



Grid Solutions
A GE and Alstom joint venture

220kV/132kV GIS SUBSTATION GHAZI ROAD , LAHORE

132/11kV TRAFO. 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	
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	18.08.2018	MUR	ABA	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	132/11kV TRAFO. RELAY PANEL (=E02+RP4) SCHEMATIC DRAWINGS					
Order no	P-60194		Document no	P60194-E-ETR-SC-001		
Sheet type	A	Total sheets	27		Sheet no	1

	1	2	3	4	5	6	7	8				
A B C D E F	PAGE NO.	SHEET NAME	SHEET DESCRIPTION			ISSUE / REVISION						
			A	B	C	D	E	F	01	02	03	04
01	A	Cover Sheet										
02	AA	List Of Contents										
03	AB	Symbol and Legends										
04	AC1	Component List										
05	AC2	Component List										
06	AD	Panel View										
07	AE	Bay Concept & Protection Logic										
08	D	AC Supply Distribution Circuit										
09	E	DC Supply Distribution Circuit										
10	F	AC/DC Supply Failure Circuit										
11	G	Relay Power Supply Circuit										
12	H1	Trafo. Differential CT/VT Circuit										
13	H2	O/C & E/F CT Input Circuit										
14	I1	Trafo Differential Relay Input Circuit										
15	I4	System Input Circuit										
16	K1	Protection Trips Circuit										
17	K11	Trips Circuit Supervision										
18	NA1	System Alarm Circuit										
19	NA2	System Alarm Circuit										
20	PA2	Protection Inter Circuit										
21	RA1	Annunciation Circuit										
22	RA2	Event & Fault Recorder Circuit										
23	RA3	SCADA Circuit										
24	Z1	Component Diagram										
25	Z2	Component Diagram										
26	Z3	Component Diagram										
27	Z4	Component Diagram										
0	AS BUILT	18.08.2018	MUR	Manufacturer  EPESOL 71-B Gurdian 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 TRAFO RELAY PANEL (=E02+RP4) LIST OF CONTANTS	Drawing no. P60194-E-ETR-SC-001			
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type AA	Sheet no. 02	
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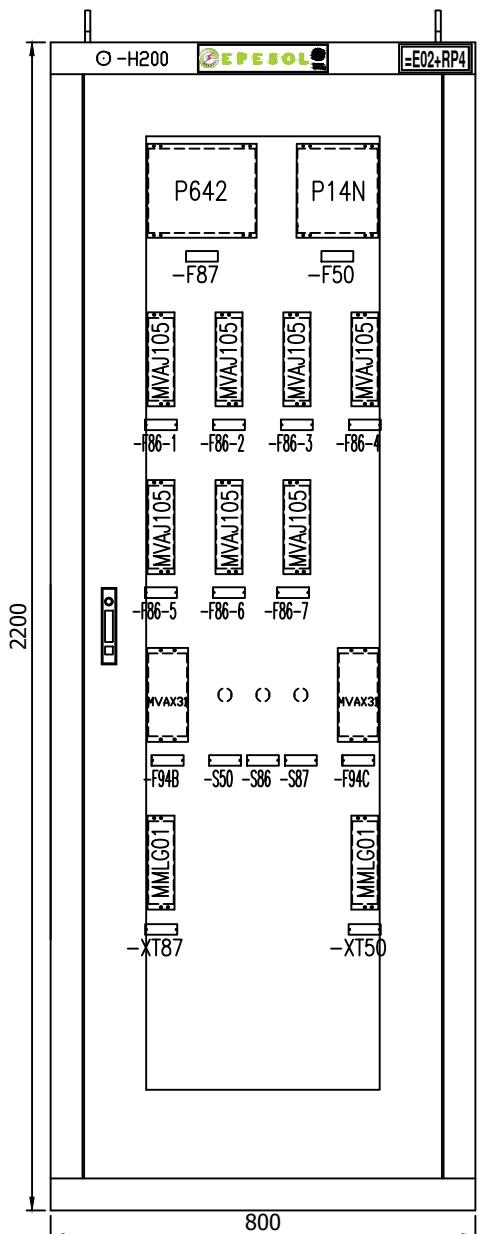
	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A		CIRCUIT BREAKER		MINIATURE CIRCUIT BREAKER		AUXILIARY CONTACTOR NO+NC	21	DISTANCE
B		SWITCH/ISOLATOR		SELECTOR SWITCH		AMMETER	24	OVEREXCITATION
C		EARTHING		LIMITED SWITCH		VOLTMETER	25	SYCHROCHECK
D		GIS TERMINATION		HUMIDITY & 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

0	AS BUILT	18.08.2018	MUR	EPESOL 71-B Gurdian Block, New Garden Town, Lahore, Pakistan	 Grid Solutions A GE and Alstom joint venture	 NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE Title 132kV TRAFO RELAY PANEL (=E02+RP4) SYMBOLA AND LEGENDS	Drawing no. P60194-E-ETR-SC-001			
								Project no.	P-60194	Sheet type	AB
REV.	DESCRIPTION	DATE	DRAWER								

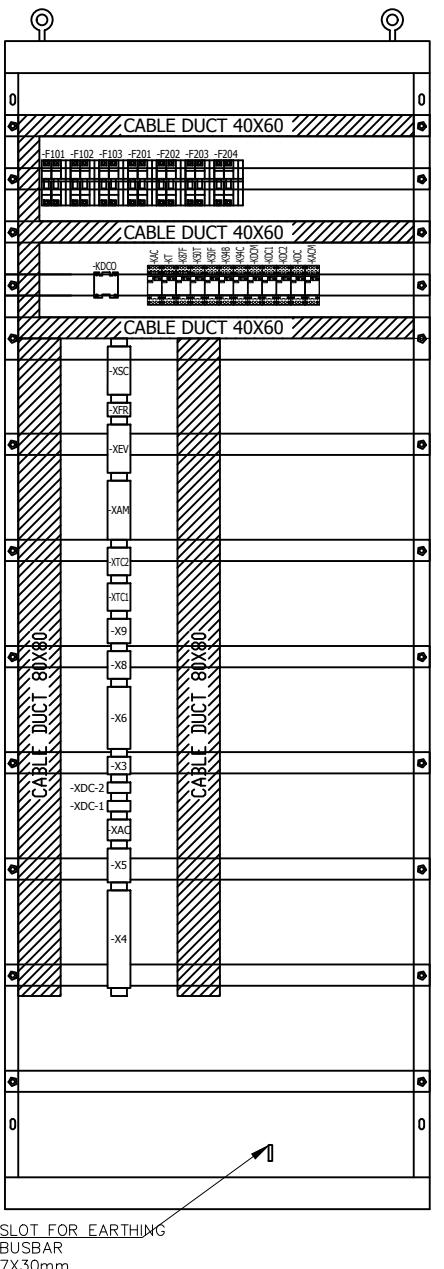
	1	2	3	4	5	6	7	8
A	QTY.	DEVICE DESCRIPTION		DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER
B	01	TRAFO DIFFERENTIAL PROTECTION RELAY		AGILE P642, Cortec: P642-91BA6M0060P Supply: 48-125VDC / 40-100VAC, 1 VT + 8 CT (100-120V:1/5A) Inputs 8 Opto Inputs, 8 Relay Outputs			-F87	GE GRID SOLUTIONS
	01	OVER CURRENT PROTECTION RELAY		AGILE P14N, Cortec: P14N-B16A7C570A 08 Opto Inputs, 08 Relay Outputs			-F50	GE GRID SOLUTIONS
C	02	TRIP CIRCUIT SUPERVISION		MVAX31, Cortec: MVAX31-S1DD0754A			-F94B-C	GE GRID SOLUTIONS
	02	TEST BLOCK		MMLG01, Cortec: MMLG01-R1AA9002D			-XT87,XT50	GE GRID SOLUTIONS
D	07	LOCKOUT RELAY (HAND/ELECTRICAL RESET)		MVAJ105, Cortec: MVAJ105-RA0802A Supply: 110-125VDC, 8 NO + 2 NC Contacts			-F861-7	GE GRID SOLUTIONS
	04	RESISTORS		4KΩ			R94 B/C 1-2	GE GRID SOLUTIONS
E	02	RESISTOR		1.5KΩ			R94 B/C 3	GE GRID SOLUTIONS
	02	CONTROL MCB - PANEL LIGHT & HEATER		G6202+(CAH2), 2-Pole, Ratings: 2A, 240VAC, 6kA @ 240VAC, 2 C/O Contacts			-F101-102	GE
F	01	CONTROL ELCB - PANEL SOCKET		DM100C16/030+(CAH2), 2-Pole, Ratings: 16A, 30mA, 240VAC, 10kA @ 240VAC, 2 C/O Contacts			-F103	GE
	04	CONTROL MCB - DC DISTRIBUTION		EP102UCC04+(CAH2), 2-Pole, Ratings: 4A, 110VDC, 10kA @ 110VDC, 2 C/O Contacts			-F201-204	GE
G	01	AUXILIARY CONTACTOR		MCRC022ATTWJ+MARN211AT, Coil Voltage: 110VDC, 3 NO & 3 NC Contacts			-KDCO	GE
	10	AUXILIARY CONTACTOR		PRC4M40DCJL, Coil Voltage: 110VDC, 4 C/O Contacts			-KAC,-KT,-K87F,-K50T,-K50F,-K94B,-K94C,-KDCM,-KDC1,-KDC2	GE
H	02	AUXILIARY CONTACTOR		PRC4M40ANL, Coil Voltage: 240VAC, 4 C/O Contacts			-KDC,-KACM	GE
	03	PUSH BUTTON		YS-AP1-2-40-B-D-W, Black Button, Spring Return, 2-Pole, Rating: 12A, 110VDC			-S50,-S86,-S87	YONGSUNG
I	01	PANEL LIGHT WITH DOOR SWITCH		YST8-30-5W+YSP315GW-B, 240VAC @ 50Hz, 5W, with Door Limit Switch			-H100,-S100	YONGSUNG
	01	THREE PIN SOCKET		1N+PE, 16A, 240VAC @ 50Hz			-X100	LEAR
J	01	PANEL HEATER		240VAC @ 50Hz, 50W			-R100	E-LABS
	01	HUMIDITY & TEMPERATURE CONTROLLER		Thermostat and Humidstat			-B100	E-LABS
K	01	INDICATION LAMP		YS-PL-2-AL-22-R-W, Type: LED , Colour : Red , supply : 240VAC @ 50Hz.			-H200	YONGSUNG
	23	TERMINAL BLOCK FOR CT CIRCUIT (SCREW TYPE) WITH SHORTENING ARRANGMENT		TYPE: SCB-6			-X4	CABUR
L	08	TERMINAL BLOCK FOR CT CIRCUIT (SCREW TYPE) WITH SHORTENING ARRANGMENT		TYPE: SCB-6			-X5	CABUR
	REV.	DESCRIPTION		DATE	DRAWER	Project	Title	Drawing no.
M	0	AS BUILT		18.08.2018	MUR	220kV/132kV GIS SUBSTATION GAZI ROAD, LAHORE	132kV TRAFO RELAY PANEL (=E02+RP4) COMPONENT LIST	P60194-E-ETR-SC-001
						NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project no.	Sheet type
N							P-60194	Sheet no.
							AC1	04

	1	2	3	4	5	6	7	8		
A B C D E F	QTY.	DEVICE DESCRIPTION		DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION		MANUFACTURER	
	06	TERMINAL BLOCK FOR AC SUPPLY DISTRIBUTION		TYPE: CBD-4			-XAC	CABUR		
	03	TERMINAL BLOCK FOR DC SUPPLY-1 DISTRIBUTION		TYPE: CBD-4			-XDC-1	CABUR		
	03	TERMINAL BLOCK FOR DC SUPPLY-2 DISTRIBUTION		TYPE: CBD-4			-XDC-2	CABUR		
	05	TERMINAL BLOCK FOR DC SUPPLY SPARE		TYPE: CBD-4			-X3	CABUR		
	18	TERMINAL BLOCK FOR CONTROL FUNCTION		TYPE: CBD-4			-X6	CABUR		
	08	TERMINAL BLOCK FOR CONTROL FUNCTION		TYPE: CBD-4			-X8	CABUR		
	07	TERMINAL BLOCK FOR CONTROL FUNCTION		TYPE: CBD-4			-X9	CABUR		
	08	TERMINAL BLOCK FOR TRIP CIRCUIT-1		TYPE: CBD-4			-XTC1	CABUR		
	08	TERMINAL BLOCK FOR TRIP CIRCUIT-2		TYPE: CBD-4			-XTC2	CABUR		
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0	AS BUILT		18.08.2018	MUR	Manufacturer  EPESOL 71-G Chakla 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 TRAFO RELAY PANEL (=E02+RP4) COMPONENT LIST	Drawing no. P60194-E-ETR-SC-001
REV.	DESCRIPTION		DATE	DRAWER						
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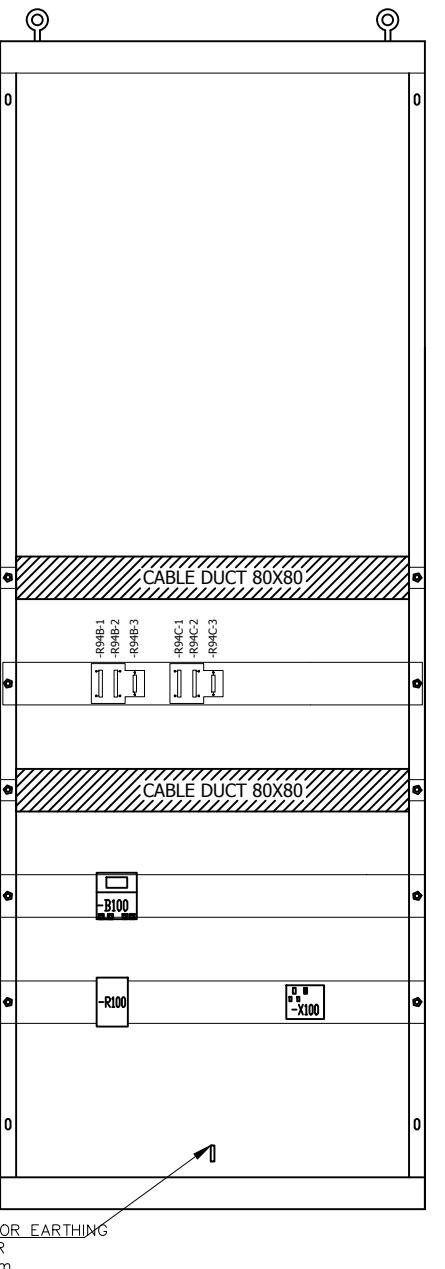
FRONT VIEW WITH DOOR



