

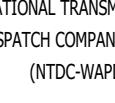


Grid Solutions

A GE and Alstom joint venture

220kV/132kV GIS SUBSTATION GHAZI ROAD , LAHORE

132kV LINE CONTROL PANEL SCHEMATIC DRAWINGS

	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	19.10.2018	ASJ	Manufacturer  EPESOL 7-E 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 (=E04+CP31) LIST OF CONTANTS	Drawing no. P60194-E-ELC-SC-003					
	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	19.10.2018	ASJ	Manufacturer EPEPSOL 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 (=E04+CP31) SYMBOL AND LEGENDS	Drawing no. P60194-E-ELC-SC-003
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: MCUP4			-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				
T	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 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 (=E04+CP31) COMPONENT LIST	Drawing no. P60194-E-ELC-SC-003	
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				
	62	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 -K36, -K42 TO -K46, -K59 -KOFF, -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: MCRC022ATWN-B+MARN21AT			-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				
B	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				
	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, 10kA @ 240VAC, 2 C/O Contacts, Ord: G62C02+CAH(2)			-F101, -F102	GE				
C	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				
	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  EPE SOL 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 (=E04+CP31) COMPONENT LIST	Drawing no. P60194-E-ELC-SC-003	
F	REV.	DESCRIPTION	DATE	DRAWER					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				
B	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				
C	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				
D	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					
E	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				
F	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				
G	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  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		Drawing no. P60194-E-ELC-SC-003	
REV.	DESCRIPTION		DATE	DRAWER					Project no. P-60194	Sheet type AC3	Sheet no. 05a

1	2	3	4	5	6	7	8			
A	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS		DEVICE DESIGNITION	MANUFACTURER				
	08	TERMINAL BLOCKS FOR METERING CT	TYPE: SCB-6		-X2	CABUR				
07 TERMINAL BLOCKS WITH DIODE TYPE IN-D4007, RATED MAXIMUM VOLTAGE 350VDC, RATED BREAK DOWN VOLTAGE 430VDC		TYPE: DAS.4/6		-XD		CABUR				
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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 (=E04+CP31) COMPONENT LIST	Drawing no. P60194-E-ELC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AC4	Sheet no. 05b

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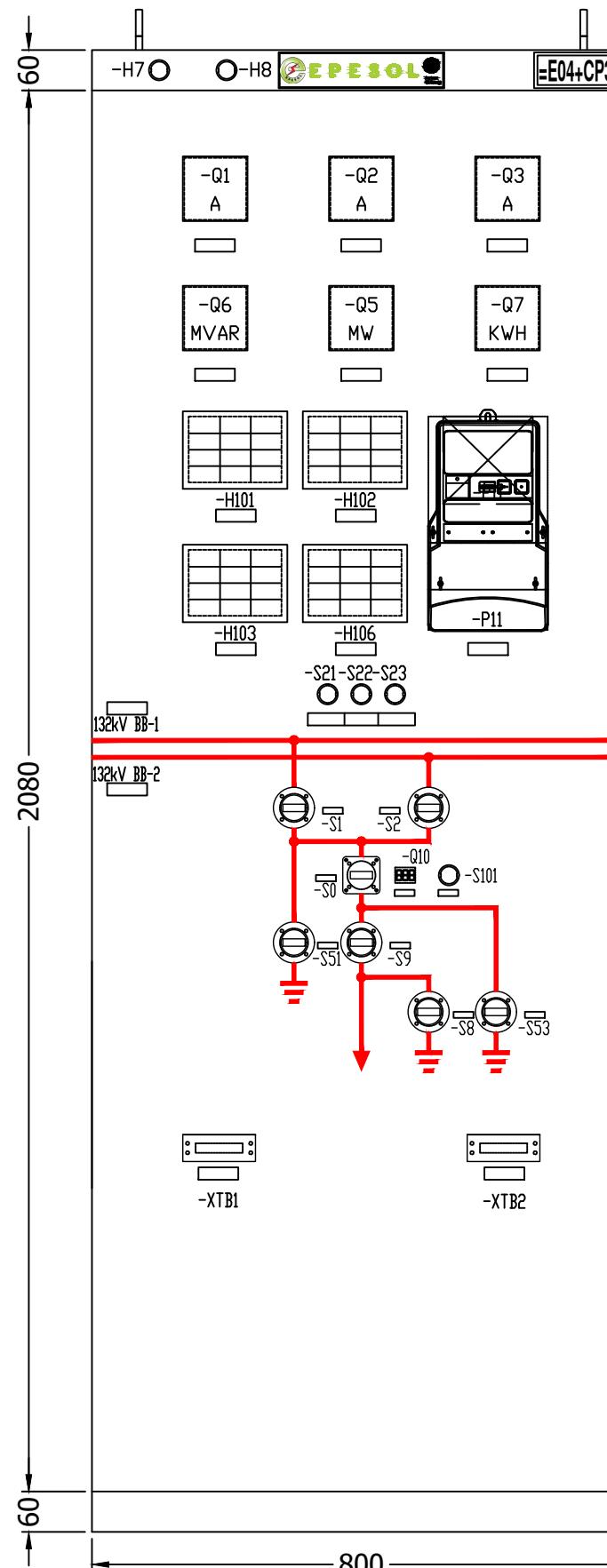
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6

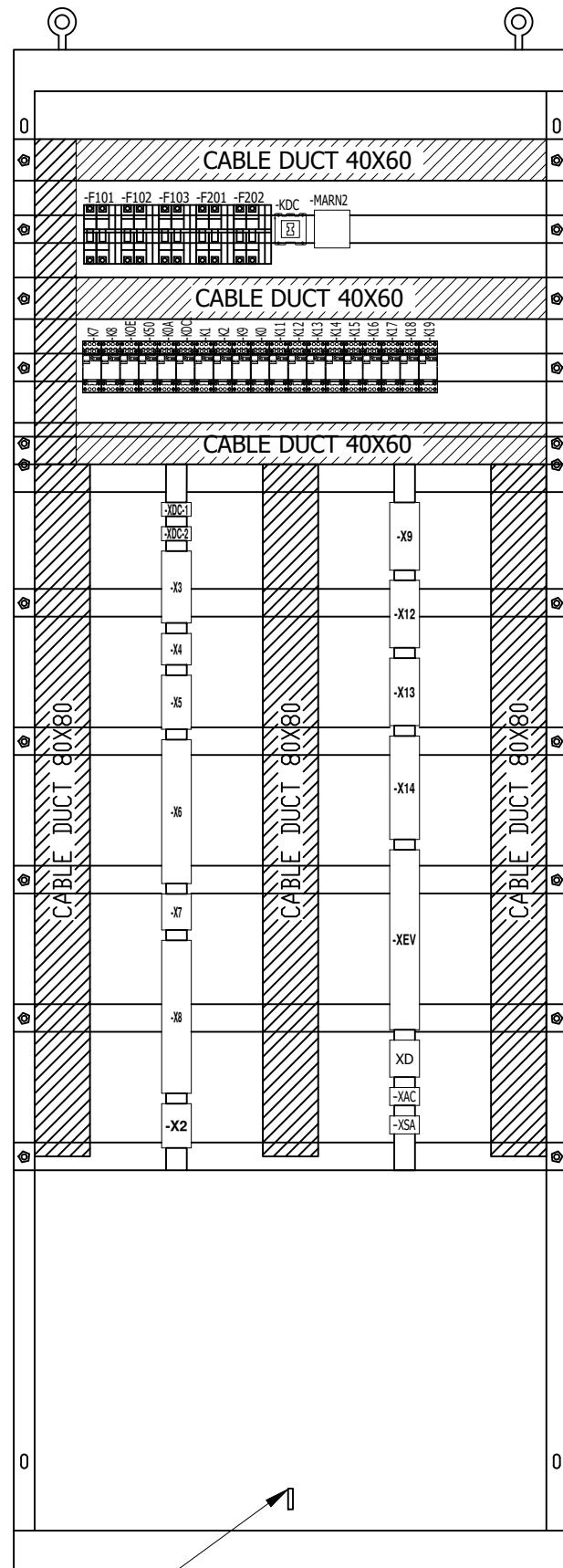
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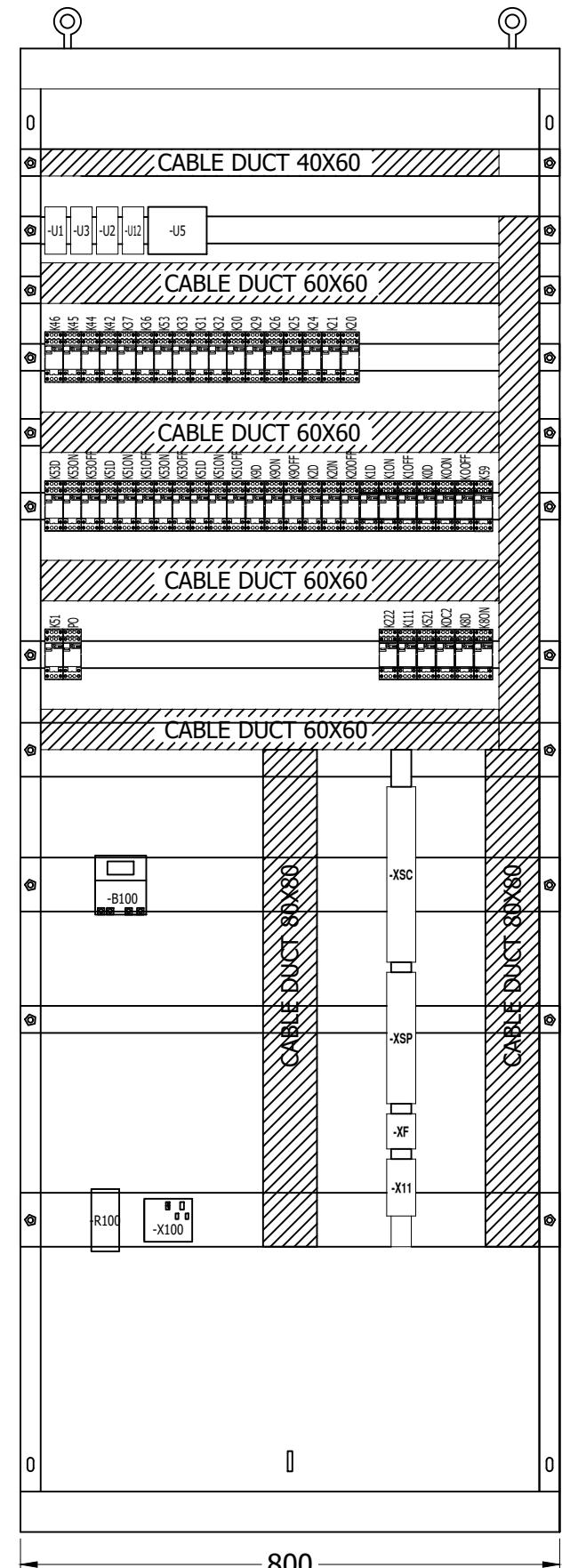
FRONT VIEW



