



**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
REVISION HISTORY					
REV	DATE	DRW. BY	CHK. BY	APR. BY	REVISION DESCRIPTION
0	20.11.2018	ASJ	MFT	NAH	AS BUILT
Scale NOT-TO-SCALE					Sheet size A3
<b>Client</b>  <b>NATIONAL TRANSMISSION &amp; DISPATCH COMPANY LIMITED (NTDC-WAPDA)</b>					
<b>Contractor</b>  <b>Grid Solutions</b> A GE and Alstom joint venture					<b>Manufacturer</b>  <b>EPESOL</b> 71-B Garden Block, New Garden Town, Lahore Pakistan
<b>Project</b> <b>220kV / 132kV GIS SUBSTATION</b> <b>GHAZI ROAD , LAHORE</b>					
<b>Title</b> <b>132kV LINE RELAY PANEL (=E09+RP3)</b> <b>SCHEMATIC DRAWINGS</b>					
<b>Order no</b> P-60194			<b>Document no</b> P60194-E-ELR-SC-006		
<b>Sheet type</b> A		<b>Total sheets</b> 26		<b>Sheet no</b> 1	



	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

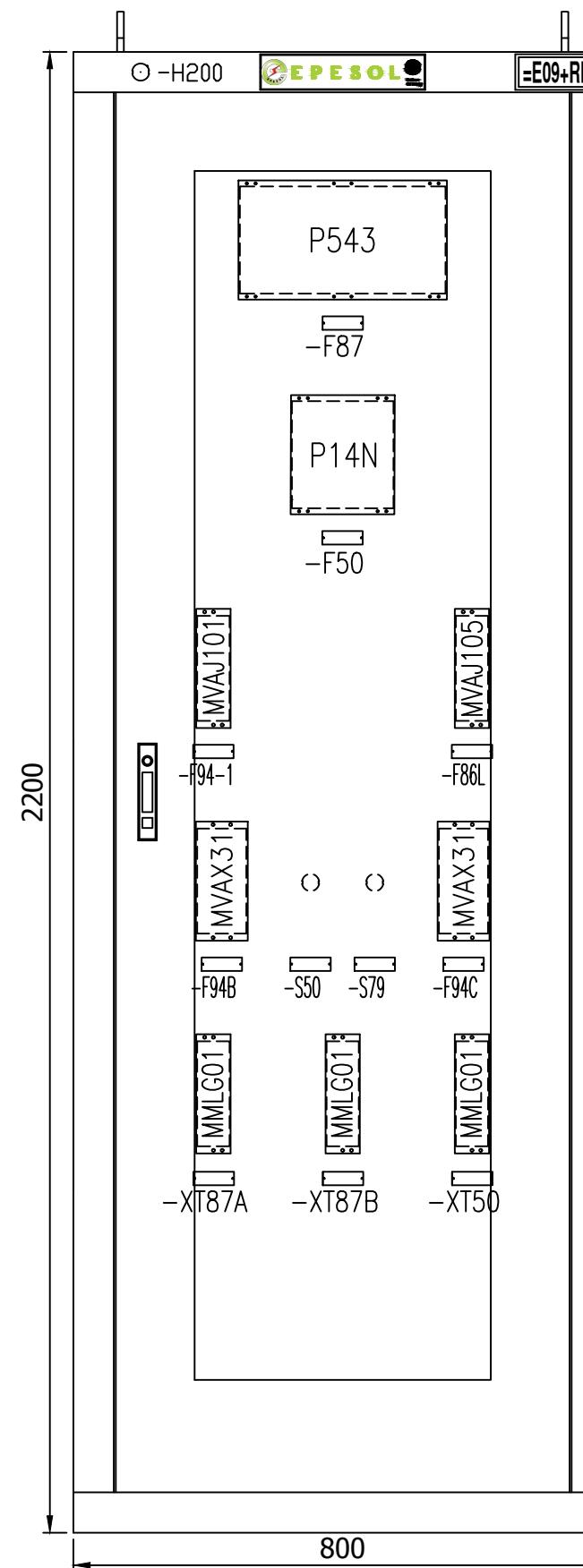
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0	AS BUILT	20-11-2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132KV LINE RELAY PANEL (=E09+RP3) SYMBOLA AND LEGENDS	Drawing no. P60194-E-ELR-SC-006
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AB

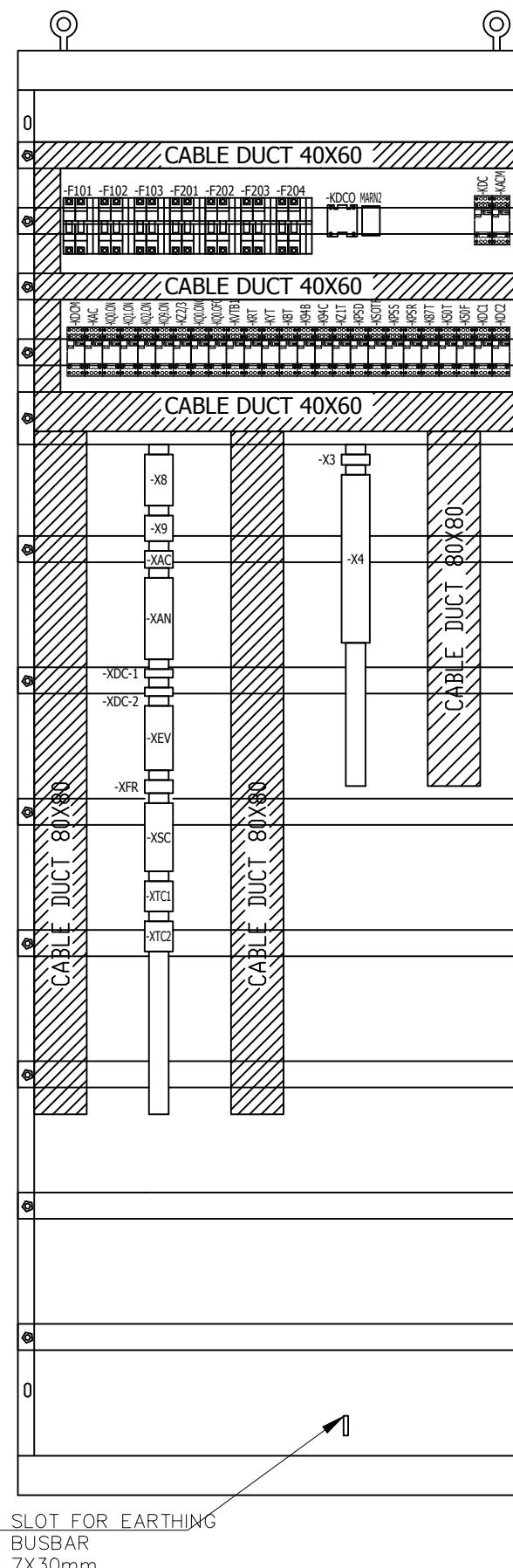
	1	2	3	4	5	6	7	8				
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER					
A	01	LINE DIFFERENTIAL PROTECTION RELAY		AGILE P543, Cortec: P543-91PC7M0820M Supply: 110-250VDC / 100-240VAC, VT + CT (100-120V:1/5A) Inputs 16 Opto 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				
H	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 GAZI ROAD, LAHORE	Title 132KV LINE RELAY PANEL (=E09+RP3) COMPONENT LIST	Drawing no. P60194-E-ELR-SC-006	
									Project no. P-60194			
	REV.	DESCRIPTION		DATE	DRAWER				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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0	AS BUILT		20.11.2018	ASJ	Manufacturer  <b>EPESOL</b> 7-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 (=E09+RP3) COMPONENT LIST	Drawing no. P60194-E-ELR-SC-006	
REV.	DESCRIPTION		DATE	DRAWER					Project no. P-60194	Sheet type AC1	Sheet no. 04a

