



Grid Solutions

A GE and Alstom joint venture

220kV/132kV GIS SUBSTATION GHAZI ROAD , LAHORE

132kV LINE CONTROL PANEL SCHEMATIC DRAWINGS

DOC / DWG REVIEW CODE	
<input type="checkbox"/>	A Approved, Issue IFC.
<input type="checkbox"/>	B Approved with comments as noted, Issue IFC after incorporation of these comments.
<input type="checkbox"/>	C Revise and re-submit for approval.
<input type="checkbox"/>	D Rejected.
Signed	
Date	
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	1	2	3	4	5	6	7	8							
	PAGE NO.	SHEET NAME	SHEET DESCRIPTION			ISSUE / REVISION									
						A	B	C	D	E	F	01	02	03	04
A	01	A	COVER SHEET			X	X	X	X	X	X				
	02	AA	LIST OF CONTENTS			X	X	X	X	X	X				
	03	AB	SYMBOL AND LEGENDS			X	X	X	X	X	X				
	04	AC1	COMPONENT LIST			X	X	X	X	X	X				
	05	AC2	COMPONENT LIST			X	X	X	X	X	X				
	06	AD	PANEL VIEW			X	X	X	X	X	X				
	07	AE	SINGLE LINE DIAGRAM			X	X	X	X	X	X				
	08	D	AC SUPPLY DISTRIBUTION CIRCUIT			X	X	X	X	X	X				
	09	E	DC SUPPLY DISTRIBUTION CIRCUIT			X	X	X	X	X	X				
	10	F	DC SUPPLY FAILURE ALARM CIRCUIT			X	X	X	X	X	X				
	11	G	METERING			X	X	X	X	X	X				
	12	H1	CB CONTROL CIRCUIT			X	X	X	X	X	X				
	13	H2	CB CONTROL CIRCUIT			X	X	X	X	X	X				
	14	I1	DISCONNECTOR & EARTH SWITCH CONTROL			X	X	X	X	X	X				
	15	I2	DISCONNECTOR & EARTH SWITCH CONTROL			X	X	X	X	X	X				
	16	K1	DISCONNECTOR CONTACT MULTIPLICATION			X	X	X	X	X	X				
	17	NA1	ALARM MULTIPLICATION			X	X	X	X	X	X				
	18	NA2	DISCREPANCY INITIATION			X	X	X	X	X	X				
	19	NA3	DISCREPANCY INITIATION			X	X	X	X	X	X				
	20	NA4	DISCREPANCY INITIATION			X	X	X	X	X	X				
	21	NA5	DISCREPANCY INDICATIONS			X	X	X	X	X	X				
	22	RA1	ANNUNCIATOR-1 CIRCUIT			X	X	X	X	X	X				
	23	RA2	ANNUNCIATOR-2 CIRCUIT			X	X	X	X	X	X				
	24	RA3	ANNUNCIATOR-3 CIRCUIT			X	X	X	X	X	X				
	25	RA4	ANNUNCIATOR-4 CIRCUIT			X	X	X	X	X	X				
	26	RA5	SCADA & ER SIGNALS			X	X	X	X	X	X				
	27	Z1	COMPONENT DIAGRAM			X	X	X	X	X	X				
F	0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town,	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) LIST OF CONTANTS	Drawing no. P60194-E-ELC-SC-007					
	REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type AA	Sheet no. 02			

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

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0	AS BUILT	30.10.2018	ASJ	Manufacturer EPESOL 71-B Garden Block, New Garden Town,	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) SYMBOL AND LEGENDS	Drawing no. P60194-E-ELC-SC-007
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AB
									Sheet no. 03

	1	2	3	4	5	6	7	8	
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER		
A	01	MWH+MVARH METER	MODEL: MT860S-A22R36S33-E1-L21-M3K03-Z7 3 PHASE, 4 WIRE PT: 132/ $\sqrt{3}$ /0.10/ $\sqrt{3}$ CT: -1A ACCURACY CLASS: 0.2S			-P11	ISKRAEMCO		
	02	ANALOG AMMETER (TRANSDUCER OPERATED)	DUAL SCALE ,In=0-20mA , Deflection:240 degree, Overload: 1.5In, Class: 1.5, Size: 96X96mm , SUITABLE FOR CT: 1600:800:400/1A. LOOSE SCALE PLATE FOR 800 & 400Amp.			-Q1 , -Q3	FRER		
	01	DIGITAL AMMETER	DIGITAL AMMETER, CLASS 1.5, 0-20mA OPERATED, SIZE: 96X96mm SUITABLE FOR CT: 1600:800:400/1A			-Q2	FRER		
B	02	CURRENT TRANSDUCER	1 Input (1A)/ 1 Output (0-20mA), Scale:0-150% of Rated Current, Frequency: 50Hz, Supply: 110VDC			-U1, -U3	FRER		
	01	CURRENT TRANSDUCER	1 Input (1A)/ 2 Outputs (0-20mA), Scale:0-150% of Rated Current, Frequency: 50Hz, Supply: 110VDC			-U2	FRER		
	01	ANALOG REAL POWER (MW) METER	In: -10,0,10mA DC, Deflection: 240° with Center zero, Size: 96x96 Sq.mm. Application: 3PH+4W Balanced System			-Q5	FRER		
C	01	ANALOG REACTIVE POWER (MVAR) METER	In: -10,0,10mA DC, Deflection: 240° with Center zero, Size: 96x96 Sq.mm. Application: 3PH+4W Balanced System			-Q6	FRER		
	01	PROGRAMMABLE UNIVERSAL TRANSDUCER	3-Phase 4-Wire Balanced Load With 4 Outputs, Input: 110/1.732V, 1A Supply: 110VDC			-U5	FRER		
	01	DIGITAL POWER METER	PM5310, Accuracy Class:0.5, Auxiliary Supply: 110VDC			-Q7	SCHNEIDER ELECTRIC		
D	01	ANNUNCIATOR	12-WINDOWS, 240VAC			-H106	ELABS		
	03	ANNUNCIATOR	12-WINDOWS, 110VDC			-H101,-H102,-H103	ELABS		
	01	PUSH BUTTON - LAMP TEST	5NO			-S21	SCHNEIDER ELECTRIC		
E	01	PUSH BUTTON - ALARM ACKNOWLEDGMENT	5NO			-S22	SCHNEIDER ELECTRIC		
	01	PUSH BUTTON - ALARM RESET	5NO			-S23	SCHNEIDER ELECTRIC		
	01	SELECTOR SWITCH - OPERATION (LOCAL-OFF-SCADA)	2 Position with OFF, 4-Pole, Ratings: 12A, 220VDC, Keylockable on both positions			-S101	SCHNEIDER ELECTRIC		
F	02	AUX. CONTACTOR	5NO, 110VDC			-K1,2	SCHNEIDER ELECTRIC		
	15	AUX. CONTACTOR	3NO+2NC, 110VDC			-K0,-K0E,-KOA,-K9,-K59,-KOD,-K1D, -K2D,-K9D,-K51D,-K53D,-K8D,-KDC,-KDC1,-KDC2	SCHNEIDER ELECTRIC		
	02	AUX. CONTACTOR	3NO+2NC, 240VAC			-KAMC,-K7	SCHNEIDER ELECTRIC		
G	01	AUX. CONTACTOR	3NO+2NC, 240VAC WITH ADDON BLOCK 2NO+2NC			-K8	SCHNEIDER ELECTRIC		
	44	AUX. RELAY	55.14, 4CO (4PDT), 110VDC			-K11-21,24-33,42-50,-K0OFF-ON,-K1OFF-ON,-K2OFF-ON, -K9OFF-ON,-K51OFF-ON,-K53OFF-ON,-K8OFF-ON	FINDER/EQUIVALENT		
	01	CONTROL DISCREPANCY SWITCH - CIRCUIT BREAKER	BHL-3B4-111-110VDC L1-W-Y-B, SQUARE FRONT PLATE			-S0	COMELETIC		
H	06	CONTROL DISCREPANCY SWITCH - ISOLATORS & EARTHING SW.	BHL-3B4-111-110VDC L1-W-Z-B, ROUND FRONT PLATE			-S1-2,-S9,-S51,-S8,-S53	COMELETIC		
	01	FLASHER RELAY	Coil Voltage: 110VDC			-K51	ELABS		
	0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town,	Contractor  GE Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) COMPONENT LIST
REV.		DESCRIPTION	DATE	DRAWER					
1		2	3	4					

	1	2	3	4	5	6	7	8		
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER			
A	01	PUSH BUTTON - ALARM RESET	TYPE: SWITCH(A TYPE:), COLOR : GREEN , SUPPLY : 120VDC, Ord: YS-AP1-2-31-G-D-W			-S23	YONGSUNG			
	01	SELECTOR SWITCH - OPERATION (LOCAL-OFF-SCADA)	3-POSITION (STATION-OFF-SCADA), 110VDC, KEYLOCKABLE TYPE, ORD: YS-AK-2-3-44-D			-S101	YONGSUNG			
B	60	AUXILIARY CONTACTOR	COIL VOLTAGE: 110VDC, 4 C/O CONTACTS, ORD: PRC4M40DCJL			-K0E, -K50, -K0A, -KDC-1, -K1, -K2, -K9, -K0, -K11 TO -K21, -K24 TO -K33, -K42 TO -K46, -K59 -K0OFF, -K0ON, -K0D, -K1OFF, -K1ON, -K1D, -K2OFF, -K2ON, -K2D, -K9OFF, -K9ON, -K9D, -K51OFF, -K51ON, -K51D, -K53OFF, -K53ON, -K53D, -K8OFF, -K8ON, -K8D, -KDC-2, -KS21, -K111, -K222	GE			
	01	AUXILIARY CONTACTOR - SUPPLY CHANGEOVER	COIL VOLTAGE: 110VDC, 3 NO + 3 NC CONTACTS, ORD: MCRC022ATWJ-B+MARN211AT			-KDC	GE			
C	03	AUXILIARY CONTACTOR	COIL VOLTAGE:: 240VAC, 4 C/O CONTACTS, ORD: PRC4M40ANL			-KAMC, -K7, -K8	GE			
	01	CONTROL DISCREPANCY SWITCH - CIRCUIT BREAKER	CONTROL AND DISCREPANCY SWITCH FOR ISOLATOR CONTROL AND INDICATION, SQUARE TYPE FOUR CONTACTS FOR COMMAND AND FOUR CONTACTS FOR INDICATION			-S0	YONGSUNG			
D	06	CONTROL DISCREPANCY SWITCH - ISOLATORS & EARTHING SW.	CONTROL AND DISCREPANCY SWITCH FOR ISOLATOR CONTROL AND INDICATION, ROUND TYPE FOUR CONTACTS FOR COMMAND AND FOUR CONTACTS FOR INDICATION ORD:YS-IC-4456-R4(49)-PM-K-G-D11-G			-S1, -S2, -S9, -S51, -S53, -S8	YONGSUNG			
	01	FLASHER RELAY	FLASHER RELAY, COIL VOLTAGE 110 VDC, ORD: FR-101-110			-K51	ELABS			
E	02	TEST BLOCK	YS-CTT-04-S, YS-PTT-04-S			-XTB1, -XTB2	YONGSUNG			
	02	INDICATION LIGHT - AC AND DC SUPPLY	TYPE: LED , COLOR : RED , SUPPLY : 240VAC ORD: YS-PL-2-AL-22-R-W			-H7, -H8	YONGSUNG			
F	01	OPERATION COUNTER	OPERATION COUNTER FOR CIRCUIT BREAKER, RATED VOLTAGE 110VDC			-Q10	ELABS			
	02	CONTROL MCB - PANEL LIGHT & HEATER	2-Pole, Ratings: 2A, 240VAC, 6kA @ 240VAC, 2 C/O Contacts, Ord: G62C02+CAH(2)			-F101, -F102	GE			
G	01	CONTROL ELCB - PANEL SOCKET	2-Pole, Ratings: 16A, 30mA, 240VAC, 1P+N, 2 C/O Contacts, Ord: DM100C16/030+CAH(2)			-F103	GE			
	02	CONTROL MCB - DC DISTRIBUTION	2-Pole, Ratings: 4A, 250VDC, 10kA @ 250VDC, 2 C/O Contacts, Ord: EP102UCC04+CAH(2)			-F201,-F202	GE			
H	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			-S100	YONGSUNG			
I	01	THREE PIN SOCKET	1N+PE, 16A, 230VAC @ 50Hz			-X100	LOCAL			
	REV.	DESCRIPTION	DATE	DRAWER	Manufacturer  EPESOL 71-B Garden Block, New Garden Town,	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) COMPONENT LIST	Drawing no. P60194-E-ELC-SC-007
								Project no. P-60194	Sheet type AC2	Sheet no. 05

	1	2	3	4	5	6	7	8		
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER			
A	01	PANEL HEATER	240VAC @ 50Hz, 50W			-R100	E-LABS			
	01	HUMIDITY & TEMPERATURE CONTROLLER	40-90%RH, 25-50 deg.C, 240VAC @ 50Hz			-B100	E-LABS			
	04	TERMINAL BLOCKS FOR AC SUPPLY	TYPE: CBD-4			-XAC	CABUR			
	02	TERMINAL BLOCKS FOR DC SUPPLY1	TYPE: CBD-4			-XDC-1	CABUR			
	02	TERMINAL BLOCKS FOR DC SUPPLY2	TYPE: CBD-4			-XDC-2	CABUR			
	16	TERMINAL BLOCKS FOR METERING	TYPE: CBD-4			-X3	CABUR			
B	08	TERMINAL BLOCKS FOR CB CONTROL CIRCUIT	TYPE: CBD-4			-X4	CABUR			
	12	TERMINAL BLOCKS FOR CB CONTROL CIRCUIT	TYPE: CBD-4			-X5	CABUR			
	35	TERMINAL BLOCKS FOR DS+ES CONTACTOR MULTIPLICATION	TYPE: CBD-4			-X6	CABUR			
	08	TERMINAL BLOCKS FOR CB/DS CONTACTOR MULTIPLICATION	TYPE: CBD-4			-X7	CABUR			
	40	TERMINAL BLOCKS FOR AUXIALARY MULTIPLICATION	TYPE: CBD-4			-X8	CABUR			
	15	TERMINAL BLOCKS FOR DISCRIPANCY INITIATION	TYPE: CBD-4			-X9	CABUR			
C	13	TERMINAL BLOCKS FOR ANNUNCIATOR-1	TYPE: CBD-4			-X11	CABUR			
	16	TERMINAL BLOCKS FOR ANNUNCIATOR-2	TYPE: CBD-4			-X12	CABUR			
	18	TERMINAL BLOCKS FOR ANNUNCIATOR-3	TYPE: CBD-4			-X13	CABUR			
	24	TERMINAL BLOCKS FOR ANNUNCIATOR-4	TYPE: CBD-4			-X14	CABUR			
	45	TERMINAL BLOCKS FOR EVENT RECORDER	TYPE: CBD-4			-XEV	CABUR			
	45	TERMINAL BLOCKS FOR SCADA	TYPE: CBD-4			-XSC	CABUR			
D	30	TERMINAL BLOCKS FOR TRANSDUCER TO SCADA	TYPE: CBD-4			-XSA	CABUR			
	30	TERMINAL BLOCKS FOR SCADA	TYPE: CBD-4			-XSP	CABUR			
	08	TERMINAL BLOCKS FOR BELL AND HOOTER	TYPE: CBD-4			-XF	CABUR			
	0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town,	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) COMPONENT LIST	Drawing no. P60194-E-ELC-SC-007
	REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AC2

