



Grid Solutions

A GE and Alstom joint venture

220kV/132kV GIS SUBSTATION GHAZI ROAD , LAHORE

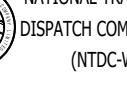
220kV TRANSFORMER RELAY SET-1 PANEL (=D04+R3) SCHEMATIC DRAWINGS

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

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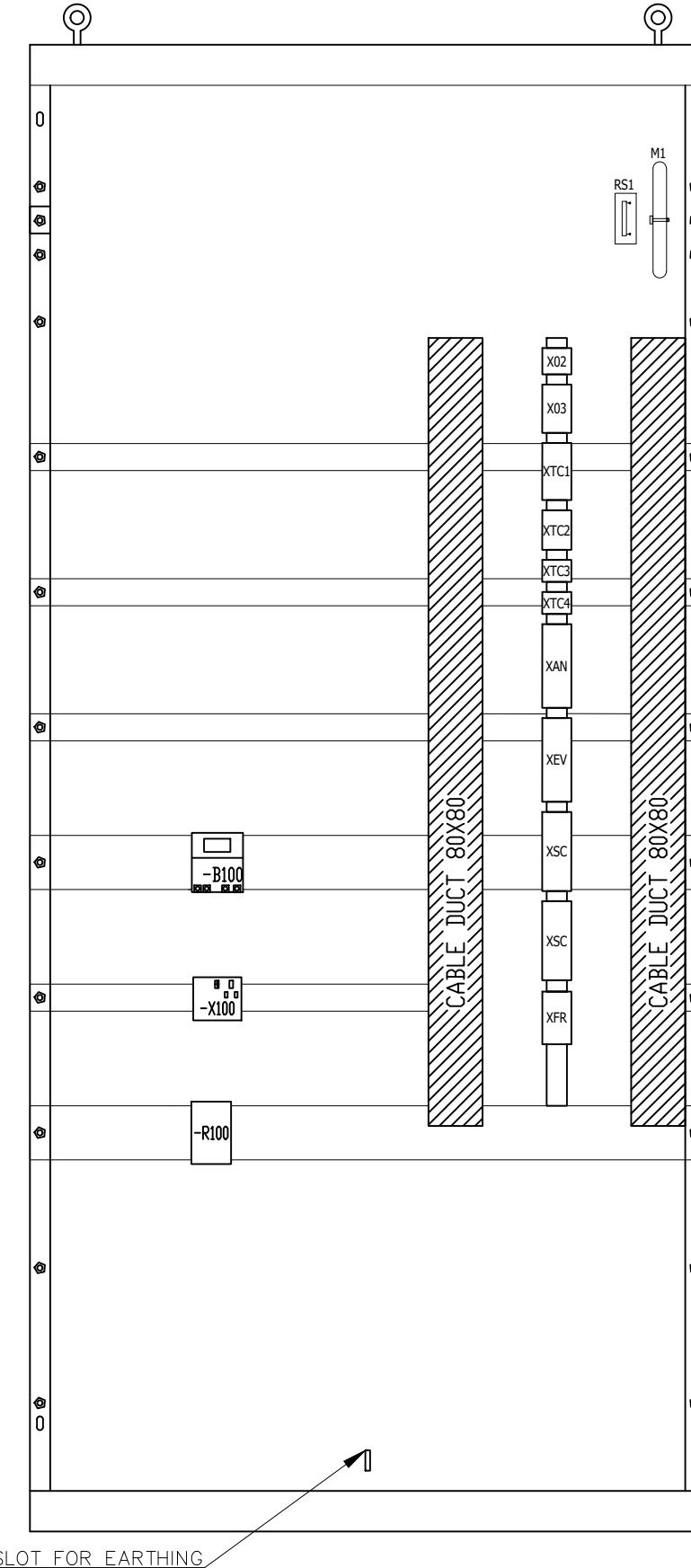
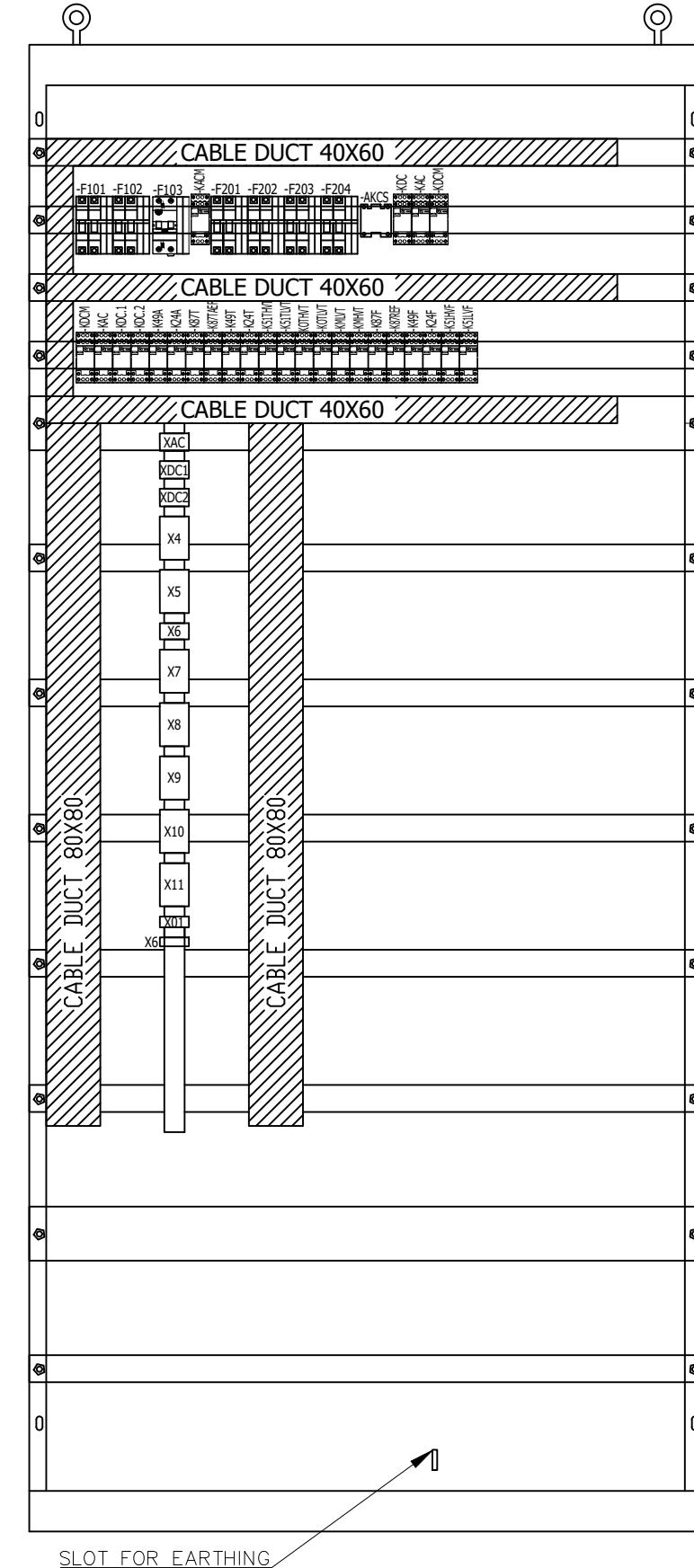
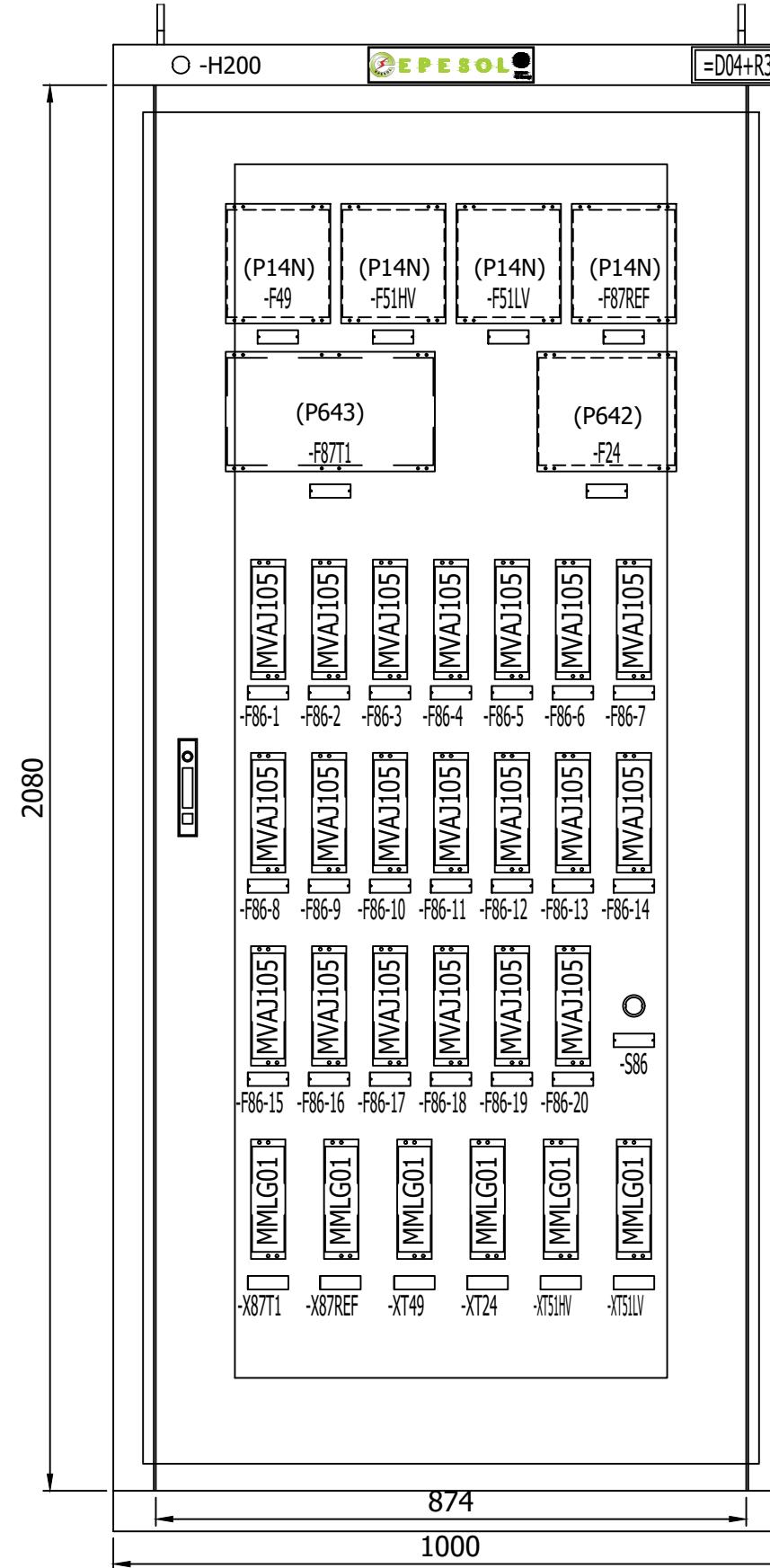
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type AB Sheet no. 03
1	2	3	4	5	6	7	8		

	1	2	3	4	5	6	7	8			
A	QTY.	DEVICE DESCRIPTION		DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION		MANUFACTURER		
	01	TRANSFORMER DIFFERENTIAL PROTECTION RELAY		AGILE P643, Cortec: P64391BA6M0060M Supply: 110-250VDC / 100-240VAC, 12 CT + 1 VT (Vn=100-120V),(In=1/5A) Inputs 16 Opto Inputs, 16 Relay Outputs			-F87T1		GE GRID SOLUTIONS		
B	01	OVER EXCITATION PROTECTION RELAY		AGILE P642, Cortec: P64291BA6M0060P Supply: 110-250VDC / 100-240VAC, 1 VT + 8 CT (Vn=100-120V),(In=1/5A) Inputs 8 Opto Inputs, 8 Relay Outputs			-F24		GE GRID SOLUTIONS		
	04	OVERCURRENT EARTHFAULT RELAY		AGILE P14N, Cortec: P14N-B16A7C0570A Supply: 24-250VDC / 110-240VAC, 4 CT (In=1/5A) Inputs 8 Opto Inputs, 8 Relay Outputs			-F49, -F51HV, -F51LV, F87REF		GE GRID SOLUTIONS		
C	06	TEST BLOCK		MMLG01, Cortec: MMLG01-R1AA9002D Supply: 220-250VDC, 8 NO + 2 NC Contacts			-XT87T1, -XT87REF, -XT49, -XT24, -XT51HV, -XT51LV,		GE GRID SOLUTIONS		
	20	TRIPPING RELAY (HAND/ELECTRICAL RESET)		MVAJ105, Cortec: MVAJ105-RA1002A Supply: 220-250VDC, 8 NO + 2 NC Contacts			-F86-1 TO -F86-20		GE GRID SOLUTIONS		
D	02	CONTROL MCB - PANEL LIGHT & HEATER		G62C02+(CAH2),2-Pole, Ratings: 2A, 230VAC, 6kA @ 230VAC, 2 C/O Contacts			-F101-102		GE		
	01	CONTROL ELCB - PANEL SOCKET		DM100C216/030+(CAH2),2-Pole, Ratings: 16A, 30mA, 230VAC, 2 C/O Contacts			-F103		GE		
E	04	CONTROL MCB - DC DISTRIBUTION		EP102UCC04+(CAH2),2-Pole, Ratings: 4A, 220VDC, 10kA, 2 C/O Contacts			-F201 ~ - F204		GE		
	01	PUSHBUTTON - DIRECT TRANSFER TRIP RESET		YS-AP1-2-40-B-D-W, Black button, Spring return, 2-Pole, Ratings: 12A, 220VDC			-S86		YOUNGSUNG		
F	01	AUXILIARY CONTACTOR		MCRC022ATWN-B+MARN211AT, Coil Voltage: 220VDC, 3NO+3NC Contacts			-KCS		GE		
	22	AUXILIARY CONTACTOR		PRC4M40DCML, Coil Voltage: 220VDC, 4 C/O Contacts			-KDCM,-KAC,-KDC1,-KDC2,-K49A,-K24A,K87T,-K87REFT,-K49T -K24T,-K51HVT,-K51LVT,-KOTHVT,-KOTLVT,-KWTHVT,KWTLVT -K87F,-K87REFF,-K49F,-K24F,-K51HVF,-K51LVF		GE		
G	02	AUXILIARY CONTACTOR		PRC4M40ANL, Coil Voltage: 230VAC, 4 C/O Contacts			-KACM, -KDC		GE		
	01	INDICATION LAMP - DC SUPPLY FAILURE		YS-PL-2-AL-22-R-W, Type: Integrated LED , Color : RED , Supply : 230VAC @ 50Hz			-H200		YOUNGSUNG		
H	01	PANEL LIGHT WITH DOOR SWITCH		YST8-30-5W+YSP3315GWB, 230VAC @ 50Hz, 20W, with Door Limit Sw. 1 CO contact			-H100, -S100		YOUNGSUNG		
	01	THREE PIN SOCKET		1N+PE, 16A, 230VAC @ 50Hz			-X100		LEAR		
I	01	PANEL HEATER		230VAC @ 50Hz, 50W			-R100		E-LABS		
	01	HUMIDITY & TEMPERATURE CONTROLLER		THERMOSTAT AND HUMIDSTAT			-B100		E-LABS		
J	01	RESISTOR		ZB9016774, (1500 Ohm)			-RS1		-		
	01	METROSIL		600A/S1/S1088			-M1		METROSIL		
K	08	TERMINAL BLOCKS FOR CT WITH SHORTING ARRANGEMNT		Type: SCB-6			-X4		CABUR		
	08	TERMINAL BLOCKS FOR CT WITH SHORTING ARRANGEMNT		Type: SCB-6			-X5		CABUR		
	03	TERMINAL BLOCKS FOR CT WITH SHORTING ARRANGEMNT		Type: SCB-6			-X6		CABUR		
	08	TERMINAL BLOCKS FOR CT WITH SHORTING ARRANGEMNT		Type: SCB-6			-X7		CABUR		
0	AS BUILT		30.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor 	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) COMPONENT LIST	Drawing no. P60194-E-DTR-SC-003	
REV.	DESCRIPTION		DATE	DRAWER					Project no. P-60194	Sheet type AC	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	08	TERMINAL BLOCKS FOR CT WITH SHORTING ARRANGEMNT	Type: SCB-6			-X8	CABUR			
	08	TERMINAL BLOCKS FOR CT WITH SHORTING ARRANGEMNT	Type: SCB-6			-X9	CABUR			
	08	TERMINAL BLOCKS FOR CT WITH SHORTING ARRANGEMNT	Type: SCB-6			-X10	CABUR			
	08	TERMINAL BLOCKS FOR CT WITH SHORTING ARRANGEMNT	Type: SCB-6			-X11	CABUR			
B	02	TERMINAL BLOCKS FOR VT	Type: SCB-6			-X01	CABUR			
	05	TERMINAL BLOCKS FOR AC SUPPLY	Type: CBD-4			-XAC	CABUR			
	04	TERMINAL BLOCKS FOR DC SUPPLY-1	Type: CBD-4			-XDC1	CABUR			
	04	TERMINAL BLOCKS FOR DC SUPPLY-2	Type: CBD-4			-XDC2	CABUR			
C	02	TERMINAL BLOCKS FOR AC FAULTY CIRCUIT	Type: CBD-4			-X12	CABUR			
	06	TERMINAL BLOCKS FOR TRANSFORMER MECH. TRIP	Type: CBD-4			-X02	CABUR			
	13	TERMINAL BLOCKS FOR 220kV CB TRIP CIRCUIT-1	Type: CBD-4			-XTC1	CABUR			
	09	TERMINAL BLOCKS FOR 220kV CB TRIP CIRCUIT-2	Type: CBD-4			-XTC2	CABUR			
D	05	TERMINAL BLOCKS FOR 132kV CB TRIP CIRCUIT-1	Type: CBD-4			-XTC3	CABUR			
	05	TERMINAL BLOCKS FOR 132kV CB TRIP CIRCUIT-2	Type: CBD-4			-XTC4	CABUR			
	11	TERMINAL BLOCKS FOR CLOSE BLOCK, BFI SIGNALS	Type: CBD-4			-X03	CABUR			
	19	TERMINAL BLOCKS FOR ANNUNCIATION SIGNALS	Type: CBD-4			-XAN	CABUR			
E	19	TERMINAL BLOCKS FOR ER SIGNALS	Type: CBD-4			-XEV	CABUR			
	18	TERMINAL BLOCKS FOR SCADA SIGNALS	Type: CBD-4			-XSC	CABUR			
	12	TERMINAL BLOCKS FOR FR SIGNALS	Type: CBD-4			-XFR	CABUR			
F										
G	0	AS BUILT	30.10.2018	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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) COMPONENT LIST	Drawing no. P60194-E-DTR-SC-003
									Project no. P-60194	
									Sheet type AC1	
									Sheet no. 04a	
REV.	DESCRIPTION	DATE	DRAWER							

FRONT VIEWLEFT SIDE VIEWRIGHT SIDE VIEW

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town, Lahore, Pakistan
REV.	DESCRIPTION	DATE	DRAWER	



Client

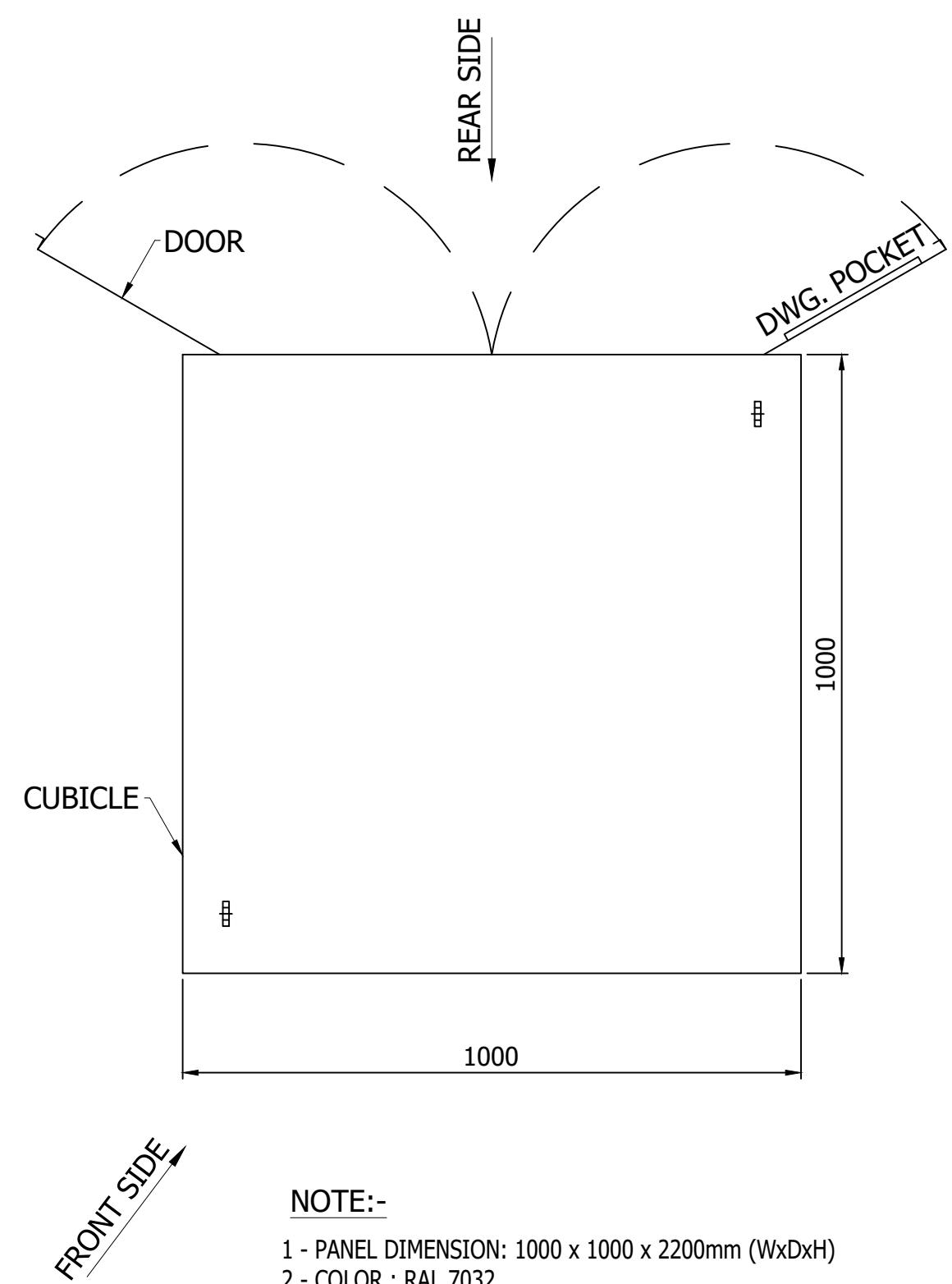
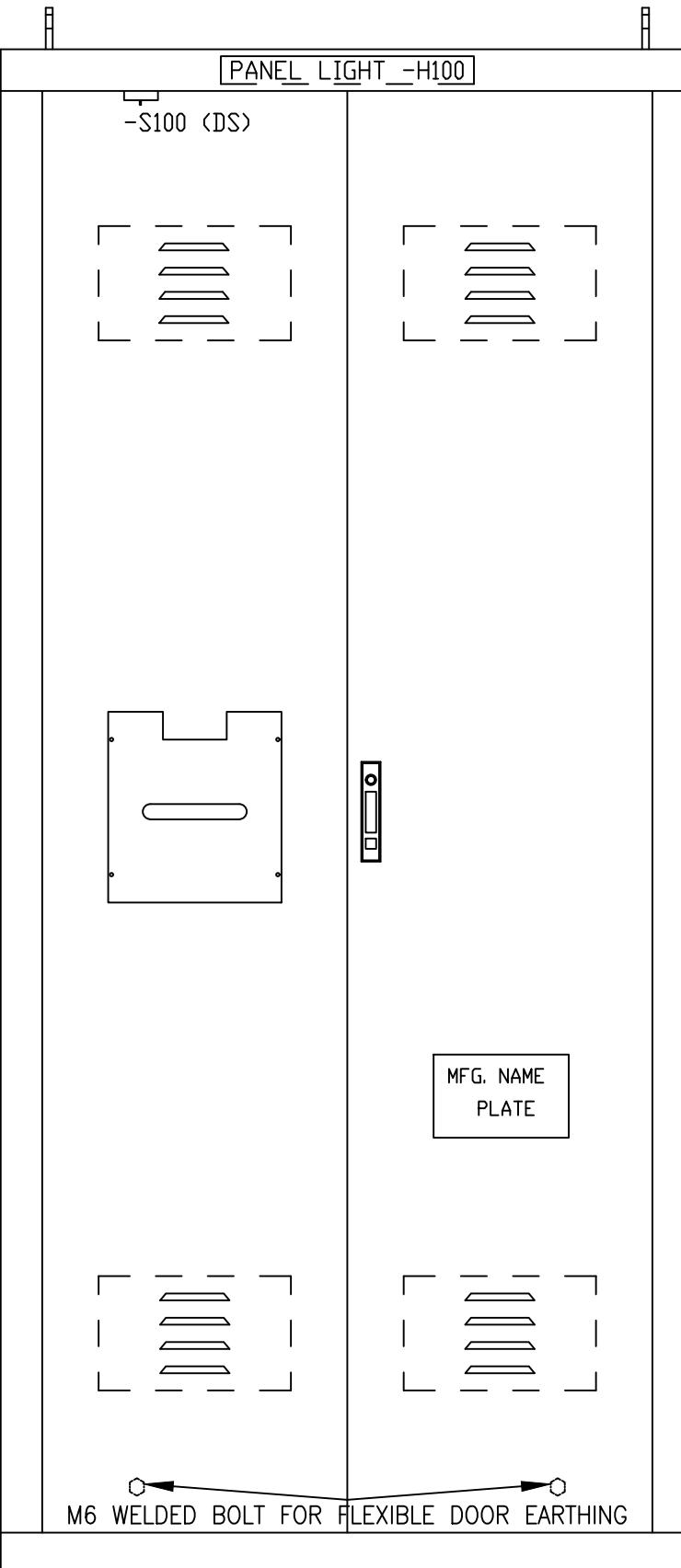
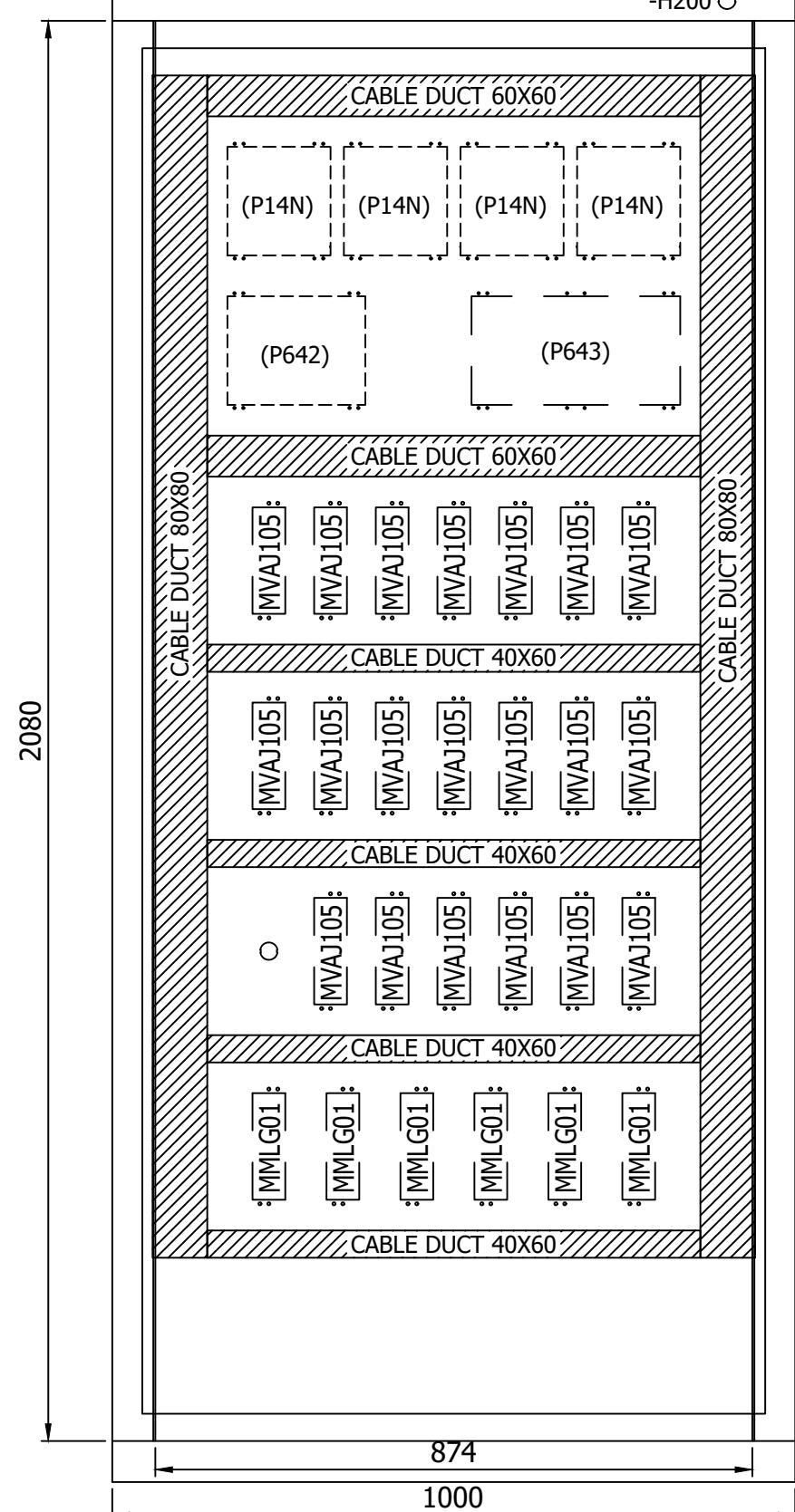
NATIONAL TRANSMISSION &
DISPATCH COMPANY LIMITED
(NTDC-WAPDA)