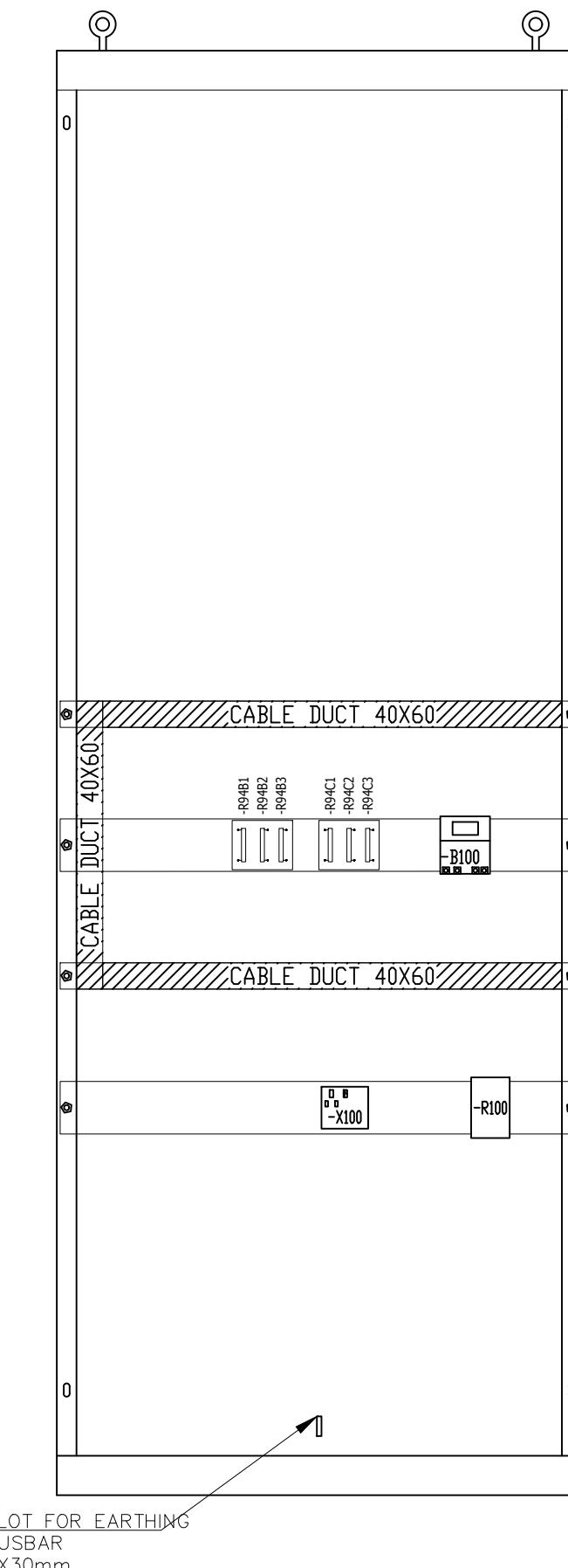
## FRONT VIEW WITH DOOR



LEFT SIDE VIEW



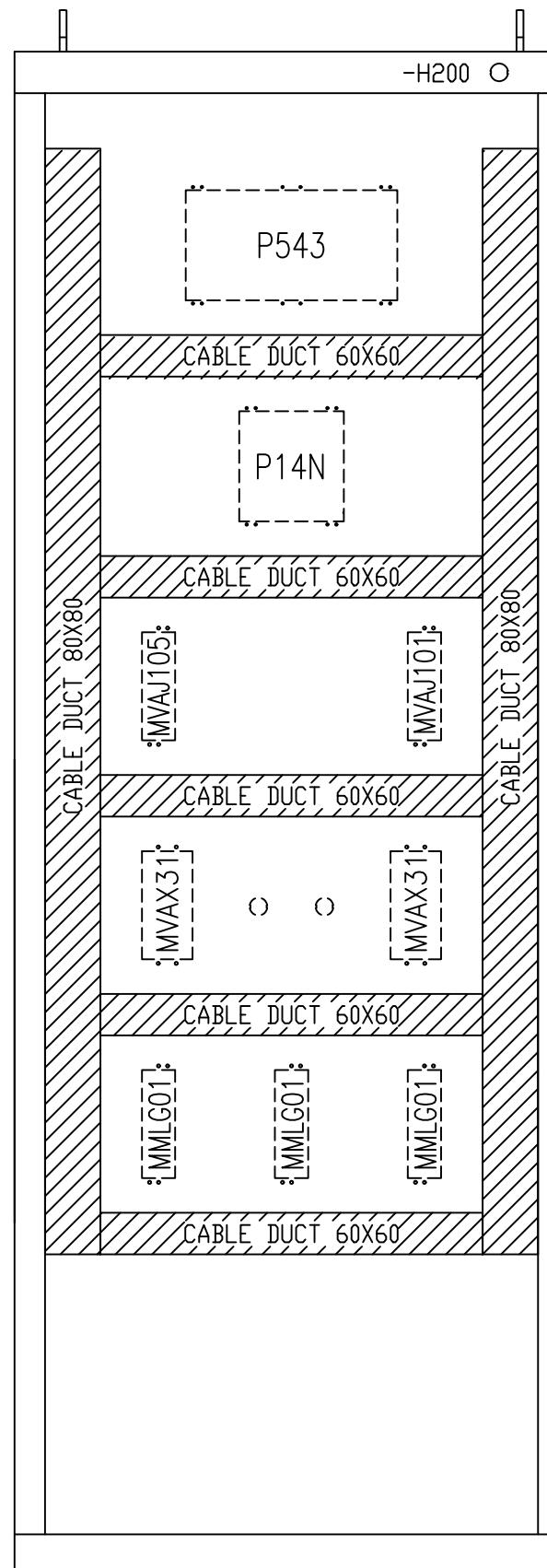
RIGHT SIDE VIEW



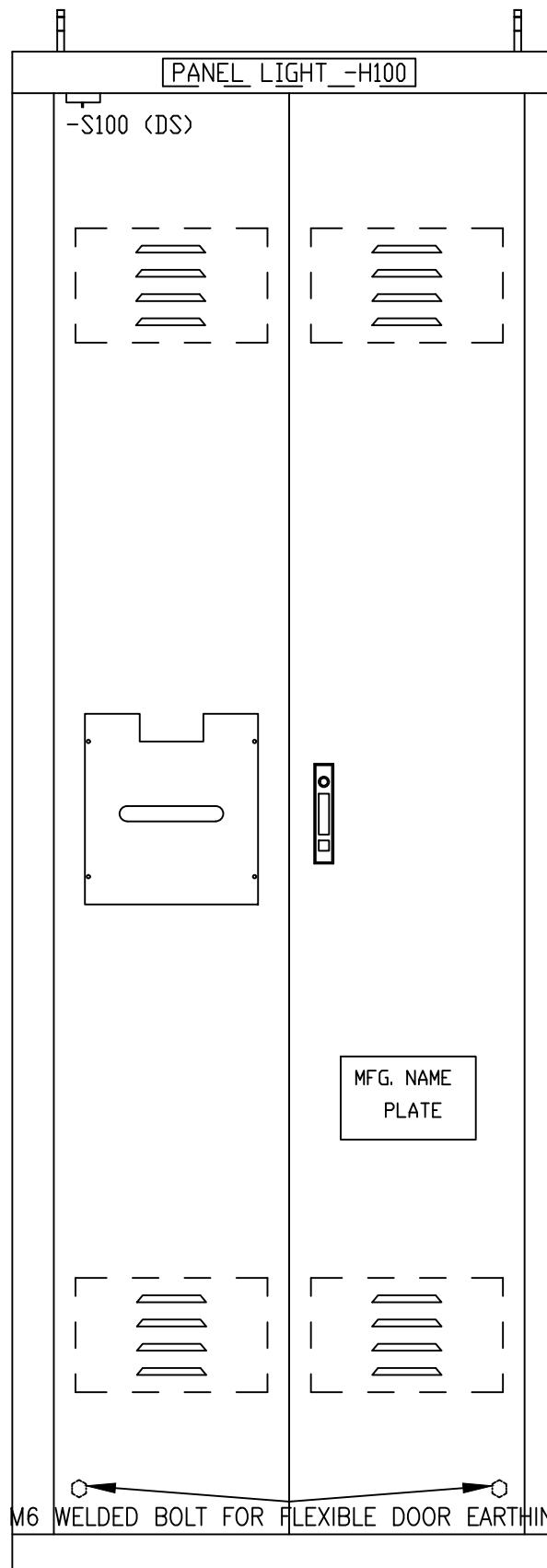
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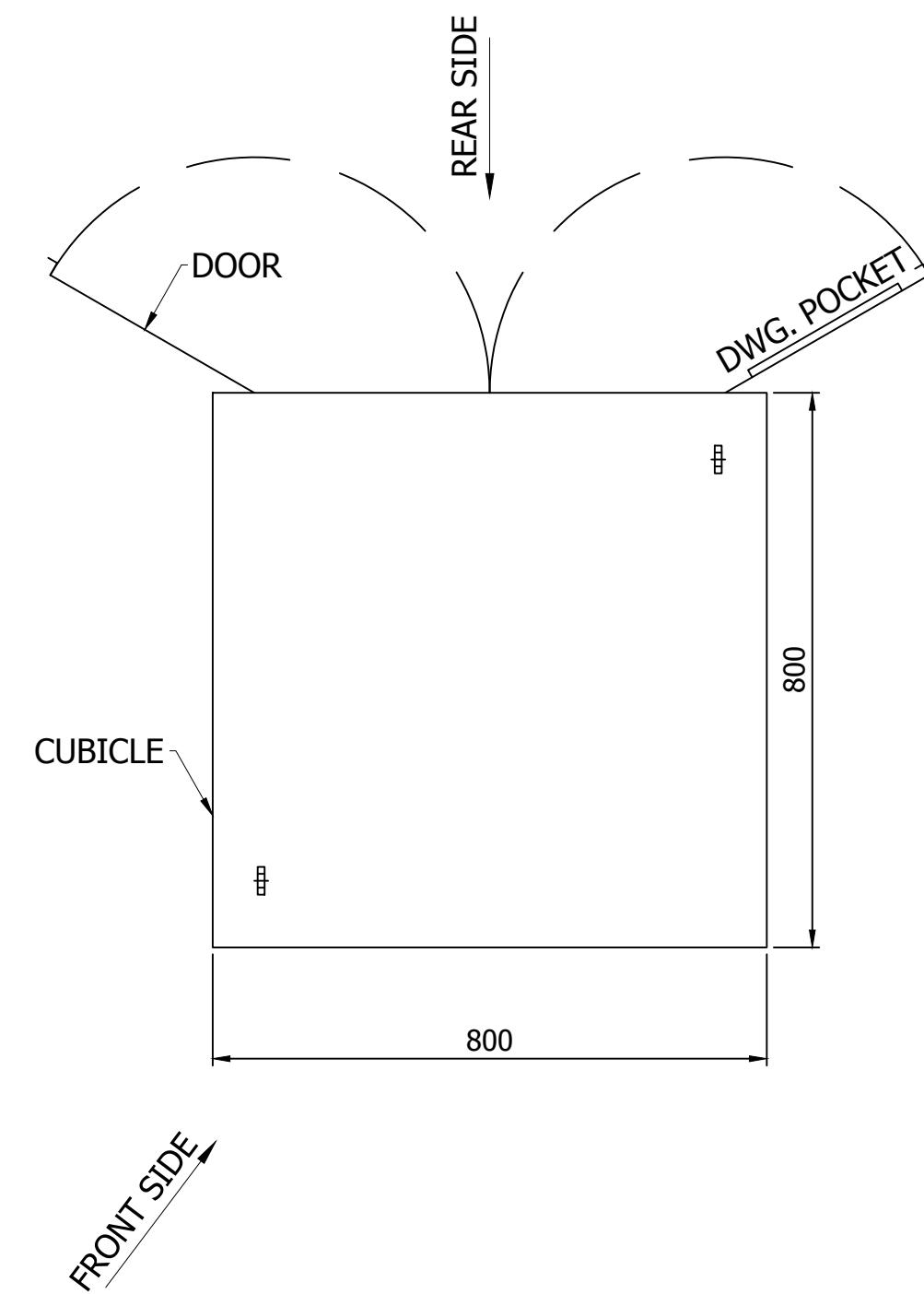
## BACK VIEW WITHOUT DOOR



## BACK VIEW WITH DOOR



TOP VIEW

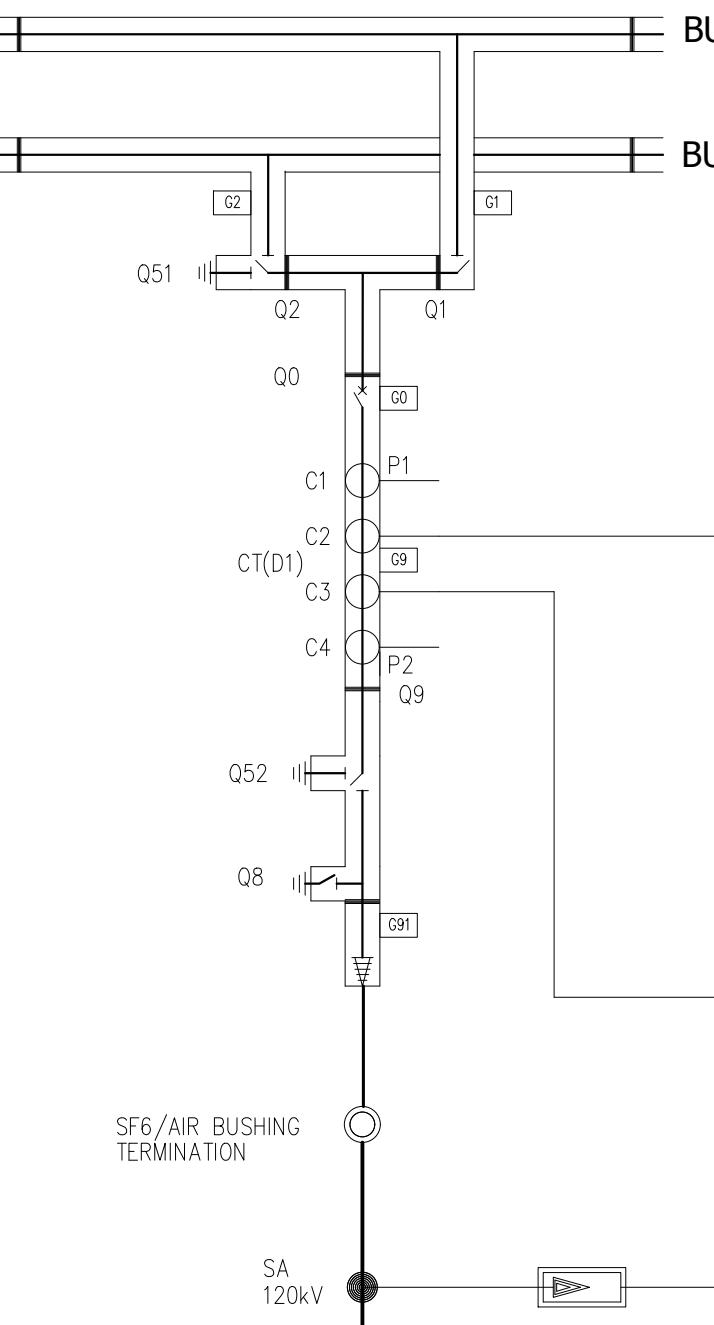


## **NOTE:-**

- 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.

0	AS BUILT	20.11.2018	ASJ	Manufacturer  <b>EPESOL</b> 7-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</b> (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E09+RP3) PANEL VIEW	Drawing no. P60194-E-ELR-SC-002		
									Project no. P-60194	Sheet type AD1	Sheet no. 05a
REV.	DESCRIPTION	DATE	DRAWER								

