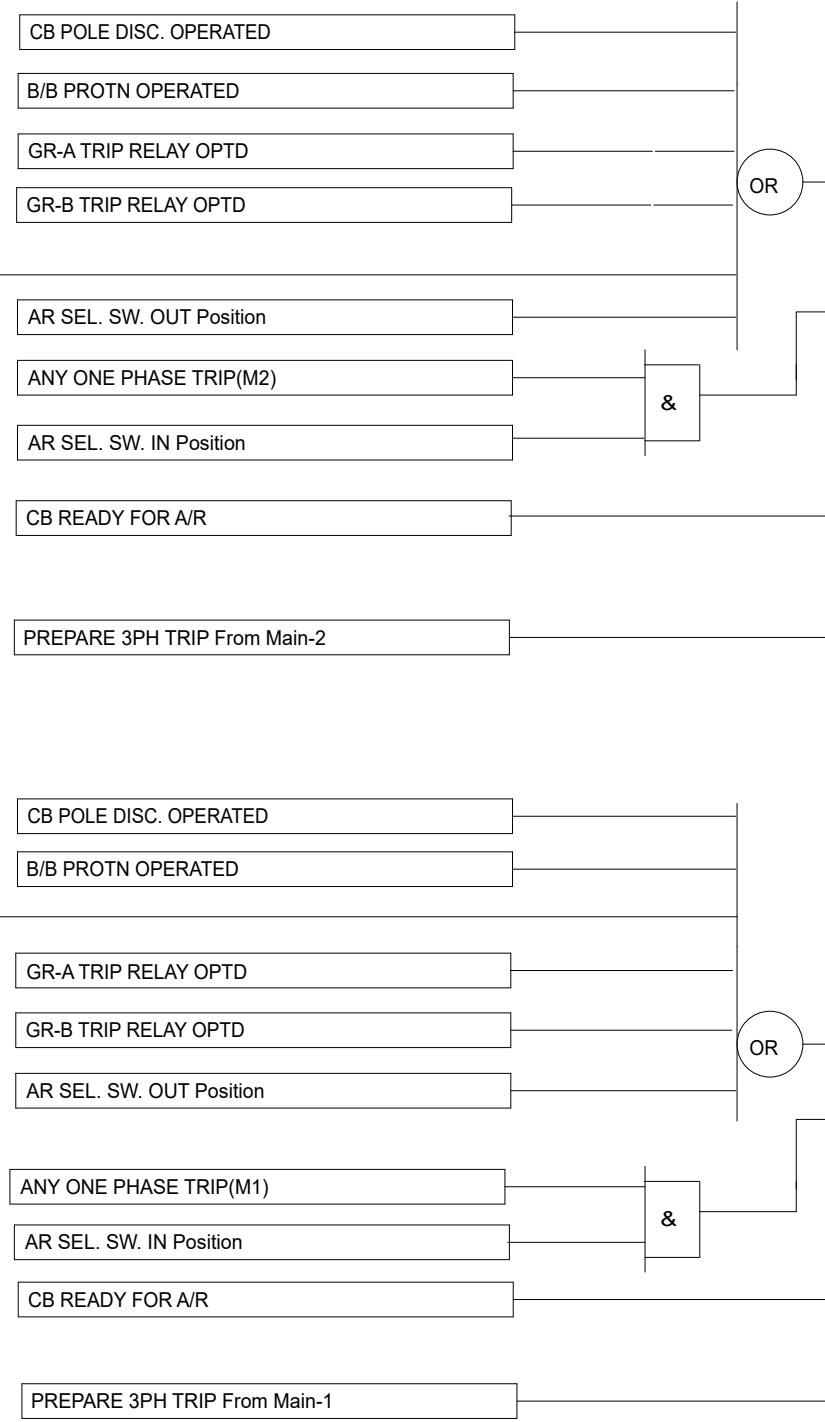
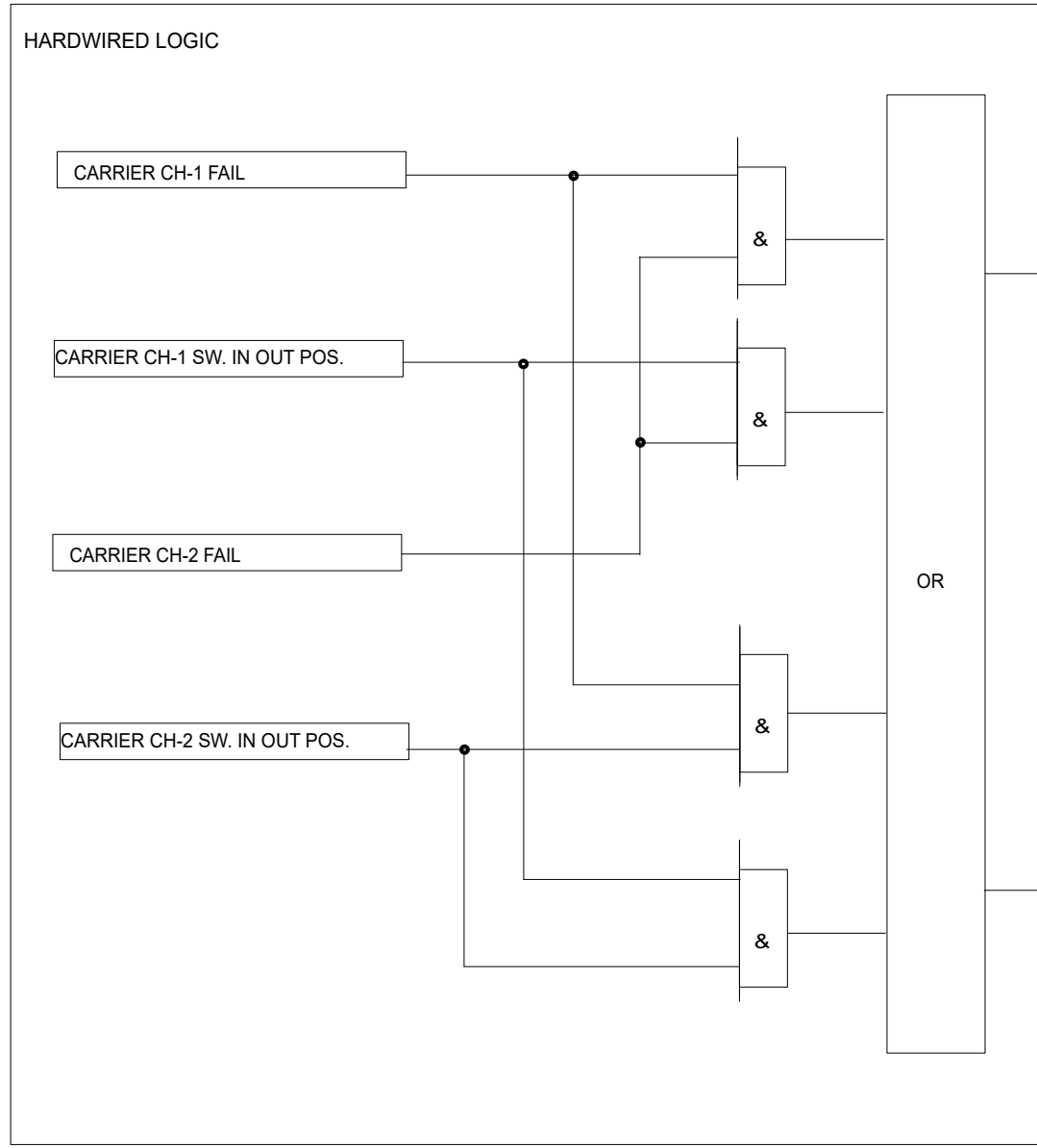
VOLTAGE SELECTION LOGIC



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

Based on		Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Circuit diagram		Ref.Des. =2KR	
		Approved 09.01.2024		GOURISH HEGDE		Control & Relay Panel		DCC EFS			
		Project APTRANSCO		STANDARD DRAWING		Hitachi Energy India Limited		PG-GAS		Rev. ind.	
						HITACHI		Language en		Sheet 26	
Rev.	Revision note	Date	Name					Doc. no. 1MNS500925-CABA		n. sheet 27	
1MYN691003-102(A3)REV01											

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Suitable for conventional 220KV SS only

NOTE:- BOTH A/R FUNCTION OF MAIN-1 & MAIN-2 SHALL OPERATE PARALLELLY.

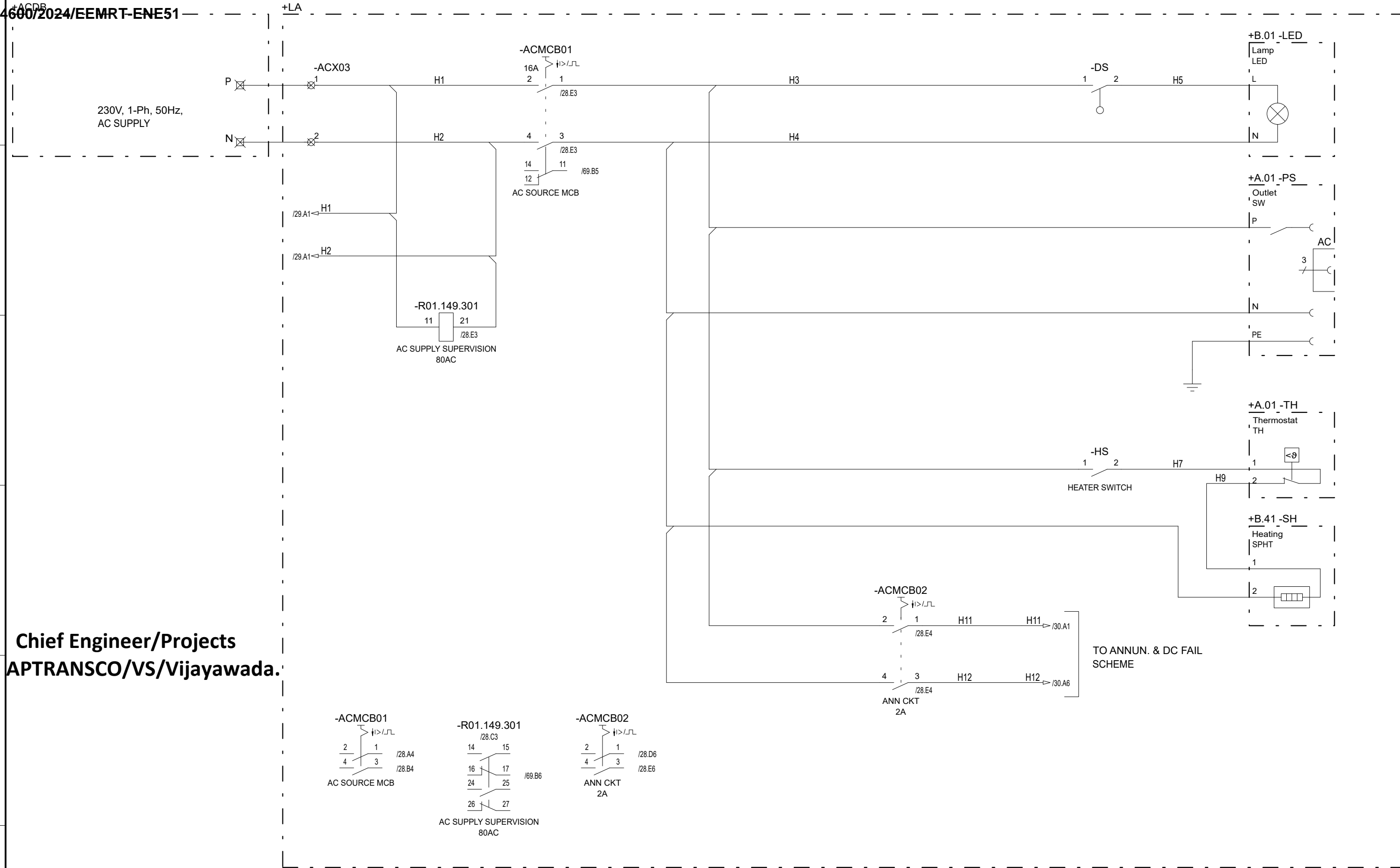
HARDWIRED SIGNAL

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
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		Project APTRANSCO		Auto Reclosure Logics	PG-GAS	Rev. ind.
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name		Doc. no. 1MNS500925-CABA	Sheet 27
1MYN691003-102(A3)REV01						n. sheet 28

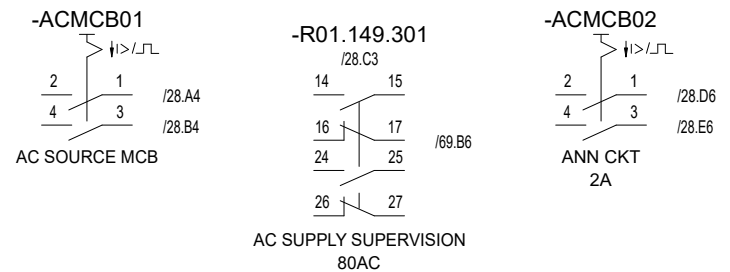
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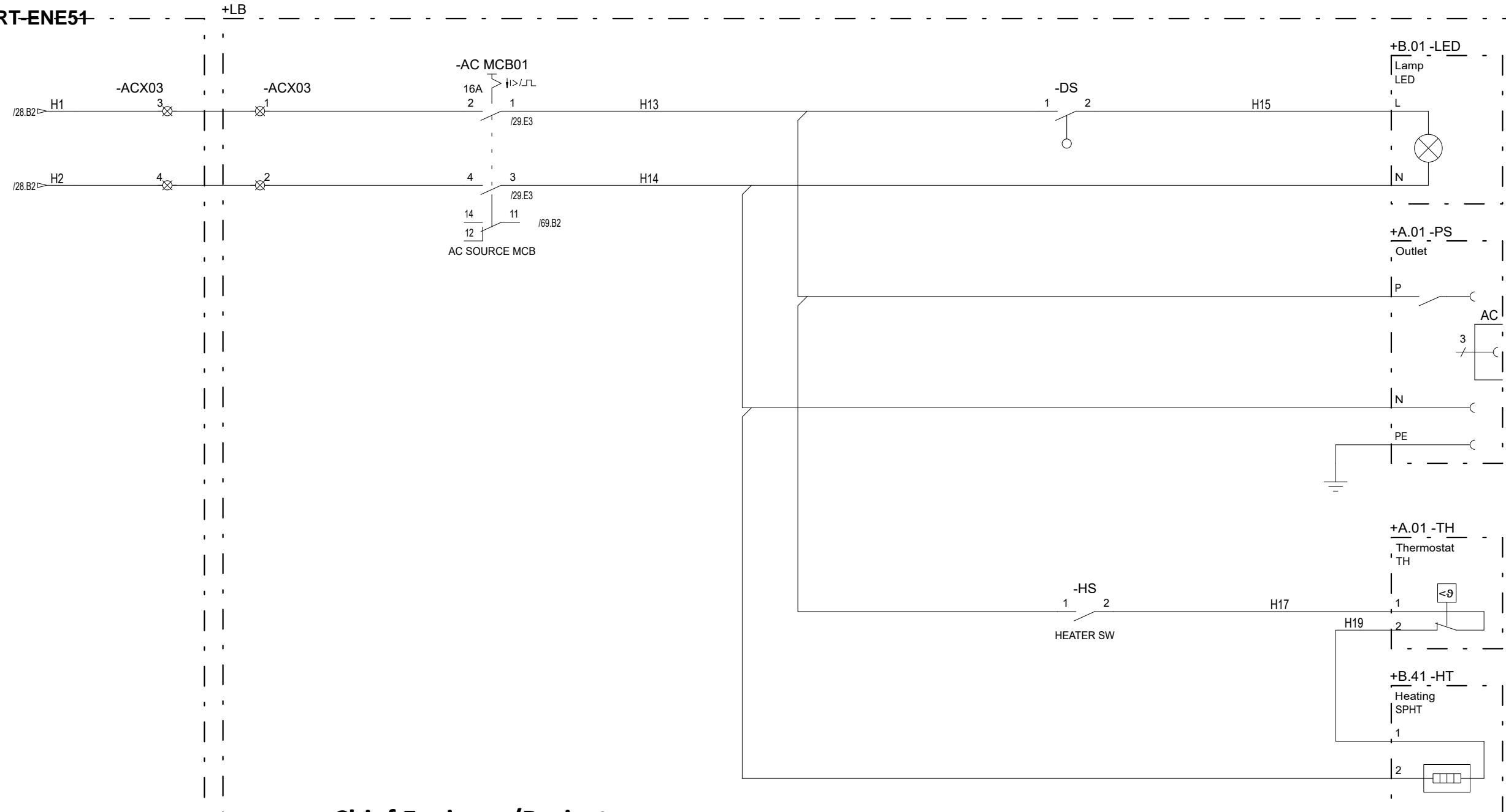
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Rev.		Revision note	Date	Name	HITACHI Hitachi Energy India Limited		Doc. no.		1MNS500925-CABA		
									Sheet	28	
									n. sheet	29	

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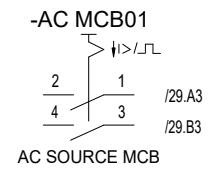
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Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
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		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CABA		Sheet 29
1MYN691003-102(A3)REV01						n. sheet 30

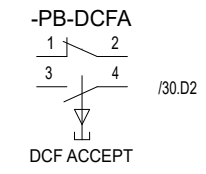
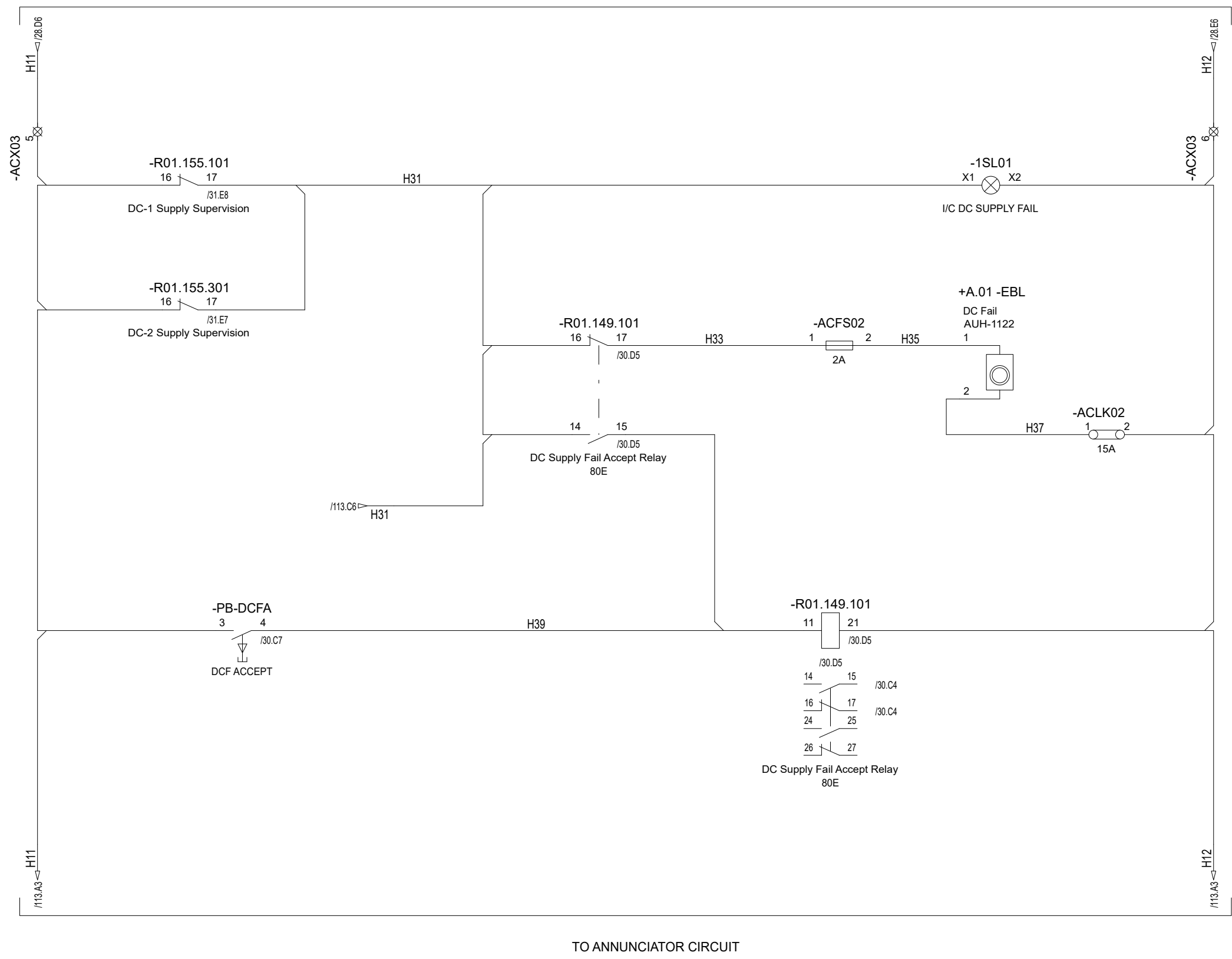
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FROM 230V AC SUPPLY



TO ANNUNCIATOR CIRCUIT

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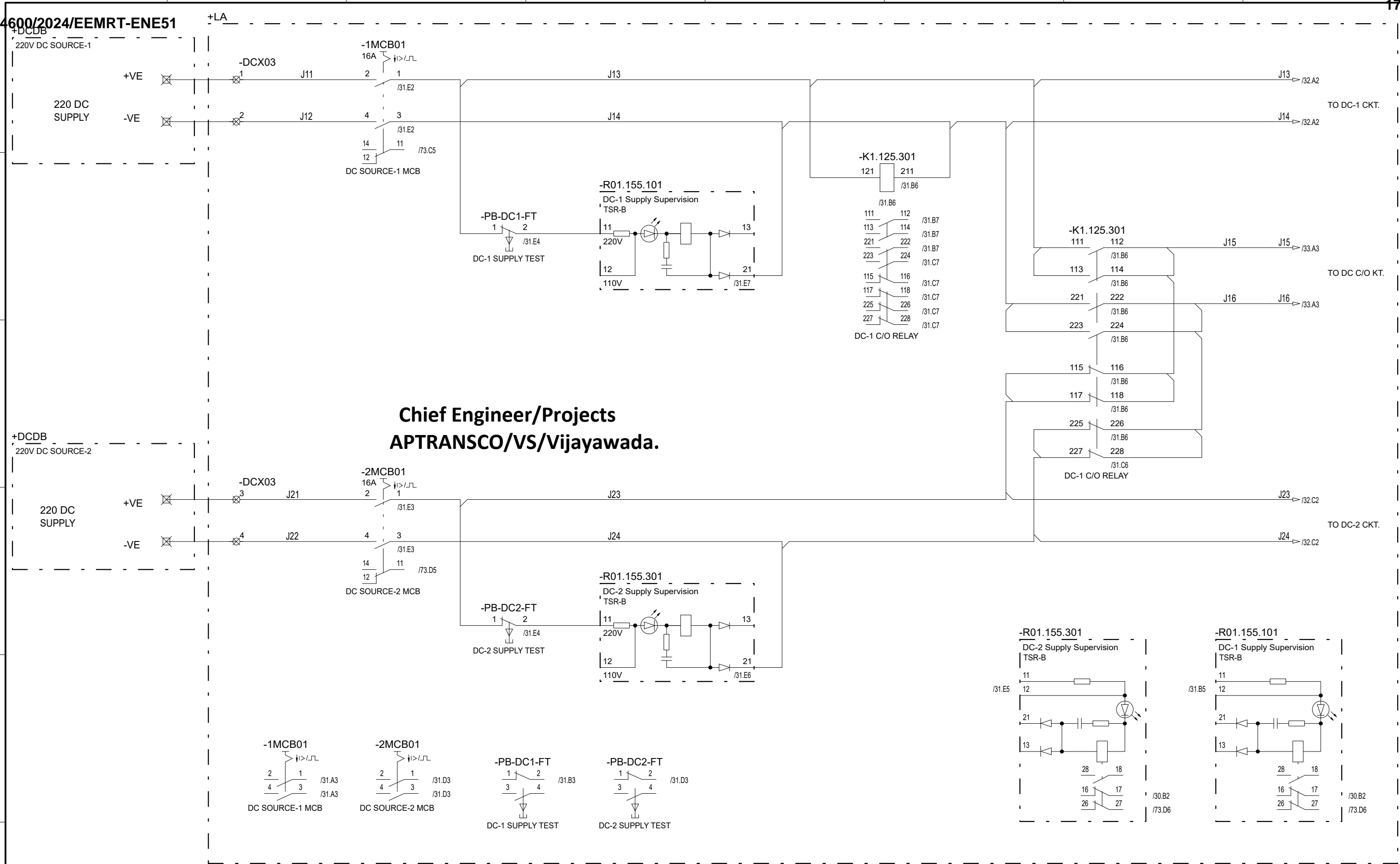
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					HITACHI		Hitachi Energy India Limited				Doc. no.	1MNS500925-CABA
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1MYN691003-102(A3)REV01										n. sheet	31	

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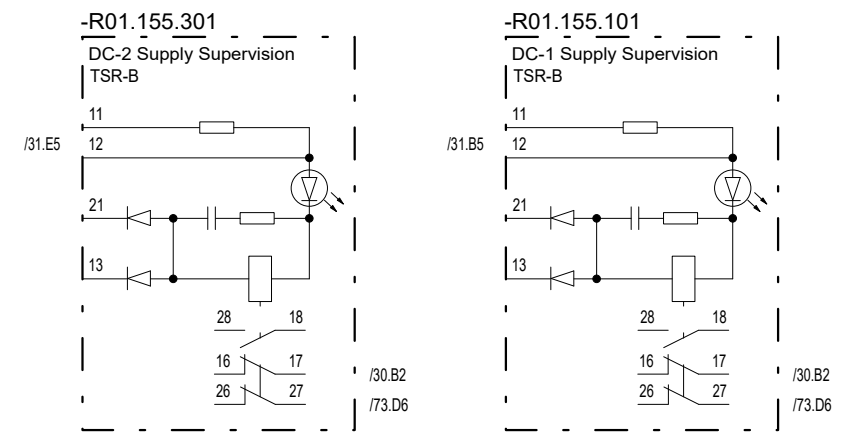
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Based on	Prepared	05.01.2024	VINOD G
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	Project	APTRANSCO STANDARD DRAWING	
Rev.	Revision note	Date	Name
1	1MYN691003-102(A3)REV01		

Title	220kV LINE FEEDER Control & Relay Panel DC Distribution Circuit
Doc. kind.	Circuit diagram
Doc. no.	1MNS500925-CABA

Doc. kind.	Circuit diagram	Ref.Des.	=2KR
Doc. no.	1MNS500925-CABA	Language	en
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		n. sheet	32

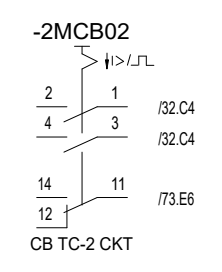
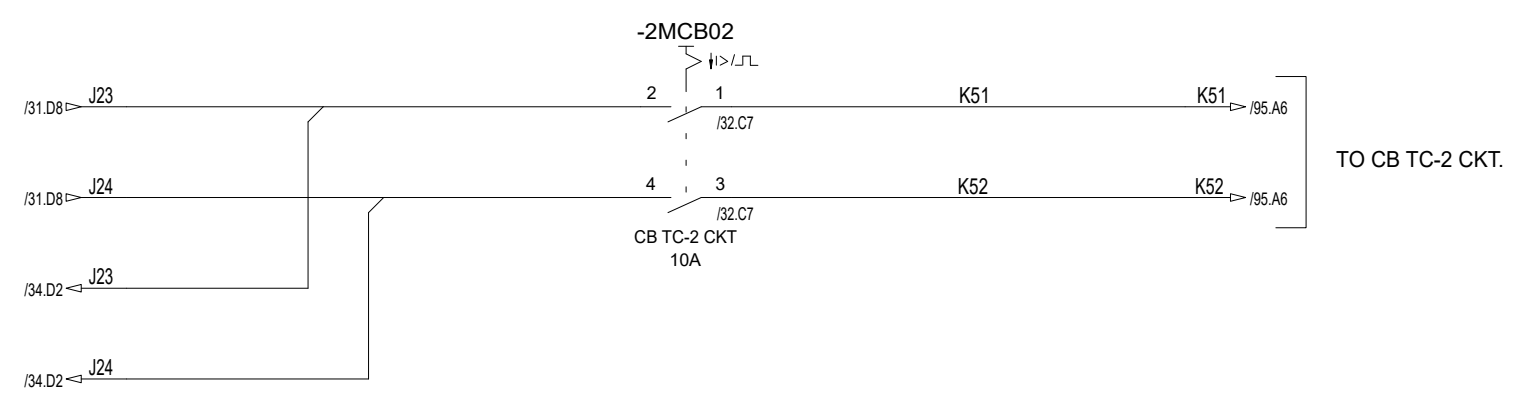
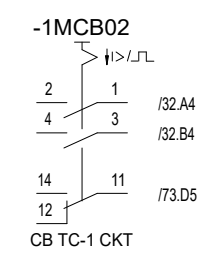
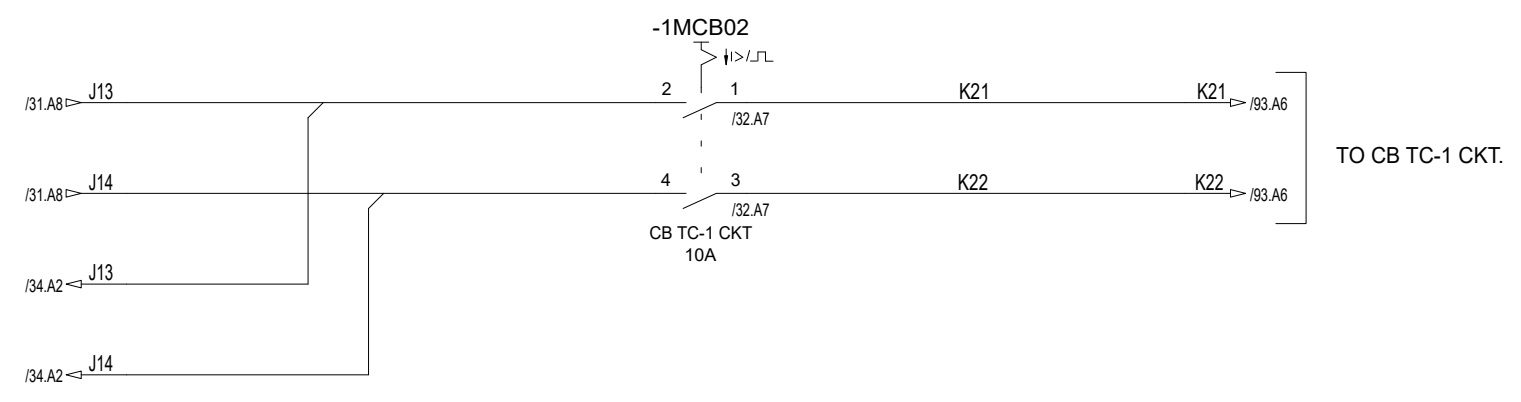
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Doc. no.	1MNS500925-CABA	Language	en
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		n. sheet	32



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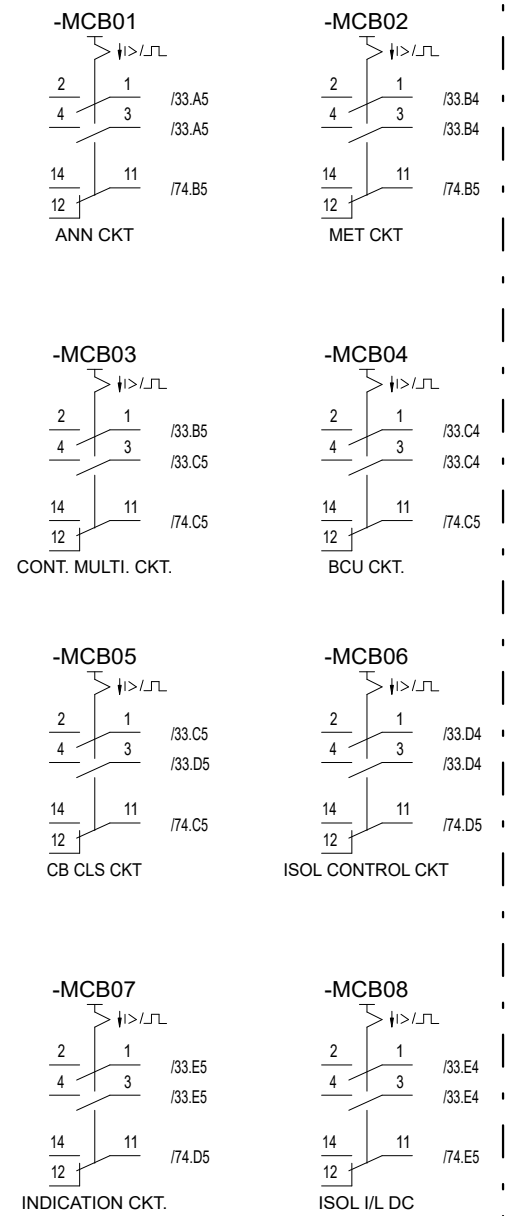
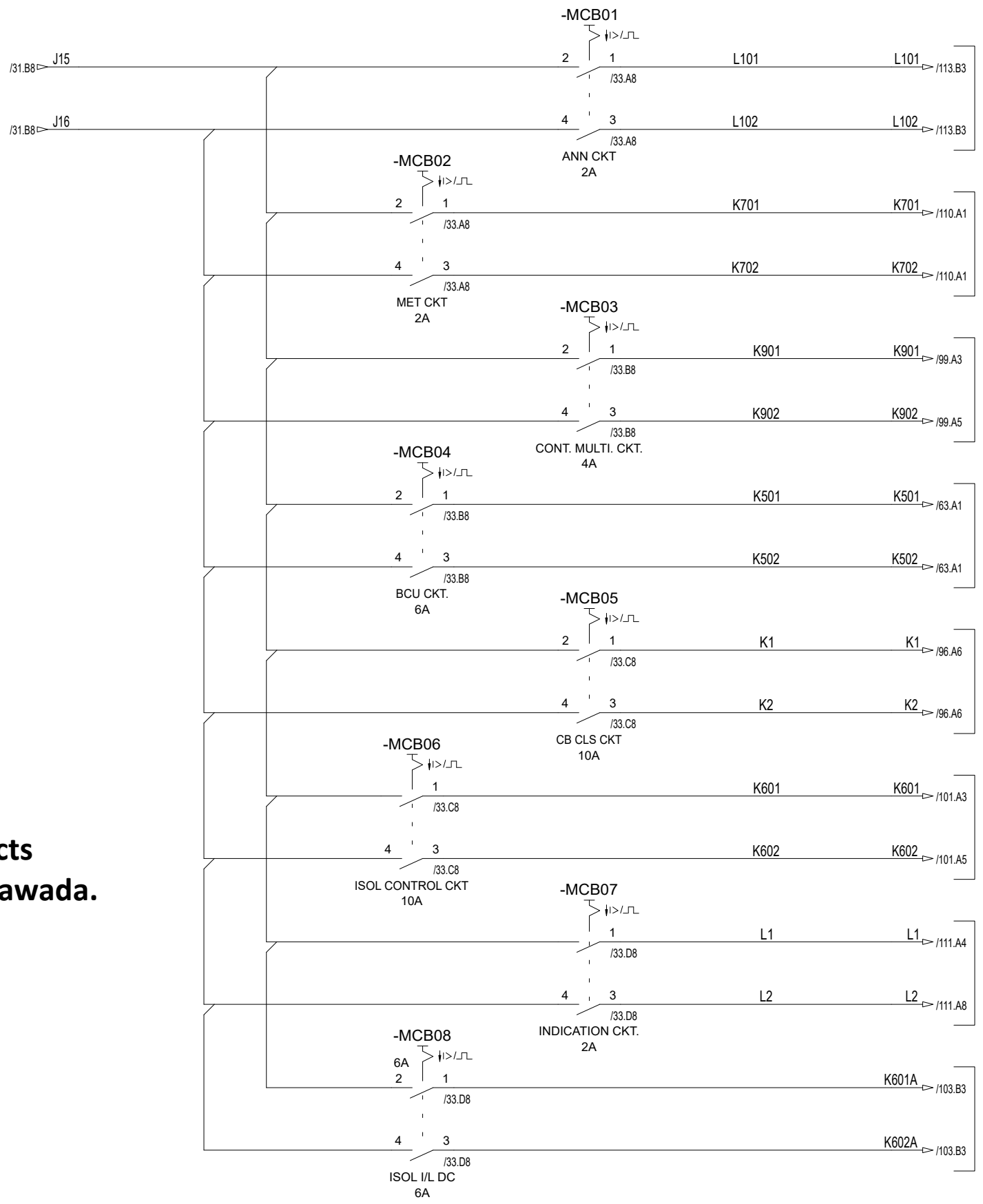
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		Project APTRANSCO				DC Distribution Circuit		Resp. dept. PG-GAS		Rev. ind.	
		STANDARD DRAWING				Hitachi Energy India Limited		Language en		Sheet 32	
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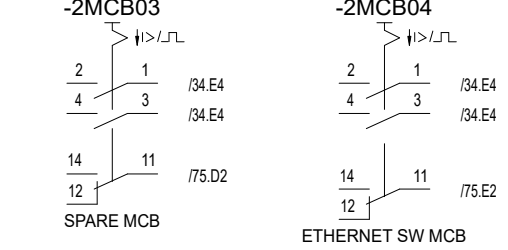
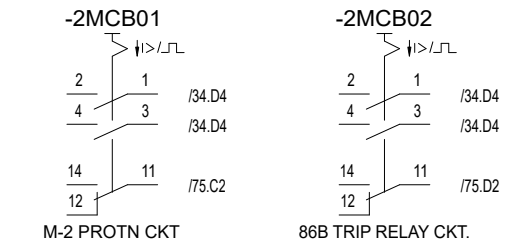
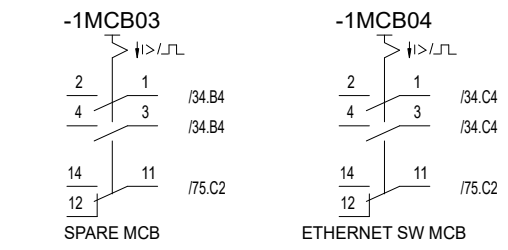
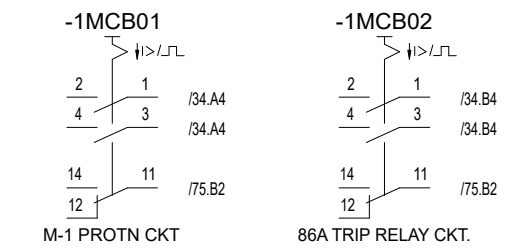
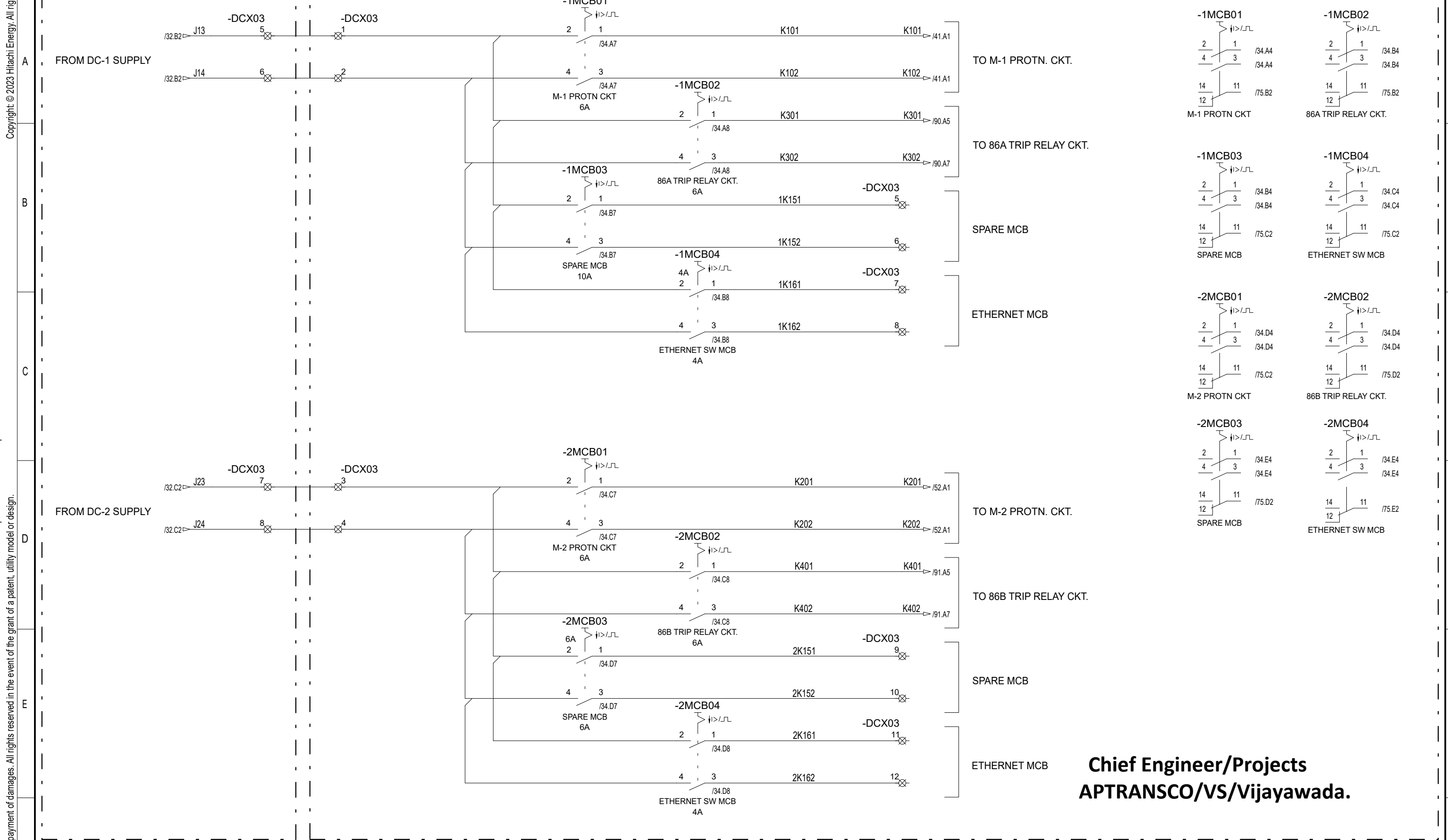
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		Project APTRANSCO		DC Distribution Circuit	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 33
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Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER	Doc. kind.	Circuit diagram	Ref.Des.	=2KR	
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		Project	APTRANSCO STANDARD DRAWING		DC Distribution Circuit		Resp. dept.	PG-GAS	Rev. ind.	Language	en
					Hitachi Energy India Limited						
Rev.	Revision note	Date	Name		HITACHI		Doc. no.		1MNS500925-CABA		
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									n. sheet	35	

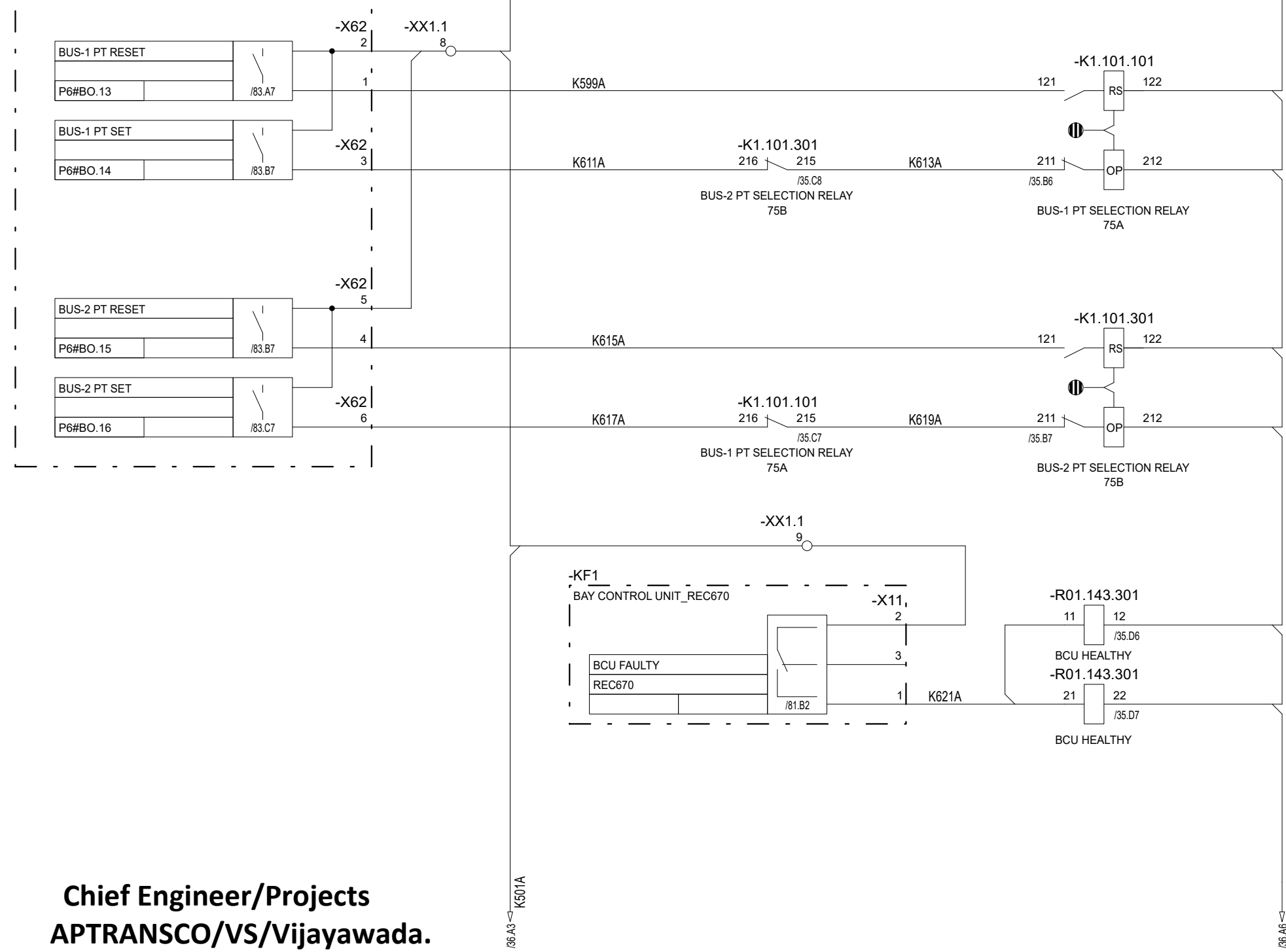
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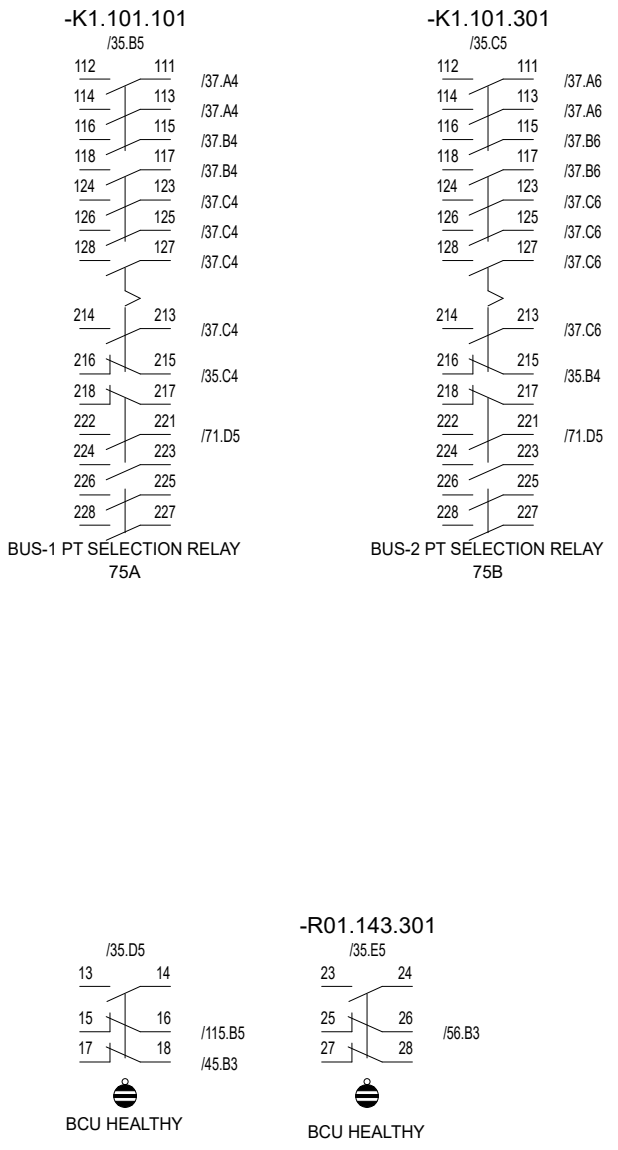
Suitable for conventional 220KV SS only

Drawing approval subject to valid vendor registration

-KF1
BAY CONTROL UNIT_REC670



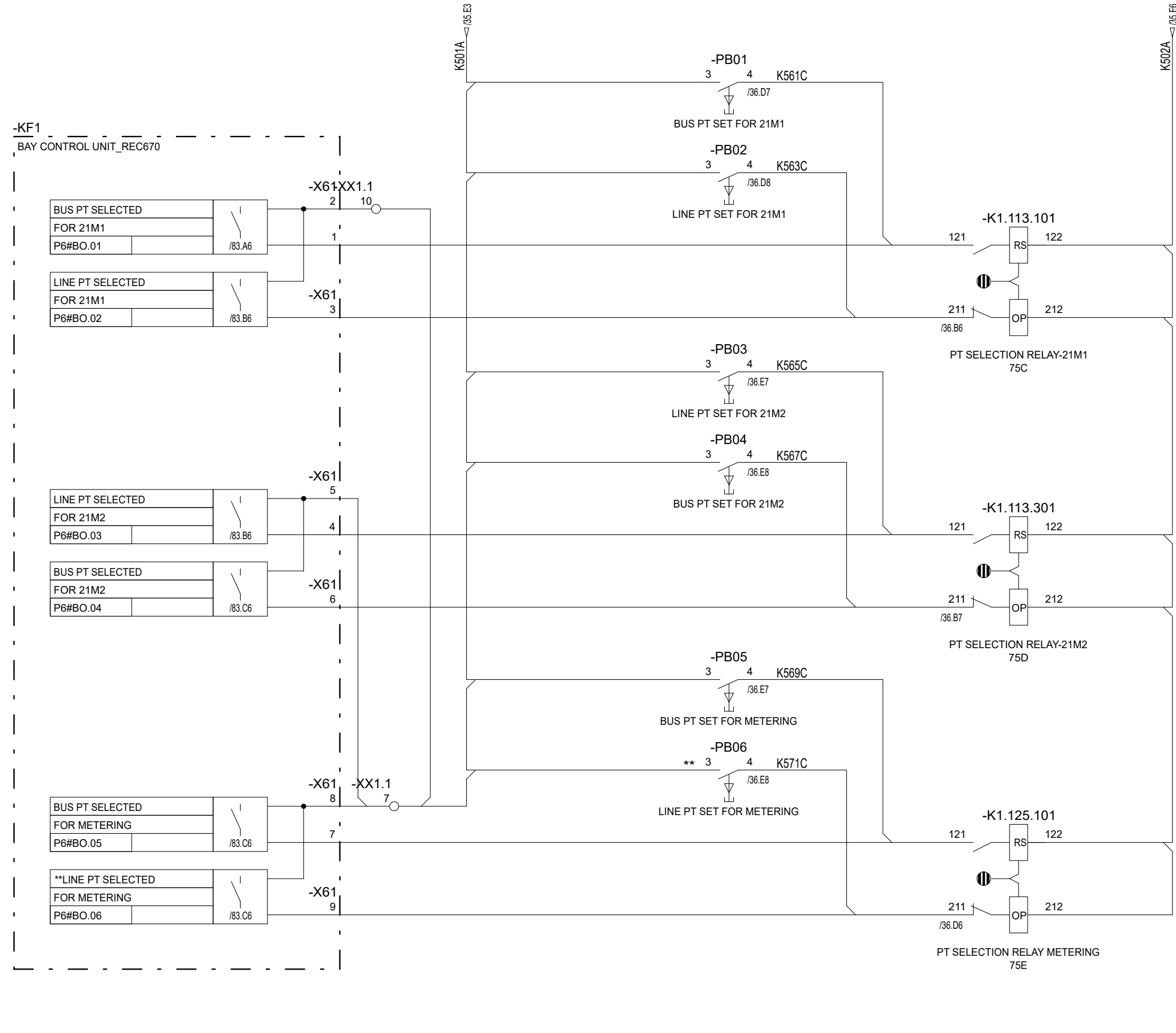
Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.



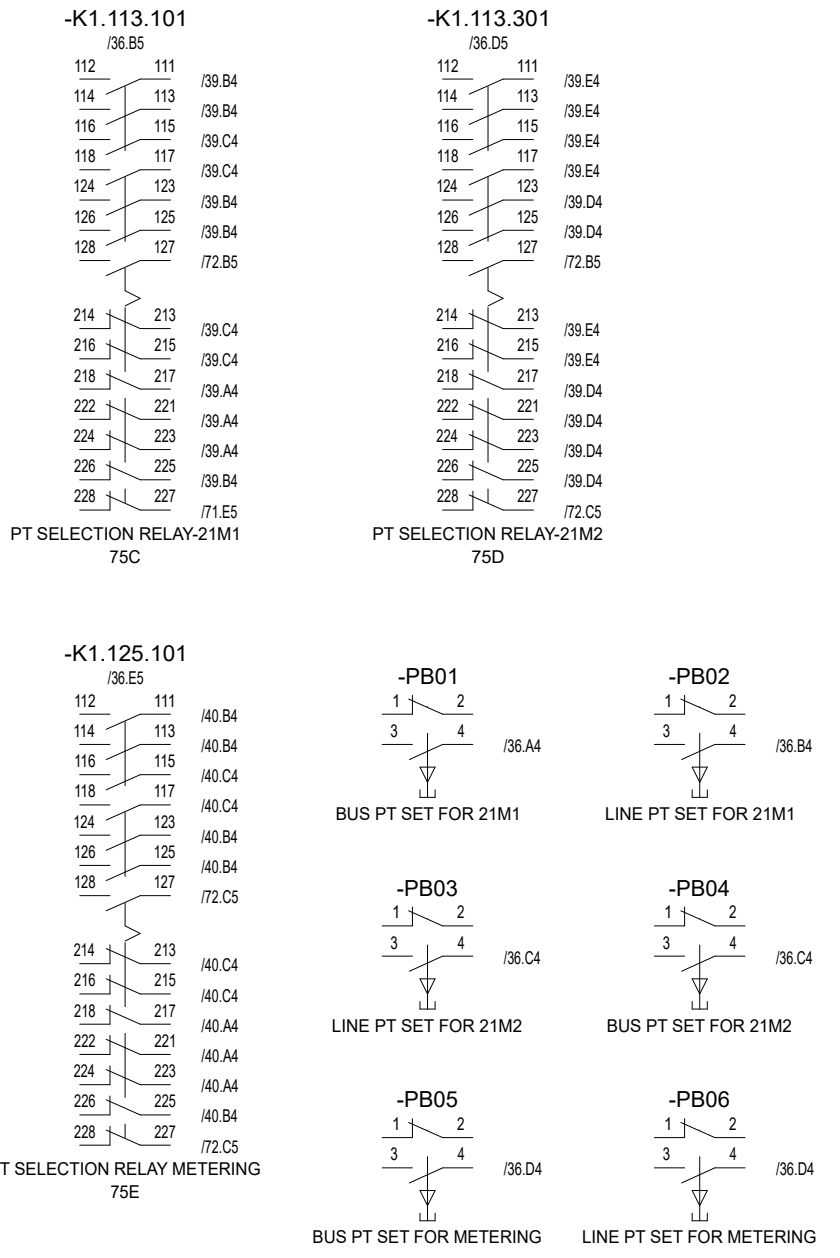
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		Project	APTRANSCO STANDARD DRAWING		BUS-1 / 2 PT Selection Relay Circuit		Resp. dept.	PG-GAS	Rev. ind.	Language	en
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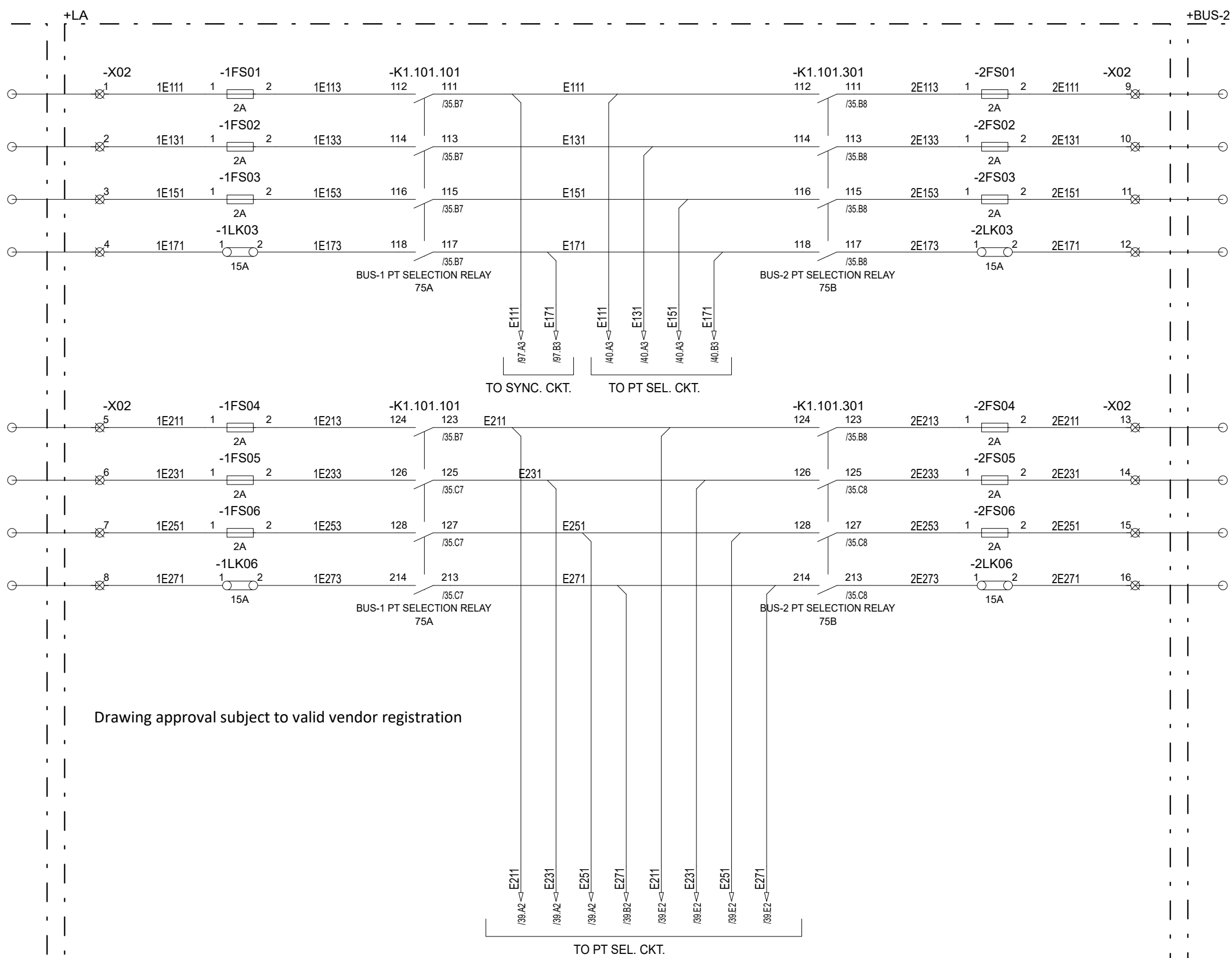
** PRIORITY SHALL BE GIVEN FOR LINE PT. BUS PT SHALL BE SET ONLY IF LINE PT IS UNHEALTHY.