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

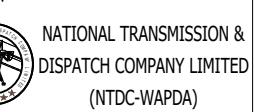
Title
220kV TRAFO RELAY SET-1 PANEL
(=D04+R3)
PANEL VIEW

Drawing no.
P60194-E-DTR-SC-003

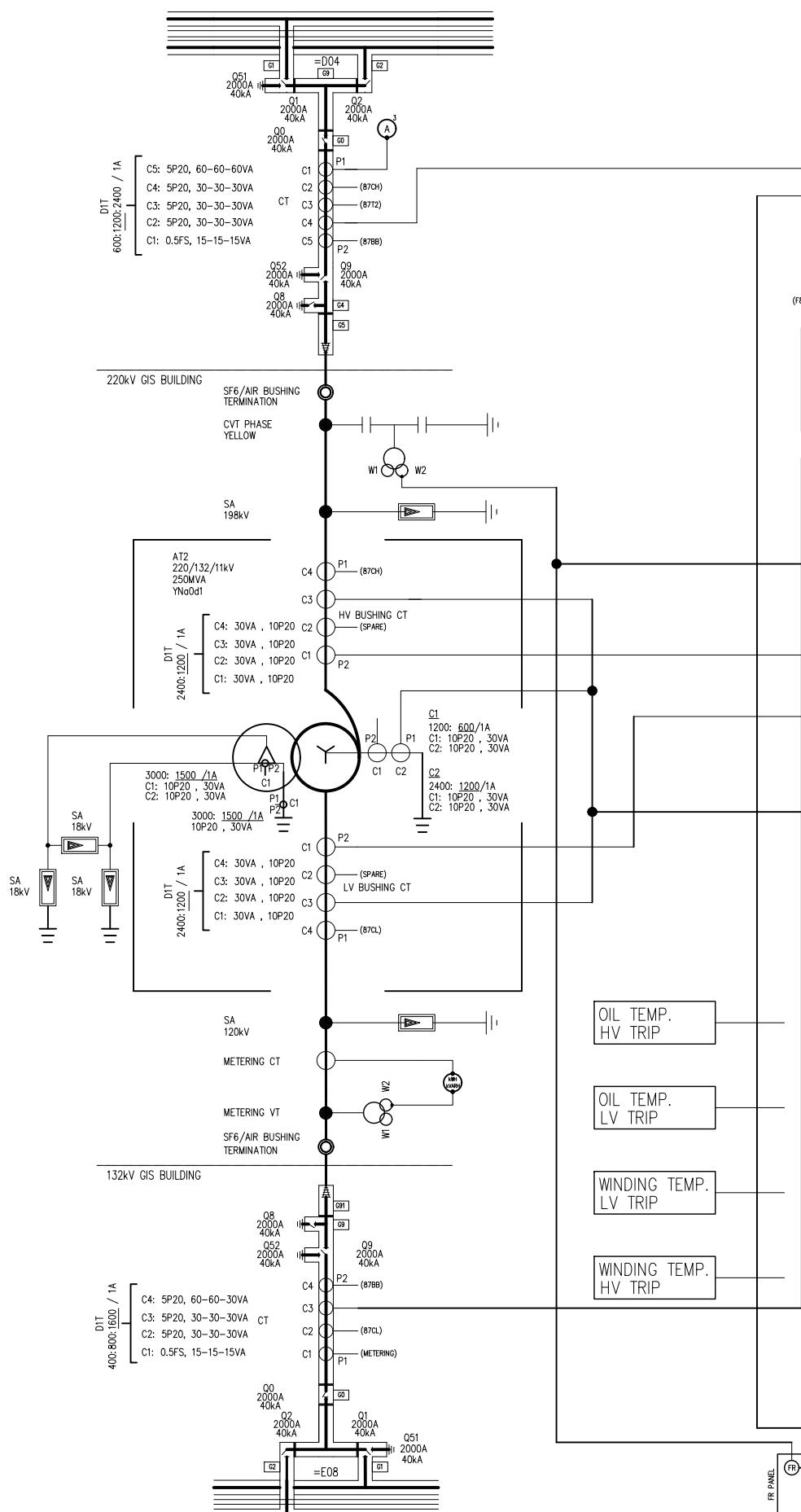
Project no. P-60194 Sheet type AD Sheet no. 05

FRONT VIEWBACK VIEW WITH DOORTOP VIEWNOTE:-

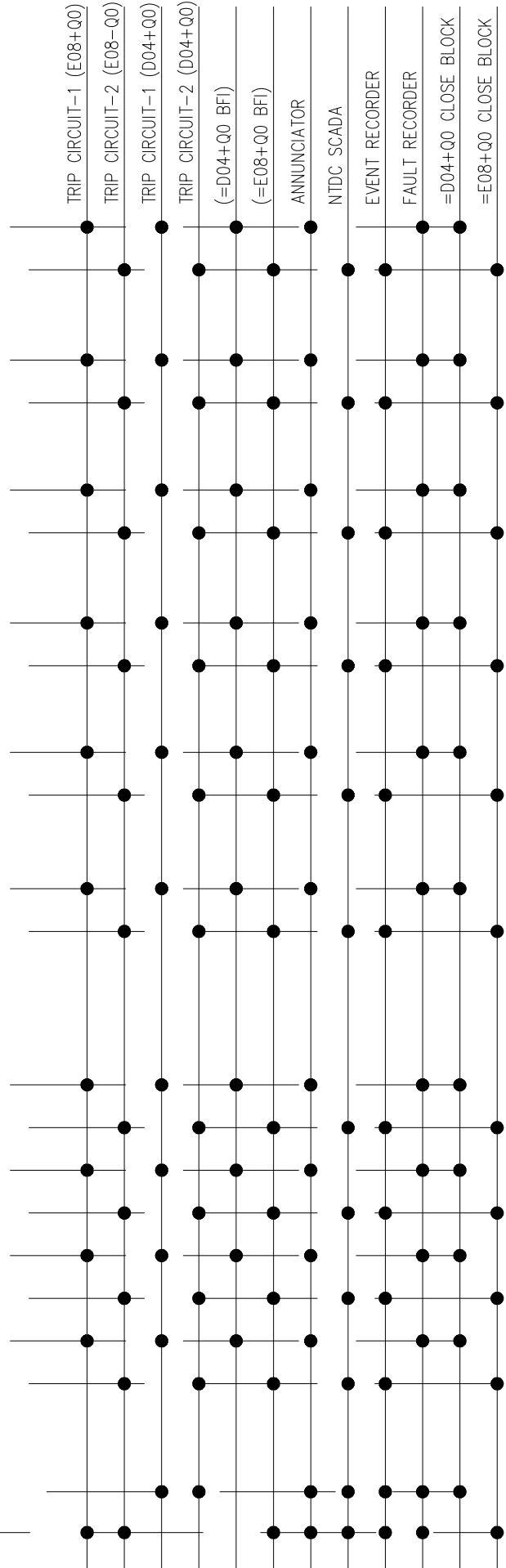
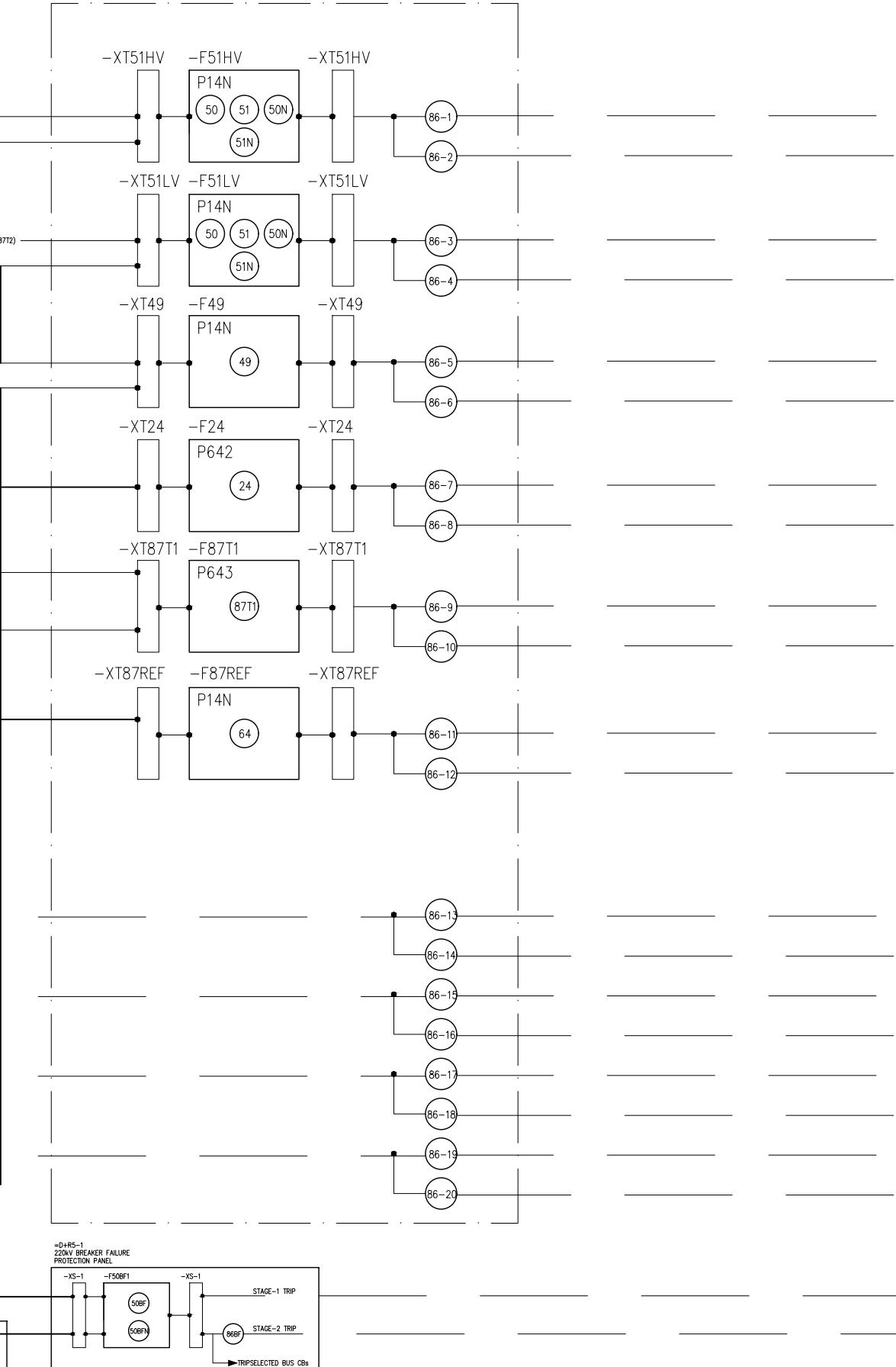
- 1 - PANEL DIMENSION: 1000 x 1000 x 2200mm (WxDxH)
- 2 - COLOR : RAL 7032
- 3 - SHEET THICKNESS : 2.25 mm
- 4 - PROTECTION CLASS : IP-51 (INDOOR TYPE)
- 5 - ALL DOOR FITTED WITH 16mm EARTH STRAP & INSULATED WITH GREEN-YELLOW COLOUR.

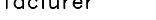
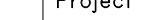
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REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AD	Sheet no. 05

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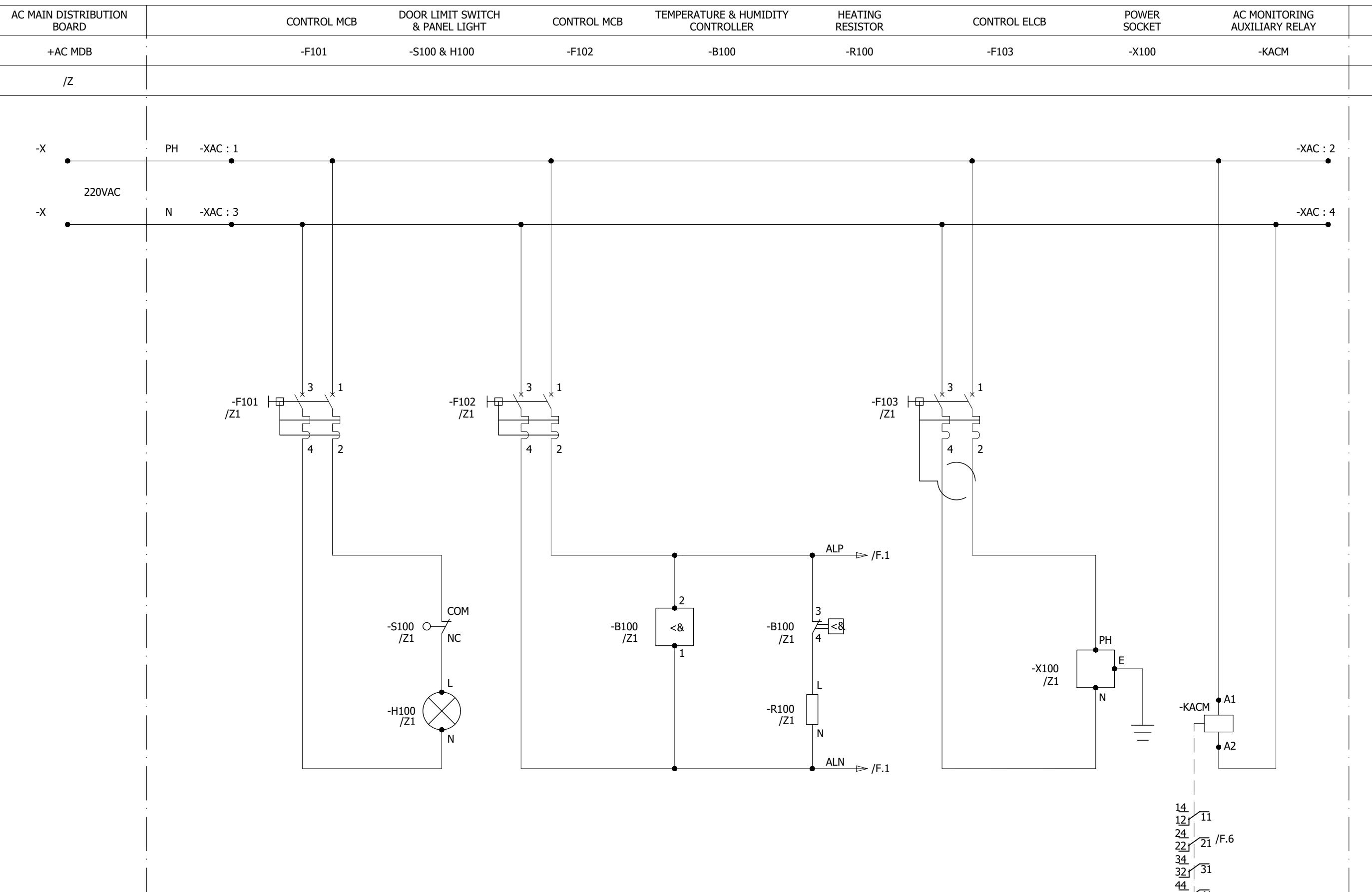


=D04+R3
220kV TRANSFORMER RELAY PANEL (SET-1)



0	AS BUILT	10.10.2018	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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) BAY CONCEPT & PROTECTION LOGICS	Drawing no. P60194-E-DTR-SC-003		
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REV.	DESCRIPTION	DATE	DRAWER								

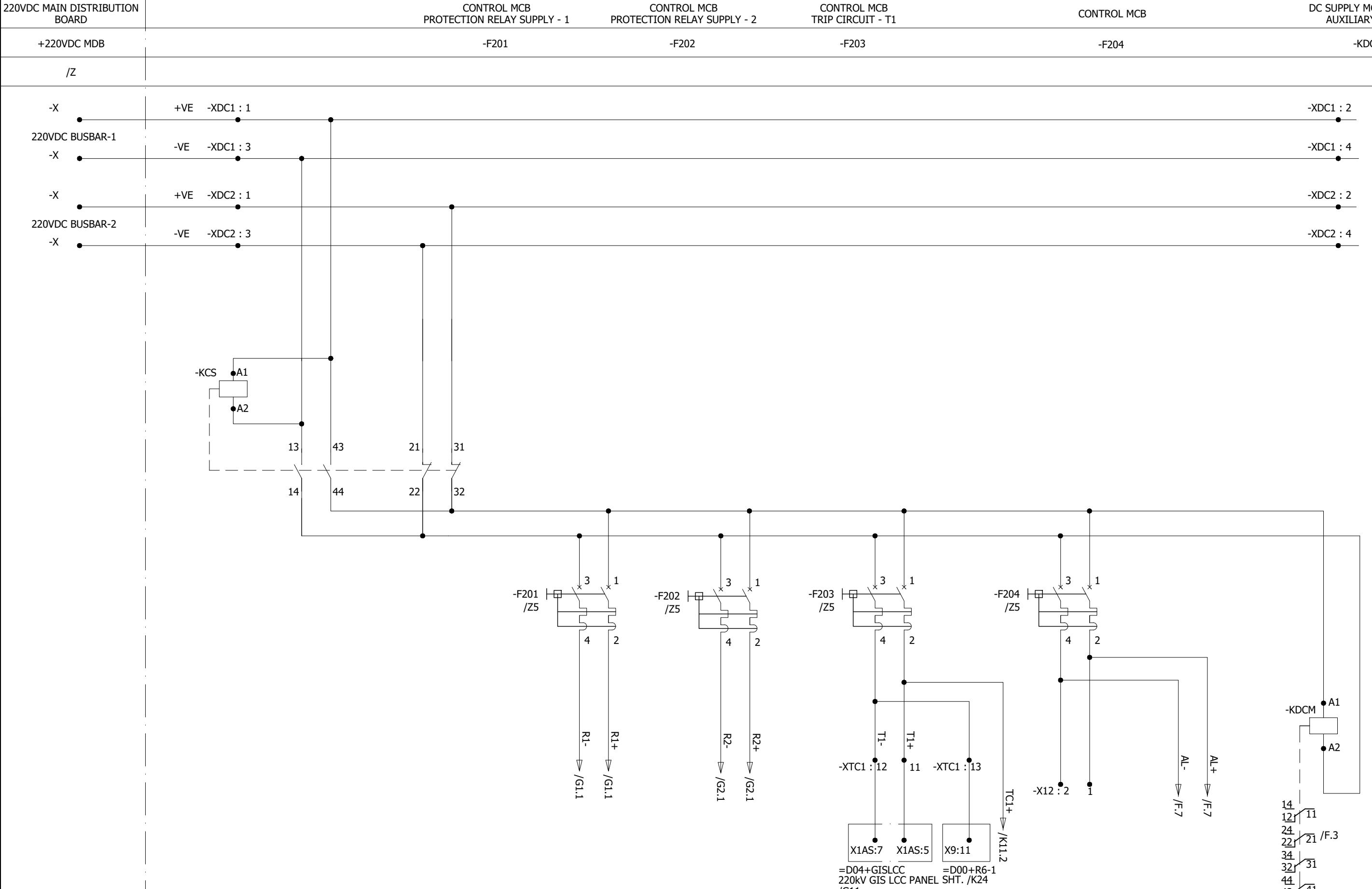
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type D
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1 2 3 4 5 6 7 8

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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type E
									Sheet no. 08

