Grid Solutions
A GE and Alstom joint venture

220kV/132kV GIS SUBSTATION GHAZI ROAD , LAHORE

220kV LINE CONTROL PANEL (=D05+C4) SCHEMATIC DRAWINGS

REFERENCE DRAWINGS

SR. NO.	DRAWING TITLE	DOCUMENT NO.
1.	220kV / 132kV Metering & Protection SLD	P60194-E-SLMP-001
2.	220kV GIS LCC Schematic Drawings	P60194-E-GISS-001

REVISION HISTORY

REV	DATE	DRW. BY	CHK. BY	APR. BY	REVISION DESCRIPTION
0	22.11.2018	ASJ	MFT	NAH	AS BUILT

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: 220kV LINE CONTROL PANEL (=D05+C4) SCHEMATIC DRAWINGS

Order no: P-60194

Document no: P60194-E-RLC-SC-003

Sheet type: A

Total sheets: 40

Sheet no: 1

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PAGE NO.	SHEET NAME	SHEET DESCRIPTION	ISSUE / REVISION										
			A	B	C	D	E	F	01	02	03	04	05
01	A	Cover Sheet	X										
02	AA1	List Of Contents	X	X									
03	AA2	List Of Contents	X	X									
04	AB	Symbols and Legends	X										
05	AC1	Component List	X	X									
06, 06a	AC2, AC2.1	Component List	X	X									
07, 07a	AD, AD1	Panel View	X	X									
08	AE	Bay Concept & Metering Logics	X										
09	D	AC Supply Distribution Circuit	X	X									
10	E	DC Supply Distribution Circuit	X	X									
11	F	AC/DC Supply Failure Circuits	X	X									
12	H1	CT/VT Metering Circuit	X										
13	H2	CT/VT Metering Circuit	X	X									
14	I1	Power Equipment input Circuit	X										
15	I2	Power Equipment input Circuit	X	X									
16	I3	Power Equipment input Circuit	X	X									
17	I4	Power Equipment input Circuit	X										
18	I5	Power Equipment input Circuit	X	X									
19	J1	Circuit Breaker Opening/Closing Circuit	X	X									
20	J2	Circuit Breaker Opening/Closing Circuit	X	X									
21	J3	Circuit Breaker Opening/Closing Circuit	X										
22	J4	Circuit Breaker Opening/Closing Circuit	X										
23	J5	Isolator/Earthing SW. Opening/Closing Circuit	X										
24	J6	Isolator/Earthing SW. Opening/Closing Circuit	X										
25	MA1	Synch Circuits	X	X									
26	MA2	Synch Circuits	X										
27	MA3	Control Circuit	X										
28	MA4	Discrepancy Check Circuit	X										
29	MA5	Discrepancy Check Circuit	X										
30	MA6	Discrepancy Check Circuit	X										
31	RA1	AC Annunciations Circuit	X	X									
32	RA2	Protection Trips Circuit	X	X									

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Title: 220kV LINE CONTRPL PANEL (=D05+C4) LIST OF CONTENTS

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

Project no.	Sheet type	Sheet no.
P-60194	AA1	02

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PAGE NO.	SHEET NAME	SHEET DESCRIPTION	ISSUE / REVISION										
			A	B	C	D	E	F	01	02	03	04	05
33	RA3	Annunciation Alarms Circuit	X	X									
34	RA4	Annunciation Alarms Circuit	X	X									
35	RA5	Annunciation Alarms Circuit	X	X									
36	RA6	Annunciation Alarms Circuit	X	X									
37	RA6-1	Annunciation Alarms Circuit		X									
38	RA7	Event & Fault Recorder Circuit	X	X									
39	RA8	Annunciation Circuit	X	X									
40	Z1	Component Diagram											

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Title: 220kV LINE CONTRPL PANEL (=D05+C4) LIST OF CONTENTS

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

Project no.	Sheet type	Sheet no.
P-60194	AA2	03

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CIRCUIT BREAKER		MINIATURE CIRCUIT BREAKER		AUXILIARY CONTACTOR NO+NC	21	DISTANCE
	SWITCH/ISOLATOR		KEY OPERATED SELECTOR SWITCH	A	AMMETER	24	OVEREXCITATION
	EARTHING		LIMITED SWITCH	V	VOLTMETER	25	SYNCHROCHECK
	SF6 TO AIR BUSHING	A1 <& A2 1 2 <&	HUMIDITY & TEMPERATURE CONTROLLER	PF	POWER FACTOR METER	49	THERMAL OVERLOAD
	LINE TRAP		PANEL HEATER	DPM	DIGITAL PANEL METER	50/51	PHASE INST./OVERCURRENT
	SURGE ARRESTOR	PH E N	THREE PIN SOCKET	MW	ACTIVE POWER METER	50N/51N	EARTH INST./OVERCURRENT
	CURRENT TRANSFORMER		INDICATION LIGHT	MVAR	REACTIVE POWER METER	50BF	CIRCUIT BREAKER FAILURE
W1 W2	COUPLING CAPACITOR VOLTAGE TRANSFORMER		PUSH BUTTON	KWH	ENERGY METER	64	RESTRICTED EARTH FAULT
	POWER TRANSFORMER		AUXILIARY CONTACTOR COIL			67N	DIRECTIONAL EARTH FAULT
	AUTO TRANSFORMER		POWER SUPPLY AC/DC			68	POWER SWING BLOCKING
			TERMINAL			78	OUT OF STEP
			OPTO CONTACTS			79	AUTO-RECLOSING
			RELAY CONTACTS			85	COMMUNICATION FAILURE
			HOOTER			87T	TRAFO DIFFERENTIAL
			AC BELL			87C	DIFFERENTIAL CONNECTION
						87BB	DIFFERENTIAL BUSBAR

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Title: 220kV LINE CONTRPL PANEL (=D05+C4) SYMBOLA AND LEGENDS

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

Project no.	Sheet type	Sheet no.
P-60194	AB	04

QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS	DEVICE DESIGNITION	MANUFACTURER
01	DIGITAL POWER METER	ENERIUM-150, Accuracy: 0.5S, IP Class: IP52, COM Port: RS485, Size: 96x96 Sq.mm.	-P10	ENERDIS
		Supply: 110-375VDC, NOMINAL INPUT: 1/5A, 110VAC(L-L)		
02	ANALOG AMMETER	Type: A96MMA, In: 0...20/30mA, Deflection: 240°, Class: 1,	-P1,-P3	FRER
		Size: 96x96 Sq.mm, Scale-1: 0...600/900A, Scale-2: 0...1200/1800A, Scale-3: 0...2400/3600A		
01	DIGITAL AMMETER	Type: D96MMA, In: 0...20/30mA DC, Class: 1, Supply: 220VDC, Size: 96x96 Sq.mm.	-P2	FRER
01	ANALOG VOLTMETER	Type: A96MMV, In: 0...20/30mA DC, Deflection: 240°, Class: 1, Size: 96x96 Sq.mm.	-P4	FRER
		Scale: 0...220/330kV, Marked Red at 220kV		
01	ANALOG REAL POWER (MW) METER	Type: A96MMA, In: -12.5/10...0...+10/12.5mA DC, Deflection: 240° with CENTER ZERO,	-P5	FRER
	Application: 3PH+4W Balanced System	Size: 96x96 Sq.mm., Class: 1, Scale-1: 450/300...0...300/450 MW (229 MW at 20mA)		
		Scale-2: 625/500...0...500/625 MW (457 MW at 20mA),		
		Scale-3: 1250/1000...0...1000/1250 MW (915 MW at 20mA)		
01	ANALOG REACTIVE POWER (MVAR) METER	Type: A96MMA, In: -12.5/10...0...+10/12.5mA DC, Deflection: 240° with CENTER ZERO,	-P6	FRER
	Application: 3PH+4W Balanced System	Size: 96x96 Sq.mm., Class: 1, Scale-1: 450/300...0...300/450 MVAR (229 MVAR at 20mA)		
		Scale-2: 625/500...0...500/625 MVAR (457 MVAR at 20mA),		
		Scale-3: 1250/1000...0...1000/1250 MVAR (915 MVAR at 20mA)		
04	CURRENT TRANSDUCER	Type: MCOEAQ, Accuracy Class: 1, Input: 1/1.5A, Output: 0...20/30mA – 1 O/P,	-U1,-U2, -U2.1, -U3	FRER
		Frequency: 50Hz, Supply: 220VDC, CT Ratio: 600:1200:2400 / 1A		
01	VOLTAGE TRANSDUCER	Type: MCOEVQ, Accuracy Class: 1, Input: 0...110/165VAC(L-L), Output: 0...20/30mA – 1 O/P	-U4	FRER
		Frequency: 50Hz, Supply: 220VDC, PT Ratio: 220/0.11 kV(L-L)		
01	PROGRAMMABLE UNIVERSAL TRANSDUCER	Type: MCOUP4, 3-Phase 4 Wire Balanced Load	-U5	FRER
		Input Voltage: 110/137.5 VAC (L-L), Input Current: 1/1.25 A, Auxiliary Voltage: 220 VDC		
		4x Programmable DC mA O/P, Accuracy Class: 1, Output: -12.5/10...0...10/12.5 mA		
		PT Ratio: 220/0.11 kV (L-L), CT Ratio: 600:1200:2400 / 1A.		
01	DISCREPANCY SWITCH - CIRCUIT BREAKER	Type: YS-IC-4456-S4(49)-PM-K-G-D22-GM, Standard-type (Push & Turn 90° after 2-position)	-S0	YONGSUNG
		Square Type, Rating: 220VDC		
06	DISCREPANCY SWITCH - ISOLATOR / EARTHING SWITCHES	Type: YS-IC-4456-R4(49)-PM-K-G-D22-GM, Standard-type (Push & Turn 90° after 2-position)	-S1,-S51,-S2,-S9,-S52,-S8	YONGSUNG
		Round Type, Rating: 220VDC		
01	SELECTOR SWITCH - VOLTMETER	Type: PO-160023R001, 7 Position (L1-L2,L2-L3,L3-L1,OFF,L1-N,L2-N,L3-N)	-S13	GIOVENZANA
01	SELECTOR SWITCH - OPERATION (LOCAL-OFF-SCADA)	Type: YS-AK-2-3-44-D, 2 Position with OFF, 4-Pole, Ratings: 12A, 220VDC, Keytype	-S100	YONGSUNG
01	SELECTOR SWITCH - SYCHRONIZATION (ON-BYPASS)	Type: YS-AK-2-2-44-D, 2 Position, 4-Pole, Ratings: 12A, 220VDC, Keytype	-S25	YONGSUNG

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Title: 220kV LINE CONTRPL PANEL (=D05+C4) COMPONENT LIST

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

Project no.	Sheet type	Sheet no.
P-60194	AC1	05

QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS	DEVICE DESIGNITION	MANUFACTURER
04	TERMINAL BLOCKS - AC SUPPLY DIST.	Screw-type, Feed Through Terminal, CBD-4	-XAC	CABUR
08	TERMINAL BLOCKS - DC SUPPLY DIST.	Screw-type, Feed Through Terminal, CBD-4	-XDC	CABUR
16	TERMINAL BLOCKS - CT METERING CIRCUIT	Screw-type, Feed Through Terminal, SCB-6	-X4	CABUR
28	TERMINAL BLOCKS - VT METERING CIRCUIT	Screw-type, Feed Through Terminal, SCB-6	-X5	CABUR
20	TERMINAL BLOCKS - POWER EQUP. INPUT	Screw-type, Feed Through Terminal, CBD-4	-X6	CABUR
27	TERMINAL BLOCKS - POWER EQUP. INPUT	Screw-type, Feed Through Terminal, CBD-4	-X7	CABUR
27	TERMINAL BLOCKS - CB OPENING/CLOSING CIRCUIT	Screw-type, Feed Through Terminal, CBD-4	-X8	CABUR
20	TERMINAL BLOCKS - CB OPENING/CLOSING CIRCUIT	Screw-type, Feed Through Terminal, CBD-4	-X9	CABUR
20	TERMINAL BLOCKS - CB OPENING/CLOSING CIRCUIT	Screw-type, Feed Through Terminal, CBD-4	-X10	CABUR
31	TERMINAL BLOCKS - ISO./ESW OPENING/CLOSING CIRCUIT	Screw-type, Feed Through Terminal, CBD-4	-X11	CABUR
20	TERMINAL BLOCKS - SYNC. CIRCUIT	Screw-type, Feed Through Terminal, CBD-4	-X12	CABUR
14	TERMINAL BLOCKS - SYNC. CIRCUIT	Screw-type, Feed Through Terminal, CBD-4	-X13	CABUR
05	TERMINAL BLOCKS - CONTROL CIRCUIT	Screw-type, Feed Through Terminal, CBD-4	-X14	CABUR
16	TERMINAL BLOCKS - DISCREPANCY CHECK CIRCUIT	Screw-type, Feed Through Terminal, CBD-4	-X15	CABUR
07	TERMINAL BLOCKS - DISCREPANCY CHECK CIRCUIT	Screw-type, Feed Through Diode Terminal, DAS.4/6	-XD	CABUR
87	TERMINAL BLOCKS - ANNUNCIATION CIRCUIT	Screw-type, Feed Through Terminal, CBD-4	-XAN	CABUR
28	TERMINAL BLOCKS - ER/FR CIRCUIT	Screw-type, Feed Through Terminal, CBD-4	-XEV	CABUR
16	TERMINAL BLOCKS - SCADA SIGNALS	Screw-type, Feed Through Terminal, CBD-4	-XSC	CABUR
06	TERMINAL BLOCKS - SCADA METERING SIGNALS	Screw-type, Feed Through Terminal, CBD-4	-XSA	CABUR
06	TERMINAL BLOCKS - CONTROL CIRCUIT	Screw-type, Feed Through Terminal, CBD-4	-X30	CABUR

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Project no.	Sheet type	Sheet no.
P-60194	AC2.1	06a

QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS	DEVICE DESIGNITION	MANUFACTURER
01	PUSH BUTTON - ACKNOWLEDGE	Type: Switch (A Type), Color : BLACK , Supply : 220VDC, Ord: YS-AP1-2-31-B-D-W	-S21	YONGSUNG
01	PUSH BUTTON - LAMP TEST	Type: Switch (A Type), Color : RED , Supply : 220VDC, Ord: YS-AP1-2-31-R-D-W	-S22	YONGSUNG
01	PUSH BUTTON - RESET	Type: Switch (A Type), Color : GREEN , Supply : 220VDC, Ord: YS-AP1-2-31-G-D-W	-S23	YONGSUNG
03	MCB - AC	2-Pole, Ratings: 2A, 240VAC, 10kA @ 240VAC, 2 C/O Contacts, Ord: G62C02+CAH(2)	-F101, -F102, -F104	GE
01	MCB - ELCB	2-Pole, Ratings: 16A, 30mA, 240VAC, 1P+N, 2 C/O Contacts, Ord: DM100C16/030+CAH(2)	-F103	GE
04	MCB - DC	2-Pole, Ratings: 4A, 250VDC, 10kA @ 250VDC, 2 C/O Contacts, Ord: EP102UCC04+CAH(2)	-F201, -F202, -F203, -F204	GE
01	MCB - VT	4-Pole, Ratings: 4A, 110VAC, 10kA @ 110VAC, Ord: G64C02	-F105	GE
01	INDICATION LAMP - DC SUPPLY FAILURE	Type: Integrated LED, Color : RED , Supply : 230VAC @ 50Hz, Ord: YS-PL-2-AL-22-R-W	-H200	YONGSUNG
01	ANNUNCIATION MODULE	12-Window, Supply: 220 VAC	-H11	E-LABS
06	ANNUNCIATION MODULE	12-Window, Supply: 220 VDC	-H12,-H13,-H14,-H15,-H16,H17	E-LABS
02	CONTACTOR RELAY	Coil Voltage: 230VAC @ 50/60 Hz, 6A, 4 C/O Contacts, Ord: PRC4M40ANL	-KACM, -KDC	GE
01	AUXILIARY CONTACTOR - SUPPLY CHANGEOVER	Coil Voltage: 220VDC, 16A, 3 NO + 3 NC Contacts, Ord: MCRC022ATWN+MARN211AT	-KCS	GE
65	CONTACTOR RELAY	Coil Voltage: 220VDC, DIODE, 4 C/O Contacts, Ord: PRC4M40DCML	-KDCM, -KAC, -KQ0.ONR, -KQ0.OFR, -KQ0.ONY, -KQ0.OFY	GE
			-KQ0.ONB, -KQ0.OFB, -KQ1.ON, -KQ1.OF, -KQ51.ON, -KQ51.OF	
			-KQ2.ON, -KQ2.OF, -KQ9.ON, -KQ9.OF, -KQ52.ON, -KQ52.OF	
			-KQ8.ON, -KQ8.OF, -KQ.ON, -KQ.OFF, -KLAC, -KLDC, -KLO1	
			-KLO2, -KLO3, -KLO4, -KLO4.1, -KLO5, -KLO5.1, -KLO6, -KLO7, -KLO8	
			-KLO9, -KG0A, -KG1A, -KG2A, -KG4A, -KG5A, -KG9A, -KGB	
			-KGW, -KVTM, -KVTP, -KVTPX, -KBVT1, -KBVT2, -KDC2	
			-KSY1, -KOE1, -KOA, -KVTB, -KDC1	
			-KTX, -KD	
			-K0D, -K1D, -K51D, -K2D, -K9D, -K52D, -K8D, -KS21, -KDC3	
01	NO VOLT RELAY FOR VT	Rated Supply: 110 VAC @ 50 Hz	-KQ8.D	E-LABS
01	FLASHER RELAY	Rated Supply: 220 VDC	-KFL	E-LABS
01	OPERATION COUNTER	Rated Supply: 220 VDC	-P0	E-LABS
01	PANEL LIGHT	230VAC @ 50Hz, 05W, Ord: YS-T8-30-5W	-H100	YONGSUNG
01	DOOR SWITCH	230VAC @ 50Hz, 1 NO Contact, Ord: YS P3315GW-B + YS MS-C	-DS	YONGSUNG
01	THREE PIN SOCKET	1N+PE, 16A, 230VAC @ 50Hz	-X100	LOCAL
01	PANEL HEATER	230VAC @ 50Hz, 60W	-R100	E-LABS
01	HUMIDITY & TEMPERATURE CONTROLLER	40-90%RH, 25-50 deg.C, 230VAC @ 50Hz	-B100	E-LABS
01	TEST BLOCK - CT	YS-CTT-04S	-XT1	YONGSUNG
01	TEST BLOCK - VT	YS-PTT-04S	-XT2	YONGSUNG

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Project no.	Sheet type	Sheet no.
P-60194	AC2	06

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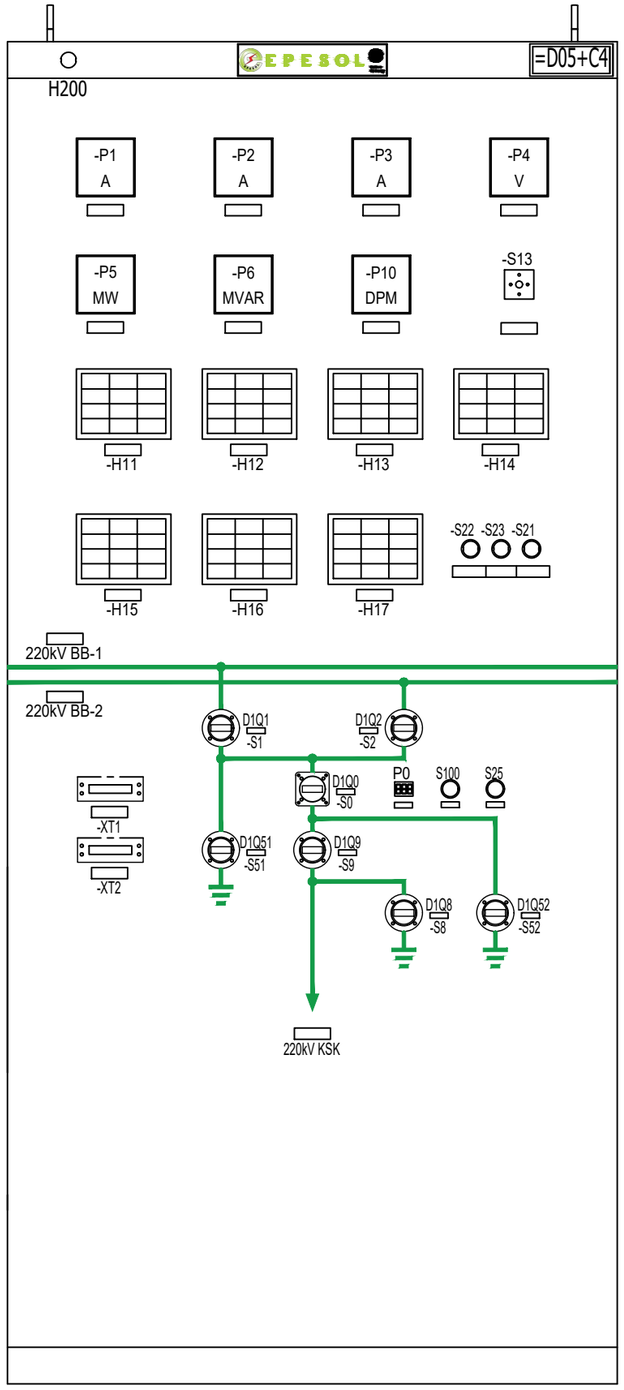
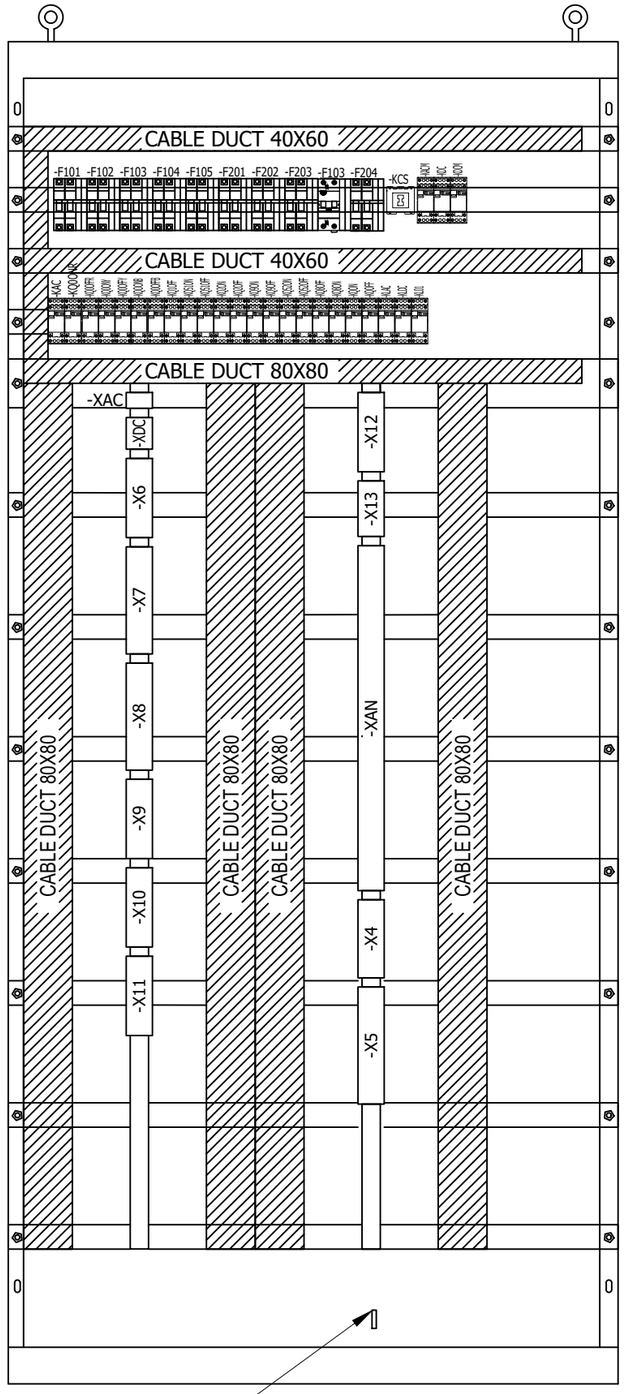
FRONT VIEW