=E09



=E09+RP3  
132KV LINE RELAY PANEL

BUS VT

-XT87A -F87 -XT87B

-XT50 -F50

TRIP

ZONE-1 TRIP

ALL TRIPS EXCEPT ZONE-1

PERMISSIVE SIGNAL SEND

RECLOSING COMMAND

TRIP & LOCKOUT

TRIP CIRCUIT-1

TRIP CIRCUIT-2

CLOSE BLOCK CB

BLOCK AUTORECLOSER

BREAKER FAILURE INITIATION

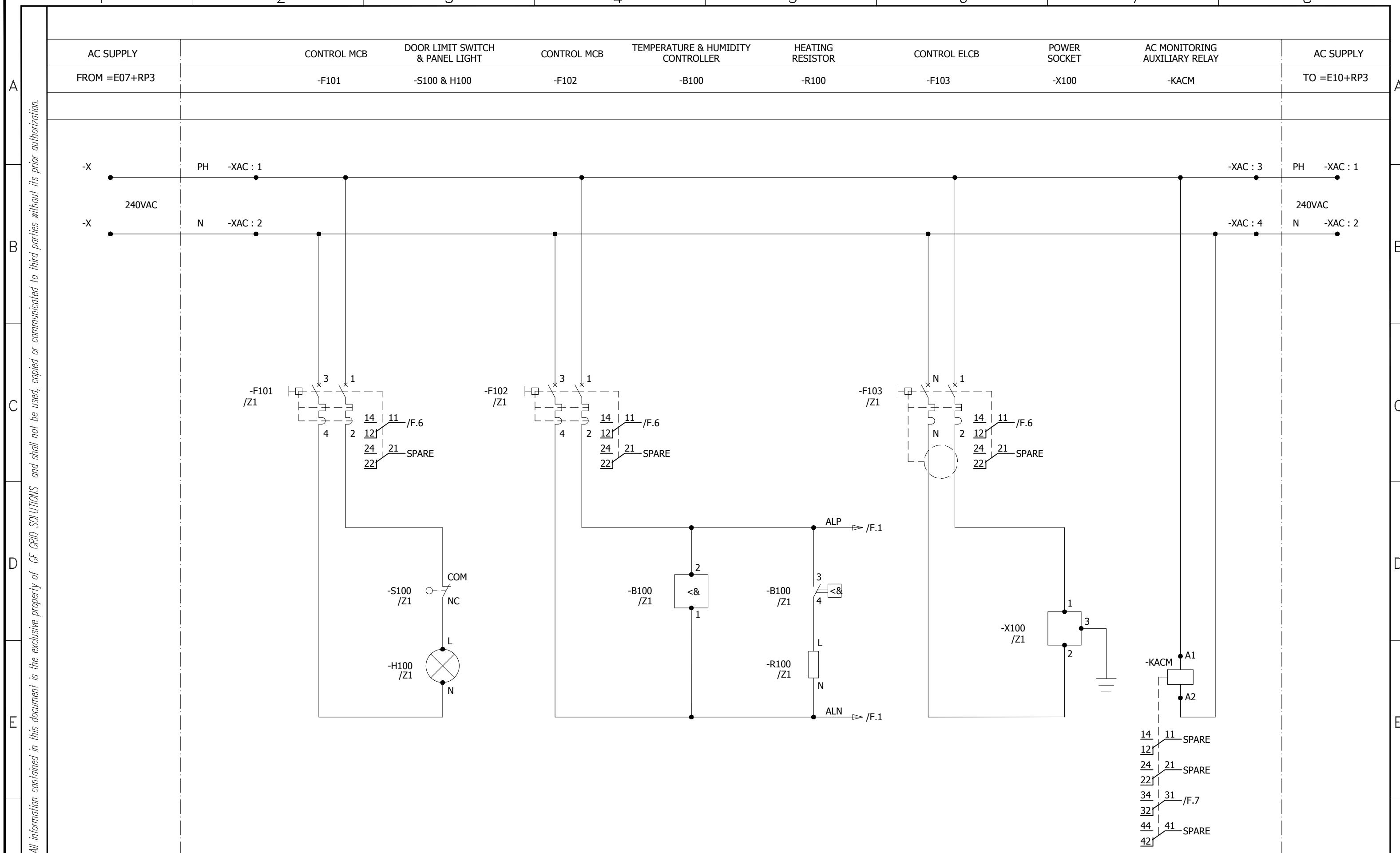
ANNUNCIATOR

EVENT RECORDER

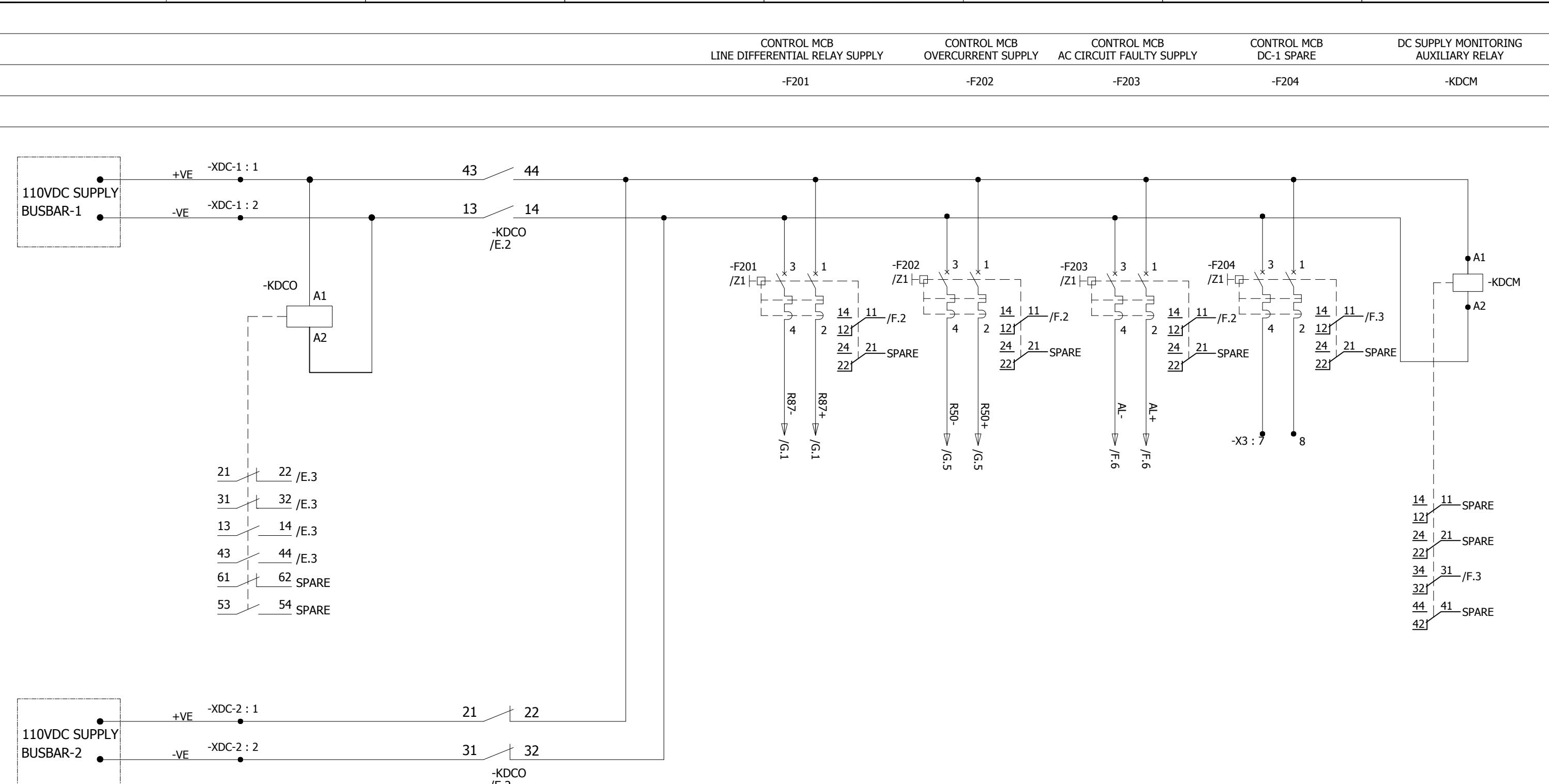
FAULT RECORDER

NTDC SCADA

0	AS BUILT	20-11-2018	ASJ	Manufacturer <b>E P E S O L</b> 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor <b>GE 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 (=E09+RP3) BAY CONCEPT & PROTECTION LOGICS	Drawing no. P60194-E-ELR-SC-006	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AE	Sheet no. 06



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 (=E09+RP3) AC SUPPLY DISTRIBUTION	Drawing no. P60194-E-ELR-SC-006
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type D



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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  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 (=E09+RP3) DC SUPPLY DISTRIBUTION	Drawing no.	
									P60194-E-ELR-SC-006	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type E	Sheet no. 08

110V DC CIRCUIT FAULTY

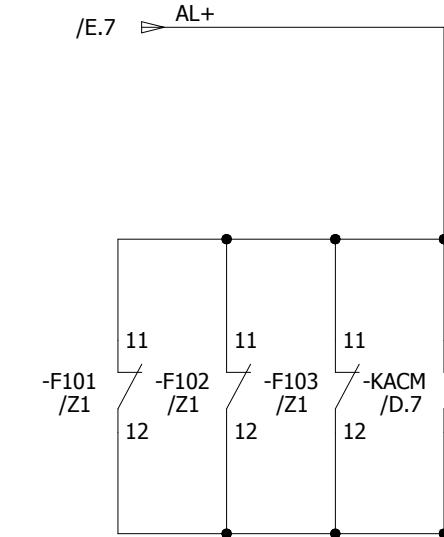
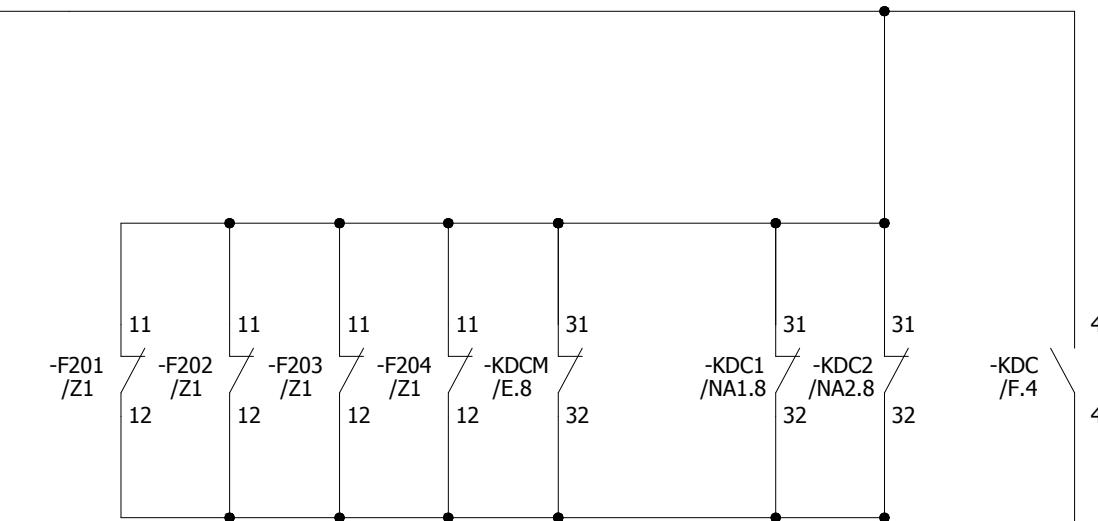
240V AC CIRCUIT FAULTY

-KDC

-KAC

/D.5 ➤ ALP

/E.7 ➤ AL+



/D.5 ➤ ALN

/E.7 ➤ AL-

14 11 /RA2.7  
12 21 /RA1.7  
24 22 /RA1.6  
34 32 /RA3.5  
32 41 /F.4  
44 42 SPARE

14 11 /RA2.7  
12 21 /RA1.6  
24 22 /RA1.6  
34 32 /RA3.5  
32 41 /F.4  
44 42 SPARE

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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 (=E09+RP3)  
AC/DC SUPPLY FAILURE CIRCUIT

Drawing no. P60194-E-ELR-SC-006

Project no. P-60194

Sheet type F

Sheet no. 09

1

2

3

4

5

6

7

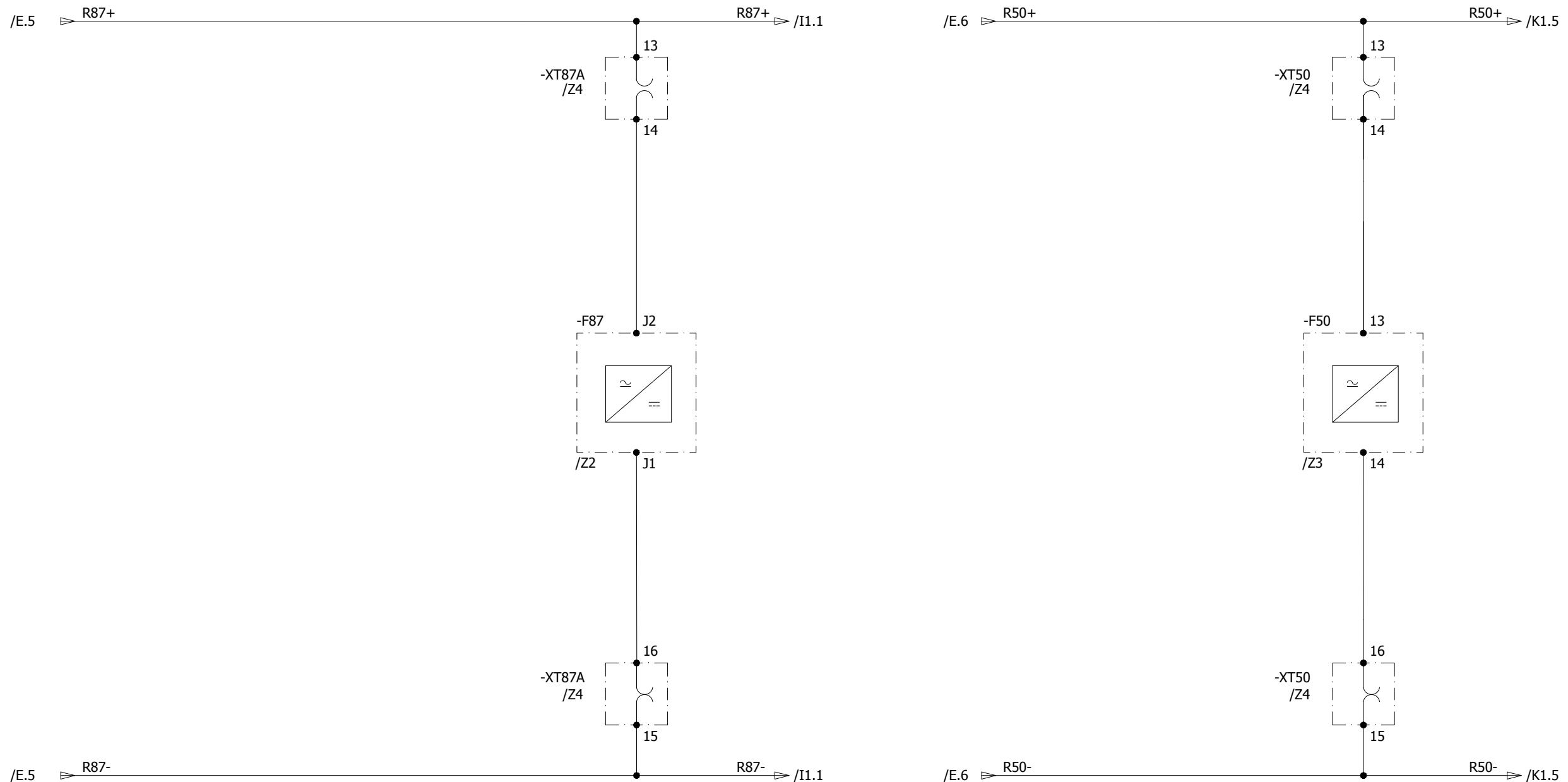
8

## LINE DIFFERENTIAL PROTECTION

## OVERCURRENT PROTECTION

## RELAY SUPPLY

## RELAY SUPPLY



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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 (=E09+RP3) RELAY POWER SUPPLY CIRCUIT	Drawing no. P60194-E-ELR-SC-006
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type G
									Sheet no. 10

