



**Grid Solutions**  
A GE and Alstom joint venture

# 220kV/132kV GIS SUBSTATION GHAZI ROAD , LAHORE

## 132kV LINE RELAY PANEL SCHEMATIC DRAWINGS

DOC / DWG REVIEW CODE	
<input type="checkbox"/> A	Approved, Issue IFC.
<input type="checkbox"/> B	Approved with comments as noted, Issue IFC after incorporation of these comments.
<input type="checkbox"/> C	Revise and re-submit for approval.
<input type="checkbox"/> D	Rejected.
Signed .....	Date .....
Permission to proceed does not constitute acceptance of approval of design details, analysers, test methods or materials/ selected by the CONTRACTOR and does not relieve the CONTRACTOR from full compliance with AGREEMENT obligations.	

REFERENCE DRAWINGS								
SR. NO.	DRAWING TITLE				DOCUMENT NO.			
1.	220kV / 132kV Metering & Protection SLD				P60194-E-SLMP-001			
REV	DATE	DRW. BY	CHK. BY	APR. BY	REVISION DESCRIPTION			
0	20.11.2018	ASJ	MFT	NAH	AS BUILT			
REVISION HISTORY								
Scale	NOT-TO-SCALE			Sheet size	A3			
Client			NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)					
Contractor			Grid Solutions A GE and Alstom joint venture		Manufacturer			
			EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan					
Project	220kV / 132kV GIS SUBSTATION GHAZI ROAD , LAHORE							
Title	132kV LINE RELAY PANEL (=E01+RP3) SCHEMATIC DRAWINGS							
Order no	P-60194		Document no P60194-E-ELR-SC-002					
Sheet type	Total sheets 26		Sheet no 1					

	1	2	3	4	5	6	7	8			
	PAGE NO.	SHEET NAME	SHEET DESCRIPTION			ISSUE / REVISION					
						A	B	C	D	E	F
A B C D E F	01	A	Cover Sheet			X	X				
	02	AA	List Of Contents			X	X				
	03	AB	Symbol and Legends			X	X				
	04	AC1	Component List			X	X				
	05	AD	Panel View			X	X				
	06	AE	Bay Concept & Protection Logic			X	X				
	07	D	AC Supply Distribution Circuit			X	X				
	08	E	DC Supply Distribution Circuit			X	X				
	09	F	AC/DC Supply Failure Circuit			X	X				
	10	G	Relay Power Supply Circuit			X	X				
	11	H1	Line Differential Relay Protection CT/VT input			X	X				
	12	H2	O/C & E/F CT input			X	X				
	13	I1	Line Differential Relay input Circuit			X	X				
	14	I4	System Input Circuit			X	X				
	15	K1	Protection Trips Circuit			X	X				
	16	K11	Trips Circuit Supervision			X	X				
	17	NA1	System Alarm Circuit			X	X				
	18	NA2	System Alarm Circuit			X	X				
	19	PA2	Protection Inter Circuit			X	X				
	20	RA1	Annunciation Circuit			X	X				
	21	RA2	Event & Fault Recorder Circuit			X	X				
	22	RA3	SCADA Circuit			X	X				
	23	Z1	Component Diagram			X	X				
	24	Z2	Component Diagram			X	X				
	25	Z3	Component Diagram			X	X				
	26	Z4	Component Diagram			X					
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0	AS BUILT	20.11.2018	ASJ	Manufacturer  <b>EPESOL</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  <b>Grid Solutions</b> A GE and Alstom joint venture	Client  <b>NATIONAL TRANSMISSION &amp; DISPATCH COMPANY LIMITED (NTDC-WAPDA)</b>	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E01+RP3) LIST OF CONTANTS	Drawing no. P60194-E-ELR-SC-002		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type AA	Sheet no. 02

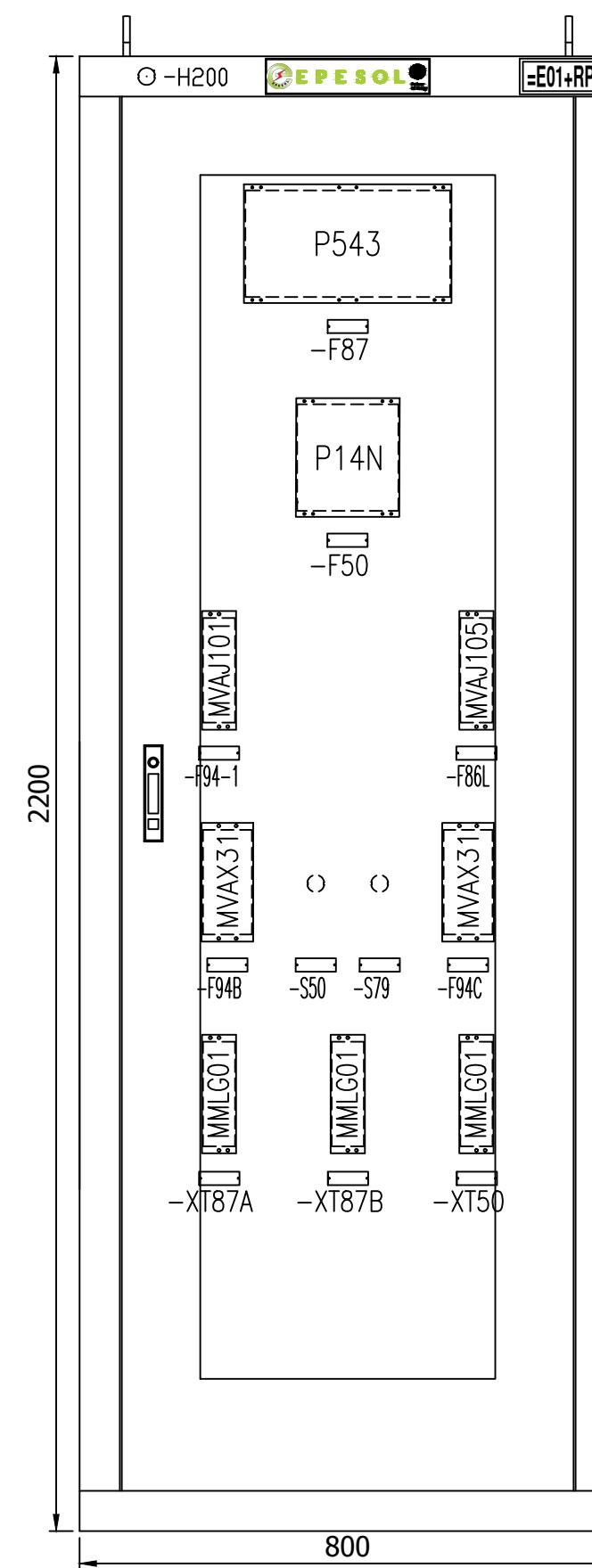
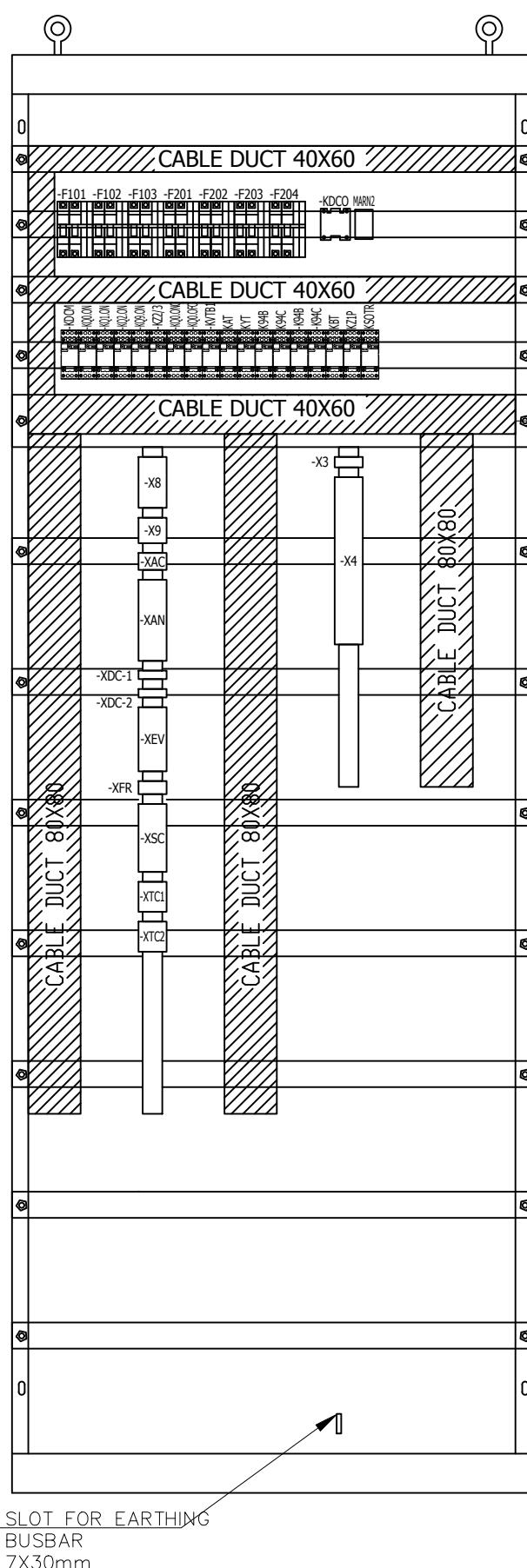
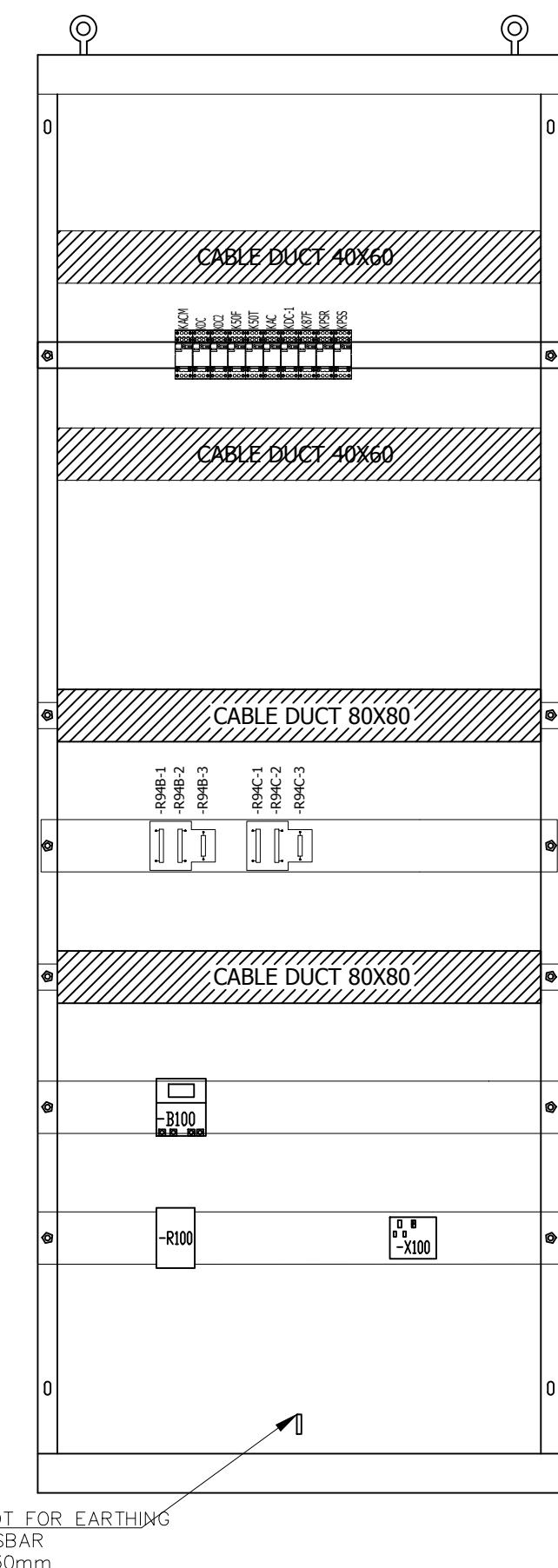
	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A		CIRCUIT BREAKER		MINIATURE CIRCUIT BREAKER		AUXILIARY CONTACTOR NO+NC	21	DISTANCE
B		SWITCH/ISOLATOR		SELECTOR SWITCH		AMMETER	24	OVEREXCITATION
C		EARTHING		LIMITED SWITCH		VOLTMETER	25	SYCHROCHECK
D		GIS TERMINATION		HUMIDITY & TEMPERATURE CONTROLLER		POWER FACTOR METER	49	THERMAL OVERLOAD
E		SF6 TO AIR BUSHING		PANEL HEATER		DIGITAL PANEL METER	50/51	PHASE OVERCURRENT
F		LINE TRAP		THREE PIN SOCKET		ACTIVE POWER METER	50N/51N	EARTH FAULT
G		SURGE ARRESTOR		INDICATION LIGHT		REACTIVE POWER METER	50BF	CIRCUIT BREAKER FAILURE
H		CURRENT TRANSFORMER		PUSH BUTTON		ENERGY METER	64	RESTRICTED EARTH FAULT
I		COUPLING CAPACITOR VOLTAGE TRANSFORMER		AUXILIARY CONTACTOR COIL			67N	DIRECTIONAL EARTH FAULT
J		POWER TRANSFORMER		POWER SUPPLY AC/DC			68	POWER SWING BLOCKING
K		AUTO TRANSFORMER		TERMINAL			78	OUT OF STEP
L				OPTO CONTACTS			79	AUTO-RECLOSING
M				RELAY CONTACTS			85	COMMUNICATION FAILURE
N				HOOTER			87T	TRAFO DIFFERENTIAL
O				AC BELL			87C	LOW IMPEDANCE DIFFERENTIAL CONNECTION
P							87BB	LOW IMPEDANCE DIFFERENTIAL BUSBAR

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0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPE SOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E01+RP3) SYMBOLA AND LEGENDS	Drawing no. P60194-E-ELR-SC-002
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AB
									Sheet no. 03