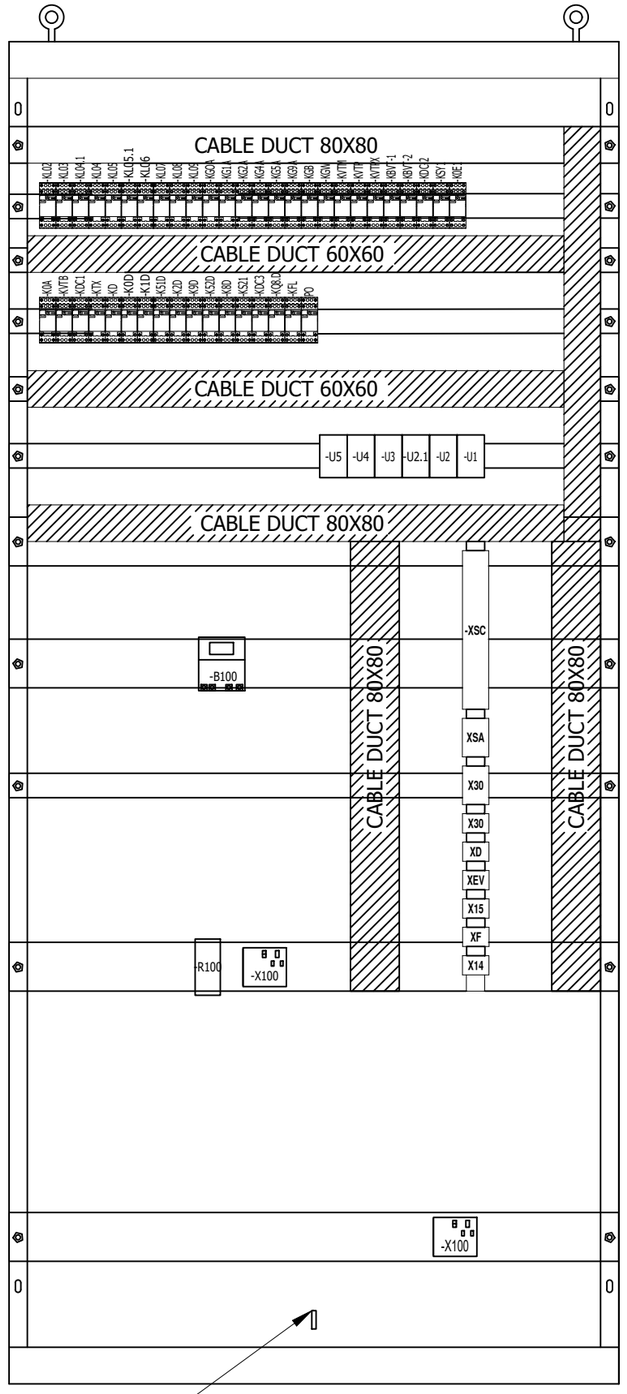


LEFT SIDE VIEW



SLOT FOR EARTHING
BUSBAR
7X30mm

RIGHT SIDE VIEW



SLOT FOR EARTHING
BUSBAR
7X30mm

MIMIC:

1. MIMIC COLOR: GREEN FOR 220kV

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Title: 220kV LINE CONTROL PANEL (=D05+C4) PANEL VIEW

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

Project no.	Sheet type	Sheet no.
P-60194	AD	07

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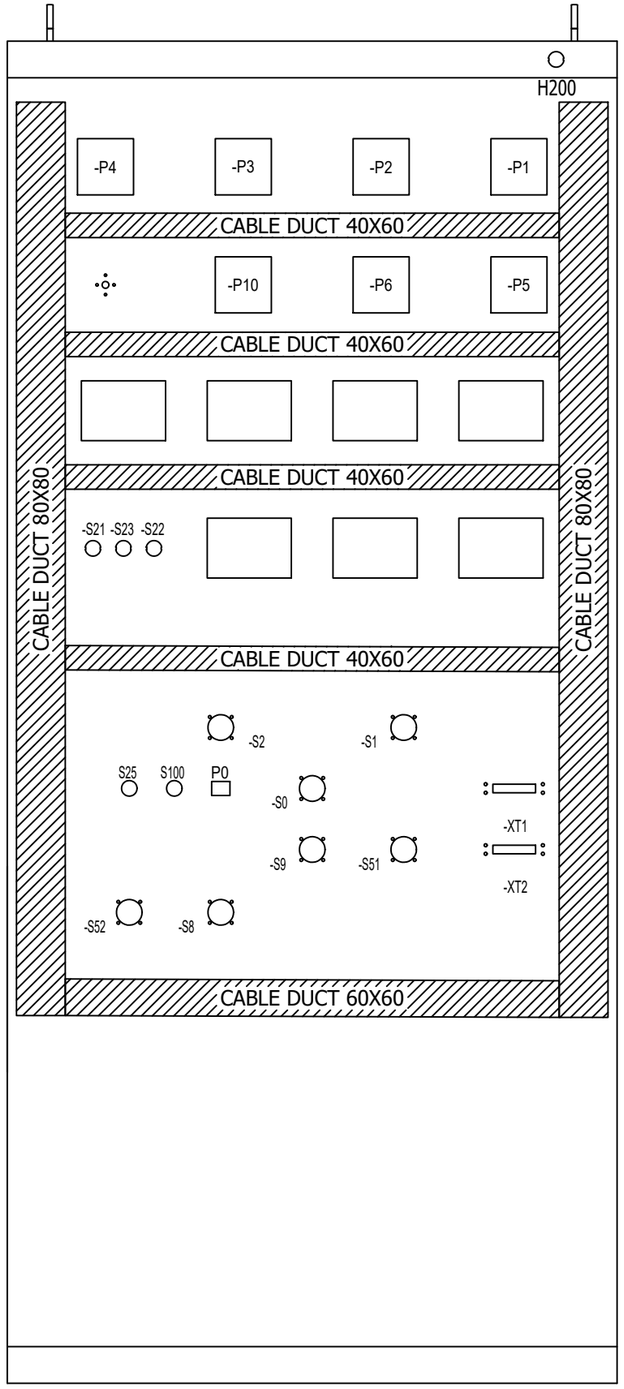
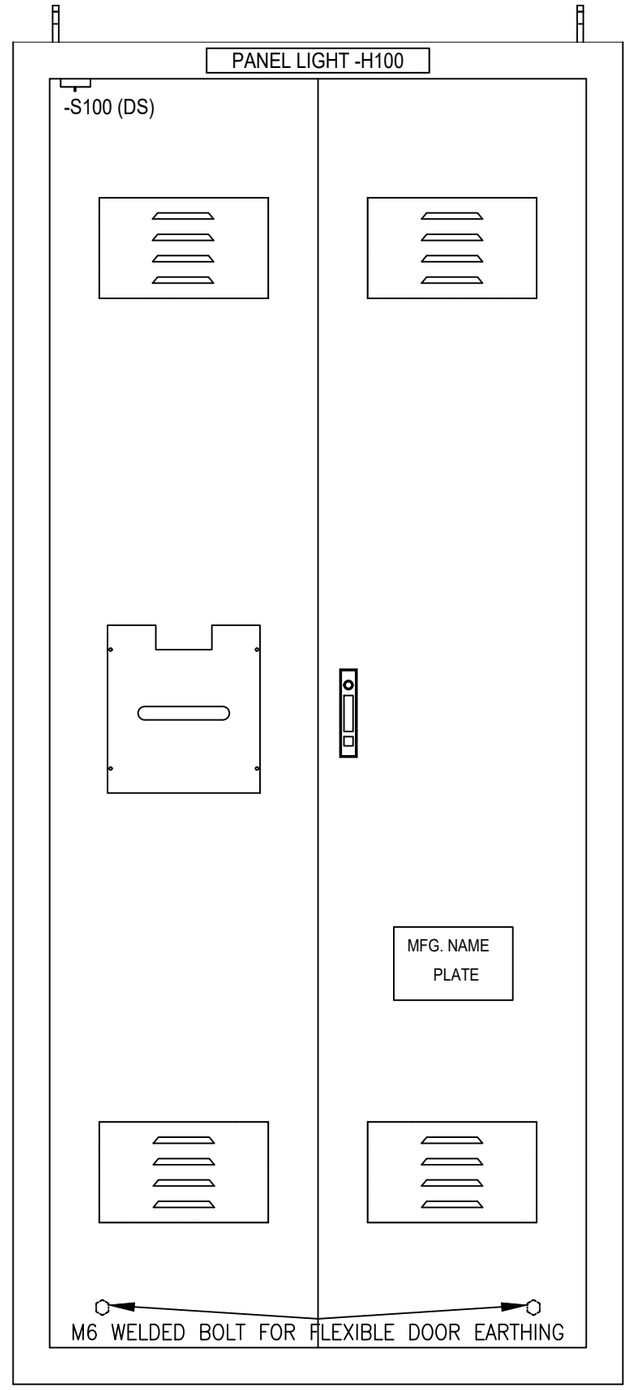
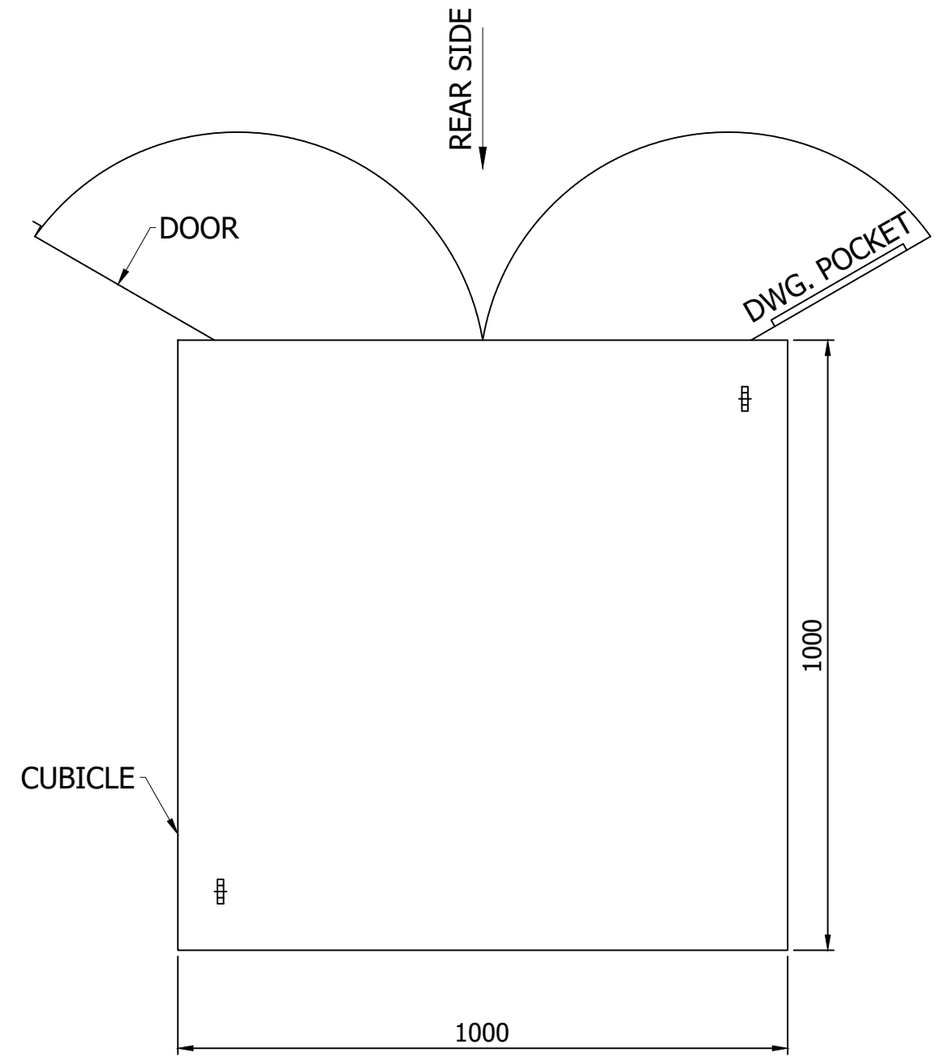
BACK VIEW WITHOUT DOOR



BACK VIEW WITH DOOR



TOP VIEW



NOTE:-

1 - PANEL DIMENSION: 1000 x 1000 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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Title: 220kV LINE CONTROL PANEL (=D05+C4) PANEL VIEW

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

Project no.	Sheet type	Sheet no.
P-60194	AD1	07a

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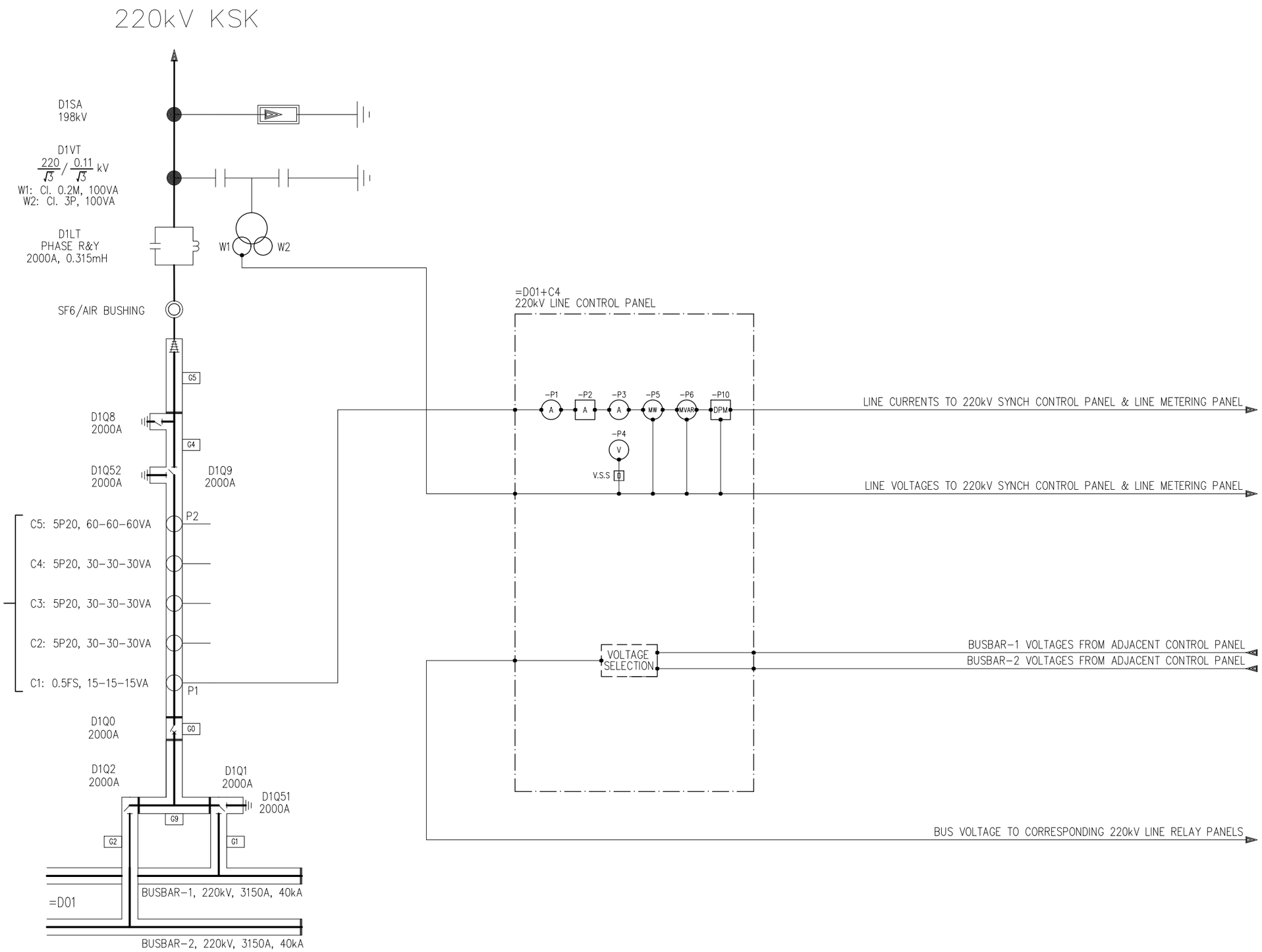

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	ASJ

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: 220kV LINE CONTROL PANEL (=D05+C4) BAY CONCEPT & METERING

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

Project no.	Sheet type	Sheet no.
P-60194	AE	08

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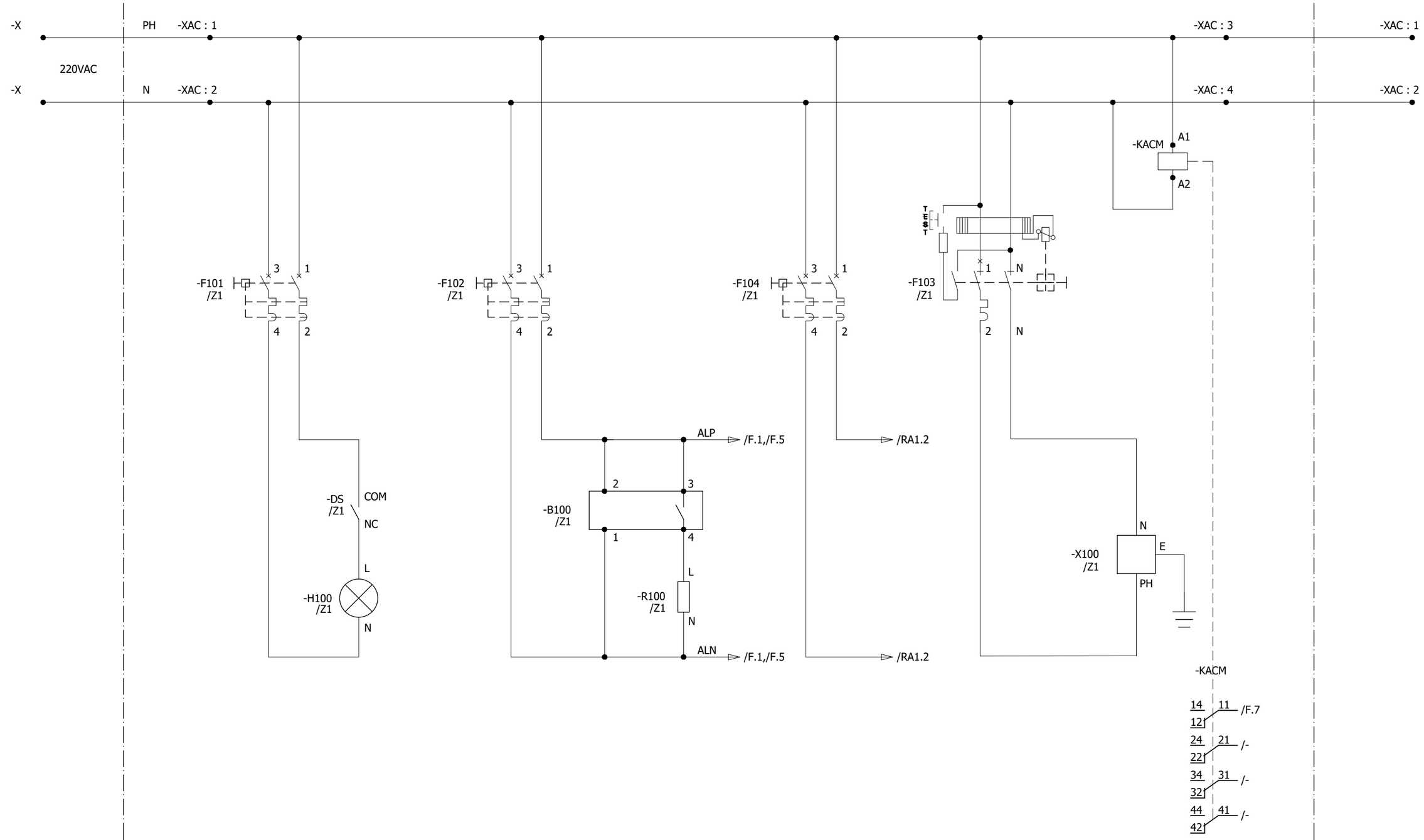
AC MAIN DISTRIBUTION BOARD	CONTROL MCB	DOOR LIMIT SWITCH & PANEL LIGHT	CONTROL MCB	TEMPERATURE & HUMIDITY CONTROLLER	HEATING RESISTOR	CONTROL MCB	CONTROL ELCB	POWER SOCKET	AC MONITORING AUXILIARY RELAY	220kV LINE CONTROL PANEL
+AC MDB	-F101	-S100 & H100	-F102	-B100	-R100	-F104	-F103	-X100	-KACM	=D02+C4
/--										/D.1