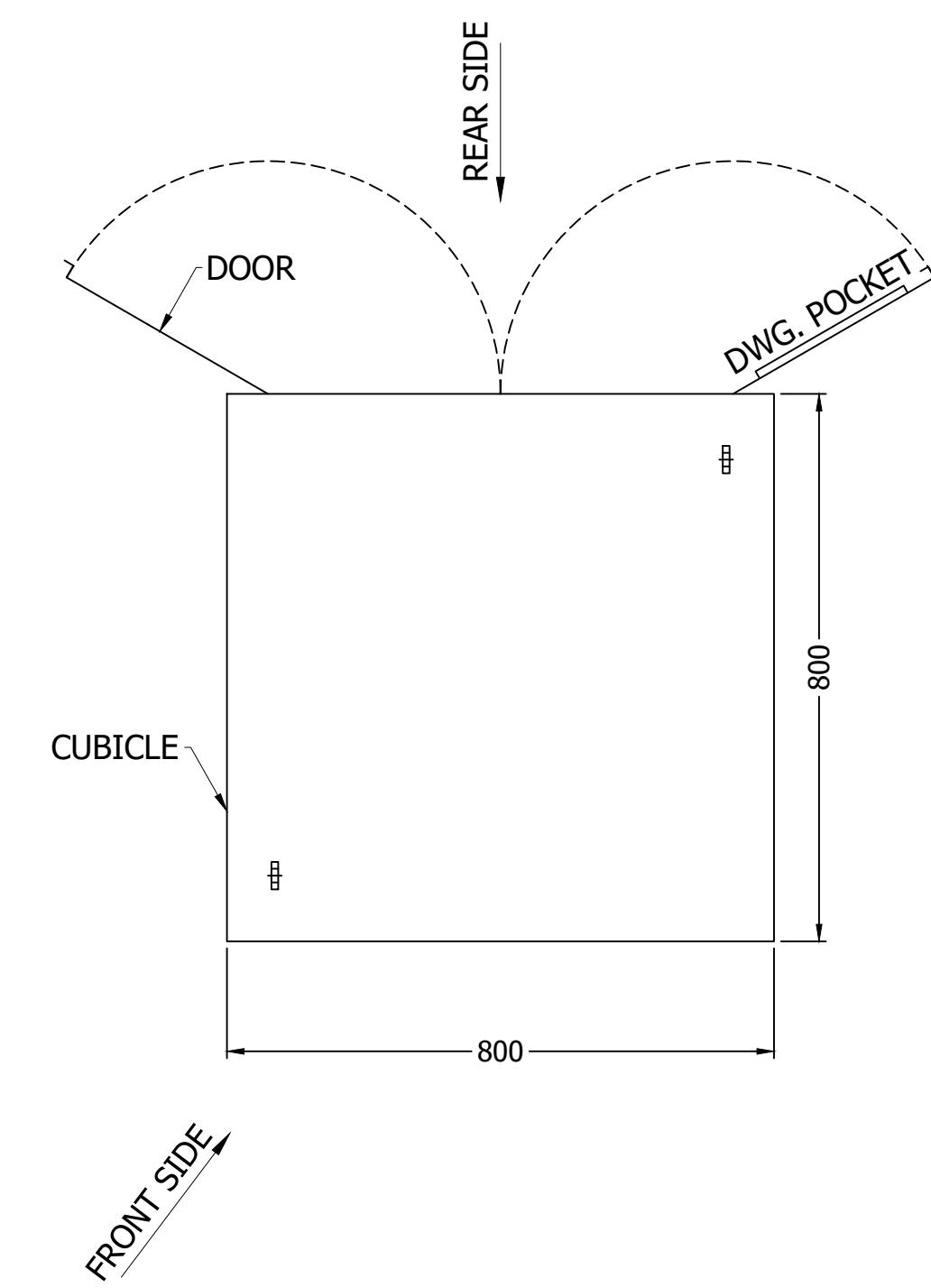
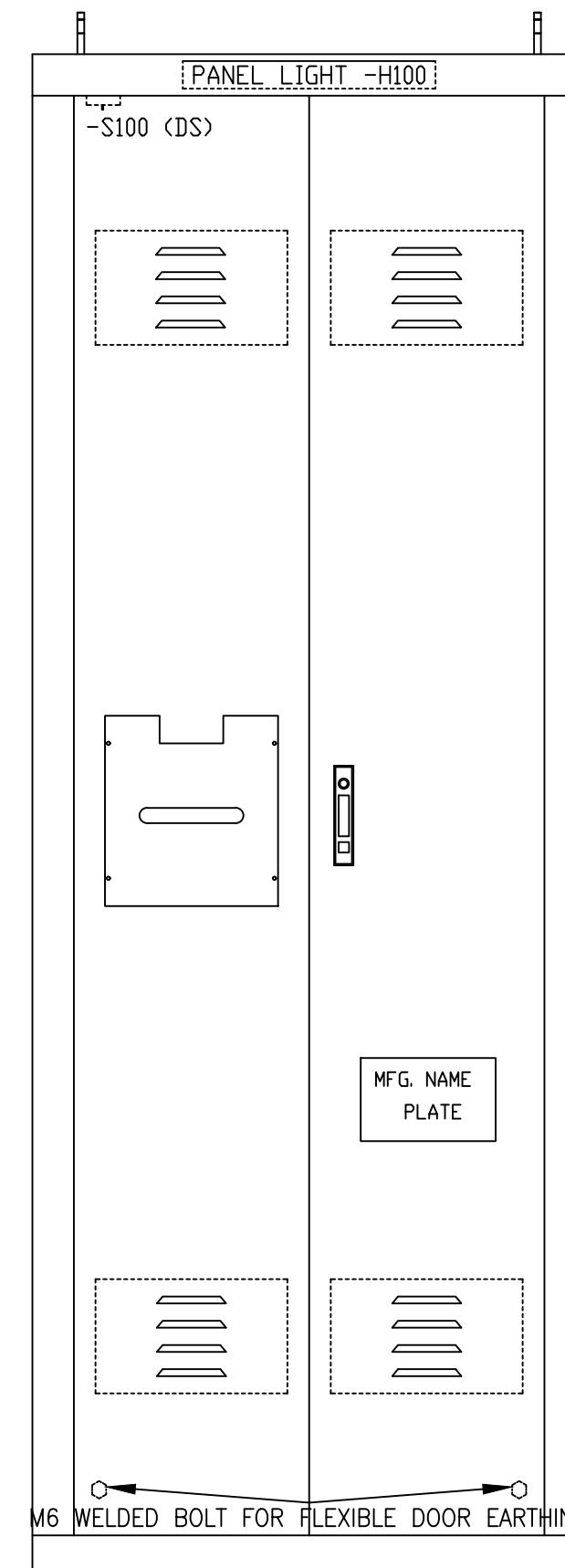
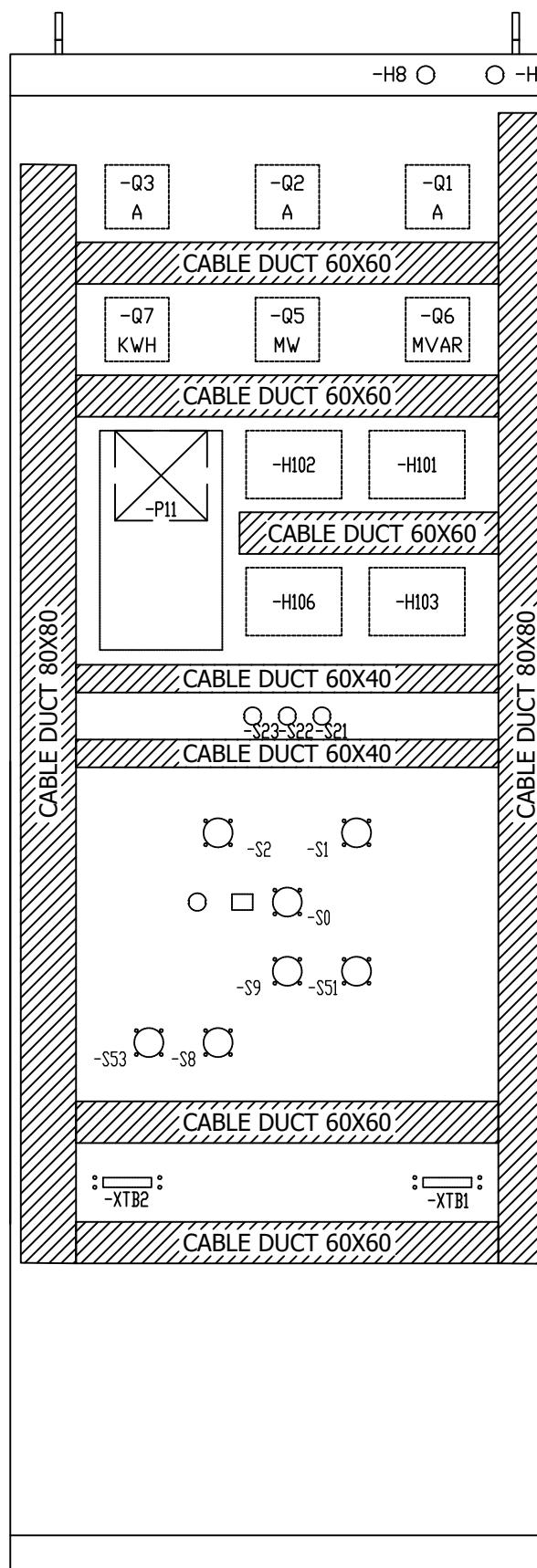
	1	2	3	4	5	6	7	8	
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER		
A	08	TERMINAL BLOCKS FOR METERING CT	TYPE: SCB-6			-X2	CABUR	A	
B	07	TERMINAL BLOCKS WITH DIODE TYPE IN-D4007, RATED MAXIMUM VOLTAGE 350VDC, RATED BREAK DOWN VOLTAGE 430VDC	TYPE: DAS.4/6			-XD	CABUR	B	
C								C	
D								D	
E								E	
F								F	
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REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194 Sheet type AC2 Sheet no. 05	

BACK VIEW WITHOUT DOOR

BACK VIEW WITH DOOR

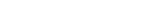
TOP VIEW

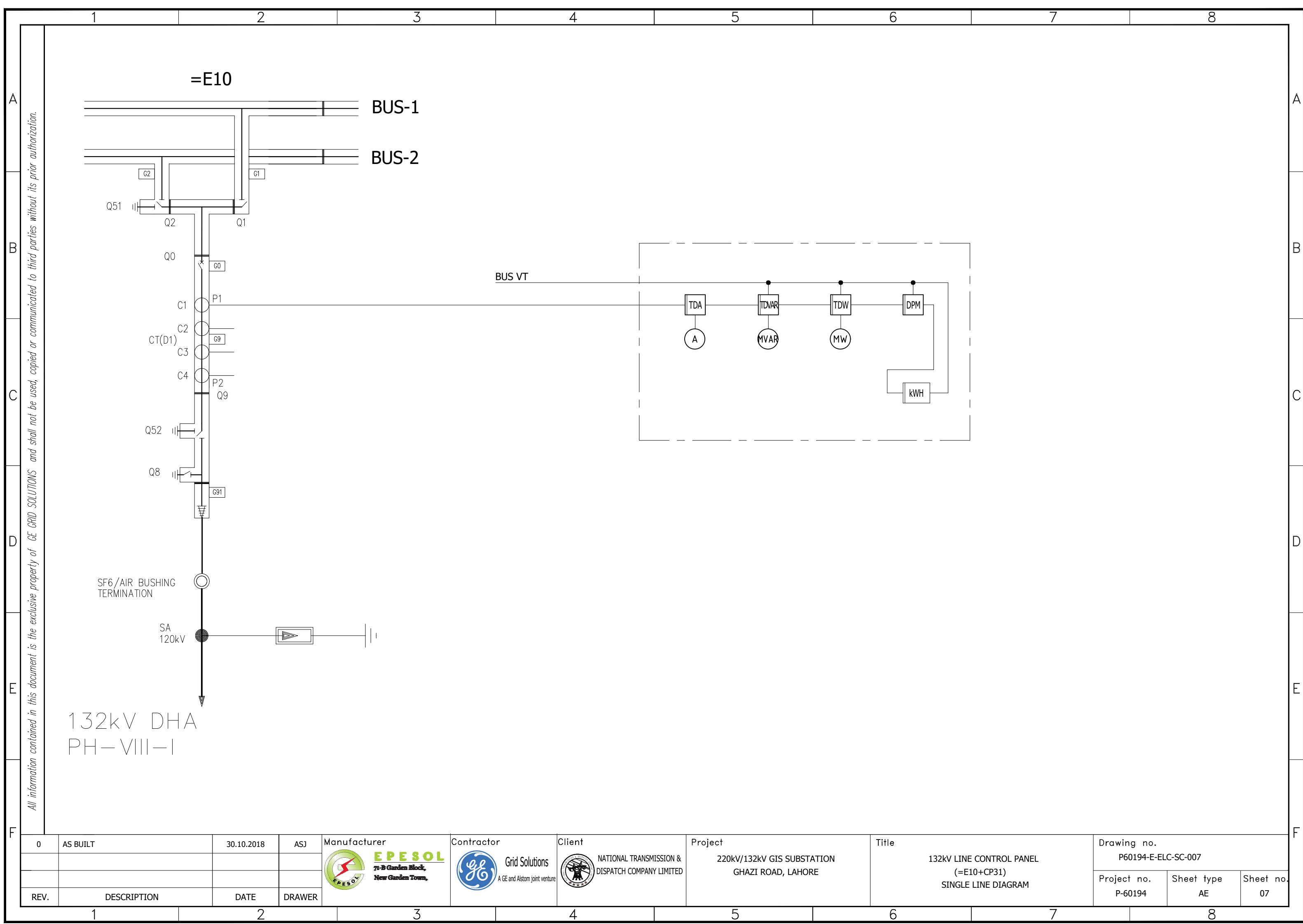
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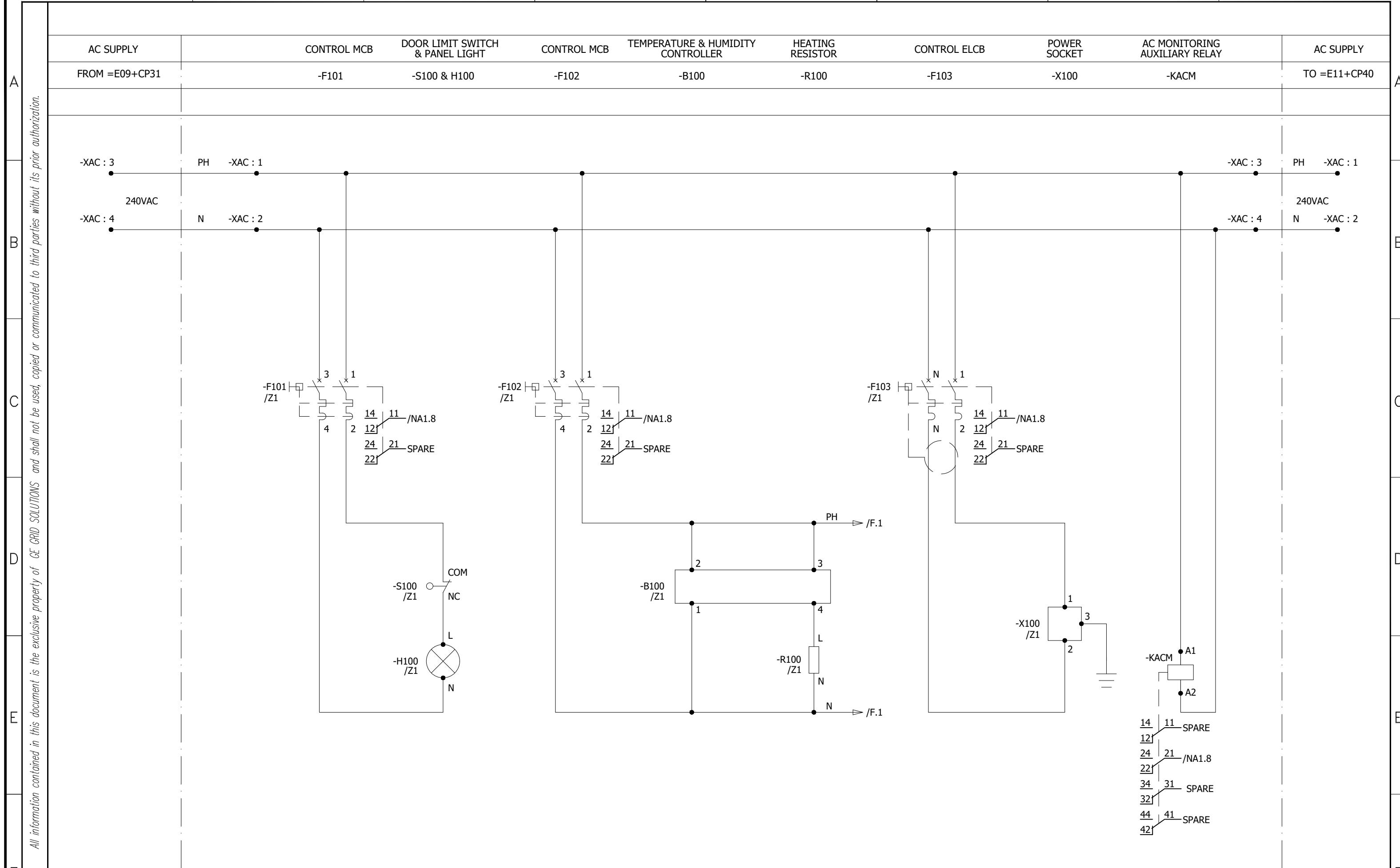