	1	2	3	4	5	6	7	8			
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER				
A	01	LINE DIFFERENTIAL PROTECTION RELAY	AGILE P543, Cortec: P543-91PC7M0820M  Supply: 110-250VDC / 100-240VAC, VT + CT (100-120V:1/5A) Inputs  16 Opto Inputs, 14 Relay Outputs	-F87		GE					
	01	OVER CURRENT PROTECTION RELAY	AGILE P14N, Cortec: P14N-B16A7C570A  08 Opto Inputs, 08 Relay Outputs	-F50		GE					
	02	TRIP CIRCUIT SUPERVISION	MVAX31, Cortec: MVAX31-S1DD0754A	-F94B-C		GE					
B	04	RESISTORS	4KΩ	-R94 B/C 1-2		GE					
	02	RESISTORS	1.5KΩ	-R94 B/C 3		GE					
	03	TEST BLOCK	MMLG01, Cortec: MMLG01-R1AA9002D	-XT87A,-XT87B,XT50		GE					
C	01	TRIPPING RELAY (SELF-RESETTING)	MVAJ101, Cortec: MVAJ101-RA0802A  Supply: 110-125VDC, 8 NO + 2 NC Contacts	-F94-1		GE					
	01	LOCKOUT RELAY (HAND/ELECTRICAL RESET)	MVAJ105, Cortec: MVAJ105-RA0802A  Supply: 110-125VDC, 8 NO + 2 NC Contacts	-F86L		GE					
	02	CONTROL MCB - PANEL LIGHT & HEATER	2-Pole, Ratings: 2A, 240VAC, 6kA @ 240VAC, 2 C/O Contacts, Ord: G62C02+CAH(2)	-F101, -F102		GE					
D	01	CONTROL ELCB - PANEL SOCKET	2-Pole, Ratings: 16A, 30mA, 240VAC, 10kA @ 240VAC, 2 C/O Contacts, Ord: DM100C16/030+CAH(2)	-F103		GE					
	04	CONTROL MCB - DC DISTRIBUTION	2-Pole, Ratings: 4A, 110VDC, 10kA @ 110VDC, 2 C/O Contacts, Ord: EP102UCC04+CAH(2)	-F201, -F202, -F203, -F204		GE					
	25	AUXILIARY CONTACTOR	Coil Voltage: 110VDC, DIODE, 4 C/O Contacts, Ord: PRC4M40DCJL	-KDCM, -KQ0.ON, -KQ1.ON, -KQ2.ON, -KQ9.ON, -KZ2/3T,  -KQ0.ONC, -KQ0.OFC, -KVTB1, -KRT, -KYT, -K94B, -K94C,  -KBT, -KZ1T, -KPSD, -KSOTF, -KPSS, -KPSR, -K87F, -KDC1,  -KAC, -K50T, -K50F, -KDC2		GE					
E	01	AUXILIARY CONTACTOR - SUPPLY CHANGEOVER	Coil Voltage: 110VDC, 3 NO + 3 NC Contacts, Ord: MCRC022ATWJ+MARN211AT	-KDCO		GE					
	02	AUXILIARY CONTACTOR	Coil Voltage: 240VAC, 4 C/O Contacts, Ord: PRC4M40ANL	-KDC, -KACM		GE					
	01	SELECTOR SWITCH - AUTORECLOSER	YS-AK-2-2-44-D, 2-Postion (IN-OUT), 110VDC, KEYLOCKABLE TYPE, KEY RELEASE ON "OUT"	-S79		YONGSUNG					
F	01	PUSH BUTTON	Black Button, Spring Return, 2-Pole, Rating 12A, 110VDC Ord: YS-AP1-2-40-B-D-W	-S50		YONGSUNG					
	01	PANEL LIGHT WITH DOOR SWITCH	240VAC @ 50Hz, 5W, with Door Limit Sw. Ord: YSP3315GW-B + YS-T8-30-5W	-H100,-S100		YONGSUNG					
	01	THREE PIN SOCKET	1N+PE, 16A, 240VAC @ 50Hz	-X100		LEAR					
G	01	PANEL HEATER	240VAC @ 50Hz, 50W	-R100		ELAB					
	01	HUMIDITY & TEMPERATURE CONTROLLER	40-90%RH, 25-50°C, 230VAC @ 50Hz	-B100		ELAB					
	01	INDICATION LAMP - DC SUPPLY FAILURE	Type: Integrated LED, Color : RED , Supply : 240VAC @ 50Hz, Ord: YS-PL-2-AL-22-R-W	-H200		YONGSUNG					
0		AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E01+RP3) COMPONENT LIST	Drawing no. P60194-E-ELR-SC-002	
REV.		DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AC1	Sheet no. 04

	1	2	3	4	5	6	7	8			
	QTY.	DEVICE DESCRIPTION		DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION		MANUFACTURER		
A	12	TERMINAL BLOCKS FOR SYSTEM INPUT STATUS			CBD-4		-X8		CABUR		
	6	TERMINAL BLOCKS FOR PROTECTION INTER CIRCUIT			CBD-4		-X9		CABUR		
	4	TERMINAL BLOCKS FOR AC SUPPLY DISTRIBUTION			CBD-4		-XAC		CABUR		
B	19	TERMINAL BLOCKS FOR ANNUNCIATOR			CBD-4		-XAN		CABUR		
	2	TERMINAL BLOCKS FOR DC SUPPLY-1 DISTRIBUTION			CBD-4		-XDC1		CABUR		
	2	TERMINAL BLOCKS FOR DC SUPPLY-2 DISTRIBUTION			CBD-4		-XDC2		CABUR		
C	15	TERMINAL BLOCKS FOR EVENT RECORDER			CBD-4		-XEV		CABUR		
	3	TERMINAL BLOCKS FOR FAULT RECORDER			CBD-4		-XFR		CABUR		
	16	TERMINAL BLOCKS FOR SCADA			CBD-4		-XSC		CABUR		
D	7	TERMINAL BLOCKS FOR TRIP CIRCUIT-1			CBD-4		-XTC1		CABUR		
	7	TERMINAL BLOCKS FOR TRIP CIRCUIT-2			CBD-4		-XTC2		CABUR		
	2	TERMINAL BLOCKS FOR CONTROL			CBD-4		-X3		CABUR		
E	22	TERMINAL BLOCKS FOR LINE DIFFERENTIAL			CBD-4		-X6		CABUR		
	16	TERMINAL BLOCKS FOR CT			SCB-6		-X4		CABUR		
	16	TERMINAL BLOCKS FOR VT			SCB-6		-X4		CABUR		
F	8	TERMINAL BLOCKS FOR CT			SCB-6		-X5		CABUR		
	16	SPARE TERMINAL BLOCKS			CBD-4		-X1		CABUR		
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REV.	DESCRIPTION		DATE	DRAWER					Project no. P-60194	Sheet type AC1	Sheet no. 04a

FRONT VIEW WITH DOORLEFT SIDE VIEWRIGHT SIDE VIEW

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1 AS BUILT 20.11.2018 ASJ Manufacturer

REV.

DESCRIPTION

DATE

DRAWER

**EPEPSOL**  
71-B Garden Block,  
New Garden Town,  
Lahore, Pakistan

**Contractor**  
**Grid Solutions**  
A GE and Alstom joint venture

**Client**  
**NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)**

**Project**  
**220kV/132kV GIS SUBSTATION**  
**GHAZI ROAD, LAHORE**

**Title**  
**132kV LINE RELAY PANEL**  
**(=E01+RP3)**  
**PANEL VIEW**

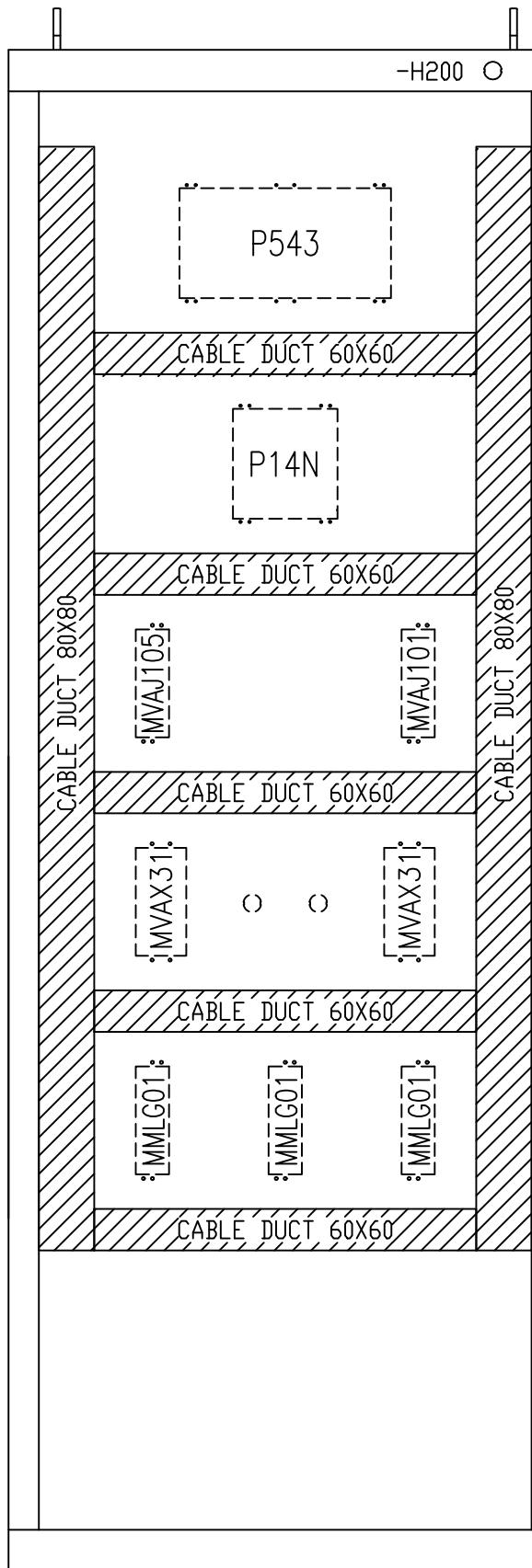
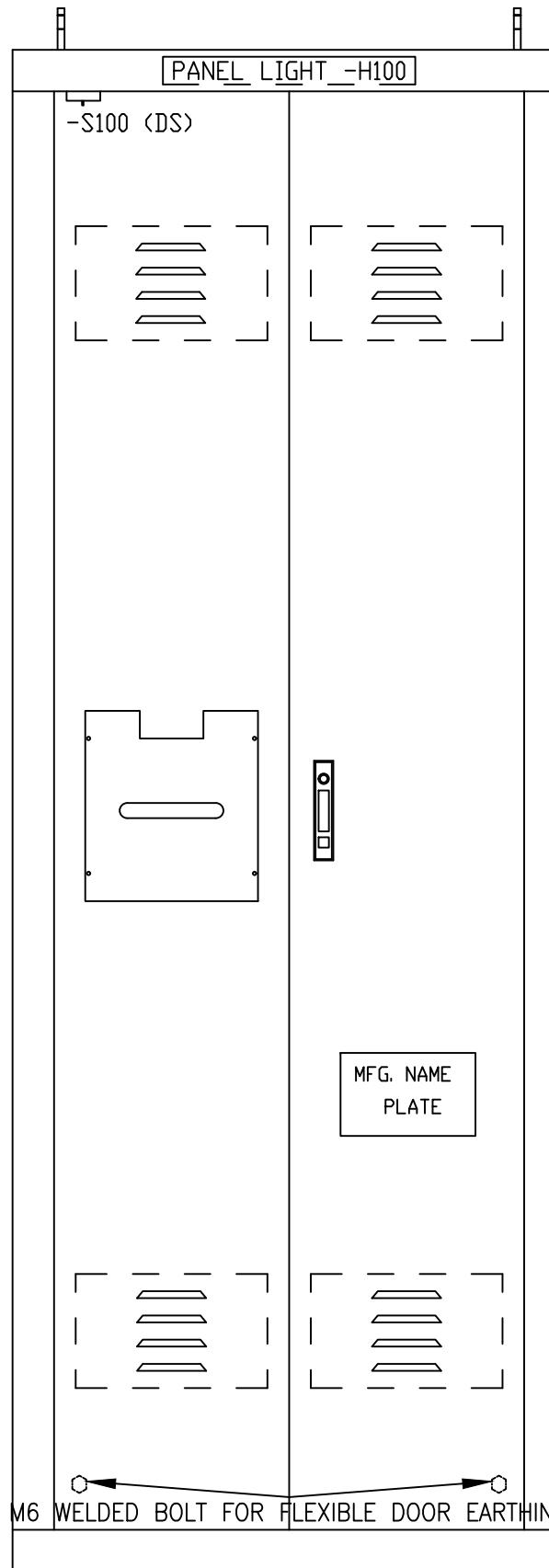
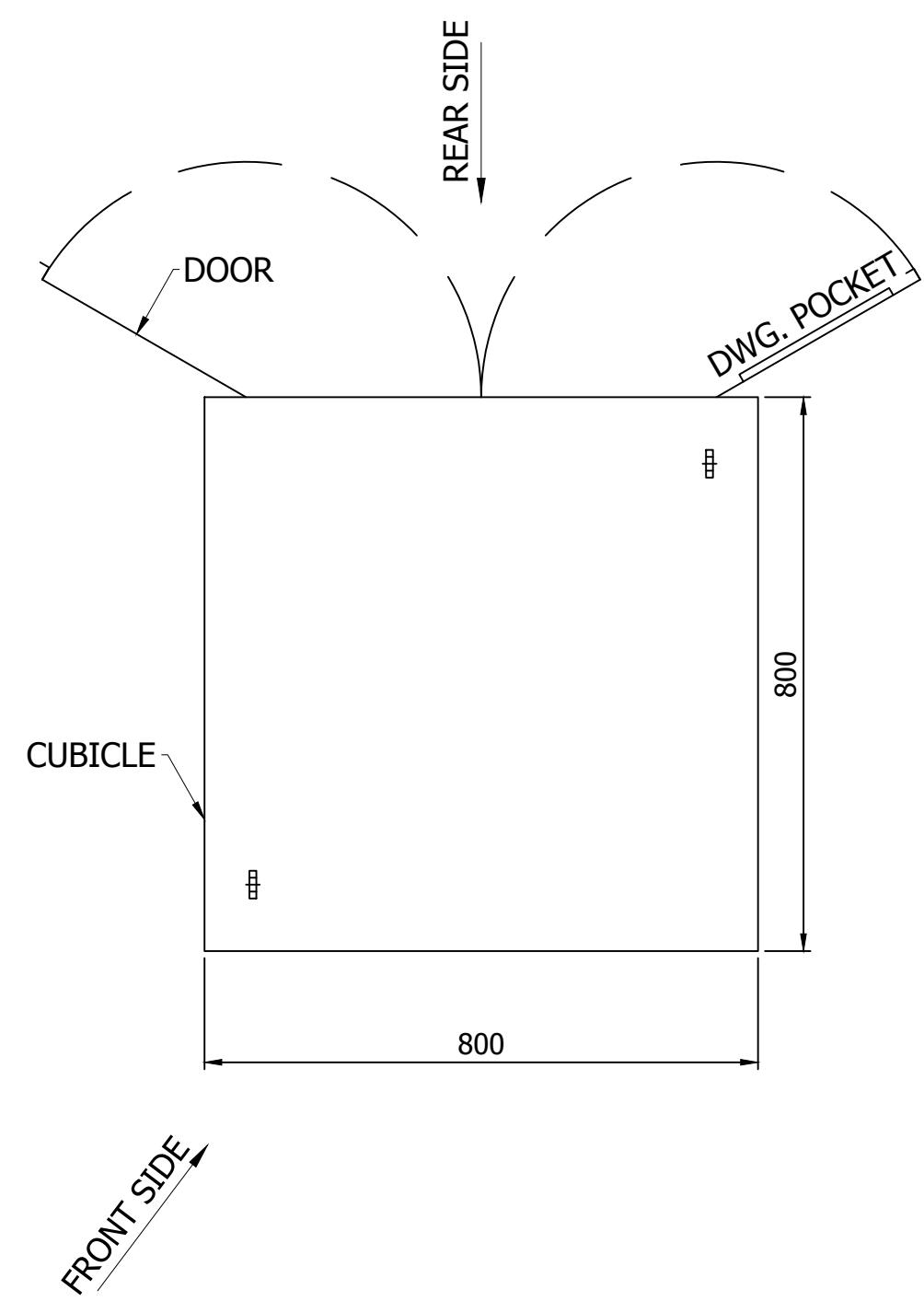
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**P60194-E-ELR-SC-002**

**Project no.**  
**P-60194**

**Sheet type**  
**AD**

**Sheet no.**

**05**

BACK VIEW WITHOUT DOORBACK VIEW WITH DOORTOP VIEW

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**NOTE:-**

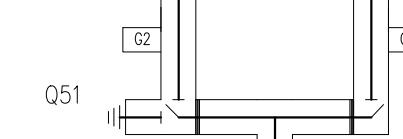
- 1 - PANEL DIMENSION: 800 x 800 x 2200mm (WxDxH)
- 2 - COLOR : RAL 7032
- 3 - SHEET THICKNESS : 2-2.5 mm
- 4 - PROTECTION CLASS : IP-51 (INDOOR TYPE)
- 5 - ALL DOOR FITTED WITH 16mm EARTH STRAP & INSULATED WITH GREEN-YELLOW COLOUR.