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) AC SUPPLY DISTRIBUTION

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

Project no.	Sheet type	Sheet no.
P-60194	D	09

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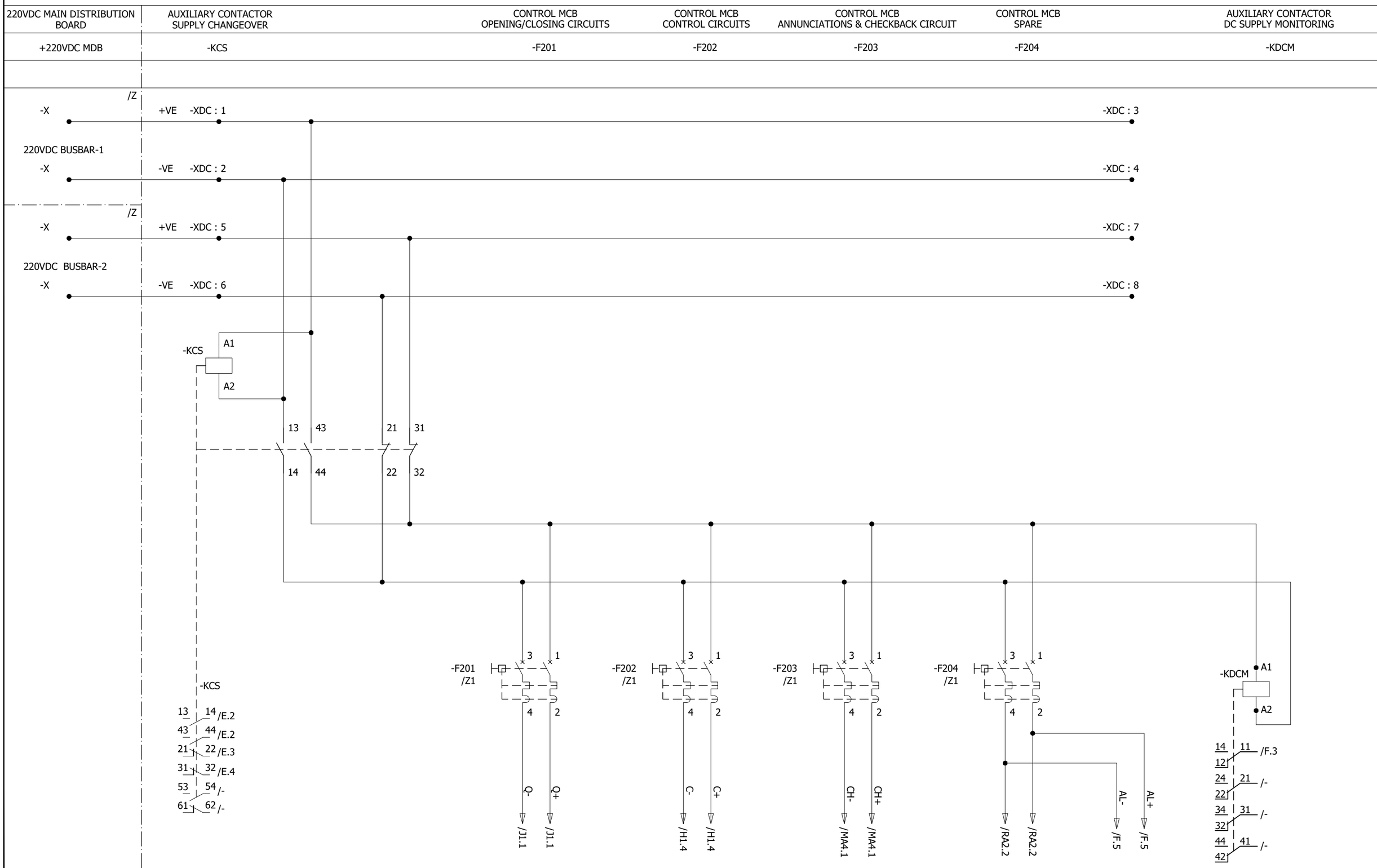


REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	ASJ

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

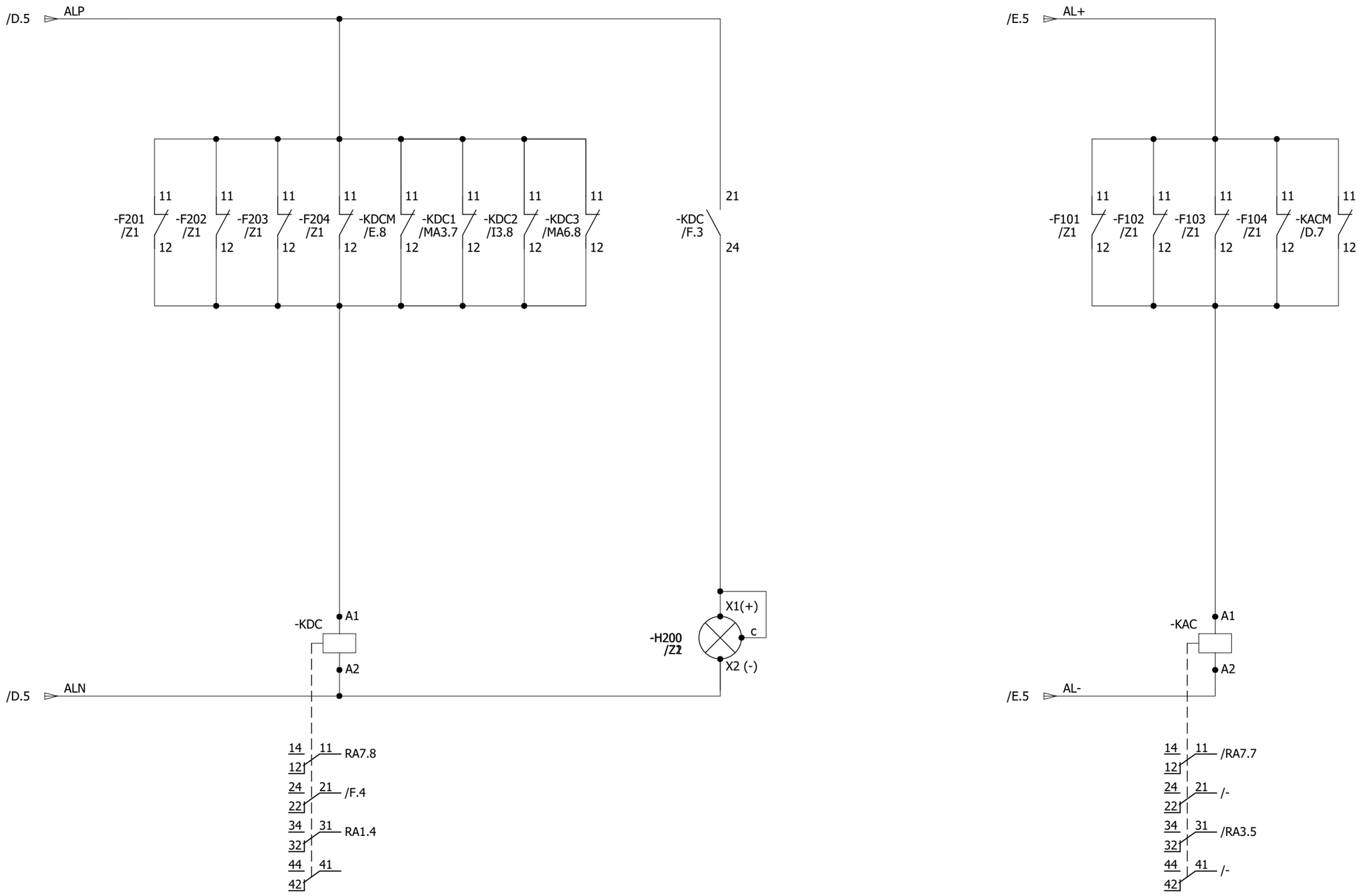
Title: 220kV LINE CONTROL PANEL (=D05+C4) DC SUPPLY DISTRIBUTION

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

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

All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.

220V DC CIRCUIT FAULTY	220V DC CIRCUIT FAULTY INDICATION	220V AC CIRCUIT FAULTY
-KDC	-H200	-KAC



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) AC/DC SUPPLY FAILURE CIRCUIT

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

Project no.	Sheet type	Sheet no.
P-60194	F	11

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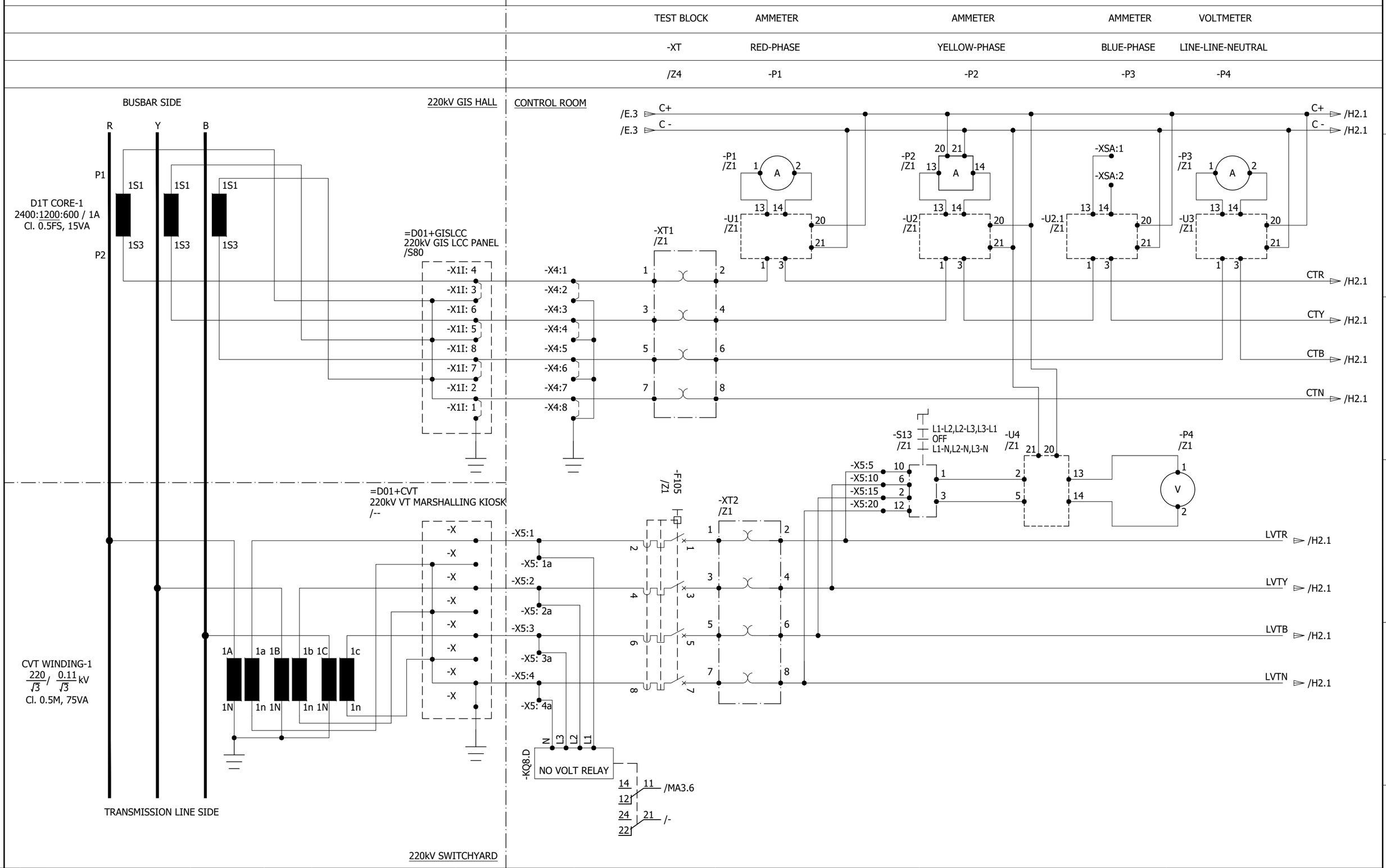


REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	ASJ

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

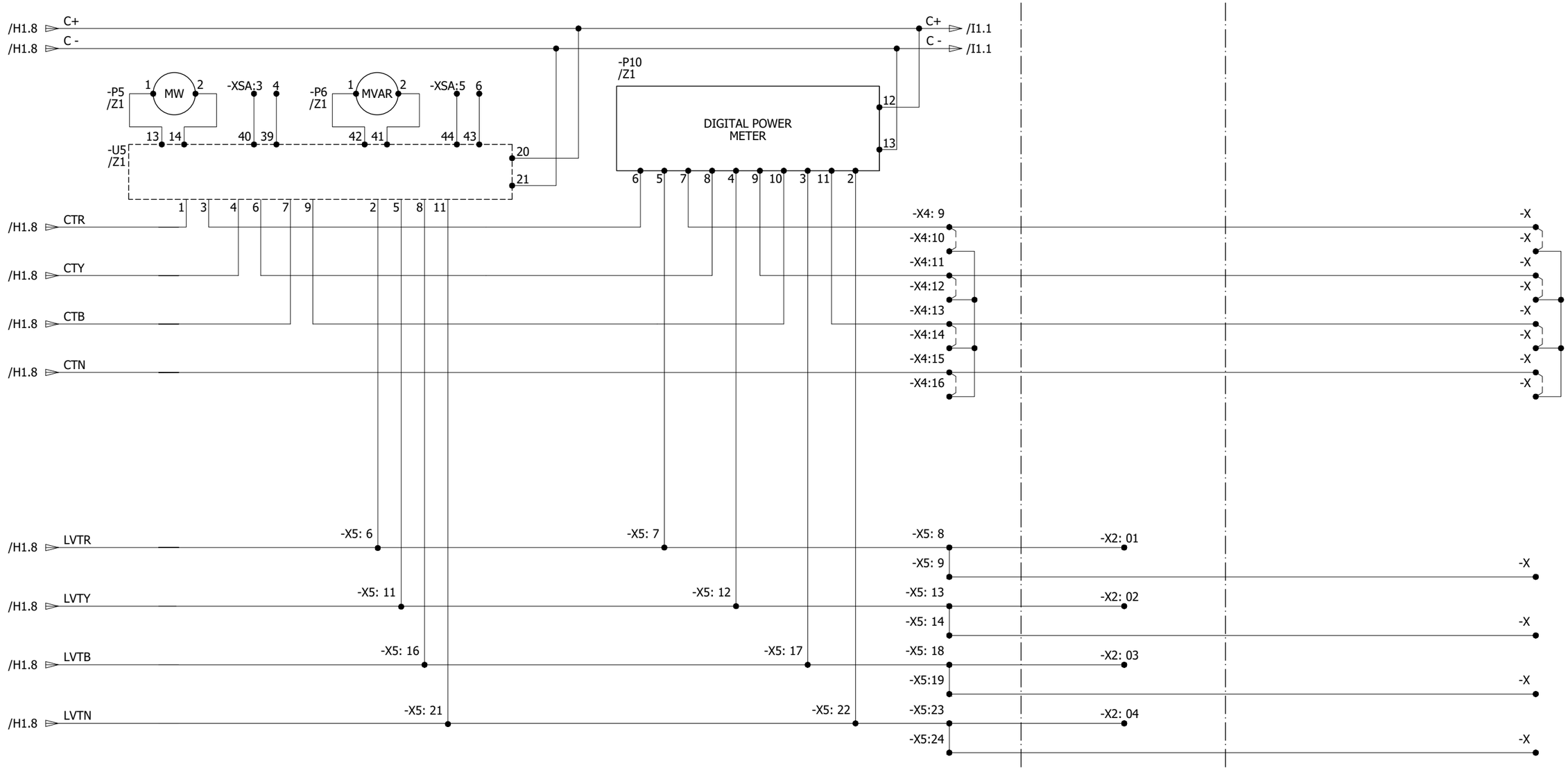
Title: 220kV LINE CONTROL PANEL (=D05+C4) CT/VT METERING CIRCUIT

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

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

All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.

REAL POWER METERING		REACTIVE POWER METER		DIGITAL POWER METER	220kV SYNCH CONTROL PANEL	LINE METERING PANEL
METER	SCADA	METER	SCADA		=D00+C6	=D00+EM
-P5		-P6		-P10	/--	/--



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) CT/VT METERING CIRCUIT

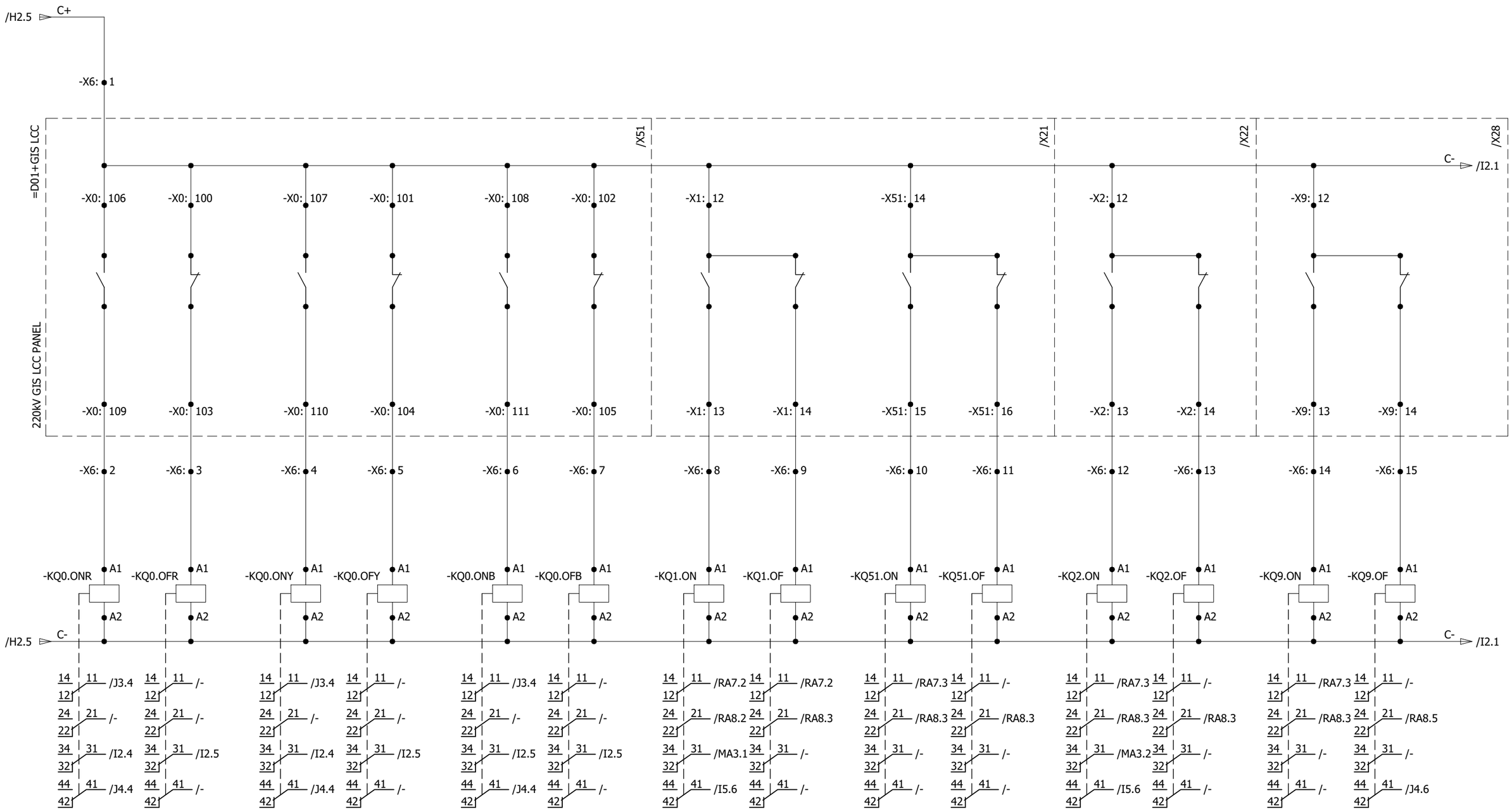
Drawing no. P60194-E-RLC-SC-003

Project no.	Sheet type	Sheet no.
P-60194	H2	13

All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.