NOTE:-

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

0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL <i>7-B Garden Block, New Garden Town, Lahore, Pakistan</i>	Contractor  Grid Solutions <small>A GE and Alstom joint venture</small>	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED <small>(NTDC-WAPDA)</small>	Project 220kV/132kV GIS SUBSTATION GAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL <small>(=E10+CP31)</small> PANEL VIEWS	Drawing no.		
									P60194-E-ELC-SC-007		
									Project no.		
									P-60194	Sheet type	Sheet no.
REV.	DESCRIPTION	DATE	DRAWER						AD	06	





0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 71-B Garden Block, New Garden Town,	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) AC SUPPLY DISTRIBUTION CIRCUIT	Drawing no. P60194-E-ELC-SC-007
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type D
									Sheet no. 08

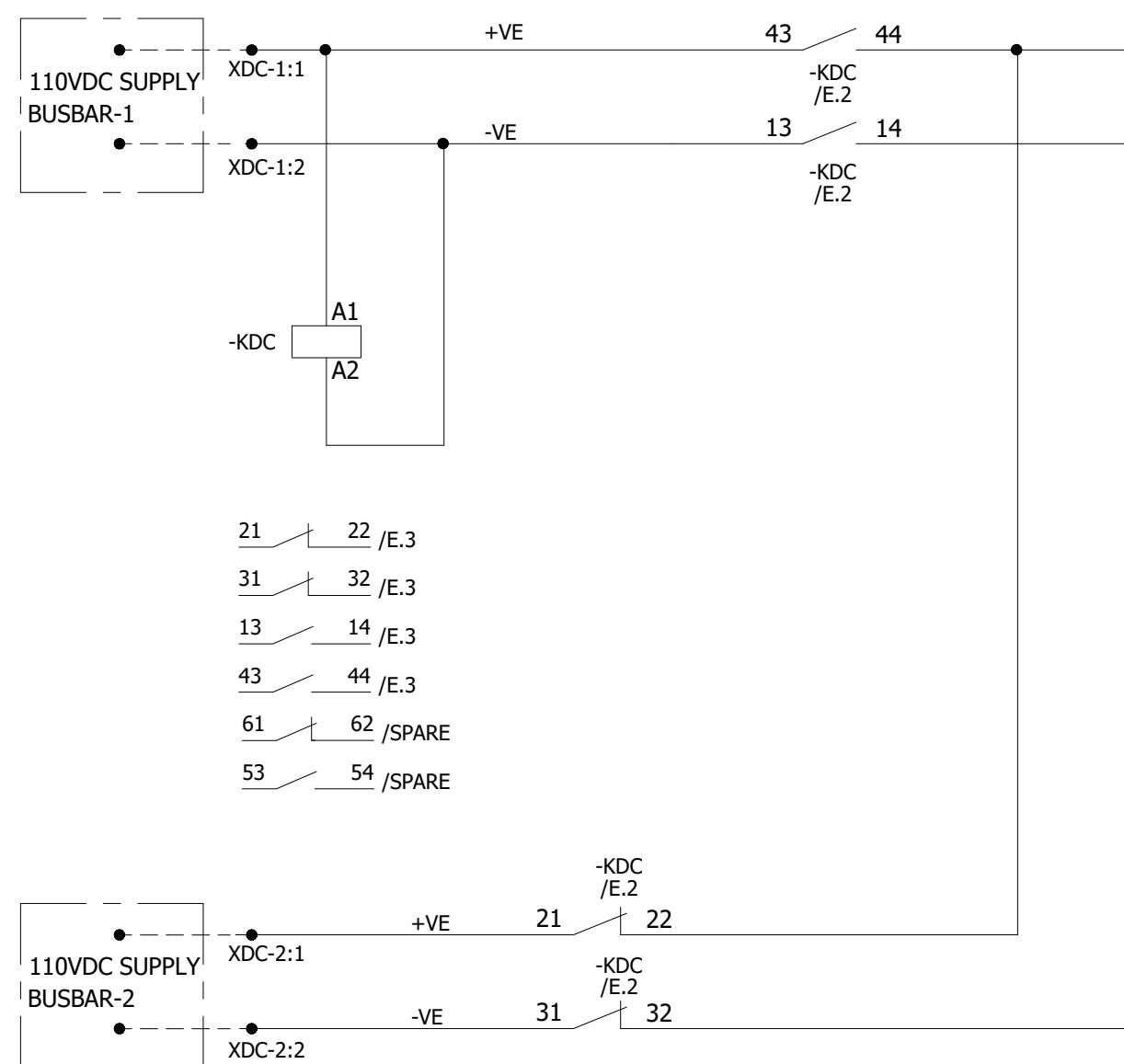
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DC MCB FOR 132kV CB
CONTROL

DC MCB FOR
INDICATION

-F201

-F202



-F201

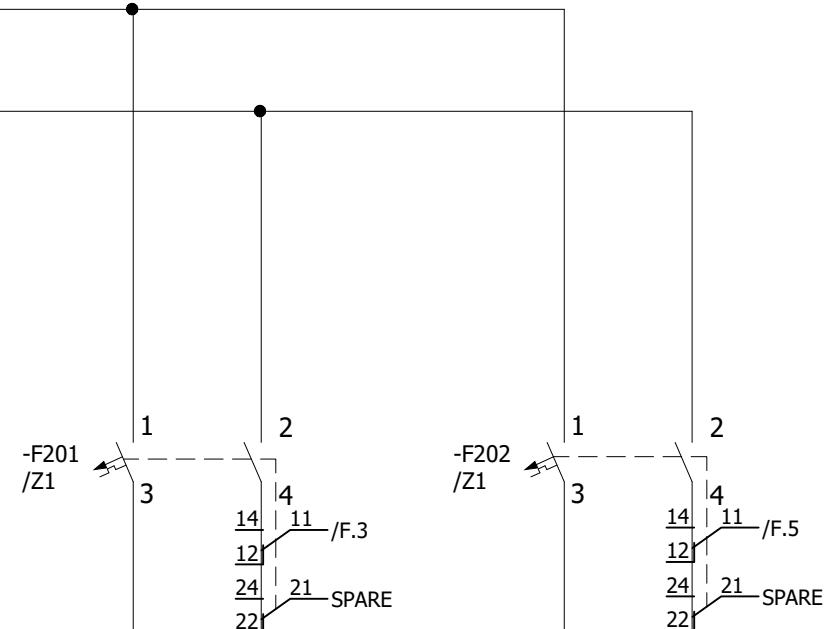
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DC SUPPLY FOR
=E10+Q0/H1.1

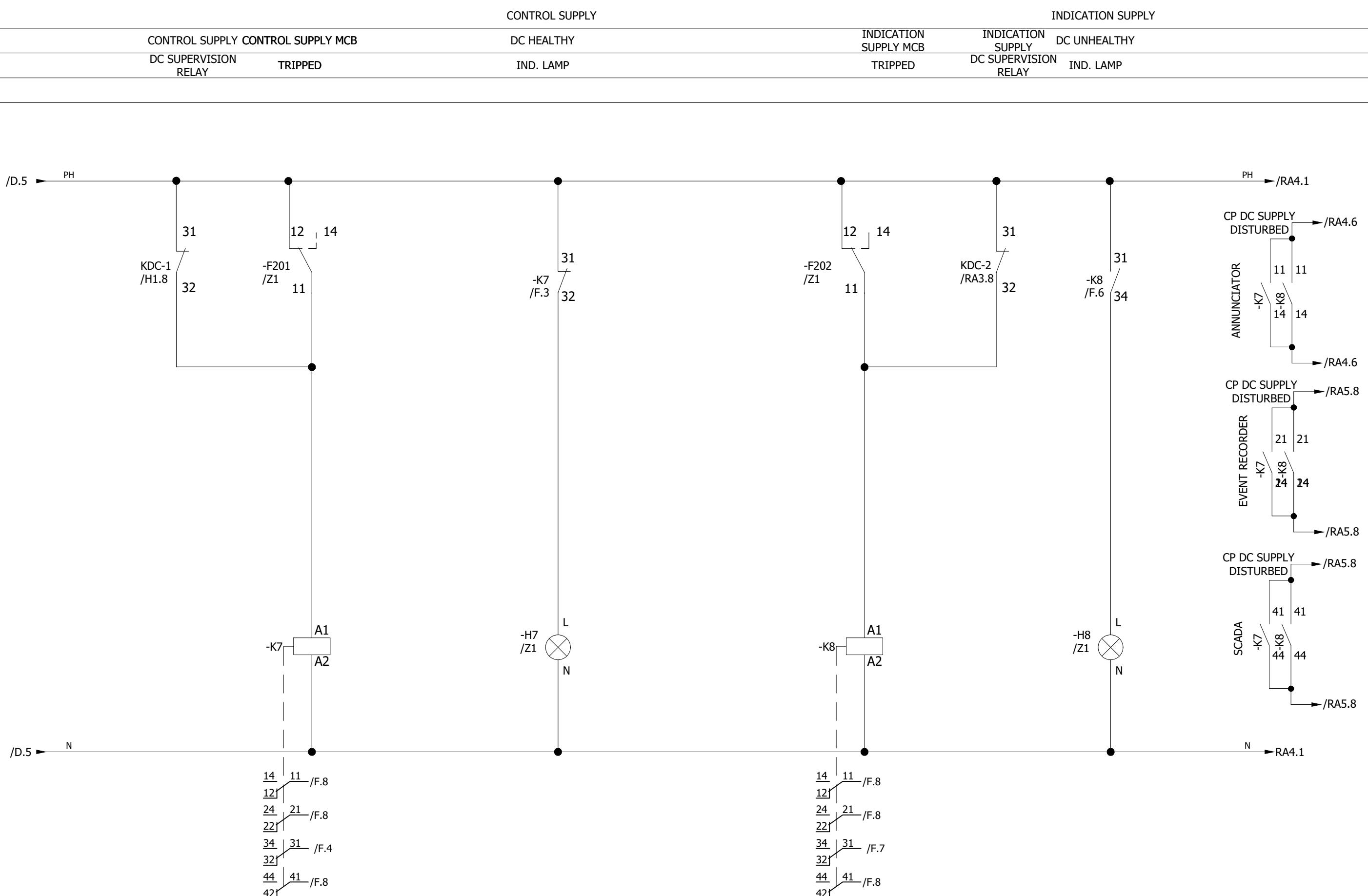
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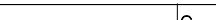
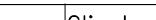
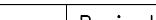
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DC SUPPLY FOR
INDICATION/G.2



0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town,	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) DC SUPPLY DISTRIBUTION CIRCUIT	Drawing no. P60194-E-ELC-SC-007
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type E
									Sheet no. 09



0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town,	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) DC SUPPLY FAILURE ALARM CIRCUIT	Drawing no. P60194-E-ELC-SC-007		
									Project no. P-60194		
									Sheet type F		
REV.	DESCRIPTION	DATE	DRAWER	1	2	3	4	5	6	7	8

1 2 3 4 5 6 7 8

TEST BLOCK

AM METERS

MW METER (-Q5)

MVAR METER (-Q6)

