



Grid Solutions

A GE and Alstom joint venture

220kV/132kV GIS SUBSTATION GHAZI ROAD , LAHORE

132kV TRAFO CONTROL PANEL SCHEMATIC DRAWINGS

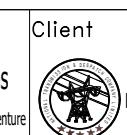
DOC / DWG REVIEW CODE	
<input type="checkbox"/>	A Approved, Issue IFC.
<input type="checkbox"/>	B Approved with comments as noted, Issue IFC after incorporation of these comments.
<input type="checkbox"/>	C Revise and re-submit for approval.
<input type="checkbox"/>	D Rejected.
Signed	
Date	
Permission to proceed does not constitute acceptance or 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.	

	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

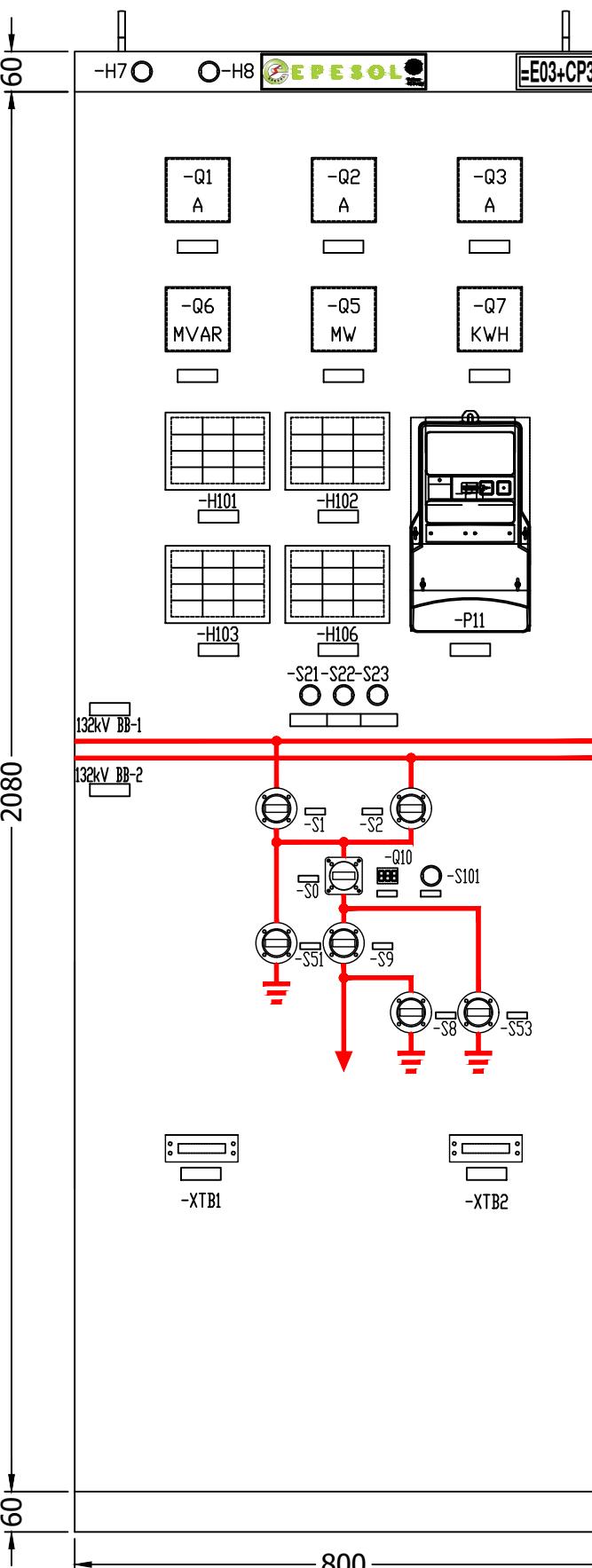
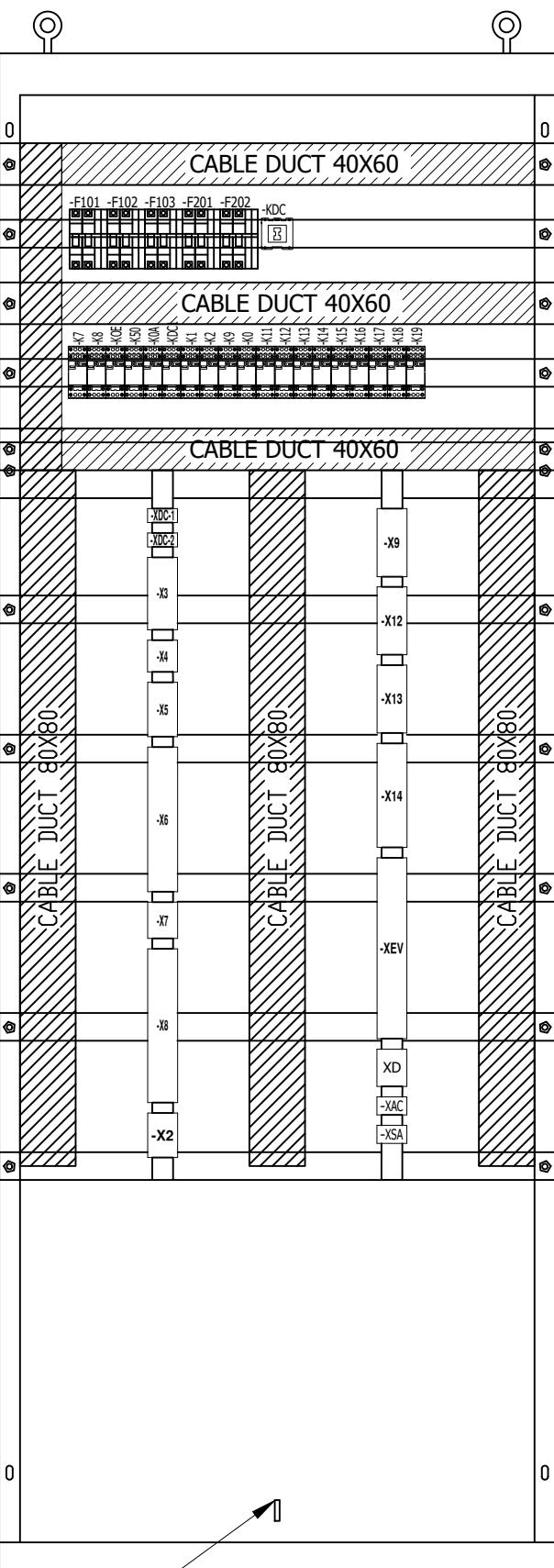
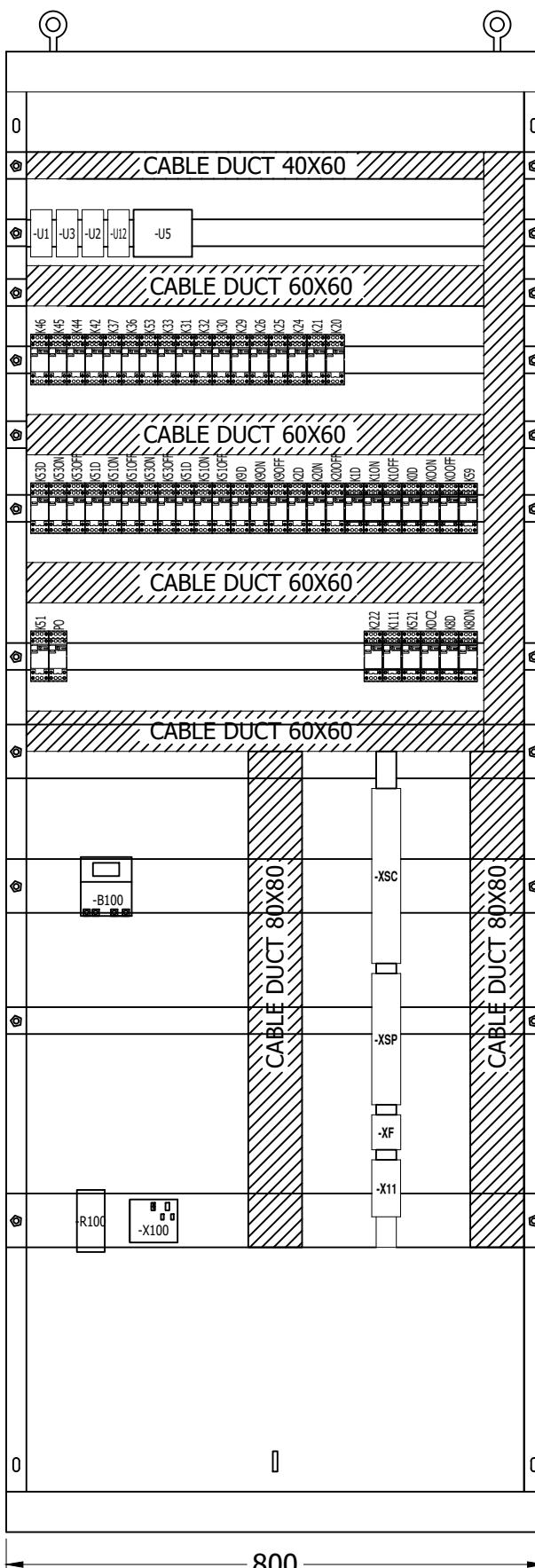
All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.

0	AS BUILT	30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) SYMBOL AND LEGENDS	Drawing no. P60194-E-ETC-SC-001
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	02	ANALOGUE AMPERE METER	METER:240 DEGREE TRANSDUCER OPERATED ANALOGUE AMPERE MATER, INPUT 0...20/30mA, ACCURACY CLASS 1, SCALE -1: 0...150A, SCALE-2:0...200/300A			-Q1, -Q3	FRER			
	02	CURRENT TRANSDUCER	NORMAL INPUT CURRENT 1/1.5A, OUTPUT CURRENT 0...20/30mA, AUXILIARY VOLTEGE 110VDC, ACCURACY CLASS 1, CT RATIO 100:200/1A. ORD: A96MMA+MCOEAQ			-U1 , -U3	FRER			
B	01	DIGITAL AMPERE METER	TRANSDUCER OPERATED DIGITAL APMERE METER:, INPUT 0...20/30mA, ACCURACY CLASS 1, SCALE-1: 0...100/150A, SCALE-2: 0...200/300A, AUXILIARY VOLTAGE 110VDC.			-Q2	FRER			
	02	CURRENT TRANSDUCER	CURRENT TRANSDUCER: NORMAL INPUTS CURRENT 1/1.5A, OUTPUT 0...20/30mA, AUXILIARY VOLTAGE 110VDC, ACCURACY CLASS1, CT RATIO 100:200/1A.. ORD: D96MMA+MCOEAQ			-U2, -U12	FRER			
C	01	DIGITAL POWER METER	THREE PHASE DIGITAL POWER METER, ACCURACY CLASS 0.5S, INPUT NORMAL CURRENT 1/5A, INPUT NORMAL VOLTAGE 110VAC (L-L), AUXILIARY VOLTAGE 110-375 VDC			-Q7	FRER			
	01	PROGRAMABLE UNIVERSAL TRANSDUCER (FOR SCADA)	TRANSDUCER: THREE PHASE, 4-WIRES BALANCED LOAD, 4-PROGRAMABLE DC mA OUTPUT NORMAL INPUT VOLTAGE 110/137.5 VAC (L-L), NORMAL INPUT CURRENT 1/1.25 A. AUXILIARY VOLTAGE 110VDC, ACCURACY CLASS 1, OUTPUT 1 TO OUTPUT 4 -12.5/-10...0...+10/12.5 mA DC, PT RATIO 132/0.11kV (L-L), CT RATIO 100:200/1A.. ORD: MCUP4			-U5	FRER			
D	03	ANNUNCIATOR	TWELVE WINDOW ANNUNCIATOR, RATED VOLTAGE 110 VDC, ORD: AM-101			-H101, -H102, -H103	ELABS			
	01	ANNUNCIATOR	TWELVE WINDOW ANNUNCIATOR, RATED VOLTAGE 240 VAC, ORD: AM-101			-H106	ELABS			
E	01	PUSH BUTTON - LAMP TEST	TYPE: SWITCH (A TYPE:), COLOR : BLACK , SUPPLY : 120VDC, Ord: YS-AP1-2-31-B-D-W			-S21	YONGSUNG			
	01	PUSH BUTTON - ALARM ACKNOWLEDGMENT	TYPE: SWITCH (A TYPE:), COLOR : RED , SUPPLY : 120VDC, Ord: YS-AP1-2-31-R-D-W			-S22	YONGSUNG			
F	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			
G	57	AUXILIARY CONTACTOR	COIL VOLTAGE: 110VDC, 4 C/O CONTACTS, ORD: PRC4M40DCJL			-K50, -K0E, -K0A, -KDC1, -KDC2, -K1, -K2, -K11 TO -K21 -K24 TO -K31, -K36 TO -K38, -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, -KS21	GE			
	01	AUXILIARY CONTACTOR - SUPPLY CHANGEOVER	COIL VOLTAGE: 110VDC, 3 NO + 3 NC CONTACTS, ORD: MCRC022ATWJ-B+MARN211AT			-KDC	GE			
H	03	AUXILIARY CONTACTOR	COIL VOLTAGE:: 240VAC, 4 C/O CONTACTS, ORD: PRC4M40ANL			-KACM, -K7, -K8	GE			
	REV.	DESCRIPTION	DATE	DRAWER	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 TRAFO CONTROL PANEL (=E02+CP51) COMPONENT LIST	Drawing no. P60194-E-ETC-SC-001
								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	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			
	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			
B	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			
C	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			
D	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			
E	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			
F	01	THREE PIN SOCKET	1N+PE, 16A, 230VAC @ 50Hz			-X100	LOCAL			
	01	PANEL HEATER	240VAC @ 50Hz, 50W			-R100	E-LABS			
G	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			
H	02	TERMINAL BLOCKS FOR DC SUPPLY1	TYPE: CBD-4			-XDC-1	CABUR			
	02	TERMINAL BLOCKS FOR DC SUPPLY2	TYPE: CBD-4			-XDC-2	CABUR			
I	24	TERMINAL BLOCKS FOR AC ANNUNCIATOR	TYPE: CBD-4			-X14	CABUR			
	41	TERMINAL BLOCKS FOR EVENT RECORDER PANEL	TYPE: CBD-4			-XEV	CABUR			
J	0	AS BUILT	30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) COMPONENT LIST	Drawing no. P60194-E-ETC-SC-001
	REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AC2

