



Grid Solutions

A GE and Alstom joint venture

220/132kV GIS SUBSTATION GHAZI ROAD , LAHORE

220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) SCHEMATIC DRAWINGS

REFERENCE DRAWINGS

SR. NO.	DRAWING TITLE	DOCUMENT NO.
1.	220kV / 132kV Metering & Protection SLD	P60194-E-SLMP-001
2.	220kV GIS LCC Schematic Drawings	P60194-E-TDHV-118
3.	220kV VT Marshalling Kiosk Schematic Drawings	P60194-E-XXXX-001
4.	132kV GIS LCC Schematic Drawings	SG2L002296

REVISION HISTORY					
REV	DATE	DRW. BY	CHK. BY	APR. BY	REVISION DESCRIPTION
0	20.11.2018	ASJ	MFT	NAH	AS BUILT

Scale	NOT-TO-SCALE	Sheet size	A3
-------	--------------	------------	----

Client	 NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)
--------	--

Contractor	Grid Solutions A GE and Alstom joint venture	Manufacturer
		 EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan

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

Title	220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) SCHEMATIC DRAWINGS		
-------	---	--	--

Order no	P-60194	Document no	P60194-E-DTC-SC-003
----------	---------	-------------	---------------------

Sheet type	Total sheets	Sheet no
A	55	1

	1	2	3	4	5	6	7	8					
	PAGE NO.	SHEET NAME	SHEET DESCRIPTION			ISSUE / REVISION							
						01	02	03	04	05	06	07	08
A	01	A	Cover Sheet			X	X						
	02	AA1	List Of Contents			X	X						
	03	AA2	List Of Contents			X	X						
	04	AB	Symbols and Legends			X	X						
	05	AC1	Component List			X	X						
B	06,06a	AC2,AC3	Component List			X	X						
	07,07a	AD,AD1	Panel View			X	X						
	08	AF	Bay Concept & Metering Logics			X	X						
	09	D	AC Supply Distribution Circuit			X	X						
	10	AE	220DC Supply Distribution Circuit			X	X						
	11	BF	110DC Supply Distribution Circuit			X	X						
C	12	F	AC/DC Supply Failure Circuits			X	X						
	13	AH1	CT/VT Metering Circuit			X	X						
	14	AH2	CT/VT Metering Circuit			X	X						
	15	BH1	CT/VT Metering Circuit			X	X						
	16	BH2	CT/VT Metering Circuit			X	X						
D	17	AI1	Power Equipment input Circuit			X	X						
	18	AI2	Power Equipment input Circuit			X	X						
	19	BI1	Power Equipment input Circuit			X	X						
	20	AI3	Power Equipment input Circuit			X	X						
	21	AI4	Power Equipment input Circuit			X	X						
	22	AI5	Power Equipment input Circuit			X	X						
	23	BI2	Power Equipment input Circuit			X	X						
	24	BI3	Power Equipment input Circuit			X	X						
E	25	AJ1	Circuit Breaker Opening/Closing Circuit			X	X						
	26	AJ2	Circuit Breaker Opening/Closing Circuit			X	X						
	27	BJ1	Circuit Breaker Opening/Closing Circuit			X	X						
	28	BJ2	Circuit Breaker Opening/Closing Circuit			X	X						
	29	AJ3	Circuit Breaker Opening/Closing Circuit			X	X						
	30	AJ4	Circuit Breaker Opening/Closing Circuit			X	X						
F	31	AJ5	Control Circuit			X	X						
	32	BJ3	Circuit Breaker Opening/Closing Circuit			X	X						
0	AS BUILT		20.11.2018	ASJ	Manufacturer  EPE SOL 7-8 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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) LIST OF CONTENTS	Drawing no. P60194-E-DTC-SC-003			
REV.	DESCRIPTION		DATE	DRAWER						Project no. P-60194	Sheet type AA1	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		KEY OPERATED SELECTOR SWITCH		AMMETER	24	OVEREXCITATION
C		EARTHING		LIMITED SWITCH		VOLTMETER	25	SYNCHROCHECK
D		SF6 TO AIR BUSHING		HUMIDITY & TEMPERATURE CONTROLLER		POWER FACTOR METER	49	THERMAL OVERLOAD
E		LINE TRAP		PANEL HEATER		DIGITAL PANEL METER	50/51	PHASE INST./OVERCURRENT
F		SURGE ARRESTOR		THREE PIN SOCKET		ACTIVE POWER METER	50N/51N	EARTH INST./OVERCURRENT
G		CURRENT TRANSFORMER		INDICATION LIGHT		REACTIVE POWER METER	50BF	CIRCUIT BREAKER FAILURE
H		COUPLING CAPACITOR VOLTAGE TRANSFORMER		PUSH BUTTON		ENERGY METER	64	RESTRICTED EARTH FAULT
I		POWER TRANSFORMER		AUXILIARY CONTACTOR COIL			67N	DIRECTIONAL EARTH FAULT
J		AUTO TRANSFORMER		POWER SUPPLY AC/DC			68	POWER SWING BLOCKING
K				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	DIFFERENTIAL CONNECTION
P							87BB	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	20.11.2018	ASJ	Manufacturer EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) SYMBOLA AND LEGENDS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AB
									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	DIGITAL POWER METER	Enerium 150, 3-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			-BP10	ENERDIS								
B	02	ANALOG AMMETER	A96MMA, 240 Degree Transducer Operated Analogue Ampere Meter, Input 0...20/30mA Accuracy Class 1, Scale1: 0...600/900A, Scale2: 0...1200/1800A, Scale3: 0...2400/3600A.			-AP1, -AP3	FRER								
	01	DIGITAL AMMETER	D96MMA, Transducer Operated Digital Ampere Meter, Input 0...20/30mA, Accuracy Class 1, Scale1: 0...600/900A, Scale2: 0...1200/1800A, Scale3: 0...2400/3600A, Aux. Voltage 220VDC.			-AP2	FRER								
C	02	ANALOG AMMETER	A96MMA, 240 Degree Transducer Operated Analogue Ampere Meter, Input 0...20/30mA Accuracy Class 1, Scale1: 0...400/600A, Scale2: 0...800/1200A, Scale3: 0...1600/2400A.			-BP1, -BP3	FRER								
	01	DIGITAL AMMETER	D96MMA, Transducer Operated Digital Ampere Meter, Input 0...20/30mA, Accuracy Class 1, Scale1: 0...400/600A, Scale2: 0...800/1200A, Scale3: 0...1600/2400A, Aux. Voltage 110VDC.			-BP2	FRER								
D	01	ANALOG VOLTMETER	A96MMA, 240 Degree, Transducer Operated Analogue Voltmeter, Input 0...20/30mA, Accuracy Class 1, Scale: 220/330kV (Marked Red at 220kV).			-AP4	FRER								
	01	ANALOG VOLTMETER	A96MMA, 240 Degree, Transducer Operated Analogue Voltmeter, Input 0...20/30mA, Accuracy Class 1, Scale: 132/198kV (Marked Red at 132kV).			-BP4	FRER								
E	01	ANALOG REAL POWER (MW) METER	A96MMA, 240 Degree, Transducer Operated Analogue MW Meter, Input -12.5/10...0...10/12.5mA Accuracy Class 1, Scale1: 125/100-0-100/125MW(91.5 MW at 20mA), Scale2: 250/200-0-200/250 MW(183MW at 20mA), Scale3: 500/400-0-400/500MW(366MW at 20mA).			-BP5	FRER								
	01	ANALOG REACTIVE POWER (MVAR) METER	A96MMA, 240 Degree, Transducer Operated Analogue MVAR Meter, Input -12.5/10...0...+10/12.5 Ma, Accuracy Class 1, Scale1: 125/100-0-100/125MVAR(91.5MVAR at 20mA), Scale2: 250/200-0 -200/250 MVAR (183 MVAR at 20mA), Scale3: 500/400-0-400/500 MVAR (366MVAR at 20mA).			-BP6	FRER								
F	04	CURRENT TRANSDUCER	MCOEAQ, Nominal Input Current 1/1.5A, Output 0...20/30mA, Auxiliary Voltage 220VDC, Accuracy Class 1, CT Ratio: 2400:1200:600/1A.			-AU1,-AU2,-AU3,-AU2A	FRER								
	04	CURRENT TRANSDUCER	MCOEAQ, Nominal Input Current 1/1.5A, Output 0...20/30mA, Auxiliary Voltage 110VDC, Accuracy Class 1, CT Ratio: 400:800:1600/1A.			-BU1,-BU2,-BU3,-BU2A	FRER								
G	01	VOLTAGE TRANSDUCER	MCOEVQ, Nominal Input Voltage 0...110/165 VAC (L-L), Output 0...20/30mA, Auxiliary Voltage 220VDC, Accuracy Class 1, PT Ratio: 220/0.11kV (L-L).			-AU4	FRER								
	01	VOLTAGE TRANSDUCER	MCOEVQ, Nominal Input Voltage 0...110/165 VAC (L-L), Output 0...20/30mA, Auxiliary Voltage 110 VDC, Accuracy Class 1, PT Ratio: 132/0.11kV (L-L).			-BU4	FRER								
H	01	PROGRAMMABLE UNIVERSAL TRANSDUCER	MCOUNP4, 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, Output 1 to Output 4: -12.5/10...0...+10/12.5 mA, PT Ratio: 132/0.11kV(L-L) CT Ratio: 1600:800:400/1A.			-BU5	FRER								
I	0	ASJ	20.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE		Drawing no. P60194-E-DTC-SC-003					
J	REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194		Sheet type AC1		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	DISCREPANCY SWITCH - CIRCUIT BREAKER	YS-IC-4456-S4(49)-PM-K-G-D22-GM, Standard-type (Push & Turn 90° after 2-position), Square Type, Rating: 220VDC	-AS0			YONGSUNG	A		
	01	DISCREPANCY SWITCH - CIRCUIT BREAKER	YS-IC-4456-S4(49)-PM-K-G-D11-GM, Standard-type (Push & Turn 90° after 2-position), Square Type, Rating: 110VDC	-BS0			YONGSUNG			
	06	DISCREPANCY SWITCH - ISOLATOR / EARTHING SWITCHES	YS-IC-4456-R4(49)-PM-K-G-D22-GM, Standard-type (Push & Turn 90° after 2-position), Round Type, Rating: 220VDC	-AS1,-AS51,-AS2,-AS9,-AS52,-AS8			YONGSUNG			
	06	DISCREPANCY SWITCH - ISOLATOR / EARTHING SWITCHES	YS-IC-4456-R4(49)-PM-K-G-D11-GM, Standard-type (Push & Turn 90° after 2-position), Round Type, Rating: 110VDC	-BS1,-BS51,-BS2,-BS9,-BS53,-BS8			YONGSUNG			
	02	SELECTOR SWITCH - VOLTMETER	PO-160023R001, 7 Position (L1-L2,L2-L3,L3-L1,OFF,L1-N,L2-N,L3-N)	-AS13,-BS13			GIOVENZANA			
	01	SELECTOR SWITCH - OPERATION (LOCAL-OFF-SCADA)	YS-AK-2-3-44-D, 2 Position with OFF, 4-Pole, Ratings: 12A, 220VDC, Keytype	-S100			YONGSUNG			
B	01	PUSHBUTTON - LAMPTEST	YS-AP1-2-31-B-D-W, 3NO+1NC contacts, Ratings: 220VDC & 12A, Black color	-S21			YONGSUNG	B		
	01	PUSHBUTTON - ALARM ACKNOWLEDGEMENT	YS-AP1-2-31-R-D-W, 3NO+1NC contacts, Ratings: 220VDC & 12A, Red color	-S22			YONGSUNG			
	01	PUSHBUTTON - ALARM RESET	YS-AP1-2-31-G-D-W, 3NO+1NC contacts, Ratings: 220VDC & 12A, Green color	-S23			YONGSUNG			
C	03	CONTROL MCB - PANEL LIGHT & HEATER	G62C02+(CAH2), 2-Pole, Ratings: 2A, 230VAC, 10kA @ 230VAC, with 2 C/O Contacts	-F101,-F102,F104			GE	C		
	01	CONTROL ELCB - PANEL SOCKET	DM100C16/030+(CAH2), 2-Pole, Ratings: 16A, 30mA, 230VAC, with 2 C/O Contacts	-F103			GE			
	08	CONTROL MCB - DC DISTRIBUTION	EP102UCC04+(CAH2), 2-Pole, Ratings: 4A, 220VDC, 10kA @ 220VDC, with 2 C/O Contacts	-AF201,-AF202,-AF203,-AF204,-BF201,-BF202,-BF203,-BF204			GE			
	03	VT MCB	G64C02+(CAH2), 4-Pole, Ratings: 2A, 230VAC, 10kA @ 230VAC, with 2 C/O Contacts	-AF105,-BF105,BF106			GE			
	02	INDICATION LAMP - DC SUPPLY FAILURE	YS-PL-2-AL-22-R-W, Type: Integrated LED , Color : RED , Supply : 230VAC @ 50Hz	-AH200,-BH200			YONGSUNG			
D	01	AUXILIARY CONTACTOR	MCRC022ATWN-B+MARN211AT, Coil Voltage: 220VDC, 3NO+3NC Contacts	-AKCS			GE	D		
	01	AUXILIARY CONTACTOR	MCRC022ATWJ+MARN211AT, Coil Voltage: 110VDC, 3NO+3NC Contacts	-BKCS			GE			
	54	AUXILIARY CONTACTOR	PRC4M40DCML, Coil Voltage: 220VDC, 4 C/O Contacts	-AKDCM,-KAC,-AKQ0.ONR,-AKQ0.OFR,-AKQ0.ONY,-AKQ0.OFY			GE			
				-AKQ0.ONB,-AKQ0.OFB,-AKQ1.ON,-AKQ1.OF,-AKQ51.ON,-AKQ51.OF						
				-AKQ2.ON,-AKQ2.OF,-AKQ9.ON,-AKQ9.OF,-AKQ52.ON,-AKQ52.OF						
				-AKQ8.ON,-AKQ8.OF,-AKQ0.ON,-AKQ0.OF,-AKLAC,-AKLDC						
				-AKL01,-AKL02,-AKL03,-AKL04,-AKL05,-AKL06,-AKL07						
				-AKL08,-AKL09,-AKG0A,-AKG1A,-AKG2A,-AKG4A,-AKG5A						
				-AKG9A,-AKGB,-AKGW,-AKDC2,-AKOE,-AKOA,-AKDC1,-AK0D,-AK1D						
				-AK51D,-AK2D,-AK9D,-AK52D,-AK8D,-AKDC3, -KS100,-KS21						
E	61	AUXILIARY CONTACTOR	PRC4M40DCKL, Coil Voltage: 110VDC, 4 C/O Contacts	-ANV				E		
				-BKDCM,-BKQ0.ON,-BKQ0.OF,-BKQ1.VT,-BKQ1.ON,-BKQ1.OF			GE			
				-BKQ51.ON,-BKQ51.OF,-BKQ2.VT,-BKQ2.ON,-BKQ2.OF,-BKQ9.ON						
				-BKQ9.OF,-BKQ53.ON,-BKQ53.OF,-BKQ8.ON,-BKQ8.OF,						
				-BKLAC,-BKLDC,-BKL01,-BKL02,-BKL03,-BKL04,-BKL05,-BKL06,						
				-BKL07,-BKG0A,-BKG1,-BKG2,-BKG9A,-BKG91,-BKGL,-BKDC2,						
				-BKQ1CC,-BKQ1CO,-BKQ51CC,-BKQ51CO,-BKQ2CC,-BKQ2CO						
				-BKQ9CO,-BKQ53CC,-BKQ53CO,-BKQ8CC,-BKQ8CO,-BREM1,BREM1A						
				-BREM2,-BREM2A,-BKDC1,-BK0D,-BK1D,-BK51D,-BK2D,-BK9D						
				-BK53D,-BK8D,-BKDC3,BKQ9CC,-BKOABKOEBNV						
F	03	AUXILIARY CONTACTOR	PRC4M40ANL, Coil Voltage: 230VAC, 4 C/O Contacts	-AKDC,-BKDC,-KACM			GE	F		
0	AS BUILT	20.11.2018	ASJ	Manufacturer  7-8 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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) COMPONENT LIST	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AC2	Sheet no. 06
1	2	3	4	5	6	7	8			