DIGITAL POWER METER

REVENUE METER

TS

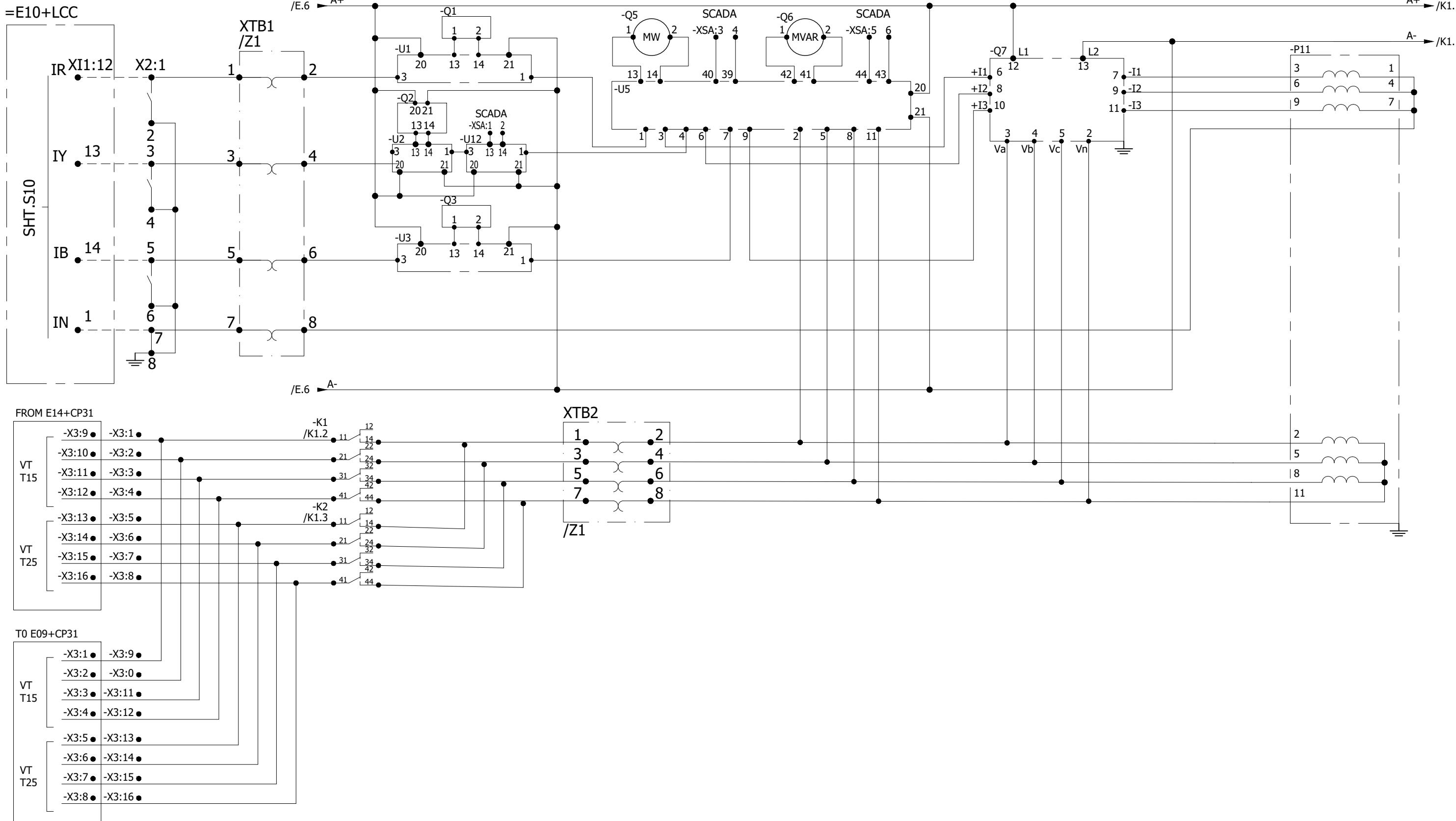
(-Q1, -Q2, -Q3) WITH
TRANSDUCERS
(-U1, , -U2, -U3)

WITH TRANSDUCER (-U5)

(-Q7)

(-P11)

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0	AS BUILT		30.10.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.		
REV.	DESCRIPTION		DATE	DRAWER	EPEPSOL 71-B Garden Block, New Garden Town,	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	132KV LINE CONTROL PANEL (=E10+CP31) METERING	P-60194-E-ELC-SC-007		
										Project no. P-60194	Sheet type G	Sheet no. 11
1			2	3	4	5	6	7	8			

1 2 3 4 5 6 7 8

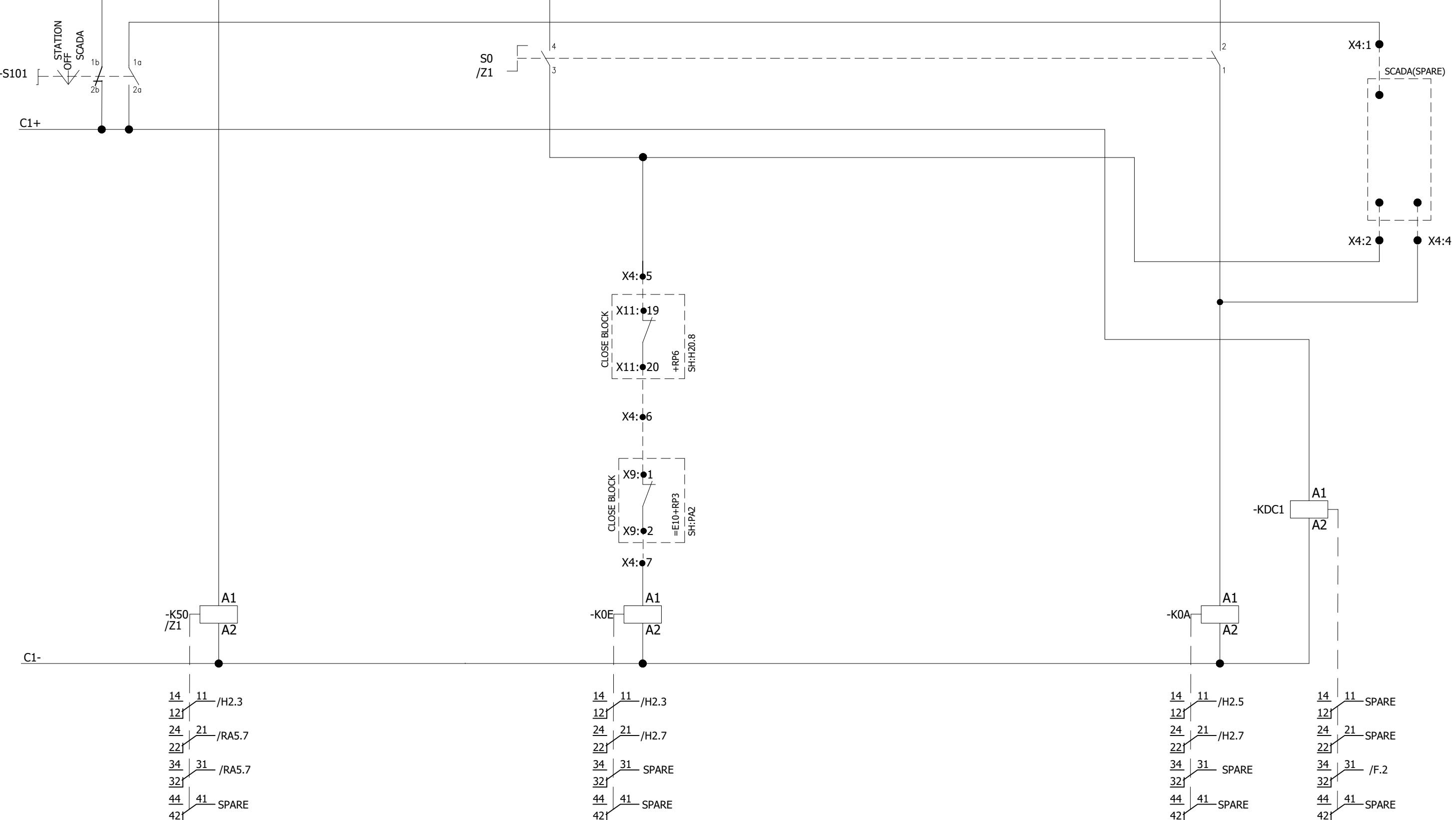
C O N T R O L R O O M

DC SUPERVISION
RELAY SCADA
CONTROL

CLOSE

OPEN KDC-1 CLOSE OPEN

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town,	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) CB CONTROL CIRCUIT	Drawing no. P60194-E-ELC-SC-007
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type H1
									Sheet no. 12

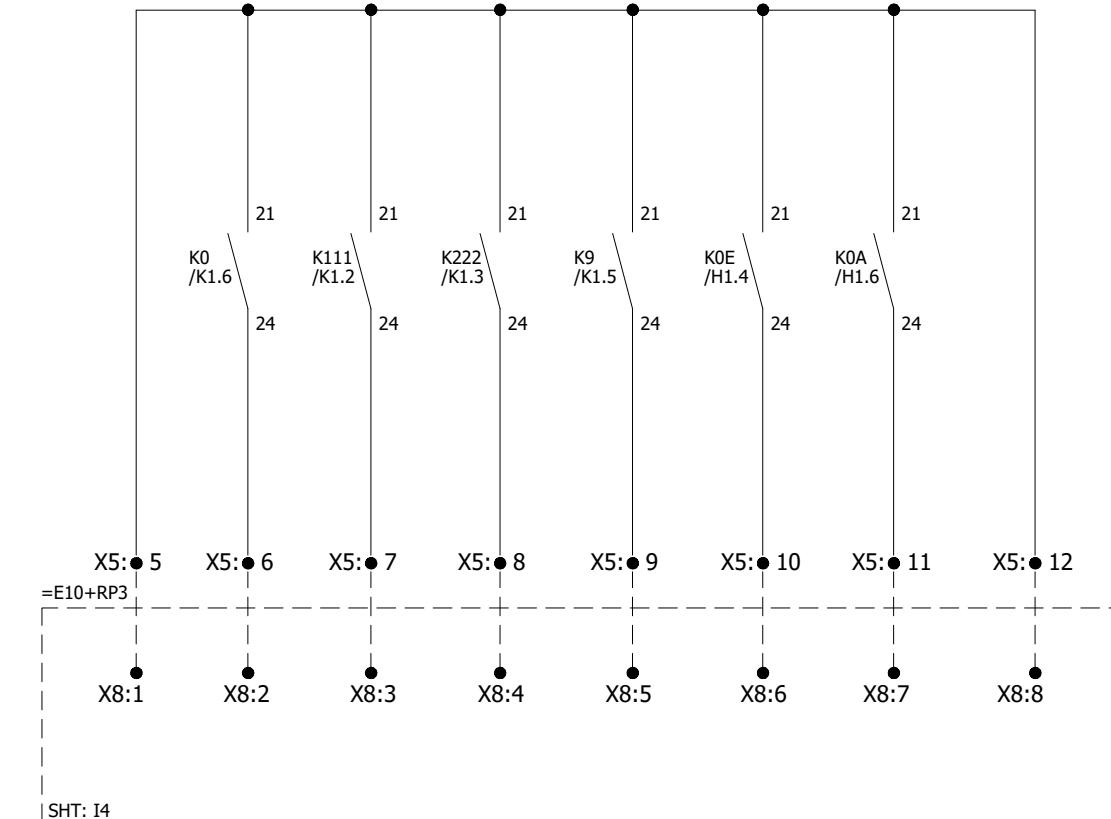
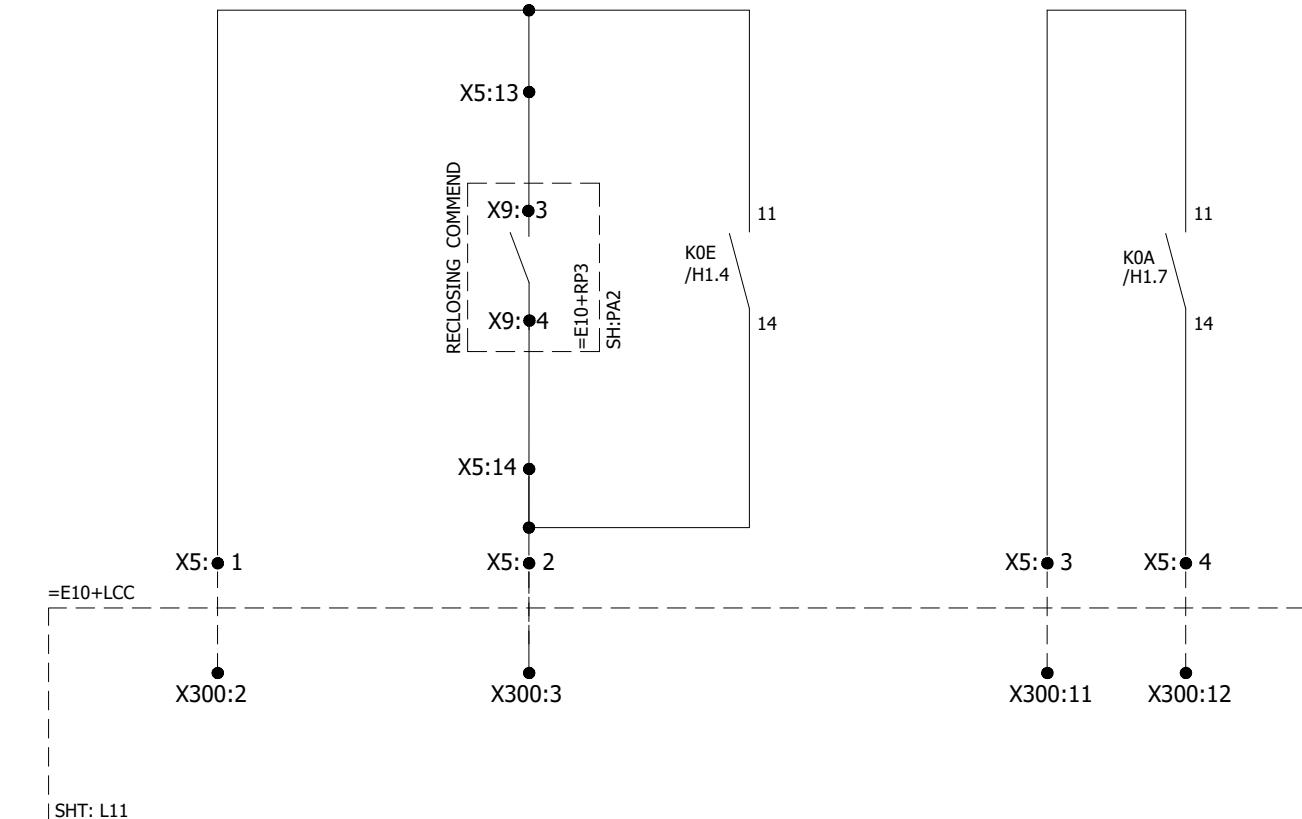
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C O N T R O L R O O M C O N T R O L

AUTORECLOSE(SPARE)

CLOSE

OPEN



CB CLOSE STATUS

Q1 CLOSE STATUS

Q2 CLOSE STATUS

Q9 CLOSE STATUS

MANUAL CLOSE INPUT FOR DISTANCE RELAY

MANUAL OPEN INPUT FOR DISTANCE RELAY

A
B
C
D
E
F

A
B
C
D
E
F

0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town,	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) CB CONTROL CIRCUIT	Drawing no. P60194-E-ELC-SC-007
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type H2
									Sheet no. 13