1 2 3 4 5 6 7 8

220V DC CIRCUIT FAULTY

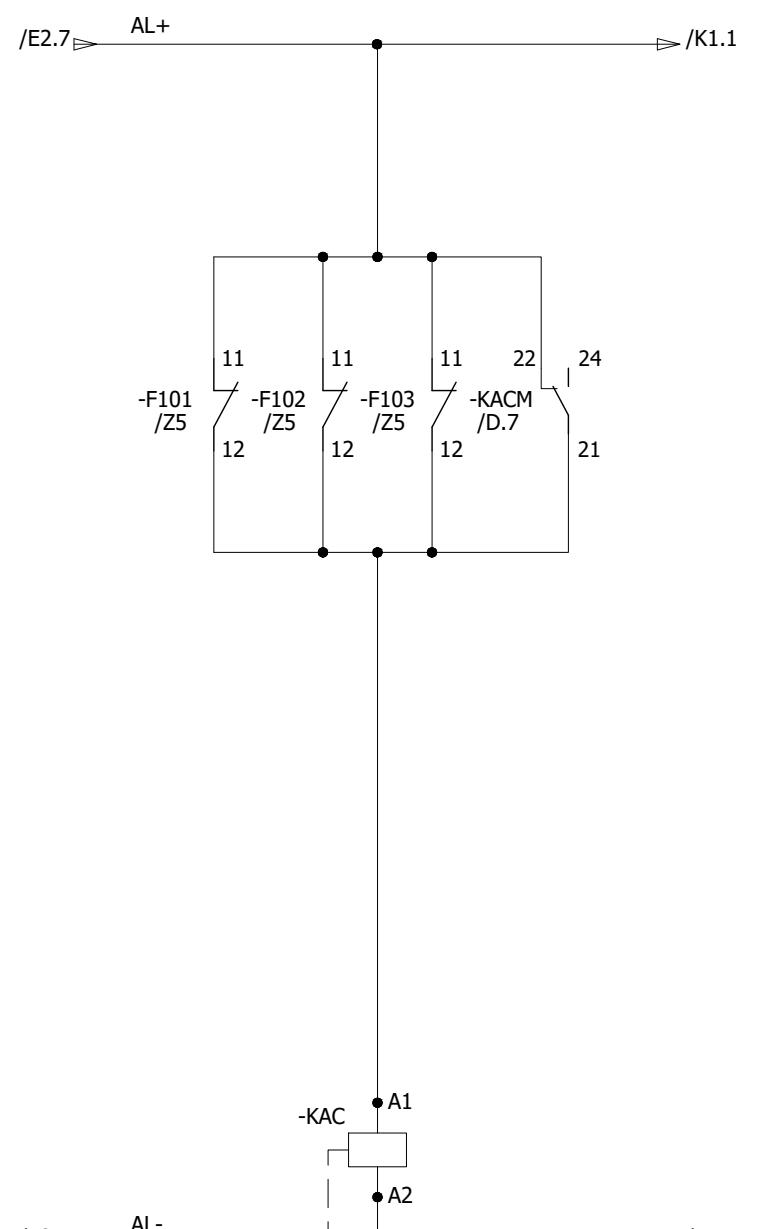
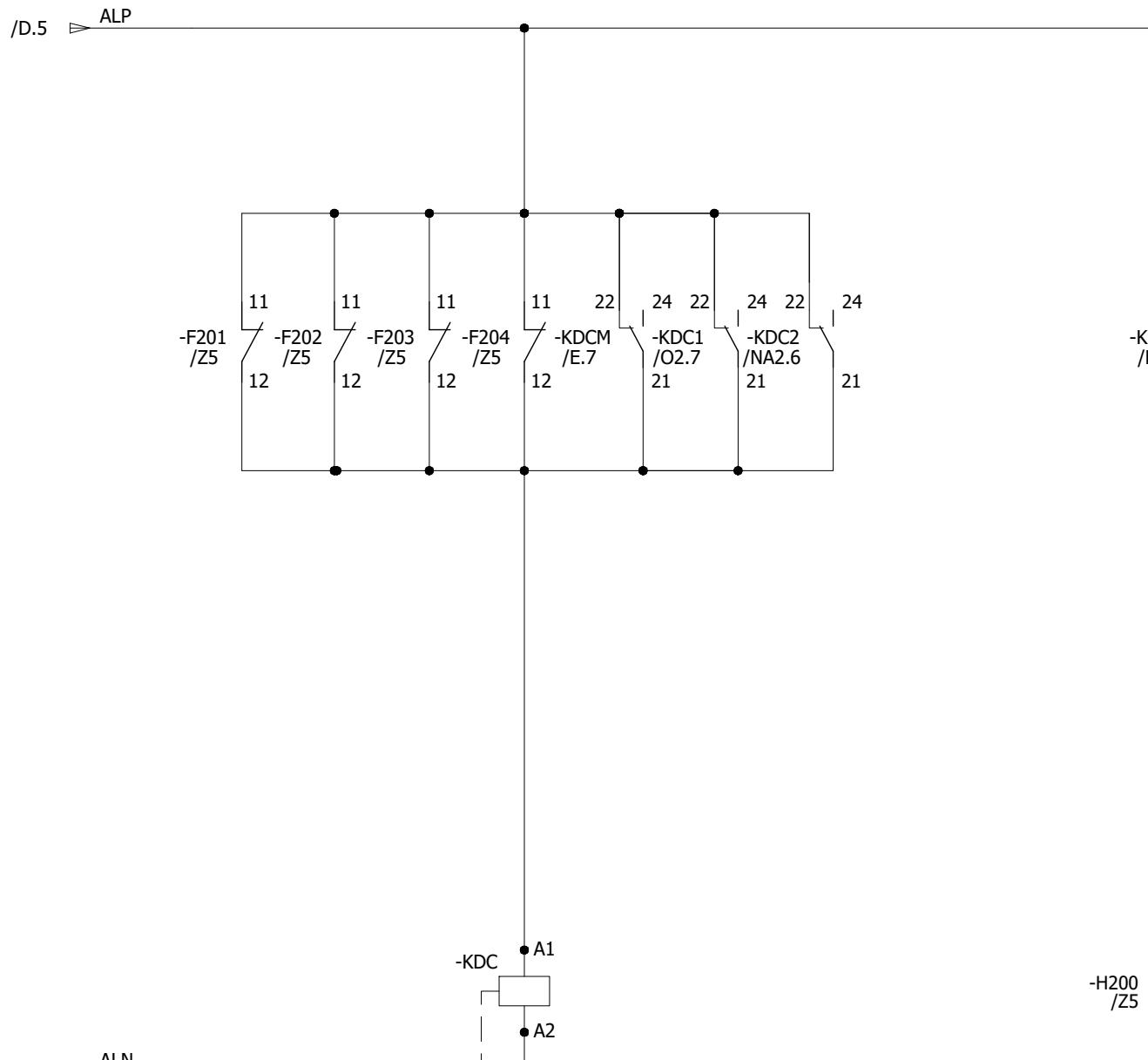
220V DC CIRCUIT FAULTY INDICATION

220V AC CIRCUIT FAULTY

-KDC

-H200

-KAC



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

TRAFO DIFF. RELAY

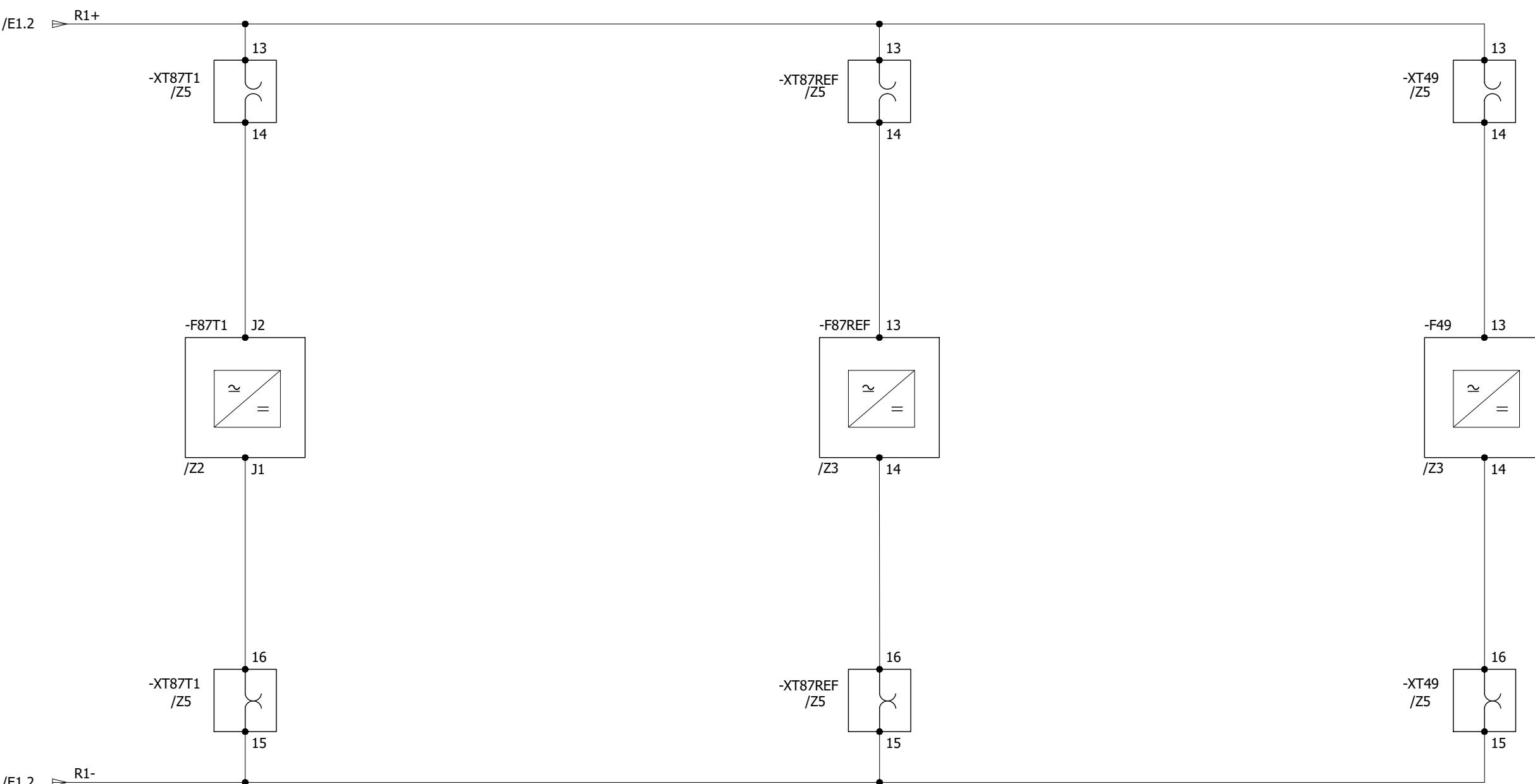
REF RELAY

THERMAL O/L RELAY

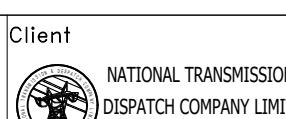
RELAY SUPPLY

RELAY SUPPLY

RELAY SUPPLY



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Project
220kV/132kV GIS SUBSTATION
GHAZI ROAD, LAHORE
Title
220kV TRAFO RELAY SET-1 PANEL
(=D04+R3)
RELAY CONTROL & SUPPLY

Drawing no.
P60194-E-DTR-SC-003

Project no. P-60194
Sheet type G1
Sheet no. 10

0	AS BUILT	10.10.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
				EPEPSOL 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	220kV TRAFO RELAY SET-1 PANEL (=D04+R3) RELAY CONTROL & SUPPLY	P60194-E-DTR-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type G1 Sheet no. 10

OVER EXCITATION RELAY

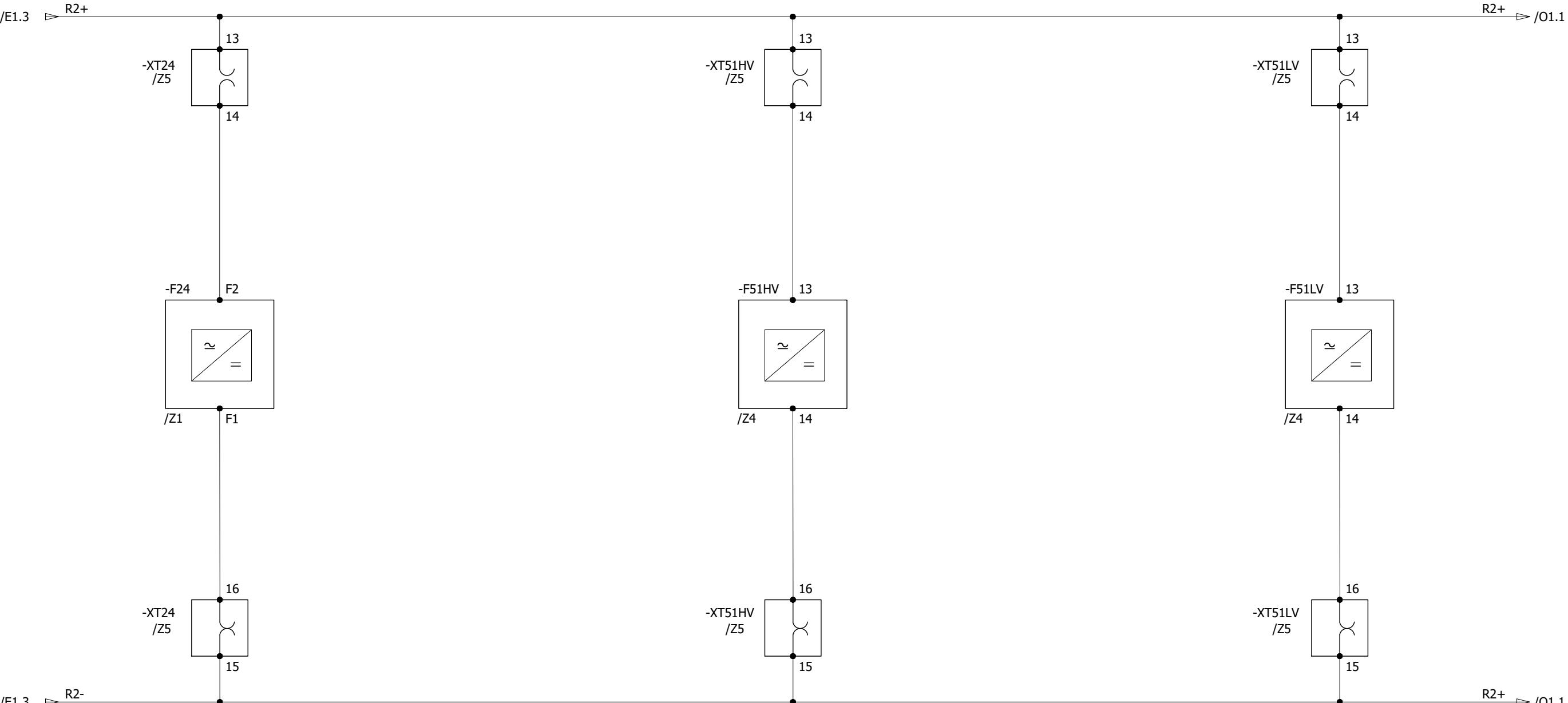
HV OC/EF RELAY

LV OC/EF RELAY

RELAY SUPPLY

RELAY SUPPLY

RELAY SUPPLY



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A

A

B

B

C

C

D

D

E

E

F

F

0	AS BUILT	10.10.2018	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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) RELAY CONTROL & SUPPLY	Drawing no. P60194-E-DTR-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type G2
									Sheet no. 11

TEST BLOCK

TRAFO DIFFERENCE PROTECTION
RELAY

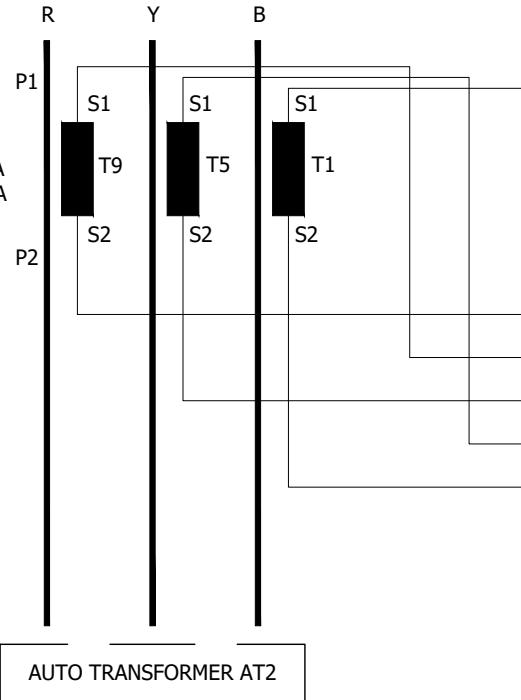
-XT87T1

-F87T1

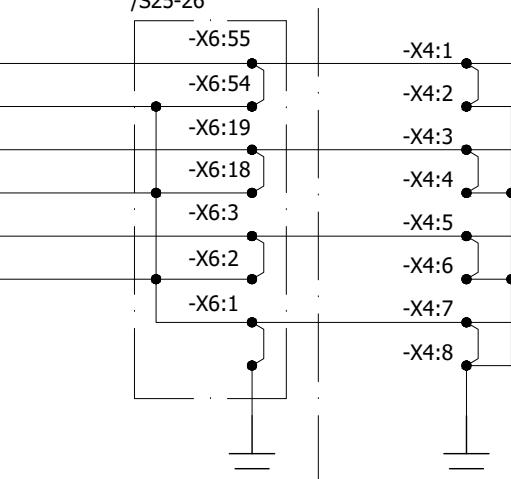
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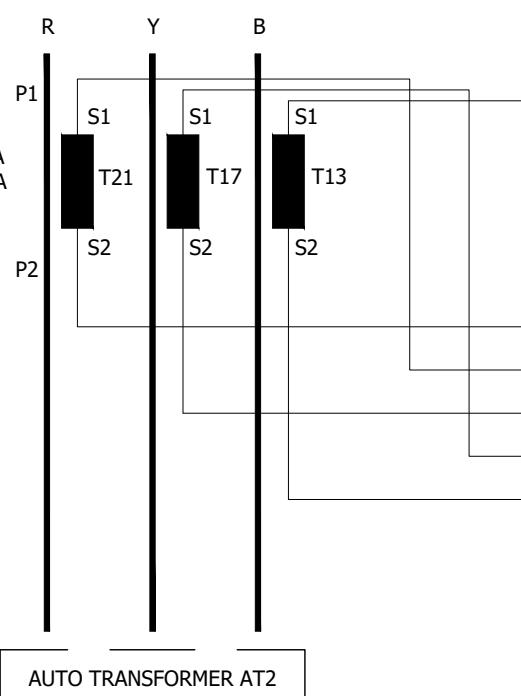
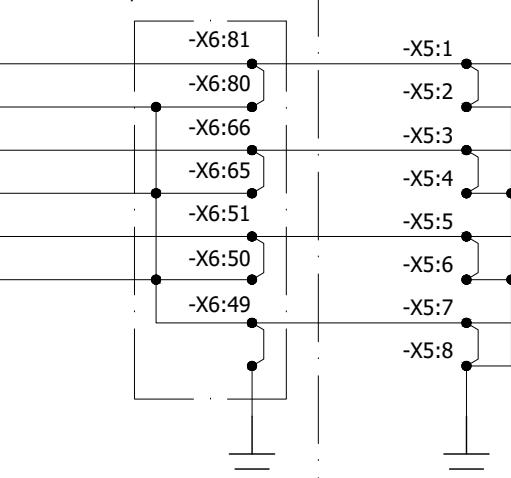
HV SIDE BUSHING CT



CONTROL ROOM

=D04+AT2
220KV/132KV AT2 TCC PANEL
/S25-26

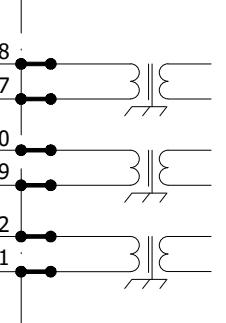
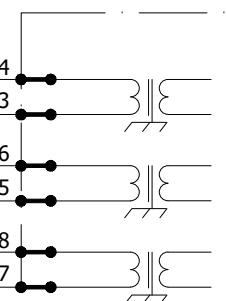
LV SIDE BUSHING CT

=D04+AT2
220KV/132KV AT2 TCC PANEL
/S23-S24

AGILE P643 TRANSFORMER DIFFERENTIAL PROTECTION RELAY

-XT87T1

-F87T1



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A

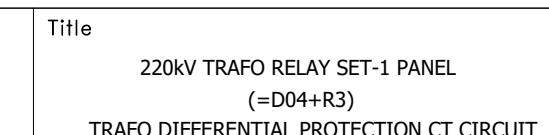
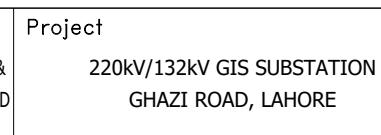
B

C

D

E

F



Drawing no.
P60194-E-DTR-SC-003

Project no. P-60194
Sheet type H1
Sheet no. 12

0	AS BUILT	10.10.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
				EPESOL	Grid Solutions	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	220KV TRAFO RELAY SET-1 PANEL (=D04+R3) TRAFO DIFFERENTIAL PROTECTION CT CIRCUIT	P60194-E-DTR-SC-003
REV.	DESCRIPTION	DATE	DRAWER	EPESOL	Grid Solutions	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	220KV TRAFO RELAY SET-1 PANEL (=D04+R3) TRAFO DIFFERENTIAL PROTECTION CT CIRCUIT	P60194-E-DTR-SC-003

TEST BLOCK

MTEROSIL

LIMITING RESISTOR

RESTRICTED EARTH FAULT RELAY

-XT87

-M1

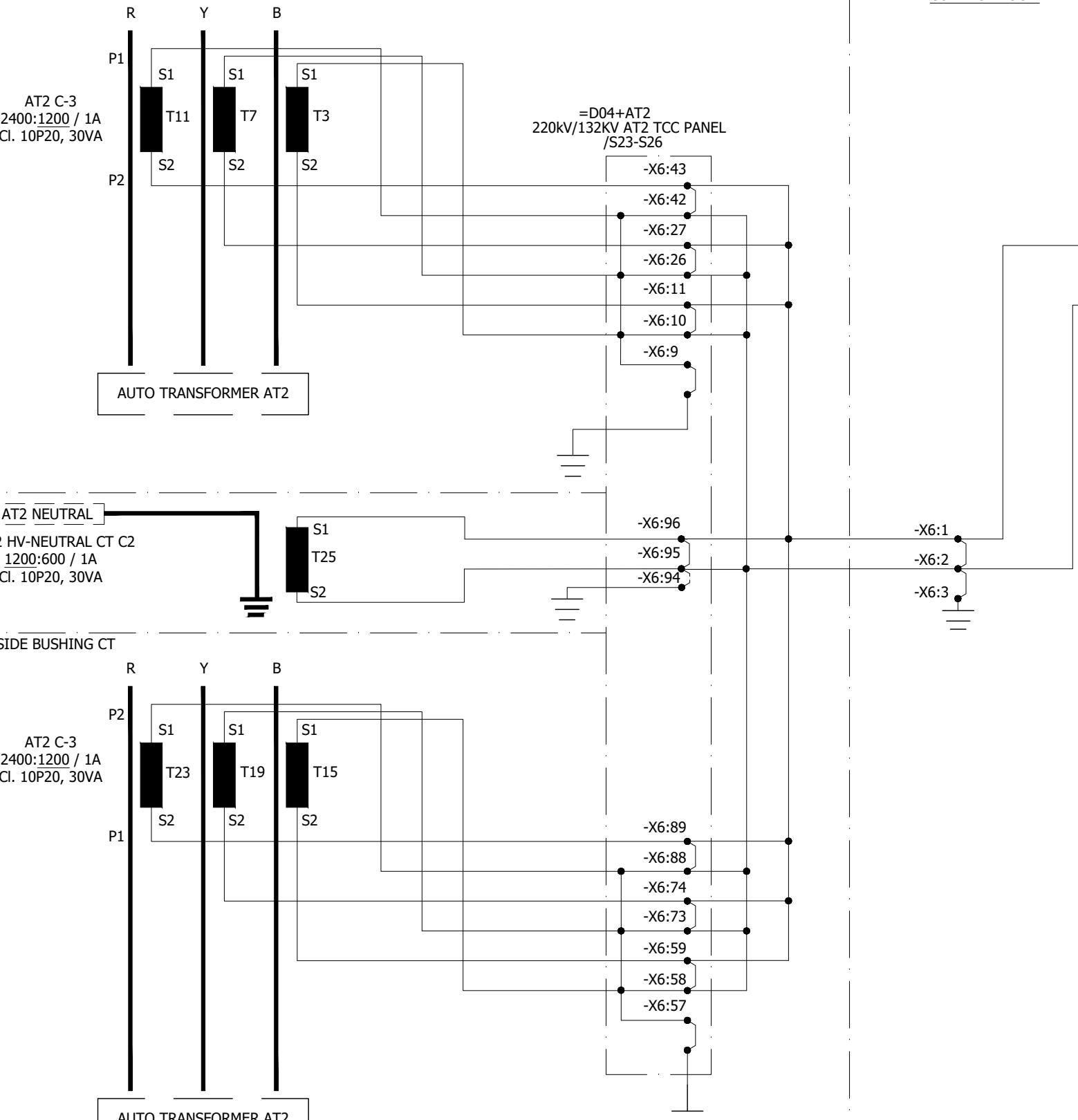
-RS1

-F87REF

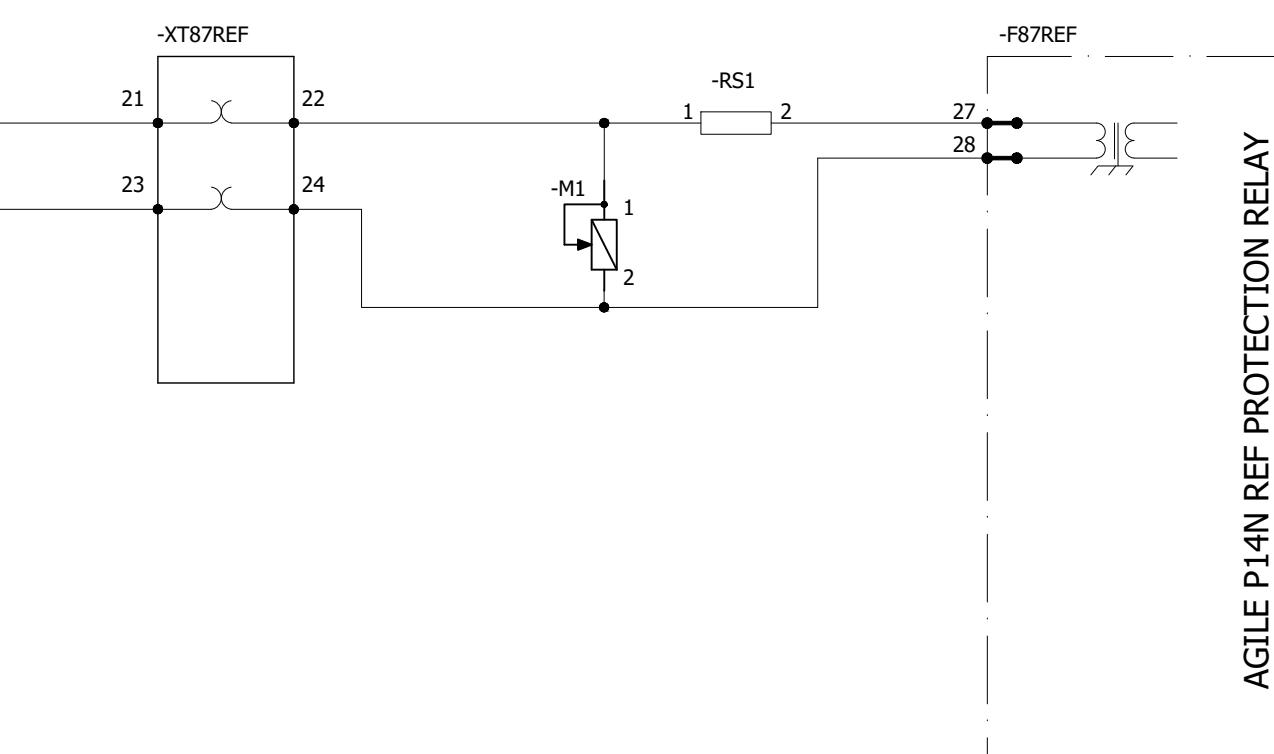
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HV SIDE BUSHING CT