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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194

=E03

BUS-1

BUS-2

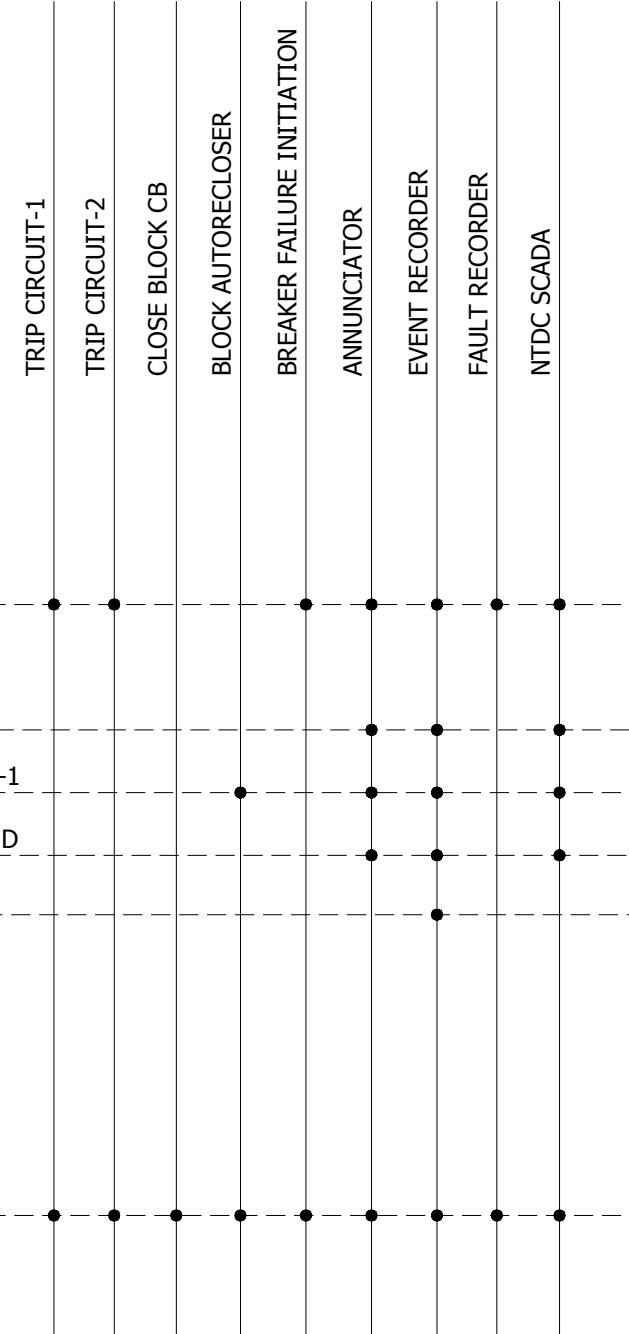
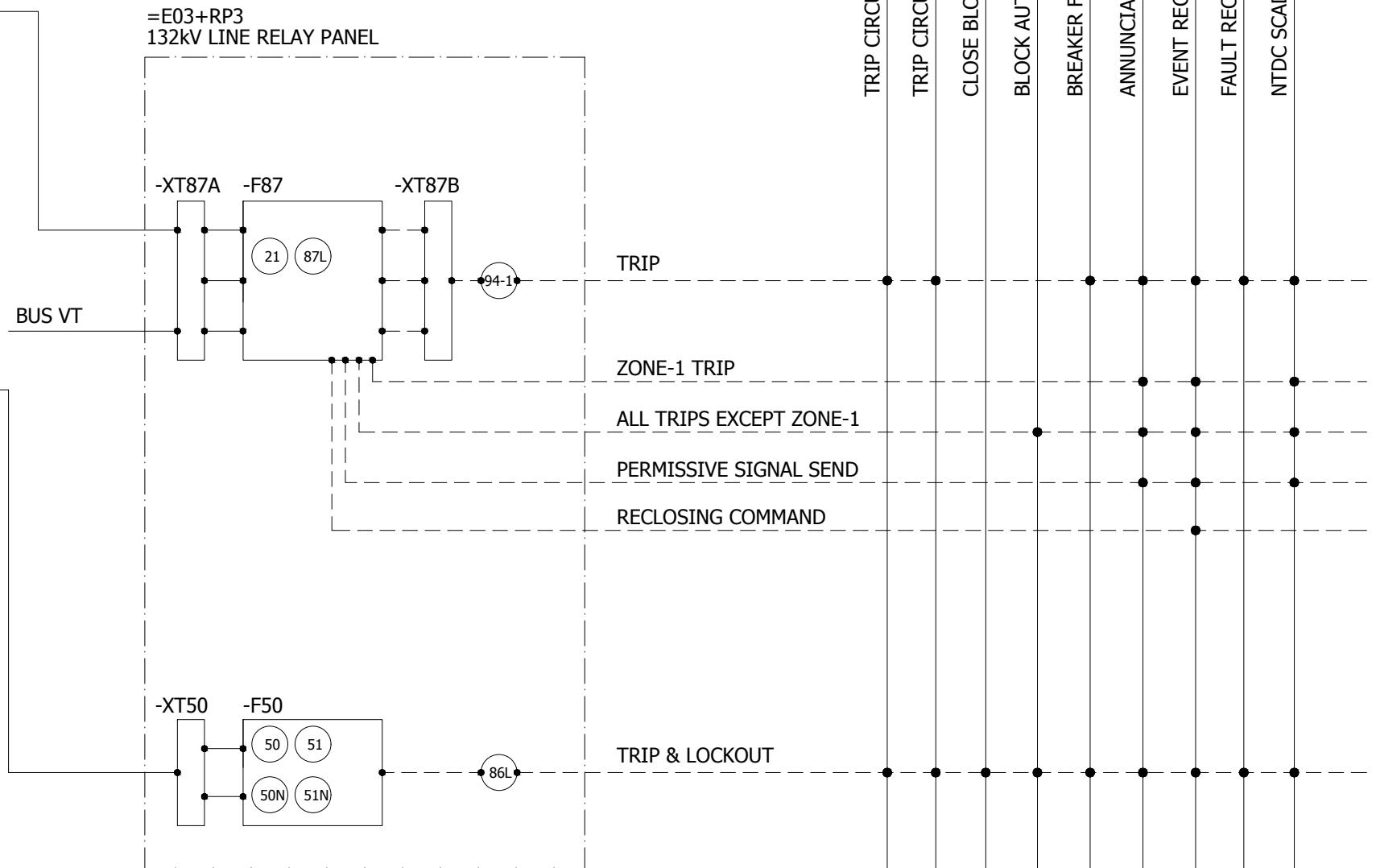


Q51  
Q2  
Q1  
Q0  
C1  
C2  
CT(D1)  
C3  
C4  
P1  
G0  
G9  
P2  
Q9  
Q52  
Q8  
G91-G94  
SF6/AIR BUSHING TERMINATION  
SA 120kV

132kV GHAZI ROAD-II

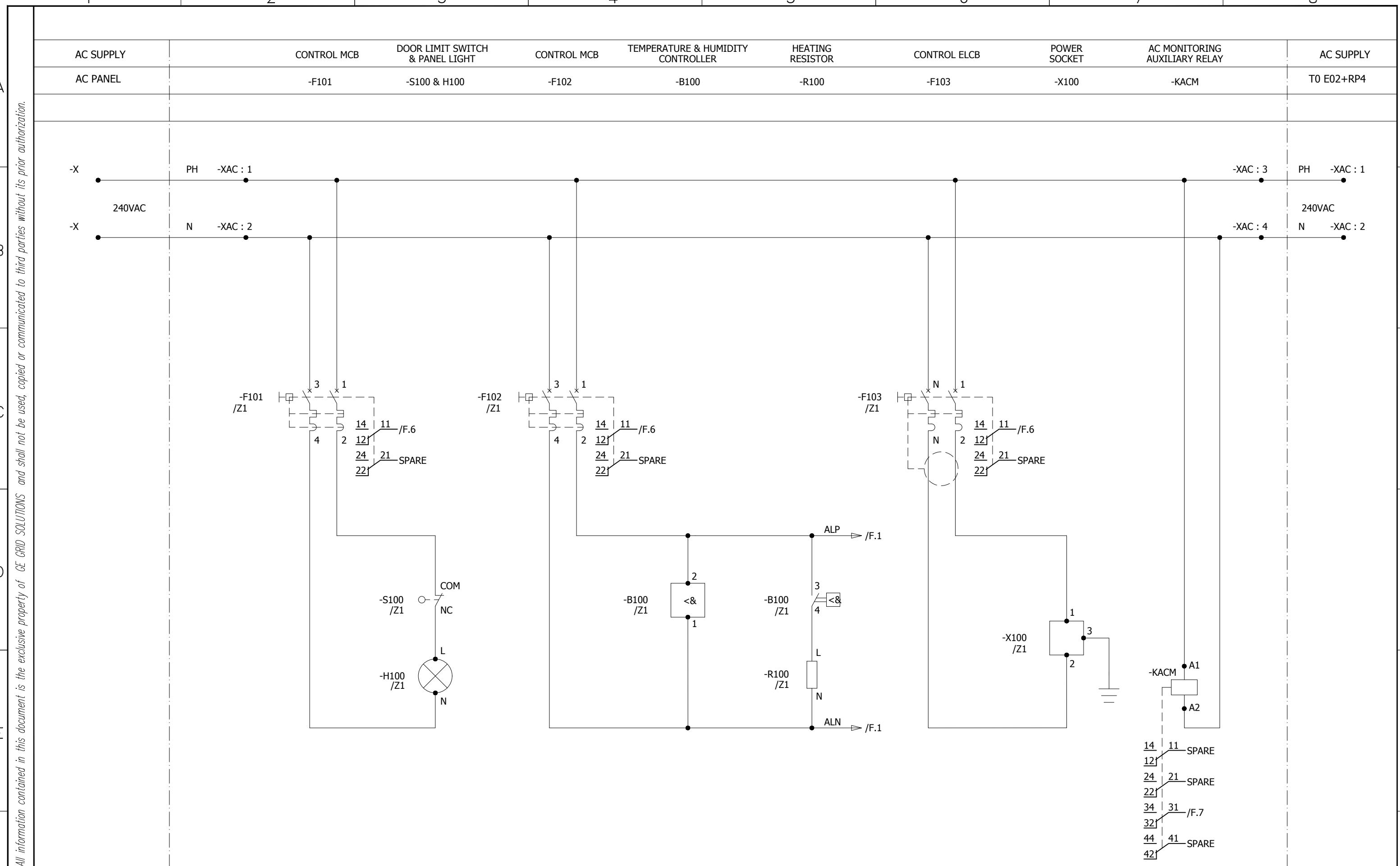
=E03+RP3  
132kV LINE RELAY PANEL

BUS VT



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REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AE
								Sheet no. 06	



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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type D Sheet no. 07
1	2	3	4	5	6	7	8		

CONTROL MCB  
LINE DIFFERENTIAL RELAY SUPPLYCONTROL MCB  
OVERCURRENT SUPPLYCONTROL MCB  
AC CIRCUIT FAULTY SUPPLYCONTROL MCB  
DC-1 SPAREDC SUPPLY MONITORING  
AUXILIARY RELAY