=E10+Q51

CLOSE

OPEN

=E10+Q53

CLOSE

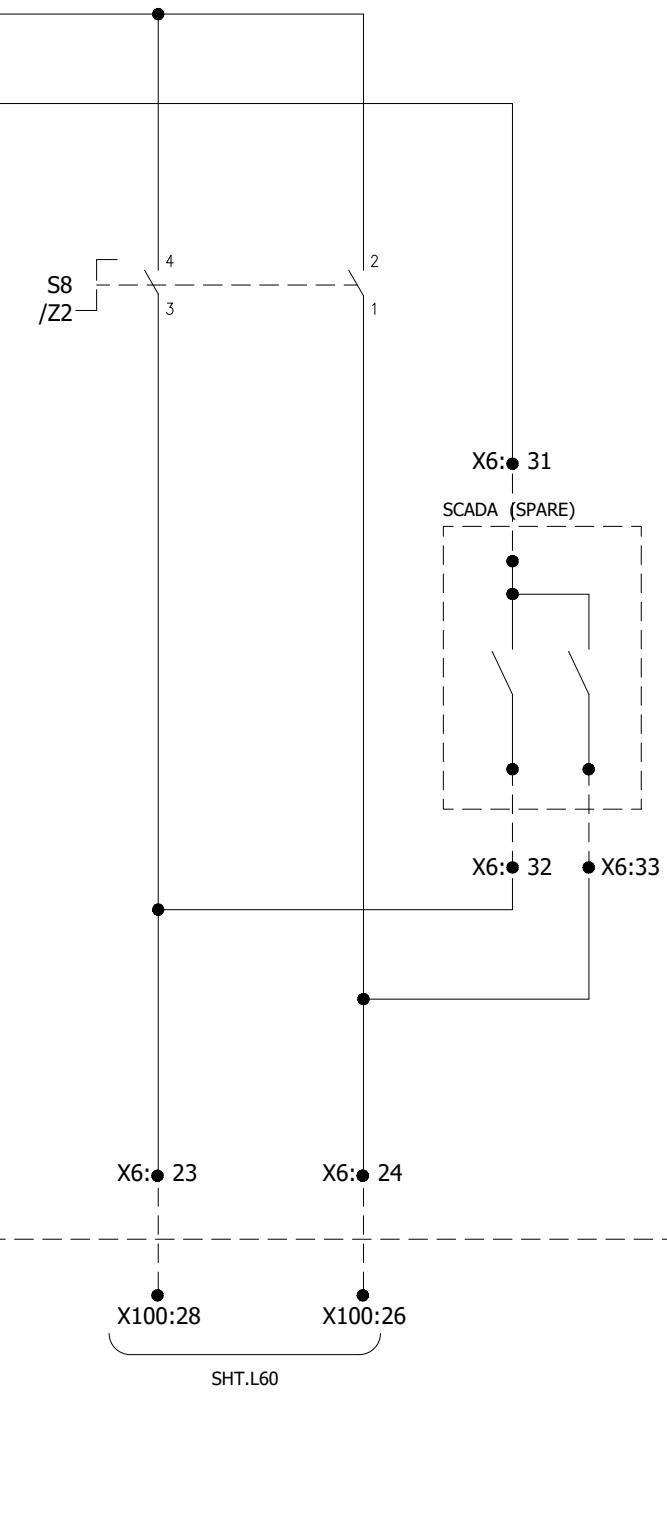
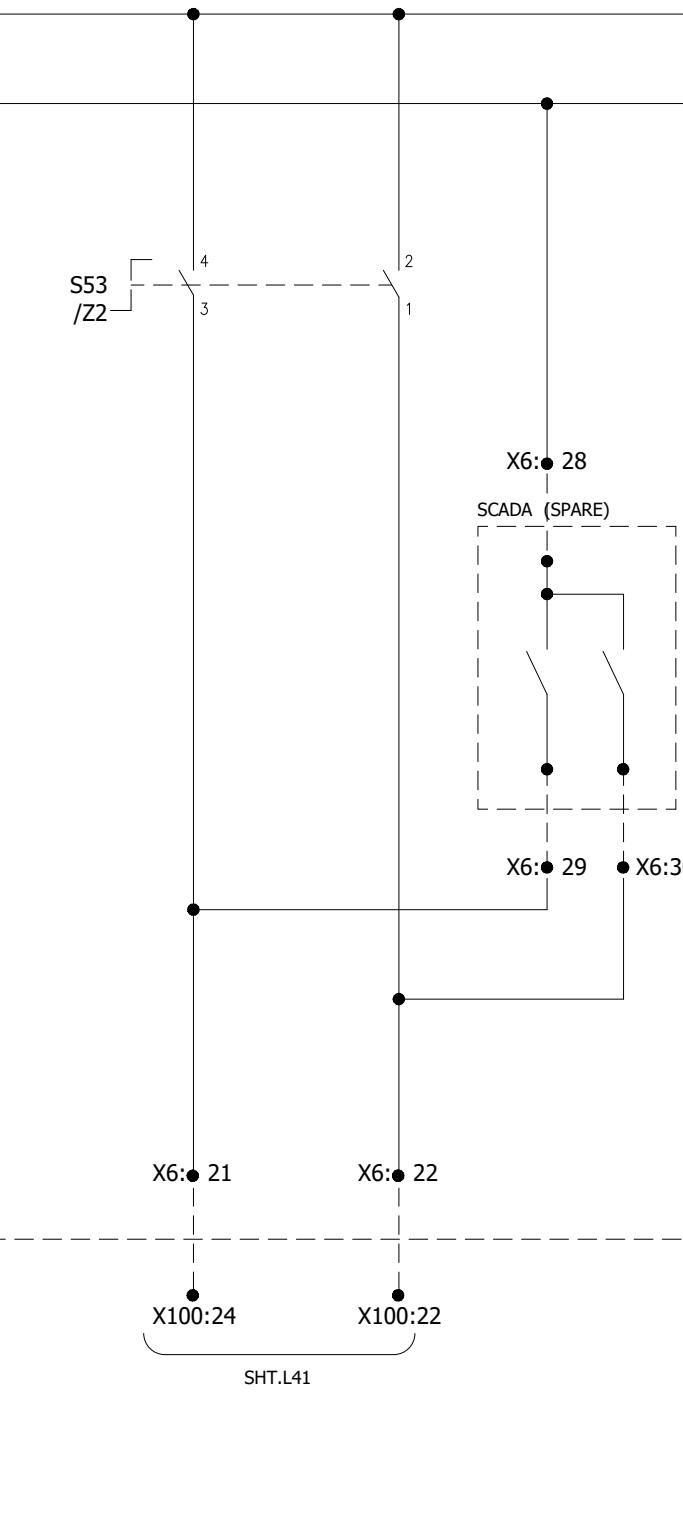
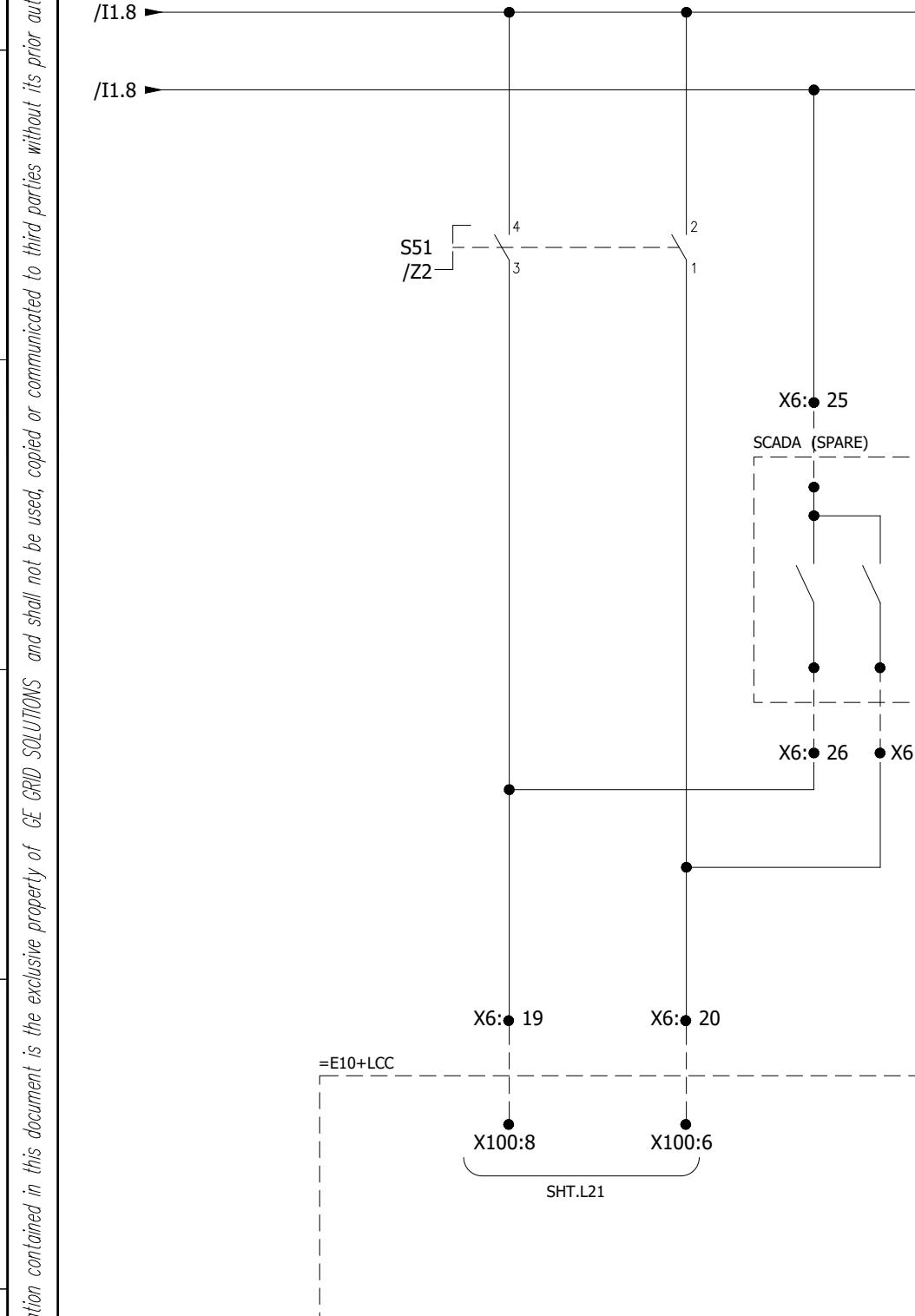
OPEN

=E10+Q8

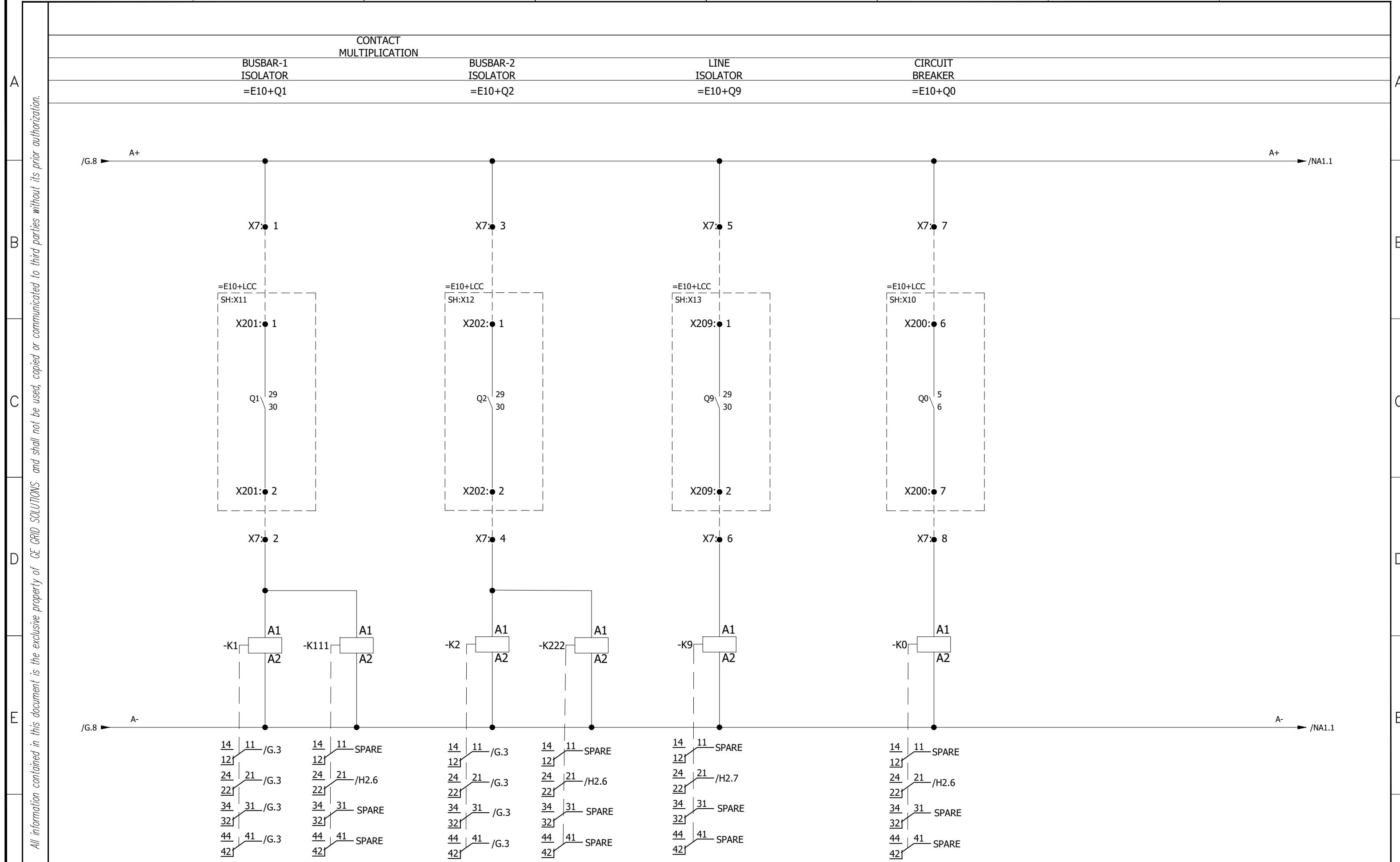
CLOSE

OPEN

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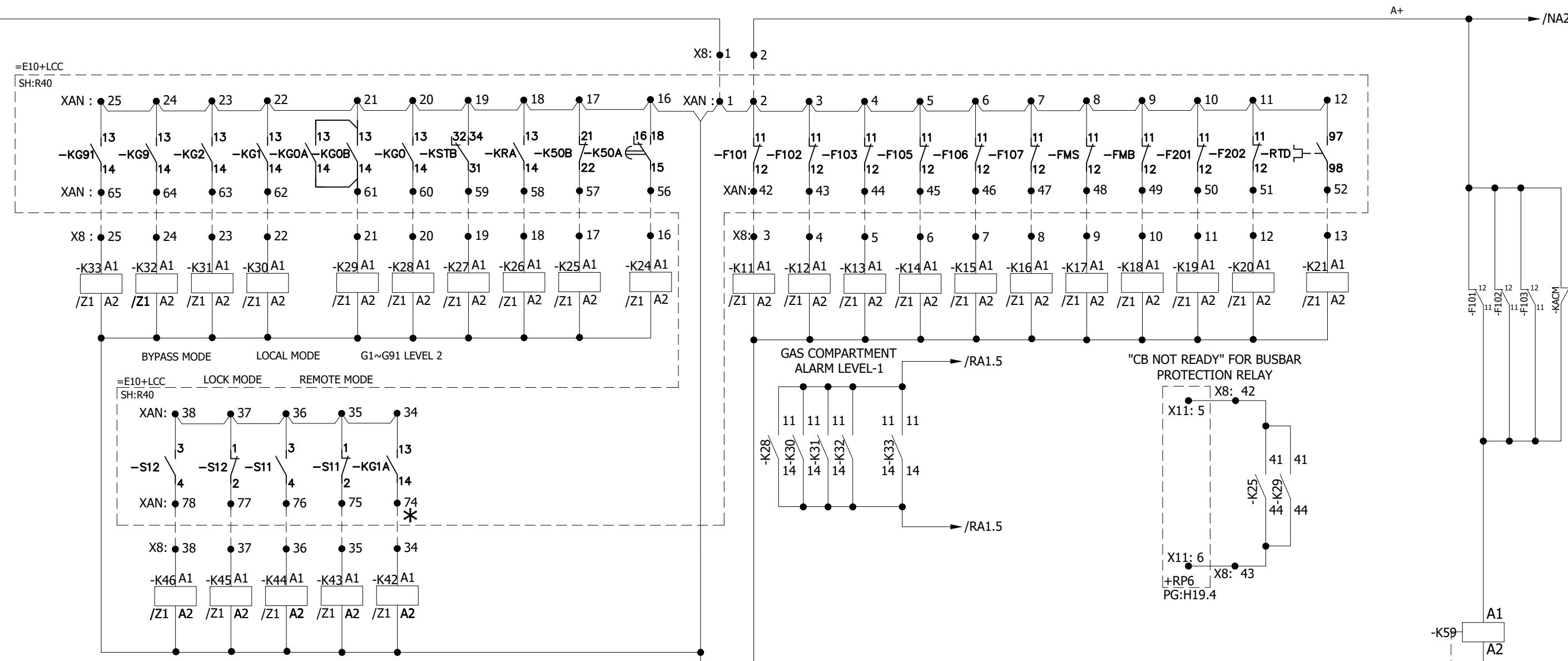
0	AS BUILT		30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town,	Contractor  GE Grid Solutions A GE and Alstom joint venture	Client 	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) DISCONNECTOR & EARTH SWITCH CONTROL	Drawing no. P60194-E-ELC-SC-007		
REV.	DESCRIPTION		DATE	DRAWER						Project no. P-60194	Sheet type I2	Sheet no. 15
1	2	3	4	5	6	7	8					