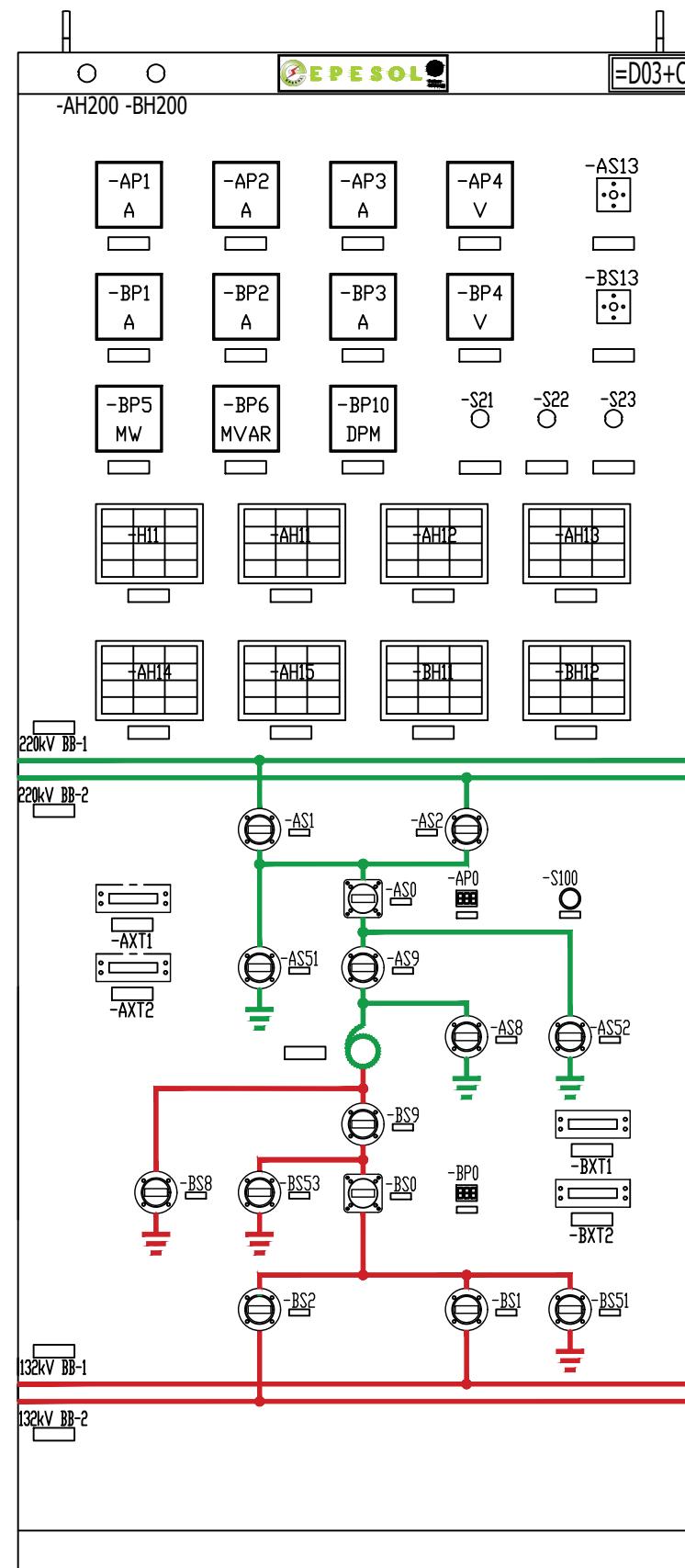
	1	2	3	4	5	6	7	8		
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER			
A	01	ANNUNCIATION MODULE	12-Window, Supply: 230 VAC			-H11		E-LABS		
	05	ANNUNCIATION MODULE	12-Window, Supply: 220 VDC			-AH11,-AH12,-AH13,-AH14,-AH15		E-LABS		
	02	ANNUNCIATION MODULE	12-Window, Supply: 110 VDC			-BH11,-BH12		E-LABS		
	01	FLASHER RELAY	Coil Voltage: 220VDC			-AKFL		E-LABS		
	01	FLASHER RELAY	Coil Voltage: 110VDC			-BKFL		E-LABS		
	01	CB OPERATION COUNTER	Supply: 220VDC			-AP0		E-LABS		
B	01	CB OPERATION COUNTER	Supply: 110VDC			-BP0		E-LABS		
	01	PANEL LIGHT WITH DOOR SWITCH	TS-T8-30-5W+YSP3315GW-B, 230VAC @ 50Hz, 20W, with Door Limit Sw.			-H100,-S101		YONGSUNG		
	01	THREE PIN SOCKET	1N+PE, 16A, 230VAC @ 50Hz			-X100		LEAR		
	01	PANEL HEATER	230VAC @ 50Hz, 50W			-R100		E-LABS		
	01	HUMIDITY & TEMPERATURE CONTROLLER	Thermostat & Humidstat			-B100		E-LABS		
	02	THREE PHASE UNDER VOLTAGE RELAY	ELUV, Three Phase Under Voltage Relay with 2 C/O Contacts			-AKQ8.D, -BKQ8.D		E-LABS		
C	02	TEST BLOCK FOR CURRENT CIRCUIT	YS-CTT-04S			-AXT1,-BXT1		YONGSUNG		
	02	TEST BLOCK FOR VOLTAGE CIRCUIT	YS-PTT-04S			-AXT2,-BXT2		YONGSUNG		
	05	TERMINAL BLOCK FOR AC SUPPLY DISTRIBUTION	CBD-4			-XAC		CABUR		
	10	TERMINAL BLOCK FOR 220VDC SUPPLY DISTRIBUTION	CBD-4			-AXDC		CABUR		
	10	TERMINAL BLOCK FOR 110VDC SUPPLY DISTRIBUTION	CBD-4			-BXDC		CABUR		
	18	TERMINAL BLOCK FOR 220kv SIDE CT WITH SHORTENING	SCB-6			-AX4		CABUR		
D	ARRANGMENT, SCREW TYPE									
	26	TERMINAL BLOCK FOR 220kv SIDE VT SCREW TYPE	SCB-6			-AX5		CABUR		
	18	TERMINAL BLOCK FOR 132kv SIDE CT WITH SHORTENING	SCB-6			-BX4		CABUR		
	ARRANGMENT, SCREW TYPE									
	14	TERMINAL BLOCK FOR 132kv SIDE VT SCREW TYPE	SCB-6			-BX5		CABUR		
	22	TERMINAL BLOCK FOR ISOLATOR STATUS	CBD-4			-AX6		CABUR		
E	17	TERMINAL BLOCK FOR ISOLATOR STATUS	CBD-4			-BX6		CABUR		
	23	TERMINAL BLOCK FOR POWER EQUIPMENT INPUTS	CBD-4			-AX7		CABUR		
	19	TERMINAL BLOCK FOR POWER EQUIPMENT INPUTS	CBD-4			-BX7		CABUR		
	20	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4			-AX8		CABUR		
	05	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4			-AX9		CABUR		
	18	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4			-BX8		CABUR		
F	0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) COMPONENT LIST	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194	
									Sheet type AC3	
									Sheet no. 06a	
	REV.	DESCRIPTION	DATE	DRAWER						
	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.

	1	2	3	4	5	6	7	8		
	QTY.	DEVICE DESCRIPTION		DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION		MANUFACTURER	
A	05	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4				-BX9		CABUR	
	35	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4				-AX11		CABUR	
	03	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4				-AX14		CABUR	
B	52	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4				-BX11		CABUR	
	03	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4				-BX14		CABUR	
	18	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4				-AX15		CABUR	
C	04	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4				-BX15		CABUR	
	15	TERMINAL BLOCK FOR AC ANNUNCIATOR UNIT	CBD-4				-XAN1		CABUR	
	10	TERMINAL BLOCK FOR 220VDC ANNUNCIATOR UNIT-2	CBD-4				-XAN2		CABUR	
D	15	TERMINAL BLOCK FOR 220VDC ANNUNCIATOR UNIT-3	CBD-4				-XAN3		CABUR	
	15	TERMINAL BLOCK FOR 220VDC ANNUNCIATOR UNIT-4	CBD-4				-XAN4		CABUR	
	16	TERMINAL BLOCK FOR 220VDC ANNUNCIATOR UNIT-5	CBD-4				-XAN5		CABUR	
E	17	TERMINAL BLOCK FOR 110VDC ANNUNCIATOR UNIT-1	CBD-4				-XAN6		CABUR	
	10	TERMINAL BLOCK FOR BELL,HOOTER,AC&DC FAULTY CIRCUITS	CBD-4				-XF		CABUR	
	28	TERMINAL BLOCK FOR EVENT RECORDER 220KV SIGNALS	CBD-4				-AXEV		CABUR	
F	22	TERMINAL BLOCK FOR EVENT RECORDER 132KV SIGNALS	CBD-4				-BXEV		CABUR	
	18	TERMINAL BLOCK FOR SCADA 220KV SIGNALS	CBD-4				-AXSC		CABUR	
	18	TERMINAL BLOCK FOR SCADA 132KV SIGNALS	CBD-4				-BXSC		CABUR	
G	06	TERMINAL BLOCK FOR CBF SIGNALS	CBD-4				-X30		CABUR	
	03	TERMINAL BLOCK FOR SCADA 220KV CT SIGNAL	CBD-4				-AXSA		CABUR	
	07	TERMINAL BLOCK FOR SCADA 132KV CT SIGNAL	CBD-4				-BXSA		CABUR	
H	0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 7-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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) COMPONENT LIST	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194	
									Sheet type AC4	
	REV.	DESCRIPTION	DATE	DRAWER					Sheet no. 06b	

	1	2	3	4	5	6	7	8			
A B C D E F	QTY.	DEVICE DESCRIPTION		DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION		MANUFACTURER		
	07	TERMINAL BLOCKS WITH DIODE TYPE IN-D4007, RATED MAXIMUM VOLTAGE 350VDC, RATED BREAK DOWN VOLTAGE 430VDC		DAS.4/6			-AXD		CABUR		
	07	TERMINAL BLOCKS WITH DIODE TYPE IN-D4007, RATED MAXIMUM VOLTAGE 350VDC, RATED BREAK DOWN VOLTAGE 430VDC		DAS.4/6			-BXD		CABUR		
	12	TERMINAL BLOCKS FOR 220kV METERING CIRCUIT		CBD4			-X6		CABUR		
	25	TERMINAL BLOCKS FOR 132kV METERING CIRCUIT		CBD4			-X7		CABUR		
<p>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.</p>											
0	AS BUILT		20.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) COMPONENT LIST	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION		DATE	DRAWER					Project no. P-60194	Sheet type AC4	Sheet no. 06c

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.

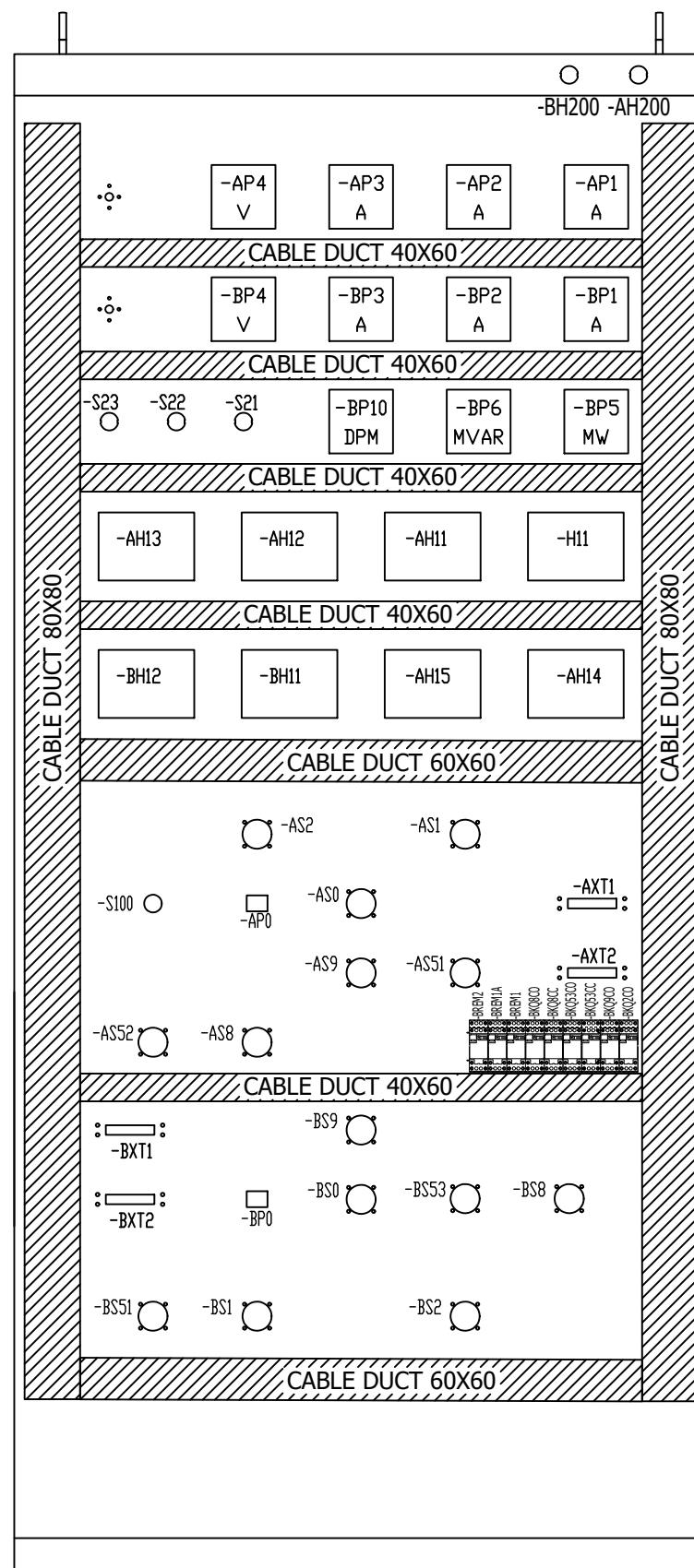


MIMIC:

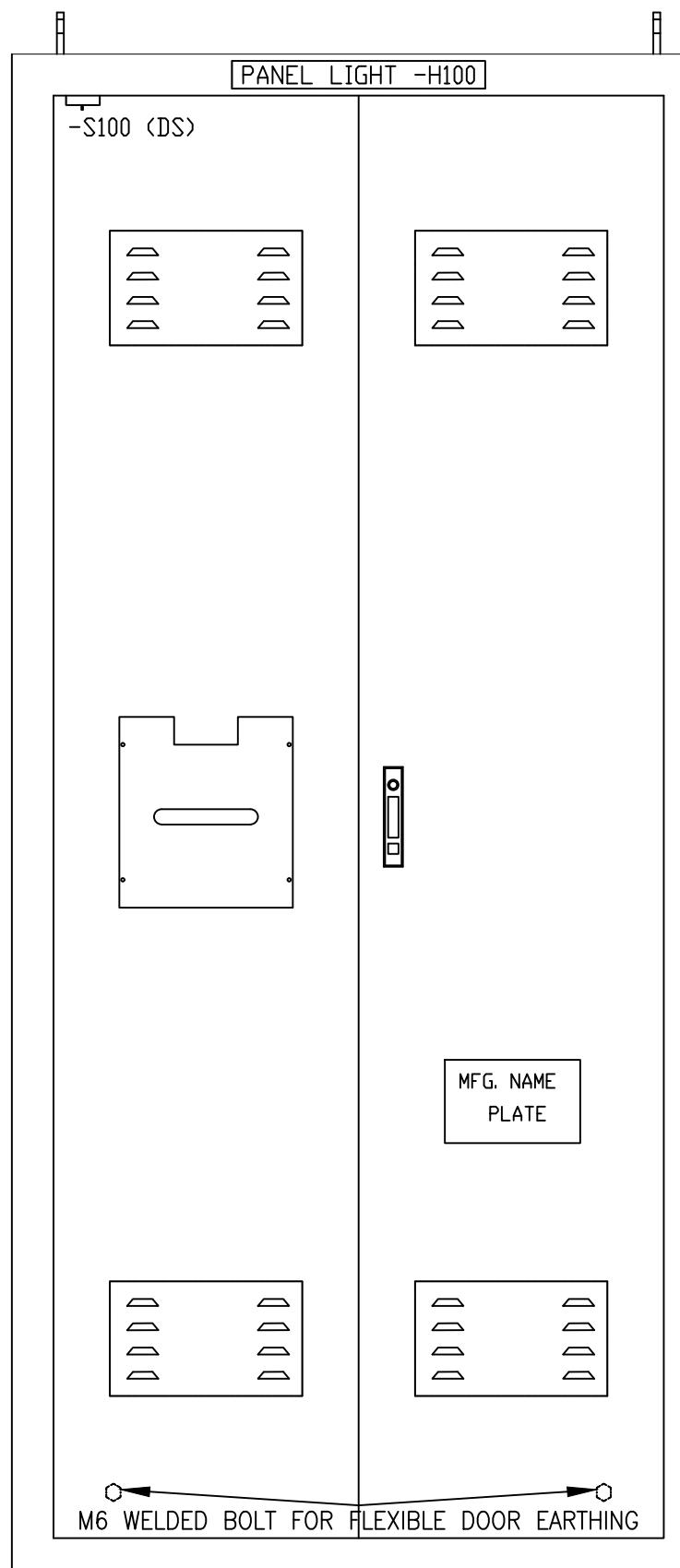
1. MIMIC COLOR: GREEN FOR 220kV & RED FOR 132kV

0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 7B 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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) PANEL VIEW	Drawing no.		
									P60194-E-DTC-SC-003		
									Project no.		
REV.	DESCRIPTION	DATE	DRAWER						P-60194	AD	07

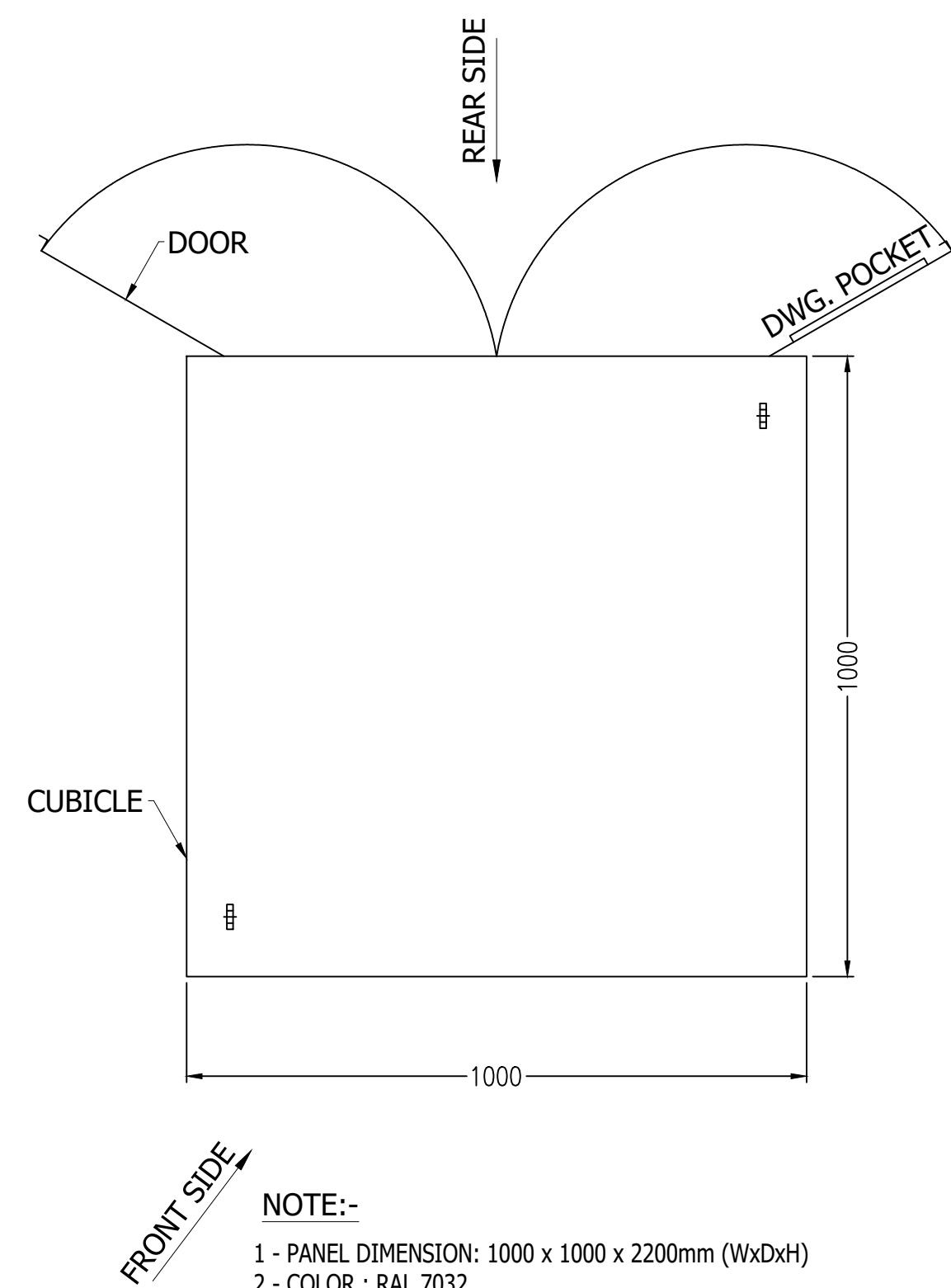
BACK VIEW WITHOUT DOOR



BACK VIEW WITH DOOR

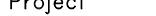


TOP VIEW

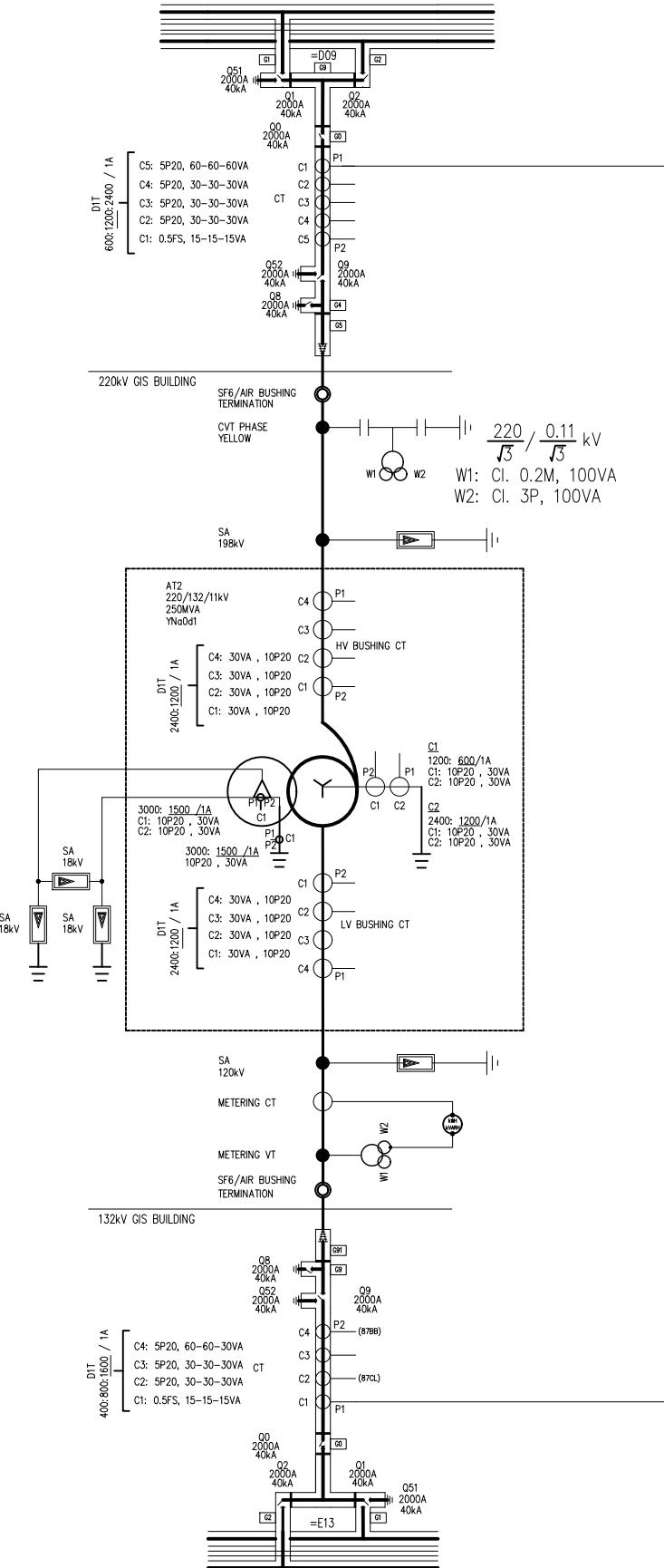


NOTE:-

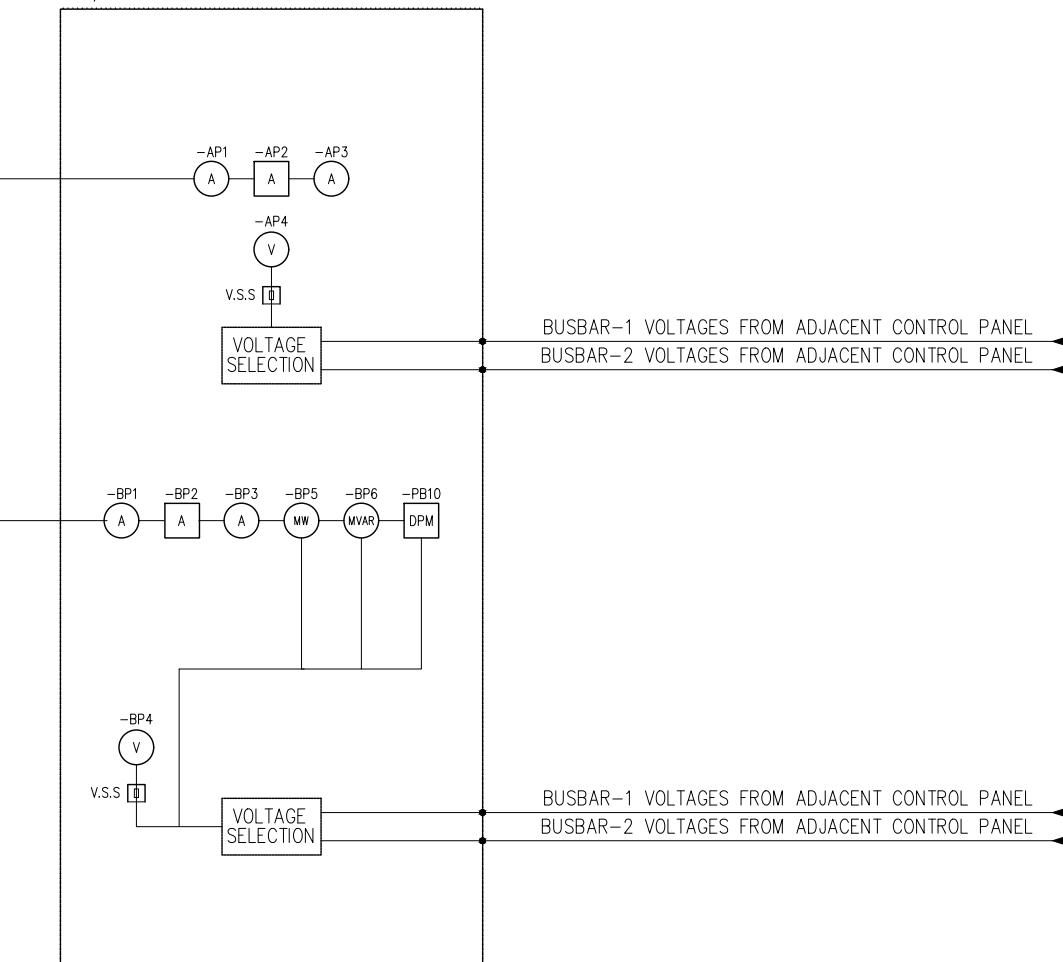
- 1 - PANEL DIMENSION: 1000 x 1000 x 2200mm (WxDxH)
 - 2 - COLOR : RAL 7032
 - 3 - SHEET THICKNESS : 2-2.5 mm
 - 4- PROTECTION CLASS : IP-51 (INDOOR TYPE)
 - 5 - ALL DOOR FITTED WITH 16mm EARTH STRAP & INSULATED WITH GREEN-YELLOW COLOUR.