LEFT SIDE VIEW



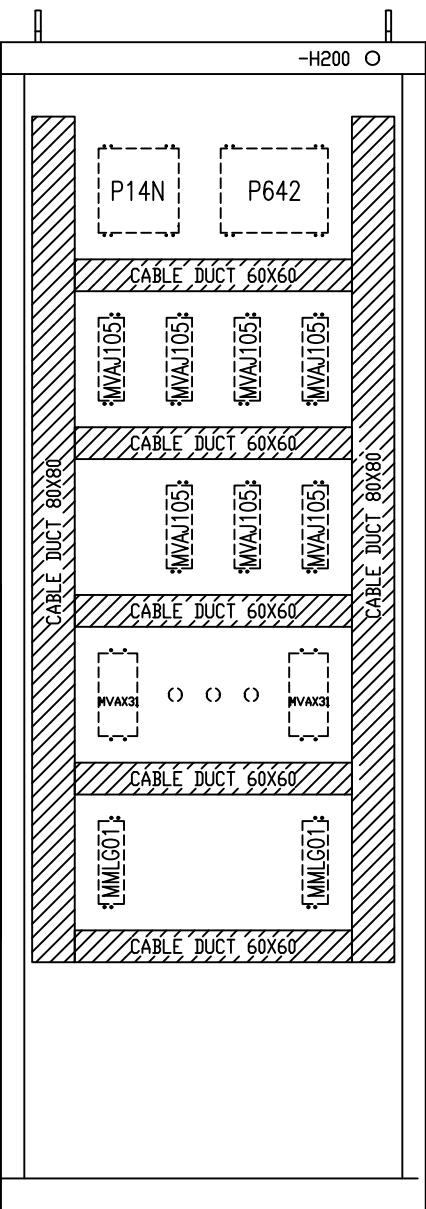
RIGHT SIDE VIEW



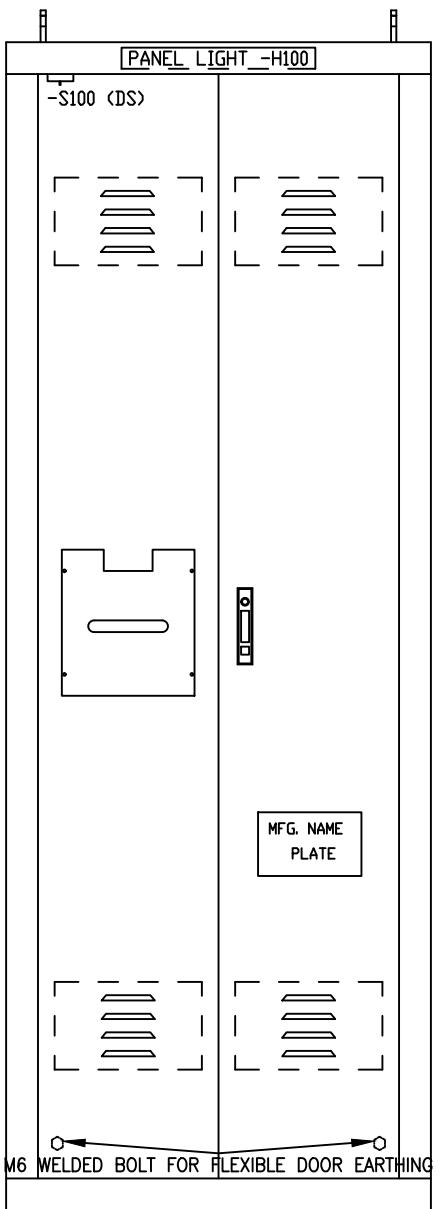
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REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AD	Sheet no. 06

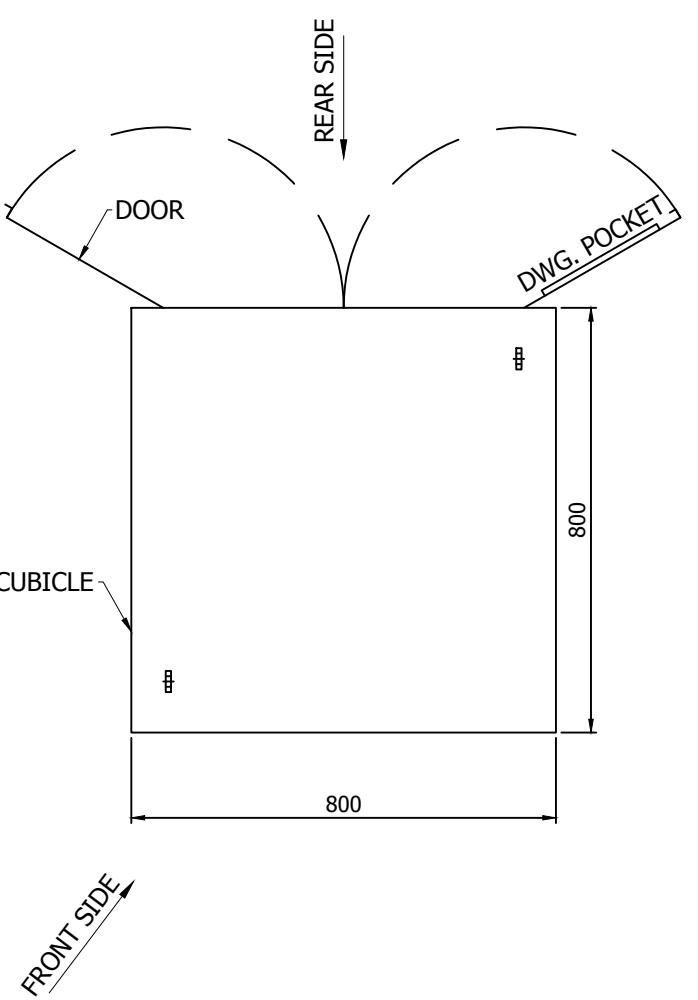
BACK VIEW WITHOUT DOOR



BACK VIEW WITH DOOR



TOP VIEW

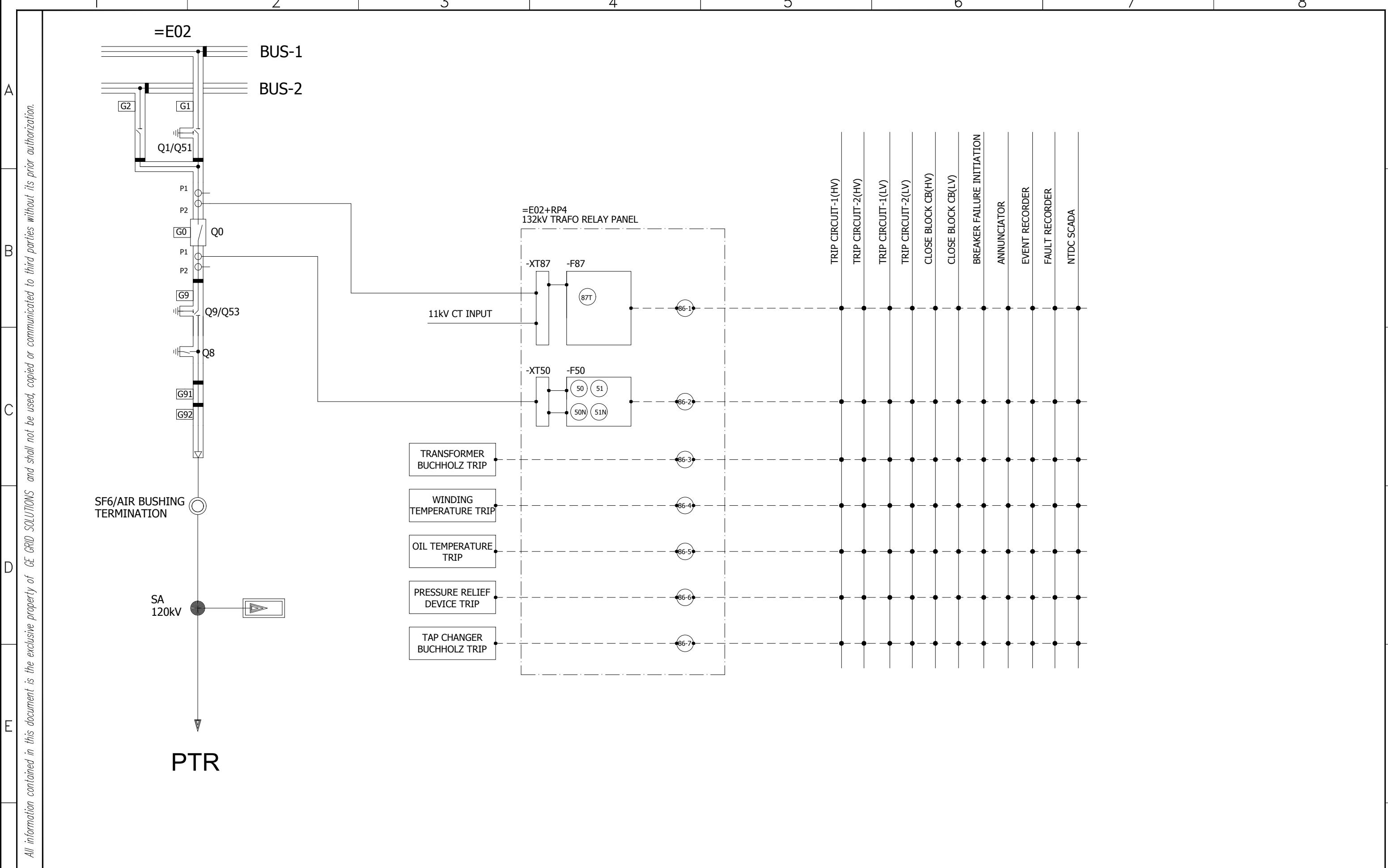


NOTE:-

- 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.

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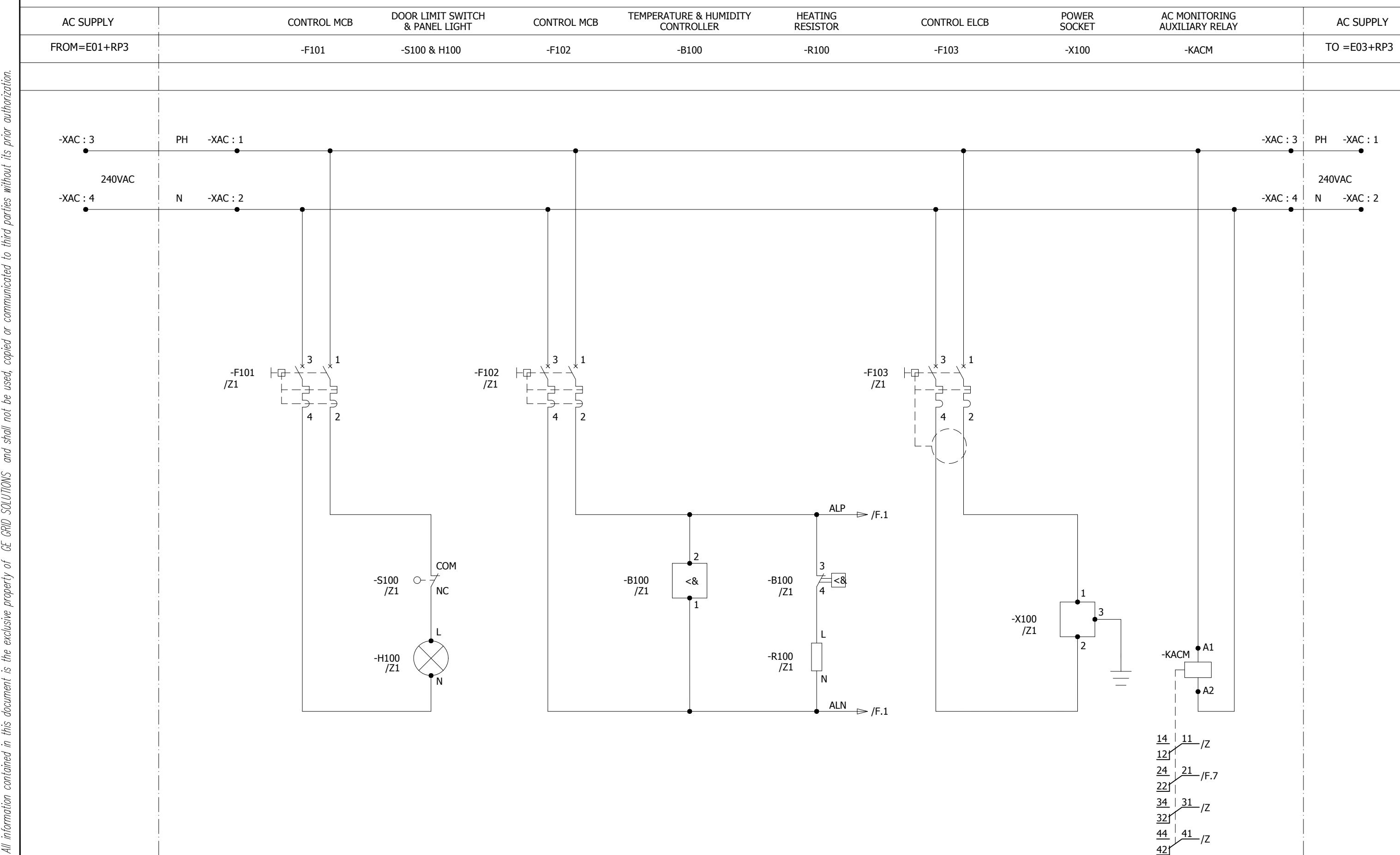
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REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AD1	Sheet no. 06a



0	AS BUILT	18.08.2018	MUR	Manufacturer E P E S O L 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor GE A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV TRAFO RELAY PANEL (=E02+RP4) BAY CONCEPT & PROTECTION LOGICS	Drawing no. P60194-E-ETR-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AE
									Sheet no. 07

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A



F

0	AS BUILT	18.08.2018	MUR	Manufacturer EPESOL 77-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 TRAFO RELAY PANEL (=E02+RP4) AC SUPPLY DISTRIBUTION	Drawing no. P60194-E-ETR-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type D
									Sheet no. 08