0	AS BUILT		30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town,	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) CB/DISCONNECTOR CONTACT MULTIPLICATION	Drawing no. P60194-E-ELC-SC-007		
REV.	DESCRIPTION		DATE	DRAWER						Project no. P-60194	Sheet type K1	Sheet no. 16
1	2	3	4	5	6	7	8					

1	2	3	4	5	6	7	8
A	CONTACT MULTIPLICATION	POSITION	LONG SPRING CHARGING TIME	CONTROL SUPPLY MCB TRIPPED	GAS MONITOR MCB TRIPPED	CB TRIPPING 1 MCB TRIPPED	LIGHTING AC SUPPLY MCB TRIPPED
G9 ALARM 1	G1 LEVEL 1	G0 ALARM	REPEAT ABNORMAL	DS/ES/HES OPERATION TIME ABNORMAL	SPRING DISCHARGED	DS/ES/HES MOTOR SUPPLY MCB TRIPPED	CB MOTOR THERMAL OVERLOAD
G91 ALARM 1	G2 LEVEL 1	G0 LOCK			ALARM SUPPLY MCB TRIPPED	CB CLOSING MCB TRIPPED	CB TRIPPING 2 MCB TRIPPED
						CB MOTOR SUPPLY MCB TRIPPED	HEATING AC SUPPLY MCB TRIPPED
							PANEL'S AC SUPPLY FAIL

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0	AS BUILT	30.10.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
				EPESOL	Grid Solutions	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	132KV LINE CONTROL PANEL (=E10+CP31) ALARM MULTIPLICATION	P-60194-E-ELC-SC-007
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type NA1 Sheet no. 17

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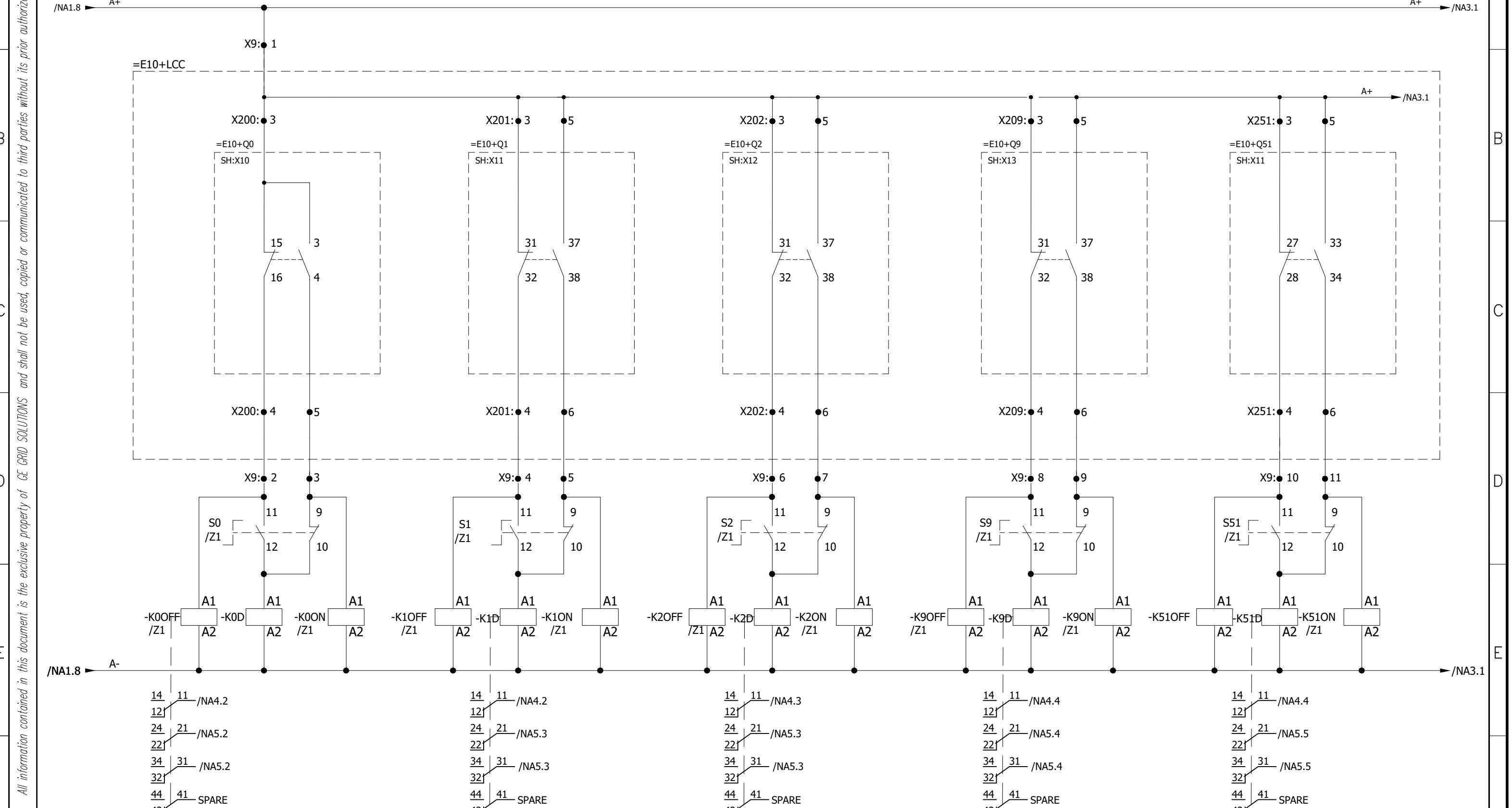
A

(=E10+Q0)
OPEN CLOSE(=E10+Q1)
OPEN CLOSE(=E10+Q2)
OPEN CLOSE(=E10+Q9)
OPEN CLOSE(=E10+Q51)
OPEN CLOSE

A+

/NA3.1

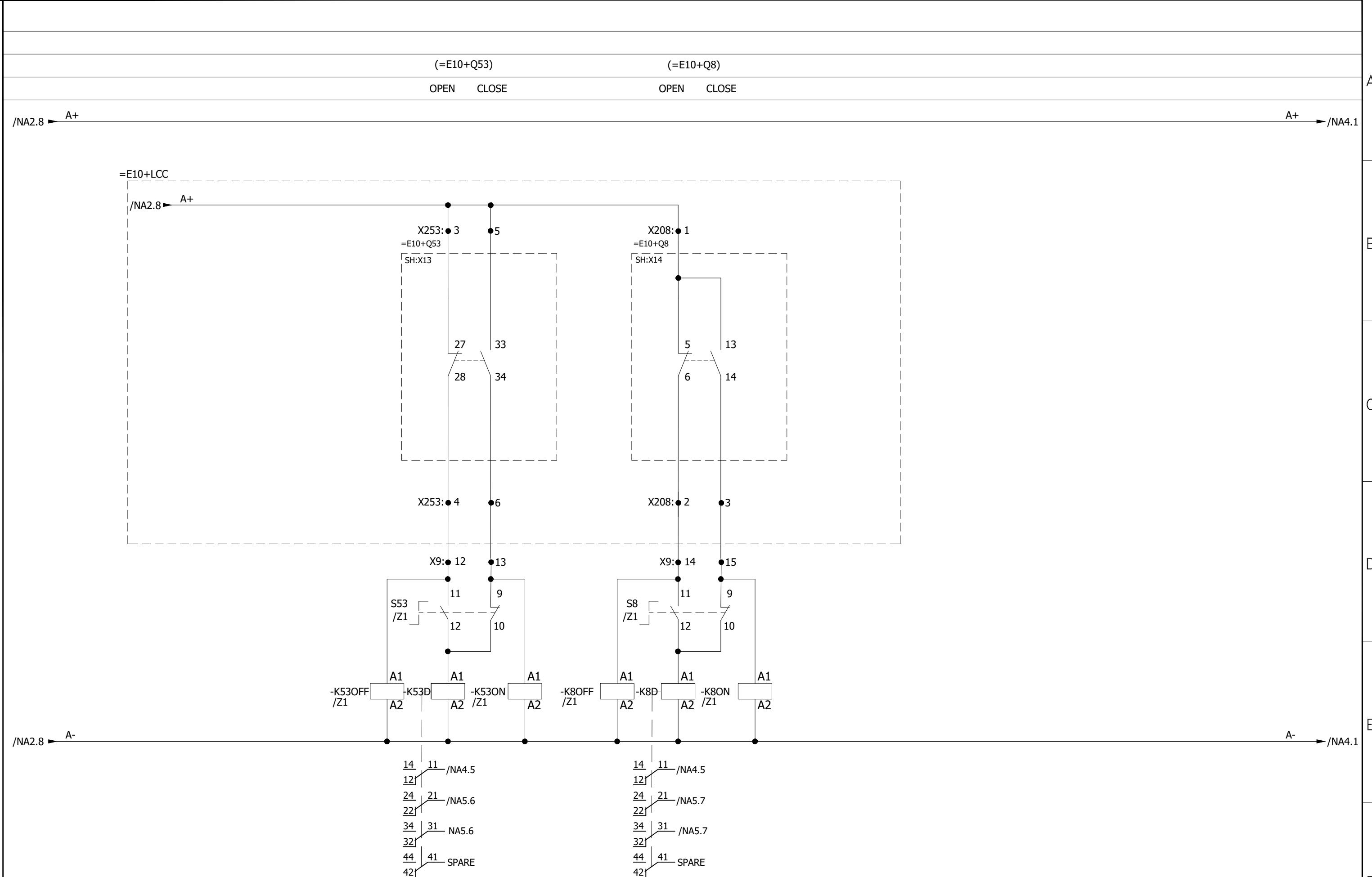
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0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 75-B Garden Block, New Garden Town,	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) DISCREPANCY INITIATION	Drawing no. P60194-E-ELC-SC-007
									Project no. P-60194
	DESCRIPTION	DATE	DRAWER						Sheet type NA2
REV.									Sheet no. 18

1 2 3 4 5 6 7 8

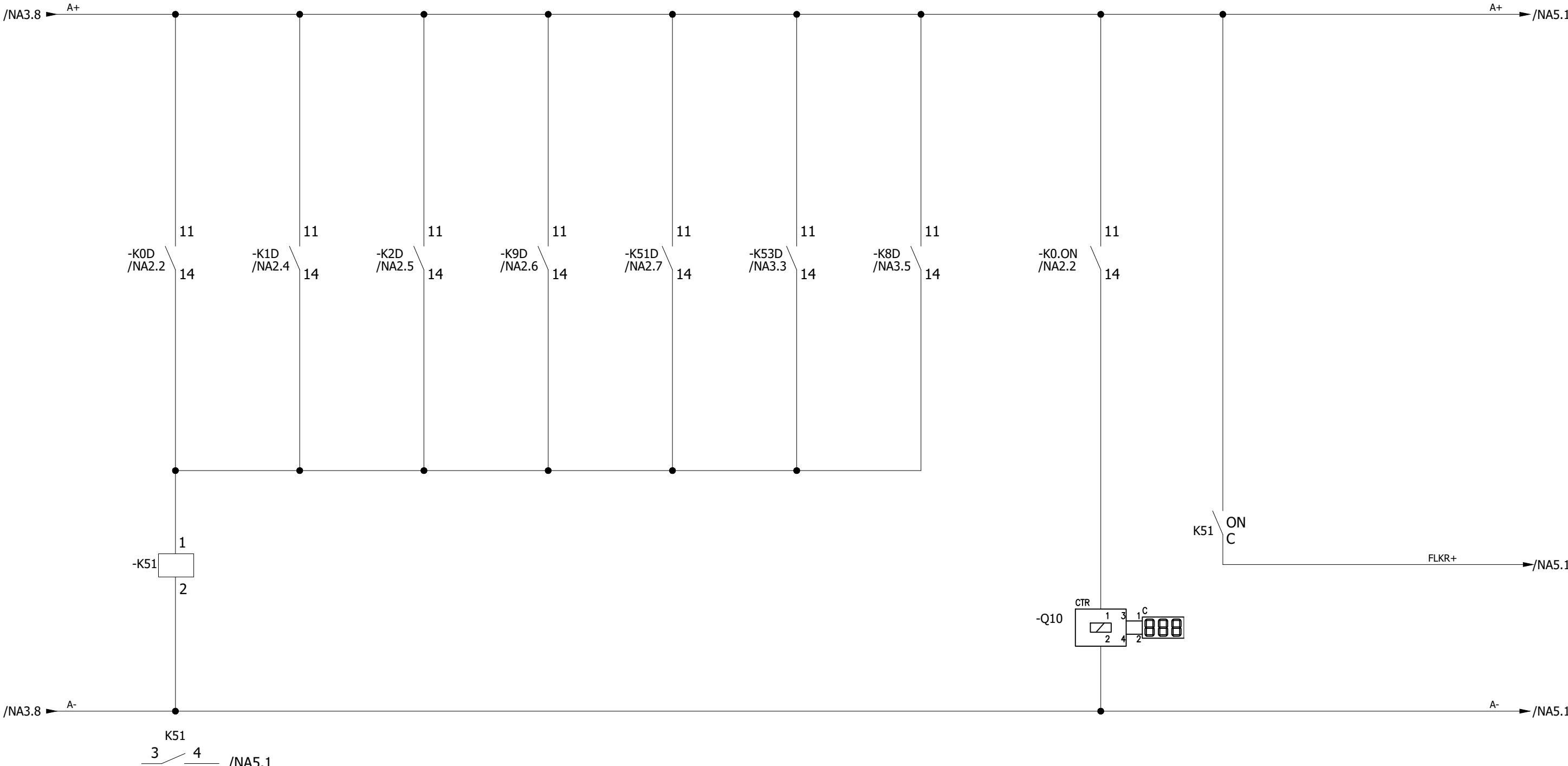
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0	AS BUILT		30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town,	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132KV LINE CONTROL PANEL (=E10+CP31) DISCREPANCY INITIATION	Drawing no. P60194-E-ELC-SC-007		
REV.	DESCRIPTION		DATE	DRAWER						Project no. P-60194	Sheet type NA3	Sheet no. 19
1	2	3	4	5	6	7	8					

1 2 3 4 5 6 7 8

OFF/ON (=E10+Q0)	OFF/ON (=E10+Q1)	OFF/ON (=E10+Q2)	OFF/ON (=E10+Q9)	OFF/ON (=E10+Q51)	OFF/ON (=E10+Q53)	OFF/ON (=E10+Q8)	CIRCUIT BREAKER OPERATION COUNTER (-Q10)
---------------------	---------------------	---------------------	---------------------	----------------------	----------------------	---------------------	--