POWER EQUIPMENT STATUS SIGNALS

CIRCUIT BREAKER		CIRCUIT BREAKER		CIRCUIT BREAKER		BUS-1 ISOLATOR		BUS SIDE EARTHING SWITCH		BUS-2 ISOLATOR		LINE ISOLATOR	
Q0 - RED POLE		Q0 - YELLOW POLE		Q0 - BLUE POLE		Q1		Q51		Q2		Q9	
CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) POWER EQUIPMENT INPUTS

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

Project no.	Sheet type	Sheet no.
P-60194	I1	14

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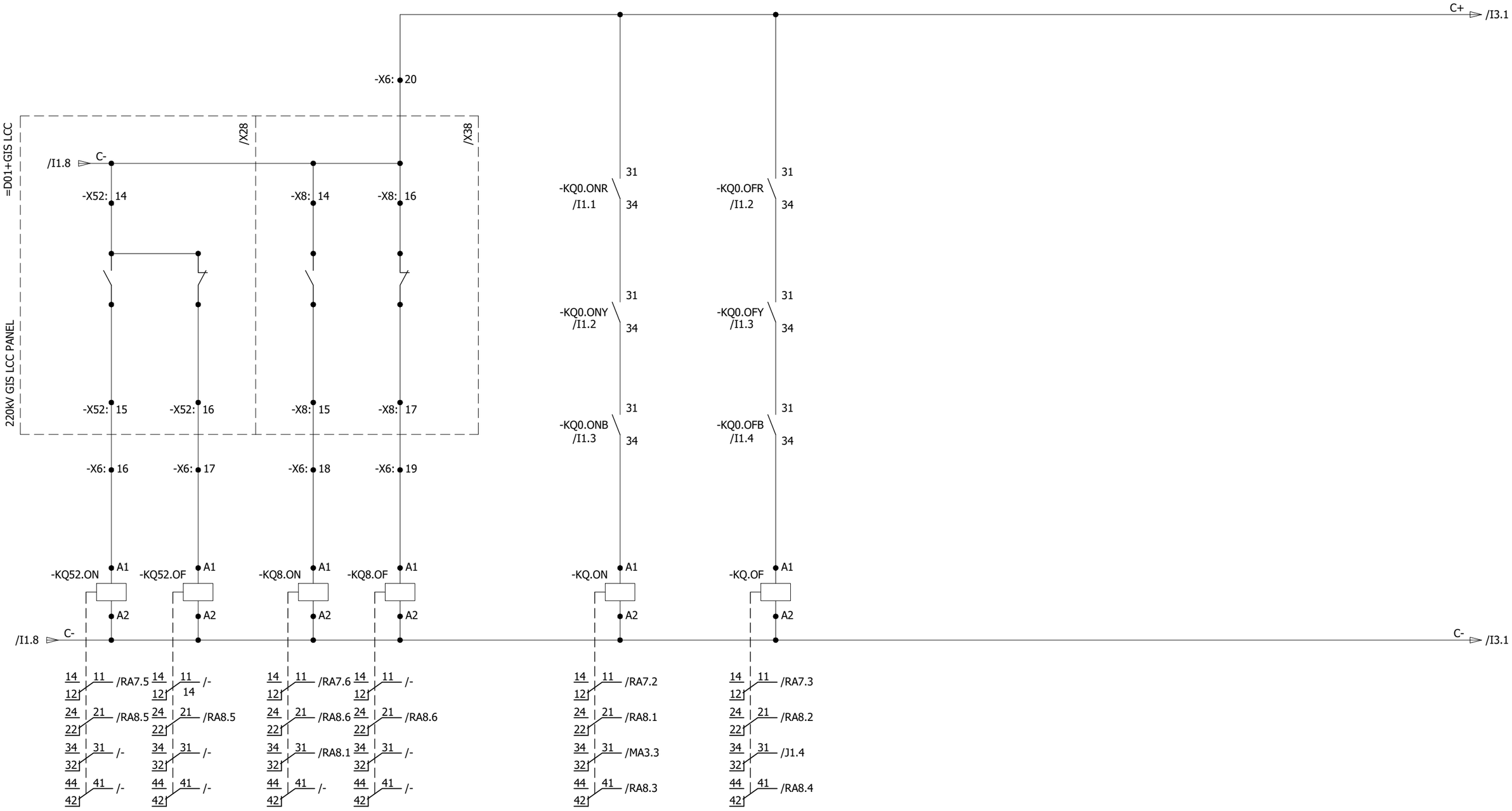
POWER EQUIPMENT STATUS SIGNALS

LINE SIDE EARTHING SWITCH		HIGH SPEED LINE EARTHING SWITCH		CIRCUIT BREAKER	CIRCUIT BREAKER
Q52		Q8		Q0	Q0
CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	ASJ

Manufacturer: EPESOL, 21-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 LINE CONTROL PANEL (=D05+C4) POWER EQUIPMENT INPUTS

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

Project no.	Sheet type	Sheet no.
P-60194	I2	15

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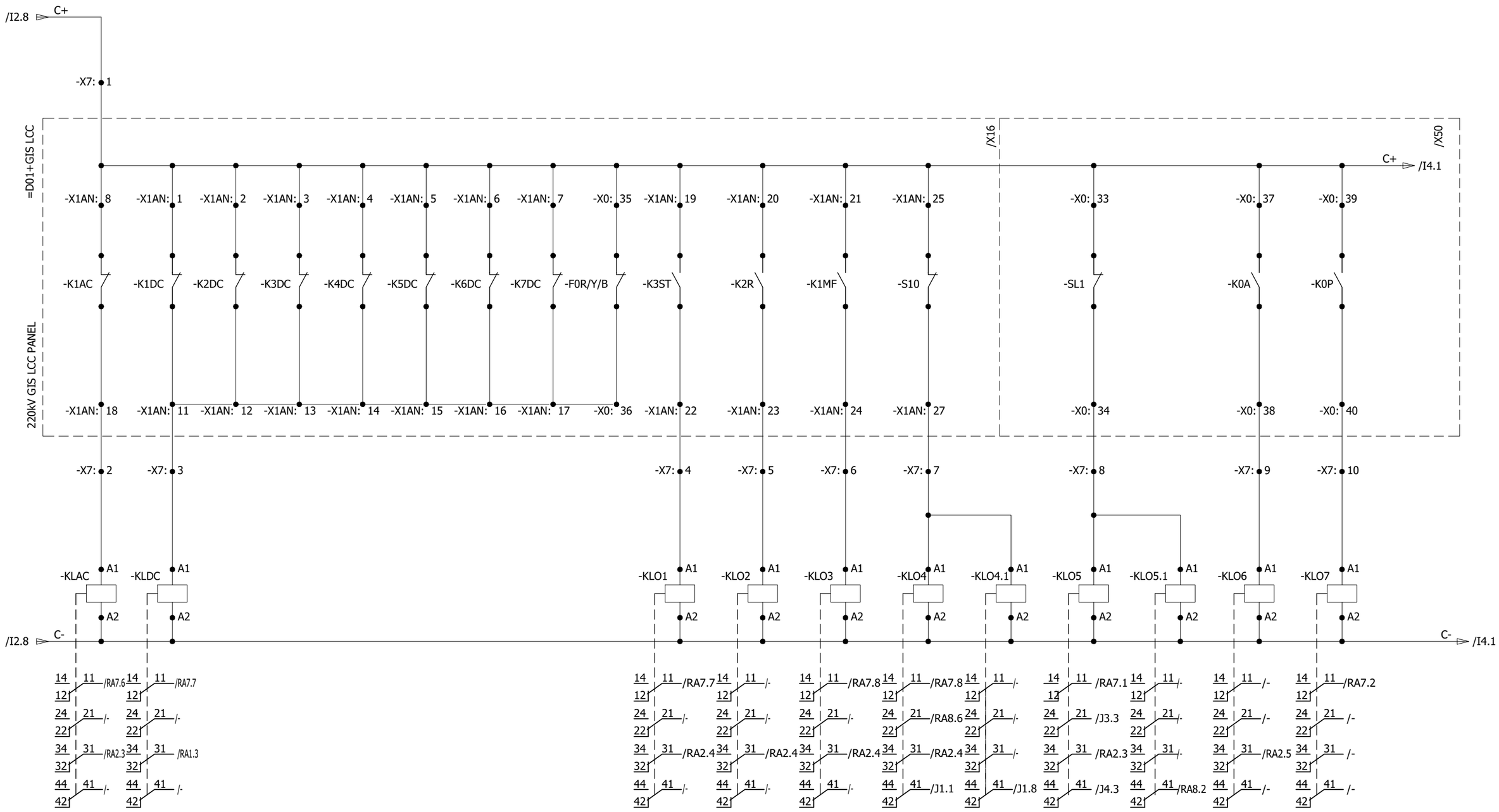
POWER EQUIPMENT INPUT SIGNALS

GIS LCC AC SUPPLY FAILURE	GIS LCC DC SUPPLY FAILURE								GIS LCC OPERATIONAL ALARMS						
HEAT/LIGHT SUPPLY FAIL	S+/- FAIL	C+/- FAIL	T1+/- FAIL	T2+/- FAIL	GM+/- FAIL	DS/ES MOTOR MCB OPEN	M1+/- FAIL	Q0 MOTOR MCB OPEN	DS/ES ABNORMAL OPERATING TIME	REPEAT RELAY ANOMALY	DS/ES MECHANISM FAULTY	BAY IN LOCAL MODE	SPRING CHARGED	LONG SPRING CHARGING TIME	MANUAL CLOSING



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) POWER EQUIPMENT INPUTS

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

Project no.	Sheet type	Sheet no.
P-60194	I3	16

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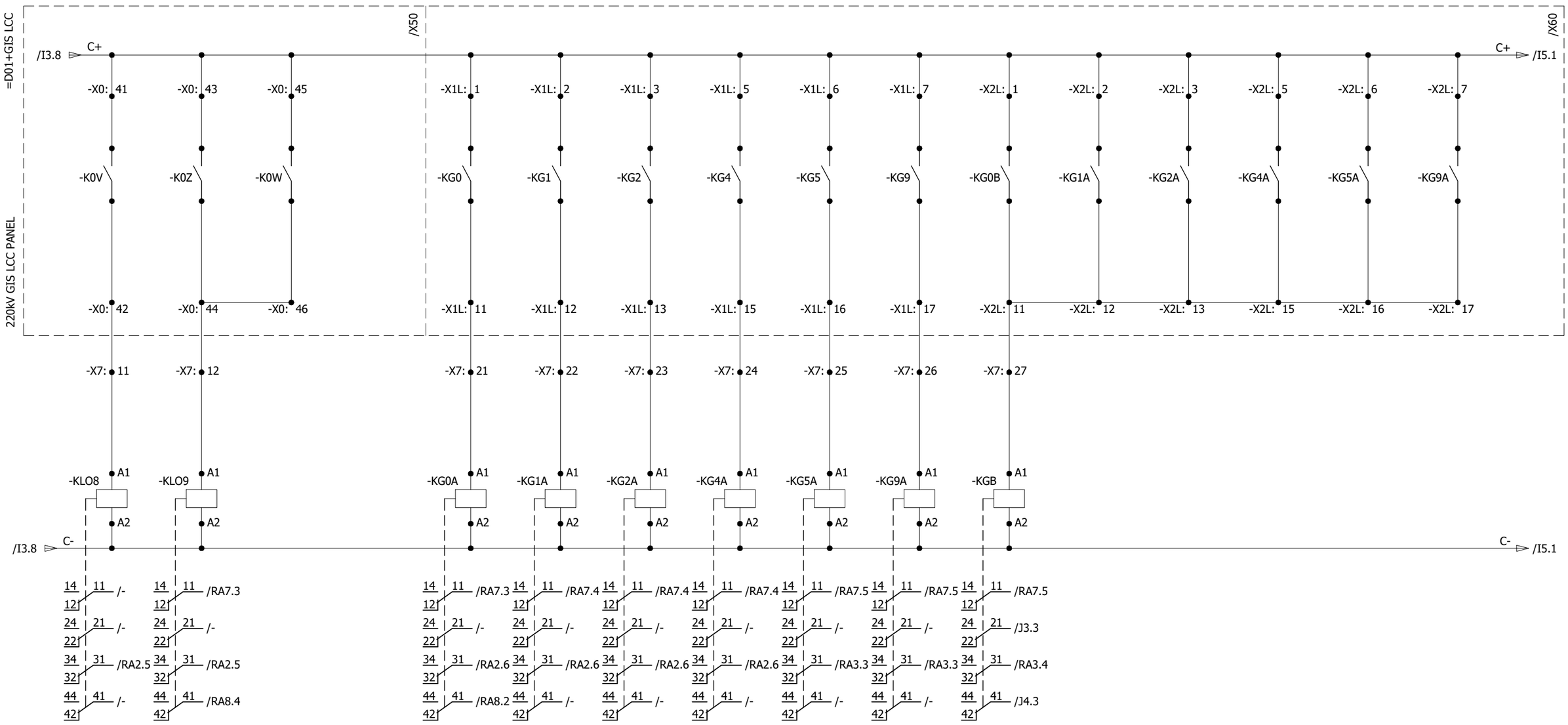
POWER EQUIPMENT INPUT SIGNALS

GIS LCC OPERATIONAL ALARMS			GIS LCC GAS COMPARTMENT ALARMS											
MANUAL TRIPPING	PHASE DISCREPANCY	PHASE DISCREPANCY	G0 LEVEL-1	G1 LEVEL-1	G2 LEVEL-1	G4 LEVEL-1	G5 LEVEL-1	G9 LEVEL-1	G0 LEVEL-2	G1 LEVEL-2	G2 LEVEL-2	G4 LEVEL-2	G5 LEVEL-2	G9 LEVEL-2
	TRIP-1	TRIP-2	ALARM	ALARM	ALARM	ALARM	ALARM	ALARM	BLOCK	BLOCK	BLOCK	BLOCK	BLOCK	BLOCK



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) POWER EQUIPMENT INPUTS

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

Project no.	Sheet type	Sheet no.
P-60194	I4	17

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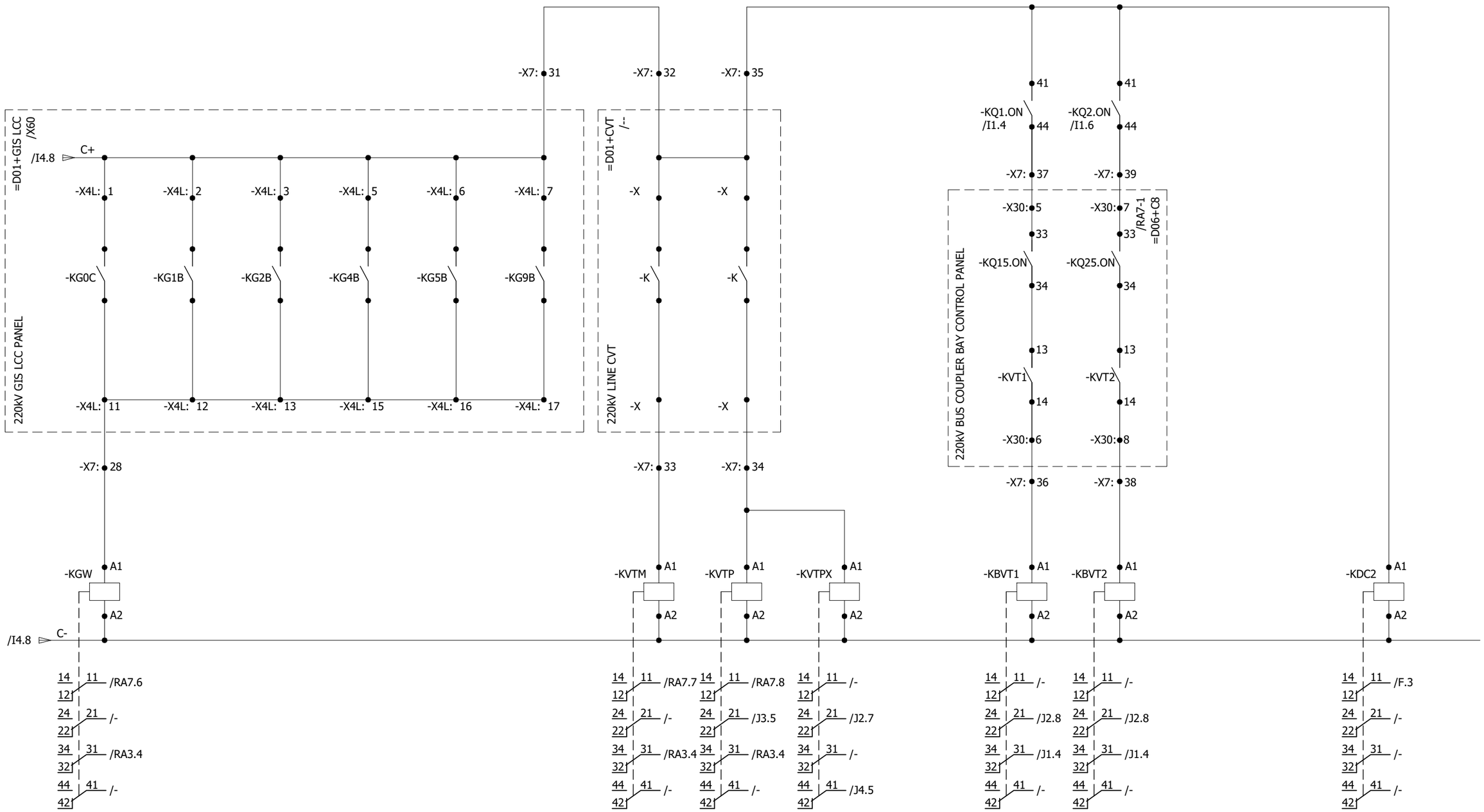
POWER EQUIPMENT INPUT SIGNALS

GIS LCC GAS COMPARTMENT ALARMS						LINE VT ALARMS		BUS VT SIGNAL FOR SYNCH.		DC CIRCUIT C+/C- MONITORING
G0 SELF WIRING	G1 SELF WIRING	G2 SELF WIRING	G4 SELF WIRING	G5 SELF WIRING	G9 SELF WIRING	METERING WINDING	PROTECTION WINDING	BUS VT-1	BUS VT-2	-KDC2
CHECK	CHECK	CHECK	CHECK	CHECK	CHECK	MCB TRIPPED	MCB TRIPPED	MCB HEALTHY	MCB HEALTHY	



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) POWER EQUIPMENT INPUTS

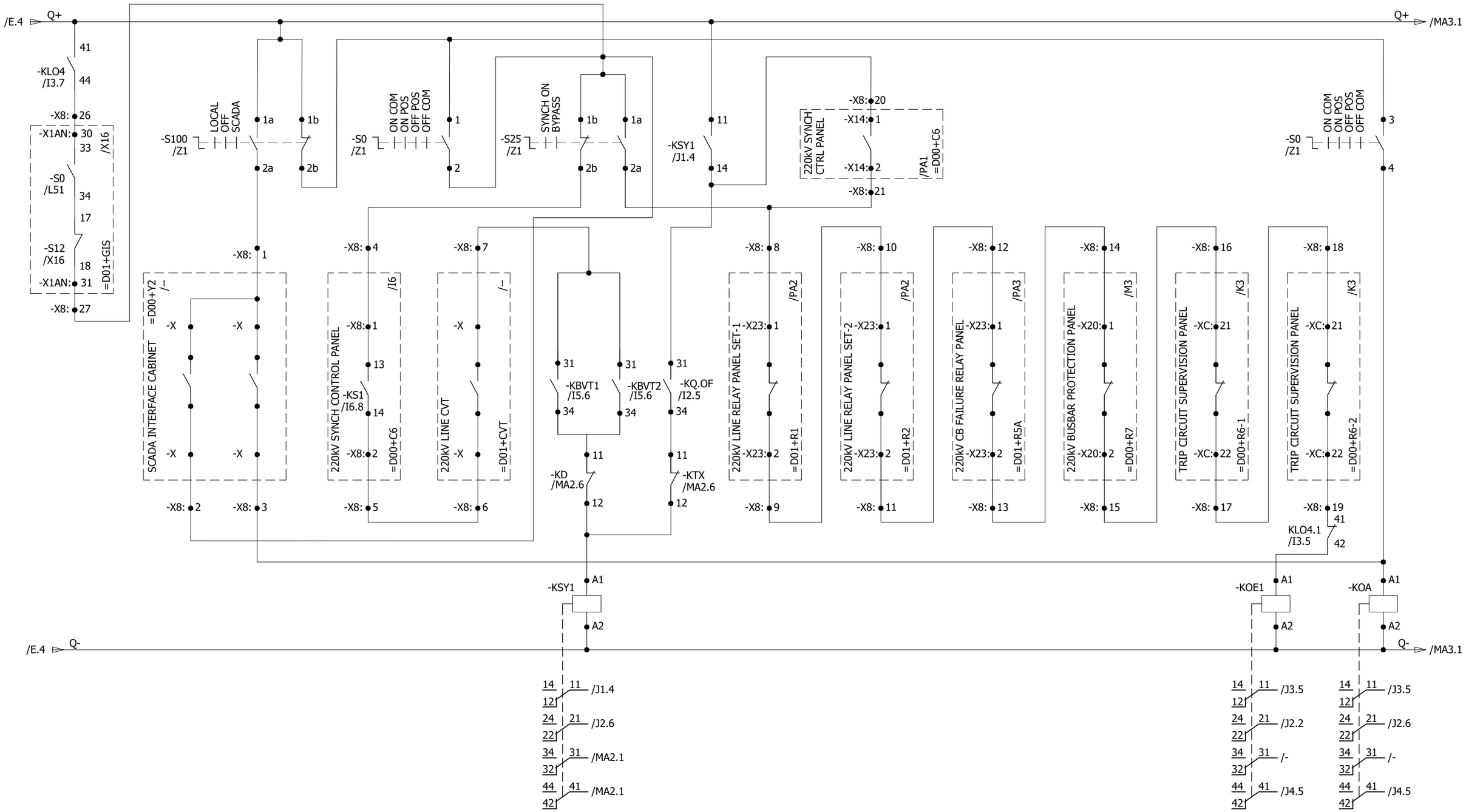
Drawing no. P60194-E-RLC-SC-003

Project no.	Sheet type	Sheet no.
P-60194	I5	18

CIRCUIT BREAKER CLOSING / OPENING CIRCUIT

LOCAL OPERATION

LCC LOCAL OPERATION	SCADA OPERATION		DISCREPANCY SWITCH COMMAND	SYNCH ON-BYPASS	SYNCH CHECK	CLOSE BLOCK CHECKS	DISCREPANY SWITCH COMMAND
CLOSE	OPEN	CLOSE	CLOSE				OPEN



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) CIRCUIT BREAKER OPENING/CLOSING CIRCUIT