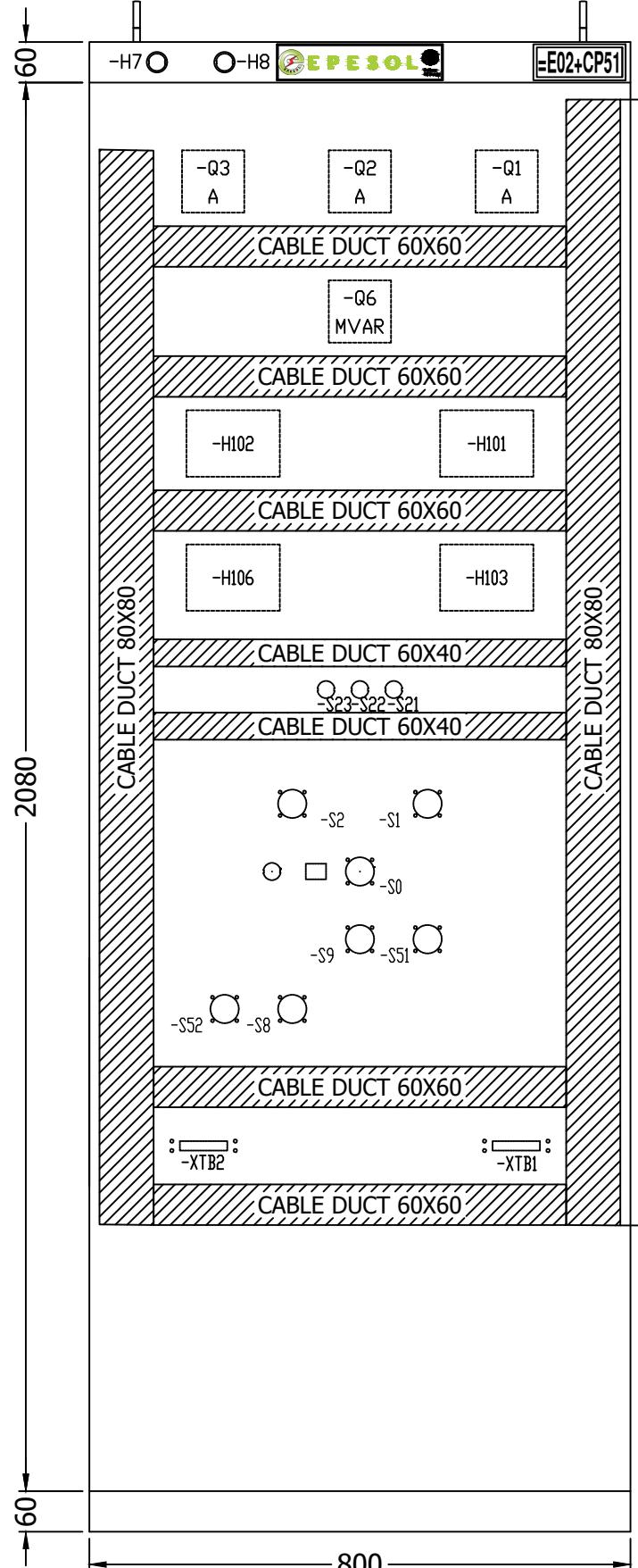
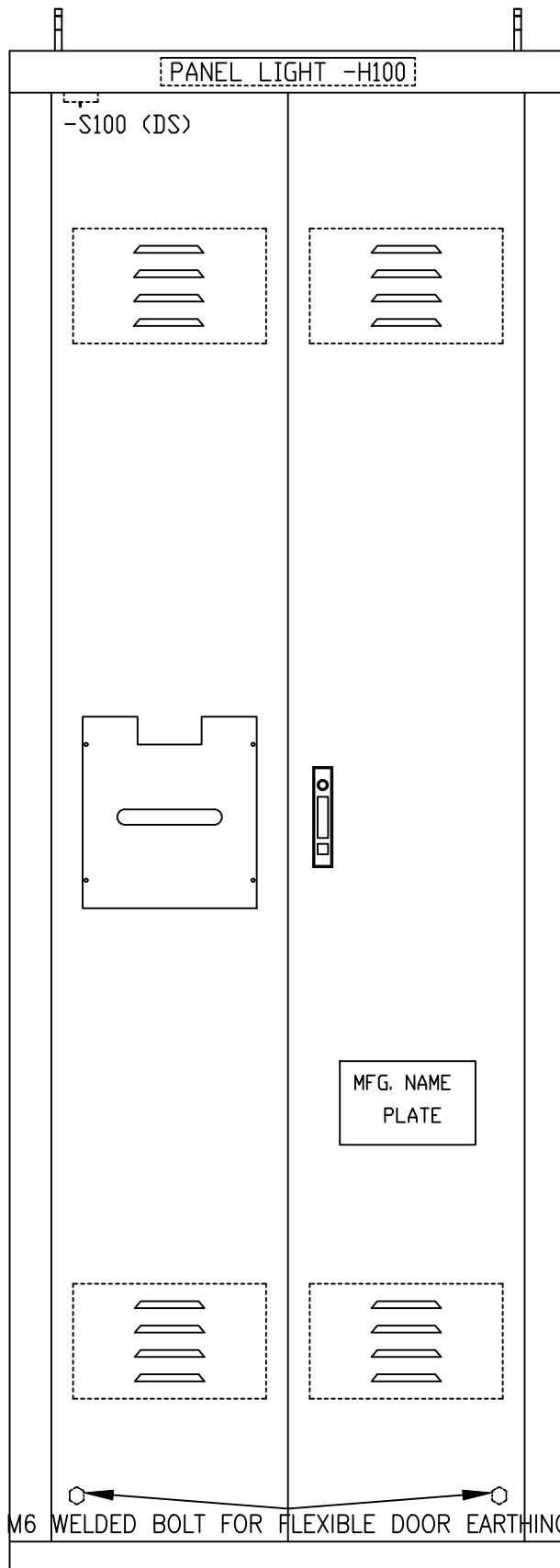
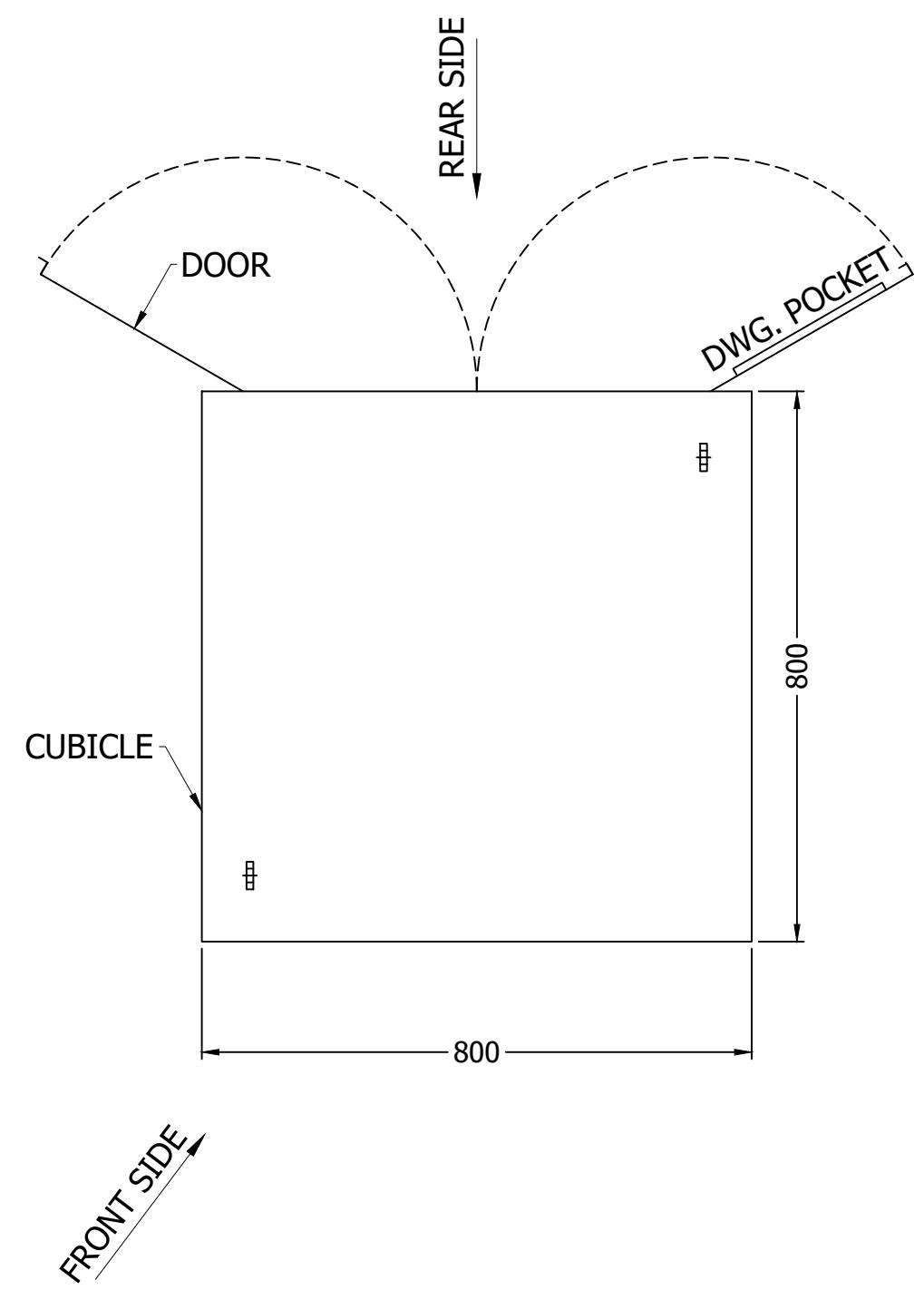
	1	2	3	4	5	6	7	8		
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER			
A	04	TERMINAL BLOCKS FOR SCADA	TYPE: CBD-4			-X5		CABUR		
	33	TERMINAL BLOCKS FOR TRANSDUCER	TYPE: CBD-4			-X6		CABUR		
	04	TERMINAL BLOCKS FOR METERING	TYPE: CBD-4			-X7		CABUR		
B	33	TERMINAL BLOCKS FOR VOLT METER	TYPE: CBD-4			-X8		CABUR		
	15	TERMINAL BLOCKS FOR DISCONNECTOR EARTH SWITCH CONTROL	TYPE: CBD-4			-X9		CABUR		
	13	TERMINAL BLOCKS FOR CB CONTROL CIRCUIT	TYPE: CBD-4			-X11		CABUR		
C	20	TERMINAL BLOCKS FOR CB CONTROL CIRCUIT	TYPE: CBD-4			-X12		CABUR		
	18	TERMINAL BLOCKS FOR SYSTEM ALARM	TYPE: CBD-4			-X13		CABUR		
	24	TERMINAL BLOCKS FOR CB CONTROL CIRCUIT	TYPE: CBD-4			-X4		CABUR		
D	42	TERMINAL BLOCKS FOR SIGNAL ALARM	TYPE: CBD-4			-XSC		CABUR		
	06	TERMINAL BLOCKS FOR DC ANNUNCIATOR-3	TYPE: CBD-4			-XSA		CABUR		
	07	TERMINAL BLOCKS WITH DIODE TYPE IN-D4007, RATED MAXIMUM VOLTAGE 350VDC, RATED BREAK DOWN VOLTAGE 430VDC	TYPE: DAS.4/6			-XD		CABUR		
E	08	TERMINAL BLOCKS FOR CT CIRCUIT	TYPE: SCB-6			-X2		CABUR		
	16	TERMINAL BLOCKS FOR VT CIRCUIT	TYPE: SCB-6			-X3		CABUR		
	30	SPARE TERMINAL BLOCKS	TYPE: CBD-4			-XSP		CABUR		
F										
G	0	AS BUILT	30-10-2018	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 GAZI ROAD, LAHORE	Title 132kV TRAFO CONTROL PANEL (=E02+CP51) COMPONENT LIST	Drawing no. P60194-E-ETC-SC-001
									Project no. P-60194	
									Sheet type AC2	
	REV.	DESCRIPTION	DATE	DRAWER					Sheet no. 05a	