CONTROL MCB
DIFFERENTIAL RELAY SUPPLYCONTROL MCB
O/C & E/F RELAY SUPPLYCONTROL MCB
DC SUPPLY FOR AC FAILURE ALARMCONTROL MCB
DC-2 SPAREDC SUPPLY MONITORING
AUXILIARY RELAY

-F201

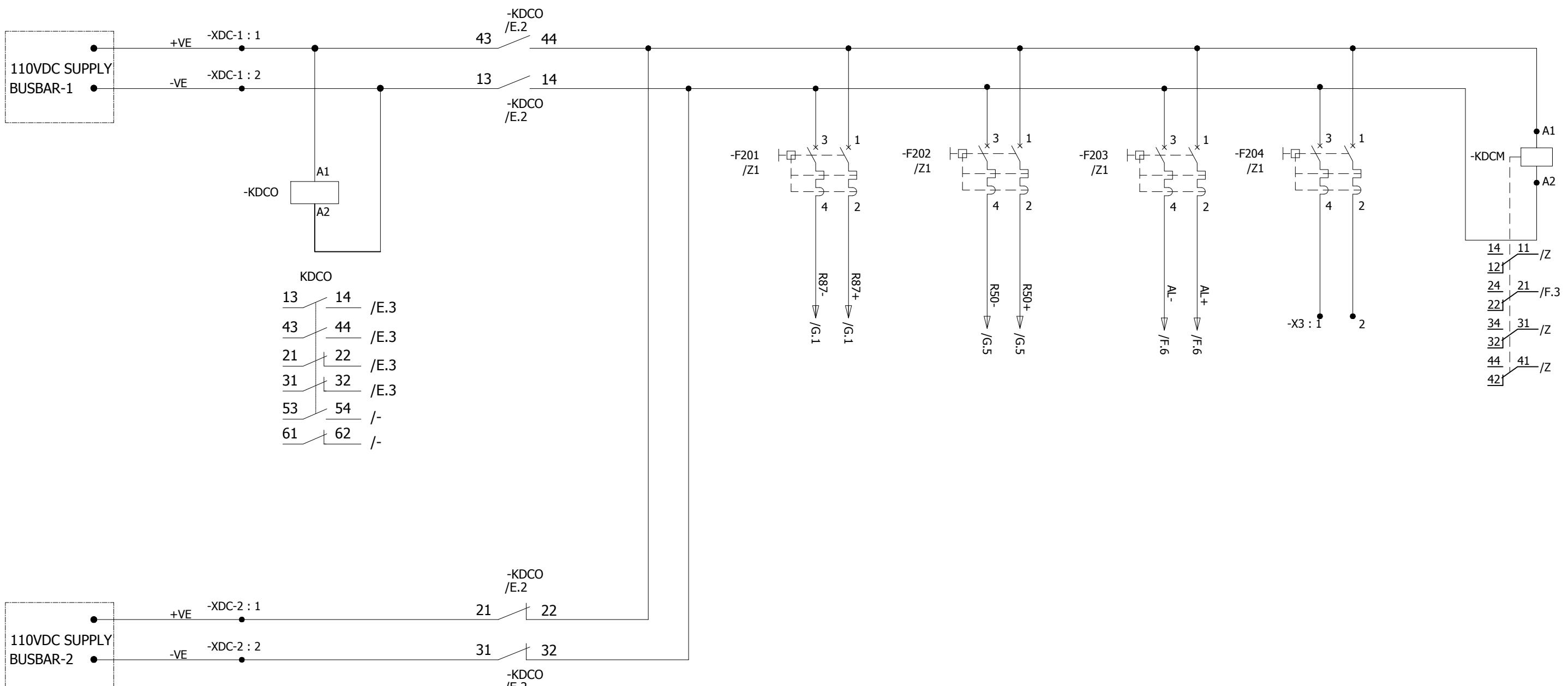
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-F203

-F204

-KDCM

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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
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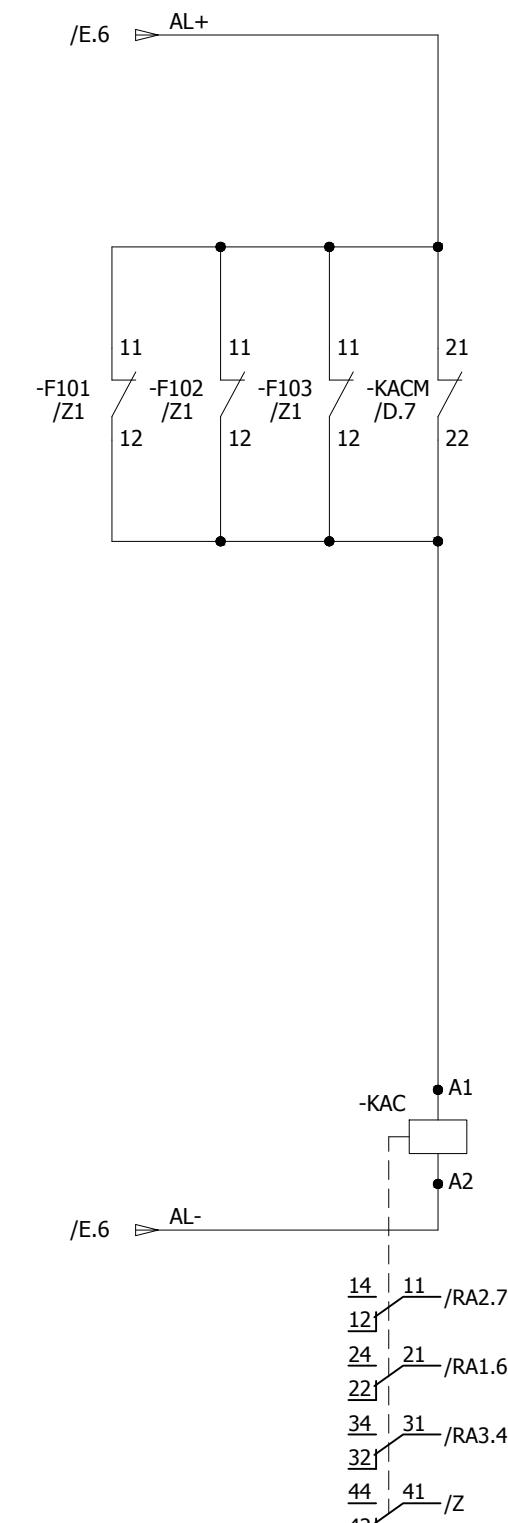
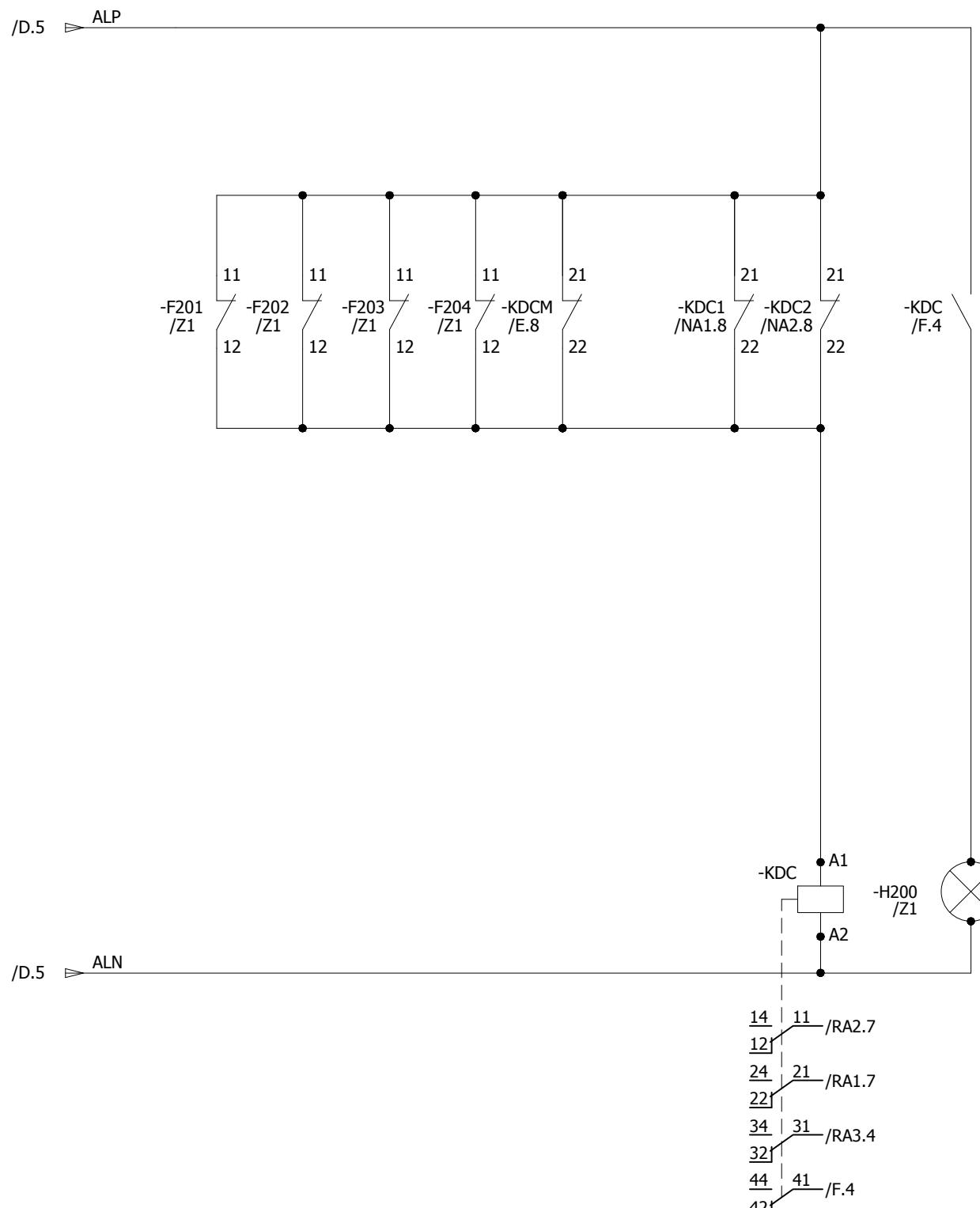
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110V DC CIRCUIT FAULTY

240V AC CIRCUIT FAULTY

-KDC

-KAC



A

A

B

B

C

C

D

D

E

E

F

F

0	AS BUILT	18.08.2018	MUR	Manufacturer EPESOL 77-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 TRAFO RELAY PANEL (=E02+RP4) AC/DC SUPPLY FAILURE CIRCUIT	Drawing no. P60194-E-ETR-SC-001
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type F
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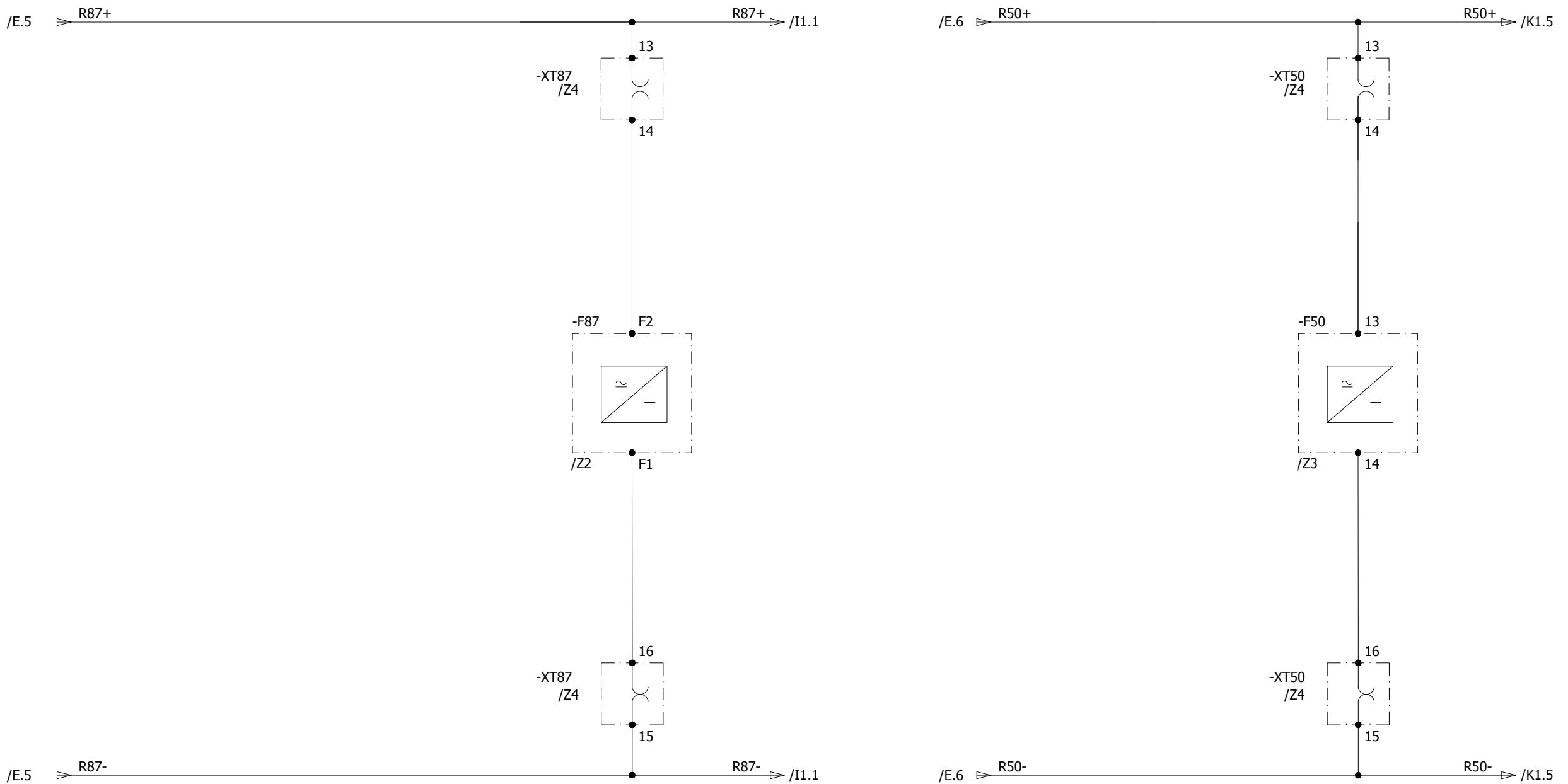
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TRAFO DIFFERENTIAL PROTECTION