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
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		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 36
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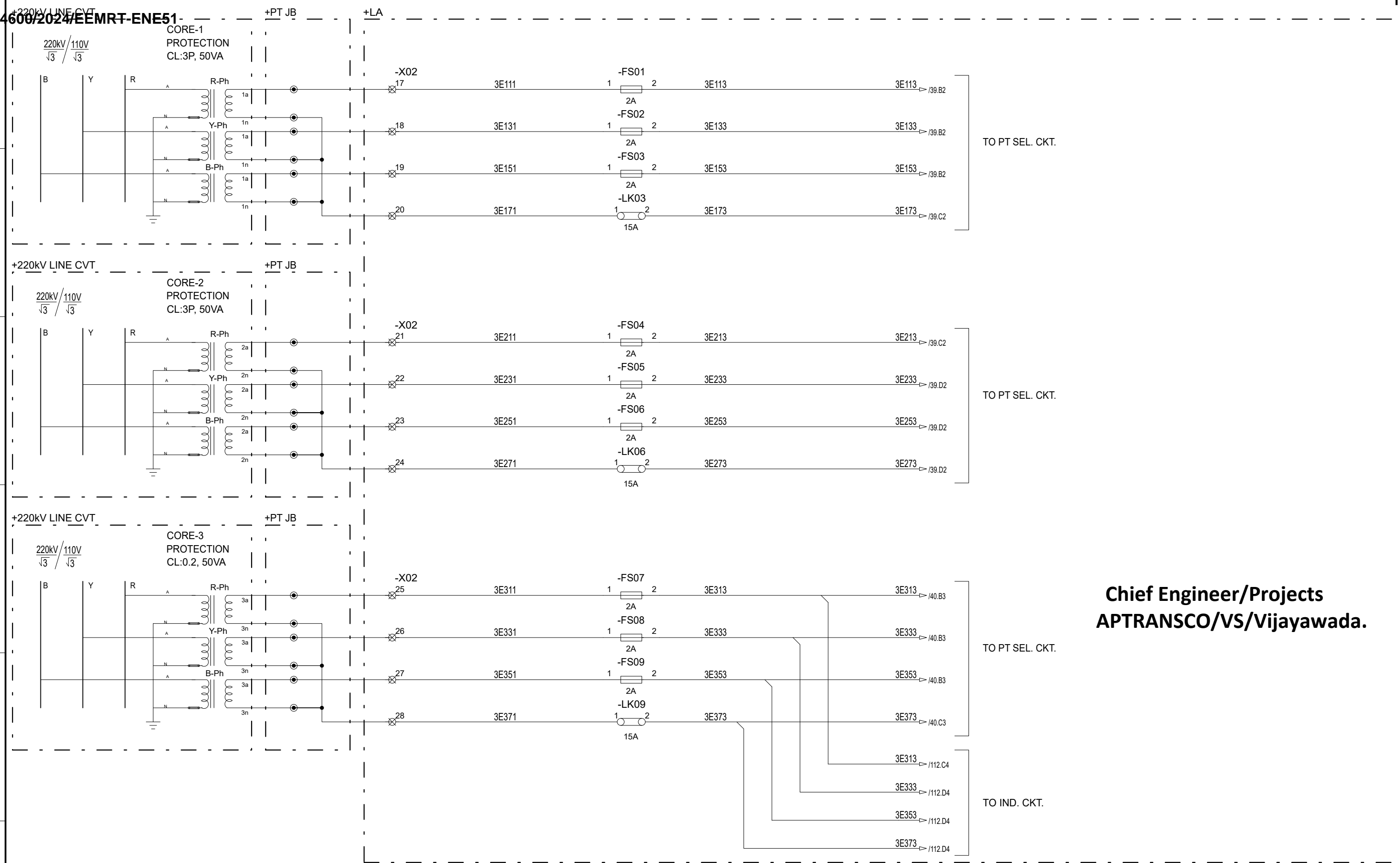
Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

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Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CABA		Sheet 37
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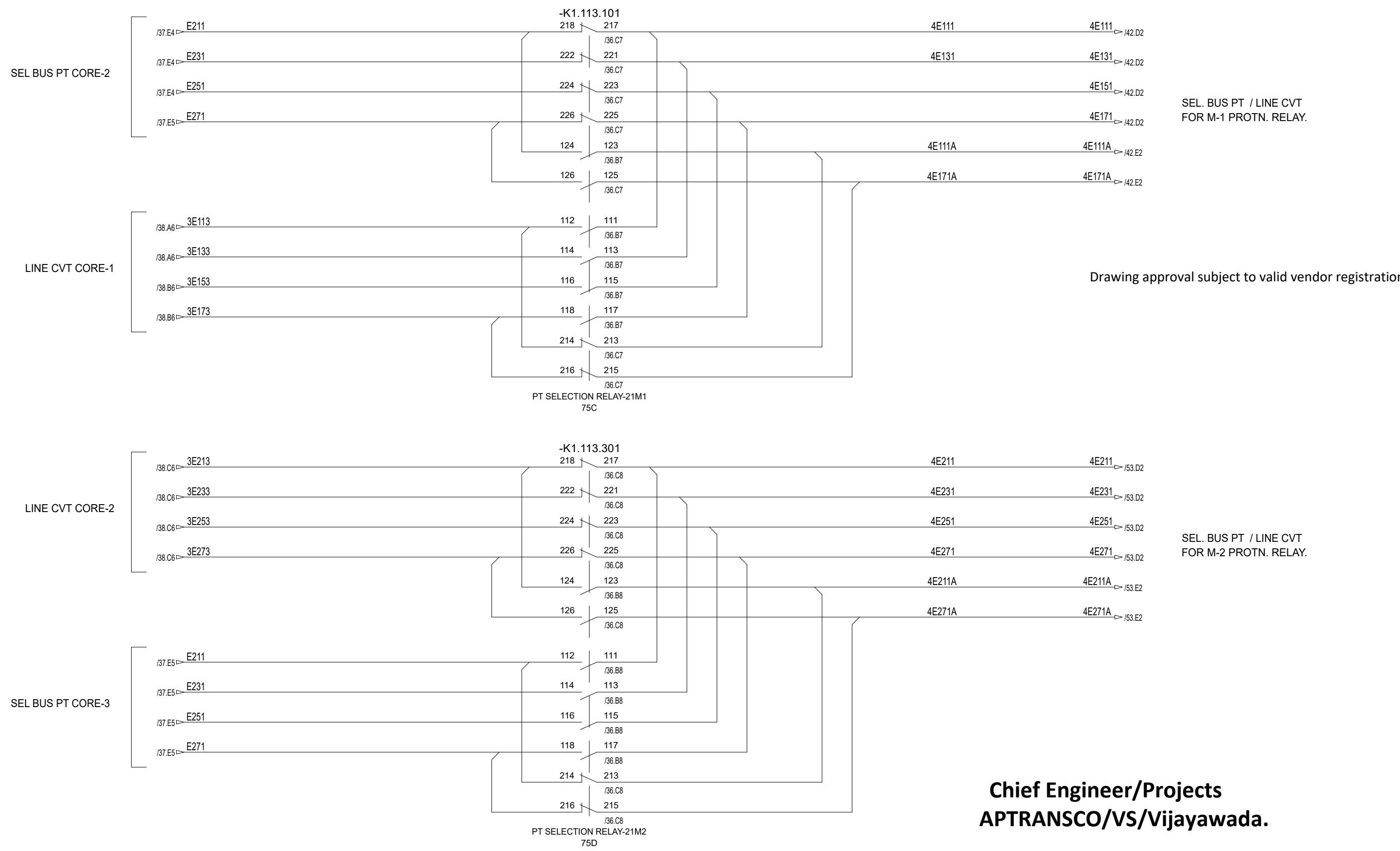
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Rev.	Revision note	Date	Name				HITACHI	1MNS500925-CABA			Sheet
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SEL. BUS PT / LINE CVT FOR M-1 PROTN. RELAY.

SEL. BUS PT / LINE CVT FOR M-2 PROTN. RELAY.

Drawing approval subject to valid vendor registration

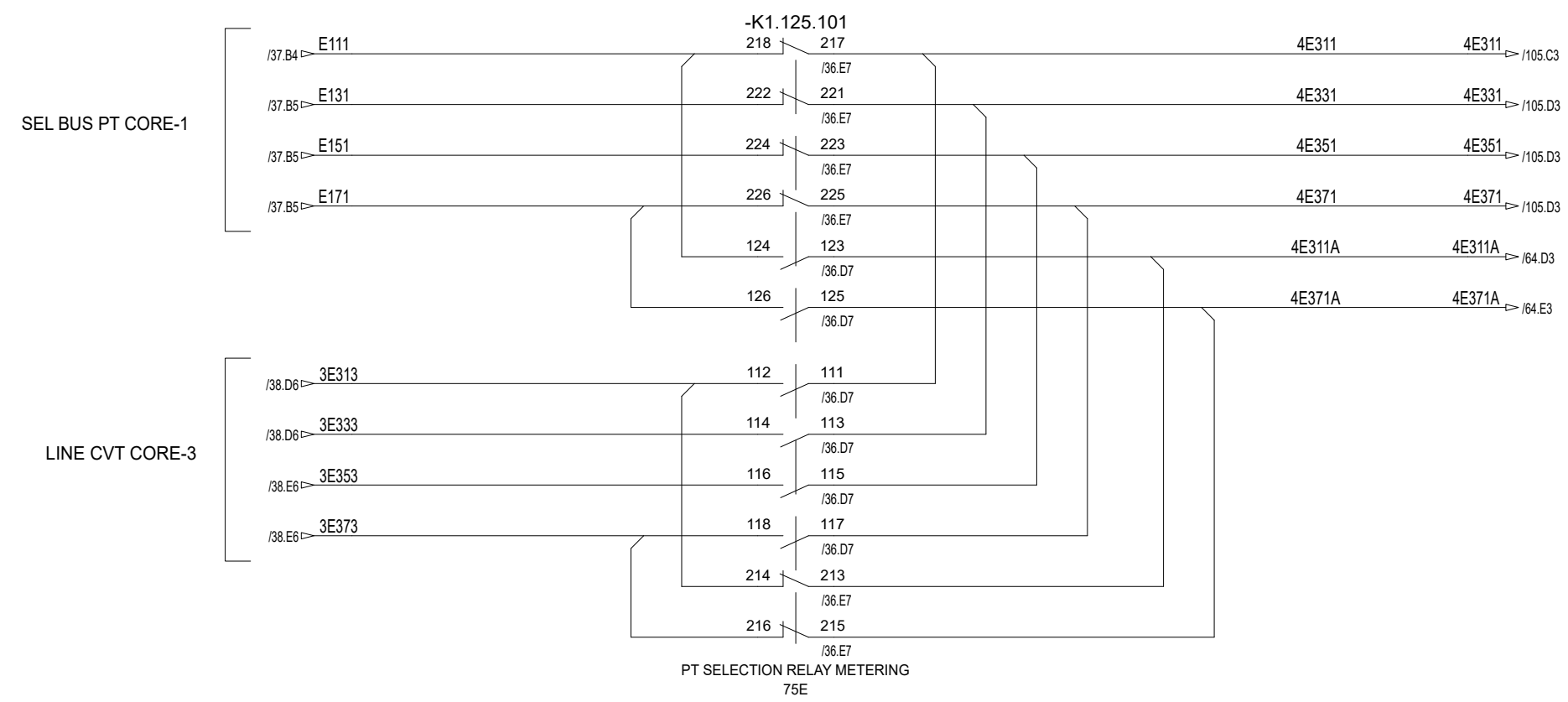
Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

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Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 39
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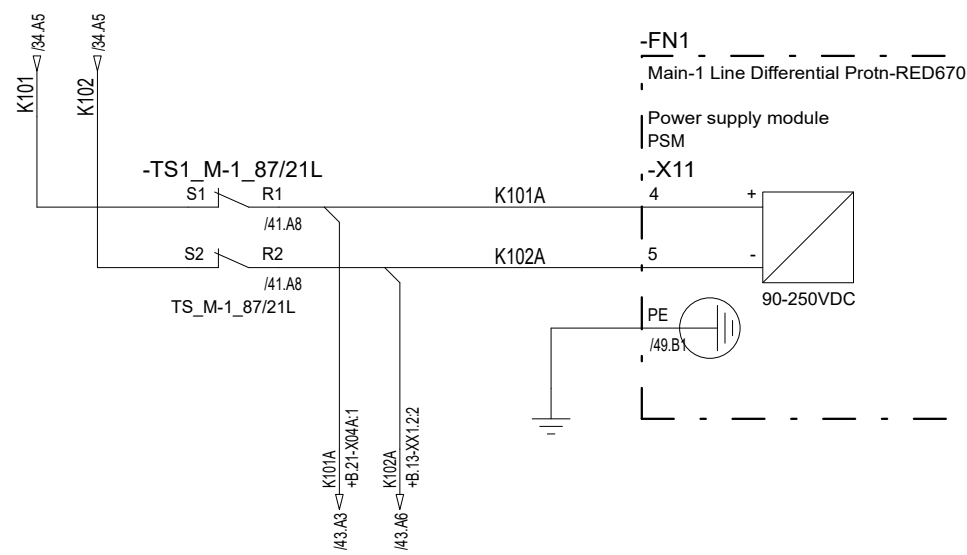


SEL. BUS PT / LINE CVT
FOR METERING CKT.

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Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER		Doc. kind.	Circuit diagram		Ref.Des.	=2KR	
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Rev.	Revision note	Date	Name	Doc. no.						n. sheet		41	
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LIST OF FUNCTIONS AVAILABLE IN RELAY

- Differential Protection (PDIF,87L)
- Distance Protection (PDIS,21)
- Autoreclose Protection (79)
- Automatic Switch on to fault(PSOF)
- Residual O/C protection(PDEF,67N)
- Fuse fail supervision(RFUF)
- Scheme Communication(PSCH,78)
- Tripping Logic(PTRC,94)
- Disturbance Recorder(RDRE) upto 200 disturbances
- Fault Locator(RFLO)
- PSB
- Auto Reclose Function
- Event Recorder (RDRE)
- Current Reversal
- Week end Infeed logics
- 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

-FN1
Main-1 Line Differential Protn-RED670

+D.04 -FN1
Indication HMI LED

RED INDICATION (GR-1)

- DIFFERENTIAL PROTN. OPTD.
- DISTANCE PROTN. OPTD.
- R-PH FAULT
- Y-PH FAULT
- B-PH FAULT
- E/F TRIP
- ZONE-1 TRIP
- ZONE-2 TRIP
- ZONE-3 TRIP
- ZONE-4 TRIP
- ZONE-5 TRIP (REV)
- Z-COM TRIP
- SOTF TRIP
- O/C TRIP
- E/F TRIP

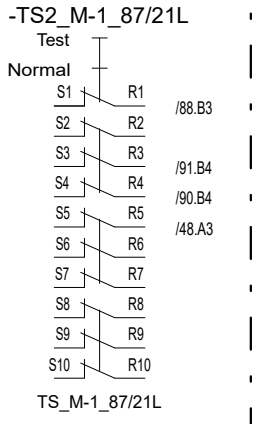
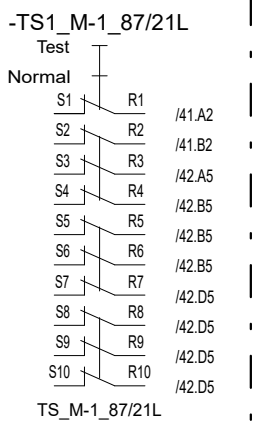
+D.04 -FN1
Indication HMI LED

YELLOW INDICATION (GR-2)

- PSB/BRC ALARM
- VTFF ALARM
- AR BLOCK
- AR CLOSE
- DIFFERENTIAL BLOCKED
- FO CHANNEL-1 FAIL
- FO CHANNEL-2 FAIL
- CARRIER SEND
- DT RECEIVED

+D.04 -FN1
Indication HMI LED

GREEN INDICATION (GR-3)



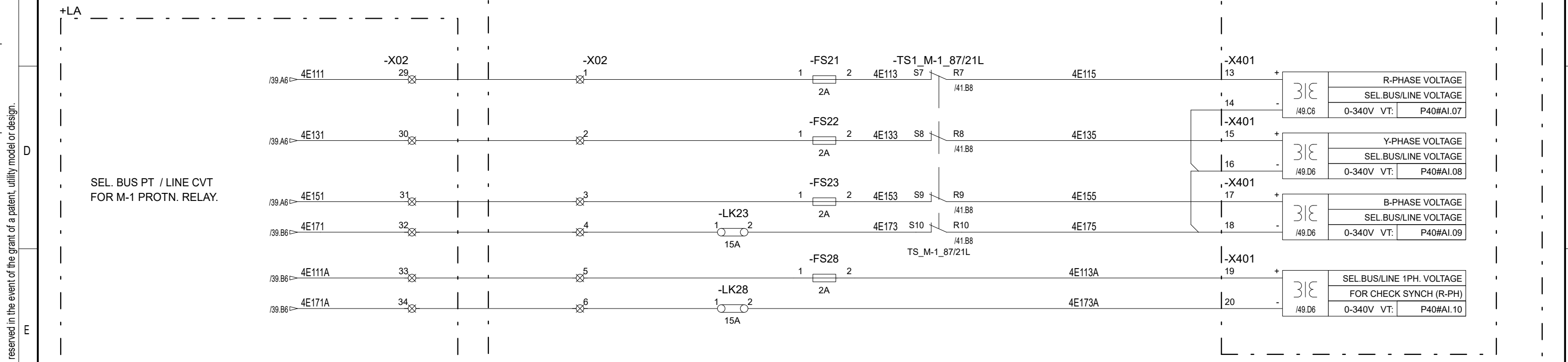
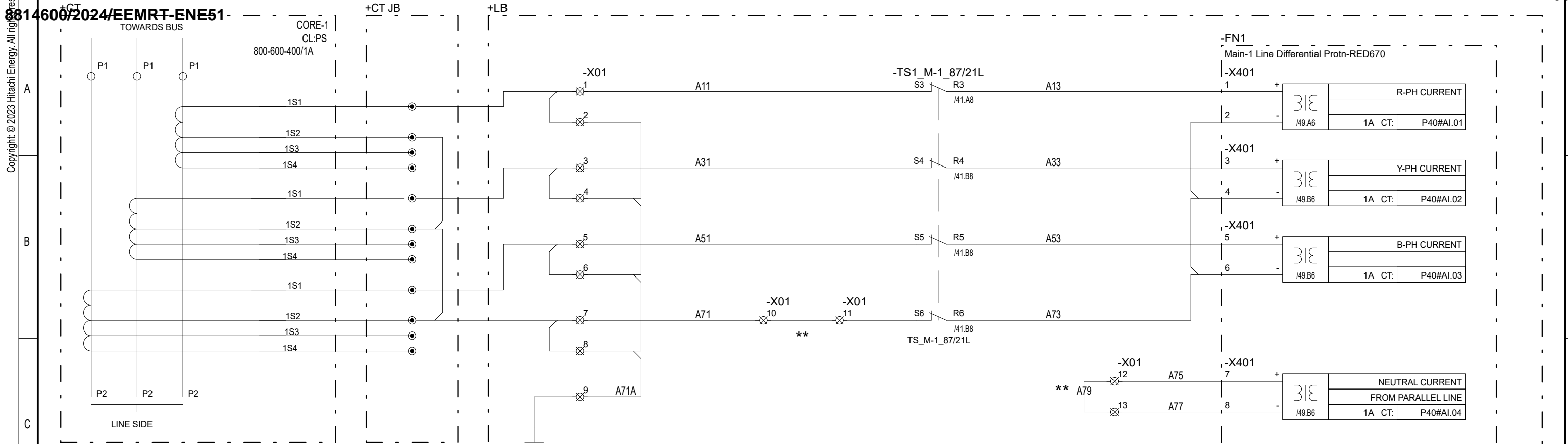
List of Functional Key Indication

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

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

Based on		Prepared 05.01.2024 VINOD G		Title 220kV LINE FEEDER		Doc. kind. Circuit diagram		Ref.Des. =2KR	
		Approved 09.01.2024 GOURISH HEGDE		Control & Relay Panel		DCC EFS			
		Project APTRANSCO		Power supply Circuit to M1 Relay		Resp. dept. PG-GAS		Rev. ind.	
		STANDARD DRAWING		Hitachi Energy India Limited		Language en			
Rev.	Revision note	Date	Name	HITACHI		Doc. no. 1MNS500925-CABA		Sheet 41	
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NOTE:- CT DETAILS TO BE CONFIRMED BY THE CUSTOMER

Chief Engineer/Projects
APTRANSCO/Vs/Vijayawada.

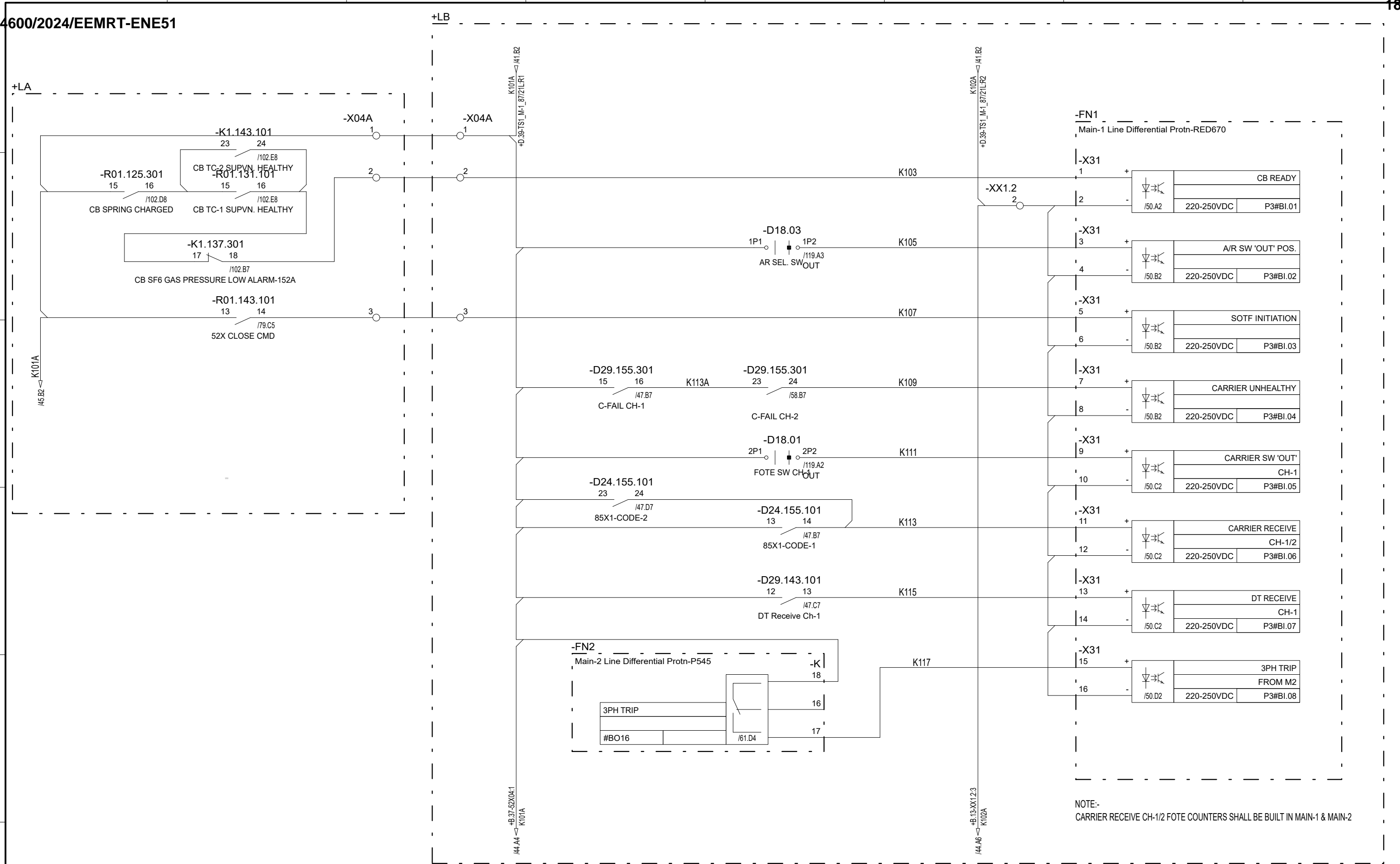
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		Project APTRANSCO		CT/PT Input Circuit to M1 Relay	Resp. dept. PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 42
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NOTE:- CARRIER RECEIVE CH-1/2 FOTE COUNTERS SHALL BE BUILT IN MAIN-1 & MAIN-2

Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER	Doc. kind.	Circuit diagram	Ref.Des.	=2KR	
		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel		DCC EFS				
		Project	APTRANSCO STANDARD DRAWING		Binary inputs-M1 Relay		Resp. dept.	PG-GAS	Rev. ind.	Language	en
					Hitachi Energy India Limited						
Rev.		Revision note	Date	Name	HITACHI		Doc. no.		1MNS500925-CABA		
		1MYN691003-102(A3)REV01							Sheet	43	
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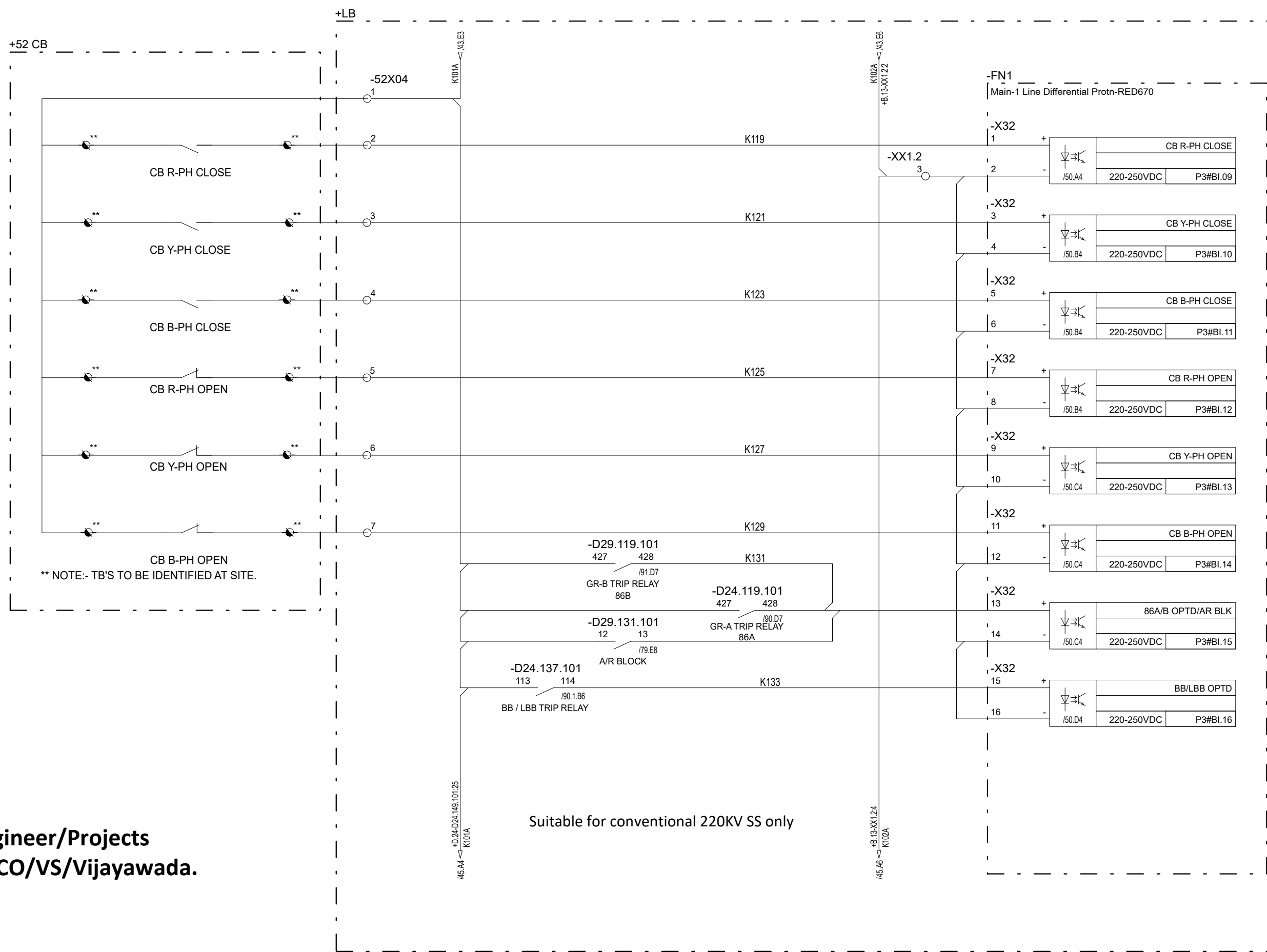
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188
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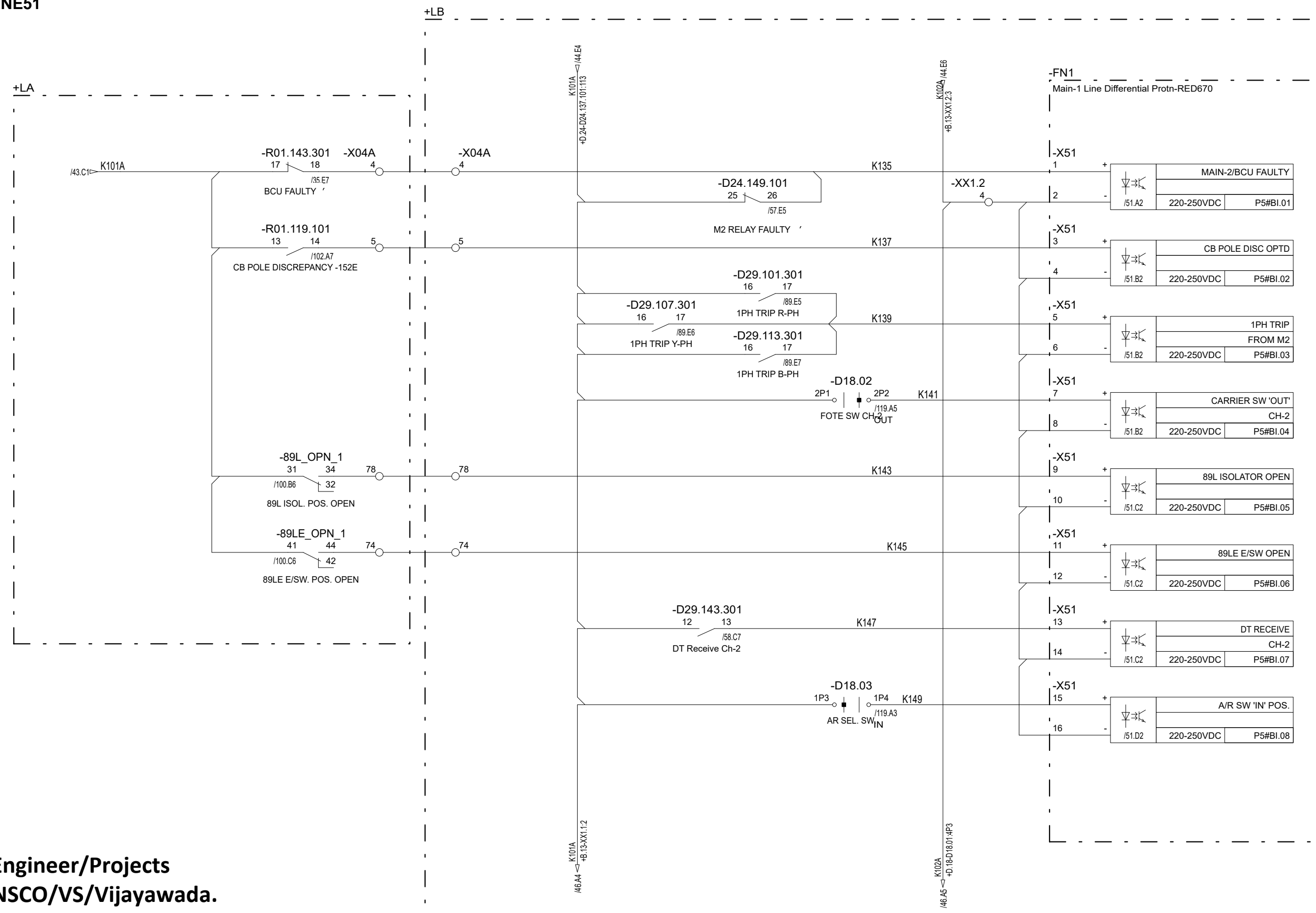
**Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.**

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Rev.	Revision note	Date	Name		HITACHI Hitachi Energy India Limited			Doc. no.		1MNS500925-CABA		Sheet	44
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Chief Engineer/Projects
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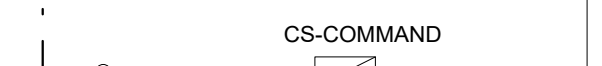
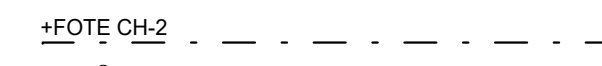
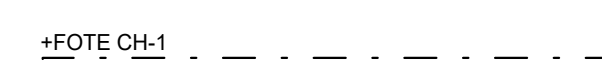
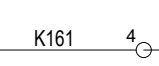
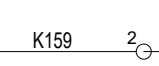
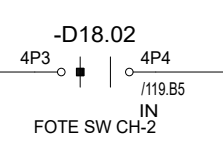
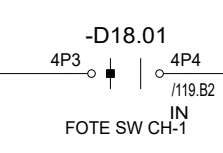
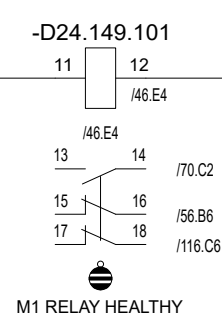
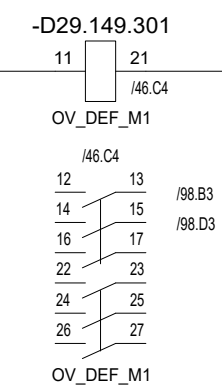
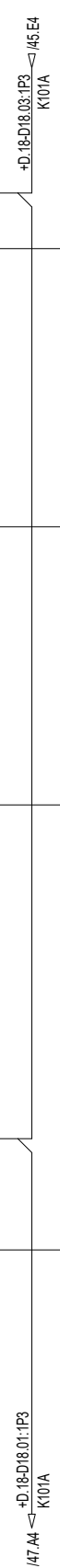
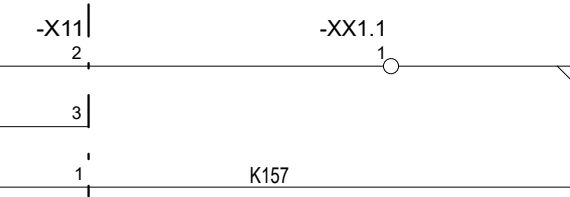
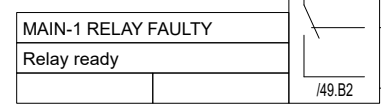
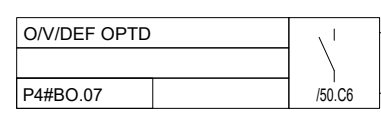
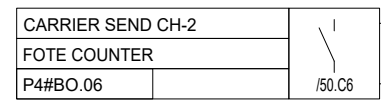
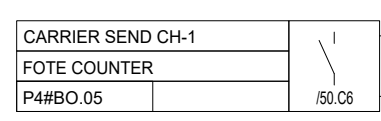
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					Hitachi Energy India Limited							
Rev.	Revision note	Date	Name					Doc. no.		1MNS500925-CABA	Sheet	45
										n. sheet		46
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-FN1
Main-1 Line Differential Protn-RED670



NOTE : TBS SHOULD BE IDENTIFIED AT SITE

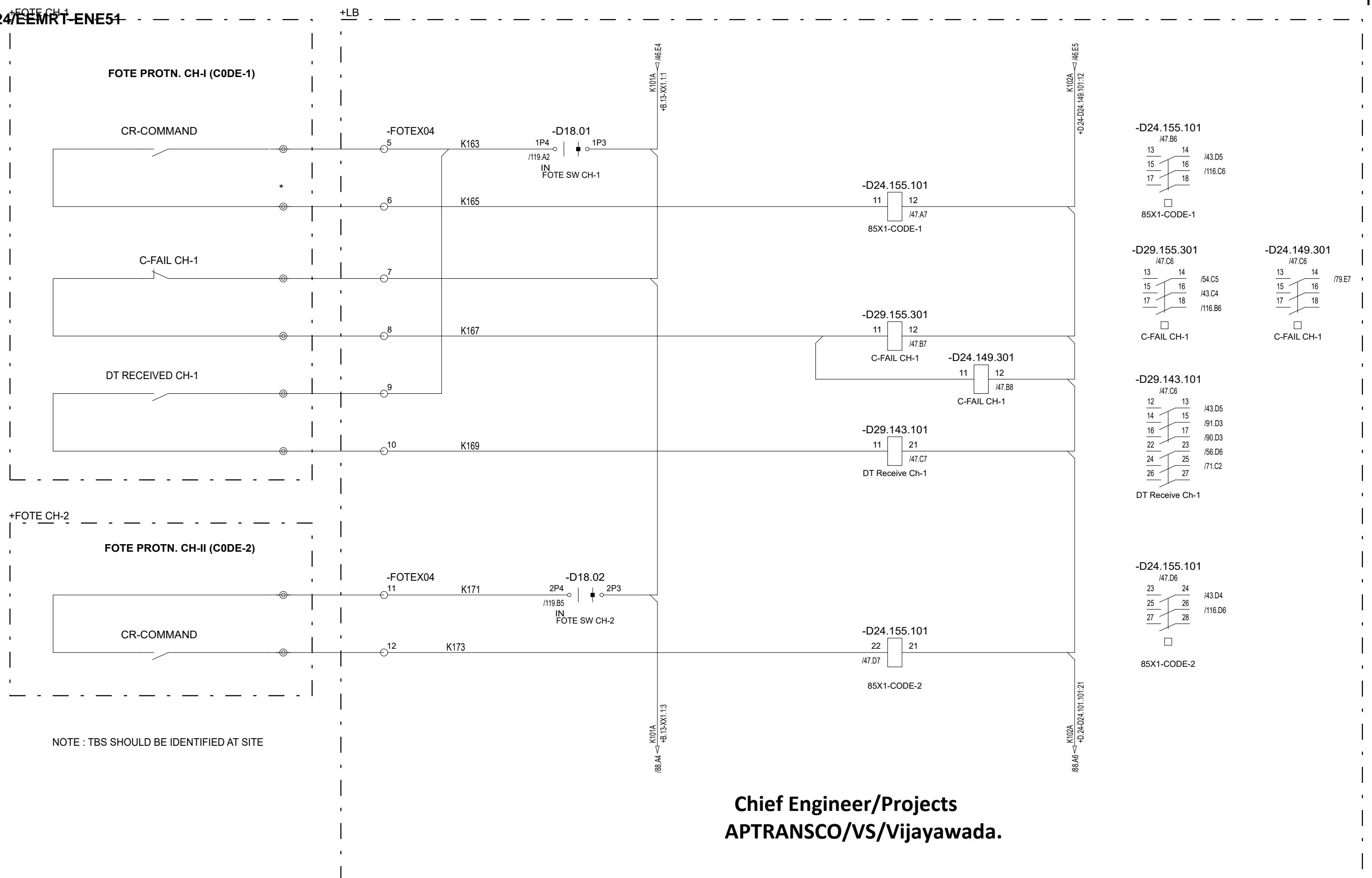
Chief Engineer/Projects
APTRANSCO/VIS/Vijayawada.

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		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 46
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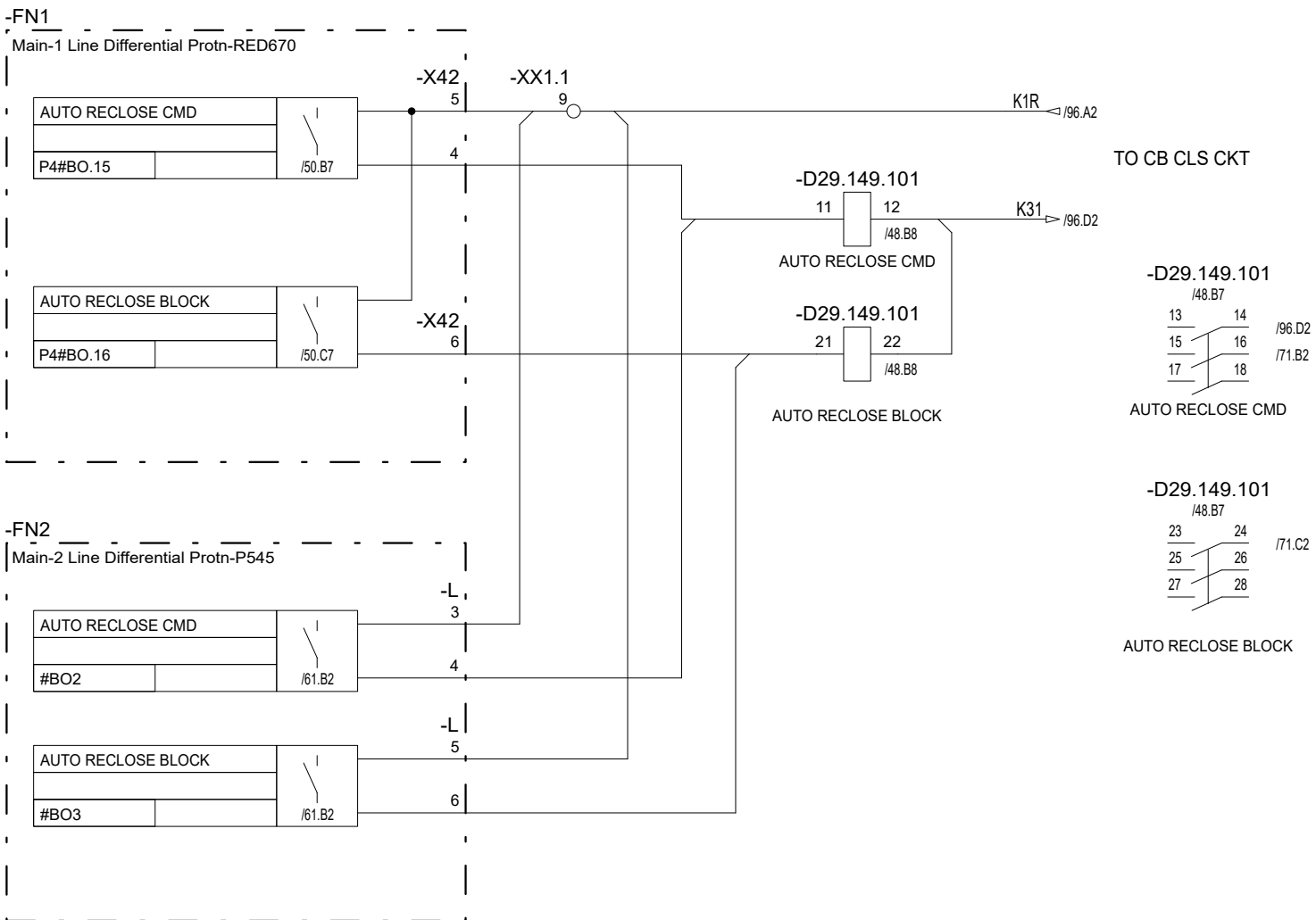
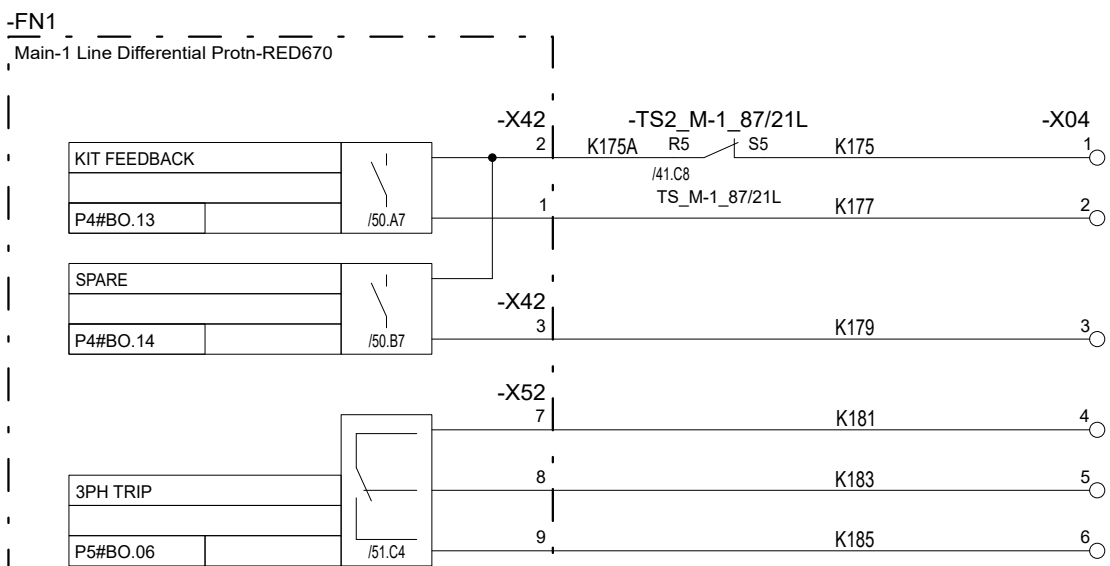
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APTRANSCO/VS/Vijayawada.**

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
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		STANDARD DRAWING		Hitachi Energy India Limited		Language en
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 47
1MYN691003-102(A3)REV01						n. sheet 48

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		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel		DCC EFS				
		Project	APTRANSCO STANDARD DRAWING		Binary outputs-M1 Relay		Resp. dept.	PG-GAS	Rev. ind.	Language	en
Rev.	Revision note	Date	Name	HITACHI		Hitachi Energy India Limited	Doc. no.		1MNS500925-CABA		
1MYN691003-102(A3)REV01								Sheet		48	
								n. sheet		49	

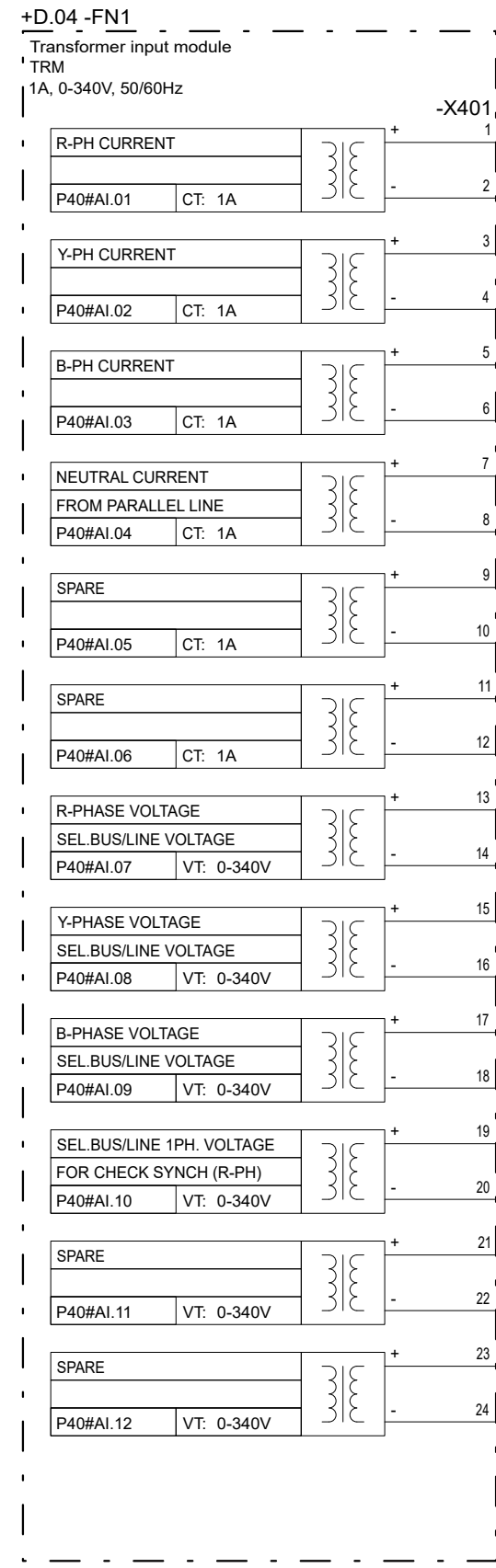
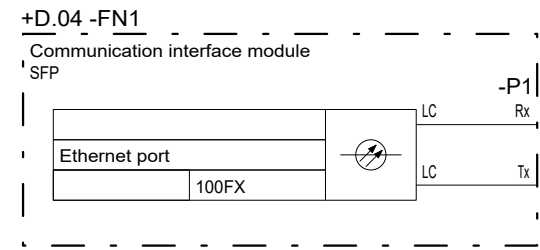
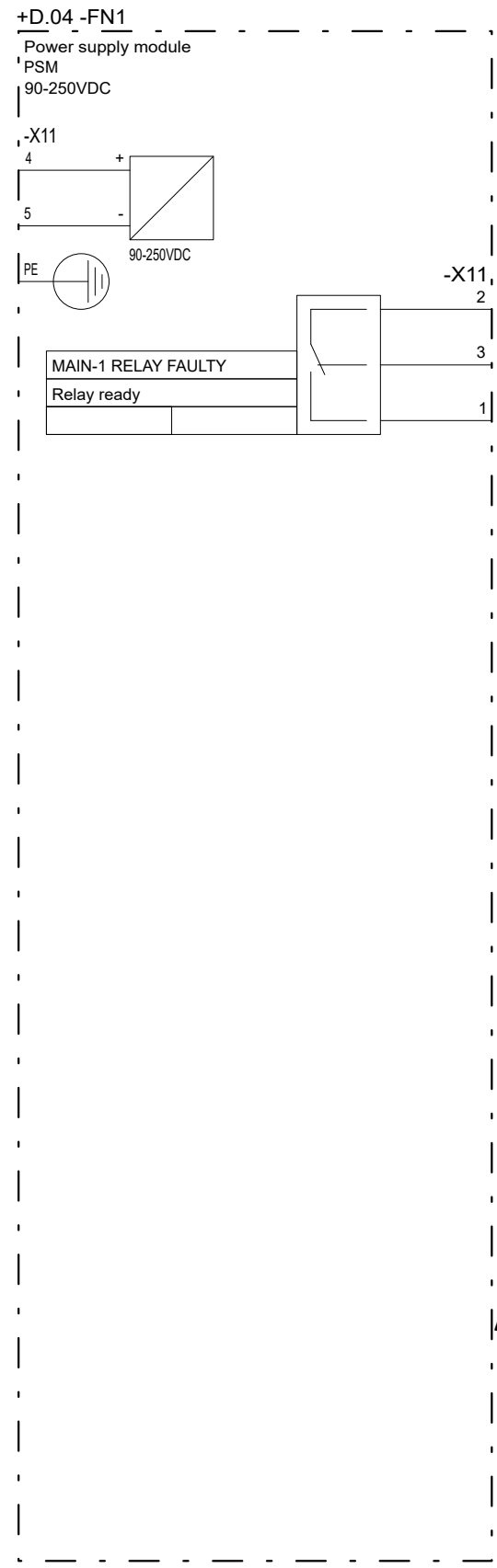
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Drawing approval subject to valid vendor registration

Suitable for conventional 220KV SS only

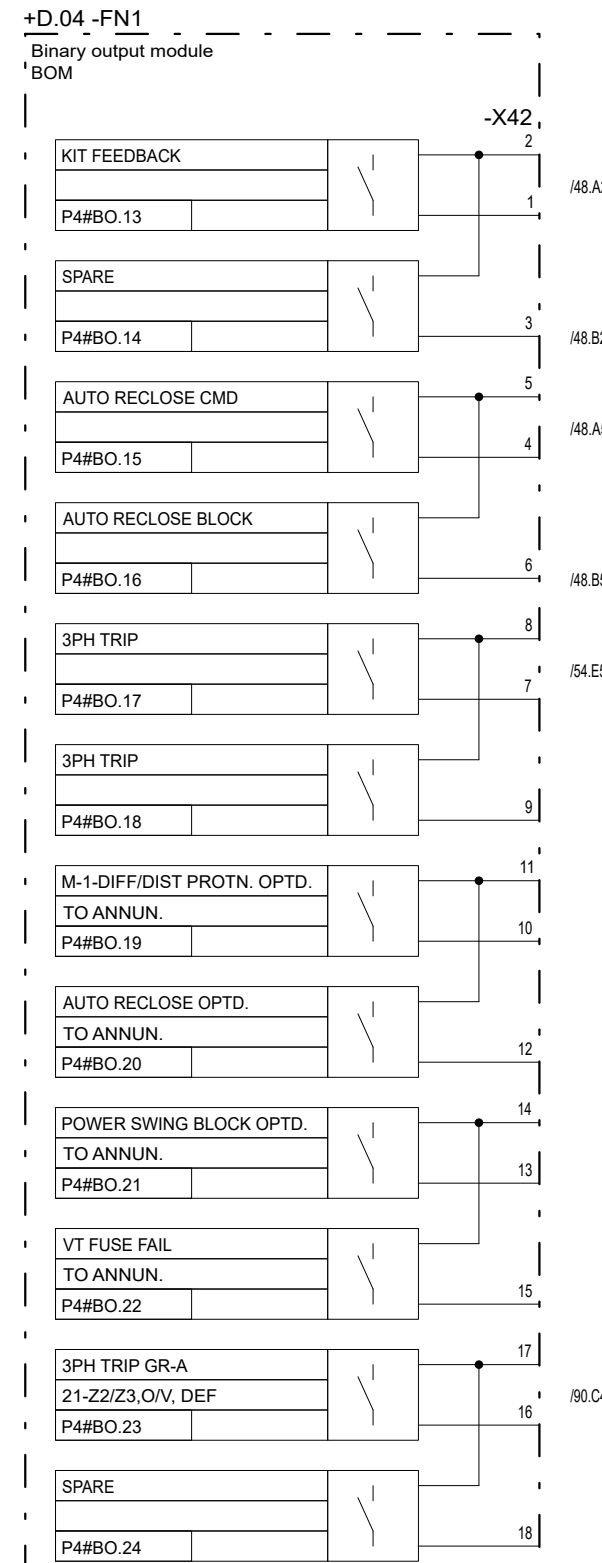
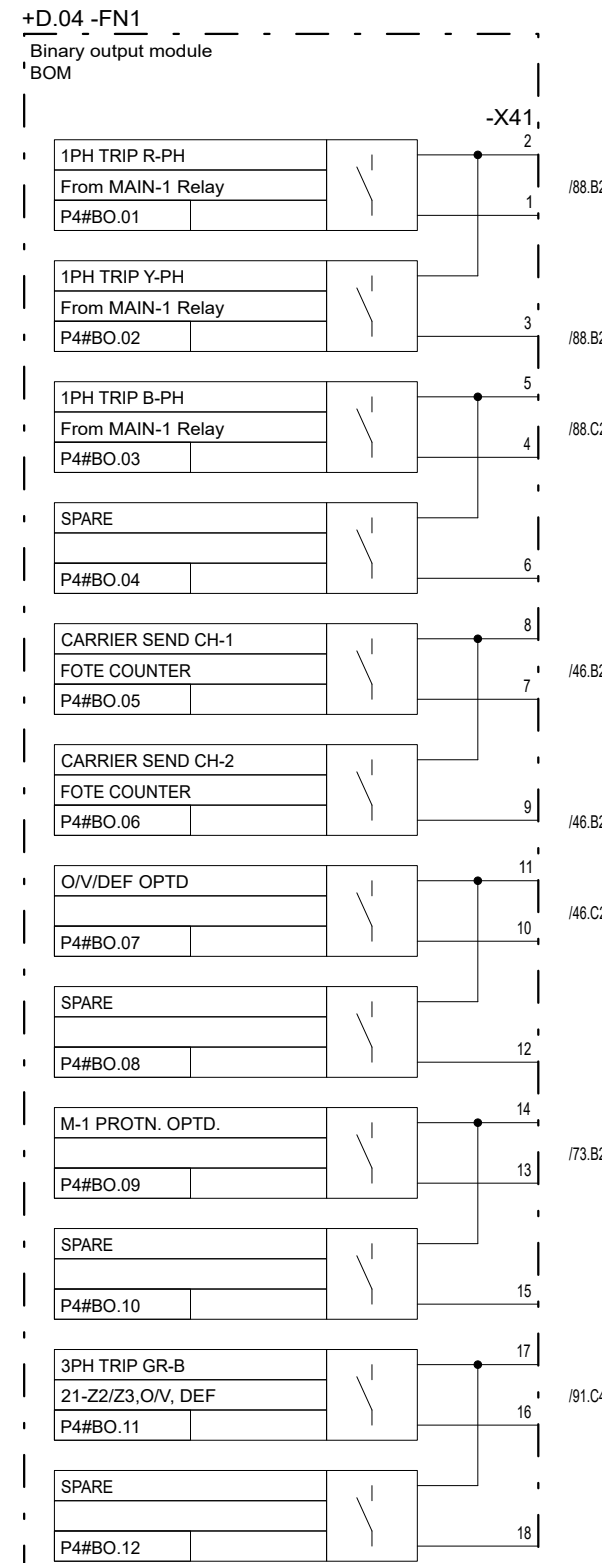
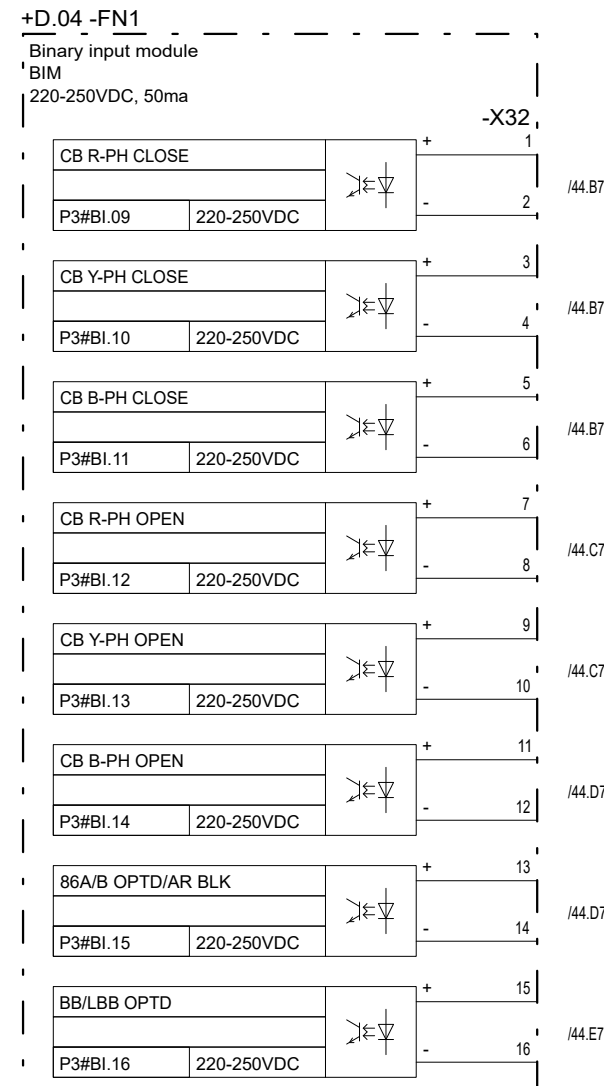
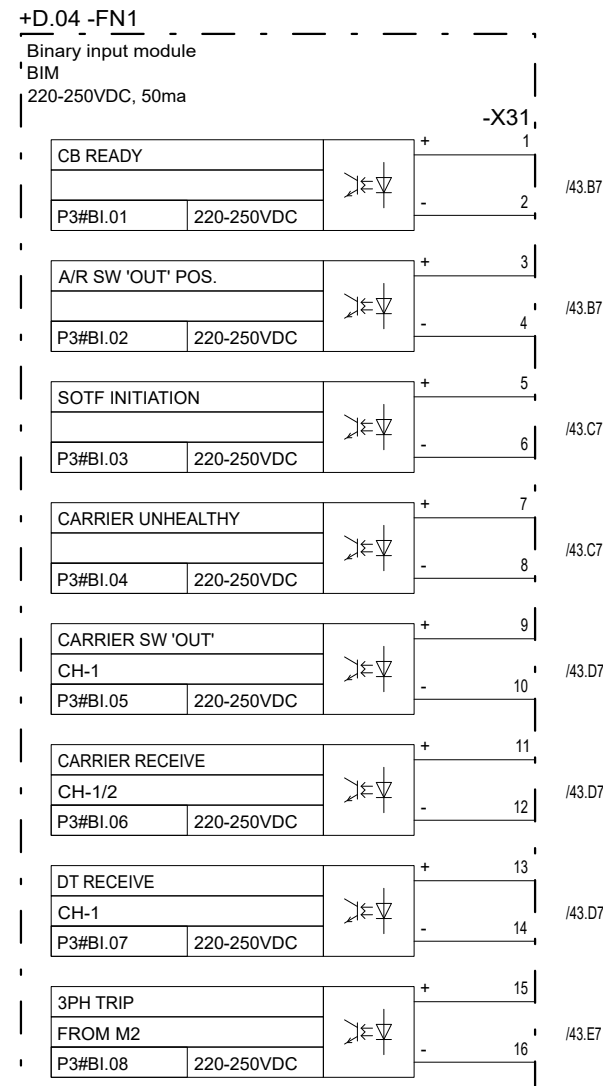
**Chief Engineer/Projects
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Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 49
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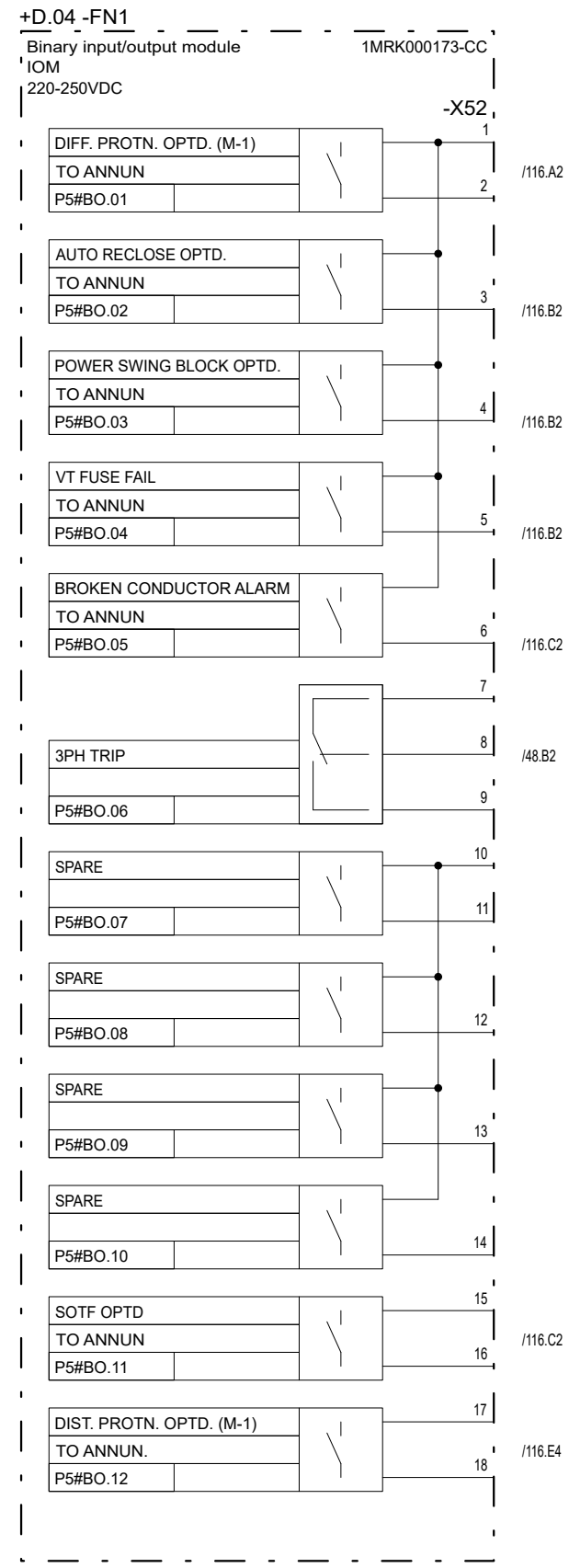
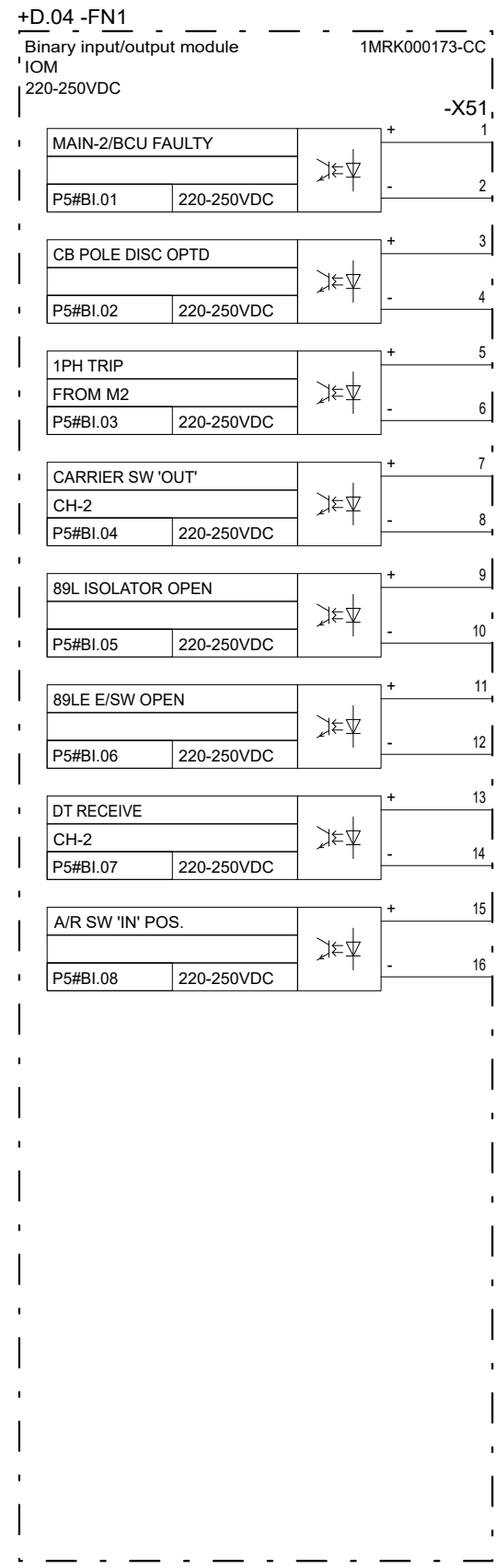
Chief Engineer/Projects
APTRANSCO/VS/Vijayawada

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				HITACHI Hitachi Energy India Limited	Language en	
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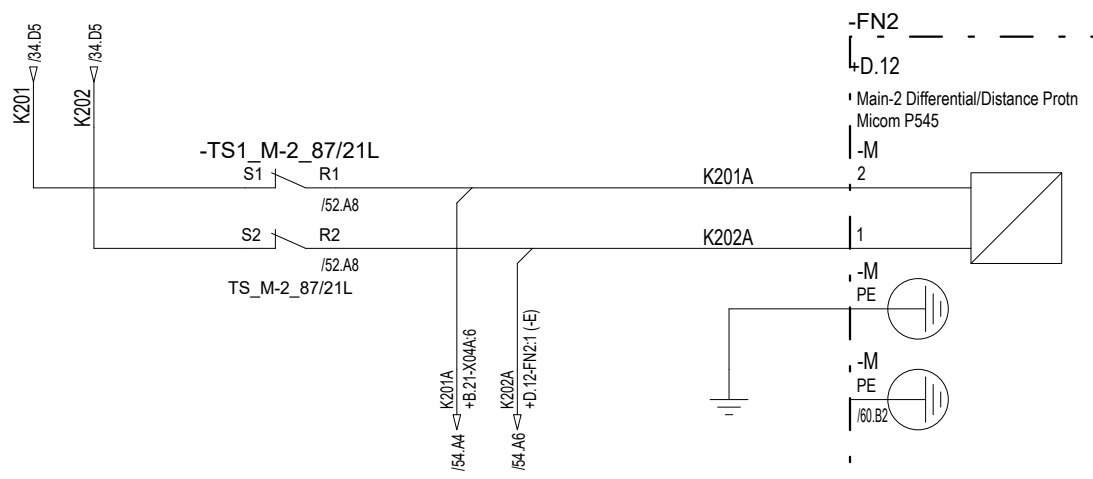


**Chief Engineer/Projects
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LIST OF FUNCTIONS AVAILABLE IN RELAY

- Distance Protection (PDIS,21)
- Automatic Switch on to fault(PSOF)
- Auto Reclose Function
- Residual O/C protection(PDEF,67N)
- Fuse fail supervision(RFUF)
- Scheme Communication(PSCH,78)
- Tripping Logic(PTRC,94)
- Disturbance Recorder(RDRE)
- Fault Locator(RFLO)
- PSB
- Event Recorder (RDRE)
- Current Reversal
- Weak end Infeed logics
- Local HMI
 - Integrated HMI with 4 line display
 - 18 freely configurable LEDs with 4 fixed LED
 - Settings and disturbance Information
 - Front port for communication with indication

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

+D.15 -D15.01
LED indication

List of LED indication (RED)

1. R-PH FAULT
2. Y-PH FAULT
3. B-PH FAULT
4. OC/DEF TRIP
5. ZONE-1 TRIP
6. ZONE-2 TRIP
7. ZONE-3 TRIP
8. ZONE-4 TRIP

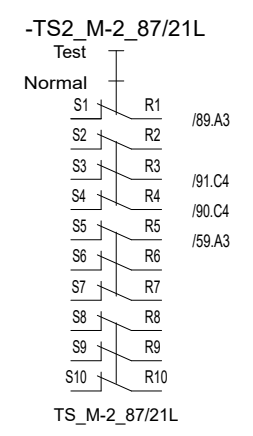
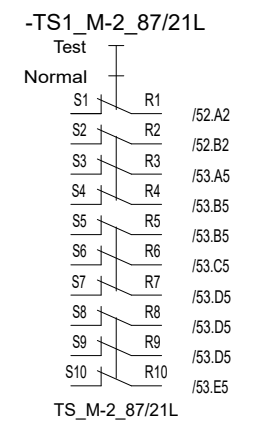
List of LED indication (YELLOW)

1. DIFFERENTIAL PROTN. OPTD.
2. DISTANCE PROTN. OPTD.
3. DIFFERENTIAL PROTN. BLOCKED
4. FO CHANNEL-1 FAIL
5. FO CHANNEL-2 FAIL

List of Functional Key Indication

- FK1. ZONE-5 TRIP (REV)
- FK2. Z-COM TRIP
- FK3. SOTF TRIP
- FK4. BRC ALARM
- FK5. PSB ALARM
- FK6. VTFF ALARM
- FK7. AR BLOCK
- FK8. AR CLOSE
- FK9. OC/EF TRIP
- FK10. LED RESET

Suitable for conventional 220KV SS only

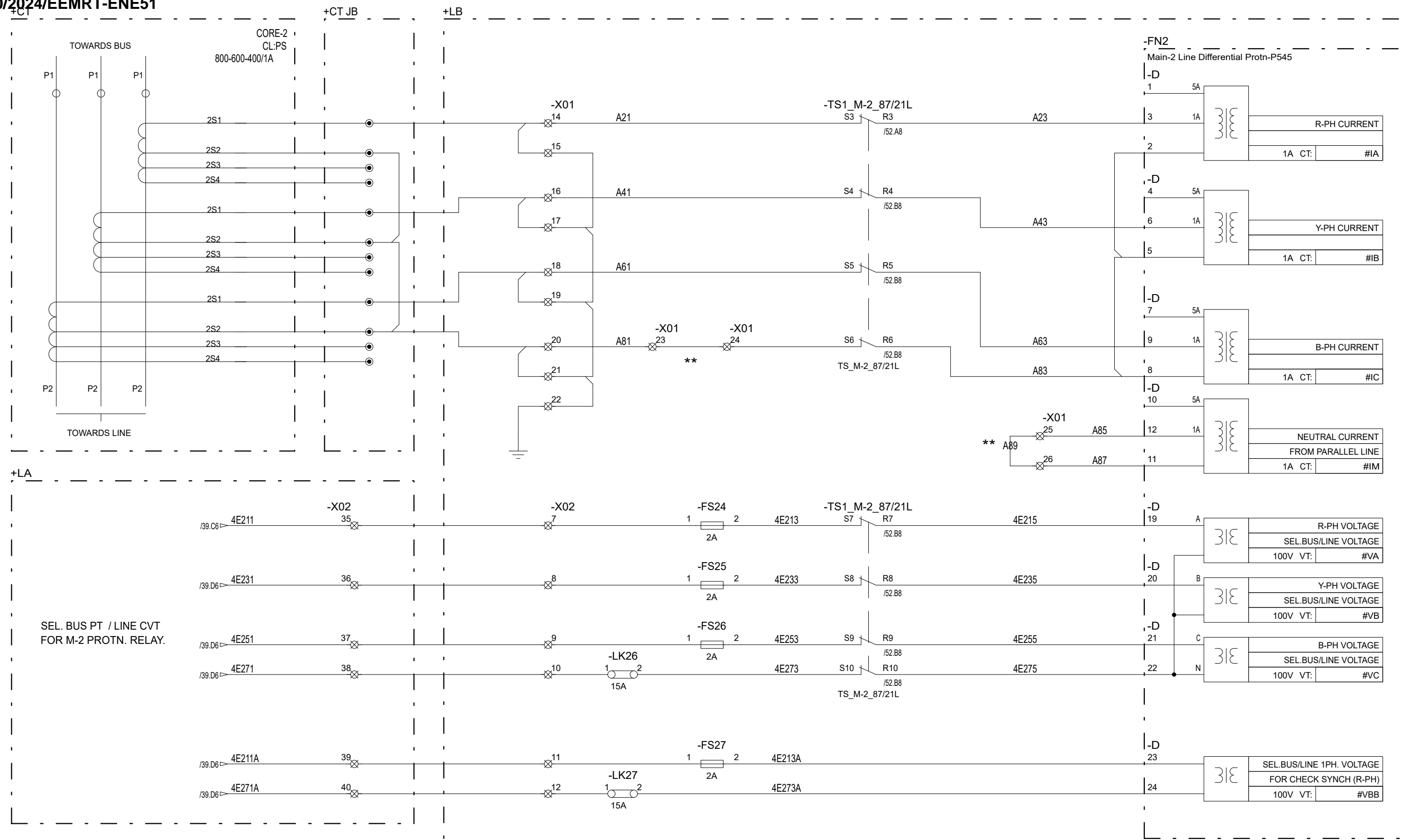


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		Project APTRANSCO STANDARD DRAWING		Power supply Circuit to M2 Relay	Resp. dept. PG-GAS	Rev. ind.	Language en
Rev.	Revision note	Date	Name	HITACHI Hitachi Energy India Limited	1MNS500925-CABA		Sheet 52
1MYN691003-102(A3)REV01							Doc. no.