CONTROL ROOM



AGILE P14N REF PROTECTION RELAY

A

A

B

B

C

C

D

D

E

E

F

F

0	AS BUILT	10.10.2018	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 220KV TRAFO RELAY SET-1 PANEL (=D04+R3) REF PROTECTION CT CIRCUIT	Drawing no. P60194-E-DTR-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type H2	Sheet no. 13

132KV GIS LCC
PANEL

TEST BLOCK

THERMAL OVERLOAD
RELAY

=E08

-XT49

-F49

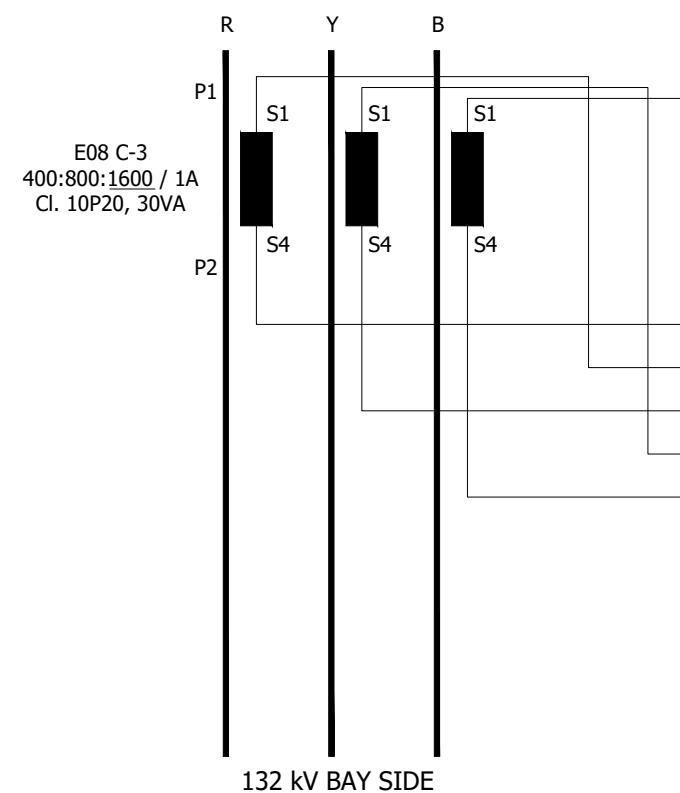
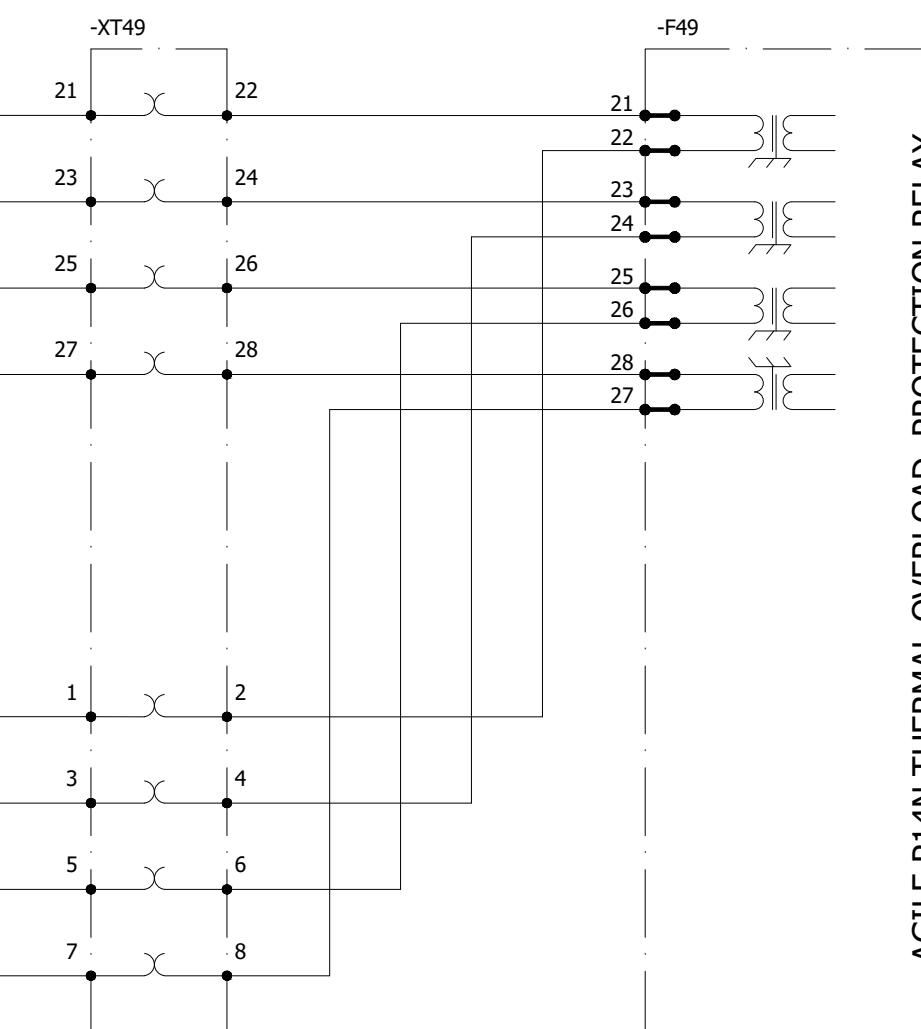
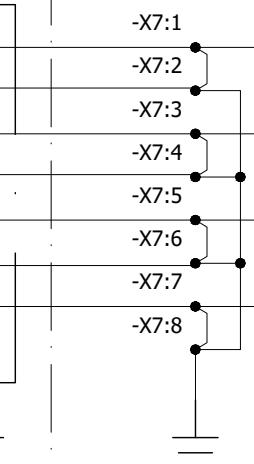
/MA1

/Z5

/Z3

LV TRAFO SIDE

132KV GIS HALL CONTROL ROOM

=E08+GIS LCC
132KV GIS LCC PANEL
/S11

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A

A

B

B

C

C

D

D

E

E

F

F

0	AS BUILT	10.10.2018	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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) THERMAL OVERLOAD RELAY CT INPUTS	Drawing no. P60194-E-DTR-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type H3	Sheet no. 14

220KV CVT TRAFO SIDE
PANEL

TEST BLOCK

OVER EXCITATION
RELAY

=D04 + CVT KIOSK

-XT24

-F24

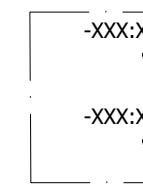
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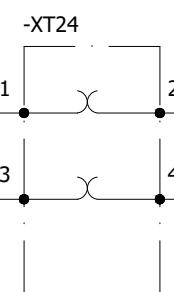
CONTROL ROOM

=CVT KIOSK
RY PHASE
/S81



-X01:1

-X01:2



-XT24

3

1

4

2

-F24



AGILE P642 OVER EXCITATION PROTECTION RELAY

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0	AS BUILT	10.10.2018	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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) OVER EXCITATION RELAY VT INPUTS	Drawing no. P60194-E-DTR-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194

220kV GIS LCC
PANEL

TEST BLOCK

HV OCP/EFP
RELAY

=D04

-XT51HV

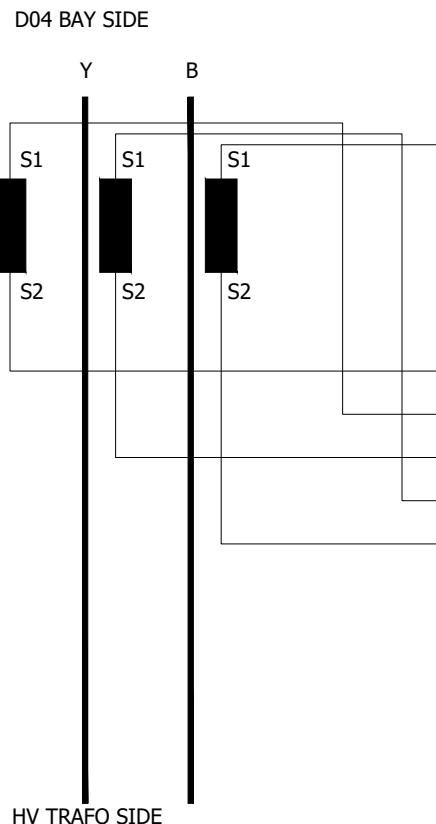
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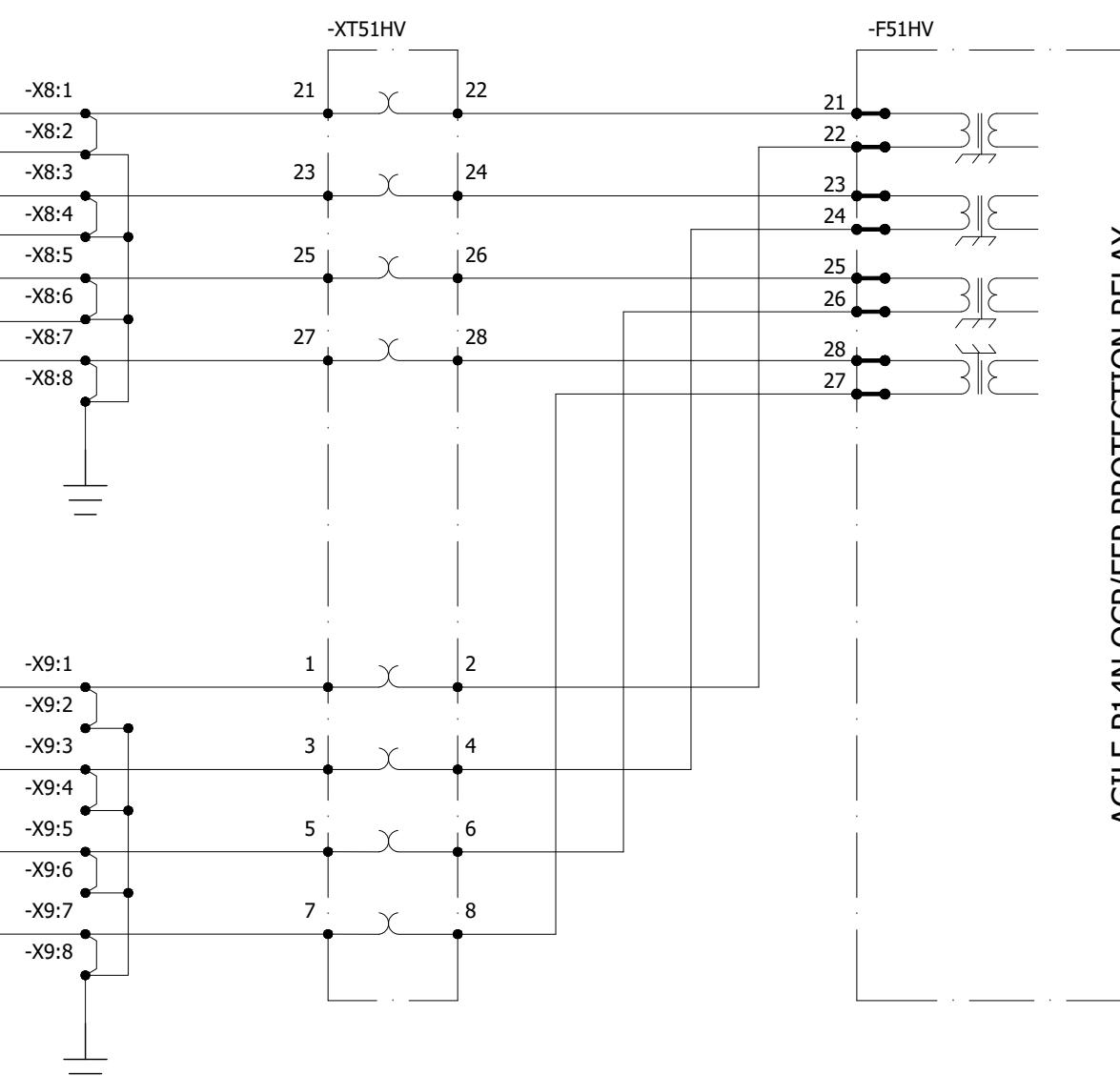
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/Z4

220kV GIS HALL CONTROL ROOM



=D04+GISLCC
220kV GIS LCC PANEL
/S81



AGILE P14N OCP/EFP PROTECTION RELAY

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0	AS BUILT	10.10.2018	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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) HV OCP/EFP RELAY CT INPUTS	Drawing no. P60194-E-DTR-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type H5
									Sheet no. 16

TEST BLOCK

LV OCP/EFP
RELAY

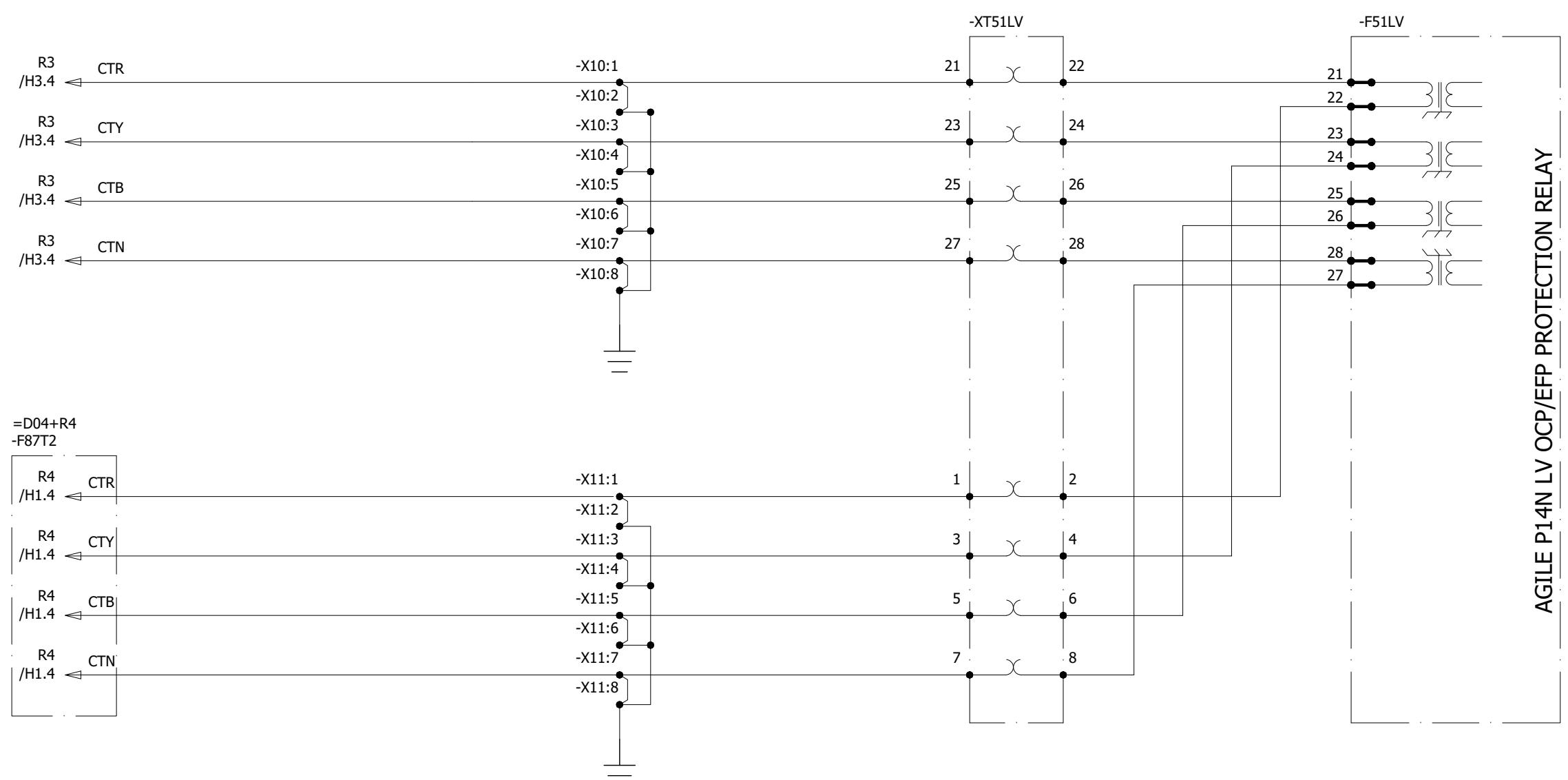
-XT51LV

-F51LV

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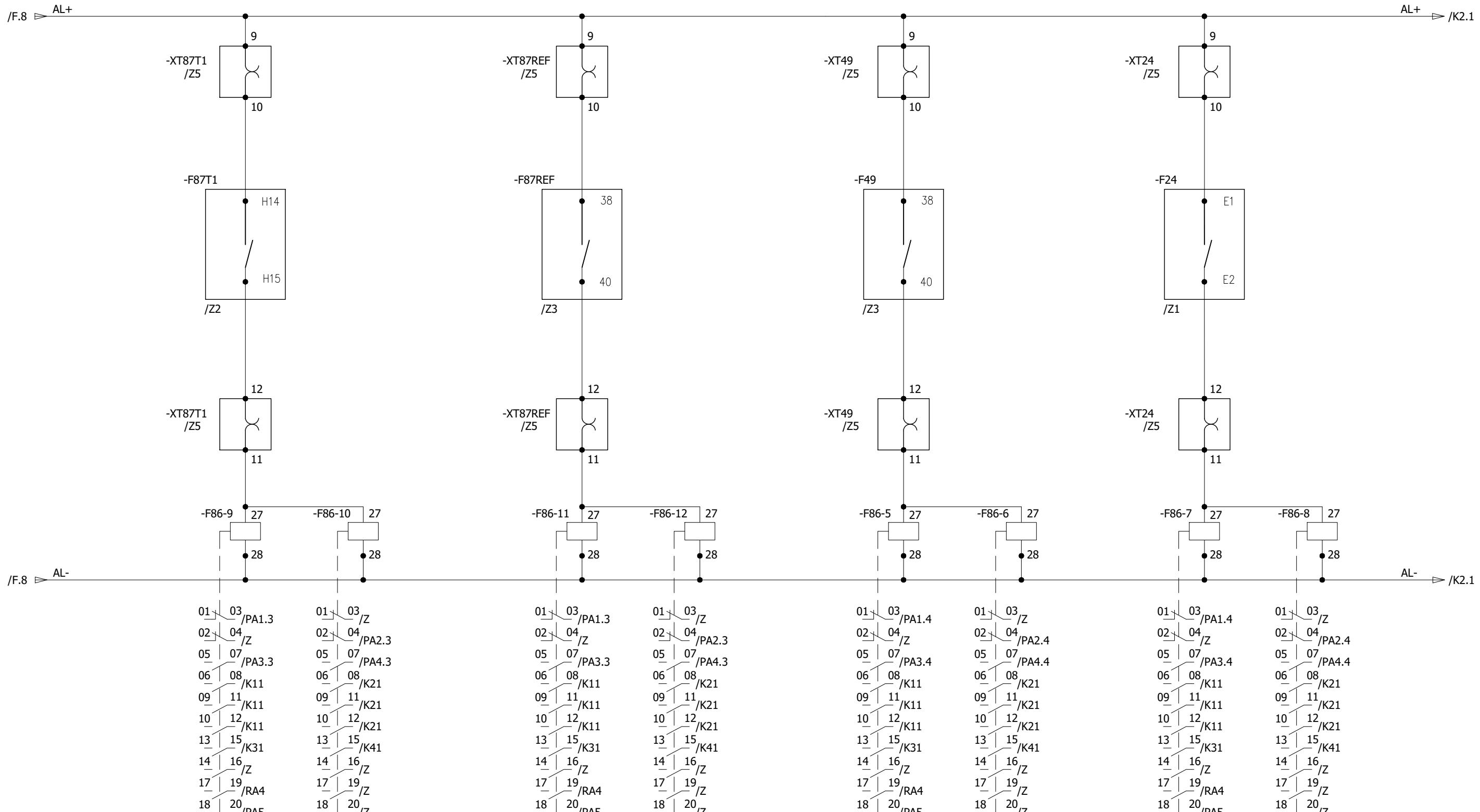
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0	AS BUILT	10.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) LV OCP/EFP RELAY CT INPUTS	Drawing no. P60194-E-DTR-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type H6
									Sheet no. 17

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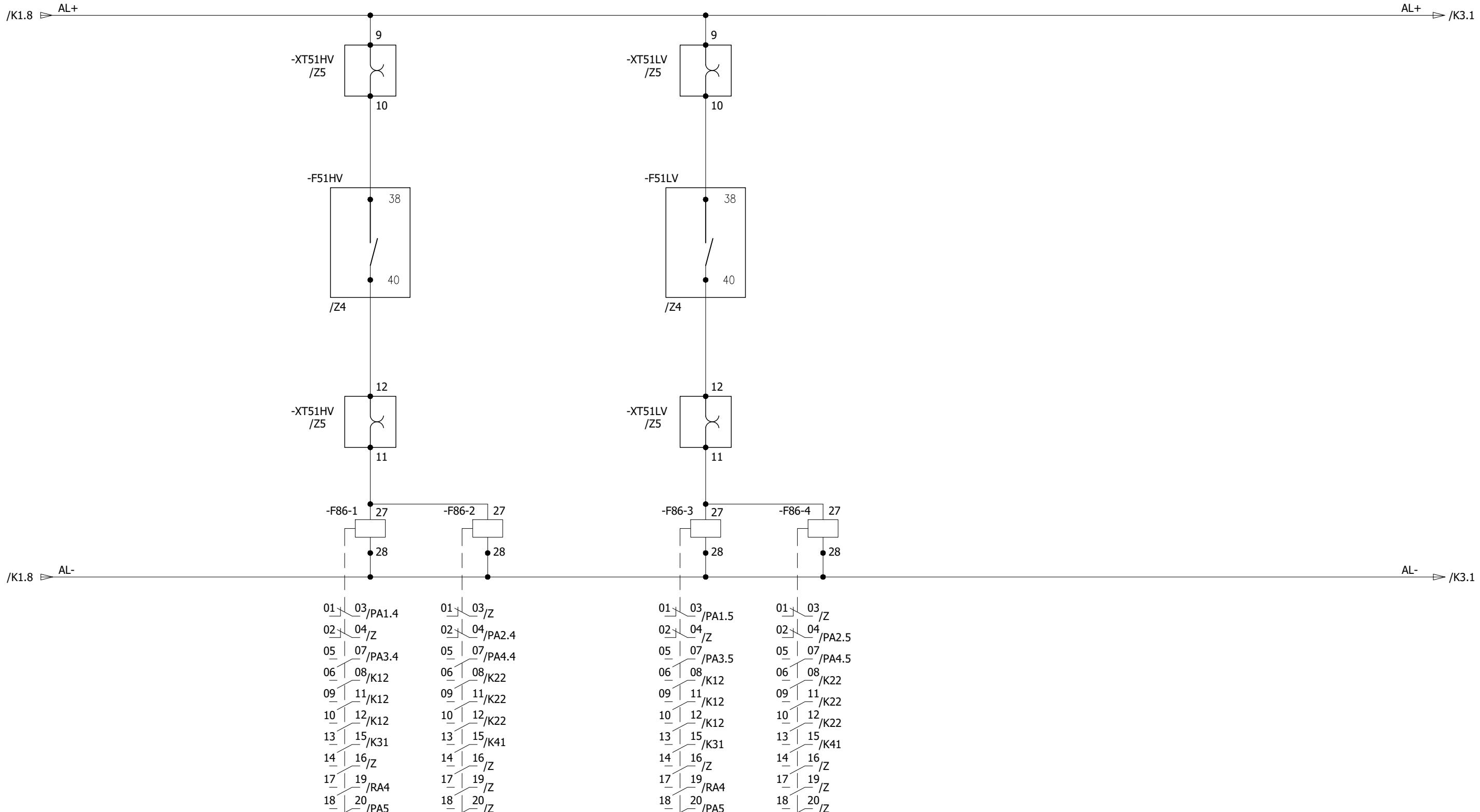


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									Project no. P-60194
									Sheet type K1
REV.	DESCRIPTION	DATE	DRAWER						Sheet no. 18

HV OC/EF PROTECTION TRIP

LV OC/EF PROTECTION TRIP

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0	AS BUILT	10.10.2018	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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) PROTECTION TRIPS	Drawing no. P60194-E-DTR-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type K2	Sheet no. 19
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OIL TEMP. HV TRIP