0	AS BUILT	20.11.2018	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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) PANEL VIEW	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type AD

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.



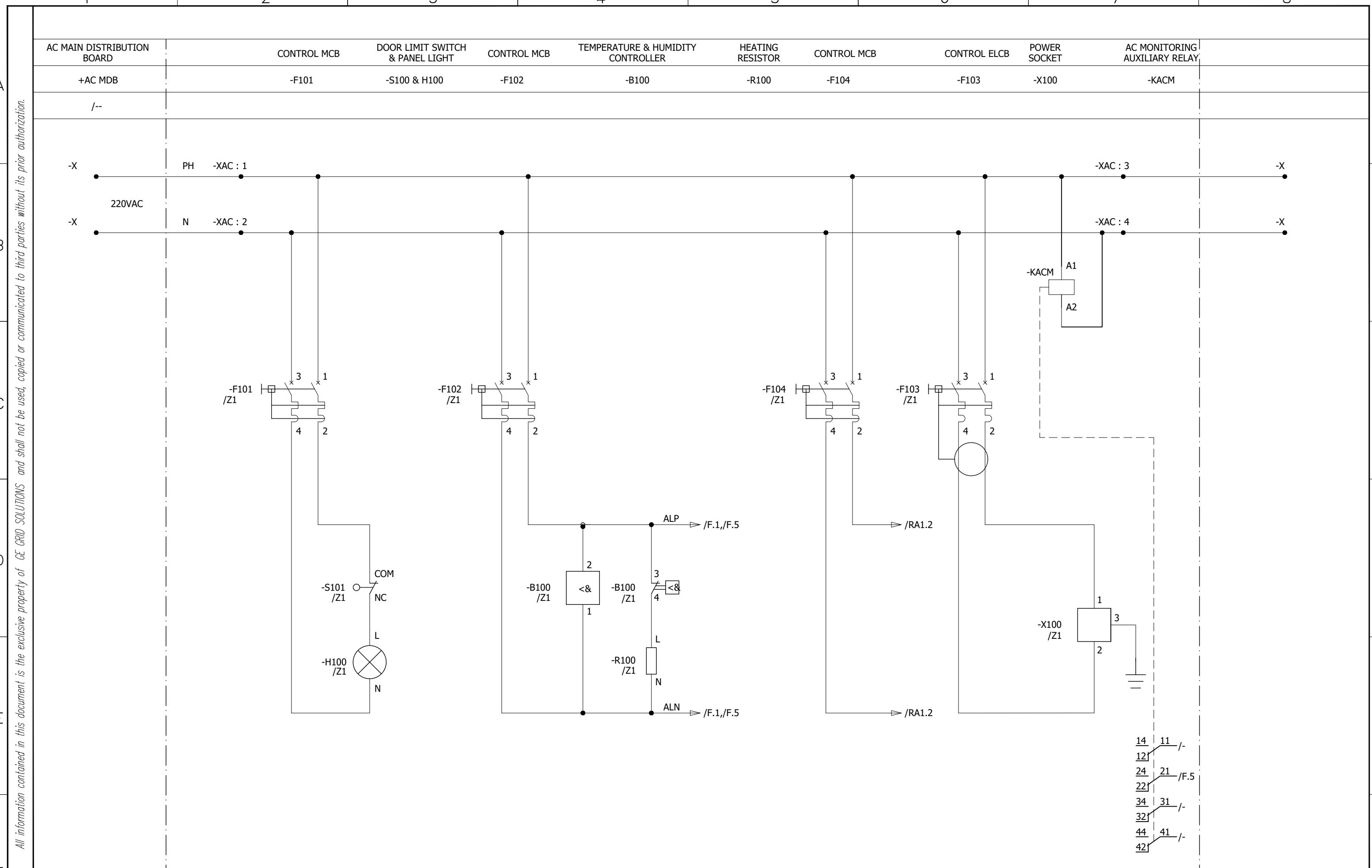
=D04+C5
220/132kV TRANSFORMER CONTROL PANEL



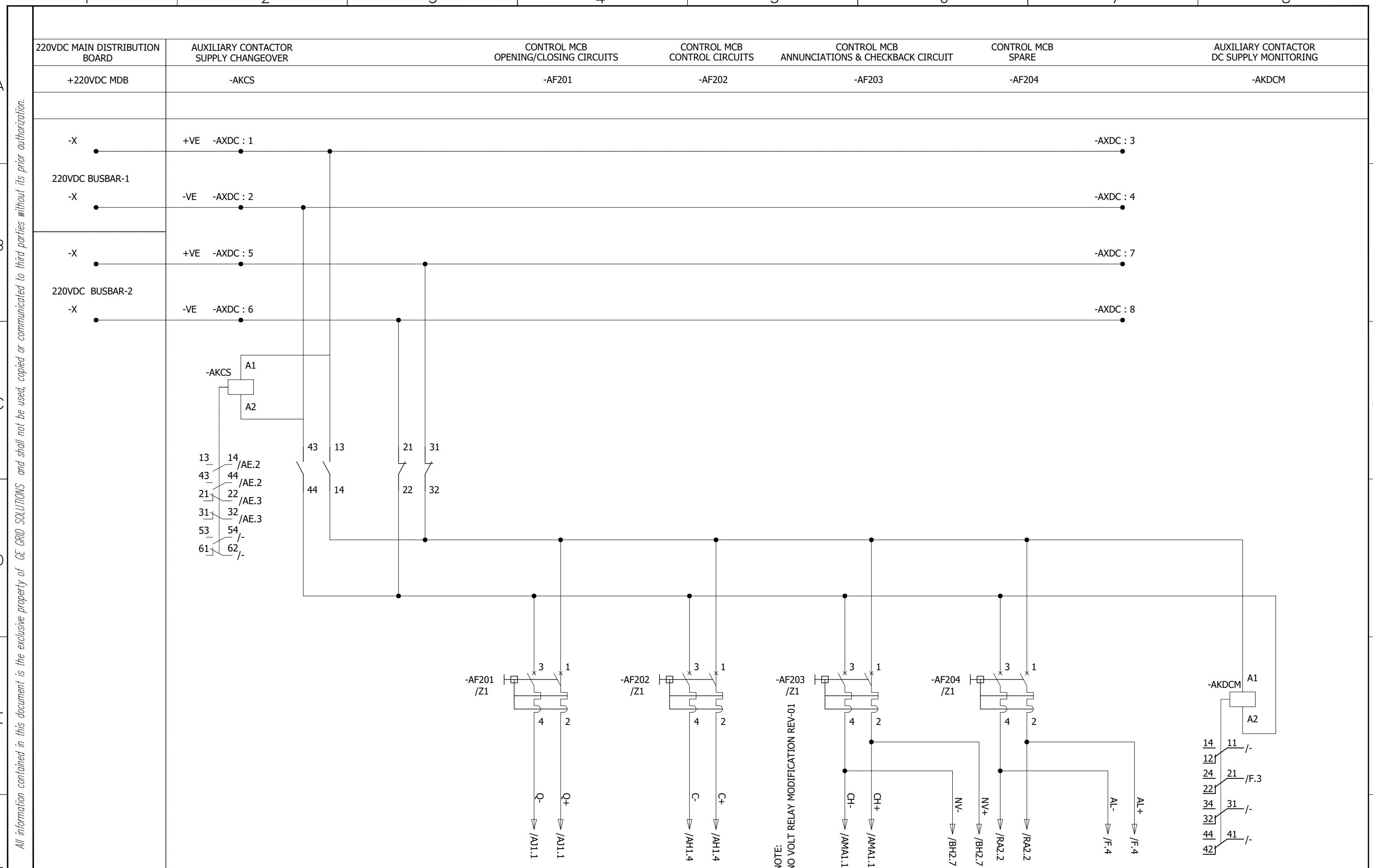
A
B
C
D
E
F

A
B
C
D
E
F

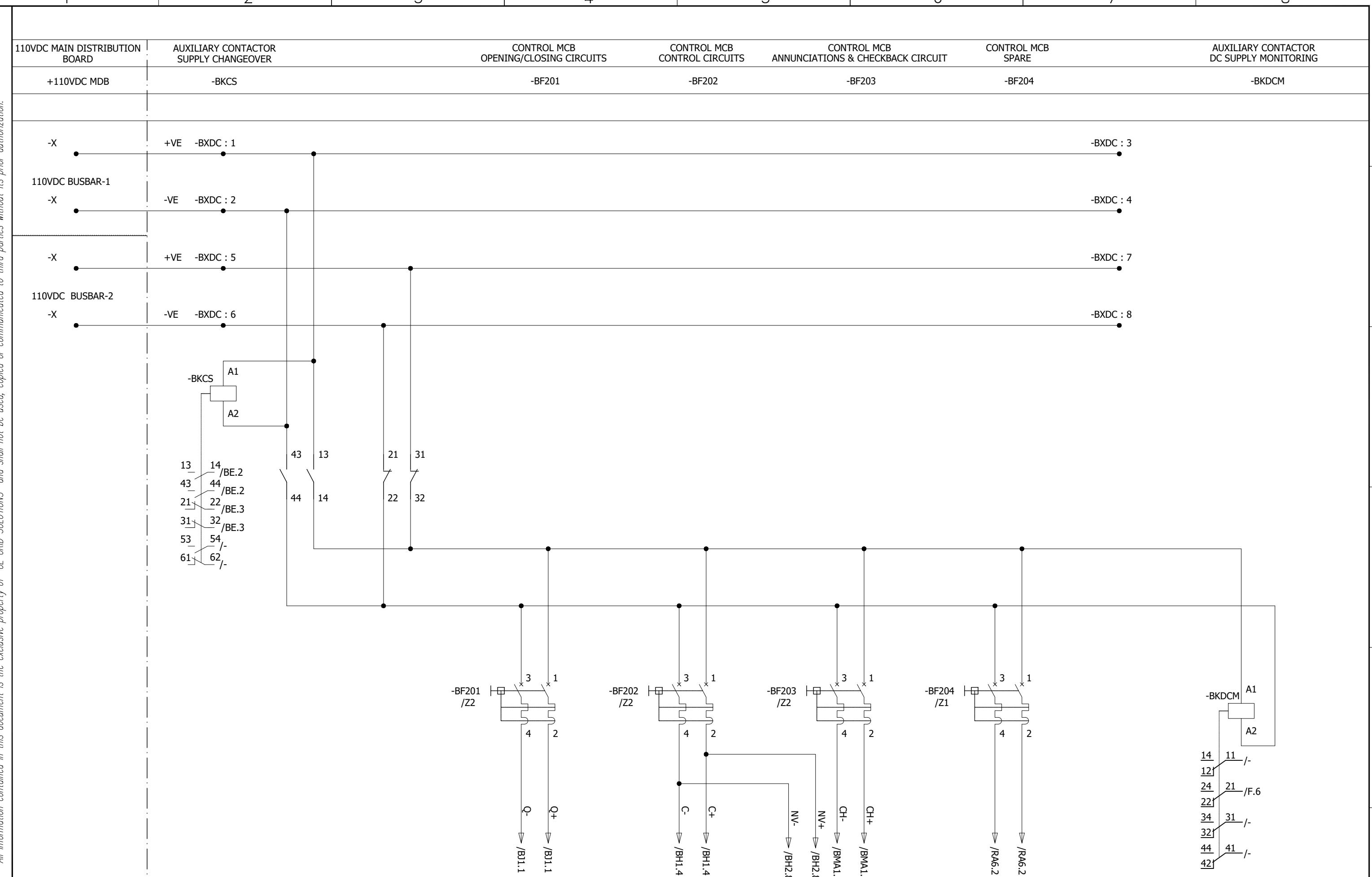
0	AS BUILT	20.11.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
REV.	DESCRIPTION	DATE	DRAWER	EPEPSOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) BAY CONCEPT & METERING	P60194-E-DTC-SC-003
									Project no. P-60194 Sheet type AF Sheet no. 08



0	AS BUILT	20.11.2018	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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) AC SUPPLY DISTRIBUTION	Drawing no. P60194-E-DTC-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type D	Sheet no. 09
1	2	3	4	5	6	7	8				



0	AS BUILT	20.11.2018	ASJ	Manufacturer E P E S O L 7-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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) DC SUPPLY DISTRIBUTION	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type AE
									Sheet no. 10



0	AS BUILT	20.11.2018	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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) DC SUPPLY DISTRIBUTION	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type BE
									Sheet no. 11

