



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	
Permission to proceed does not constitute acceptance of approval of design details, analysers, test methods or materials/ selected by the CONTRACTOR and does not relieve the CONTRACTOR from full compliance with AGREEMENT obligations.	

REFERENCE DRAWINGS					
SR. NO.	DRAWING TITLE			DOCUMENT NO.	
1.	220kV / 132kV Metering & Protection SLD			P60194-E-SLMP-001	
REVISION HISTORY					
REV	DATE	DRW. BY	CHK. BY	APR. BY	REVISION DESCRIPTION
0	19.10.2018	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 132kV LINE CONTROL PANEL (=E03+CP31) SCHEMATIC DRAWINGS					
Order no P-60194		Document no P60194-E-ELC-SC-002			
Sheet type A		Total sheets 27		Sheet no 1	

	1	2	3	4	5	6	7	8				
	PAGE NO.	SHEET NAME	SHEET DESCRIPTION			ISSUE / REVISION						
						A	B	C	D	E	F	01
A	01	A	COVER SHEET			X	X					
	02	AA	LIST OF CONTENTS			X	X					
	03	AB	SYMBOL AND LEGENDS			X	X					
	04	AC1	COMPONENT LIST			X	X					
	05	AC2	COMPONENT LIST			X	X					
B	06	AD	PANEL VIEW			X	X					
	07	AE	SINGLE LINE DIAGRAM			X	X					
	08	D	AC SUPPLY DISTRIBUTION CIRCUIT			X	X					
	09	E	DC SUPPLY DISTRIBUTION CIRCUIT			X	X					
	10	F	DC SUPPLY FAILURE ALARM CIRCUIT			X	X					
C	11	G	METERING			X	X					
	12	H1	CB CONTROL CIRCUIT			X	X					
	13	H2	CB CONTROL CIRCUIT			X	X					
	14	I1	DISCONNECTOR & EARTH SWITCH CONTROL			X	X					
	15	I2	DISCONNECTOR & EARTH SWITCH CONTROL			X	X					
	16	K1	DISCONNECTOR CONTACT MULTIPLICATION			X	X					
D	17	NA1	ALARM MULTIPLICATION			X	X					
	18	NA2	DISCREPANCY INITIATION			X	X					
	19	NA3	DISCREPANCY INITIATION			X	X					
	20	NA4	DISCREPANCY INITIATION			X	X					
	21	NA5	DISCREPANCY INDICATIONS			X	X					
	22	RA1	ANNUNCIATOR-1 CIRCUIT			X	X					
	23	RA2	ANNUNCIATOR-2 CIRCUIT			X	X					
	24	RA3	ANNUNCIATOR-3 CIRCUIT			X	X					
	25	RA4	ANNUNCIATOR-4 CIRCUIT			X	X					
	26	RA5	SCADA & ER SIGNALS			X	X					
E	27	Z1	COMPONENT DIAGRAM			X	X					
F	0	AS BUILT	19.10.2018	ASJ	Manufacturer  EPESOL 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 132KV LINE CONTROL PANEL (=E03+CP31) LIST OF CONTANTS	Drawing no. P60194-E-ELC-SC-002		
	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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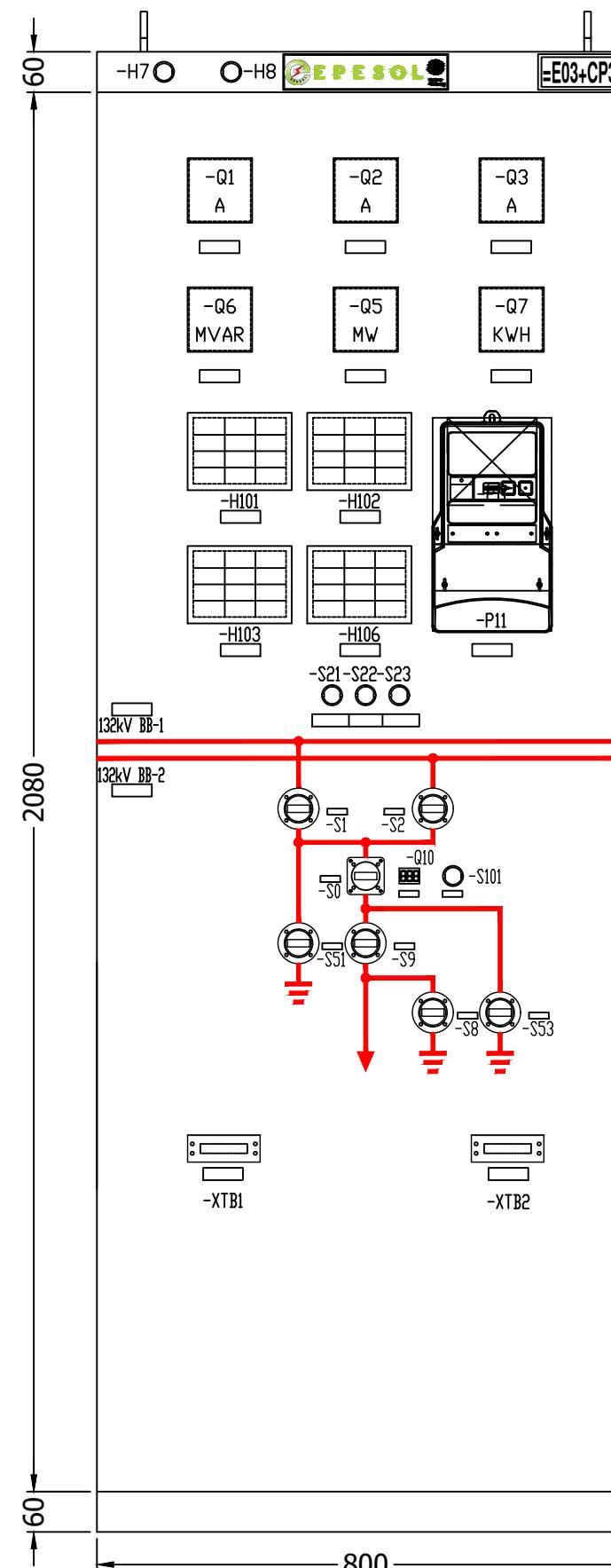
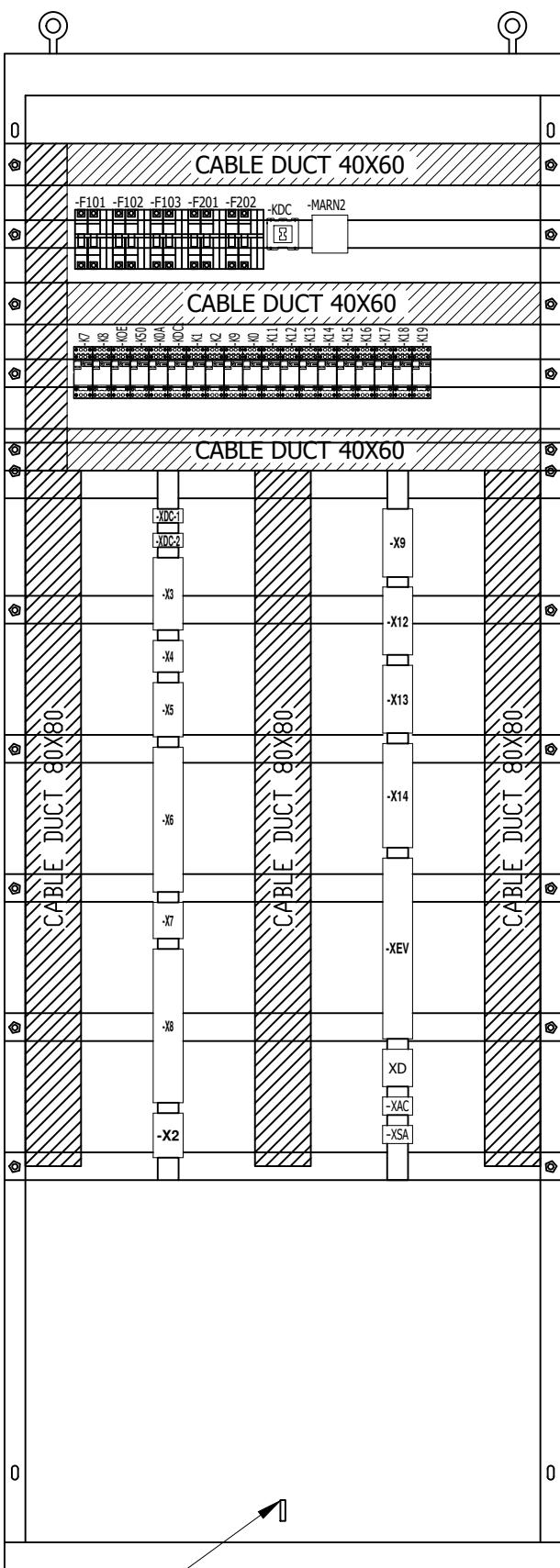
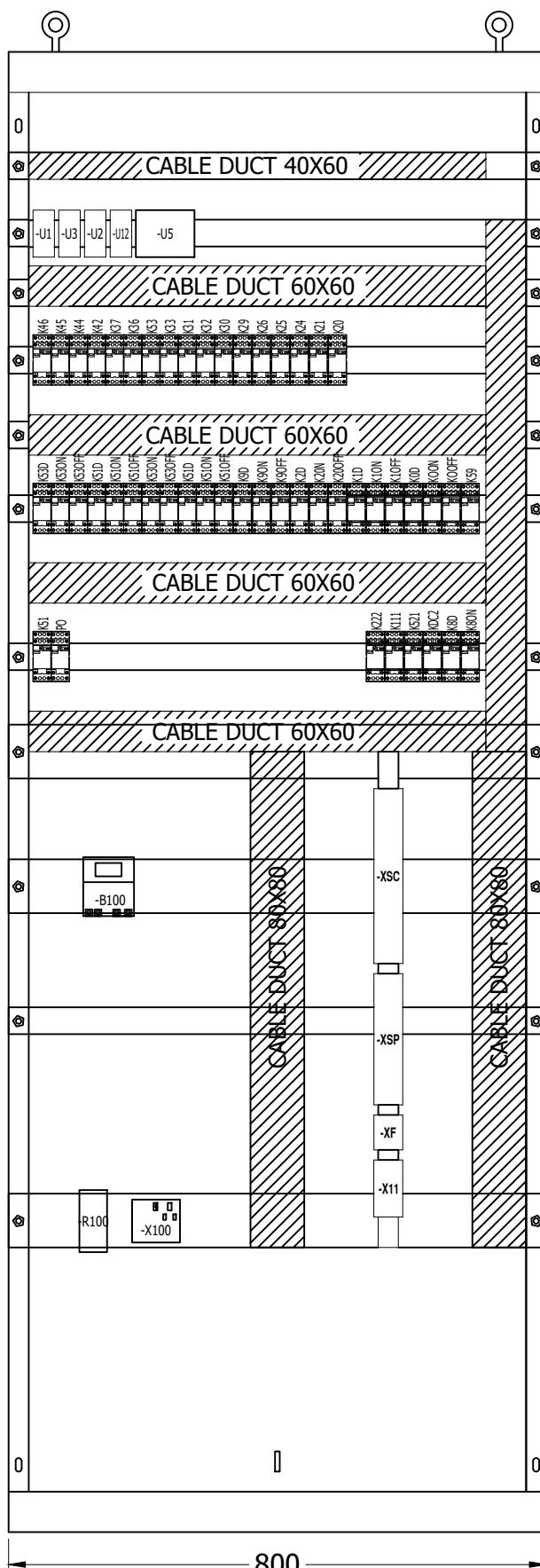
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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AB
									Sheet no. 03