1 2 3 4 5 6 7 8

TEST BLOCK

LINE DIFFERENTIAL PROTECTION  
RELAY

-XT87A

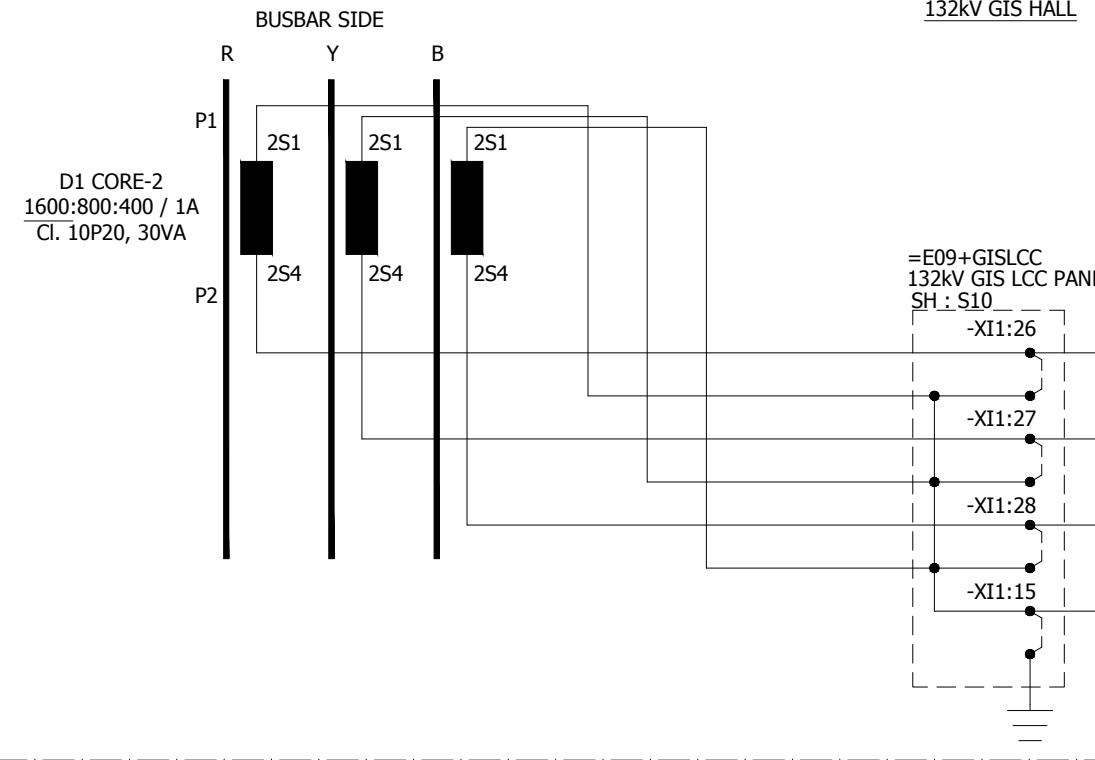
-F87

/Z4

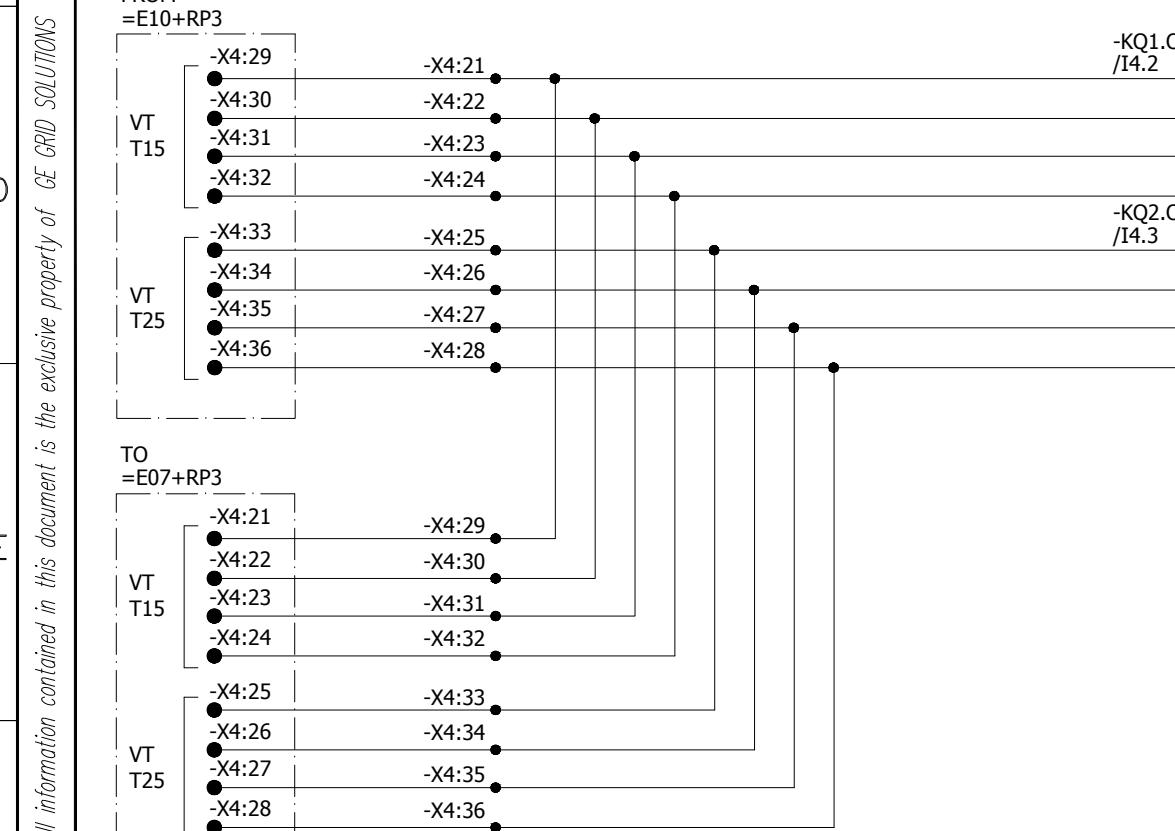
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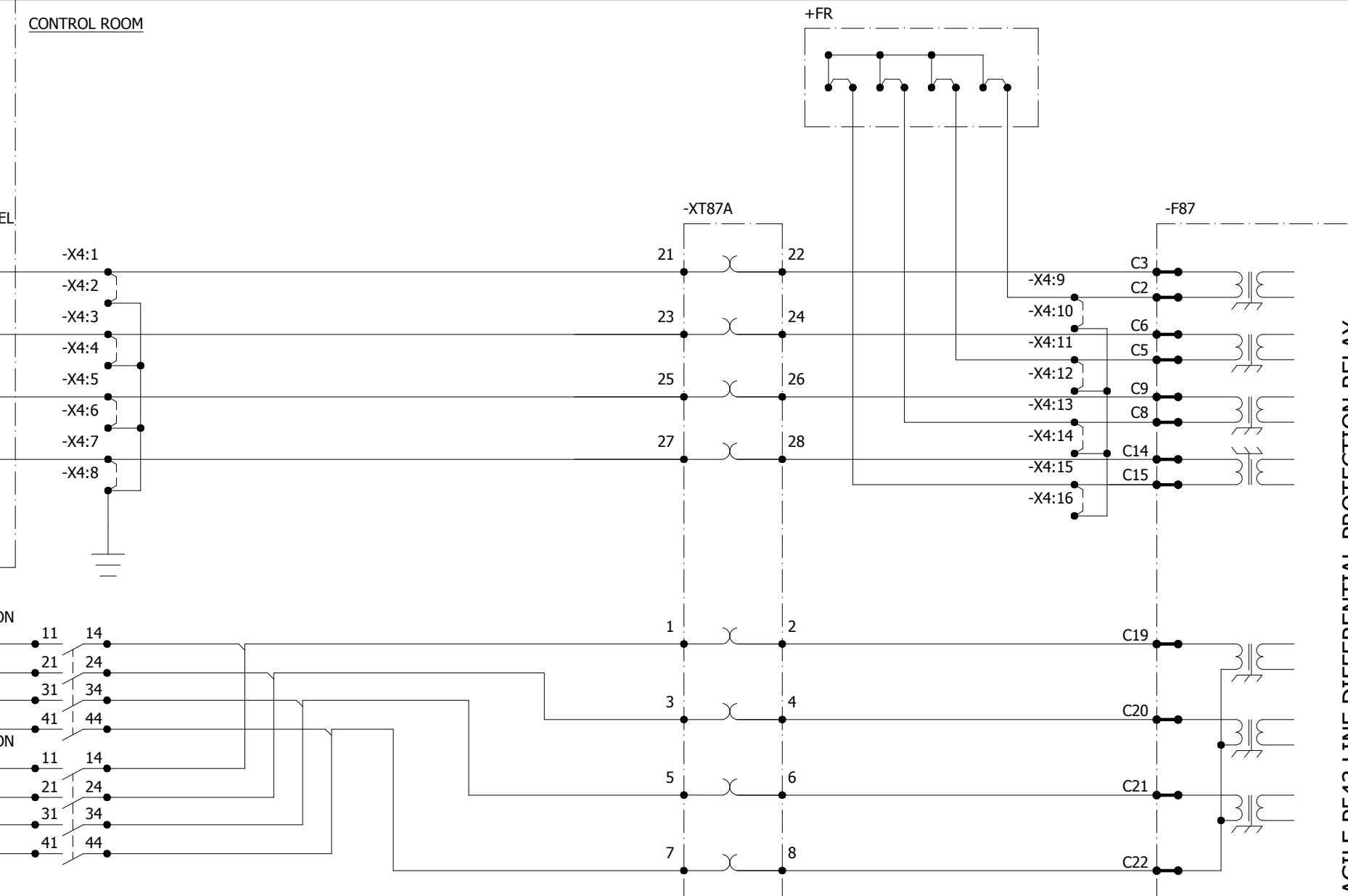
A



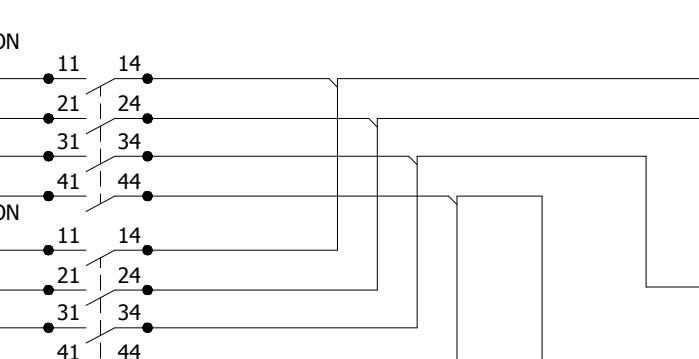
B



C



D



AGILE P543 LINE DIFFERENTIAL PROTECTION RELAY

0	AS BUILT	20-11-2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
				 <b>EPESOL</b> 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 (=E09+RP3) LINE DIFFERENTIAL PROTECTION CT/VT CIRCUIT	P60194-E-ELR-SC-006
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type H1 Sheet no. 11

1 2 3 4 5 6 7 8

TEST BLOCK

OVERCURRENT  
RELAY

-XT50

-F50

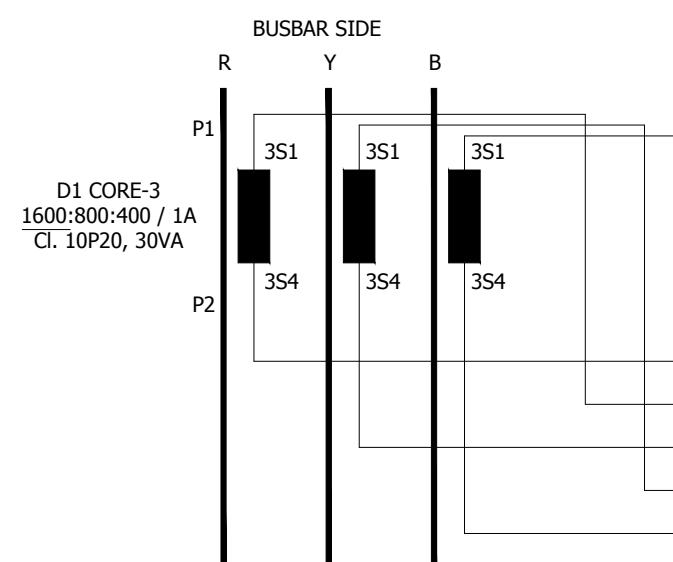
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/Z3

## 132kV GIS HALL

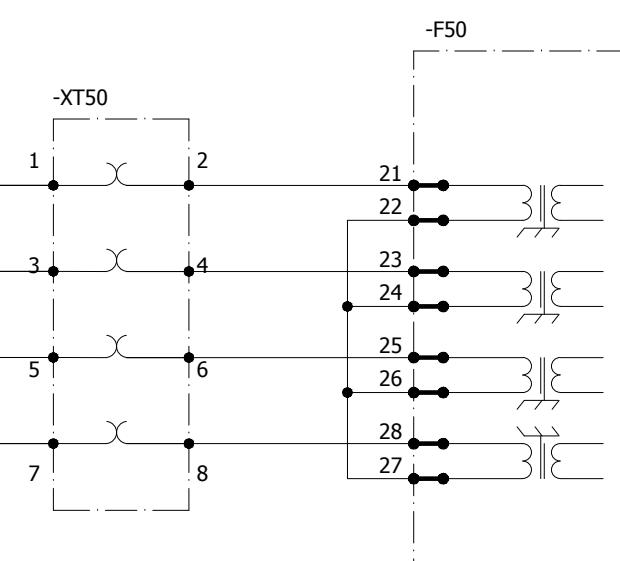
## CONTROL ROOM

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=E09+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

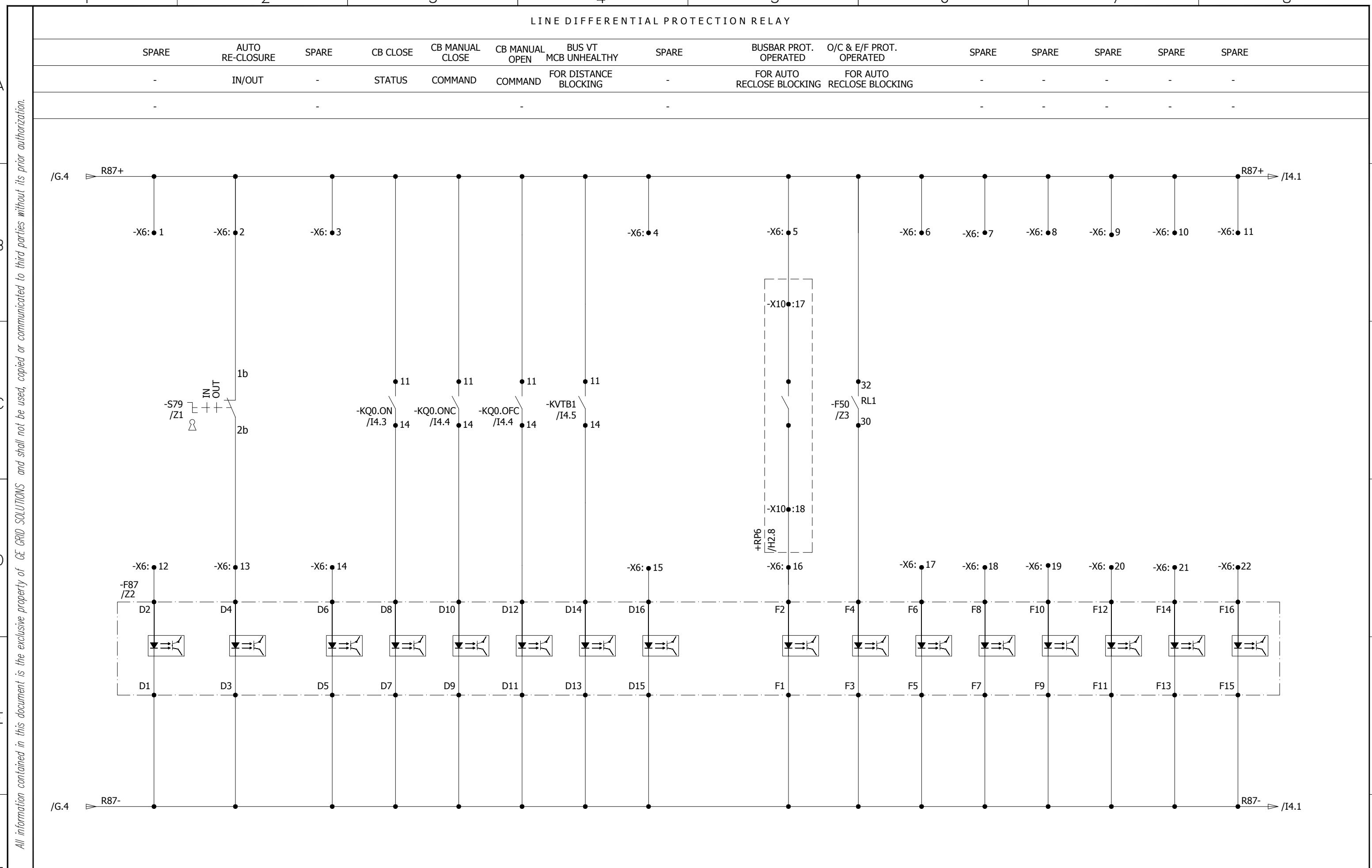
E

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 (=E09+RP3) O/C & E/F CT INPUTS	Drawing no. P60194-E-ELR-SC-005	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type H2	Sheet no. 12