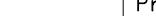
LEFT SIDE VIEW



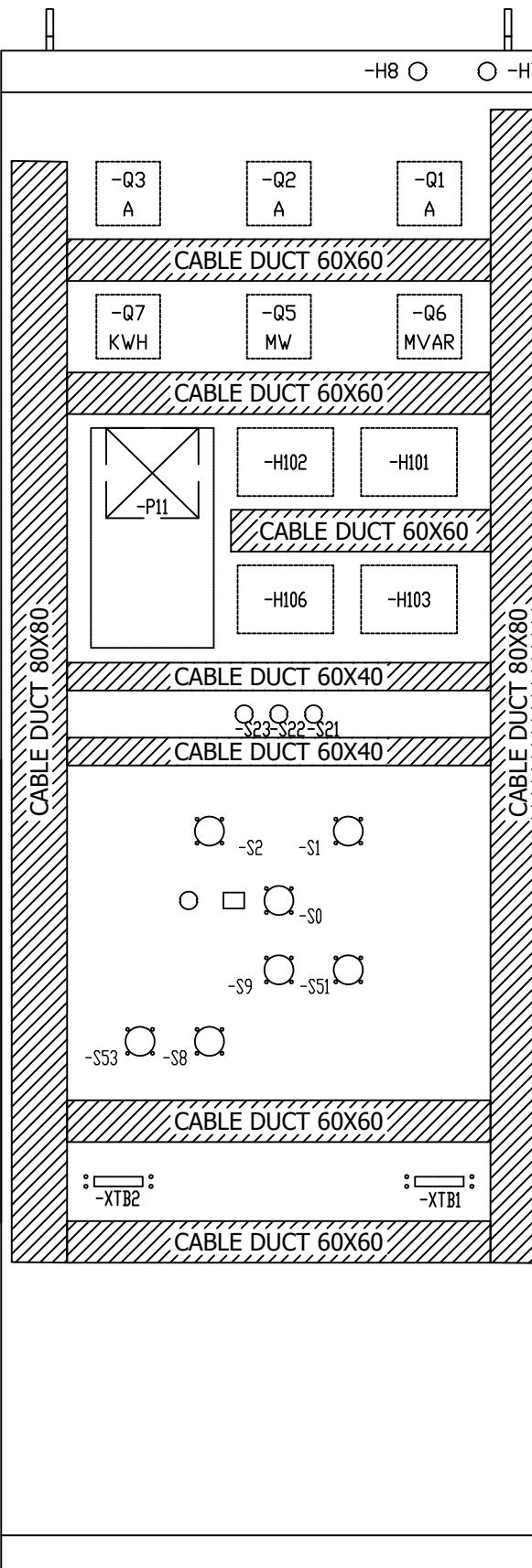
RIGHT SIDE VIEW



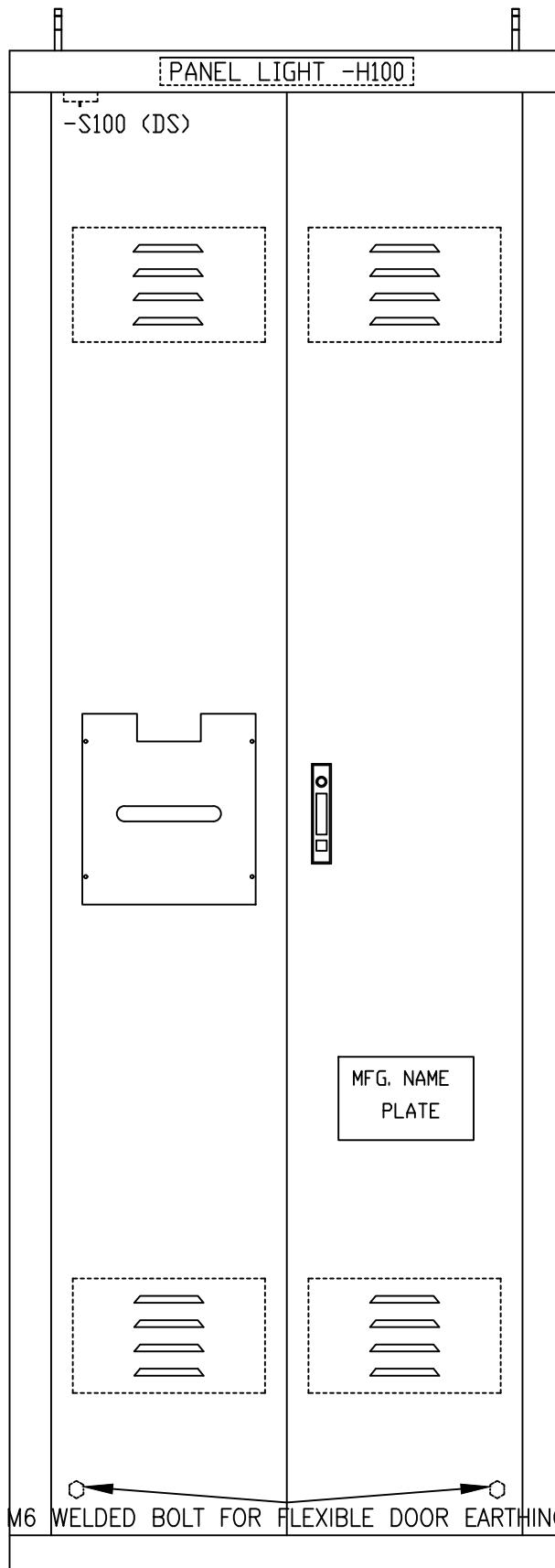
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									Project no. P-60194		
									Sheet type AD	Sheet no. 06	
REV.	DESCRIPTION	DATE	DRAWER								