FRONT VIEWLEFT SIDE VIEWRIGHT SIDE VIEW

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

A
B
C
D
E
F

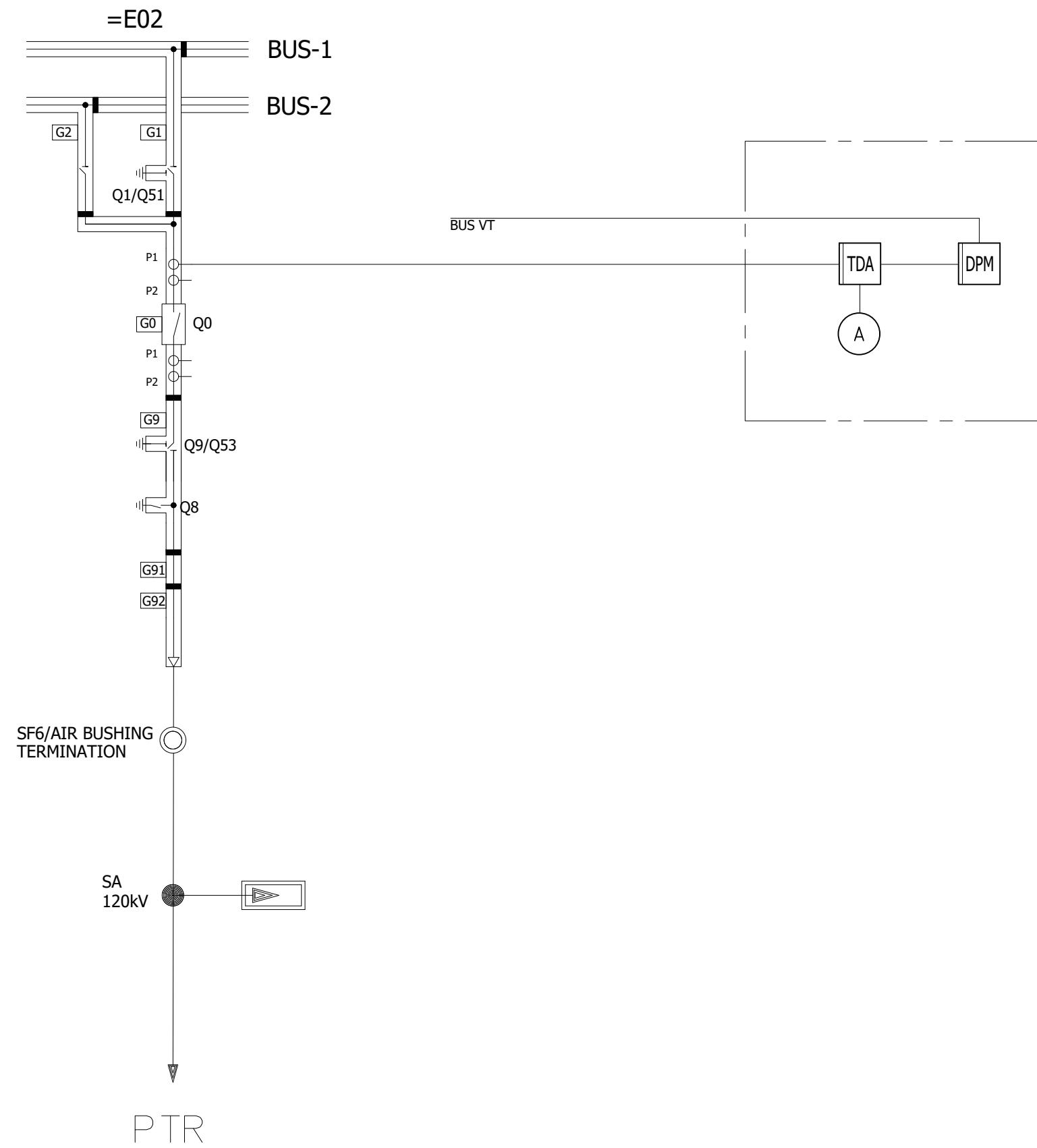
0	AS BUILT	30-10-2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
				EPESEL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	132kV LINE CONTROL PANEL (=E03+CP31) PANEL VIEWS	P-60194-E-ELC-SC-002
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type AD Sheet no. 06

FRONT VIEWBACK VIEW WITH DOORTOP VIEWNOTE:-

- 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.

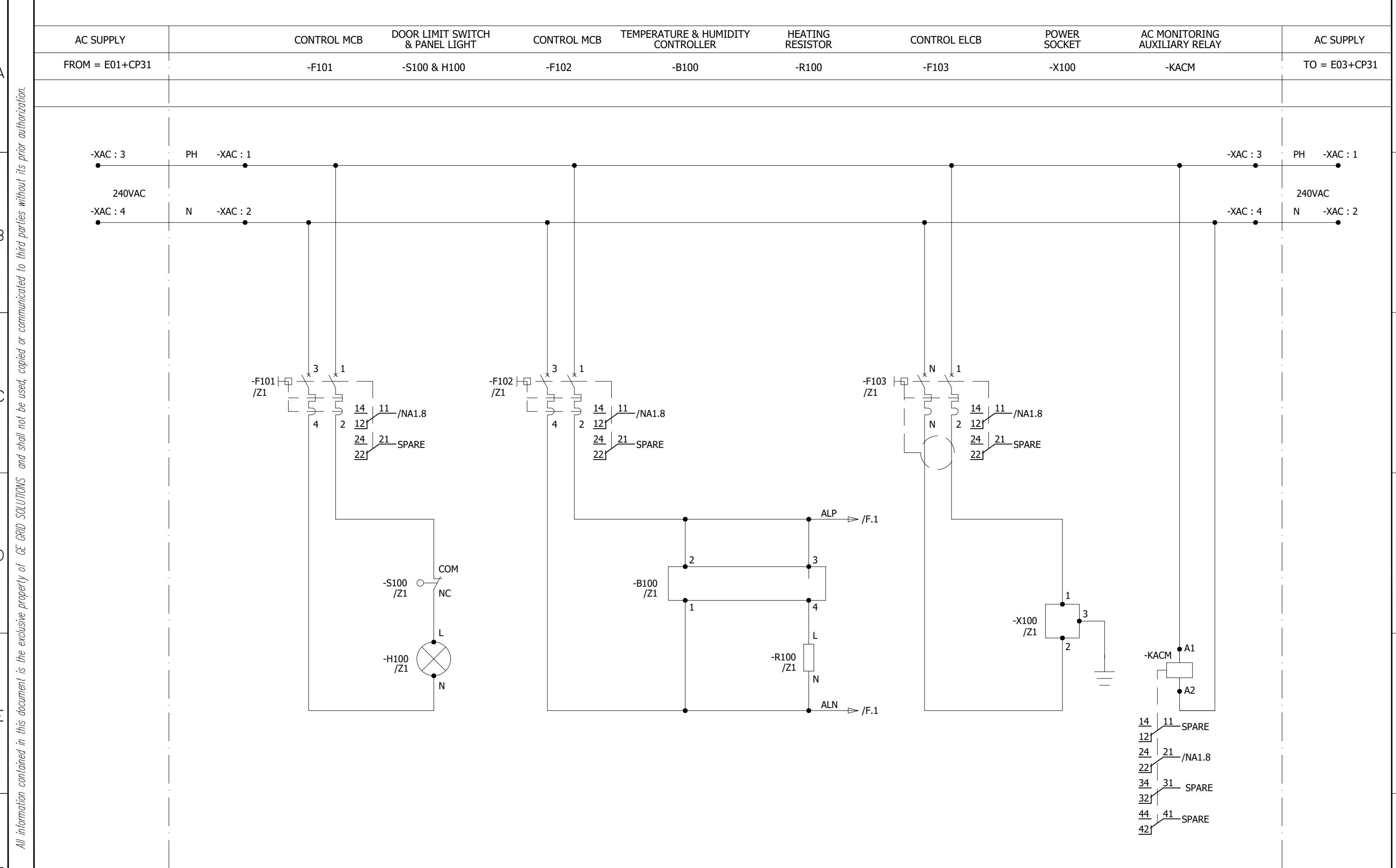
0	AS BUILT	30-10-2018	ASJ	Manufacturer EPESEL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor GE Grid Solutions A GE and Alstom joint venture	Client NTDC-WAPDA NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132KV TRAFO CONTROL PANEL (=E02+CP51) PANEL VIEWS	Drawing no. P60194-E-ETC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AD1
									Sheet no. 06a

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



0	AS BUILT	30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) SINGLE LINE DIAGRAM	Drawing no. P60194-E-ETC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AE
									Sheet no. 07

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



0	AS BUILT	30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) AC SUPPLY DISTRIBUTION CIRCUIT	Drawing no. P60194-E-ETC-SC-001
									Project no. P-60194 Sheet type D Sheet no. 08
REV.	DESCRIPTION	DATE	DRAWER						

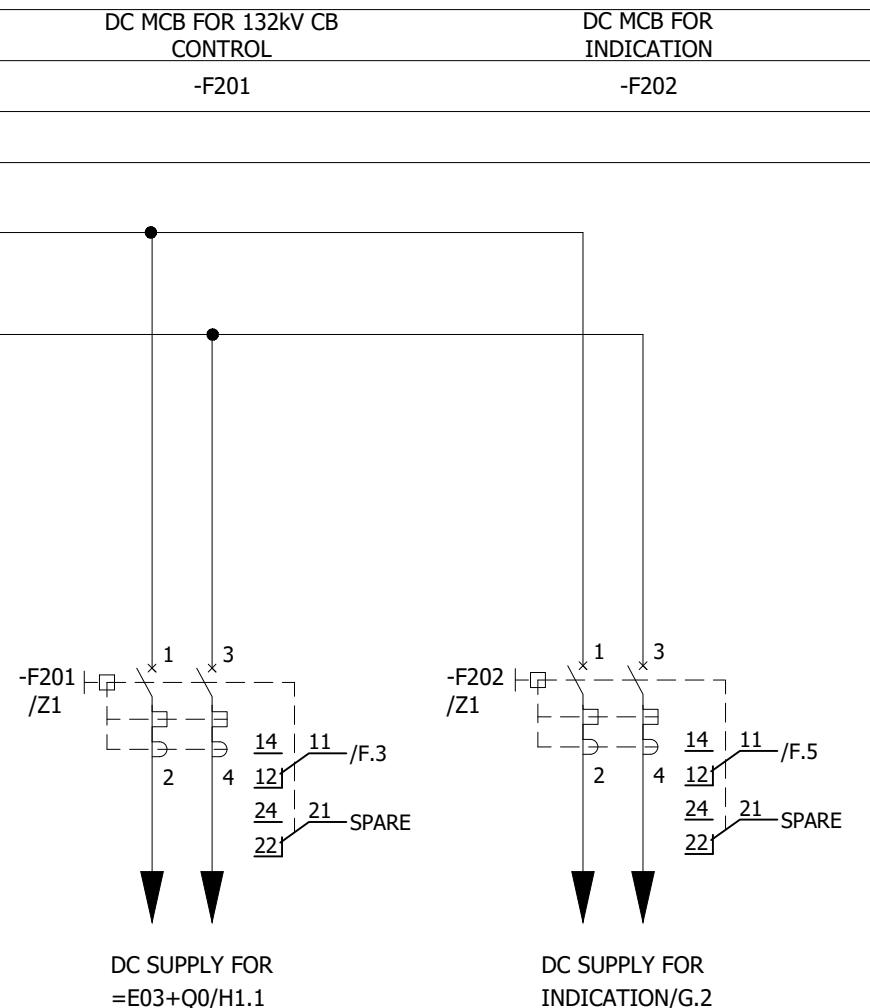
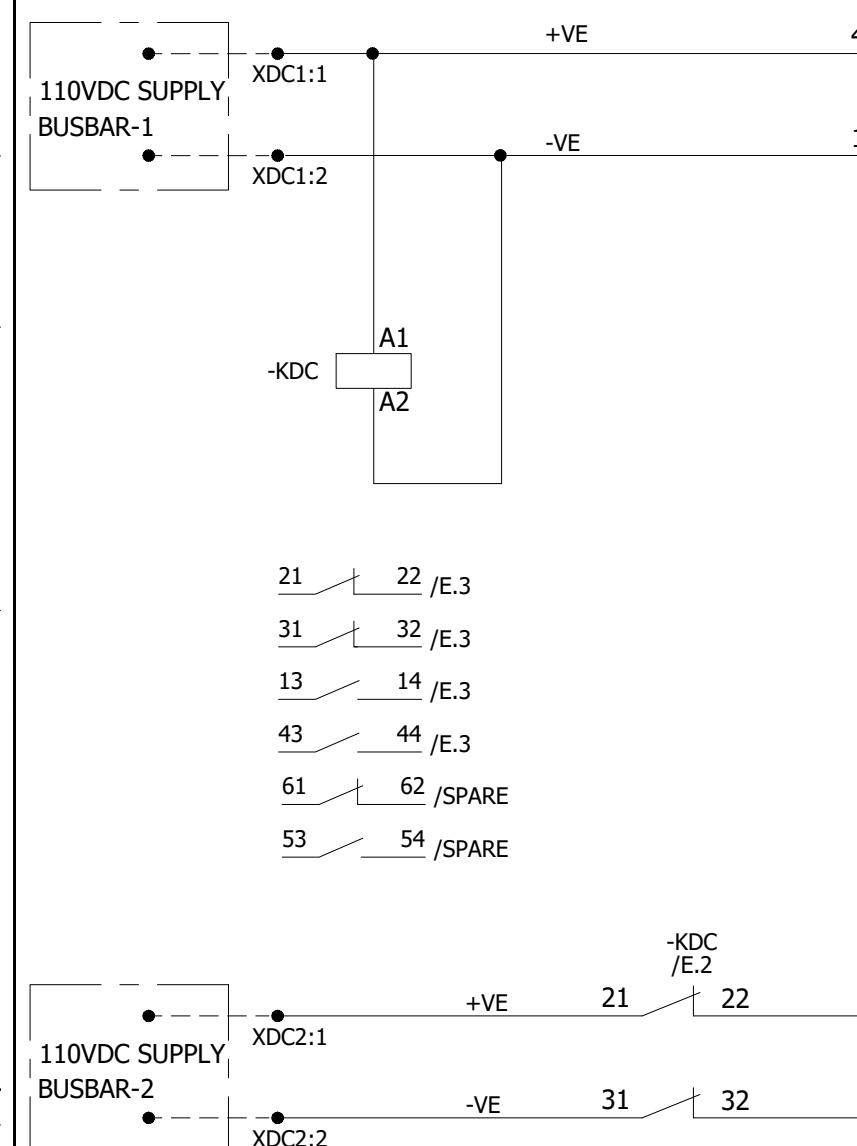
DC MCB FOR 132KV CB
CONTROL