OVERCURRENT PROTECTION

RELAY SUPPLY

RELAY SUPPLY



0	AS BUILT	18.08.2018	MUR	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 TRAFO RELAY PANEL (=E02+RP4) RELAY POWER SUPPLY CIRCUIT	Drawing no. P60194-E-ETR-SC-001	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type G	Sheet no. 11

TEST BLOCK

TRAFO DIFFERENTIAL PROTECTION RELAY

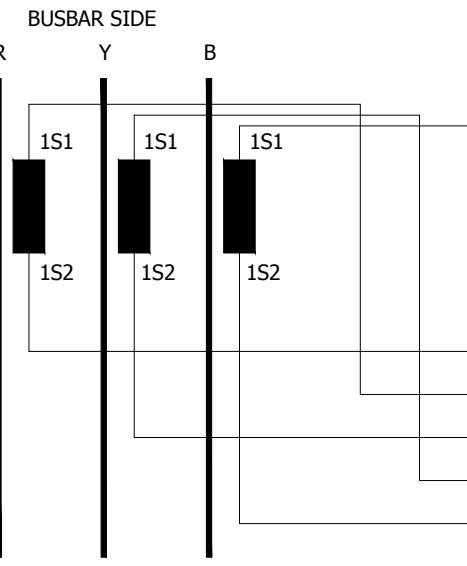
-XT87

-F87

/Z4

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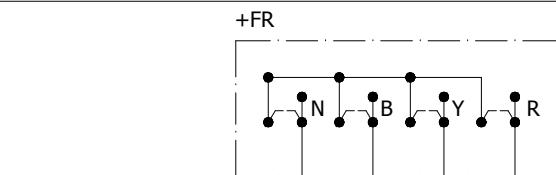
132KV GIS HALL

CONTROL ROOM

=E02+GISLCC
132KV GIS LCC PANEL
SH : S12
-XI2:6

-XI2:5
-XI2:4
-XI2:9

-X4:1
-X4:2
-X4:3
-X4:4
-X4:5
-X4:6
-X4:7
-X4:8



21

23

25

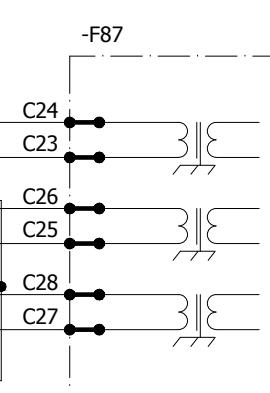
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22

24

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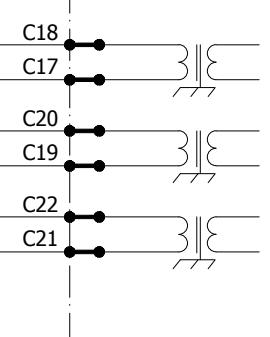
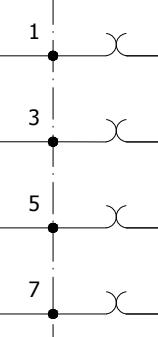
28



MV PANEL
MV CT INPUT

R
Y
B
N

-X4:21
-X4:22
-X4:23
-X4:24
-X4:25
-X4:26
-X4:27
-X4:28



A

AGILE P642 TRAFO DIFFERENTIAL PROTECTION RELAY

B

B

C

C

D

D

E

E

F

F

0	AS BUILT	18.08.2018	MUR	Manufacturer EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor GE 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 TRAFO RELAY PANEL (=E02+RP4) TRAFO. DIFFERENTIAL RELAY CT/VT CIRCUIT	Drawing no. P60194-E-ETR-SC-001
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type H1
								Sheet no. 12	

TEST BLOCK

OVERCURRENT
RELAY

-XT50

-F50

/Z4

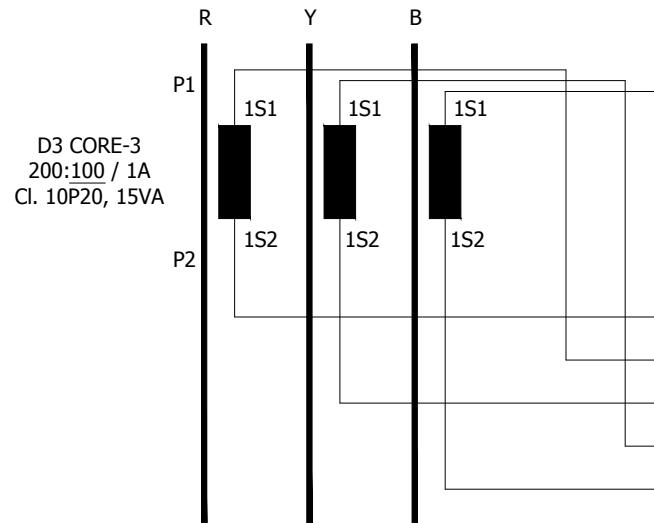
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132KV GIS HALL

CONTROL ROOM

BUSBAR SIDE

D3 CORE-3
200:100 / 1A
Cl. 10P20, 15VA=E02+GISLCC
132KV GIS LCC PANEL

SH : S13

-XI3:6

-XI3:7

-XI3:8

-XI3:3

-X5:1

-X5:2

-X5:3

-X5:4

-X5:5

-X5:6

-X5:7

-X5:8

-XT50

1

2

3

4

5

6

7

8

-F50

21

22

23

24

25

26

27

28

AGILE P14N O/C & E/F RELAY

A

B

C

D

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E

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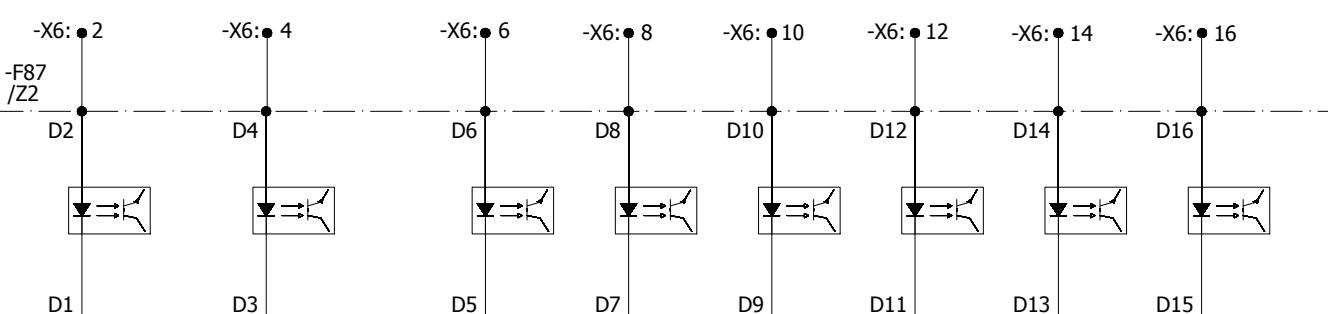
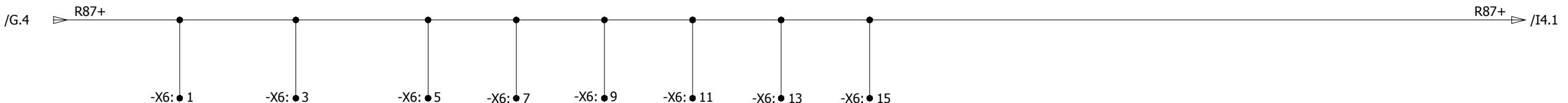
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0	AS BUILT	18.08.2018	MUR	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV TRAFO RELAY PANEL (=E02+RP4) O/C & E/F CT INPUTS	Drawing no. P60194-E-ETR-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type H2
									Sheet no. 13

TRAFO DIFFERENTIAL PROTECTION RELAY

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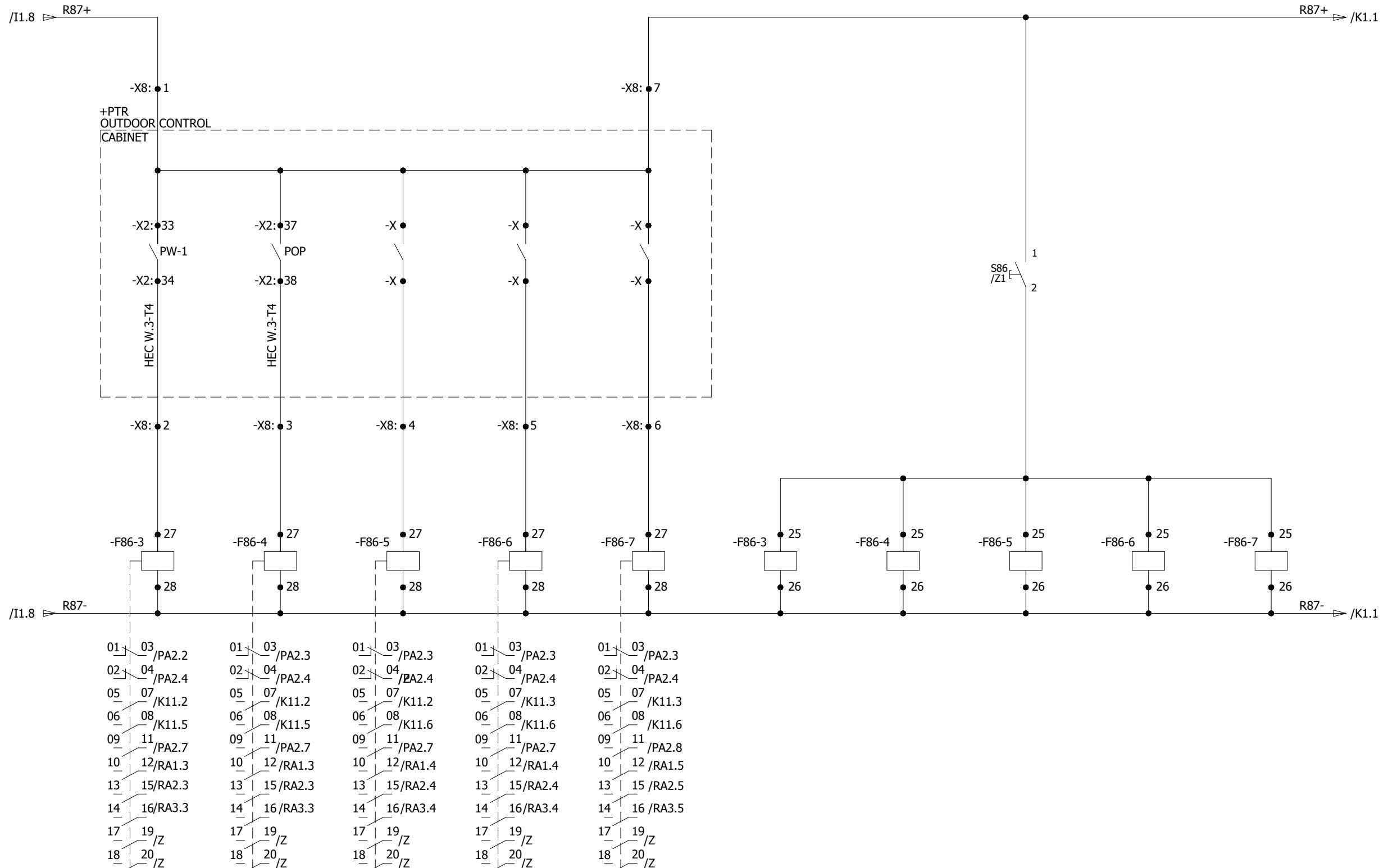
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REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type I1
									Sheet no. 14

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LOCKOUT RELAY LOCKOUT RELAY LOCKOUT RELAY LOCKOUT RELAY LOCKOUT RELAY
 WINDING TEMPERATURE OIL TEMPERATURE T/F BUCHHOLZ PRESSURE RELIEF DEVICE OLTC BUCHHOLZ

TRIP RELAY RESET



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0	AS BUILT	18.08.2018	MUR	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 TRAFO RELAY PANEL (=E02+RP4) SYSTEM INPUTS	Drawing no. P60194-E-ETR-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type I4
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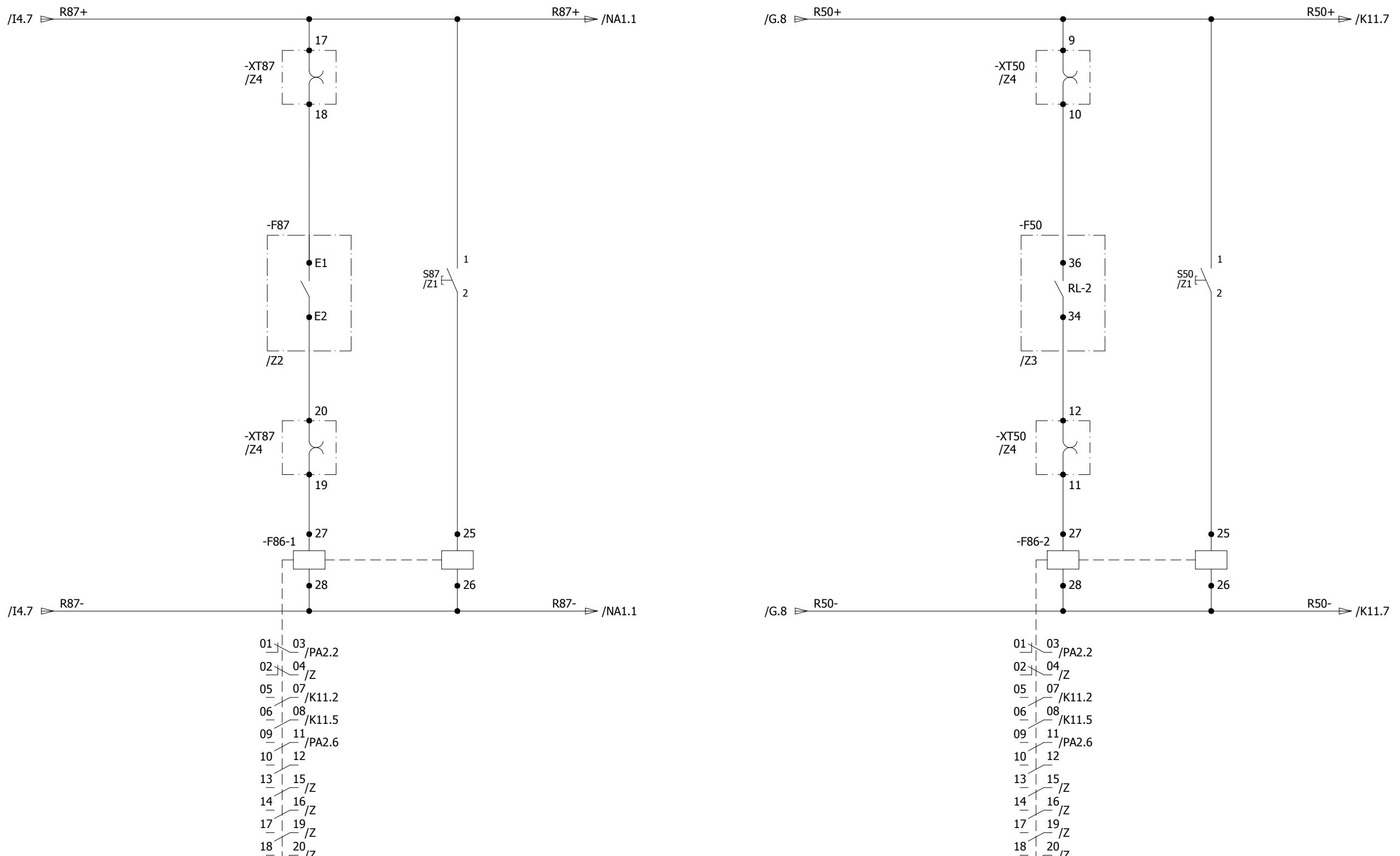
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TRIP RELAY RESET