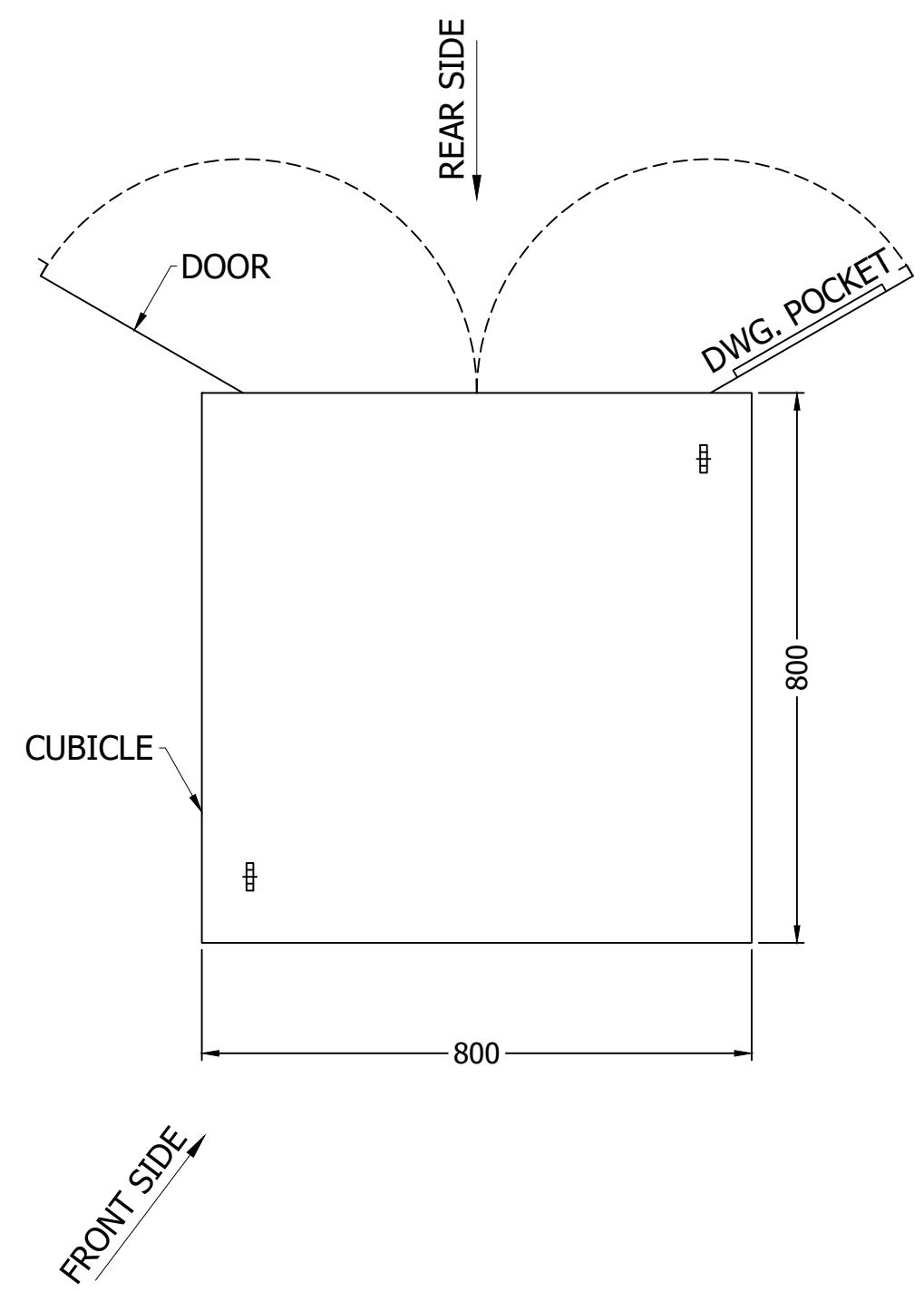
BACK VIEW WITHOUT DOOR



BACK VIEW WITH DOOR



TOP VIEW

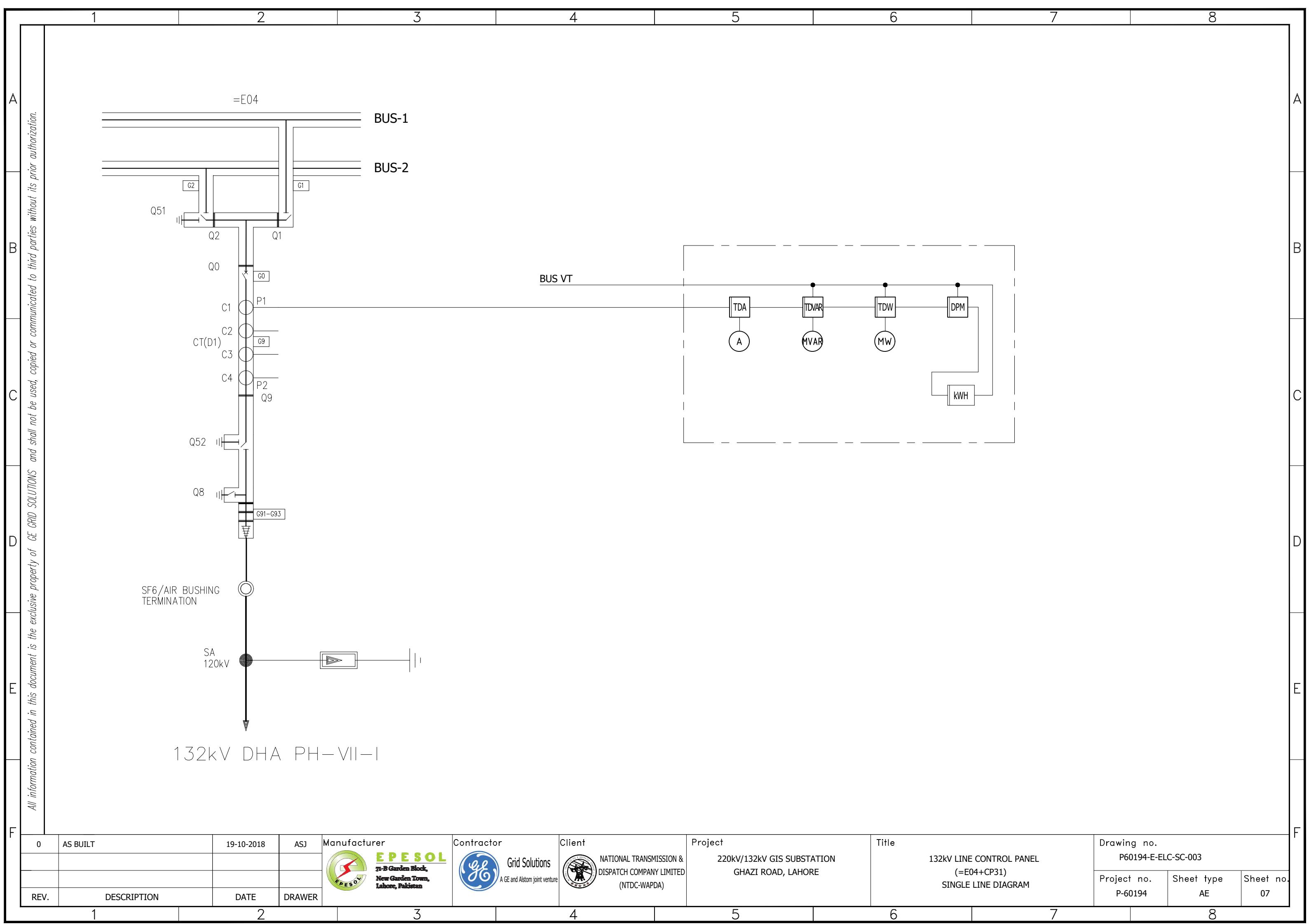


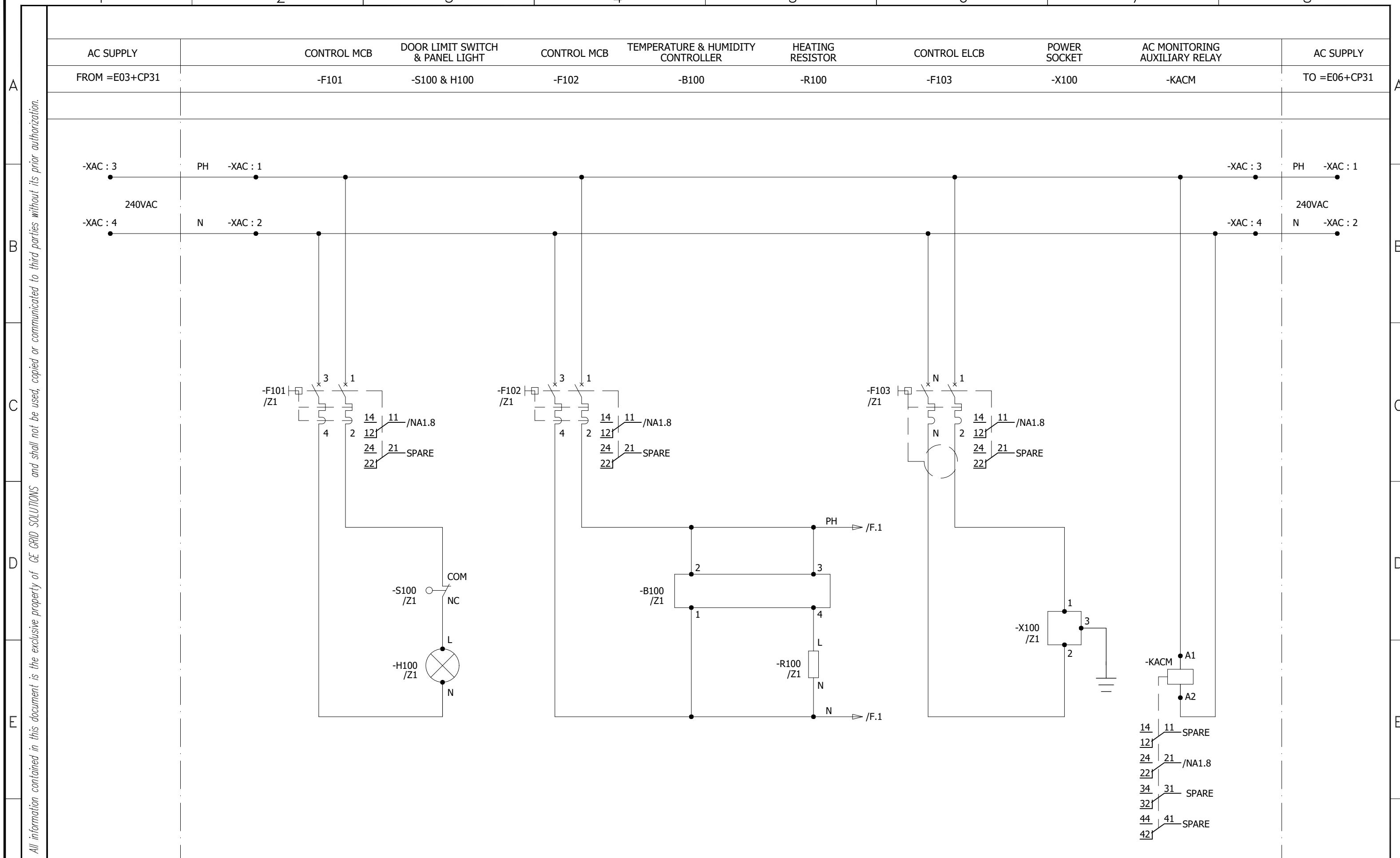
NOTE:-

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

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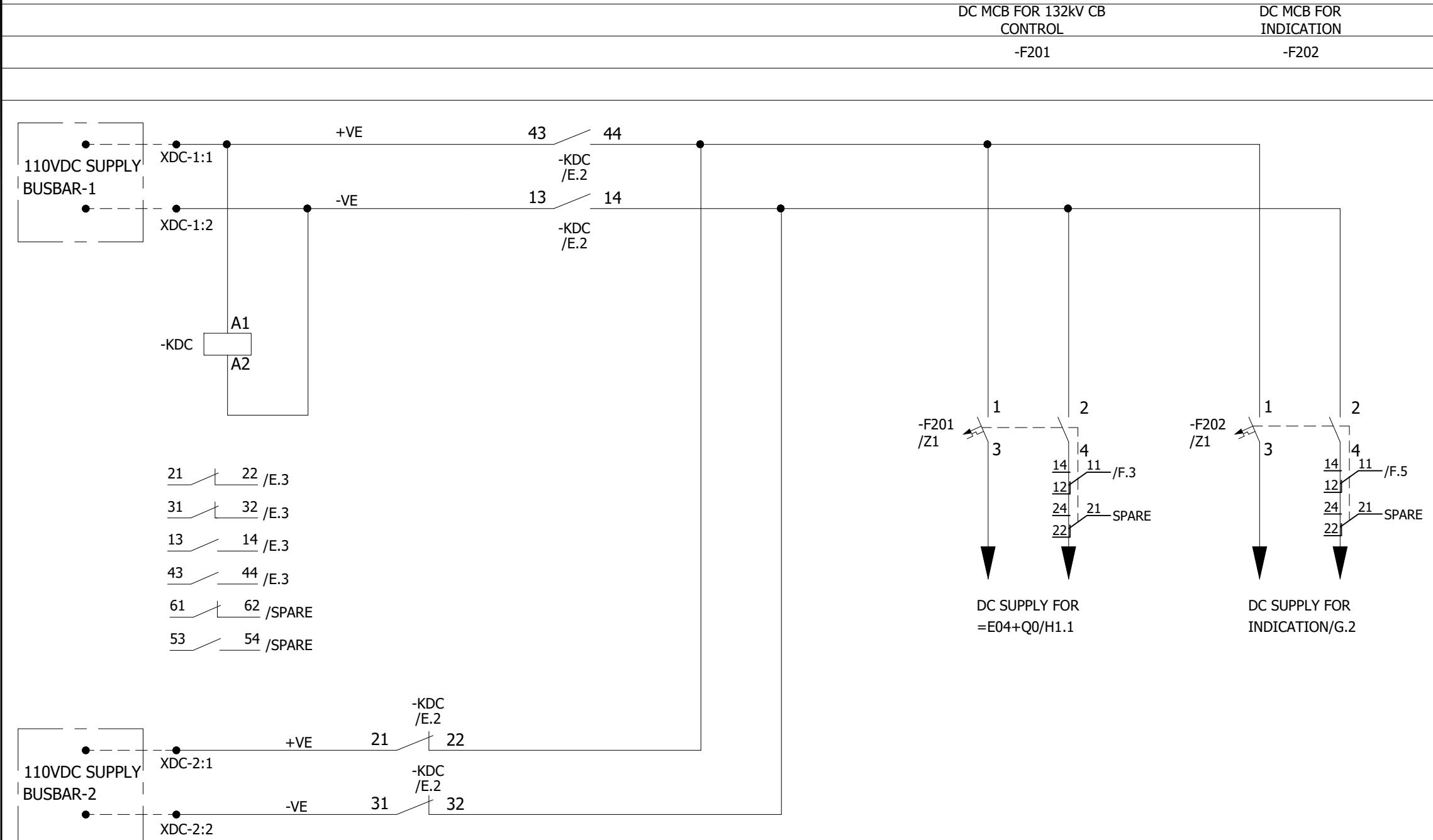
0	AS BUILT	19-10-2018	ASJ	Manufacturer EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor GE Grid Solutions A GE and Alstom joint venture	Client NTDC-WAPDA NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132KV LINE CONTROL PANEL (=E04+CP31) PANEL VIEWS	Drawing no. P60194-E-ELC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194





0	AS BUILT	19-10-2018	ASJ	Manufacturer EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (=NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E04+CP31) AC SUPPLY DISTRIBUTION CIRCUIT	Drawing no. P60194-E-ELC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type D

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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type E Sheet no. 09
1	2	3	4	5	6	7	8		

CONTROL SUPPLY

INDICATION SUPPLY

CONTROL SUPPLY CONTROL SUPPLY MCB

DC SUPERVISION
RELAY

TRIPPED

DC HEALTHY

IND. LAMP

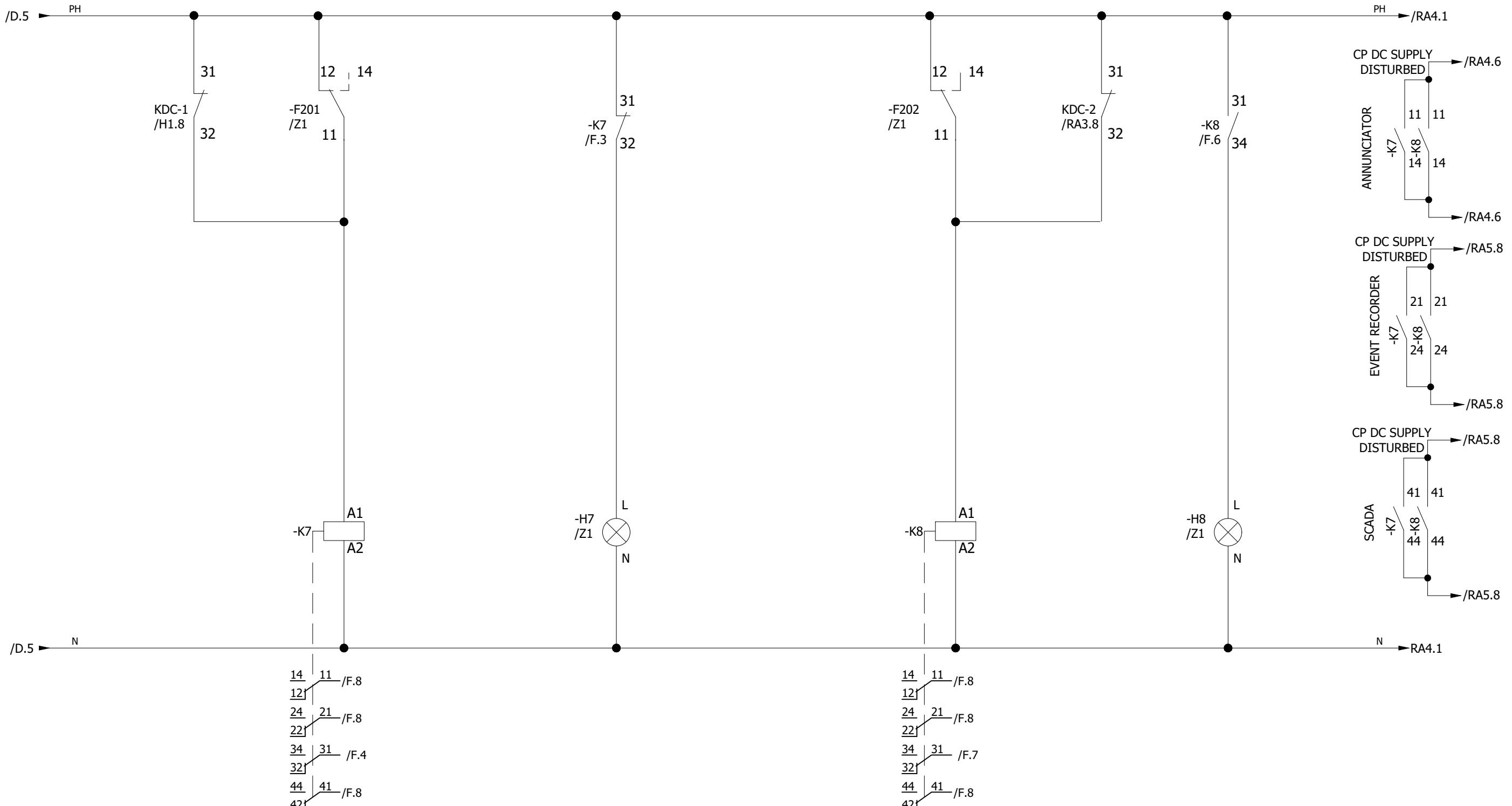
INDICATION
SUPPLY MCB

TRIPPED

INDICATION
SUPPLYDC SUPERVISION
RELAY

DC UNHEALTHY

IND. LAMP



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A

A

B

B

C

C

D

D

E

E

F

F

1

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5

6

7

8

0	AS BUILT	19-10-2018	ASJ	Manufacturer EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E04+CP31) DC SUPPLY FAILURE ALARM CIRCUIT	Drawing no. P60194-E-ELC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type F
									Sheet no. 10

1 2 3 4 5 6 7 8

TEST BLOCK

AM METERS

MW METER (-Q5)

MVAR METER (-Q6)

DIGITAL POWER METER

REVENUE METER

TS

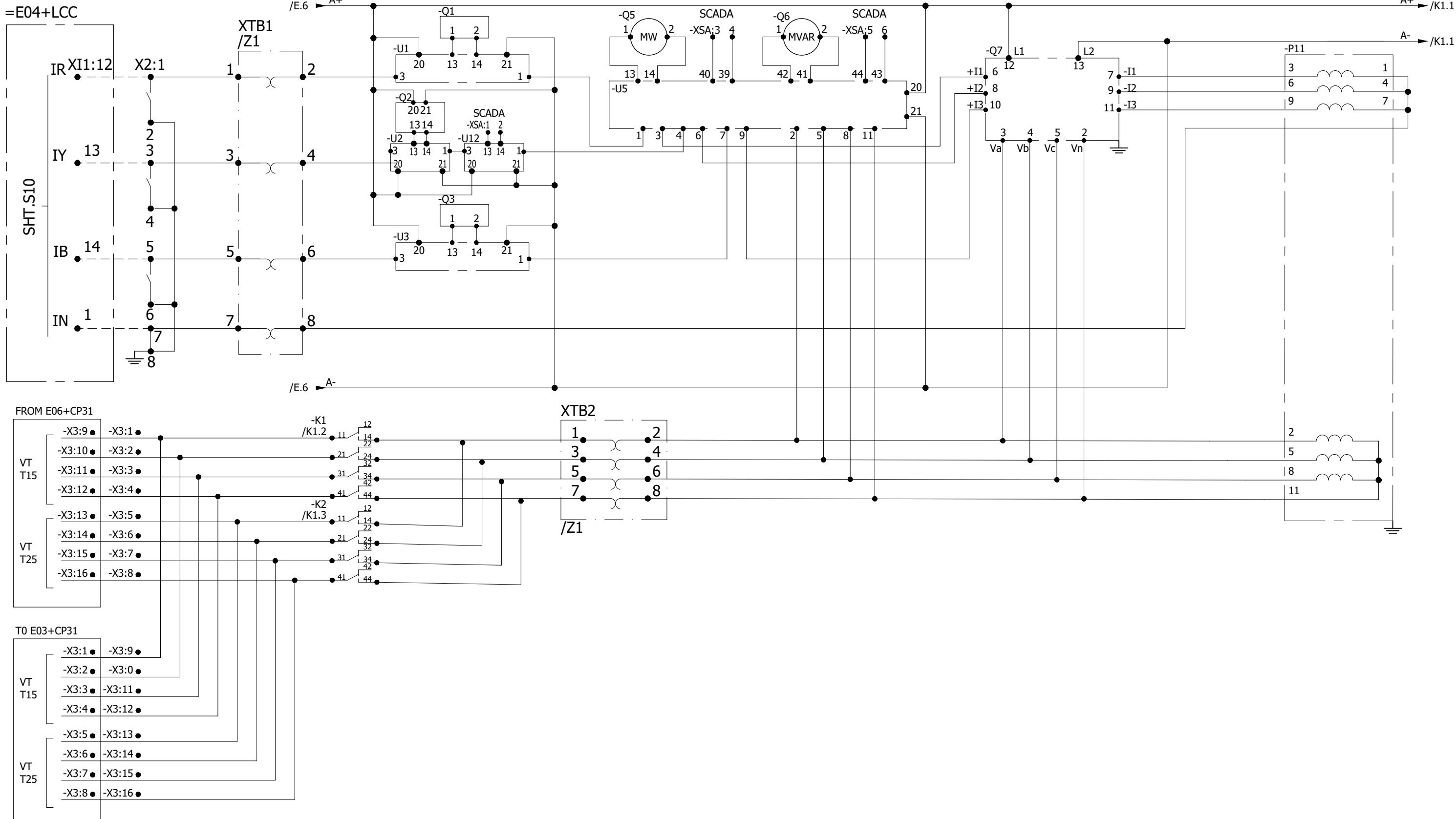
(-Q1, -Q2, -Q3) WITH
TRANSDUCERS
(-U1, , -U2, -U3)

WITH TRANSDUCER (-U5)

(-Q7)

(-P11)

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0	AS BUILT	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 (=E04+CP31) METERING	Drawing no. P60194-E-ELC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type G
									Sheet no. 11