-F201

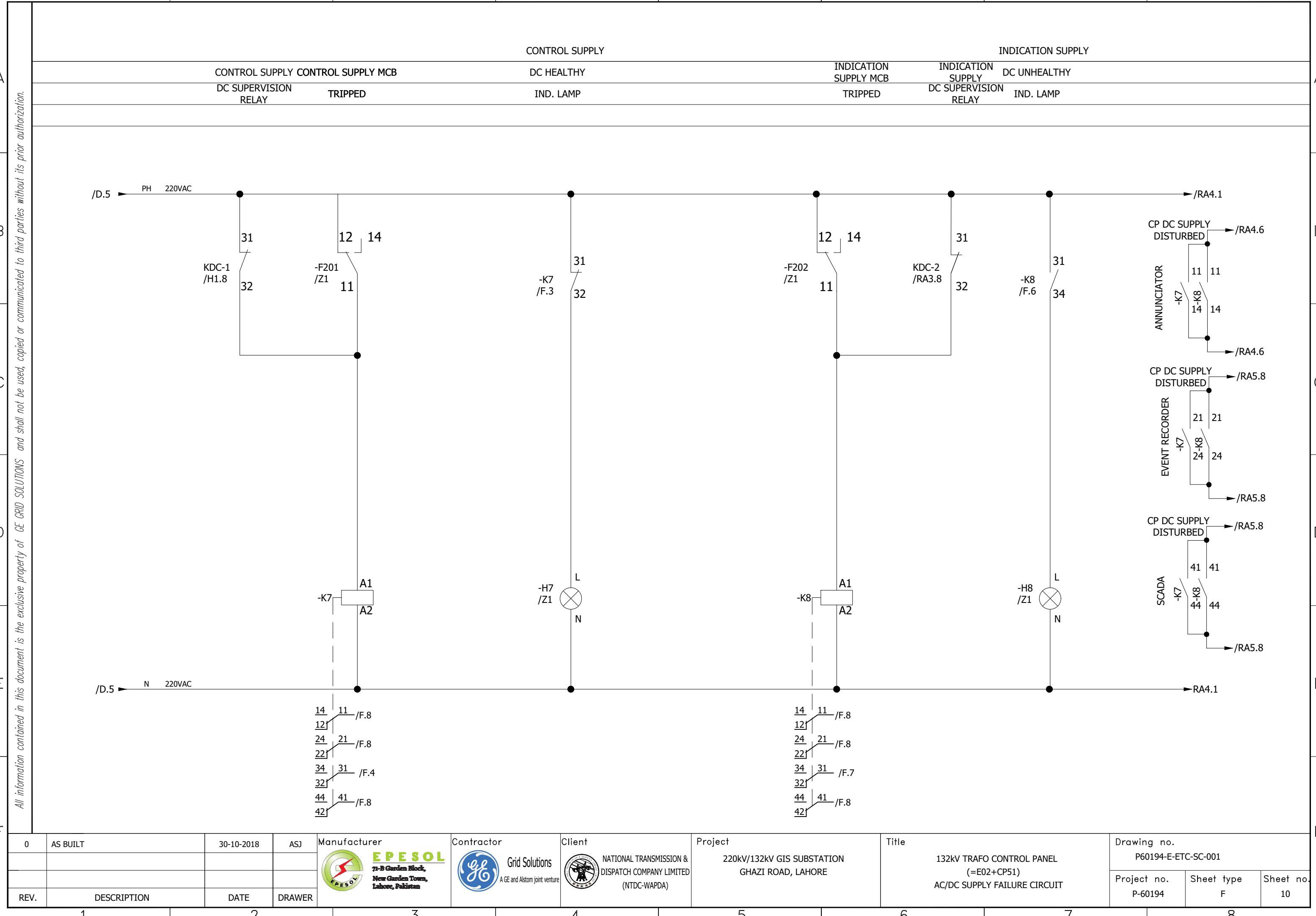
DC MCB FOR
INDICATION

-F202

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



0	AS BUILT	30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) DC SUPPLY DISTRIBUTION CIRCUIT	Drawing no. P60194-E-ETC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type E Sheet no. 09



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

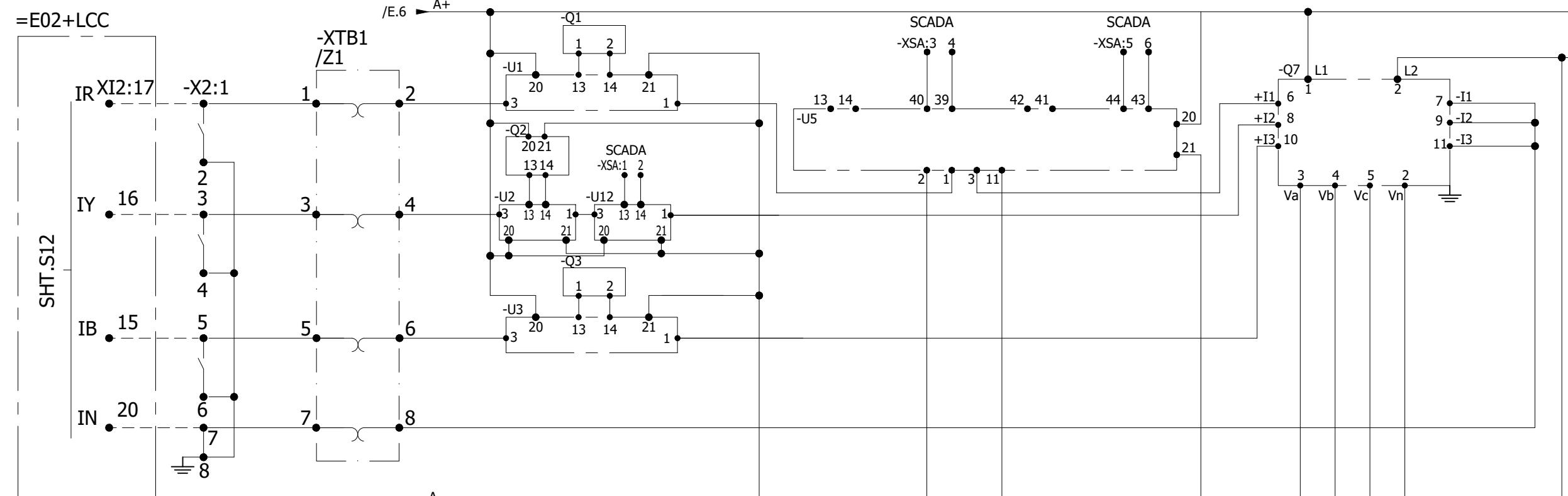
TEST BLOCK

TS

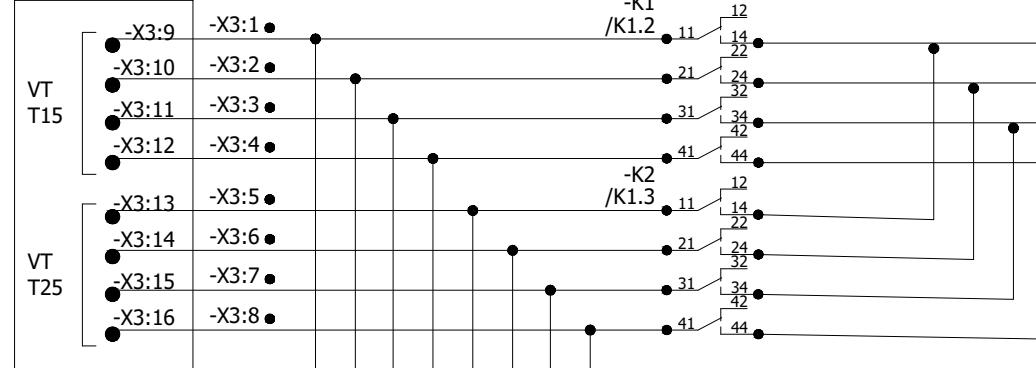
AM METERS

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

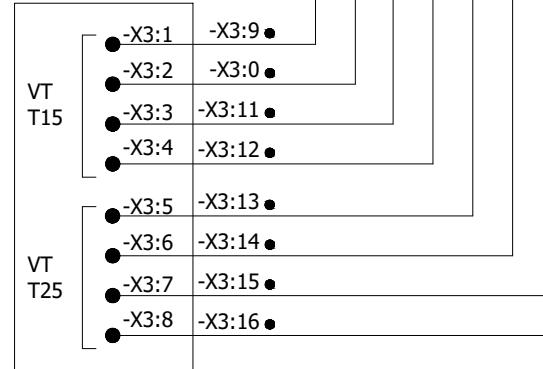
(-Q7)



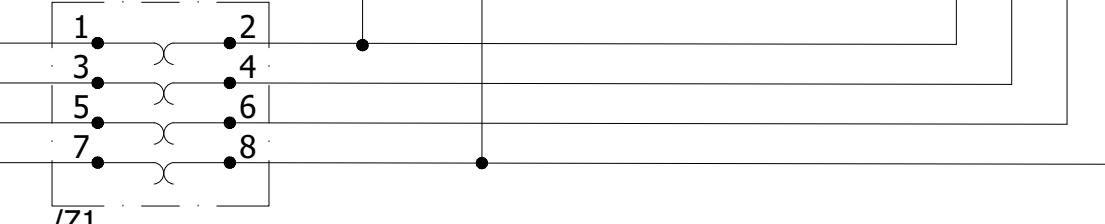
FROM=E03+CP31



TO=E01+CP31



-XTB2



0	AS BUILT	30-10-2018	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	Project 220KV/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132KV TRAFO CONTROL PANEL (=E02+CP51) METERING	Drawing no. P60194-E-ETC-SC-001
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

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

A

A

B

B

C

C

D

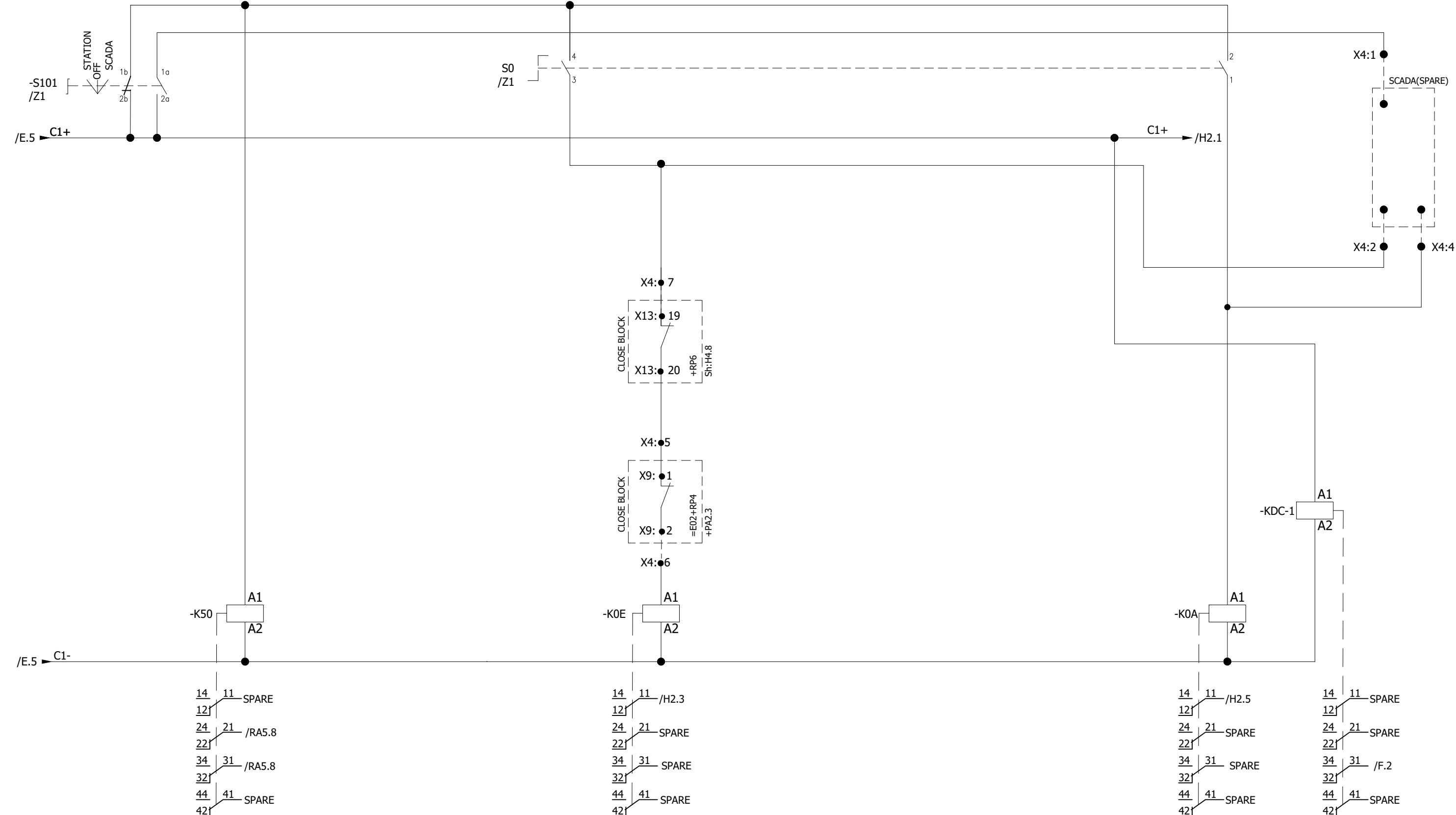
D

E

E

F

F



0	AS BUILT	30-10-2018	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	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV TRAFO CONTROL PANEL (=E02+CP51) CB CONTROL CIRCUIT	Drawing no. P60194-E-ETC-SC-001	
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