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NOTE:- CT DETAILS TO BE CONFIRMED BY THE CUSTOMER

**SHORTING TO BE REMOVED WHEN DOUBLE CKT IS COMMISSIONED
(TO ENABLE MUTUAL COMPENSATION FOR FAULT LOCATOR)

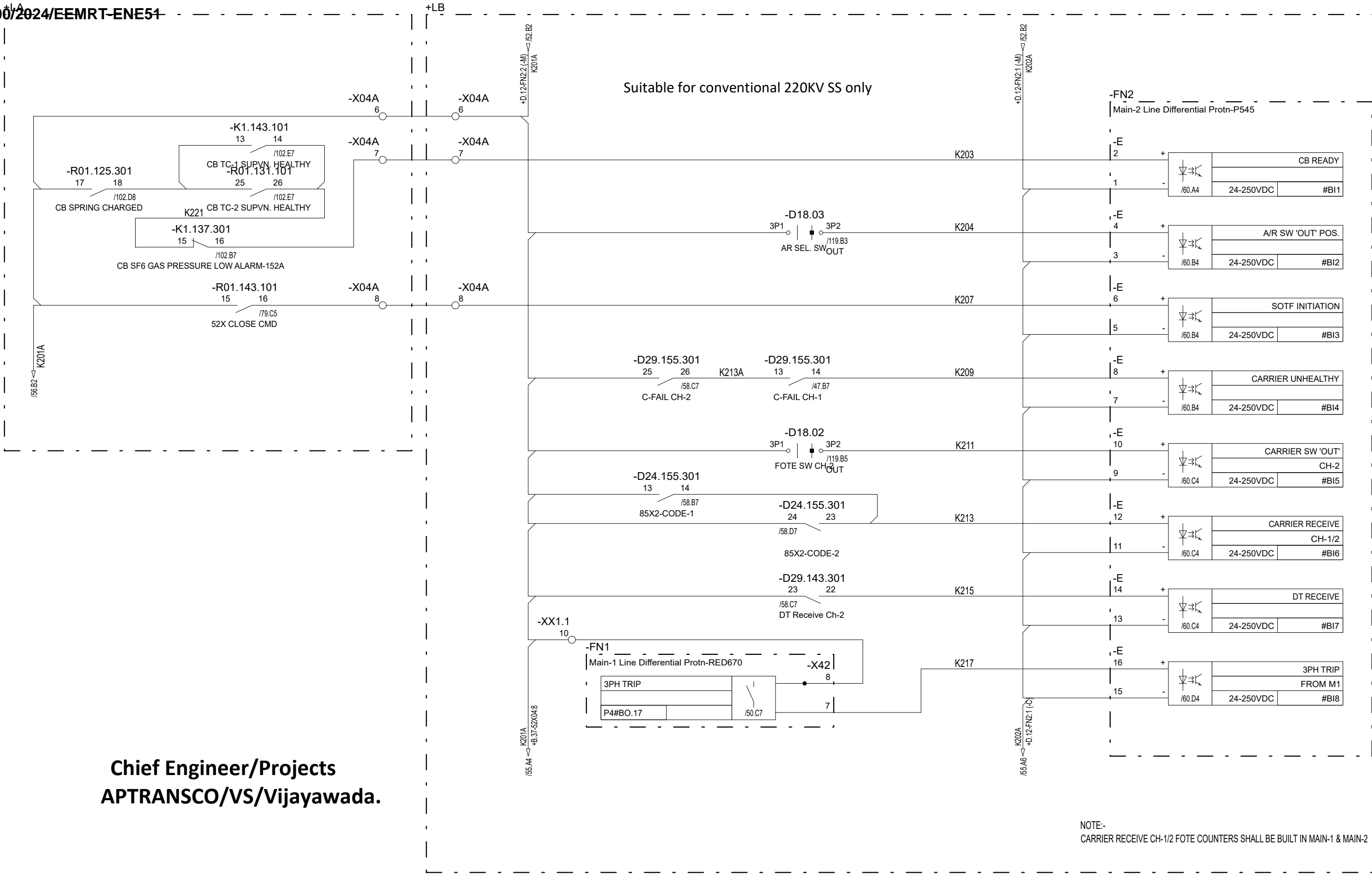
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Rev.	Revision note	Date	Name					Sheet	53		
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NOTE:-
CARRIER RECEIVE CH-1/2 FOTE COUNTERS SHALL BE BUILT IN MAIN-1 & MAIN-2

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		Project	APTRANSCO STANDARD DRAWING		Binary inputs-M2 Relay		Resp. dept.	PG-GAS	Rev. ind.	Language	en	
Rev.		Revision note	Date	Name	HITACHI Hitachi Energy India Limited		Doc. no.		1MNS500925-CABA		Sheet	54
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1MYN691003-102(A3)REV01

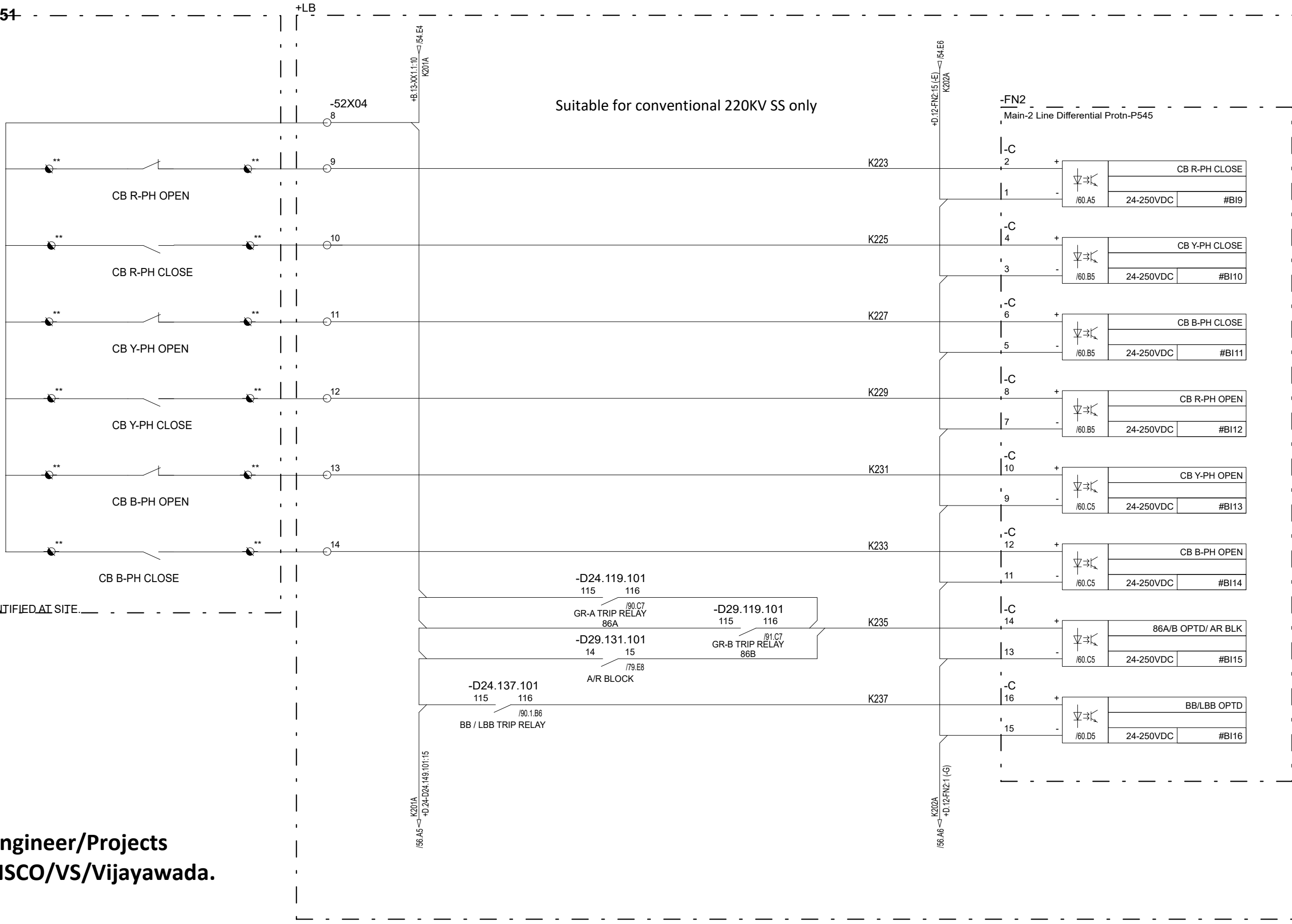
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8814600/2024/EEMRT-ENE51

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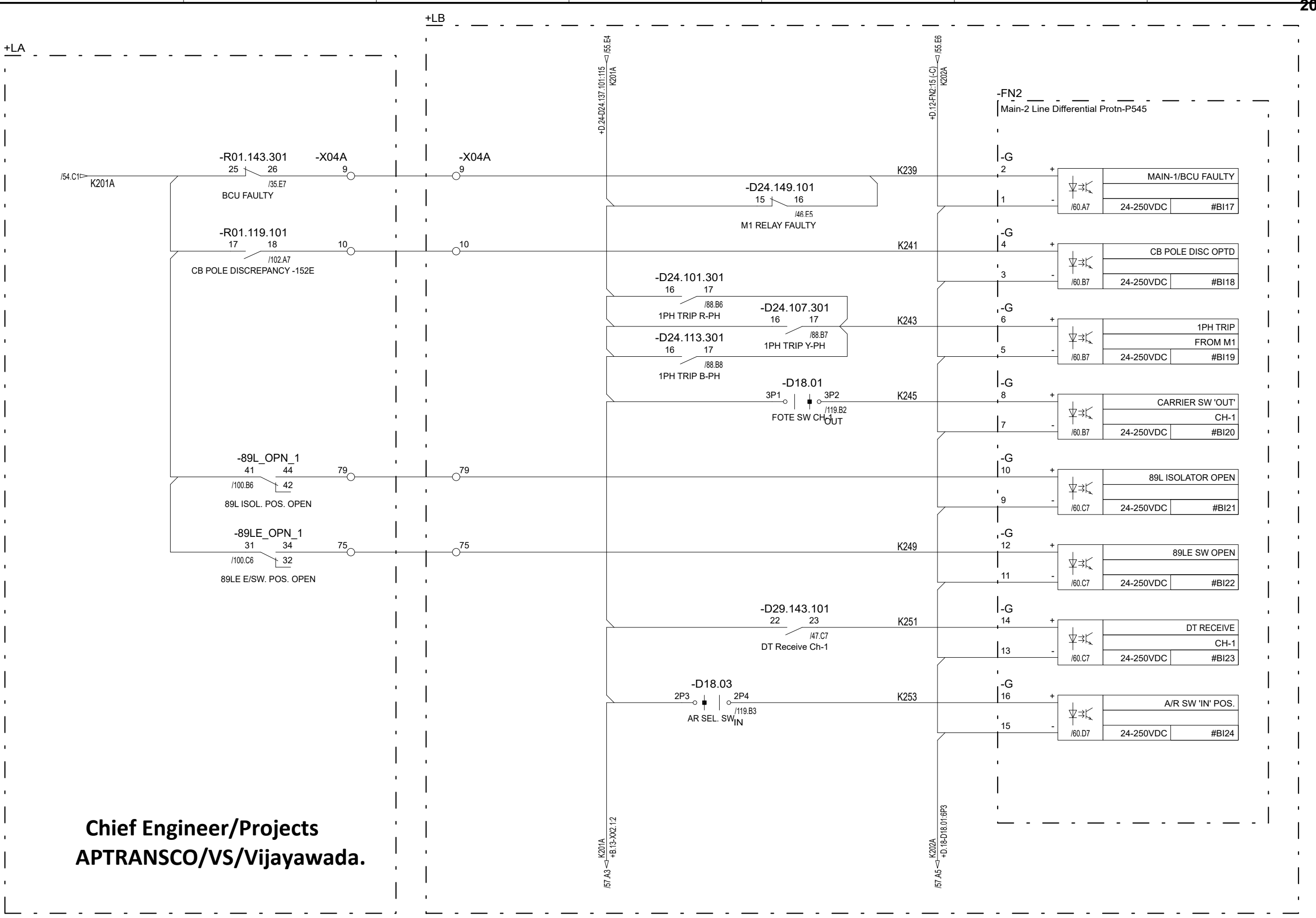


**Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.**

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Binary inputs-M2 Relay	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 55
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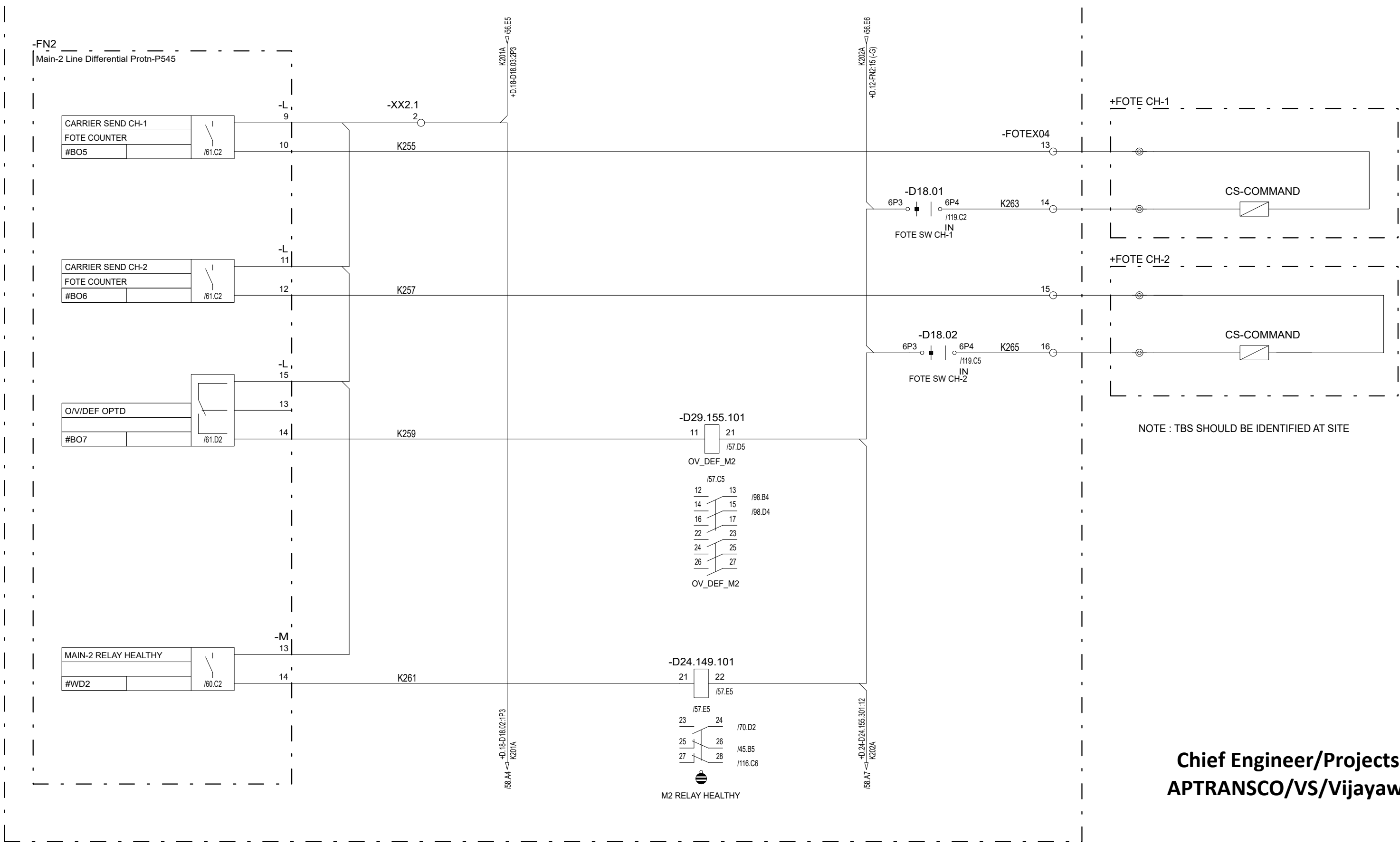


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Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Binary inputs-M2 Relay	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 56
1MYN691003-102(A3)REV01						n. sheet 57

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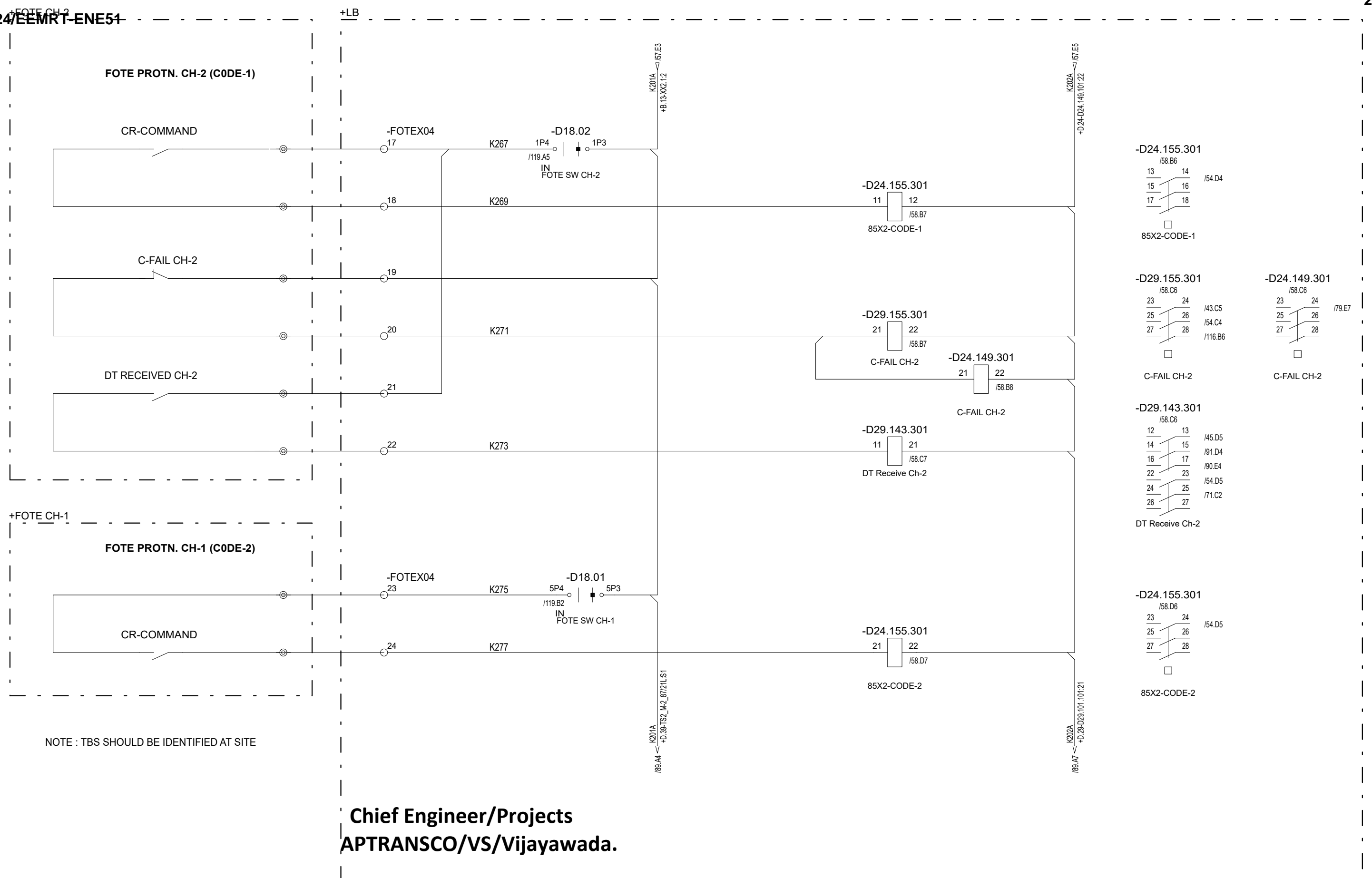
Chief Engineer/Projects
APTRANSCO/VS/Vijayawada

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		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel		DCC EFS						
		Project	APTRANSCO STANDARD DRAWING		Binary outputs-M2 Relay		Resp. dept.	PG-GAS		Rev. ind.	Language	en	
Rev.	Revision note	Date	Name	HITACHI		Hitachi Energy India Limited		Doc. no.		1MNS500925-CABA		Sheet	57
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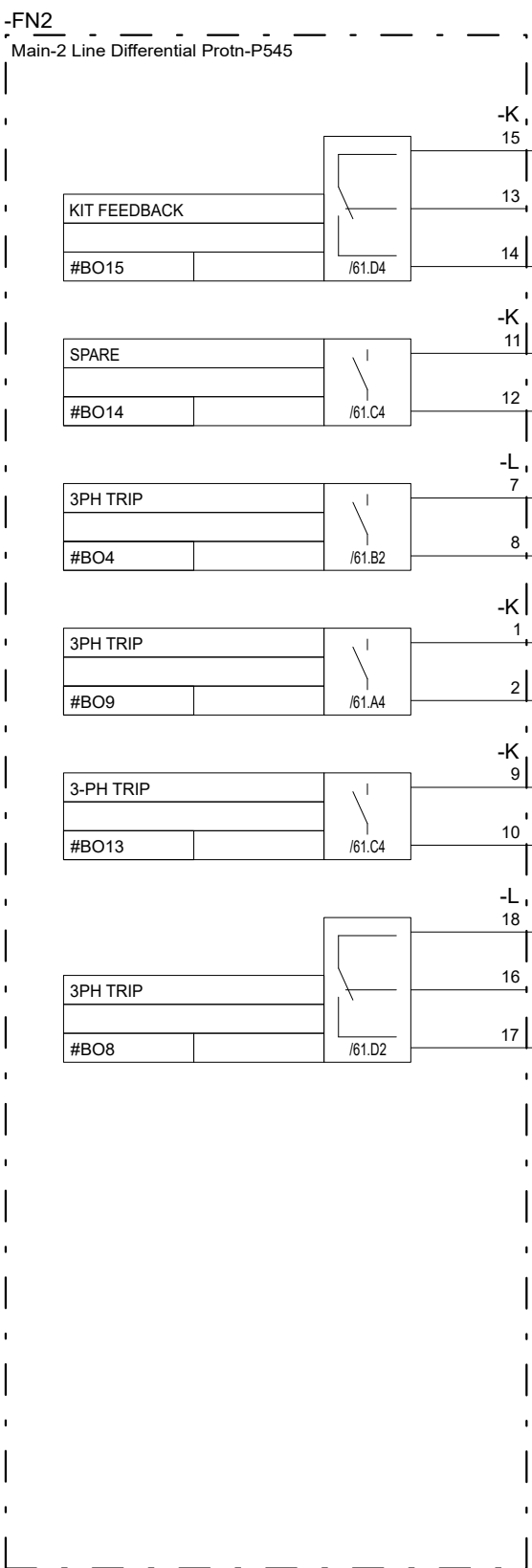
NOTE : TBS SHOULD BE IDENTIFIED AT SITE

Chief Engineer/Projects
APTRANSCO/VIS/Vijayawada.

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Carrier Received Signal to M2 Relay	Resp. dept. PG-GAS	Rev. ind.
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CABA		Sheet 58
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Drawing approval subject to valid vendor registration

Suitable for conventional 220KV SS only

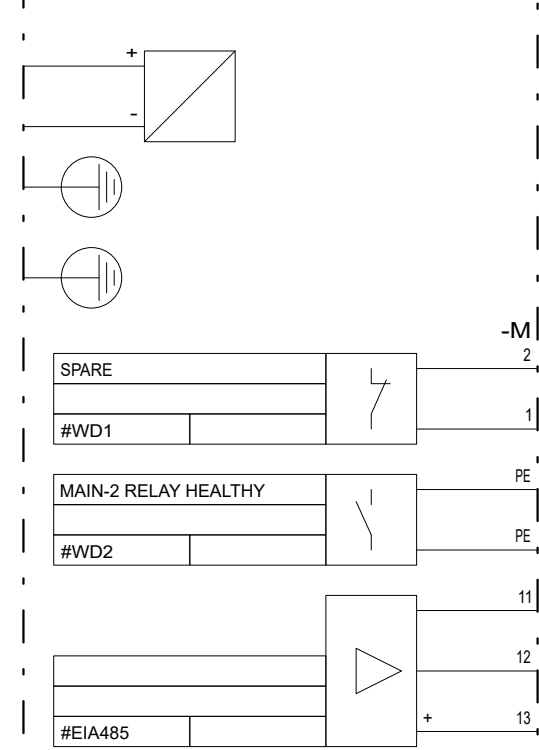
**Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.**

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		Project	APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited		HITACHI		Resp. dept.	PG-GAS	Rev. ind.	Language	en
Rev.	Revision note	Date	Name					Doc. no.		1MNS500925-CABA		Sheet	59
												n. sheet	60

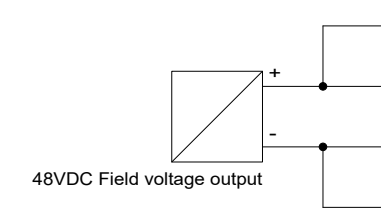
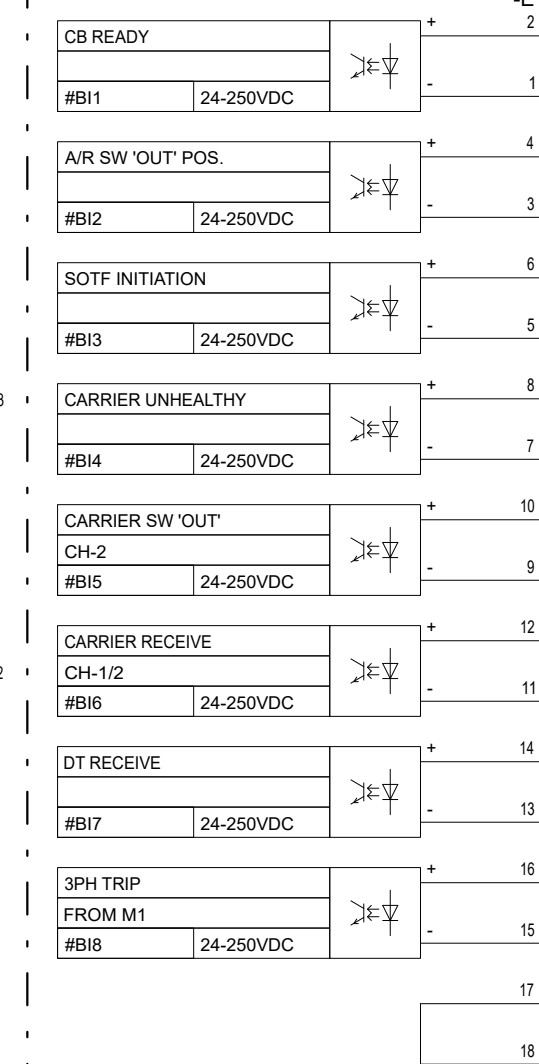
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+D.12 -FN2
Main-2 Differential/Distance Protn
Micom P545
110-250VDC, 100-240VAC



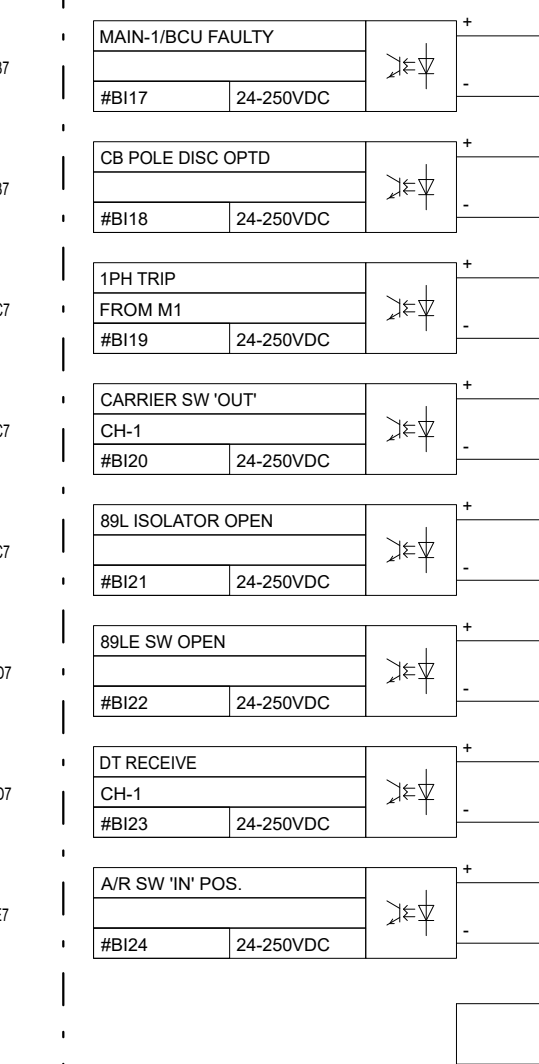
+D.12 -FN2
Main-2 Differential/Distance Protn
Micom P545
110-250VDC, 100-240VAC



+D.12 -FN2
Main-2 Differential/Distance Protn
Micom P545
110-250VDC, 100-240VAC

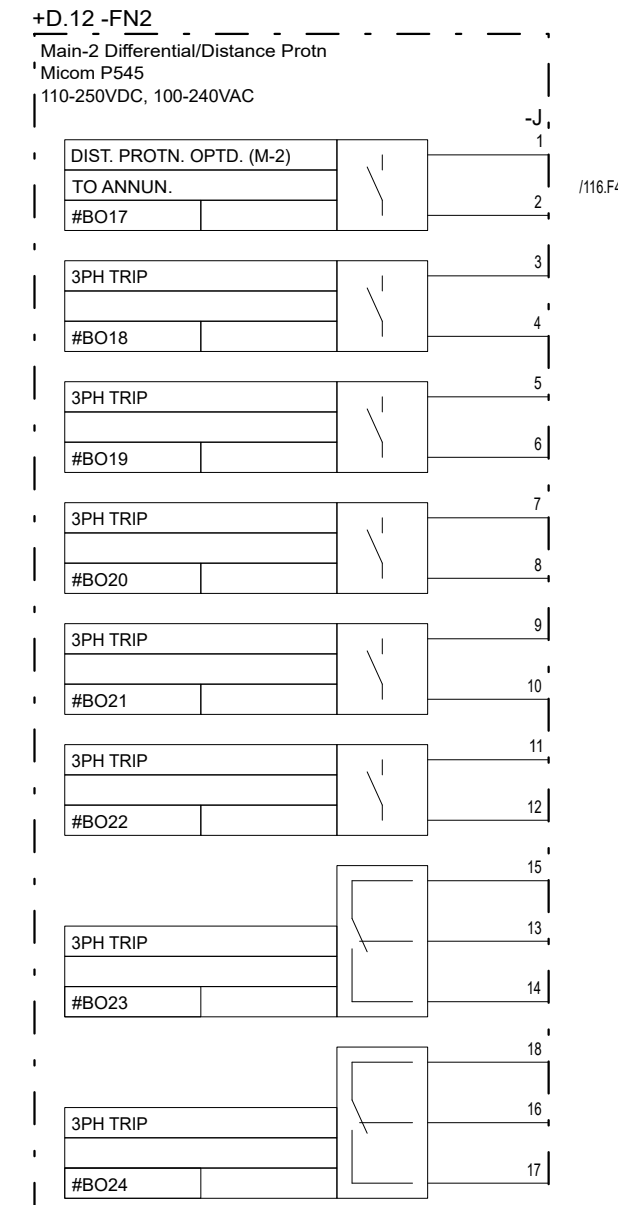
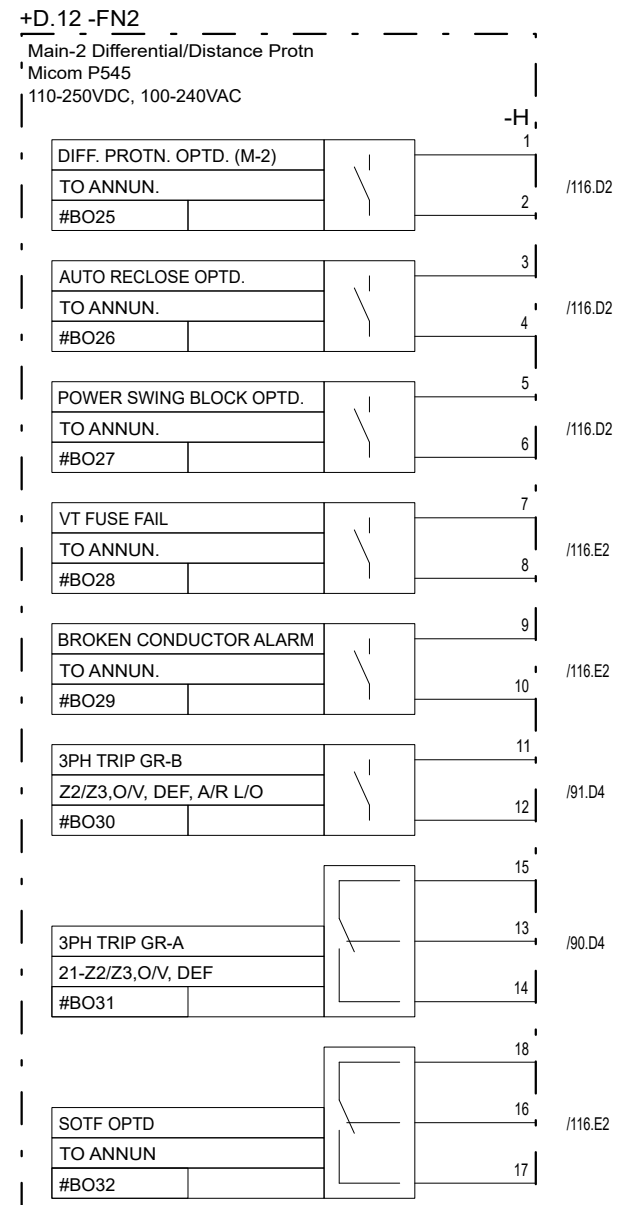
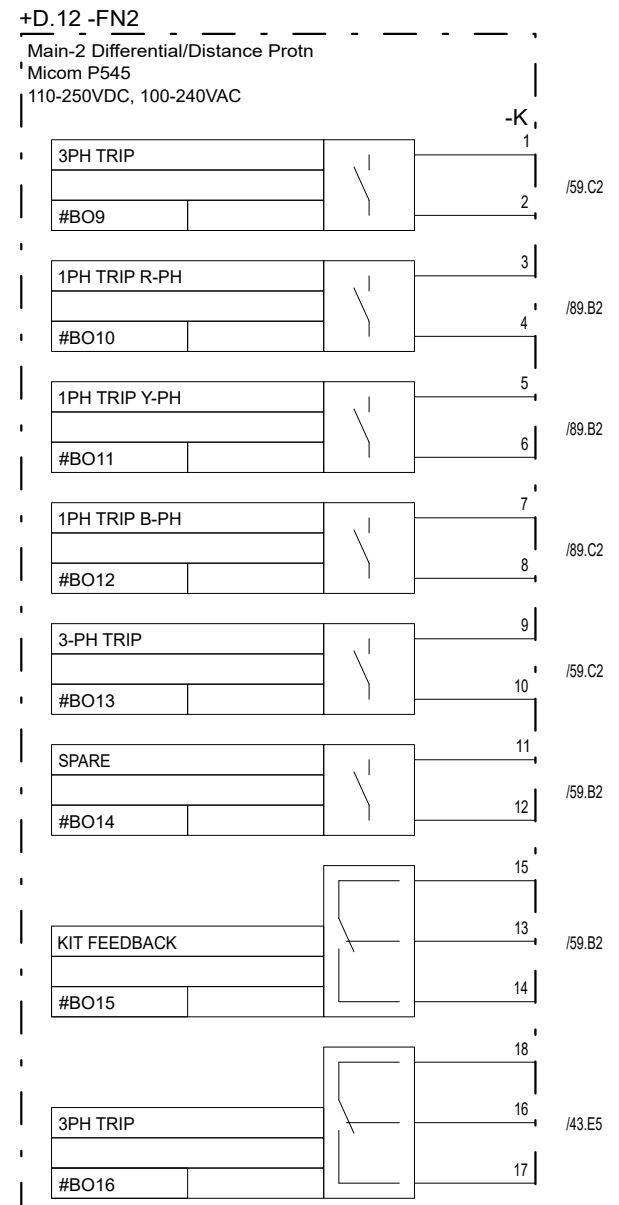
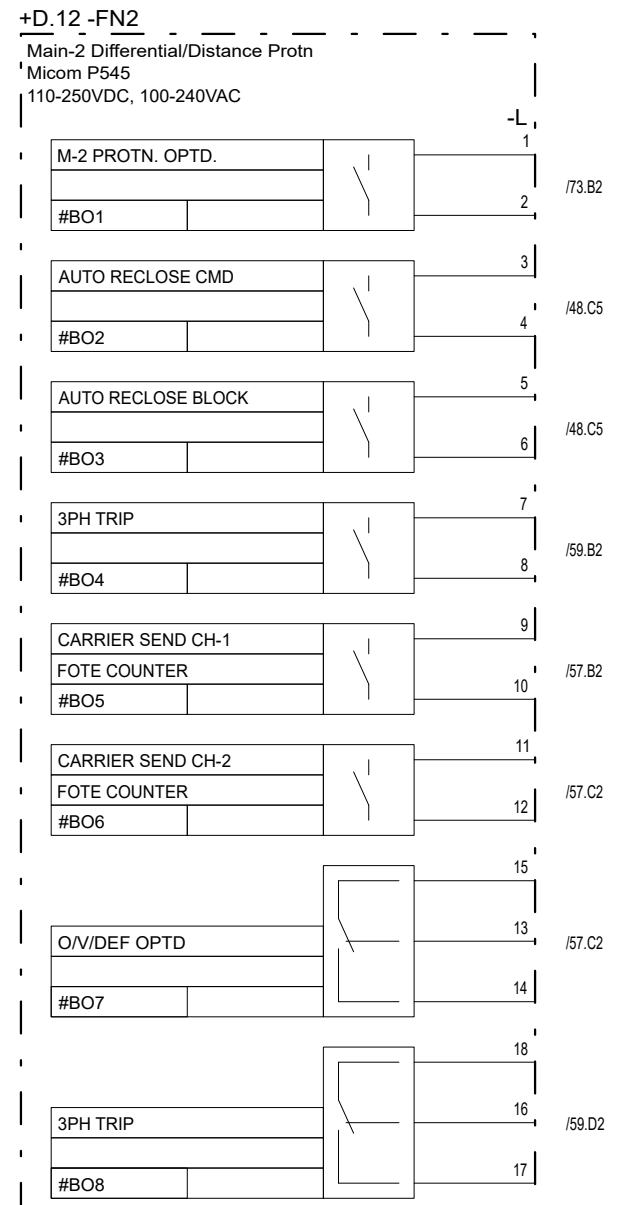


+D.12 -FN2
Main-2 Differential/Distance Protn
Micom P545
110-250VDC, 100-240VAC



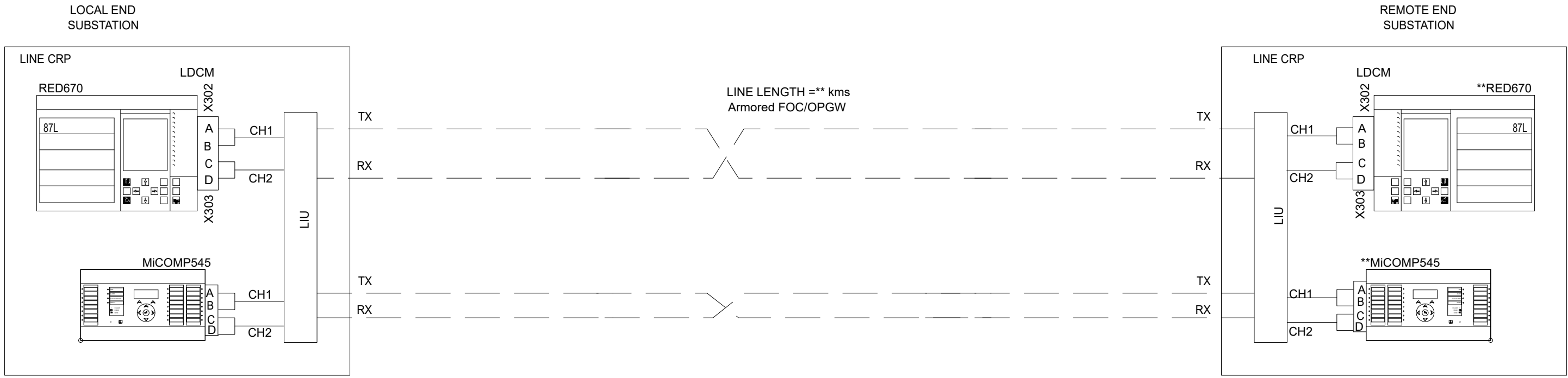
Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER		Doc. kind.	Circuit diagram		Ref.Des.	=2KR	
		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel			DCC EFS					
		Project	APTRANSCO STANDARD DRAWING		Main-2 Protn. Relay-Master Blocks			Resp. dept.	PG-GAS	Rev. ind.	Language	en	
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Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Main-2 Protn. Relay-Master Blocks	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 61
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SCOPE:
 1) Armored Fiber Optic/OPGW Cables is not in Hitachi Energy Scope of Supply.
 2) Patch cord between LIU to FOTE is not in Hitachi Energy Scope of Supply.
 3) Patch cord between IED to LIU at local end will be Duplex Singlemode cable with ST connectors.

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

LIST OF SIGNAL SEND THROUGH FIBRE OPTIC CABLE FROM LOCAL END TO REMOTE END

- 1] INTER TRIP SEND
- 2] LOCAL END CURRENT
- 3] BLOCK DIFFERENTIAL PROTN. DURING TEST MODE THROUGH TEST HANDLE
- 4] 89L ISO OPEN & 89LE EARTH. S/W. OPEN FOR REMOTE END EARTH SW & ISOL. CLOSING I/L

LIST OF SIGNAL SEND THROUGH FIBRE OPTIC CABLE FROM REMOTE END TO LOCAL END

- 1] INTER TRIP SEND
- 2] REMOTE END CURRENT
- 3] BLOCK DIFFERENTIAL PROTN. DURING TEST MODE THROUGH TEST HANDLE
- 4] LINE ISO OPEN & EARTH S/W. OPEN FOR LOCAL END EARTH SW & ISOL. CLOSING I/L

LIST OF SIGNAL SEND RECEIVED THROUGH FIBRE OPTIC CABLE FROM REMOTE END TO LOCAL END

- 1] INTER TRIP RECEIVED FROM REMOTE END
- 2] REMOTE END CURRENT
- 3] BLOCK DIFFERENTIAL PROTN. DURING TEST MODE THROUGH TEST HANDLE
- 4] LINE ISO OPEN FOR LOCAL END EARTH SW CLOSING I/L

LIST OF SIGNAL SEND RECEIVED THROUGH FIBRE OPTIC CABLE FROM LOCAL END TO REMOTE END

- 1] INTER TRIP RECEIVED FROM LOCAL END
- 2] LOCAL END CURRENT
- 3] BLOCK DIFFERENTIAL PROTN. DURING TEST MODE THROUGH TEST HANDLE
- 4] 89L ISO OPEN FOR REMOTE END EARTH SW CLOSING I/L

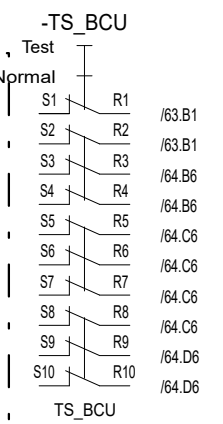
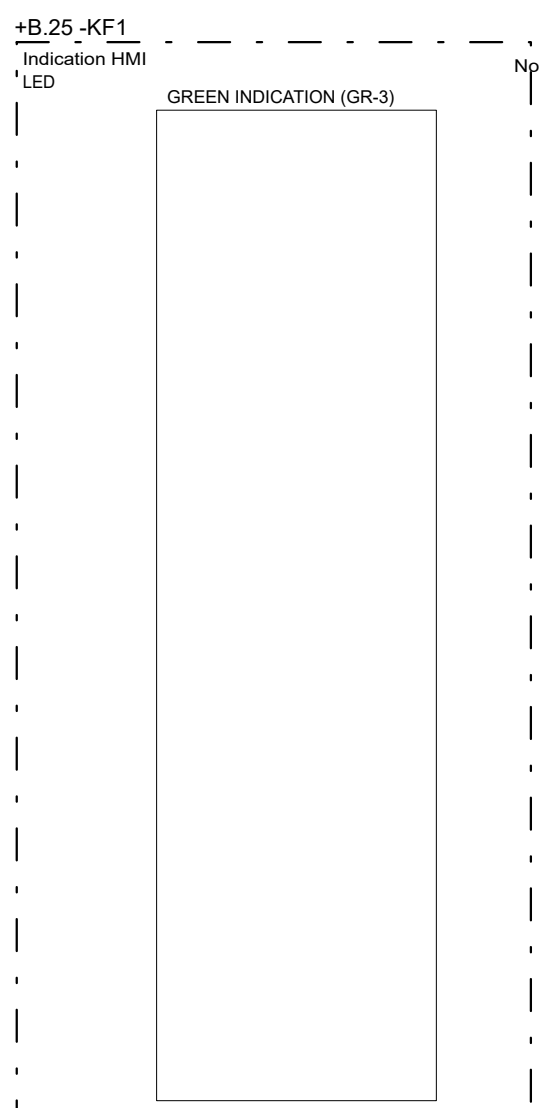
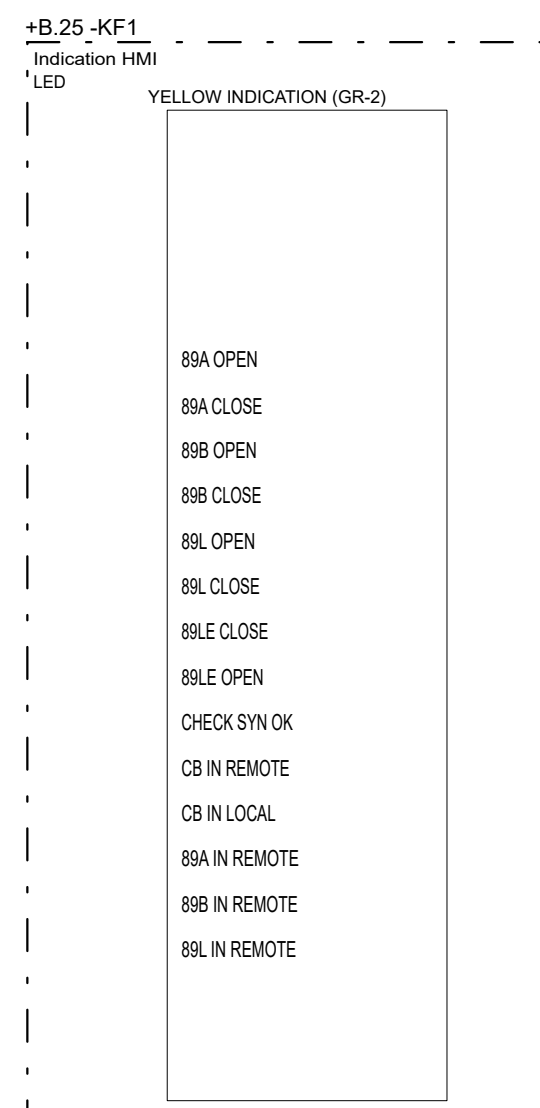
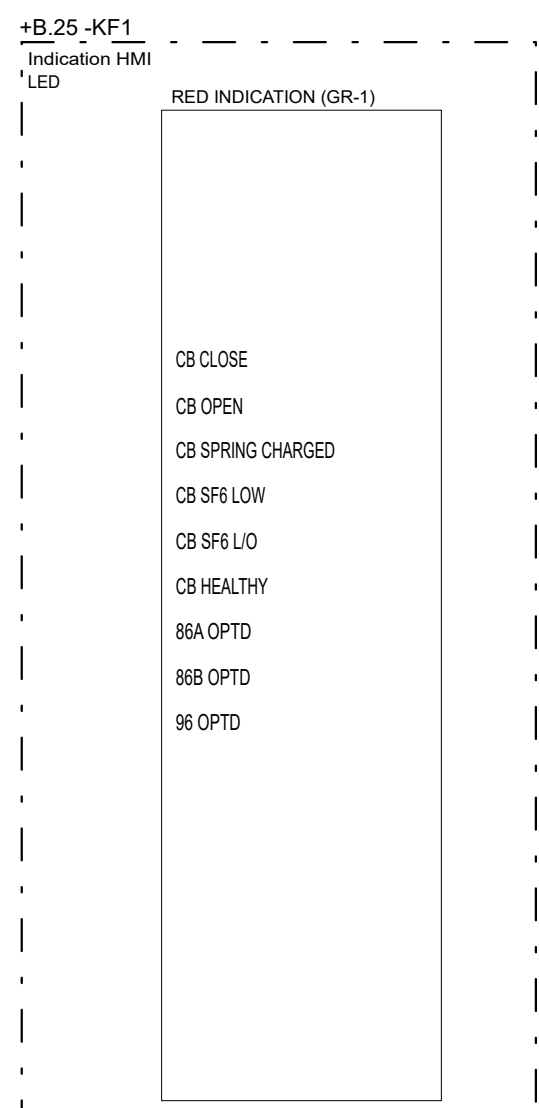
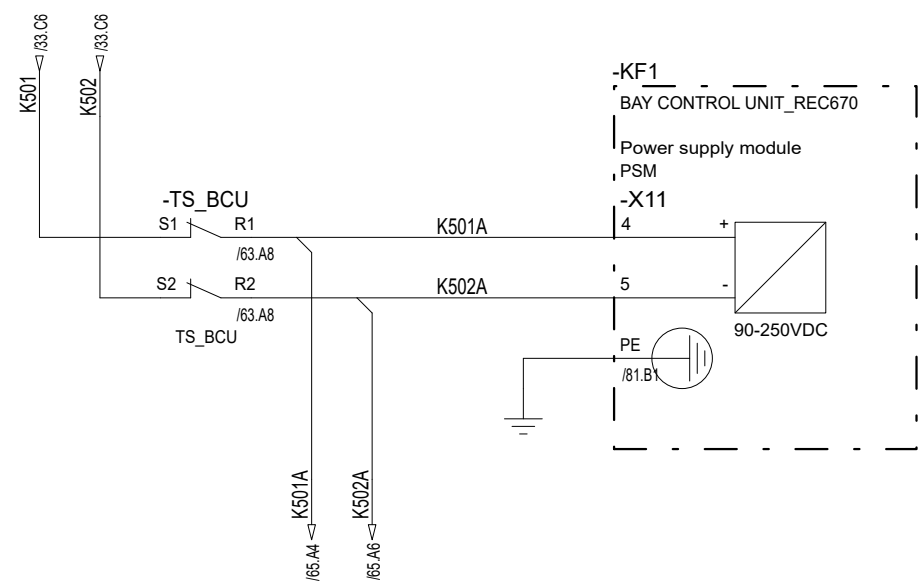
** Note: Line length to be confirmed by customer during approval.