1 2 3 4 5 6 7 8

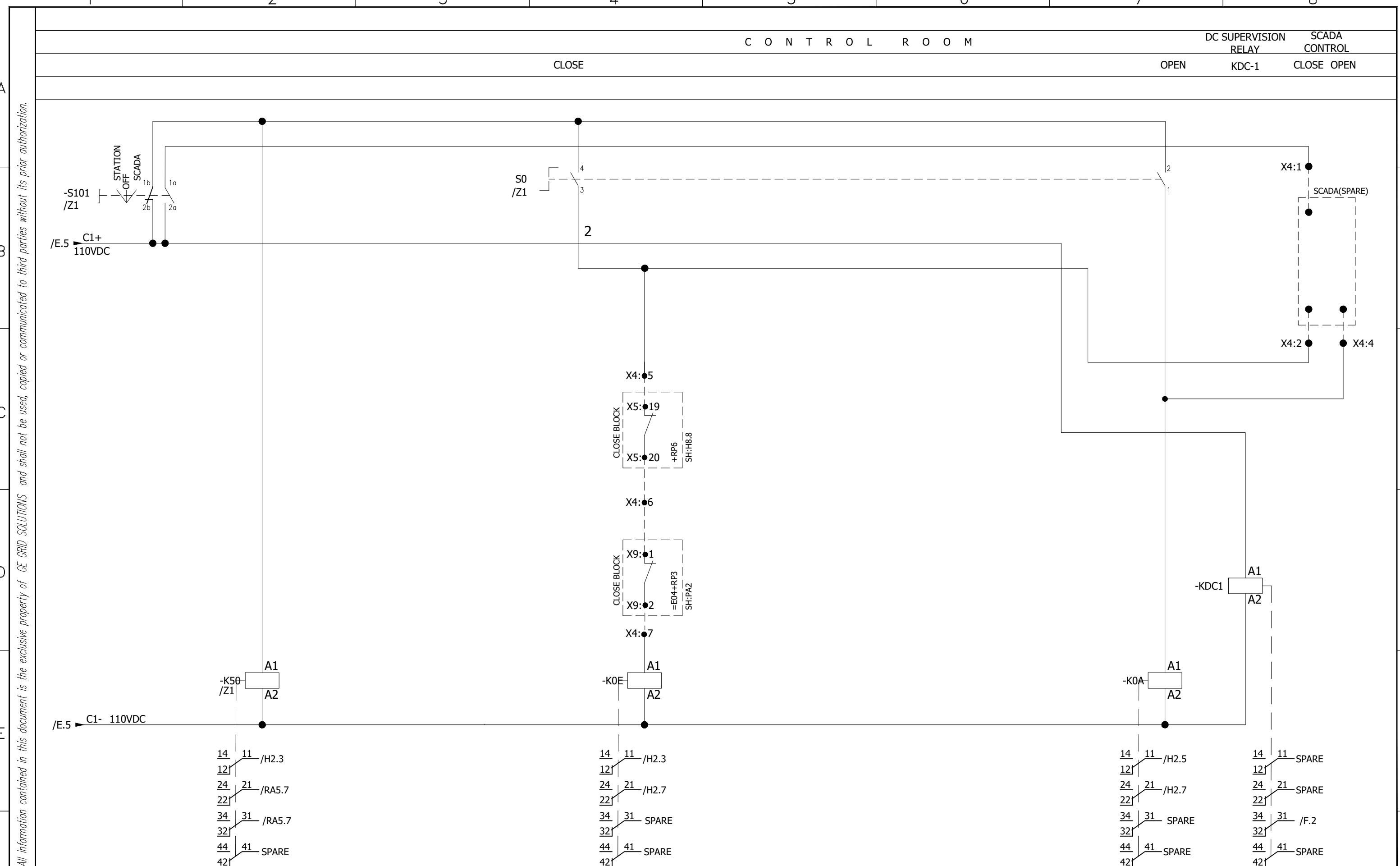
C O N T R O L R O O M

DC SUPERVISION
RELAYSCADA
CONTROL

OPEN KDC-1 CLOSE OPEN

CLOSE

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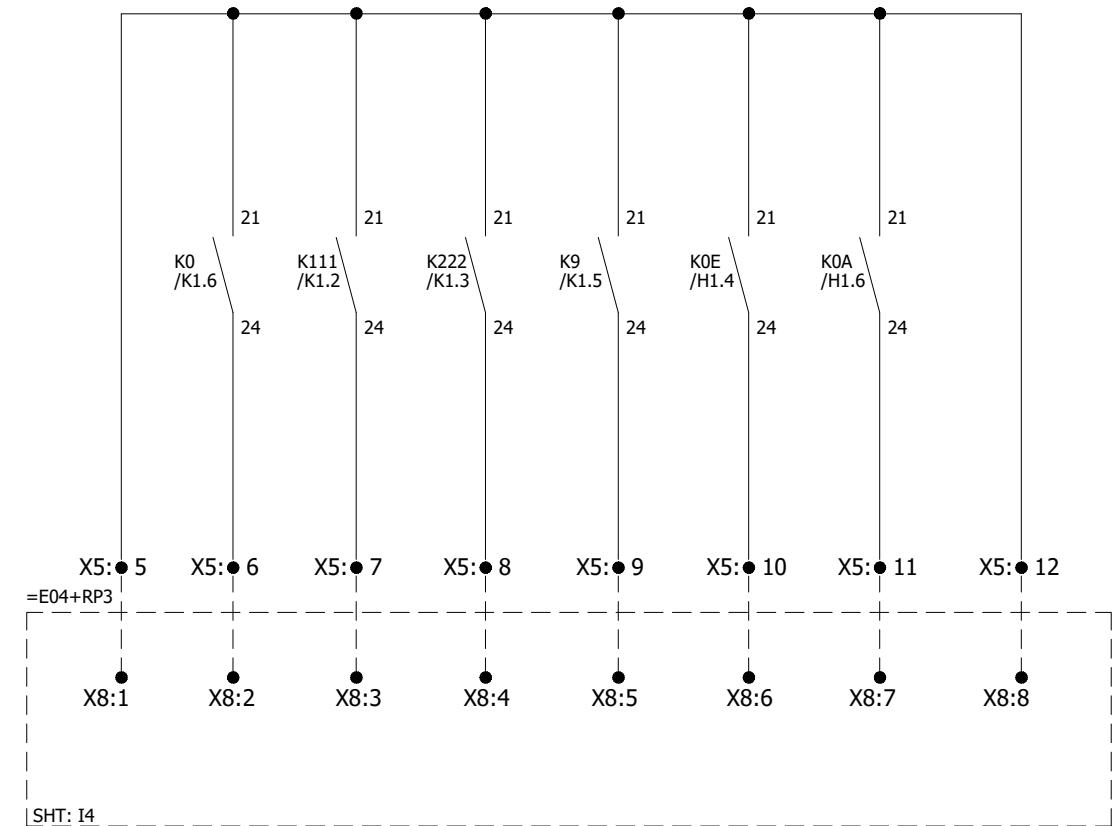
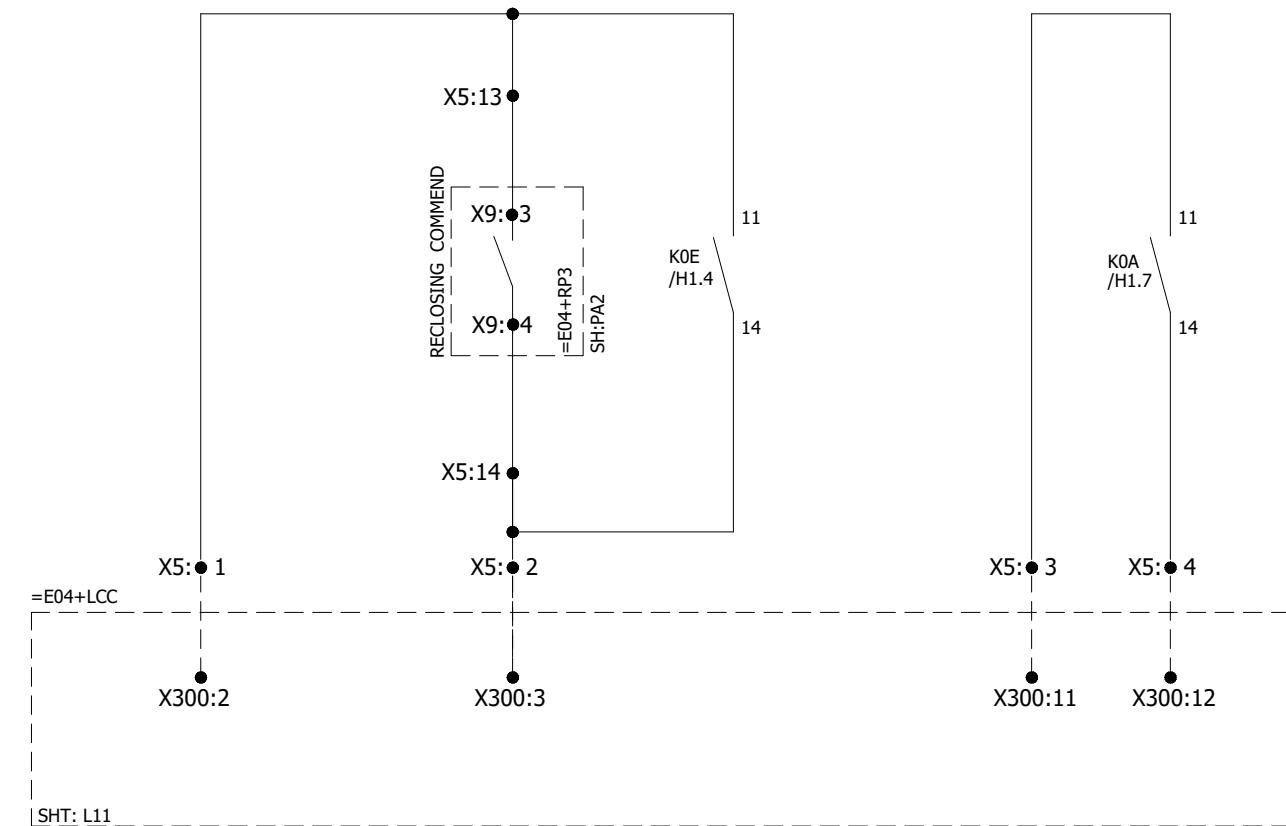
0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E04+CP31) CB CONTROL CIRCUIT	Drawing no. P60194-E-ELC-SC-003
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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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 (=E04+CP31) CB CONTROL CIRCUIT	Drawing no. P60194-E-ELC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type H2
									Sheet no. 13