O/C & E/F PROTECTION TRIP

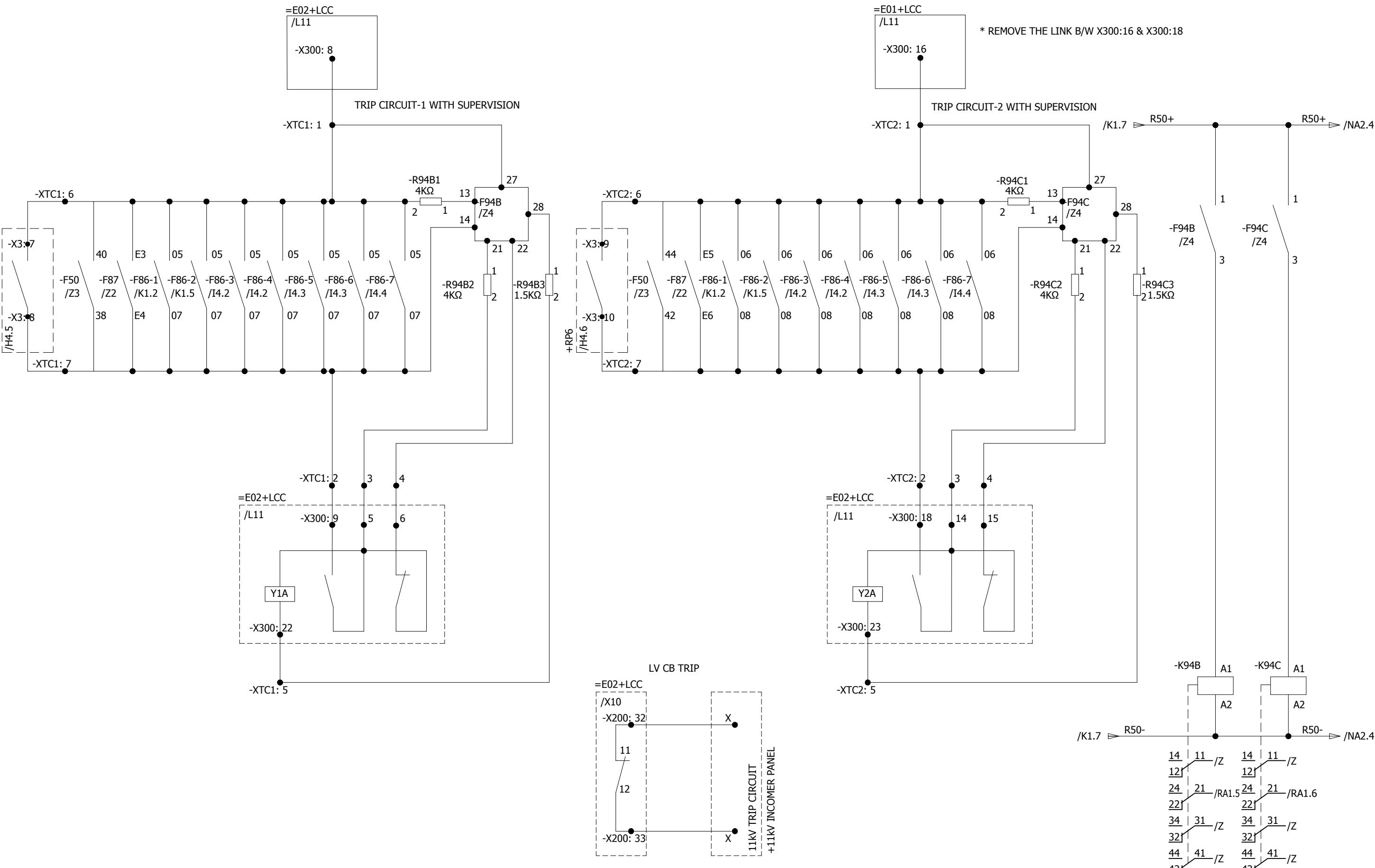
TRIP RELAY RESET

PROTECTION GENERAL TRI



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									P60194-E-ETR-SC-001		
									Project no.		
									P-60194	K1	16
REV.	DESCRIPTION	DATE	DRAWER	1	2	3	4	5	6	7	8

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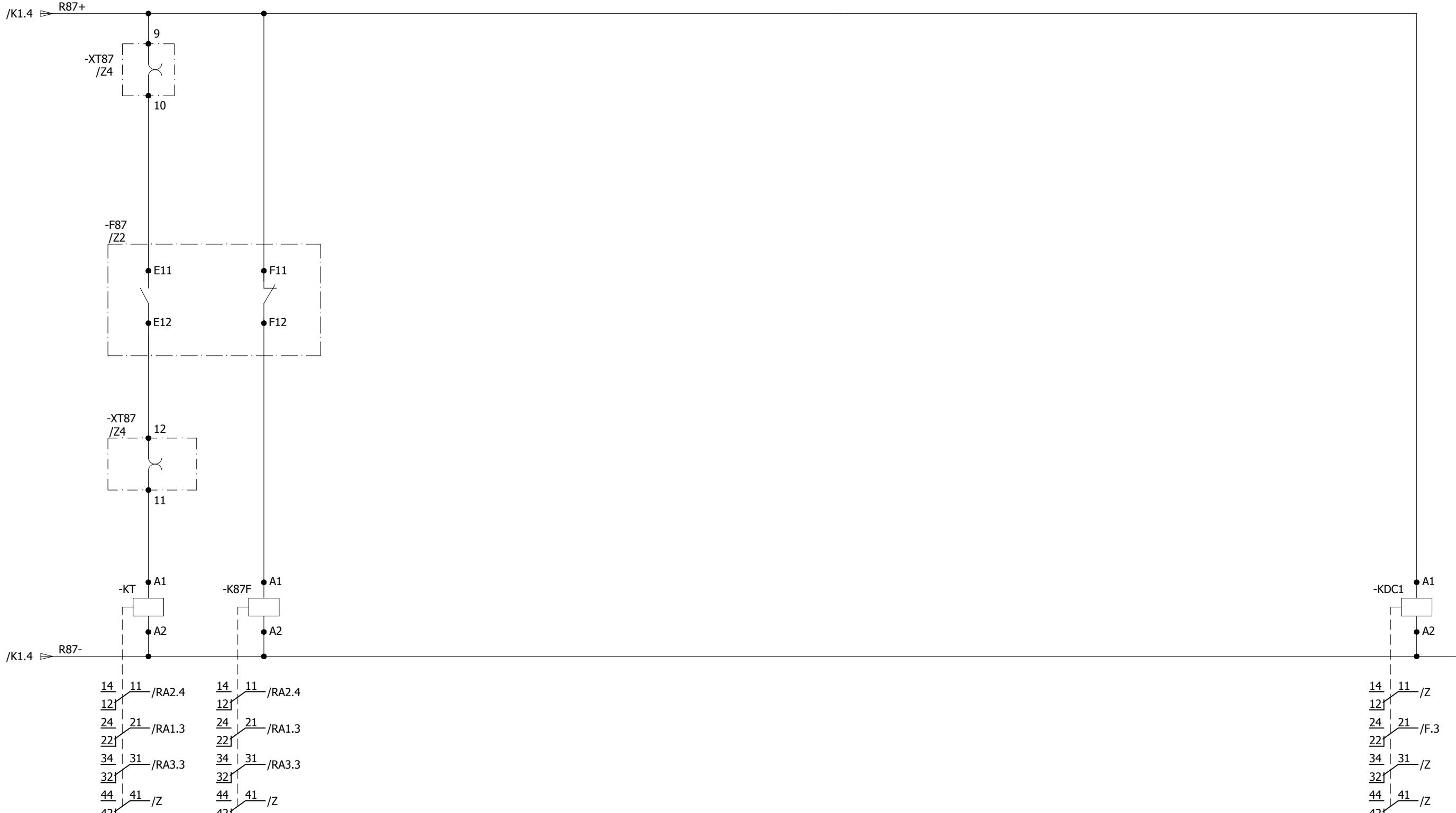


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									Project no. P-60194		
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REV.	DESCRIPTION	DATE	DRAWER						Sheet no. 17		

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TRAFO DIFFERENTIAL TRIP TRAFO DIFFERENTIAL RELAY FAULTY

R87+ DC SUPPLY MONITORING
+KDC1



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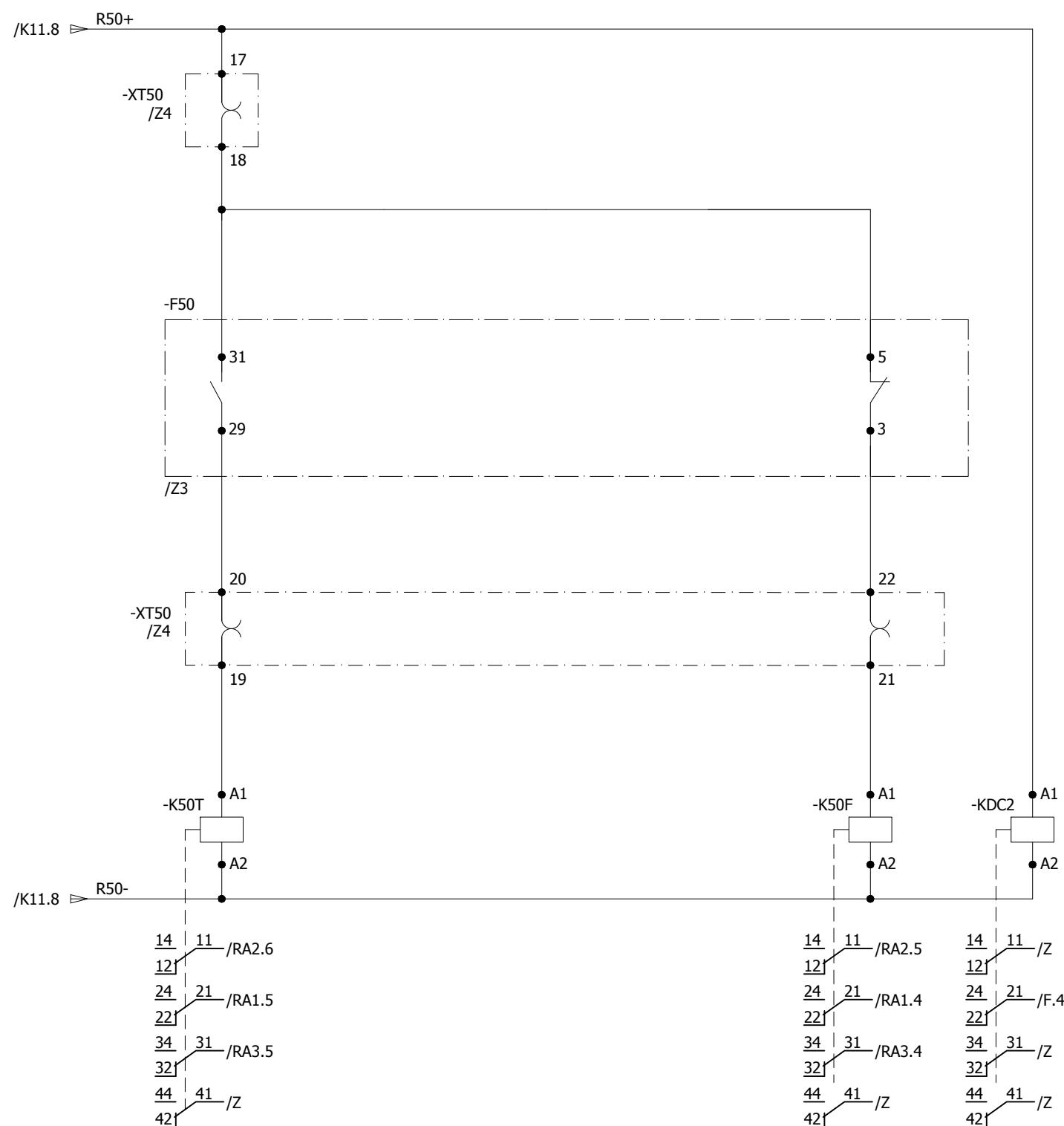
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type NA1 Sheet no. 18

O/C & E/F RELAY ALARMS

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

+KDC2

/Z3



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0	AS BUILT	18.08.2018	MUR	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 TRAFO RELAY PANEL (=E02+RP4) SYSTEM ALARMS	Drawing no. P60194-E-ETR-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type NA2
									Sheet no. 19