Suitable for conventional 220KV SS only

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		LINE DIFF. PROTN COMMUNICATION	Resp. dept. PG-GAS	Rev. ind.
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
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LIST OF FUNCTIONS AVAILABLE IN RELAY

- 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

List of Functional Key Indication

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

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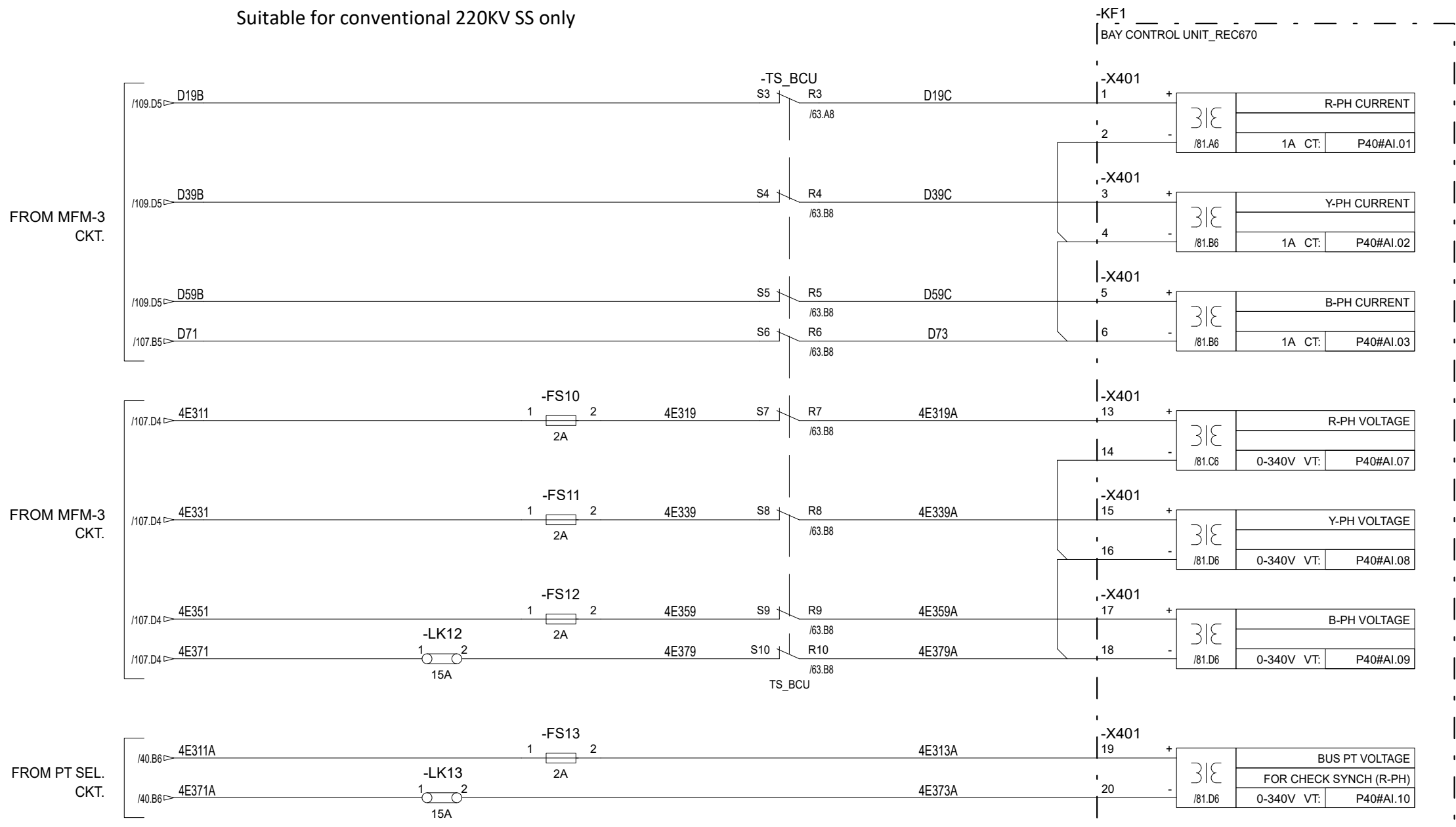
Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		BCU-Power supply Circuit	Resp. dept. PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 63
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Suitable for conventional 220KV SS only



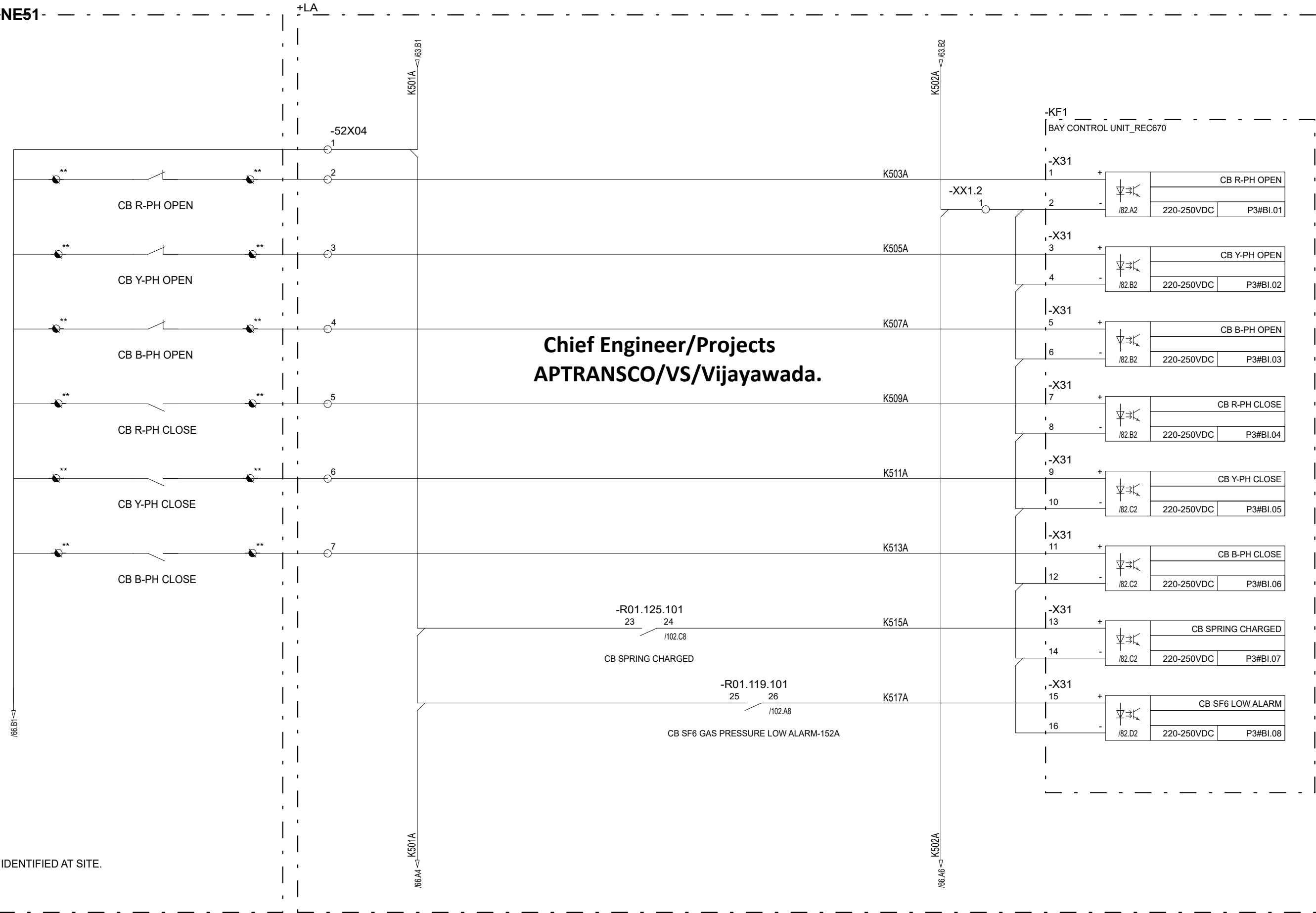
Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		BCU-CT & PT Input Circuit	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited		Language en
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	
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						n. sheet 65

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		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		BCU-Binary Input Ckt.	Resp. dept. PG-GAS	Rev. ind. Language en
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Doc. no. 1MNS500925-CABA	
Rev.	Revision note	Date	Name			Sheet 65
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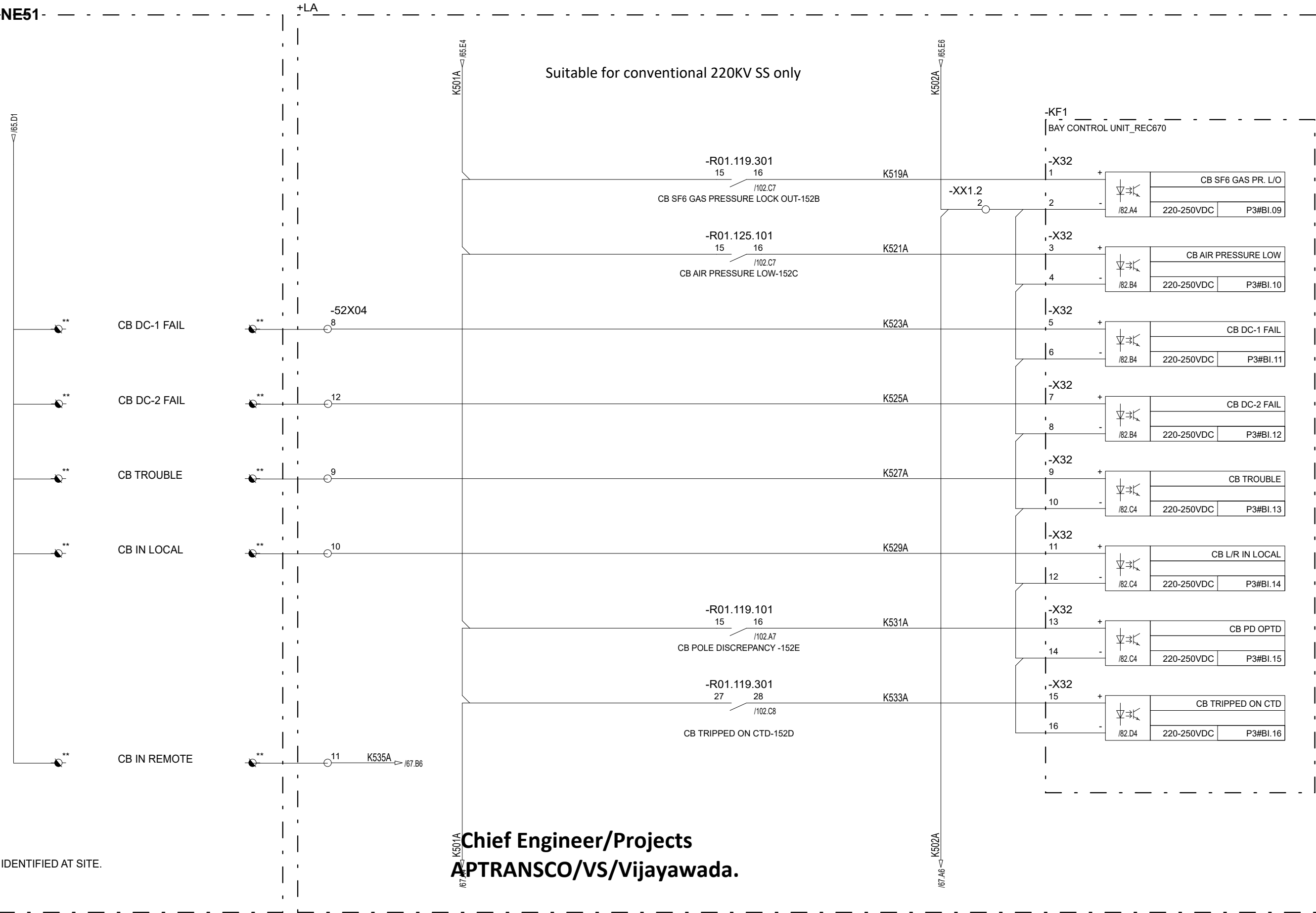
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Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		BCU-Binary Input Ckt.	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 66
1MYN691003-102(A3)REV01						n. sheet 67

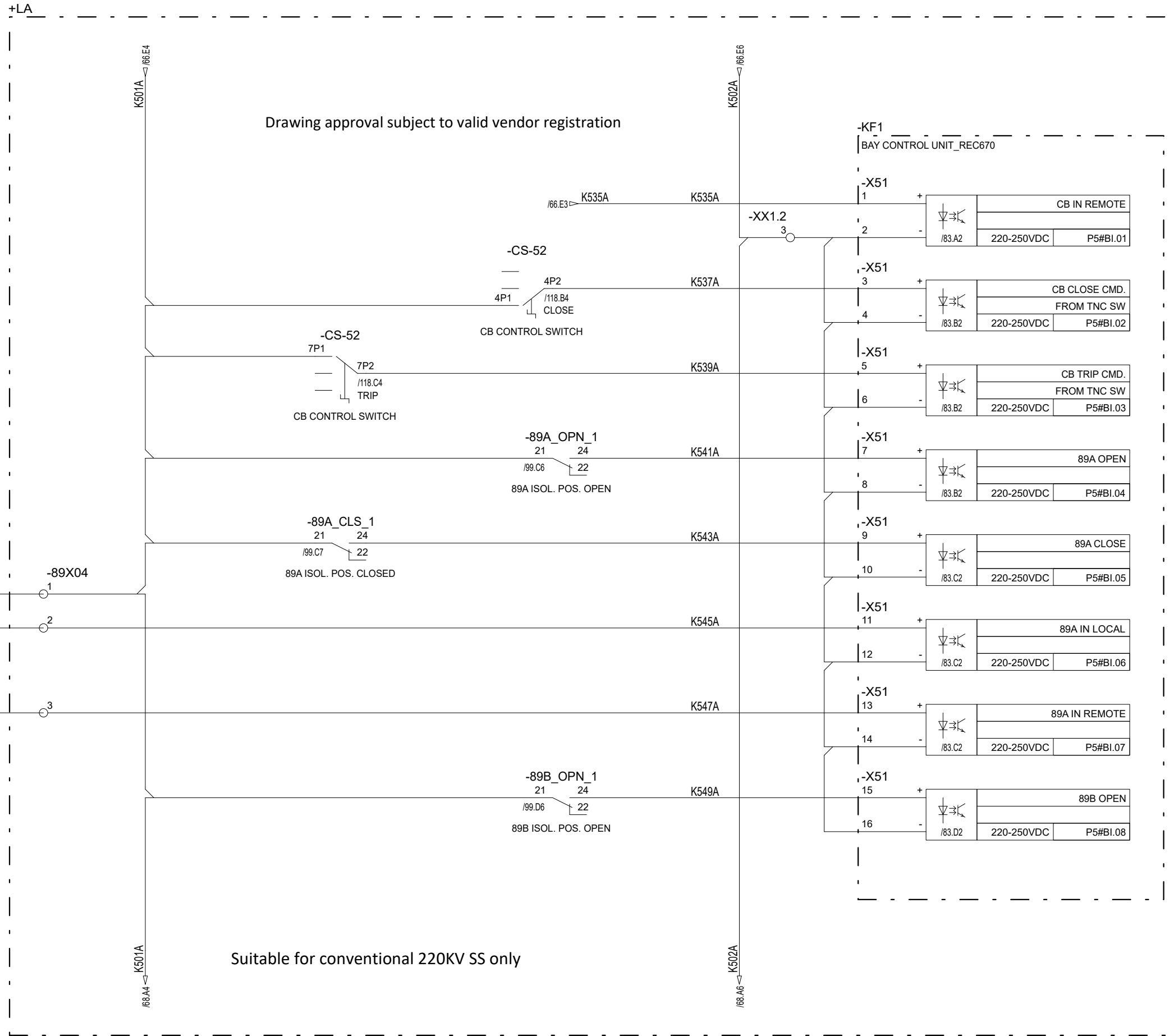
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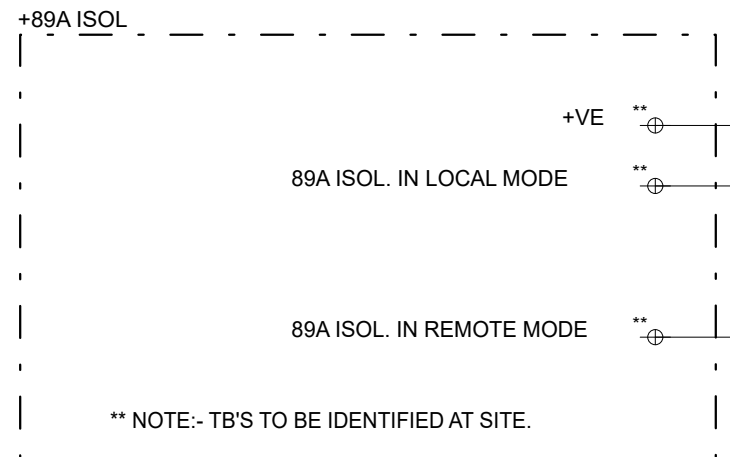
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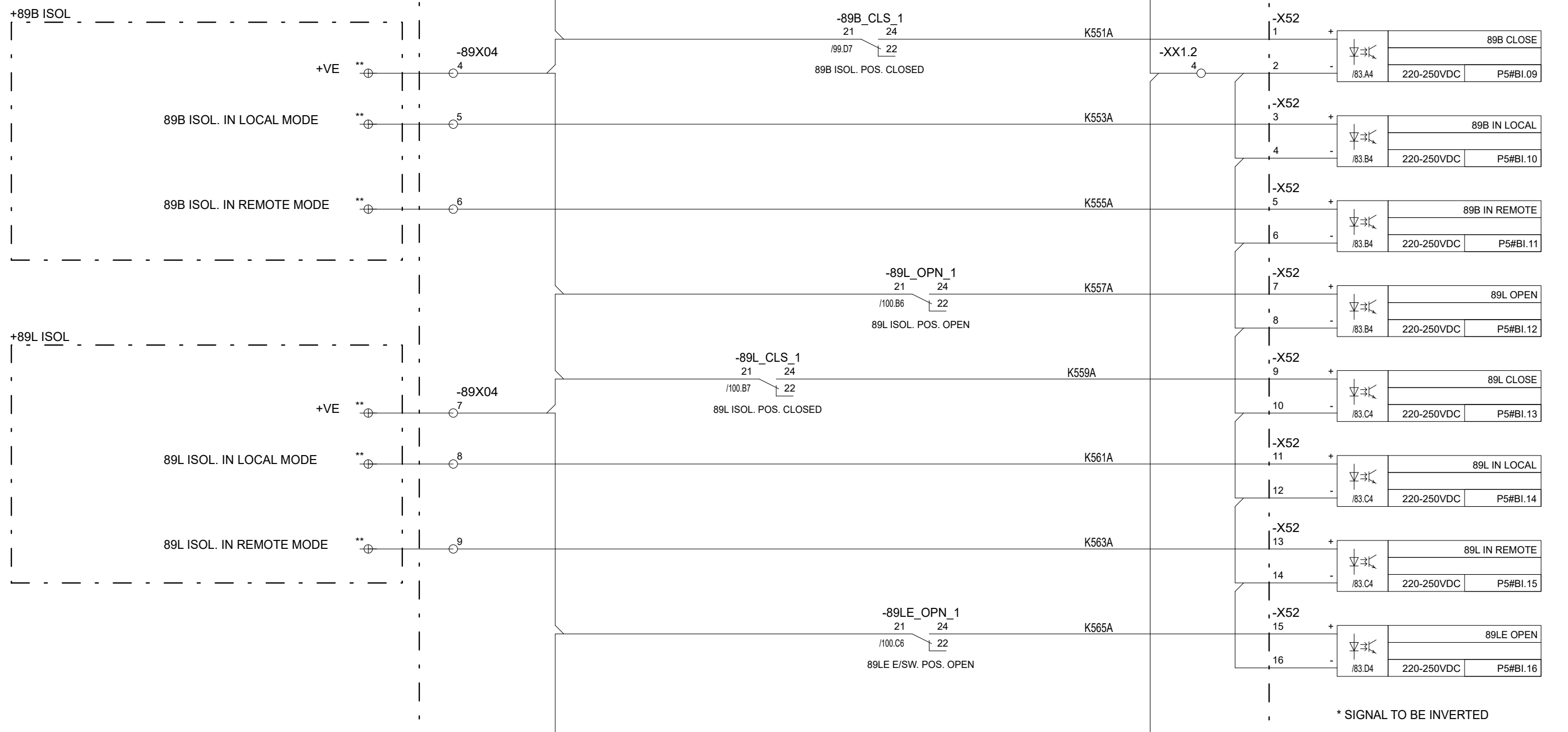
**Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.**



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		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
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		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 67
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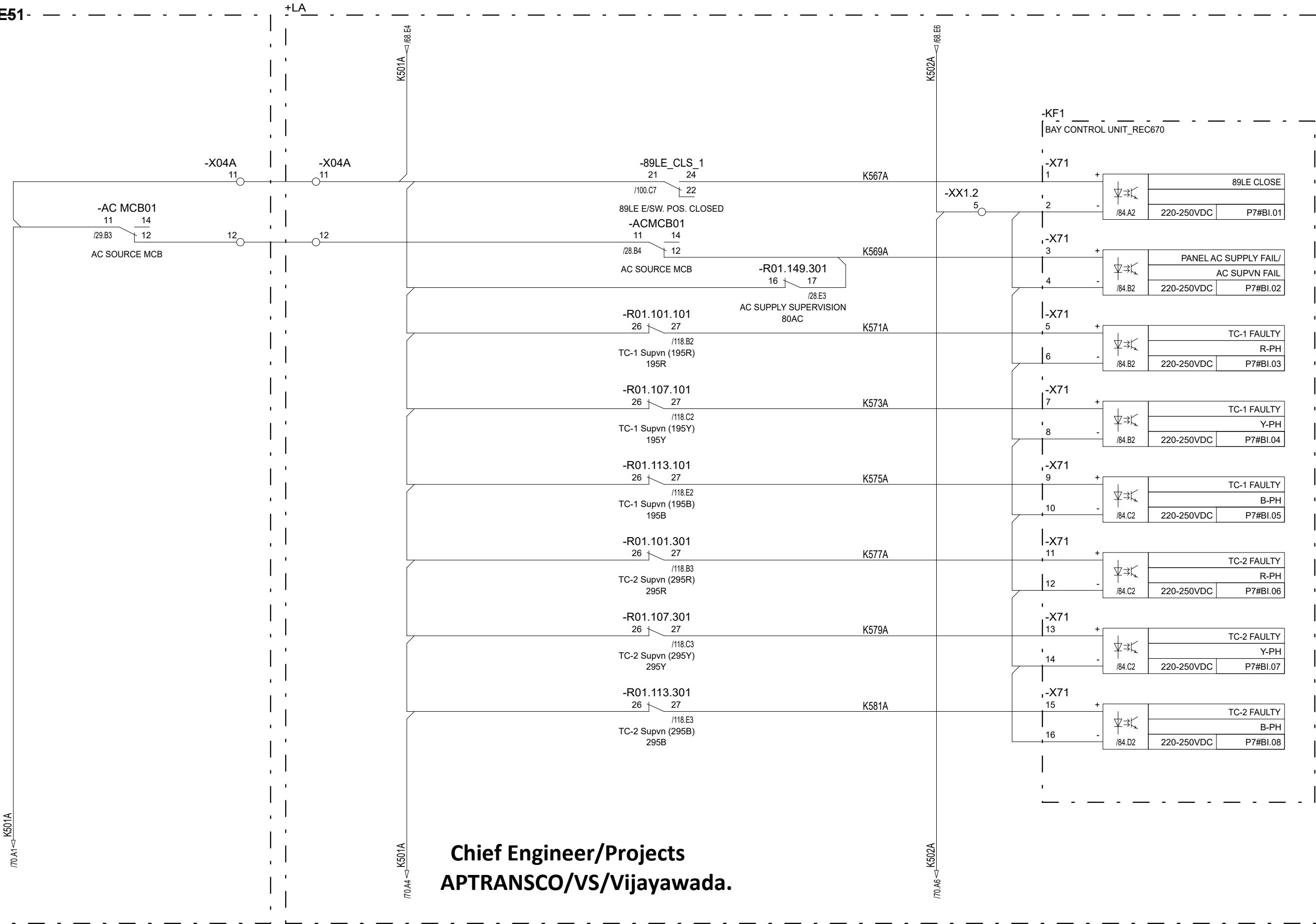
APTRANSCO/VS/Vijayawada

Based on		Prepared 05.01.2024	APTRANSCO VS VJYAWADA 220KV FEEDER		Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE		DCC EFS	
		Project APTRANSCO	Control & Relay Panel		Resp. dept. PG-GAS	Rev. ind.
		STANDARD DRAWING	BCU-Binary Input Ckt.		Language en	
Rev.	Revision note	Date	HITACHI Hitachi Energy India Limited		Doc. no. 1MNS500925-CABA	Sheet 68
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Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		BCU-Binary Input Ckt.	PG-GAS	Rev. ind.
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CABA	Sheet 69	n. sheet 70
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8814600/2024/EEMRT-ENE51

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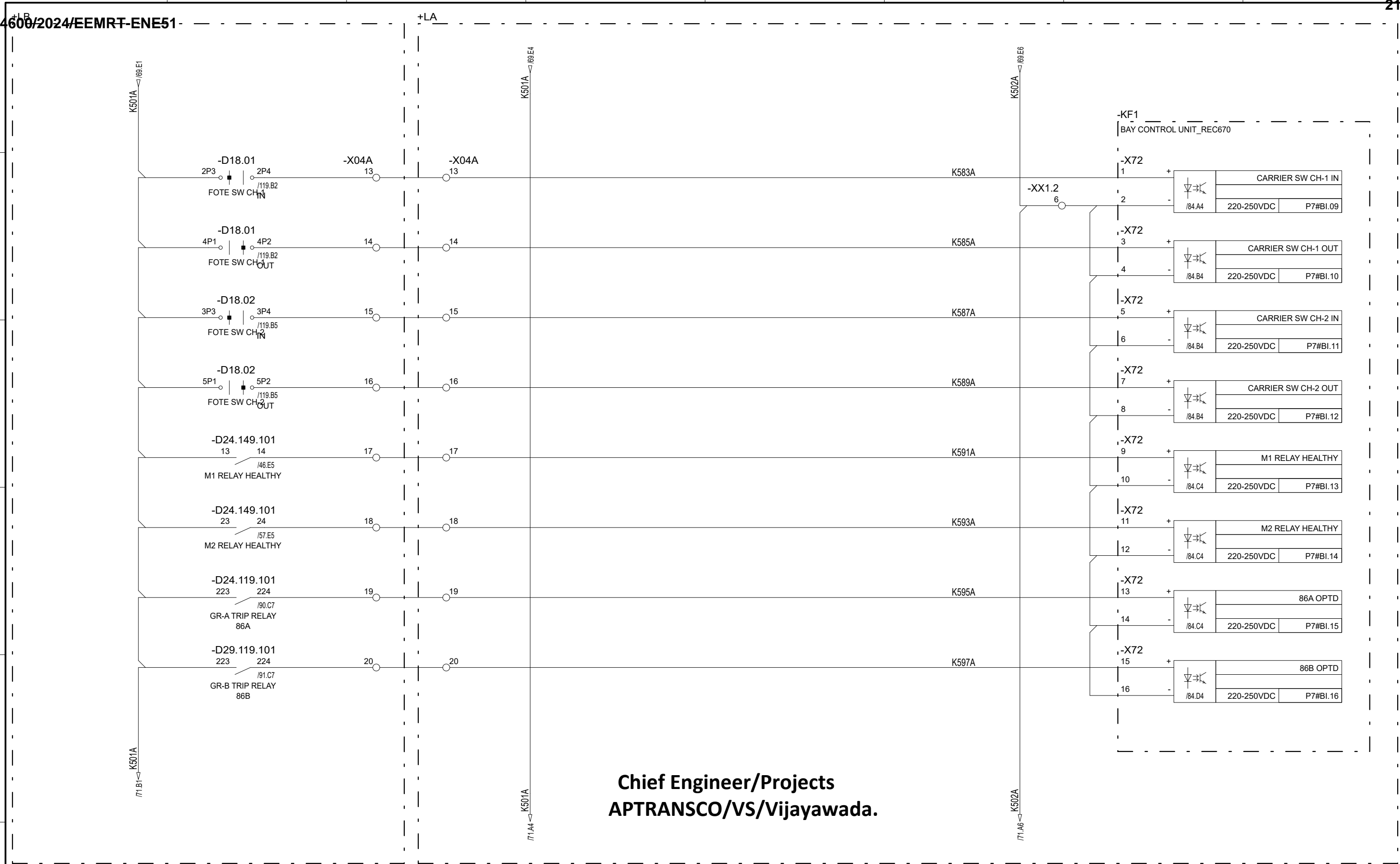
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APTRANSCO/VS/Vijayawada.**

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		Project APTRANSCO STANDARD DRAWING		BCU-Binary Input Ckt.		Resp. dept. PG-GAS		Rev. ind.	
				HITACHI Hitachi Energy India Limited		1MNS500925-CABA		Language en	
Rev.		Revision note						Sheet 70	
		Date				Doc. no.		n. sheet 71	
1MYN691003-102(A3)REV01									

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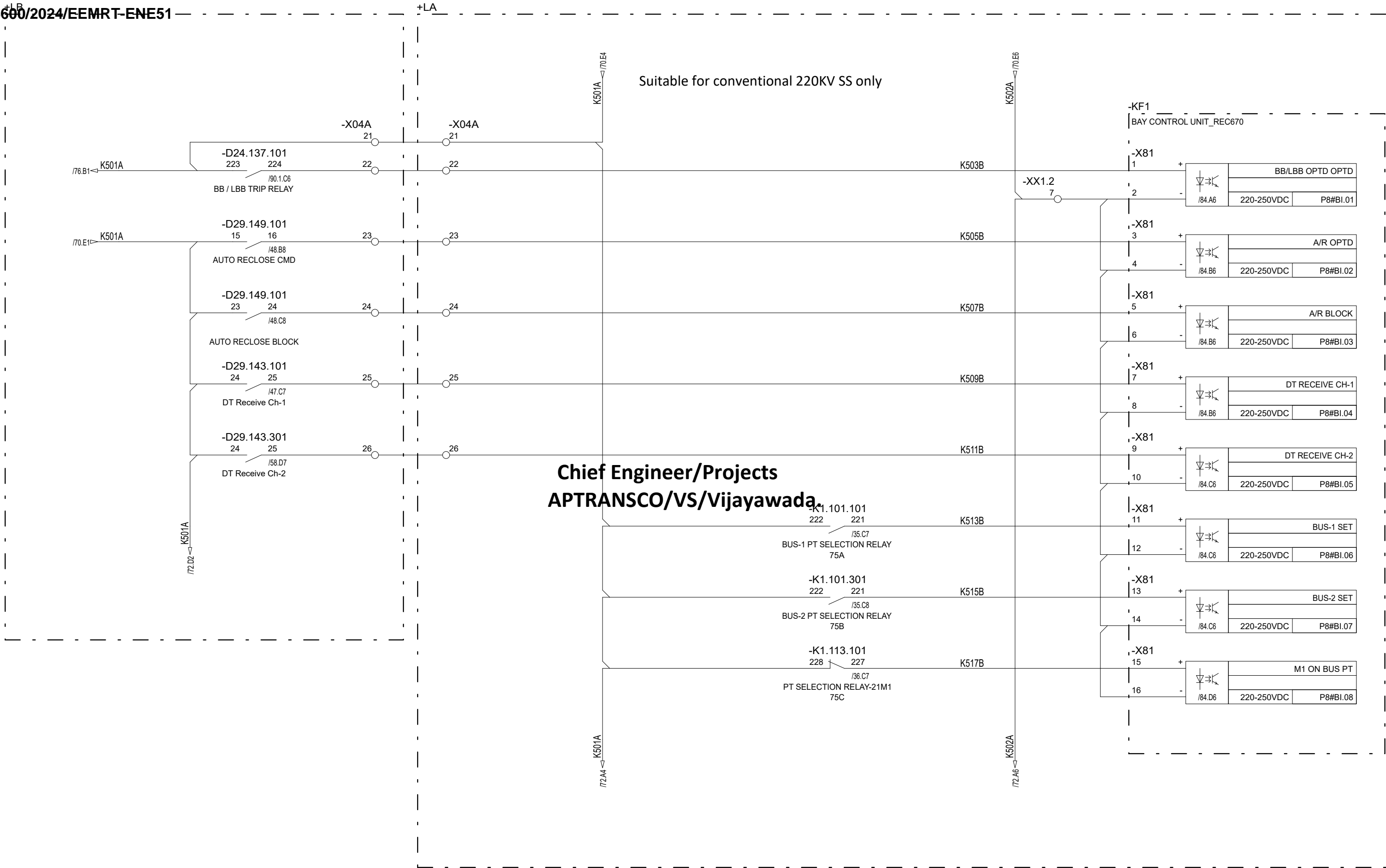
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8814600/2024/EEMRT-ENE51



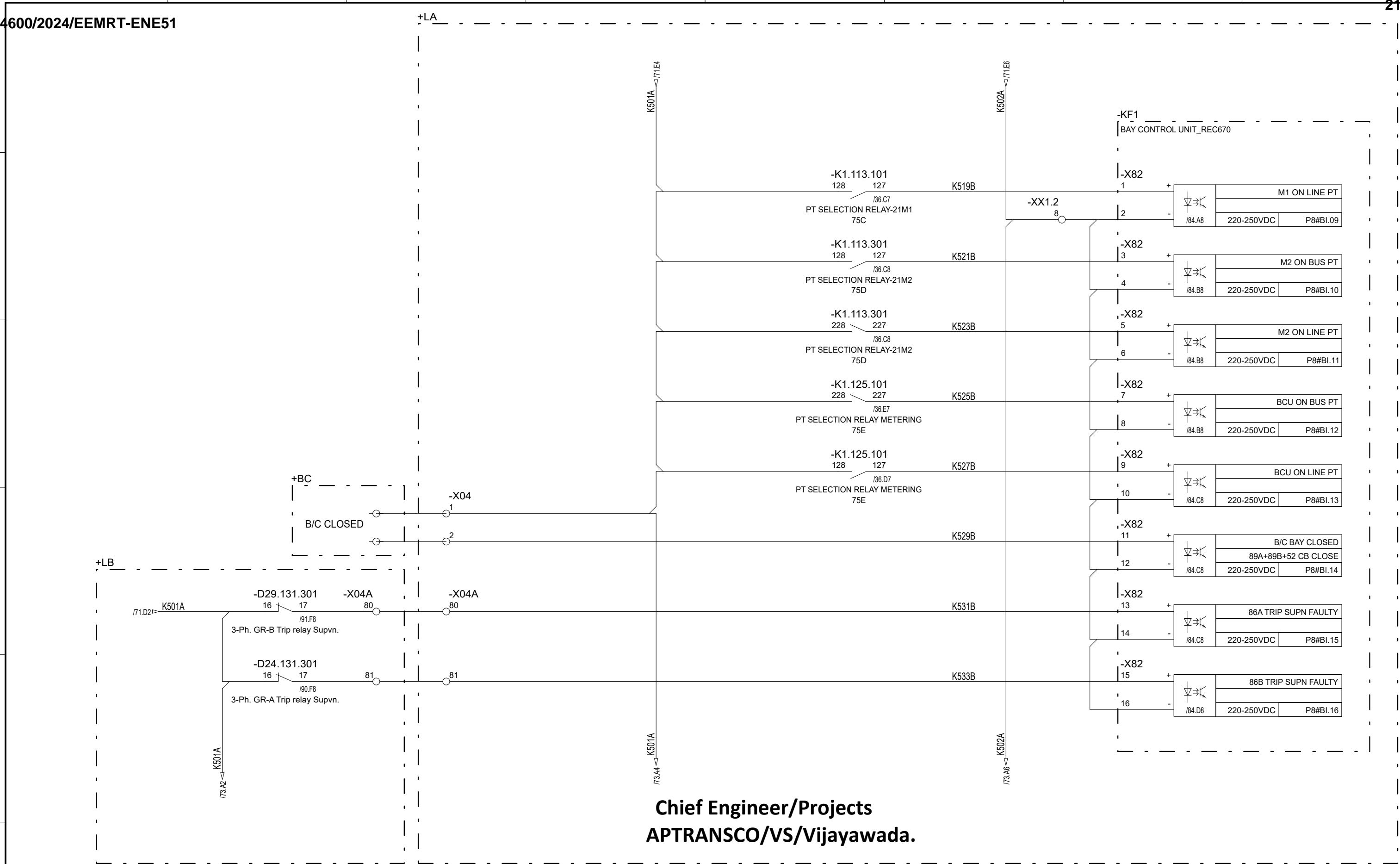
**Chief Engineer/Projects
APTRANSCO/VS/Vijayawada**

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		BCU-Binary Input Ckt.	Resp. dept. PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 71
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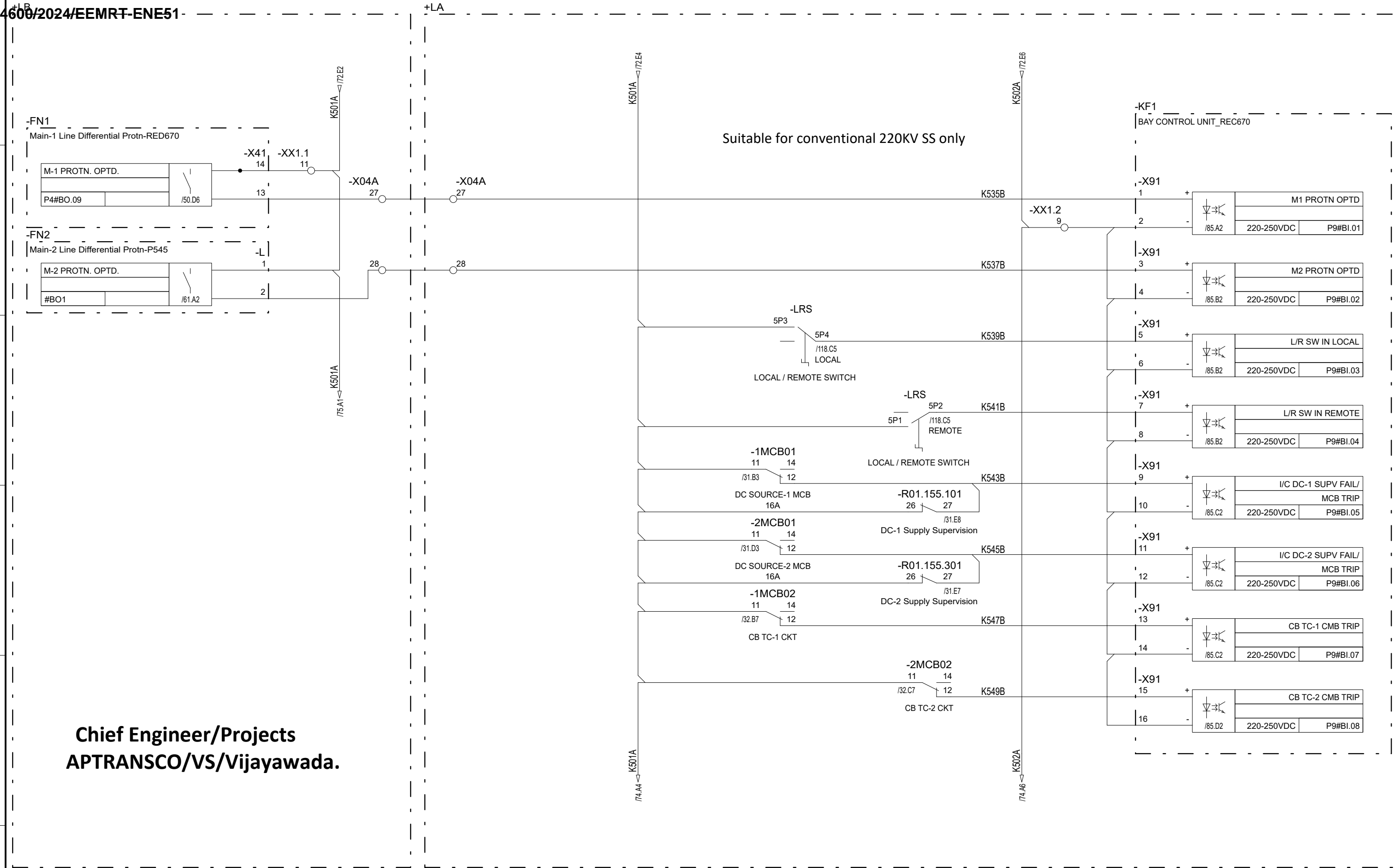
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Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
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		Project APTRANSCO		BCU-Binary Input Ckt.	Resp. dept. PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
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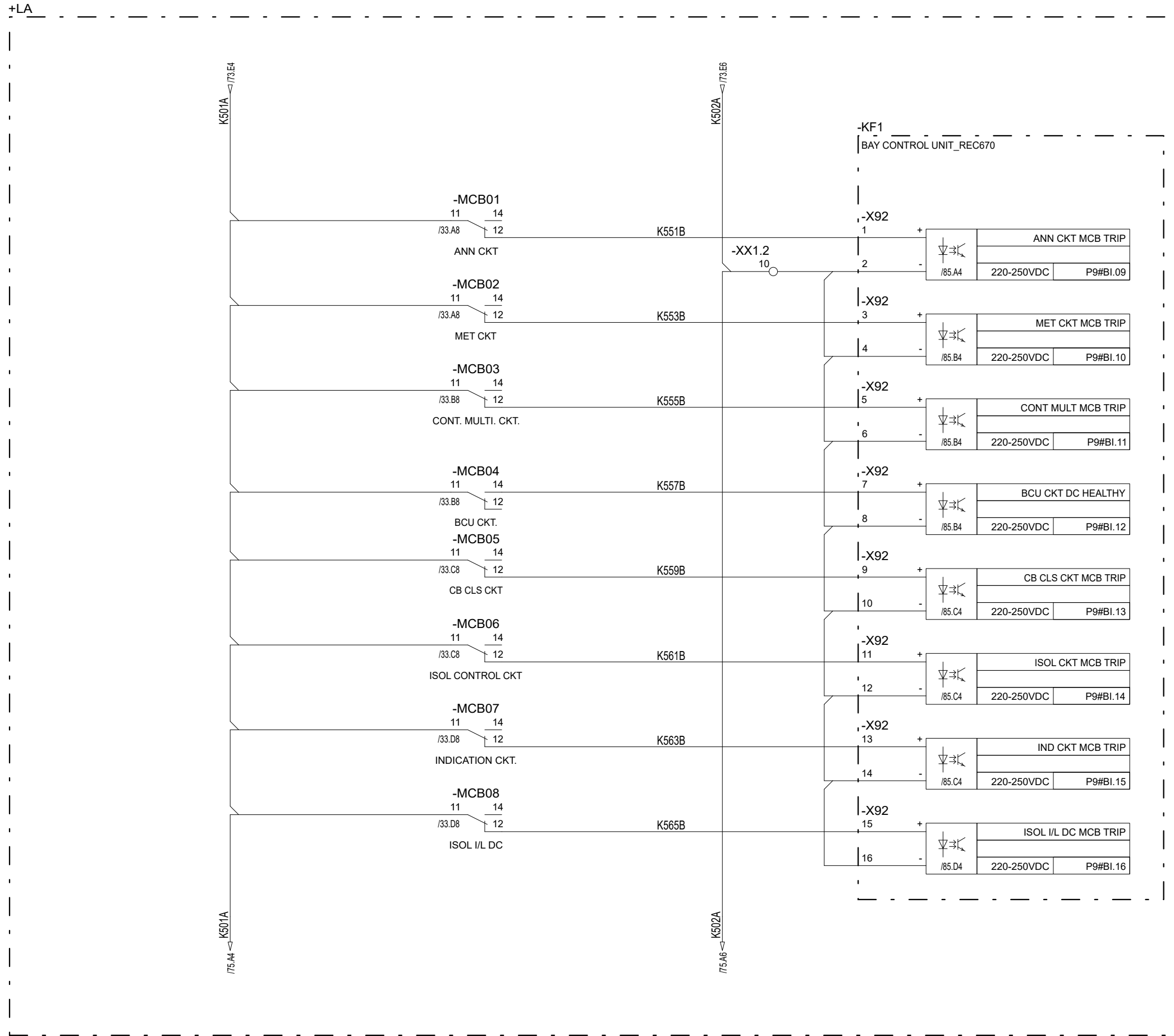
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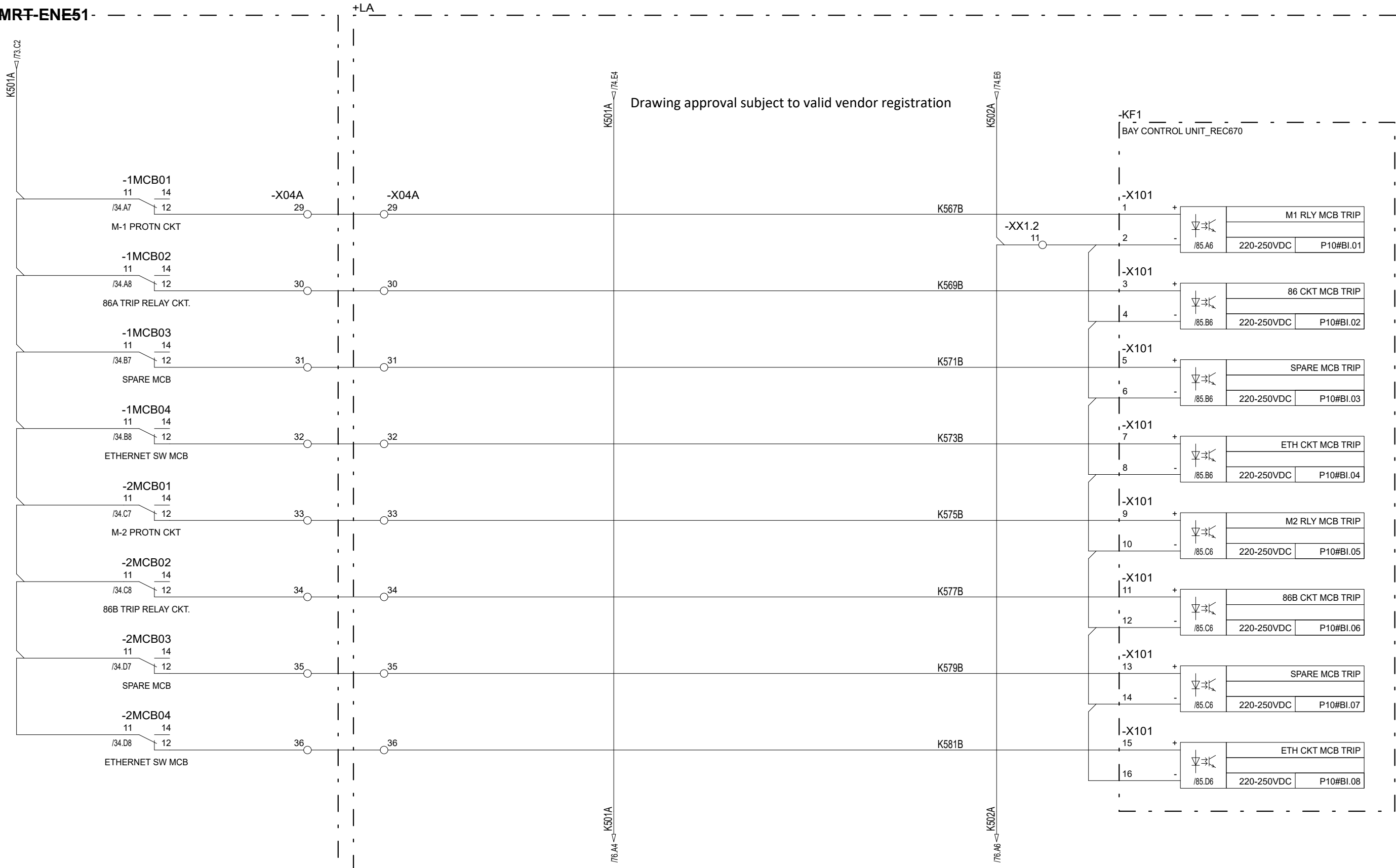
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Drawing approval subject to valid vendor registration



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Rev.	Revision note	Date	Name		Doc. no. 1MNS500925-CABA	Sheet 75
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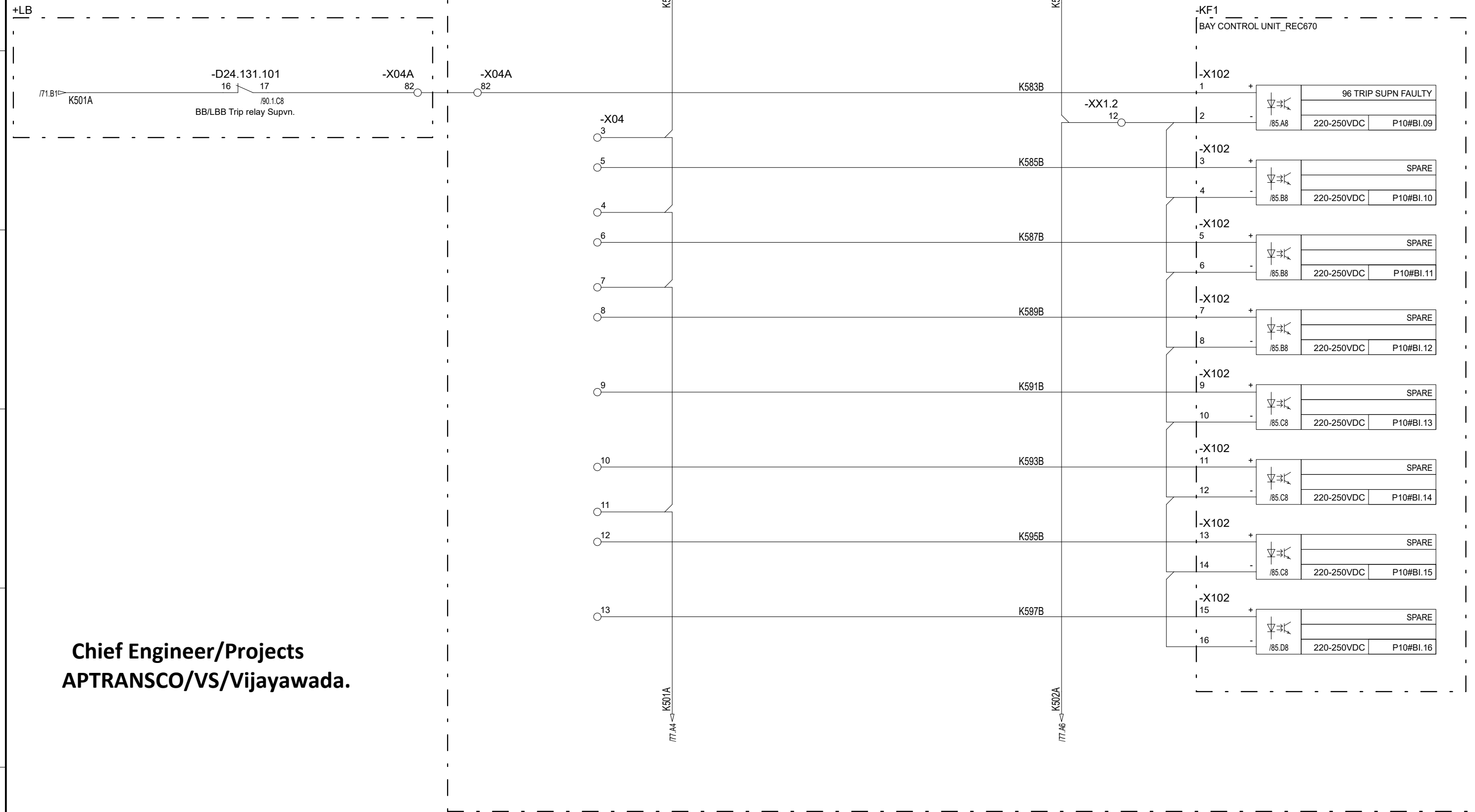
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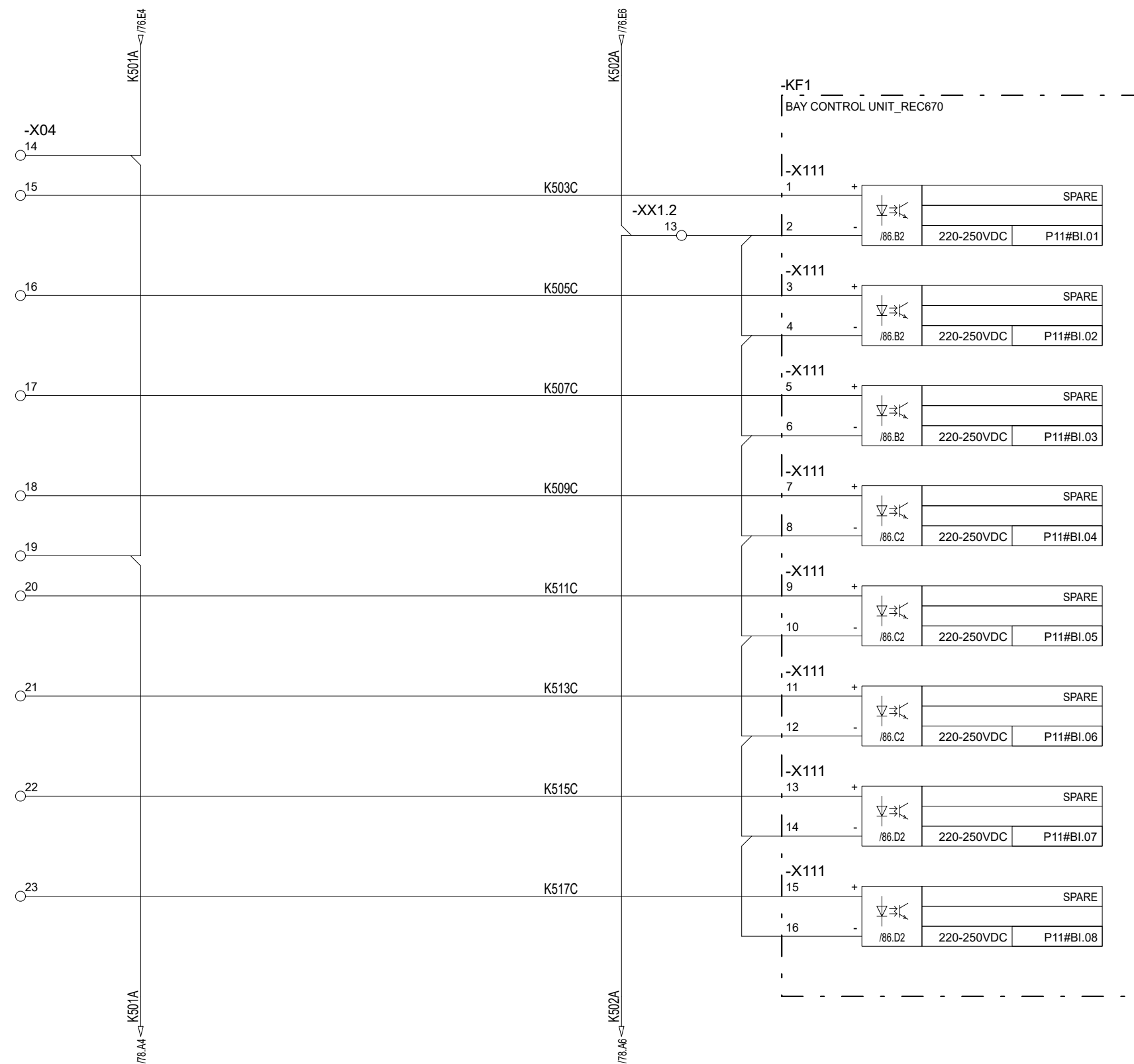
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Rev.	Revision note	Date	Name									n. sheet	78

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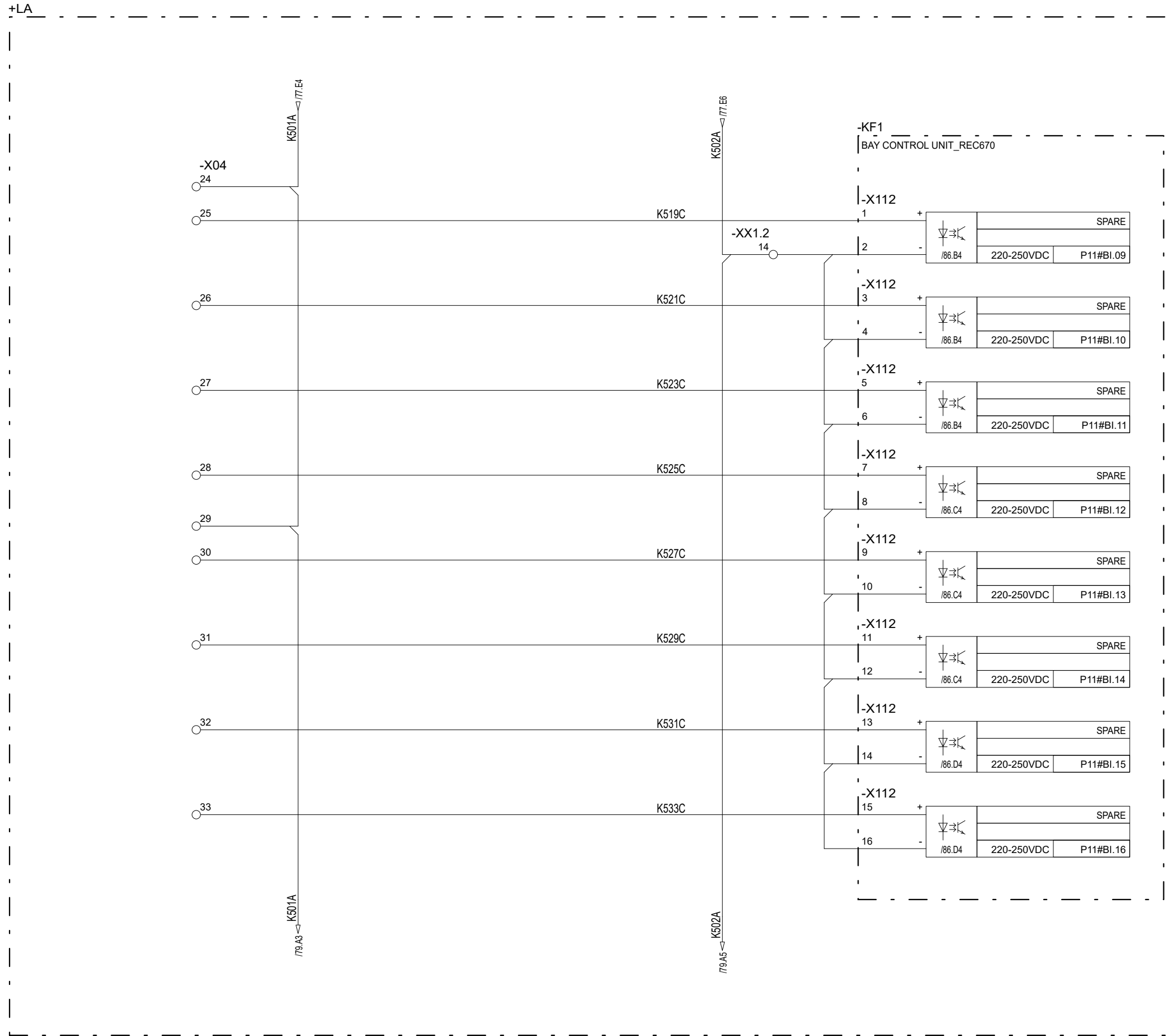
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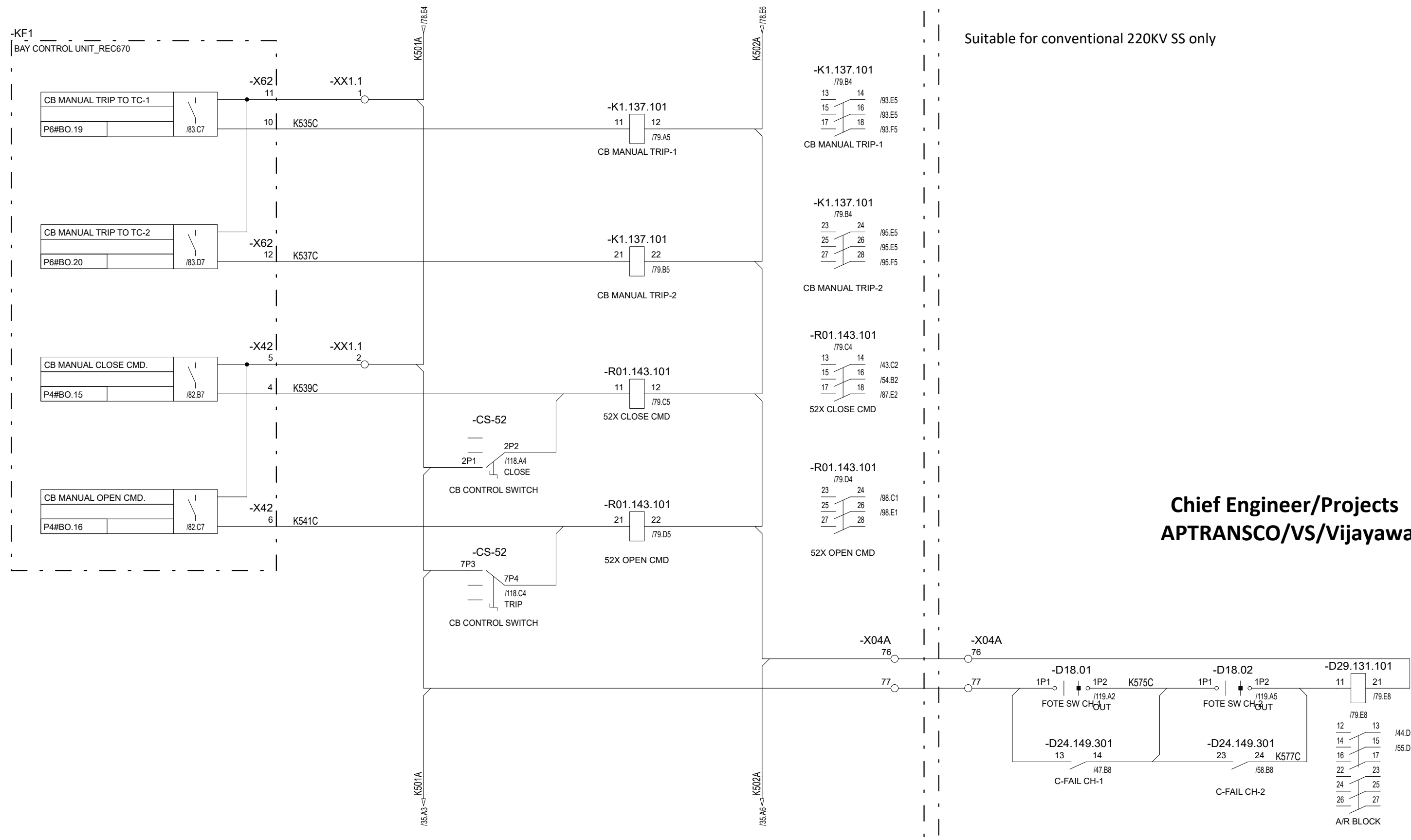