$=E04+Q1$

CLOSE

OPEN

 $=E04+Q2$

CLOSE

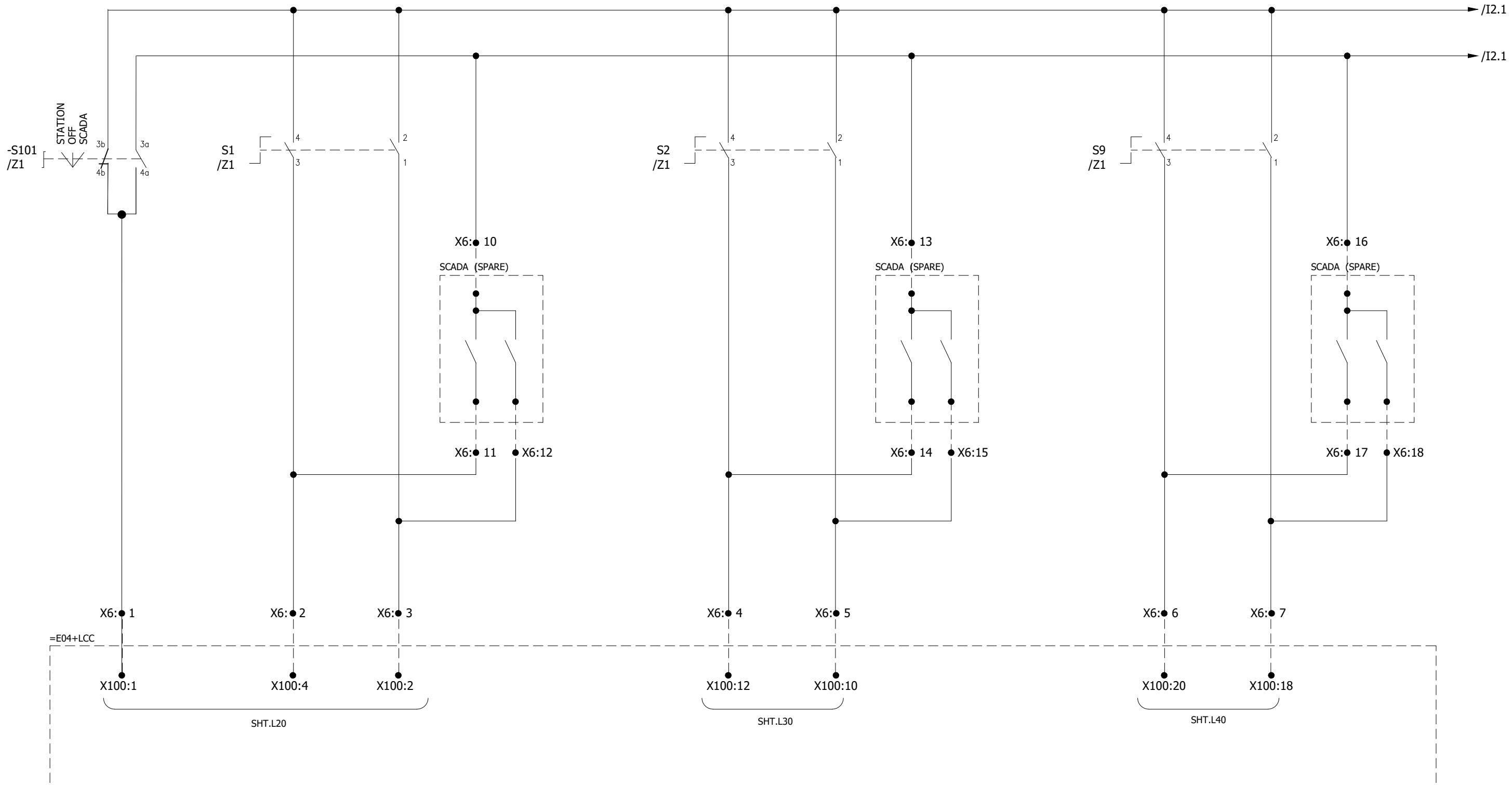
OPEN

 $=E04+Q9$

CLOSE

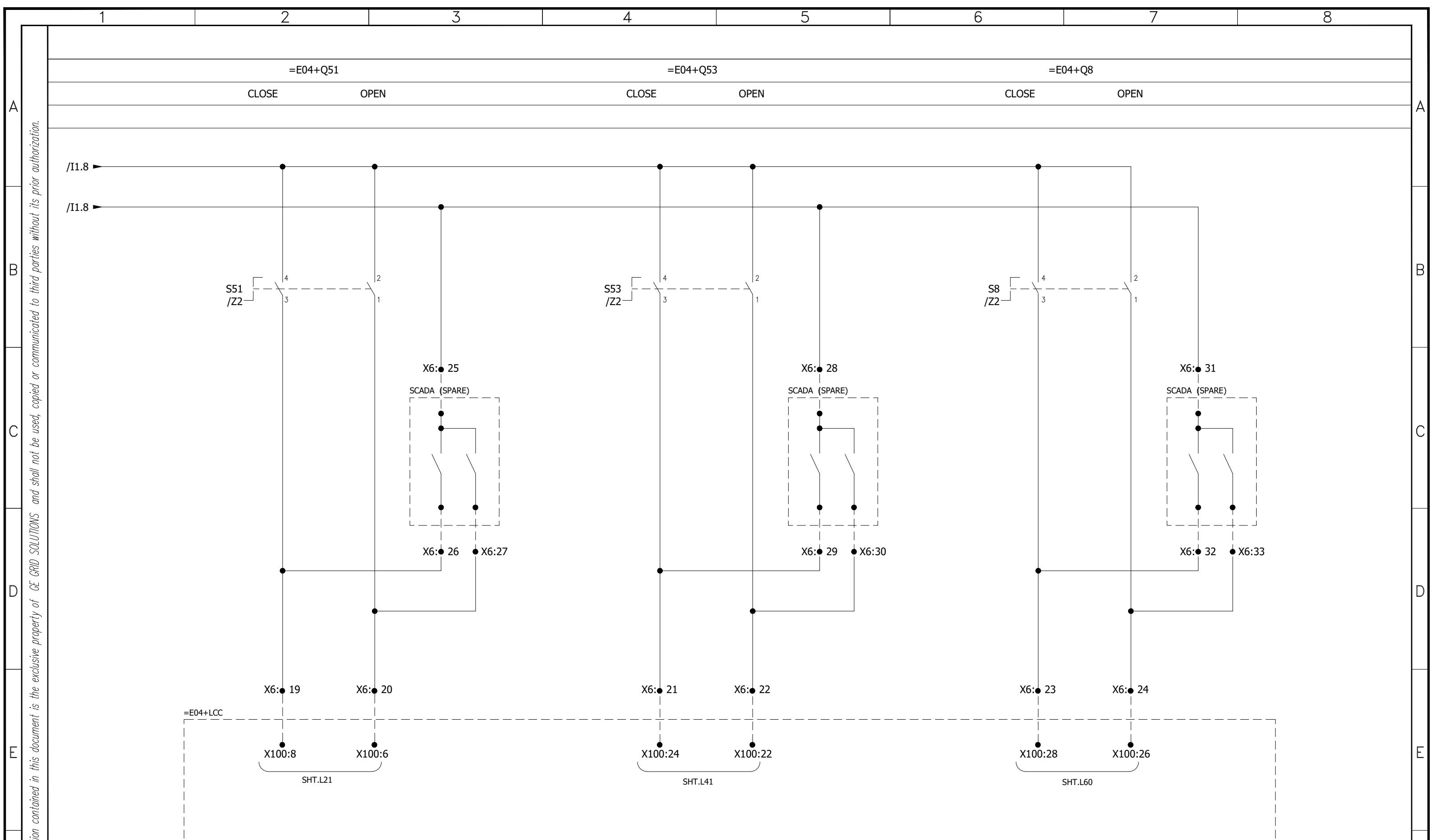
OPEN

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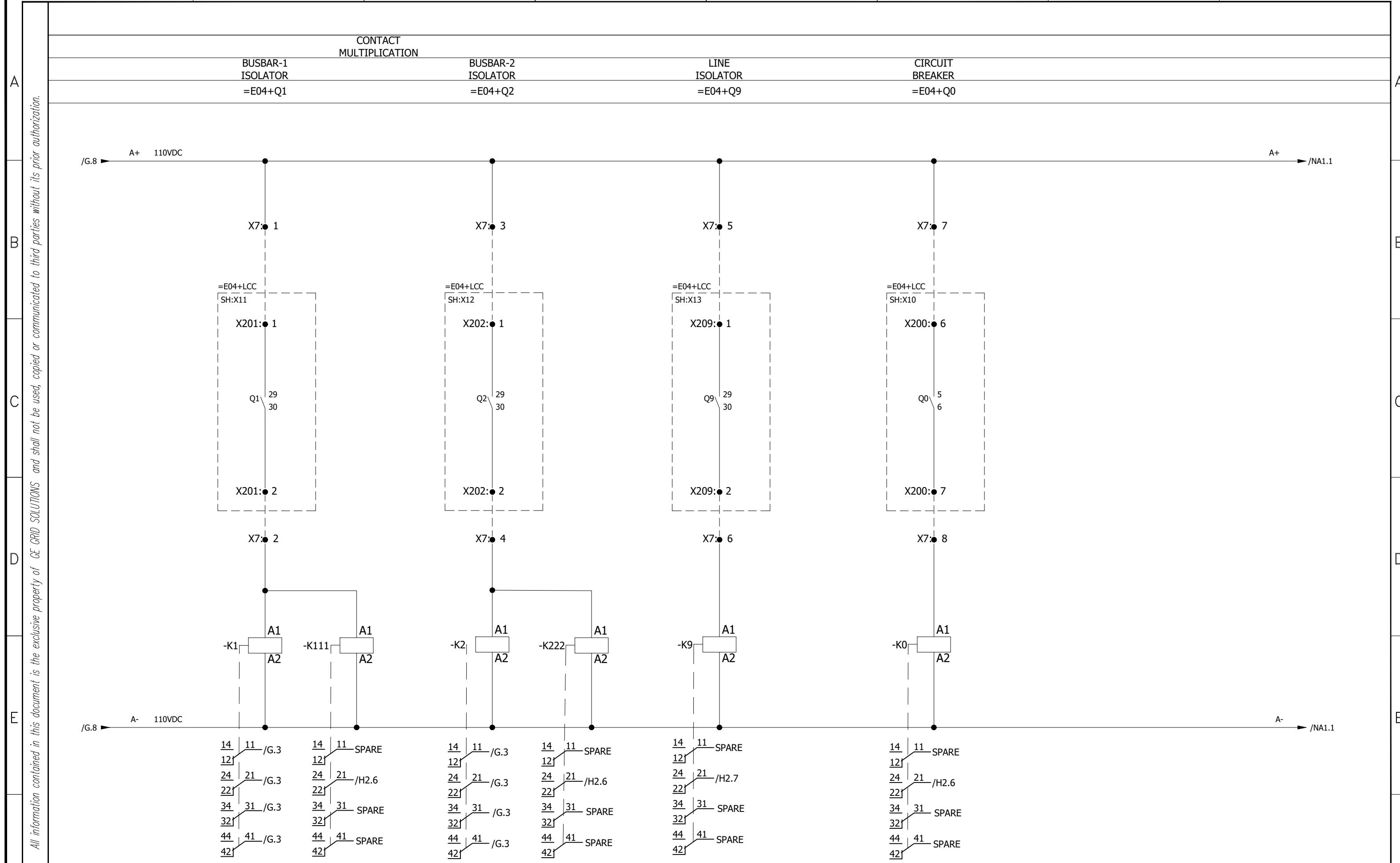
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									Project no. P-60194
	DESCRIPTION	DATE	DRAWER						Sheet type I1
REV.									Sheet no. 14

1 2 3 4 5 6 7 8



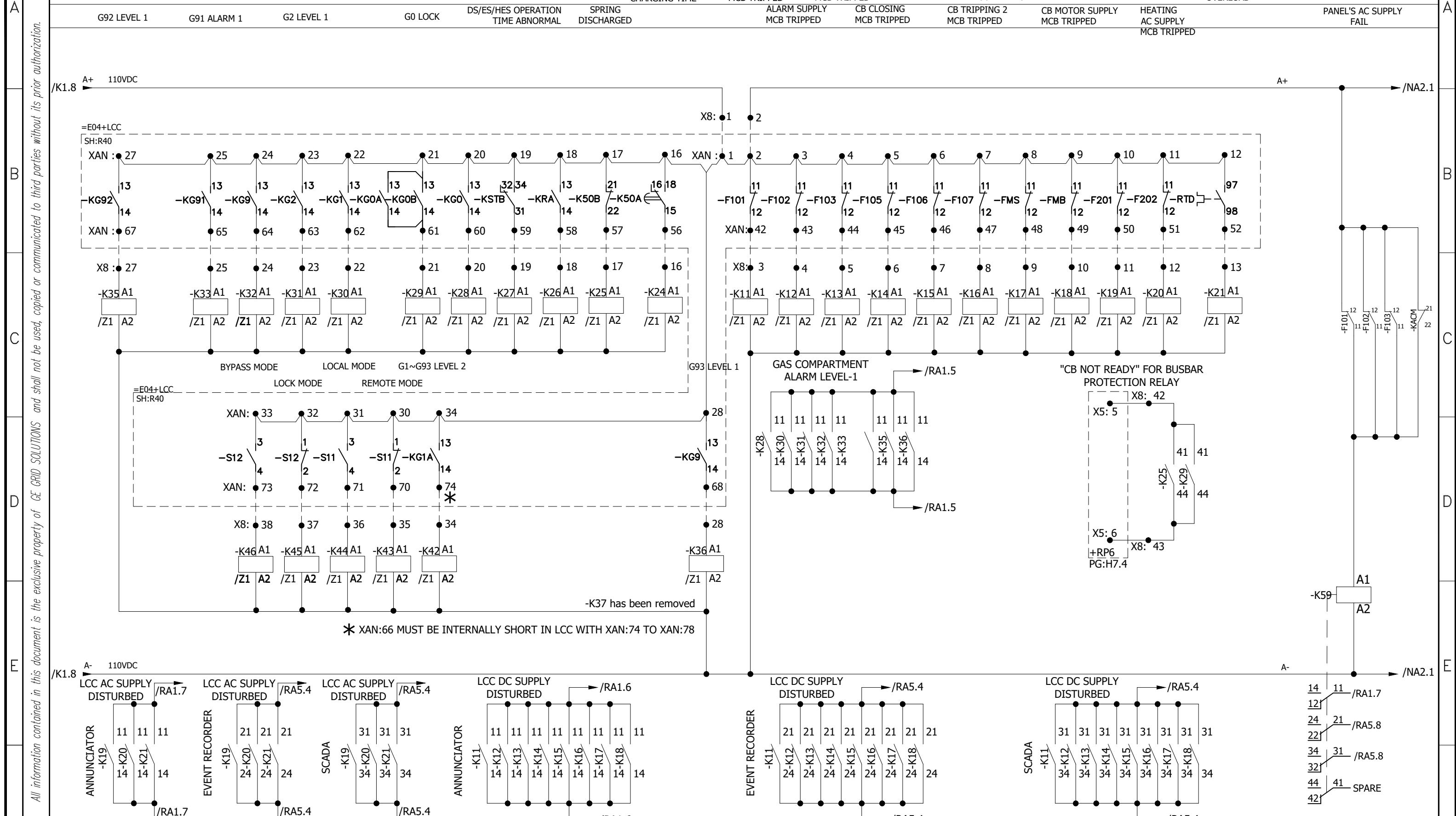
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									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type I2
									Sheet no. 15

1 2 3 4 5 6 7 8



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 (=E04+CP31) CB/DISCONNECTOR CONTACT MULTIPLICATION	Drawing no. P60194-E-ELC-SC-003	
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 MOTOR SUPPLY MCB TRIPPED					
G9 ALARM 1	G1 LEVEL 1	G0 ALARM	REPEAT ABNORMAL	G0 LOCK	DS/ES/HES OPERATION TIME ABNORMAL	SPRING DISCHARGED	CB CLOSING MCB TRIPPED	CB TRIPPING 2 MCB TRIPPED	CB MOTOR SUPPLY MCB TRIPPED	HEATING AC SUPPLY MOTOR SUPPLY MCB TRIPPED	CB MOTOR THERMAL OVERLOAD	
G92 LEVEL 1	G91 ALARM 1	G2 LEVEL 1		G0 LOCK	DS/ES/HES OPERATION TIME ABNORMAL	SPRING DISCHARGED	ALARM SUPPLY MCB TRIPPED	CB CLOSING MCB TRIPPED	CB TRIPPING 2 MCB TRIPPED	CB MOTOR SUPPLY MCB TRIPPED	HEATING AC SUPPLY MOTOR SUPPLY MCB TRIPPED	PANEL'S AC SUPPLY FAIL



0	AS BUILT	19-10-2018	ASJ	Manufacturer EPE SOL 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 (=E04+CP31) ALARM MULTIPLICATION	Drawing no. P60194-E-ELC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type NA1
									Sheet no. 17

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($=E04+Q0$)