CLOSE

OPEN

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

A

A

B

B

C

C

D

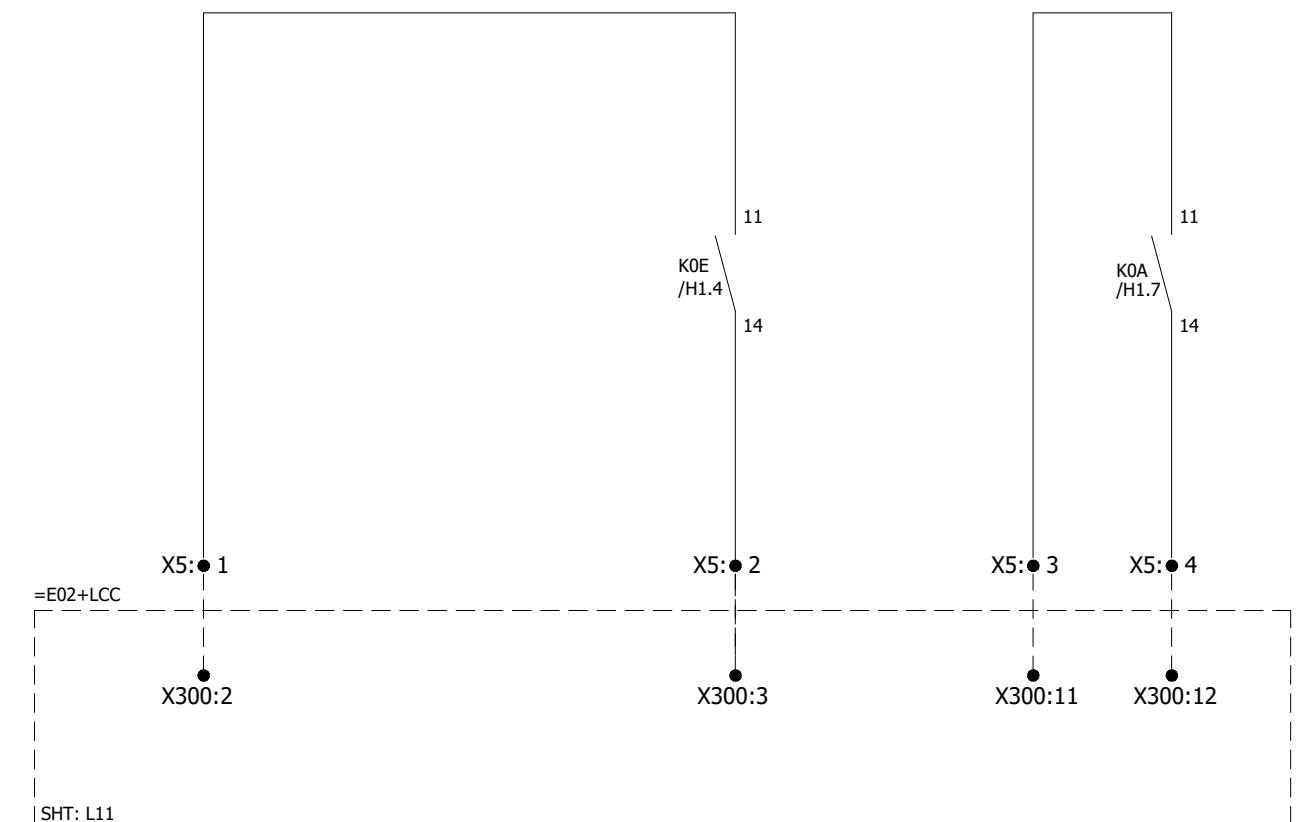
D

E

E

F

F



0	AS BUILT	30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) CB CONTROL CIRCUIT	Drawing no. P60194-E-ETC-SC-001
									Project no. P-60194
	DESCRIPTION	DATE	DRAWER						Sheet type H2
REV.									Sheet no. 13

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

=E02+Q1

CLOSE

OPEN

=E02+Q2

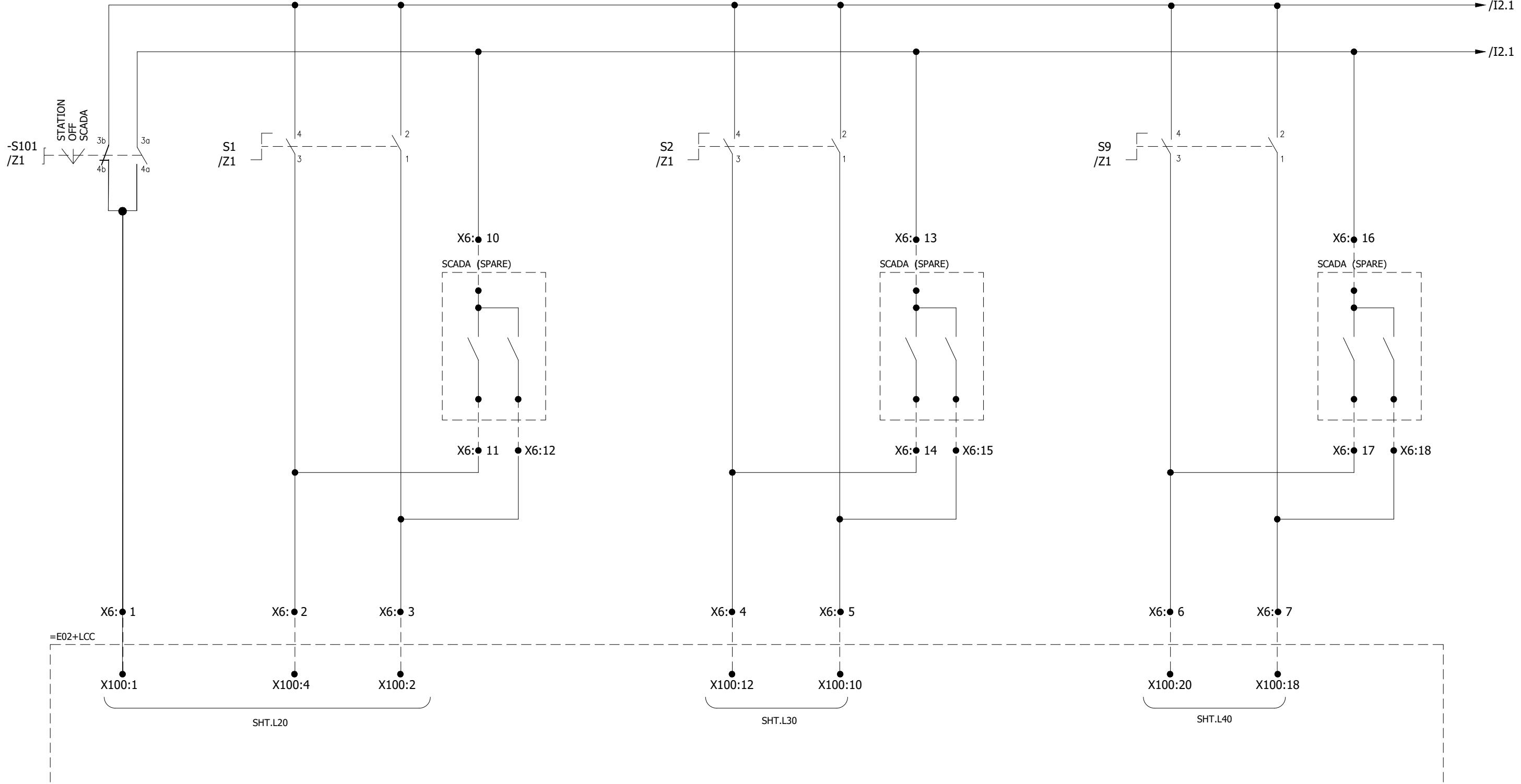
CLOSE

OPEN

=E02+Q9

CLOSE

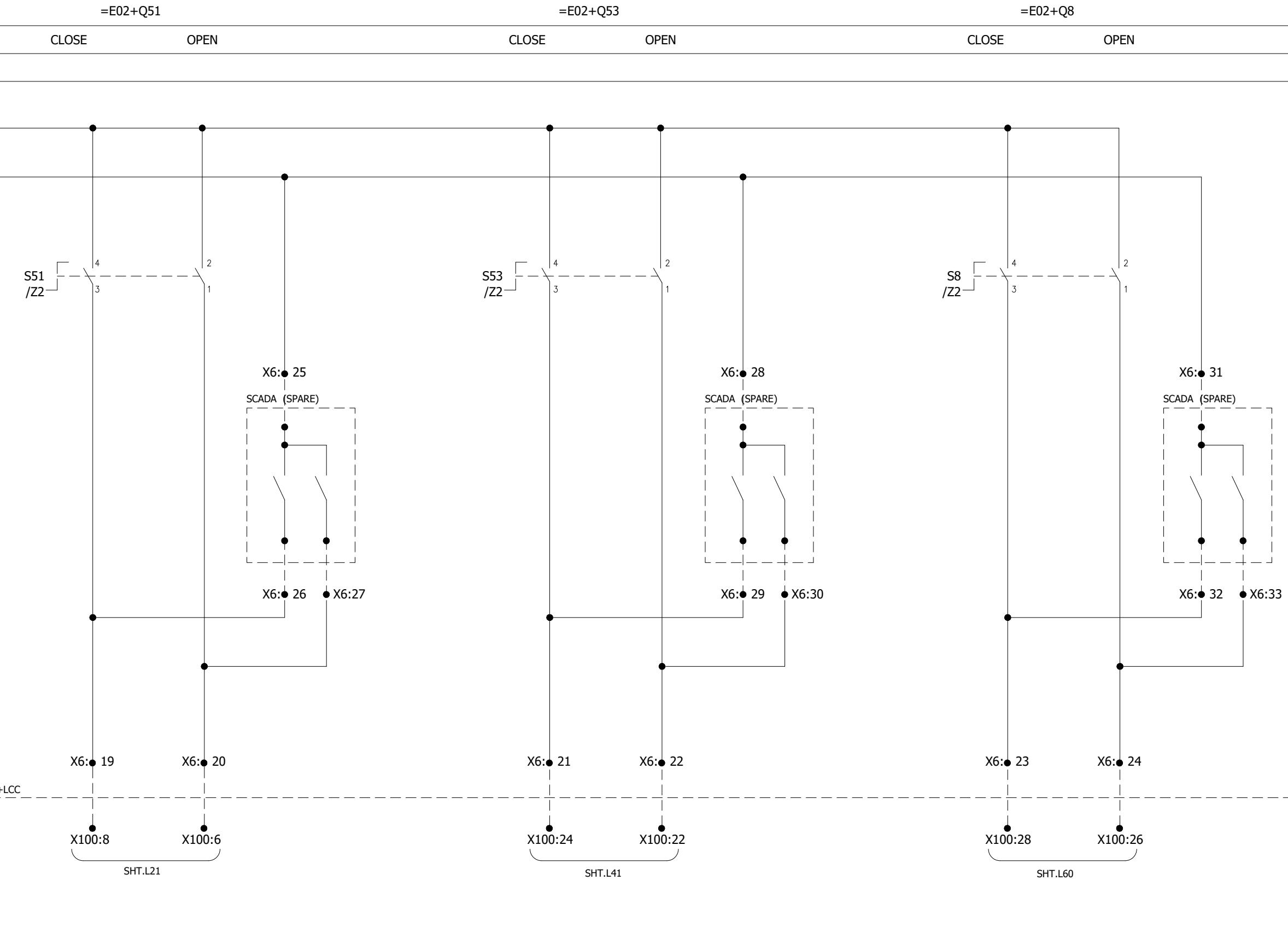
OPEN



0	AS BUILT		30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) DISCONNECTOR & EARTH SWITCH CONTROL	Drawing no. P60194-E-ETC-SC-001		
REV.	DESCRIPTION		DATE	DRAWER						Project no. P-60194	Sheet type I1	Sheet no. 14
1	2	3	4	5	6	7	8					