	1	2	3	4	5	6	7	8		
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER			
A	01	MWH+MVARH METER	THREE PHASE FOUR WIRE STATIC ENERGY METER, CLASS 0.2, PT RATIO: 132/0.11 KV (L-L), CT RATIO 400:800:1600/1A , MODEL: MT860S-A22R36S33-E12-L21-M3K03-Z7			-P11	ISKRAEMECO			
	02	ANALOG AMMETER	METER: TRANSDUCER OPERATED DIGITAL AMPERE METER, INPUT 0...20/30 mA, ACCURACY CLASS 1, SCALE_1: 0...400/600A, SCALE_2: 0...800/1200A, SCALE_3: 0...1600/2400A. , AUX. VOLTAGE 110 VDC.			-Q1 , -Q3	FRER			
B	02	CURRENT TRANSDUCER	CURRENT TRANSDUCER: 1-INPUT, 2-OUTPUT, NOMINAL INPUT CURRENT 1/1.5A, OUTPUT1: 0...20/30mA, OUTPUT2: 0...20/30mA, AUXILIARY VOLTAGE 110 VDC, ACCURACY CLASS 1, CT RATIO 400:800:1600/1A ORD: A96MMA + MCOEAQ			-U1, -U3	FRER			
	01	DIGITAL AMMETER	METER: TRANSDUCER OPERATED DIGITAL AMPERE METER, INPUT 0...20/30 mA, ACCURACY CLASS 1, SCALE_1: 0...400/600A, SCALE_2: 0...800/1200A, SCALE_3: 0...1600/2400A. , AUX. VOLTAGE 110 VDC.			-Q2	FRER			
C	02	CURRENT TRANSDUCER	CURRENT TRANSDUCER: 1-INPUT, 2-OUTPUT, NOMINAL INPUT CURRENT 1/1.5A, OUTPUT1: 0...20/30mA, OUTPUT2: 0...20/30mA, AUXILIARY VOLTAGE 110 VDC, ACCURACY CLASS 1, CT RATIO 400:800:1600/1A ORD: D96MMA + MCOEAQ			-U2, -U12	FRER			
	01	ANALOG REAL POWER (MW) METER	METER: 240 DEGREE TRANSDUCER OPERATED ANALOGUE MW METER, INPUT -12.5/10...0...+10/12.5 mA, ACCURACY CLASS 1, SCALE_1: 125/100-0-100/125 MW (91.5 MW at 20mA), SCALE_2: 250/200-0-200/250 MW (183 MW at 20mA), SCALE_3: 500/400-0-400/500 MW (366 MW at 20mA).			-Q5	FRER			
D	01	ANALOG REACTIVE POWER (MVAR) METER	METER: 240 DEGREE TRANSDUCER OPERATED ANALOGUE MVAR METER, INPUT -12.5/10...0...+10/12.5 mA, ACCURACY CLASS 1, SCALE_1: 125/100-0-100/125 MVAR (91.5 MVAR at 20mA), SCALE_2: 250/200-0-200/250 MVAR (183 MVAR at 20mA), SCALE_3: 500/400-0-400/500 MVAR (366 MVAR at 20mA).			-Q6	FRER			
	01	PROGRAMMABLE UNIVERSAL TRANSDUCER (for MW and MVAR meters)	TRANSDUCER: 3-PHASE, 4-WIRE BALANCED LOAD, 4 PROGRAMMABLE DC mA OUTPUTS. NOMINAL INPUT VOLTAGE 110/137.5 VAC(L-L), NOMINAL INPUT CURRENT 1/1.25A, AUXILIARY VOLTAGE 110 VDC, ACCURACY CLASS 1, OUTPUT1 to OUTPUT4: -12.5/10...0...+10/12.5 mA, PT RATIO: 132/0.11 KV (L-L), CT RATIO 400:800:1600/1A. ORD: MCOP4			-U5	FRER			
E	01	DIGITAL POWER METER	THREE PHASE DIGITAL POWER METER, ACCURACY CLASS 0.5s, INPUT NOMINAL CURRENT, 1/5A, INPUT NOMINAL VOLTAGE 110 VAC (L-L), AUXILIARY VOLTAGE 110-375 VDC.			-Q7	ENERDIS			
	03	ANNUNCIATOR	TWELVE WINDOW ANNUNCIATOR, RATED VOLTAGE 110 VDC, ORD: AM-101			-H101, -H102, -H103	ELABS			
F	01	ANNUNCIATOR	TWELVE WINDOW ANNUNCIATOR, RATED VOLTAGE 240 VAC, ORD: AM-101			-H106	ELABS			
	01	PUSH BUTTON - LAMP TEST	TYPE: SWITCH (A TYPE:), COLOR : BLACK , SUPPLY : 120VDC, Ord: YS-AP1-2-31-B-D-W			-S21	YONGSUNG			
F	01	PUSH BUTTON - ALARM ACKNOWLEDGMENT	TYPE: SWITCH (A TYPE:), COLOR : RED , SUPPLY : 120VDC, Ord: YS-AP1-2-31-R-D-W			-S22	YONGSUNG			
	0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132KV LINE CONTROL PANEL (=E03+CP31) COMPONENT LIST	Drawing no. P60194-E-ELC-SC-002
	REV.	DESCRIPTION	DATE	DRAWER				Project no. P-60194	Sheet type AC1	Sheet no. 04

	1	2	3	4	5	6	7	8	
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER		
A	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		
	63	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, -K35 TO -K37, -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		
B	01	AUXILIARY CONTACTOR - SUPPLY CHANGEOVER	COIL VOLTAGE: 110VDC, 3 NO + 3 NC CONTACTS, ORD: MCRC022ATWJ-B+MARN211AT			-KDC	GE		
	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		
C	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		
	02	TEST BLOCK	YS-CTT-04-S, YS-PTT-04-S			-XTB1, -XTB2	YONGSUNG		
D	02	INDICATION LIGHT - AC AND DC SUPPLY	TYPE: LED , COLOR : RED , SUPPLY : 240VAC ORD: YS-PL-2-AL-22-R-W			-H7, -H8	YONGSUNG		
	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		
E	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		
	01	PANEL LIGHT	230VAC @ 50Hz, 05W, Ord: YS-T8-30-5W			-H100	YONGSUNG		
F	01	DOOR SWITCH	230VAC @ 50Hz, 1 NO Contact, Ord: YS P3315GW-B + YS MS-C			-S100	YONGSUNG		
	01	THREE PIN SOCKET	1N+PE, 16A, 230VAC @ 50Hz			-X100	LOCAL		
	0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132KV LINE CONTROL PANEL (=E03+CP31) COMPONENT LIST
REV.	DESCRIPTION		DATE	DRAWER					

	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					
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	19-10-2018	ASJ	Manufacturer  EPE SOL 21-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  GE Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E03+CP31) COMPONENT LIST	Drawing no. P60194-E-ELC-SC-002	
	REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AC3	Sheet no. 05a
	1	2	3	4	5	6	7	8			

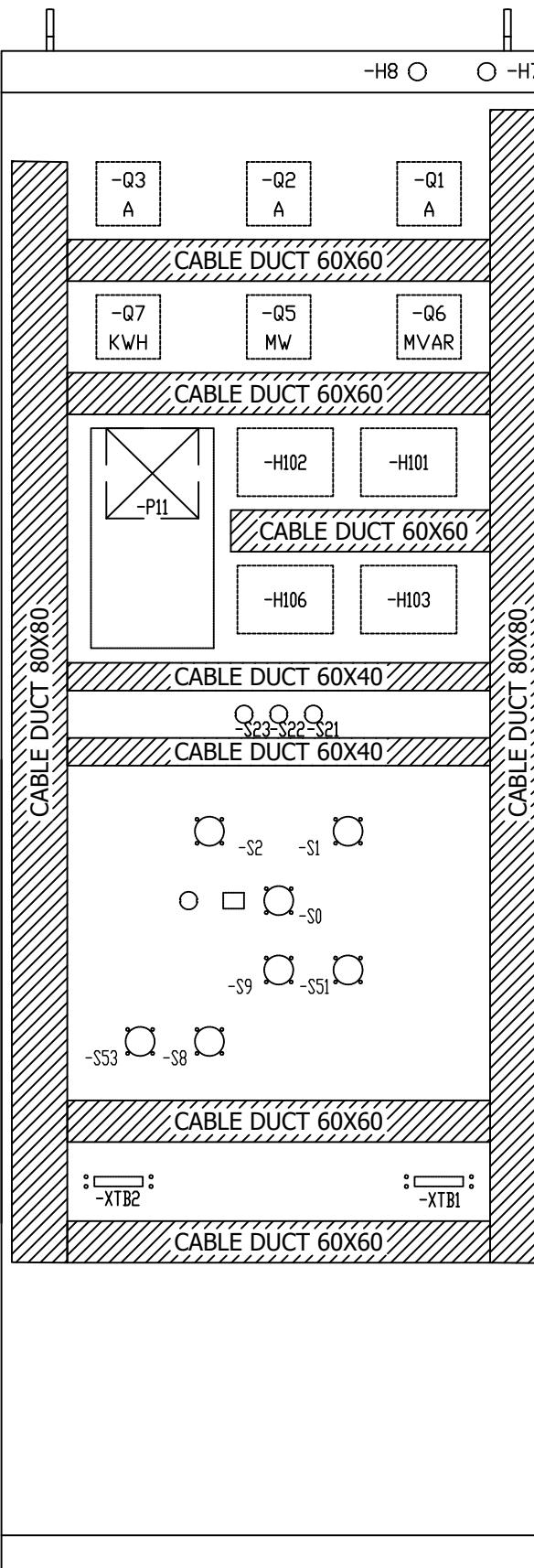
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	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER			
A	08	TERMINAL BLOCKS FOR METERING CT	TYPE: SCB-6			-X2		CABUR		
B	07	TERMINAL BLOCKS WITH DIODE TYPE IN-D4007, RATED MAXIMUM VOLTAGE 350VDC, RATED BREAK DOWN VOLTAGE 430VDC	TYPE: DAS.4/6			-XD		CABUR		
C										
D										
E										
F										
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0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPE SOL 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 132KV LINE CONTROL PANEL (=E03+CP31) COMPONENT LIST	Drawing no. P60194-E-ELC-SC-002	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AC3	Sheet no. 05b

FRONT VIEWLEFT SIDE VIEWRIGHT SIDE VIEW

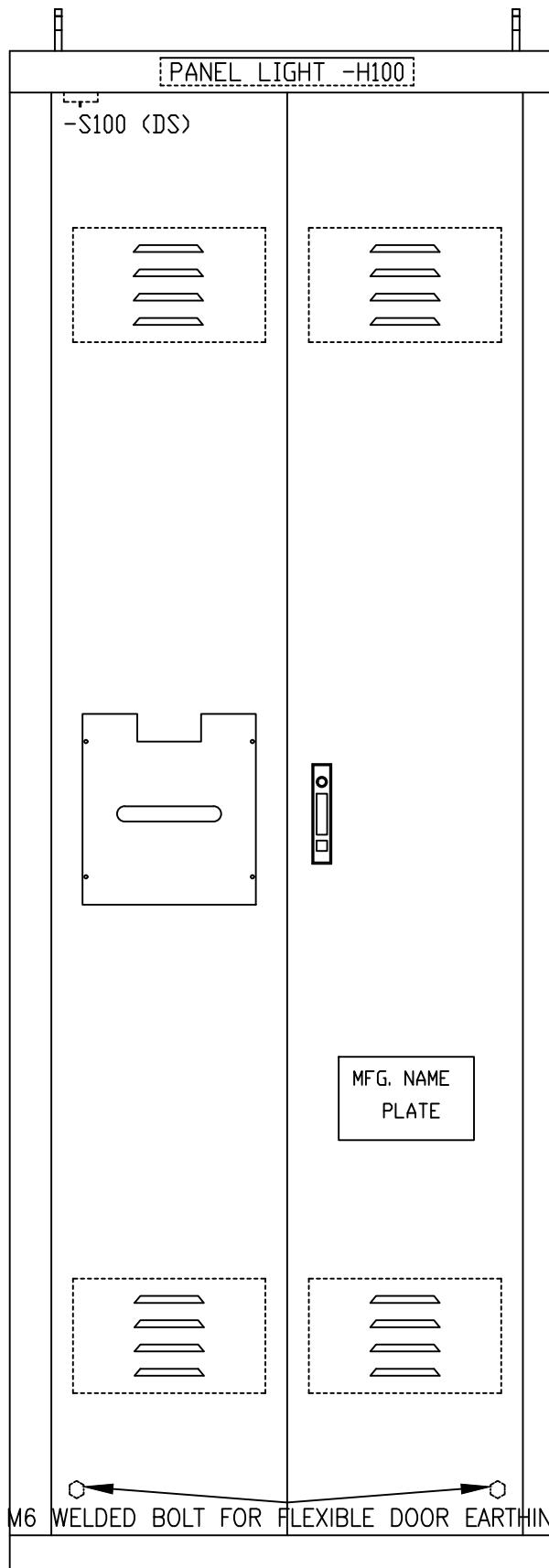
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REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AD	Sheet no. 06