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Rev.	Revision note	Date	Name				Doc. no.			n. sheet	80	
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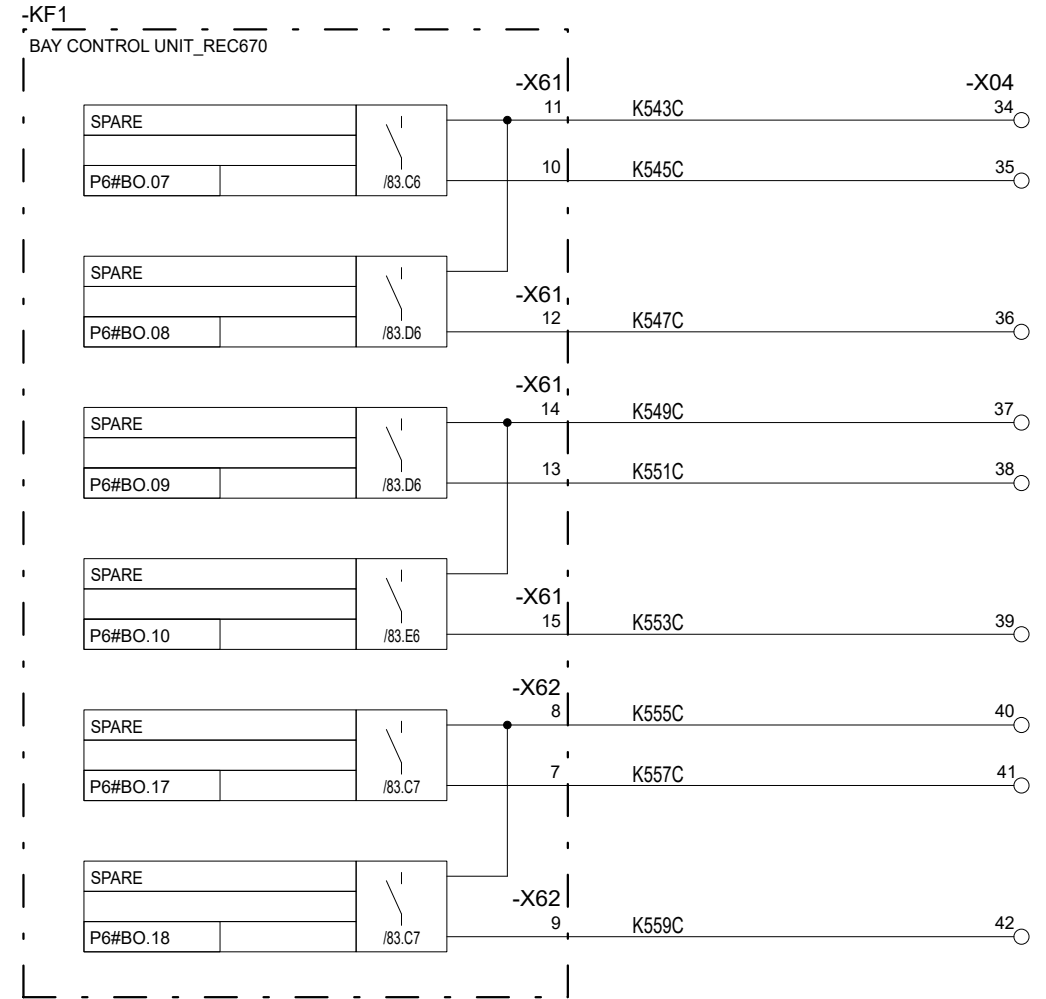
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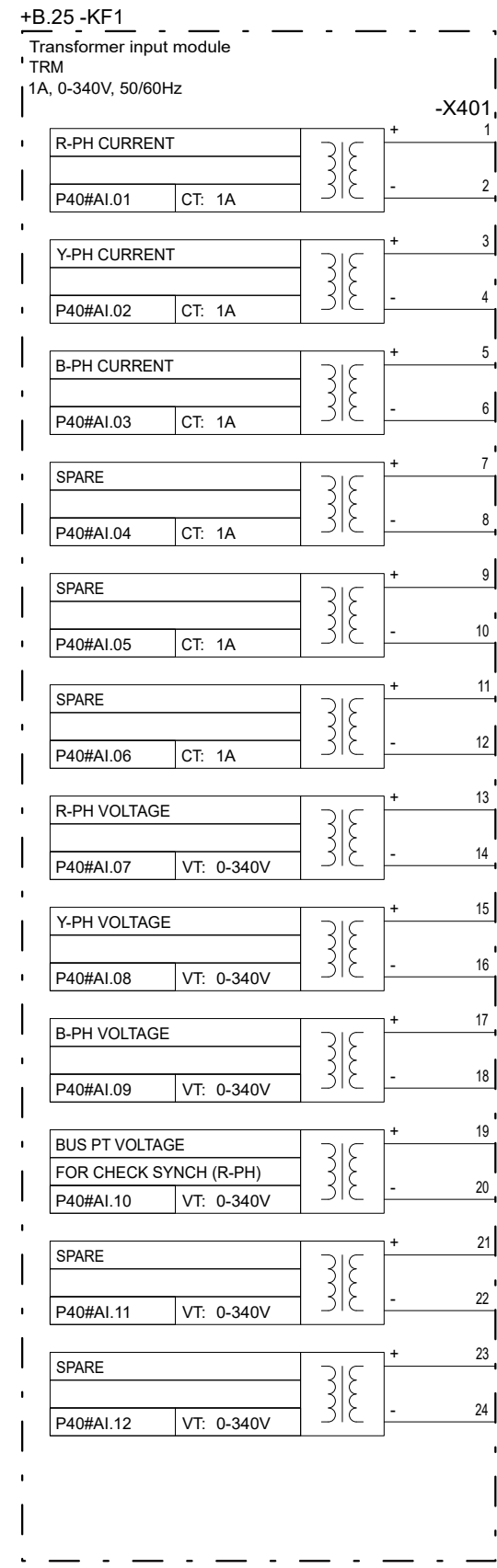
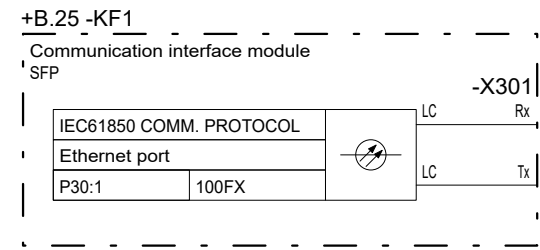
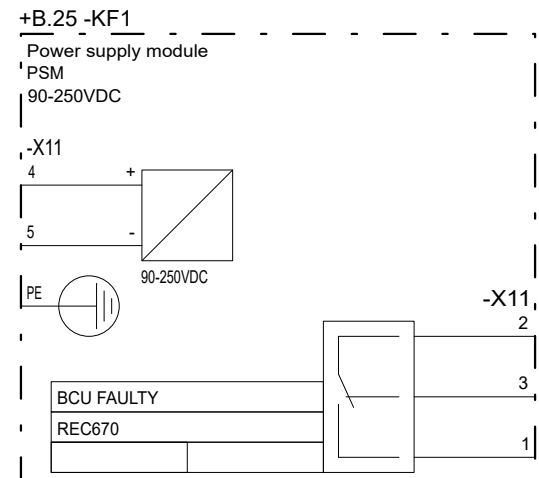
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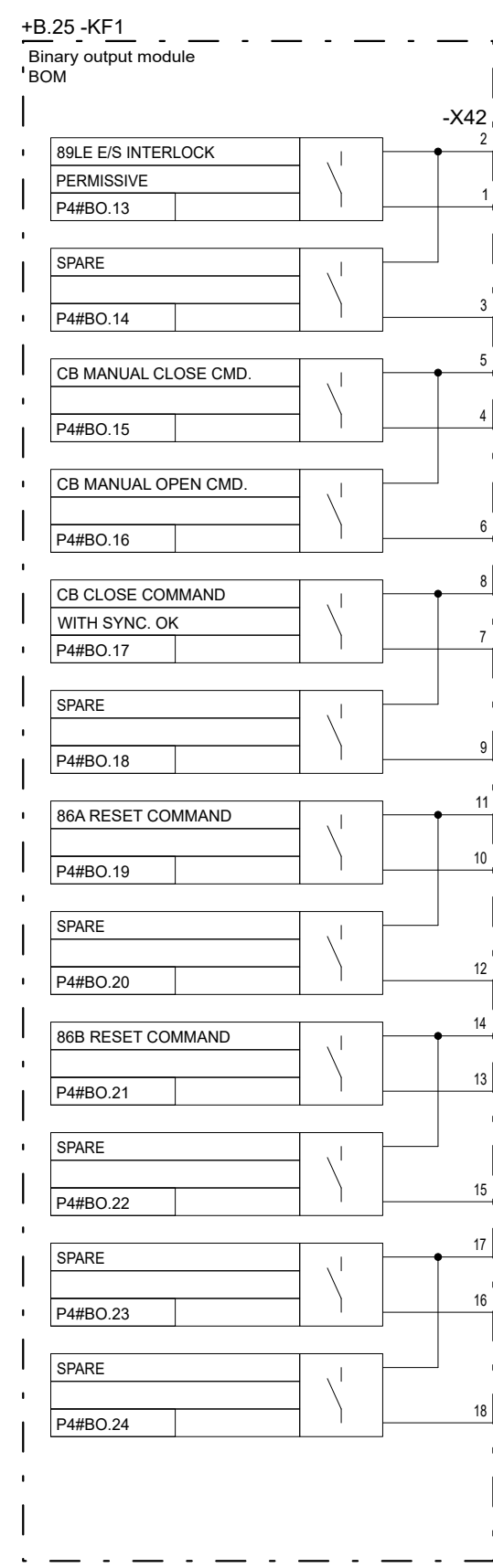
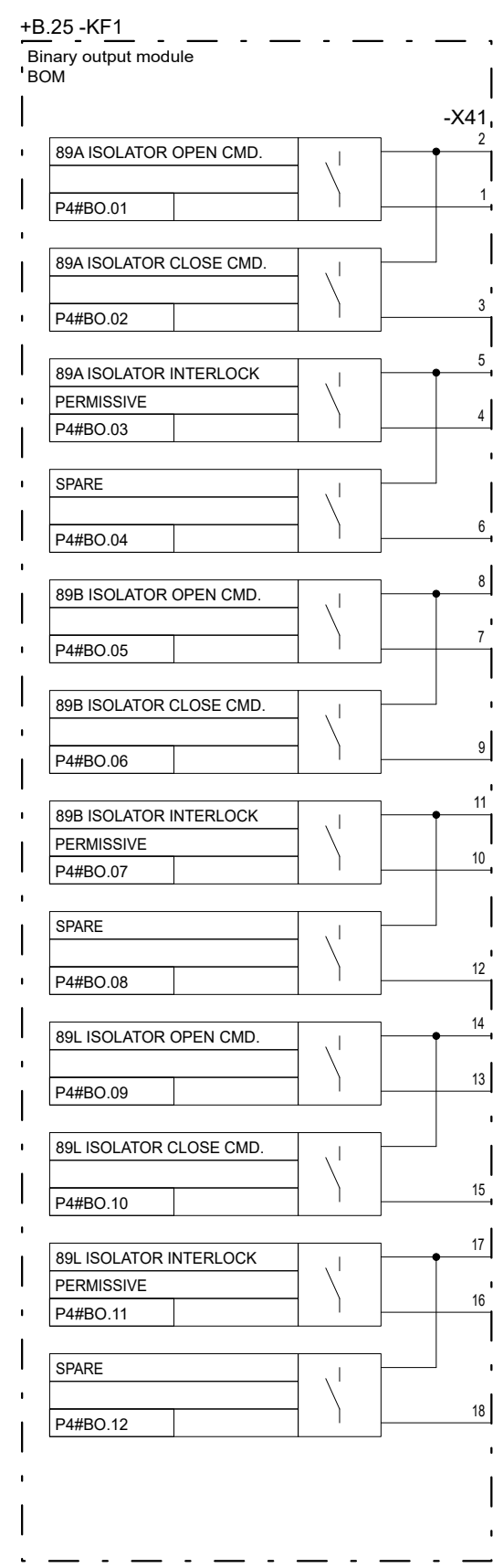
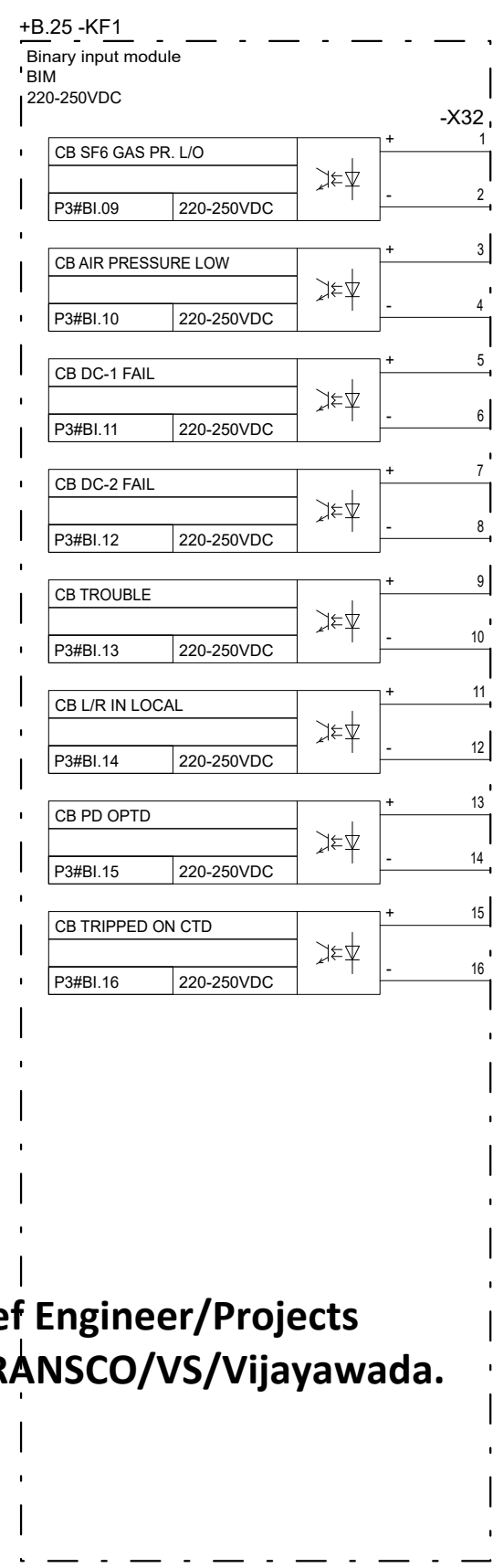
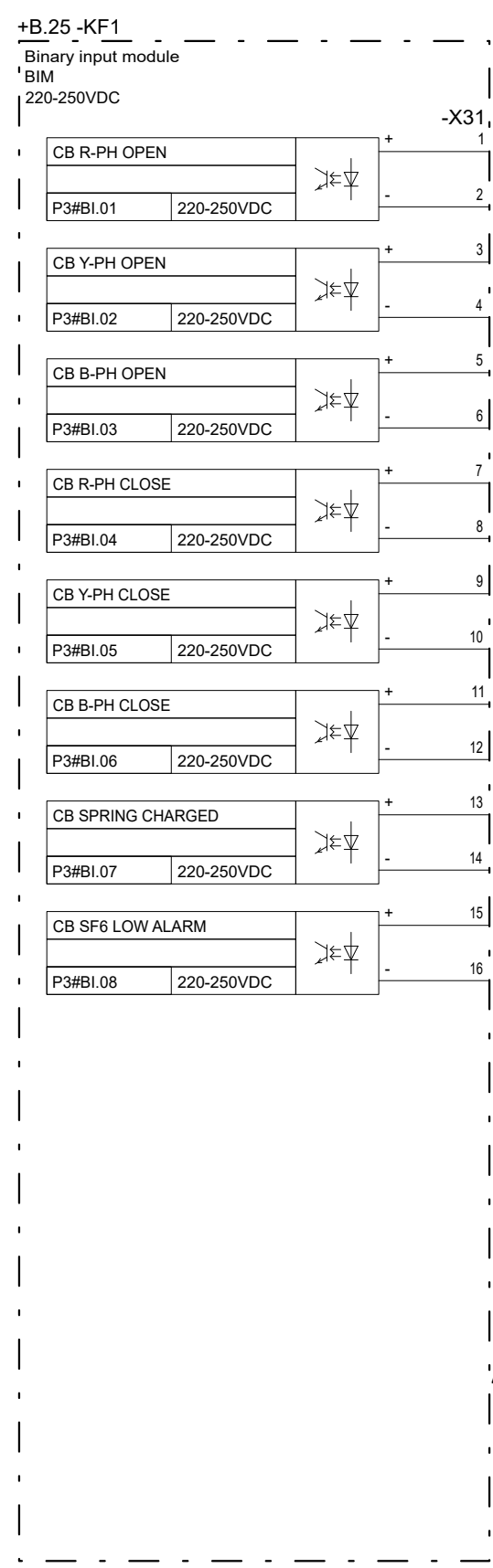
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Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 81
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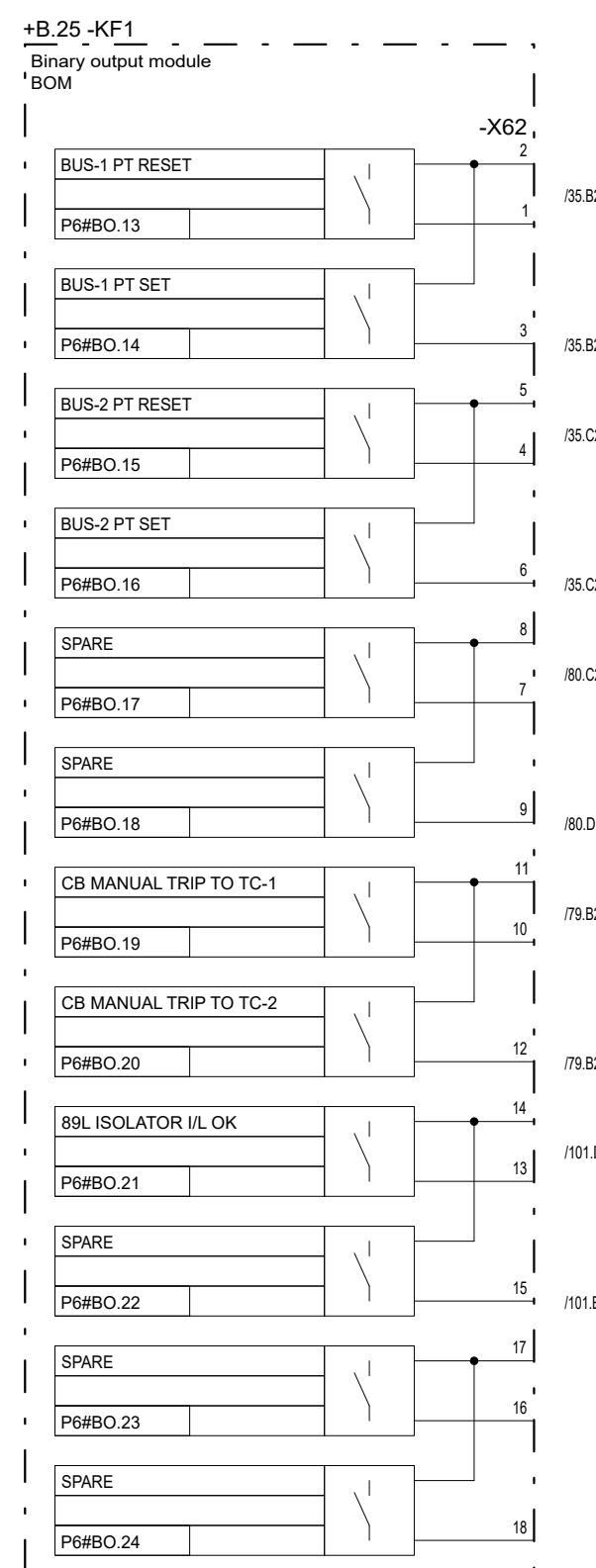
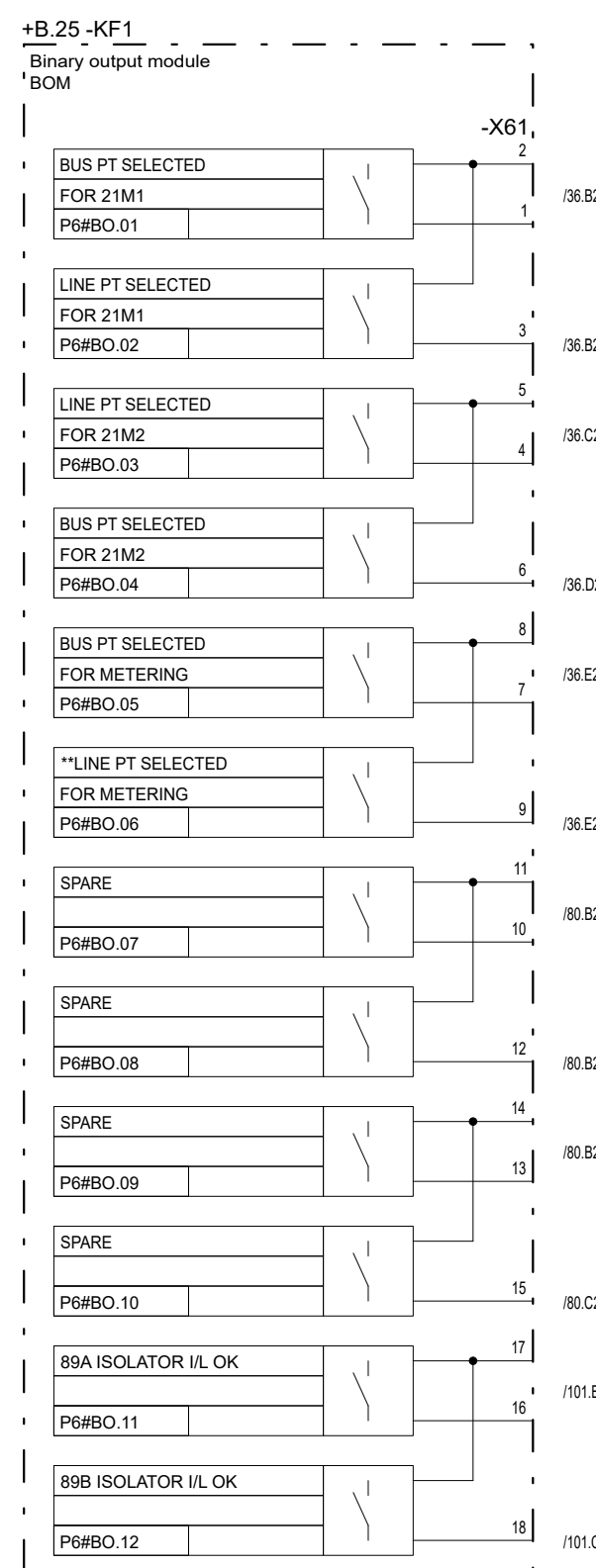
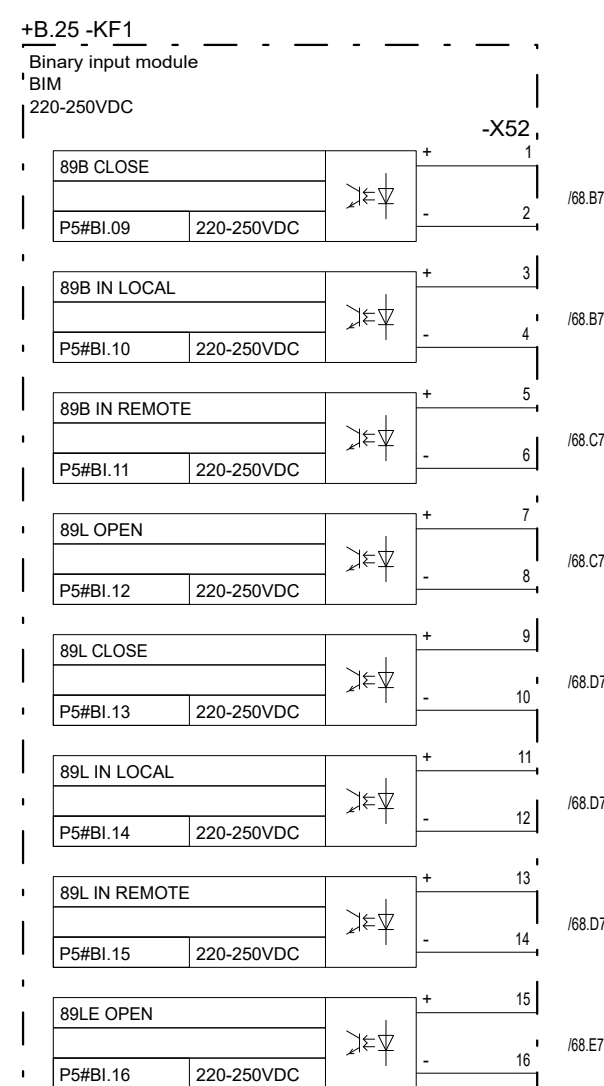
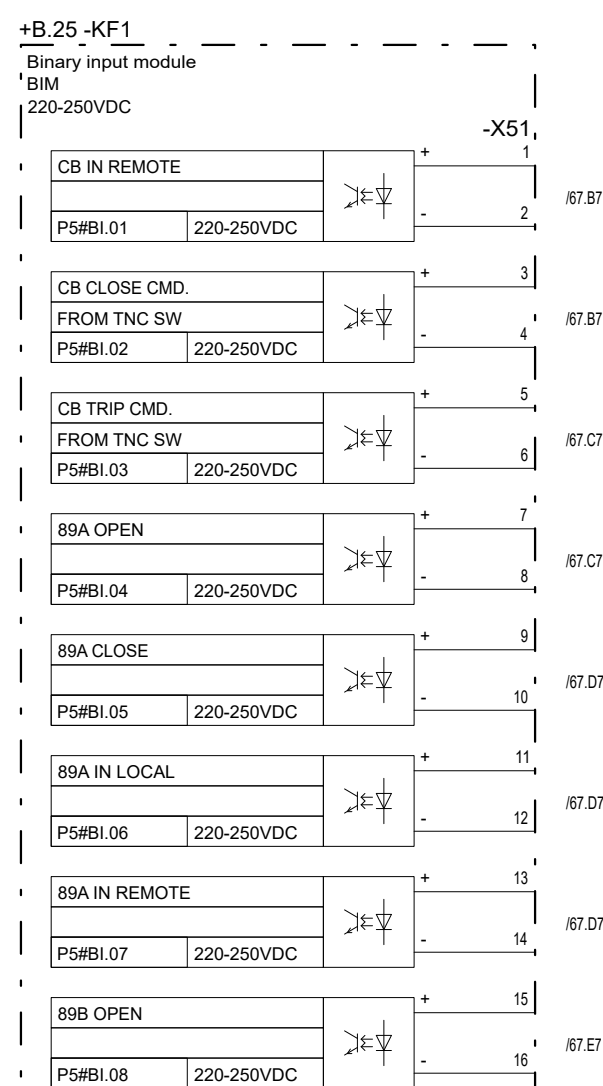
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		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
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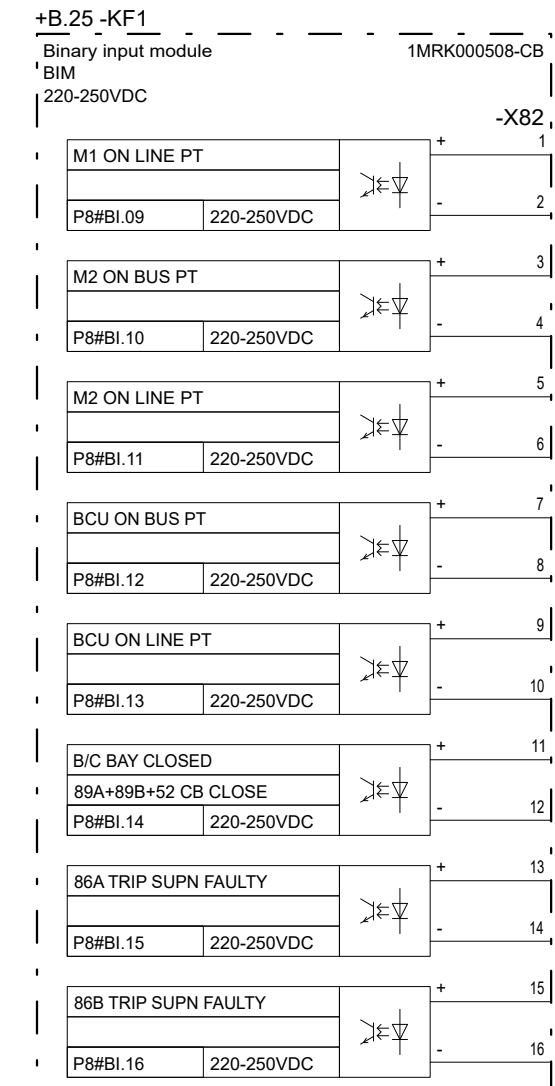
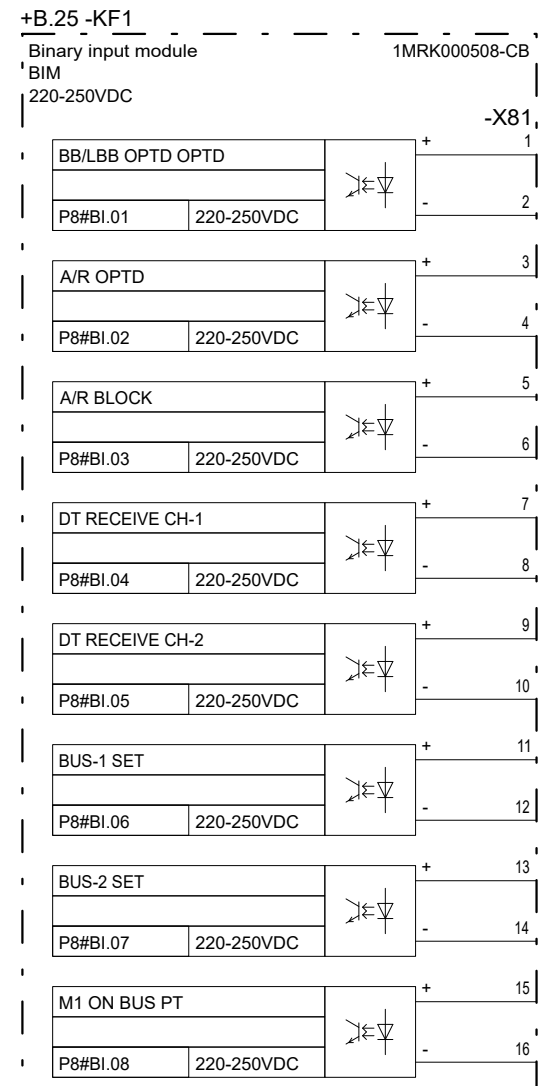
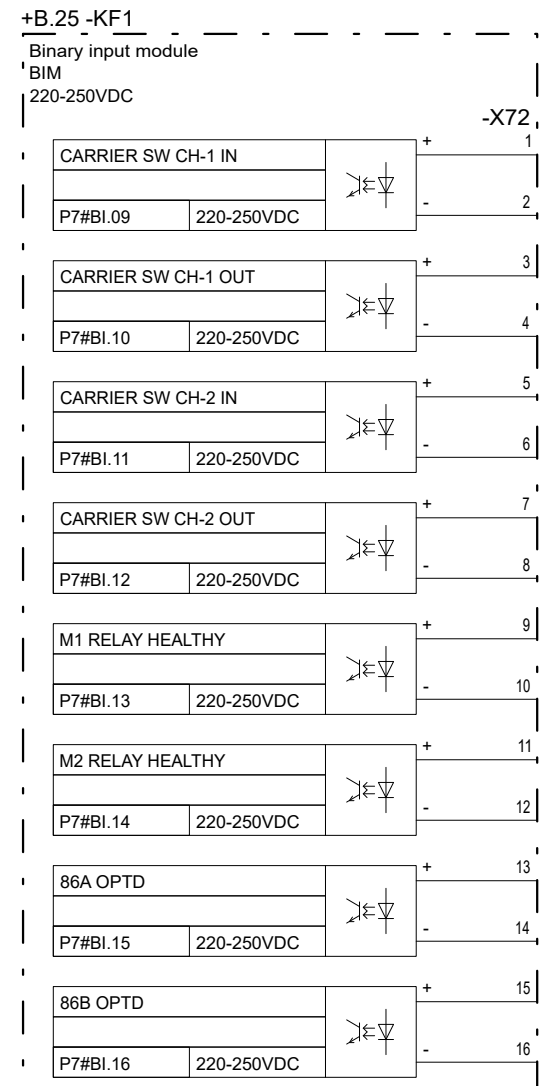
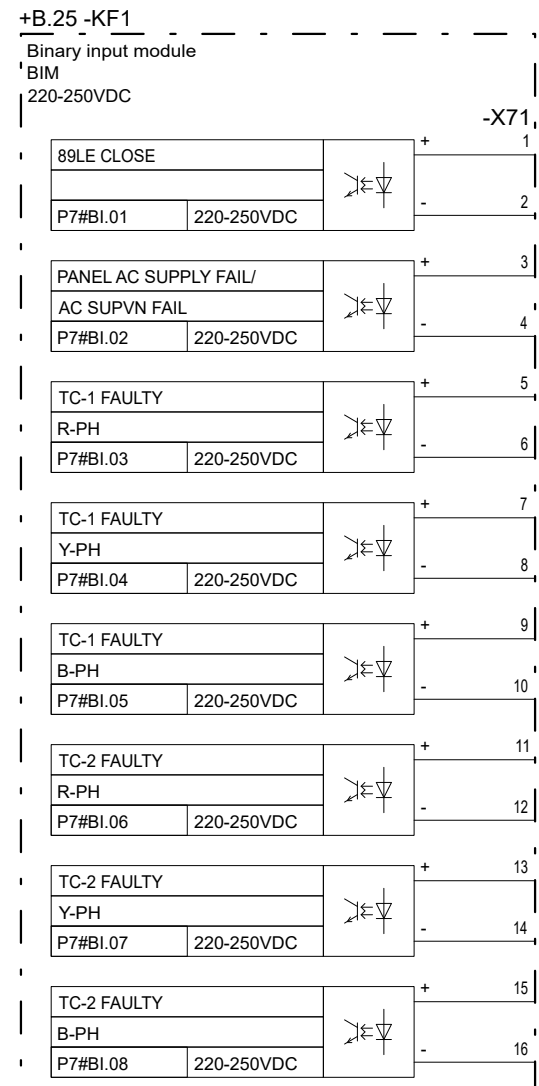


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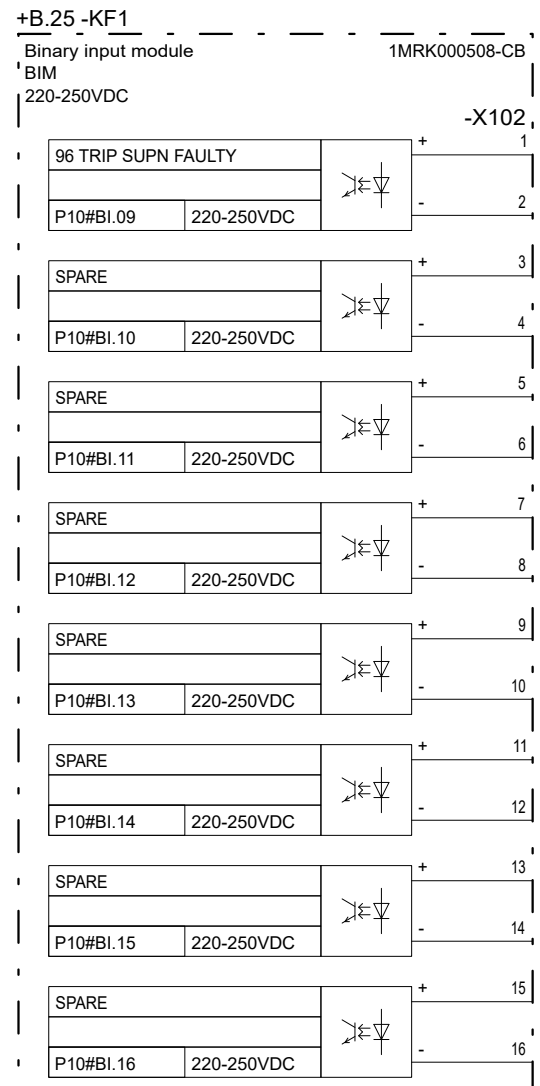
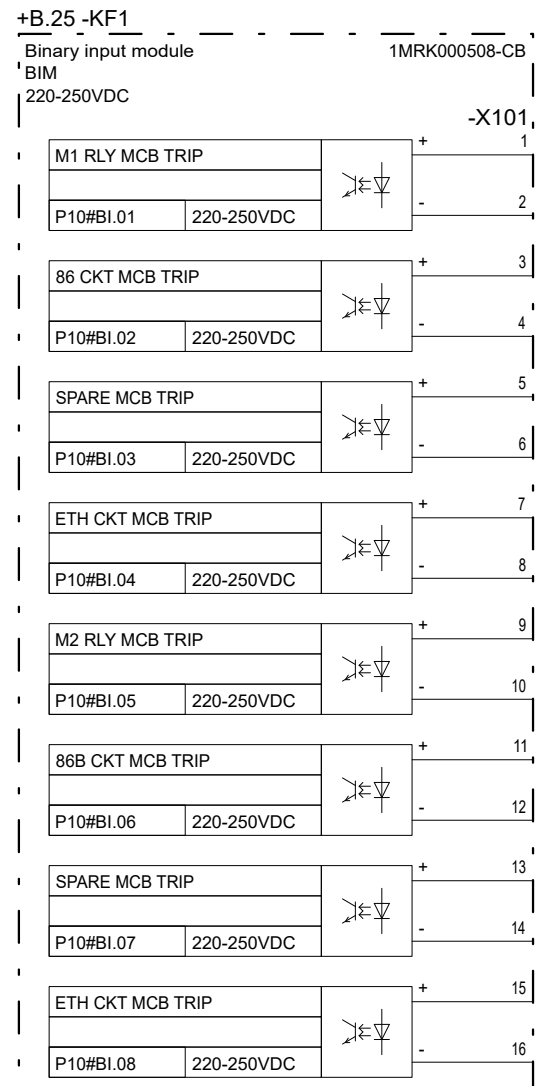
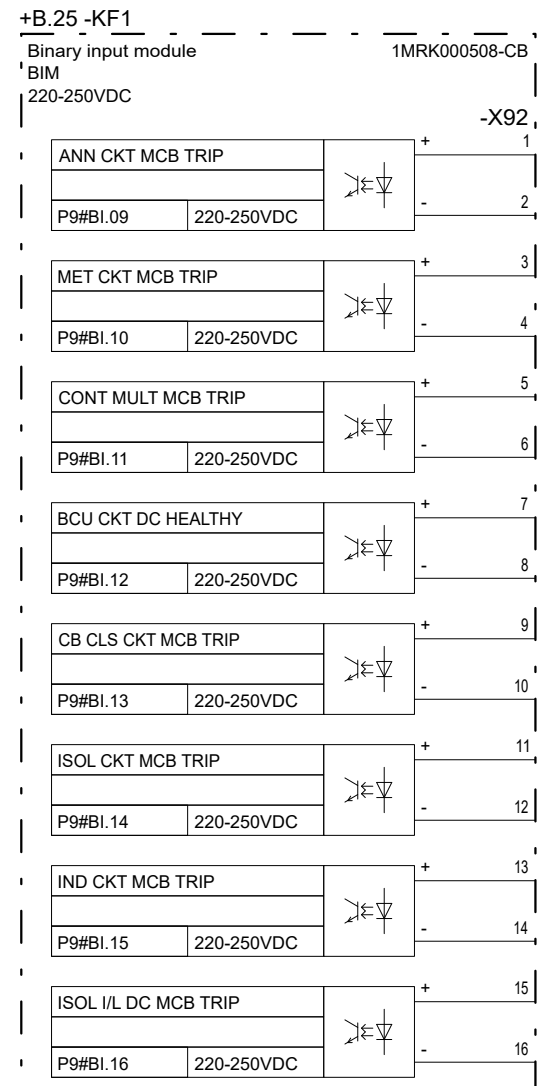
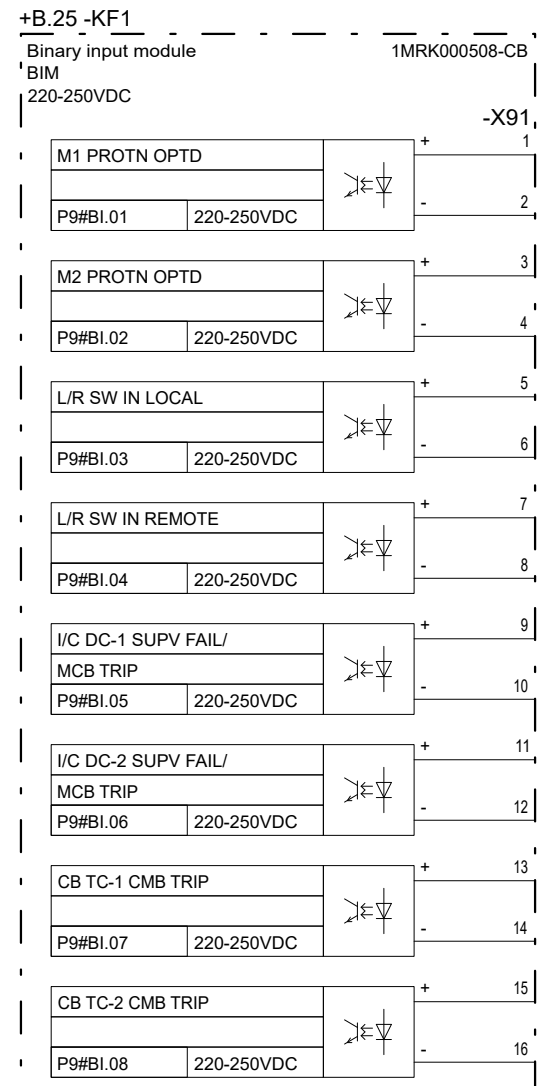
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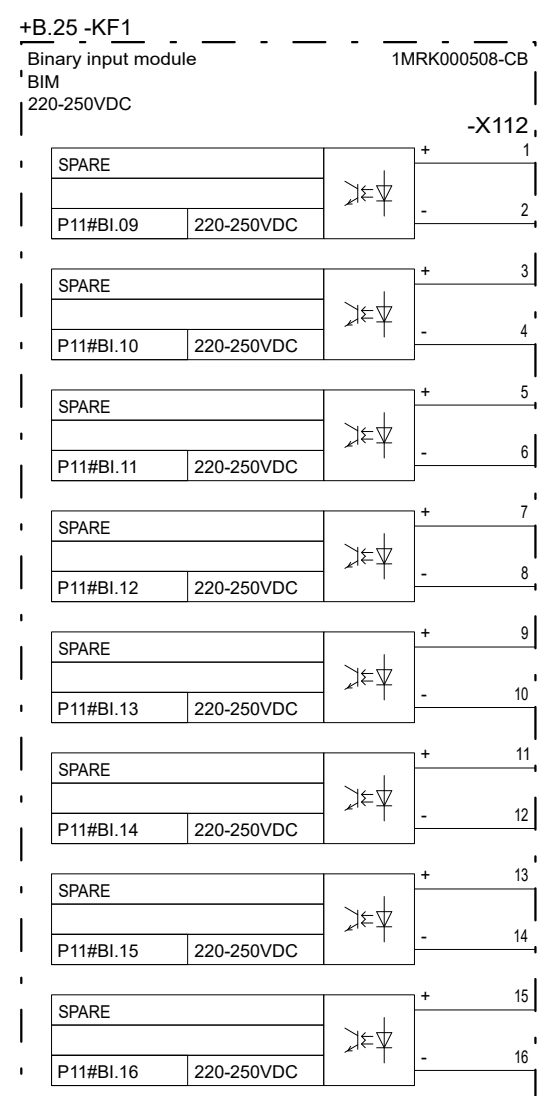
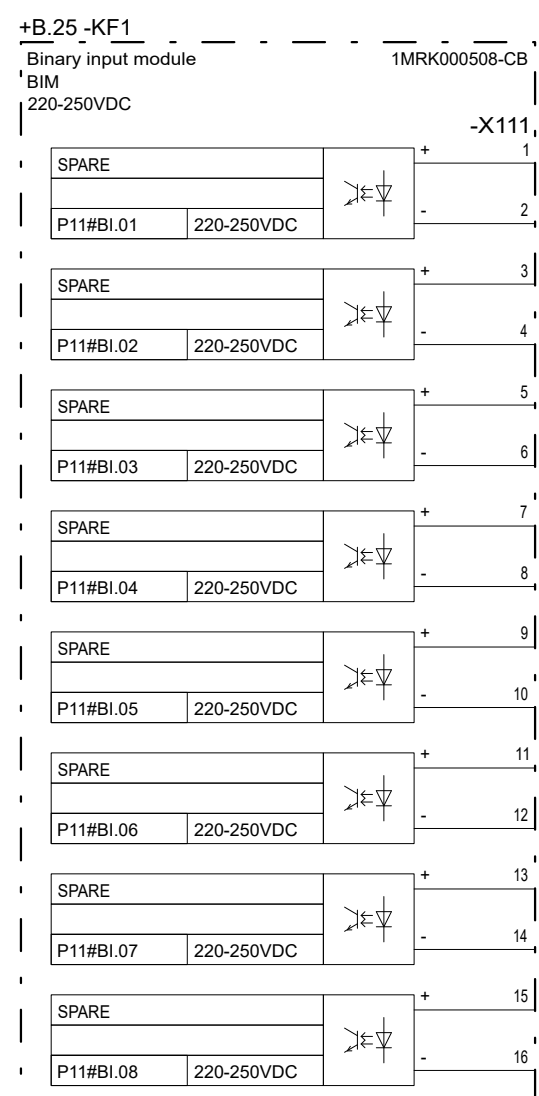


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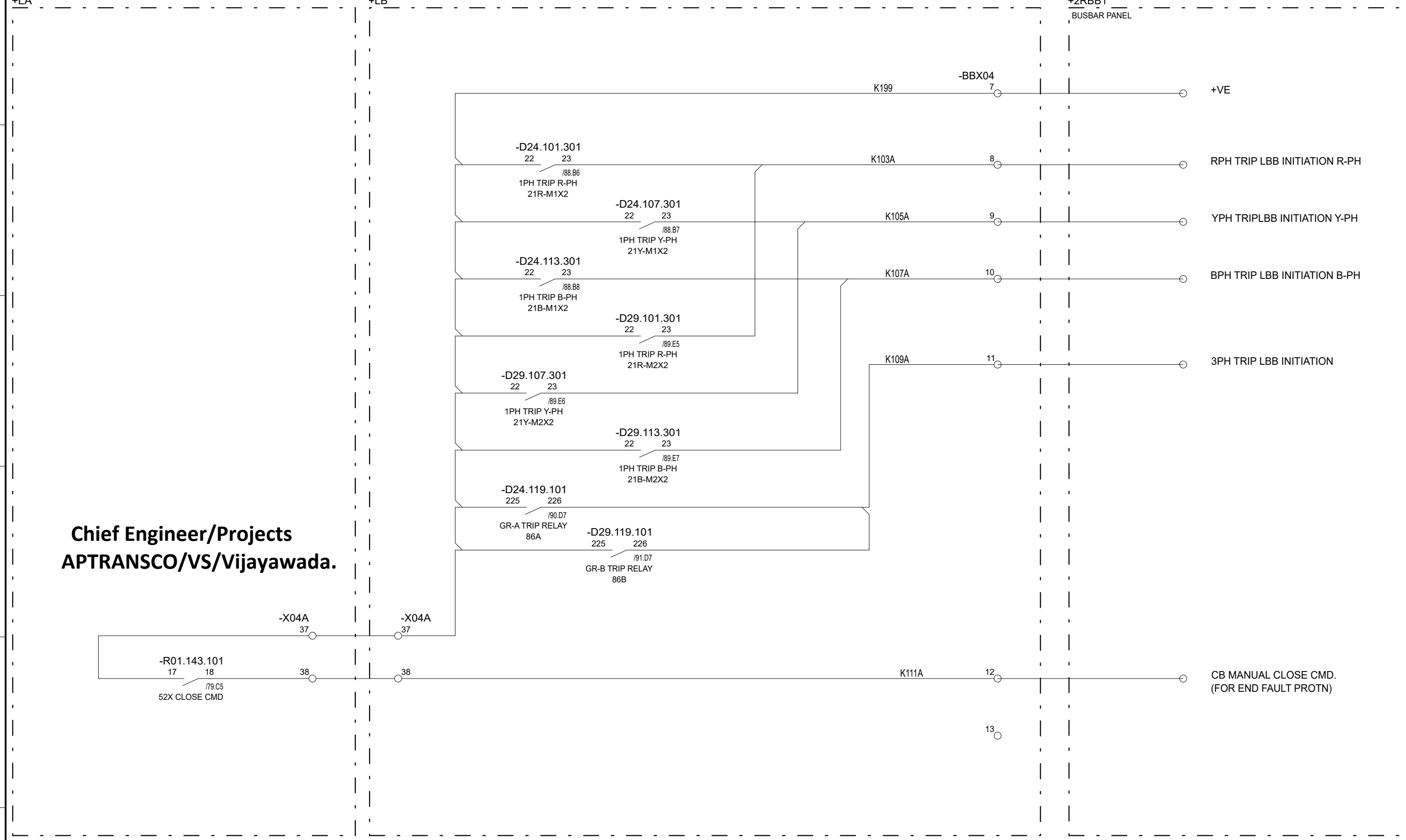
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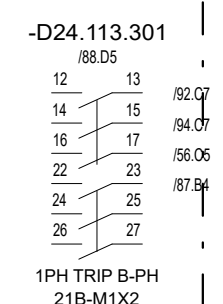
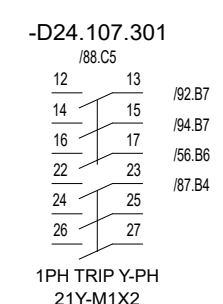
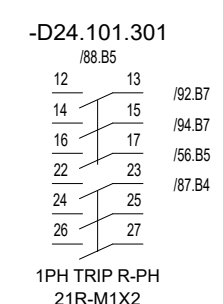
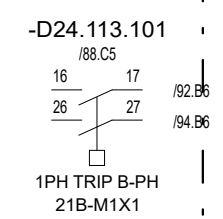
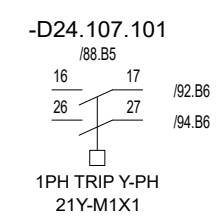
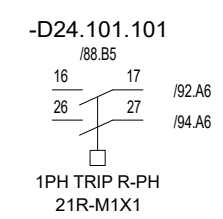
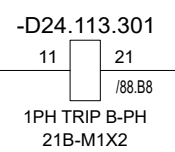
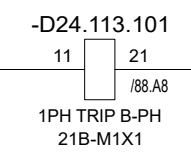
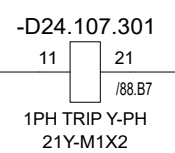
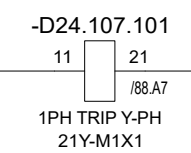
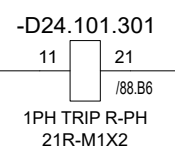
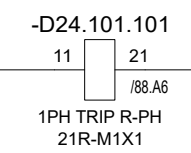
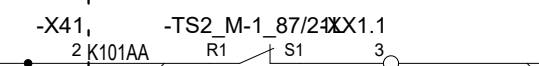
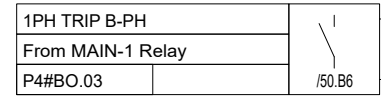
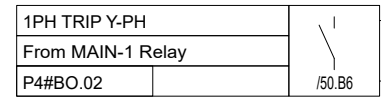
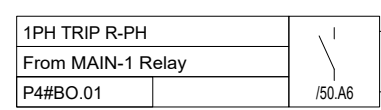
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-FN1
Main-1 Line Differential Protn-RED670



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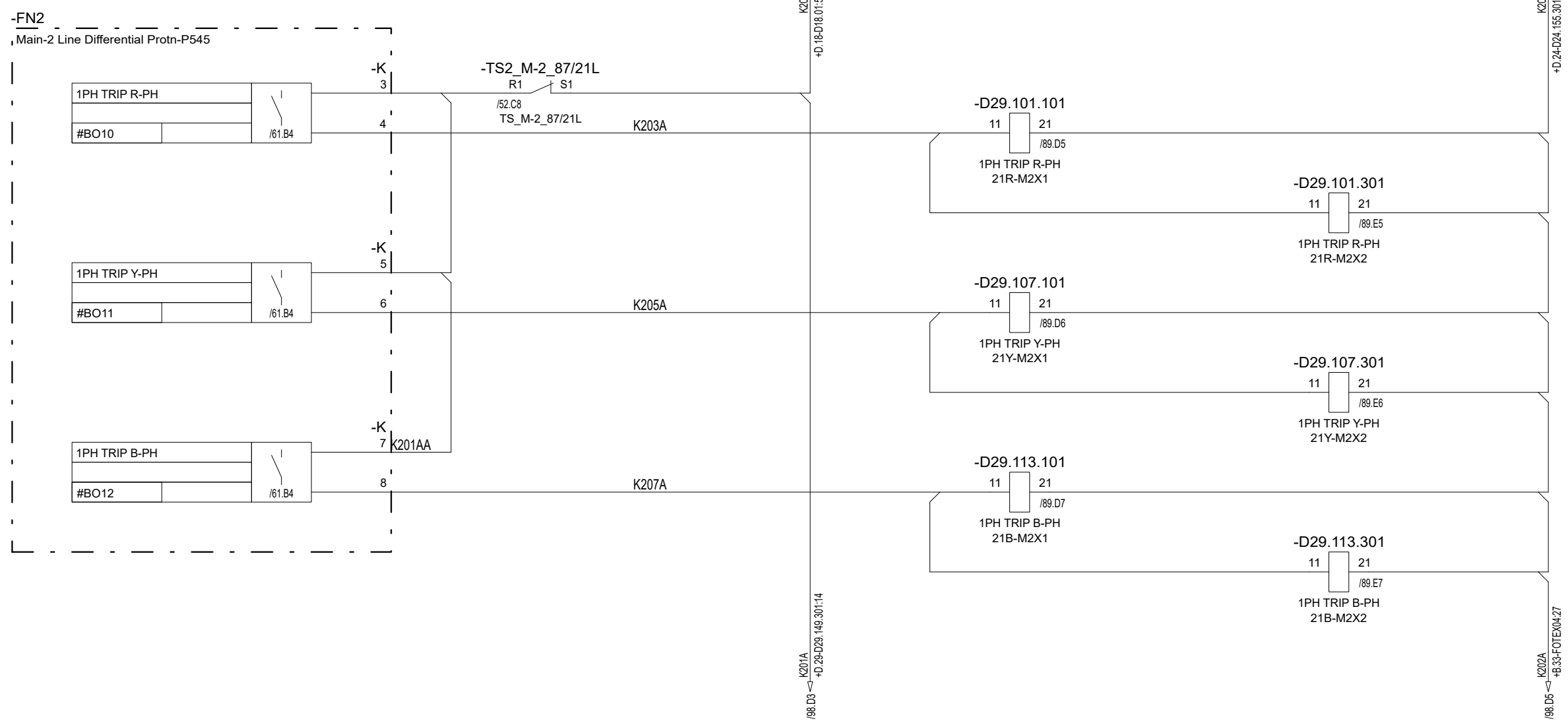
Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

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		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 88
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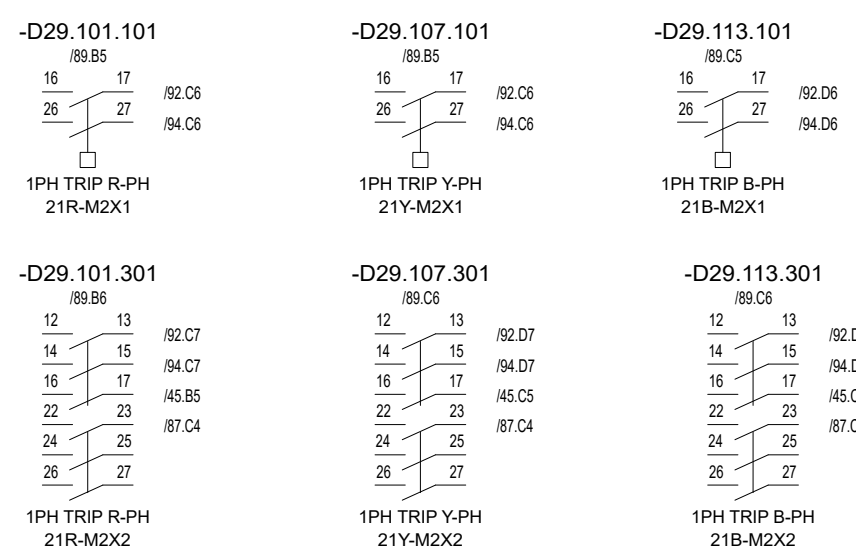
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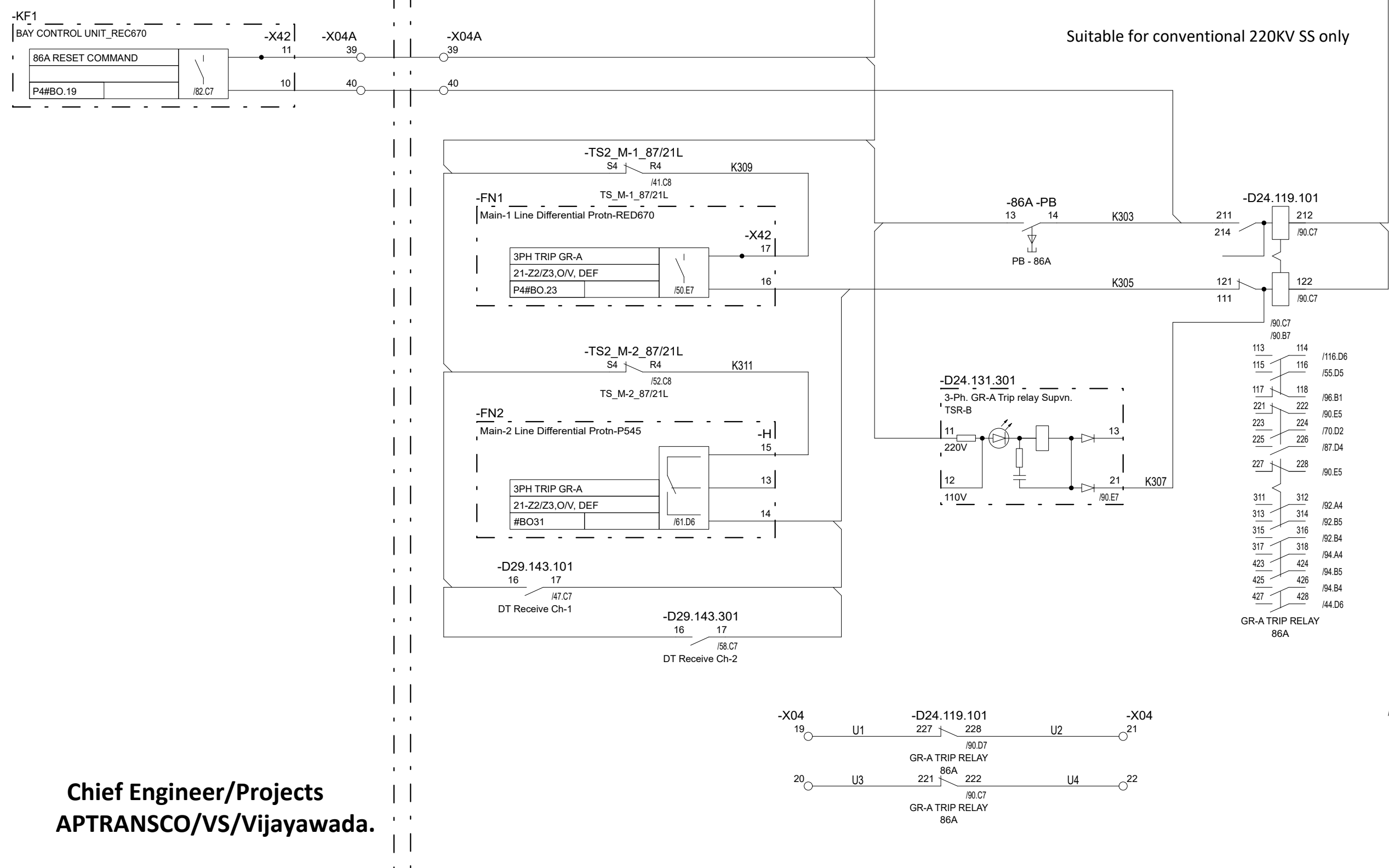


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					Hitachi Energy India Limited						
Rev.	Revision note	Date	Name			Doc. no.		1MNS500925-CABA		Sheet	89
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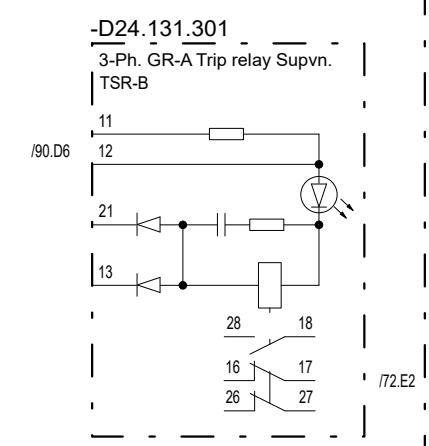
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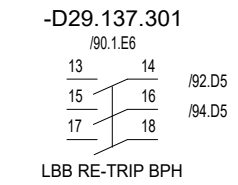
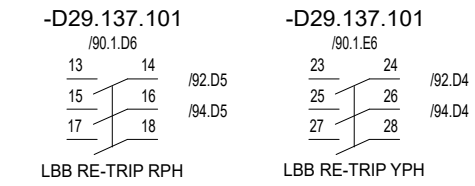
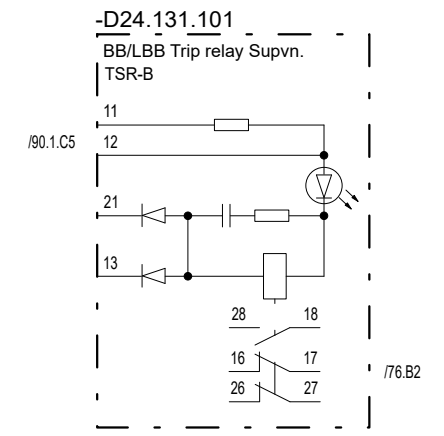
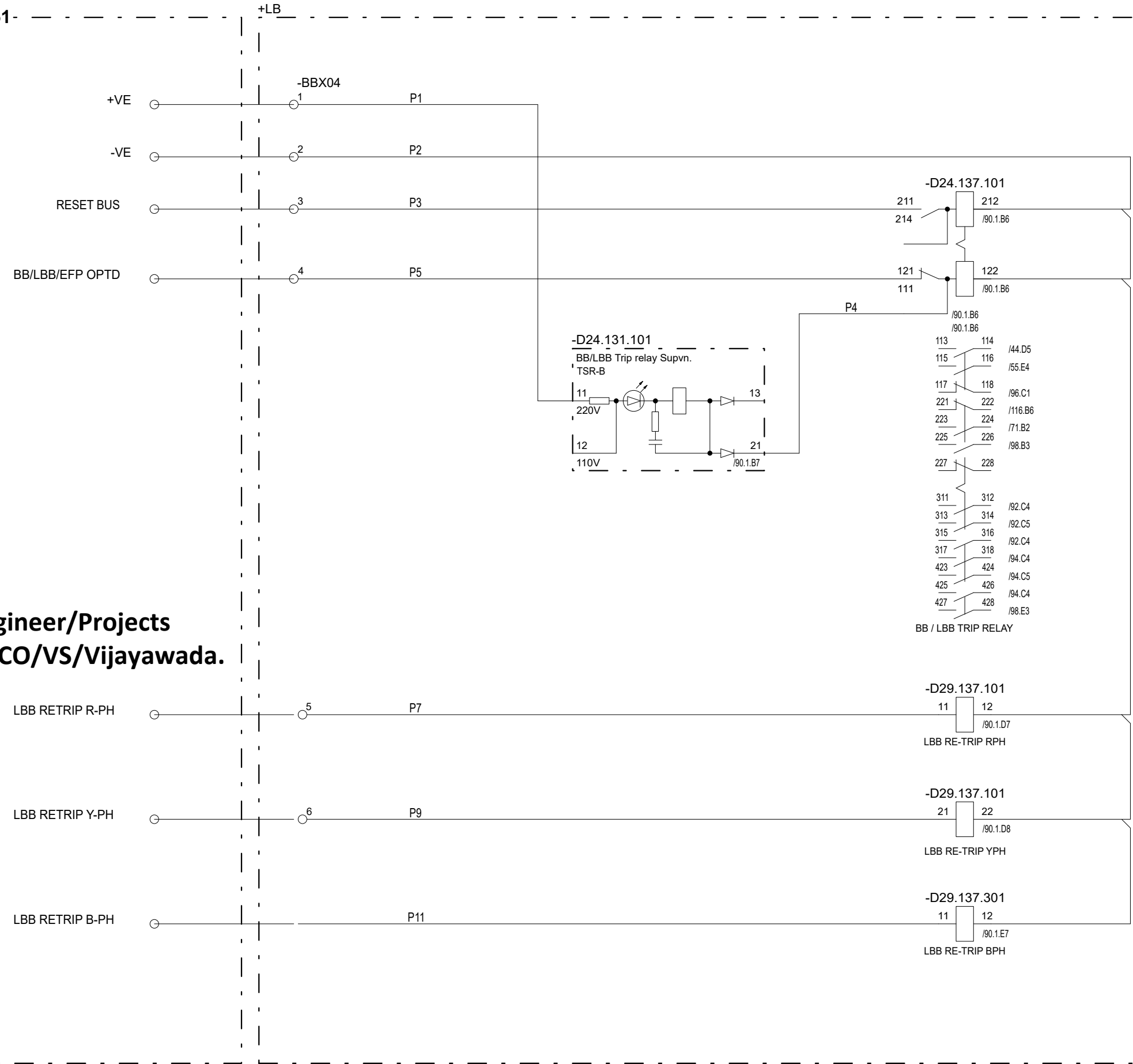


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BUSBAR PANEL



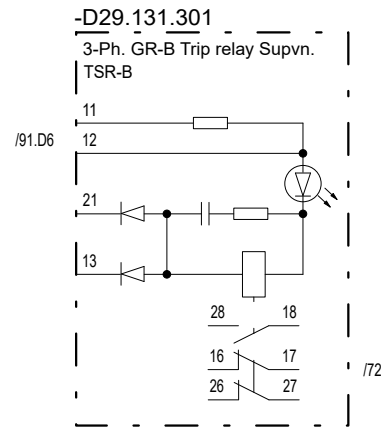
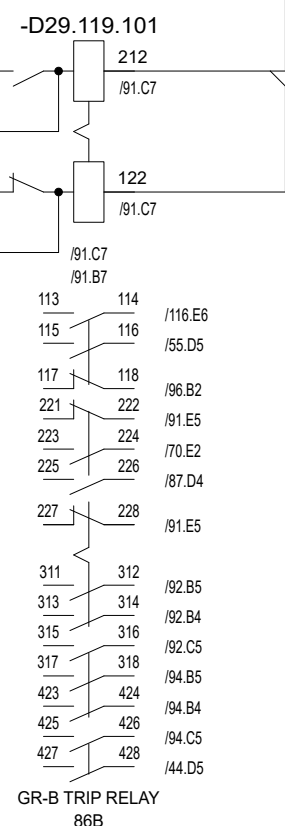
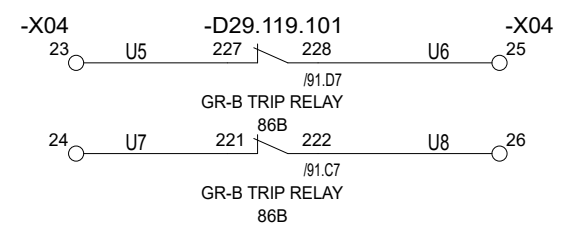
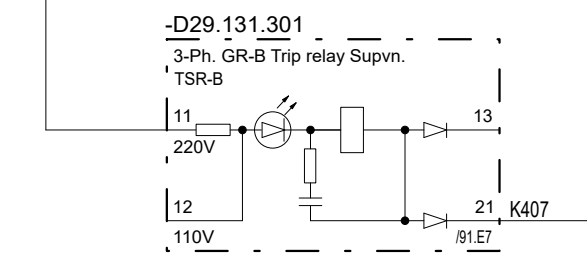
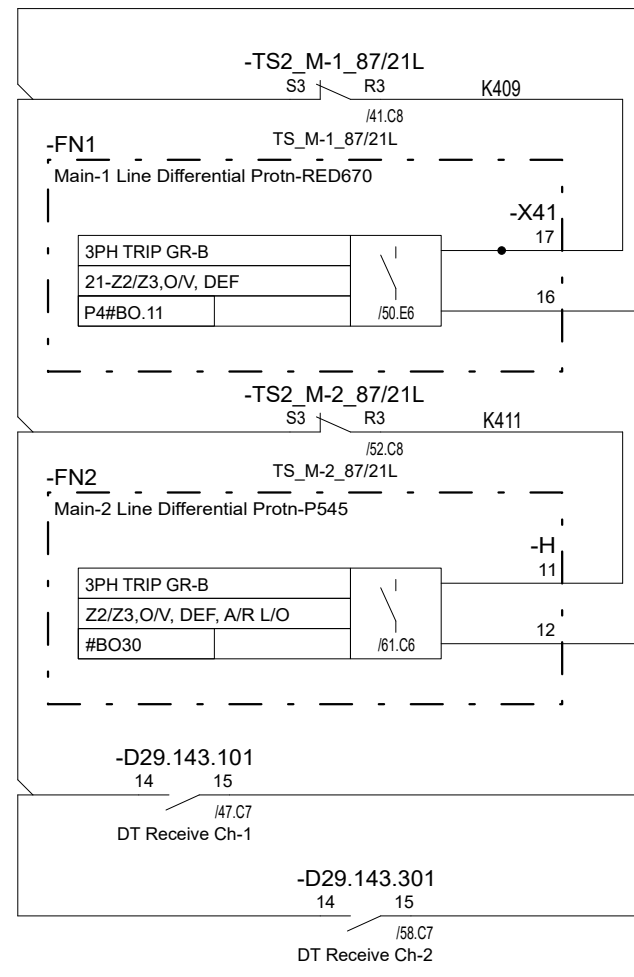
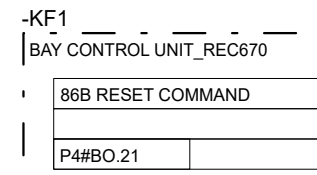
Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