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

Project no.	Sheet type	Sheet no.
P-60194	J1	19

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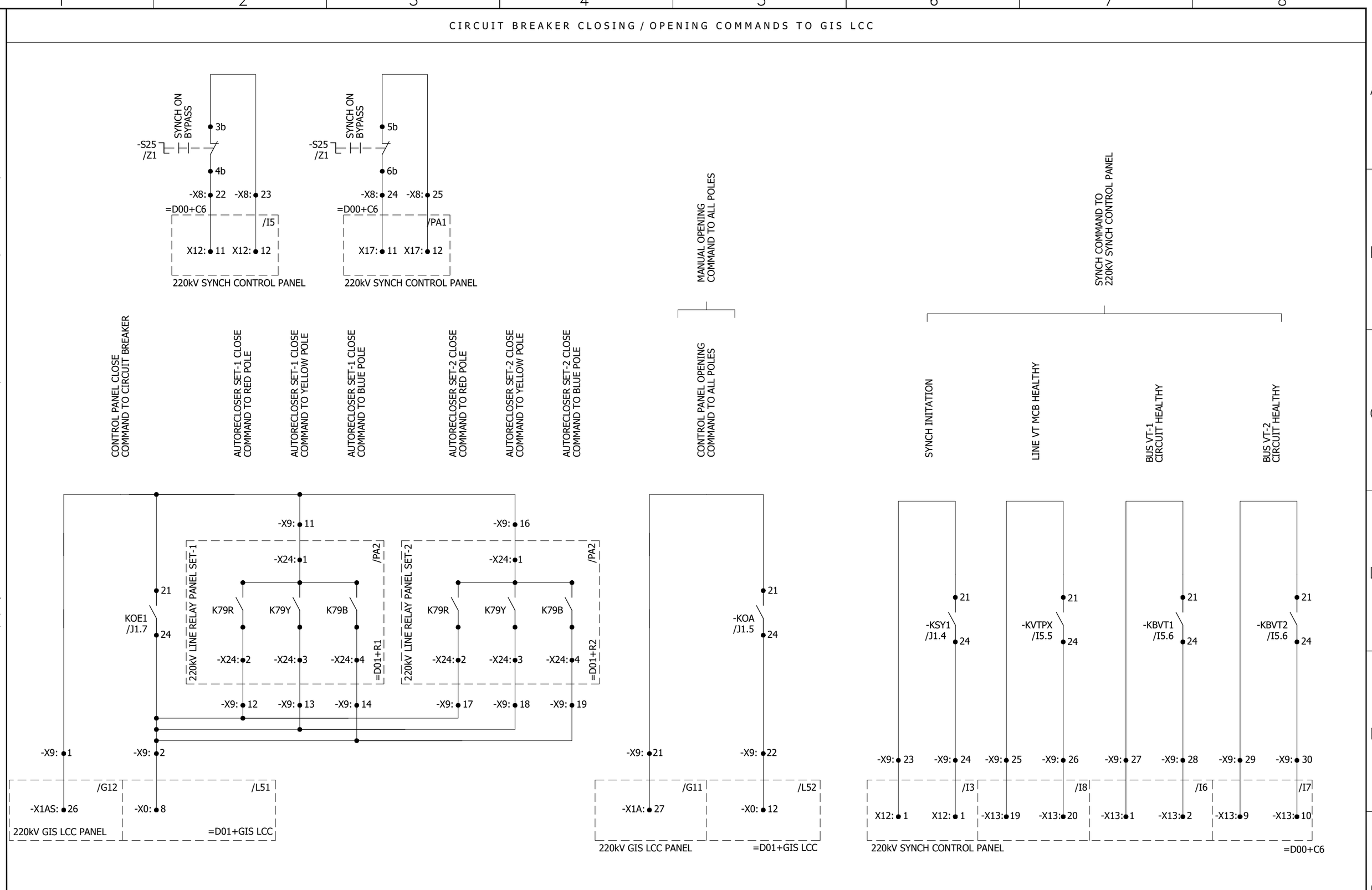
CIRCUIT BREAKER CLOSING / OPENING COMMANDS TO GIS LCC



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) CIRCUIT BREAKER OPENING/CLOSING CIRCUIT

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

Project no.	Sheet type	Sheet no.
P-60194	J2	20

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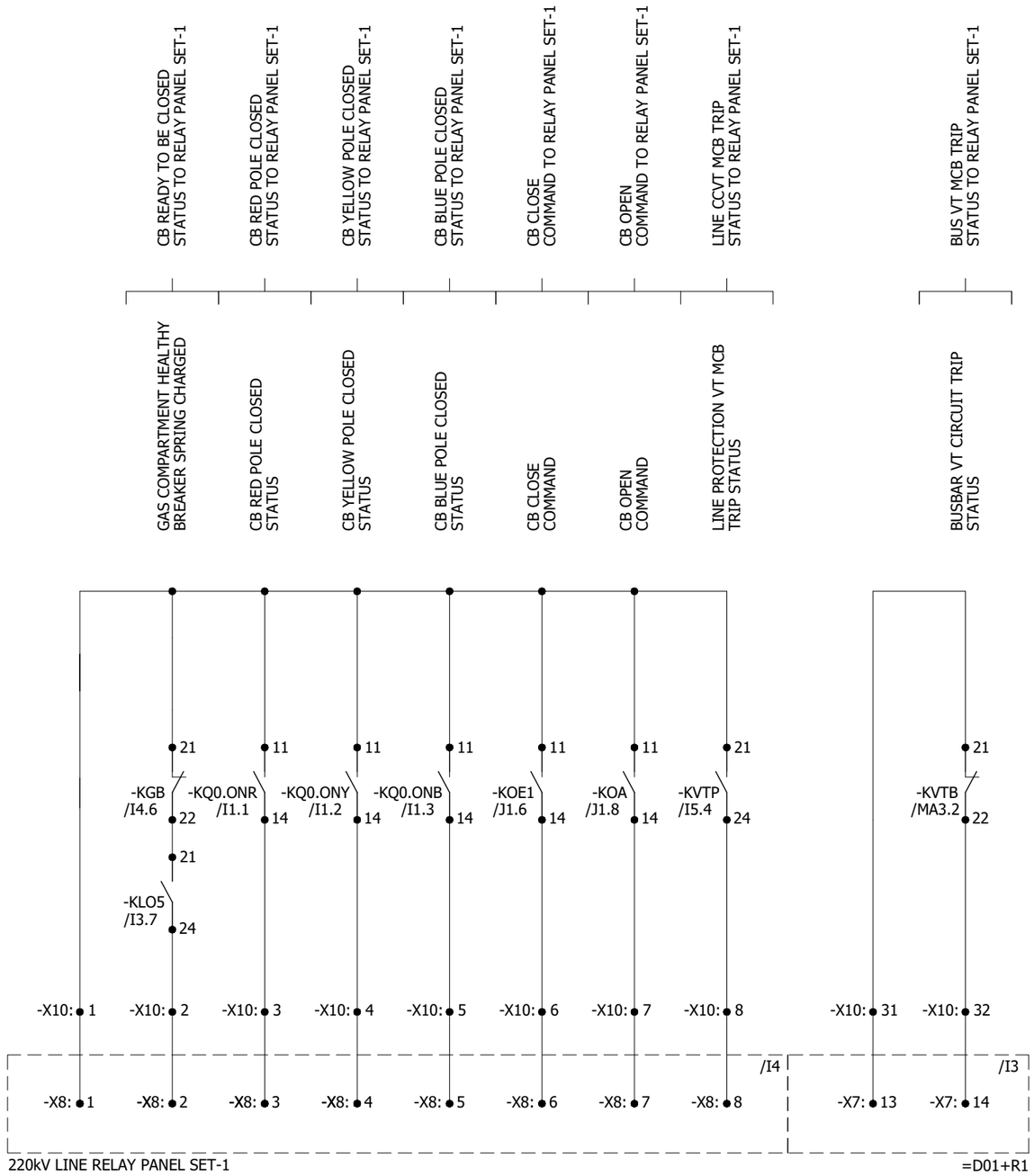
CIRCUIT BREAKER CLOSING / OPENING INTER-CIRCUITS



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) CIRCUIT BREAKER OPENING/CLOSING CIRCUIT

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

Project no.	Sheet type	Sheet no.
P-60194	J3	21

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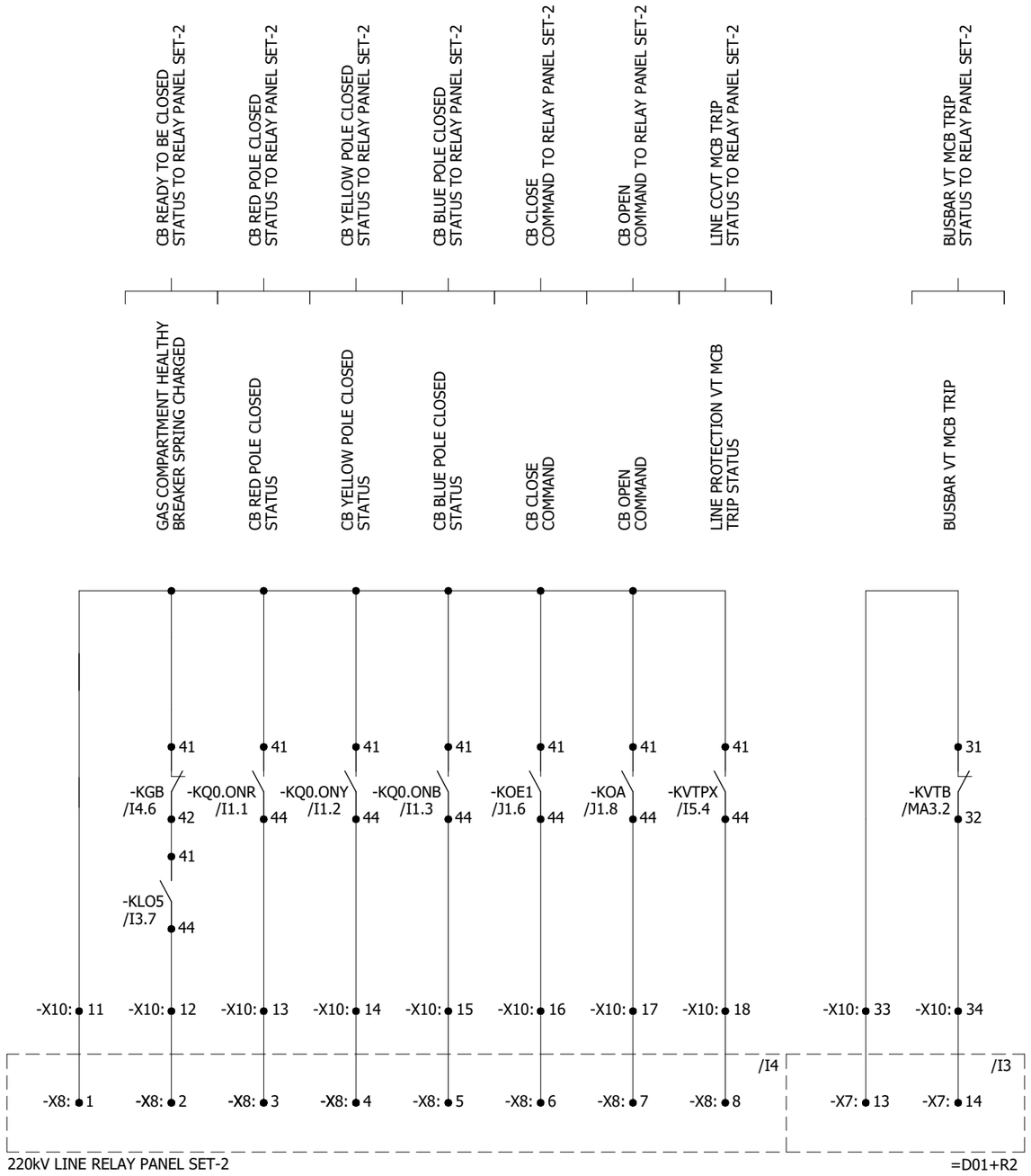
CIRCUIT BREAKER CLOSING / OPENING INTER-CIRCUITS



REV.	DESCRIPTION	DATE	DRAWER
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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 LINE CONTROL PANEL (=D05+C4) CIRCUIT BREAKER OPENING/CLOSING CIRCUIT

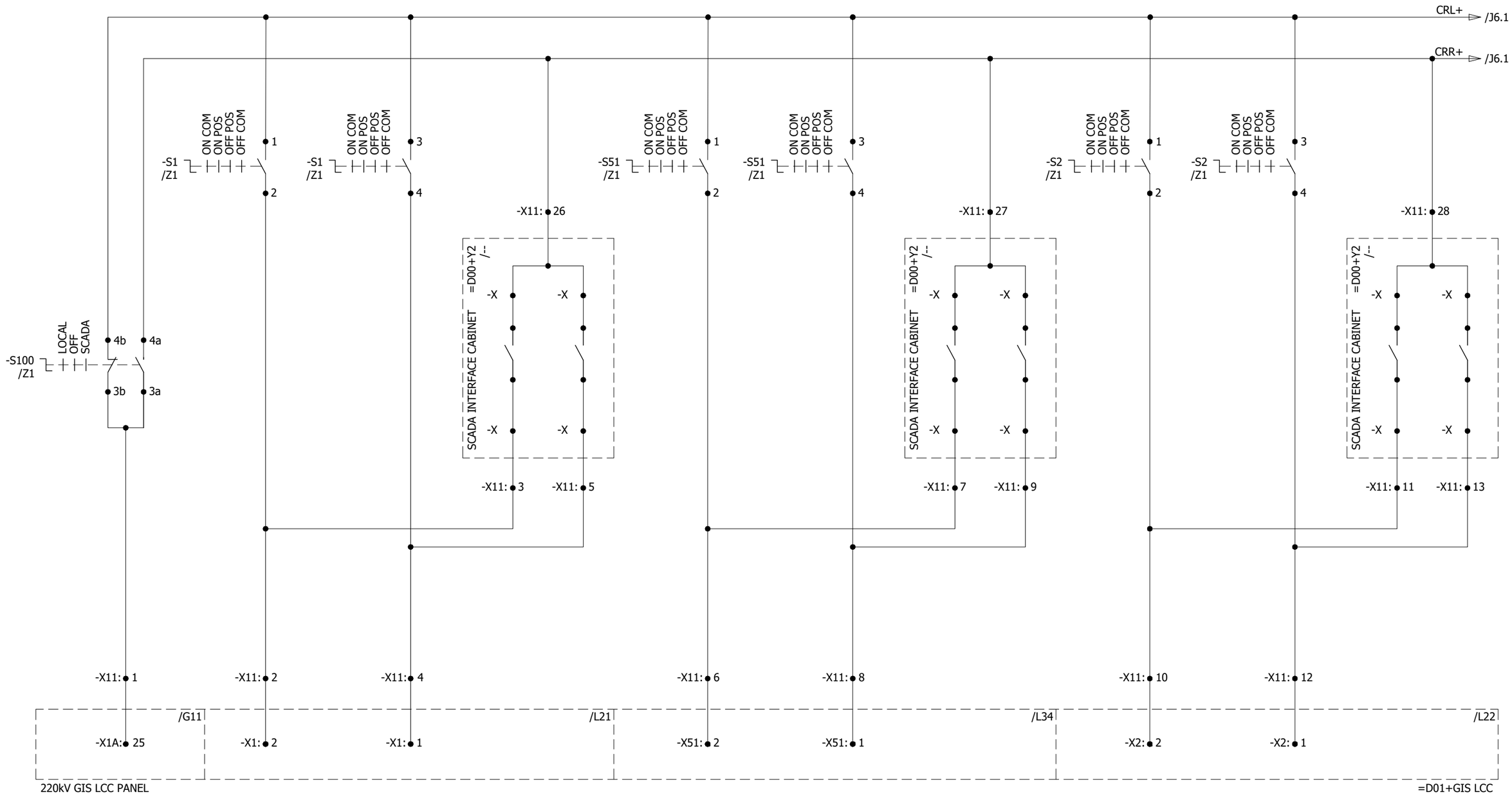
Drawing no. P60194-E-RLC-SC-003

Project no.	Sheet type	Sheet no.
P-60194	J4	22

All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.

ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

SELECTOR SWITCH	BUS-1 ISOLATOR (=D01+Q1)				BUS SIDE EARTHING SWITCH (=D01+Q51)				BUS-2 ISOLATOR (=D01+Q2)			
LOCAL-OFF-SCADA	LOCAL OPERATION		SCADA OPERATION		LOCAL OPERATION		SCADA OPERATION		LOCAL OPERATION		SCADA OPERATION	
	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE



REV.	DESCRIPTION	DATE	DRAWER
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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

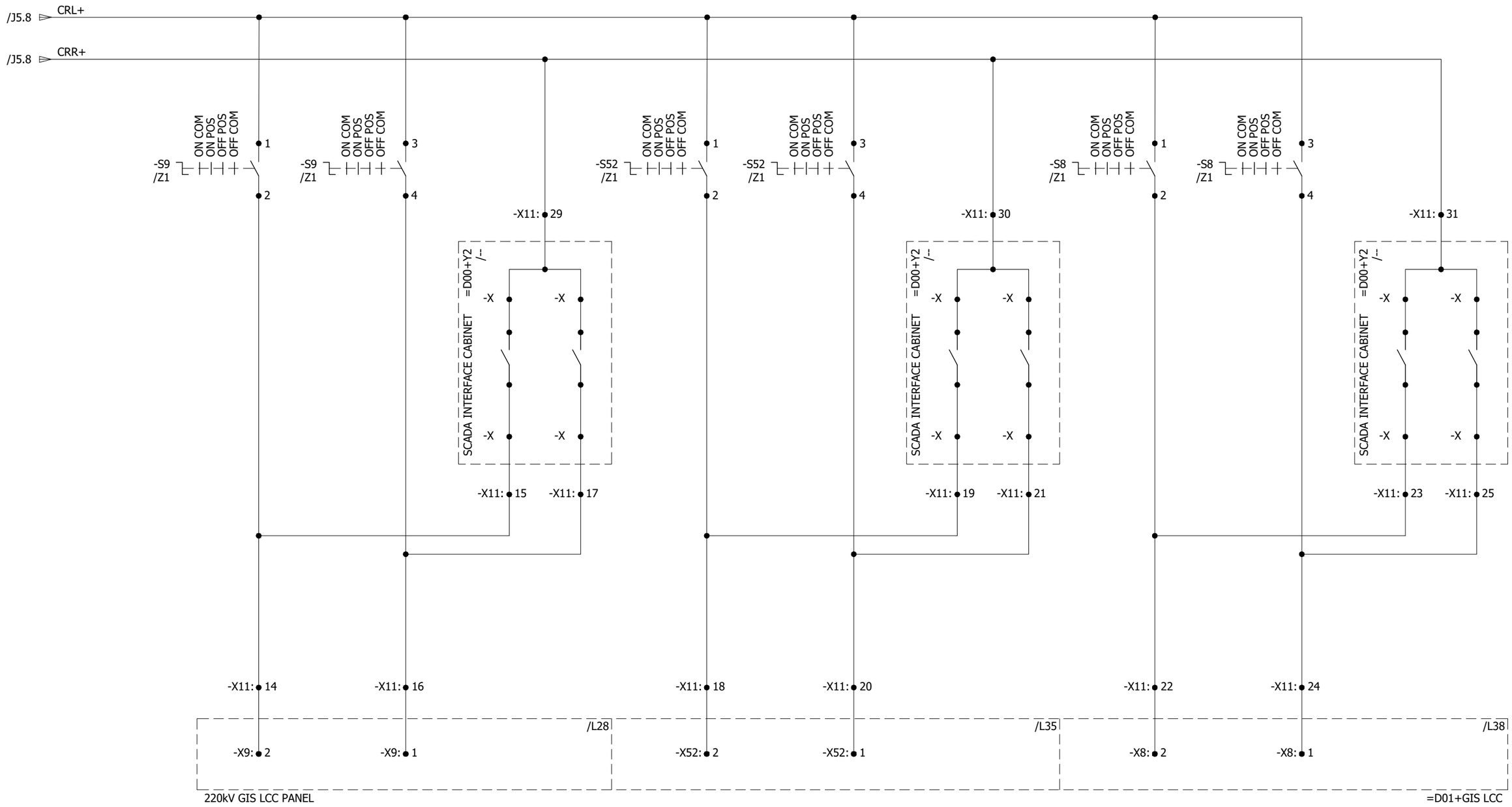
Title: 220kV LINE CONTROL PANEL (=D05+C4) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT

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

Project no.	Sheet type	Sheet no.
P-60194	J5	23

ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

	LINE ISOLATOR (=D01+Q9)				LINE SIDE EARTHING SWITCH (=D01+Q52)				HIGH SPEED LINE EARTHING SWITCH (=D01+Q8)			
	LOCAL OPERATION		SCADA OPERATION		LOCAL OPERATION		SCADA OPERATION		LOCAL OPERATION		SCADA OPERATION	
	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN



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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)

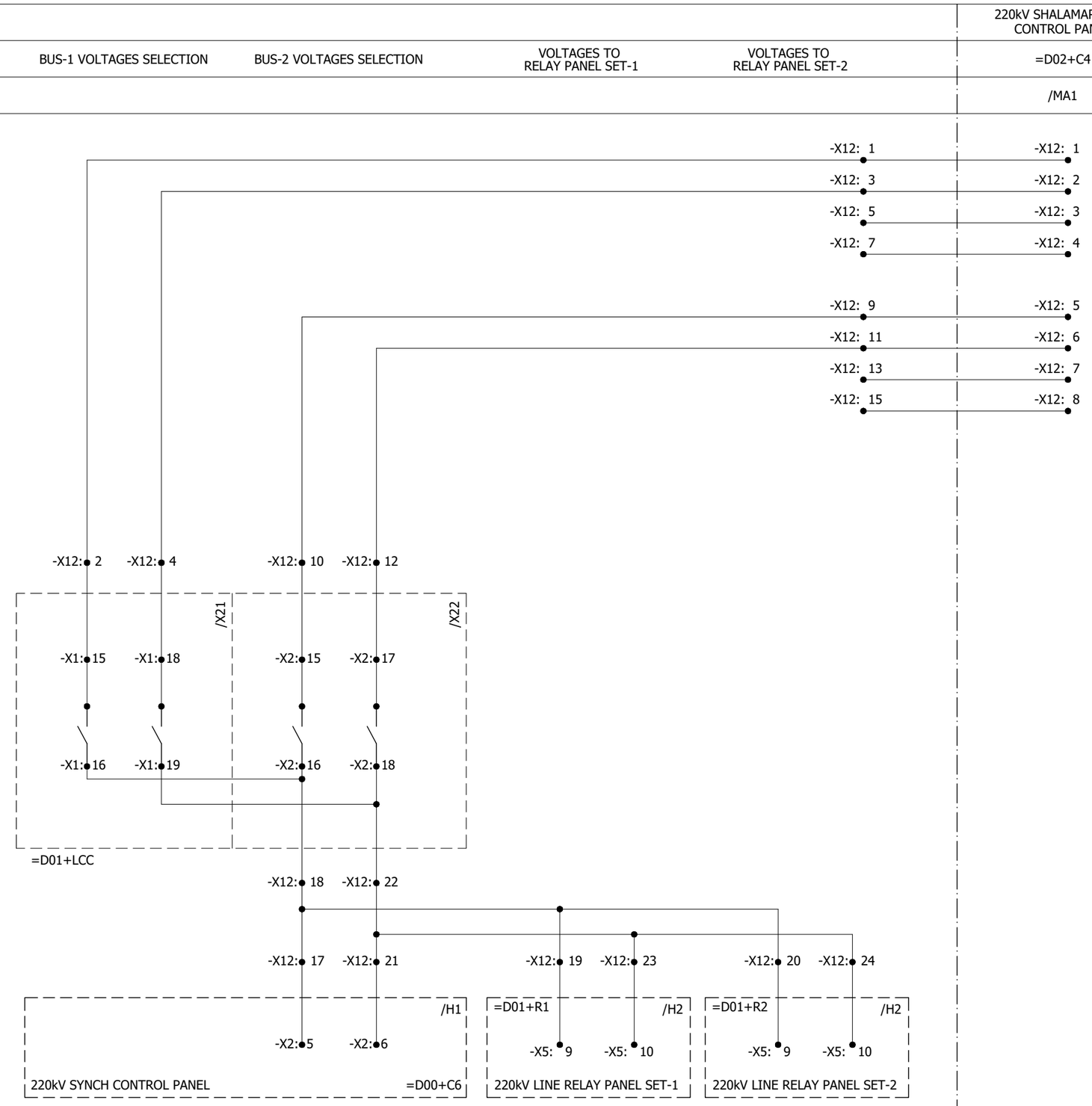
Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 220kV LINE CONTROL PANEL (=D05+C4) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT'