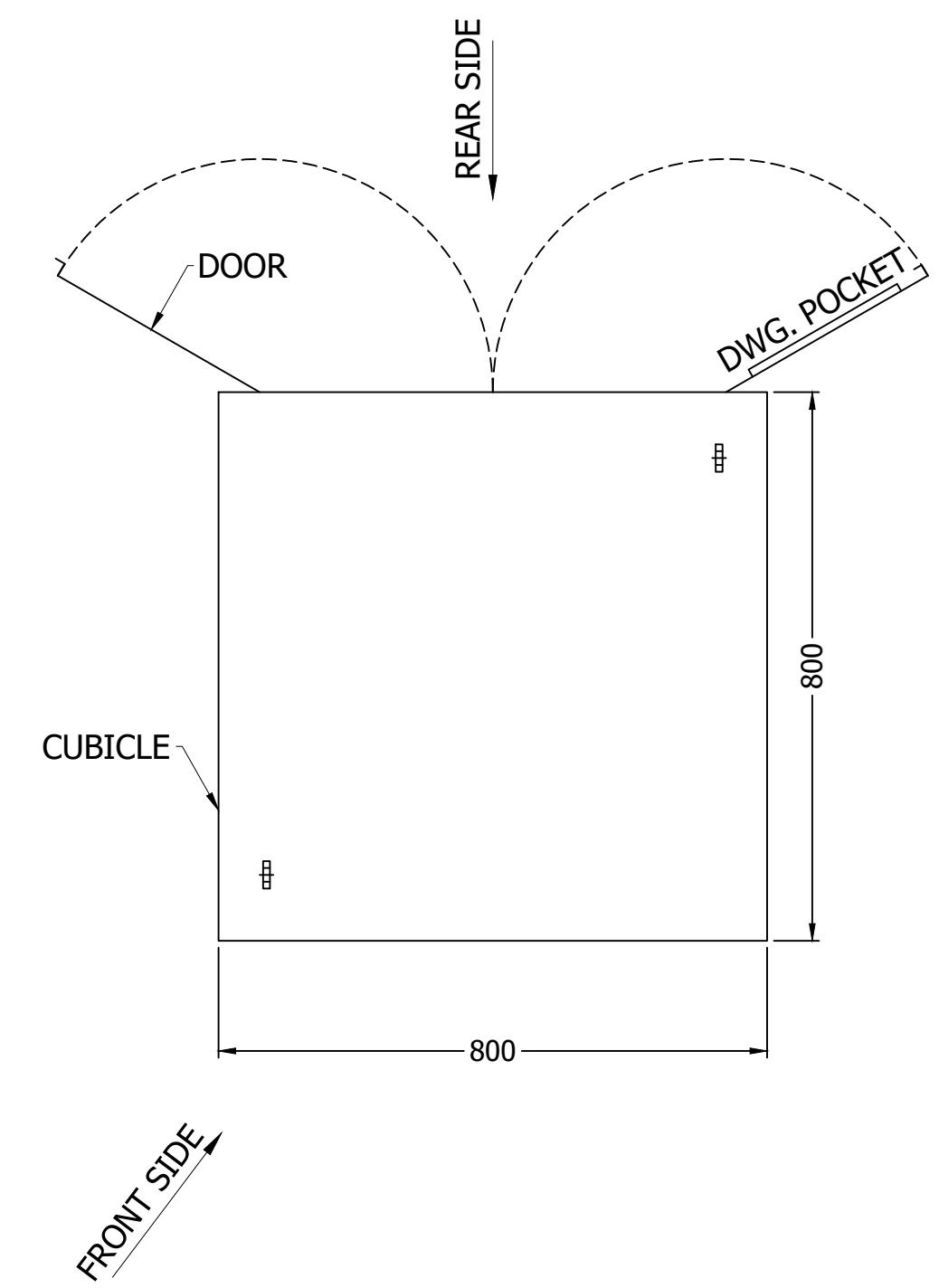
BACK VIEW WITHOUT DOOR



BACK VIEW WITH DOOR



TOP VIEW

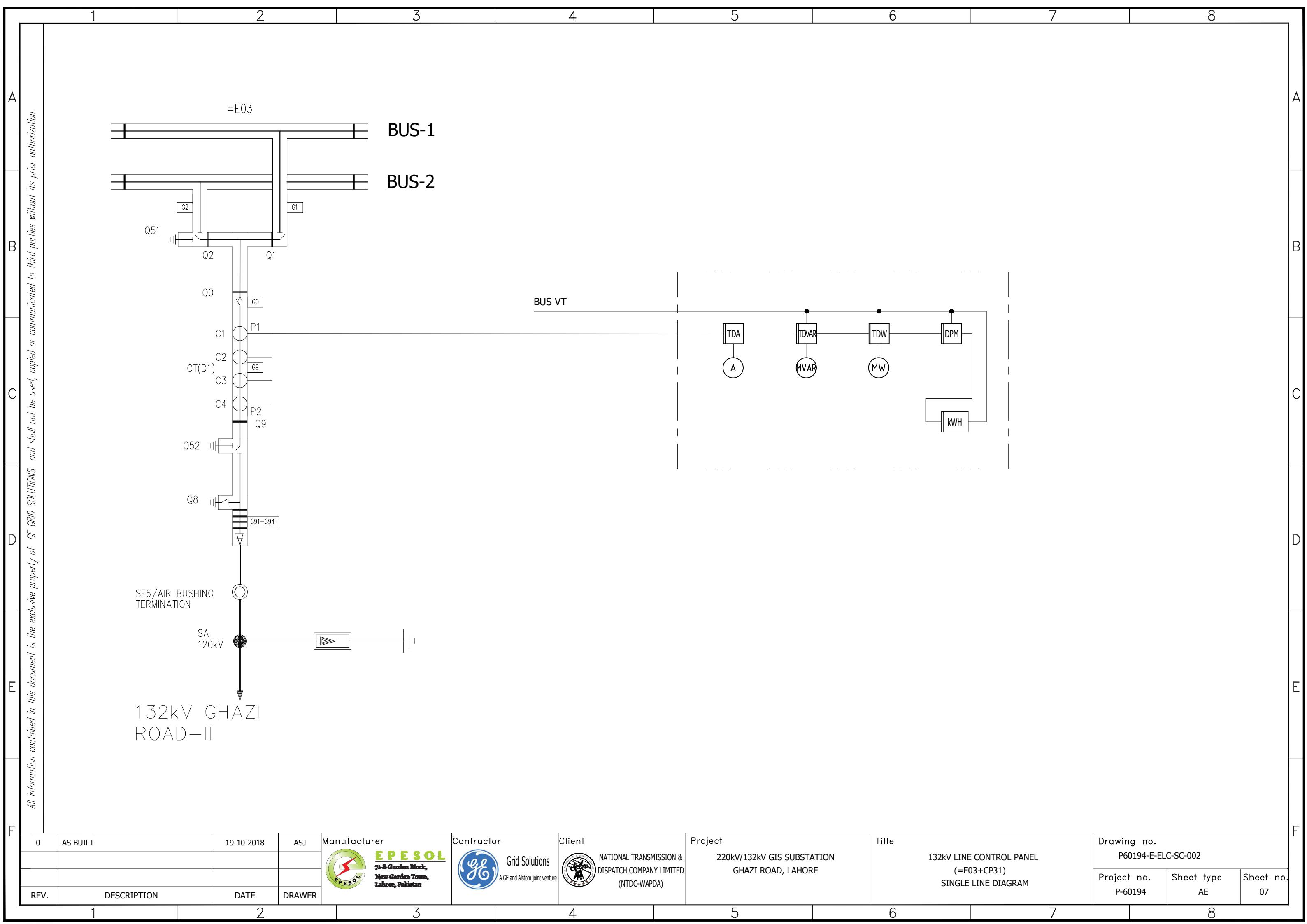


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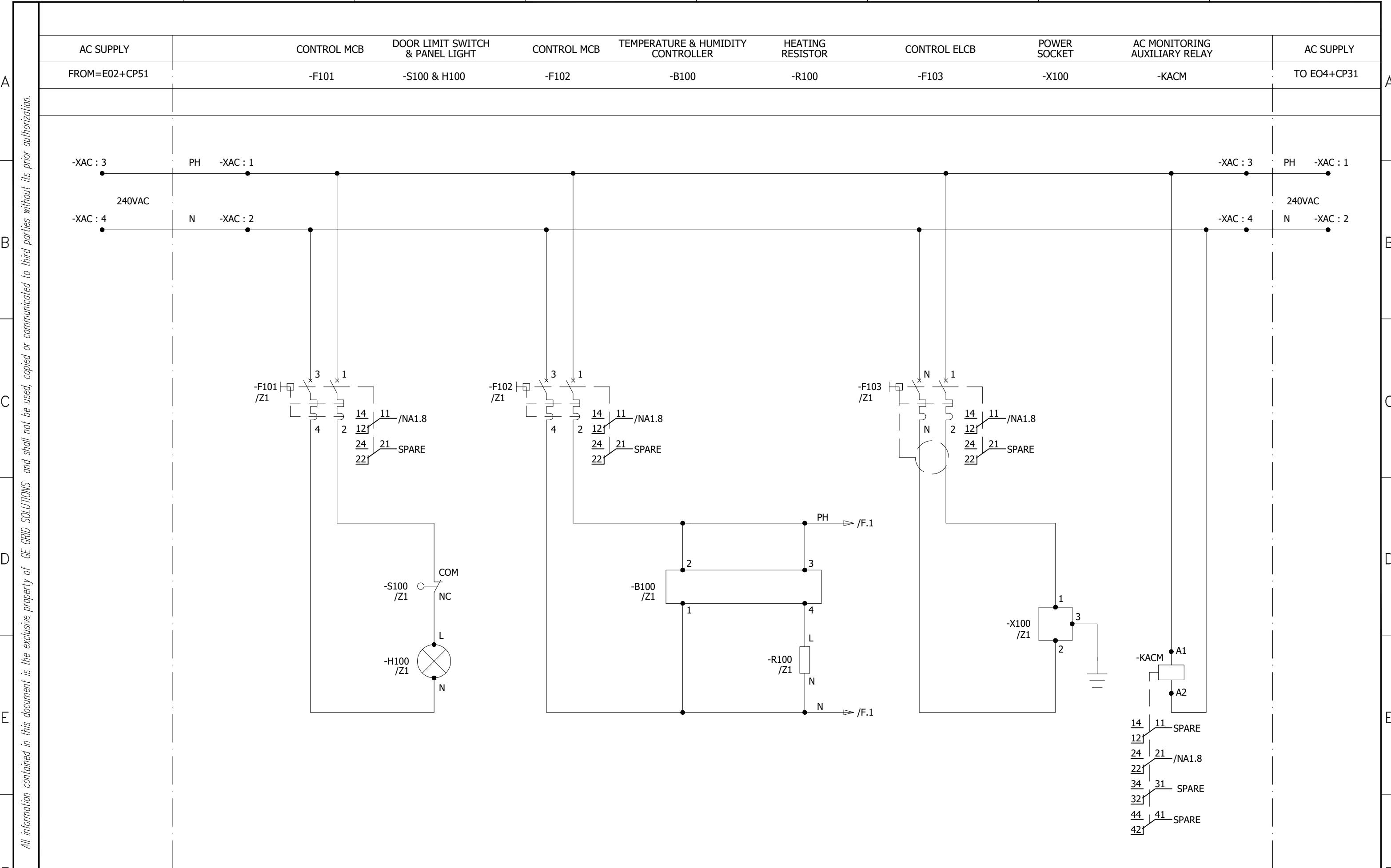
- 1 - PANEL DIMENSION: 800 x 800 x 2200mm (WxDxH)
- 2 - COLOR : RAL 7032
- 3 - SHEET THICKNESS : 2-2.5 mm
- 4- PROTECTION CLASS : IP-51 (INDOOR TYPE)
- 5 - ALL DOOR FITTED WITH 16mm EARTH STRAP & INSULATED WITH GREEN-YELLOW COLOUR.

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1 2 3 4 5 6 7 8



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

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1 2 3 4 5 6 7 8

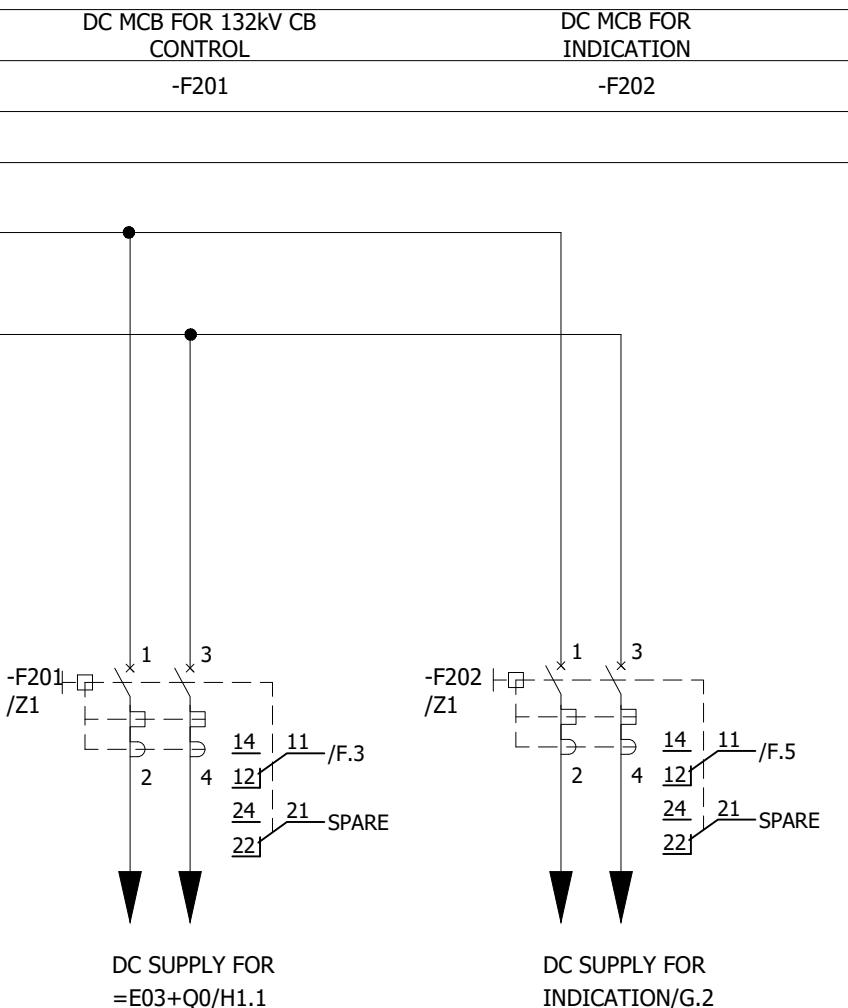
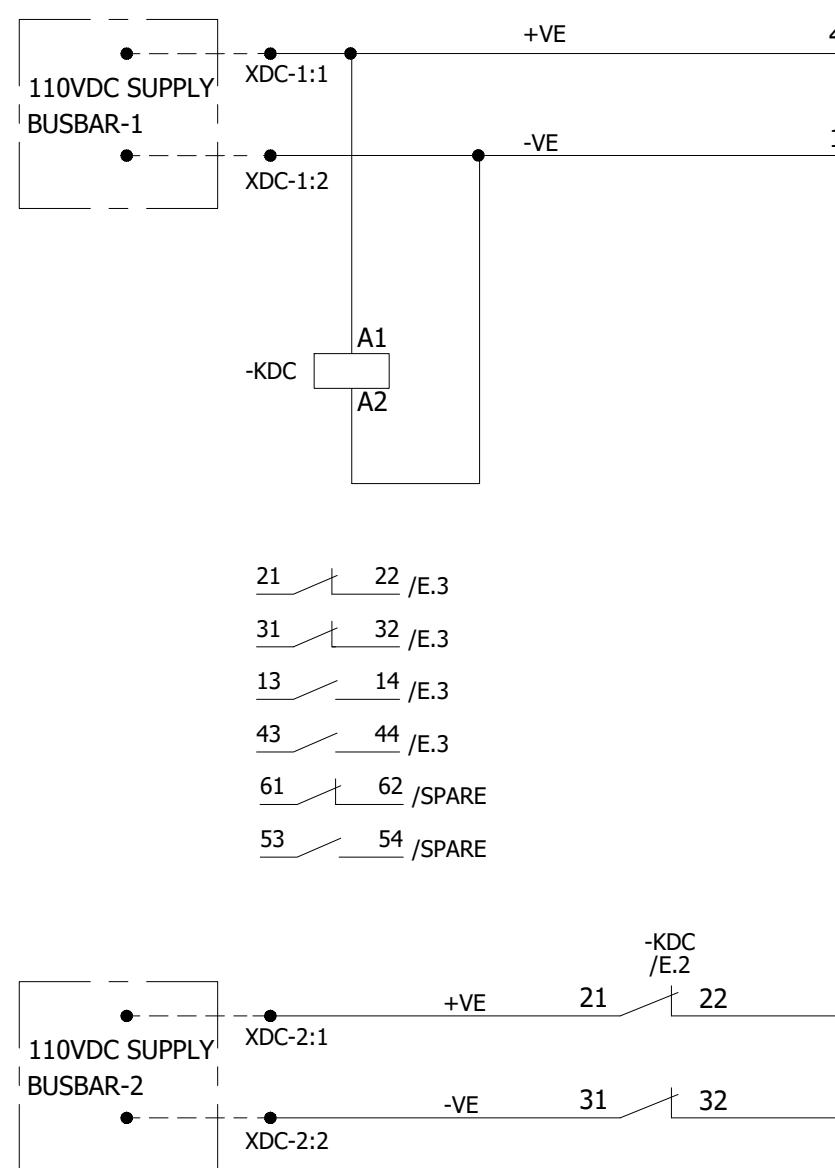
DC MCB FOR 132KV CB
CONTROL