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		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name		Doc. no. 1MNS500925-CABA	Sheet 90.1
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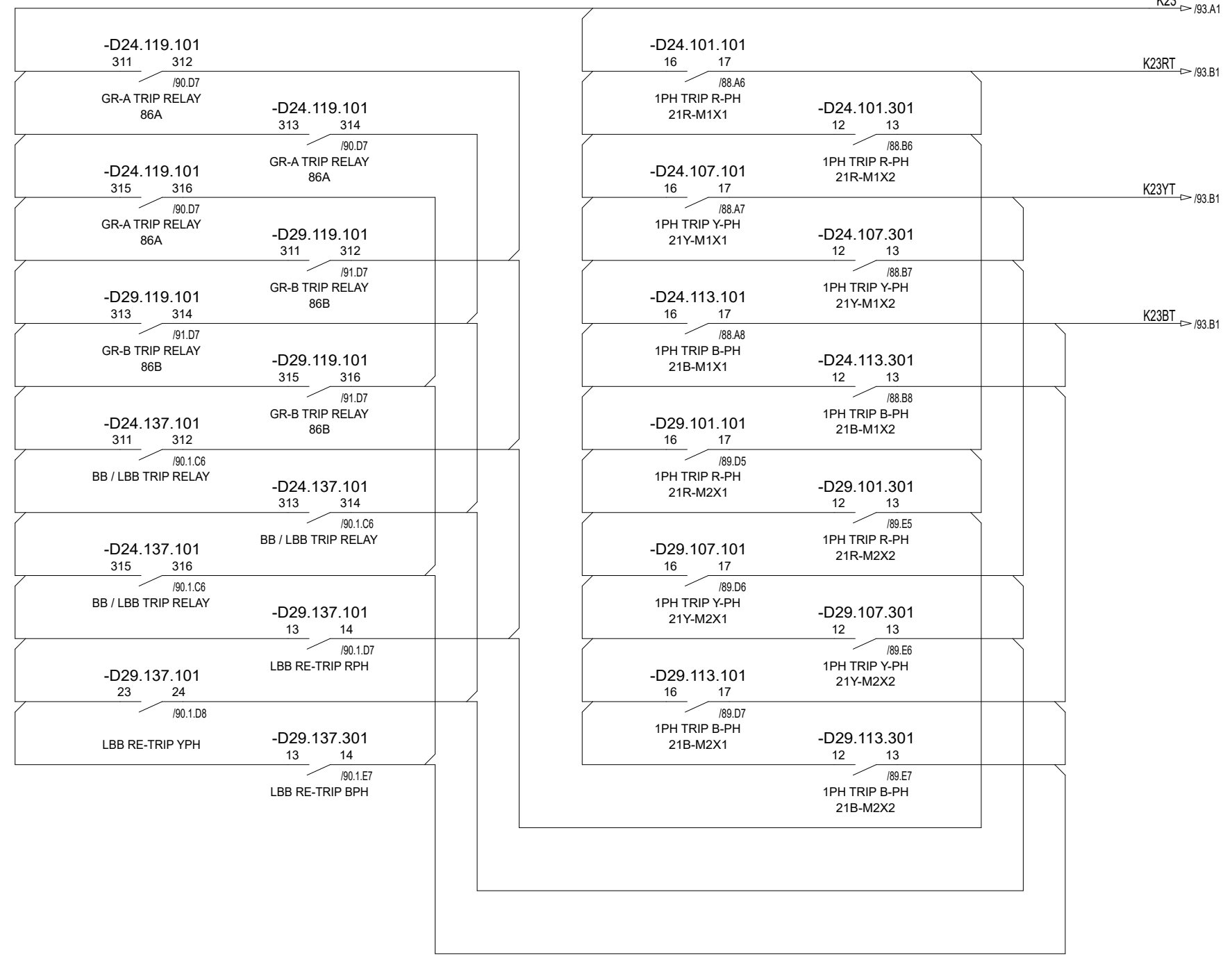
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Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 91
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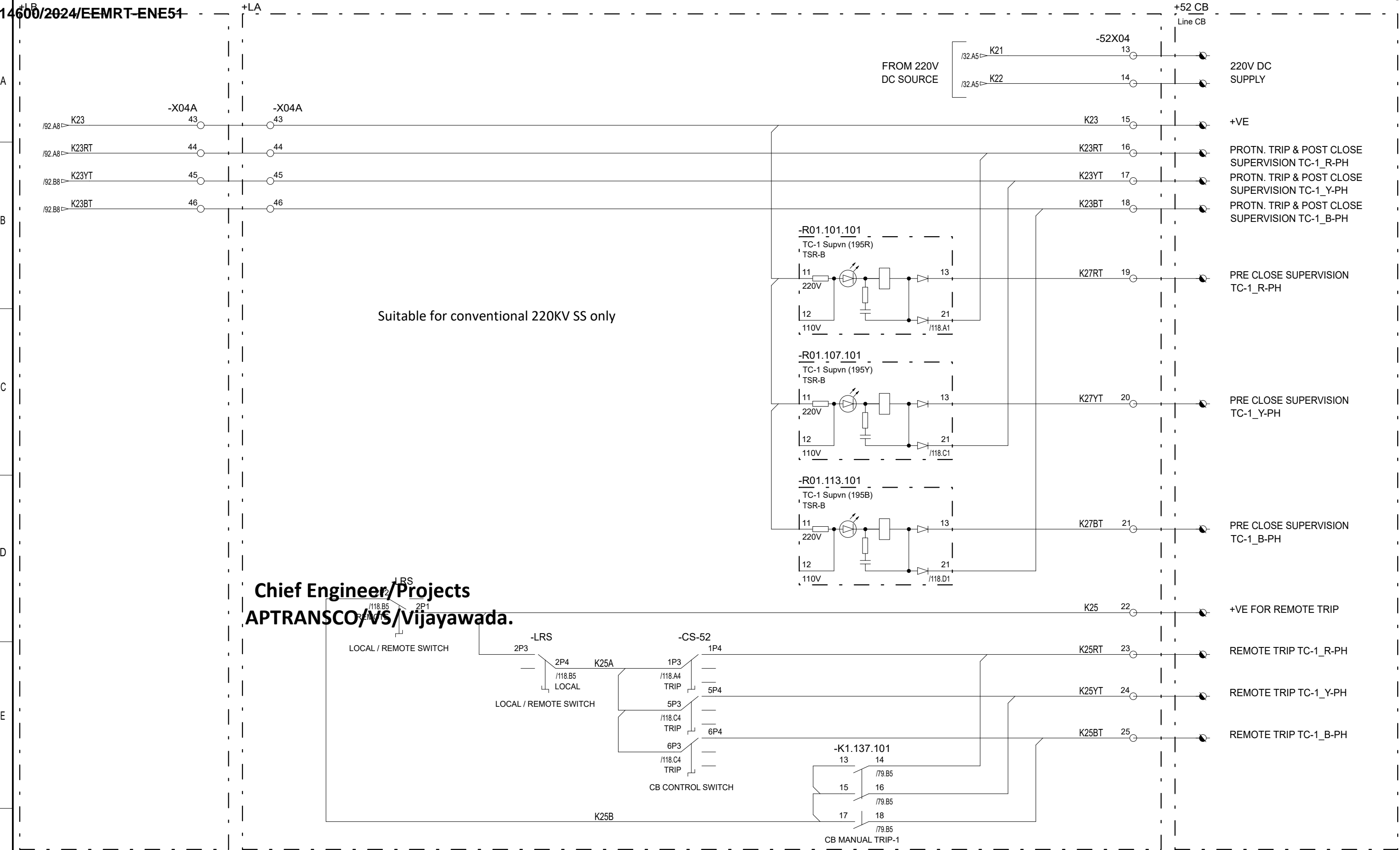
Suitable for conventional 220KV SS only

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Rev.	Revision note	Date	Name	HITACHI		Hitachi Energy India Limited		Doc. no.		1MNS500925-CABA		n. sheet	93
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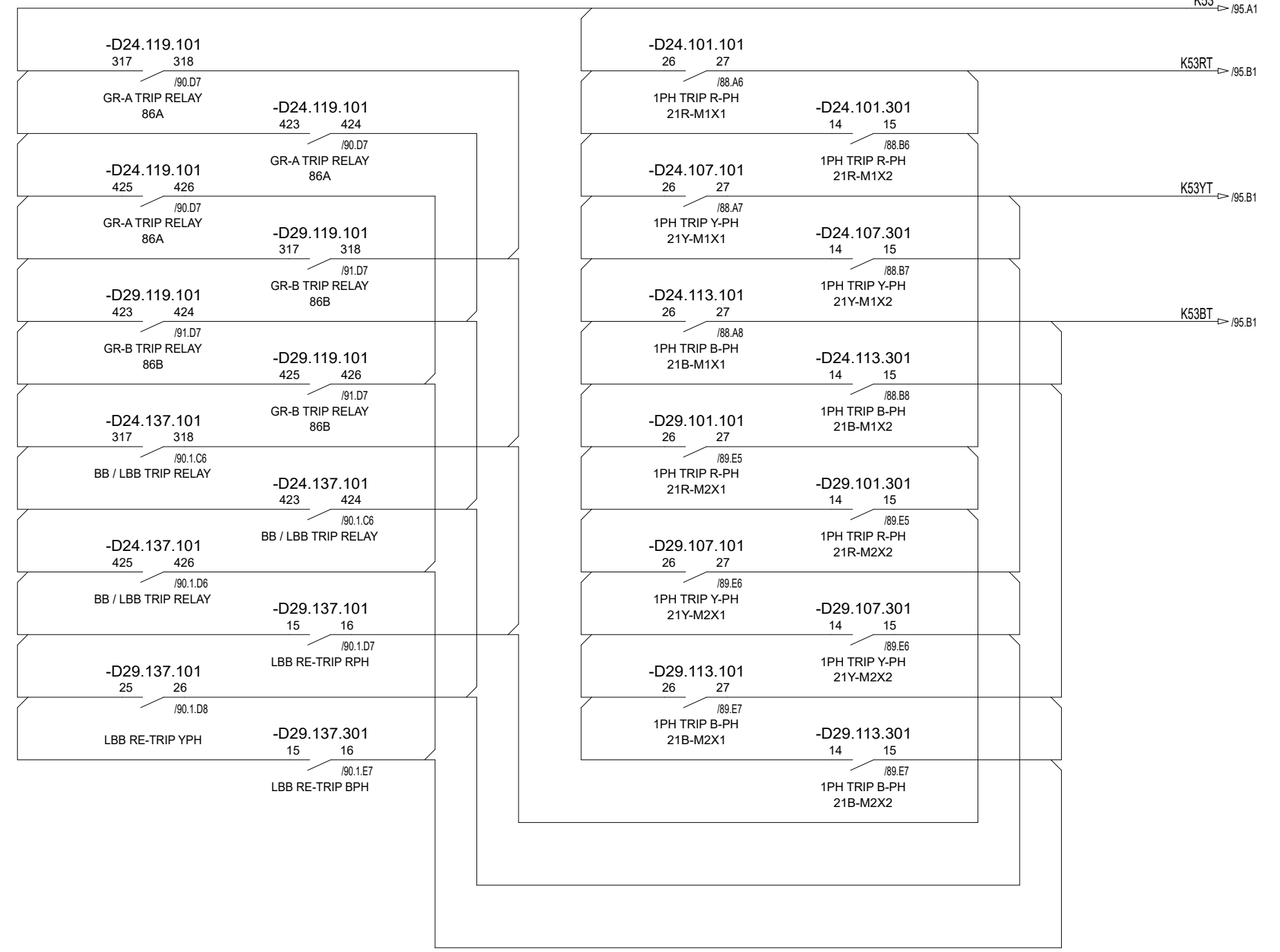
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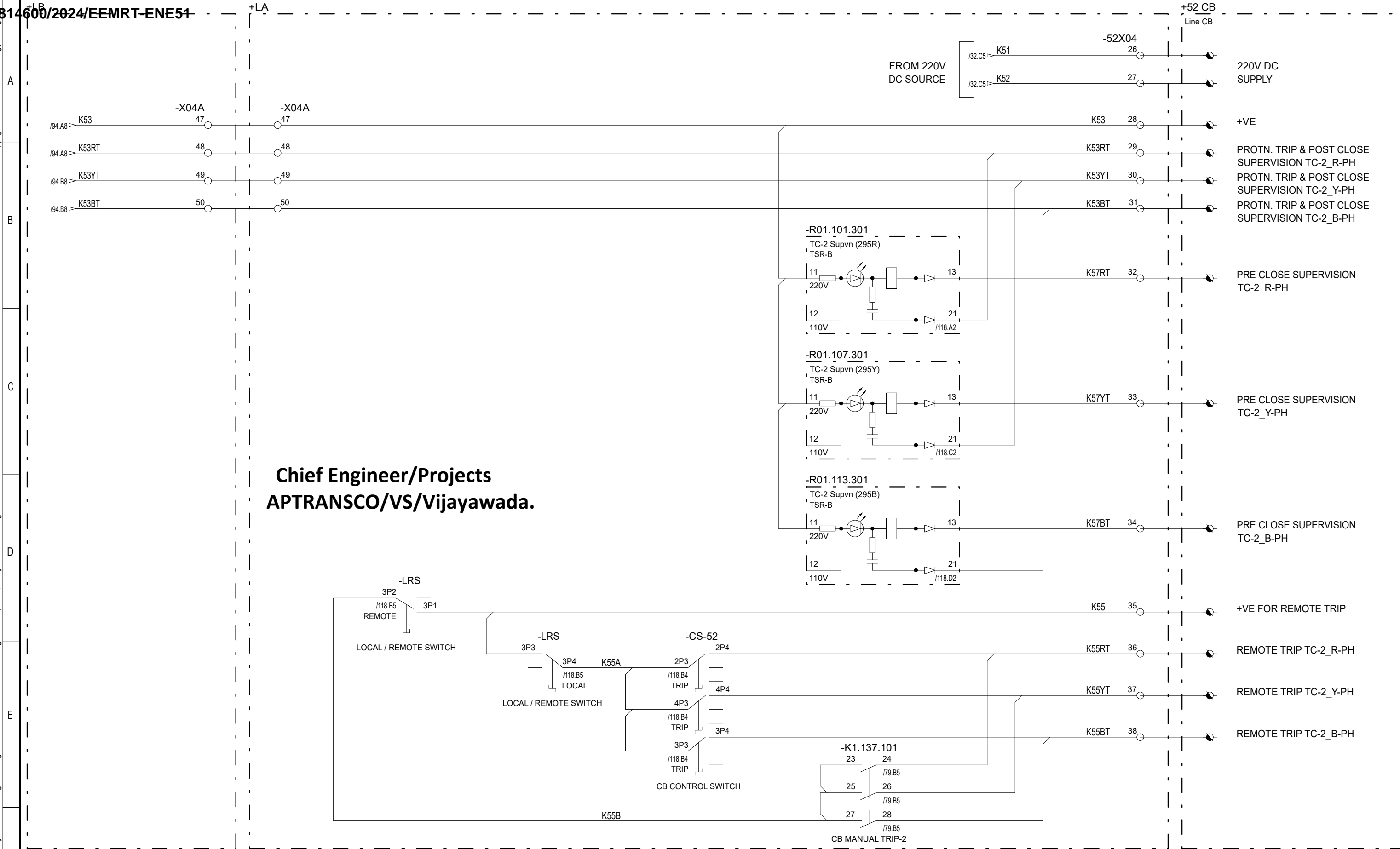


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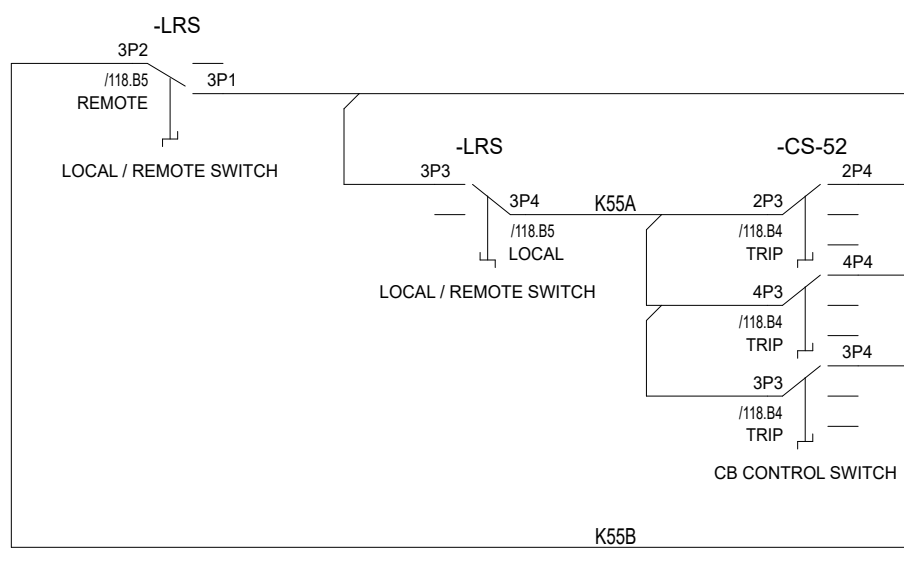
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Rev.	Revision note	Date	Name	HITACHI		Hitachi Energy India Limited	Doc. no.		1MNS500925-CABA		
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1MYN691003-102(A3)REV01										n. sheet	96

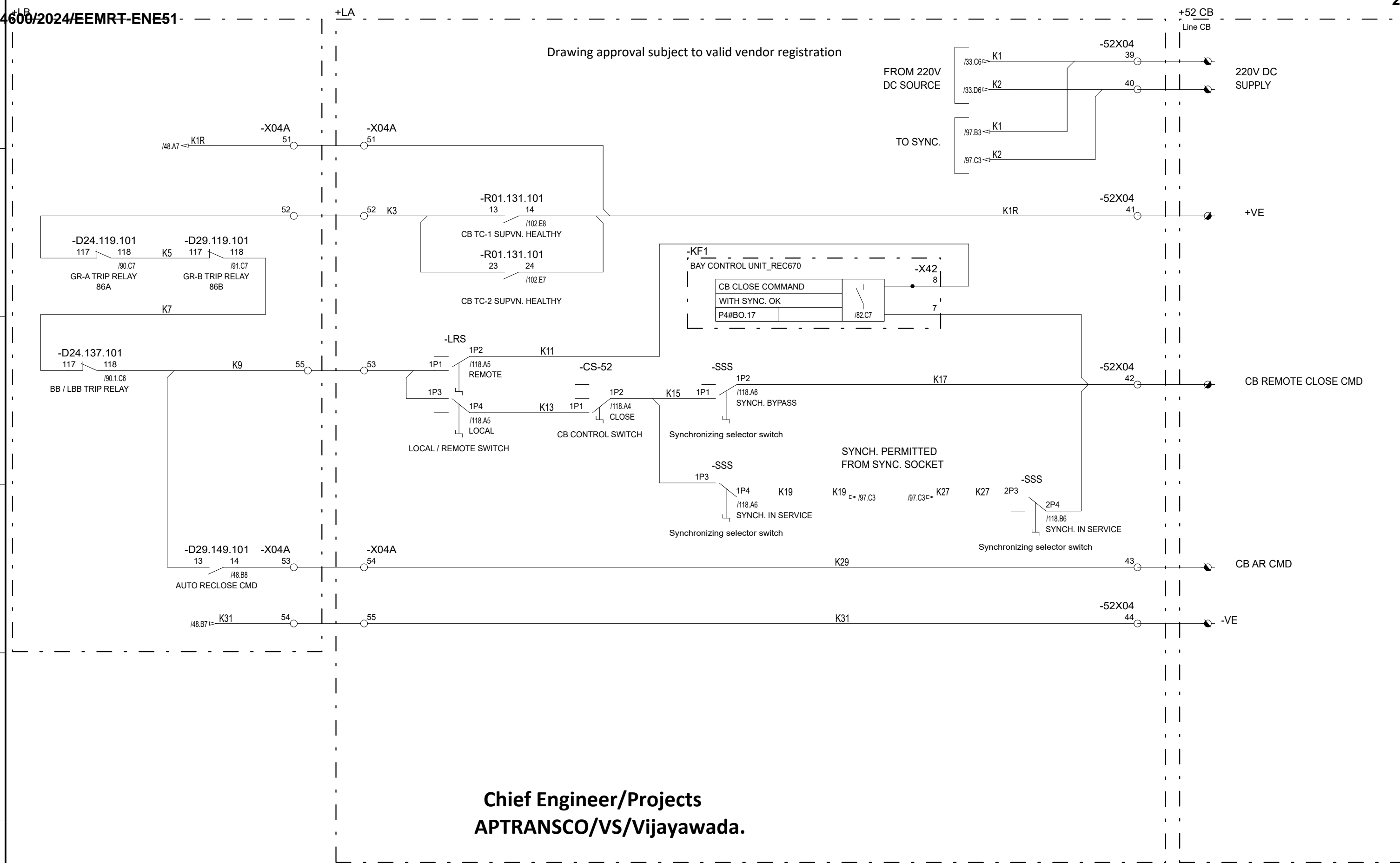
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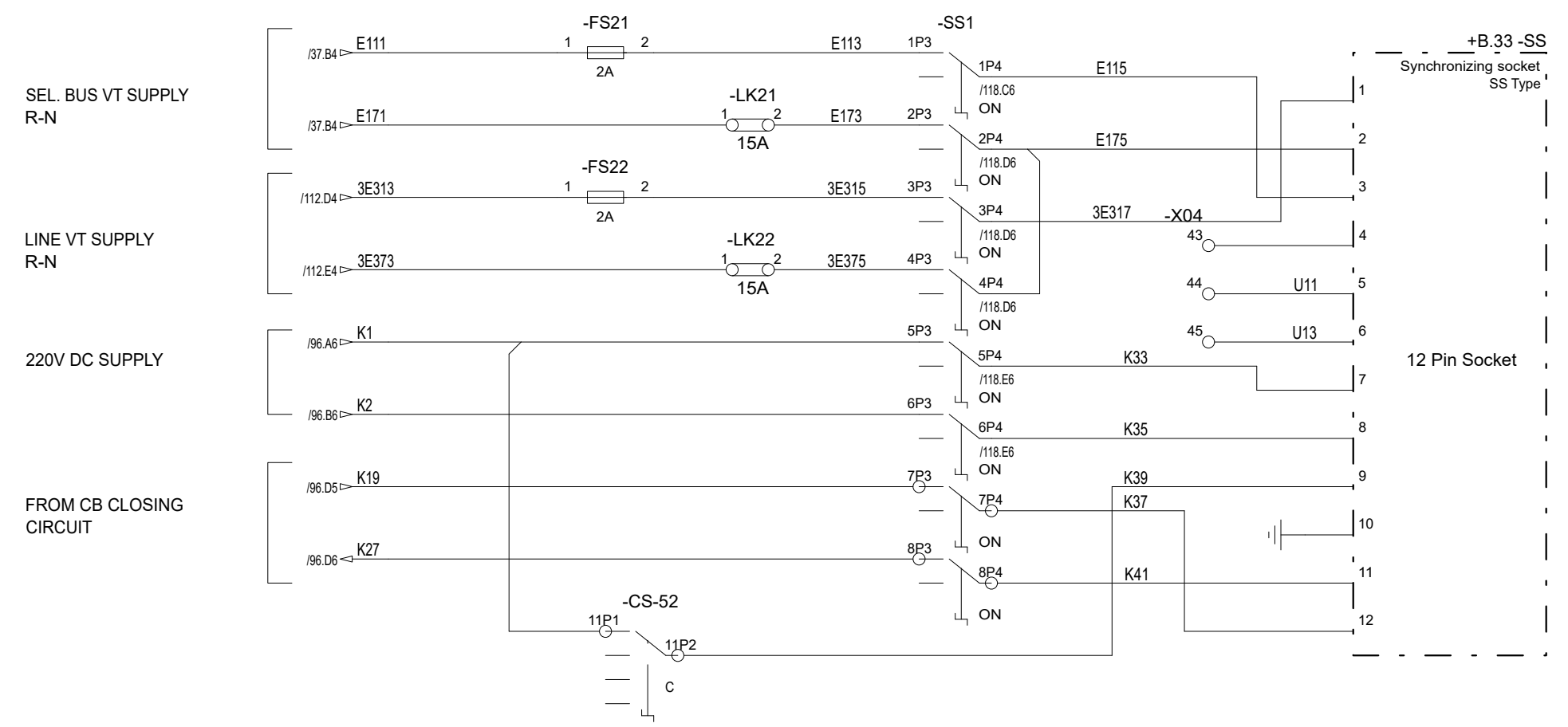
Chief Engineer/Projects
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Rev.		Revision note	Date	Name	HITACHI Hitachi Energy India Limited			Doc. no.		1MNS500925-CABA		Sheet	96
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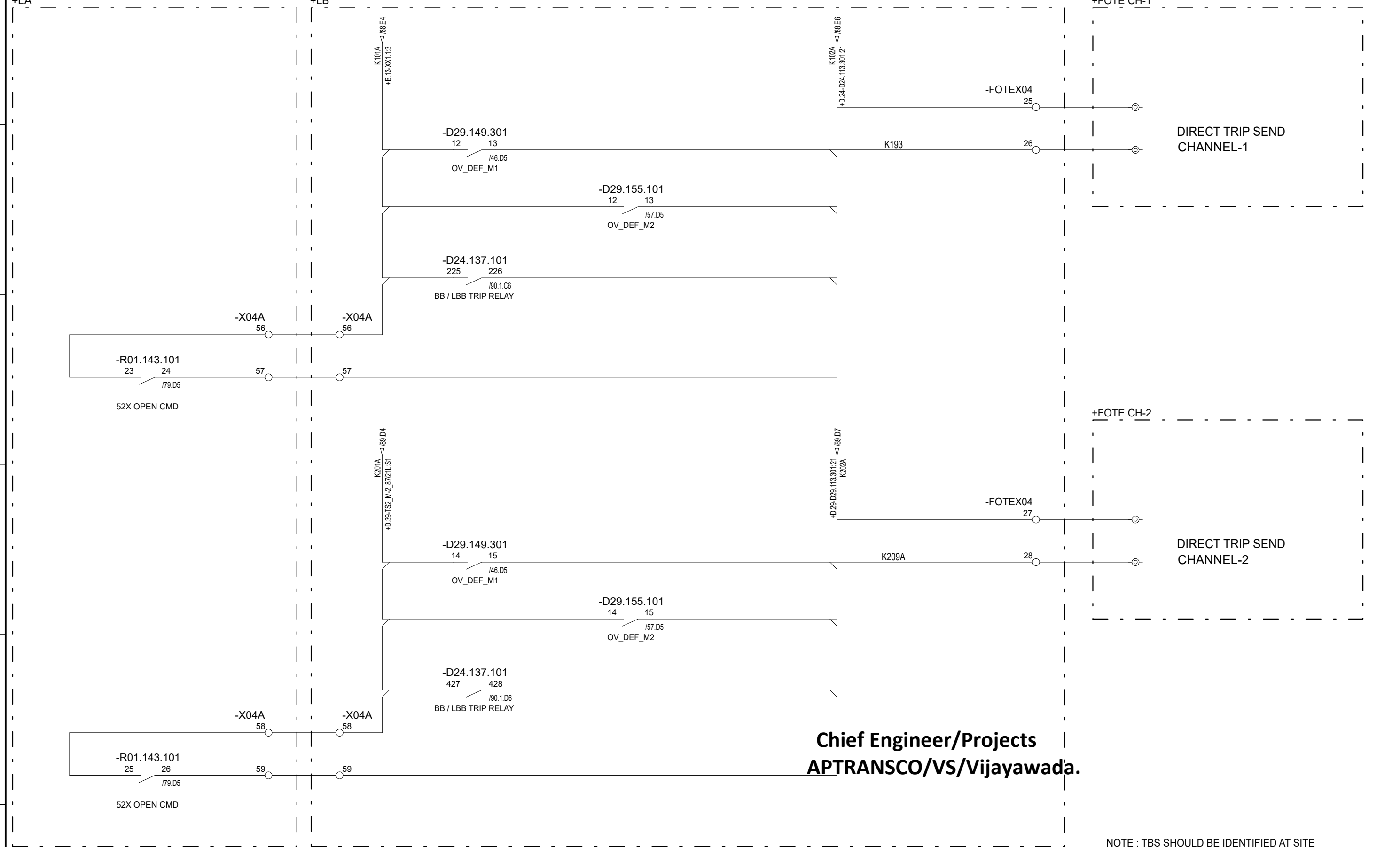
Chief Engineer/Projects
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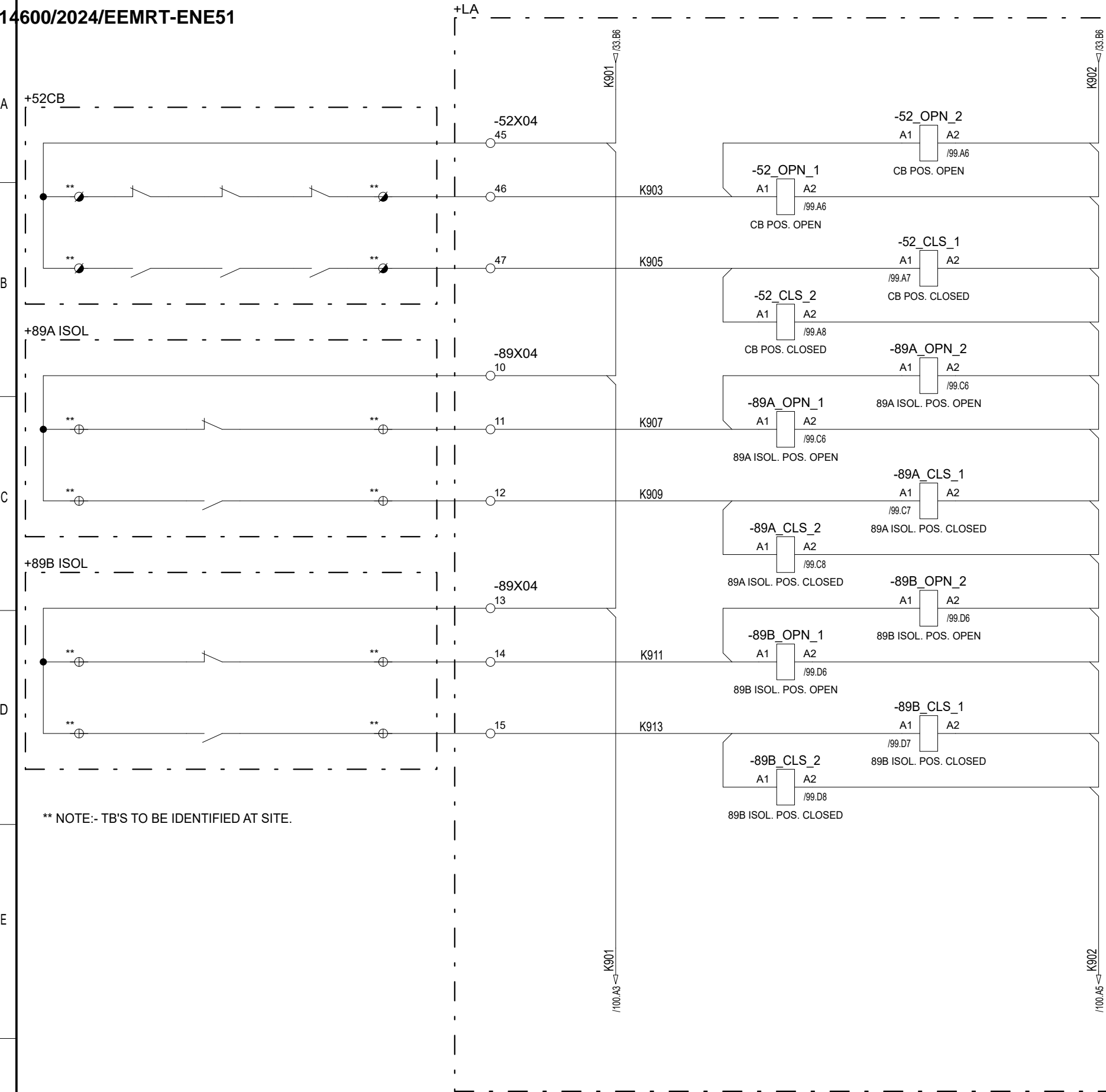
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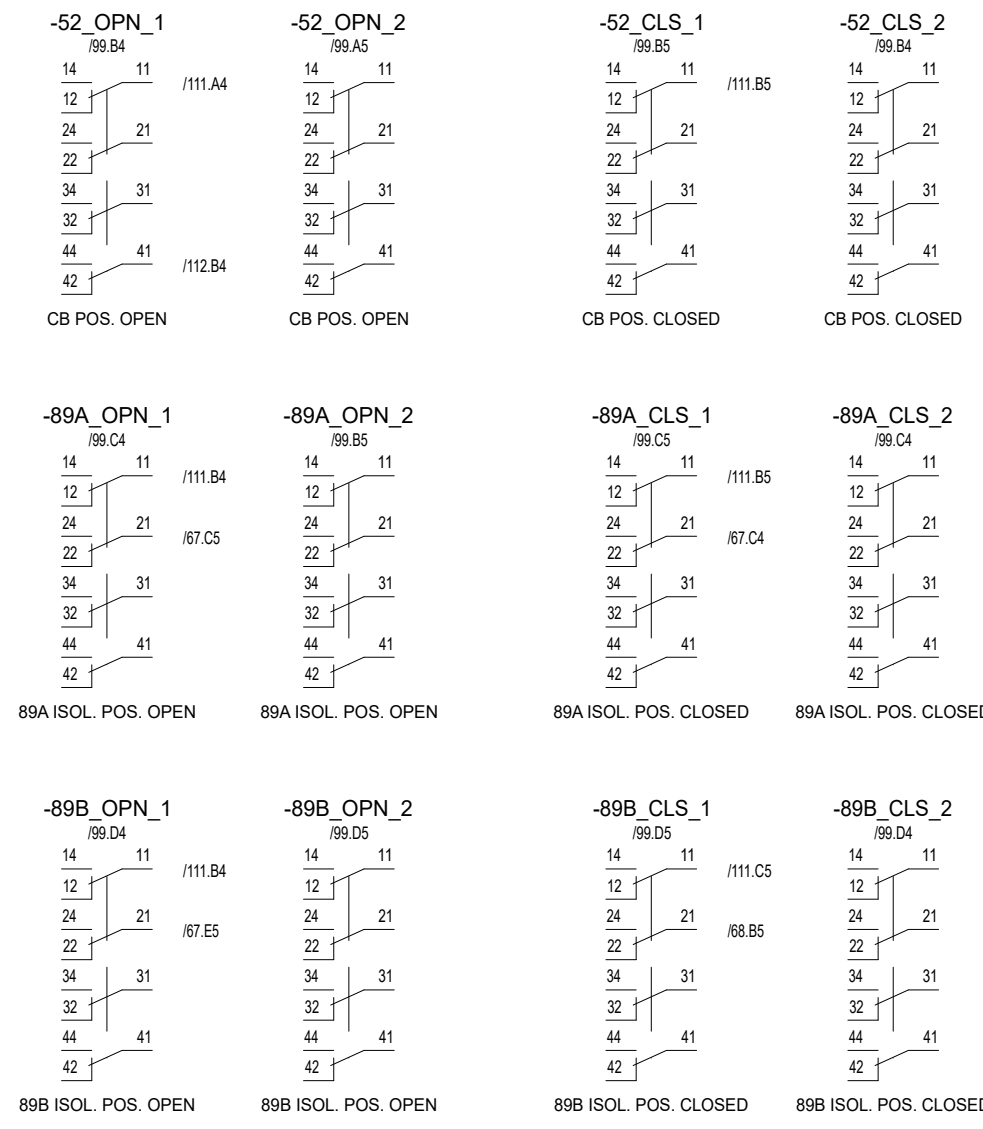
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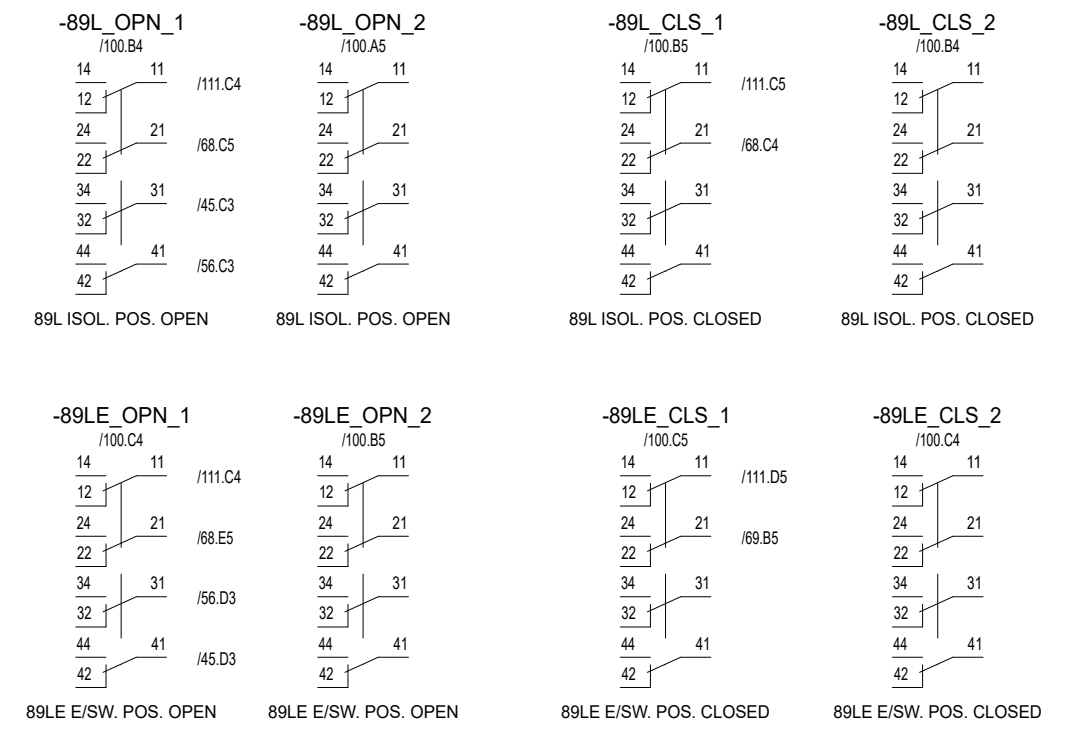
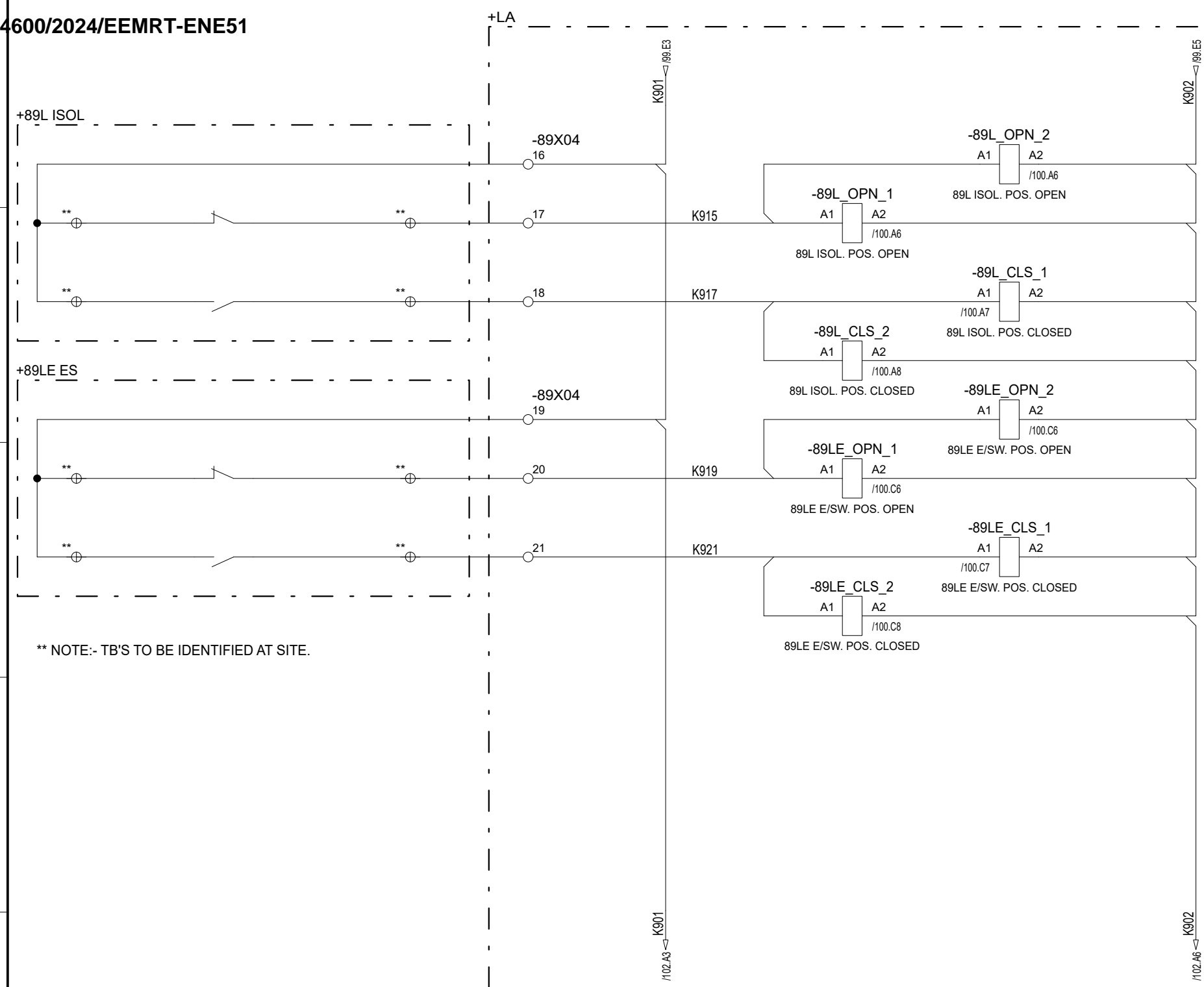


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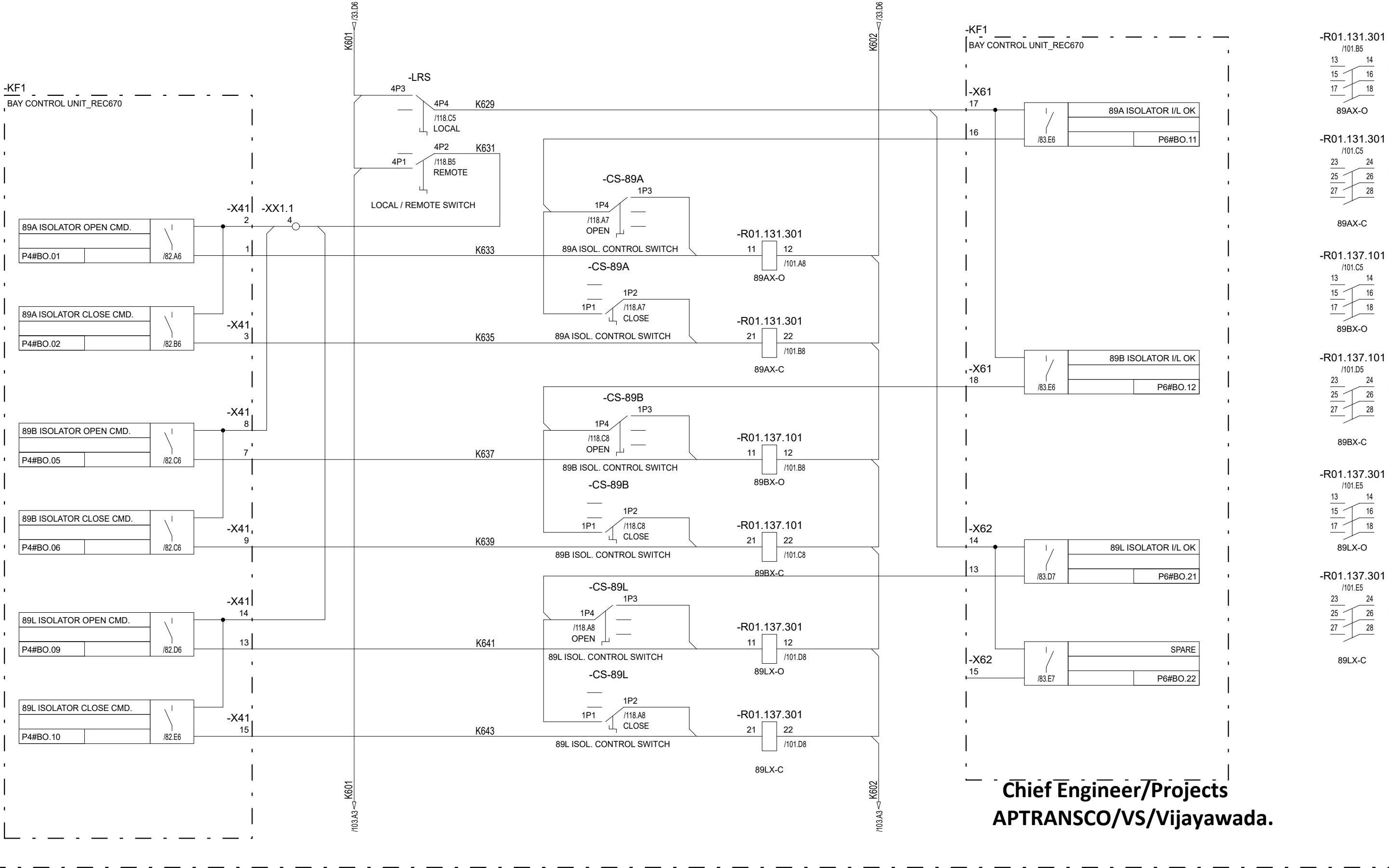
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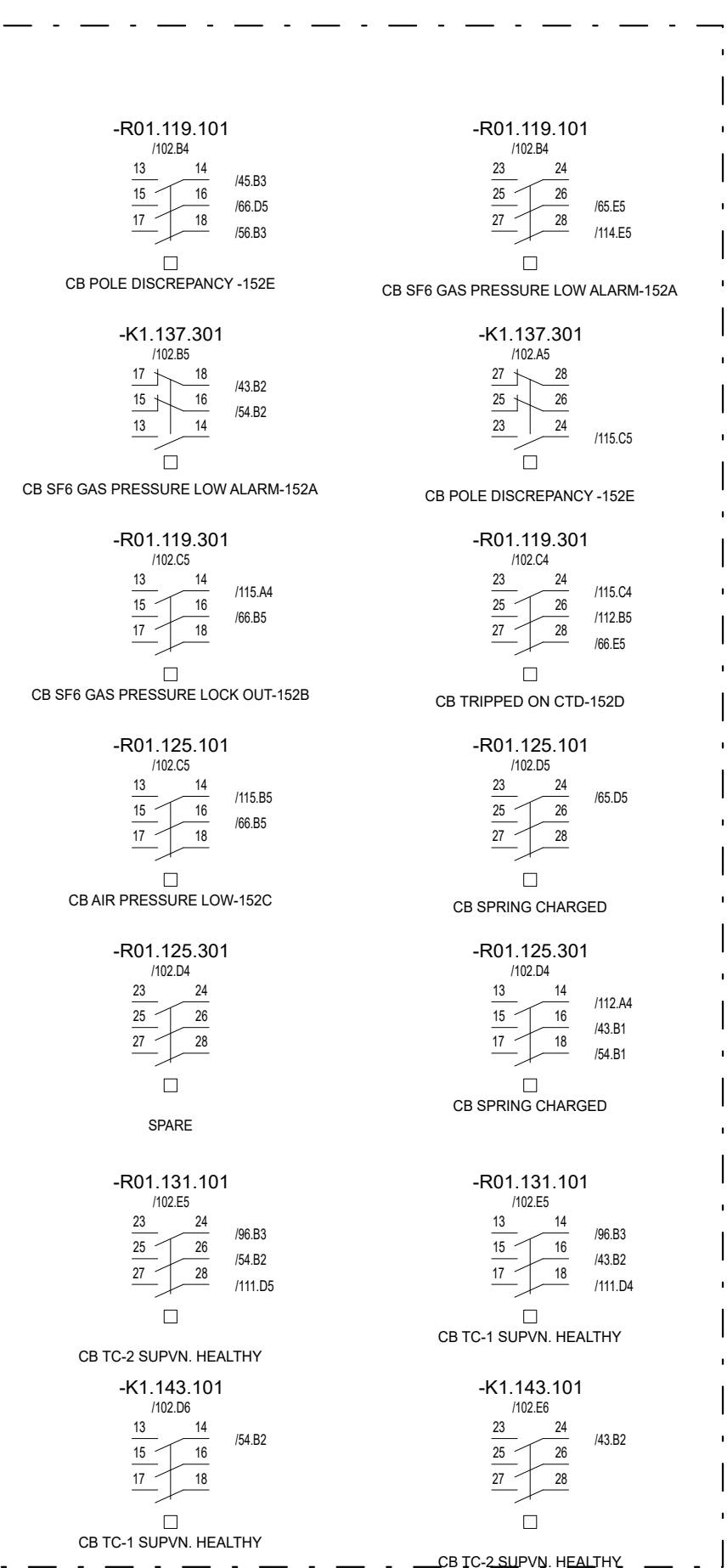
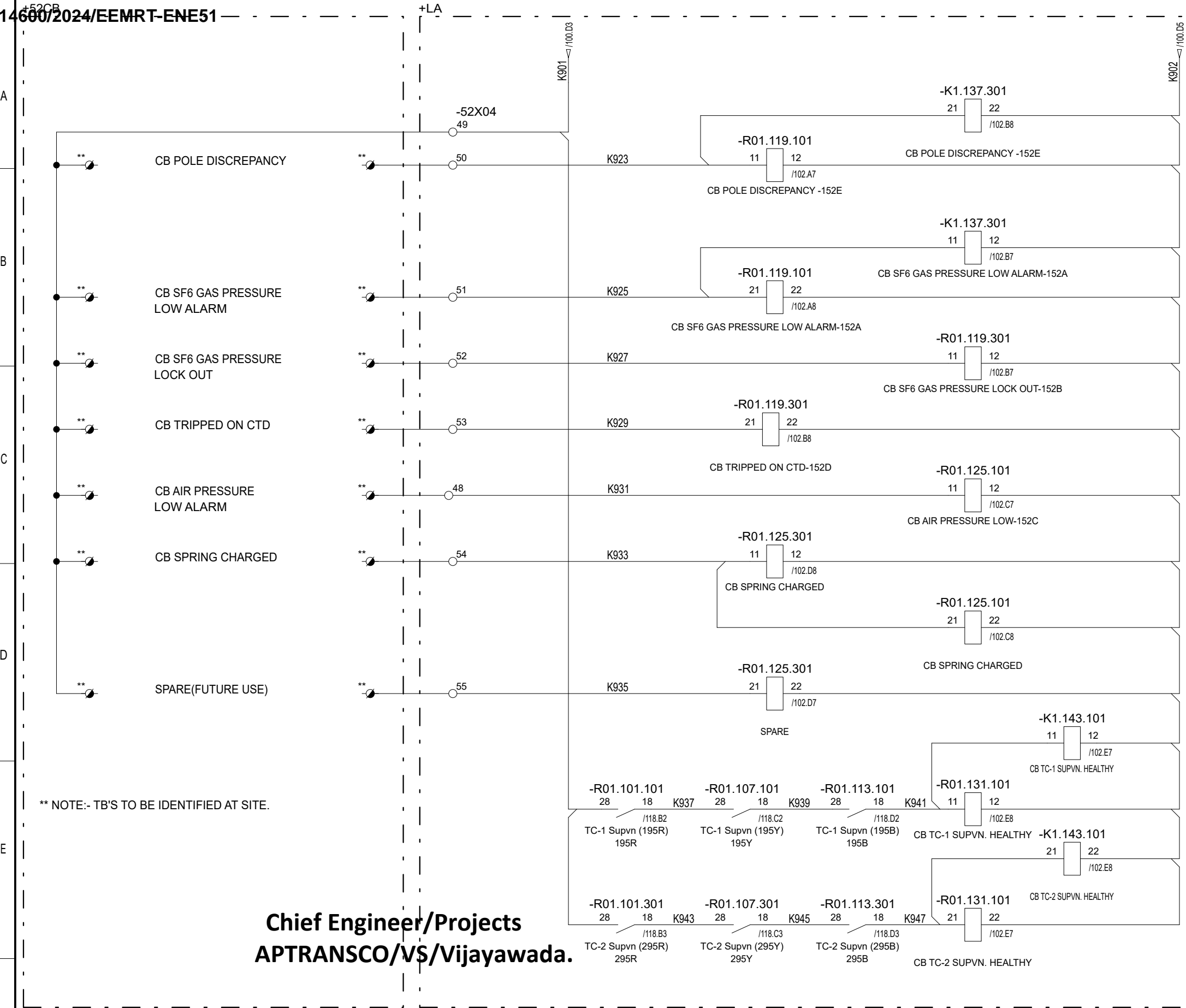
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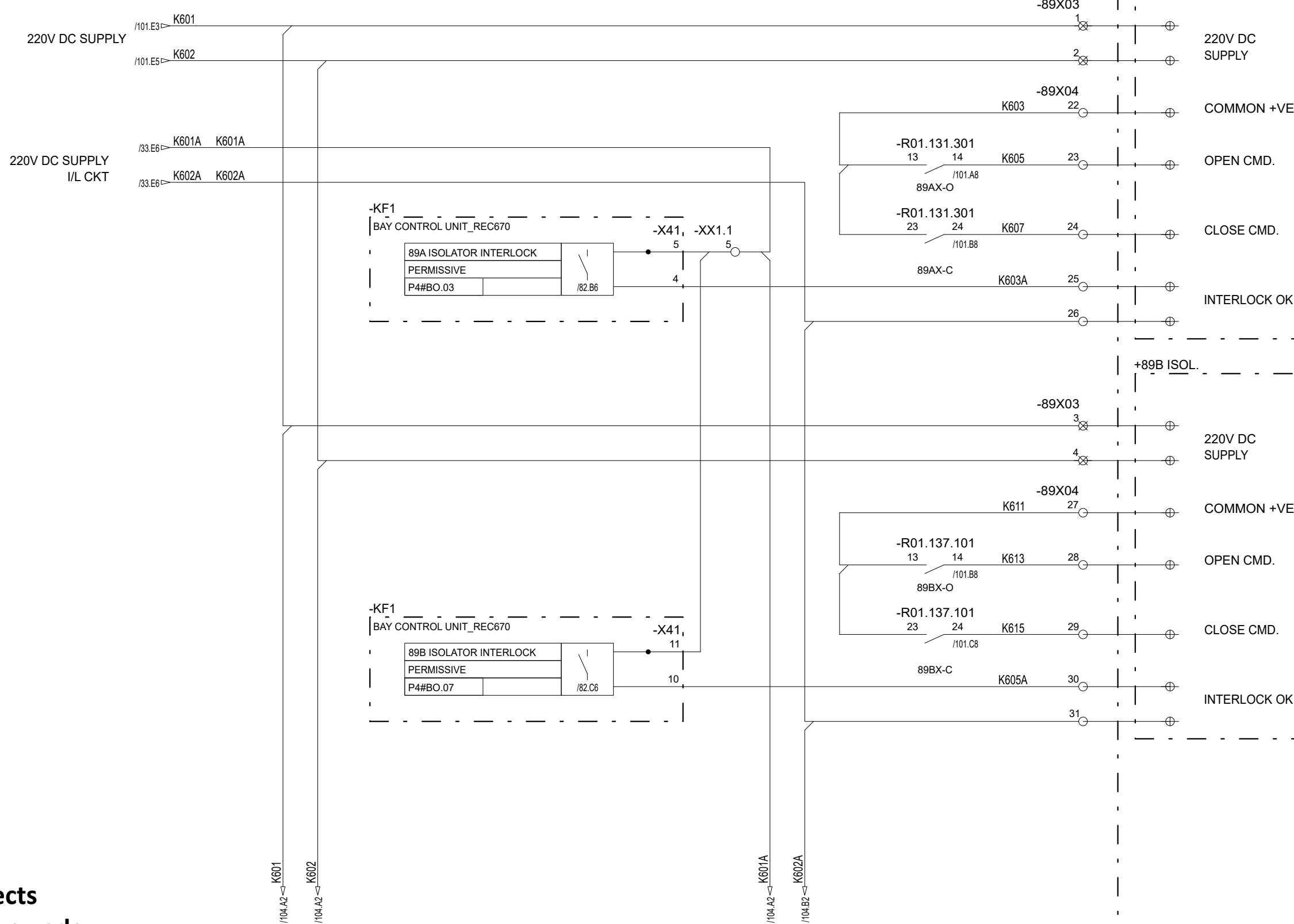
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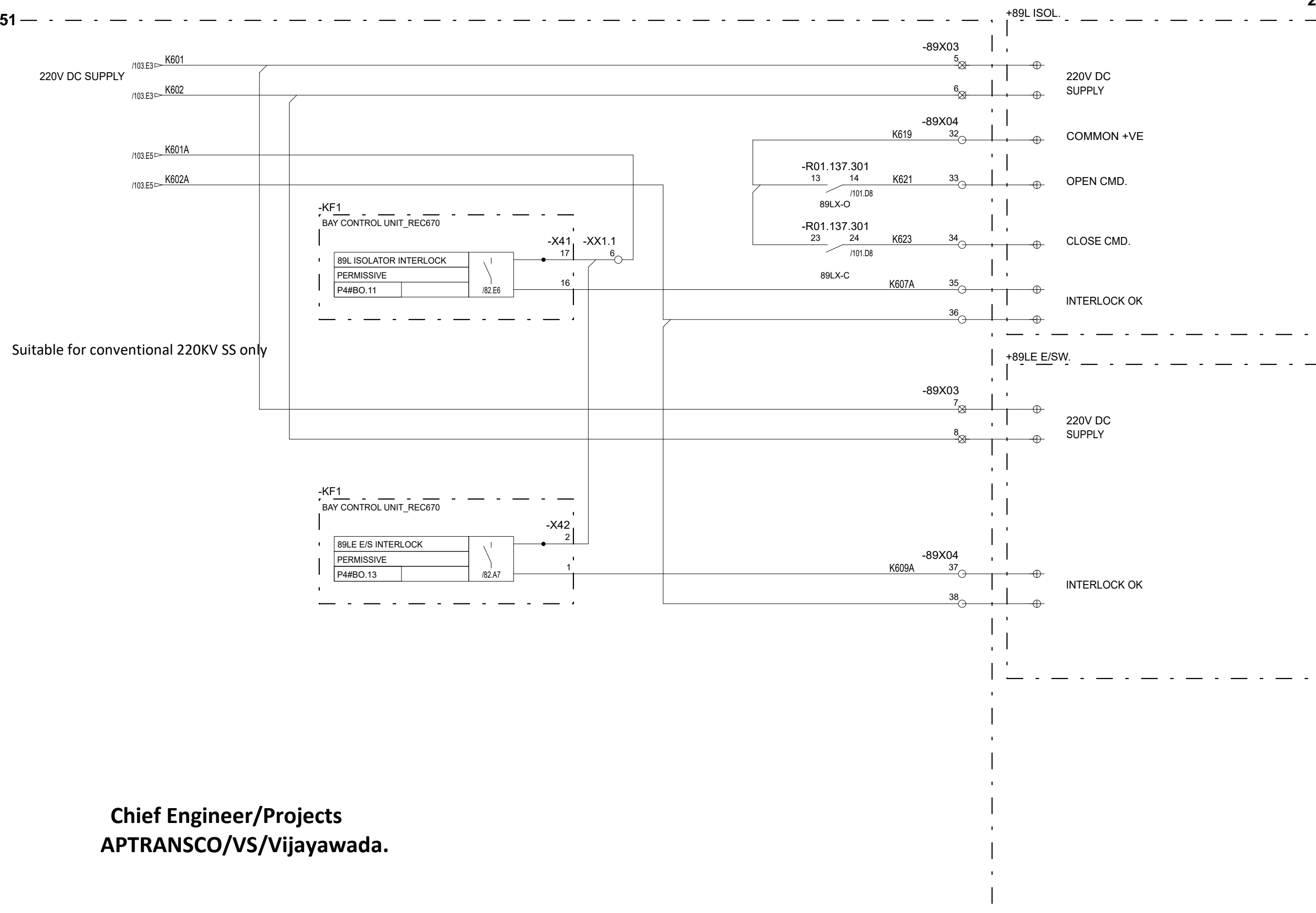


Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER		Doc. kind.	Circuit diagram		Ref.Des.	=2KR
		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel			DCC EFS				
		Project	APTRANSCO STANDARD DRAWING		89A, 89B Isol. Control Circuit			Resp. dept.	PG-GAS	Rev. ind.	Language	en
Rev.	Revision note	Date	Name	HITACHI Hitachi Energy India Limited			Doc. no.		1MNS500925-CABA		Sheet	103
1MYN691003-102(A3)REV01											n. sheet	104

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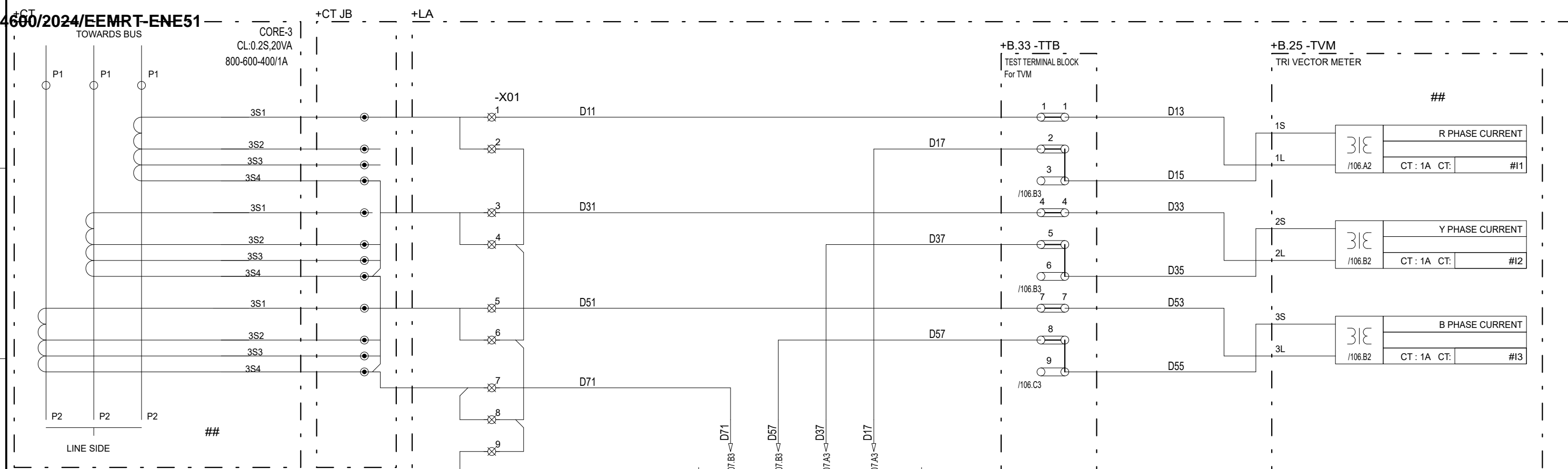
Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER		Doc. kind.	Circuit diagram		Ref.Des.	=2KR
		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel			DCC EFS				
		Project	APTRANSCO		89L Isol., 89LE E/Sw. Control Circuit		Resp. dept.	PG-GAS		Rev. ind.	Language	en
		STANDARD DRAWING		Hitachi Energy India Limited		Doc. no.		1MNS500925-CABA		Sheet	104	
Rev.	Revision note	Date	Name							n. sheet	105	
1MYN691003-102(A3)REV01												

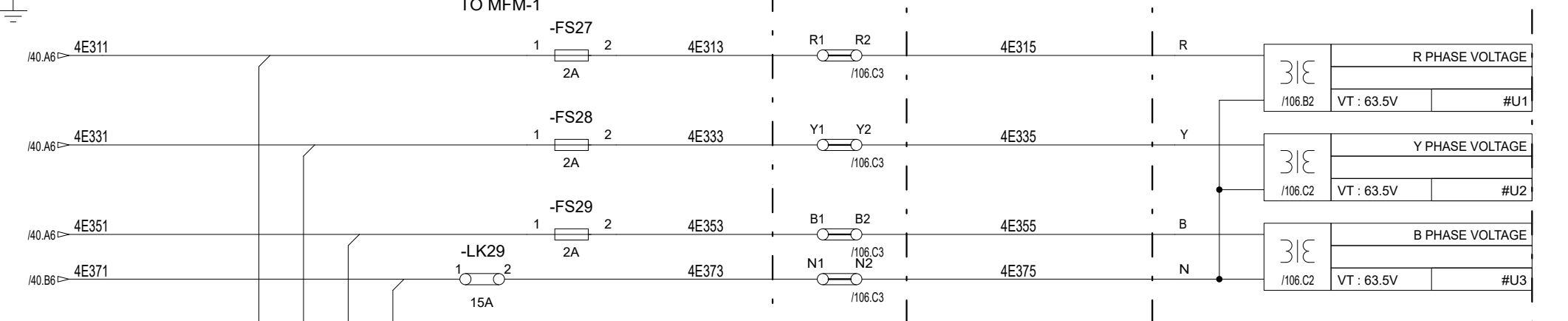
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NOTE:- CT DETAILS TO BE CONFIRMED BY THE CUSTOMER.