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

220V DC CIRCUIT FAULTY

220V DC CIRCUIT FAULTY INDICATION

110V DC CIRCUIT FAULTY

110V DC CIRCUIT FAULTY INDICATION

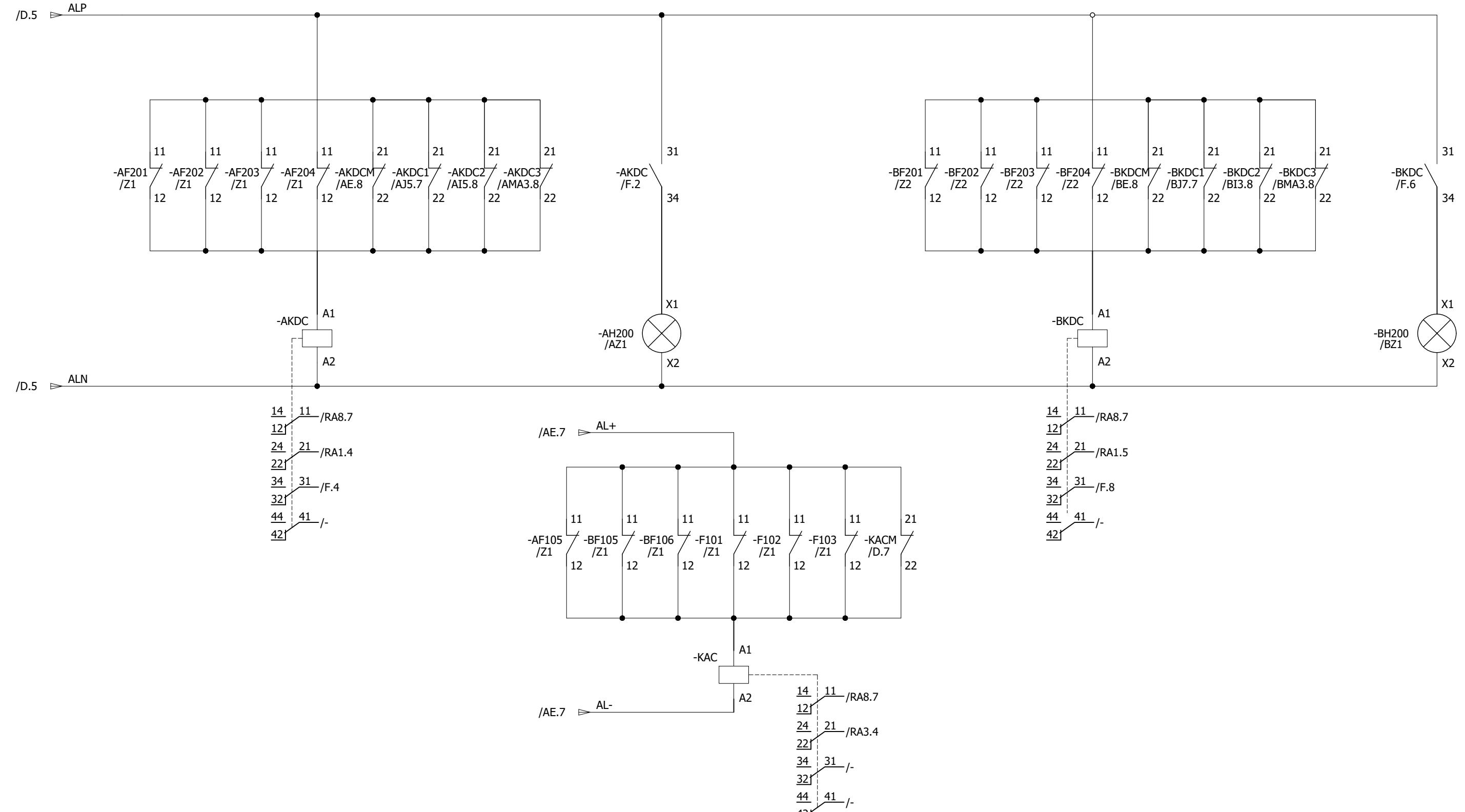
-AKDC

-AH200 220V AC CIRCUIT FAULTY

-BKDC

-BH200

-KAC



A

A

B

B

C

C

D

D

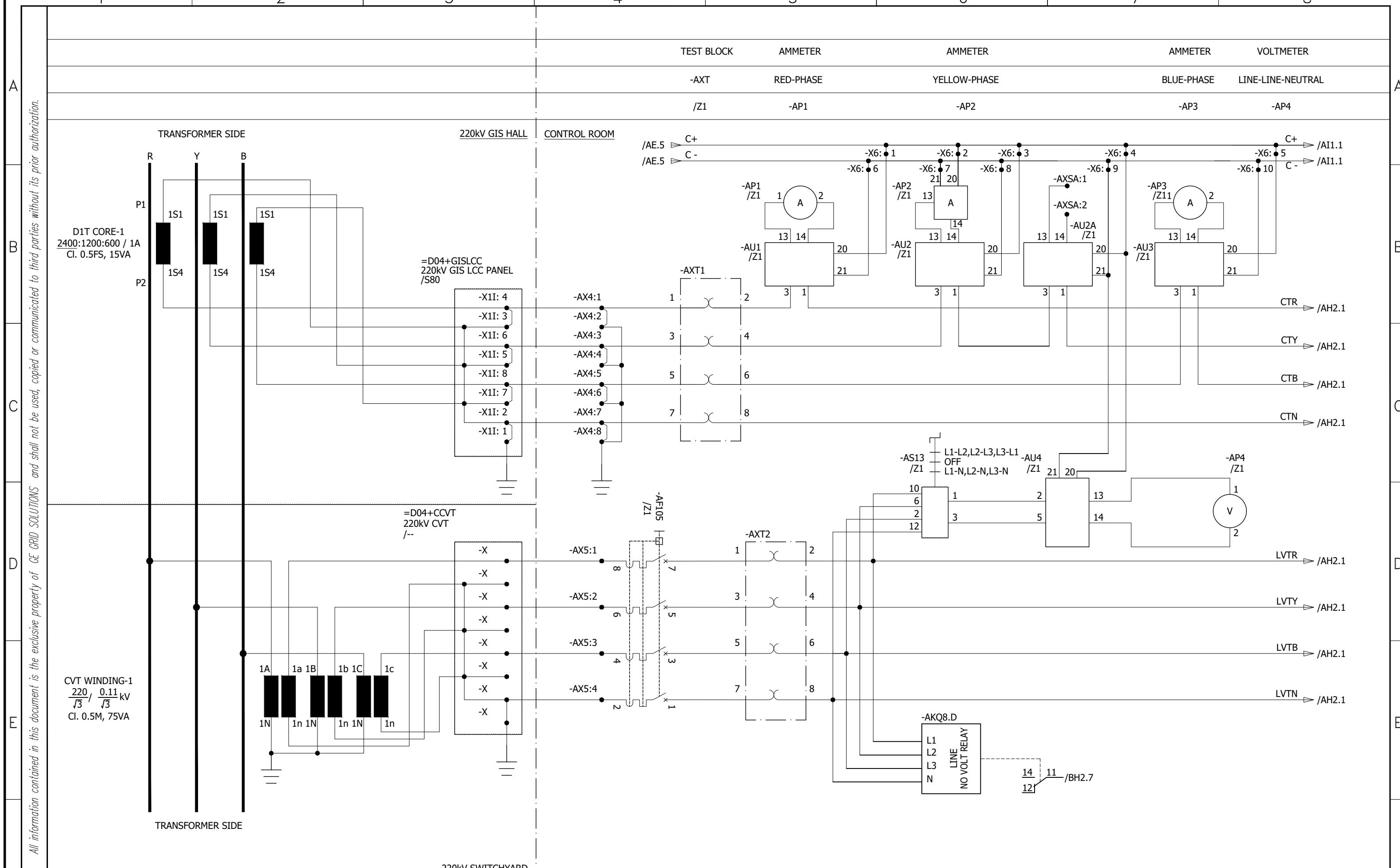
E

E

F

F

0	AS BUILT	20.11.2018	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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) AC/DC SUPPLY FAILURE CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type F
									Sheet no. 12



0	AS BUILT	20.11.2018	ASJ	Manufacturer EPESOL 7-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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) CT/VT METERING CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AH1
									Sheet no. 13

1

2

3

4

5

6

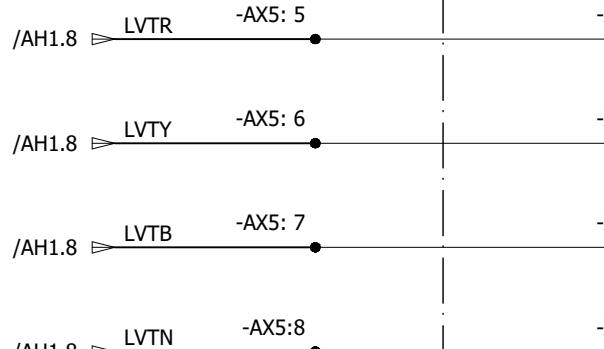
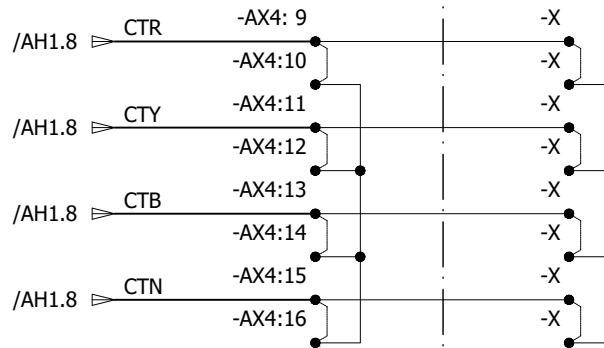
7

8

SCADA INTERFACE CABINET

=D00+Y2

/-



VT SELECTION VIA ISOLATOR STATUS

LINE-LINE-NEUTRAL YELLOW-PHASE

BLUE-PHASE RED-PHASE

132KV GIS HALL

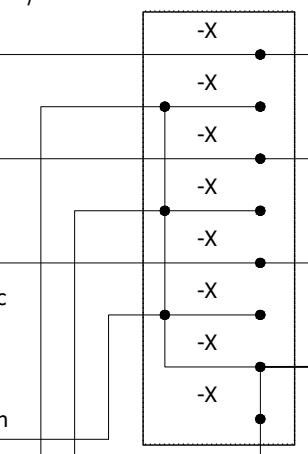
CONTROL ROOM

/Z1

E12CVT(G15) WINDING-1
 $\frac{110}{\sqrt{3}} / \frac{0.11}{\sqrt{3}}$ kV
CI. 0.5M, 75VA

132KV BUSBAR VT

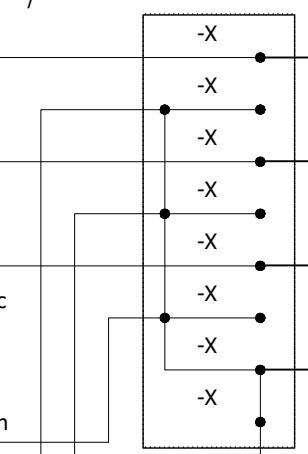
=E12(G15)+CVT
132kV CVT
/-



E12CVT(G25) WINDING-1
 $\frac{110}{\sqrt{3}} / \frac{0.11}{\sqrt{3}}$ kV
CI. 0.5M, 75VA

132KV BUSBAR VT

=E12(G25)+CVT
132kV CVT
/-



/Z1

CONTROL ROOM

/Z1

VT SELECTION VIA ISOLATOR STATUS

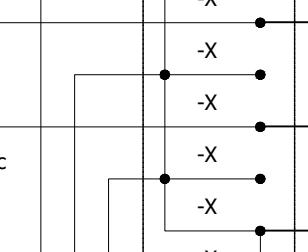
LINE-LINE-NEUTRAL YELLOW-PHASE

BLUE-PHASE RED-PHASE

132KV GIS HALL

CONTROL ROOM

/Z1



/Z1

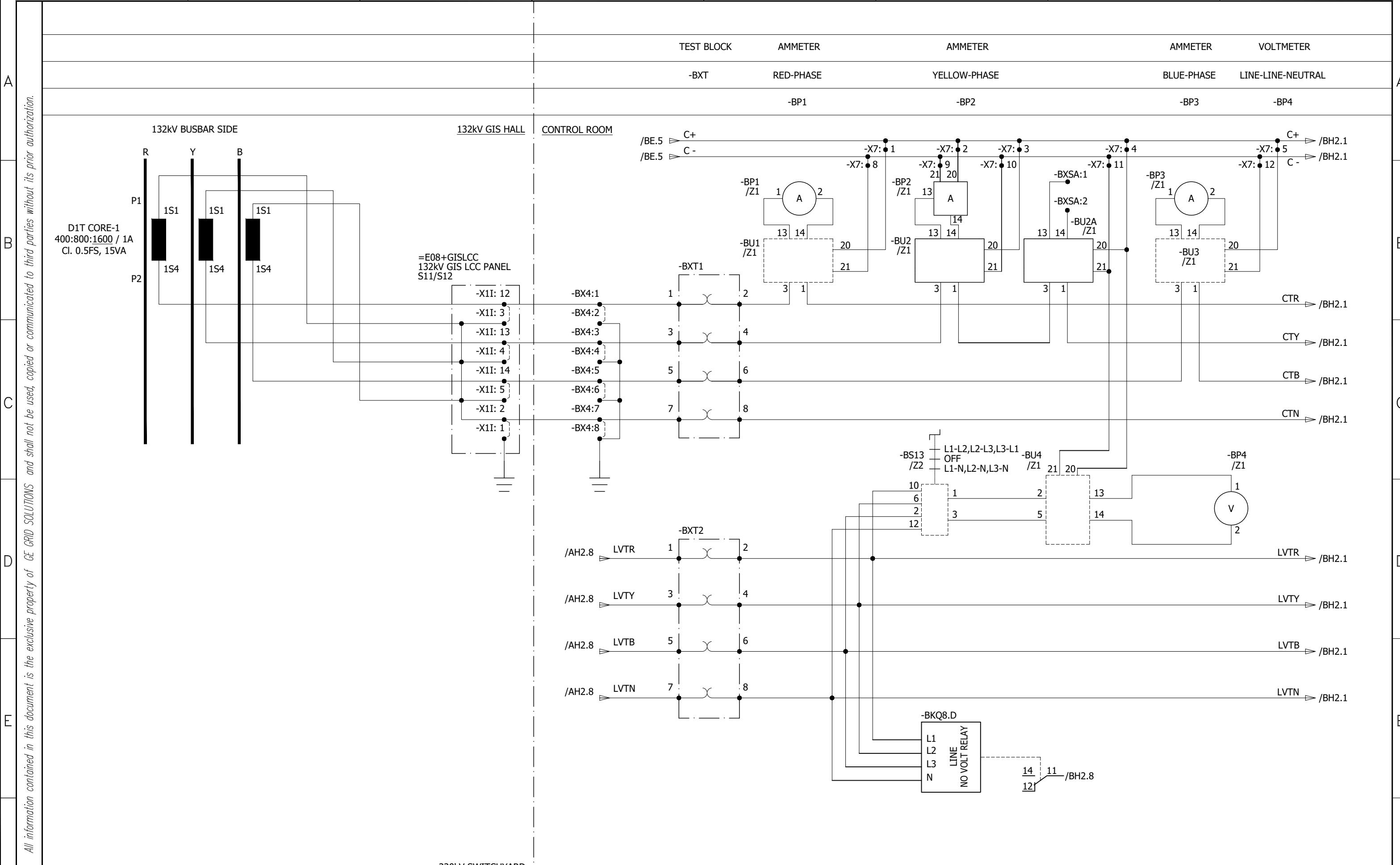
VT SELECTION VIA ISOLATOR STATUS

LINE-LINE-NEUTRAL YELLOW-PHASE

BLUE-PHASE RED-PHASE

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.