-F201

DC MCB FOR
INDICATION

-F202

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0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPESOL 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 132KV LINE CONTROL PANEL (=E03+CP31) DC SUPPLY DISTRIBUTION CIRCUIT	Drawing no. P60194-E-ELC-SC-002
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type E Sheet no. 09

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

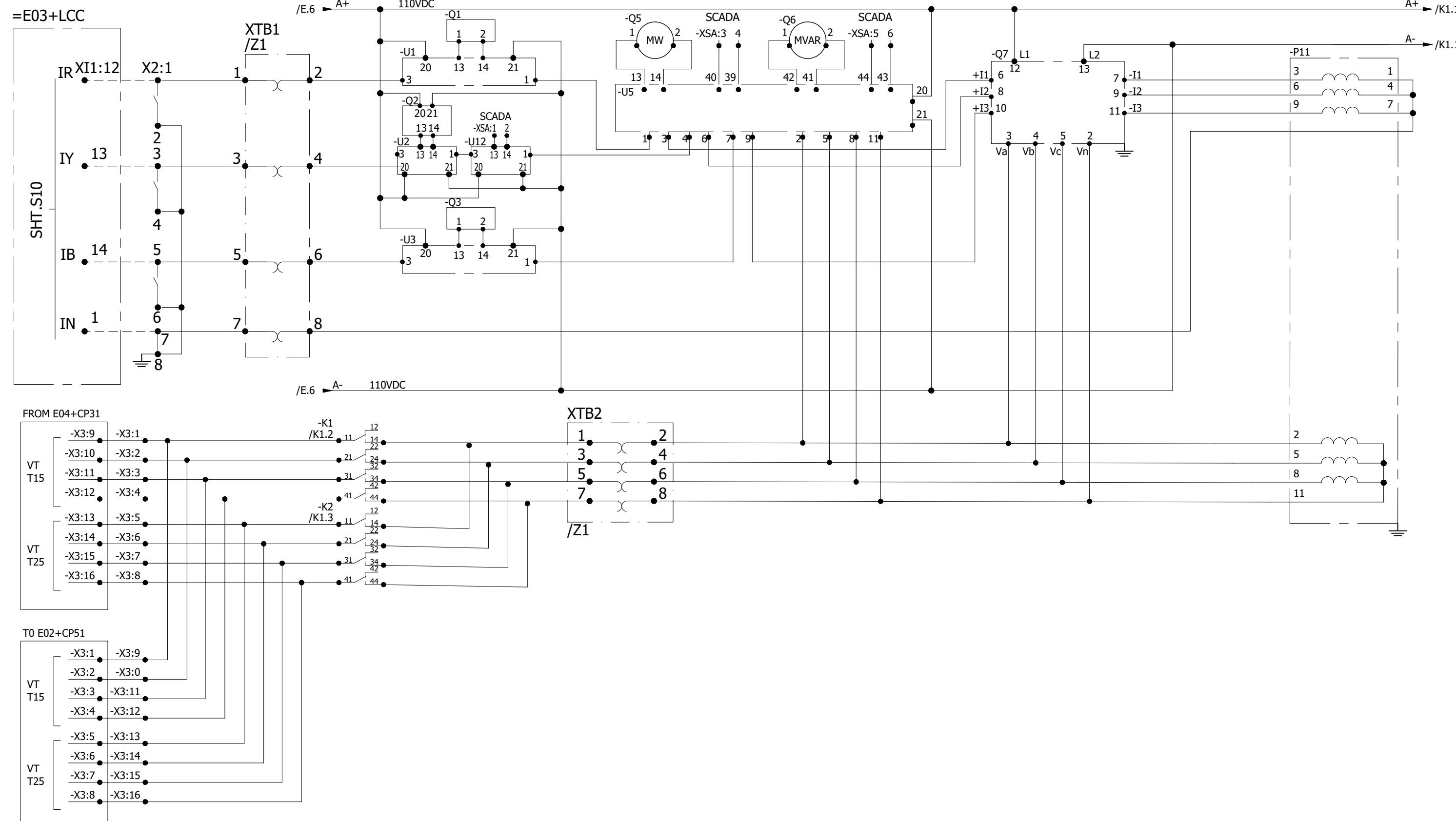
TS

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

WITH TRANSDUCER (-U5)

(-Q7)

(-P11)



0	AS BUILT	19.10.2018	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 132kV LINE CONTROL PANEL (-E03+CP31) METERING	Drawing no. P60194-E-ELC-SC-002
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type G
									Sheet no. 11

1 2 3 4 5 6 7 8

C O N T R O L R O O M

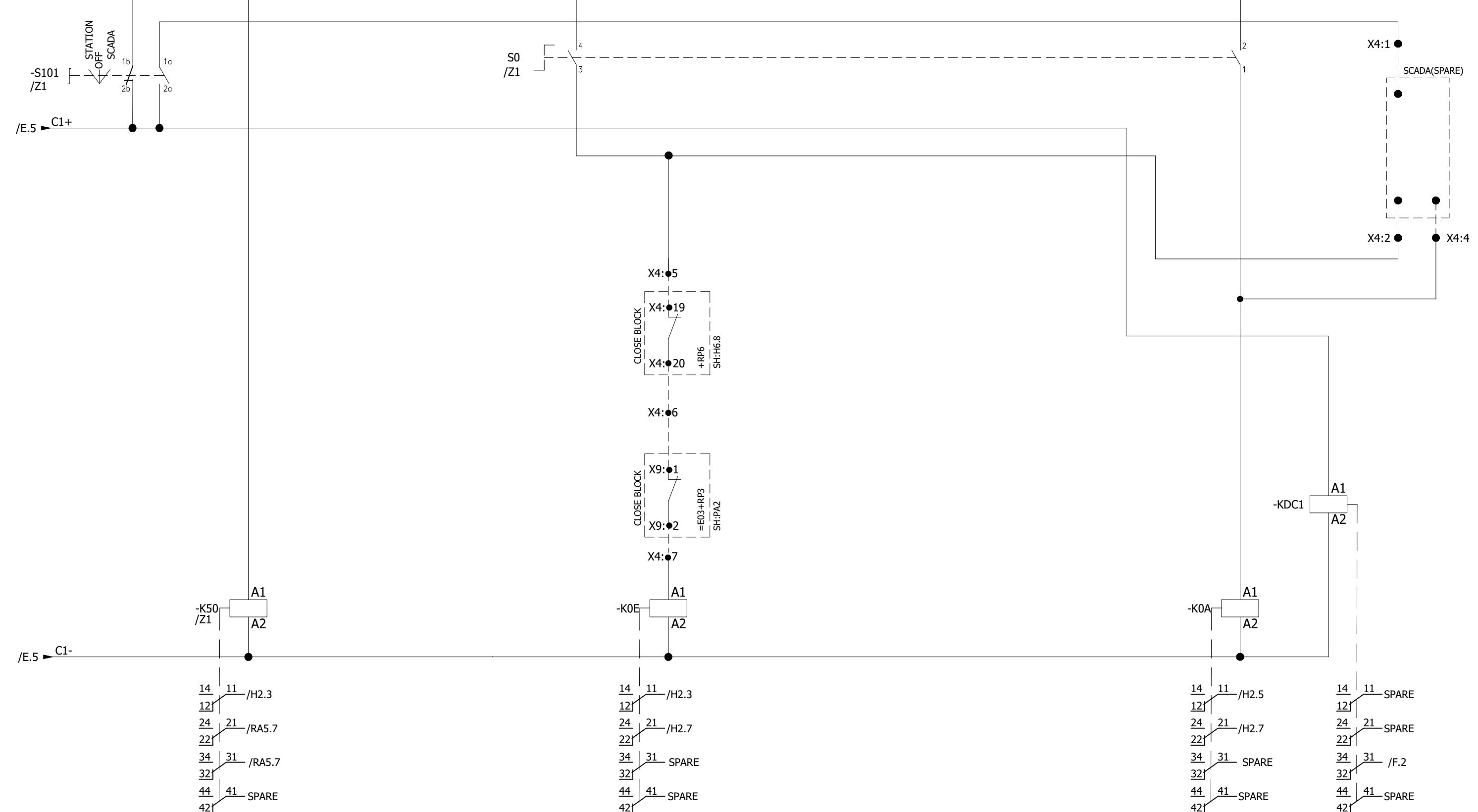
DC SUPERVISION
RELAY SCADA
CONTROL

CLOSE

OPEN KDC-1 CLOSE OPEN

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A



0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPESOL 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 132kV LINE CONTROL PANEL (=E03+CP31) CB CONTROL CIRCUIT	Drawing no. P60194-E-ELC-SC-002	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type H1	Sheet no. 12

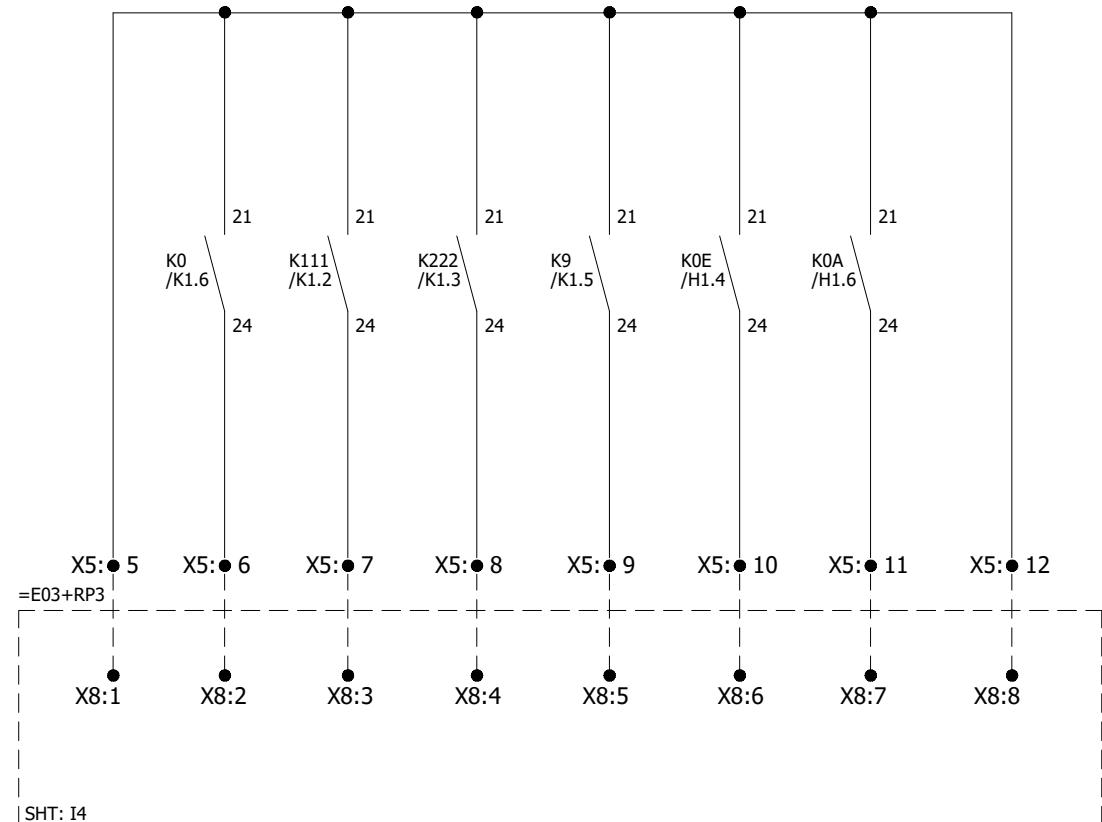
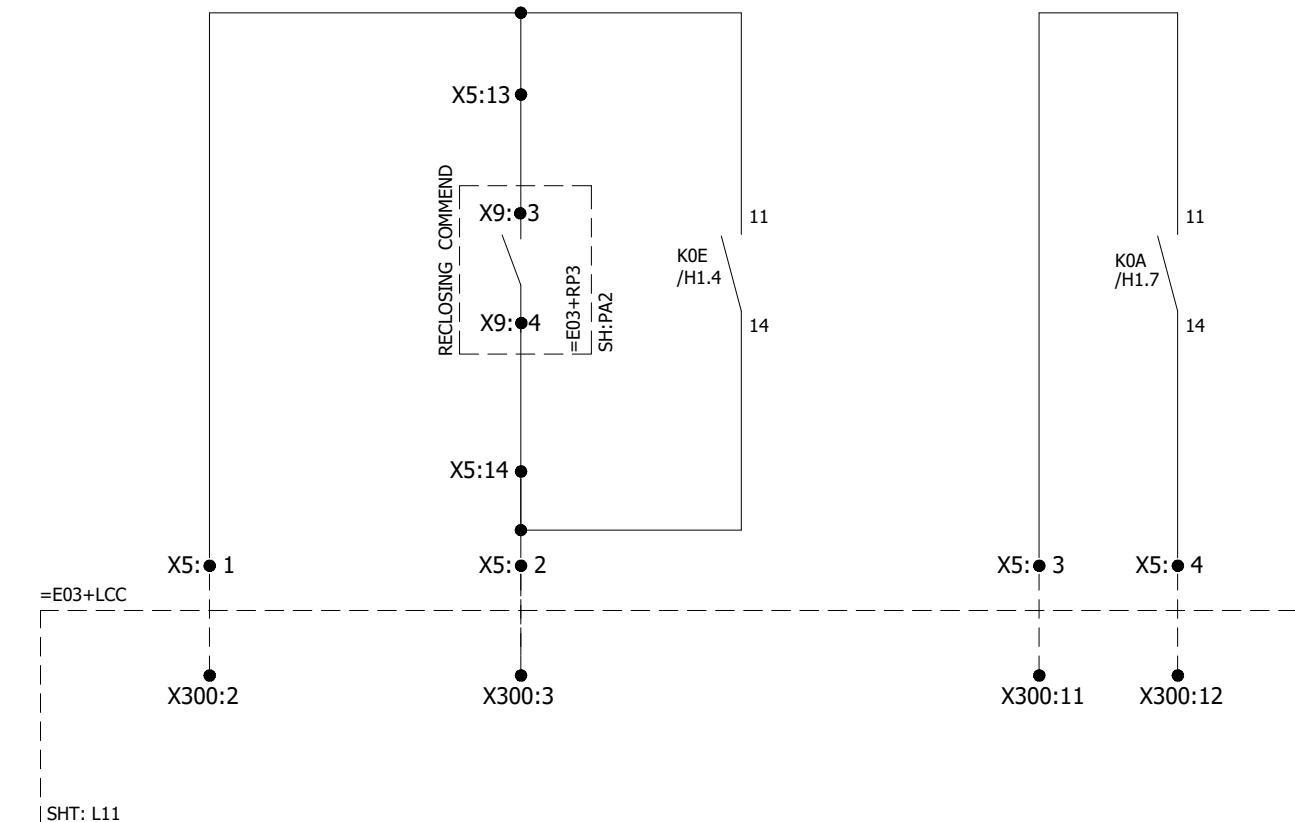
C O N T R O L R O O M C O N T R O L