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

Project no.	Sheet type	Sheet no.
P-60194	J6	24

VOLTAGE SELECTION CIRCUIT FOR SYNCHRONIZATION



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REV.	DESCRIPTION	DATE	DRAWER
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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)

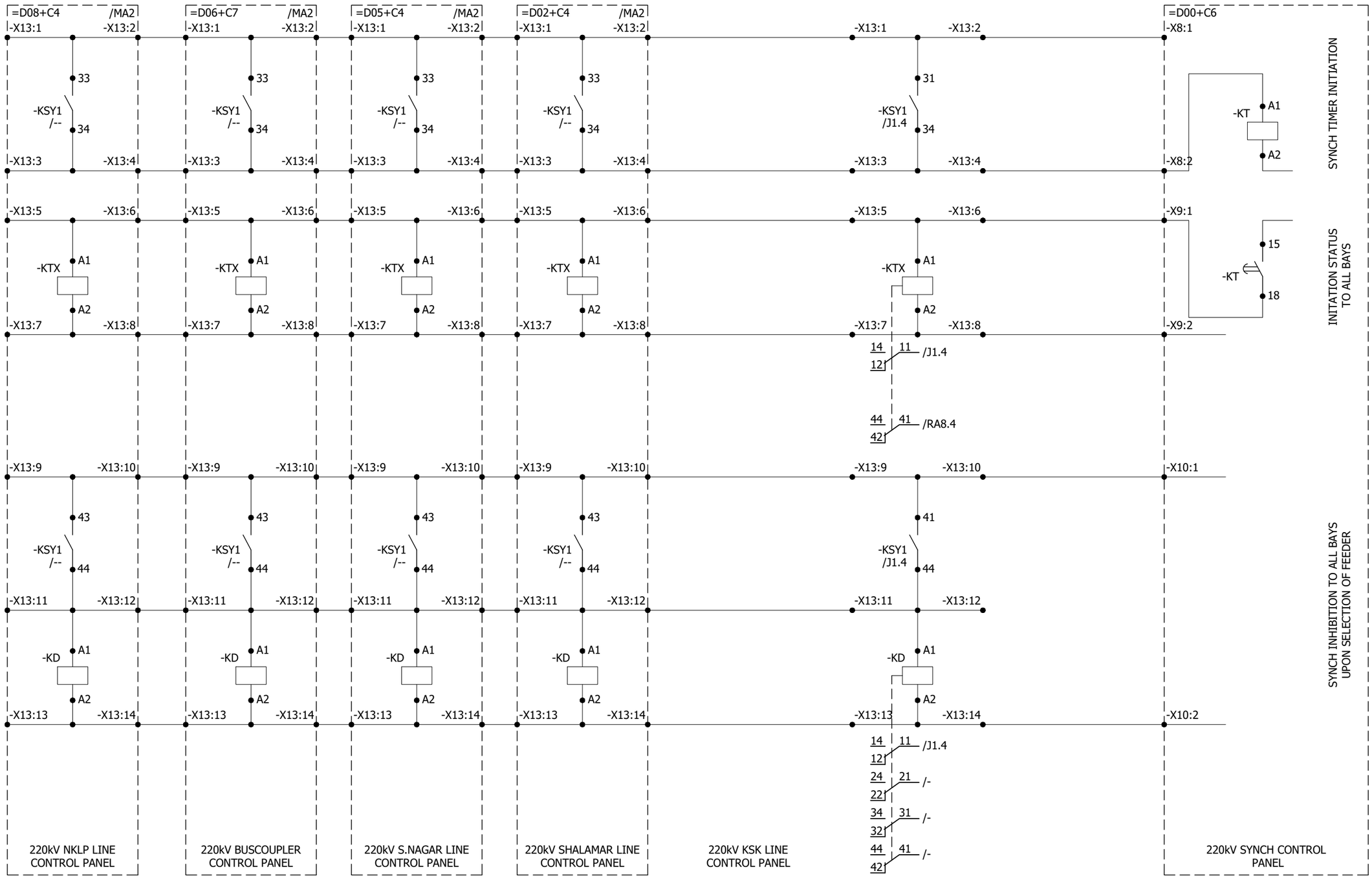
Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 220kV LINE CONTROL PANEL (=D05+C4) SYNCH CIRCUIT

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

Project no.	Sheet type	Sheet no.
P-60194	MA1	25

SYNCHRONIZATION INITIATION & INHIBITION CIRCUIT



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REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) SYNCH CIRCUIT

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

Project no.	Sheet type	Sheet no.
P-60194	MA2	26

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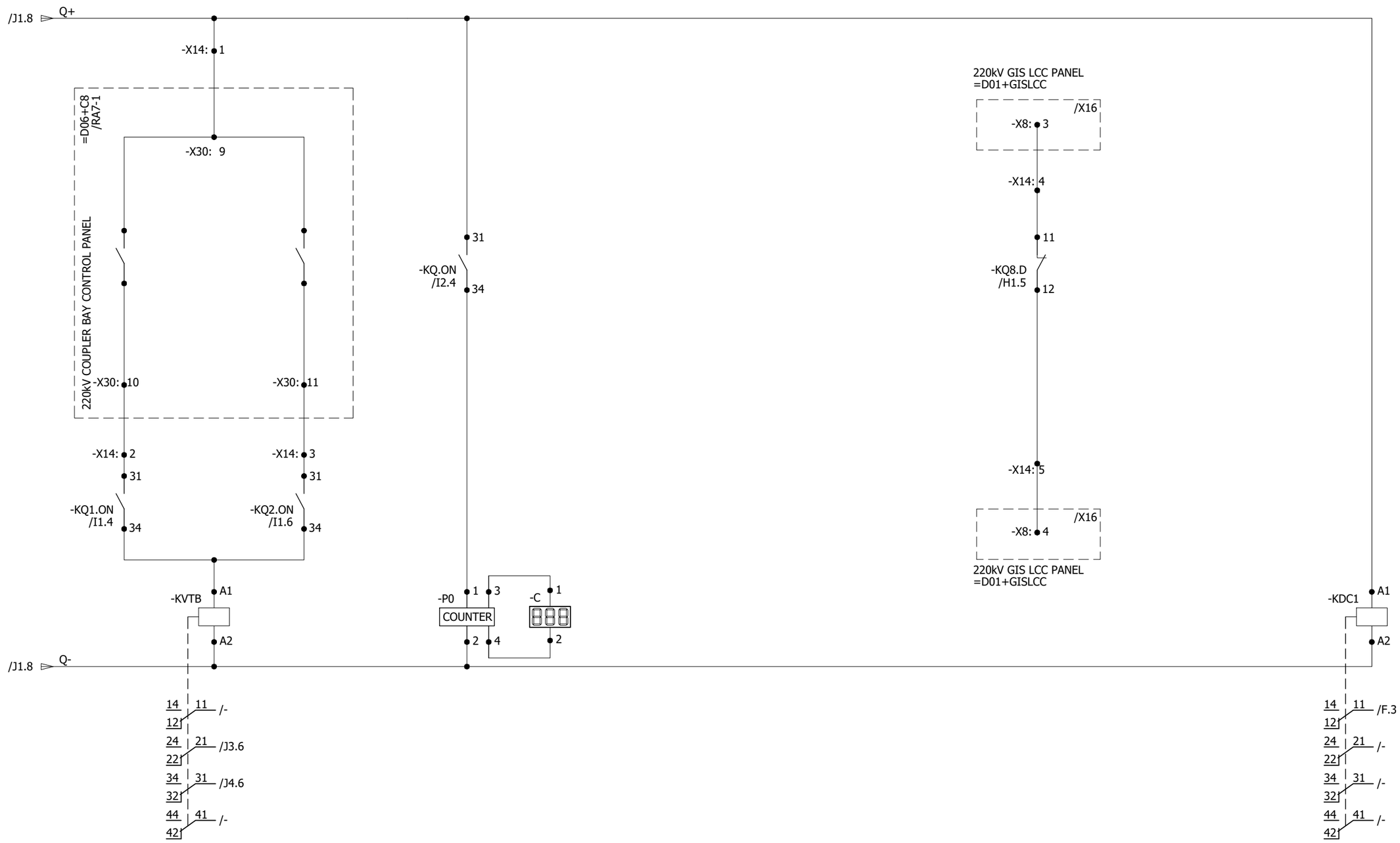
CONTROL CIRCUIT

BUSBAR-1 VT PROTECTION WINDING	BUSBAR-2 VT PROTECTION WINDING	CIRCUIT BREAKER OPERATION COUNTER	INTERLOCK FOR LINE EARTHING SWITCH	DC CIRCUIT Q+/Q- MONITORING
TRIP STATUS	TRIP STATUS	-P0		-KDC1
=D00+C6	=D00+C6			



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) CONTROL CIRCUIT

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

Project no.	Sheet type	Sheet no.
P-60194	MA3	27

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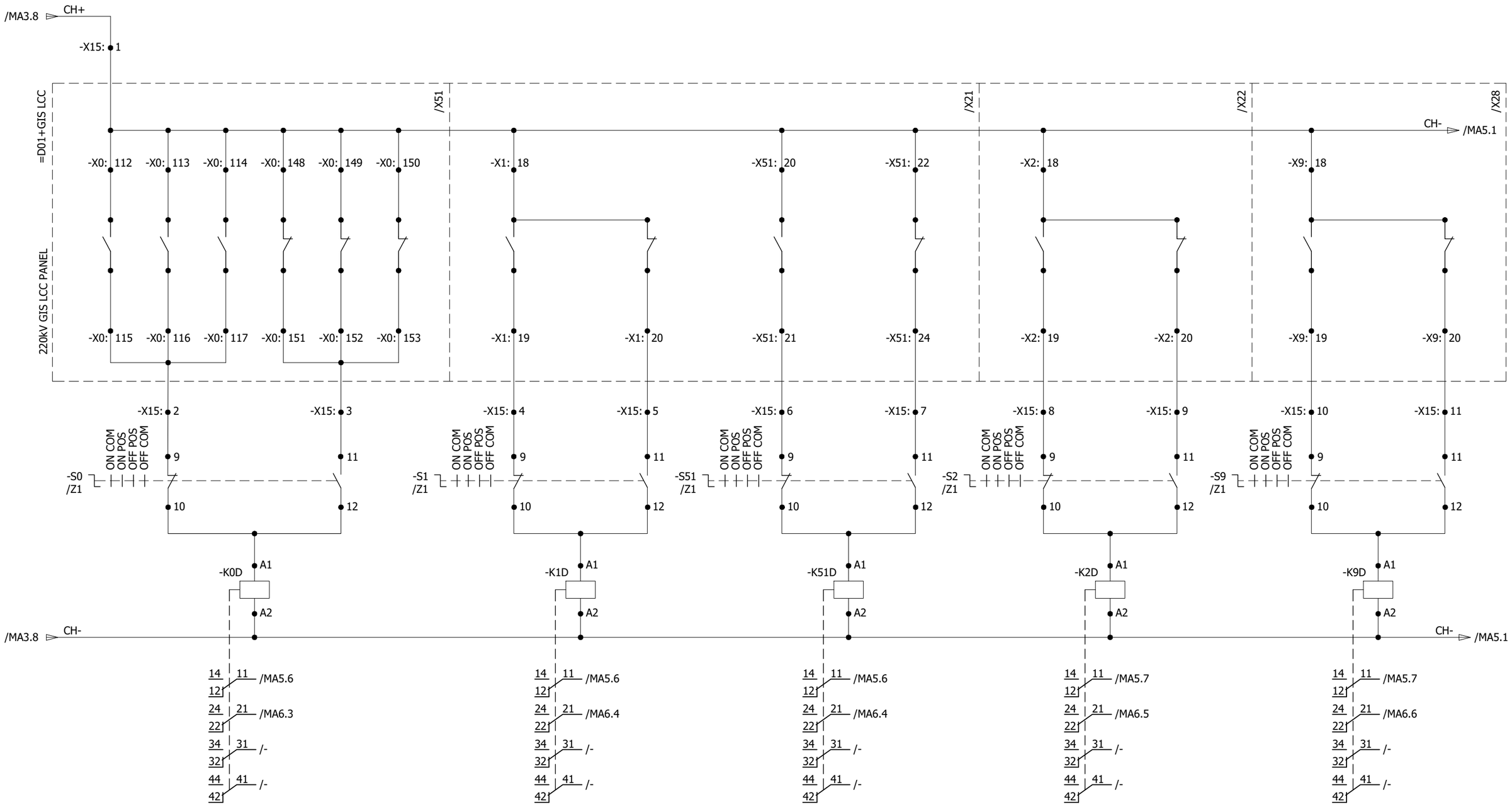
DISCREPANCY CHECK CIRCUIT

CIRCUIT BREAKER	BUS-1 ISOLATOR	BUS SIDE EARTHING SWITCH	BUS-2 ISOLATOR	LINE ISOLATOR
-Q0	-Q1	-Q51	-Q2	-Q9



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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)

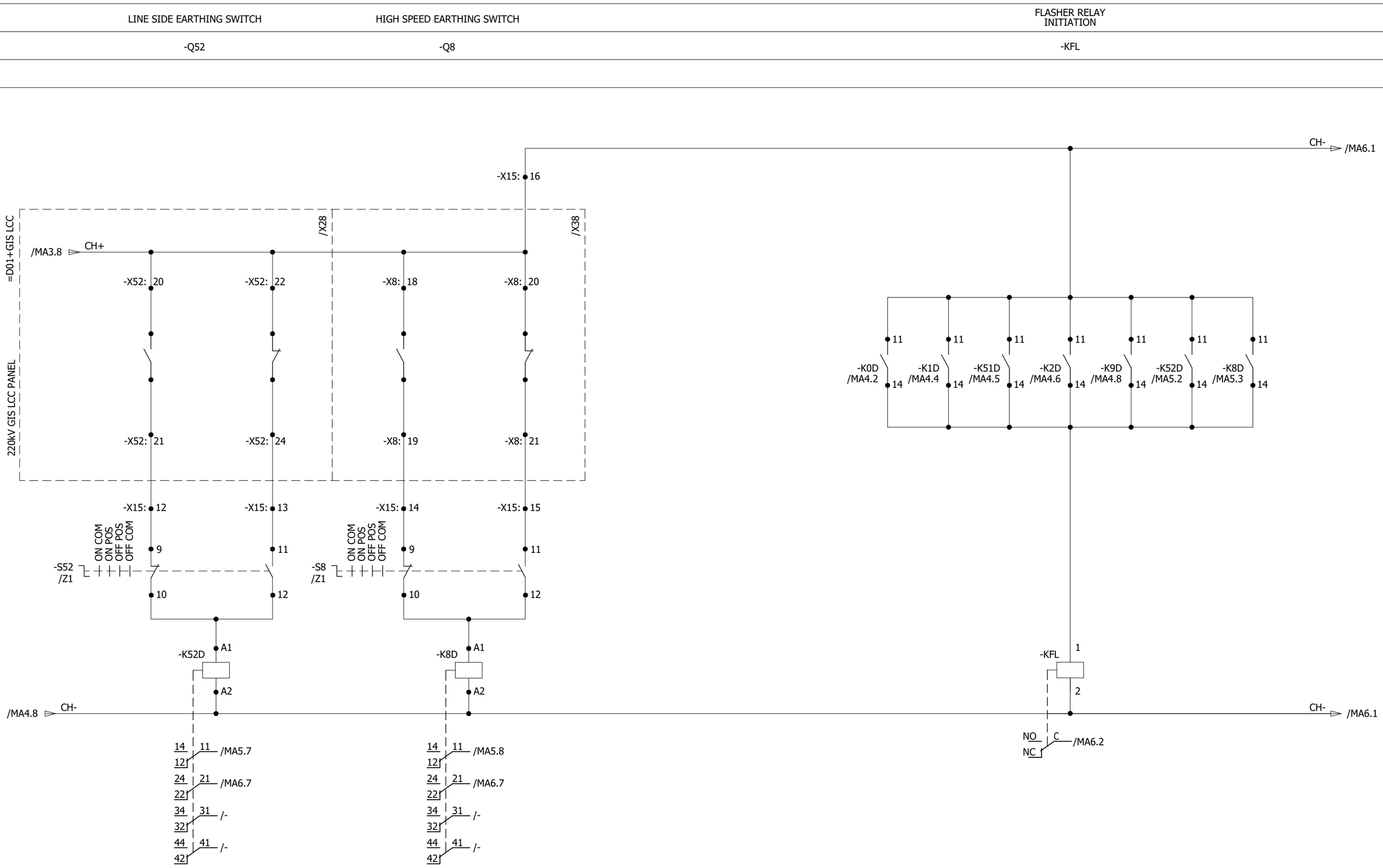
Project: 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE

Title: 220kV LINE CONTROL PANEL (=D05+C4) DISCREPANCY CHECK CIRCUIT

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

Project no.	Sheet type	Sheet no.
P-60194	MA4	28

DISCREPANCY CHECK CIRCUIT



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REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) DISCREPANCY CHECK CIRCUIT

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

Project no.	Sheet type	Sheet no.
P-60194	MA5	29

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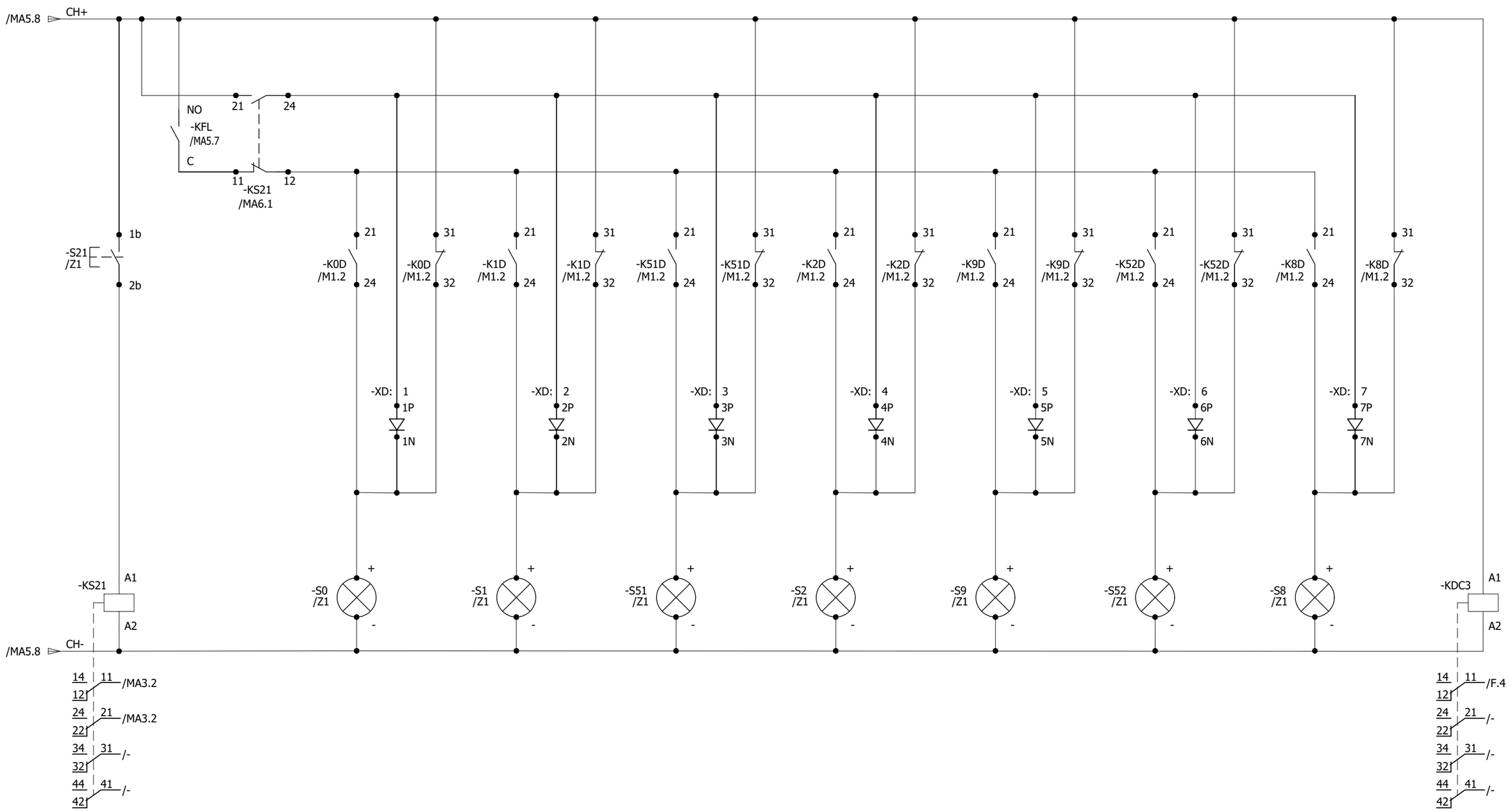
DISCREPANCY CHECK CIRCUIT



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	ASJ
01			

Manufacturer: EPESOL, 21-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 LINE CONTROL PANEL (=D05+C4) DISCREPANCY CHECK CIRCUIT