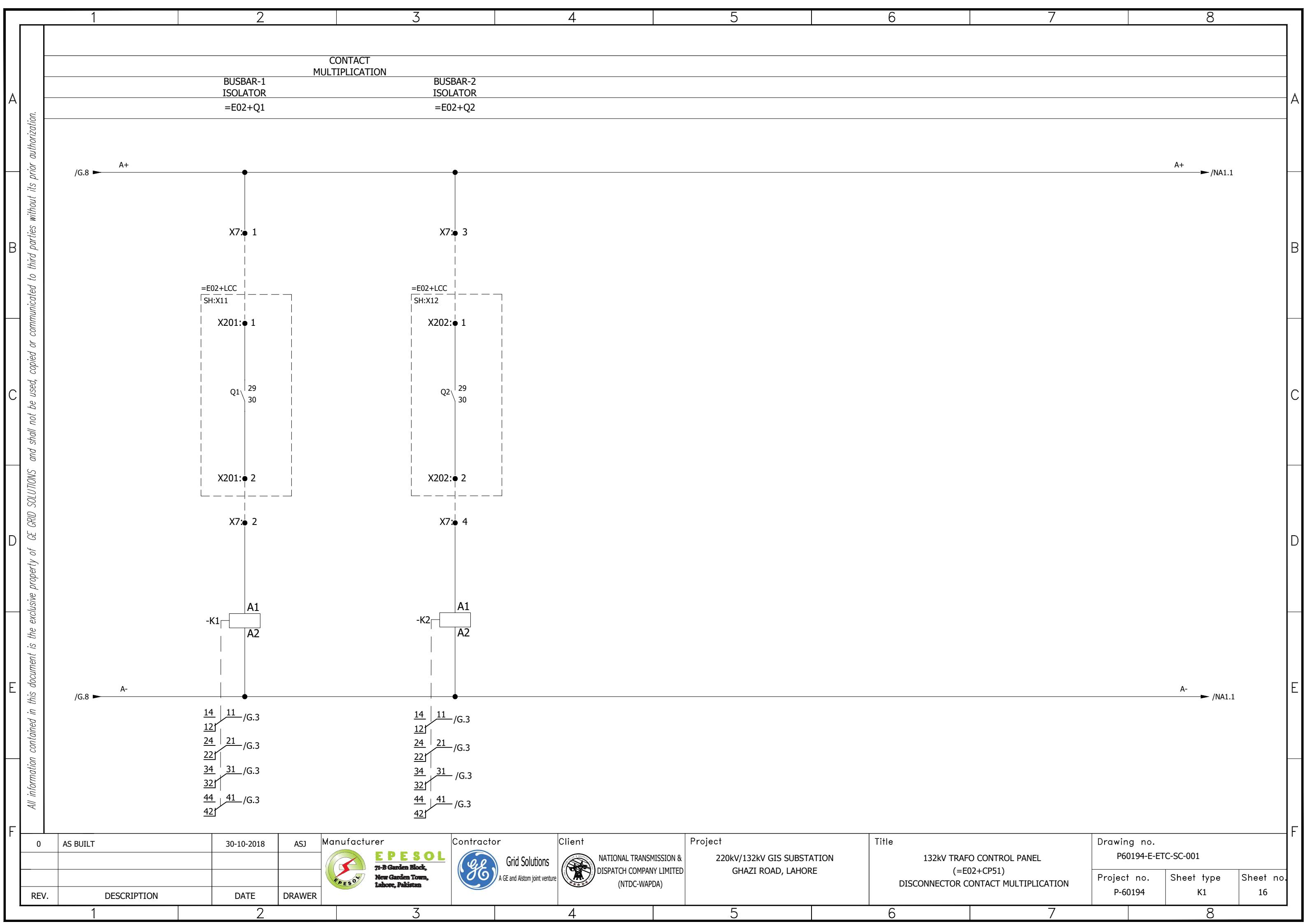
1 2 3 4 5 6 7 8

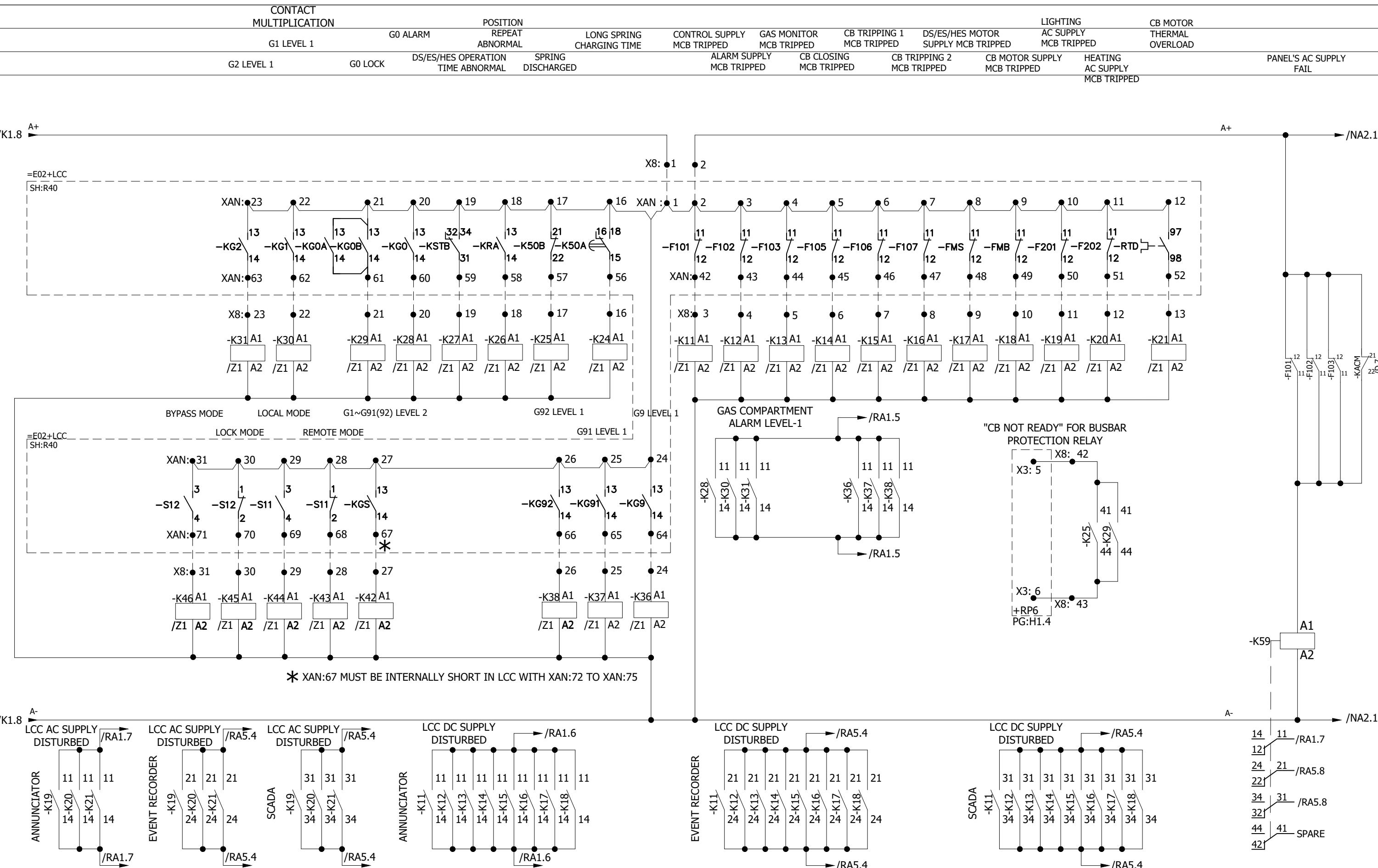
All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.



0	AS BUILT		30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) DISCONNECTOR & EARTH SWITCH CONTROL	Drawing no. P60194-E-ETC-SC-001		
REV.	DESCRIPTION		DATE	DRAWER						Project no. P-60194	Sheet type I2	Sheet no. 15
1	2	3	4	5	6	7	8					

1 2 3 4 5 6 7 8





CIRCUIT BREAKER

($=E02+Q0$)

OPEN CLOSE

BUSBAR-I
ISOLATOR($=E02+Q1$)

OPEN CLOSE

BUSBAR-II
ISOLATOR($=E02+Q2$)

OPEN CLOSE

LINE ISOLATOR

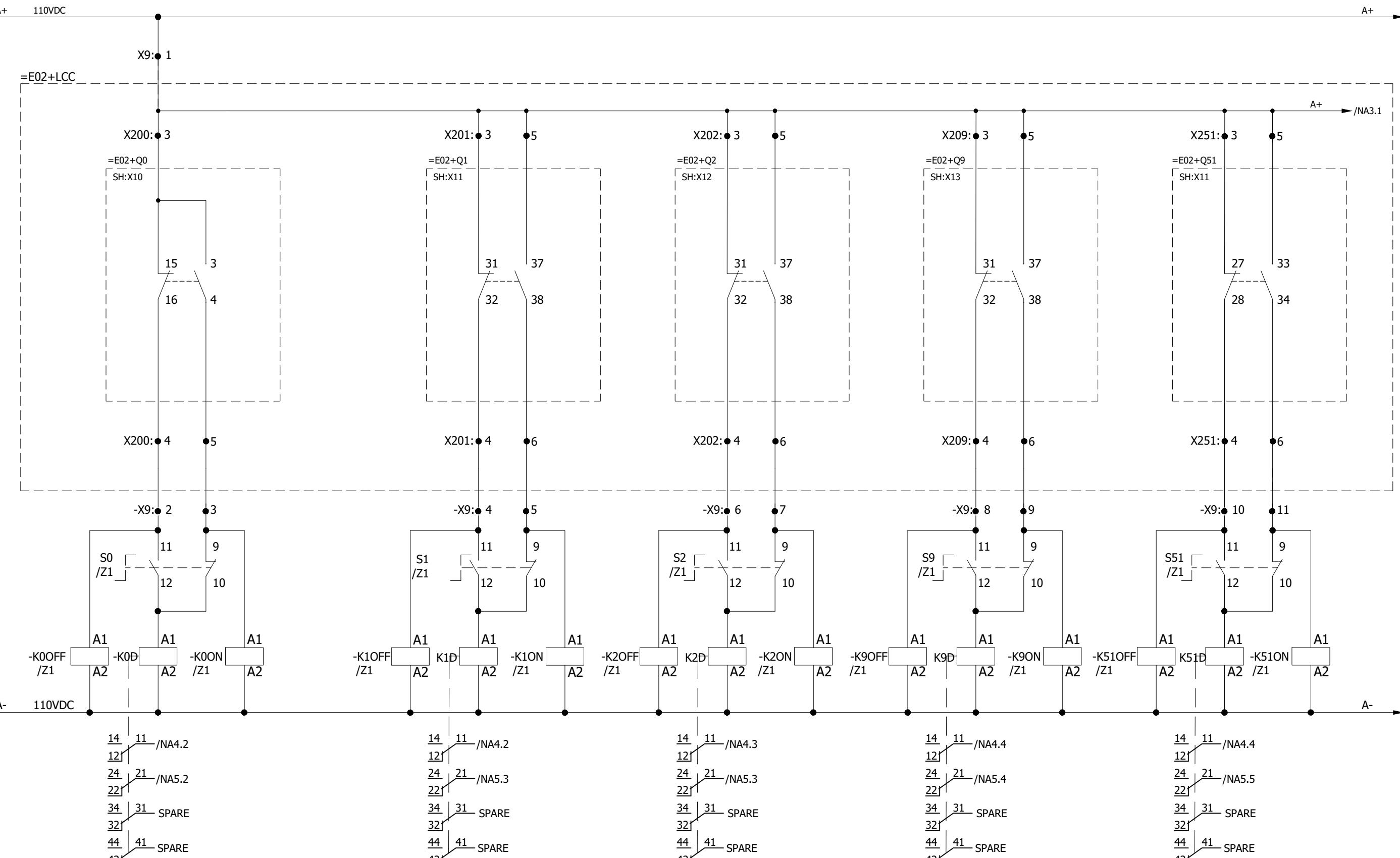
($=E02+Q9$)

OPEN CLOSE

LINE EARTHING
SWITCH($=E02+Q51$)

OPEN CLOSE

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



0	AS BUILT	30-10-2018	ASJ	Manufacturer  7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV TRAFO CONTROL PANEL ($=E02+CP51$) DISCREPANCY INITIATION	Drawing no. P60194-E-ETC-SC-001
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type NA2
								Sheet no. 18	

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

(=E02+Q53)

OPEN CLOSE

(=E02+Q8)