OPEN CLOSE

($=E04+Q1$)

OPEN CLOSE

($=E04+Q2$)

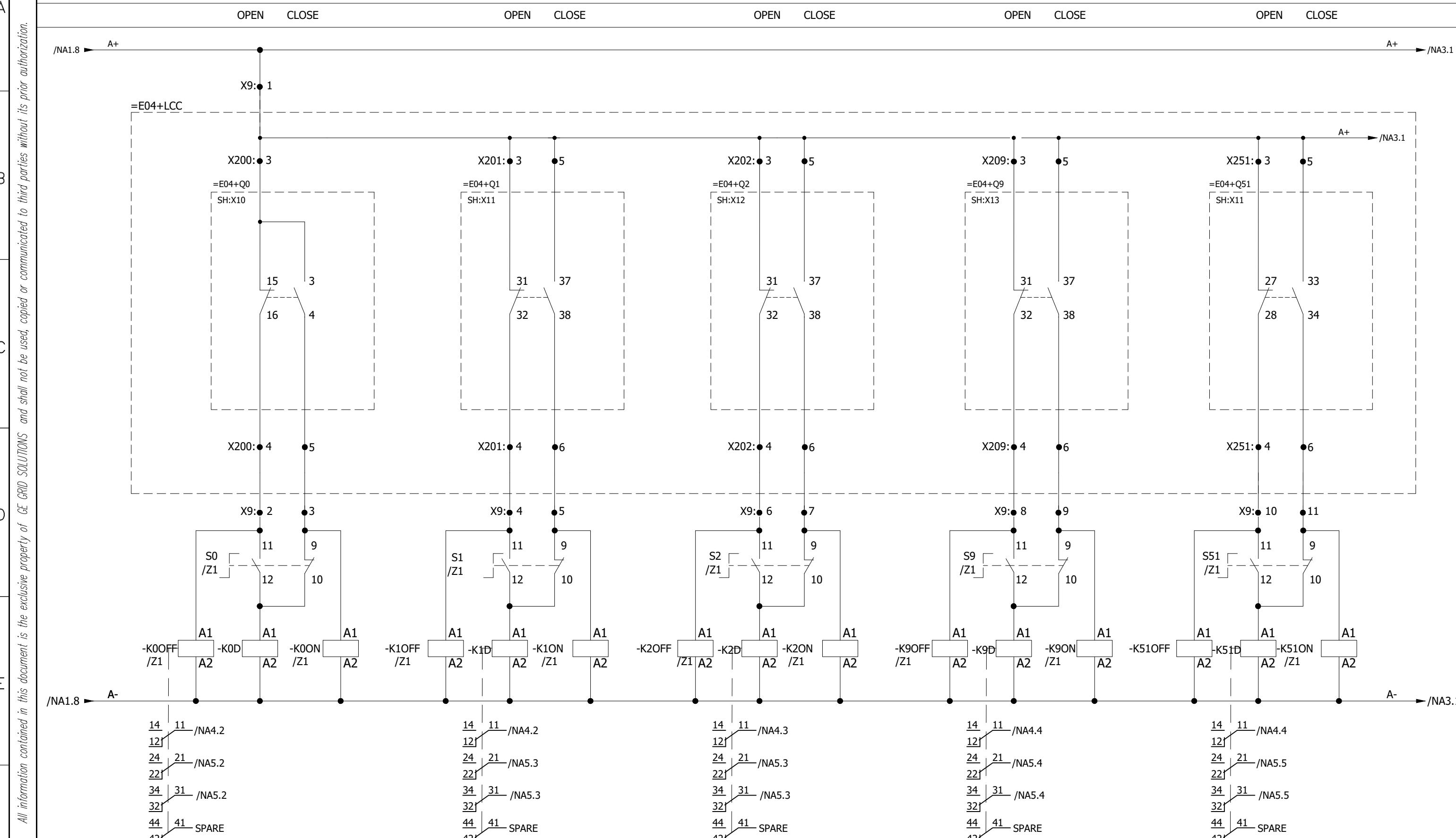
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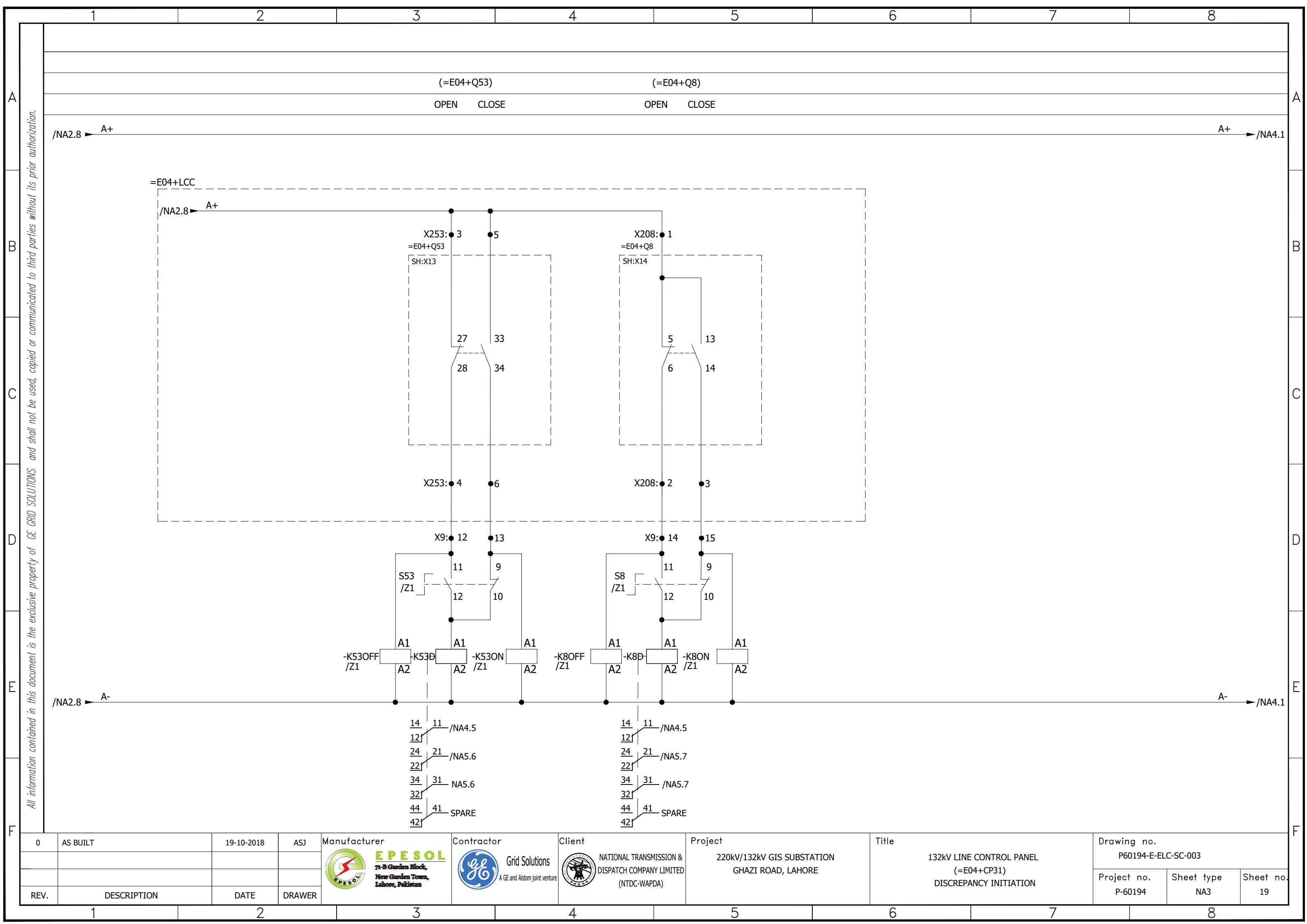
OPEN CLOSE

($=E04+Q51$)

OPEN CLOSE

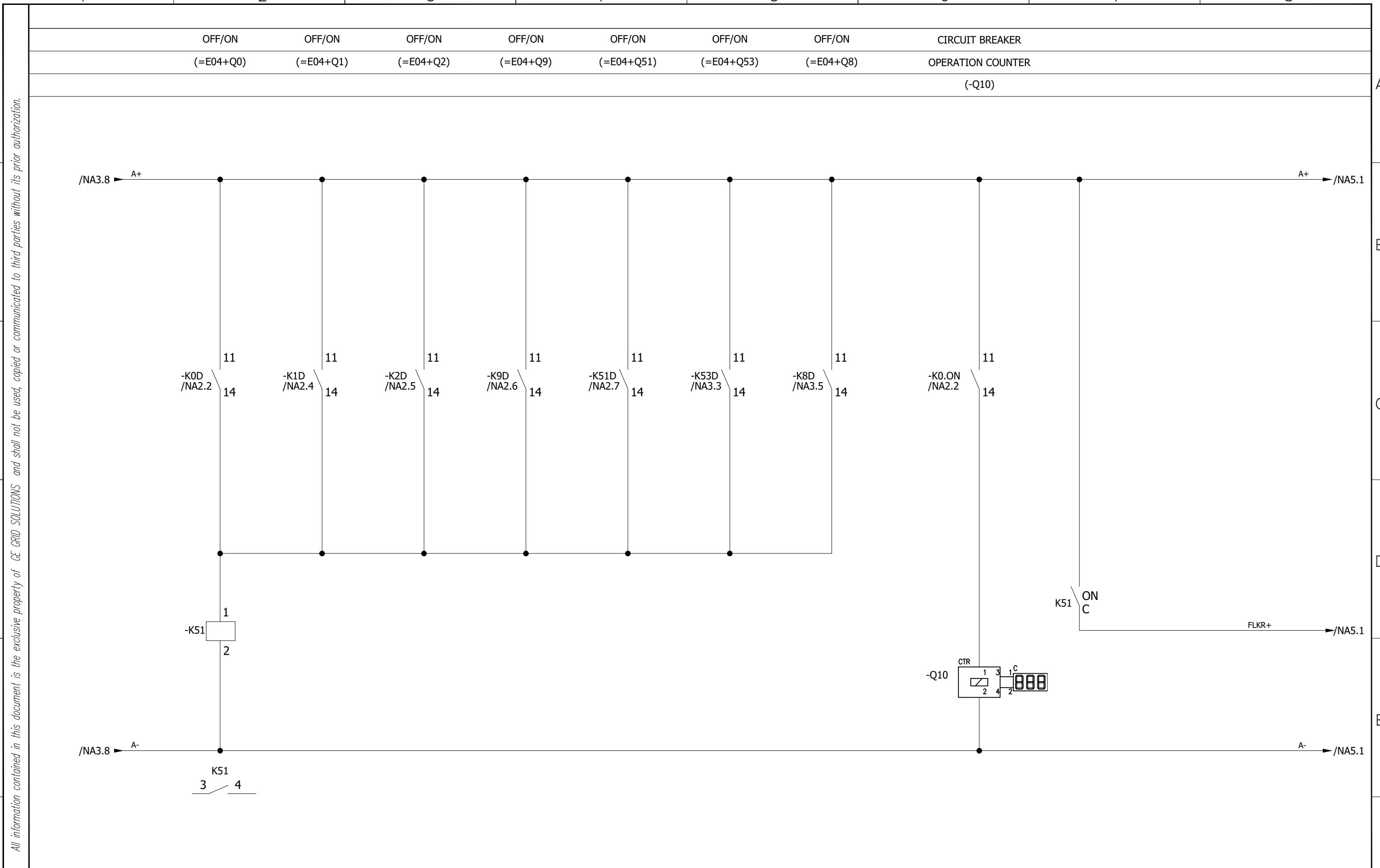


0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL ($=E04+CP31$) DISCREPANCY INITIATION	Drawing no. P60194-E-ELC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type NA2
									Sheet no. 18