0	AS BUILT	30.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town,	Contractor  A GE and Alstom joint venture	Client 	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (-E10+CP31) DISCREPANCY INITIATION	Drawing no. P60194-E-ELC-SC-007
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type NA4
									Sheet no. 20

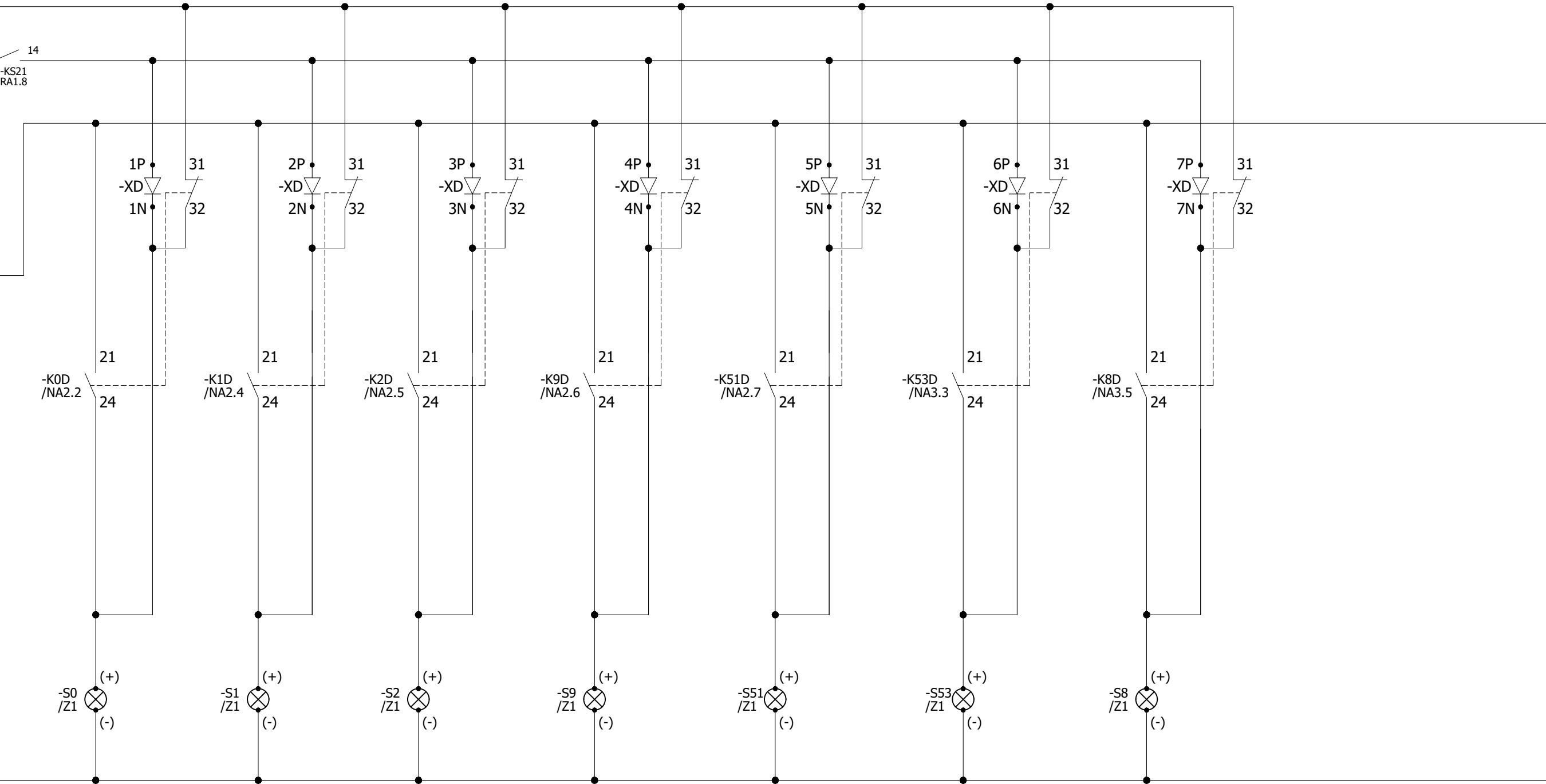
1 2 3 4 5 6 7 8

1 2 3 4 5 6 7 8

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(=E10+Q0) (=E10+Q1) (=E10+Q2) (=E10+Q9) (=E10+Q51) (=E10+Q53) (=E10+Q8)

A



B

(=E10+Q0) (=E10+Q1) (=E10+Q2) (=E10+Q9) (=E10+Q51) (=E10+Q53) (=E10+Q8)

(=E10+Q0) (=E10+Q1) (=E10+Q2) (=E10+Q9) (=E10+Q51) (=E10+Q53) (=E10+Q8)

C

(=E10+Q0) (=E10+Q1) (=E10+Q2) (=E10+Q9) (=E10+Q51) (=E10+Q53) (=E10+Q8)

D

(=E10+Q0) (=E10+Q1) (=E10+Q2) (=E10+Q9) (=E10+Q51) (=E10+Q53) (=E10+Q8)

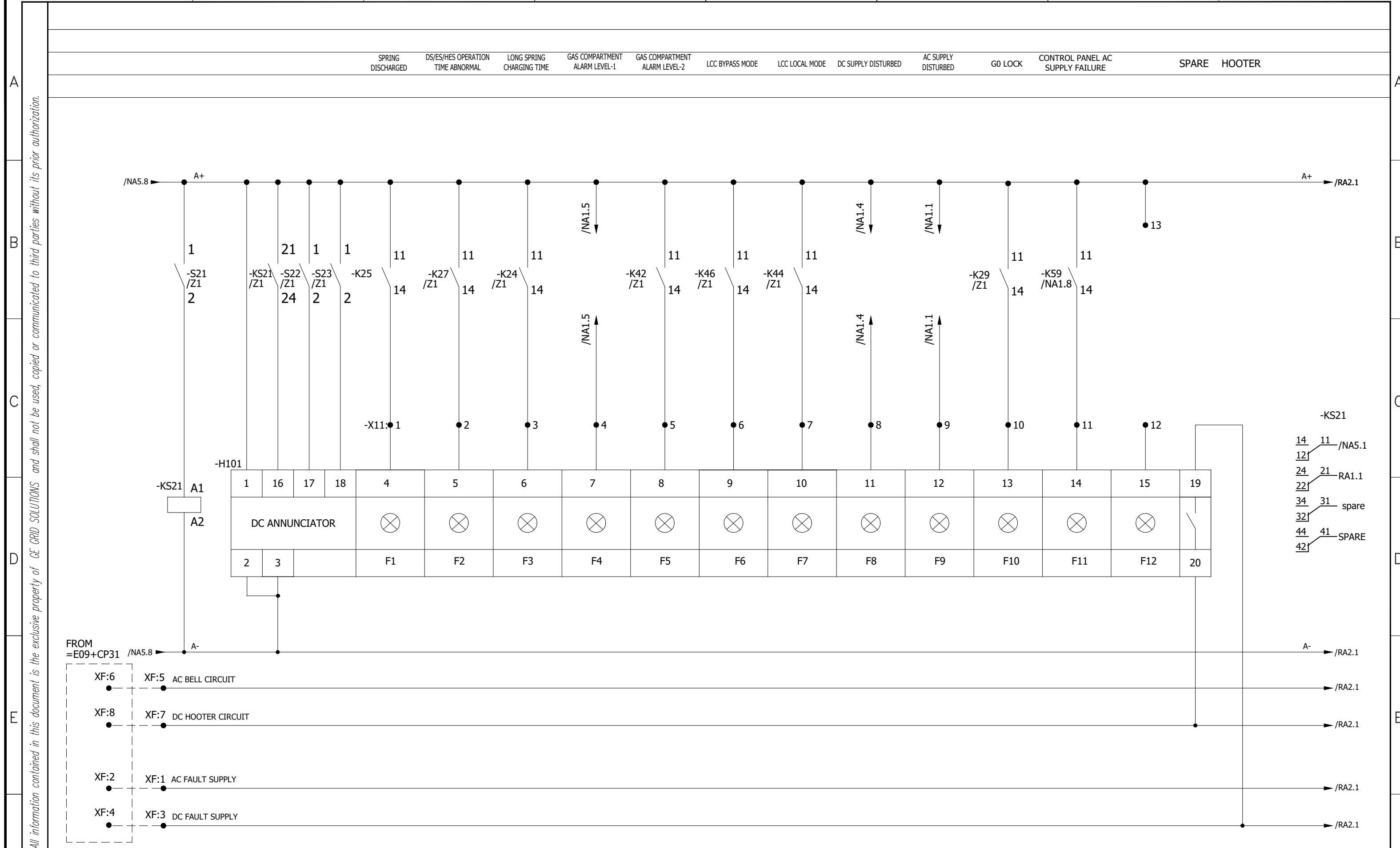
E

(=E10+Q0) (=E10+Q1) (=E10+Q2) (=E10+Q9) (=E10+Q51) (=E10+Q53) (=E10+Q8)

F

(=E10+Q0) (=E10+Q1) (=E10+Q2) (=E10+Q9) (=E10+Q51) (=E10+Q53) (=E10+Q8)

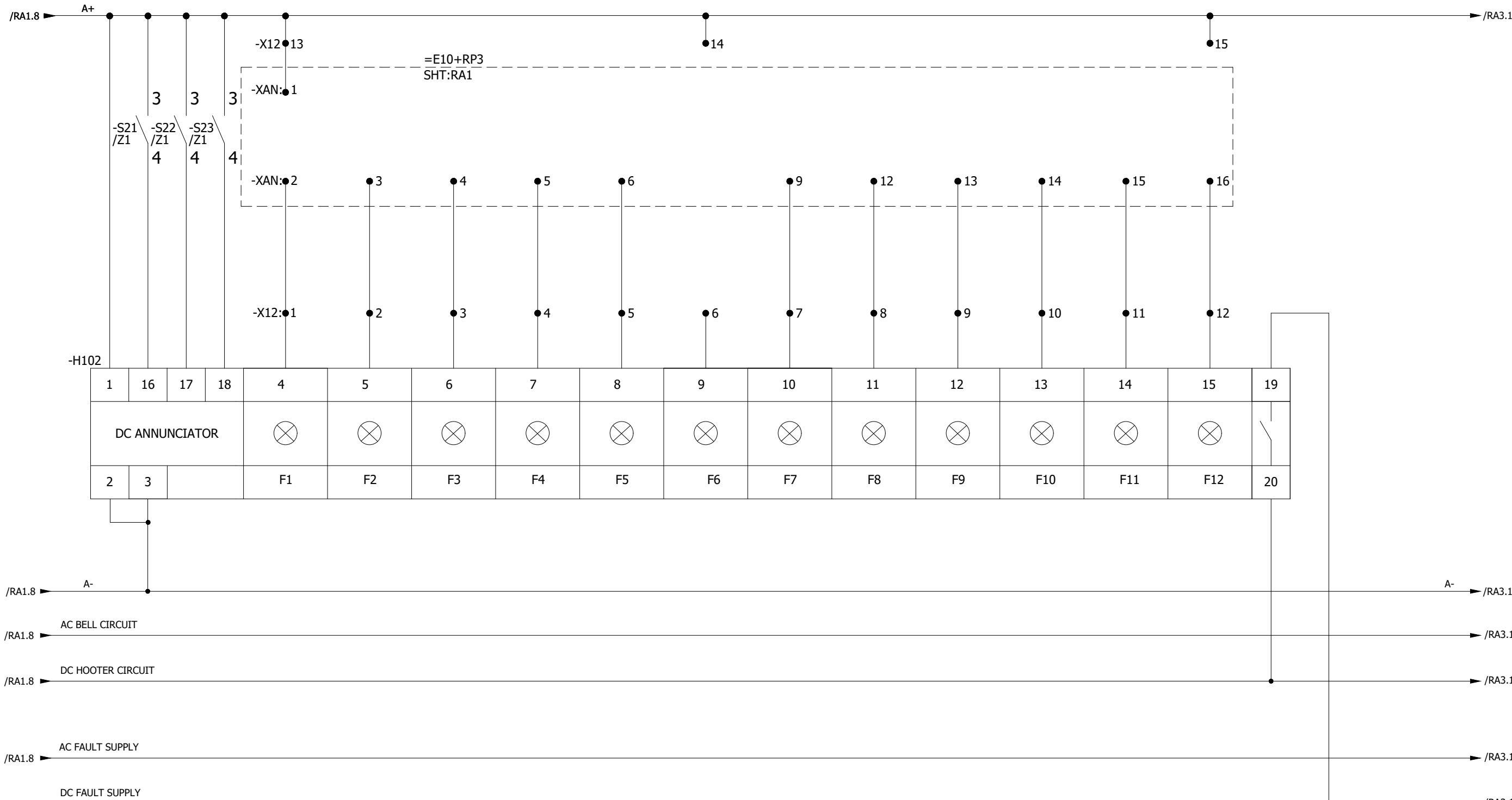
0	AS BUILT	30.10.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town,	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132KV LINE CONTROL PANEL (=E10+CP31) DISCREPANCY INDICATIONS	Drawing no. P60194-E-ELC-SC-007
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type NA5 Sheet no. 21
1	2	3	4	5	6	7	8		



0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town,	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) ANNUNCIATOR-1 CIRCUIT	Drawing no. P60194-E-ELC-SC-007
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type RA1
									Sheet no. 22

RED PHASE TRIP YELLOW PHASE TRIP BLUE PHASE TRIP ZONE-1 TRIP ZONE-2/3 TRIP SPARE POWER SWING DETECTED SOTF OPERATED AUTORECLOSE OPERATED AUTORECLOSE BLOCKED LINE DIFFERENTIAL PROTECTION SPARE HOOTER
RELAY FAULTY