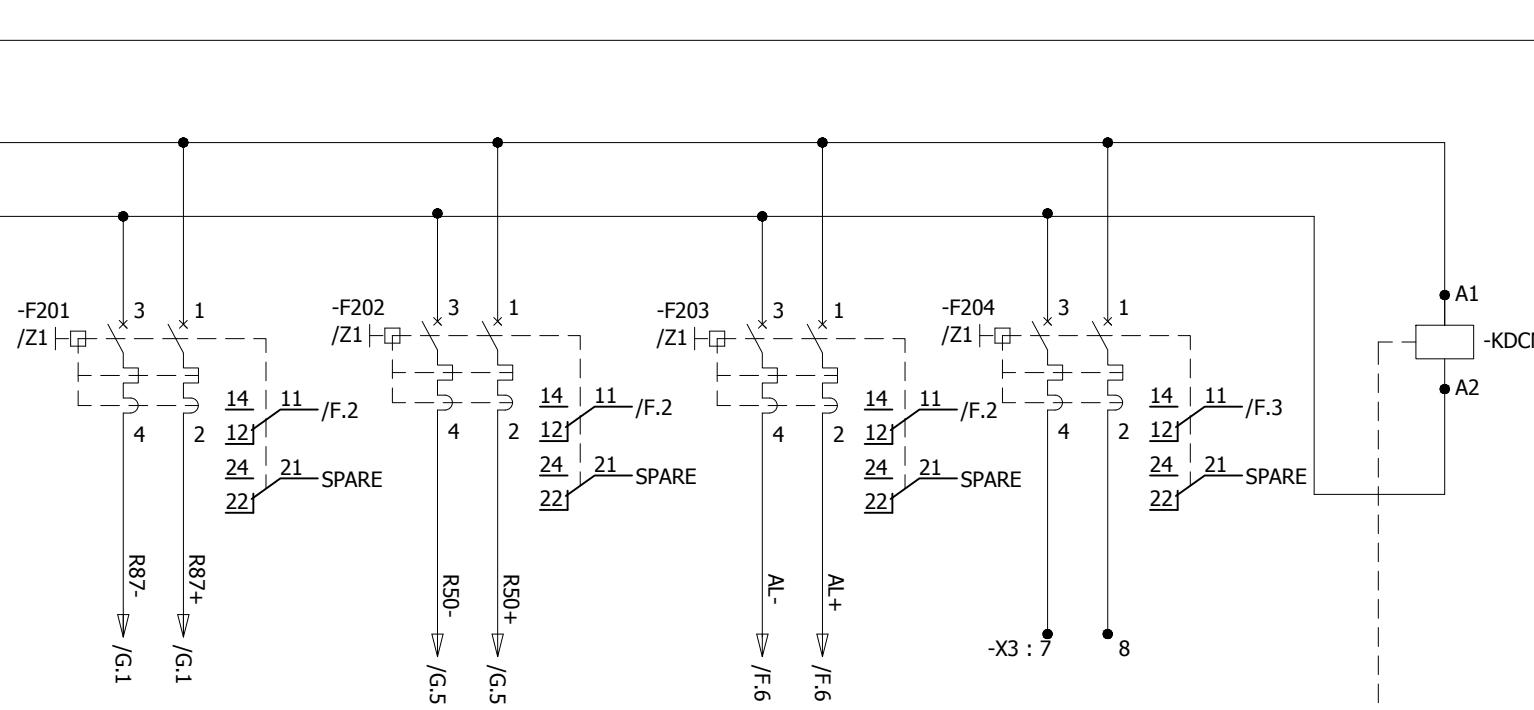
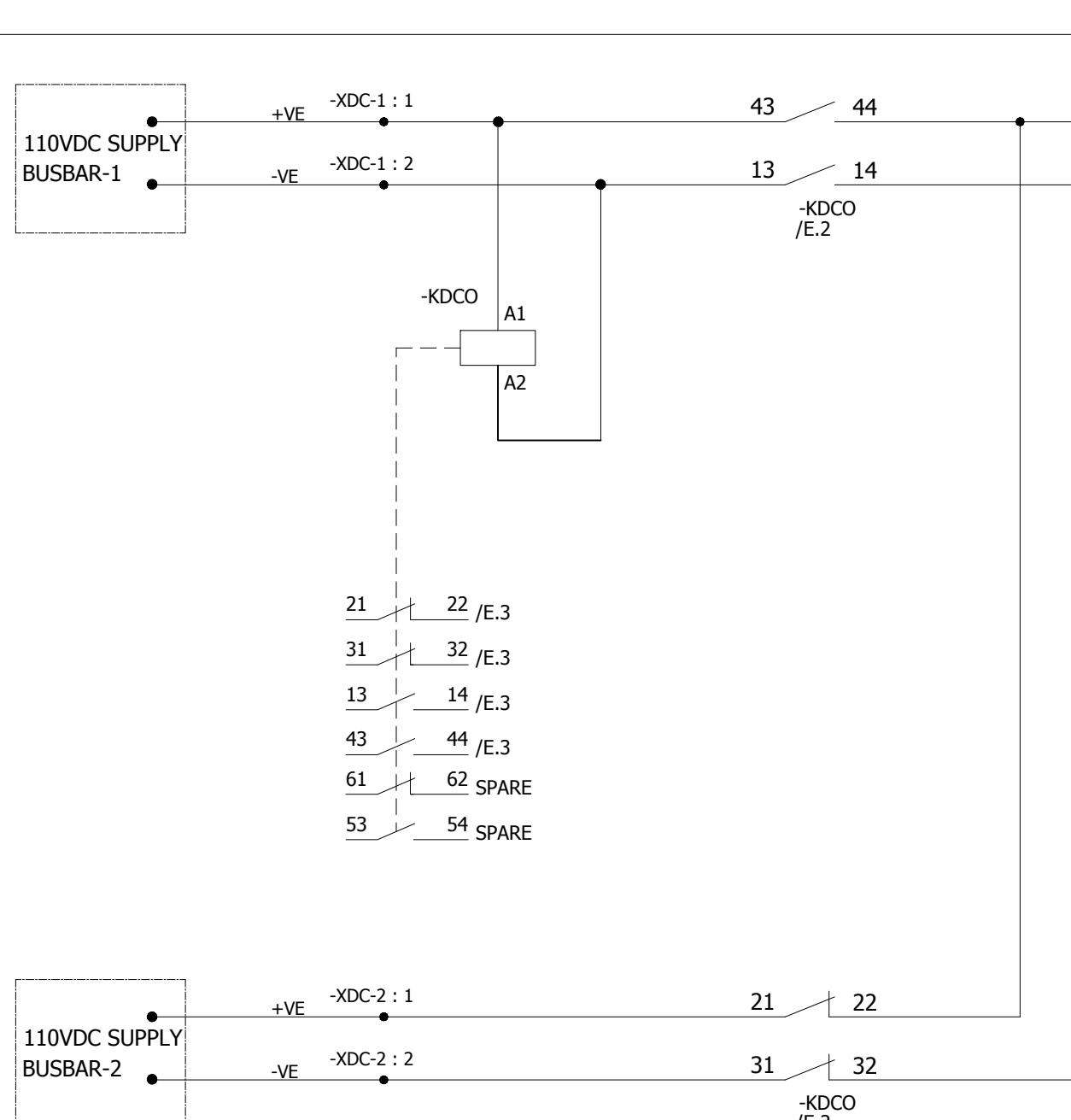
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-KDCM



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A

A

B

B

C

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D

D

E

E

F

F

0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132KV LINE RELAY PANEL (=E01+RP3) DC SUPPLY DISTRIBUTION	Drawing no. P60194-E-ELR-SC-001	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type E	Sheet no. 08

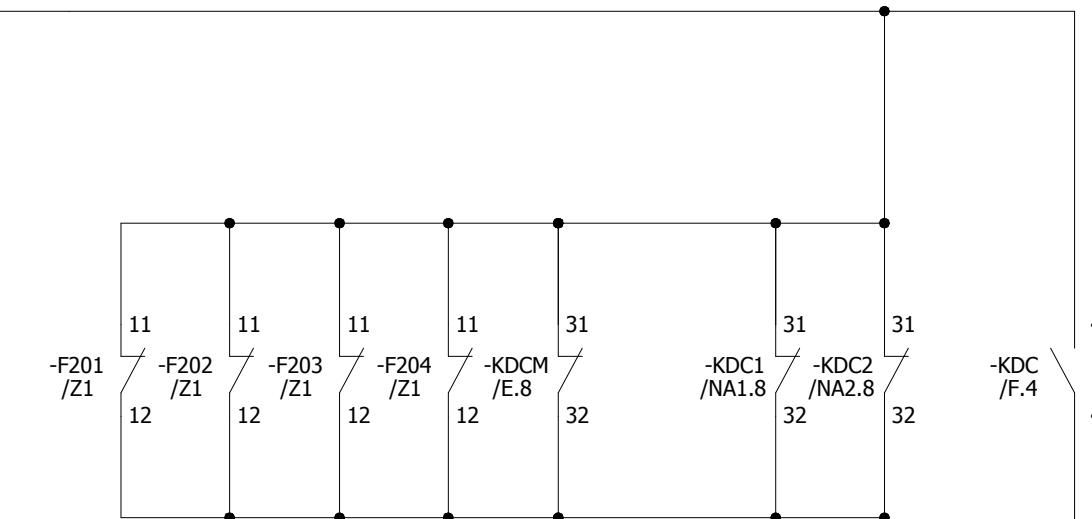
110V DC CIRCUIT FAULTY

240V AC CIRCUIT FAULTY

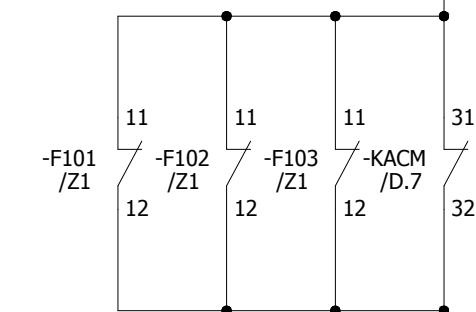
-KDC

-KAC

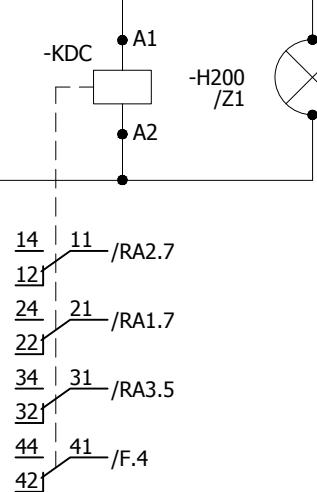
/D.5 ➤ ALP



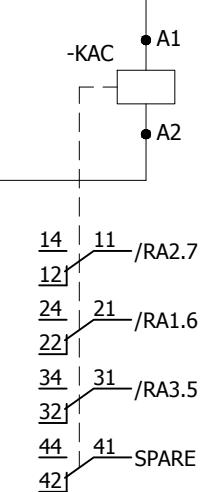
/E.7 ➤ AL+



/D.5 ➤ ALN



/E.7 ➤ AL-



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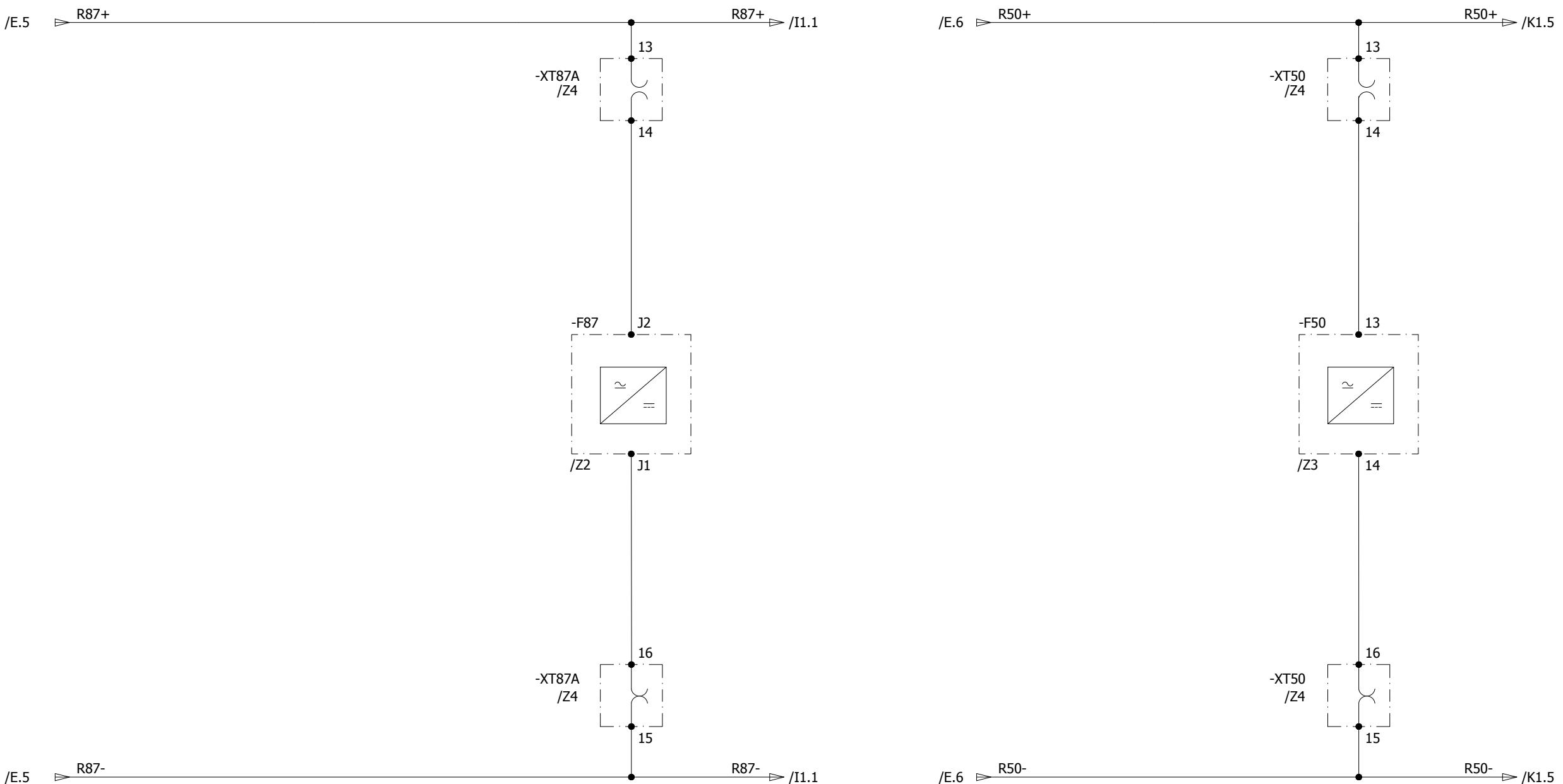
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type F
									Sheet no. 09

## LINE DIFFERENTIAL PROTECTION

## OVERCURRENT PROTECTION

## RELAY SUPPLY

## RELAY SUPPLY



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A  
B  
C  
D  
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F

A  
B  
C  
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E  
F

0	AS BUILT	20.11.2018	ASJ	Manufacturer  <b>EPESOL</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E01+RP3) RELAY POWER SUPPLY CIRCUIT	Drawing no. P60194-E-ELR-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type G
									Sheet no. 10