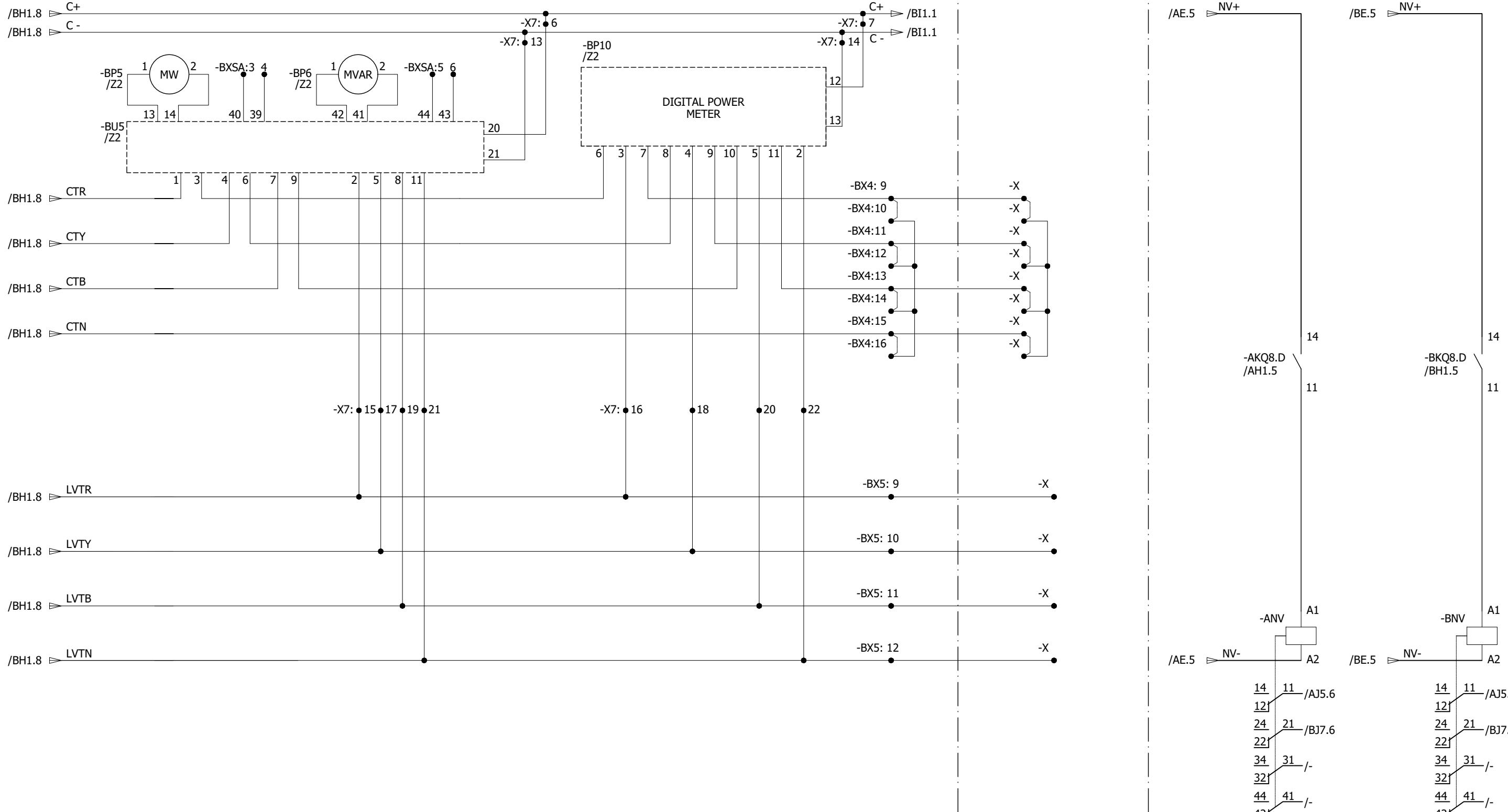
0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) CT/VT METERING CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AH2
									Sheet no. 14



0	AS BUILT	20.11.2018	ASJ	Manufacturer EPE SOL 7-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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) CT/VT METERING CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type BH1

1 2 3 4 5 6 7 8

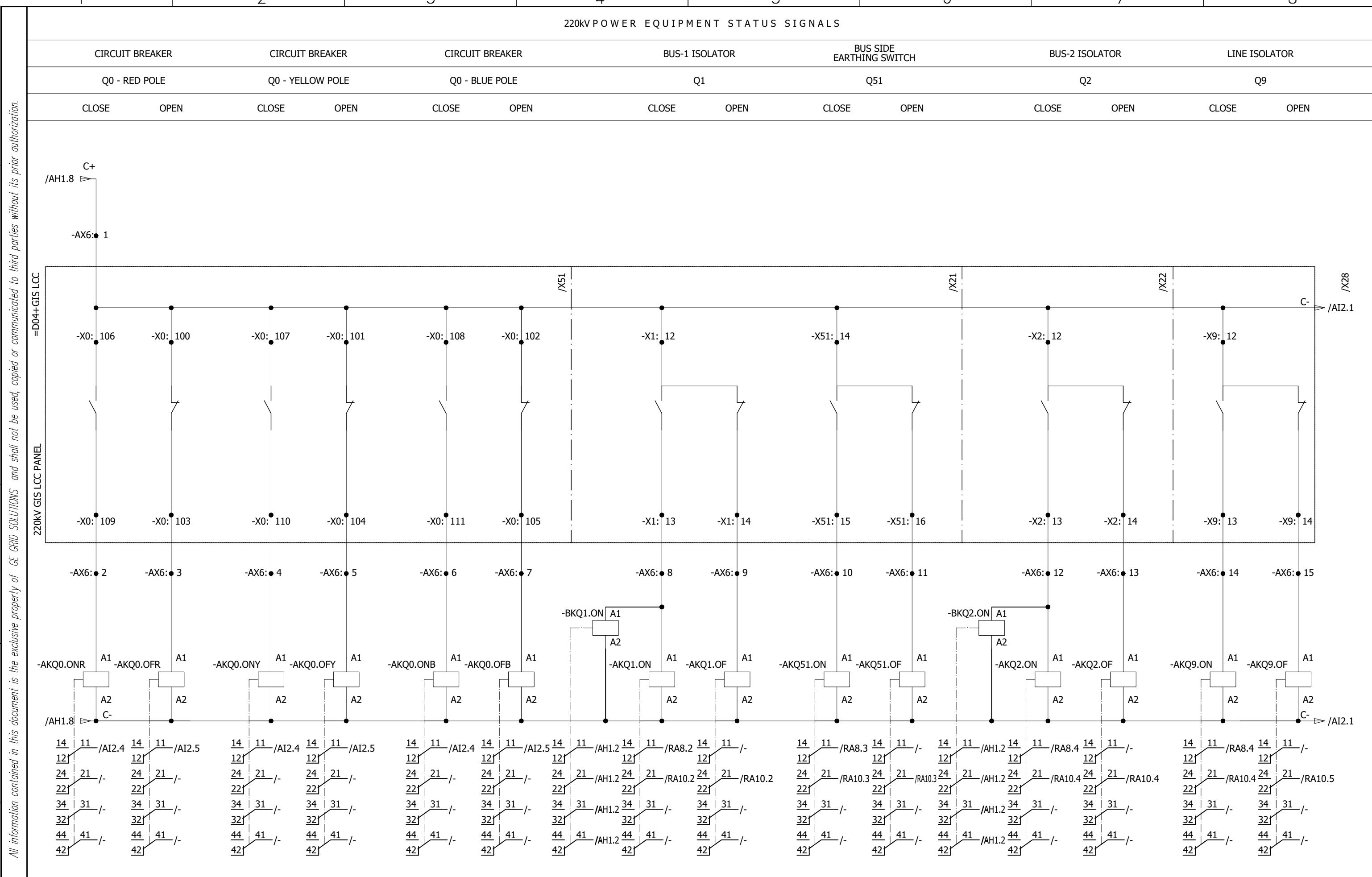
	REAL POWER METERING	REACTIVE POWER METER	DIGITAL POWER METER	SCADA INTERFACE CABINET	220KV SIDE VT NO VOLT RELAY	132KV SIDE VT NO VOLT RELAY
A	METER	SCADA	METER	SCADA	=D00+Y2	CONTACTS MULTIPLICATION
	-BP5		-BP6		-/-	CONTACTS MULTIPLICATION



0	AS BUILT	20.11.2018	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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) CT/VT METERING CIRCUIT	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type BH2

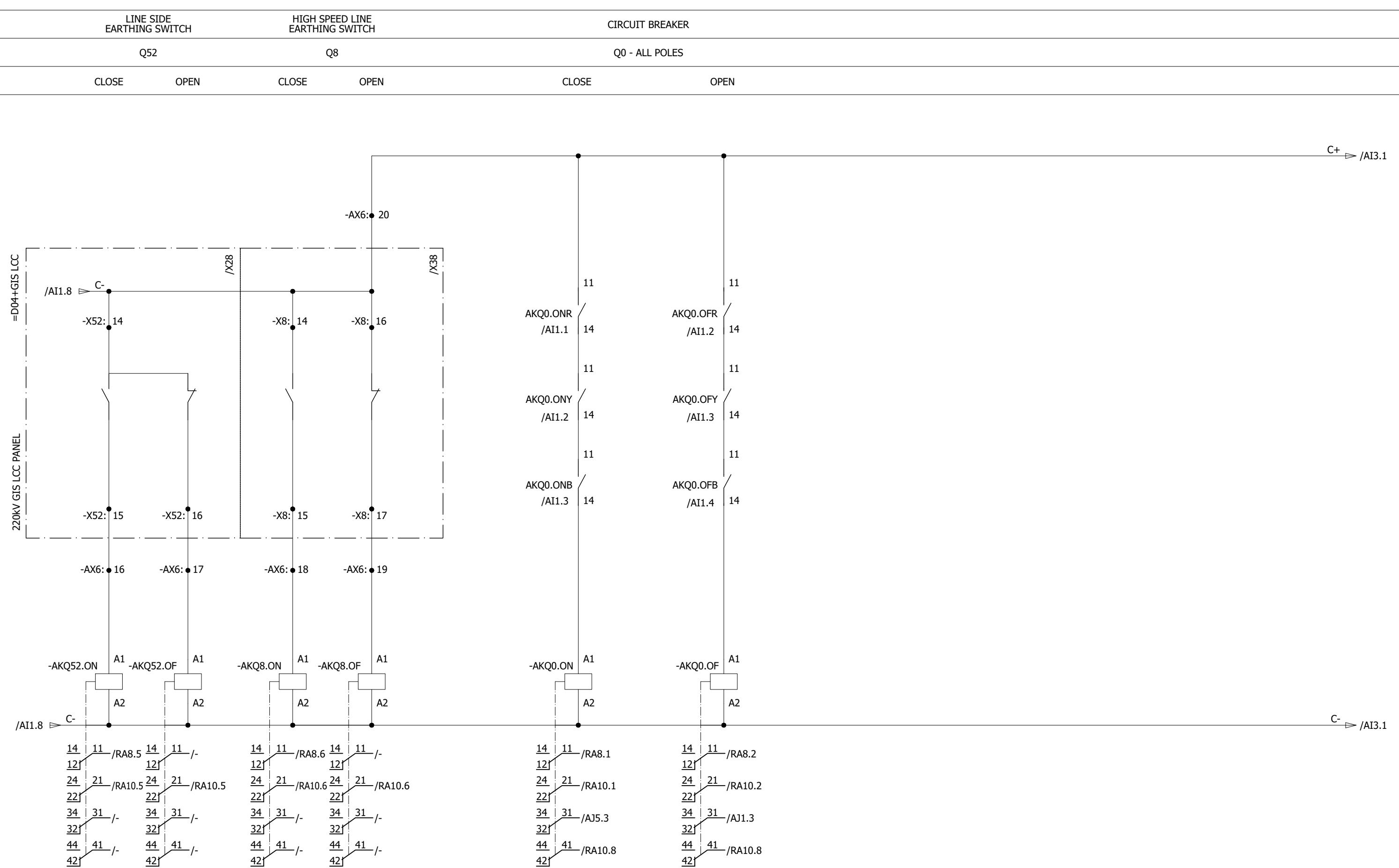
1 2 3 4 5 6 7 8

220KV POWER EQUIPMENT STATUS SIGNALS



0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPEPSOL 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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AI1
									Sheet no. 17

220KV POWER EQUIPMENT STATUS SIGNALS

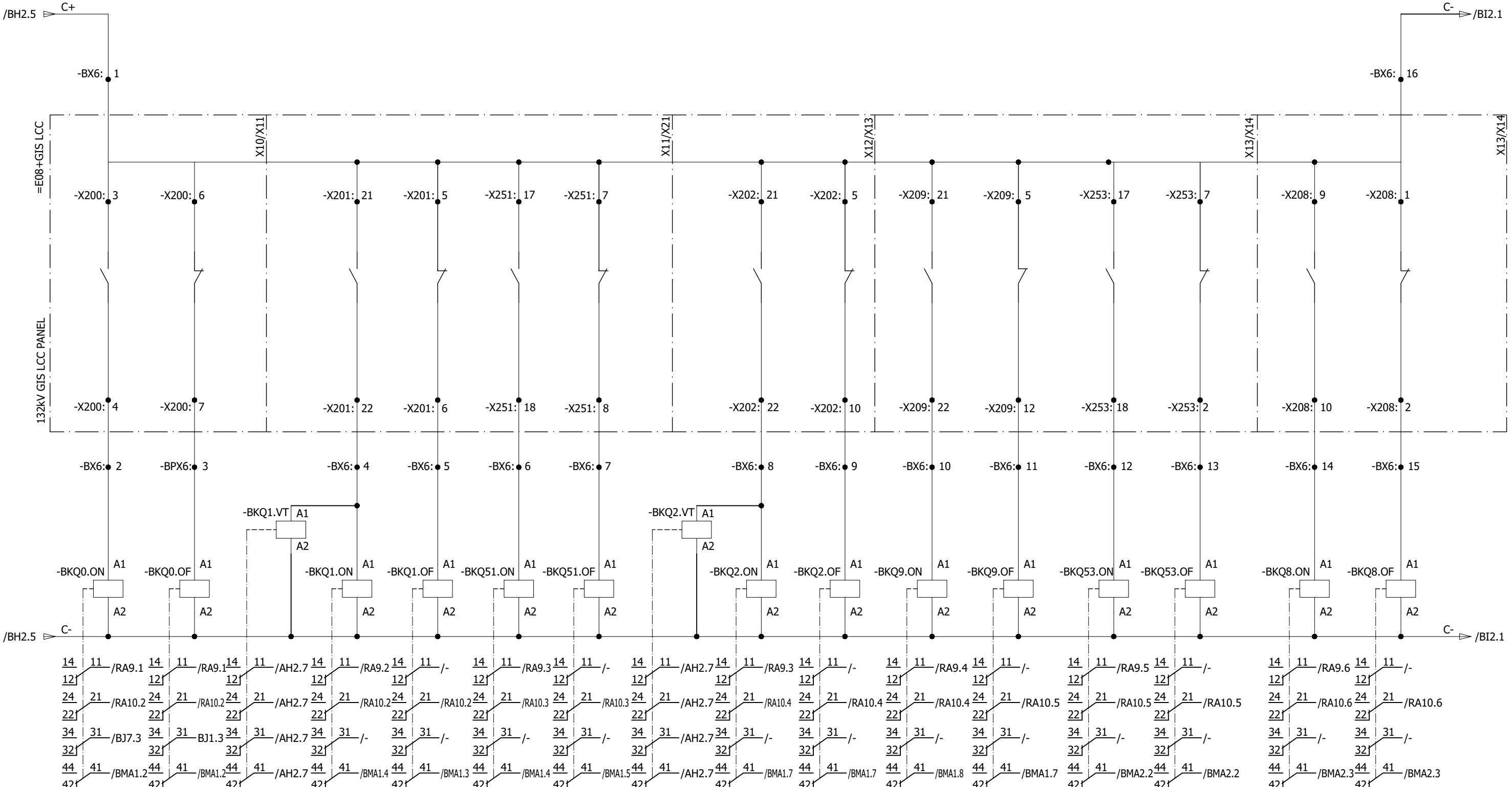


0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AI2
									Sheet no. 18

132KV POWER EQUIPMENT STATUS SIGNALS

CIRCUIT BREAKER	BUS-1 ISOLATOR	BUS SIDE EARTHING SWITCH	BUS-2 ISOLATOR	LINE ISOLATOR	LINE SIDE EARTHING SWITCH	HIGH SPEED LINE EARTHING SWITCH
-----------------	----------------	--------------------------	----------------	---------------	---------------------------	---------------------------------