AUTORECLOSE(SPARE)

CLOSE

OPEN

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CB CLOSE STATUS

Q1 CLOSE STATUS

Q2 CLOSE STATUS

Q9 CLOSE STATUS

MANUAL CLOSE INPUT FOR DISTANCE RELAY

MANUAL OPEN INPUT FOR DISTANCE RELAY

0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPESOL 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 132kV LINE CONTROL PANEL (=E03+CP31) CB CONTROL CIRCUIT	Drawing no. P60194-E-ELC-SC-002
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type H2
									Sheet no. 13

1 2 3 4 5 6 7 8

=E03+Q1

=E03+Q2

=E03+Q9

CLOSE

OPEN

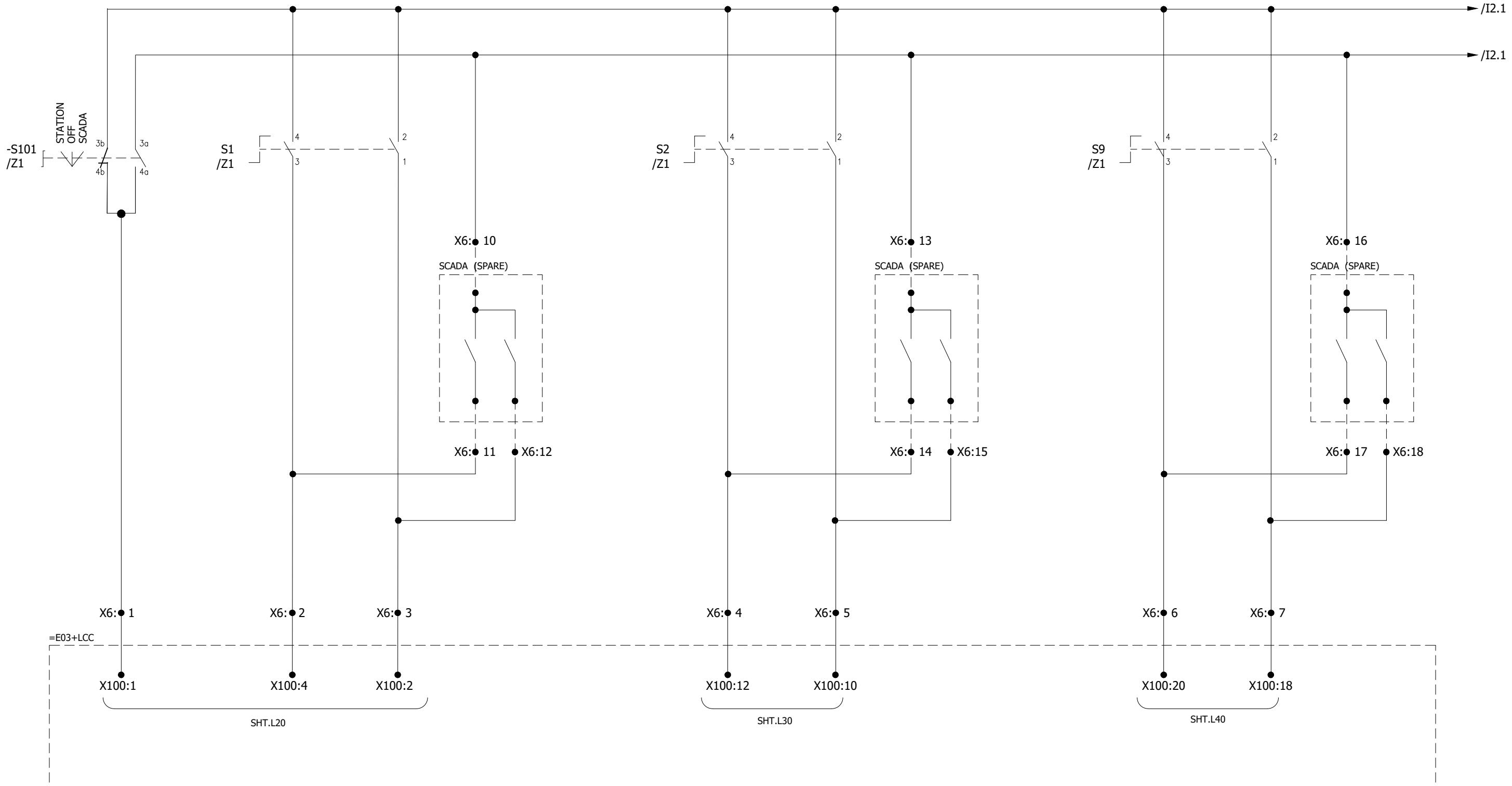
CLOSE

OPEN

CLOSE

OPEN

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0	AS BUILT	19-10-2018	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 132KV LINE CONTROL PANEL (=E03+CP31) DISCONNECTOR & EARTH SWITCH CONTROL	Drawing no. P60194-E-ELC-SC-002
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type I1
									Sheet no. 14

1 2 3 4 5 6 7 8

1

1

1

1

4

6

7

1

CLOSE

OP

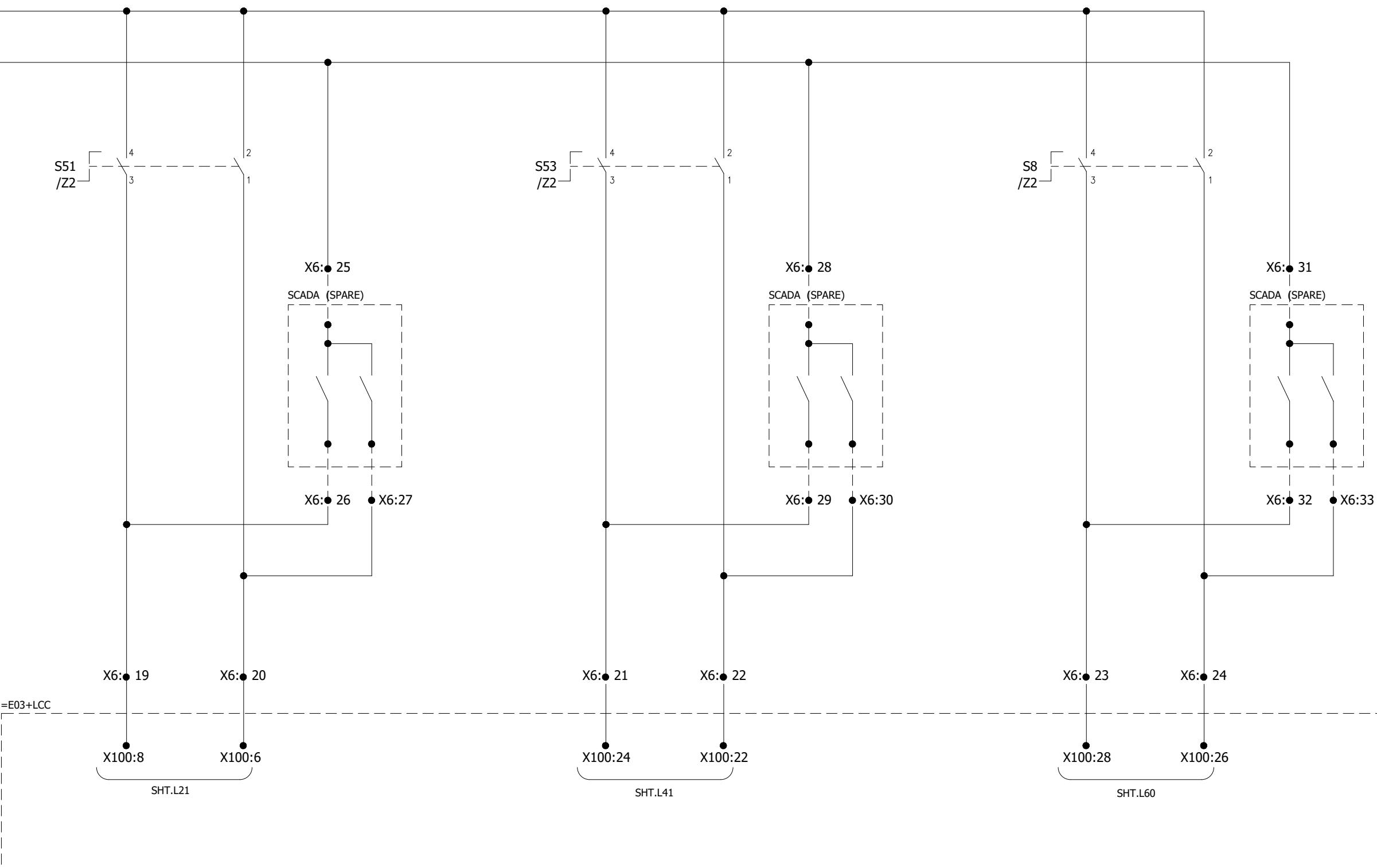
CLOSE

OPEN

CLOSE

OPEN

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0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	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 GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL <small>(=E03+CP31)</small> DISCONNECTOR & EARTH SWITCH CONTROL	Drawing no.		
									P60194-E-ELC-SC-002		
									Project no.	Sheet type	Sheet no.
REV.	DESCRIPTION	DATE	DRAWER						P-60194	I2	15