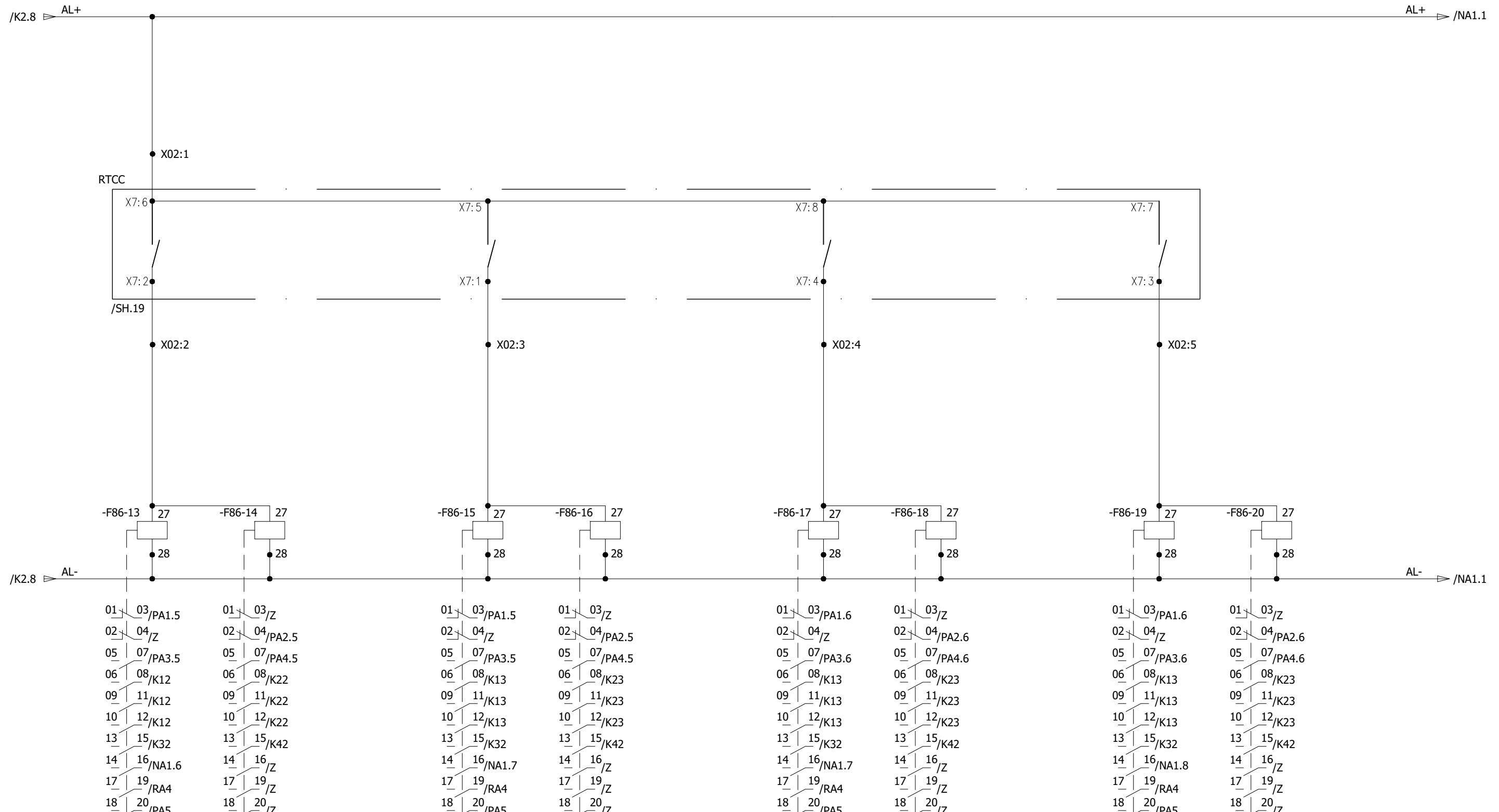
OIL TEMP. LV TRIP

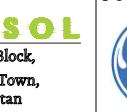
WINDING TEMP. HV TRIP

WINDING TEMP. LV TRIP

DC MONITORING

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0	AS BUILT	10.10.2018	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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) PROTECTION TRIPS	Drawing no. P60194-E-DTR-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type K3
									Sheet no. 20

220KV GIS LCC
PANEL

TRAFO DIFFERENTIAL PROTECTION SET-1 TRIPS

REF PROTECTION TRIP

THERMAL OVERLOAD PROTECTION TRIP

OVER EXCITATION PROTECTION TRIPS

=D04+GISLCC

R-PH Y-PH B-PH

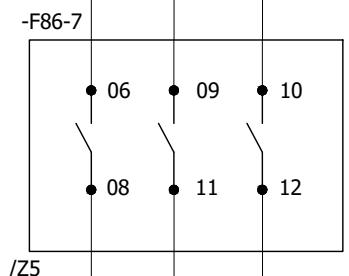
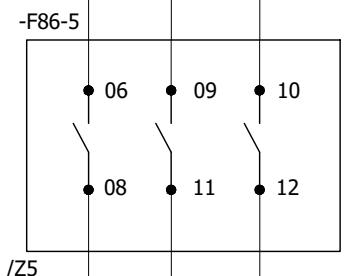
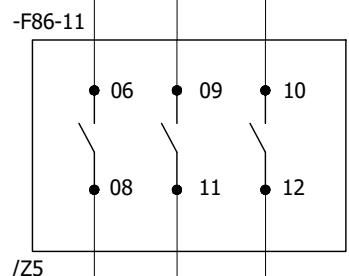
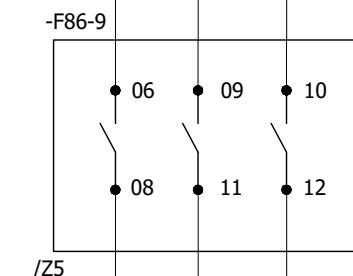
R-PH Y-PH B-PH

R-PH Y-PH B-PH

R-PH Y-PH B-PH

/L52

-XTC1 : 1 TC1+ /E.5 ⇒ /K12.2



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-X0 : 13 -XTC1 : 2 /K12.2
-X0 : 14 -XTC1 : 3 /K12.2
-X0 : 15 -XTC1 : 4 /K12.2



Manufacturer

EPESOL

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

Contractor

Grid Solutions

A GE and Alstom joint venture



Client

NTDC-WAPDA

(NTDC-WAPDA)

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

Title
220KV TRAFO RELAY SET-1 PANEL
(=D04+R3)
TRIP CIRCUIT FOR COIL - 1

Drawing no.
P60194-E-DTR-SC-003

Project no. P-60194
Sheet type K11
Sheet no. 21

0	AS BUILT	10.10.2018	ASJ	1
				2
REV.	DESCRIPTION	DATE	DRAWER	3

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HV OC/EF PROTECTION TRIPS

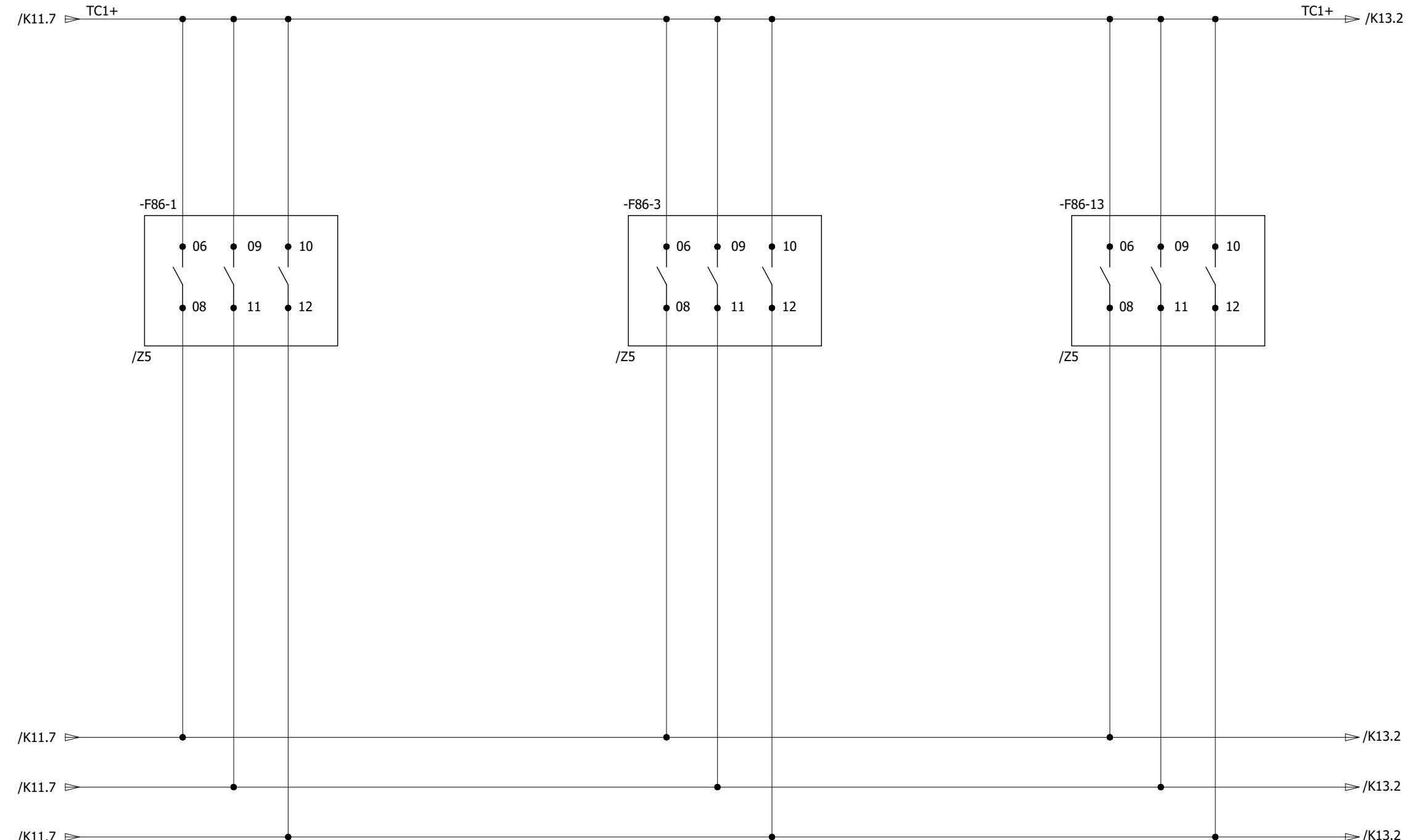
LV OC/EF PROTECTION TRIPS

OIL TEMP. HV TRIPS

R-PH Y-PH B-PH

R-PH Y-PH B-PH

R-PH Y-PH B-PH



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								P60194-E-DTR-SC-003			
								Project no.			
REV.	DESCRIPTION	DATE	DRAWER					P-60194	K12	22	

OIL TEMP. LV TRIPS

WINDING TEMP. HV TRIPS

WINDING TEMP. LV TRIPS

220KV TRAFO RELAY PANEL
SET-2

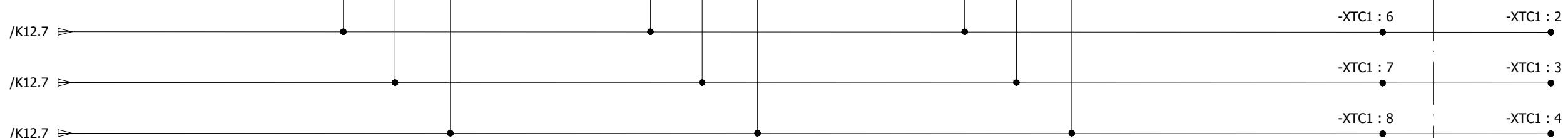
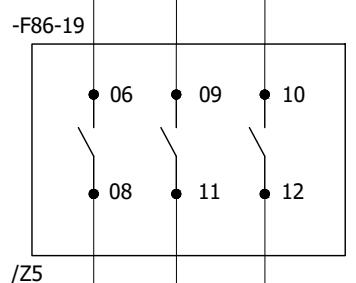
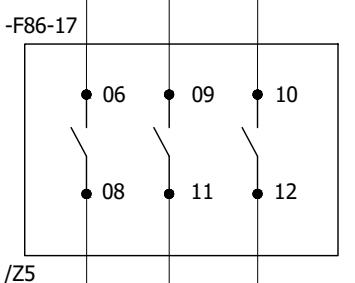
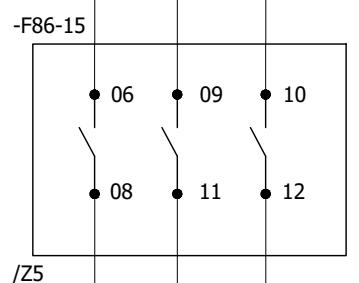
R-PH Y-PH B-PH

R-PH Y-PH B-PH

R-PH Y-PH B-PH

=D04+R4

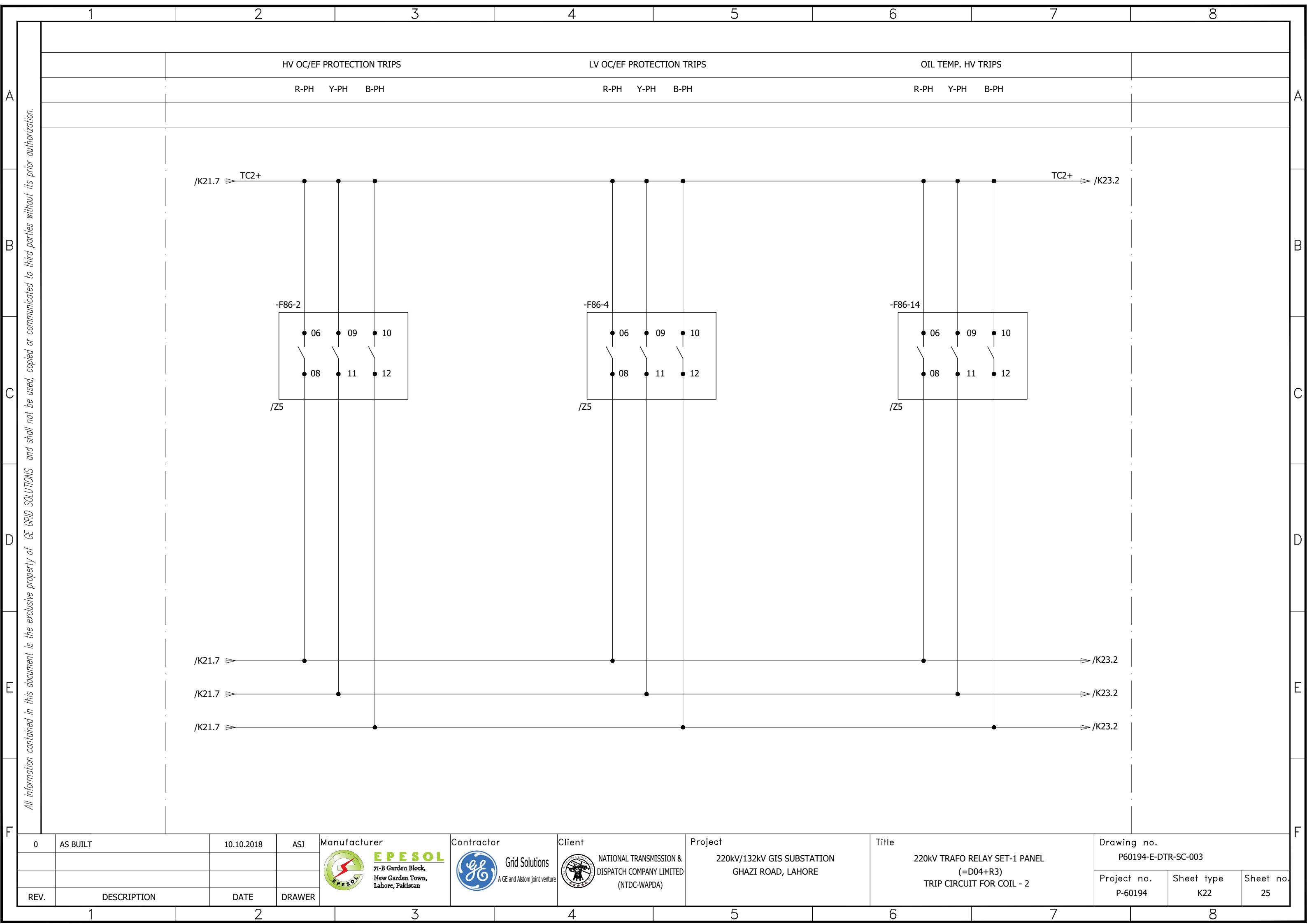
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0	AS BUILT	10.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220KV TRAFO RELAY SET-1 PANEL (=D04+R3) TRIP CIRCUIT FOR COIL - 1	Drawing no. P60194-E-DTR-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type K13
									Sheet no. 23

AS BUILT	10.10.2018	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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) TRIP CIRCUIT FOR COIL - 2	Drawing no. P60194-E-DTR-SC-003		
V.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type K21	Sheet no. 24



220kV CBF PANEL
SET-1

=D00+R5

/K11

OIL TEMP. LV TRIPS

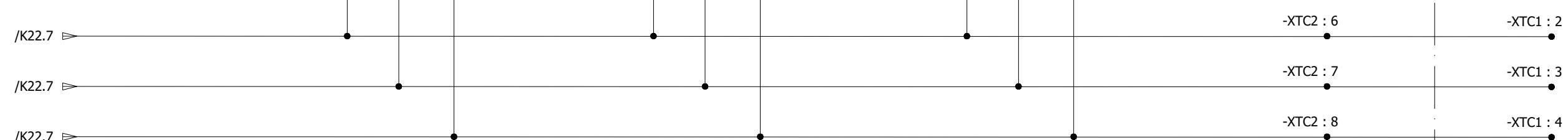
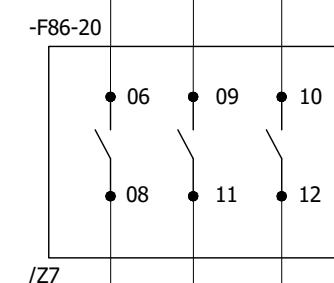
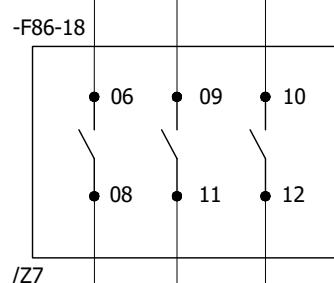
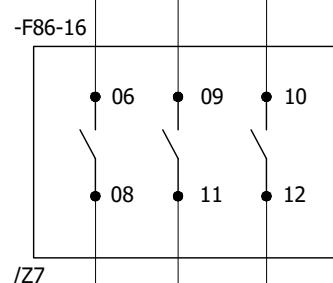
WINDING TEMP. HV TRIPS

WINDING TEMP. LV TRIPS

R-PH Y-PH B-PH

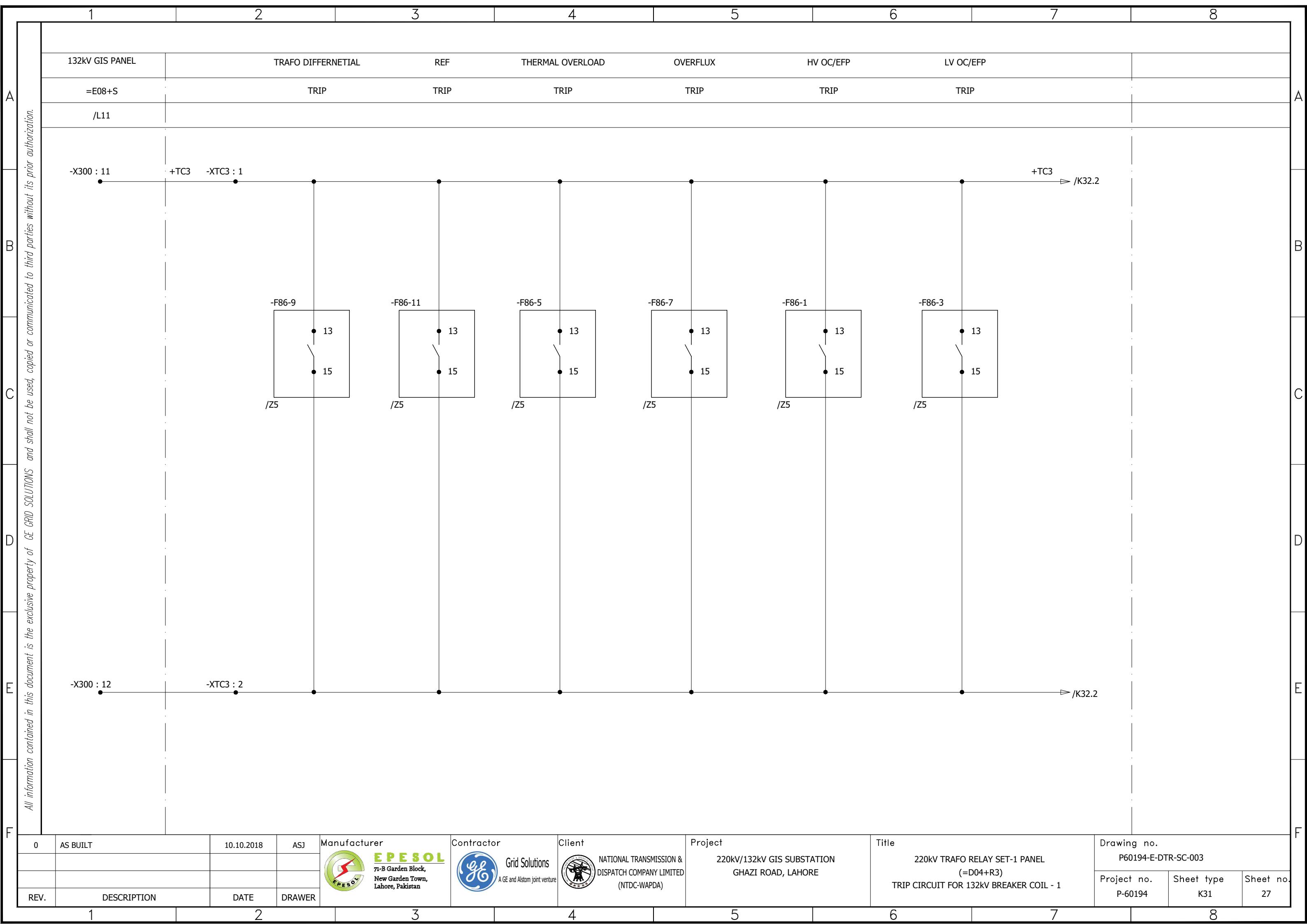
R-PH Y-PH B-PH

R-PH Y-PH B-PH



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0	AS BUILT	10.10.2018	ASJ	Manufacturer  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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) TRIP CIRCUIT FOR COIL - 2	Drawing no. P60194-E-DTR-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type K23
									Sheet no. 26