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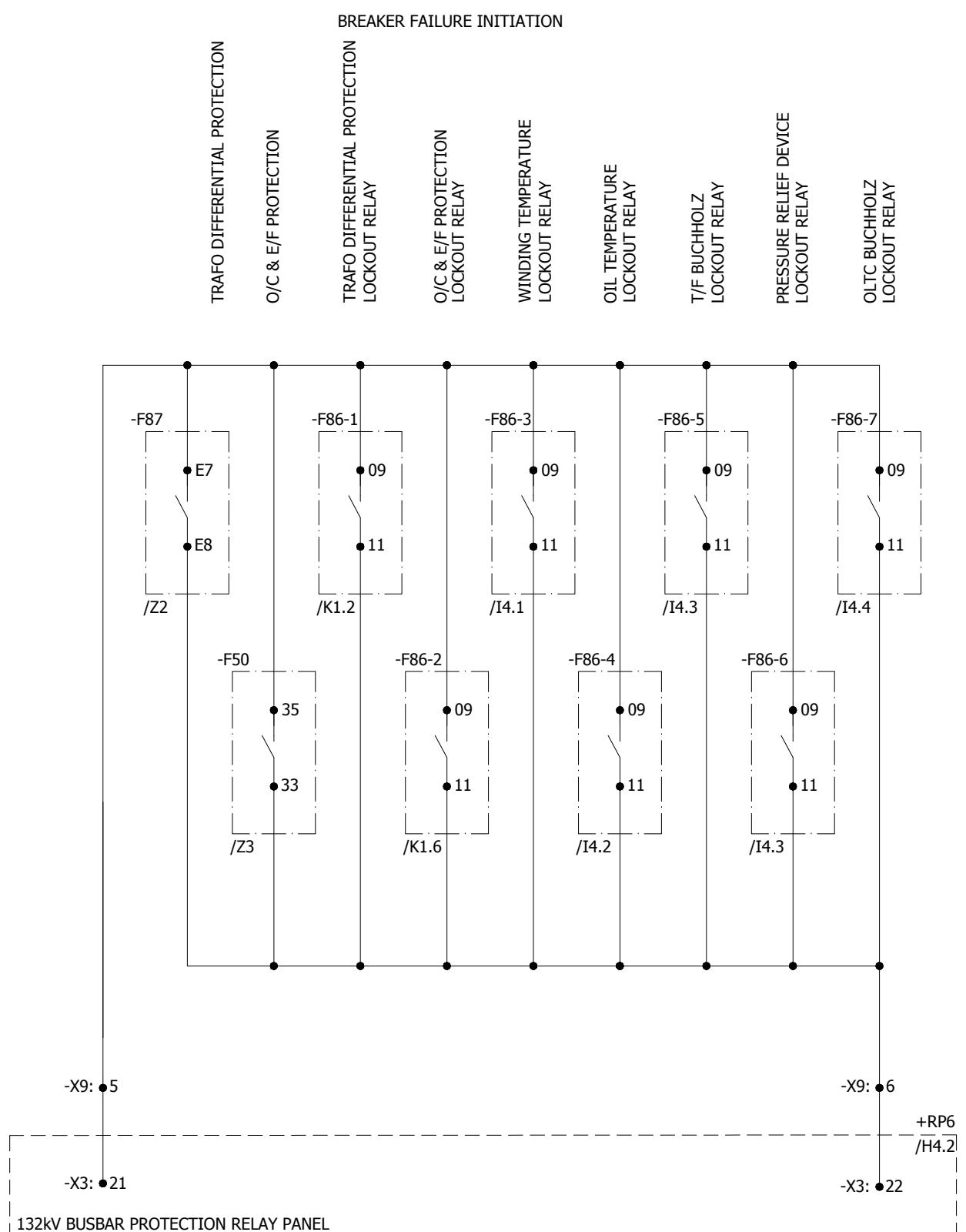
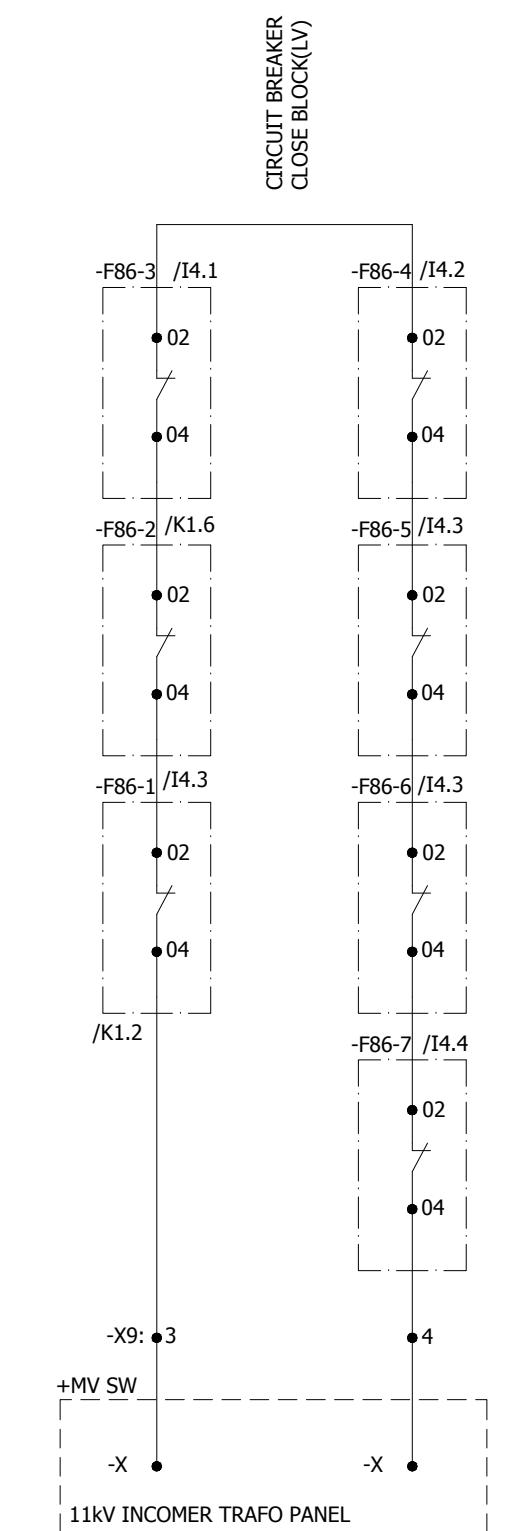
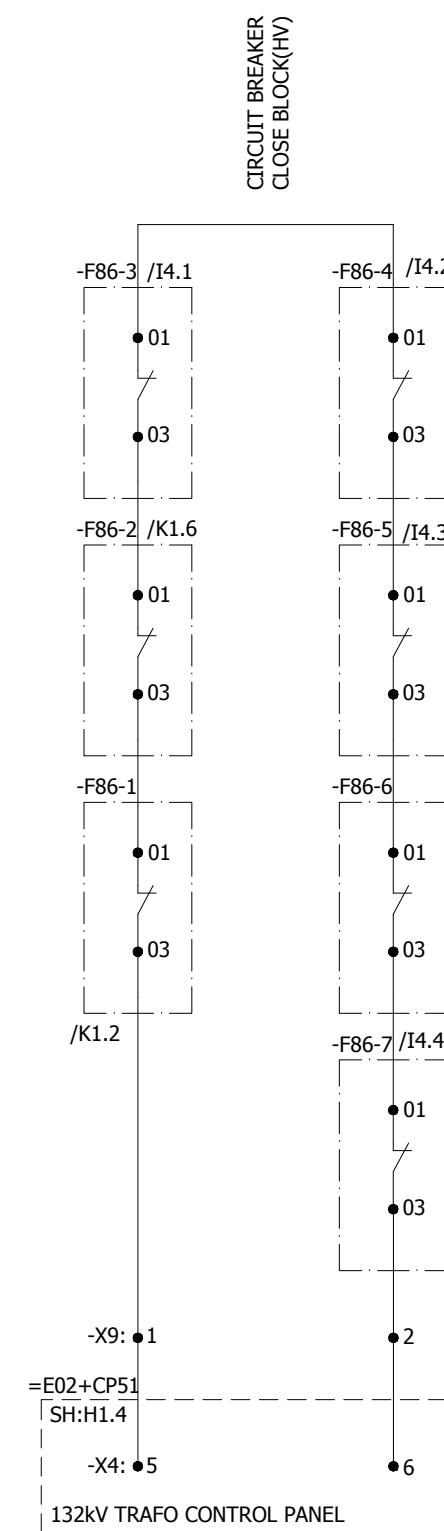
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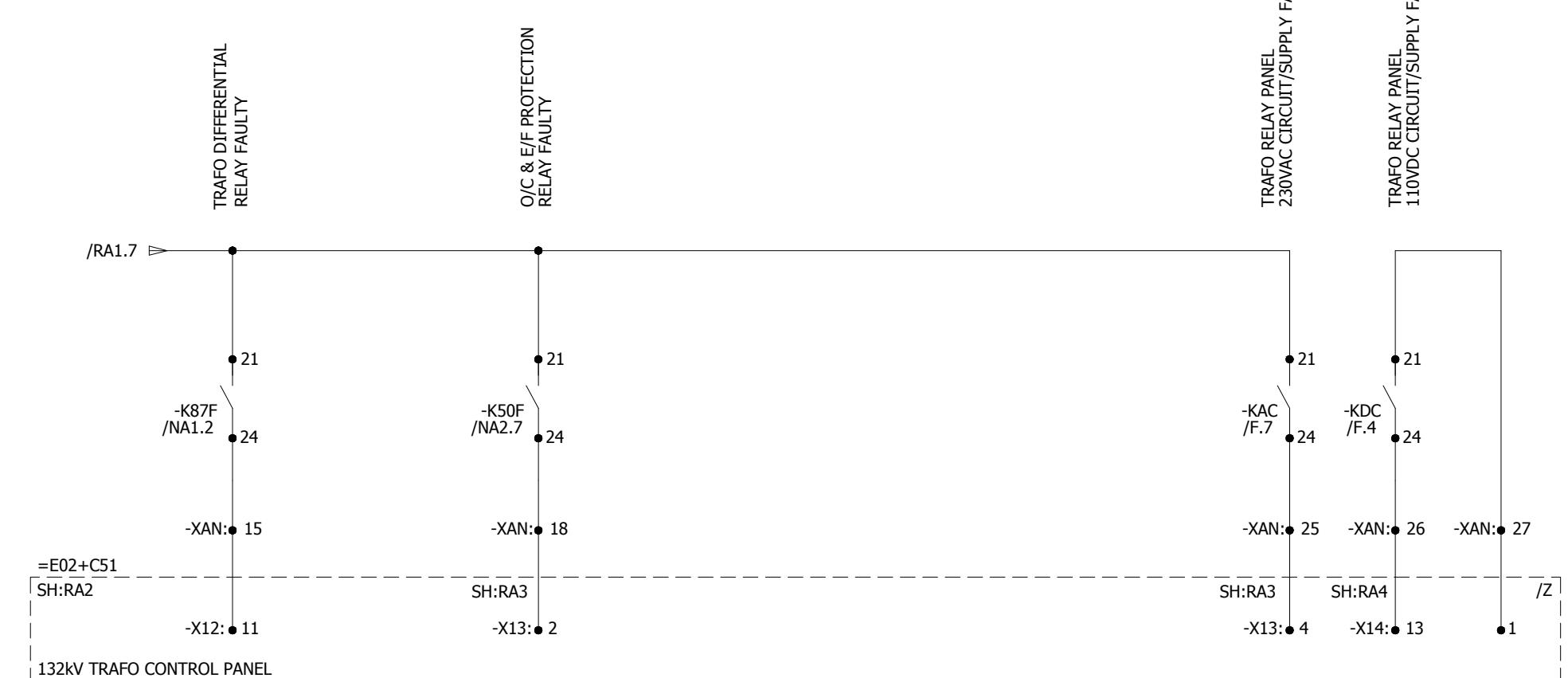
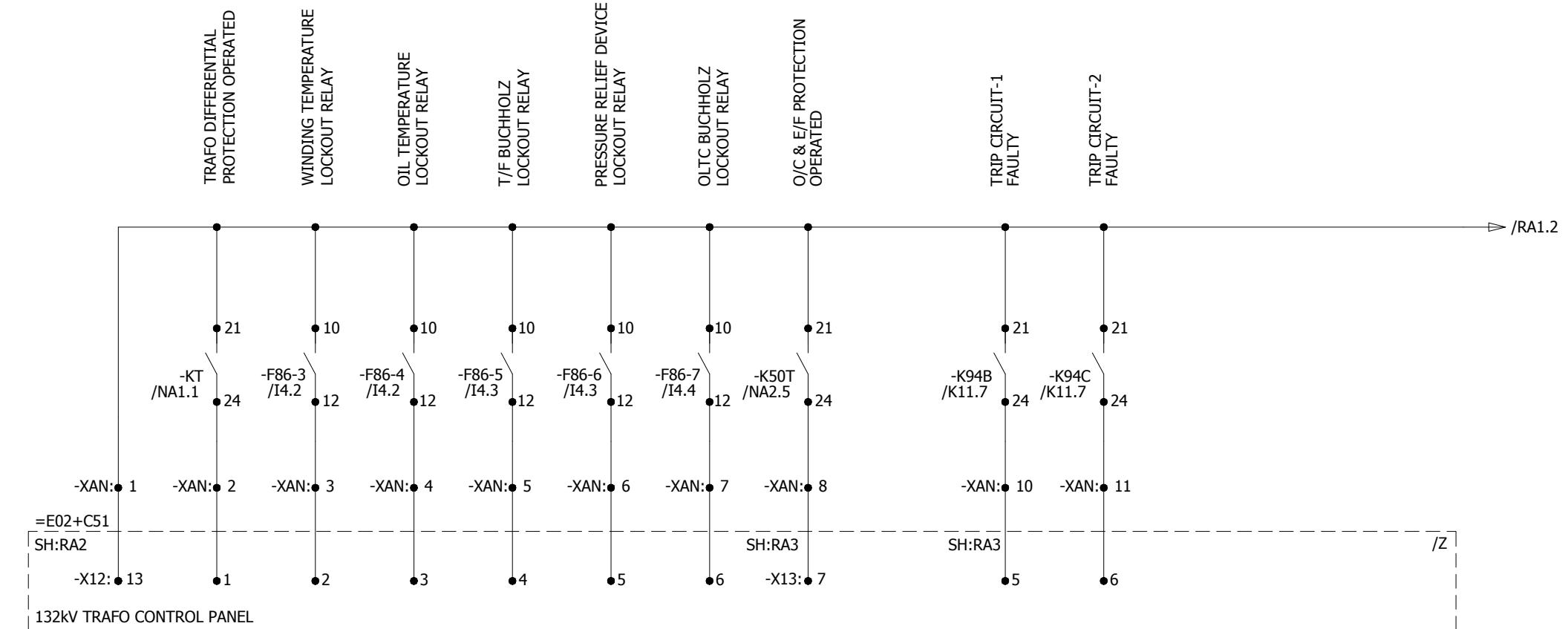
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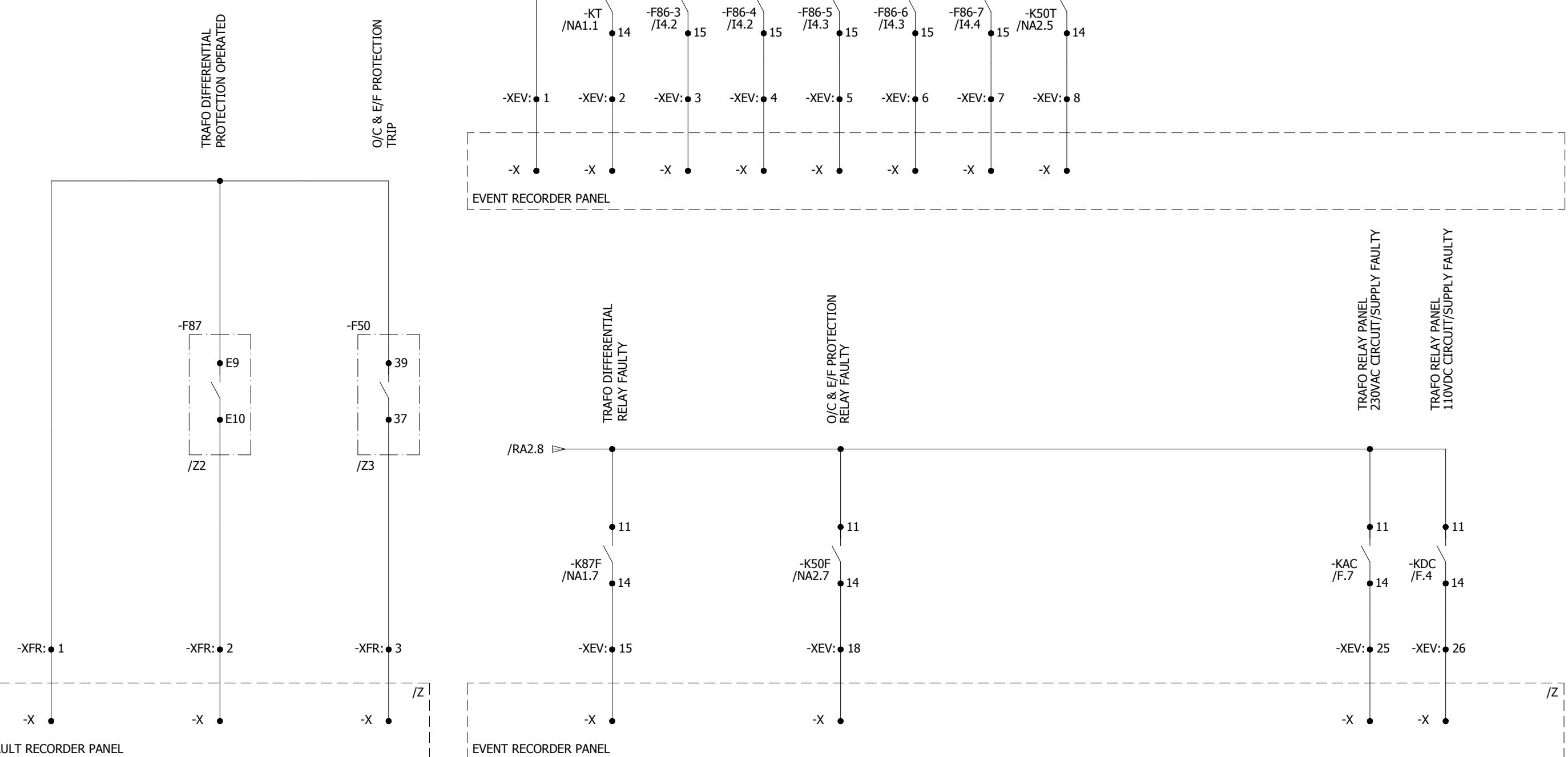
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				EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	132kV TRAFO RELAY PANEL (=E02+RP4) PROTECTION INTER-CIRCUITS	P60194-E-ETR-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type PA2 Sheet no. 20