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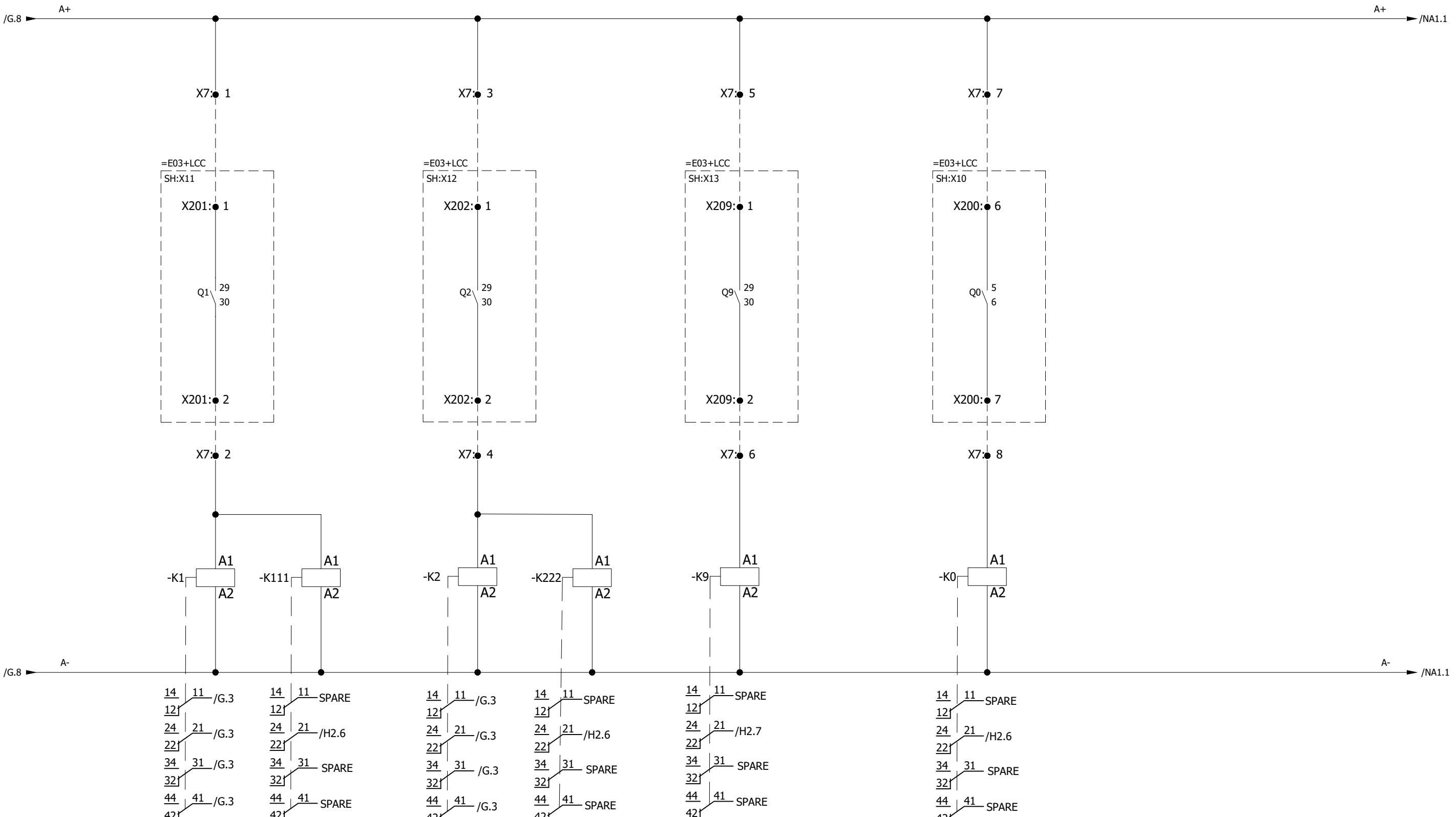
CONTACT
MULTIPLICATION

BUSBAR-1
ISOLATOR
=E03+Q1

BUSBAR-2
ISOLATOR
=E03+Q2

LINE
ISOLATOR
=E03+Q9

CIRCUIT
BREAKER
=E03+Q0



A

A

B

B

C

C

D

D

E

E

F

F

1

2

3

4

5

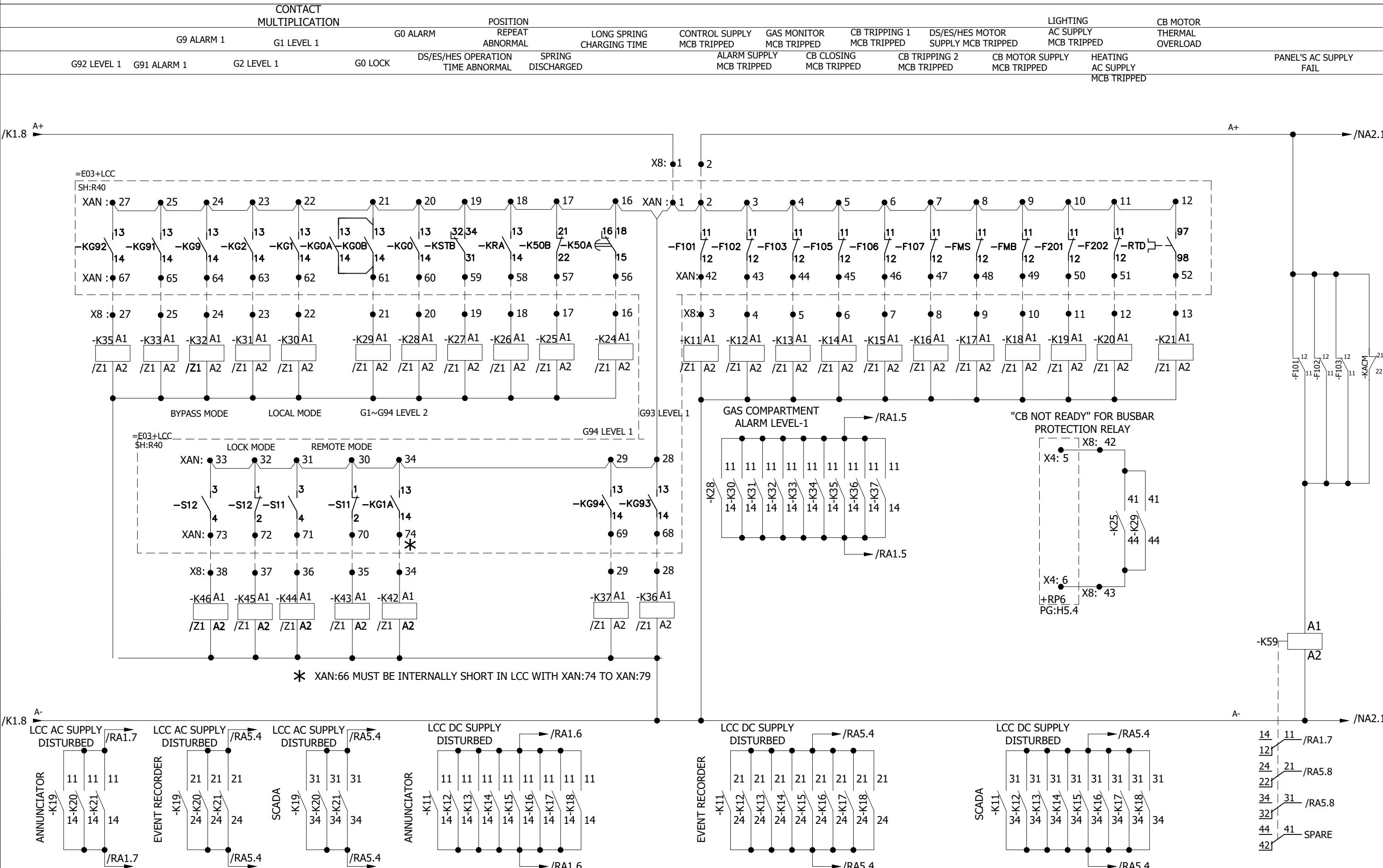
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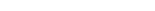
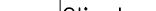
7

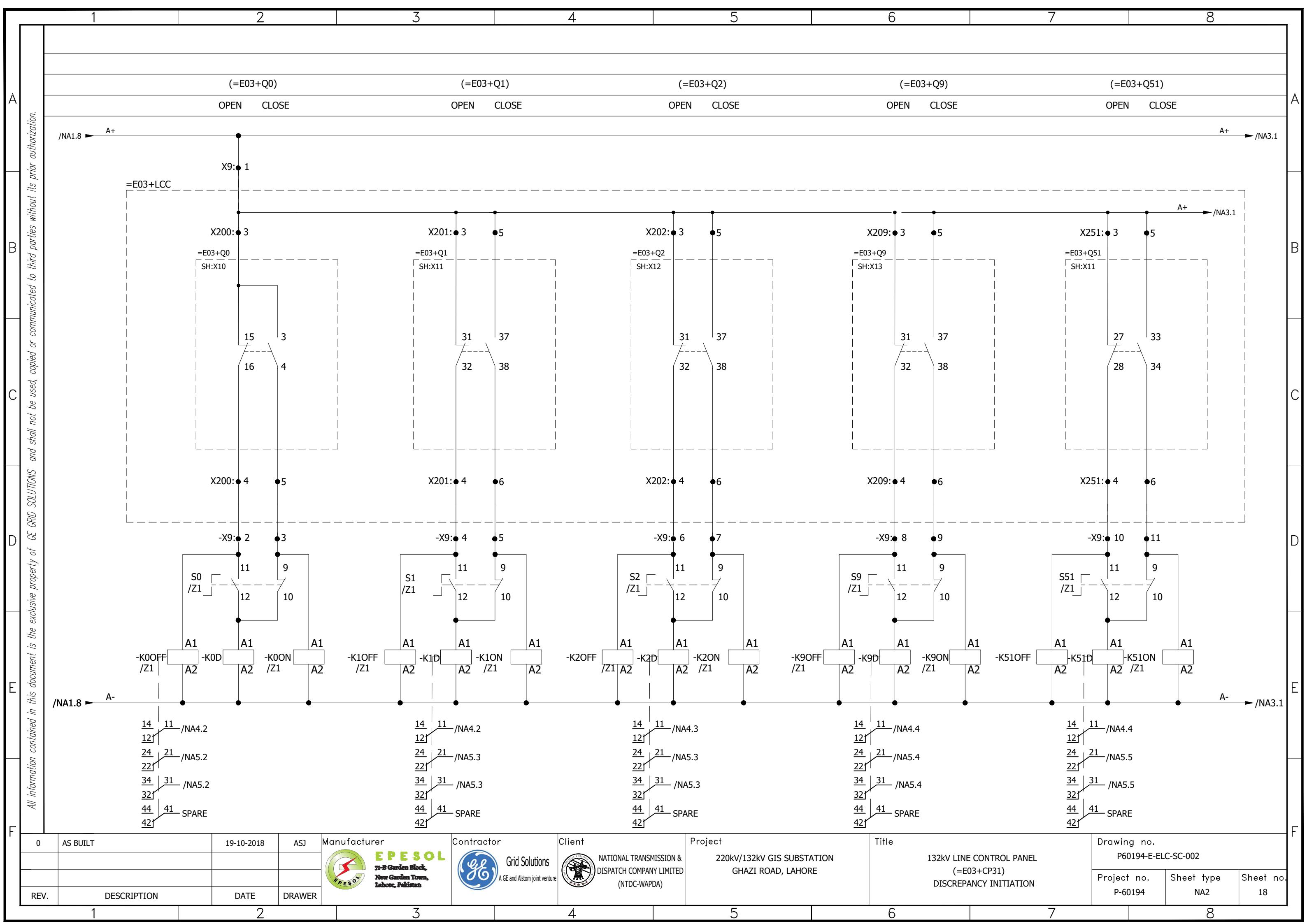
8

0	AS BUILT	19-10-2018	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	132kV LINE CONTROL PANEL (=E03+CP31) CB/DISCONNECTOR CONTACT MULTIPLICATION	P60194-E-ELC-SC-002		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type K1	Sheet no. 16

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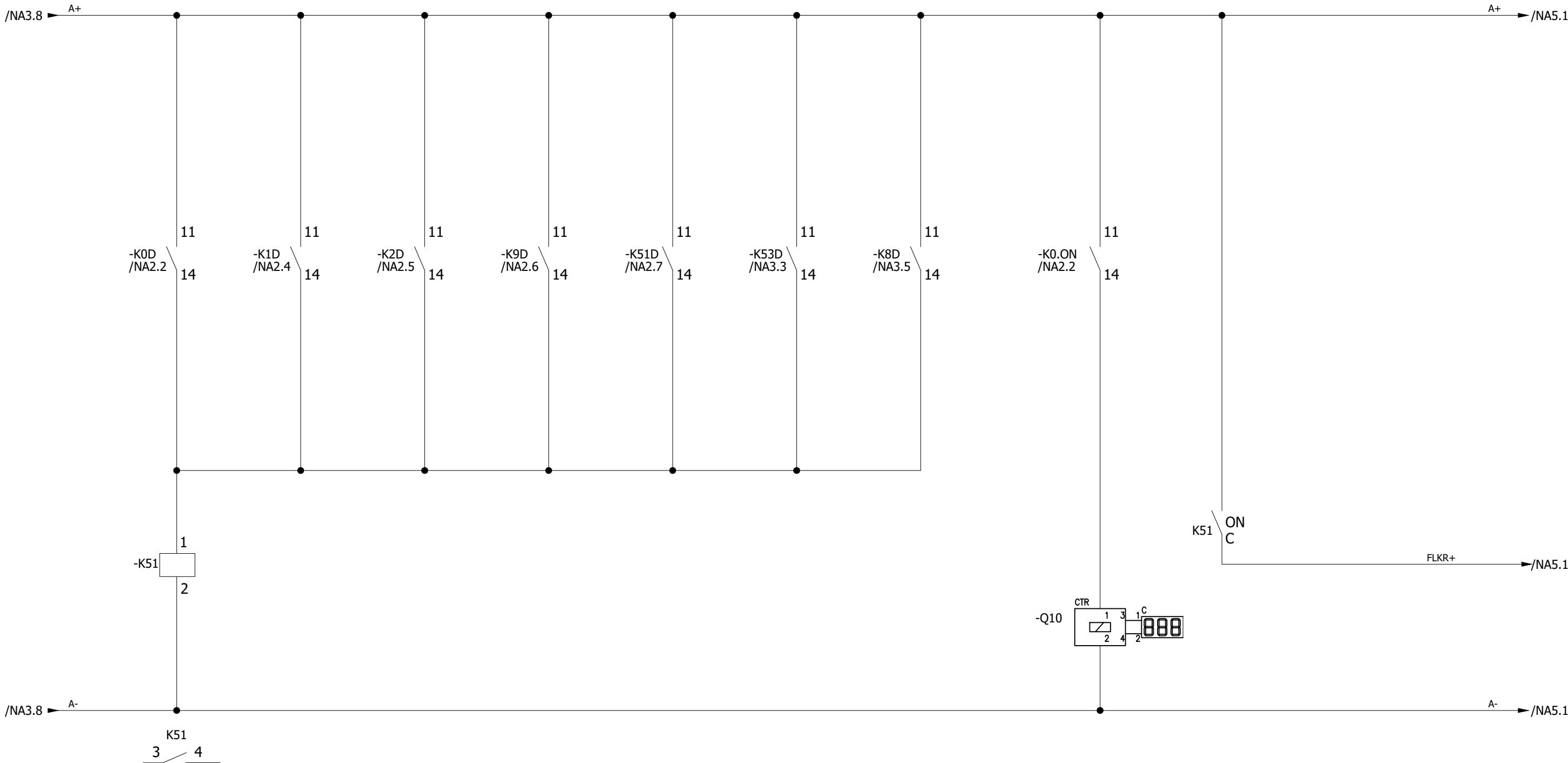