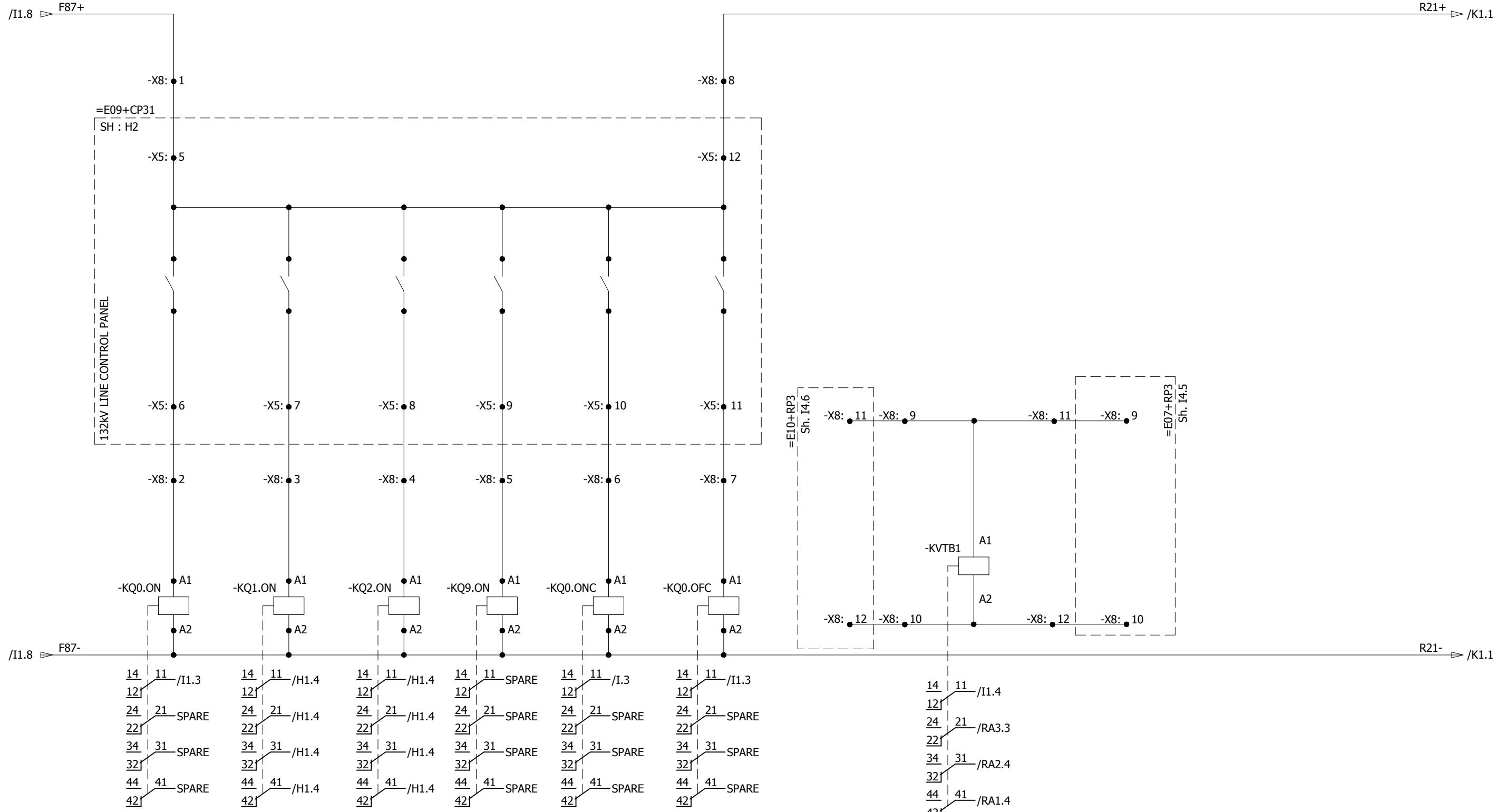
## LINE DIFFERENTIAL PROTECTION RELAY



0	AS BUILT		20-11-2018	ASJ	Manufacturer  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 (=E09+RP3) LINE DIFFERENTIAL RELAY INPUTS	Drawing no. P60194-E-ELR-SC-006		
REV.	DESCRIPTION		DATE	DRAWER								
1	2	3	4	5	6	7	8	1	2	3	4	5

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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
=E09+LCC	=E09+LCC	=E09+LCC	=E09+LCC	=E09+LCC	=E09+LCC	=E10+RP3

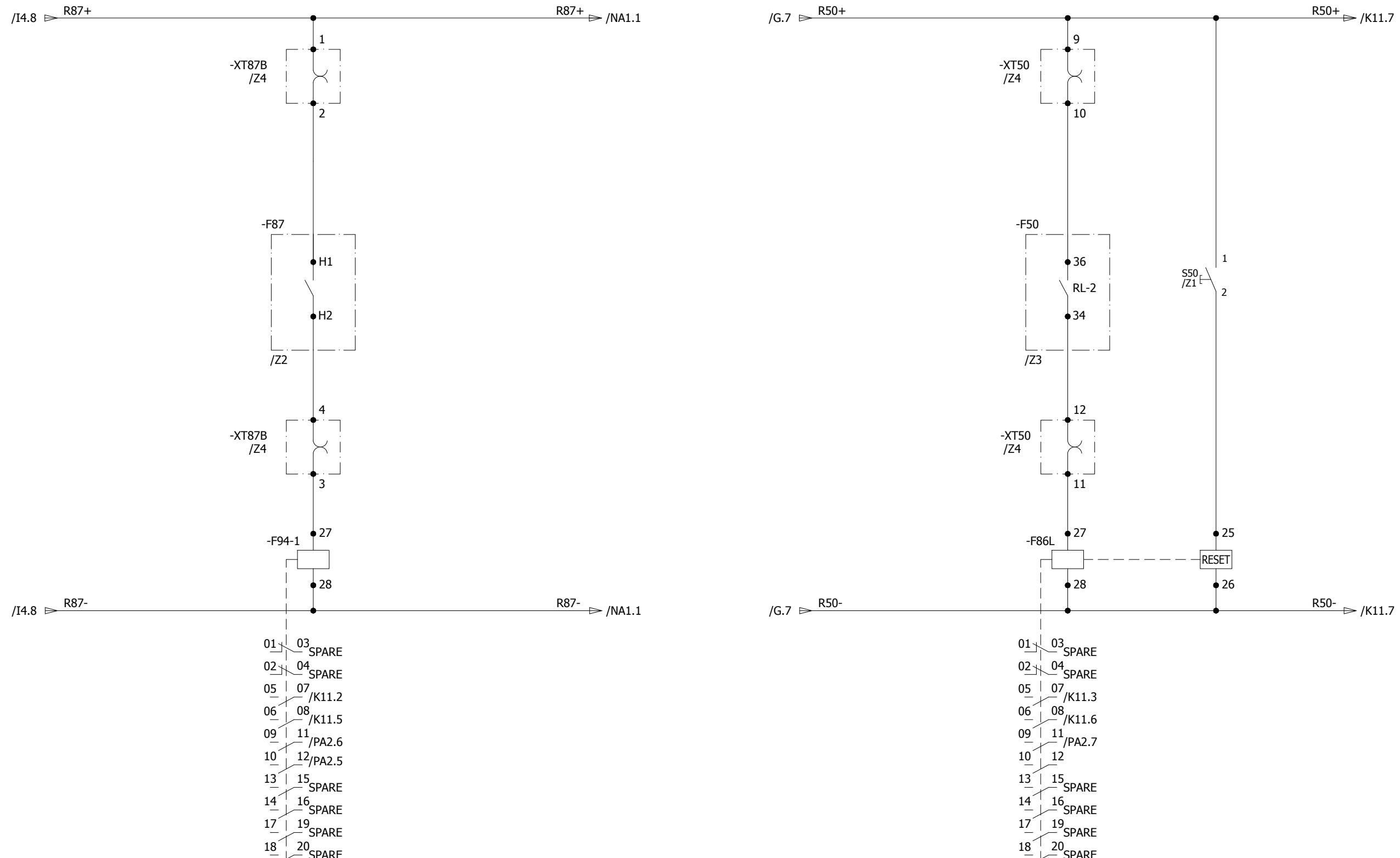


0	AS BUILT	20-11-2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E09+RP3) SYSTEM INPUTS	Drawing no. P60194-E-ELR-SC-006		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type I4	Sheet no. 14
1	2	3	4	5	6	7	8				

## LINE DIFFERENTIAL PROTECTION GENERAL TRIP

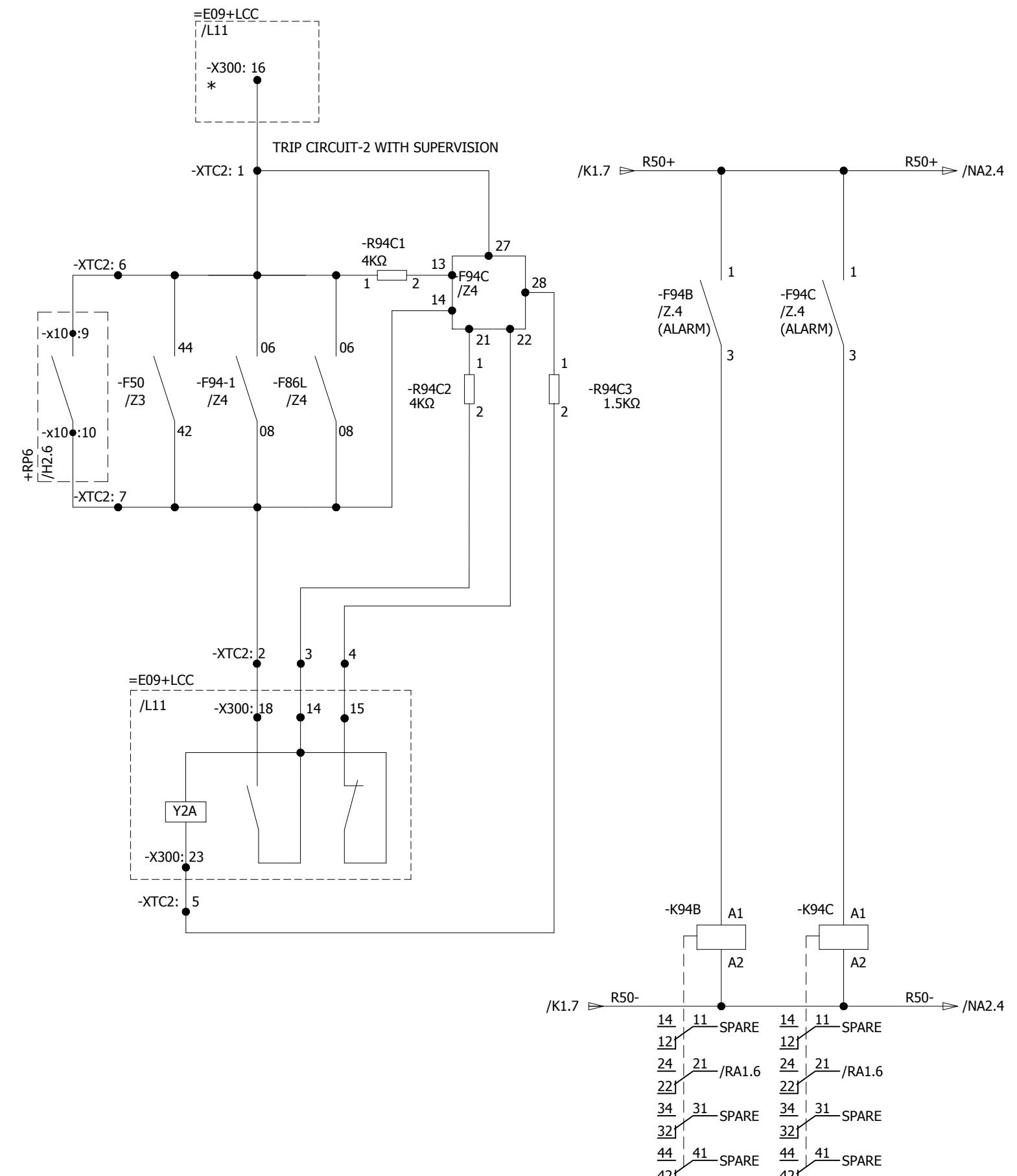
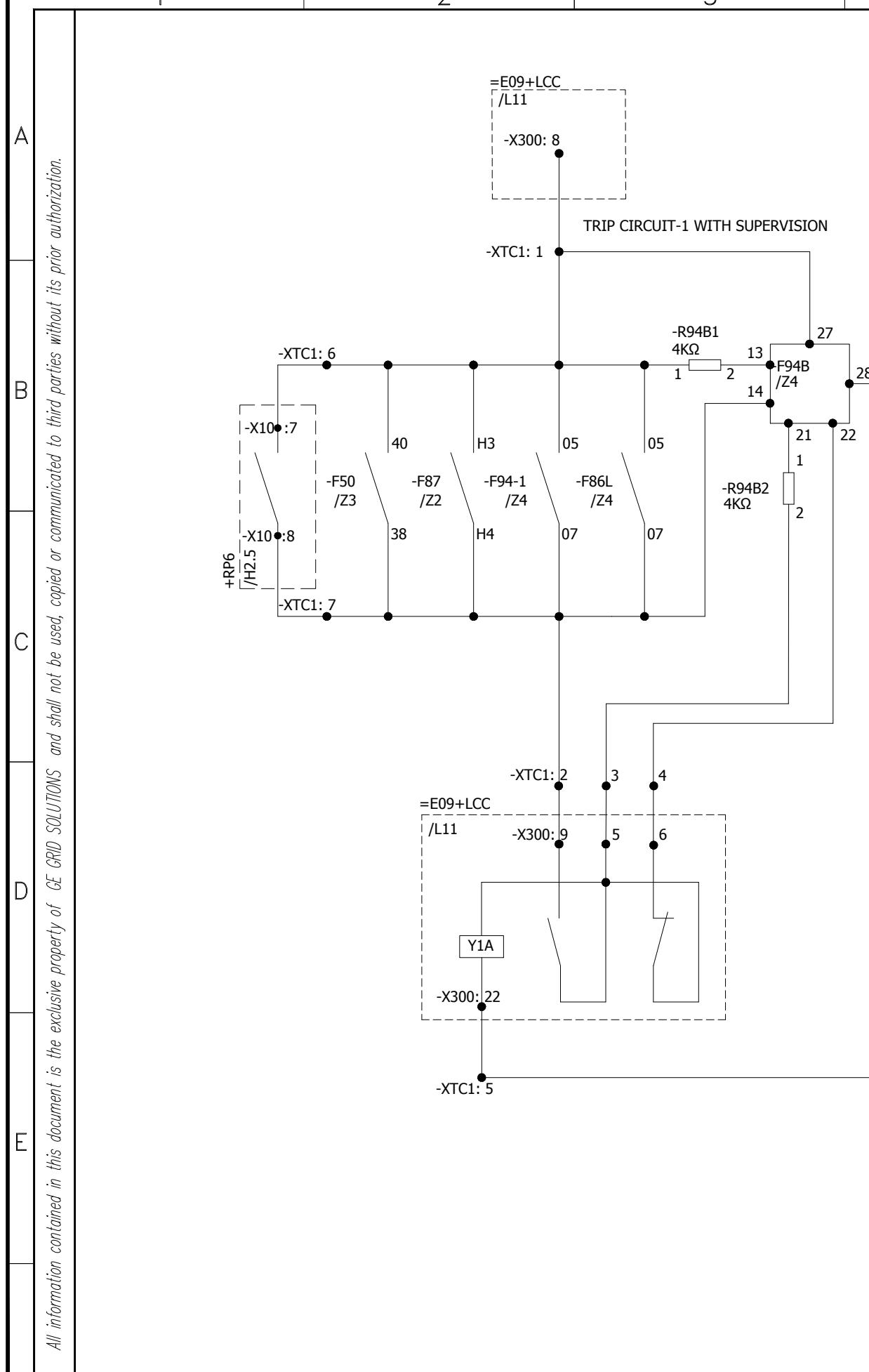
O/C &amp; E/F PROTECTION TRIP    TRIP RELAY RESET