OIL TEMP. HV

OIL TEMP. LV

WINDING TEMP. HV

WINDING TEMP. LV

220KV TRAFO RELAY PANEL
SET-2

TRIP

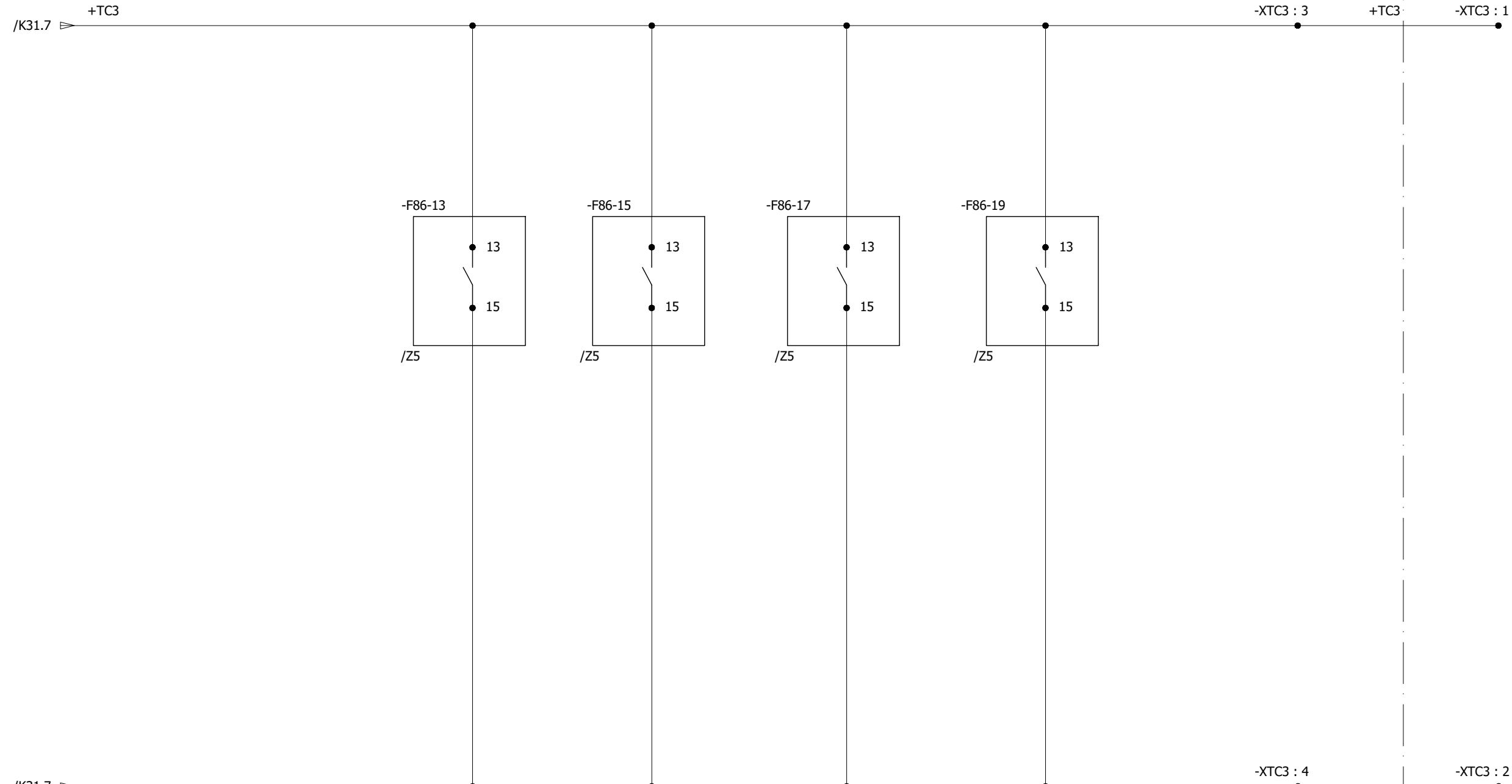
TRIP

TRIP

TRIP

=D04+R4

/K31



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A

A

B

B

C

C

D

D

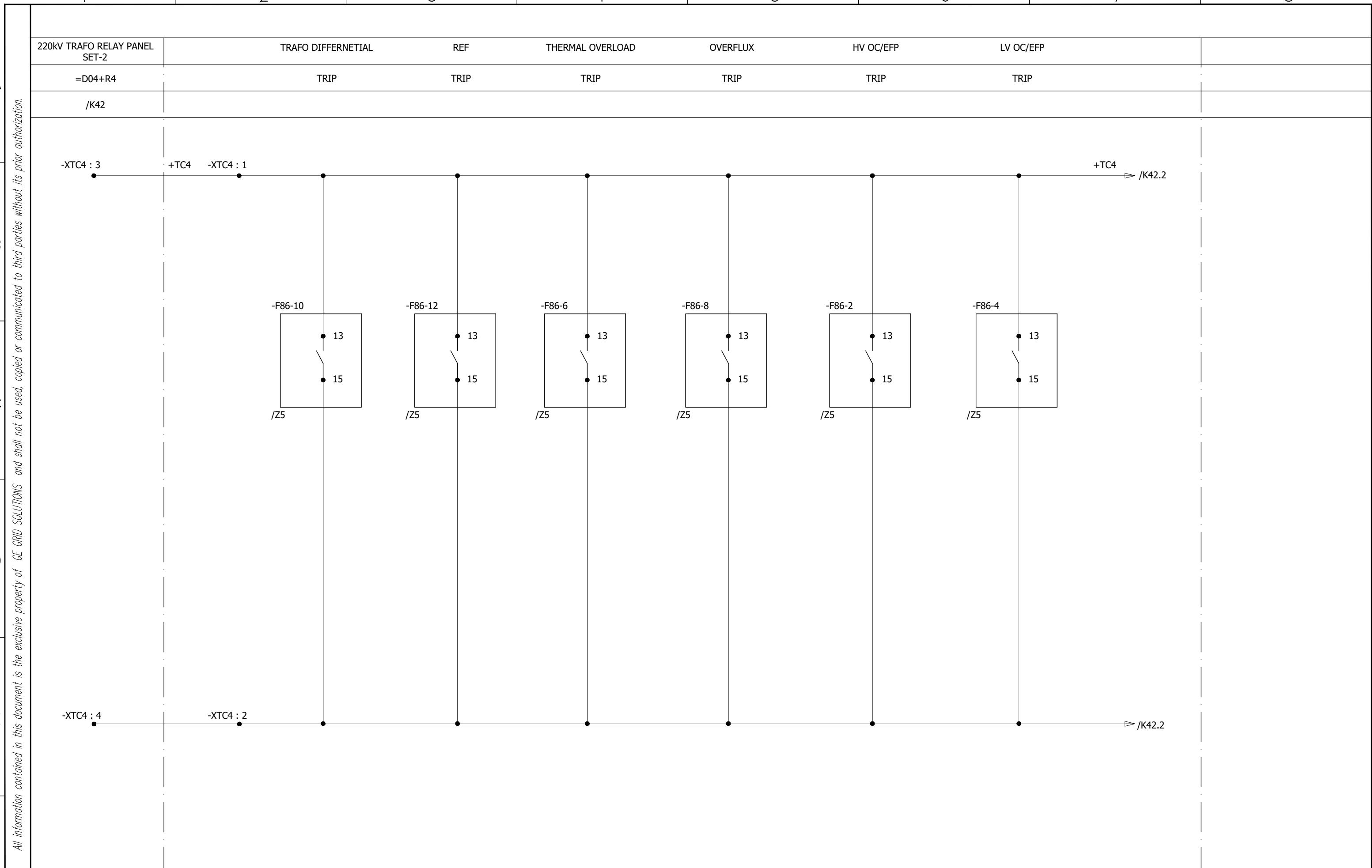
E

E

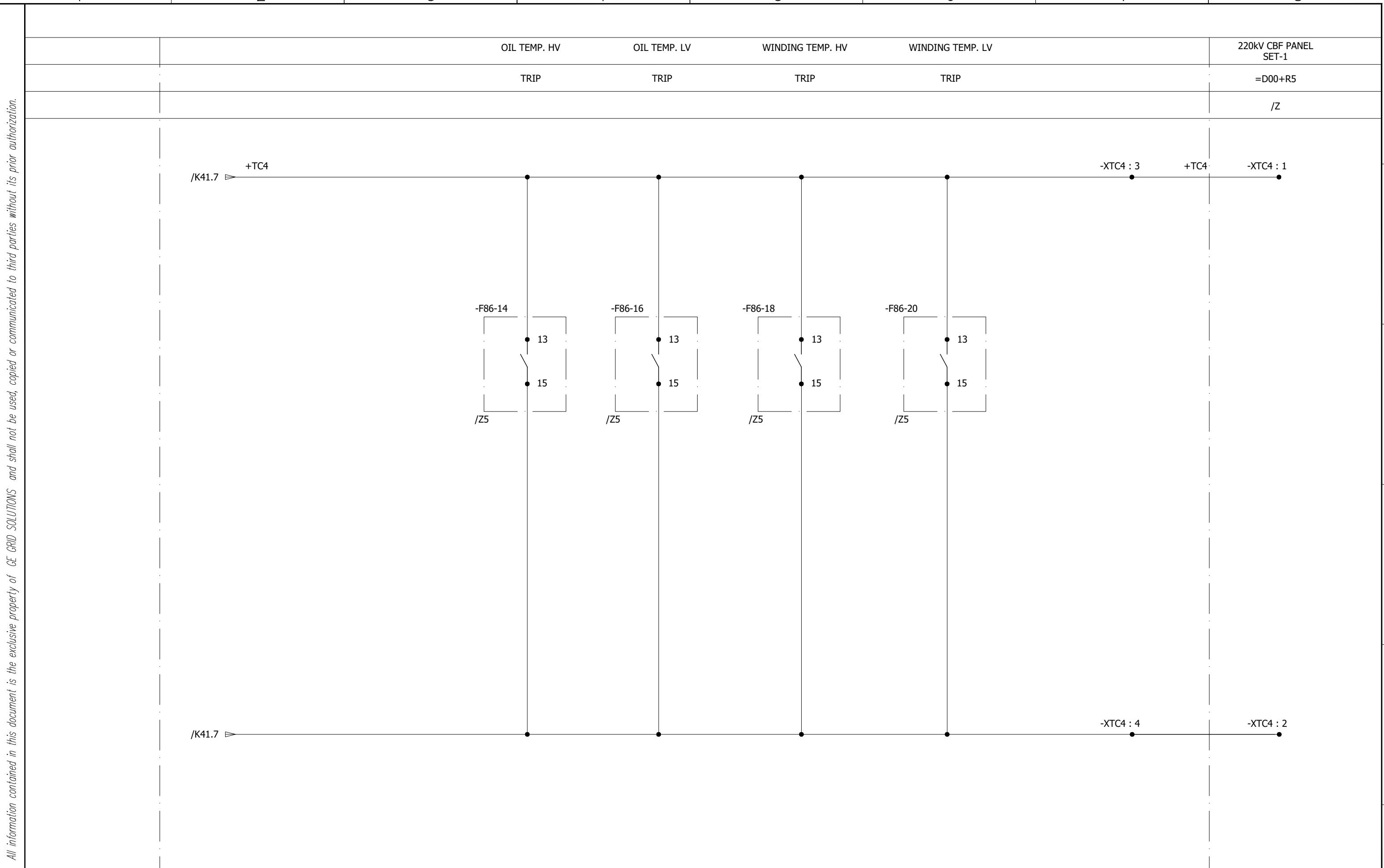
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0	ASSEMBLED	10.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) TRIP CIRCUIT FOR 132kV BREAKER COIL - 1	Drawing no. P60194-E-DTR-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type K32
									Sheet no. 28

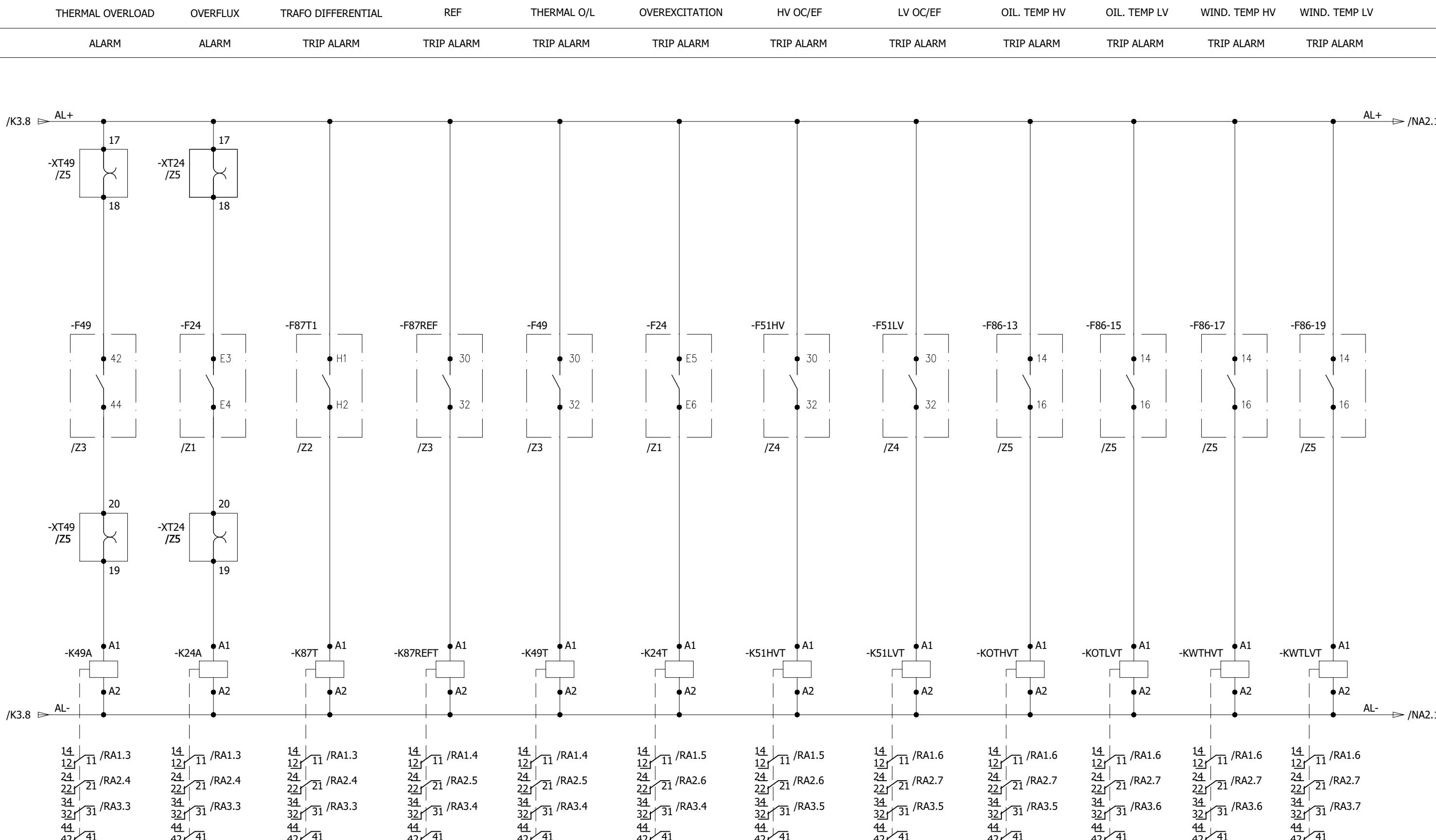


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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type K41	Sheet no. 29



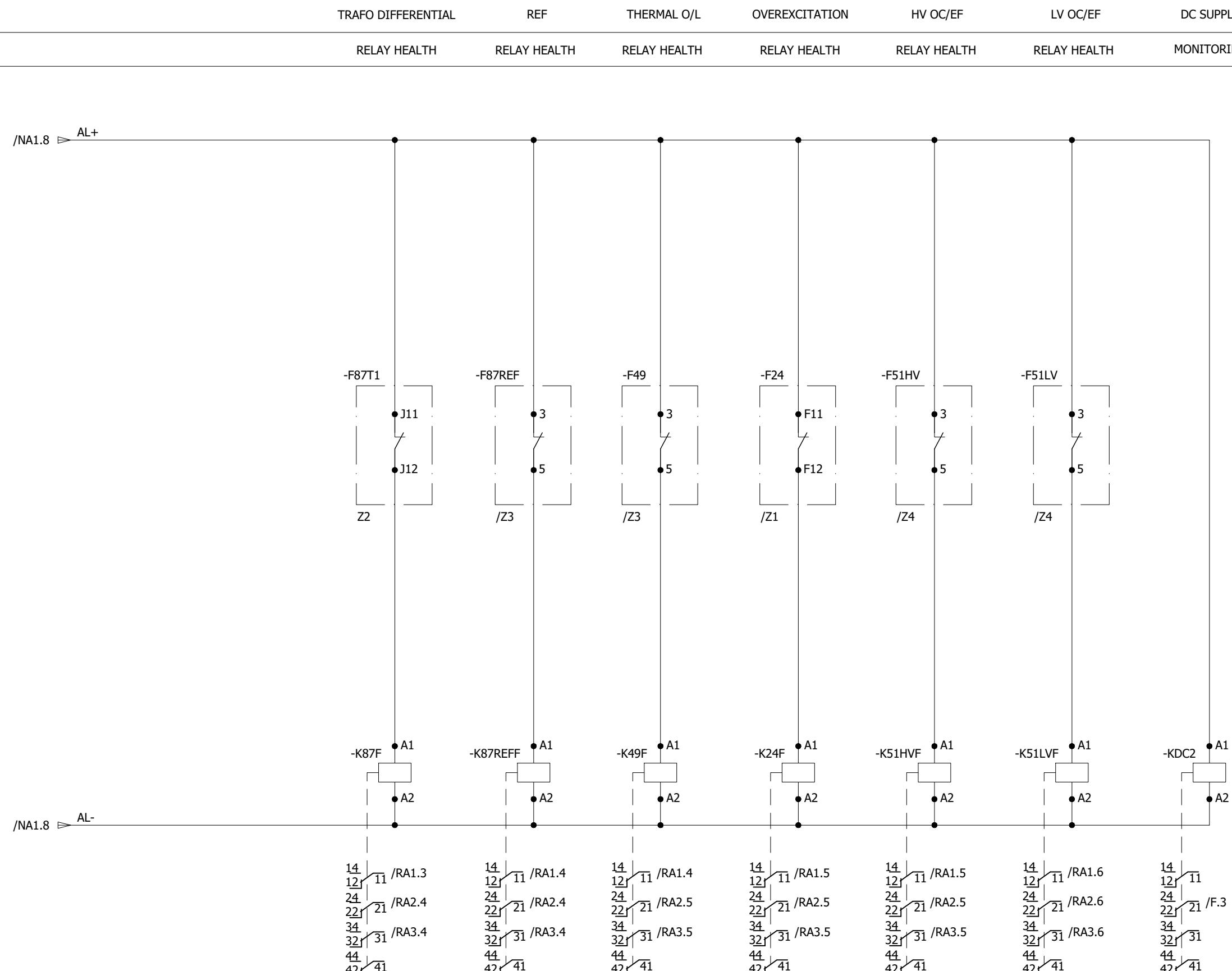
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REV.	DESCRIPTION		DATE	DRAWER					Project no. P-60194	Sheet type K42	Sheet no. 30
1	2	3	4	5	6	7	8				

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0	AS BUILT	10.10.2018	ASJ	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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) SYSTEM ALARMS	Drawing no. P60194-E-DTR-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type NA1

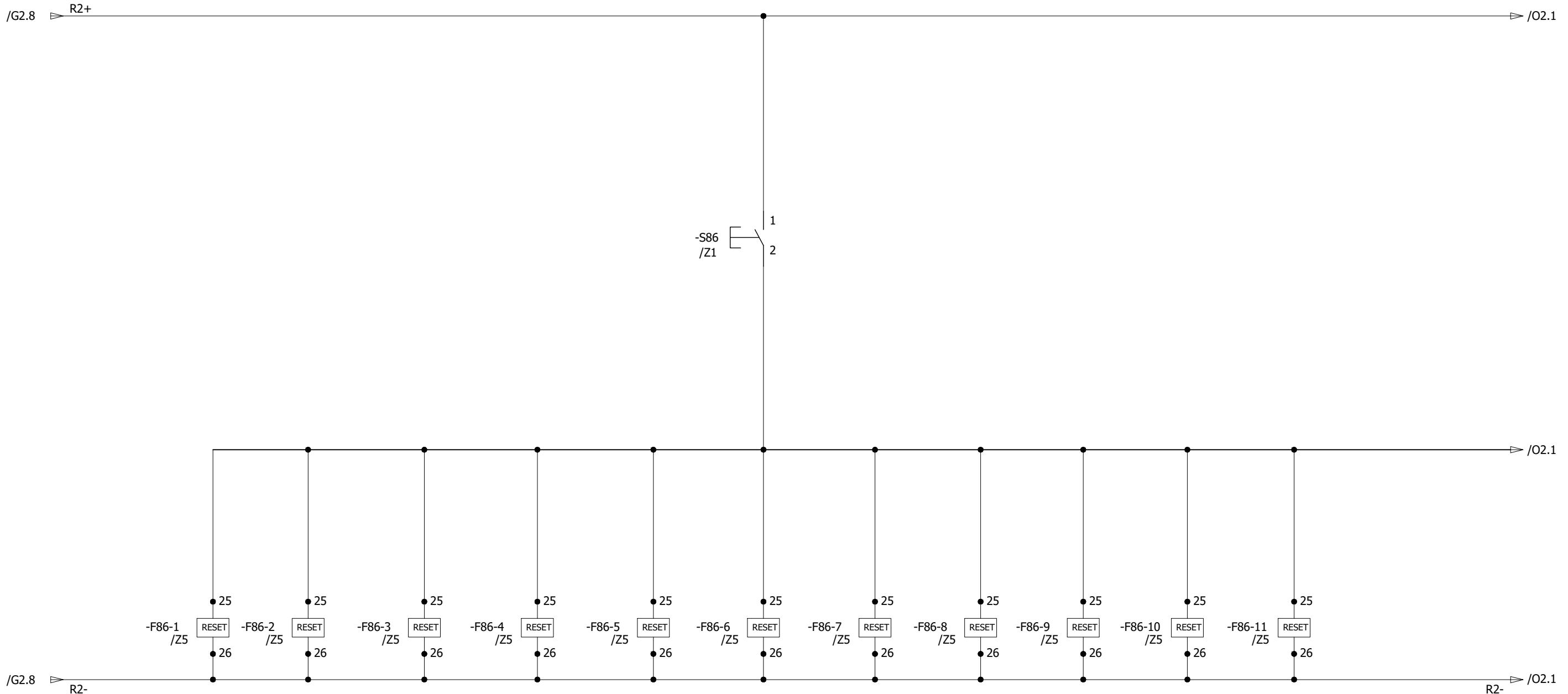
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0	AS BUILT		10.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  GE Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) SYSTEM ALARMS	Drawing no. P60194-E-DTR-SC-003	
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type NA2	Sheet no. 32

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0	AS BUILT	10.10.2018	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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) RESET CIRCUIT OF TRIPPING RELAYS	Drawing no. P60194-E-DTR-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type O1
									Sheet no. 33

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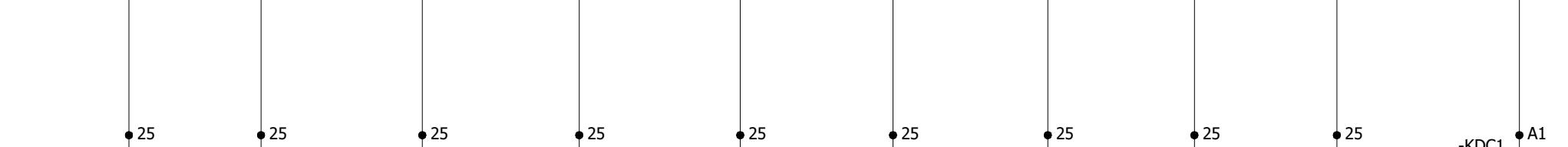
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0	AS BUILT	10.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) RESET CIRCUIT OF TRIPPING RELAYS	Drawing no. P60194-E-DTR-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type O2
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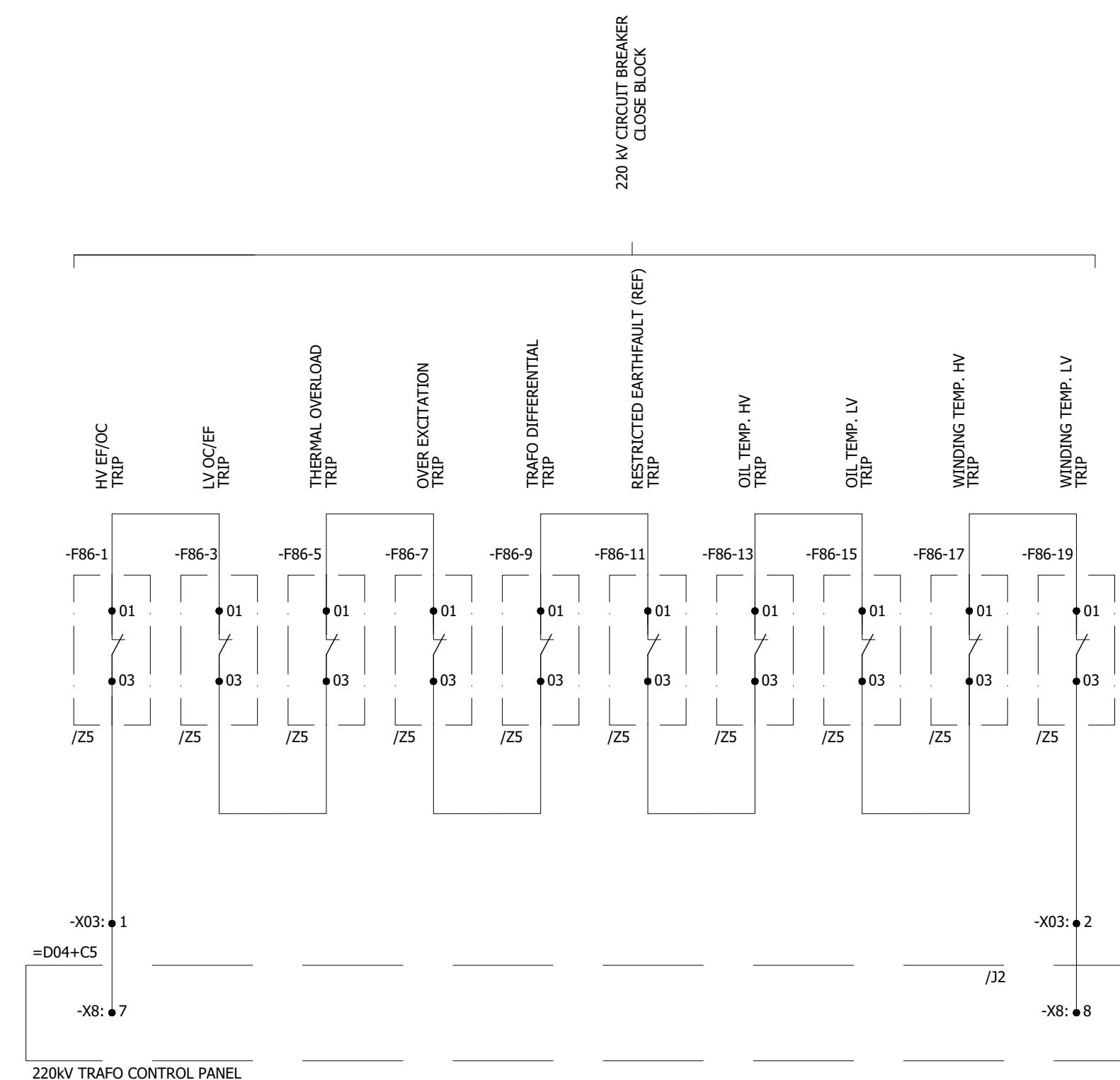
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									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type PA1
1	2	3	4	5	6	7	8		Sheet no. 35

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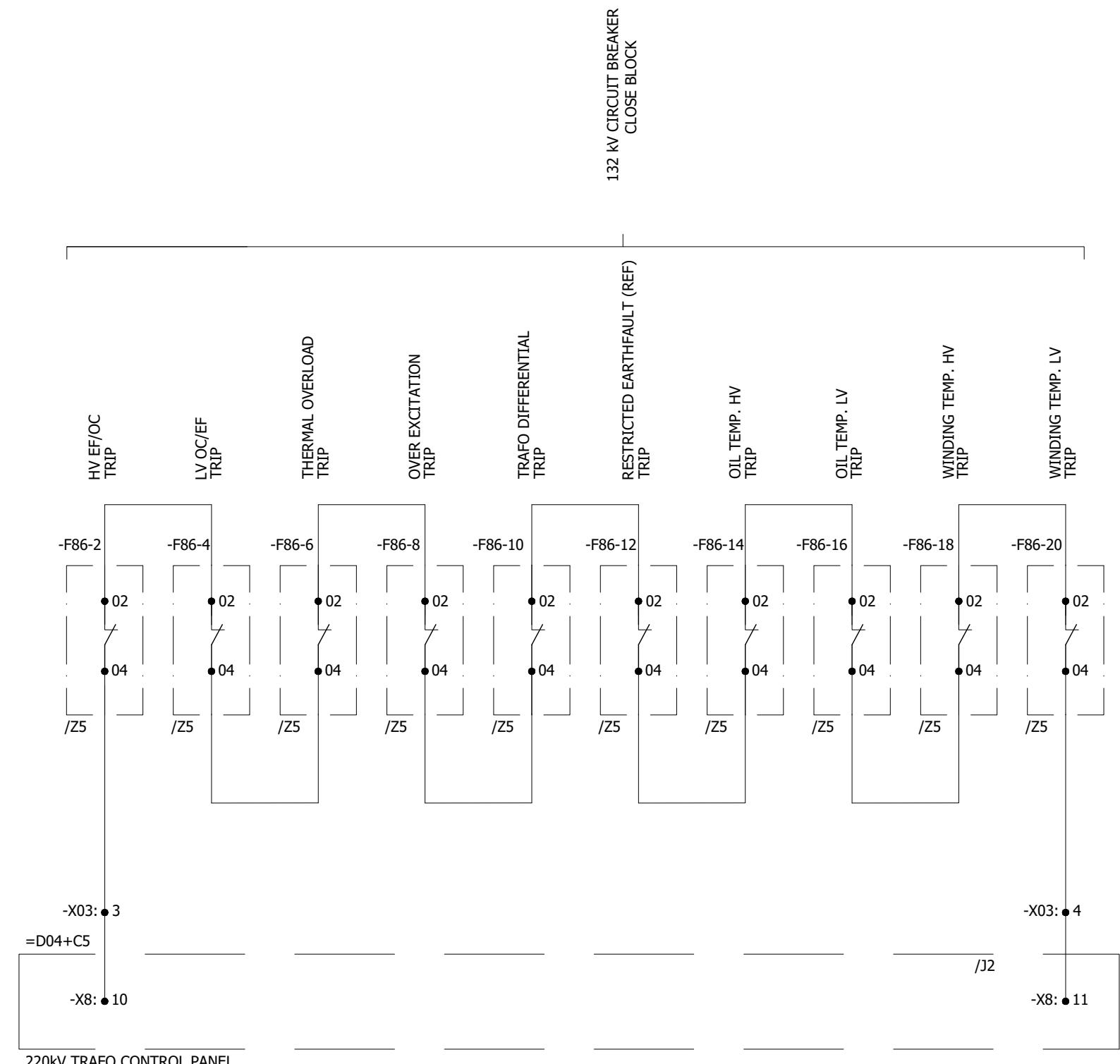
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0	AS BUILT	10.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) PROTECTION INTER-CIRCUITS	Drawing no. P60194-E-DTR-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type PA2
									Sheet no. 36