0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220KV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E03+CP31) ALARM MULTIPLICATION	Drawing no. P60194-E-ELC-SC-002		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type NA1	Sheet no. 17



1 2 3 4 5 6 7 8

OFF/ON (=E03+Q0)	OFF/ON (=E03+Q1)	OFF/ON (=E03+Q2)	OFF/ON (=E03+Q9)	OFF/ON (=E03+Q51)	OFF/ON (=E03+Q53)	OFF/ON (=E03+Q8)	CIRCUIT BREAKER OPERATION COUNTER (-Q10)
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0	AS BUILT	19-10-2018	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 132kV LINE CONTROL PANEL (=E03+CP31) DISCREPANCY INITIATION	Drawing no. P60194-E-ELC-SC-002
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type NA4
									Sheet no. 20

1 2 3 4 5 6 7 8

1

2

3

4

5

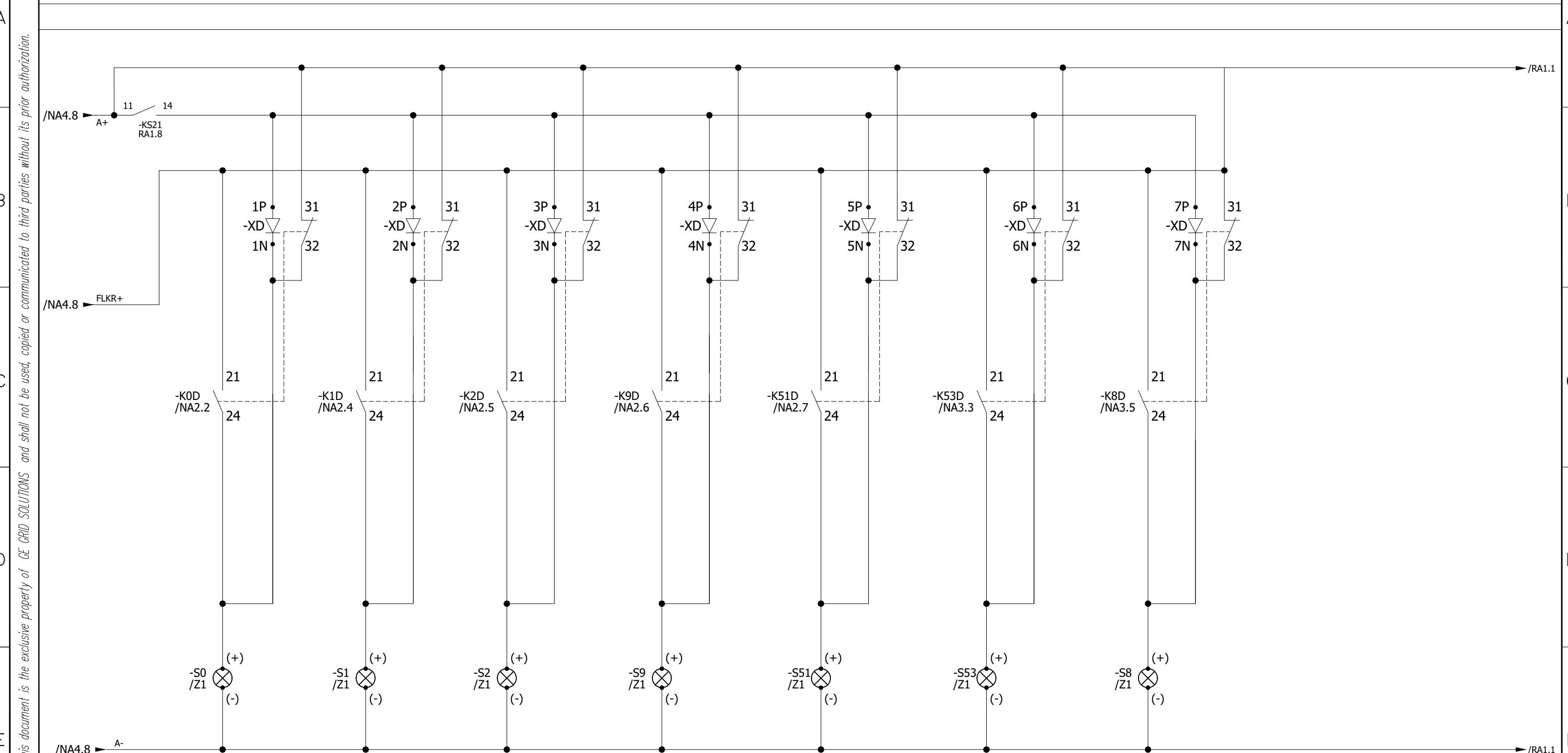
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7

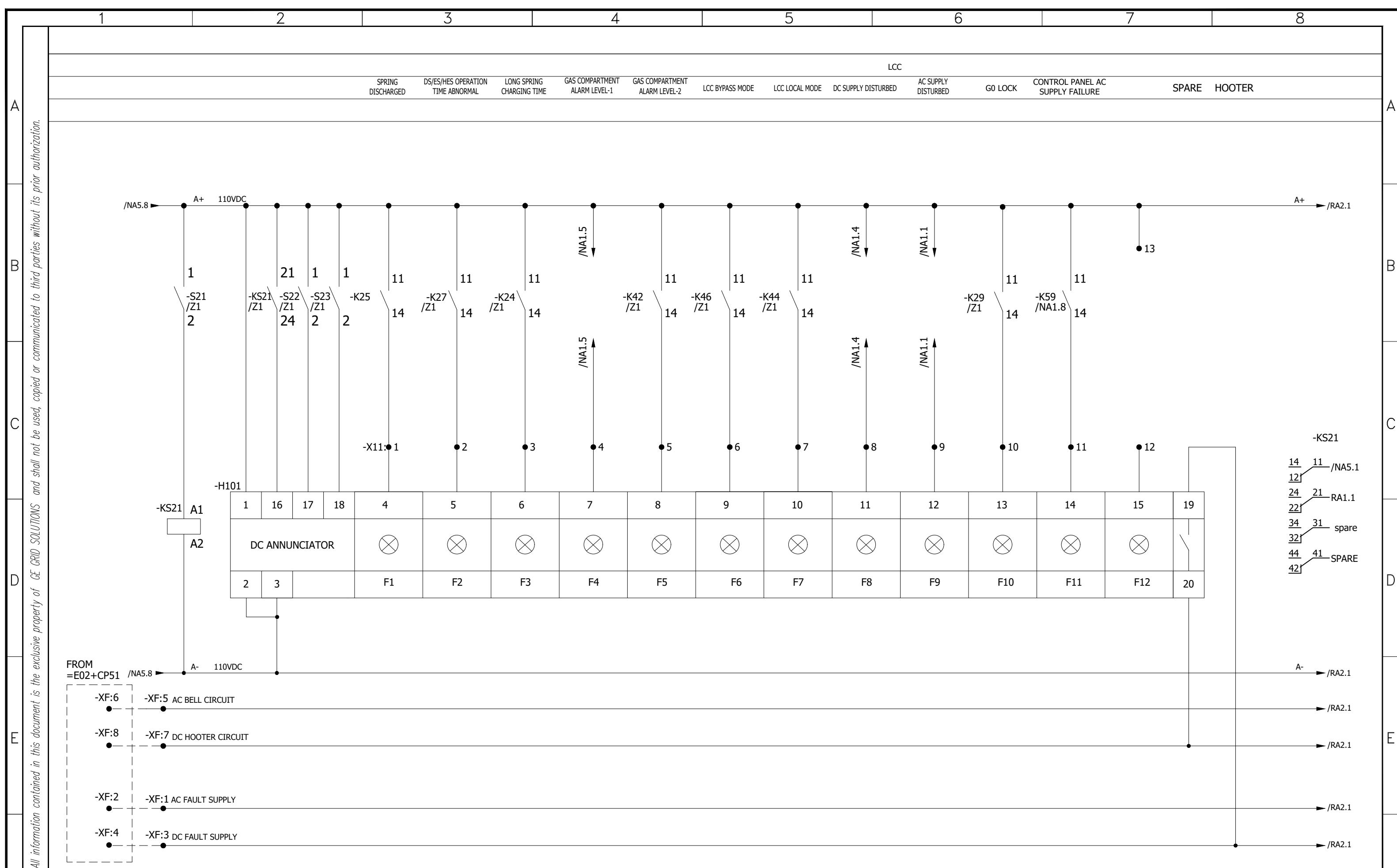
8

(=E03+Q0) (=E03+Q1) (=E03+Q2) (=E03+Q9) (=E03+Q51) (=E03+Q53) (=E03+Q8)

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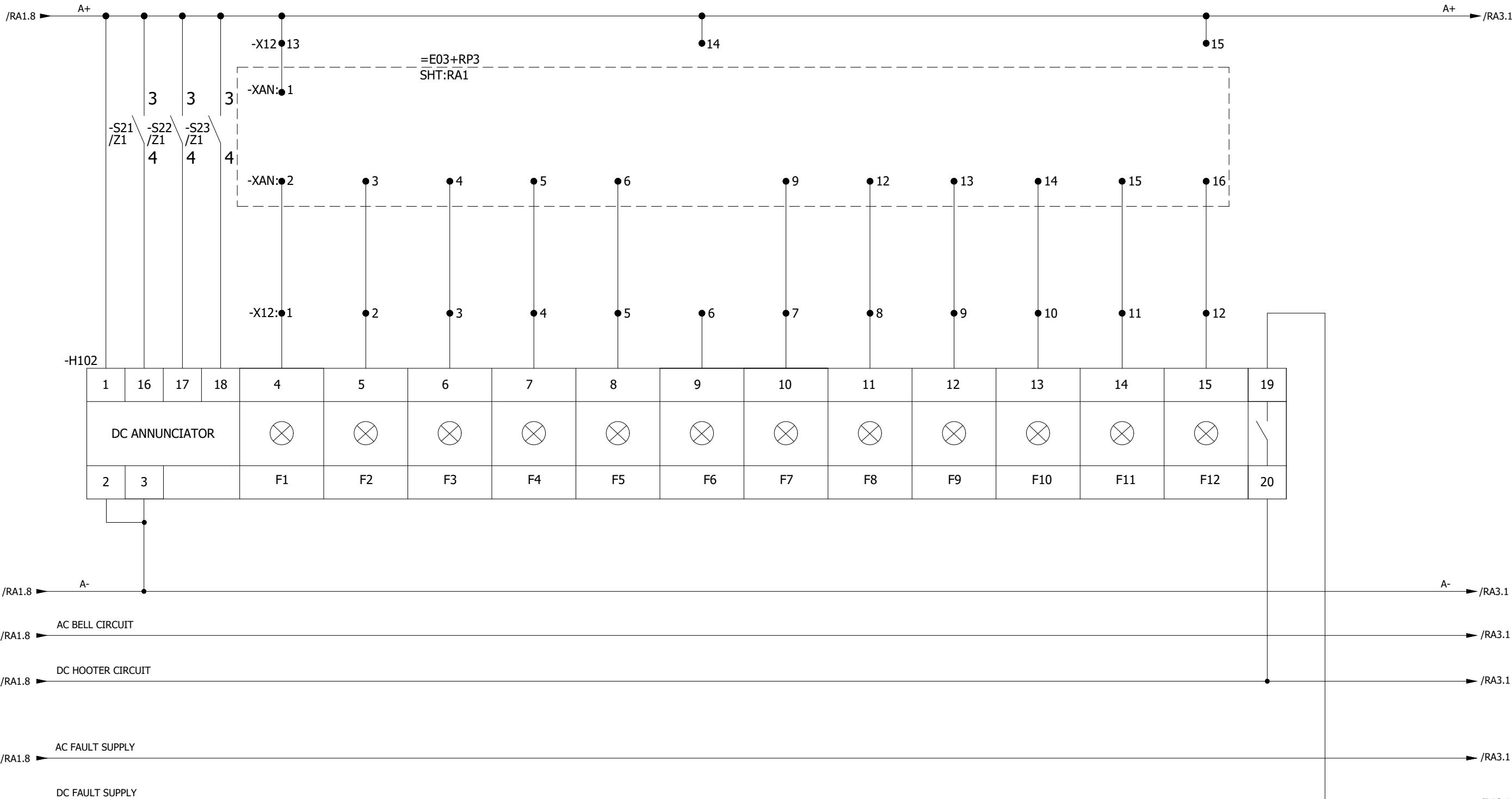


0	AS BUILT		19-10-2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132KV LINE CONTROL PANEL (=E03+CP31) DISCREPANCY INDICATIONS	Drawing no. P60194-E-ELC-SC-002		
REV.	DESCRIPTION		DATE	DRAWER						Project no. P-60194	Sheet type NA5	Sheet no. 21
1	2	3	4	5	6	7	8					