Chief Engineer/Projects
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Note: +ve reading is import & -ve reading is export active/reactive energy.

Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER	Doc. kind.	Circuit diagram	Ref.Des.	=2KR	
		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel		DCC EFS				
		Project	APTRANSCO STANDARD DRAWING		Metering Circuit- TVM		Resp. dept.	PG-GAS	Rev. ind.	Language	en
					Hitachi Energy India Limited						
Rev.		Revision note	Date	Name	HITACHI		Doc. no.		1MNS500925-CABA		
									Sheet	105	
									n. sheet	106	

1MYN691003-102(A3)REV01

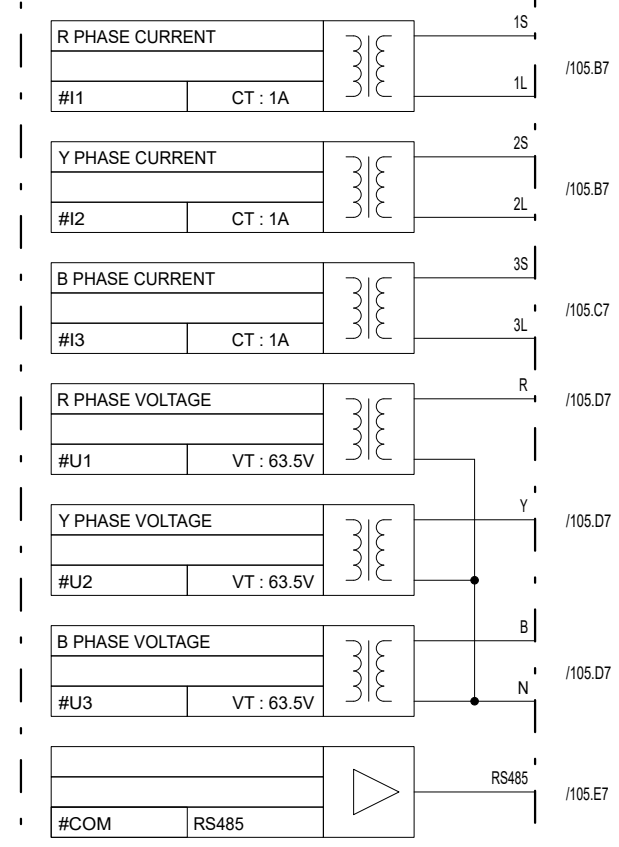
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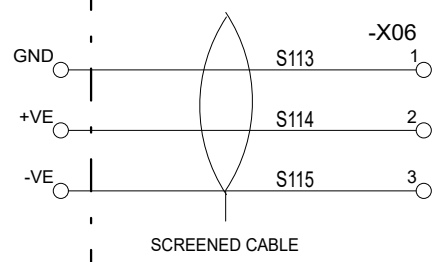
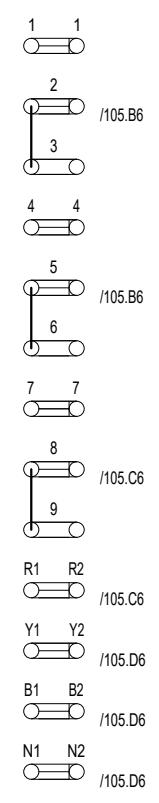
8814600/2024/EEMRT-ENE51

+B.25 -TVM

Tri Vector Meter With ABT
Premier 300
3Ph, 4Wire, 3Element



-TTB



Drawing approval subject to valid vendor registration

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

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO STANDARD DRAWING		Metering Circuit- TVM	Resp. dept. PG-GAS	Rev. ind. Language en
				HITACHI Hitachi Energy India Limited	Doc. no. 1MNS500925-CABA	
Rev.	Revision note	Date	Name			Sheet 106
1MYN691003-102(A3)REV01						n. sheet 107

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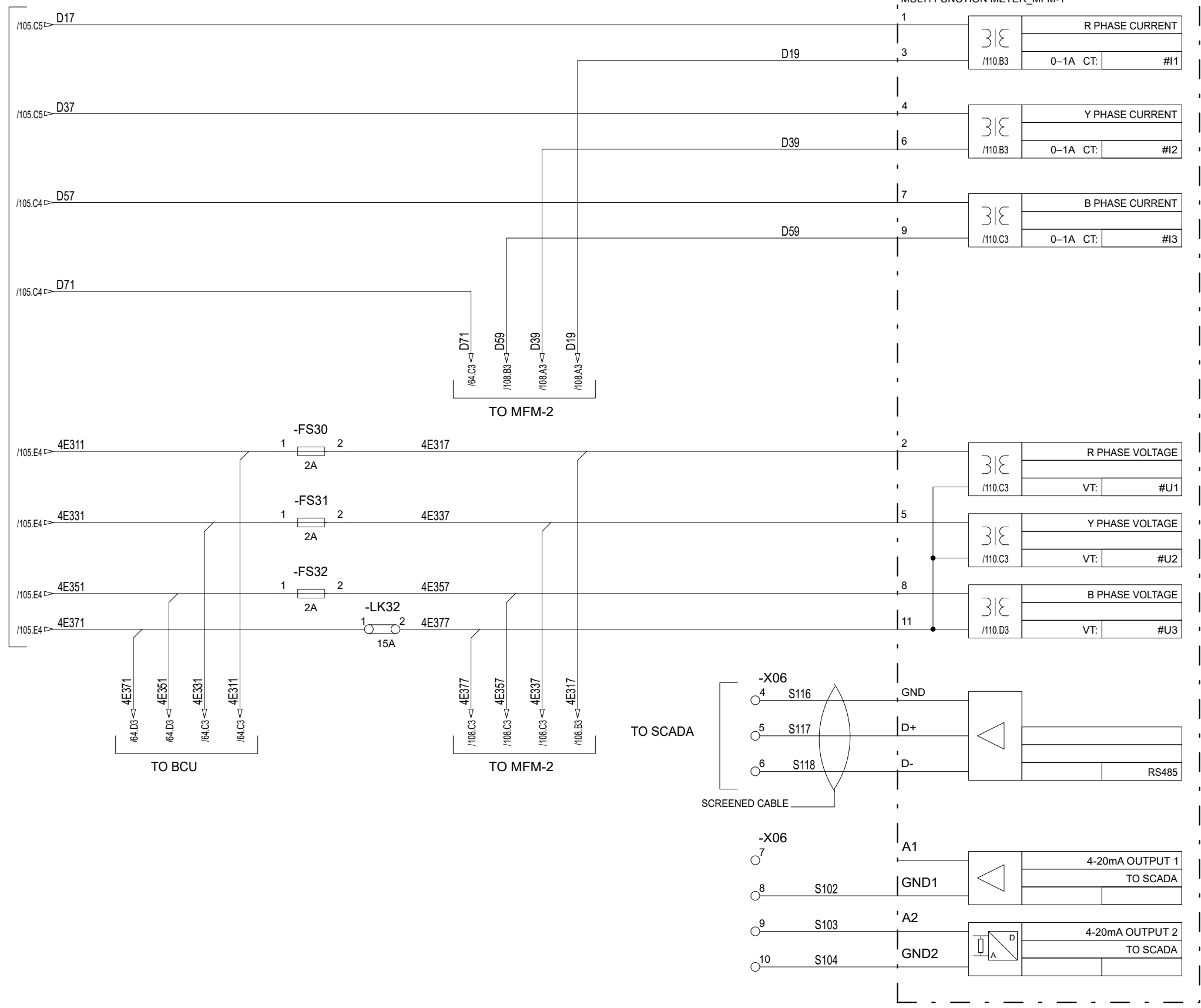
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Suitable for conventional 220KV SS only

FROM TVM
CKT.

+B.05 -MFM-1
MULTI FUNCTION METER_MFM-1



** DEPENDING ON THE SITE CONDITIONS, EARTHING SHALL BE DONE AT ONE POINT.

Based on		Prepared 05.01.2024	VINOD G	Title 220KV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Metering Circuit- MFM-1	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 107
1MYN691003-102(A3)REV01						n. sheet 108

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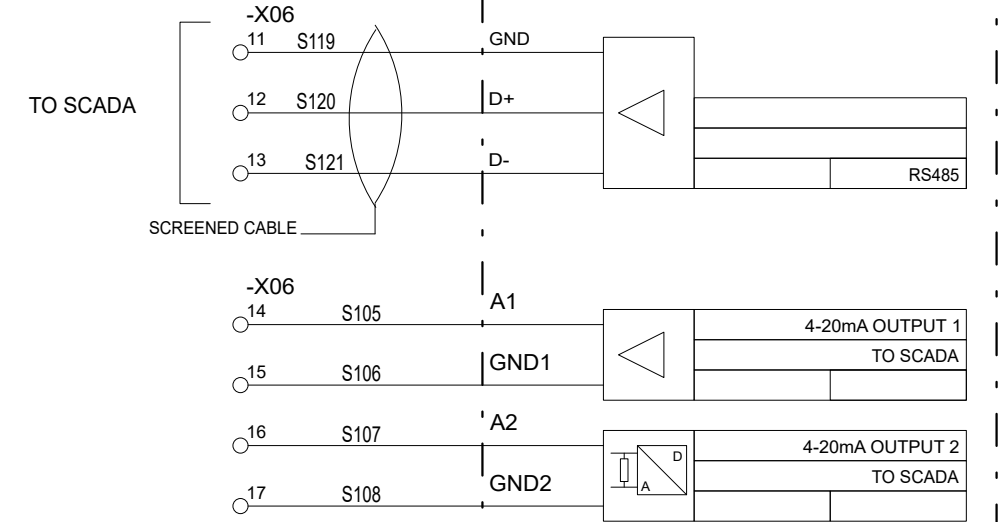
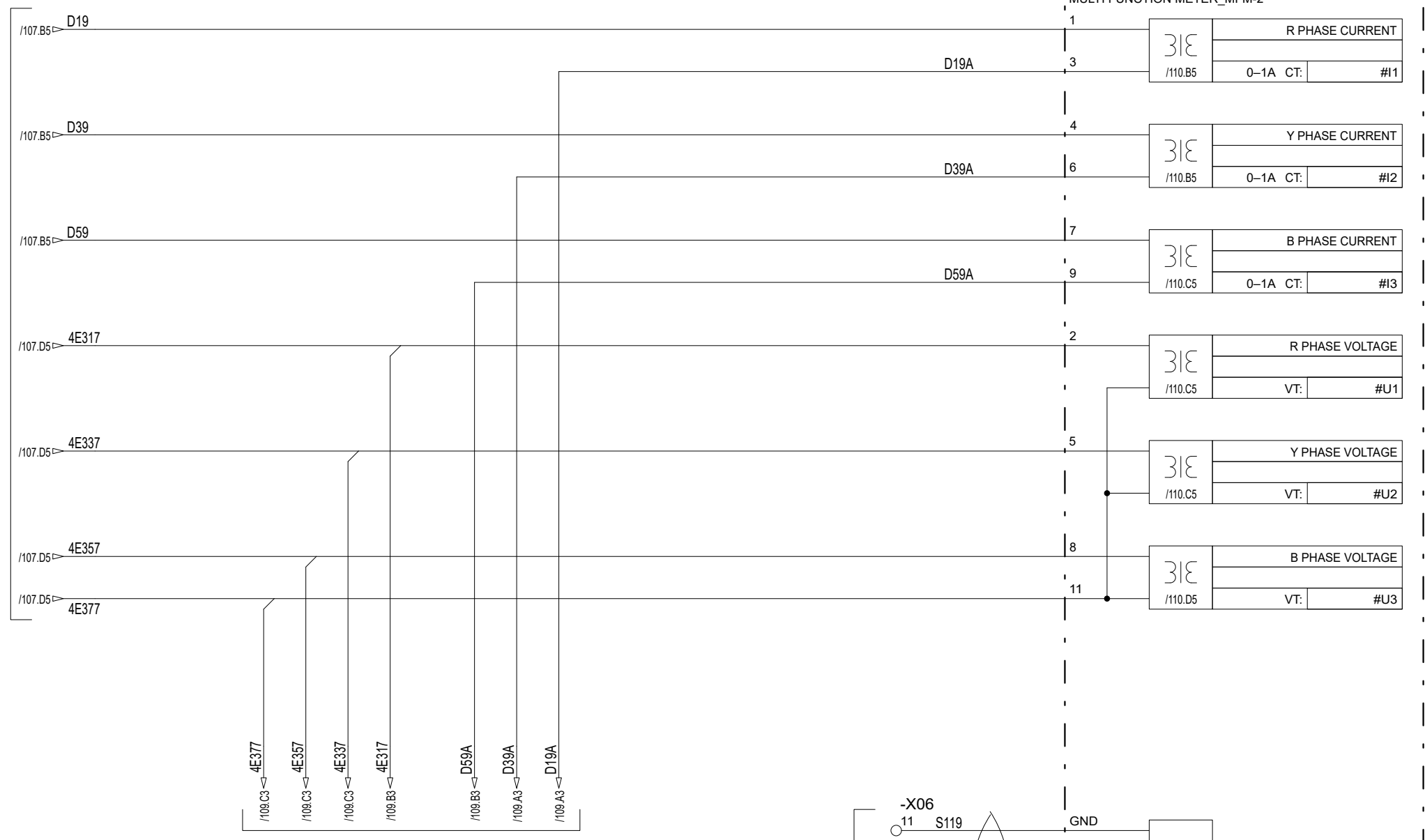
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Drawing approval subject to valid vendor registration

FROM MFM-1
CKT.

+B.05 -MFM-2
MULTI FUNCTION METER_MFM-2



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Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Metering Circuit- MFM-2	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 108
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8814600/2024/EEMRT-ENE51

A

B

C

D

F

A

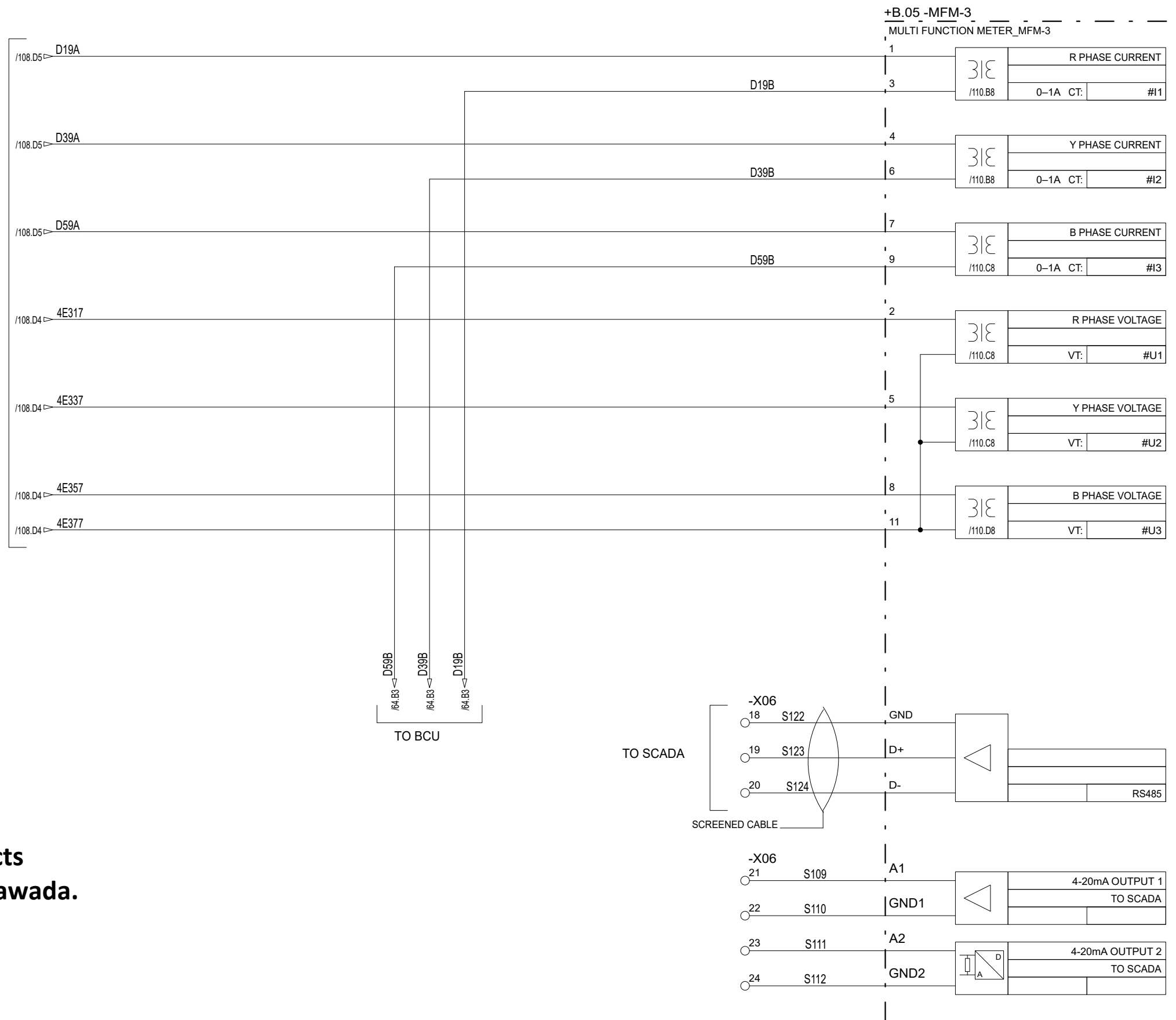
B

C

D

E

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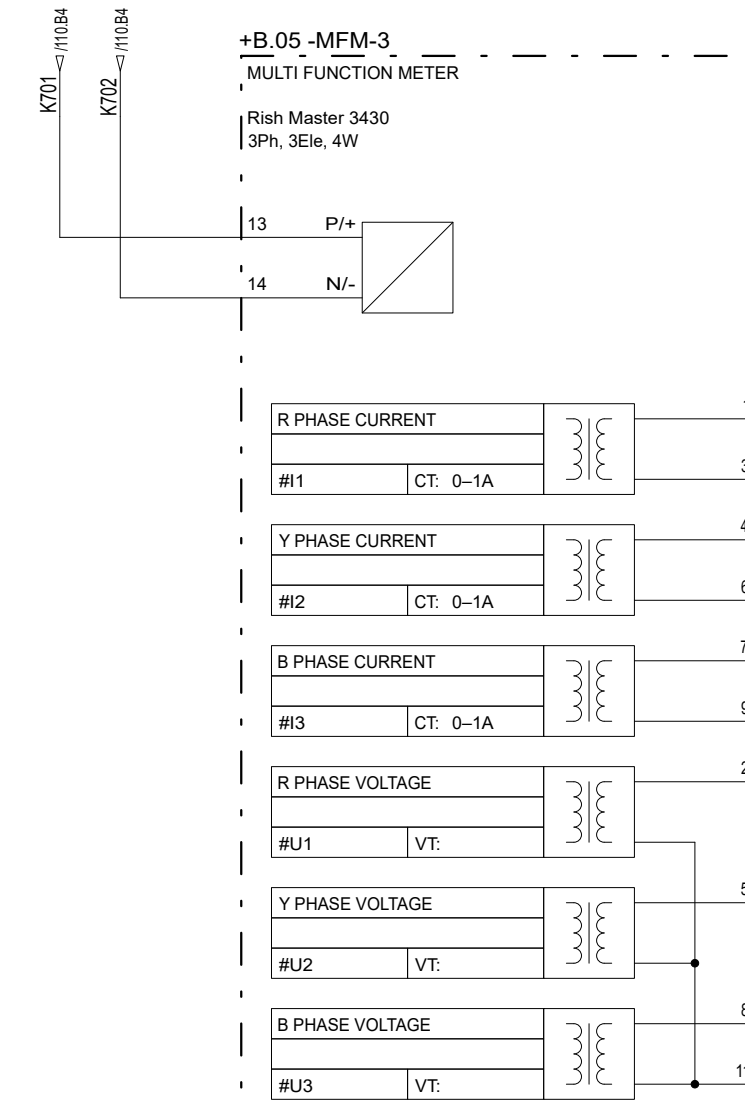
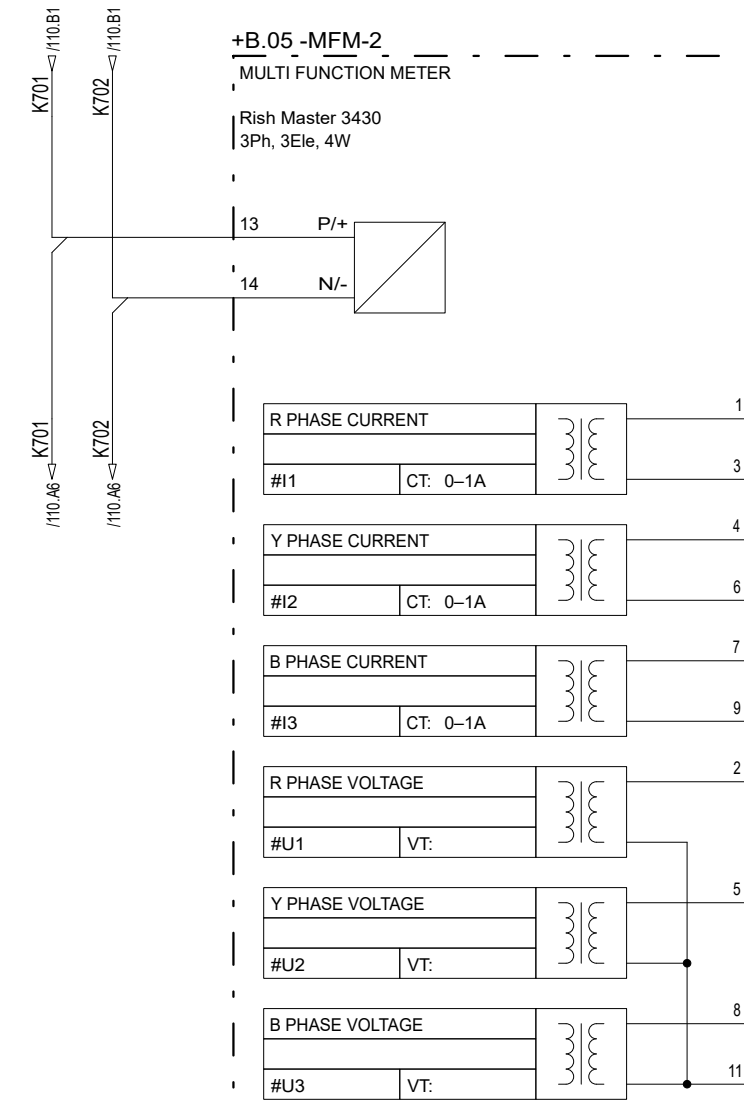
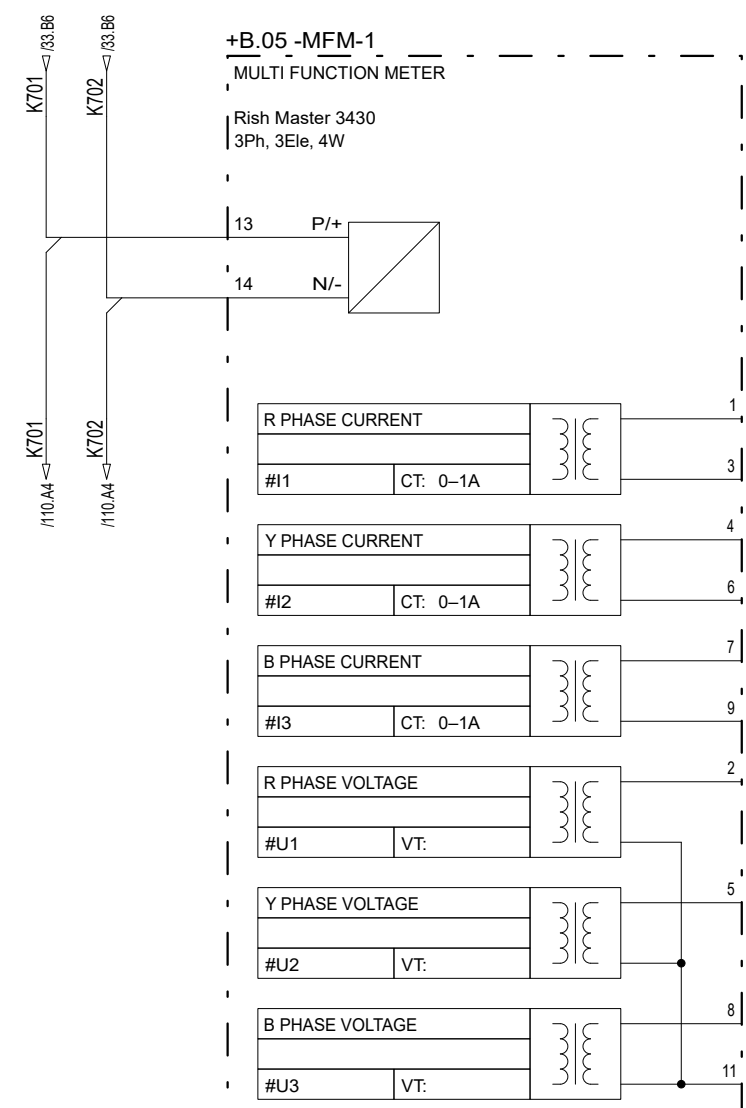


Chief Engineer/Projects
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Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Metering Circuit- MFM-3	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 109
1MYN691003-102(A3)REV01						n. sheet 110

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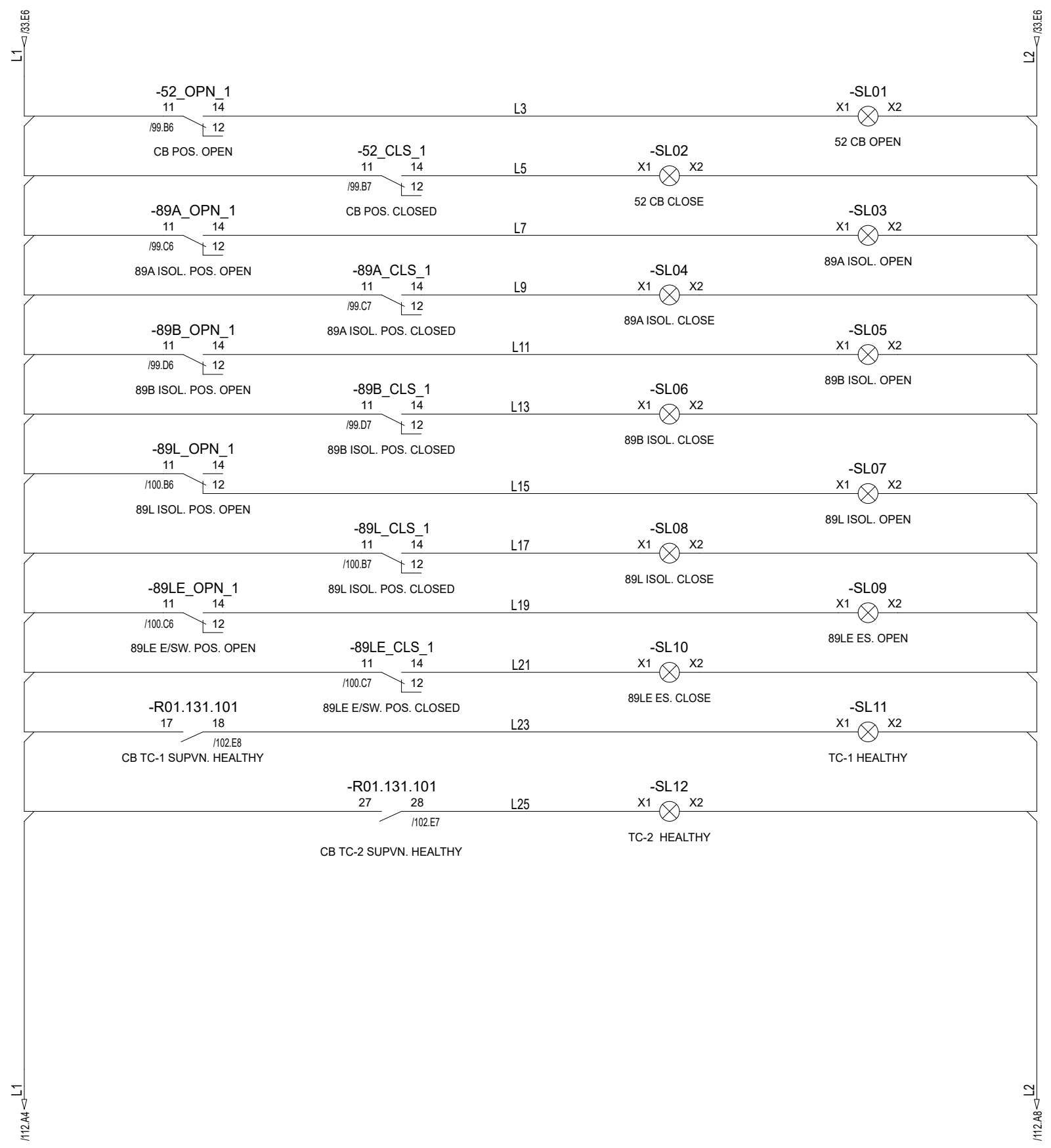
Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER		Doc. kind.	Circuit diagram		Ref.Des.	=2KR
		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel		DCC EFS					
		Project	APTRANSCO STANDARD DRAWING		Metering Circuit- MFM		Resp. dept.	PG-GAS		Rev. ind.	Language en	
Rev.	Revision note	Date	Name		HITACHI Hitachi Energy India Limited		Doc. no.		1MNS500925-CABA		Sheet	110
1MYN691003-102(A3)REV01											n. sheet	111

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Suitable for conventional 220KV SS only

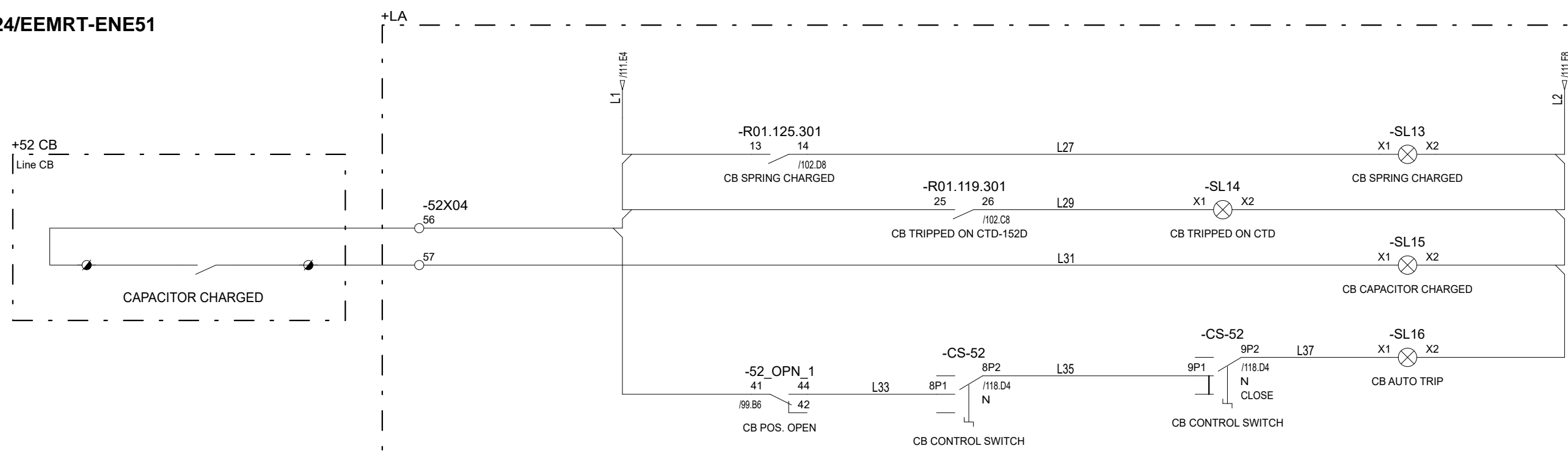
Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.



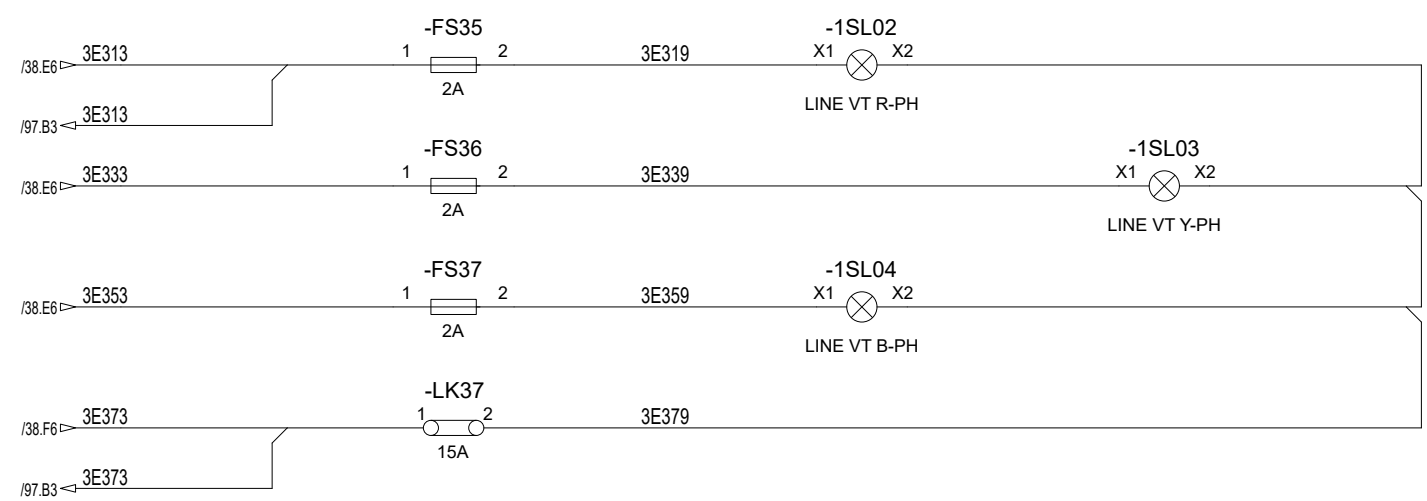
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		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel			DCC EFS				
		Project	APTRANSCO STANDARD DRAWING		Indication Circuit			Resp. dept.	PG-GAS	Rev. ind.	Language	en
Rev.	Revision note	Date	Name	HITACHI Hitachi Energy India Limited			Doc. no.		1MNS500925-CABA		Sheet	111
1MYN691003-102(A3)REV01											n. sheet	112

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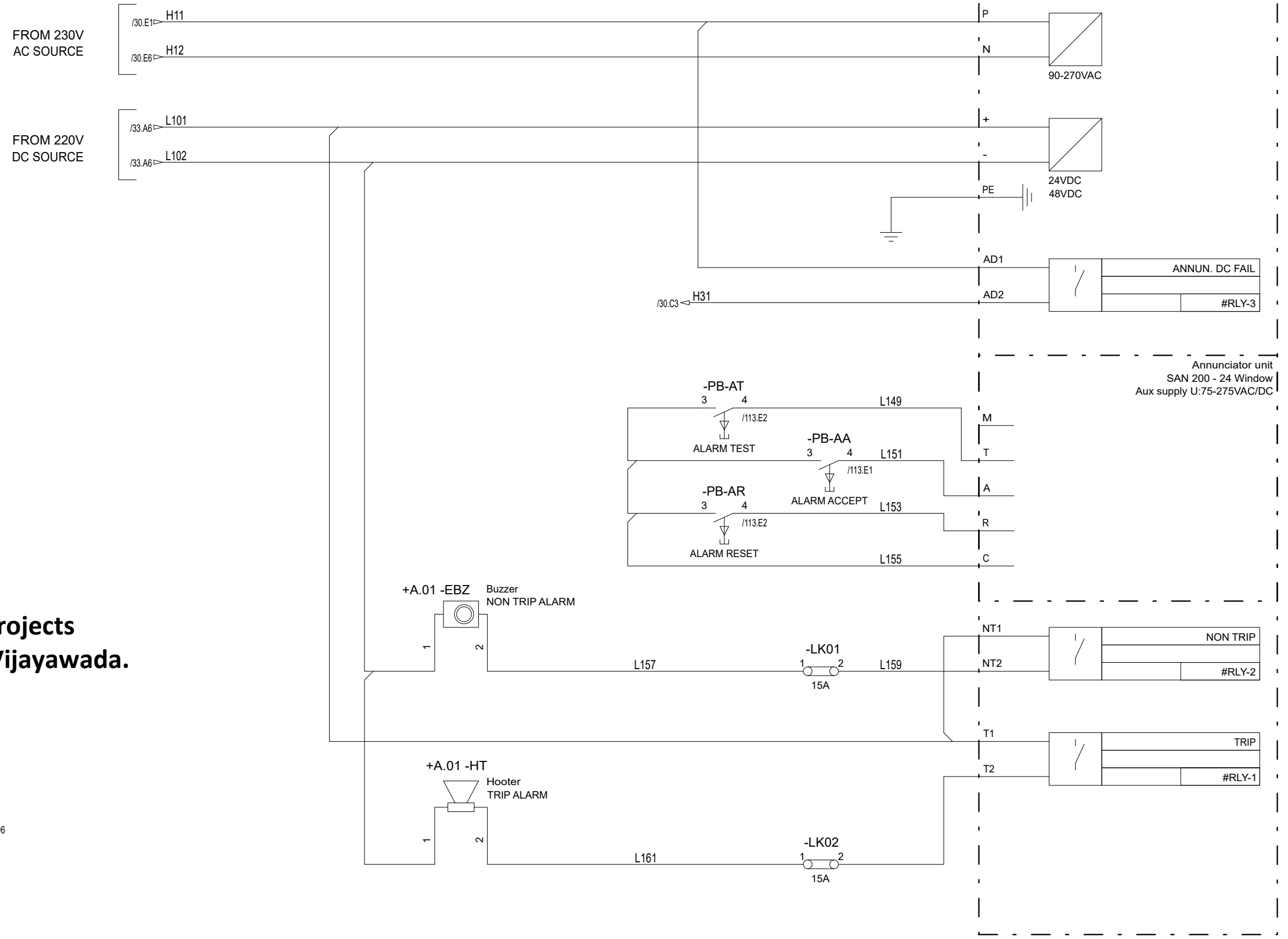
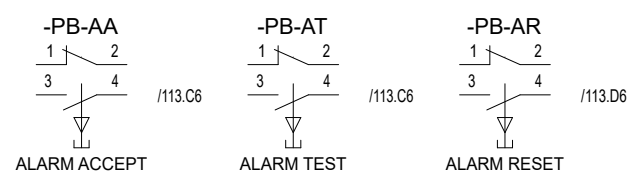
Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER		Doc. kind.	Circuit diagram		Ref.Des.	=2KR	
		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel			DCC EFS					
		Project	APTRANSCO		Indication Circuit			Resp. dept.	PG-GAS		Rev. ind.	Language	en
		STANDARD DRAWING			Hitachi Energy India Limited			1MNS500925-CABA		Sheet		112	
Rev.	Revision note	Date	Name				Doc. no.		1MNS500925-CABA		n. sheet		113
1MYN691003-102(A3)REV01													

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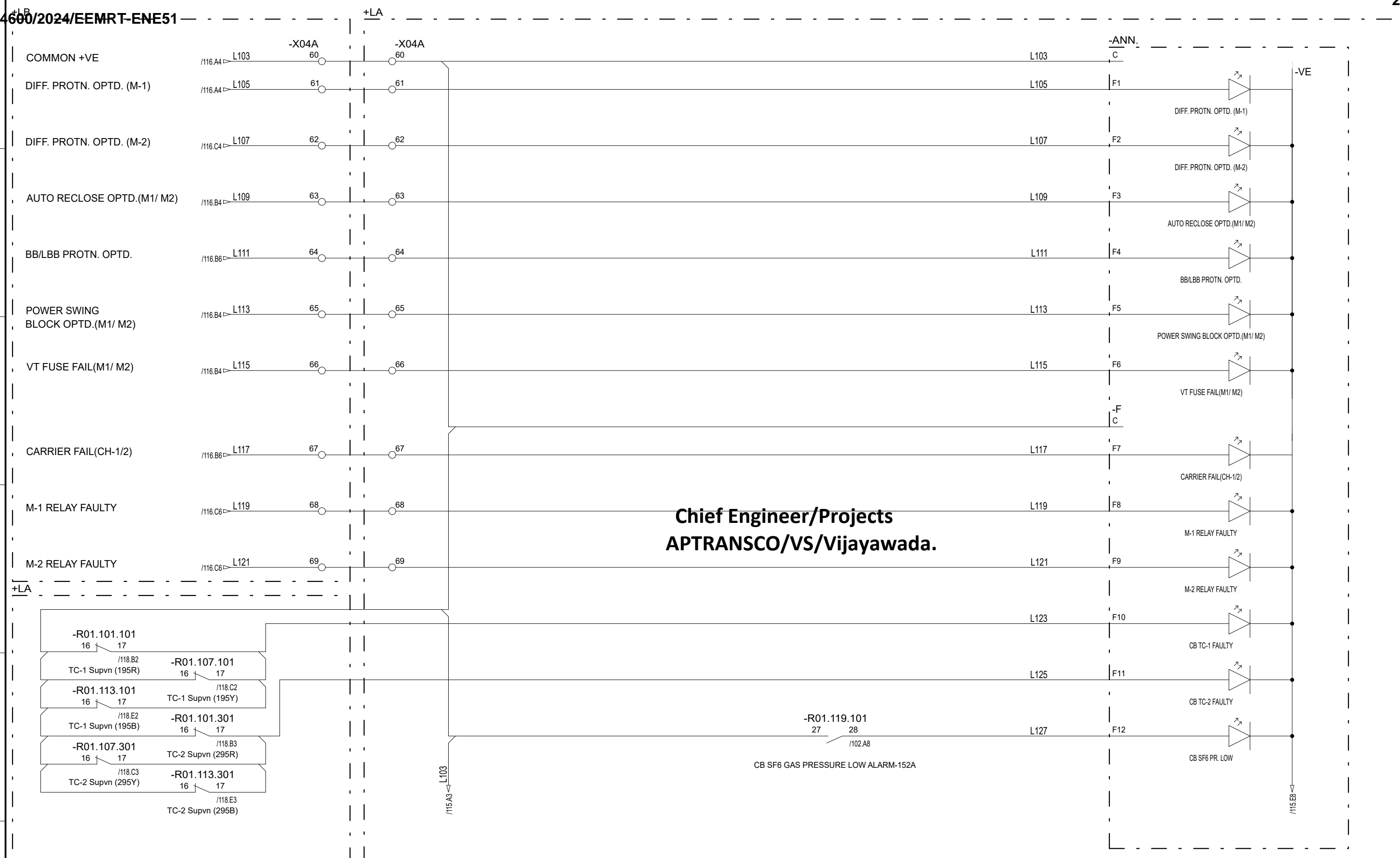


Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER		Doc. kind.	Circuit diagram		Ref.Des.	=2KR
		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel			DCC	EFS			
		Project	APTRANSCO STANDARD DRAWING		Annunciation Circuit			Resp. dept.	PG-GAS	Rev. ind.	Language	en
Rev.	Revision note	Date	Name	HITACHI Hitachi Energy India Limited			Doc. no. 1MNS500925-CABA		Sheet		113	
1MYN691003-102(A3)REV01									n. sheet		114	

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Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER		Doc. kind.	Circuit diagram		Ref.Des.	=2KR	
		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel			DCC EFS					
		Project	APTRANSCO		Annunciation Circuit			Resp. dept.	PG-GAS		Rev. ind.	Language	en
		STANDARD DRAWING			Hitachi Energy India Limited			1MNS500925-CABA		Sheet	114		
Rev.	Revision note	Date	Name				Doc. no.			n. sheet	115		
1MYN691003-102(A3)REV01													

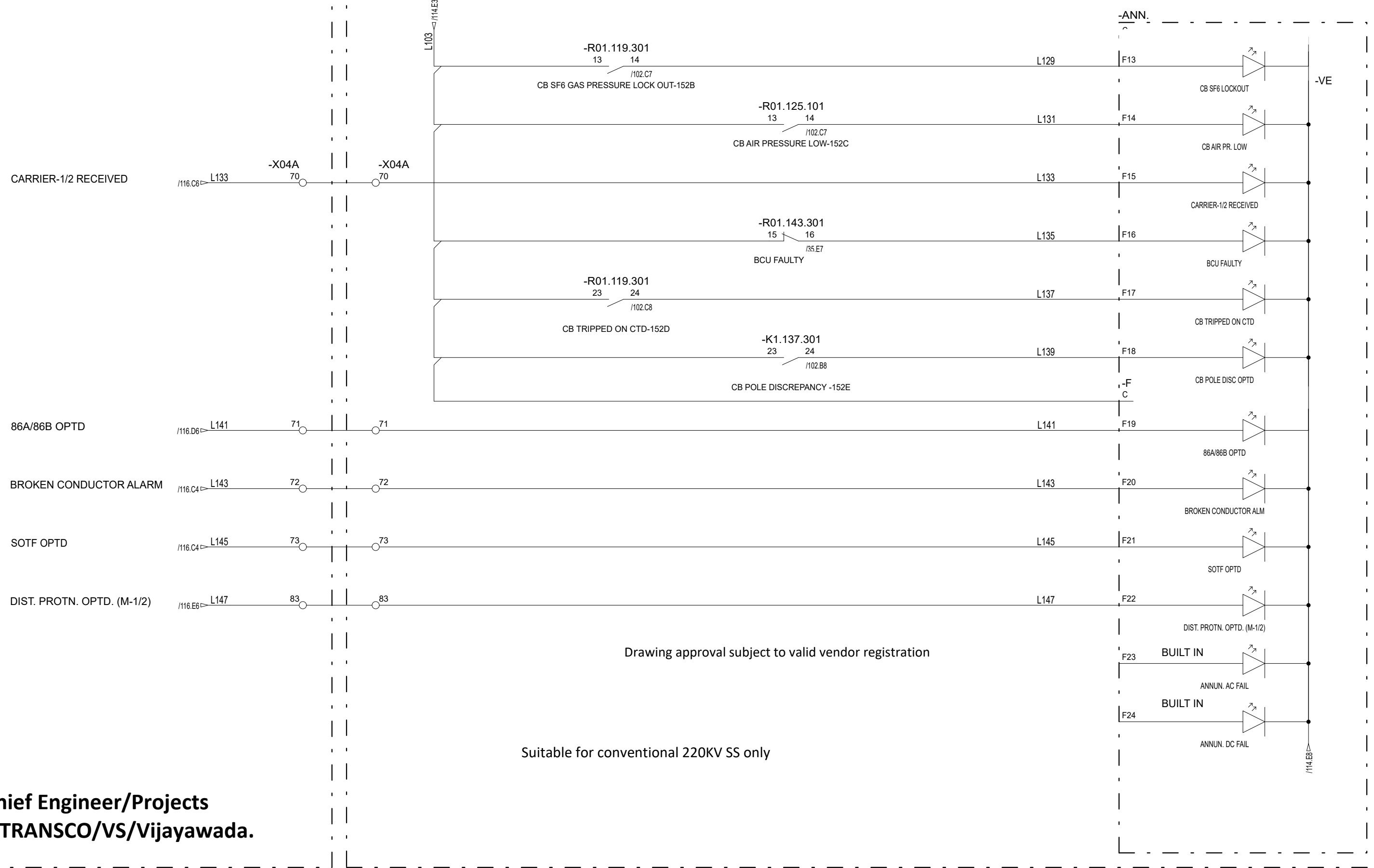
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+LA

260



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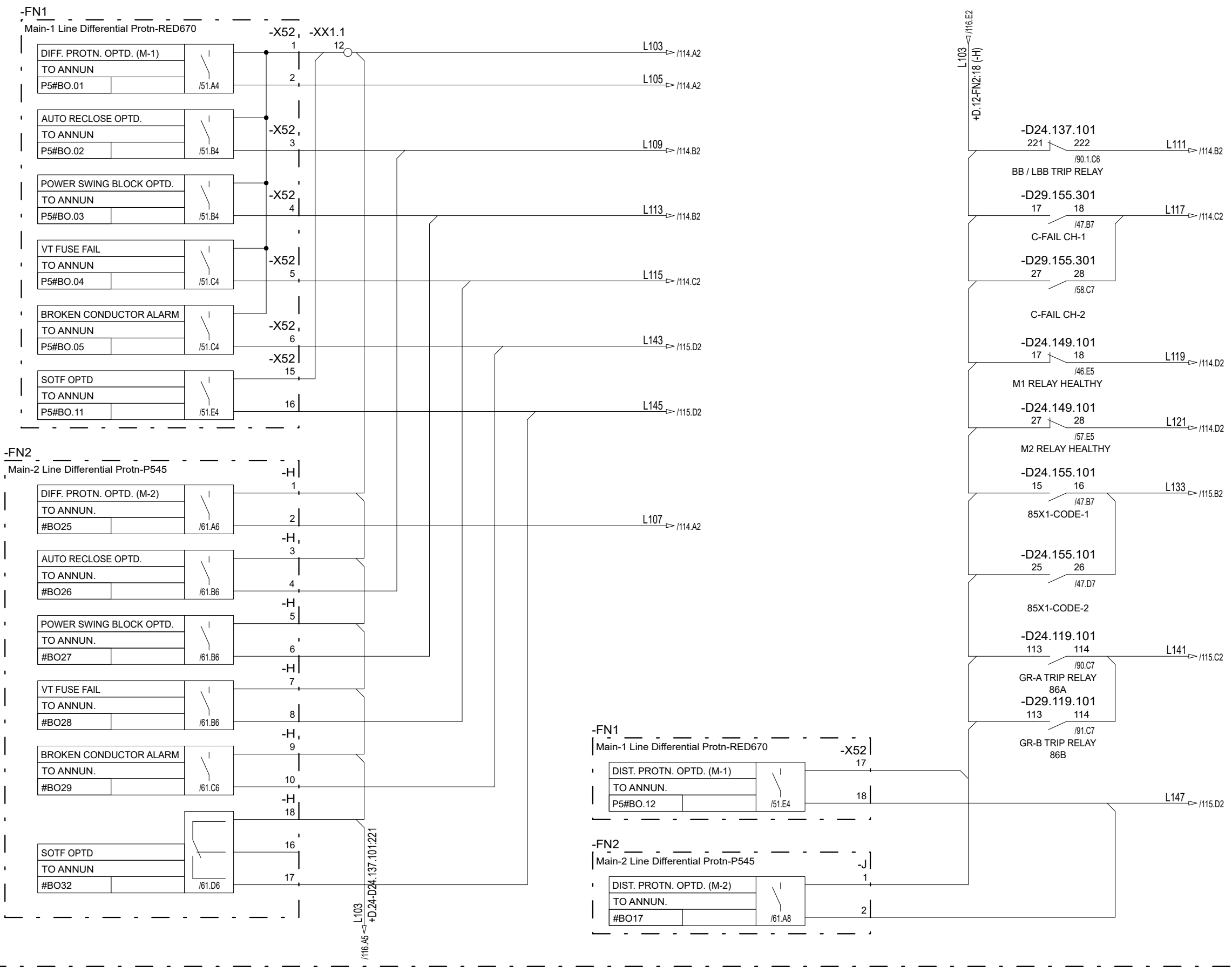
Suitable for conventional 220KV SS only

Chief Engineer/Projects
APTRANSCO/VIS/Vijayawada.

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Annunciation Circuit	Resp. dept. PG-GAS	Rev. ind.
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CABA		Sheet 115
1MYN691003-102(A3)REV01						n. sheet 116

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Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER		Doc. kind.	Circuit diagram		Ref.Des.	=2KR	
		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel			DCC EFS					
		Project	APTRANSCO		Annunciation Circuit			Resp. dept.	PG-GAS	Rev. ind.	Language	en	
		STANDARD DRAWING			Hitachi Energy India Limited								
Rev.	Revision note	Date	Name		HITACHI			Doc. no.		1MNS500925-CABA		Sheet	116
1MYN691003-102(A3)REV01												n. sheet	117

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ANNUNCIATION INSCRIPTION DETAILS

ANN.

1 DIFF. PROTN. OPTD. (M-1) T	2 DIFF. PROTN. OPTD. (M-2) T	3 AUTO RECLOSE OPTD. (M1/ M2) T	4 BB/LBB PROTN. OPTD. T	5 POWER SWING BLOCK OPTD. (M1/ M2) NT	6 VT FUSE FAIL(M1/ M2) NT
7 CARRIER FAIL(CH-1/2) NT	8 M-1 RELAY FAULTY NT	9 M-2 RELAY FAULTY NT	10 CB TC-1 FAULTY NT	11 CB TC-2 FAULTY NT	12 CB SF6 PR. LOW NT
13 CB SF6 LOCKOUT NT	14 CB AIR PR. LOW NT	15 CARRIER-1/2 RECEIVED T	16 BCU FAULTY NT	17 CB TRIPPED ON CTD T	18 CB POLE DISCREPANCY OPTD T
19 86A/86B OPTD T	20 BROKEN CONDUCTOR CHECK T	21 SOTF OPTD T	22 DIST. PROTN. OPTD. (M-1/2) NT	23 ANNUN. AC FAIL NT	24 ANNUN. DC FAIL NT

NOTE:-

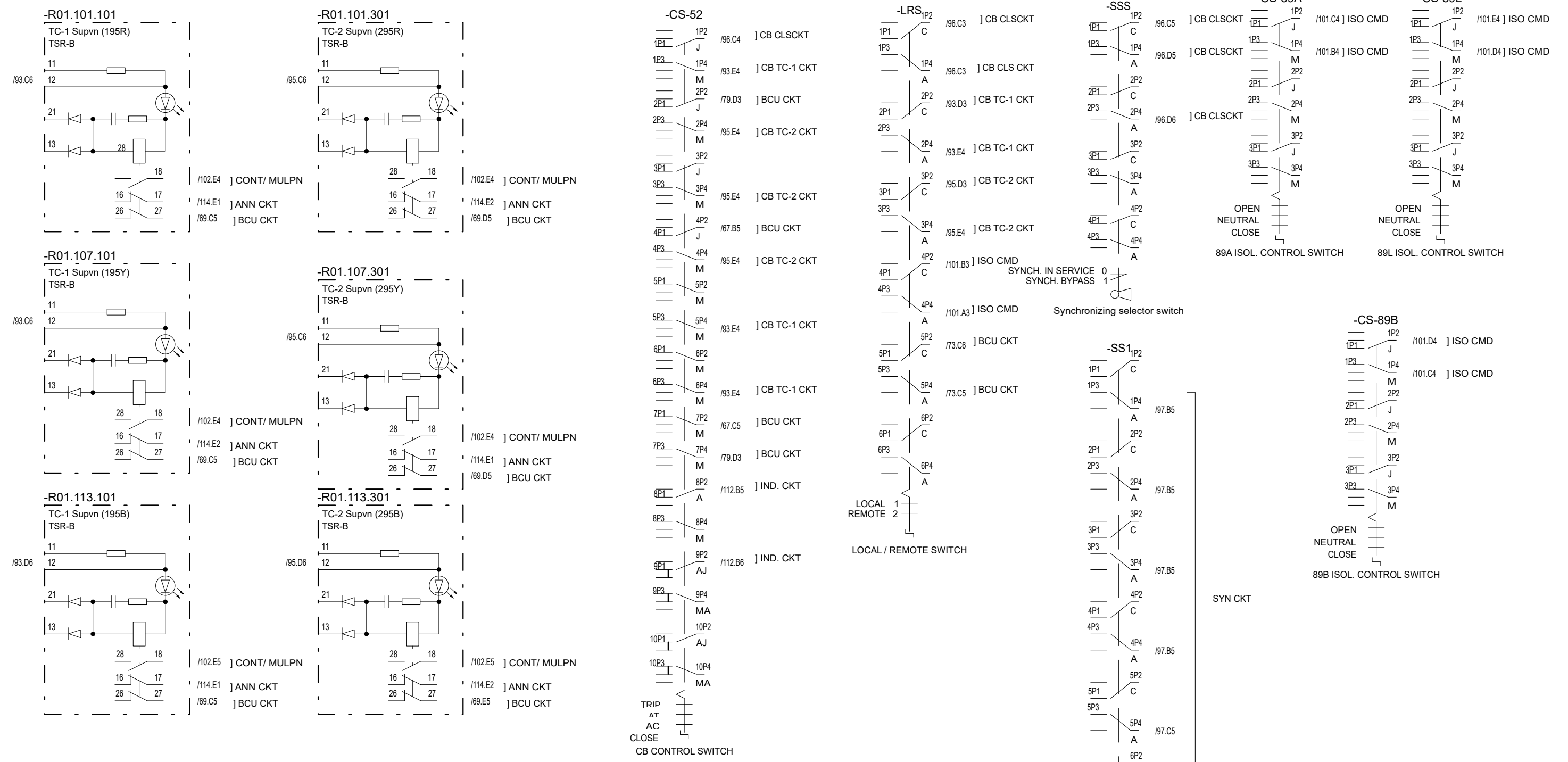
- 1) NUMBERS FROM 1 TO 24 ARE FOR WINDOW IDENTIFICATION.
- 2) T :- TRIP ALARM WITH RED COLOUR LED WINDOW
- 3) NT :- NON TRIP ALARM WITH WHITE COLOUR LED WINDOW

Chief Engineer/Projects
APTRANSCO/VIS/Vijayawada.