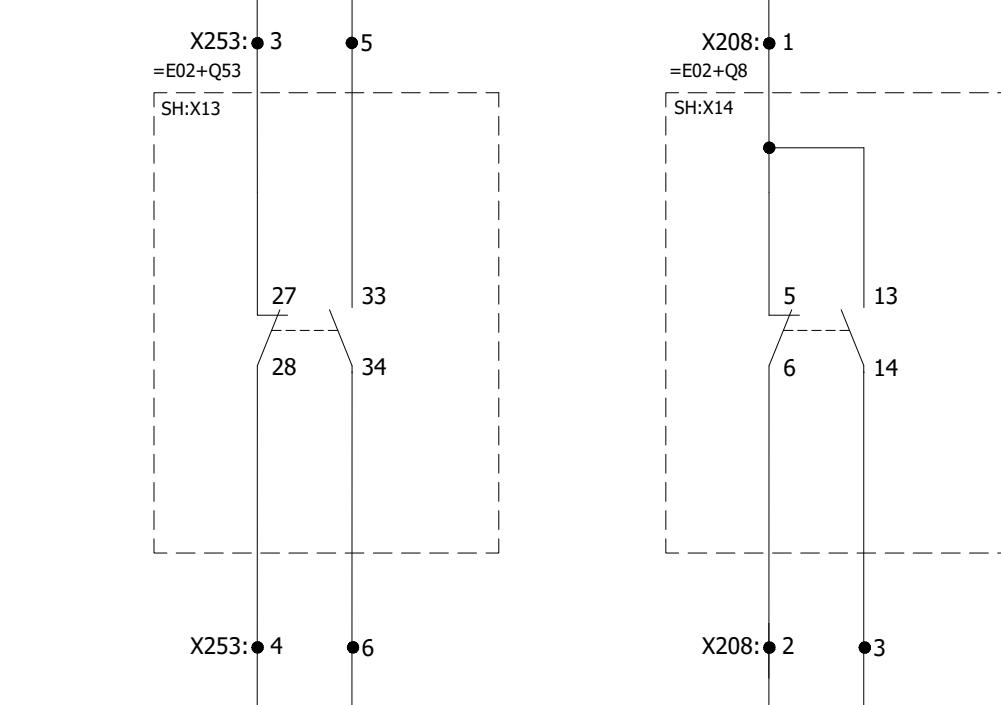
OPEN CLOSE

/NA2.8 A+

A+ /NA4.1

=E02+LCC

/NA2.8 A+ 110VDC



14 11 /NA4.5
12 21 /NA5.6
24 21 /NA5.6
34 31 /NA5.6
32 31 /NA5.7
44 41 SPARE
42 41 SPARE

14 11 /NA4.5
12 21 /NA5.7
24 21 /NA5.7
34 31 /NA5.7
32 31 /NA5.7
44 41 SPARE
42 41 SPARE

/NA2.8 A- 110VDC

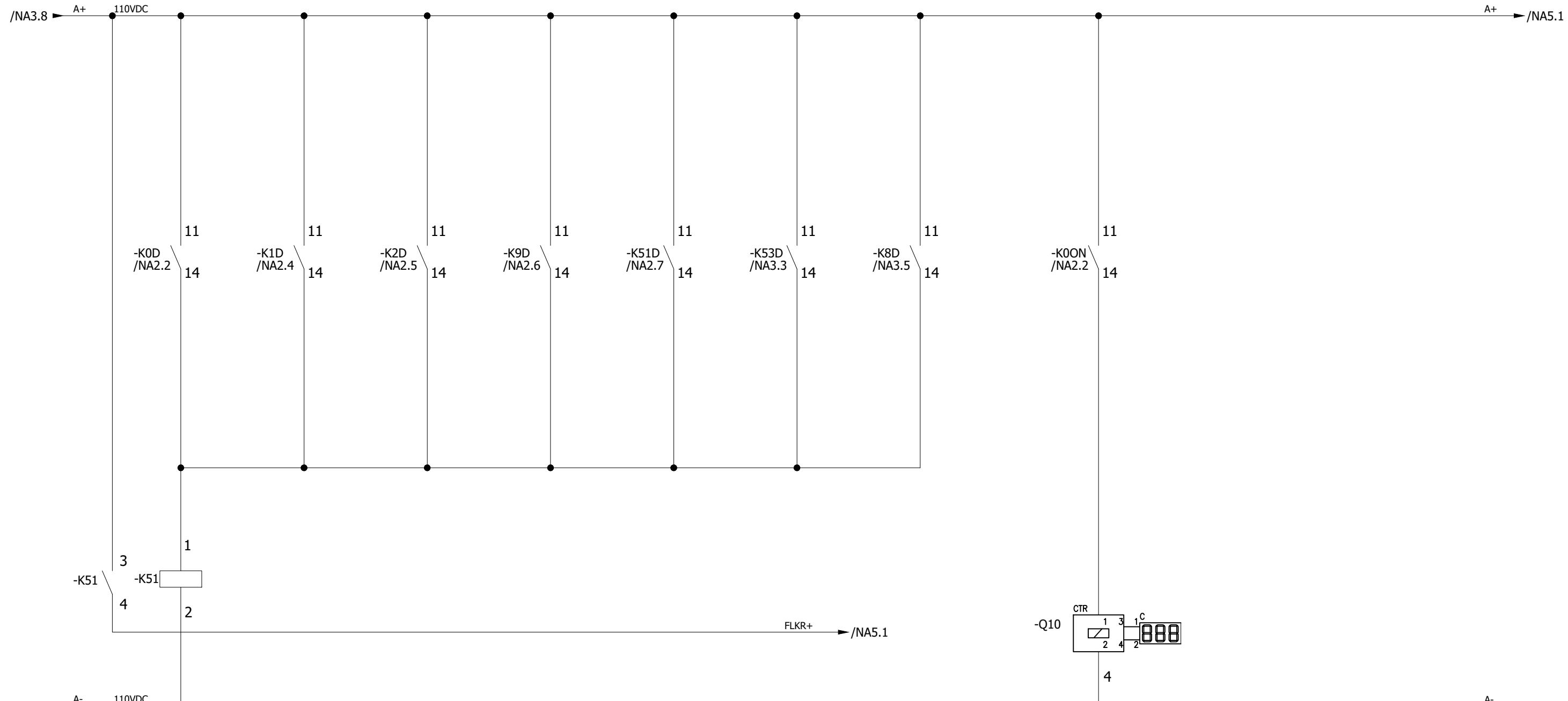
A- /NA4.1

0	AS BUILT	30-10-2018	ASJ	Manufacturer  7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV TRAFO CONTROL PANEL (=E02+CP51) DISCREPANCY INITIATION	Drawing no. P60194-E-ETC-SC-001
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type NA3
									Sheet no. 19

1 2 3 4 5 6 7 8

OFF/ON (=E02+Q0)	OFF/ON (=E02+Q1)	OFF/ON (=E02+Q2)	OFF/ON (=E02+Q9)	OFF/ON (=E02+Q51)	OFF/ON (=E02+Q53)	OFF/ON (=E02+Q8)
---------------------	---------------------	---------------------	---------------------	----------------------	----------------------	---------------------

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

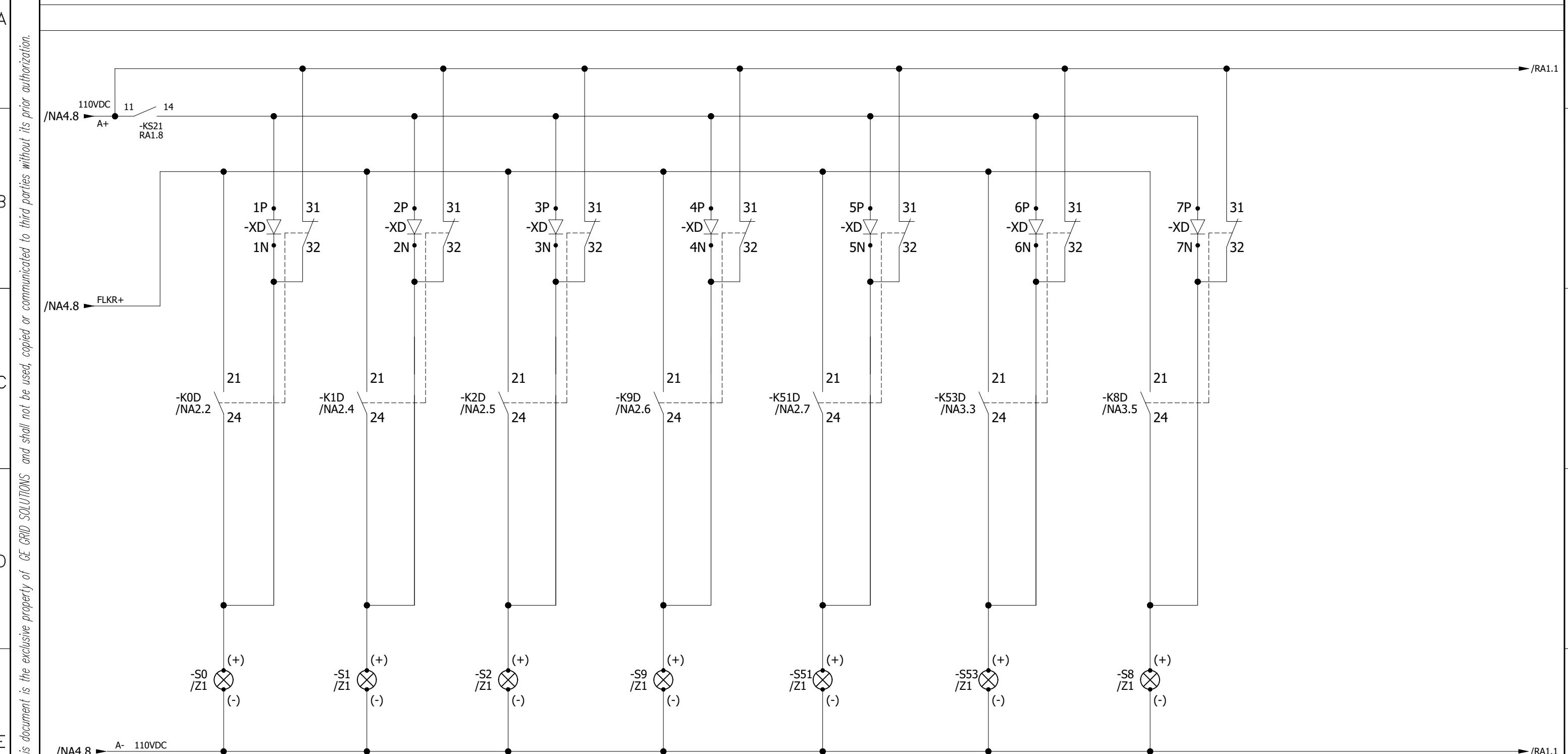


A A
B B
C C
D D
E E
F F

0	AS BUILT	30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) DISCREPANCY INITIATION	Drawing no. P60194-E-ETC-SC-001		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type NA4	Sheet no. 20
1	2	3	4	5	6	7	8				

(=E02+Q0) (=E02+Q1) (=E02+Q2) (=E02+Q9) (=E02+Q51) (=E02+Q53) (=E02+Q8)

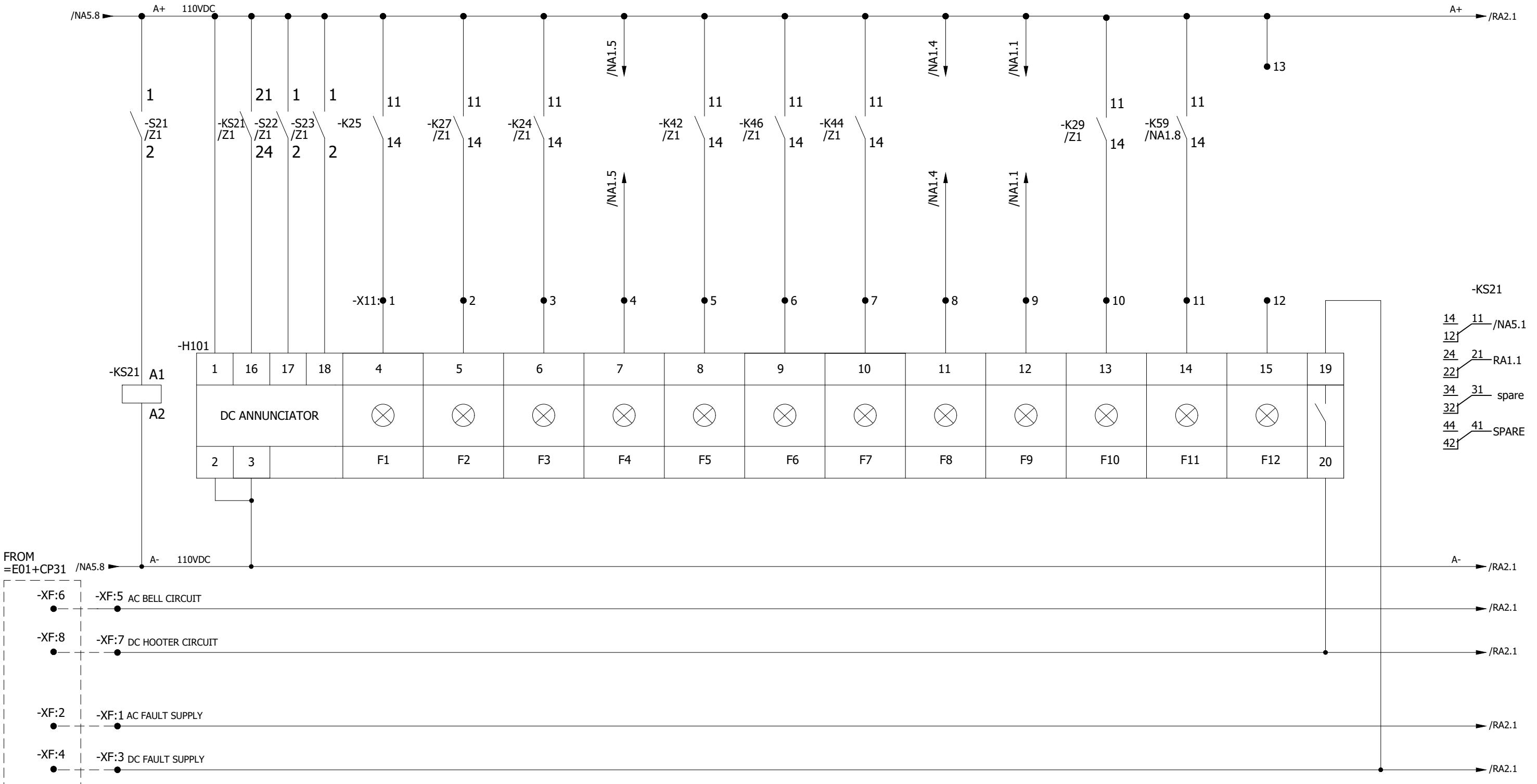
All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.