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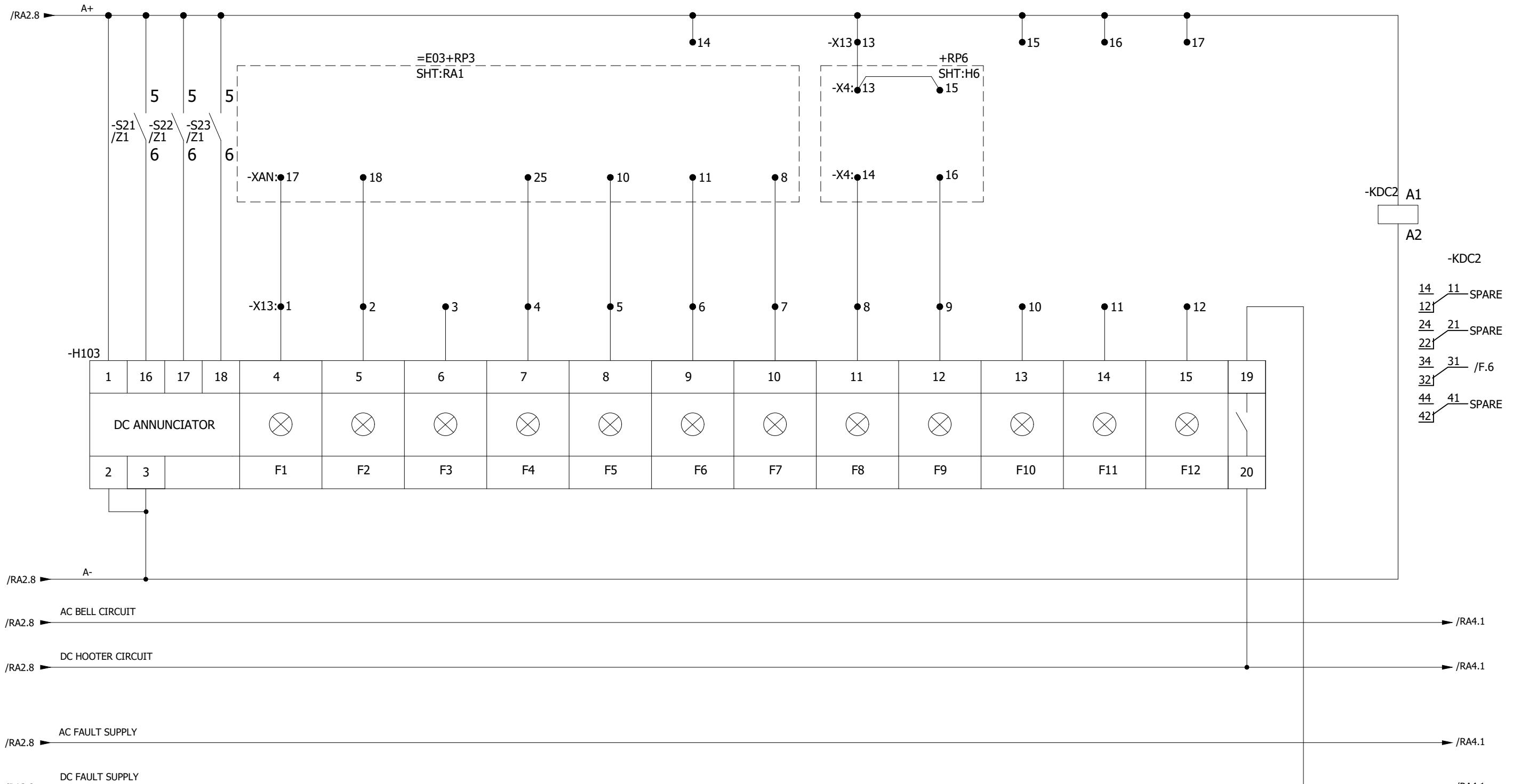
RED PHASE TRIP	YELLOW PHASE TRIP	BLUE PHASE TRIP	ZONE-1 TRIP	ZONE-2/3 TRIP	SPARE	POWER SWING DETECTED	SOTF OPERATED	AUTORECLOSE OPERATED	AUTORECLOSE BLOCKED	LINE DIFFERENTIAL PROTECTION	SPARE	HOOTER
											RELAY FAULTY	



0	AS BUILT	19-10-2018	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 132kV LINE CONTROL PANEL (=E03+CP31) ANNUNCIATOR-2 CIRCUIT	Drawing no. P60194-E-ELC-SC-002		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type RA2	Sheet no. 23
1	2	3	4	5	6	7	8	9	10	11	12

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

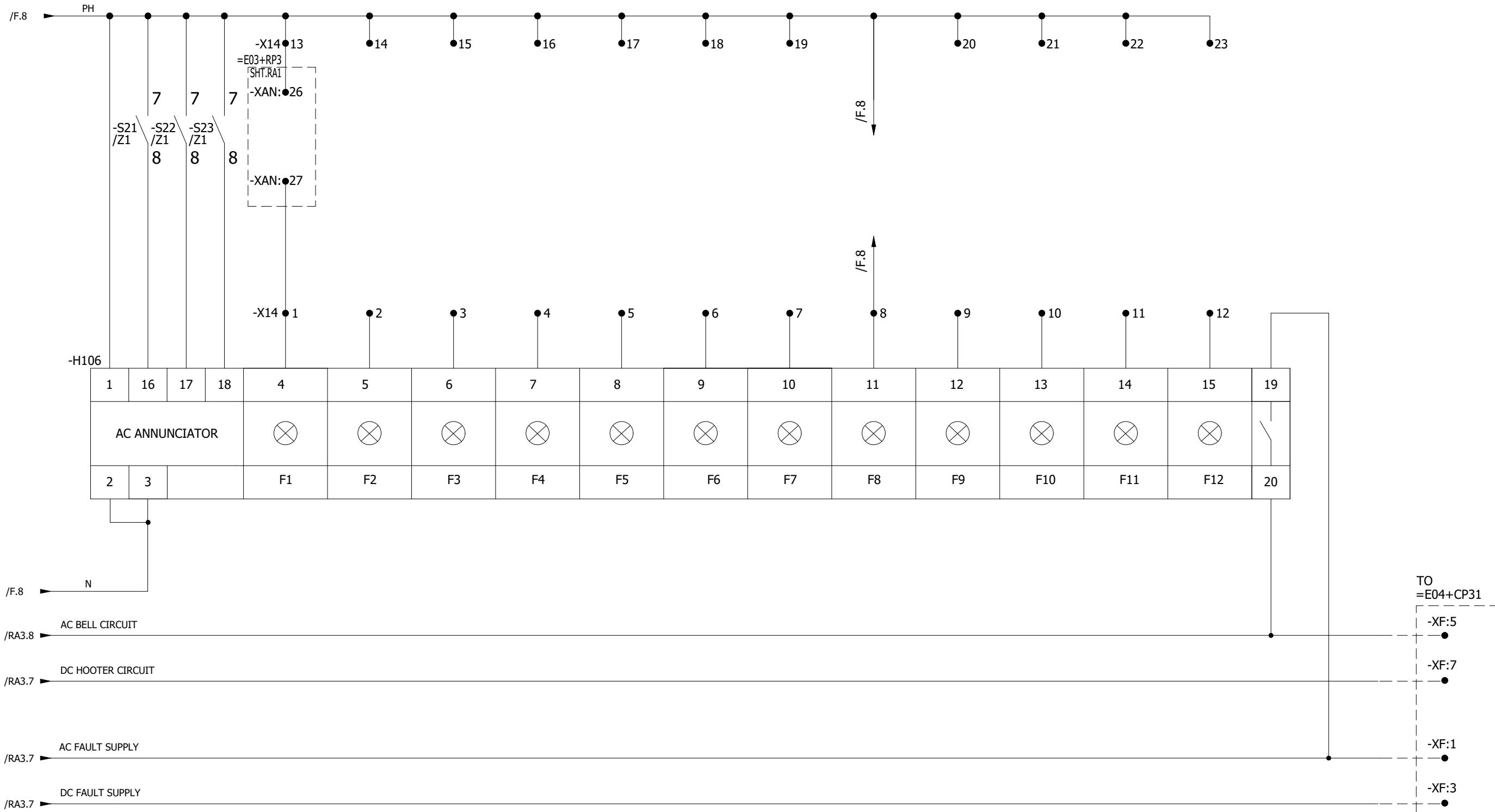
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0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPE SOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E03+CP31) ANNUNCIATOR-3 CIRCUIT	Drawing no. P60194-E-ELC-SC-002
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type RA3
									Sheet no. 24

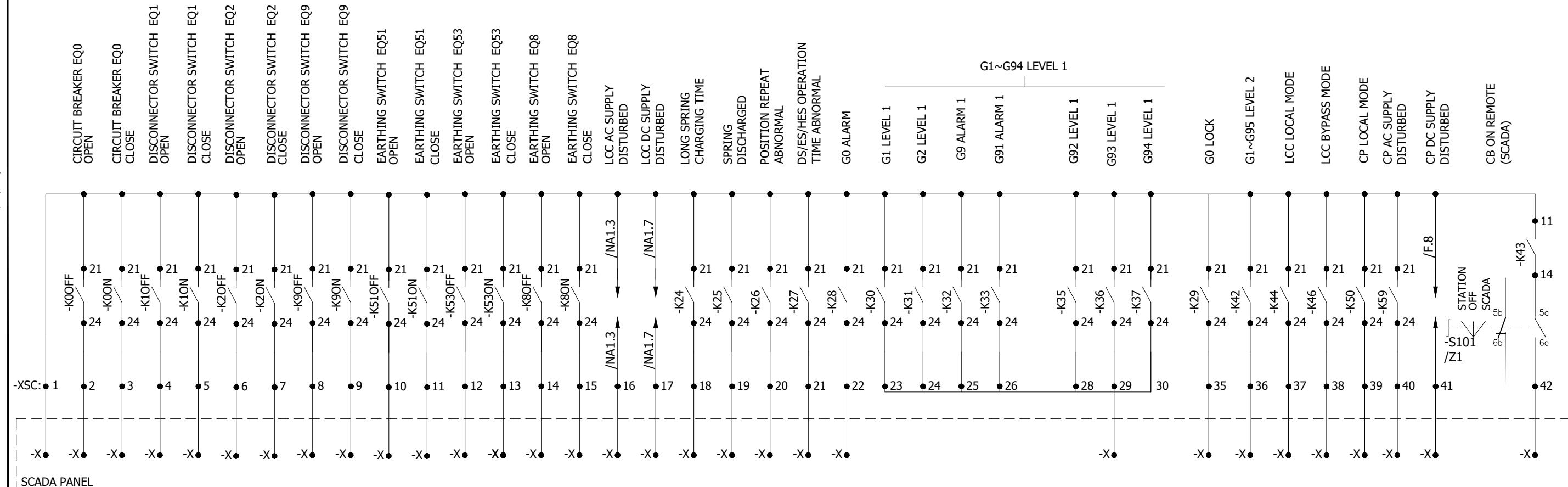
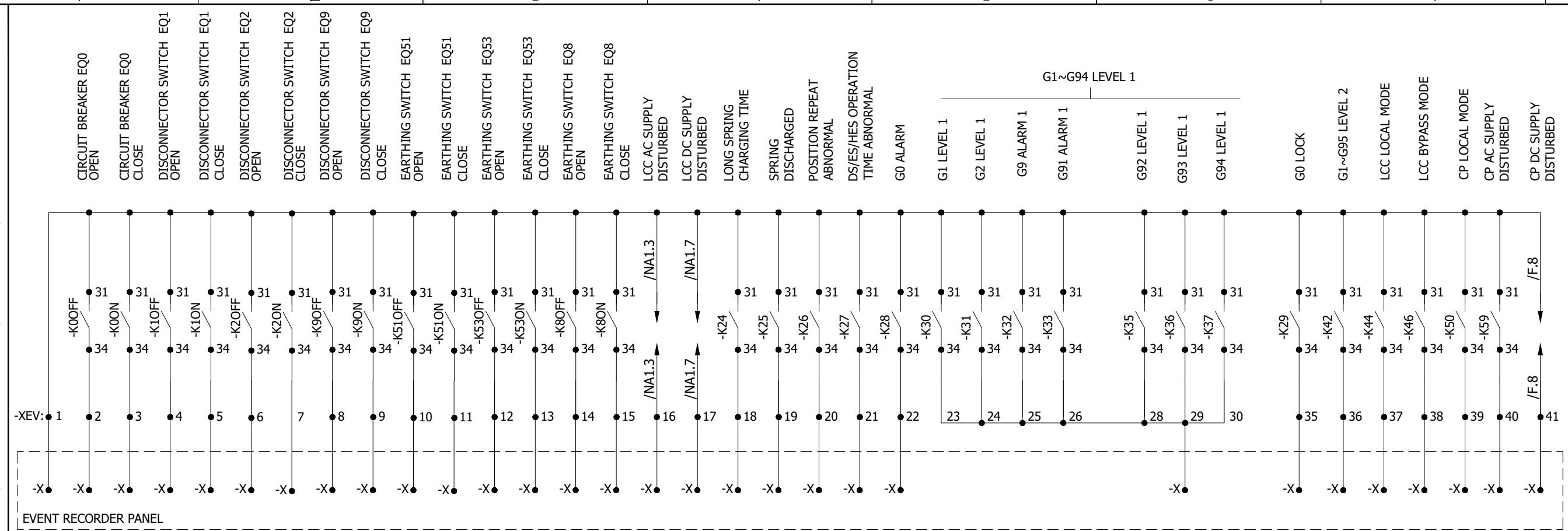
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LINE RELAY PANEL
110VDC
CIRCUIT/SUPPLY FAULTY SPARE SPARE SPARE SPARE SPARE SPARE CONTROL PANEL
DC FAIL SPARE SPARE SPARE SPARE AC BELL



0	AS BUILT	19-10-2018	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 132kV LINE CONTROL PANEL (=E03+CP31) ANNUNCIATOR-4 CIRCUIT	Drawing no. P60194-E-ELC-SC-002
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type RA4 Sheet no. 25

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0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	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 GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL <small>(=E03+CP31)</small> SCADA & ER SIGNALS	Drawing no.		
									P60194-E-ELC-SC-002		
									Project no.		
									P-60194	Sheet type	Sheet no.
REV.	DESCRIPTION	DATE	DRAWER						RA5	26	