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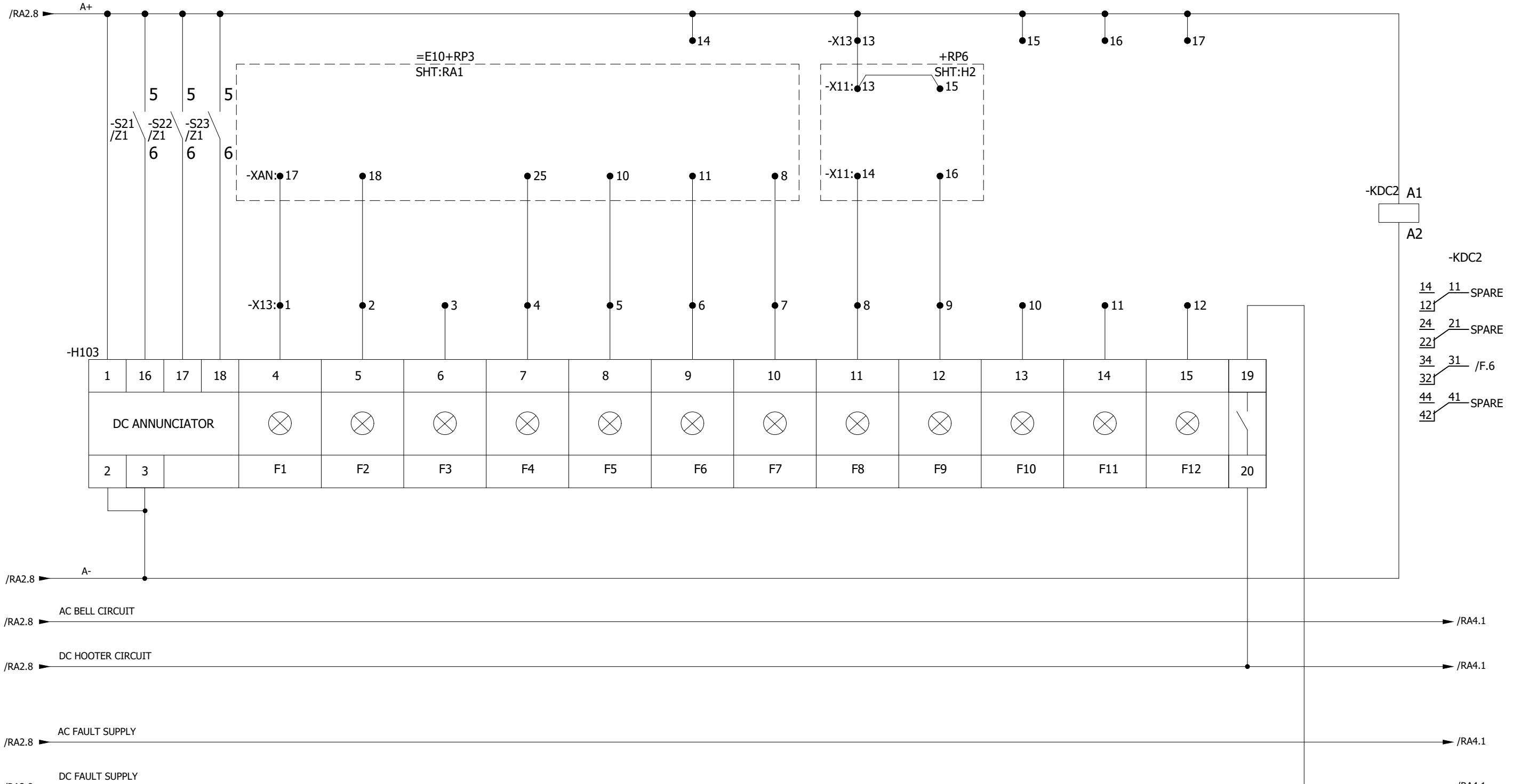


0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town,	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) ANNUNCIATOR-2 CIRCUIT	Drawing no. P60194-E-ELC-SC-007
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type RA2 Sheet no. 23

A

BUS VT
SECONDARY CIRCUIT
MCB UNHEALTHY O/C & E/F PROT.
RELAY FAULTY SPARE LINE RELAY PANEL 230VAC
CIRCUIT/SUPPLY FAULTY TRIP CIRCUIT-1
FAULTY TRIP CIRCUIT-2
FAULTY O/C & E/F PROT.
OPERATED DTT
SEND CBF STG-1
OPERATED SPARE SPARE SPARE HOOTER

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F

0	AS BUILT	30.10.2018	ASJ	Manufacturer EPESOL 21-B Garden Block, New Garden Town,	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E10+CP31) ANNUNCIATOR-3 CIRCUIT	Drawing no. P60194-E-ELC-SC-007
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type RA3

A

B

C

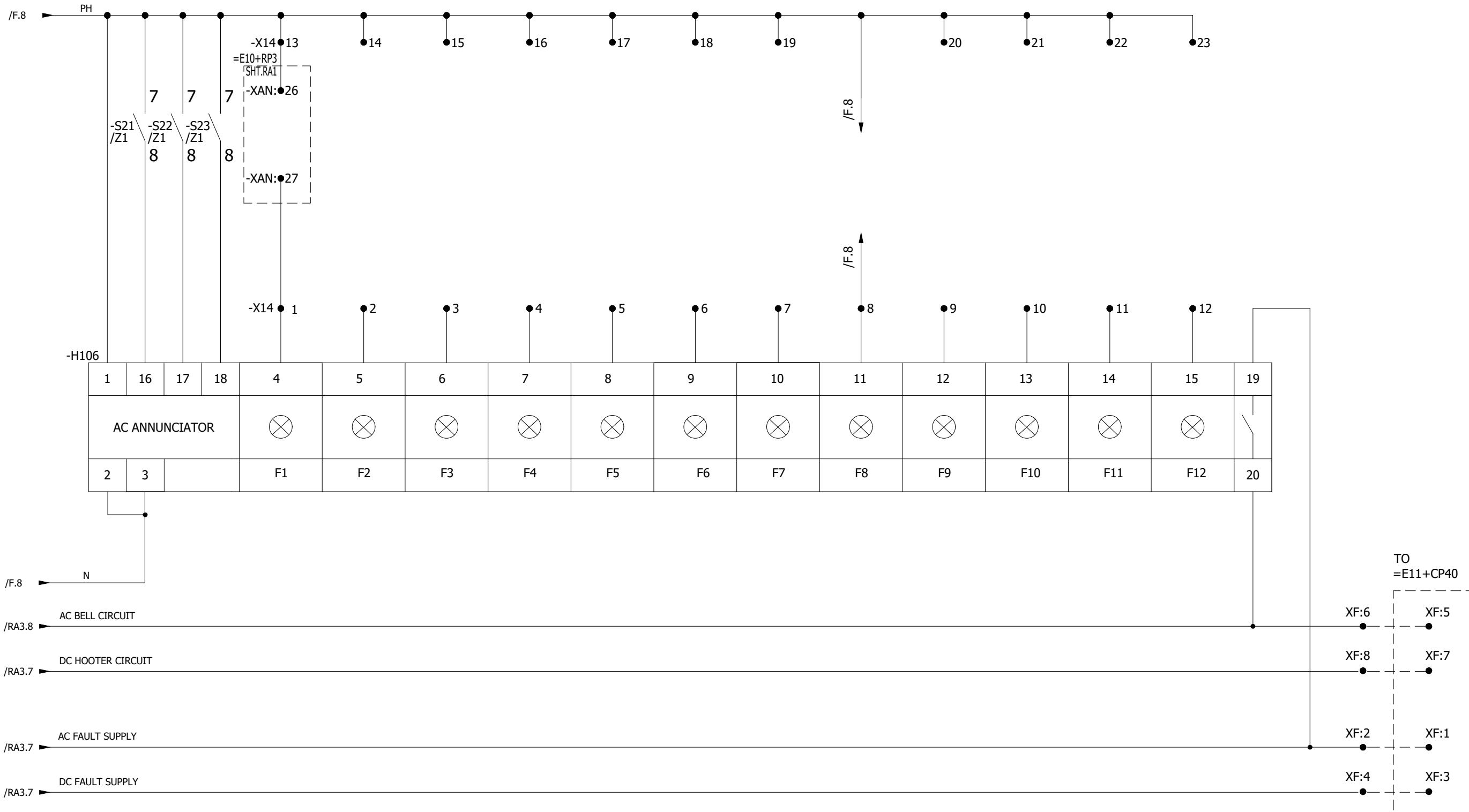
D

E

F

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LINE RELAY PANEL 110VDC CIRCUIT/SUPPLY FAULTY	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	CONTROL PANEL DC FAIL	SPARE	SPARE	SPARE	SPARE	AC BELL
---	-------	-------	-------	-------	-------	-------	--------------------------	-------	-------	-------	-------	---------



A
A

B
B

C
C

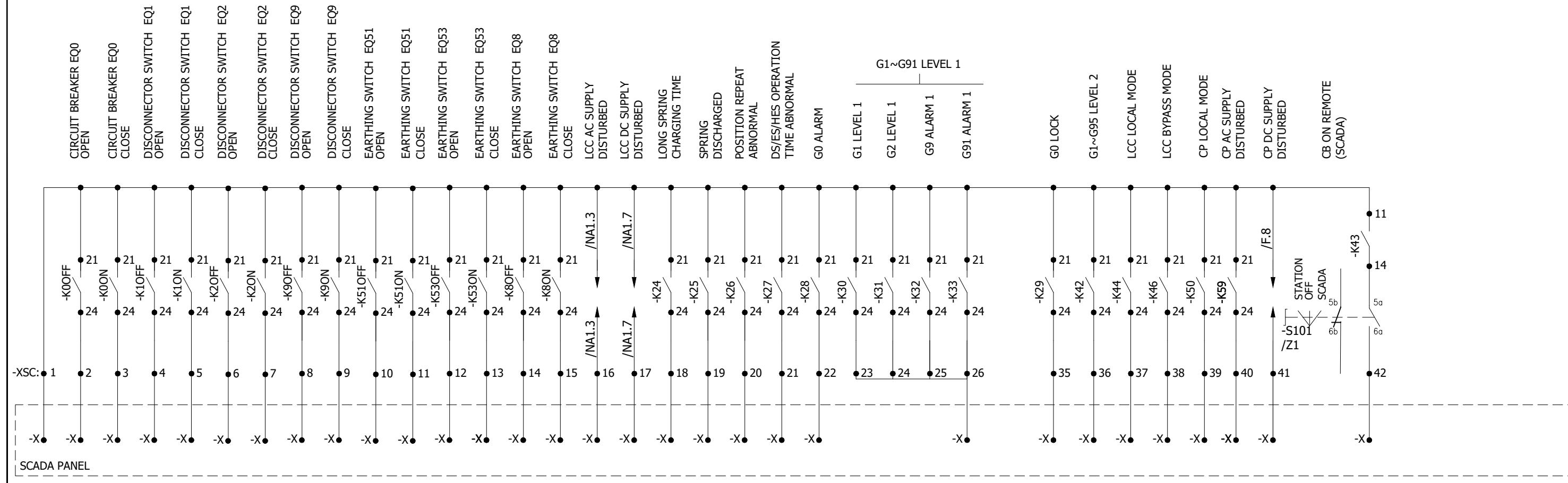
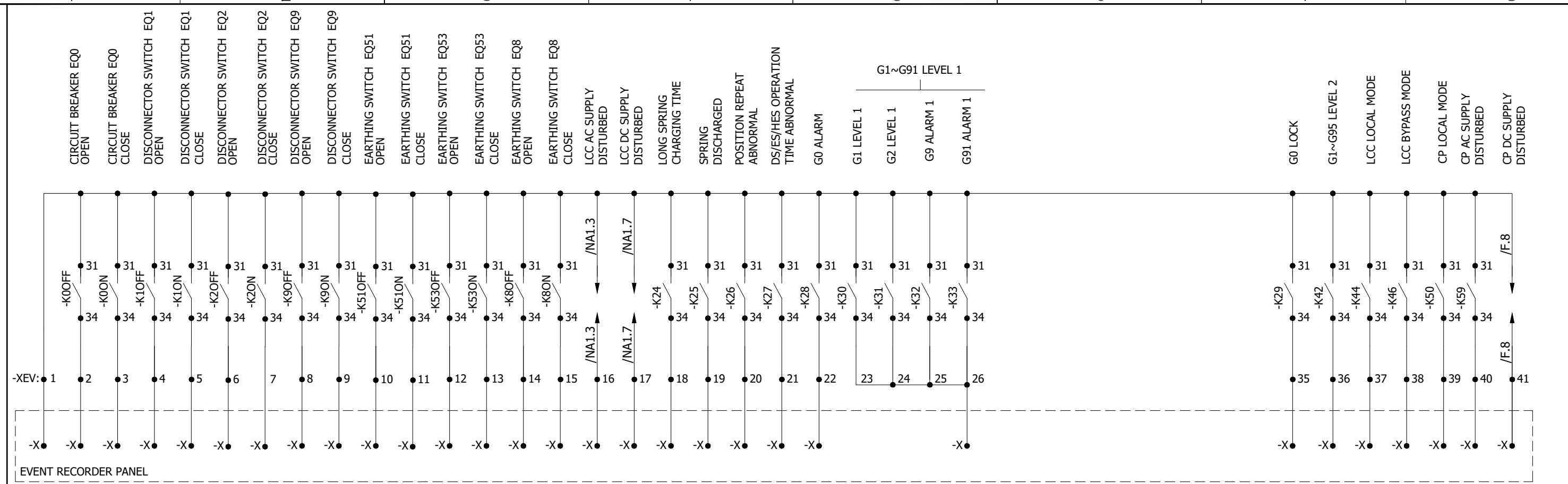
D
D

E
E

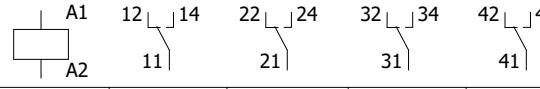
F
F

0	AS BUILT	30.10.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
REV.	DESCRIPTION	DATE	DRAWER	EPESOL 71-B Garden Block, New Garden Town,	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	132kV LINE CONTROL PANEL (=E10+CP31) ANNUNCIATOR-4 CIRCUIT	P60194-E-ELC-SC-007
									Project no. P-60194 Sheet type RA4 Sheet no. 25

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1 2 3 4 5 6 7 8

A	
-K11	NA1.5 NA1.3 NA1.5 NA1.6
-K12	NA1.5 NA1.3 NA1.5 NA1.6
-K13	NA1.5 NA1.3 NA1.5 NA1.7
-K14	NA1.5 NA1.4 NA1.5 NA1.7
-K15	NA1.6 NA1.4 NA1.5 NA1.7
-K16	NA1.6 NA1.4 NA1.5 NA1.7
-K17	NA1.6 NA1.4 NA1.5 NA1.7
-K18	NA1.6 NA1.4 NA1.6 NA1.7
-K19	NA1.7 NA1.1 NA1.2 NA1.3
-K20	NA1.7 NA1.1 NA1.2 NA1.3
-K21	NA1.7 NA1.1 NA1.2 NA1.3
-K24	NA1.4 RA1.4 RA5.4 RA5.4
-K25	NA1.4 RA1.3 RA5.4 RA5.4 NA1.7
-K26	NA1.4 RA5.4 RA5.4
-K27	NA1.3 RA1.4 RA5.5 RA5.5
-K28	NA1.3 NA1.5 RA5.5 RA5.5
-K29	NA1.3 RA1.7 RA5.7 RA5.7 NA1.7
-K30	NA1.2 NA1.5 RA5.5 RA5.5
-K31	NA1.2 NA1.5 RA5.5 RA5.5
-K32	NA1.2 NA1.5 RA5.5 RA5.5
-K42	NA1.3 RA1.5 RA5.7 RA5.7
-K43	NA1.3 RA5.8
-K44	NA1.2 RA1.6 RA5.7 RA5.7
-K45	NA1.2
-K46	NA1.2 RA1.5 RA5.8 RA5.7
-K47	NA1.2 NA1.4 NA1.6 NA1.7
-K48	NA1.1 NA1.4 NA1.6 NA1.7
-K49	NA1.1 NA1.4 NA1.6 NA1.7
-K50	H1.2 RA5.8 RA5.8
-K0OFF	NA2.2 RA5.1 RA5.1
-K0ON	NA2.3 NA4.6 RA5.1 RA5.1
-K1OFF	NA2.3 RA5.2 RA5.2
-K1ON	NA2.4 RA5.2 RA5.2
-K2OFF	NA2.5 RA5.2 RA5.2
-K2ON	NA2.6 RA5.2 RA5.2
-K9OFF	NA2.6 RA5.3 RA5.2
-K9ON	NA2.7 RA5.3 RA5.3
-K51OFF	NA2.7 RA5.3 RA5.3
-K51ON	NA2.8 RA5.3 RA5.3
-K53OFF	NA3.3 RA5.3 RA5.3
-K53ON	NA3.4 RA5.4 RA5.3
-K8OFF	NA3.4 RA5.4 RA5.3
-K8ON	NA3.5 RA5.4 RA5.4