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0	AS BUILT	20-11-2018	ASJ	Manufacturer  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 (=E09+RP3) PROTECTION TRIPS	Drawing no. P60194-E-ELR-SC-006
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type K1
									Sheet no. 15

1 2 3 4 5 6 7 8

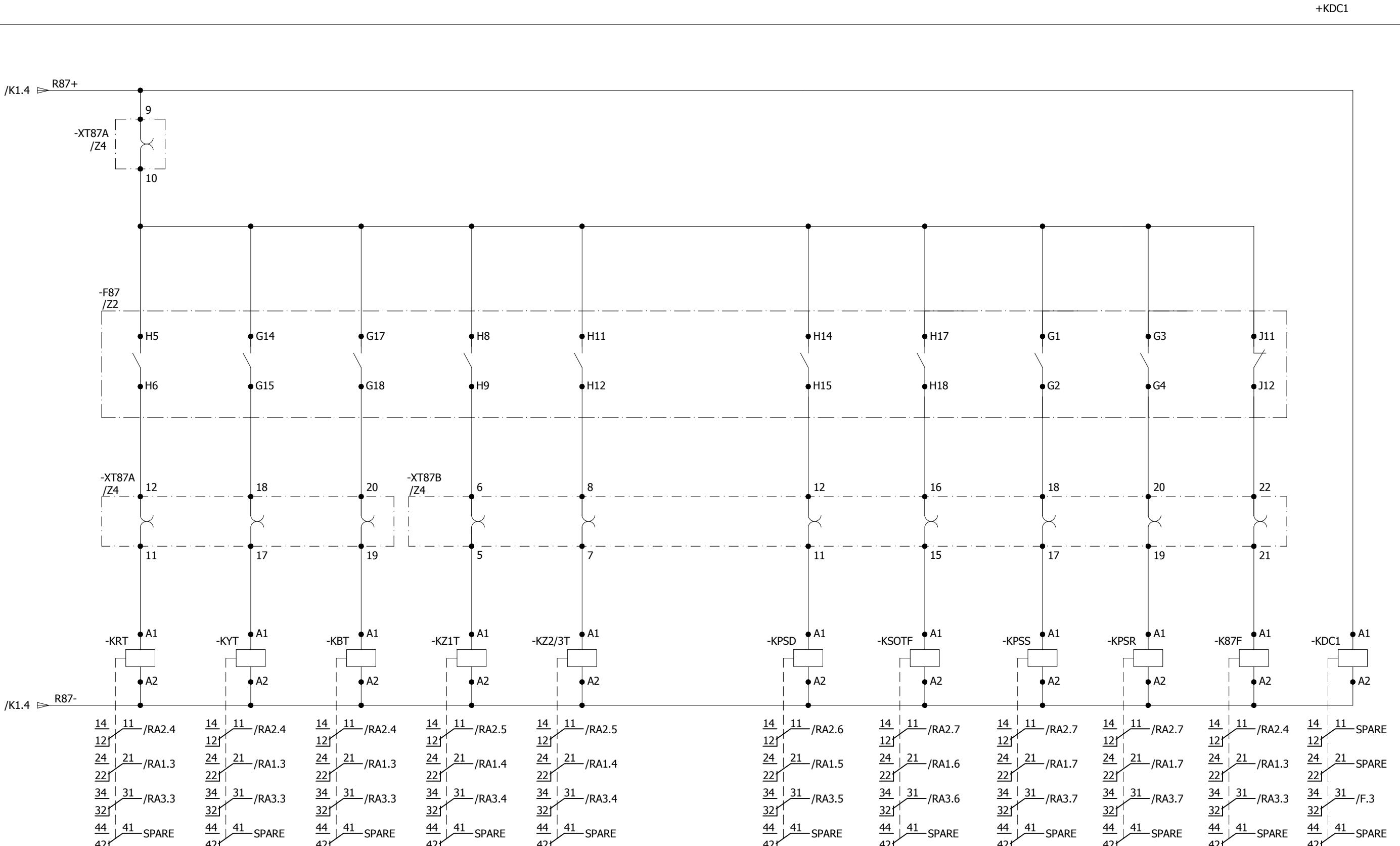


0	AS BUILT	20-11-2018	ASJ	Manufacturer <b>EPE SOL</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor <b>Grid Solutions</b> A GE and Alstom joint venture	Client <b>NATIONAL TRANSMISSION &amp; DISPATCH COMPANY LIMITED (NTDC-WAPDA)</b>	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132KV LINE RELAY PANEL (=E09+RP3) TRIP CIRCUIT SUPERVISION CIRCUIT	Drawing no. P60194-E-ELR-SC-006
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type K11
									Sheet no. 16

## 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
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+KDC1



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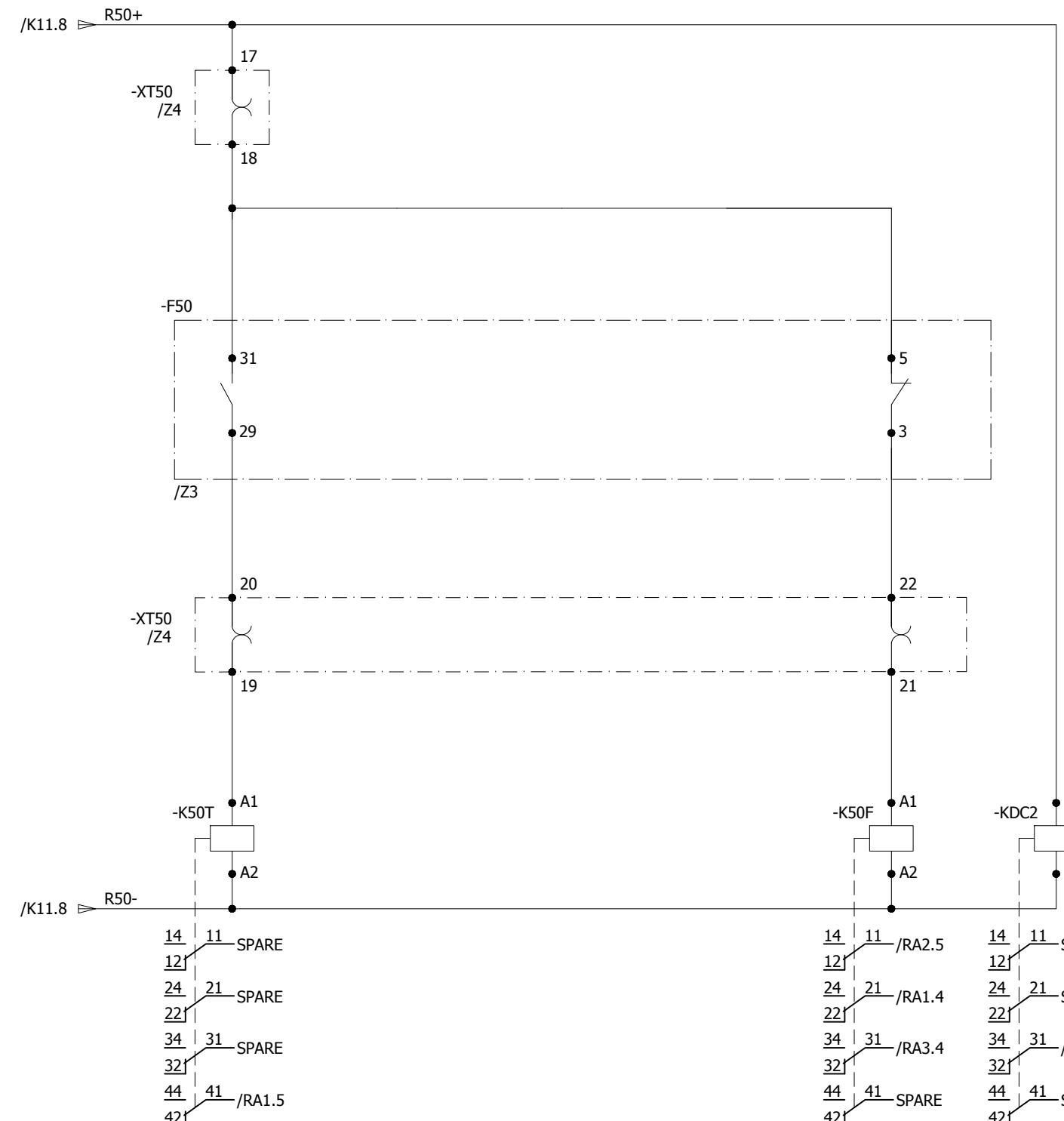
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type NA1
									Sheet no. 17

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 (=E09+RP3) SYSTEM ALARMS	Drawing no. P60194-E-ELR-SC-006		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type NA2	Sheet no. 18