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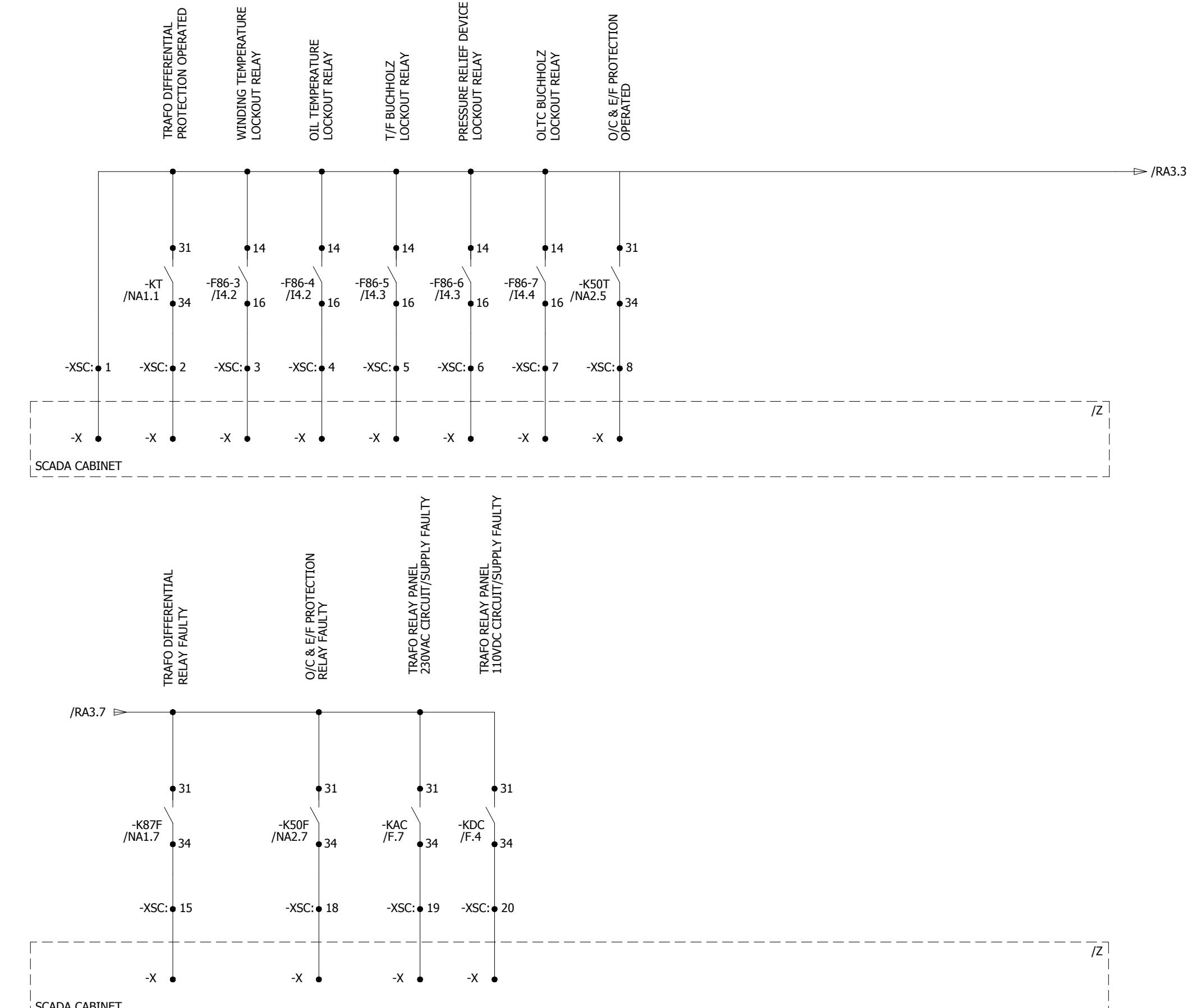


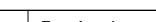
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type RA1 Sheet no. 21



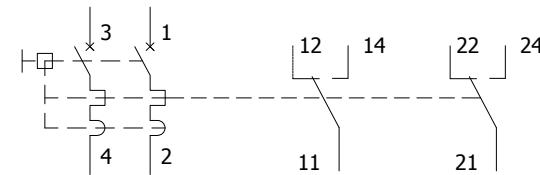
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REV.	DESCRIPTION	DATE	DRAWER	EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	132kV TRAFO RELAY PANEL (=E02+RP4) EVENT & FAULT RECORDER CIRCUITS	Project no. P-60194	Sheet type RA2	Sheet no. 22

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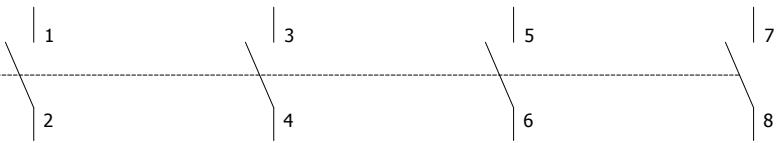


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					Project no. P-60194						
					Sheet type RA3						
REV.	DESCRIPTION	DATE	DRAWER		Sheet no. 23						

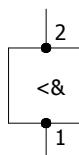
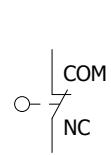
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-F101	D.2	F.6	
-F102	D.4	F.6	
-F103	D.6	F.6	
-F201	E.5	F.1	
-F202	E.5	F.2	
-F203	E.6	F.2	
-F204	E.7	F.3	

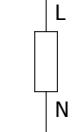
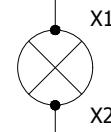


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-S86	I4.6	-	-	-
-S87	K1.3	-	-	-



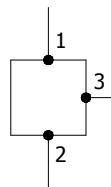
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-B100	D.4	D.5
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-H200	F.4
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-R100	D.5
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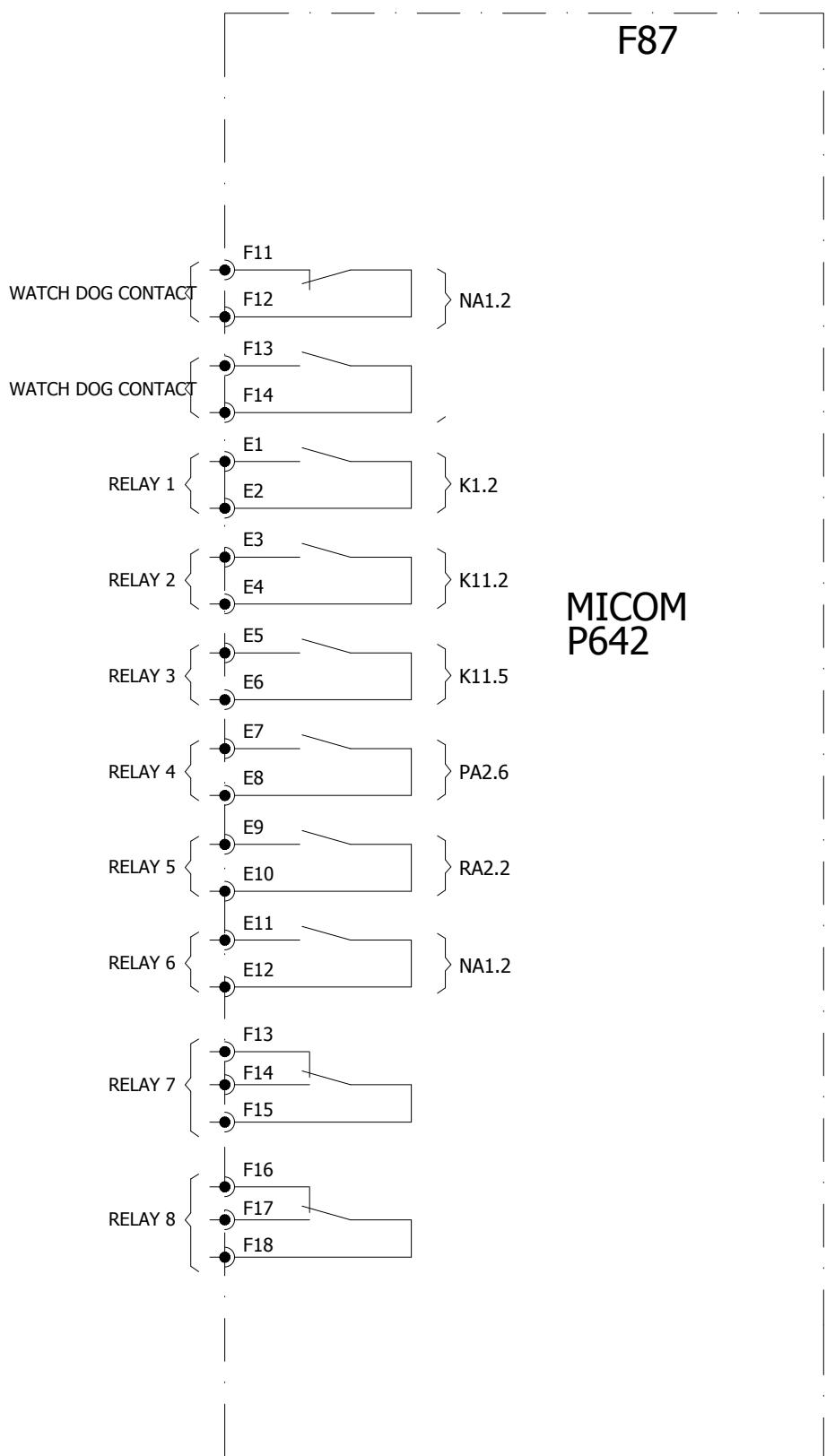
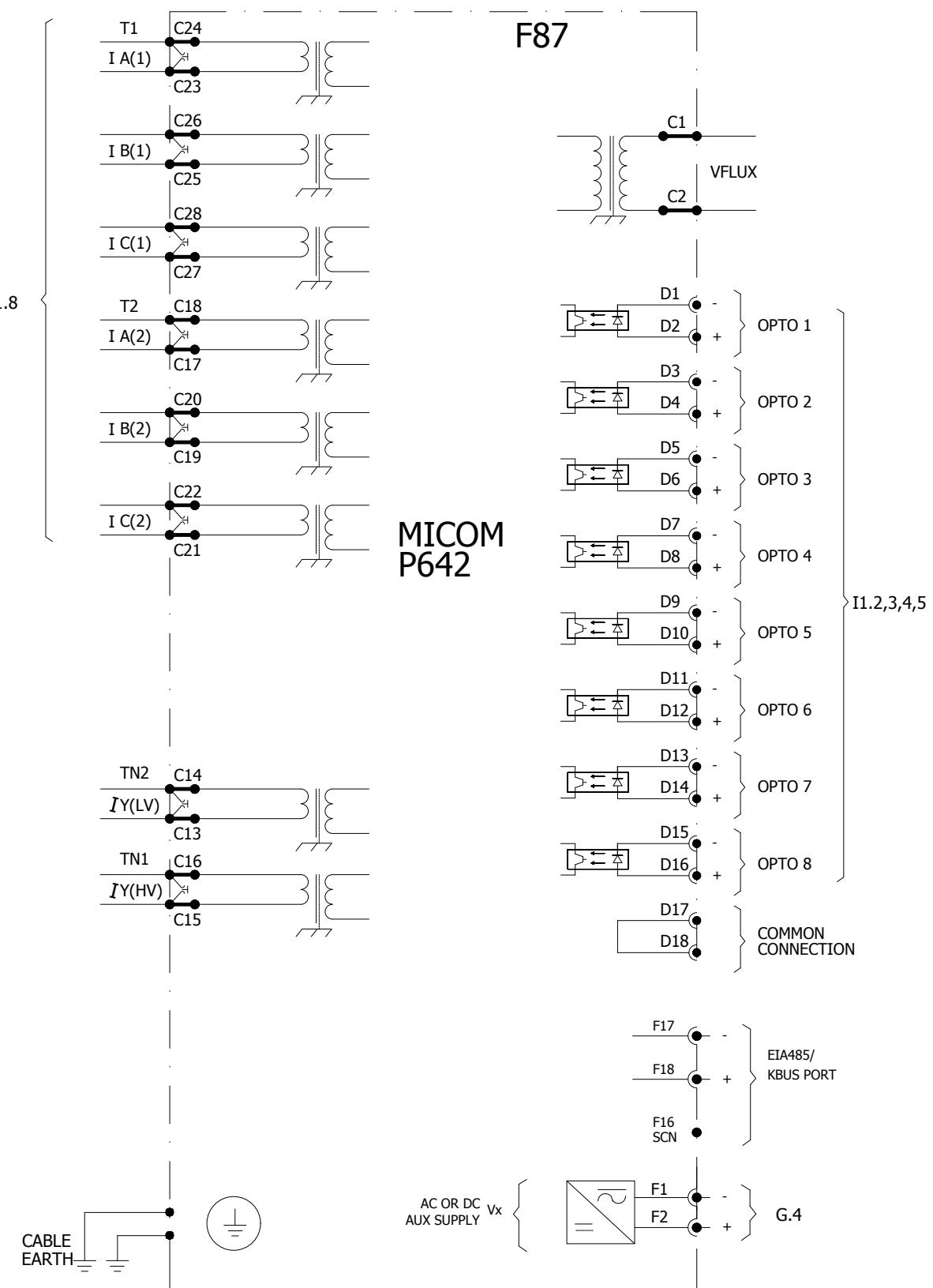