TEST BLOCK

LINE DIFFERENTIAL PROTECTION  
RELAY

-XT87A

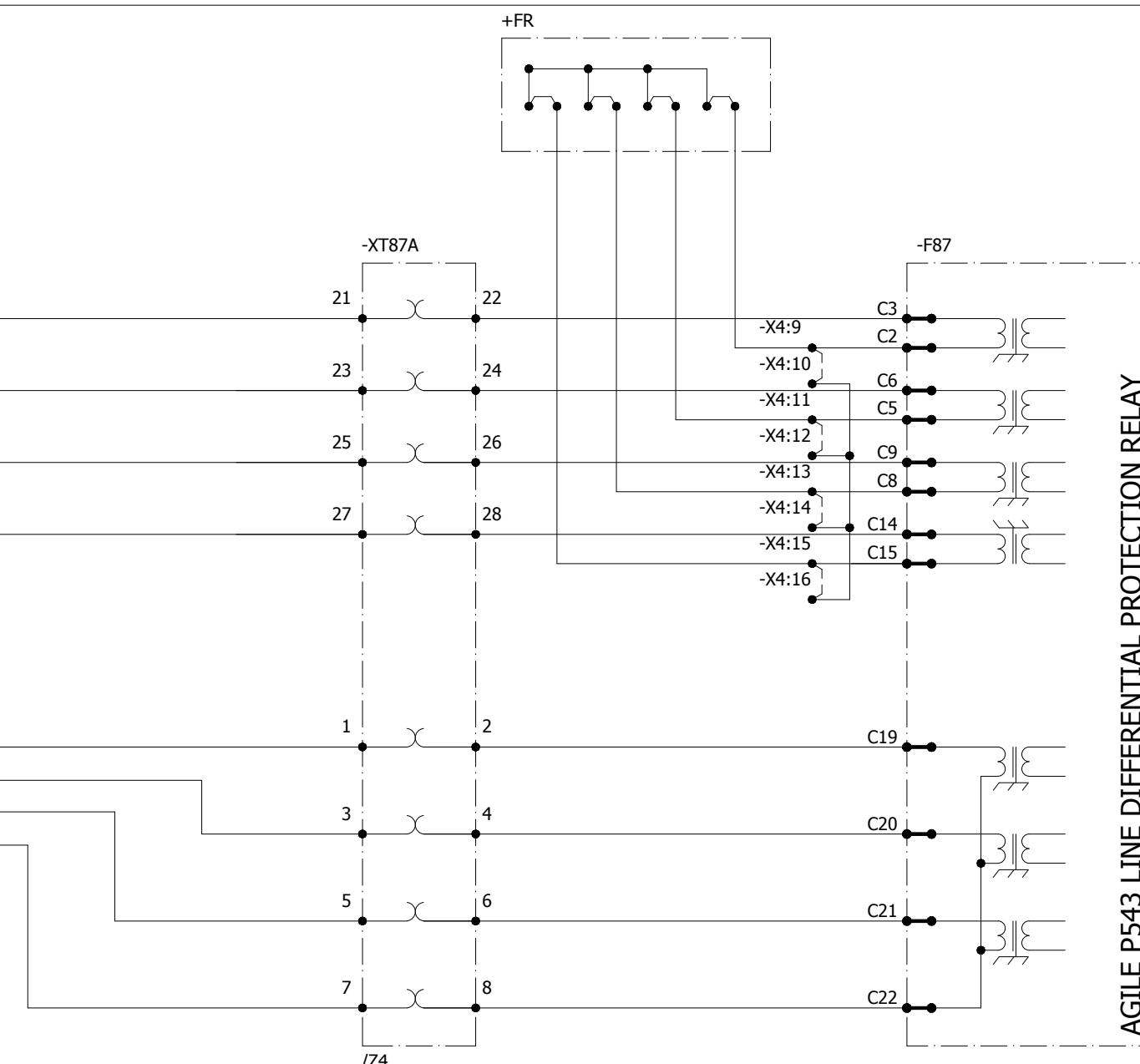
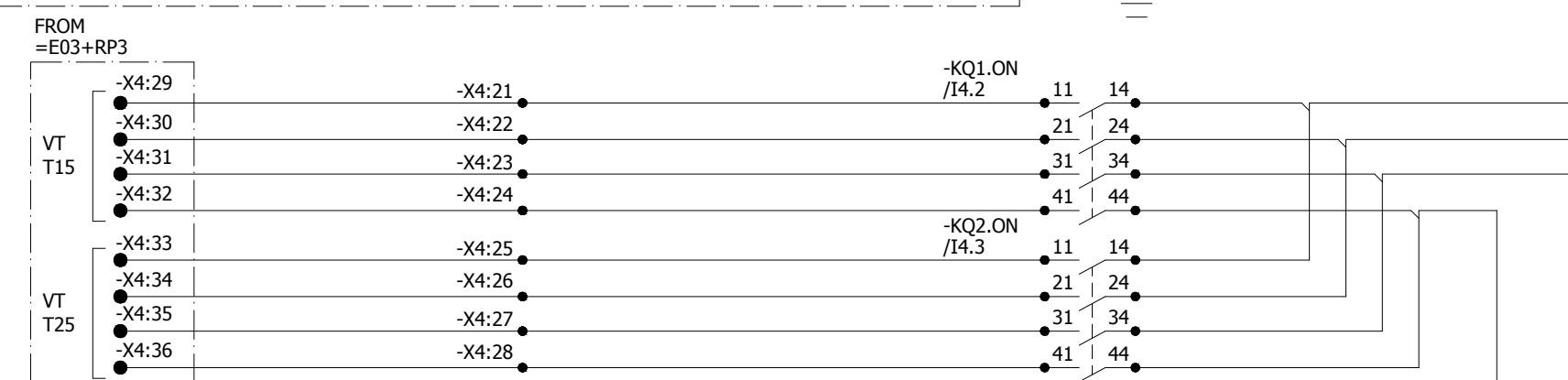
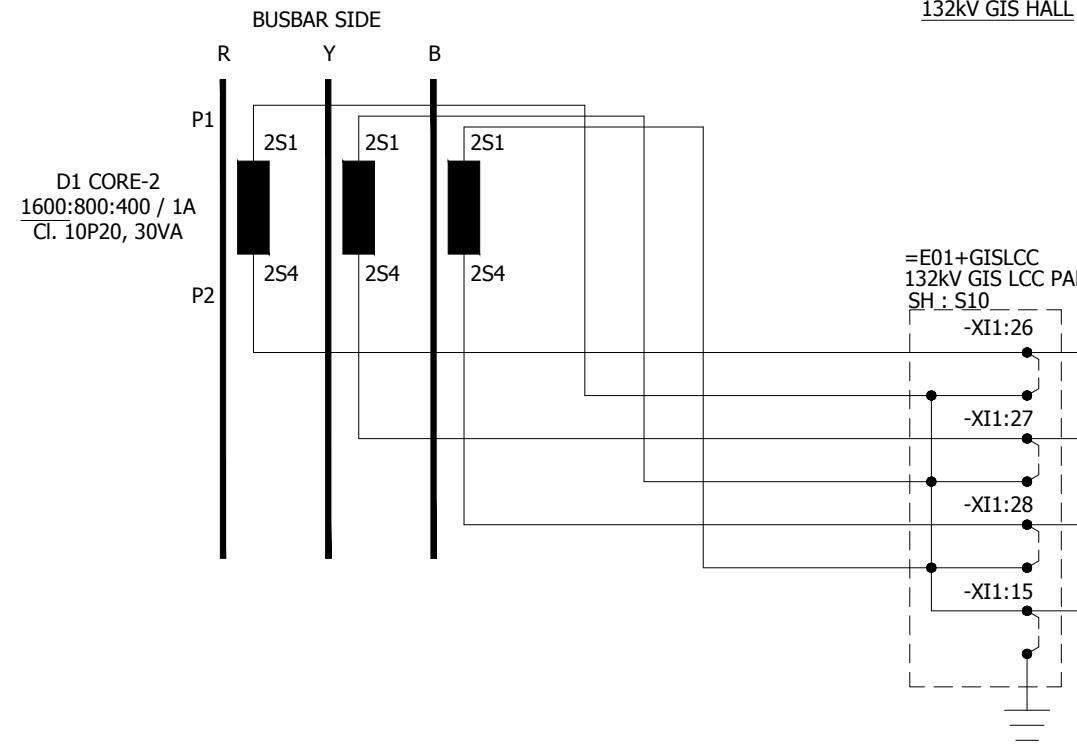
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A



0	AS BUILT	20.11.2018	ASJ	Manufacturer <b>EPESOL</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor <b>Grid Solutions</b> A GE and Alstom joint venture	Client <b>NATIONAL TRANSMISSION &amp; DISPATCH COMPANY LIMITED (NTDC-WAPDA)</b>	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E01+RP3) LINE DIFFERENTIAL PROTECTION CT/VT CIRCUIT	Drawing no. P60194-E-ELR-SC-001
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type H1
									Sheet no. 11

TEST BLOCK

OVERCURRENT  
RELAY

-XT50

-F50

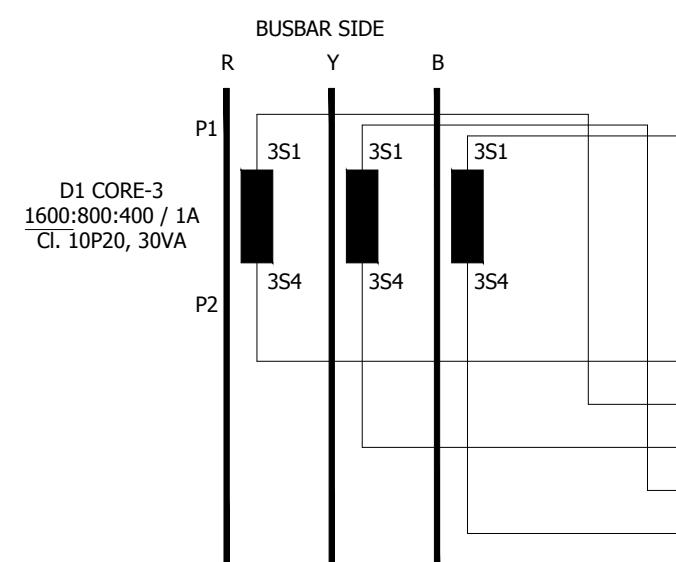
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## 132kV GIS HALL

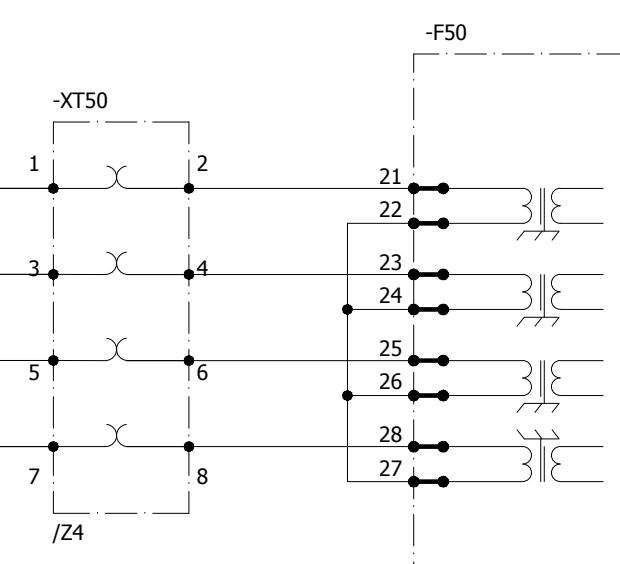
## CONTROL ROOM

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=E01+GISLCC  
132kV GIS LCC PANEL  
SH : S11  
-XI1:40  
-XI1:41  
-XI1:42  
-XI1:29

-X5:1  
-X5:2  
-X5:3  
-X5:4  
-X5:5  
-X5:6  
-X5:7  
-X5:8



A

A

B

B

C

C

D

D

E

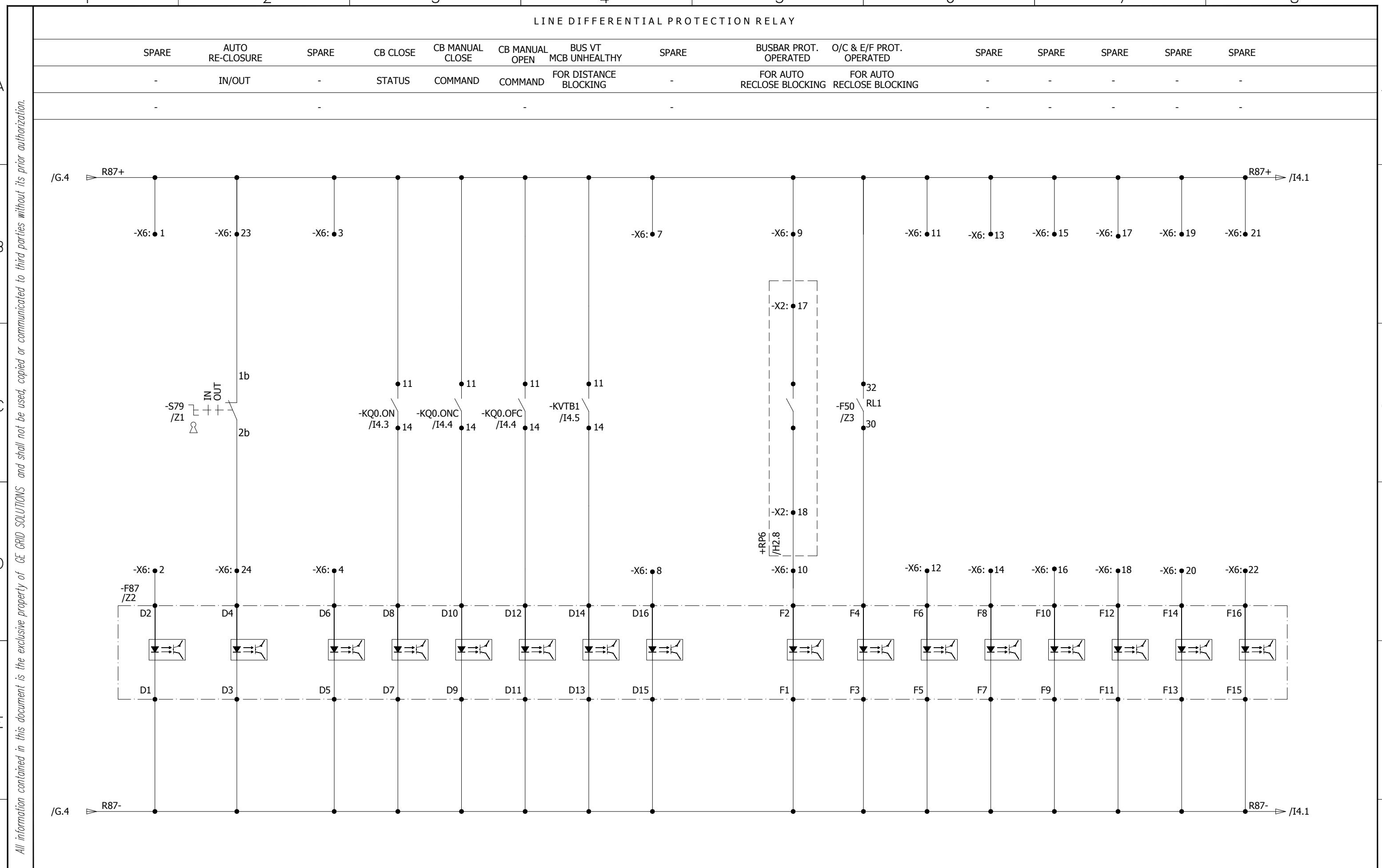
E

F

F

0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E01+RP3) O/C & E/F CT INPUTS	Drawing no. P60194-E-ELR-SC-001	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type H2	Sheet no. 12