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A

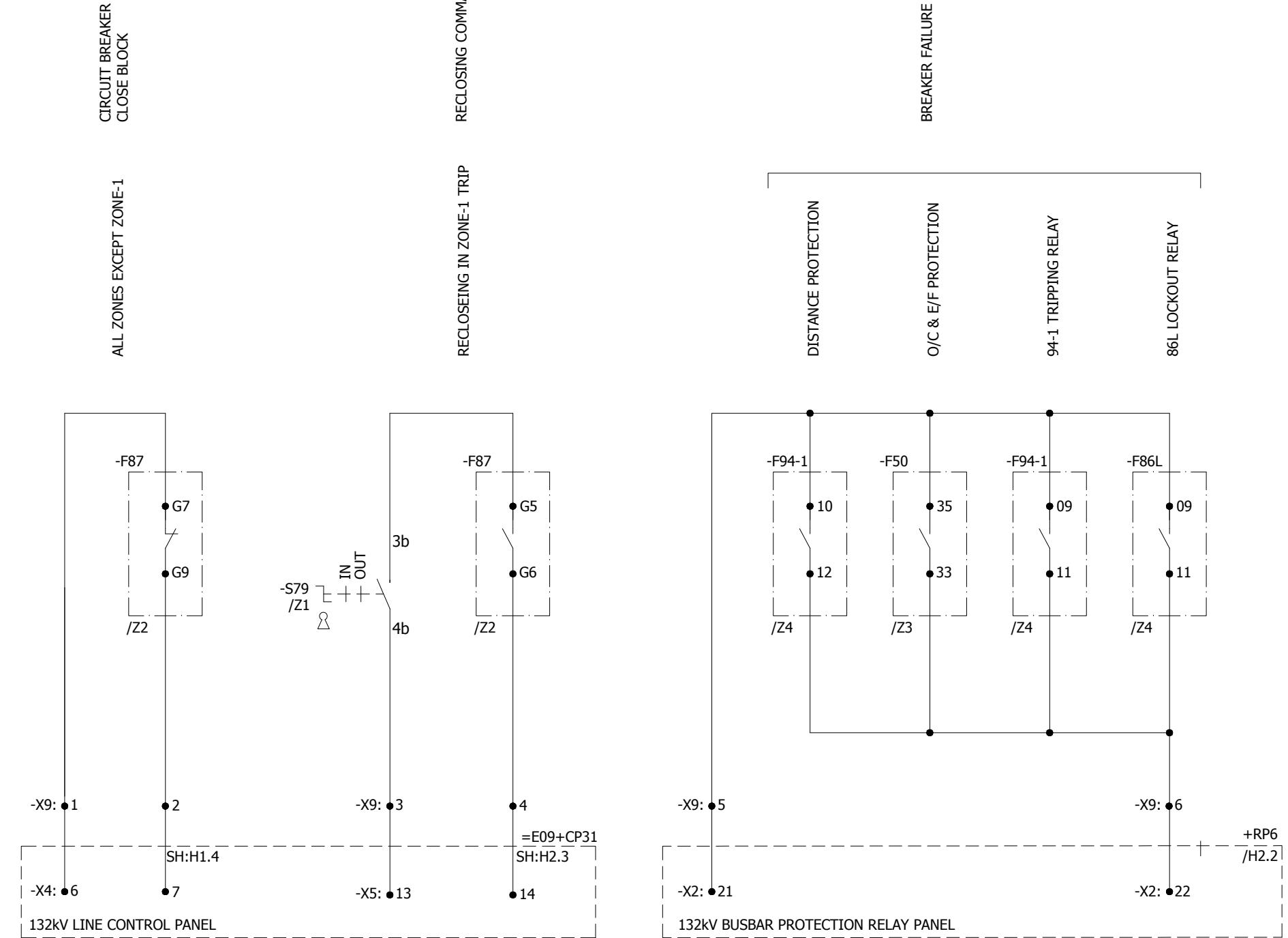
B

C

D

E

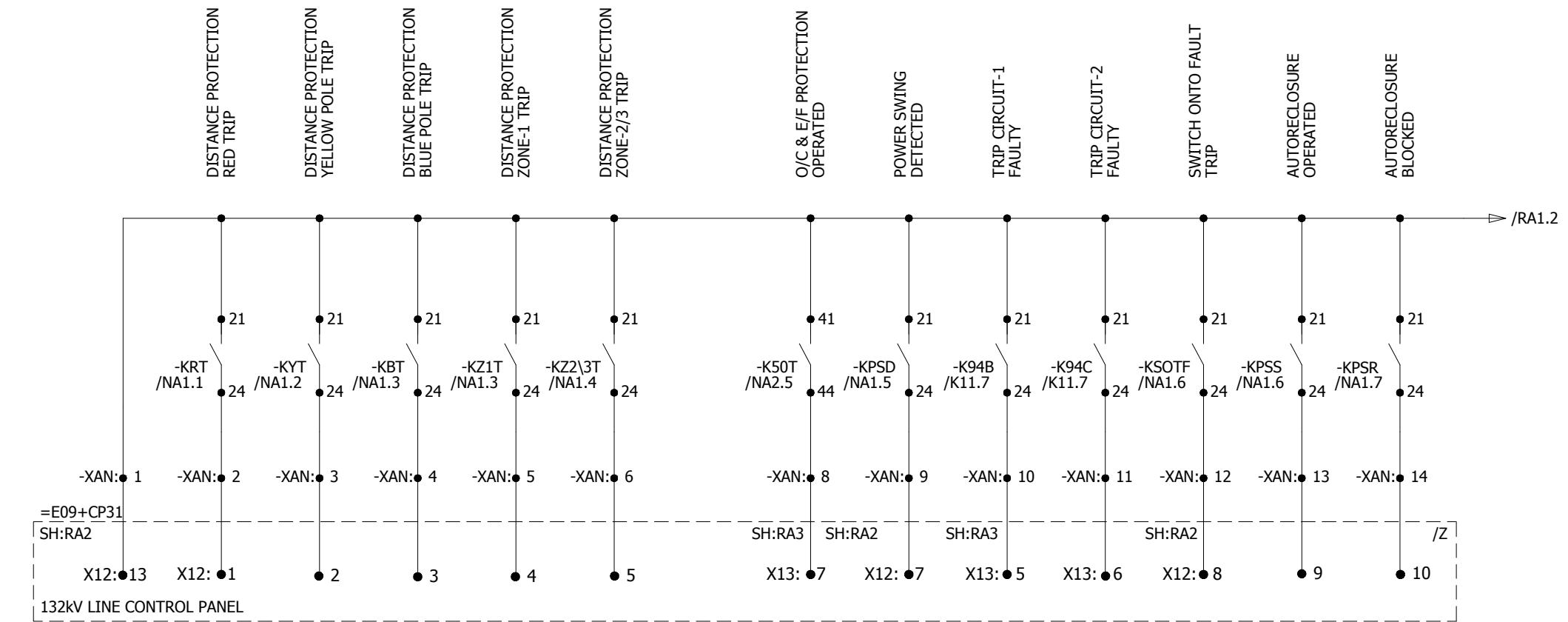
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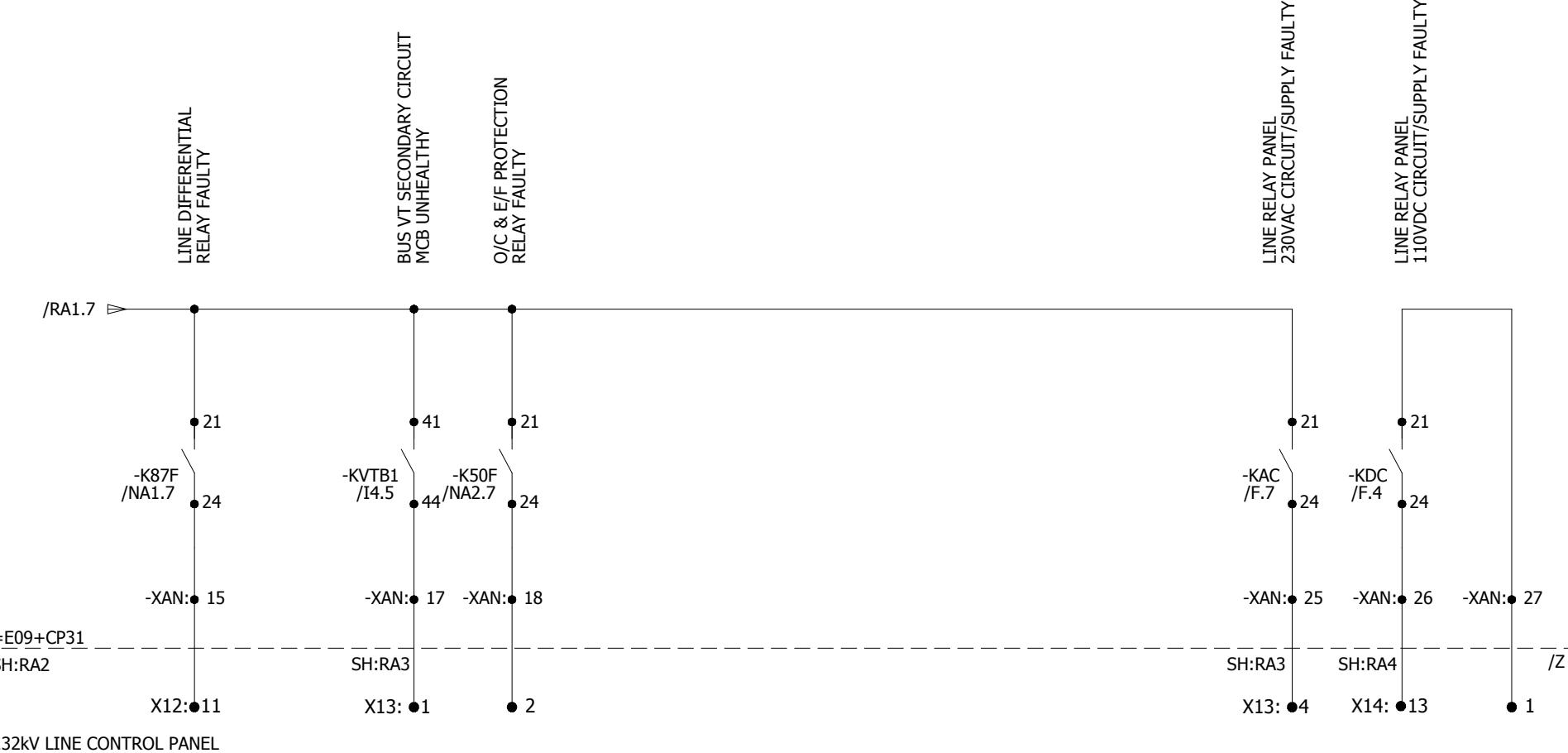
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type PA2	Sheet no. 19
1		2	3	4	5	6	7	8			

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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 (=E09+RP3) ANNUNCIATION CIRCUIT	Drawing no. P60194-E-ELR-SC-006		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type RA1	Sheet no. 20
1		2	3								

1

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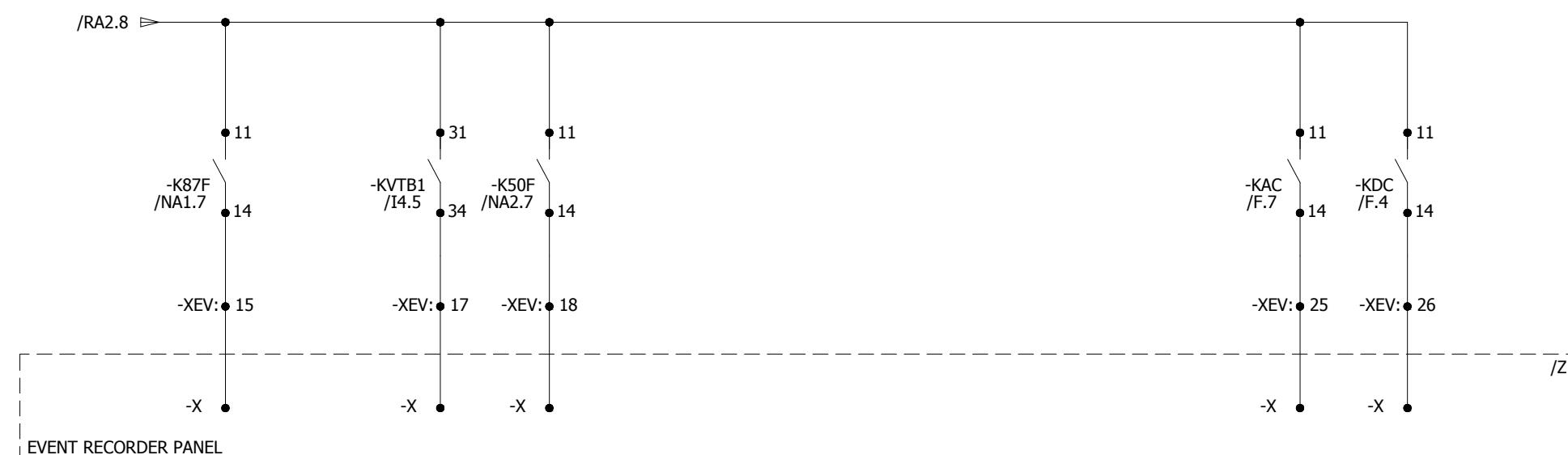
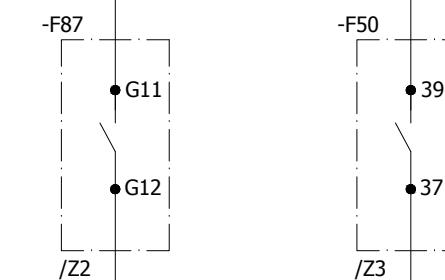
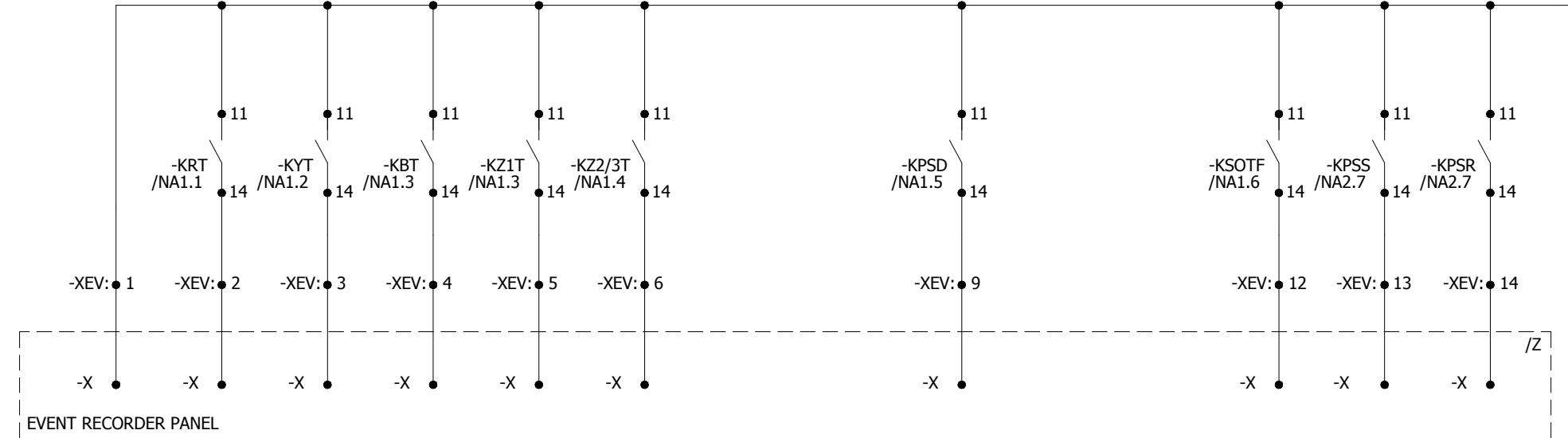
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REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type RA2	Sheet no. 21

DISTANCE PROTECTION  
GENERAL TRIPO/C & E/F PROTECTION  
TRIP

DISTANCE PROTECTION  
RED TRIP  
DISTANCE PROTECTION  
YELLOW POLE TRIP  
DISTANCE PROTECTION  
BLUE POLE TRIP  
DISTANCE PROTECTION  
ZONE-1 TRIP  
DISTANCE PROTECTION  
ZONE-2/3 TRIP