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

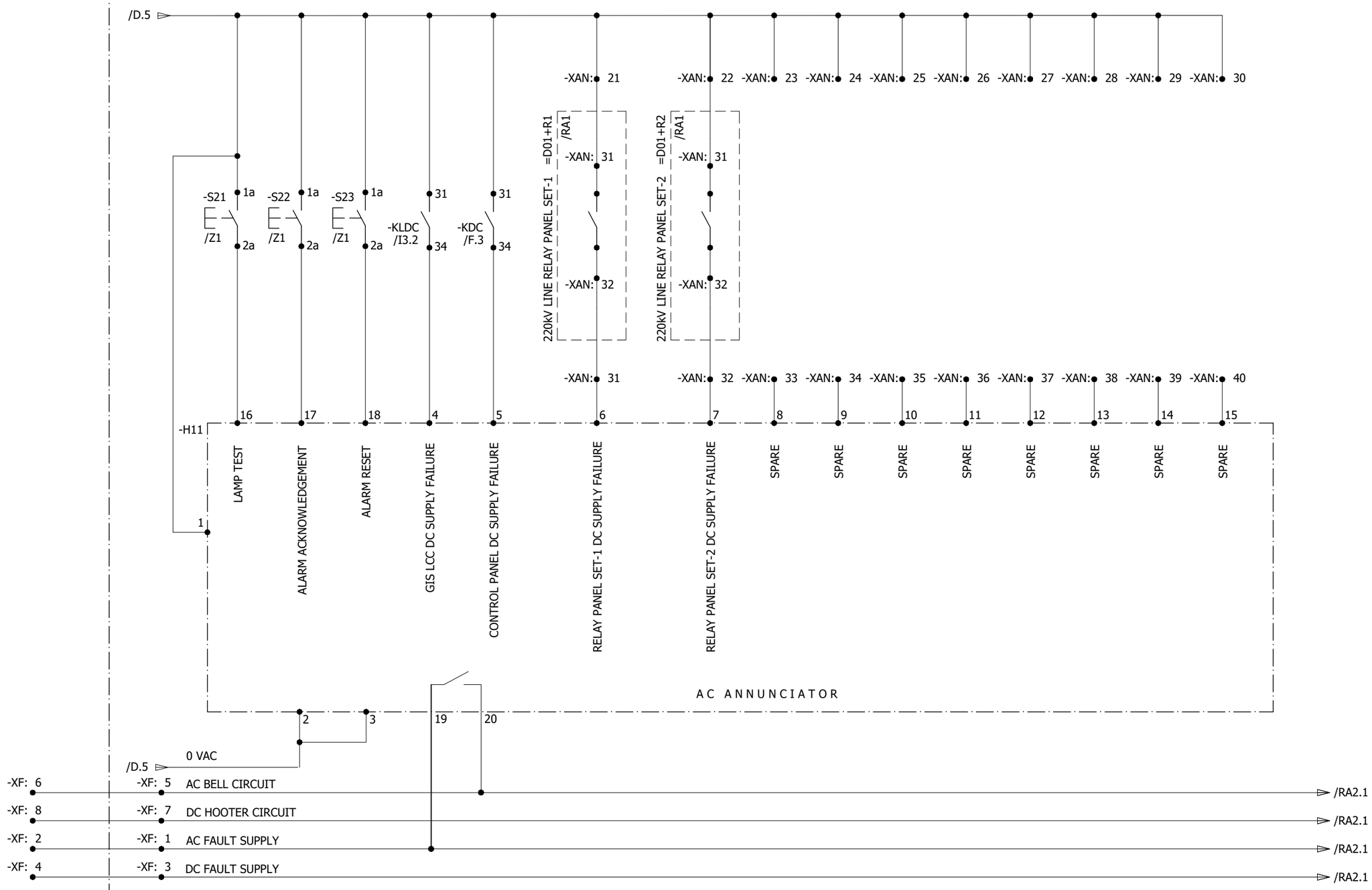
Project no.	Sheet type	Sheet no.
P-60194	MA6	30

ANNUNCIATION CIRCUIT

220kV SYNCH CONTROL PANEL

=D00+C6

/RA3



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REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) AC ANNUNCIATIONS

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

Project no.	Sheet type	Sheet no.
P-60194	RA1	31

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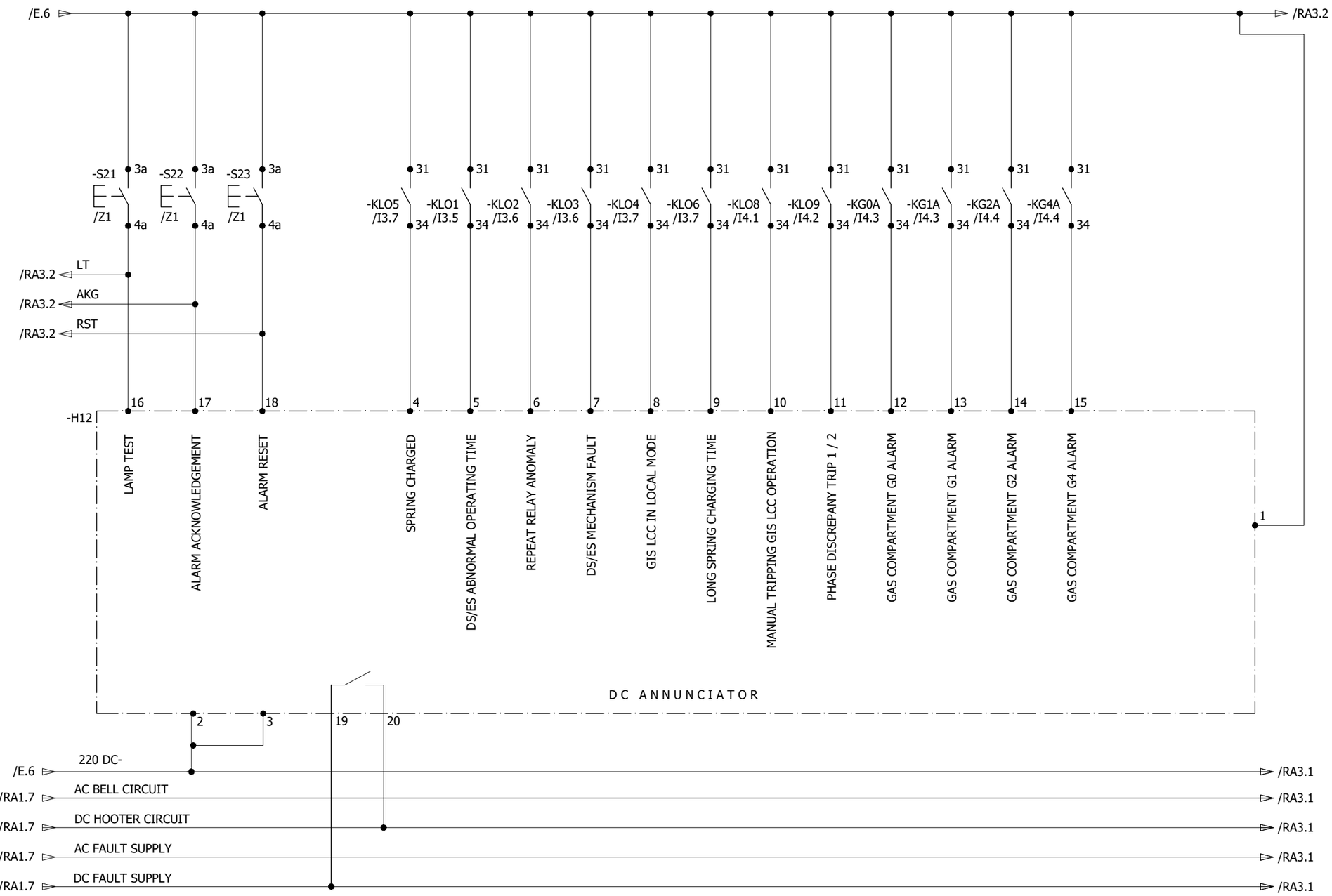
ANNUNCIATION CIRCUIT



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) PROTECTION TRIPS

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

Project no.	Sheet type	Sheet no.
P-60194	RA2	32

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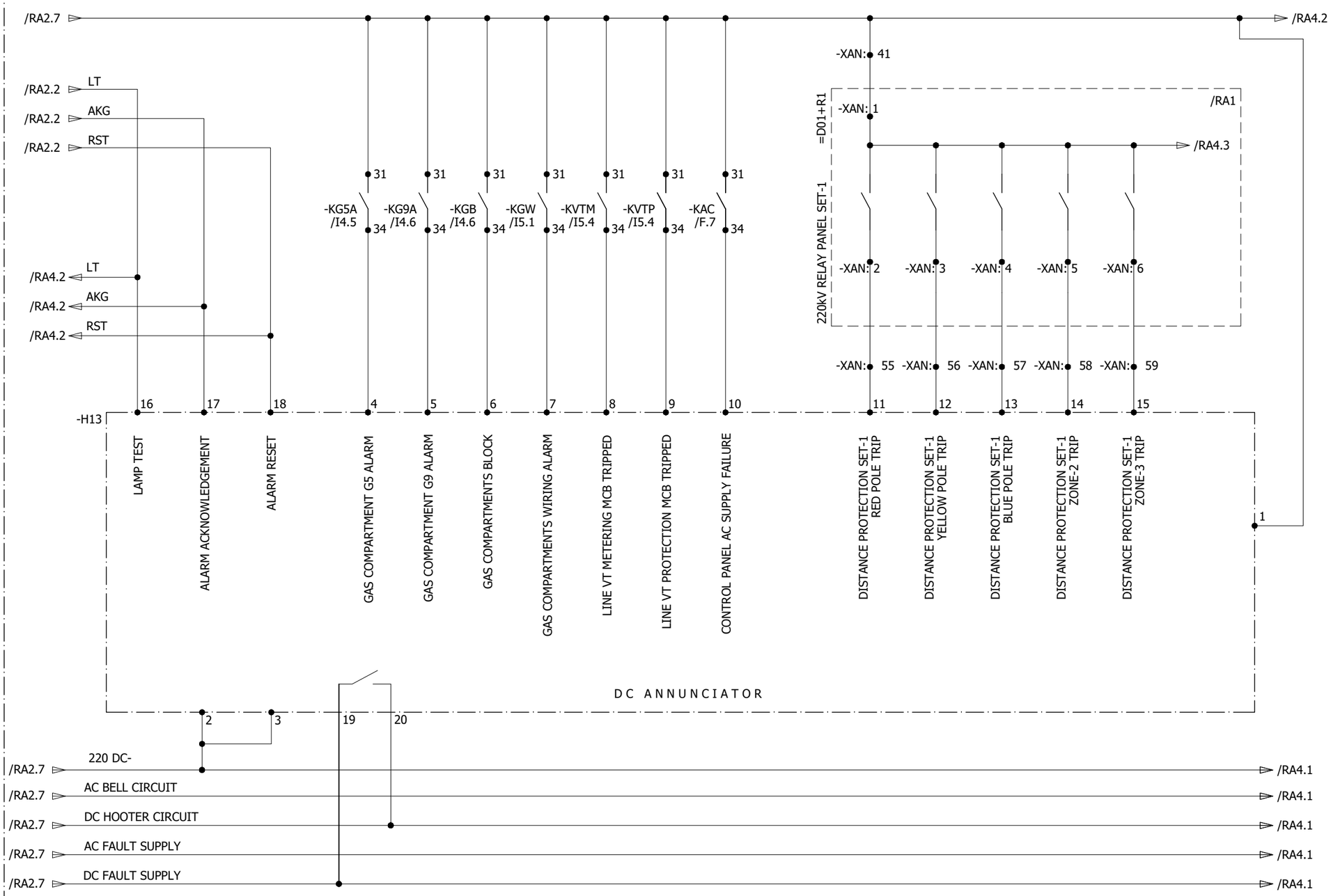
ANNUNCIATION CIRCUIT



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) ANNUNCIATOR ALARMS

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

Project no.	Sheet type	Sheet no.
P-60194	RA3	33

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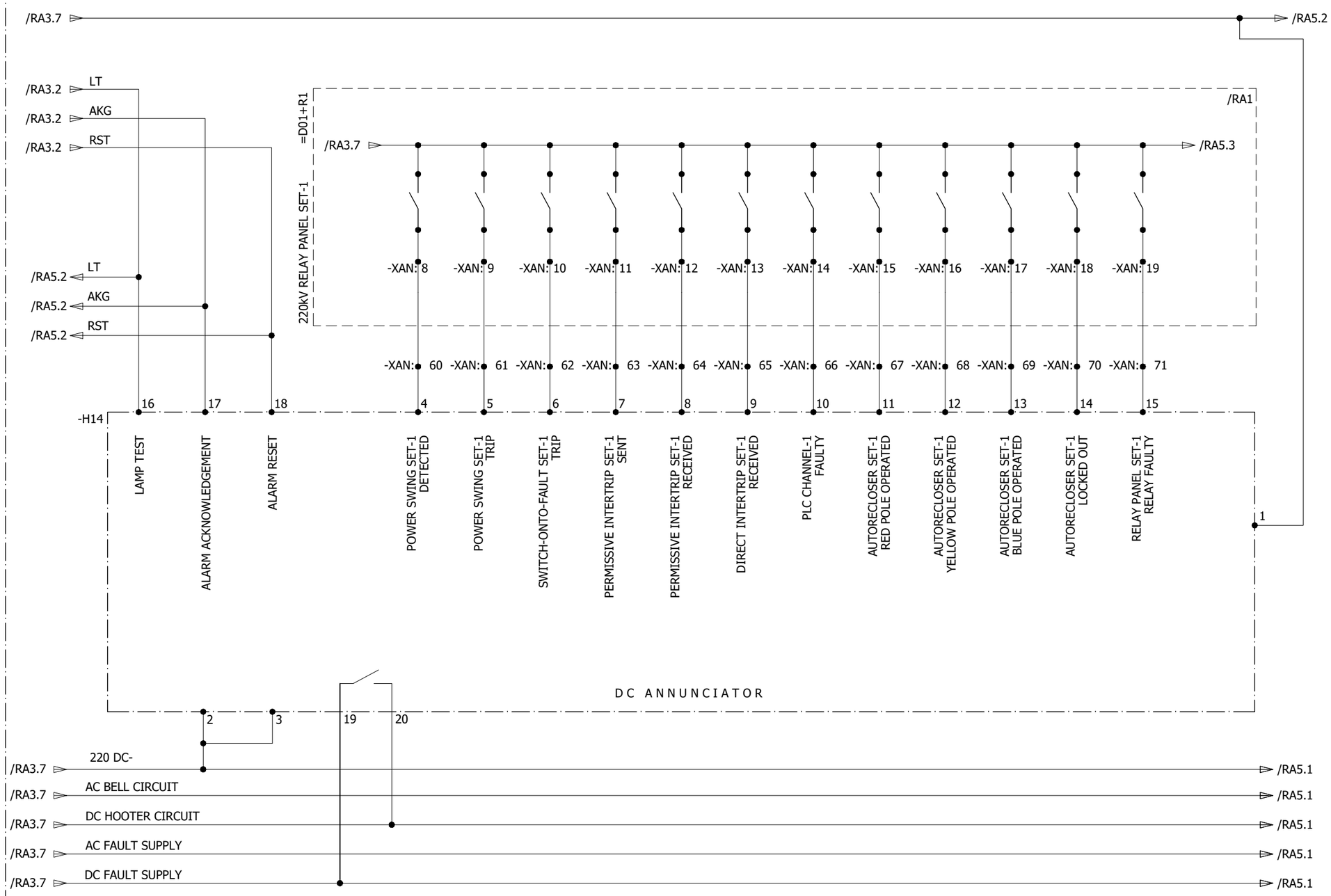
ANNUNCIATION CIRCUIT



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) ANNUNCIATOR ALARMS

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

Project no.	Sheet type	Sheet no.
P-60194	RA4	34

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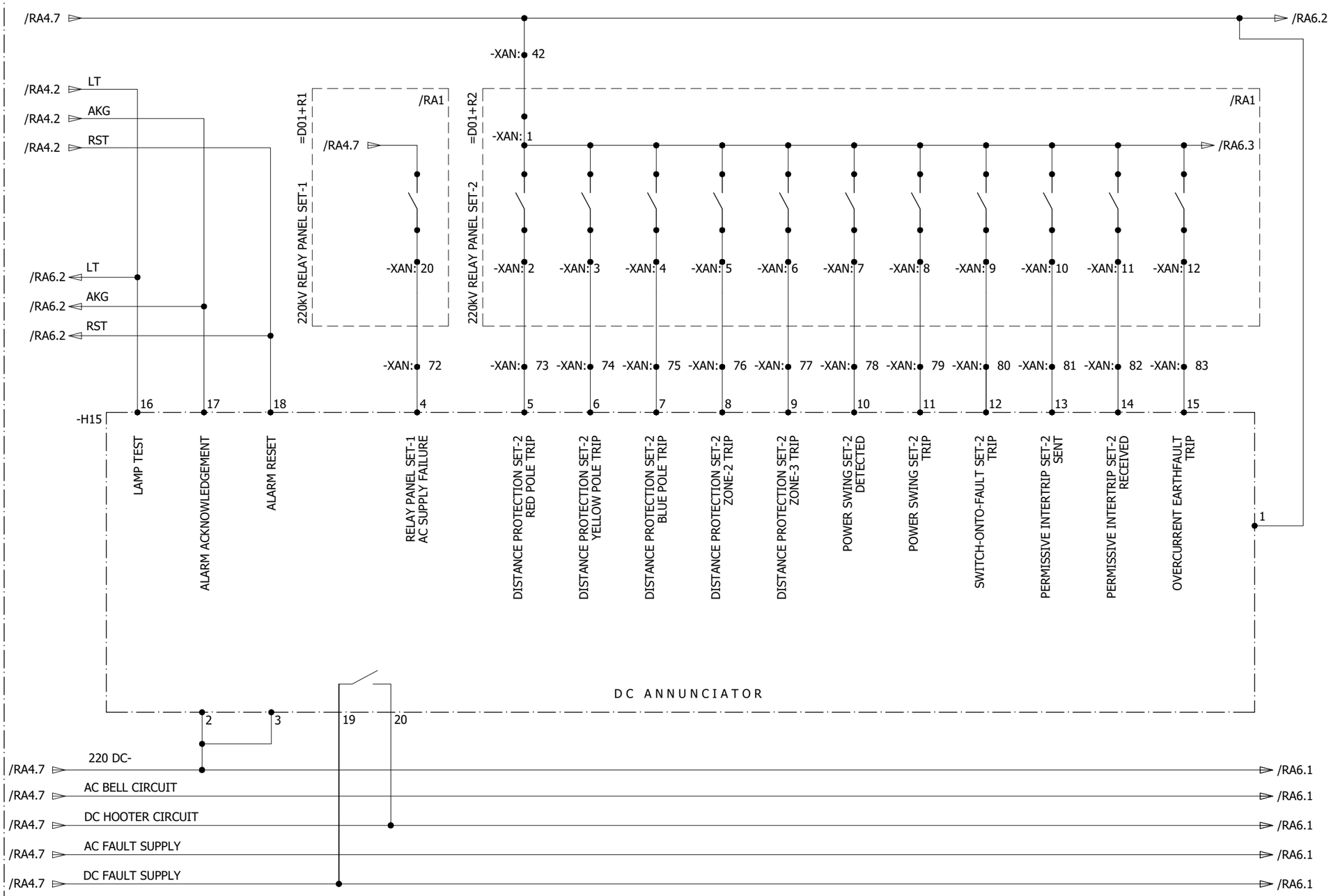
ANNUNCIATION CIRCUIT



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) ANNUNCIATOR ALARMS

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

Project no.	Sheet type	Sheet no.
P-60194	RA5	35

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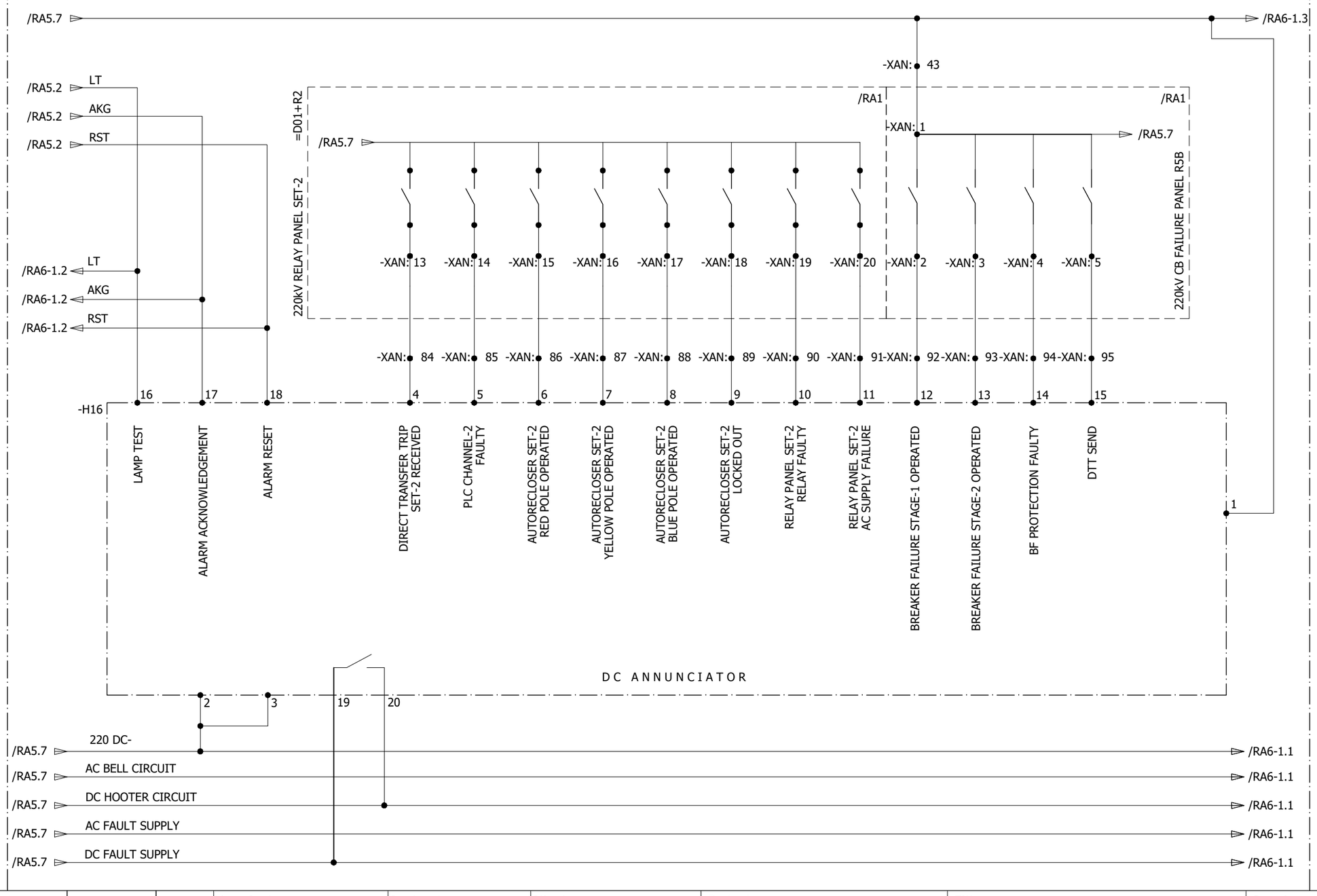
ANNUNCIATION CIRCUIT