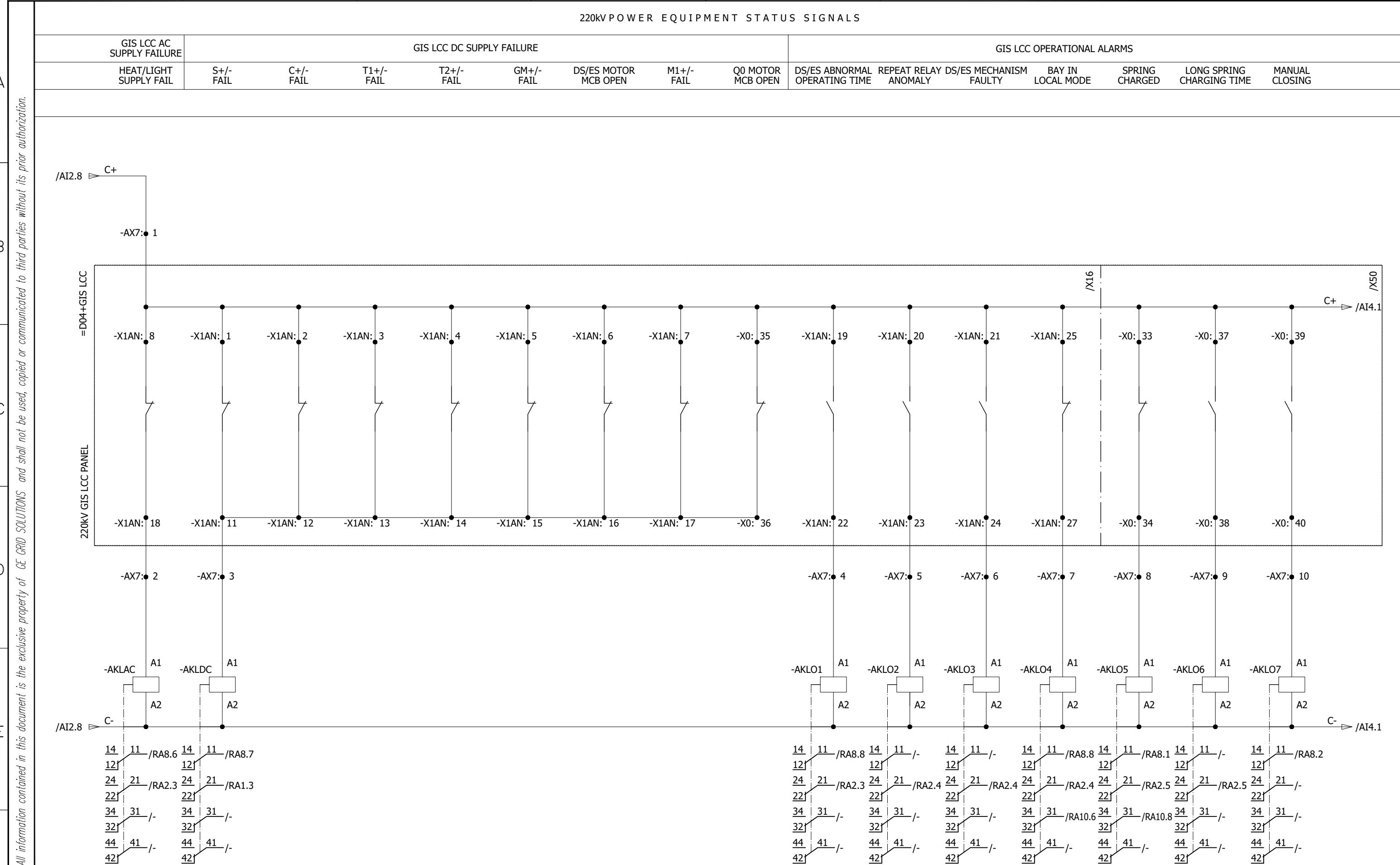
Q0	Q1	Q51	Q2	Q9	Q53	Q8
CLOSE	OPEN	CLOSE	OPEN	CLOSE	OPEN	CLOSE



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.

0	AS BUILT	20.11.2018	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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type BI1
									Sheet no. 19

220KV POWER EQUIPMENT STATUS SIGNALS

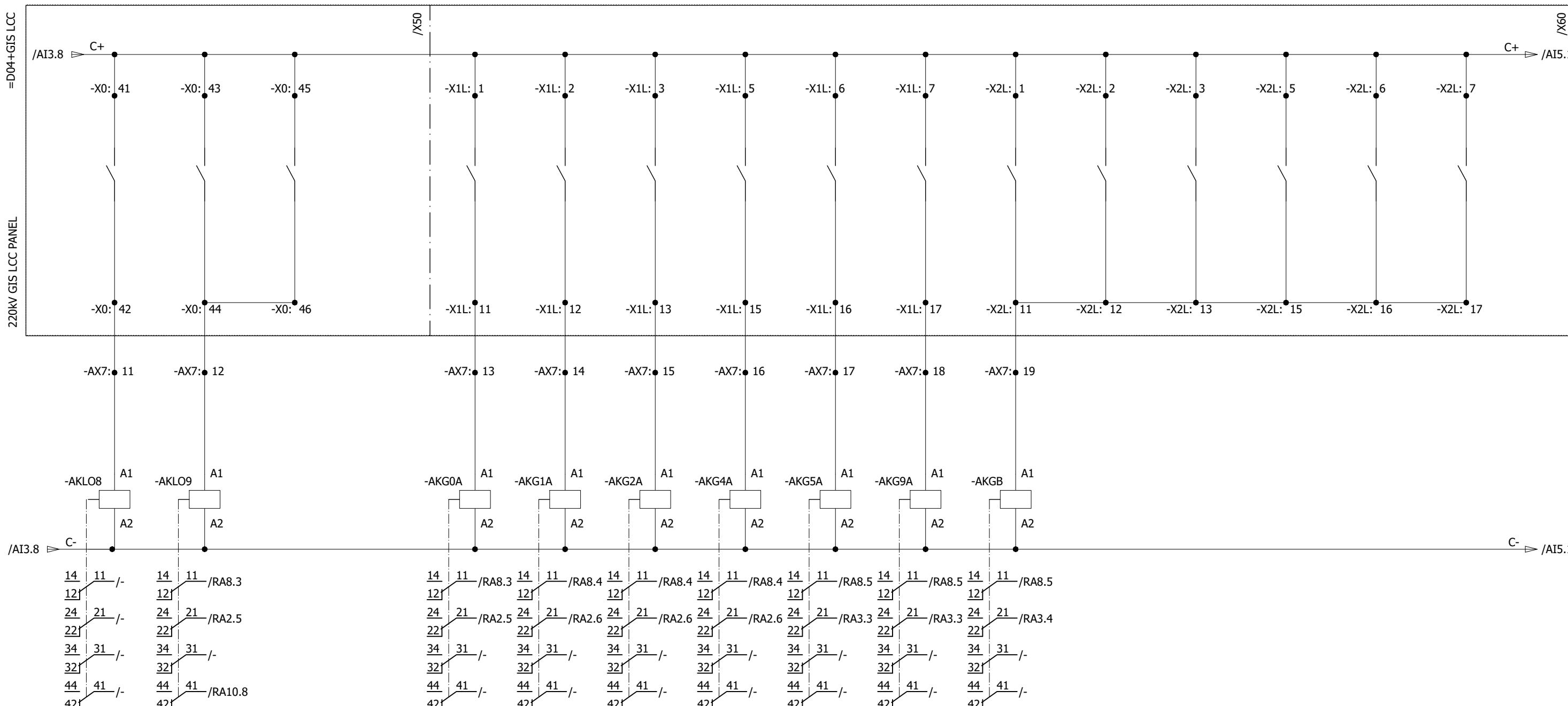


0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AI3
									Sheet no. 20

220kV POWER EQUIPMENT STATUS SIGNALS

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

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	20.11.2018	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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DTC-SC-003		
									Project no. P-60194		
									Sheet type AI4		
									Sheet no. 21		
REV.	DESCRIPTION	DATE	DRAWER	1	2	3	4	5	6	7	8

220KV POWER EQUIPMENT STATUS SIGNALS

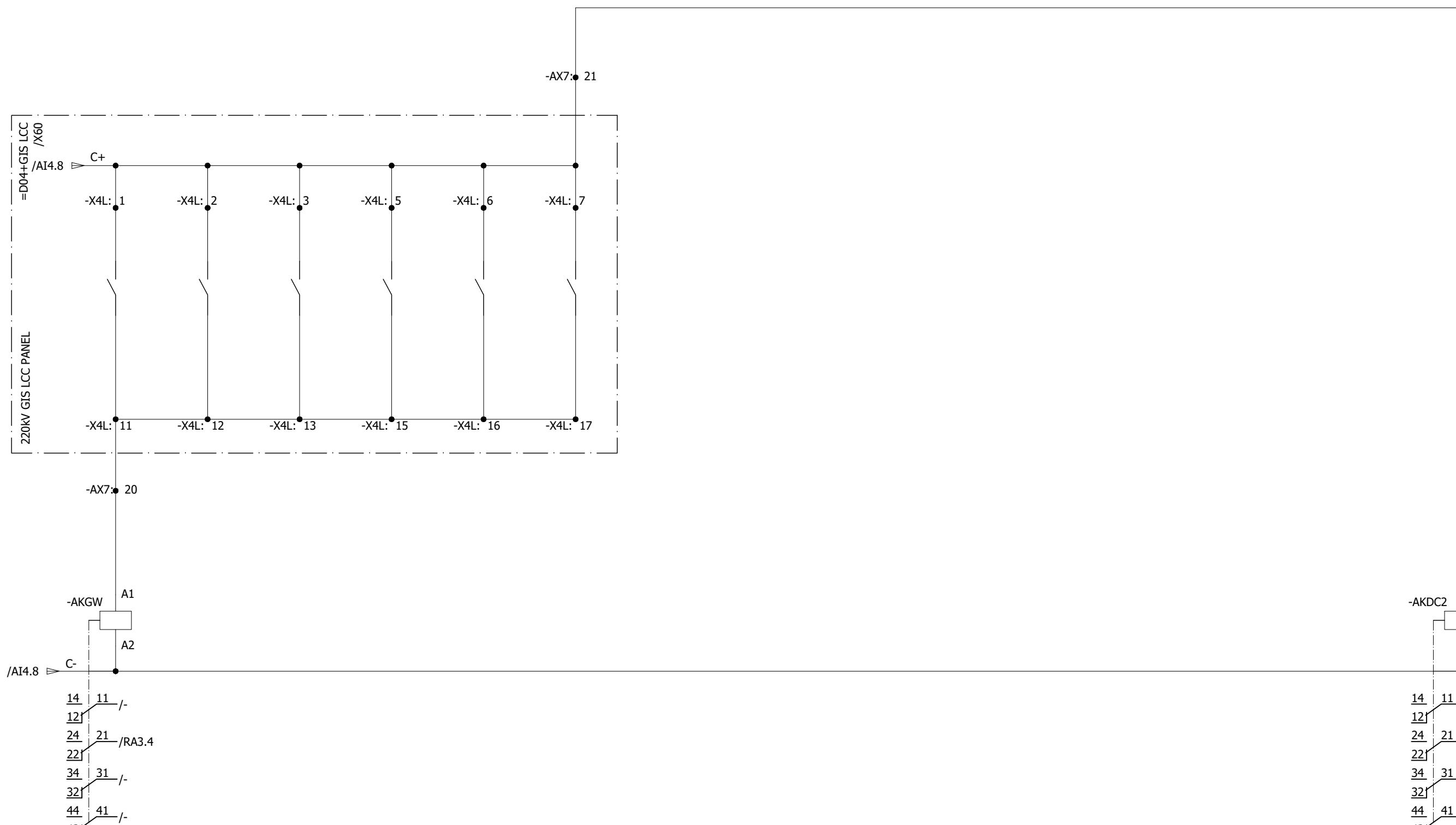
GIS LCC GAS COMPARTMENT ALARMS

DC CIRCUIT C+/C-
MONITORING

-AKDC2

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.