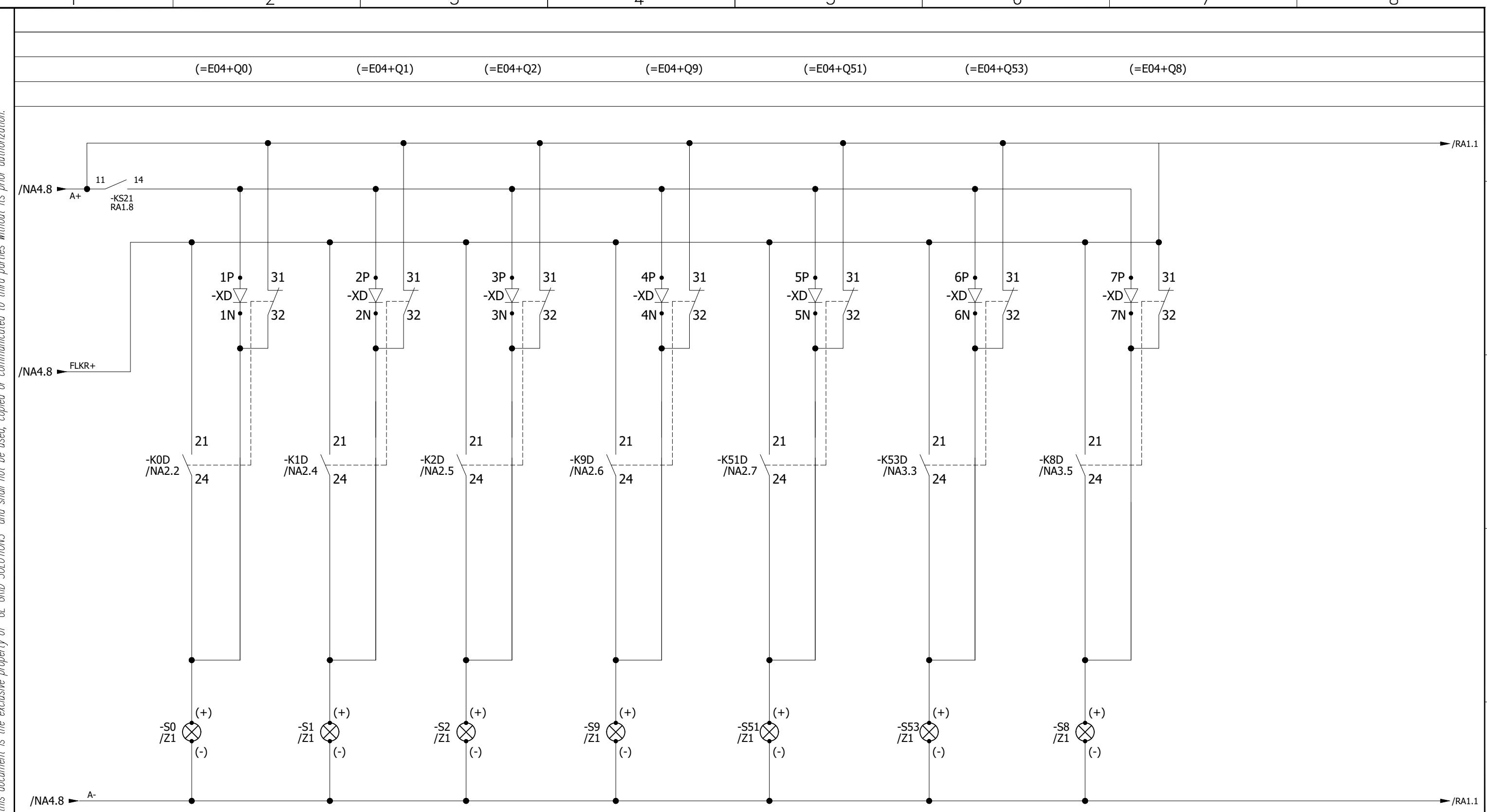
1	2	3	4	5	6	7	8			
A		(=E04+Q53)		(=E04+Q8)			A			
		OPEN CLOSE		OPEN CLOSE						
/NA2.8 → A+							A+ → /NA4.1			
B							B			
C							C			
D							D			
E							E			
F							F			
0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions 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 (=E04+CP31) DISCREPANCY INITIATION	Drawing no. P60194-E-ELC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type NA3	Sheet no. 19

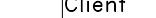
1 2 3 4 5 6 7 8

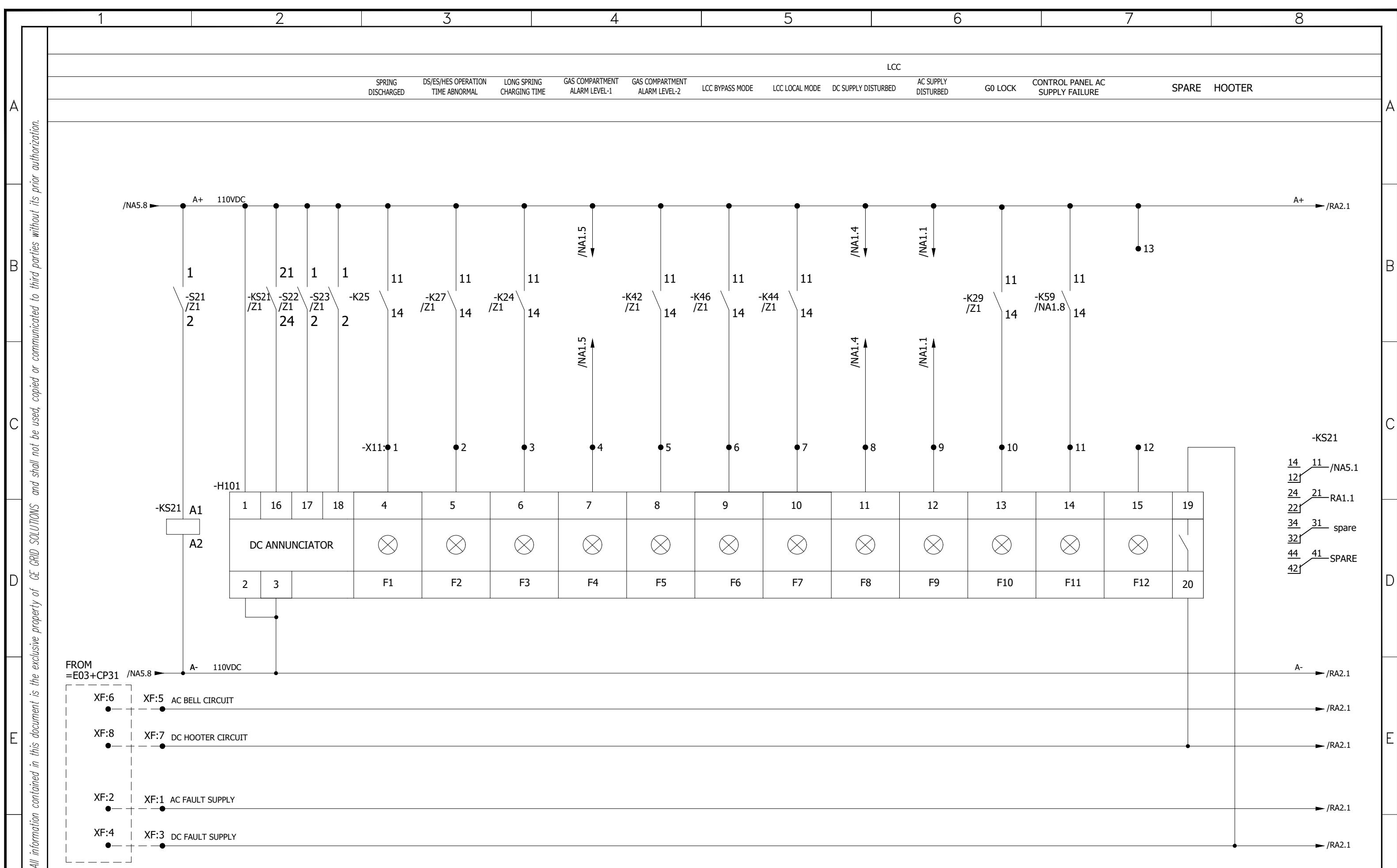


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REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type NA4
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1 2 3 4 5 6 7 8

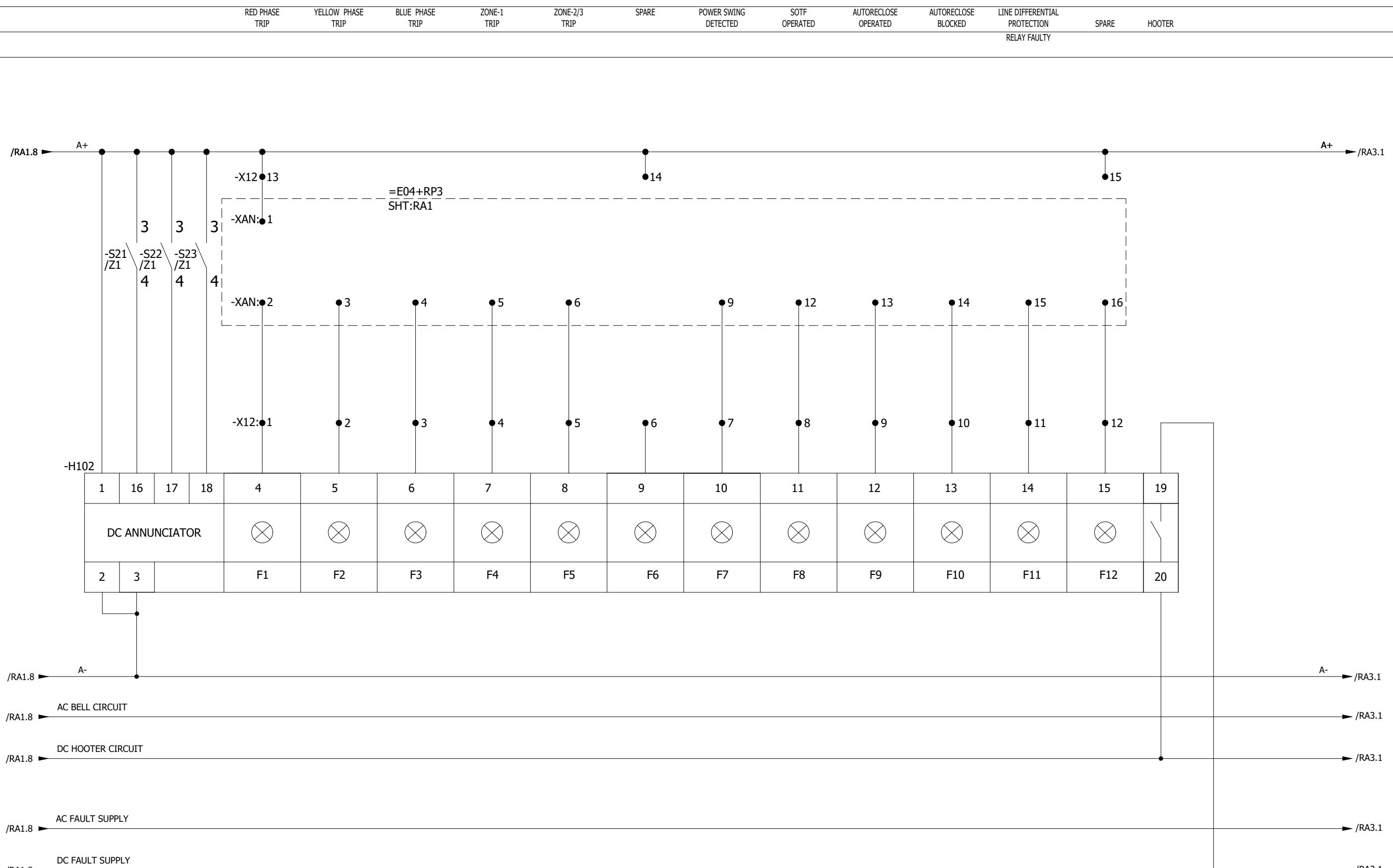


0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E04+CP31) DISCREPANCY INDICATIONS	Drawing no. P60194-E-ELC-SC-003		
									Project no. P-60194		
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REV.	DESCRIPTION	DATE	DRAWER						Sheet no. 21		



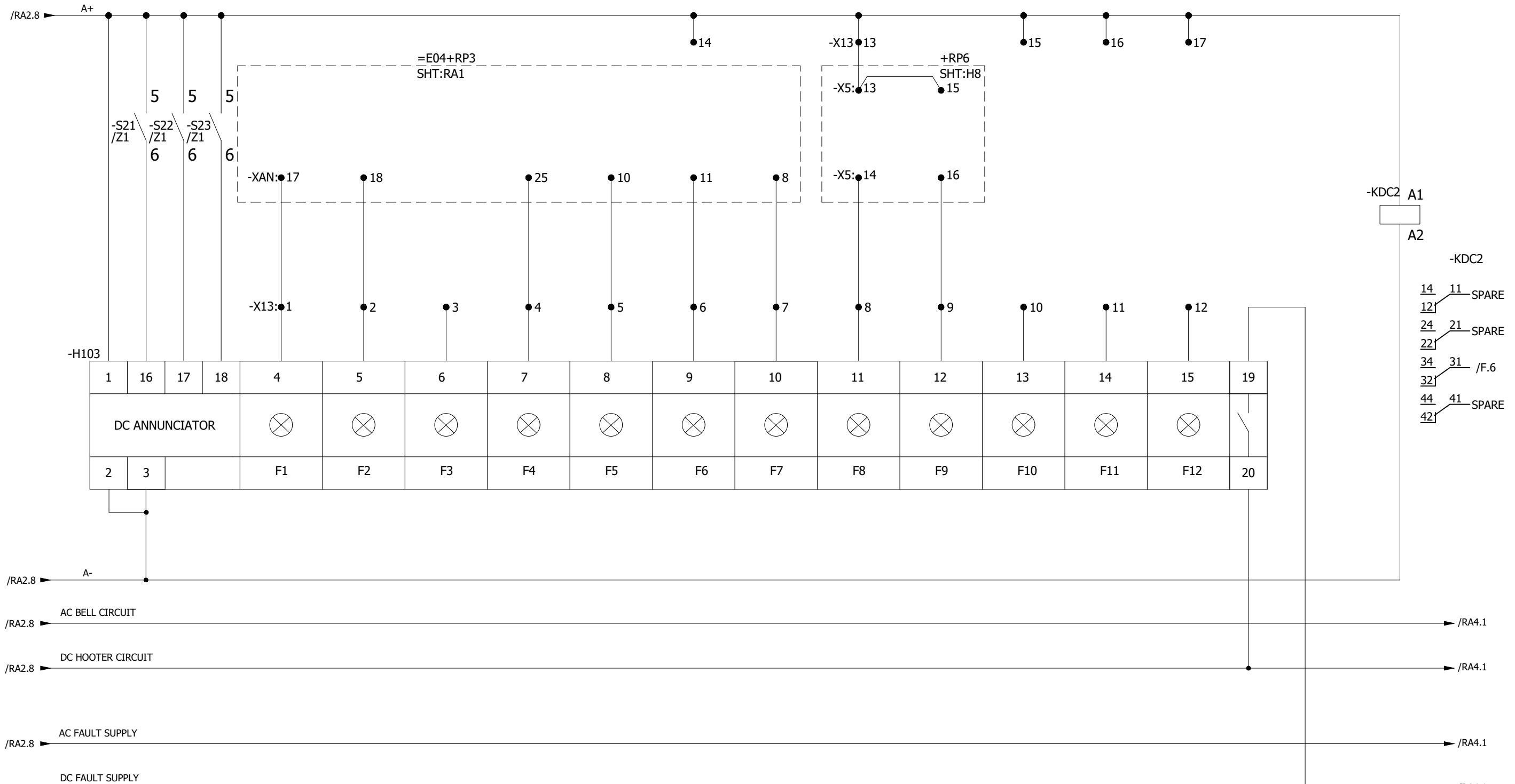
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									Project no. P-60194	Sheet type RA1	
										Sheet no. 22	
REV.	DESCRIPTION	DATE	DRAWER	1	2	3	4	5	6	7	8