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		Annunciation Incriptions	Resp. dept. PG-GAS	Rev. ind.
		STANDARD DRAWING		HITACHI Hitachi Energy India Limited	Language en	
Rev.	Revision note	Date	Name	Doc. no. 1MNS500925-CABA		Sheet 117
1MYN691003-102(A3)REV01						n. sheet 118

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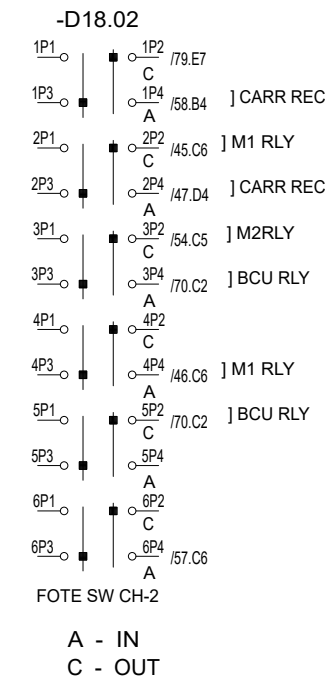
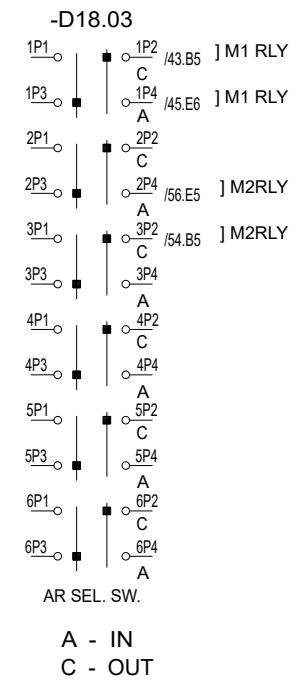
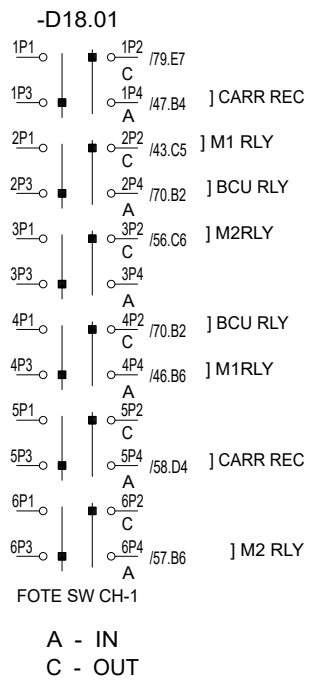
Suitable for conventional 220KV SS only

Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER		Doc. kind.	Circuit diagram		Ref.Des.	=2KR
		Approved	09.01.2024	GOURISH HEGDE	Control & Relay Panel			DCC EFS				
		Project	APTRANSCO STANDARD DRAWING		Contact Distribution Circuit			Resp. dept.	PG-GAS	Rev. ind.	Language	en
Rev.		Revision note	Date	Name	HITACHI Hitachi Energy India Limited			Doc. no.		1MNS500925-CABA		
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Drawing approval subject to valid vendor registration

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

Based on		Prepared 05.01.2024 VINOD G		Title 220kV LINE FEEDER		Doc. kind. Circuit diagram		Ref.Des. =2KR	
		Approved 09.01.2024 GOURISH HEGDE		Control & Relay Panel		DCC EFS			
		Project APTRANSCO STANDARD DRAWING		Contact Distribution Circuit		Resp. dept. PG-GAS		Rev. ind.	
				HITACHI Hitachi Energy India Limited		Language en			
Rev.	Revision note	Date	Name			Doc. no. 1MNS500925-CABA		Sheet 119	
1MYN691003-102(A3)REV01								n. sheet 120	

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814600/2024/EEMRT-ENE51

DISTURBANCE / EVENT RECORDED SIGNALS

EXTERNAL TRIGGERING	-87/21M1	-RED670	INTERNAL TRIGGERING
	ANALOUGE CHANNEL		
R-Ph CURRENT	▶	◀	GENERAL TRIP
Y-Ph CURRENT	▶	◀	TRIP-R Ph
B-Ph CURRENT	▶	◀	TRIP-Y Ph
NU CURRENT	▶	◀	TRIP-B Ph
R-Ph VOLTAGE	▶	◀	ZONE-1 TRIP
Y-Ph VOLTAGE	▶	◀	ZONE-1 START
B-Ph VOLTAGE	▶	◀	ZONE-2 TRIP
	DIGITAL CHANNEL		
CB R-Ph OPEN	▶	◀	ZONE-2 START
CB Y-Ph OPEN	▶	◀	ZONE-3 TRIP
CB B-Ph OPEN	▶	◀	ZONE-3 START
CB R-Ph CLOSE	▶	◀	ZONE-4 TRIP
CB Y-Ph CLOSE	▶	◀	ZONE-4 START
CB B-Ph CLOSE	▶	◀	ZONE-5 TRIP
			ZONE-5 START
3-Ph TRIP GR A/B	▶	◀	ZCOM TRIP (Z-2 + CARR. REC)
MAIN-2 RELAY OPTD.	▶	◀	CARRIER RECEIVE
BB/LBB OPTD.	▶	◀	CARRIER SEND
CB READY	▶	◀	CARRIER FAIL/ CARR. SW. OUT
1-Ph LBB INITIATION	▶	◀	AR START
3-Ph LBB INITIATION	▶	◀	AR OPERATED
DT RECEIVE CH-1/2	▶	◀	AR BLOCK
A/R SW POS OUT	▶	◀	SOTF TRIP
CB CLOSE CMD(SOTF INI)	▶	◀	PSB OPERATED
			DEF OPERATED
O/V START	▶	◀	FUSE FAIL
O/V STAGE-1 TRIP	▶	◀	BROKEN COND TPIR
O/V STAGE-2 TRIP	▶	◀	DT SEND CH-1/2

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

Chief Engineer/Projects
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DISTURBANCE / EVENT RECORDED SIGNALS

EXTERNAL TRIGGERING	-87/21M2	-MICOM P545	INTERNAL TRIGGERING
	ANALOUGE CHANNEL		
R-Ph CURRENT	▶	◀	GENERAL TRIP
Y-Ph CURRENT	▶	◀	TRIP-R Ph
B-Ph CURRENT	▶	◀	TRIP-Y Ph
NU CURRENT	▶	◀	TRIP-B Ph
R-Ph VOLTAGE	▶	◀	ZONE-1 TRIP
Y-Ph VOLTAGE	▶	◀	ZONE-1 START
B-Ph VOLTAGE	▶	◀	ZONE-2 TRIP
	DIGITAL CHANNEL		
CB R-Ph OPEN	▶	◀	ZONE-2 START
CB Y-Ph OPEN	▶	◀	ZONE-3 TRIP
CB B-Ph OPEN	▶	◀	ZONE-3 START
CB R-Ph CLOSE	▶	◀	ZONE-4 TRIP
CB Y-Ph CLOSE	▶	◀	ZONE-4 START
CB B-Ph CLOSE	▶	◀	ZONE-5 TRIP
			ZONE-5 START
3-Ph TRIP GR A/B	▶	◀	ZCOM TRIP (Z-2 + CARR. REC)
MAIN-1 RELAY OPTD.	▶	◀	CARRIER RECEIVE
BB/LBB OPTD.	▶	◀	CARRIER SEND
CB READY	▶	◀	CARRIER FAIL/ CARR. SW. OUT
1-Ph LBB INITIATION	▶	◀	AR START
3-Ph LBB INITIATION	▶	◀	AR OPERATED
DT RECEIVE CH-1/2	▶	◀	AR BLOCK
A/R SW POS OUT	▶	◀	SOTF TRIP
CB CLOSE CMD(SOTF INI)	▶	◀	PSB OPERATED
			DEF OPERATED
O/V START	▶	◀	FUSE FAIL
O/V STAGE-1 TRIP	▶	◀	BROKEN COND TPIR
O/V STAGE-2 TRIP	▶	◀	DT SEND CH-1/2

NO. OF ANALOG CHANNEL-8
NO. OF DIGITAL CHANNEL-24
NO. OF DR RECORDS-20 @ 10.5sec
NO. OF FAULT RECORDS-5

Based on		Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER	Doc. kind. Circuit diagram	Ref.Des. =2KR
		Approved 09.01.2024	GOURISH HEGDE	Control & Relay Panel	DCC EFS	
		Project APTRANSCO		DISTURBANCE RECORDER MAIN-1/2	PG-GAS	Rev. ind.
		STANDARD DRAWING		Hitachi Energy India Limited		Language en
Rev.	Revision note	Date	Name	HITACHI	Doc. no. 1MNS500925-CABA	Sheet 120
1MYN691003-102(A3)REV01						n. sheet 121

-X04
 Used: 45
 (20%)Spare: 9
 Total: 54

46 ○ 47 ○ 48 ○ 49 ○ 50 ○ 51 ○ 52 ○
 53 ○ 54 ○

-DCX03
 Used: 8
 (20%)Spare: 2
 Total: 10

9 ⊗ 10 ⊗

-XX1.2
 Used: 14
 (20%)Spare: 3
 Total: 17

15 ○ 16 ○ 17 ○

-X01
 Used: 9
 (20%)Spare: 2
 Total: 11

10 ⊗ 11 ⊗

-ACX03
 Used: 6
 (20%)Spare: 2
 Total: 8

7 ⊗ 8 ⊗

-X07
 Used: 2
 (20%)Spare: 2
 Total: 4

3 ○ 4 ○ 1 ○ 2 ○

-52X04
 Used: 57
 (20%)Spare: 12
 Total: 69

58 ○ 59 ○ 60 ○ 61 ○ 62 ○ 63 ○ 64 ○
 65 ○ 66 ○ 67 ○ 68 ○ 69 ○

-TVM
 Used: 3
 (20%)Spare: 0
 Total: 3

-X06
 Used: 24
 (20%)Spare: 5
 Total: 29

25 ○ 26 ○ 27 ○ 28 ○ 29 ○

-89X04
 Used: 38
 (20%)Spare: 8
 Total: 46

39 ○ 40 ○ 41 ○ 42 ○ 43 ○ 44 ○ 45 ○
 46 ○

-89X03
 Used: 8
 (20%)Spare: 2
 Total: 10

9 ⊗ 10 ⊗

-X02
 Used: 40
 (20%)Spare: 8
 Total: 48

41 ⊗ 42 ⊗ 43 ⊗ 44 ⊗ 45 ⊗ 46 ⊗ 47 ⊗
 48 ⊗

-X04A
 Used: 82
 (20%)Spare: 3
 Total: 85

84 ○ 85 ○

-XX1.1
 Used: 2
 (20%)Spare: 1
 Total: 3

3 ○

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

Based on		Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Assembly drawing		Ref.Des. =2KR	
		Approved 09.01.2024		GOURISH HEGDE		SPARE TERMINALS		DCC ELU		+LA	
		Project APTRANSCO				SPARE TERMINALS		Resp. dept. PG-GAS		Rev. ind.	
		STANDARD DRAWING				Hitachi Energy India Limited		Language en		Sheet 121	
Rev. Revision note		Date		Name		HITACHI		Doc. no. 1MNS500925-CABA		n. sheet 122	
1MYN691003-102(A3)REV01											

-ACX03
Used: 2
(20%)Spare: 1
Total: 3

3

-X02
Used: 12
(20%)Spare: 3
Total: 15

13 14 15

-BBX04
Used: 13
(20%)Spare: 3
Total: 16

14 15 16

-DCX03
Used: 12
(20%)Spare: 3
Total: 15

13 14 15

-XX1.1
Used: 5
(20%)Spare: 3
Total: 8

4 7 8

-X04
Used: 30
(20%)Spare: 15
Total: 45

31 33 36 39 42 44
32 34 37 40 43 45
35 38 41

-XX1.2
Used: 4
(20%)Spare: 1
Total: 5

5

-XX2.1
Used: 5
(20%)Spare: 1
Total: 6

6

-FOTEX04
Used: 28
(20%)Spare: 6
Total: 34

29 30 31 32 33 34

-XX2.2
Used: 1
(20%)Spare: 1
Total: 2

2

-52X04
Used: 14
(20%)Spare: 3
Total: 17

15 16 17

-X04A
Used: 79
(20%)Spare: 6
Total: 85

84 85

-X01
Used: 26
(20%)Spare: 6
Total: 32

27 28 29 30 31 32

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

Suitable for conventional 220KV SS only

Based on		Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER SPARE TERMINALS SPARE TERMINALS		Doc. kind.	Circuit diagram		Ref.Des.	=2KR +LB	
		Approved	09.01.2024	GOURISH HEGDE				DCC	EFS				
		Project	APTRANSCO STANDARD DRAWING					PG-GAS		Rev. ind.	Language	en	
												Sheet	122
Rev.	Revision note	Date	Name									n. sheet	1001
1MYN691003-102(A3)REV01													

Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet				
A	1	+A.01	-ACMCB01	Miniature circuit breaker	-	16A	240VAC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CAAA/28			
				Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CAAA/28,69			
B	2	+A.01	-ACMCB02	Miniature circuit breaker	-	2A	240VAC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CAAA/28			
				Bell for DC Fail Alarm	AUH-1122	80-140V/160-280VAC/DC	Three tone electronic bell	1MYN593002-002	Alan electronic systems pvt.ltd	1	1MNS500925-CAAA/30				
												Electronic buzzer for Non-Trip Alarm	Buzzer	160-280V AC/DC	96x96mm
C	5	+A.01	-HS	On/off Switch		1-2 pos on/off switch, 5A,Flush mounting	Wing Type knob	1MYN533014-001	Switron	1	1MNS500925-CAAA/28				
				6	+A.01	-HT	Hooter for Trip alarm	Hooter	220VDC		1MYN593002-004	Alan electronic systems pvt.ltd	1MYN593002-004	1	1MNS500925-CAAA/113
							7	+A.01	-LK01	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T
Neutral link	NL	15A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-				1	1MNS500925-CAAA/113				
D	8	+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-CAAA/113			
				9	+A.01	-PS	AC Socket with Switch	SW	230VAC, 05-15A	Box type, Indian standard	1MYN538103-001	Anchor	1	1MNS500925-CAAA/28	
10	+A.01	-TH	Thermostat				TH	230VAC, 15A, 50 Hz	Range : 30-85°C	IN7635-3001	GIRISH EGO	1	1MNS500925-CAAA/28		
E	11	+A.03	-ACFS02	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/30			
				Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1				
F	12	+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-CAAA/30			
Based on				Prepared	05.01.2024	VINOD G	Title 220kV LINE FEEDER			Doc. kind.	Parts list	Ref.Des.	=2KR		
				Approved	09.01.2024	GOURISH HEGDE	Parts list			DCC EPB		+LA			
				Project	APTRANSCO		=2KR+LA			Resp. dept.	PG-GAS	Rev. ind.	Language	en	
				STANDARD DRAWING			HITACHI Hitachi Energy India Limited			1MNS500925-ABA		Sheet	1001		
Rev.	Revision note		Date	Name					Doc. no.			n. sheet	1002		
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
13	+A.03	-FS12	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/64
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
14	+A.03	-FS27	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/105
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
15	+A.03	-FS28	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/105
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
16	+A.03	-FS29	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/105
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
17	+A.03	-FS35	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/112
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
18	+A.03	-FS36	Fuse	-	2A	Chief Engineer/Projects APTRANSCO/Vs/Vijayawada.	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/112
			Control Fuse Base	-	32A			-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	
19	+A.03	-FS37	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/112
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	

Based on				Prepared 05.01.2024 VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA	
				Approved 09.01.2024 GOURISH HEGDE		Parts list =2KR+LA		DCC EPB			
				Project APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited		Resp. dept. PG-GAS		Rev. ind. Language en	
Rev. Revision note				Date Name		HITACHI		Doc. no. 1MNS500925-ABA		Sheet 1002 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
20	+A.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-CAAA/64	
21	+A.03	-LK29	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-CAAA/105	
22	+A.03	-LK37	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-CAAA/112	
23	+A.05	-1MCB01	Miniature circuit breaker	-	16A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/31
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/31,73
24	+A.05	-1MCB02	Miniature circuit breaker	-	10A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/32
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/32,73
25	+A.05	-2MCB01	Miniature circuit breaker	-	16A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/31
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/31,73
26	+A.05	-2MCB02	Miniature circuit breaker	-	10A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/32
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/32,73
27	+A.05	-FS22	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/97
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	

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

Based on				Prepared 05.01.2024 VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA	
				Approved 09.01.2024 GOURISH HEGDE		Parts list =2KR+LA		DCC EPB			
				Project APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited		Resp. dept. PG-GAS		Rev. ind. Language en	
Rev. Revision note				Date Name		HITACHI		Doc. no. 1MNS500925-ABA		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
28	+A.05	-FS30	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/107
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
29	+A.05	-FS31	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/107
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
30	+A.05	-FS32	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/107
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
31	+A.05	-LK22	Control Fuse Base	-	32A	Chief Engineer/Projects APTRANSCO/VS/Vijayawada.	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
			Neutral link	15A	15A		ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/97	
32	+A.05	-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-CAAA/107
33	+A.07	-MCB01	Miniature circuit breaker	-	2A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/33
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/33,74
34	+A.07	-MCB02	Miniature circuit breaker	-	2A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/33
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/33,74
35	+A.07	-MCB03	Miniature circuit breaker	-	4A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/33
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/ Siemens	-	1	1MNS500925-CAAA/33,74

Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA	
				Approved 09.01.2024		GOURISH HEGDE		Parts list =2KR+LA		DCC EPB			
				Project APTRANSCO				=2KR+LA		PG-GAS		Rev. ind.	
				STANDARD DRAWING				Hitachi Energy India Limited		Resp. dept.		Language en	
Rev. Revision note				Date		Name		HITACHI		Doc. no. 1MNS500925-ABA		Sheet 1004	
1MYN691003-102(A3)REV01												n. sheet 1005	

8814600/2024/EEMRT-ENE51	1	2	3	4	5	6	7	8	272				
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet		
A	36	+A.07	-MCB04	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CAAA/33	
											Auxiliary contact block	-	1CO
B	37	+A.07	-MCB05	Miniature circuit breaker	-	10A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CAAA/33	
											Auxiliary contact block	-	1CO
C	38	+A.07	-MCB06	Miniature circuit breaker	-	10A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CAAA/33	
											Auxiliary contact block	-	1CO
C	39	+A.07	-MCB07	Miniature circuit breaker	-	2A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CAAA/33	
											Auxiliary contact block	-	1CO
C	40	+A.07	-MCB08	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CAAA/33	
											Auxiliary contact block	-	1CO
D	41	+A.09	-89X04	Feed-through terminal	CAT M4	1100V, 57A	2.5-6mm ² , grey	IN2662-3001-3	Elmex		46	1MNS500925-CAAA/67,68,99,100,103,104,121	
	42	+A.09	-X06	Feed-through terminal	CAT M4	1100V, 57A	2.5-6mm ² , grey	IN2662-3001-3	Elmex		29	1MNS500925-CAAA/106,107,108,109,121	
	43	+A.09	-XX1.1	Feed-through terminal	CAT M4	1100V, 57A	2.5-6mm ² , grey	IN2662-3001-3	Elmex		8	1MNS500925-CAAA/79,121	
	44	+A.10	-52X04	Feed-through terminal	CAT M4	1100V, 57A	2.5-6mm ² , grey	IN2662-3001-3	Elmex		69	1MNS500925-CAAA/65,66,93,95,96,99,102,112,121	
E	45	+A.10	-X07	Feed-through terminal	CAT M4	1100V, 57A	2.5-6mm ² , grey	IN2662-3001-3	Elmex		4	1MNS500925-CAAA/115,121	
	46	+A.11	-ACX03	Disconnect terminal	CATD M4	1100V, 41A	2.5-6mm ²	1MYN266003-002	Elmex		8	1MNS500925-CAAA/28,29,30,121	
	47	+A.11	-X01	Disconnect terminal	CATD M4	1100V, 41A	2.5-6mm ²	1MYN266003-002	Elmex		11	1MNS500925-CAAA/105,121	
	48	+A.11	-X02	Disconnect terminal	CATD M4	1100V, 41A	2.5-6mm ²	1MYN266003-002	Elmex		48	1MNS500925-CAAA/37,38,42,53,121	
Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR	
				Approved 09.01.2024		GOURISH HEGDE		Parts list =2KR+LA		DCC EPB		+LA	
				Project APTRANSCO				Hitachi Energy India Limited		Resp. dept. PG-GAS		Rev. ind. Language en	
				STANDARD DRAWING				HITACHI		Doc. no. 1MNS500925-ABA		Sheet 1005	
Rev. Revision note				Date		Name						n. sheet 1006	
1MYN691003-102(A3)REV01													

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1	2	3	4	5	6	7	8								
Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet				
A 49	+A.11	-XX1.2	Feed-through terminal	CAT M4	1100V, 57A	2.5-6mm ² , grey	IN2662-3001-3	Elmex		17	1MNS500925-CAAA/ 65,66,67,68,69,70,71, 72,73,74,75,76,77,78, 121				
B 50	+B.01	-DS	Door limit switch	DLS	230V AC, 5A	Single pole, 1NO, Cover for Insulation	IIN5374-3001-1	Kaycee		1	1MNS500925-CAAA/28				
B 51	+B.01	-LED	LED Lamp	LED	240VAC, 9.08W			SPECTRUM TECHVISION (P) LTD		1	1MNS500925-CAAA/28				
B 52	+B.03	-ANN.	Annunciator unit	SAN 200 - 24 Window	Aux supply U:75- 275VAC/DC	without multi tone, Size:34x74mm, 6N case	1MYN900017-723	Seco	1MYN900017-723	1	1MNS500925-CAAA/ 113,114,115				
C 53	+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	1MNS500925-MAAA	1	1MNS500925-CAAA/107,110				
C 54	+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	1MNS500925-MAAA	1	1MNS500925-CAAA/108,110				
D 55	+B.05	-MFM-3	MULTI FUNCTION METER_MFM-3	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	1MNS500925-MAAA	1	1MNS500925-CAAA/109,110				
E 56	+B.09	-1SL01	Indicator light	-	230V AC, 7mA	WHITE	-	ABB/L&T/Teknic/ Schneider/SECO	-	1	1MNS500925-CAAA/30				
E 57	+B.09	-1SL02	Indicator light	-	60VDC/63.5VAC, 7mA	RED	-	ABB/L&T/Teknic/ Schneider/SECO	-	1	1MNS500925-CAAA/112				
E 58	+B.09	-1SL03	Indicator light	-	60VDC/63.5VAC, 7mA	YELLOW	-	ABB/L&T/Teknic/ Schneider/SECO	-	1	1MNS500925-CAAA/112				
E 59	+B.09	-1SL04	Indicator light	-	60VDC/63.5VAC, 7mA	BLUE	-	ABB/L&T/Teknic/ Schneider/SECO	-	1	1MNS500925-CAAA/112				
F 60	+B.09	-PB01	Push button	-	1NO, 1NC	Black, Compact, momentary	-	ABB/L&T/Teknic/ Schneider/SECO	-	1	1MNS500925-CAAA/36				
F 61	+B.09	-PB02	Push button	-	1NO, 1NC	Black, Compact, momentary	-	ABB/L&T/Teknic/ Schneider/SECO	-	1	1MNS500925-CAAA/36				
Based on				Prepared	05.01.2024	VINOD G	Title 220kV LINE FEEDER		Doc. kind.	Parts list		Ref.Des.	=2KR		
				Approved	09.01.2024	GOURISH HEGDE	Parts list		DCC EPB				+LA		
				Project	APTRANSCO		=2KR+LA		PG-GAS		Rev. ind.	Language	en		
				STANDARD DRAWING			HITACHI Hitachi Energy India Limited						Sheet	1006	
Rev.	Revision note		Date	Name						Doc. no.		1MNS500925-ABA		n. sheet	1007
1MYN691003-102(A3)REV01															

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8814600/2024/EEMRT-ENE51	1	2	3	4	5	6	7	8	274																																																																								
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet																																																																						
A	62	+B.09	-PB03	Push button	-	1NO, 1NC	Black, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/36	A																																																																				
	63	+B.09	-PB04	Push button	-	1NO, 1NC	Black, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/36																																																																					
	64	+B.09	-PB05	Push button	-	1NO, 1NC	Black, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/36																																																																					
B	65	+B.09	-PB06	Push button	-	1NO, 1NC	Black, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/36	B																																																																				
	66	+B.09	-PB-AA	Push button	-	1NO, 1NC	Red, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/113																																																																					
	67	+B.09	-PB-AR	Push button	-	1NO, 1NC	Black, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/113																																																																					
	68	+B.09	-PB-AT	Push button	-	1NO, 1NC	Yellow, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/113																																																																					
C	69	+B.09	-PB-DC1-FT	Push button	-	1NO, 1NC	Yellow, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/31	C																																																																				
	70	+B.09	-PB-DC2-FT	Push button	-	1NO, 1NC	Yellow, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/31																																																																					
	71	+B.09	-PB-DCFA	Push button	-	1NO, 1NC	Red, Compact, momentary	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/30																																																																					
D	72	+B.13	-CS-89A	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-CAAA/101,118	D																																																																				
	73	+B.13	-CS-89B	Rotary Switch	6-3-pos. contacts with 0 position	32A, 660V	Spring return with Pistol grip handle 45 degree Switching	1MNS500925-NAAA	Switron	1MNS500925-NAAA	1	1MNS500925-CAAA/101,118																																																																					
	74	+B.13	-SL03	Indicator light	-	220VDC, 7mA	GREEN	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/111																																																																					
	75	+B.13	-SL04	Indicator light	-	220VDC, 7mA	RED	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/111																																																																					
E	76	+B.13	-SL05	Indicator light	-	220VDC, 7mA	GREEN	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/111	E																																																																				
	77	+B.13	-SL06	Indicator light	-	220VDC, 7mA	RED	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/111																																																																					
<table border="1"> <tr> <td colspan="4">Based on</td> <td colspan="2">Prepared 05.01.2024</td> <td colspan="2">VINOD G</td> <td colspan="2">Title 220kV LINE FEEDER</td> <td colspan="2">Doc. kind. Parts list</td> <td colspan="2">Ref.Des. =2KR +LA</td> </tr> <tr> <td colspan="4"></td> <td colspan="2">Approved 09.01.2024</td> <td colspan="2">GOURISH HEGDE</td> <td colspan="2">Parts list =2KR+LA</td> <td colspan="2">DCC EPB</td> <td colspan="2"></td> </tr> <tr> <td colspan="4"></td> <td colspan="2">Project APTRANSCO</td> <td colspan="2">STANDARD DRAWING</td> <td colspan="2">Hitachi Energy India Limited</td> <td colspan="2">PG-GAS</td> <td colspan="2">Rev. ind. Language en</td> </tr> <tr> <td colspan="4">Rev. Revision note</td> <td colspan="2">Date</td> <td colspan="2">Name</td> <td colspan="2">HITACHI</td> <td colspan="2">Doc. no. 1MNS500925-ABA</td> <td colspan="2">Sheet 1007</td> </tr> <tr> <td colspan="4"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2">n. sheet 1008</td> </tr> </table>												Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA						Approved 09.01.2024		GOURISH HEGDE		Parts list =2KR+LA		DCC EPB								Project APTRANSCO		STANDARD DRAWING		Hitachi Energy India Limited		PG-GAS		Rev. ind. Language en		Rev. Revision note				Date		Name		HITACHI		Doc. no. 1MNS500925-ABA		Sheet 1007														n. sheet 1008	
Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA																																																																					
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8814600/2024/EEMRT-ENE51	1	2	3	4	5	6	7	8	275																																																																								
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet																																																																						
A	78	+B.17	-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-CAAA/67,79,93,95,96,112,118	A																																																																				
	79	+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-CAAA/73,93,95,96,101,118																																																																					
B	80	+B.17	-SL01	Indicator light	-	220VDC, 7mA	GREEN	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/111	B																																																																				
	81	+B.17	-SL02	Indicator light	-	220VDC, 7mA	RED	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/111																																																																					
	82	+B.17	-SL11	Indicator light	-	220VDC, 7mA	WHITE	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/111																																																																					
C	83	+B.17	-SL12	Indicator light	-	220VDC, 7mA	WHITE	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/111	C																																																																				
	84	+B.17	-SL13	Indicator light	-	220VDC, 7mA	BLUE	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/112																																																																					
	85	+B.17	-SL14	Indicator light	-	220VDC, 7mA	AMBER	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/112																																																																					
D	86	+B.17	-SL15	Indicator light	-	220VDC, 7mA	WHITE	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/112	D																																																																				
	87	+B.17	-SL16	Indicator light	-	220VDC	AMBER	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/112																																																																					
	88	+B.19	-CS-89L	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-CAAA/101,118																																																																					
	89	+B.19	-SL07	Indicator light	-	220VDC, 7mA	GREEN	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/111																																																																					
E	90	+B.19	-SL08	Indicator light	-	220VDC, 7mA	RED	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/111	E																																																																				
	91	+B.19	-SL09	Indicator light	-	220VDC, 7mA	GREEN	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/111																																																																					
	92	+B.19	-SL10	Indicator light	-	220VDC, 7mA	RED	-	ABB/L&T/Teknic/Schneider/SECO	-	1	1MNS500925-CAAA/111																																																																					
<table border="1"> <tr> <td colspan="4">Based on</td> <td colspan="2">Prepared 05.01.2024</td> <td colspan="2">VINOD G</td> <td colspan="2">Title 220kV LINE FEEDER</td> <td colspan="2">Doc. kind. Parts list</td> <td colspan="2">Ref.Des. =2KR +LA</td> </tr> <tr> <td colspan="4"></td> <td colspan="2">Approved 09.01.2024</td> <td colspan="2">GOURISH HEGDE</td> <td colspan="2">Parts list =2KR+LA</td> <td colspan="2">DCC EPB</td> <td colspan="2"></td> </tr> <tr> <td colspan="4"></td> <td colspan="2">Project APTRANSCO</td> <td colspan="2">STANDARD DRAWING</td> <td colspan="2">Hitachi Energy India Limited</td> <td colspan="2">PG-GAS</td> <td colspan="2">Rev. ind. Language en</td> </tr> <tr> <td colspan="4">Rev. Revision note</td> <td colspan="2">Date</td> <td colspan="2">Name</td> <td colspan="2">HITACHI</td> <td colspan="2">Doc. no. 1MNS500925-ABA</td> <td colspan="2">Sheet 1008</td> </tr> <tr> <td colspan="4">1MYN691003-102(A3)REV01</td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2">n. sheet 1009</td> </tr> </table>												Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA						Approved 09.01.2024		GOURISH HEGDE		Parts list =2KR+LA		DCC EPB								Project APTRANSCO		STANDARD DRAWING		Hitachi Energy India Limited		PG-GAS		Rev. ind. Language en		Rev. Revision note				Date		Name		HITACHI		Doc. no. 1MNS500925-ABA		Sheet 1008		1MYN691003-102(A3)REV01												n. sheet 1009	
Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA																																																																					
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Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
93	+B.19	-SS1	Rotary Switch	12-2-pos. contacts	32A, 660V	Wing knob type stayput with 90 Degree switching angle	1MNS500925-NAAB	Switron	1MNS500925-NAAB	1	1MNS500925-CAAA/97,118
94	+B.19	-SSS	Rotary Switch	8 2-pos. contacts	32A, 660V	Stayput, Lever Handle, Key removable in both postions, 90D Switching angle	1MYN533019-001	Switron		1	1MNS500925-CAAA/96,118
95	+B.25	-KF1	Numerical bay control IED	REC670			1MNS500925-XCAC	ABB	1MNS500925-XCAC	1	
			Power supply module	PSM	90-250VDC	50/60Hz		ABB		1	1MNS500925-CAAA/35,63,81
			Binary input module	BIM	220-250VDC	16 inputs		ABB		7	1MNS500925-CAAA/65,66,67,68,69,70,71,72,73,74,75,76,77,78,82,83,84,85,86
			Binary output module	BOM		24 output relays		ABB		2	1MNS500925-CAAA/35,36,79,80,82,83,90,91,96,101,103,104
			Ethernet module	SFP	100Base-FX, LC connectors	Version 2.2		ABB		1	1MNS500925-CAAA/81
			Transformer input module	TRM	1A, 0-340V, 50/60Hz	6I+6U		ABB		1	1MNS500925-CAAA/64,81
			Rack casing	1/1x19" rack casing	14xI/O, 1xTRM	1/1x19", Version 2.2		ABB		1	
15 LED indication module	LED		Normal size		ABB		1				
15 LED indication module	LED		Normal size, Rex670 V2.2		ABB		3	1MNS500925-CAAA/63			
96	+B.25	-TVM	Energy meter	Premier 300	3Ph-4W-3E, Acc. Cl: 0.2s,CTR:TO BE DEFINED, ADOPTED CTR:TO BE DEFINED, PTR: 220kV/110V	ABT meter & AMRI compatible,with 1no. front optical & 1no. RS485 port, MDI : 15 Min.	1MNS500925-MAAB	Secure meters limited	1MNS500925-MAAB	1	1MNS500925-CAAA/105,106

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

Based on				Prepared 05.01.2024	VINOD G	Title 220kV LINE FEEDER		Doc. kind. Parts list	Ref.Des. =2KR	
				Approved 09.01.2024	GOURISH HEGDE	Parts list =2KR+LA		DCC EPB	+LA	
				Project APTRANSCO		=2KR+LA		Resp. dept. PG-GAS	Rev. ind.	Language en
				STANDARD DRAWING		HITACHI Hitachi Energy India Limited		Doc. no. 1MNS500925-ABA		Sheet 1009
Rev.	Revision note	Date	Name							n. sheet 1010
1MYN691003-102(A3)REV01										

8814600/2024/EEMRT-ENE51	1	2	3	4	5	6	7	8	277				
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet		
A	97	+B.33	-R01	Terminal base	RX4	4U12C	Rack mounting	ABB	5619499-A	5	1MNS500925-CAAA/ 69,93,102,114,118		
			-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	
-R01.137.301	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					
98	+B.33	-SS	Synchronizing socket	SS Type	500VAC/DC	Panel mounting socket	IN 5381 3001-1	BCH Electric limited		1	1MNS500925-CAAA/97		
99	+B.33	-TS_BCU	Test block	MPG	10NC		1MNS500925-NXAA	GE	1MNS500925-NXAA	1	1MNS500925-CAAA/63,64		
100	+B.33	-TTB	Test Terminal Block for TVM	TTB	1100V, 50A	Compact, Flush mounting	1MYN266015-003	Deepl		1	1MNS500925-CAAA/105,106		
101	+B.41	-SH	Heating	SPHT	230V AC, 50W		IN6677-3001-2	KWK RESISTORS / TGS		1	1MNS500925-CAAA/28		
102	+C.01	-FS01	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/38		
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1			
Based on				Prepared	05.01.2024	VINOD G	Title 220kV LINE FEEDER		Doc. kind.	Parts list	Ref.Des.	=2KR	
				Approved	09.01.2024	GOURISH HEGDE	Parts list		DCC	EPB	+LA		
				Project	APTRANSCO		=2KR+LA		Resp. dept.	PG-GAS	Rev. ind.	Language	en
				STANDARD DRAWING			HITACHI Hitachi Energy India Limited		1MNS500925-ABA		Sheet	1010	
Rev.	Revision note		Date	Name					Doc. no.			n. sheet	1011
1MYN691003-102(A3)REV01													

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1	2	3	4	5	6	7	8																																																																																								
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet																																																																																				
A	+C.01	-FS02	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/38																																																																																				
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1																																																																																						
B	+C.01	-FS03	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/38																																																																																				
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1																																																																																						
C	+C.01	-FS04	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/38																																																																																				
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1																																																																																						
C	+C.01	-FS05	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/38																																																																																				
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1																																																																																						
D	+C.01	-FS06	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/38																																																																																				
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1																																																																																						
F	+C.01	-FS07	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/38																																																																																				
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1																																																																																						
F	+C.01	-FS08	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/38																																																																																				
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1																																																																																						
<table border="1"> <tr> <td colspan="4">Based on</td> <td colspan="2">Prepared 05.01.2024</td> <td colspan="2">VINOD G</td> <td colspan="2">Title 220kV LINE FEEDER</td> <td colspan="2">Doc. kind. Parts list</td> <td colspan="2">Ref.Des. =2KR +LA</td> </tr> <tr> <td colspan="4"></td> <td colspan="2">Approved 09.01.2024</td> <td colspan="2">GOURISH HEGDE</td> <td colspan="2">Parts list =2KR+LA</td> <td colspan="2">DCC EPB</td> <td colspan="2"></td> </tr> <tr> <td colspan="4"></td> <td colspan="2">Project APTRANSCO</td> <td colspan="2"></td> <td colspan="2">=2KR+LA</td> <td colspan="2">PG-GAS</td> <td colspan="2">Rev. ind.</td> </tr> <tr> <td colspan="4"></td> <td colspan="2">STANDARD DRAWING</td> <td colspan="2"></td> <td colspan="2">Hitachi Energy India Limited</td> <td colspan="2">Resp. dept.</td> <td colspan="2">Language en</td> </tr> <tr> <td colspan="4">Rev. Revision note</td> <td colspan="2">Date</td> <td colspan="2">Name</td> <td colspan="2">HITACHI</td> <td colspan="2">Doc. no. 1MNS500925-ABA</td> <td colspan="2">Sheet 1011</td> </tr> <tr> <td colspan="4">1MYN691003-102(A3)REV01</td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2">n. sheet 1012</td> </tr> </table>												Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA						Approved 09.01.2024		GOURISH HEGDE		Parts list =2KR+LA		DCC EPB								Project APTRANSCO				=2KR+LA		PG-GAS		Rev. ind.						STANDARD DRAWING				Hitachi Energy India Limited		Resp. dept.		Language en		Rev. Revision note				Date		Name		HITACHI		Doc. no. 1MNS500925-ABA		Sheet 1011		1MYN691003-102(A3)REV01												n. sheet 1012	
Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA																																																																																			
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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.01	-FS09	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/38
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
111	+C.01	-FS10	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/64
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
112	+C.01	-FS11	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/64
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
113	+C.01	-LK03	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-CAAA/38
114	+C.01	-LK06	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-CAAA/38
115	+C.01	-LK09	Control Fuse Base	-	32A	Chief Engineer/Projects APTRANSCO/VIS/Vijayawada.	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
			Neutral link	NL	15A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/38
116	+C.03	-2FS01	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	

Based on				Prepared 05.01.2024 VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA	
				Approved 09.01.2024 GOURISH HEGDE		Parts list =2KR+LA		DCC EPB			
				Project APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited		Resp. dept. PG-GAS		Rev. ind. Language en	
Rev. Revision note				Date Name		HITACHI		Doc. no. 1MNS500925-ABA		Sheet 1012	
1MYN691003-102(A3)REV01										n. sheet 1013	

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Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
117	+C.03	-2FS02	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
118	+C.03	-2FS03	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
119	+C.03	-2FS04	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
120	+C.03	-2FS05	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
121	+C.03	-2FS06	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
122	+C.03	-2LK03	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
			Neutral link	NL	15A	Chief Engineer/Projects APTRANSCO/VS/Vijayawada.	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
123	+C.03	-2LK06	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-CAAA/37

Based on				Prepared	05.01.2024	VINOD G	Title		220kV LINE FEEDER		Doc. kind.	Parts list		Ref.Des.	=2KR +LA					
				Approved	09.01.2024	GOURISH HEGDE	Title		Parts list =2KR+LA		DCC EPB									
				Project			APTRANSCO STANDARD DRAWING			Resp. dept.		PG-GAS		Rev. ind.		Language		en		
Rev.				Revision note			Date			Name			Doc. no.		1MNS500925-ABA		Sheet		1013	
																	n. sheet		1014	
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	+C.03	-FS13	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/64
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
B	+C.03	-LK13	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/64
			Neutral link	NL	15A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
C	+C.05	-1FS01	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
D	+C.05	-1FS02	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
D	+C.05	-1FS03	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
E	+C.05	-1FS04	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
E	+C.05	-1FS05	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		

Based on				Prepared 05.01.2024 VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA	
				Approved 09.01.2024 GOURISH HEGDE		Parts list =2KR+LA		DCC EPB			
				Project APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited		Resp. dept. PG-GAS		Rev. ind. Language en	
Rev. Revision note				Date Name		HITACHI		Doc. no. 1MNS500925-ABA		Sheet 1014 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
131	+C.05	-1FS06	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
132	+C.05	-1LK03	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Neutral link	NL	15A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
133	+C.05	-1LK06	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/37
			Neutral link	NL	15A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
134	+C.05	-FS21	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/97
			Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
135	+C.05	-LK21	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CAAA/97
			Neutral link	15A	15A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
136	+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-CAAA/99,111
			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		

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

Based on				Prepared	05.01.2024	VINOD G	Title		220kV LINE FEEDER		Doc. kind.	Parts list		Ref.Des.	=2KR +LA	
				Approved	09.01.2024	GOURISH HEGDE	Title		Parts list =2KR+LA		DCC EPB					
				Project	APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited		HITACHI		Resp. dept.	PG-GAS		Rev. ind.	Language	en
Rev.	Revision note			Date	Name						Doc. no.	1MNS500925-ABA		Sheet	1015	
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8814600/2024/EEMRT-ENE51	1	2	3	4	5	6	7	8	283																																																																																						
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet																																																																																				
A	137	+C.07	-52_CLS_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/99																																																																																				
				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	138	+C.07	-52_OPN_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/99,111,112																																																																																				
				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	139	+C.07	-52_OPN_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/99																																																																																				
				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	140	+C.07	-89A_CLS_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/67,99,111																																																																																				
				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	141	+C.07	-89A_CLS_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/99																																																																																				
				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																																																																																						
<table border="1"> <tr> <td colspan="4">Based on</td> <td colspan="2">Prepared 05.01.2024</td> <td colspan="2">VINOD G</td> <td colspan="2">Title 220kV LINE FEEDER</td> <td colspan="2">Doc. kind. Parts list</td> <td colspan="2">Ref.Des. =2KR +LA</td> </tr> <tr> <td colspan="4"></td> <td colspan="2">Approved 09.01.2024</td> <td colspan="2">GOURISH HEGDE</td> <td colspan="2">Parts list =2KR+LA</td> <td colspan="2">DCC EPB</td> <td colspan="2"></td> </tr> <tr> <td colspan="4"></td> <td colspan="2">Project APTRANSCO</td> <td colspan="2"></td> <td colspan="2">=2KR+LA</td> <td colspan="2">PG-GAS</td> <td colspan="2">Rev. ind.</td> </tr> <tr> <td colspan="4"></td> <td colspan="2">STANDARD DRAWING</td> <td colspan="2"></td> <td colspan="2">Hitachi Energy India Limited</td> <td colspan="2">Resp. dept.</td> <td colspan="2">Language en</td> </tr> <tr> <td colspan="4">Rev. Revision note</td> <td colspan="2">Date</td> <td colspan="2">Name</td> <td colspan="2">HITACHI</td> <td colspan="2">Doc. no. 1MNS500925-ABA</td> <td colspan="2">Sheet 1016</td> </tr> <tr> <td colspan="4">1MYN691003-102(A3)REV01</td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2">n. sheet 1017</td> </tr> </table>												Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA						Approved 09.01.2024		GOURISH HEGDE		Parts list =2KR+LA		DCC EPB								Project APTRANSCO				=2KR+LA		PG-GAS		Rev. ind.						STANDARD DRAWING				Hitachi Energy India Limited		Resp. dept.		Language en		Rev. Revision note				Date		Name		HITACHI		Doc. no. 1MNS500925-ABA		Sheet 1016		1MYN691003-102(A3)REV01												n. sheet 1017	
Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA																																																																																			
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Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
A	+C.07	-89A_OPN_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CAAA/67,99,111
			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	-89A_OPN_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CAAA/99
			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	-89B_CLS_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CAAA/68,99,111
			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	-89B_CLS_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CAAA/99
			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	-89B_OPN_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	1MNS500579-CRMA	Phoenix Contact	1109562	1	1MNS500925-CAAA/67,99,111
			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	

Based on				Prepared	05.01.2024	VINOD G	Title		220kV LINE FEEDER		Doc. kind.	Parts list		Ref.Des.	=2KR +LA	
				Approved	09.01.2024	GOURISH HEGDE	Title		Parts list =2KR+LA		DCC EPB					
				Project	APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited		HITACHI		Resp. dept.	PG-GAS		Rev. ind.	Language en	
Rev.	Revision note			Date	Name						Doc. no.	1MNS500925-ABA		Sheet	1017	
1MYN691003-102(A3)REV01														n. sheet	1018	

8814600/2024/EEMRT-ENE51	1	2	3	4	5	6	7	8	285																																																																																						
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet																																																																																				
A	147	+C.07	-89B_OPN_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/99																																																																																				
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			Retaining bracket	ECOR-RH-2L	-	1MNS500579-CRMD	Phoenix contact	1051972	1																																																																																						
B	148	+C.07	-89L_CLS_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/68,100,111																																																																																				
				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																																																																																						
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C	149	+C.07	-89L_CLS_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/100																																																																																				
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			Retaining bracket	ECOR-RH-2L	-	1MNS500579-CRMD	Phoenix contact	1051972	1																																																																																						
D	150	+C.07	-89L_OPN_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/68,100,111																																																																																				
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				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	151	+C.07	-89L_OPN_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/100																																																																																				
				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																																																																																						
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Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LA																																																																																			
				Approved 09.01.2024		GOURISH HEGDE		Parts list =2KR+LA		DCC EPB																																																																																					
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Rev. Revision note				Date		Name		Doc. no. 1MNS500925-ABA				Sheet 1018																																																																																			
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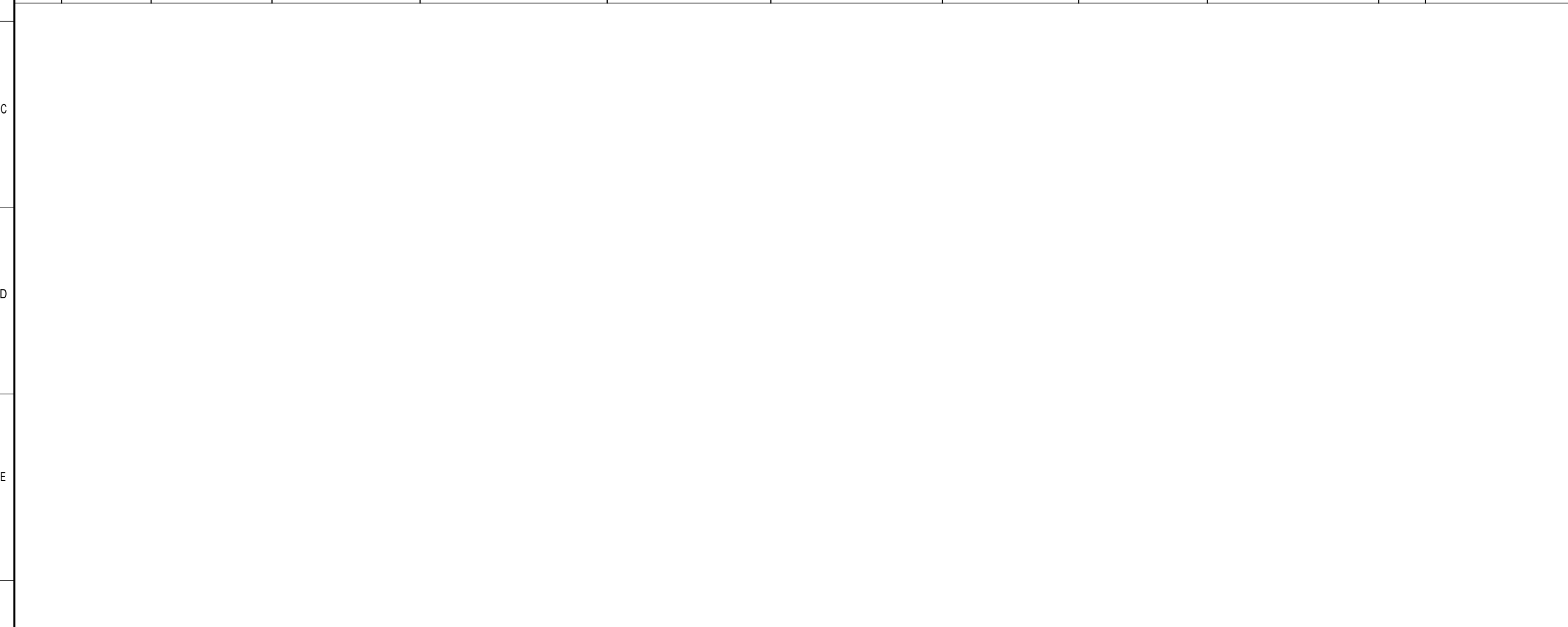
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Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet							
A	152	+C.07	-89LE_CLS_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/69,100,111							
				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	153	+C.07	-89LE_CLS_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/100							
				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	154	+C.07	-89LE_OPN_1	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/68,100,111							
				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	155	+C.07	-89LE_OPN_2	Relay	REL-IR-BL/L-220DC/4X21	220VDC	4CO, screw connection, test button, mechanical indicator	Phoenix Contact	1109562	1	1MNS500925-CAAA/100							
				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	156	+C.07	-K1 -K1.101.101 -K1.101.301 -K1.113.101 -K1.113.301 -K1.125.101 -K1.125.301 -K1.137.101	Terminal base	RXZ 4	4U12C	Rail mounting	ABB	1MRK000893-D	1MRK000893-D	4							
				Bistable relay	RXMFV 21	220VDC	12NO, 2NC	ABB	1MRK030405-AS	1MRK030405-AS	1	1MNS500925-CAAA/35,37,71						
				Bistable relay	RXMFV 21	220VDC	12NO, 2NC	ABB	1MRK030405-AS	1MRK030405-AS	1	1MNS500925-CAAA/35,37,71						
				Bistable relay	RXMFV 21	220VDC	7NO, 7NC	ABB	1MRK030401-AS	1MRK030401-AS	1	1MNS500925-CAAA/36,39,71,72						
				Bistable relay	RXMFV 21	220VDC	7NO, 7NC	ABB	1MRK030401-AS	1MRK030401-AS	1	1MNS500925-CAAA/36,39,72						
				Bistable relay	RXMFV 21	220VDC	7NO, 7NC	ABB	1MRK030401-AS	1MRK030401-AS	1	1MNS500925-CAAA/36,40,72						
				Auxiliary relay	RXMH2	220VDC	4NO, 4NC, without flag	ABB	RK 223069-AS	RK 223069-AS	1	1MNS500925-CAAA/31						
Auxiliary relay	RXMM1	220-250VDC	6NO	ABB	RK214-003-AS	RK214-003-AS	1	1MNS500925-CAAA/79,93,95										
	157	+C.07	-K1.137.301	Auxiliary relay	RXSF1	220-250VDC	4NC, 2NO	ABB	RK271-009-AS	1	1MNS500925-CAAA/43,54,102,115							
	158	+C.07	-K1.143.101	Auxiliary relay	RXSF1	220-250VDC	6NO	ABB	RK 271018-AS	1	1MNS500925-CAAA/43,54,102							
Based on				Prepared	05.01.2024	VINOD G		Title		220kV LINE FEEDER		Doc. kind.	Parts list		Ref.Des.		=2KR	
				Approved	09.01.2024	GOURISH HEGDE		Parts list		=2KR+LA		DCC EPB				+LA		
				Project	APTRANSCO		=2KR+LA		Hitachi Energy India Limited		PG-GAS		Rev. ind.		Language		en	
				STANDARD DRAWING		HITACHI				1MNS500925-ABA		Sheet		1019				
Rev.	Revision note			Date	Name					Doc. no.		1020						
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
159	+C.11	-89X03	Disconnect terminal	CATD M4	1100V, 41A	2.5-6mm ²	1MYN266003-002	Elmex		10	1MNS500925-CAAA/ 103,104,121
160	+C.11	-DCX03	Disconnect terminal	CATD M4	1100V, 41A	2.5-6mm ²	1MYN266003-002	Elmex		10	1MNS500925-CAAA/31,34,121
161	+C.11	-X04	Feed-through terminal	CAT M4	1100V, 57A	2.5-6mm ² , grey	IN2662-3001-3	Elmex		54	1MNS500925-CAAA/ 72,76,77,78,80,97,121
162	+C.11	-X04A	Feed-through terminal	CAT M4	1100V, 57A	2.5-6mm ² , grey	IN2662-3001-3	Elmex		85	1MNS500925-CAAA/ 43,45,54,56,69,70,71, 73,75,87,90,91,93,95, 96,98,114,115,121
163	+D.33	-R01.143.301	Auxiliary relay	RXSF1	220-250VDC	2NO, 4NC	RK271-019-AS	ABB	RK271-019-AS	1	1MNS500925-CAAA/ 35,45,56,115



Based on			Prepared	05.01.2024	VINOD G	Title	220kV LINE FEEDER Parts list =2KR+LA	Doc. kind.	Parts list		Ref.Des.	=2KR +LA	
			Approved	09.01.2024	GOURISH HEGDE				DCC	EPB			
			Project	APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited	Resp. dept.	PG-GAS		Rev. ind.	Language		en
Rev.	Revision note		Date	Name				HITACHI	Doc. no.		1MNS500925-ABA		n. sheet
1MYN691003-102(A3)REV01												1021	

Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet		
A	1	+A.01	-AC MCB01	Miniature circuit breaker	-	16A	220VDC, 2P, C-curve, lcn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/29	
											1	1MNS500925-CABA/29,69	
B	2	+A.01	-HS	On/off Switch		1-2 pos on/off switch, 5A, Flush mounting		1MYN533014-001	Switron		1	1MNS500925-CABA/29	
	3	+A.01	-PS	AC Socket with Switch	SW	230VAC, 05-15A	Box type, Indian standard	1MYN538103-001	Anchor		1	1MNS500925-CABA/29	
	4	+A.01	-TH	Thermostat	TH	250VAC, 15A, 50 Hz	Range : 25-85°C	IN7635-3001	GIRISH EGO		1	1MNS500925-CABA/29	
	5	+A.10	-BBX04	Feed-through terminal	CAT M4	800V, 45A	2.5-6mm ² , grey	IN2662-3001-3	Elmex		16	90.1 1MNS500925-CABA/87,122	
	6	+A.10	-X01	Disconnect terminal	CATD M4	800V, 41A	2.5-6mm ²	1MYN266003-002	Elmex		32	1MNS500925-CABA/42,53,122	
C	7	+A.10	-X02	Disconnect terminal	CATD M4	800V, 41A	2.5-6mm ²	1MYN266003-002	Elmex		15	1MNS500925-CABA/42,53,122	
	8	+B.01	-DS	Door limit switch	DLS	230V AC, 5A	Single pole, 1NO, Cover for Insulation	IIN5374-3001-1	Kaycee		1	1MNS500925-CABA/29	
	9	+B.01	-LED	LED Lamp	LED	240VAC, 9.08W			SPECTRUM TECHVISION (P) LTD		1	1MNS500925-CABA/29	
D	10	+B.05	-FS21	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CABA/42	
				Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
	11	+B.05	-FS22	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CABA/42	
E	12	+B.05	-FS23	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CABA/42	
				Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
F	13	+B.05	-FS24	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CABA/53	
				Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR	
				Approved 09.01.2024		GOURISH HEGDE		Parts list =2KR+LB		DCC EPB		+LB	
				Project APTRANSCO				=2KR+LB		PG-GAS		Rev. ind.	
				STANDARD DRAWING				Hitachi Energy India Limited		Rev. ind.		Language en	
Rev. Revision note				Date		Name		HITACHI		Doc. no. 1MNS500925-ABB		Sheet 1021	
1MYN691003-102(A3)REV01												n. sheet 1022	

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

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Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet
14	+B.05	-FS25	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CABA/53
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
15	+B.05	-FS26	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CABA/53
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
16	+B.05	-FS27	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CABA/53
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
17	+B.05	-FS28	Fuse	-	2A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CABA/42
			Control Fuse Base	-	32A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
18	+B.05	-LK23	Control Fuse Base	-	32A	Chief Engineer/Projects APTRANSCO/VIS/Vijayawada.	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CABA/42
			Neutral link	NL	15A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	
19	+B.05	-LK26	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CABA/53
			Neutral link	NL	15A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		
20	+B.05	-LK27	Control Fuse Base	-	32A		-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1	1MNS500925-CABA/53
			Neutral link	NL	15A	-	ABB/EATON(cooper Bussmann) /Schneider/L&T	-	1		

Based on				Prepared 05.01.2024 VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR +LB	
				Approved 09.01.2024 GOURISH HEGDE		Parts list =2KR+LB		DCC EPB			
				Project APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited		Resp. dept. PG-GAS		Rev. ind. Language en	
Rev. Revision note				Date Name		HITACHI		Doc. no. 1MNS500925-ABB		Sheet 1022 n. sheet 1023	
1MYN691003-102(A3)REV01											

8814600/2024/EEMRT-ENE51	1	2	3	4	5	6	7	8	290						
Pos.	Location	Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet				
A	+B.05	-LK28	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-CABA/42				
B	+B.09	-1MCB01	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34				
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34,75				
C	+B.09	-1MCB02	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34				
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34,75				
C	+B.09	-1MCB03	Miniature circuit breaker	-	10A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34				
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34,75				
D	+B.09	-1MCB04	Miniature circuit breaker	-	4A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34				
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34,75				
D	+B.09	-2MCB01	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34				
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34,75				
E	+B.09	-2MCB02	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34				
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34,75				
E	+B.09	-2MCB03	Miniature circuit breaker	-	6A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34				
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34,75				
F	+B.09	-2MCB04	Miniature circuit breaker	-	4A	220VDC, 2P, C-curve, Icn-10kA	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34				
			Auxiliary contact block	-		1CO	-	ABB/Schneider/L&T/Siemens	-	1	1MNS500925-CABA/34,75				
F	+B.13	-XX1.1	Feed-through terminal	CAT M4	800V, 45A	2.5-6mm ² , grey	IN2662-3001-3	Elmex		12	1MNS500925-CABA/46,48,54,73,88,116,122				
Based on				Prepared	05.01.2024	VINOD G	Title 220kV LINE FEEDER		Doc. kind.	Parts list		Ref.Des.	=2KR		
				Approved	09.01.2024	GOURISH HEGDE	Parts list		DCC EPB				+LB		
				Project	APTRANSCO		=2KR+LB		Resp. dept.	PG-GAS		Rev. ind.	Language	en	
				STANDARD DRAWING			HITACHI Hitachi Energy India Limited						Sheet	1023	
Rev.	Revision note		Date	Name						Doc. no.		1MNS500925-ABB		n. sheet	1024
1MYN691003-102(A3)REV01															
1	2	3	4	5	6	7	8								

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1	2	3	4	5	6	7	8																						
Pos.	Location	ENE51 Device designation	Device description	Type designation	Technical data	Remark	Article number	Manufacturer	Manufacturer number	Qty.	Document / sheet																		
A	49	+D.24	-D24 -D24.101.101 -D24.101.301 -D24.107.101 -D24.107.301 -D24.113.101 -D24.113.301 -D24.119.101 -D24.131.101 -D24.131.301 -D24.137.101 -D24.149.101 -D24.149.301 -D24.155.101 -D24.155.301	Terminal base Auxiliary relay High speed trip relay Auxiliary relay High speed trip relay Auxiliary relay High speed trip relay Bistable relay Trip circuit supervision relay Trip circuit supervision relay Bistable relay Auxiliary relay Auxiliary relay Auxiliary relay Auxiliary relay	RX4 RXME18 RXMS1 RXME18 RXMS1 RXME18 RXMS1 RXMVB4 TSR-B TSR-B RXMVB4 RXSF1 RXSF1 RXSF1 RXSF1	4U12C 220-250VDC 220VDC 220-250VDC 220VDC 220-250VDC 220VDC 220VDC 110/220VDC 110/220VDC 220VDC 220-250VDC 220-250VDC 220-250VDC	Rack mounting 2NO 6NO, Variant B 2NO 6NO, Variant B 2NO 6NO, Variant B 11NO, 3NC 2NC, 1NO 2NC, 1NO 11NO, 3NC 2NO, 4NC 6NO 6NO 6NO	5619499-A RK221-825-AS RK 216063-AS RK221-825-AS RK 216063-AS RK221-825-AS RK 216063-AS 1MYN563039-AS 1MYN569339-A 1MYN569339-A 1MYN563039-AS RK271-019-AS RK271-018-AS RK271-018-AS RK271-018-AS	ABB ABB ABB ABB ABB ABB ABB ABB ABB ABB ABB	5619499-A RK221-825-AS RK 216063-AS RK221-825-AS RK 216063-AS RK221-825-AS RK 216063-AS 1MYN563039-AS 1MYN569339-A 1MYN569339-A 1MYN563039-AS RK271-019-AS RK 271018-AS RK 271018-AS RK 271018-AS	5 1 1 1 1 1 1 1 1 1 1 1	1MNS500925-CABA/88,92,94 1MNS500925-CABA/ 56,87,88,92,94 1MNS500925-CABA/88,92,94 1MNS500925-CABA/ 56,87,88,92,94 1MNS500925-CABA/88,92,94 1MNS500925-CABA/ 56,87,88,92,94 1MNS500925-CABA/ 44,55,70,87,90,92,94, 96,116 90.1 1MNS500925-CABA/76 1MNS500925-CABA/72,90 90.1 1MNS500925-CABA/ 44,55,71,92,94,96,98, 116 1MNS500925-CABA/ 45,46,56,57,70,116 1MNS500925-CABA/47,58,79 1MNS500925-CABA/43,47,116 1MNS500925-CABA/54,58																	
													1No.Spare Trip relay RXMVB4 and 1No spare supervision relay TSR-B shall be supplied as loose and fixed in the panel.																
													Based on			Prepared	05.01.2024	VINOD G	Title			220kV LINE FEEDER		Doc. kind.	Parts list		Ref.Des.	=2KR +LB	
																Approved	09.01.2024	GOURISH HEGDE	Parts list			=2KR+LB		DCC EPB					
																Project	APTRANSCO STANDARD DRAWING		Hitachi Energy India Limited			PG-GAS		Rev. ind.	Language		en		
													Rev.			Revision note	Date	Name	HITACHI			Doc. no.		1MNS500925-ABB		Sheet		1026	
																										n. sheet		1027	
													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	+D.29	-D29	Terminal base	RX4	4U12C	Rack mounting	5619499-A	ABB	5619499-A	5	1MNS500925-CABA/89,92,94 1MNS500925-CABA/ 45,87,89,92,94		
		-D29.101.101	Auxiliary relay	RXME18	220-250VDC	2NO	RK221-825-AS	ABB	RK221-825-AS	1			
		-D29.101.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK 216063-AS	ABB	RK 216063-AS	1			
		-D29.107.101	Auxiliary relay	RXME18	220-250VDC	2NO	RK221-825-AS	ABB	RK221-825-AS	1			
		-D29.107.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK 216063-AS	ABB	RK 216063-AS	1			
		-D29.113.101	Auxiliary relay	RXME18	220-250VDC	2NO	RK221-825-AS	ABB	RK221-825-AS	1			
		-D29.113.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK 216063-AS	ABB	RK 216063-AS	1			
		-D29.119.101	Bistable relay	RXMMB4	220VDC	11NO, 3NC	1MYN563039-AS	ABB	1MYN563039-AS	1			
		-D29.131.101	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216-063-AS	ABB	RK216-063-AS	1			
		-D29.131.301	Trip circuit supervision relay	TSR-B	110/220VDC	2NC, 1NO	1MYN569339-A	ABB	1MYN569339-A	1			
B	+D.29	-D29.137.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214-003-AS	ABB	RK214-003-AS	1	90.1 1MNS500925-CABA/92,94		
		-D29.137.301	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214-003-AS	ABB	RK214-003-AS	1	90.1 1MNS500925-CABA/92,94		
		-D29.143.101	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216-063-AS	ABB	RK216-063-AS	1	1MNS500925-CABA/ 43,47,56,71,90,91		
		-D29.143.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216-063-AS	ABB	RK216-063-AS	1	1MNS500925-CABA/ 45,54,58,71,90,91		
		-D29.149.101	Auxiliary relay	RXMM1	220-250VDC	6NO	RK214-003-AS	ABB	RK214-003-AS	1	1MNS500925-CABA/48,71,96		
		-D29.149.301	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216-063-AS	ABB	RK216-063-AS	1	1MNS500925-CABA/46,98		
		-D29.155.101	High speed trip relay	RXMS1	220VDC	6NO, Variant B	RK216-063-AS	ABB	RK216-063-AS	1	1MNS500925-CABA/57,98		
		-D29.155.301	Auxiliary relay	RXSF1	220-250VDC	6NO	RK271-018-AS	ABB	RK 271018-AS	1	1MNS500925-CABA/ 43,47,54,58,116		
C	+D.39	-TS1_M-1_87/21L	Test block	MPG	10NC		1MNS500925-NXAA	GE	1MNS500925-NXAA	1	1MNS500925-CABA/41,42		
		-TS1_M-2_87/21L	Test block	MPG	10NC		1MNS500925-NXAA	GE	1MNS500925-NXAA	1	1MNS500925-CABA/52,53		
		-TS2_M-1_87/21L	Test block	MPG	10NC		1MNS500925-NXAA	GE	1MNS500925-NXAA	1	1MNS500925-CABA/ 41,48,88,90,91		
		-TS2_M-2_87/21L	Test block	MPG	10NC		1MNS500925-NXAA	GE	1MNS500925-NXAA	1	1MNS500925-CABA/ 52,59,89,90,91		
D	+D.39	-TS1_M-1_87/21L	Test block	MPG	10NC		1MNS500925-NXAA	GE	1MNS500925-NXAA	1	1MNS500925-CABA/41,42		
		-TS1_M-2_87/21L	Test block	MPG	10NC		1MNS500925-NXAA	GE	1MNS500925-NXAA	1	1MNS500925-CABA/52,53		
		-TS2_M-1_87/21L	Test block	MPG	10NC		1MNS500925-NXAA	GE	1MNS500925-NXAA	1	1MNS500925-CABA/ 41,48,88,90,91		
		-TS2_M-2_87/21L	Test block	MPG	10NC		1MNS500925-NXAA	GE	1MNS500925-NXAA	1	1MNS500925-CABA/ 52,59,89,90,91		
Chief Engineer/Projects APTRANSCO/VS/Vijayawada. Suitable for conventional 220KV SS only													
Based on				Prepared 05.01.2024		VINOD G		Title 220kV LINE FEEDER		Doc. kind. Parts list		Ref.Des. =2KR	
				Approved 09.01.2024		GOURISH HEGDE		Parts list =2KR+LB		DCC EPB		+LB	
				Project APTRANSCO				=2KR+LB		Resp. dept. PG-GAS		Rev. ind. Language en	
				STANDARD DRAWING				HITACHI Hitachi Energy India Limited		Doc. no. 1MNS500925-ABB		Sheet 1027	
Rev. Revision note				Date		Name						n. sheet	
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