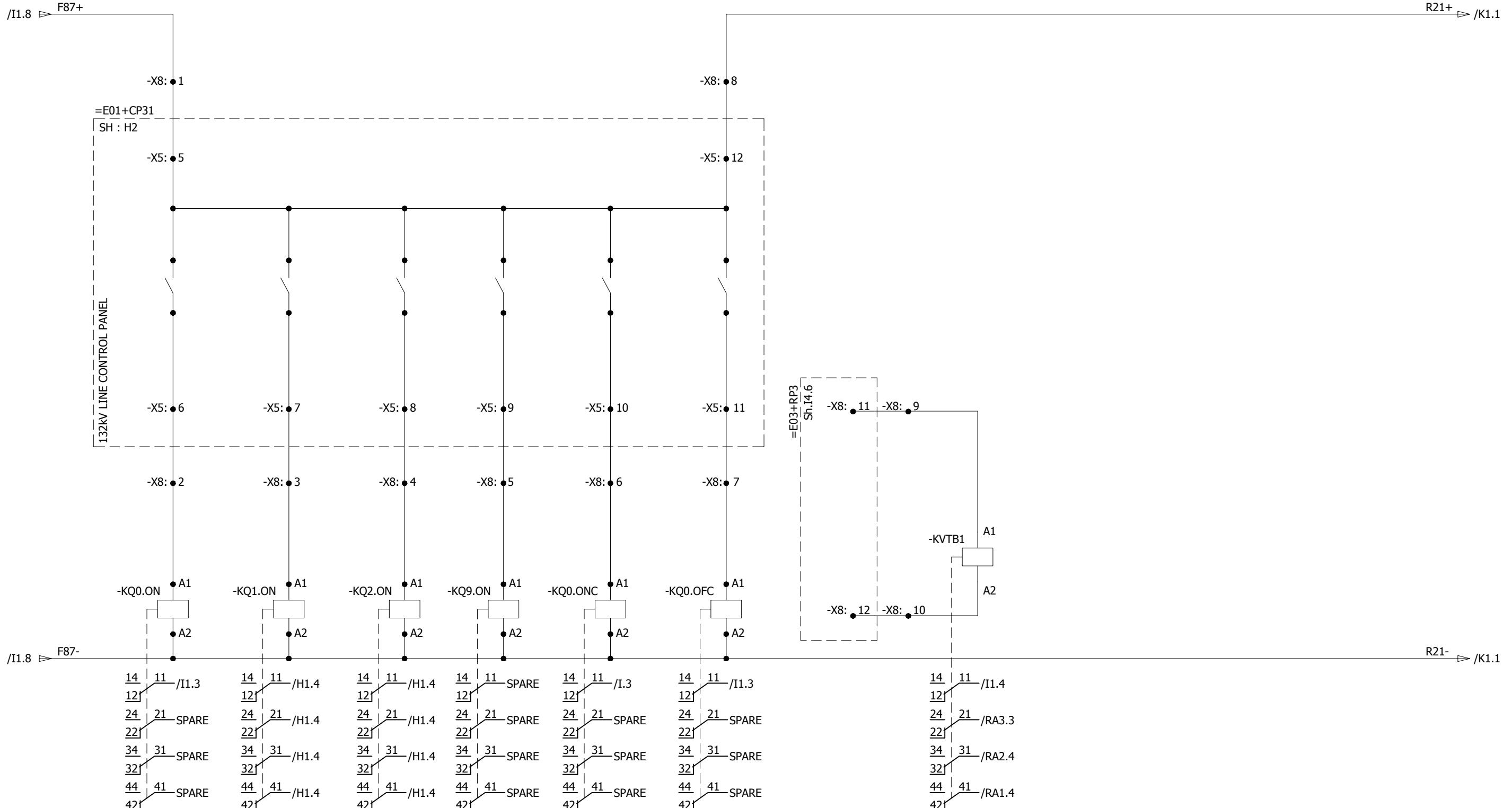
## LINE DIFFERENTIAL PROTECTION RELAY



0	AS BUILT	20.11.2018	ASJ	Manufacturer <b>EPESOL</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor <b>GE</b> Grid Solutions A GE and Alstom joint venture	Client <b>NATIONAL TRANSMISSION &amp; DISPATCH COMPANY LIMITED (NTDC-WAPDA)</b>	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132KV LINE RELAY PANEL (=E01+RP3) LINE DIFFERENTIAL RELAY INPUTS	Drawing no. P60194-E-ELR-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type I1
									Sheet no. 13

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CB CLOSE	Q1 CLOSE	Q2 CLOSE	Q9 CLOSE	CB MANUAL CLOSE	CB MANUAL OPEN	BUS VT MCB UNHEALTHY
STATUS	STATUS	STATUS	STATUS	COMMAND	COMMAND	STATUS
=E01+LCC	=E01+LCC	=E01+LCC	=E01+LCC	=E01+LCC	=E01+LCC	=E03+RP3



A  
A  
B  
B  
C  
C  
D  
D  
E  
E  
F  
F

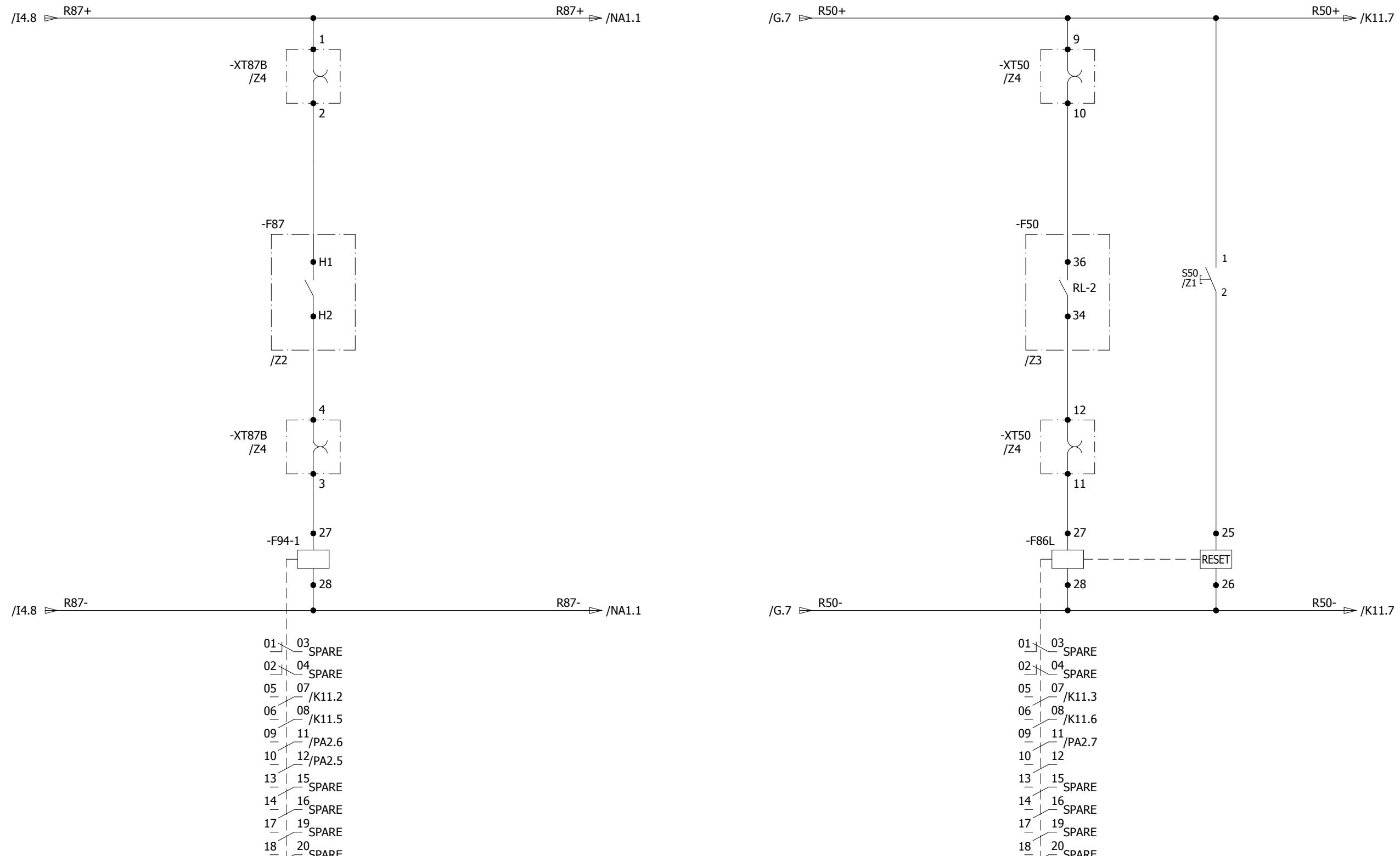
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194

LINE DIFFERENTIAL PROTECTION GENERAL TRIP

O/C &amp; E/F PROTECTION TRIP

TRIP RELAY RESET

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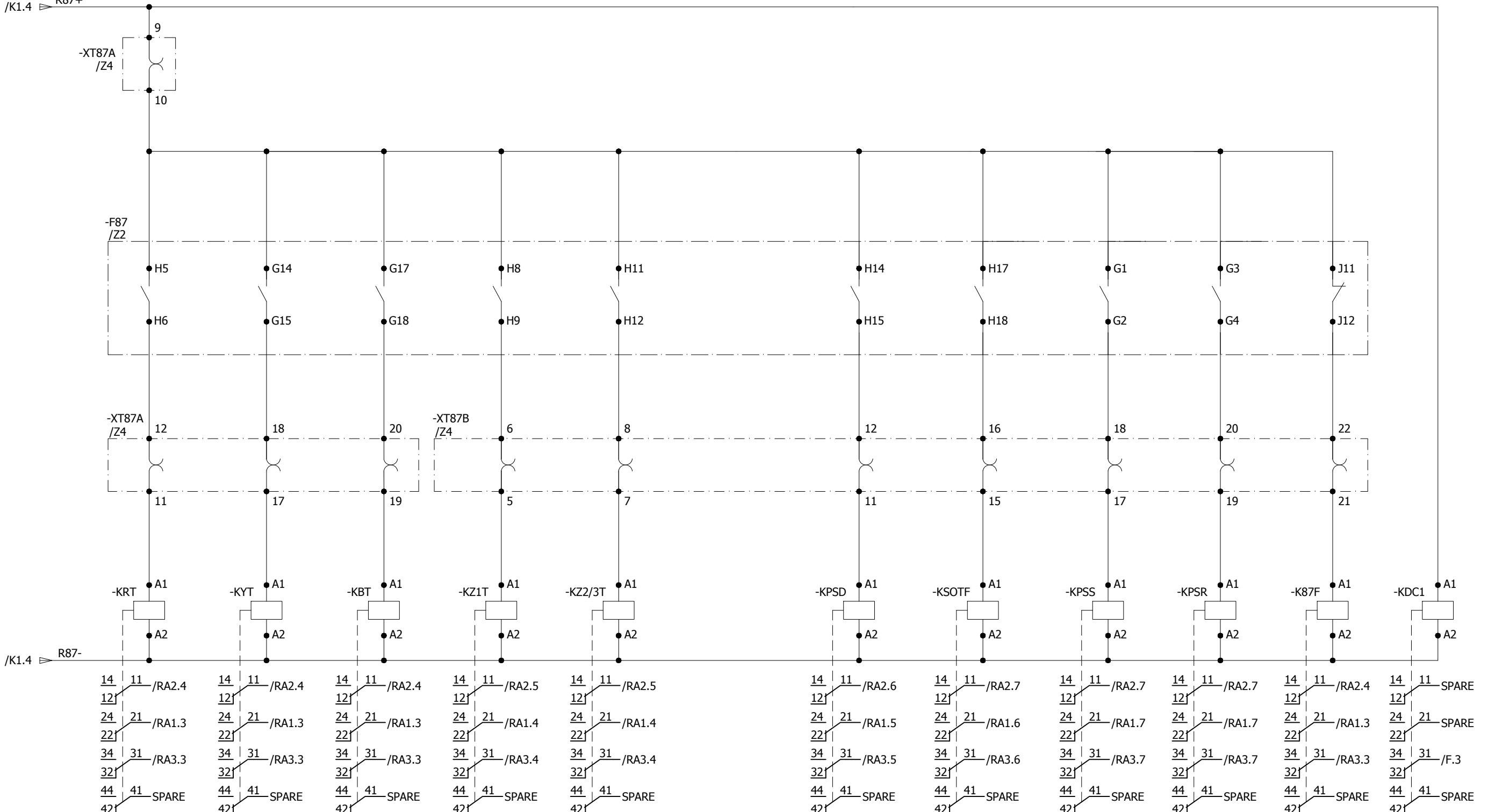
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type K1	Sheet no. 15
1	2	3	4	5	6	7	8				



## LINE DIFFERENTIAL PROTECTION

RED-PH TRIP	YELLOW-PH TRIP	BLUE-PH TRIP	ZONE-1 TRIP	ZONE-2 TRIP/ZONE-3 TRIP	POWER SWING DETECT	SWITCH ON TO FAULT	AUTORECLOSURE OPERATED	AUTORECLOSURE BLOCKED	LINE DIFF. RELAY FAULTY	R87+ DC SUPPLY MONITORING
-------------	----------------	--------------	-------------	-------------------------	--------------------	--------------------	------------------------	-----------------------	-------------------------	---------------------------

+KDC1

A A  
B B  
C C  
D D  
E E  
F F

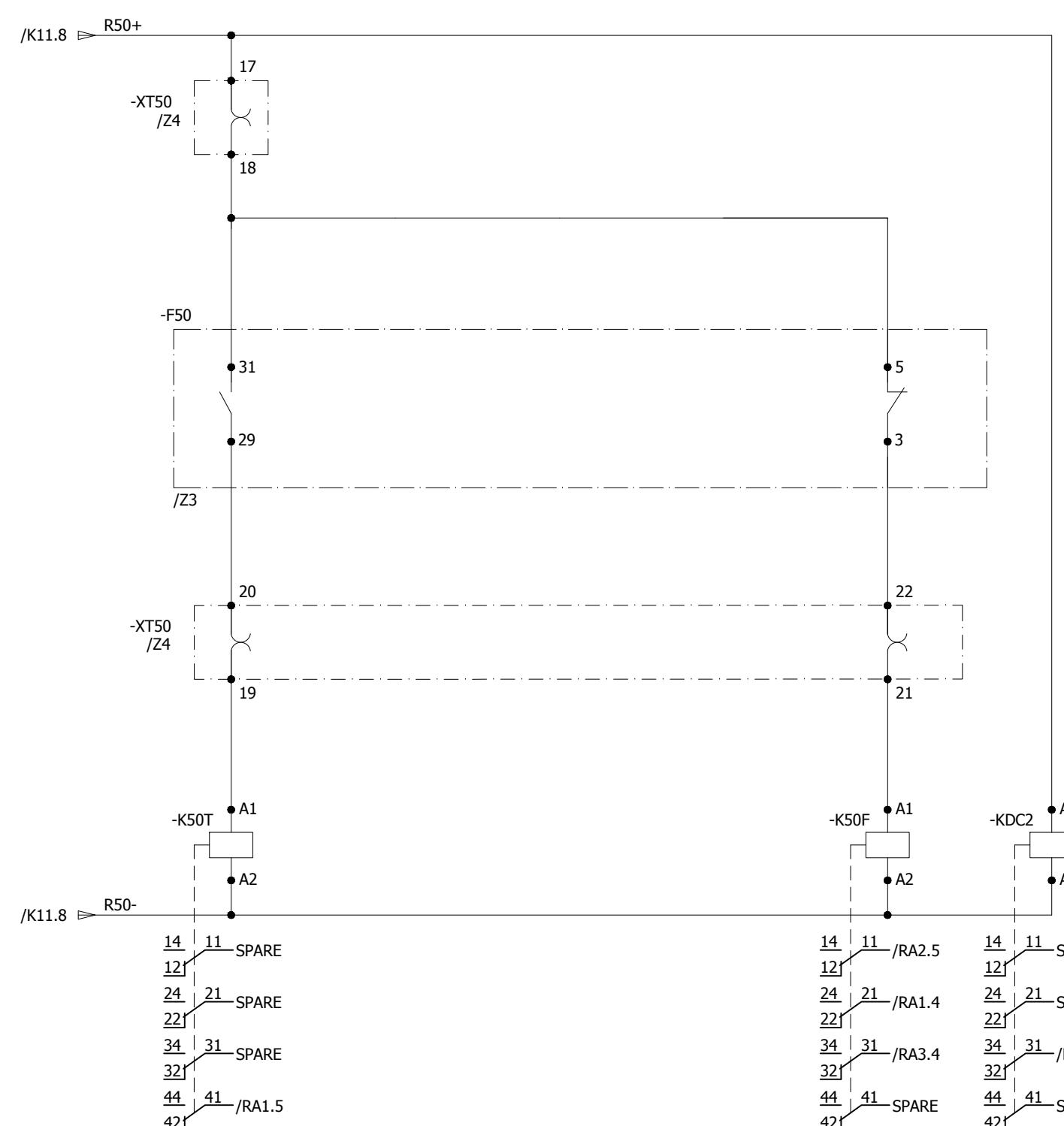
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type NA1
									Sheet no. 17