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) ANNUNCIATOR ALARMS

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

Project no.	Sheet type	Sheet no.
P-60194	RA6	36

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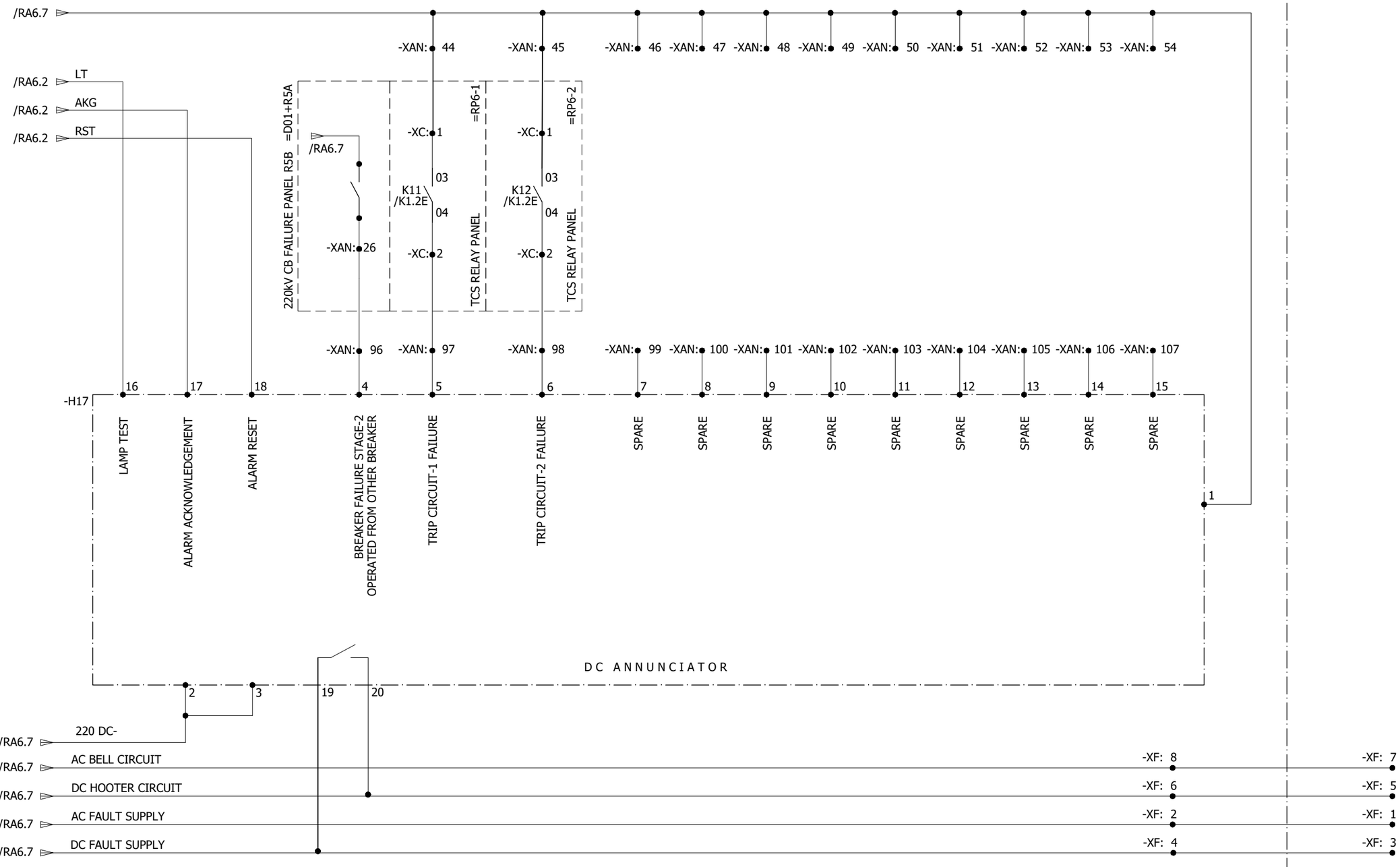
ANNUNCIATION CIRCUIT

220kV LINE CONTROL PANEL

=D02+C4

/RA1



REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTROL PANEL (=D05+C4) ANNUNCIATOR ALARMS

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

Project no.	Sheet type	Sheet no.
P-60194	RA6-1	37

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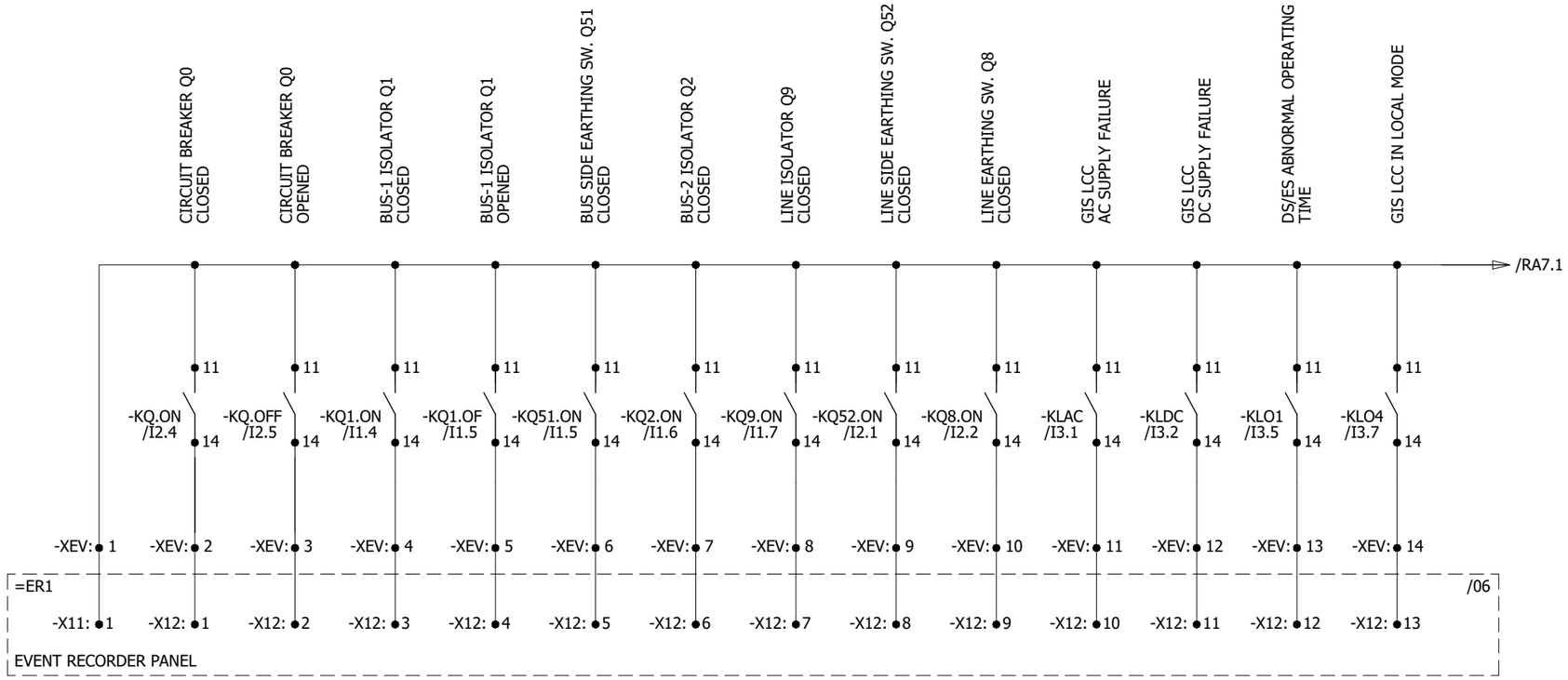

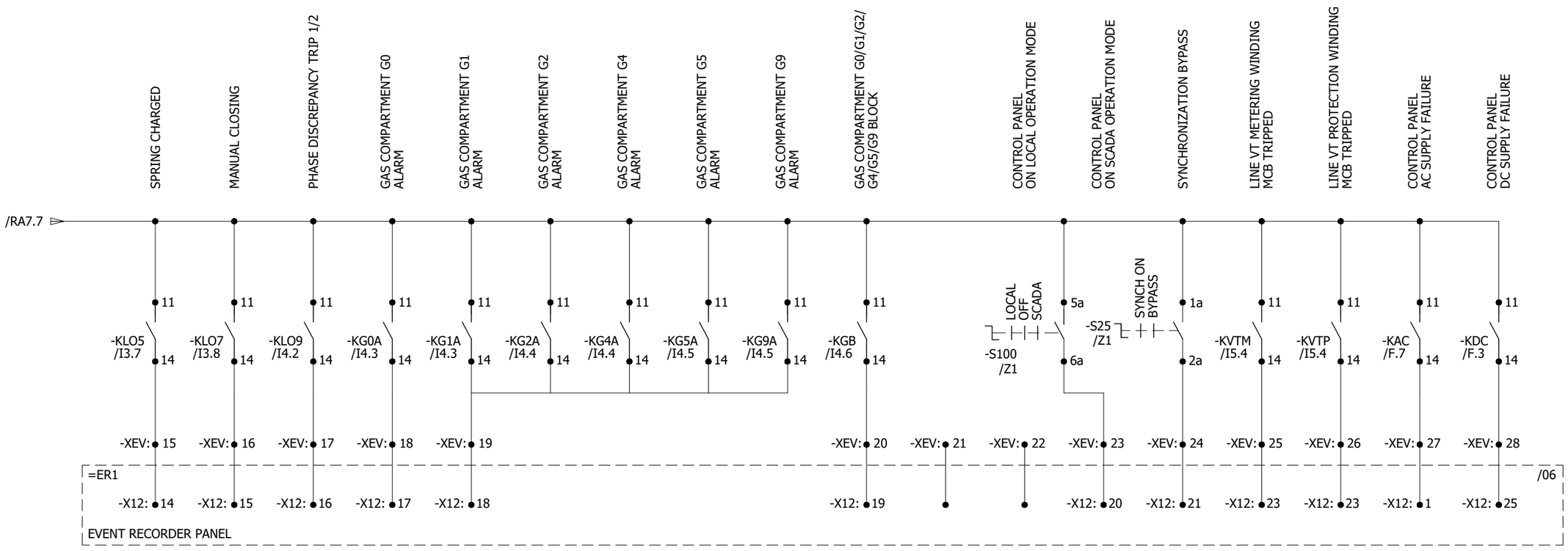

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	ASJ

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: 220kV LINE CONTRPL PANEL (=D05+C4) EVENT & FAULT RECORDER CIRCUITS

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

Project no.	Sheet type	Sheet no.
P-60194	RA7	38

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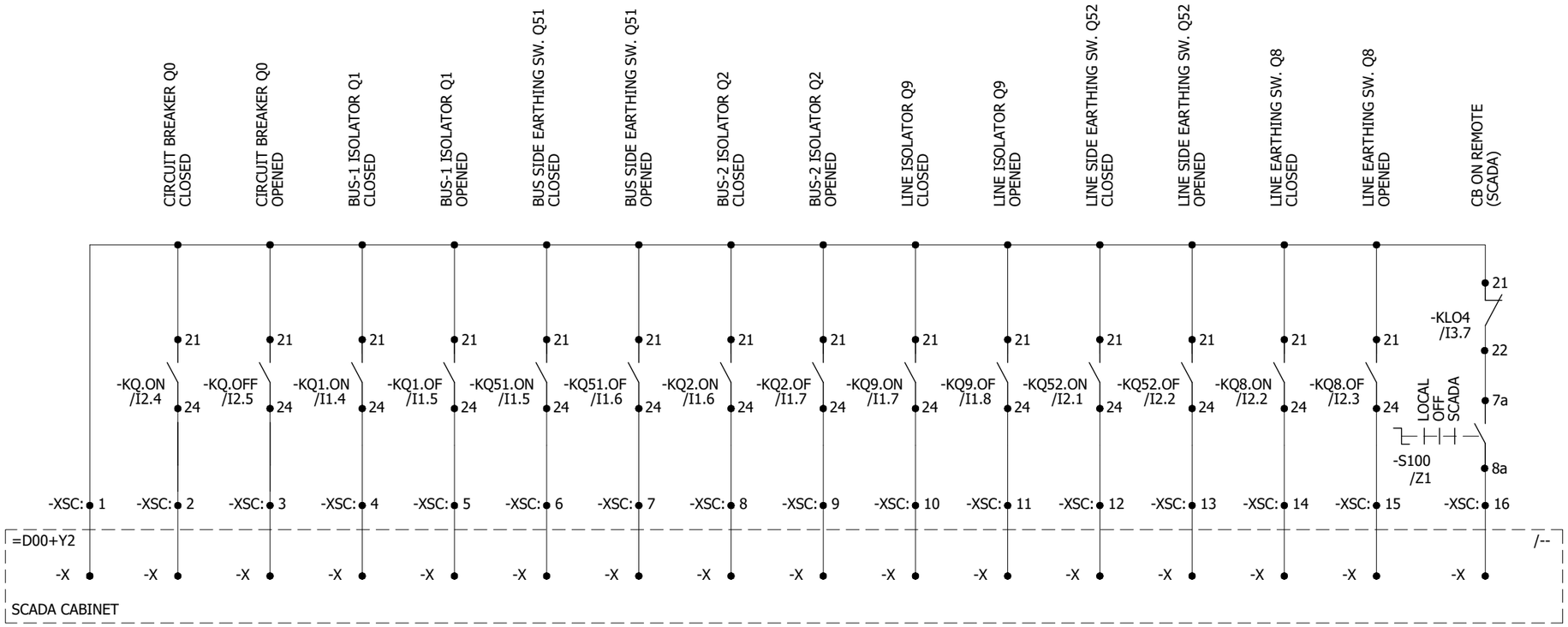

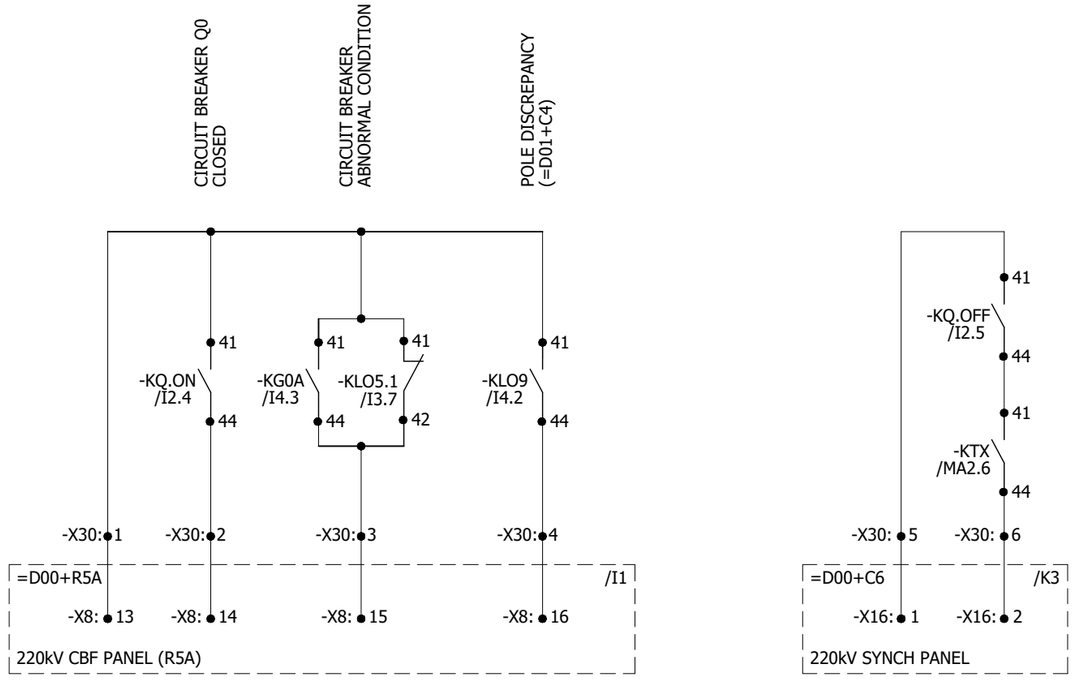

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	ASJ

Manufacturer: EPESOL, 21-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 LINE CONTRPL PANEL (=D05+C4) SCADA CIRCUIT

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

Project no.	Sheet type	Sheet no.
P-60194	RA8	39

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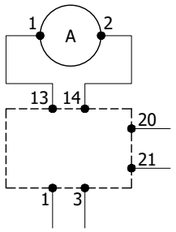
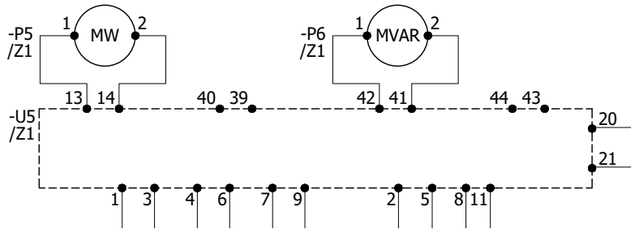
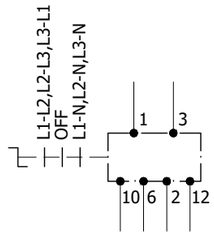


-P1	H1.5
-U1	H1.5
-P3	H1.7
-U3	H1.7



-P5	H2.2	
-P6		H2.3
-U5	H2.2	

-R100	D.4



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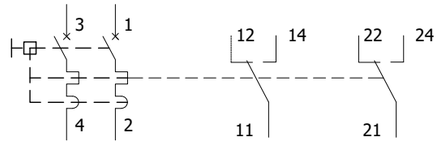
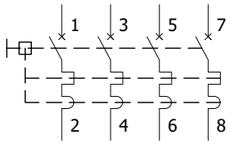


-F101	D.2	F.6	
-F102	D.4	F.6	
-F103	D.6	F.6	
-F201	E.4	F.2	
-F202	E.4	F.2	
-F203	E.5	F.2	
-F204	E.6	F.3	
-F104	D.5	F.6	



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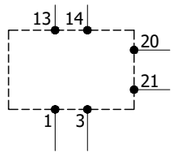
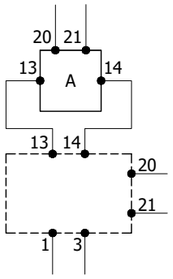


-U2.1	H1.7



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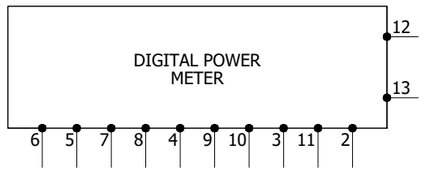
-U2	H1.6



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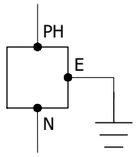

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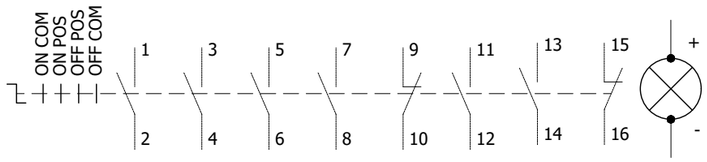
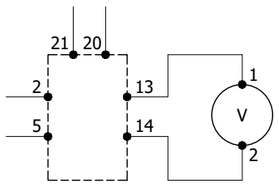


-S0	J1.3	J1.8			MA4.2	MA4.2			MA6.3
-S1	J5.2	J5.3			MA4.3	MA4.4			MA6.3
-S2	J5.6	J5.7			MA4.6	MA4.7			MA6.5
-S8	J6.6	J6.7			MA5.3	MA5.4			MA6.7
-S9	J6.2	J6.3			MA4.7	MA4.8			MA6.6
-S51	J5.4	J5.5			MA4.5	MA4.5			MA6.4
-S52	J6.4	J6.5			MA5.1	MA5.2			MA6.7



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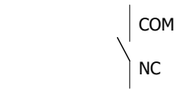
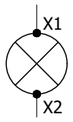
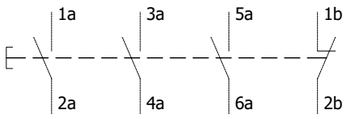
-U4	H1.7



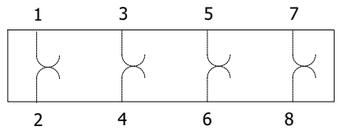
-DS	D.3



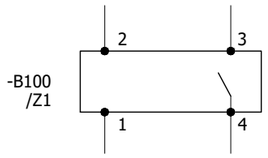
-H100	D.3
-H200	F.4



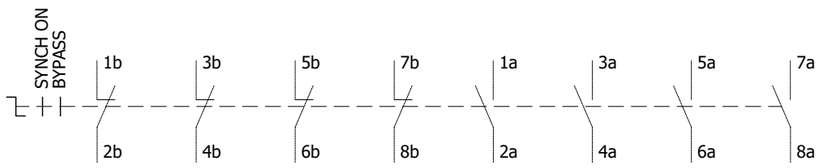
-S21	RA1.2	RA2.2	-	MA6.1
-S22	RA1.2	RA2.2	-	
-S23	RA1.3	RA2.3	-	



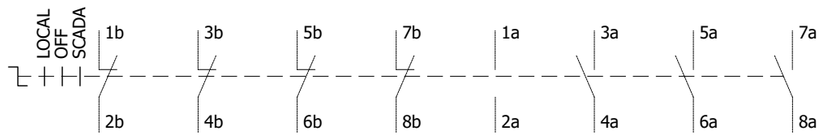
-XT1	H1.4
-XT2	H1.4



-B100	D.4



-S25	J1.4	J2.2	J2.3	-	RA7.6	-	-	-



-S100	J1.2	J5.1	-	-	J1.2	J5.1	RA7.6	RA8.6

REV.	DESCRIPTION	DATE	DRAWER
0	AS BUILT	22.11.2018	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: 220kV LINE CONTRPL PANEL (=D05+C4) COMPONENT DIAGRAM

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

Project no.	Sheet type	Sheet no.
P-60194	Z1	40