POWER SWING  
DETECTED

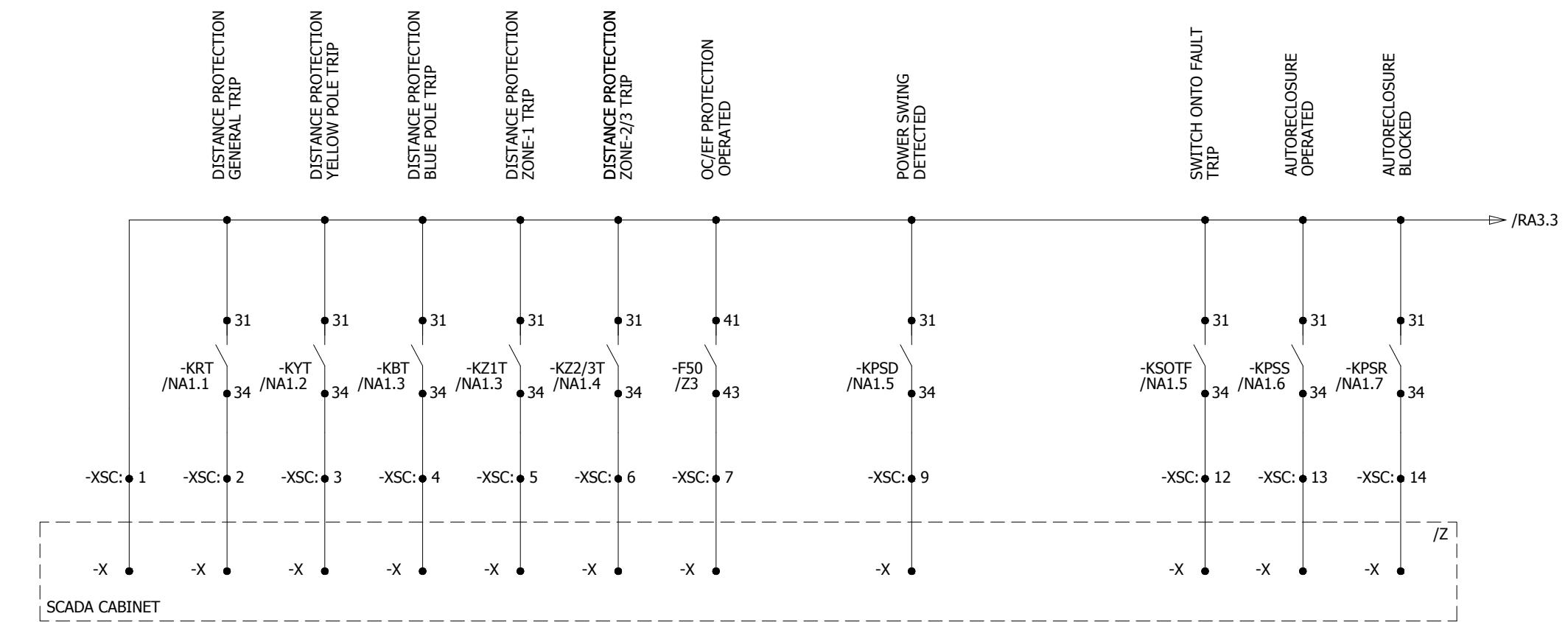
SWITCH ONTO FAULT  
TRIP  
AUTORECLOSURE  
OPERATED  
AUTORECLOSURE  
BLOCKED



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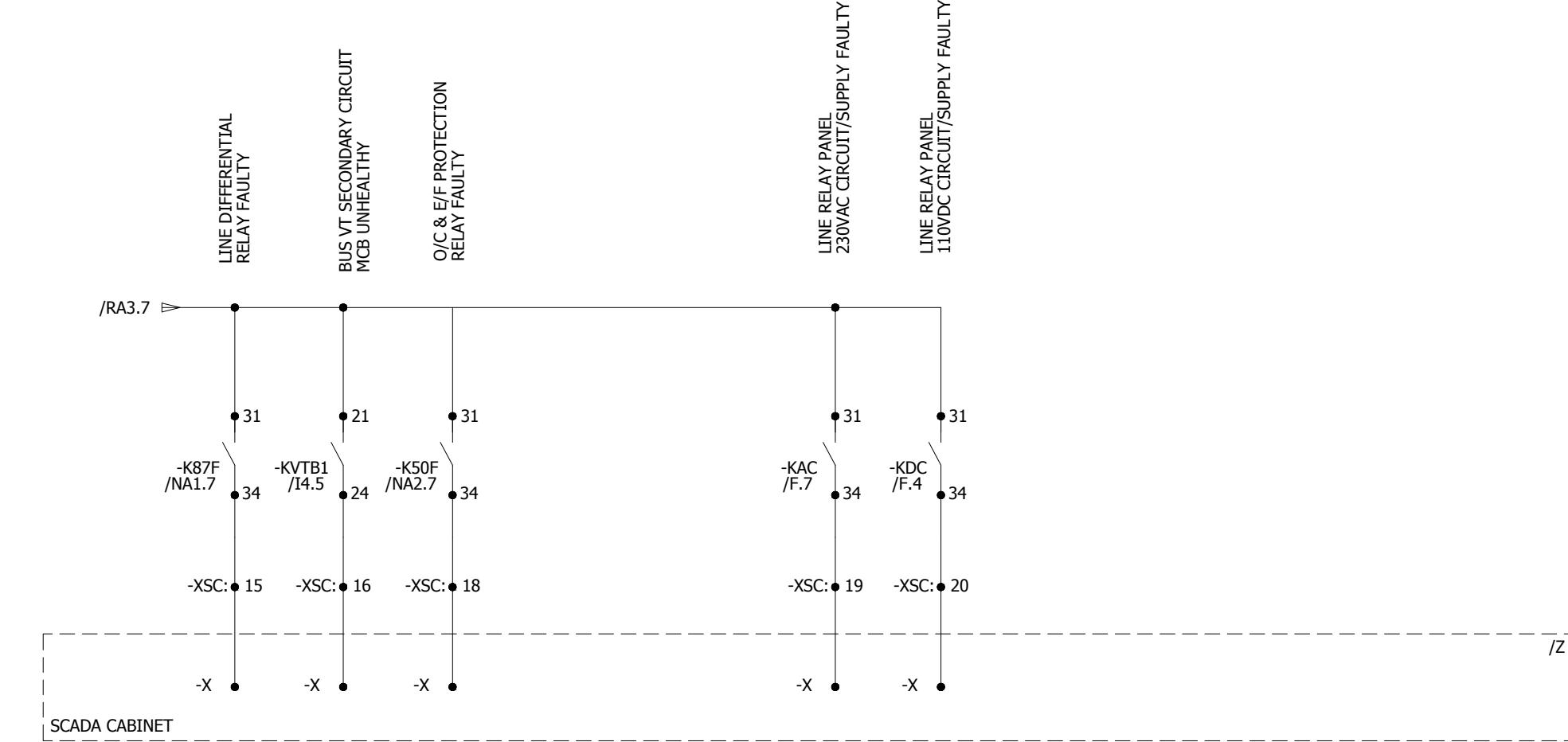
A

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E

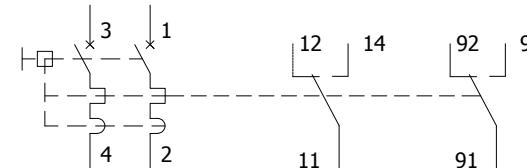
E

F

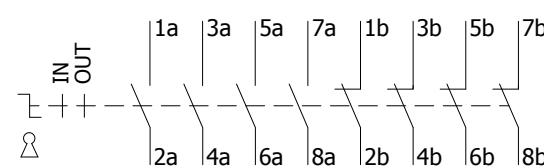
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0	AS BUILT	20-11-2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E09+RP3) SCADA CIRCUIT	Drawing no. P60194-E-ELR-SC-006
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194

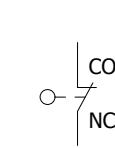
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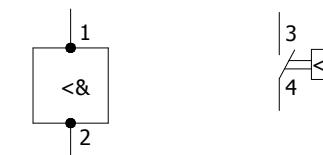
-F101	D.2	F.6	
-F102	D.4	F.6	
-F103	D.6	F.6	
-F201	E.5	F.2	
-F202	E.5	F.2	
-F203	E.6	F.2	
-F204	E.7	F.3	



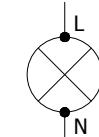
-S79 I1.2 PA2.4



-S100 D.3



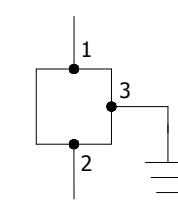
-B100 D.4 D.5



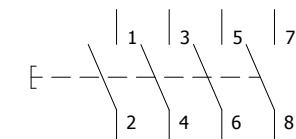
-H100	D.3
-H200	F.4



-R100 D.5



-X100 D.7



-S50 K1.7

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-F101	D.2	F.6	
-F102	D.4	F.6	
-F103	D.6	F.6	
-F201	E.5	F.2	
-F202	E.5	F.2	
-F203	E.6	F.2	
-F204	E.7	F.3	

-S79			I1.2	PA2.4	
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-S100	D.3	
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-B100	D.4	D.5
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-H100	D.3	
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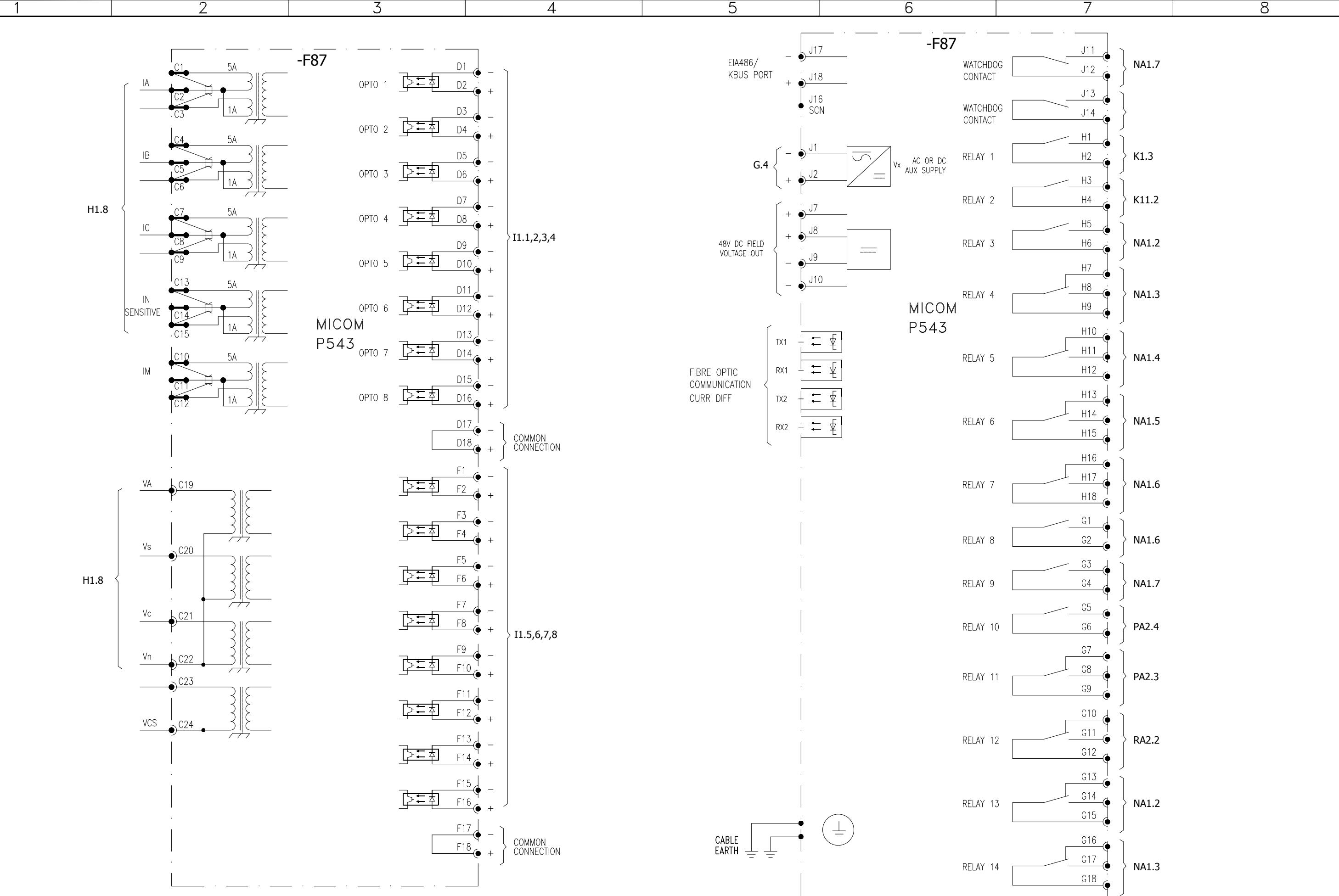
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-X100	D.7	
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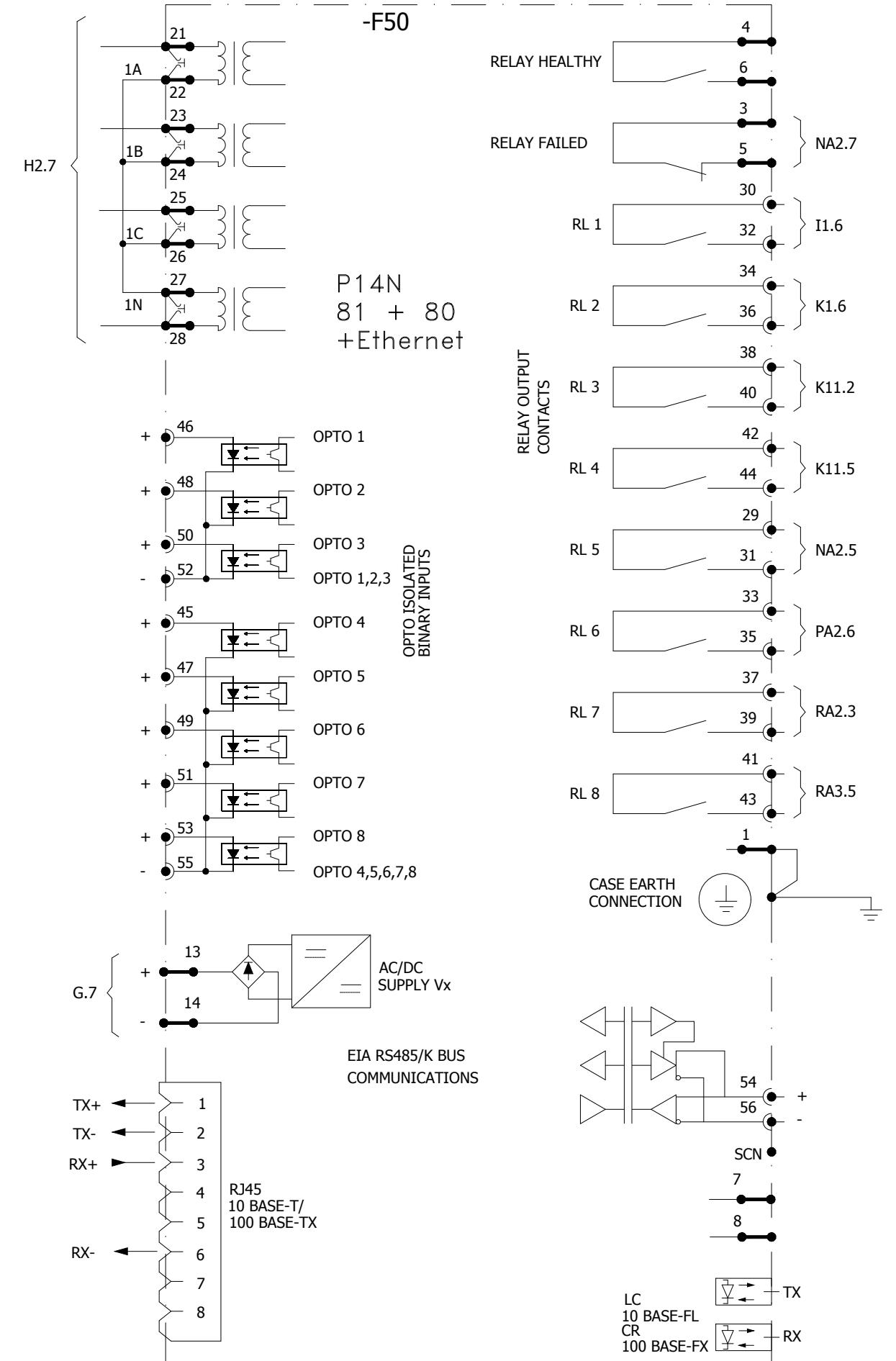
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0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE RELAY PANEL (=E09+RP3) COMPONENT DIAGRAM	Drawing no. P60194-E-ELR-SC-002
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REV.	DESCRIPTION	DATE	DRAWER	Project no. P-60194	Sheet type Z1	Sheet no. 23
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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 (=E09+RP3) COMPONENT DIAGRAM	Drawing no. P60194-E-ELR-SC-002		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type Z2	Sheet no. 24



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 (=E09+RP3) COMPONENT DIAGRAM	Drawing no. P60194-E-ELR-SC-002
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type Z3
									Sheet no. 25