O/C &amp; E/F RELAY ALARMS

R50+ DC SUPPLY  
MONITORINGO/C & E/F  
TRIPPROTECTION  
FAULTY

+KDC2

/Z3



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0	AS BUILT	20.11.2018	ASJ	Manufacturer <b>EPE SOL</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor <b>Grid Solutions</b> A GE and Alstom joint venture	Client <b>NATIONAL TRANSMISSION &amp; DISPATCH COMPANY LIMITED (NTDC-WAPDA)</b>	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E01+RP3) SYSTEM ALARMS	Drawing no. P60194-E-ELR-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type NA2
									Sheet no. 18

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A

B

C

D

E

F

A

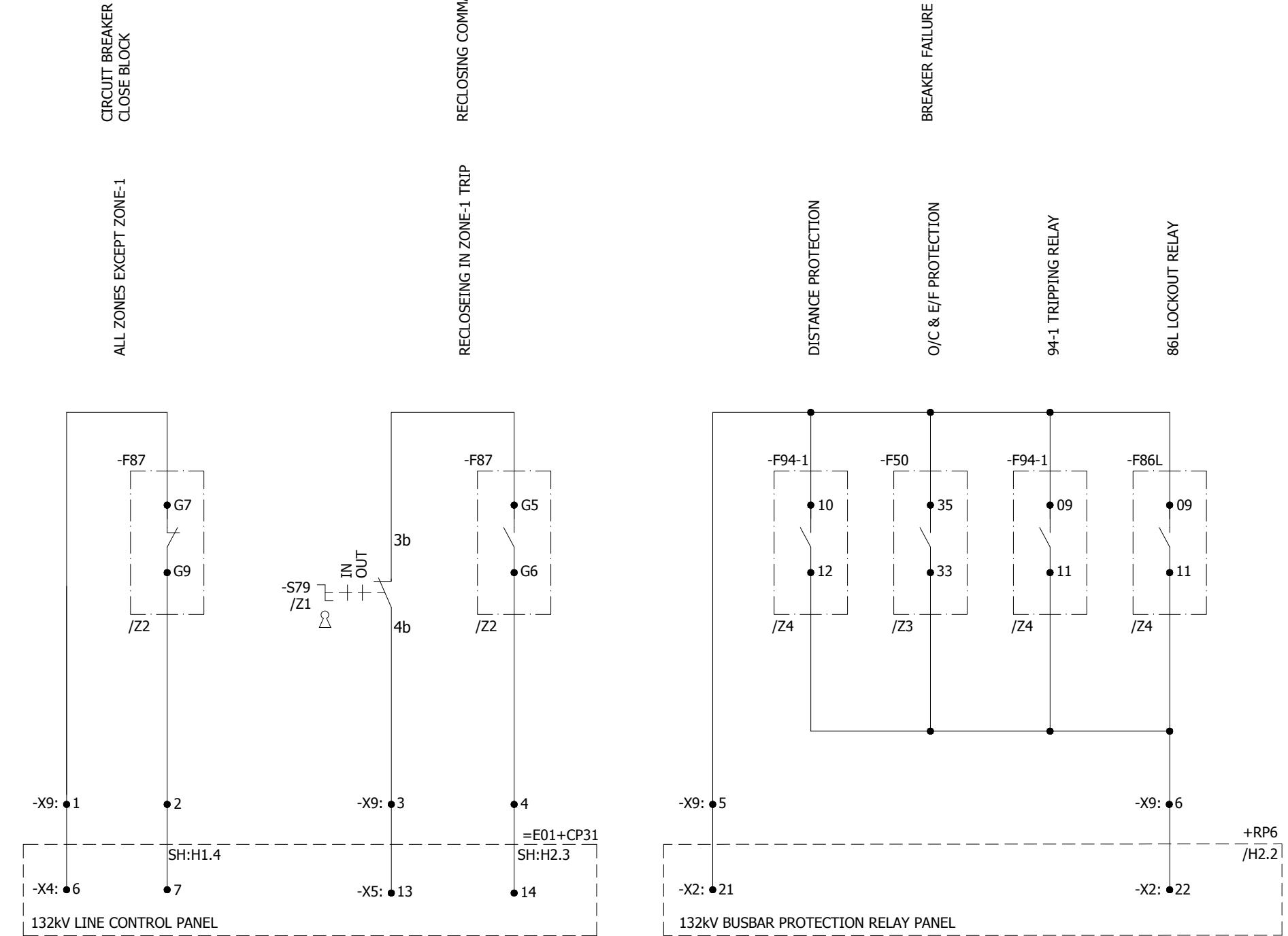
B

C

D

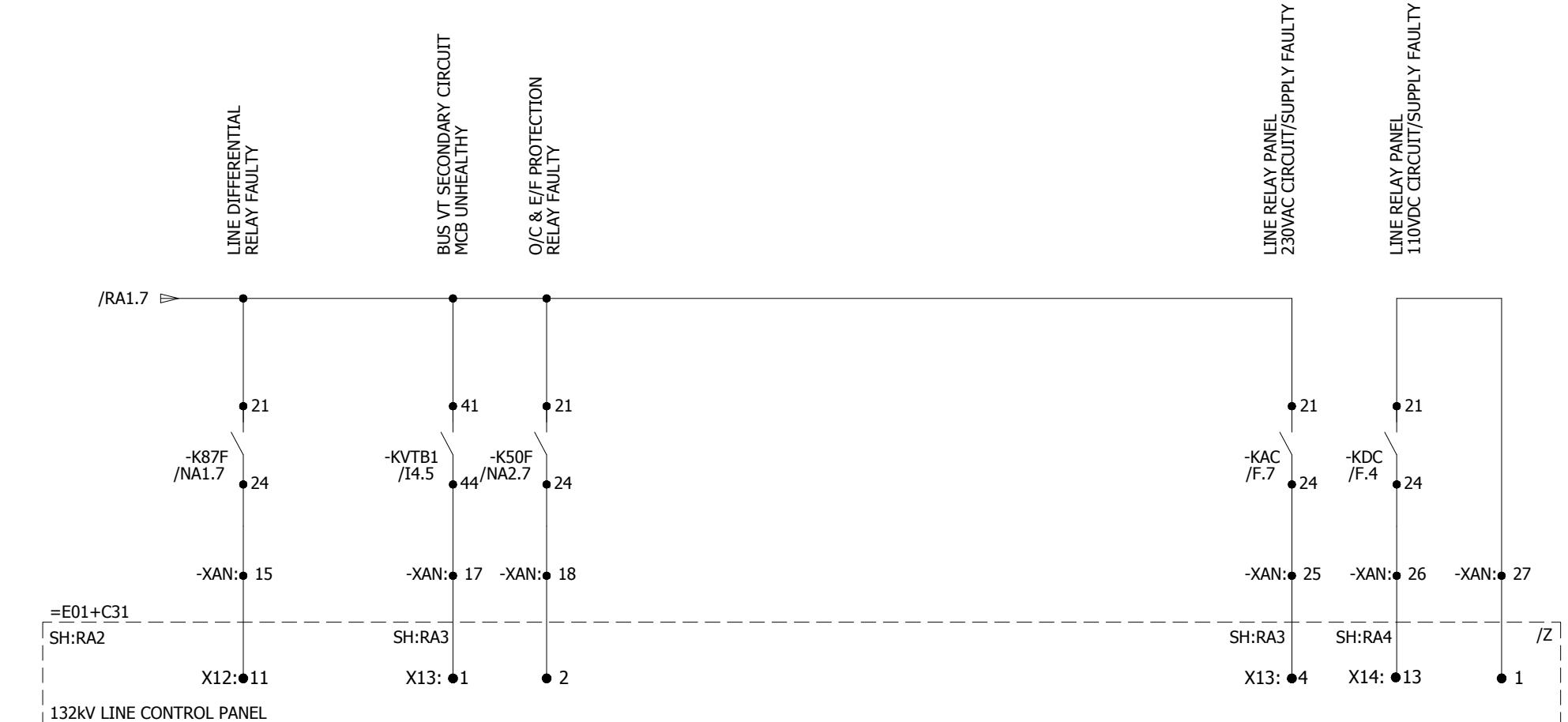
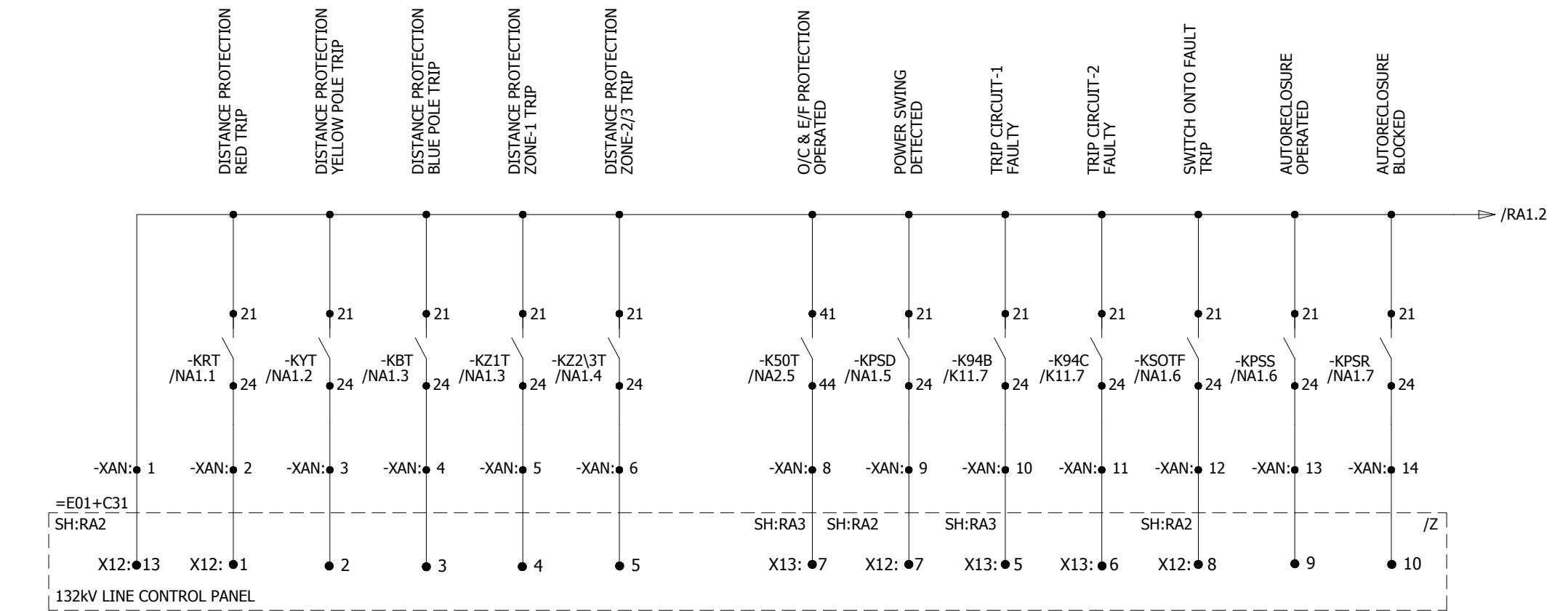
E

F



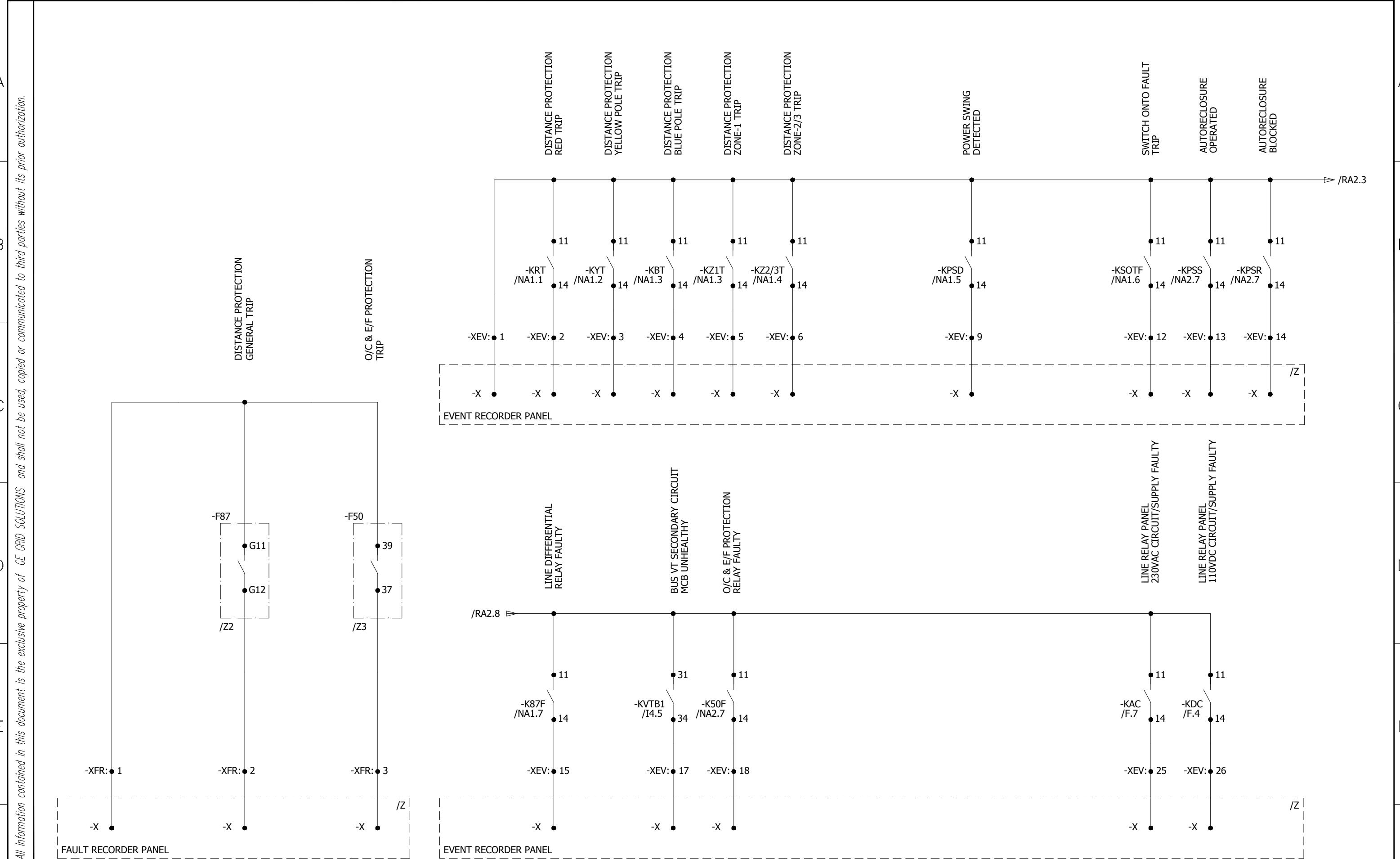
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REV.	DESCRIPTION		DATE	DRAWER						Project no. P-60194	Sheet type PA2	Sheet no. 19
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0	AS BUILT	20.11.2018	ASJ	Manufacturer  <b>EPESOL</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  <b>Grid Solutions</b> A GE and Alstom joint venture	Client  <b>NATIONAL TRANSMISSION &amp; DISPATCH COMPANY LIMITED (NTDC-WAPDA)</b>	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E01+RP3) ANNUNCIATION CIRCUIT	Drawing no. P60194-E-ELR-SC-001
									Project no. P-60194
									Sheet type RA1
REV.	DESCRIPTION	DATE	DRAWER						Sheet no. 20