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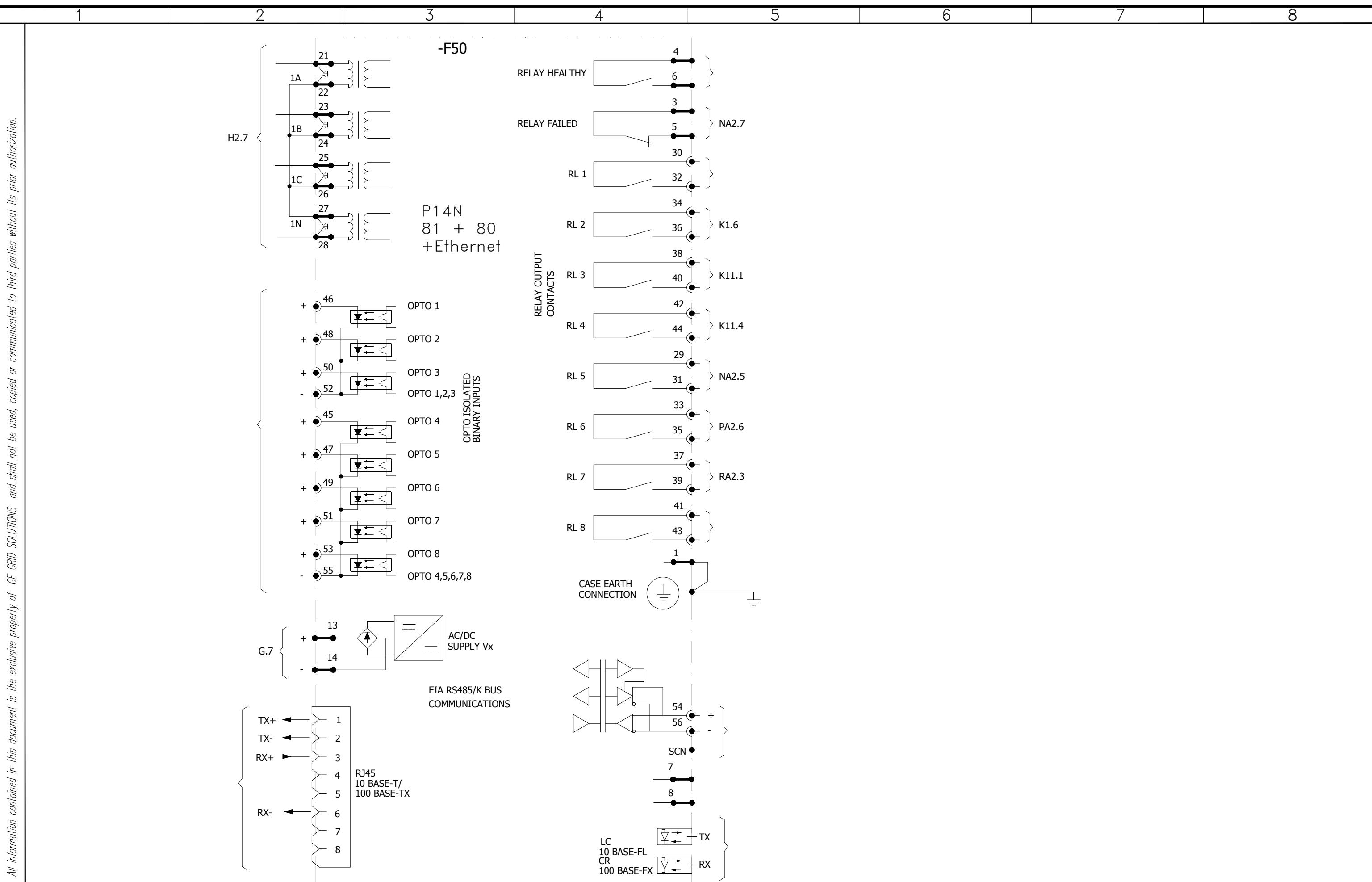
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0	AS BUILT	18.08.2018	MUR	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client 	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV TRAFO RELAY PANEL (=E02+RP4) COMPONENT DIAGRAM	Drawing no. P60194-E-ETR-SC-001		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type Z1	Sheet no. 24
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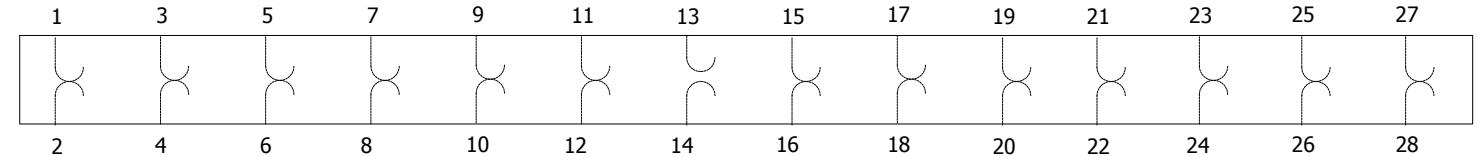
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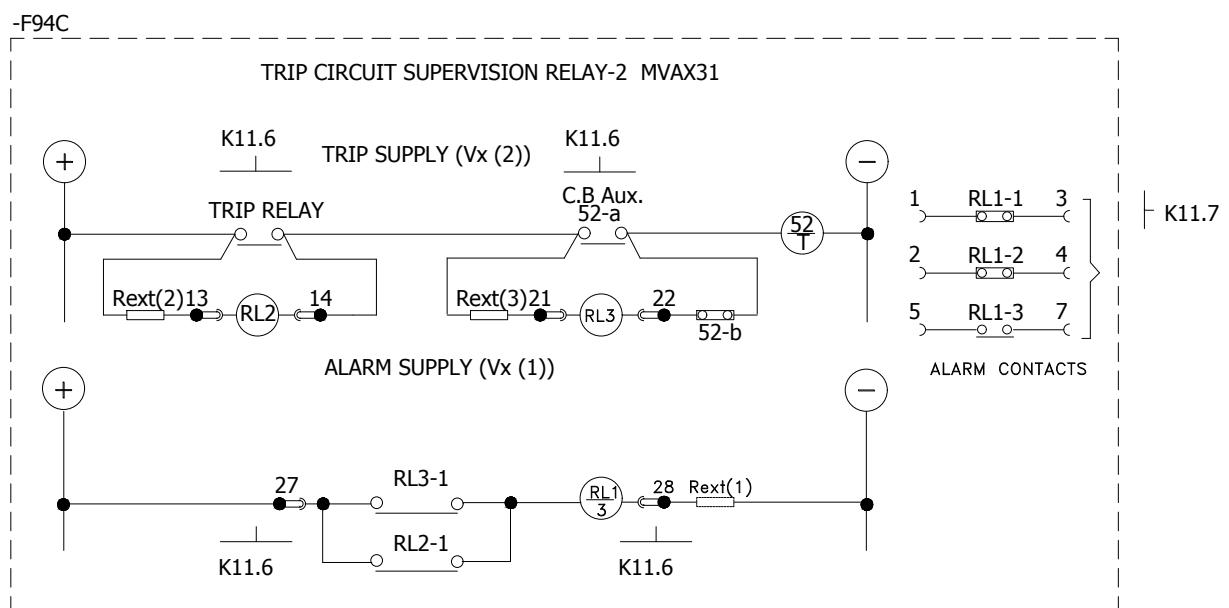
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REV.	DESCRIPTION	DATE	DRAWER	EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220kV/132kV GIS SUBSTATION GAZI ROAD, LAHORE	132kV TRAFO RELAY PANEL (=E02+RP4) COMPONENT DIAGRAM	P60194-E-ETR-SC-001		
									Project no. P-60194	Sheet type Z2	Sheet no. 25



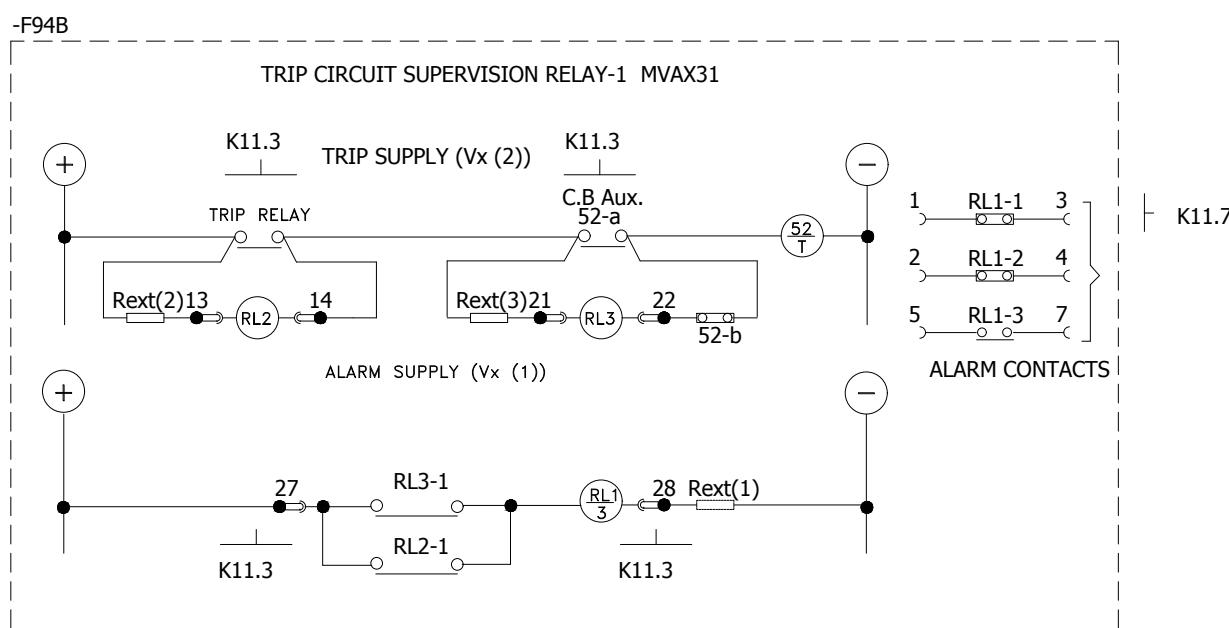
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type Z3
									Sheet no. 26



-XT87	H1.6	NA1.1	G.4	K1.2	H1.6	
-XT50	H2.6	K1.6	G.7	NA2.5	NA2.7	



-94B1	K11.3
-94B2	K11.3
-94B3	K11.3
-94C1	K11.6
-94C2	K11.6
-94C3	K11.6



-94B1	K11.3
-94B2	K11.3
-94B3	K11.3
-94C1	K11.6
-94C2	K11.6
-94C3	K11.6

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0	AS BUILT	18.08.2018	MUR	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 TRAFO RELAY PANEL (=E02+RP4) COMPONENT DIAGRAM	Drawing no. P60194-E-ETR-SC-001		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type Z4	Sheet no. 27
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