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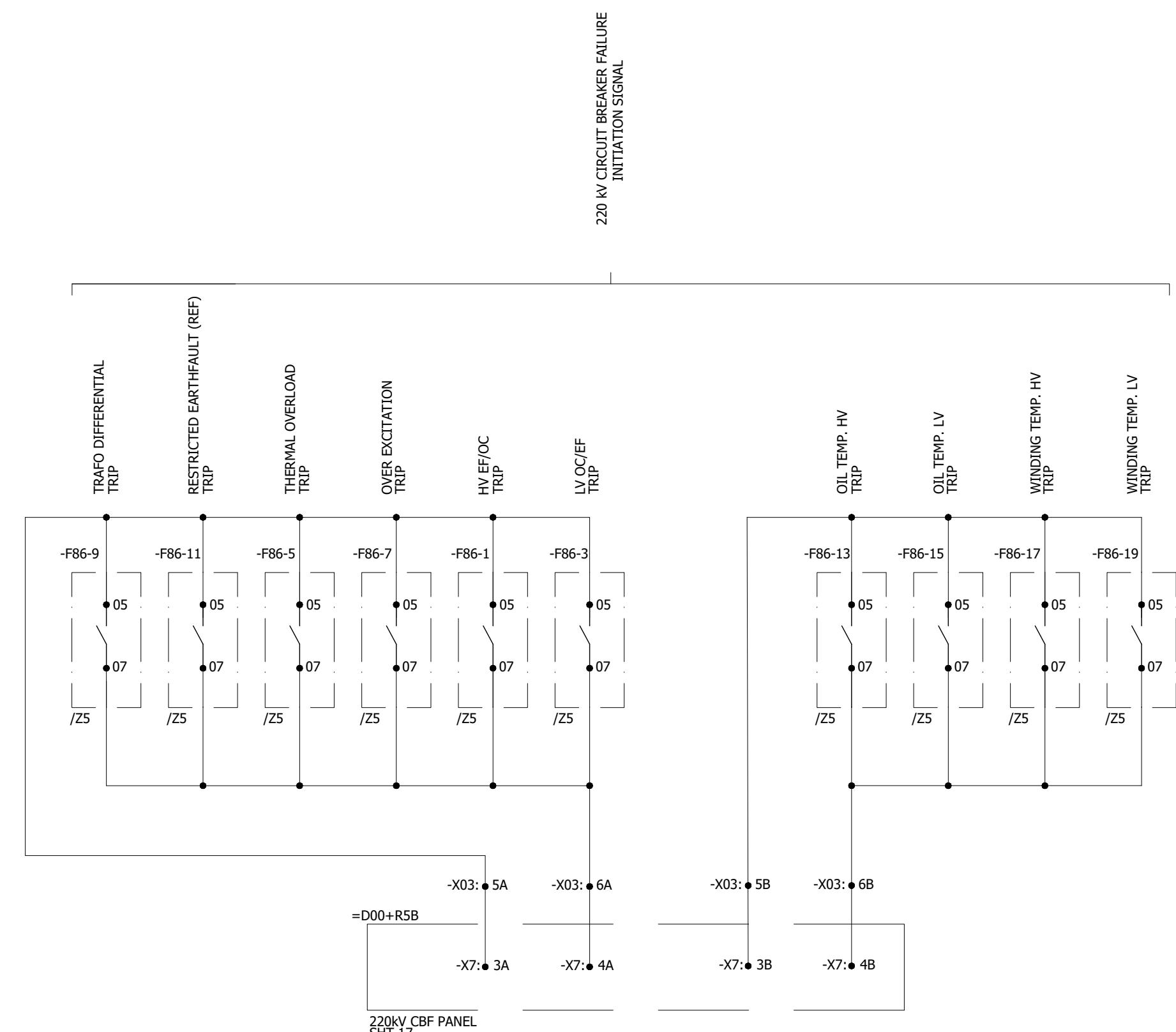
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0	AS BUILT	10.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) PROTECTION INTER-CIRCUITS	Drawing no. P60194-E-DTR-SC-003
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type PA3
								Sheet no. 37	

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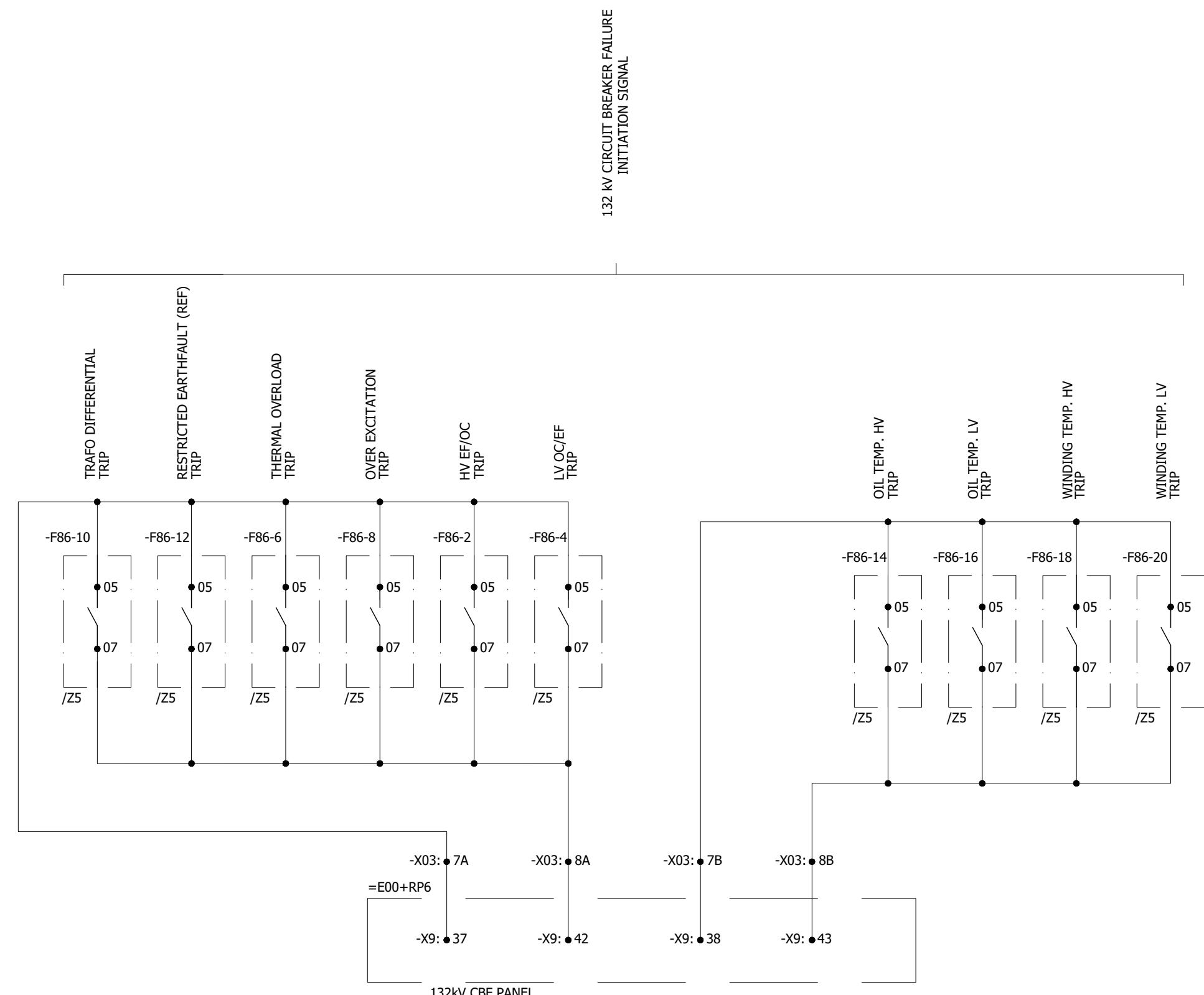
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0	AS BUILT	10.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) PROTECTION INTER-CIRCUITS	Drawing no. P60194-E-DTR-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type PA4
1	2	3	4	5	6	7	8		Sheet no. 38

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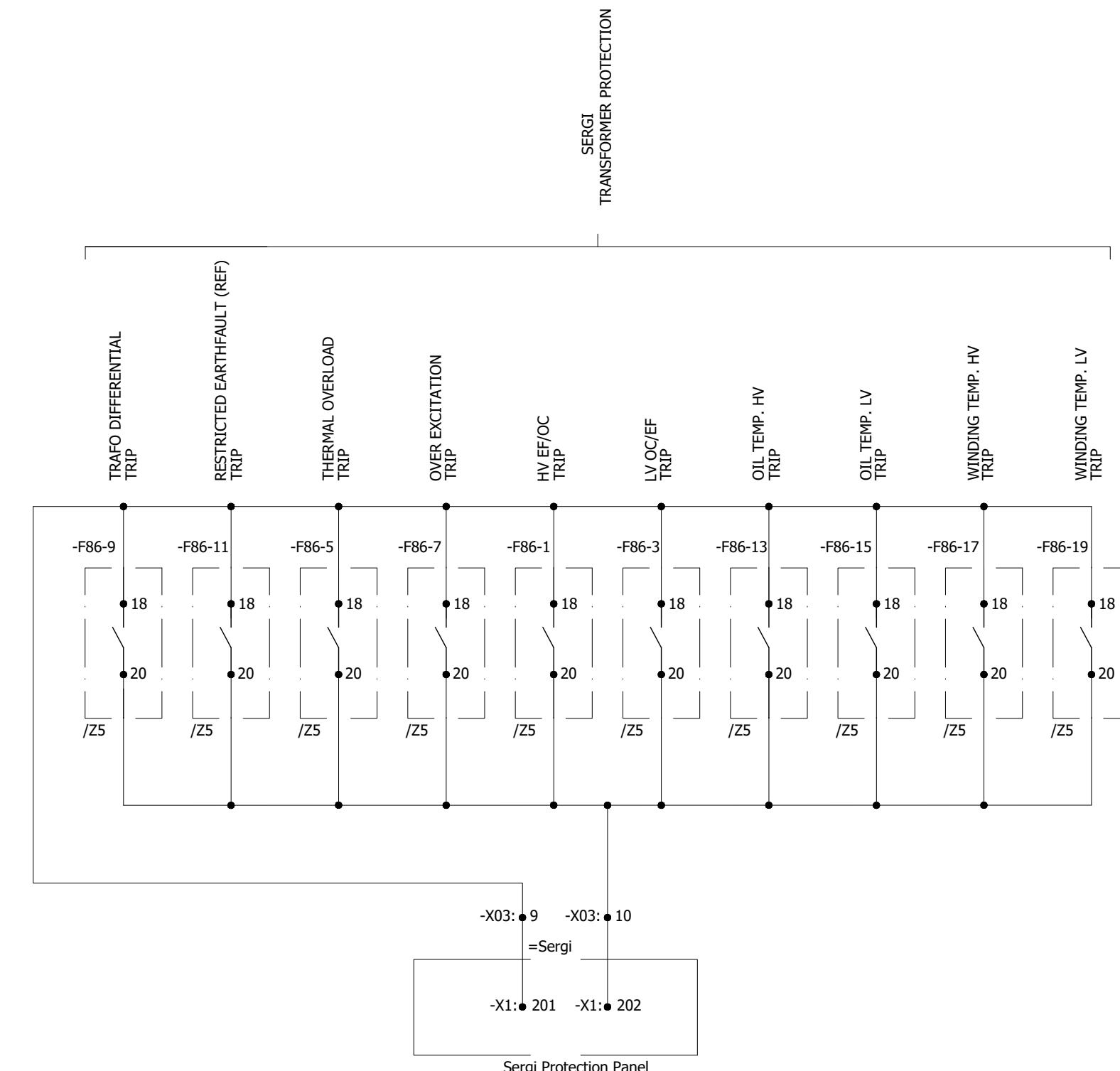
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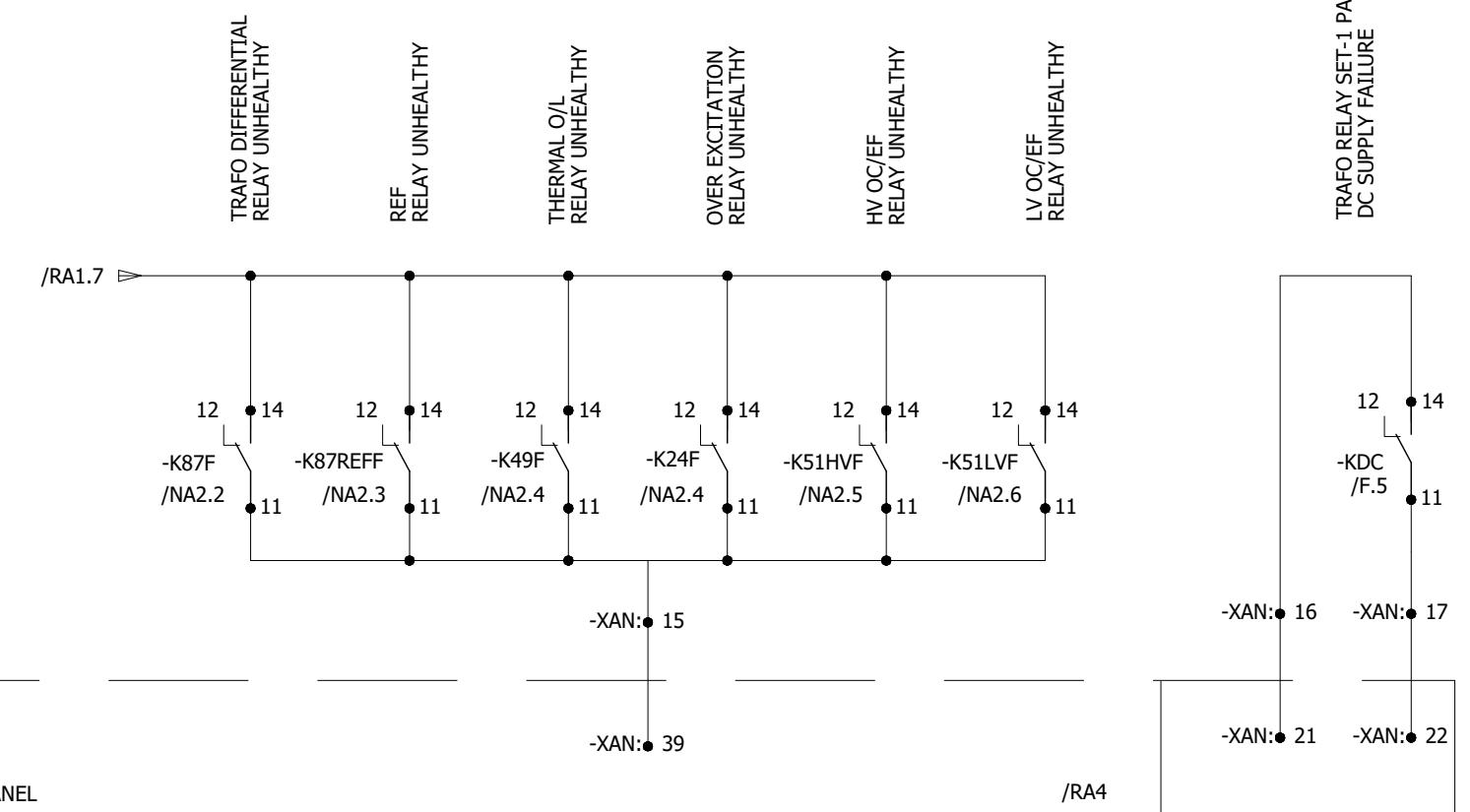
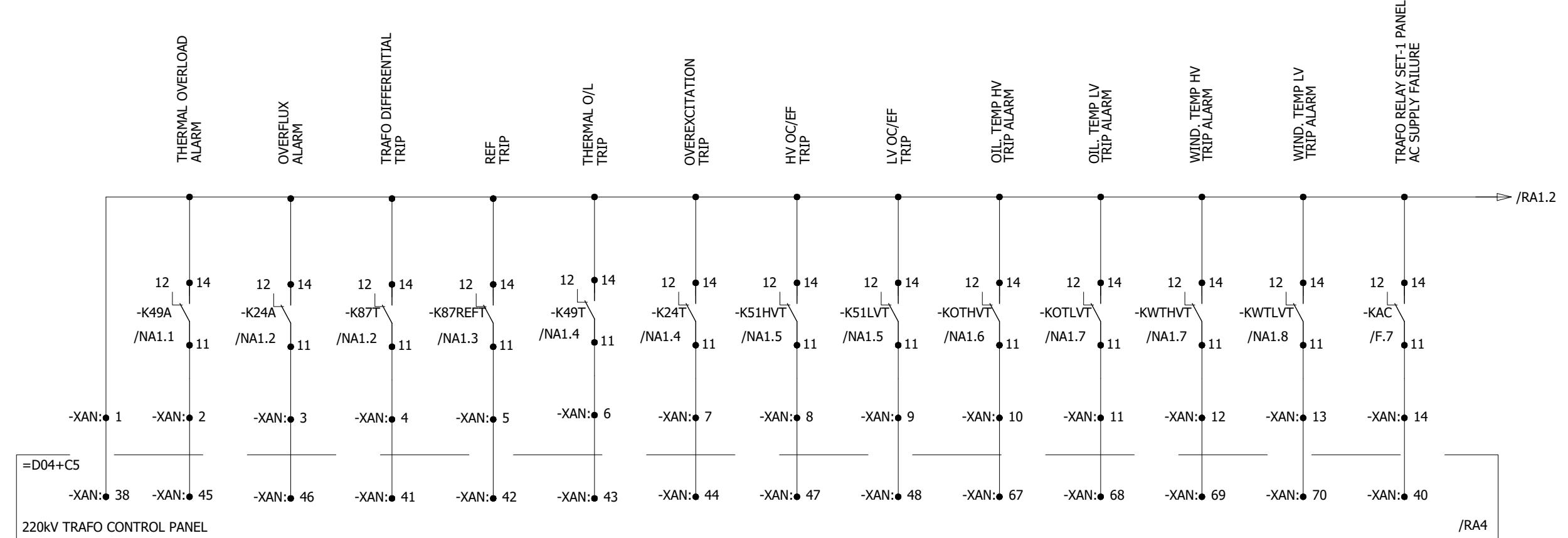
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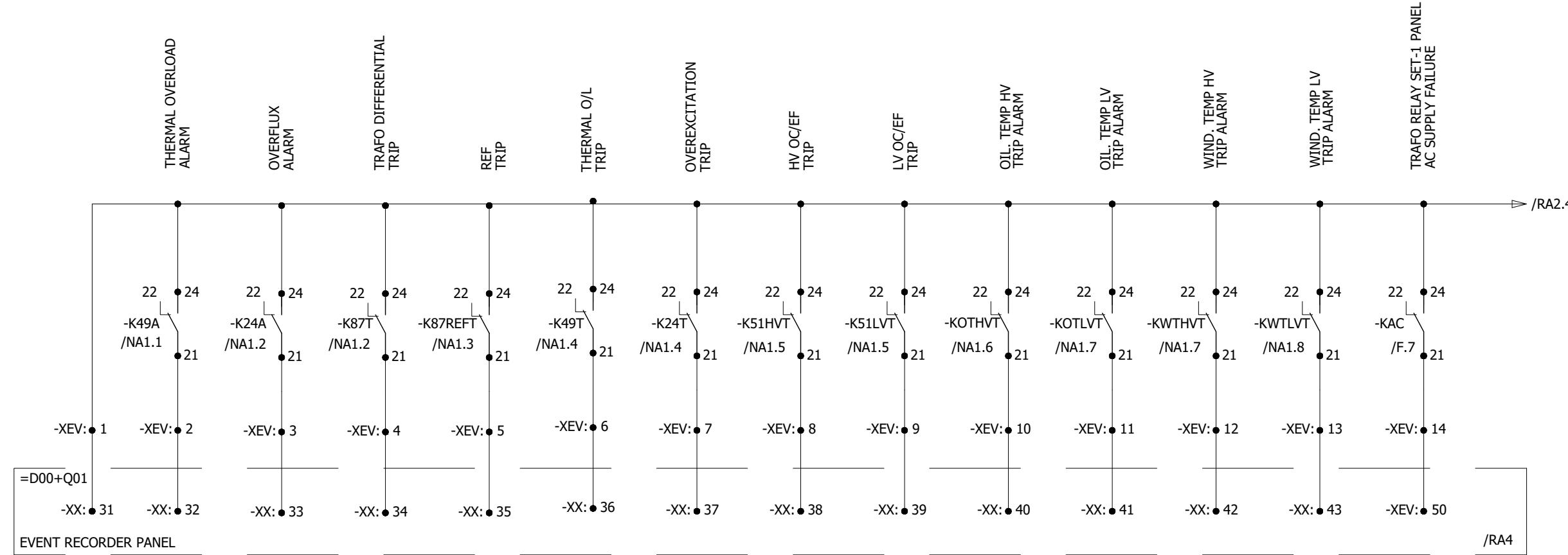
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type PA5
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0	AS BUILT	10.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) ANNUNCIATION CIRCUIT	Drawing no. P60194-E-DTR-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type RA1	Sheet no. 40
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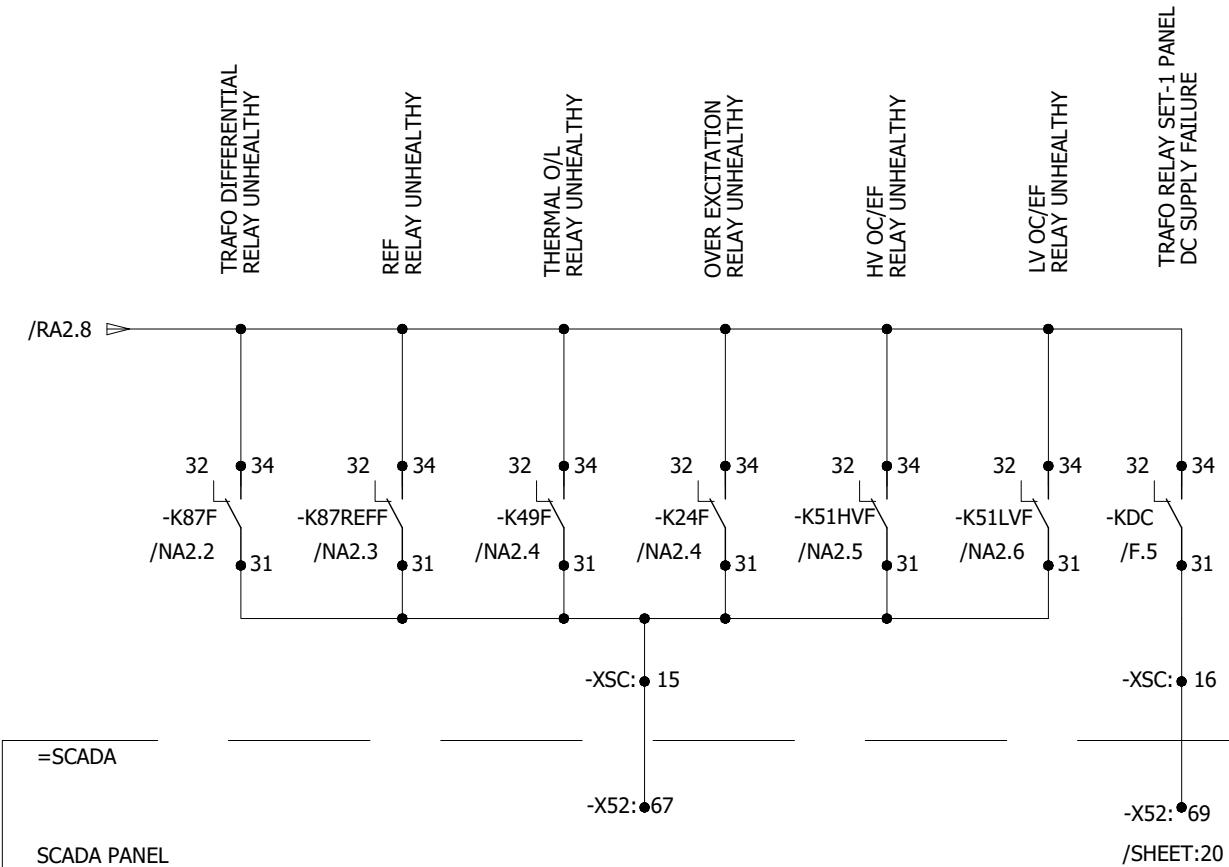
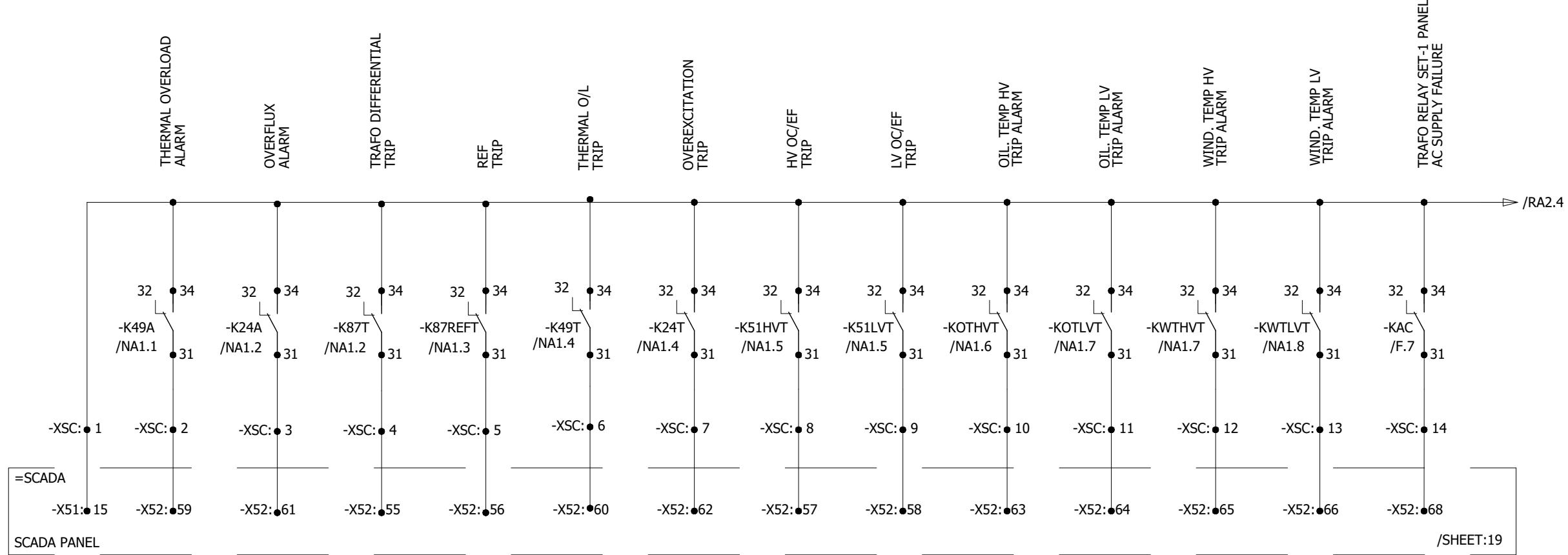