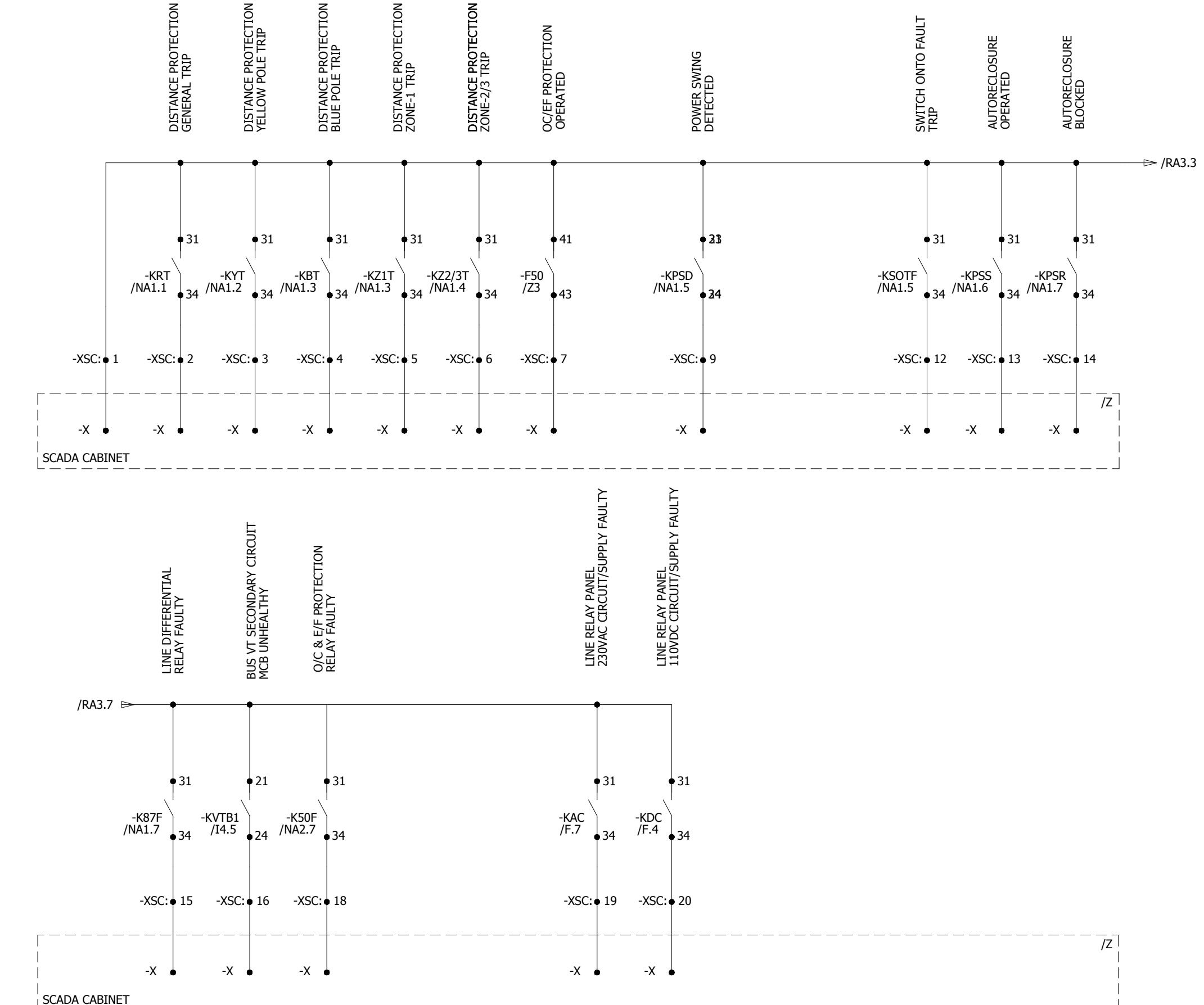
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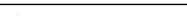
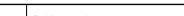
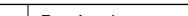


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0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E01+RP3) EVENT & FAULT RECORDER CIRCUITS	Drawing no. P60194-E-ELR-SC-001		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type RA2	Sheet no. 21
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0	AS BUILT	20.11.2018	ASJ	<b>Manufacturer</b>  <b>EPESOL</b> 7-B Garden Block, New Garden Town, Lahore, Pakistan	<b>Contractor</b>  <b>Grid Solutions</b> A GE and Alstom joint venture	<b>Client</b>  <b>NATIONAL TRANSMISSION &amp; DISPATCH COMPANY LIMITED</b> (NTDC-WAPDA)	<b>Project</b> 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	<b>Title</b> 132kV LINE RELAY PANEL (=E01+RP3) SCADA CIRCUIT	<b>Drawing no.</b>		
								P60194-E-ELR-SC-001			
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								P-60194	Sheet type	Sheet no.	
REV.	DESCRIPTION	DATE	DRAWER						RA3	22	

1

2

3

4

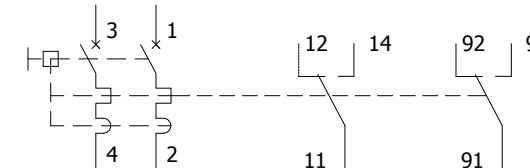
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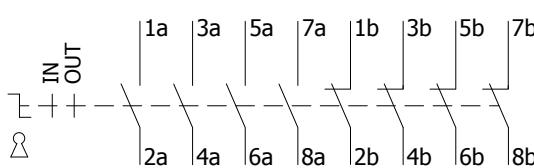
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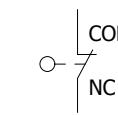
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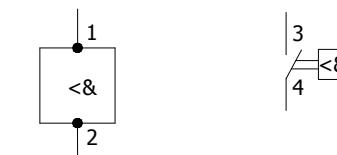
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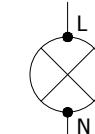
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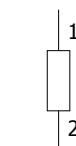
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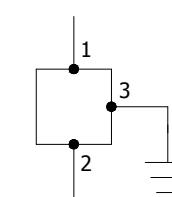
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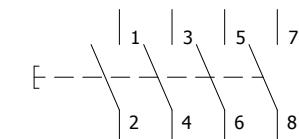
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-R100	D.5
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-X100	D.7
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-S50	K1.7		
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A  
B  
C  
D  
E  
F

A  
B  
C  
D  
E  
F

0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E01+RP3) COMPONENT DIAGRAM	Drawing no. P60194-E-ELR-SC-001		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type Z1	Sheet no. 23
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2

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4

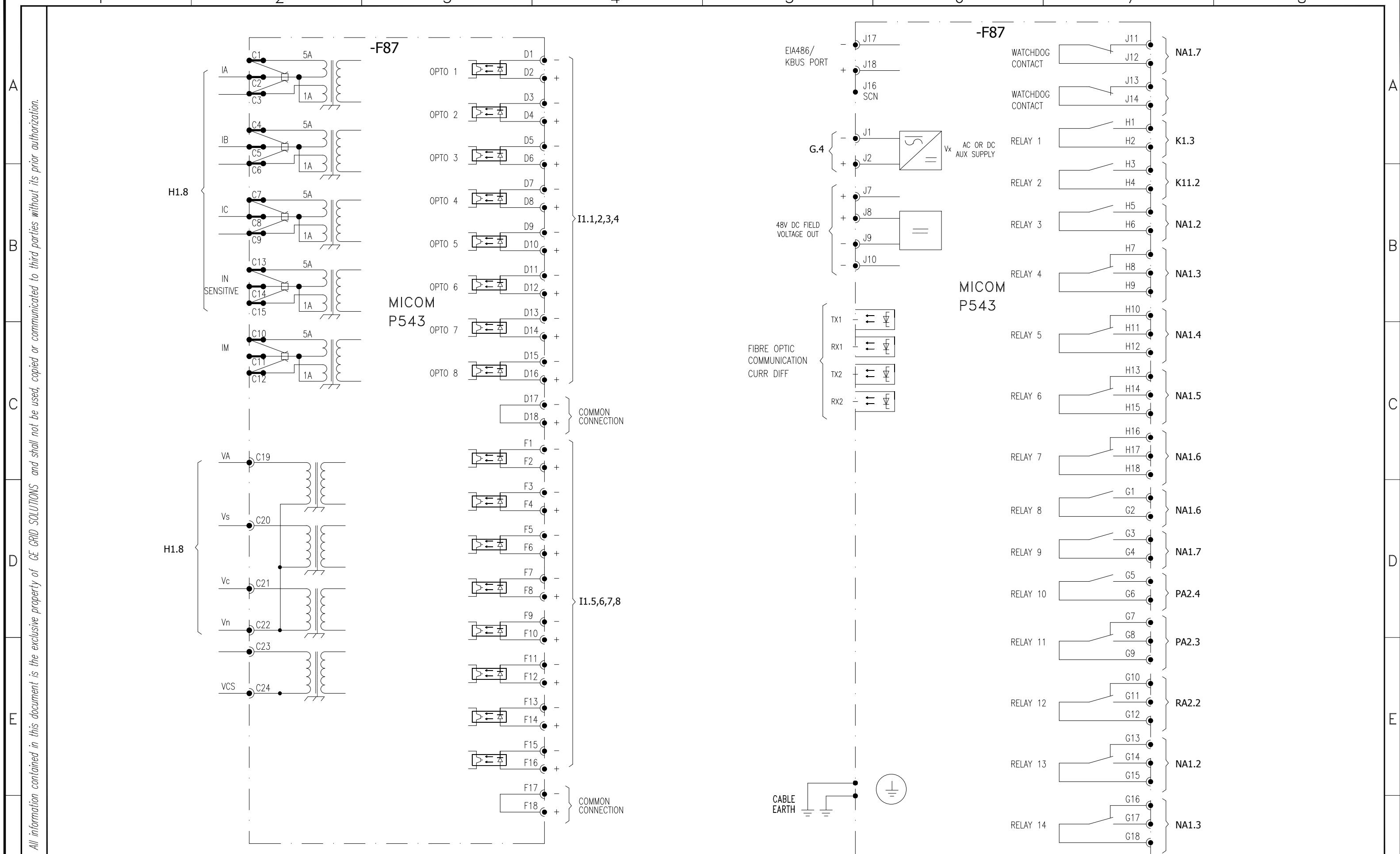
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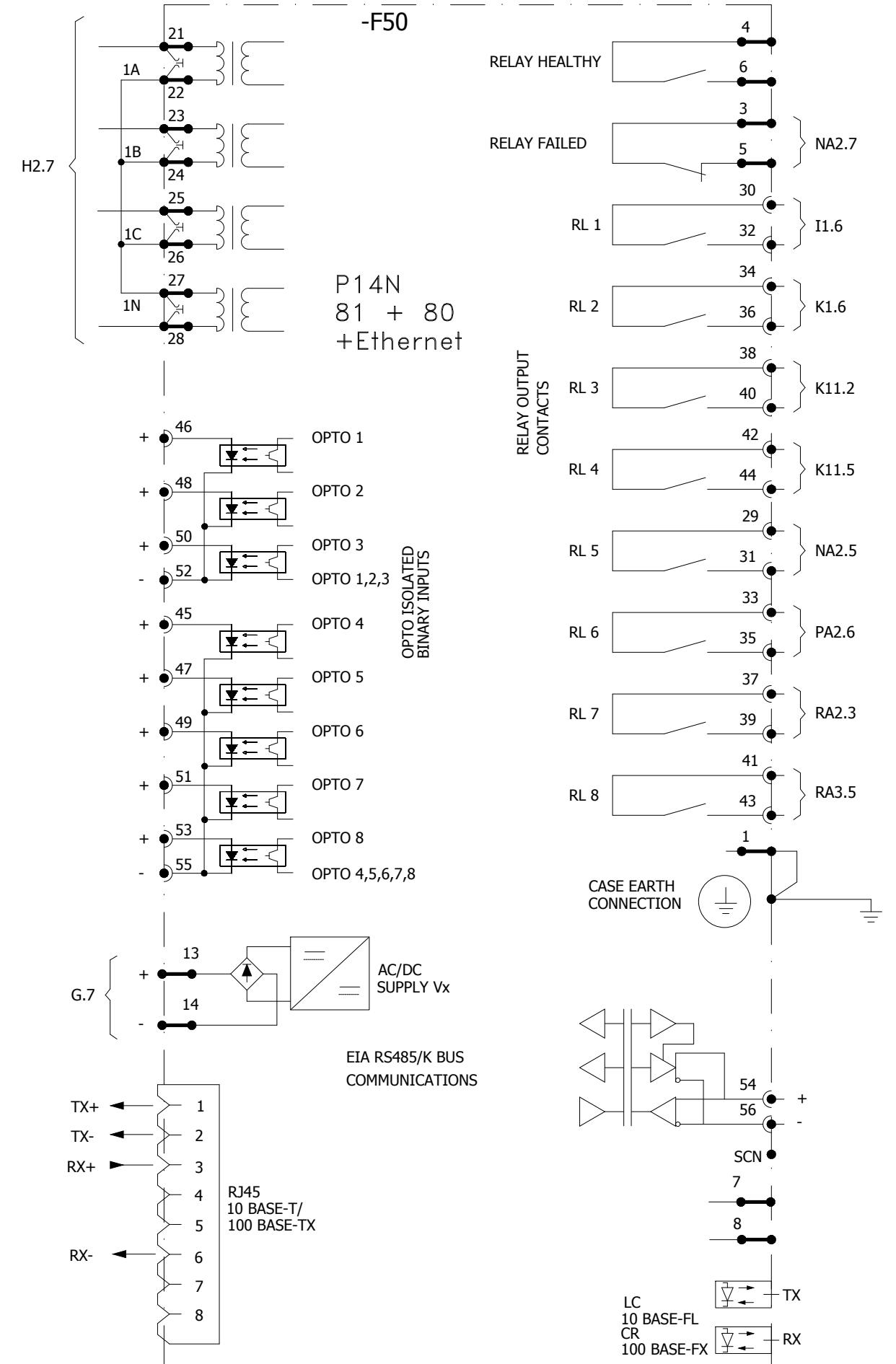
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8

1 2 3 4 5 6 7 8



0	AS BUILT	20.11.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
				EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	132KV LINE RELAY PANEL (=E01+RP3) COMPONENT DIAGRAM	P60194-E-ELR-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type Z2 Sheet no. 24



0	AS BUILT	20.11.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.		
				EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	132KV LINE RELAY PANEL (=E01+RP3) COMPONENT DIAGRAM	Project no. P-60194	Sheet type Z3	Sheet no. 25