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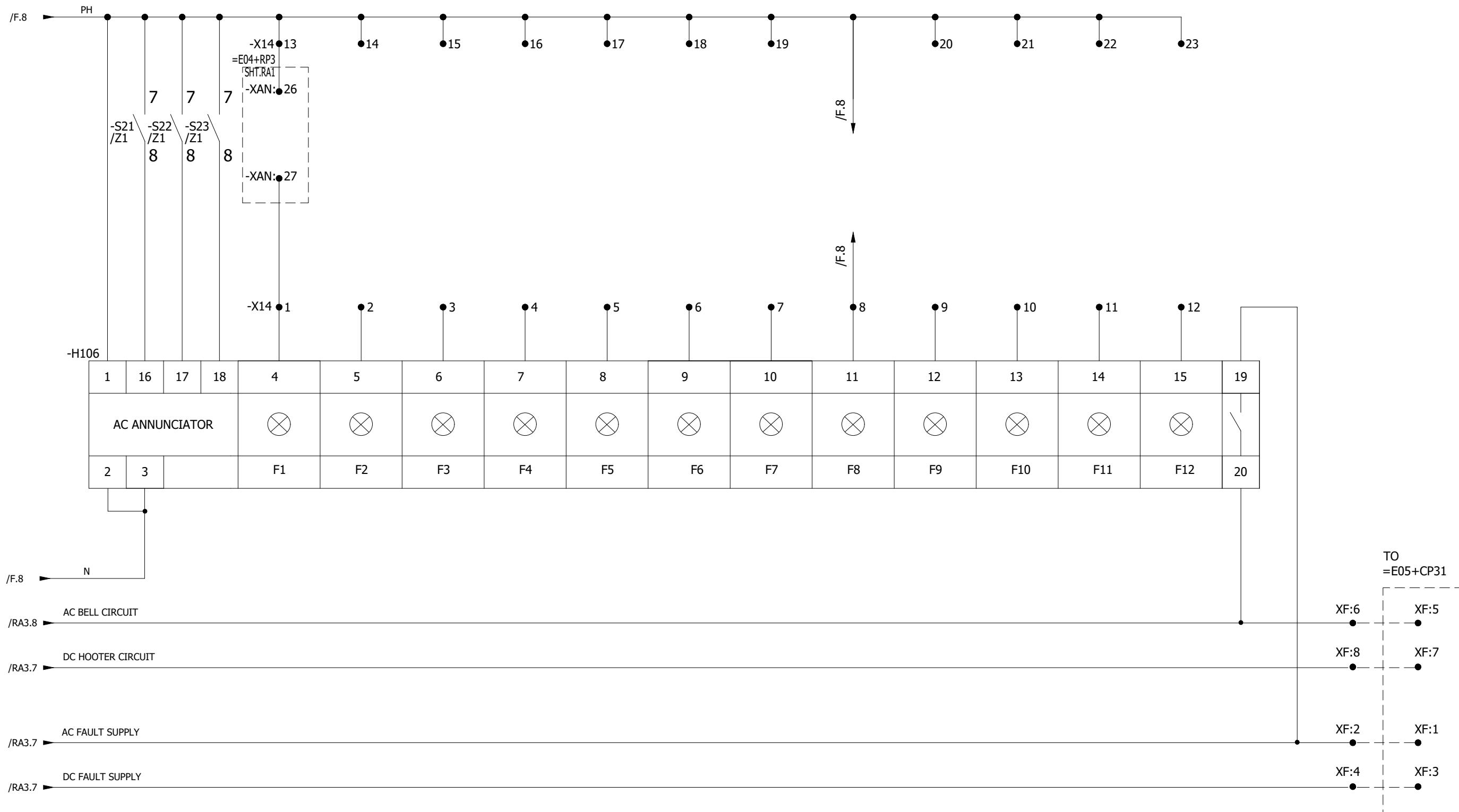
BUS VT
SECONDARY CIRCUIT
MCB UNHEALTHY O/C & E/F PROT.
RELAY FAULTY SPARE LINE RELAY PANEL 230VAC
CIRCUIT/SUPPLY FAULTY TRIP CIRCUIT-1
FAULTY TRIP CIRCUIT-2
FAULTY O/C & E/F PROT.
OPERATED DTT
SEND CBF STG-1
OPERATED SPARE SPARE SPARE HOOTER

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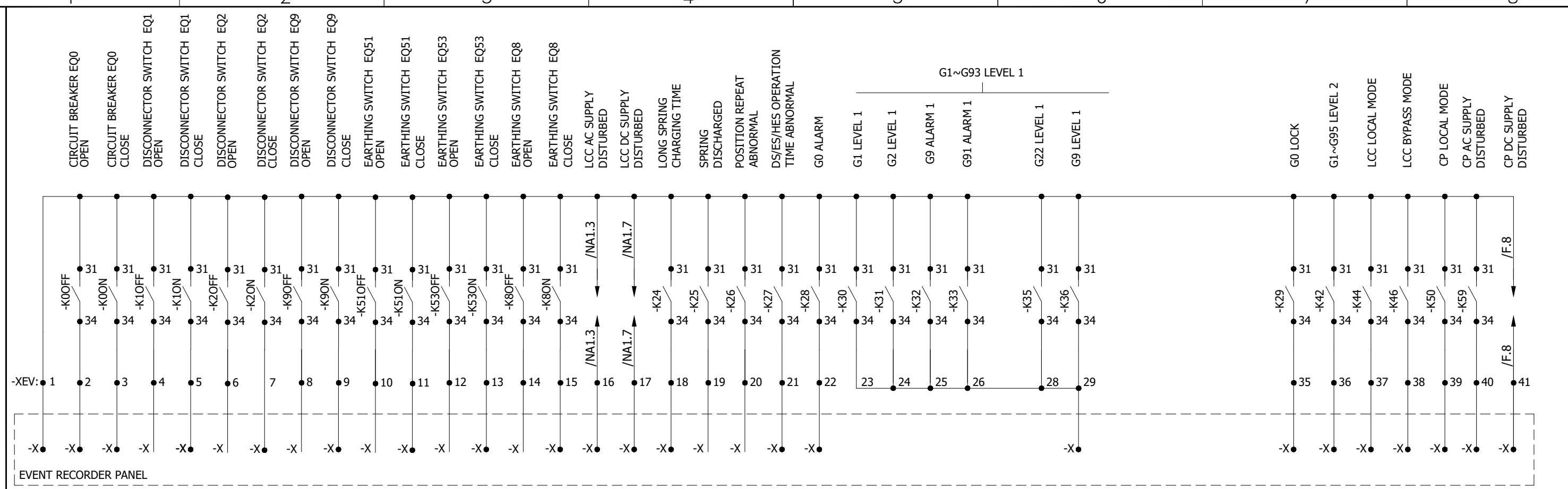


LINE RELAY PANEL
110VDC SPARE
CIRCUIT/SUPPLY FAULTY SPARE SPARE SPARE SPARE SPARE CONTROL PANEL
SPARE DC FAIL SPARE SPARE SPARE SPARE AC BELL

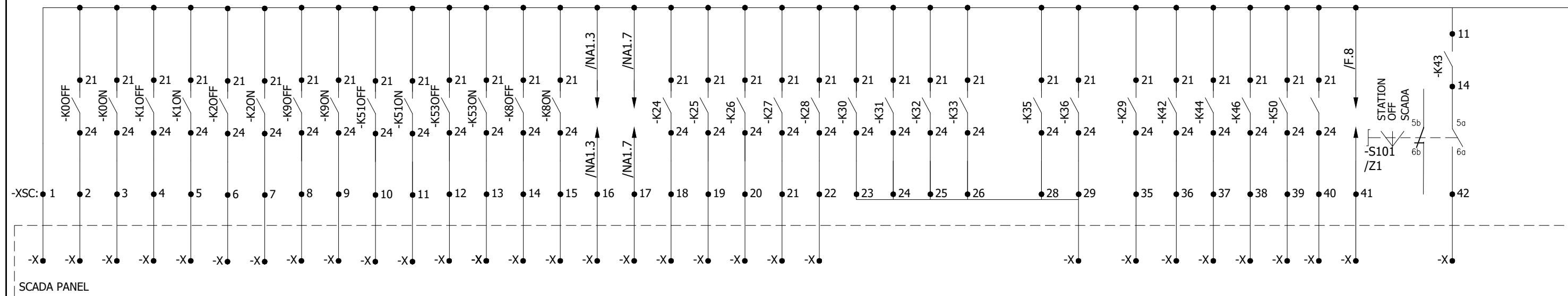
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0	AS BUILT	19-10-2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV LINE CONTROL PANEL (=E04+CP31) ANNUNCIATOR-4 CIRCUIT	Drawing no. P60194-E-ELC-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type RA4	Sheet no. 25
1	2	3	4	5	6	7	8				



EVENT RECORDER PANEL



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 (=E04+CP31) SCADA & ER SIGNALS	Drawing no. P60194-E-ELC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type RA5	Sheet no. 26
1			2							
2			3							
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7			8							

1

2

3

4

5

6

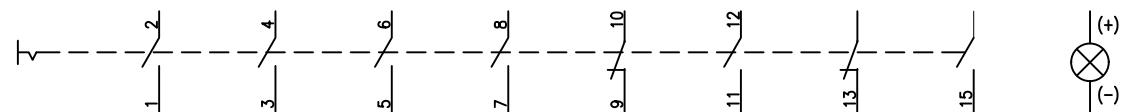
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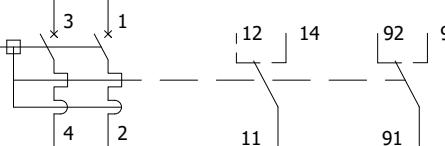
A



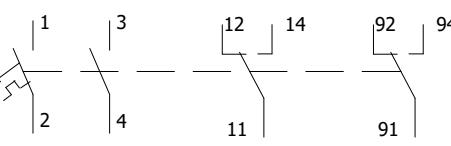
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-K14	NA1.5	NA1.4	NA1.5	NA1.7	
-K15	NA1.6	NA1.4	NA1.5	NA1.7	
-K16	NA1.6	NA1.4	NA1.5	NA1.7	
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-K24	NA1.4	RA1.4	RA5.4	RA5.4	
-K25	NA1.4	RA1.3	RA5.4	RA5.4	NA1.7
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-K27	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	
-K33	NA1.1	NA1.5	RA5.6	RA5.5	
-K35	NA1.1	NA1.6	RA5.6	RA5.6	
-K36	NA1.4	NA1.6	RA5.6	RA5.6	
-K37	NA1.4	NA1.6	RA5.6	RA5.6	
-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	
-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	
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-K51ON	NA2.8		RA5.3	RA5.3	
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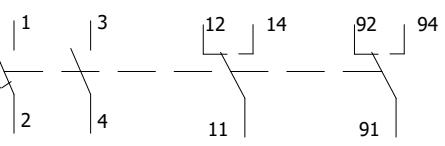
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-S9	I1.7	I1.7			NA2.6	NA5.3			NA5.3
-S51	I2.2	I2.3			NA3.1	NA5.5			NA5.5
-S53	I2.4	I2.5			NA3.3	NA5.5			NA5.5
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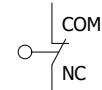
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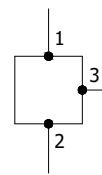
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-F202	E.6	F.5	



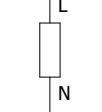
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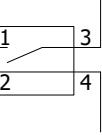
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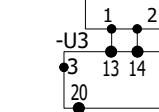
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-R100	D.5
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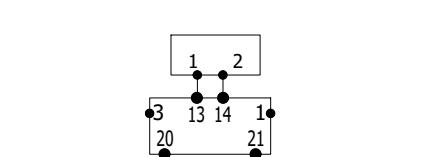


-Q10	NA4.6
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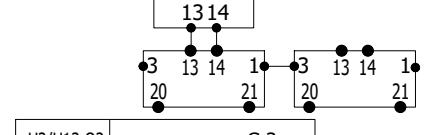


-U3/Q3	G.3
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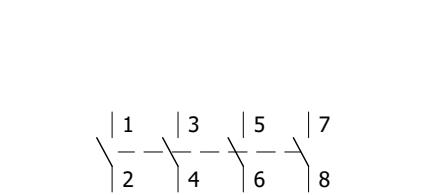
14 16



-U1/Q1	G.3
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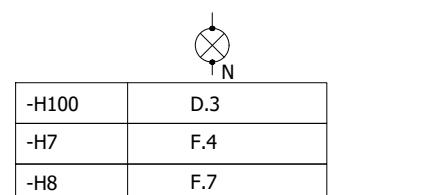
-U2/U12,Q2	G.3
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-S22	RA1.2	RA2.2	RA3.2	RA4.2
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-S23	RA1.2	RA2.2	RA3.2	RA4.2
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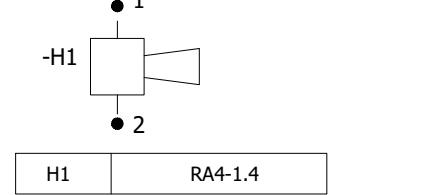
-S21	RA1.2	RA2.2	RA3.2	RA4.2
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-H100	D.3
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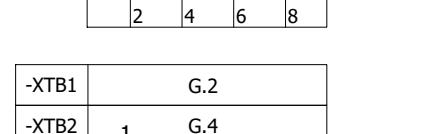
-H7	F.4
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-H8	F.7
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-XTB1	G.2
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-XTB2	G.4
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B1	RA4.1.2
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0 AS BUILT

19-10-2018 ASJ

Manufacturer

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