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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type RA2
									Sheet no. 41

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0	AS BUILT	10.10.2018	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 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) SCADA CIRCUIT	Drawing no. P60194-E-DTR-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type RA3	Sheet no. 42
1	2	3	4	5	6	7	8				

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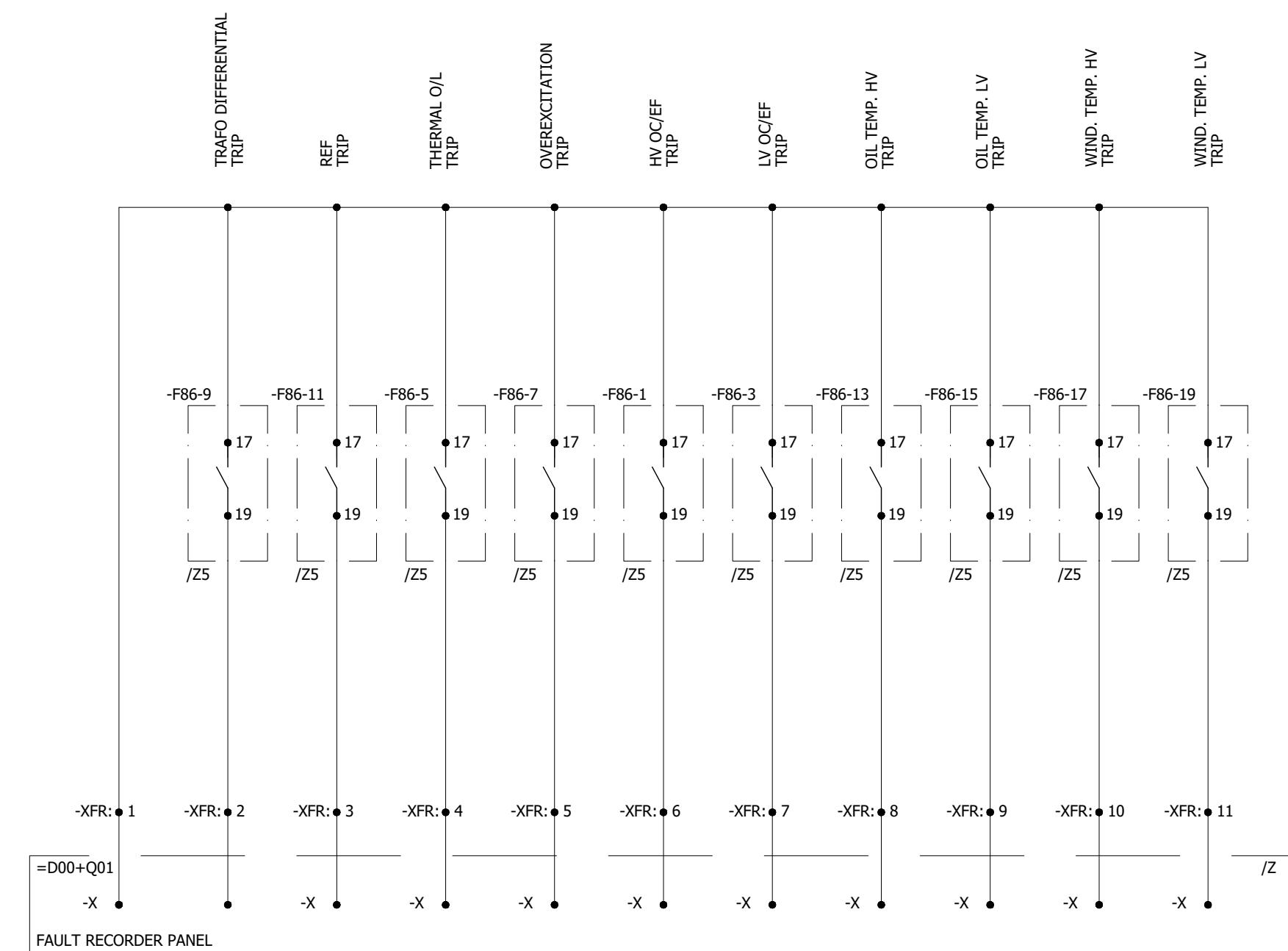
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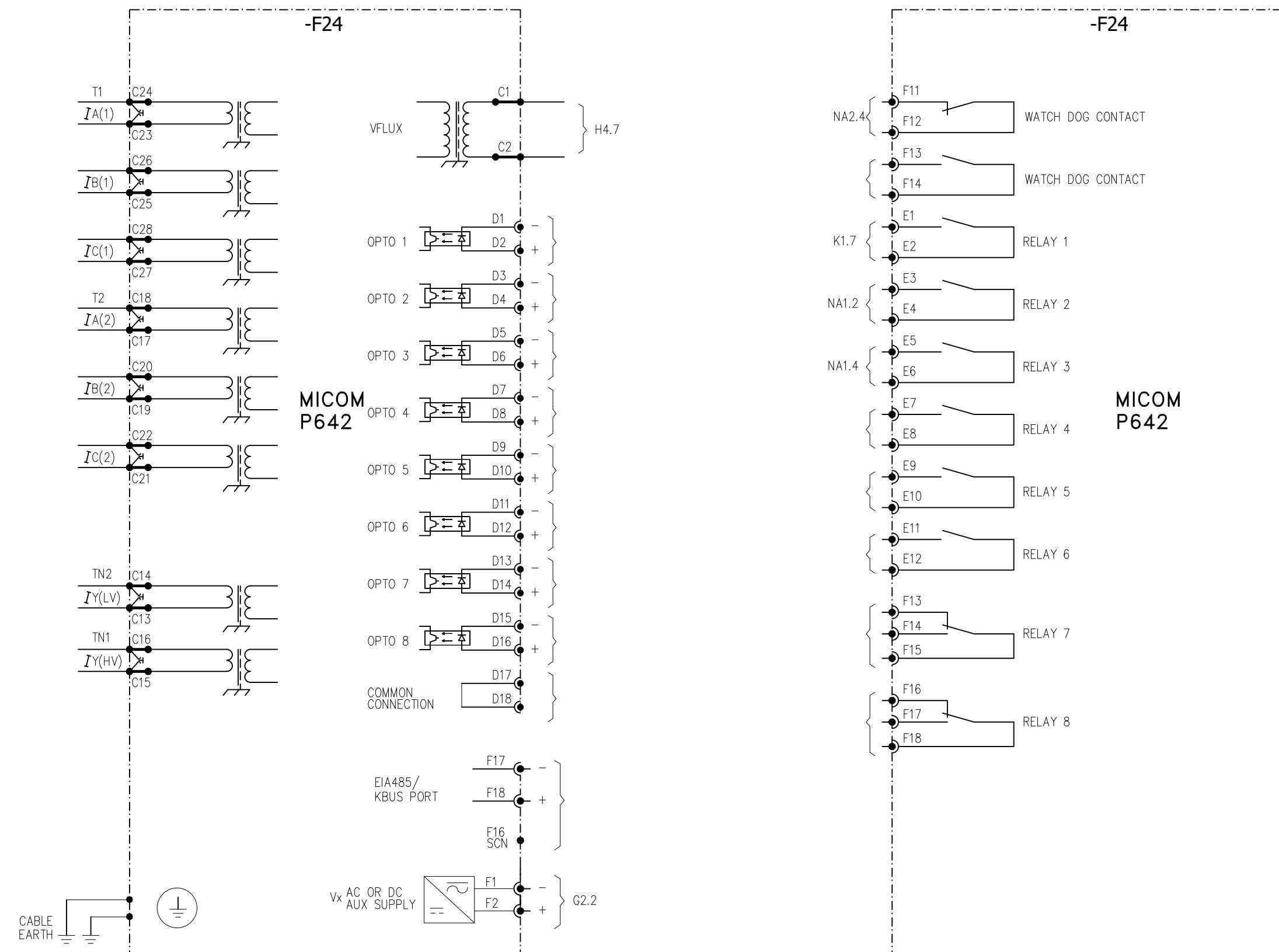
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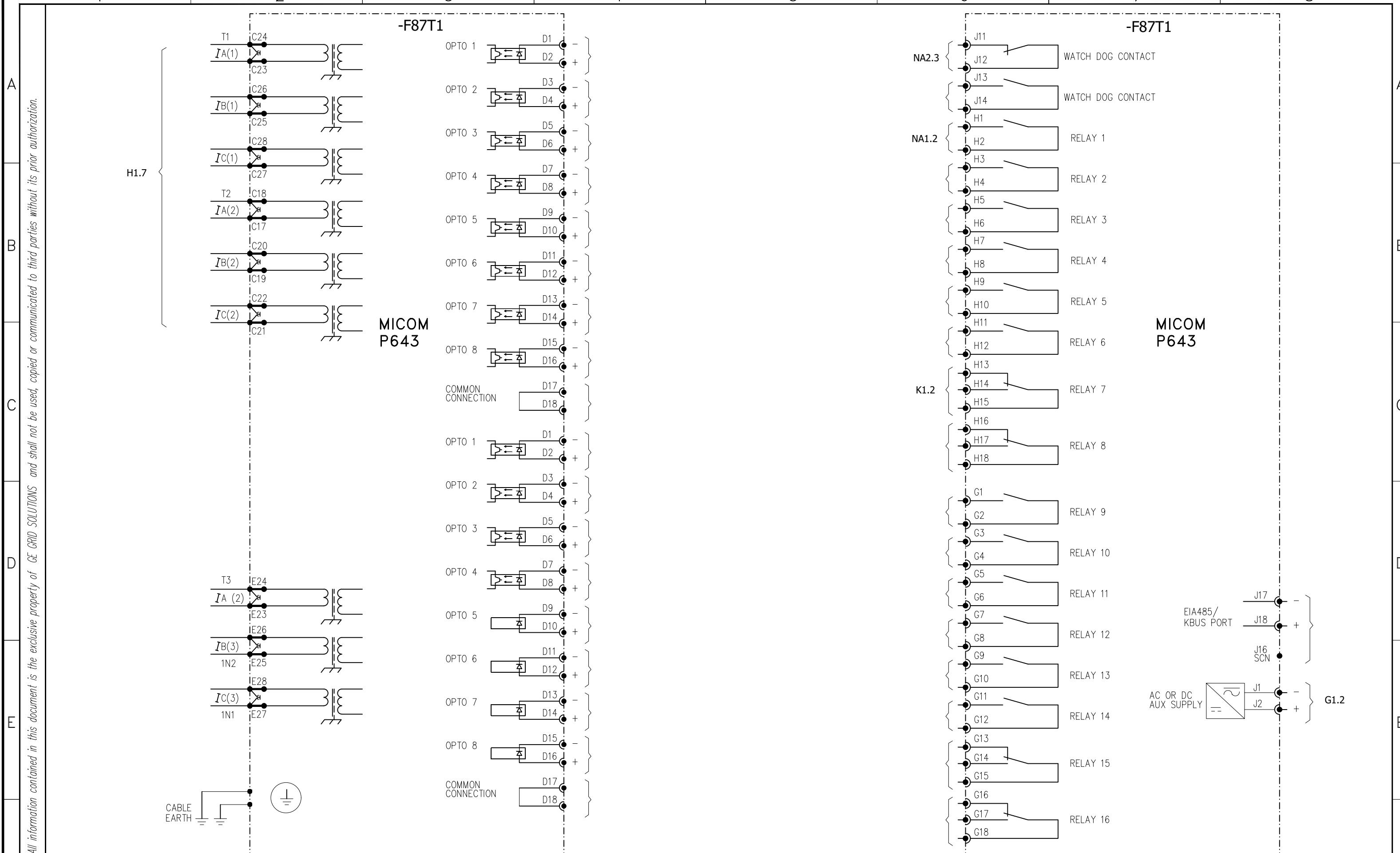
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REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type RA4	Sheet no. 43

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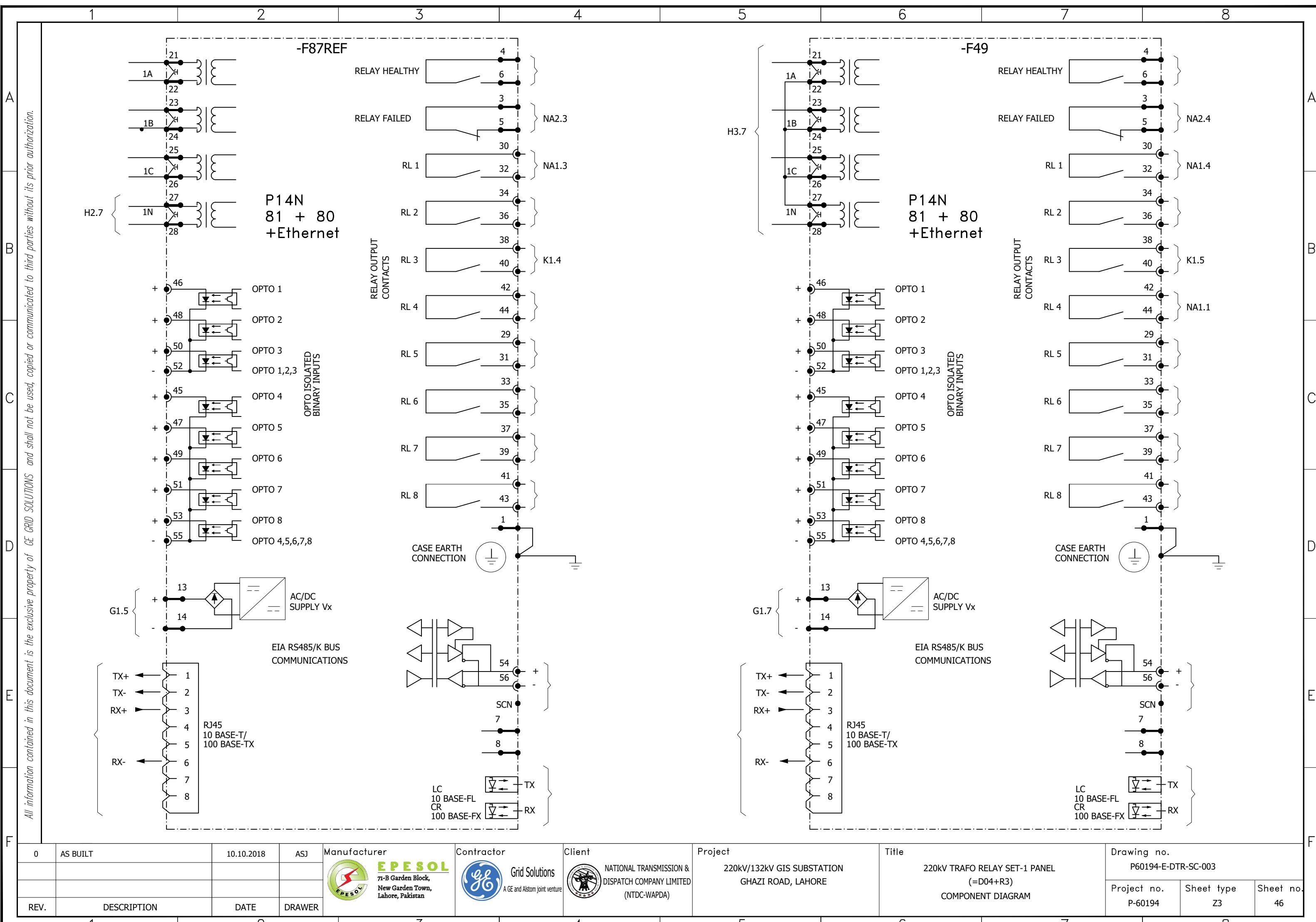


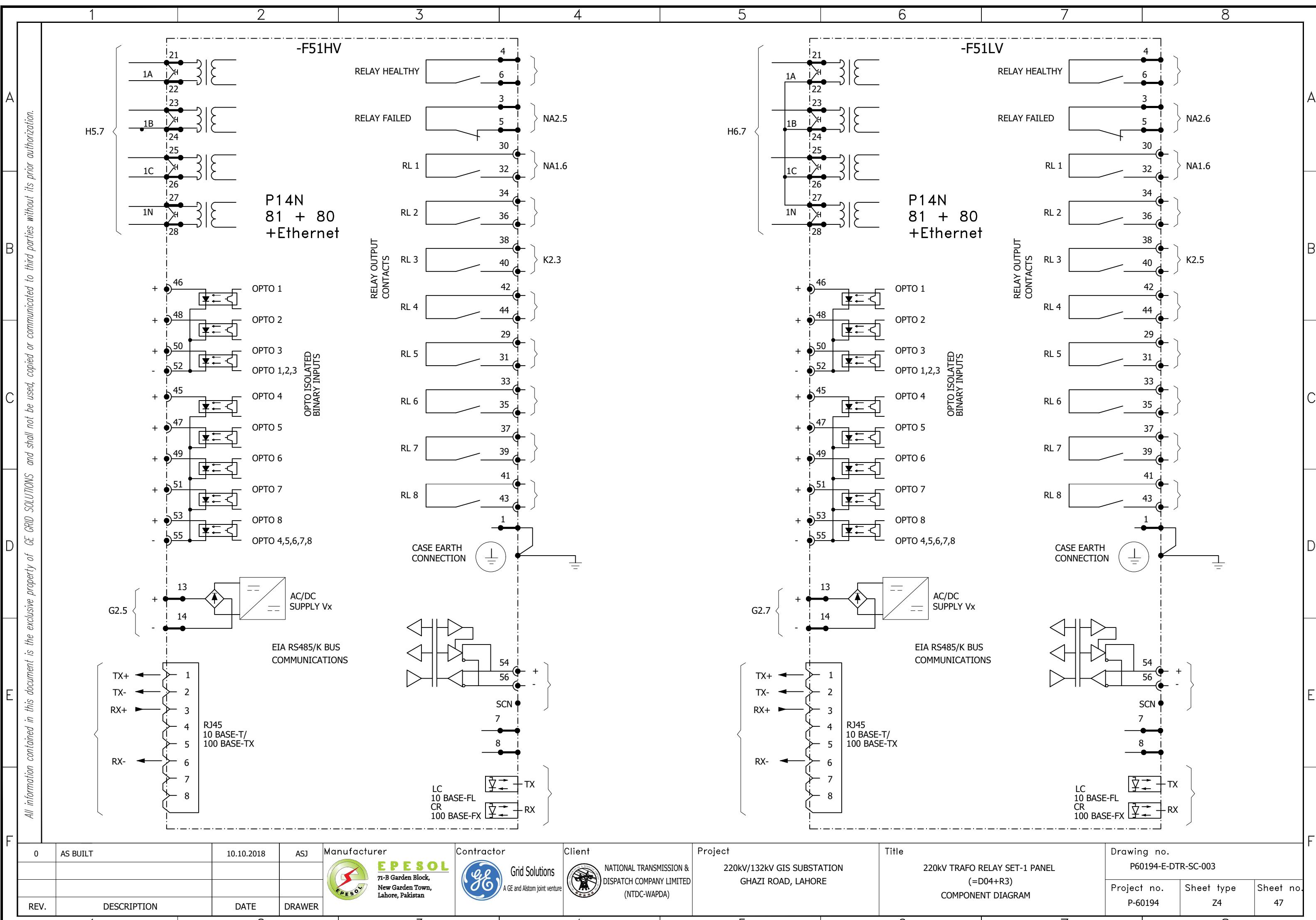
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type Z1	Sheet no. 44

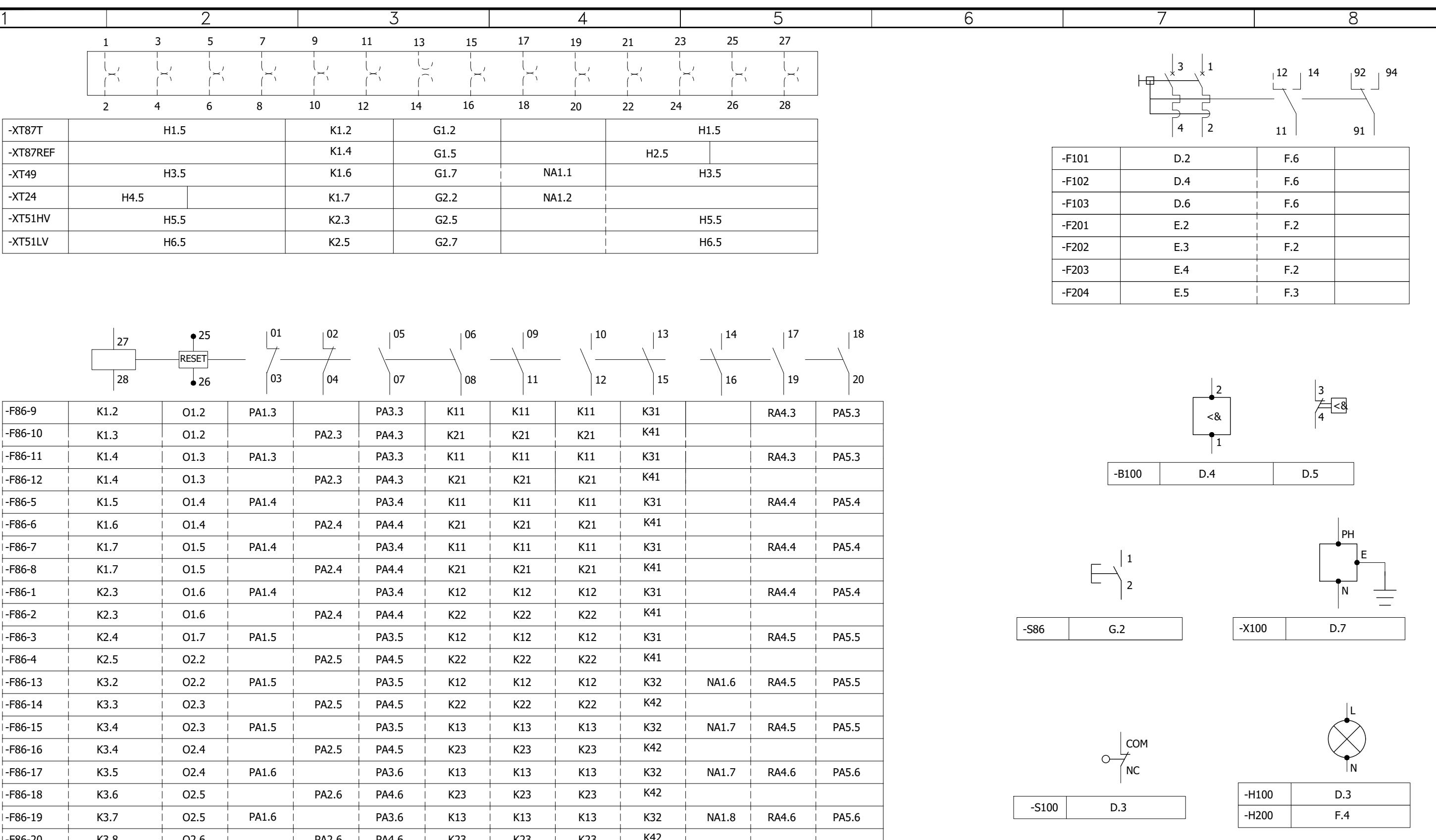
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type Z2	Sheet no. 45
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0	AS BUILT	10.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220kV TRAFO RELAY SET-1 PANEL (=D04+R3) COMPONENT DIAGRAM	Drawing no. P60194-E-DTR-SC-003			
REV.	DESCRIPTION	DATE	DRAWER							Project no. P-60194	Sheet type Z5	Sheet no. 48
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