0	AS BUILT		30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) DISCREPANCY INDICATIONS	Drawing no. P60194-E-ETC-SC-001		
REV.	DESCRIPTION		DATE	DRAWER						Project no. P-60194	Sheet type NA5	Sheet no. 21
1	2	3	4	5	6	7	8					

LCC SPRING DISCHARGED LCC DS/ES/HES OPERATION LCC LONG SPRING CHARGING TIME LCC GAS COMPARTMENT ALARM LEVEL-1 LCC GAS COMPARTMENT ALARM LEVEL-2 LCC BYPASS MODE LCC LOCAL MODE LCC DC SUPPLY DISTURBED LCC AC SUPPLY DISTURBED LCC GO LOCK LCC CONTROL PANEL AC SUPPLY FAILURE SPARE HOOTER

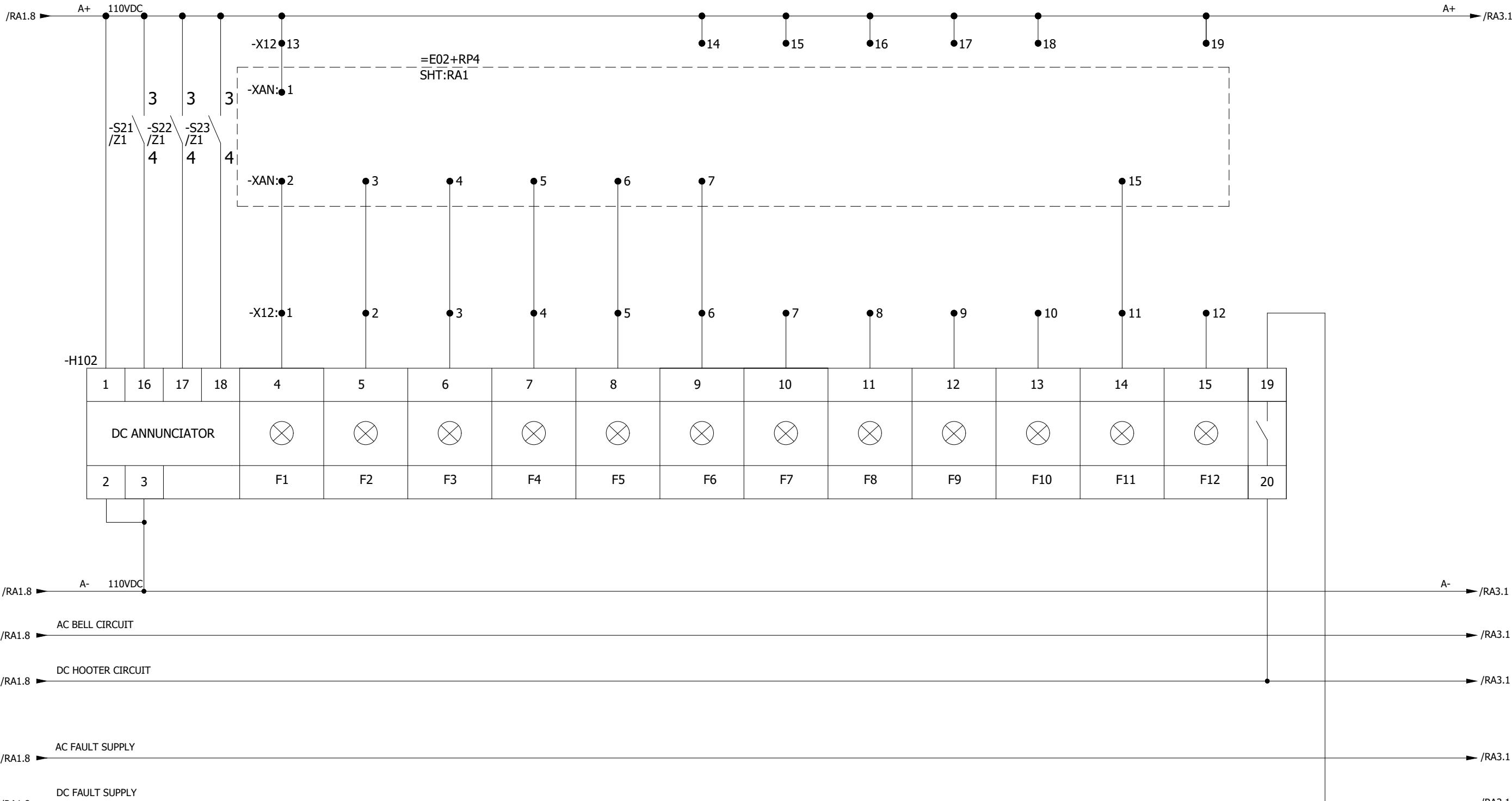
All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.



0	AS BUILT	30-10-2018	ASJ	Manufacturer EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220kV/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 132kV TRAFO CONTROL PANEL (=E02+CP51) ANNUNCIATOR-1 CIRCUIT	Drawing no. P60194-E-ETC-SC-001
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type RA1
									Sheet no. 22

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

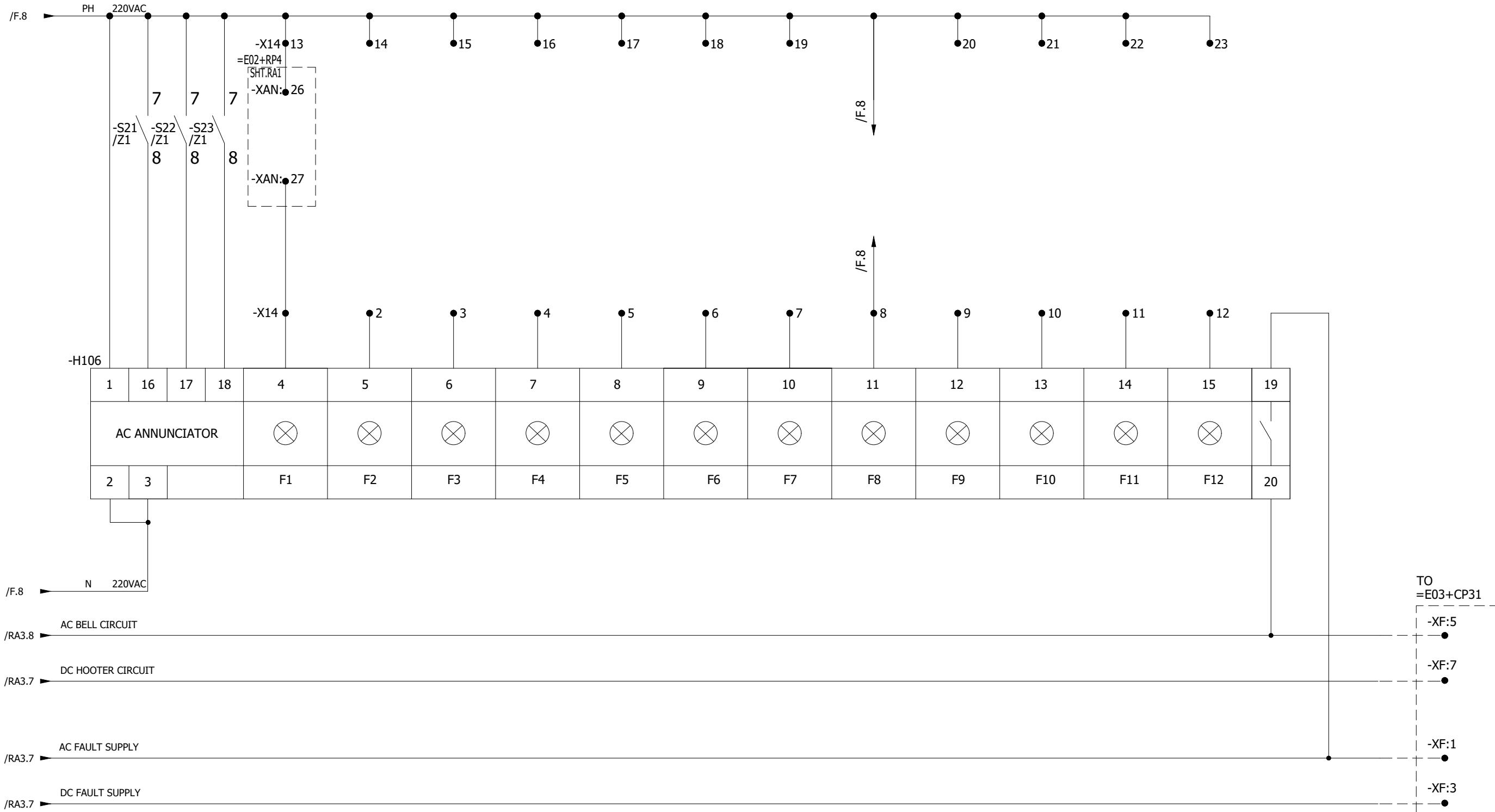
TRAFO DIFFERENTIAL PROTECTION OPERATED WINDING TEMPERATURE LOCKOUT RELAY OIL TEMPERATURE LOCKOUT RELAY T/F BUCHHOLZ LOCKOUT RELAY PRESSUR RELIEF DEVICE LOCKOUT RELAY OLTC BUCHHOLZ LOCKOUT RELAY SPARE SPARE SPARE SPARE SPARE TRAFO DIFFERENTIAL RELAY FAULTY SPARE HOOTER



0	AS BUILT	30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) ANNUNCIATOR-2 CIRCUIT	Drawing no. P60194-E-ETC-SC-001
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type RA2
									Sheet no. 23

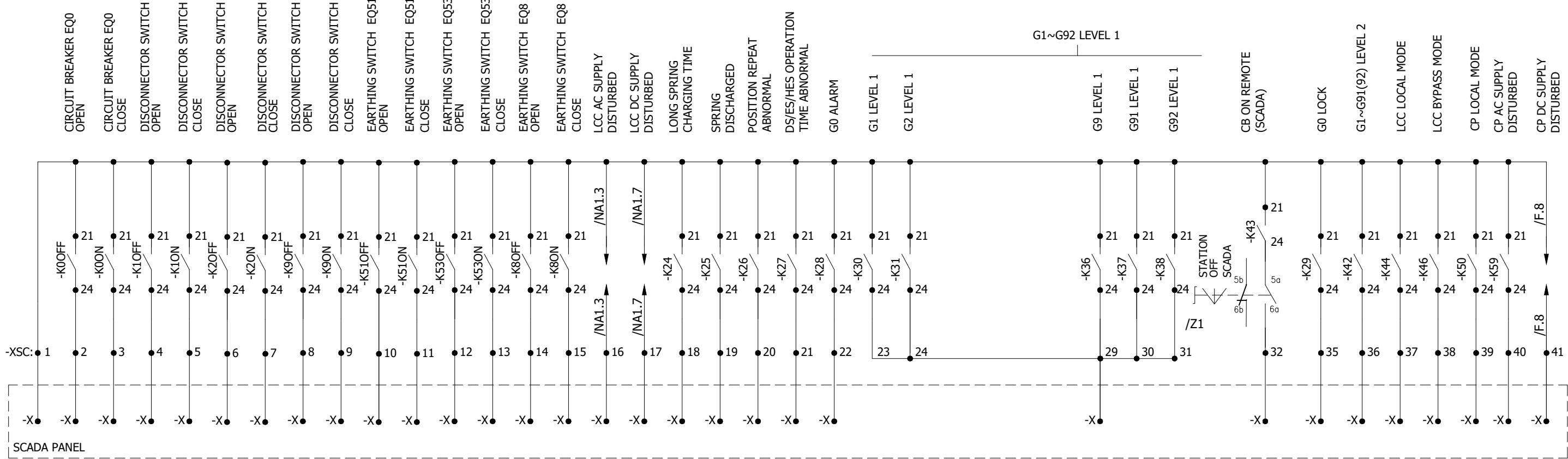
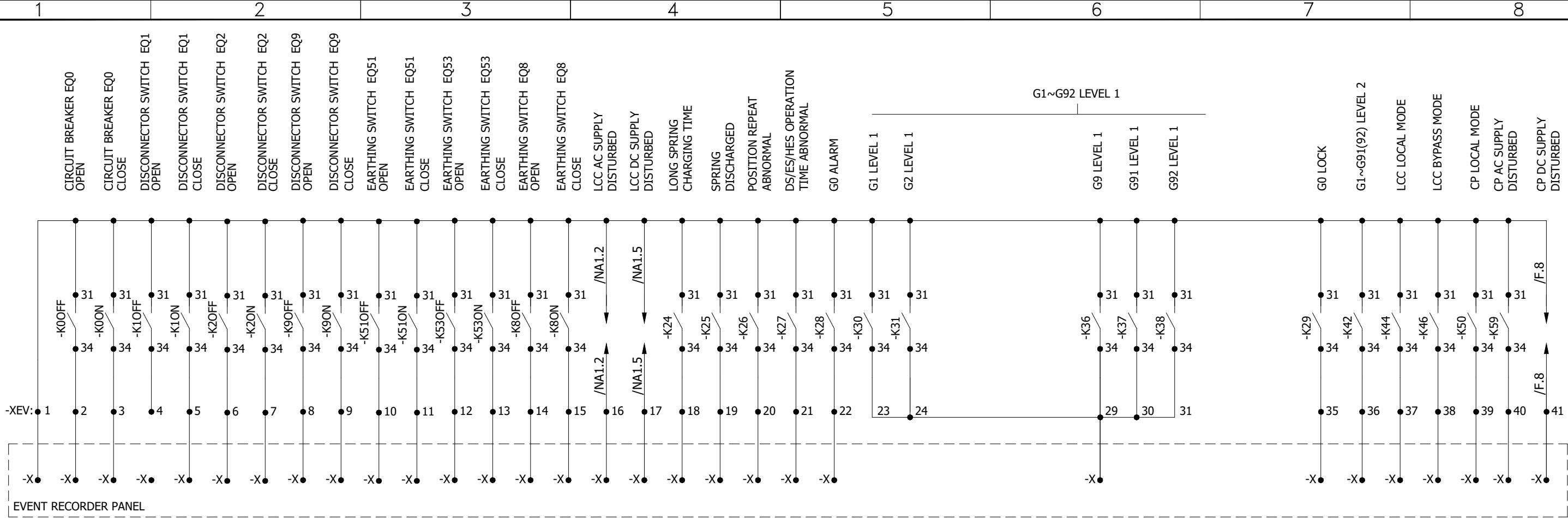
All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.

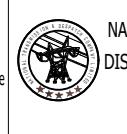
TRAFO RELAY PANEL
110VDC
CIRCUIT/SUPPLY FAULTY SPARE SPARE SPARE SPARE SPARE SPARE CONTROL PANEL
DC FAIL SPARE SPARE SPARE SPARE AC BELL



0	AS BUILT		30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) ANNUNCIATOR-4 CIRCUIT	Drawing no. P60194-E-ETC-SC-001		
REV.	DESCRIPTION		DATE	DRAWER						Project no. P-60194	Sheet type RA4	Sheet no. 25
1	2	3	4	5	6	7	8	9	10	11	12	13

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



0	AS BUILT	30-10-2018	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 TRAFO CONTROL PANEL (=E02+CP51) SCADA & ER SIGNALS	Drawing no. P60194-E-ETC-SC-001					
REV.	DESCRIPTION	DATE	DRAWER							Project no. P-60194	Sheet type RA5	Sheet no. 26		
1	A	2	3	4	5	6	7	8	G1~G92 LEVEL 1	G1~G91(92) LEVEL 2	LCC LOCAL MODE	CP LOCAL MODE	CP AC SUPPLY DISTURBED	CP DC SUPPLY DISTURBED