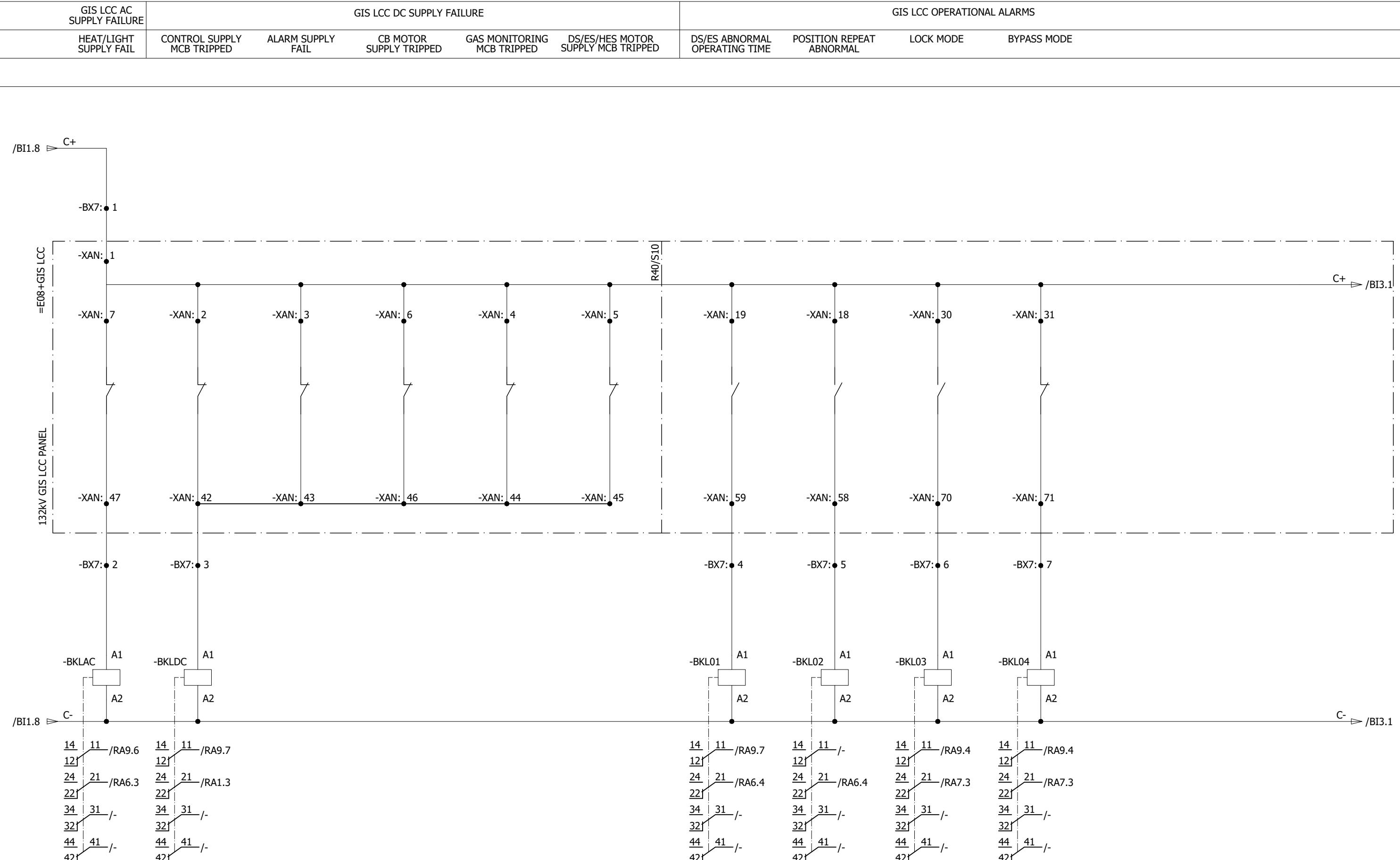
G0 SELF WIRING	G1 SELF WIRING	G2 SELF WIRING	G4 SELF WIRING	G5 SELF WIRING	G9 SELF WIRING
CHECK	CHECK	CHECK	CHECK	CHECK	CHECK



0	AS BUILT	20.11.2018	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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DTC-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type A15	Sheet no. 22
1	2	3	4	5	6	7	8				

132kV GIS POWER EQUIPMENT INPUT SIGNALS

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		20.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION		DATE	DRAWER					Project no. P-60194	Sheet type BI2	Sheet no. 23
1	1		2	3	4	5	6	7	8		

132kV GIS POWER EQUIPMENT INPUT SIGNALS

GIS LCC GAS COMPARTMENT ALARMS

DC CIRCUIT C+/C-MONITORING

SPRING DISCHARGED

LONG SPRING CHARGING TIME

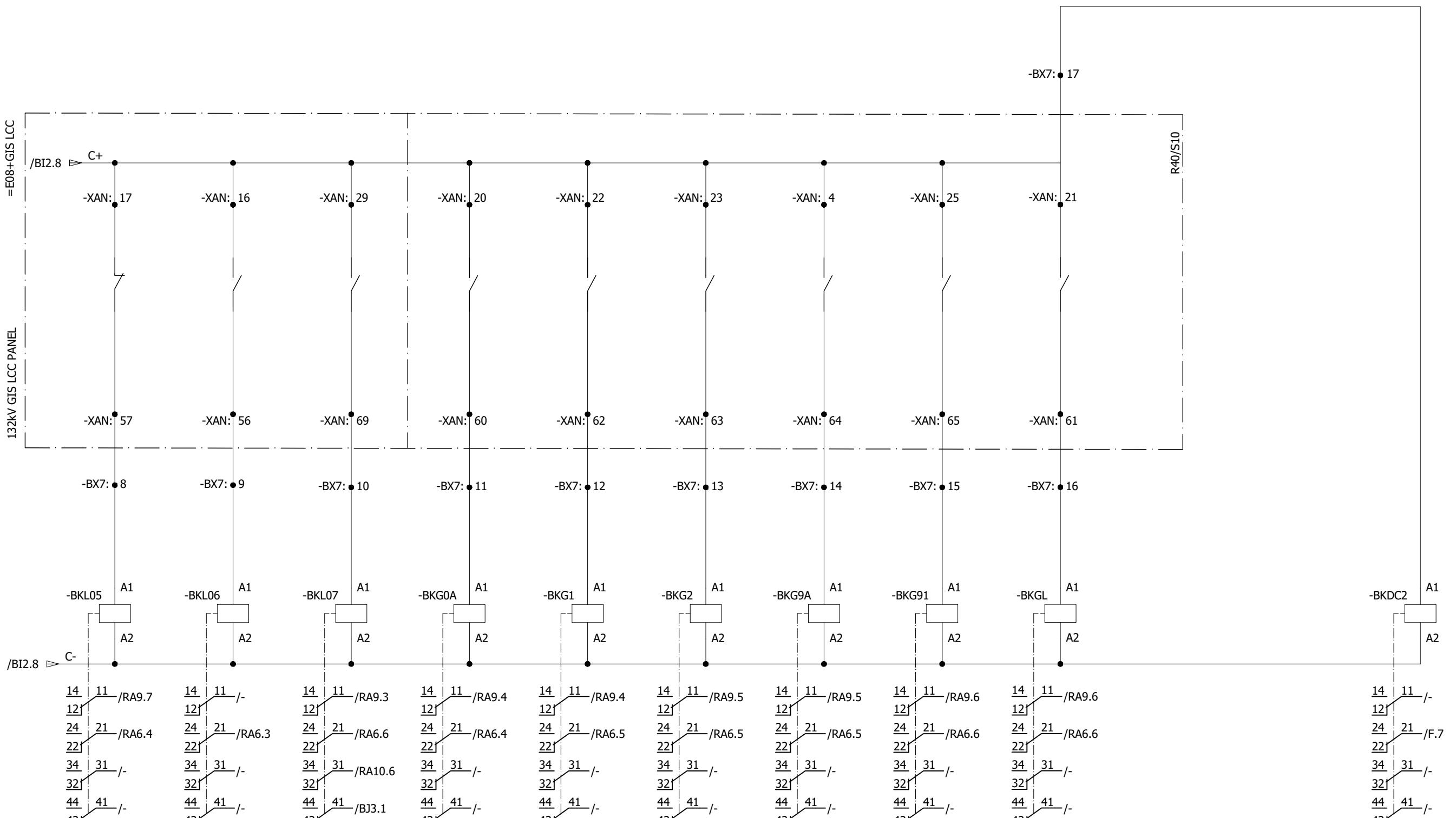
GIS LOCAL MODE

ALARM

ALARM

-BKDC2

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	20.11.2018	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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type BI3
									Sheet no. 24

220kV CIRCUIT BREAKER CLOSING / OPENING CIRCUIT

SCADA OPERATION

LOCAL OPERATION

DISCREPANCY SWITCH
COMMAND

CLOSE OPEN

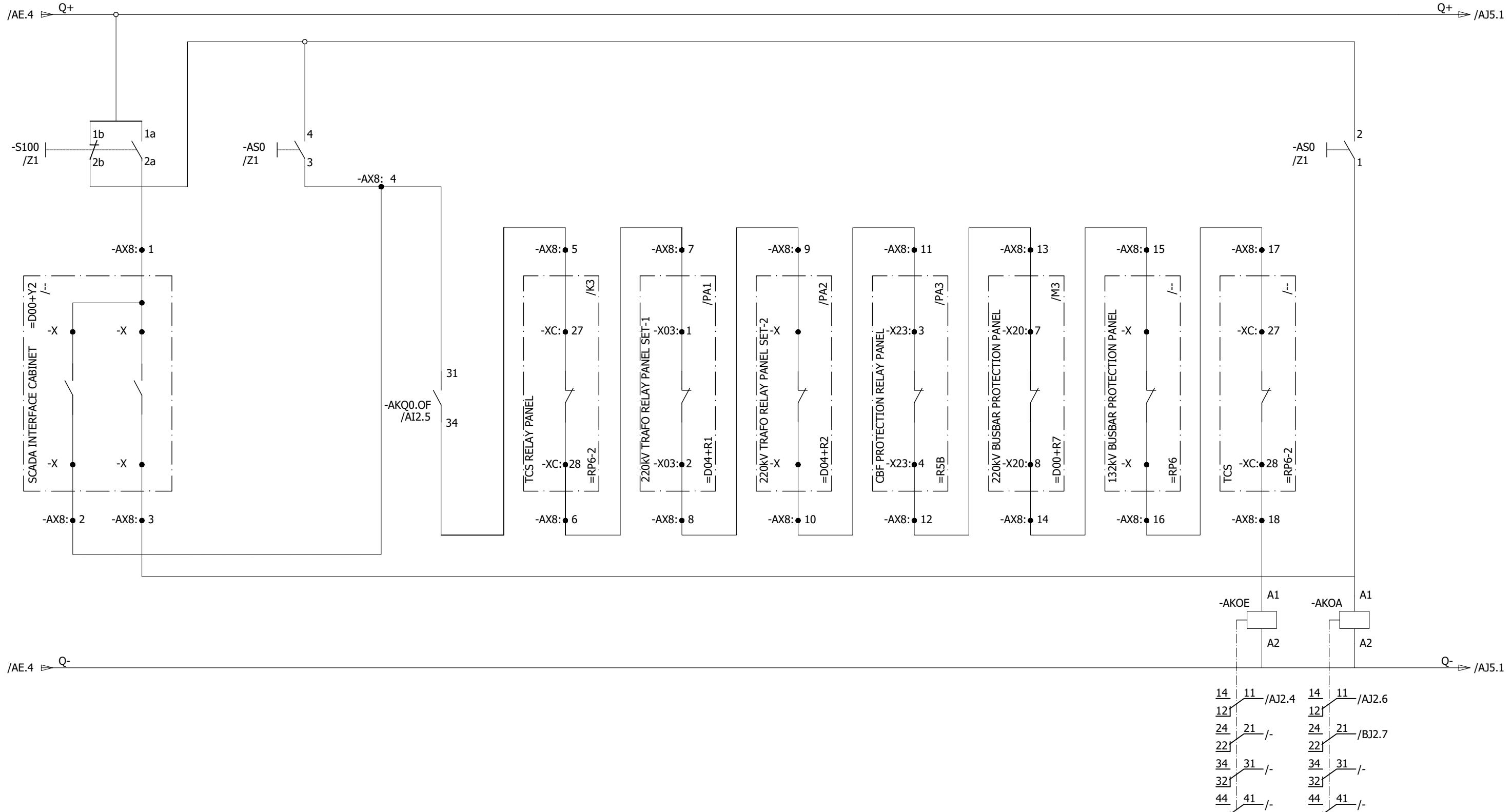
DISCREPANCY SWITCH
COMMAND

CLOSE

CLOSE BLOCK CHECKS

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.



0	AS BUILT	20.11.2018	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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) CIRCUIT BREAKER OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AJ1	Sheet no. 25

220kV CIRCUIT BREAKER CLOSING / OPENING COMMANDS TO GIS LCC

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

A

B

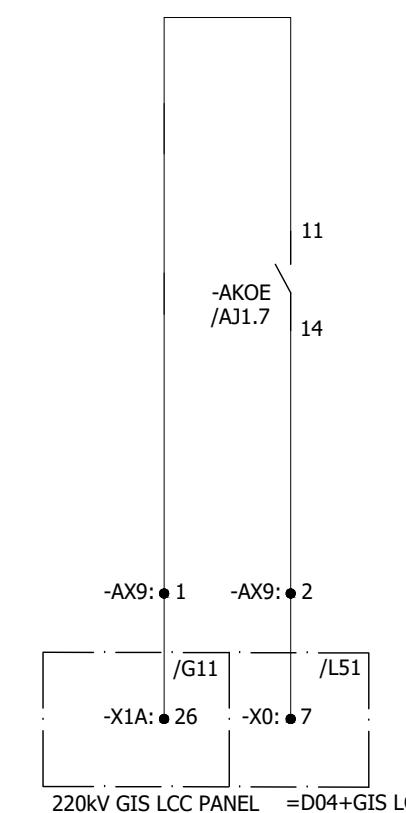
C

D

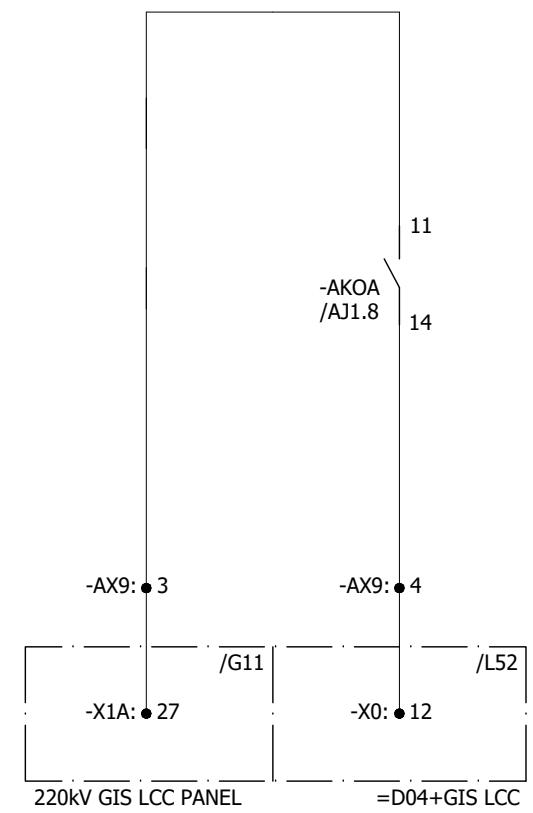
E

F

CONTROL PANEL CLOSE
COMMAND TO CIRCUIT BREAKER

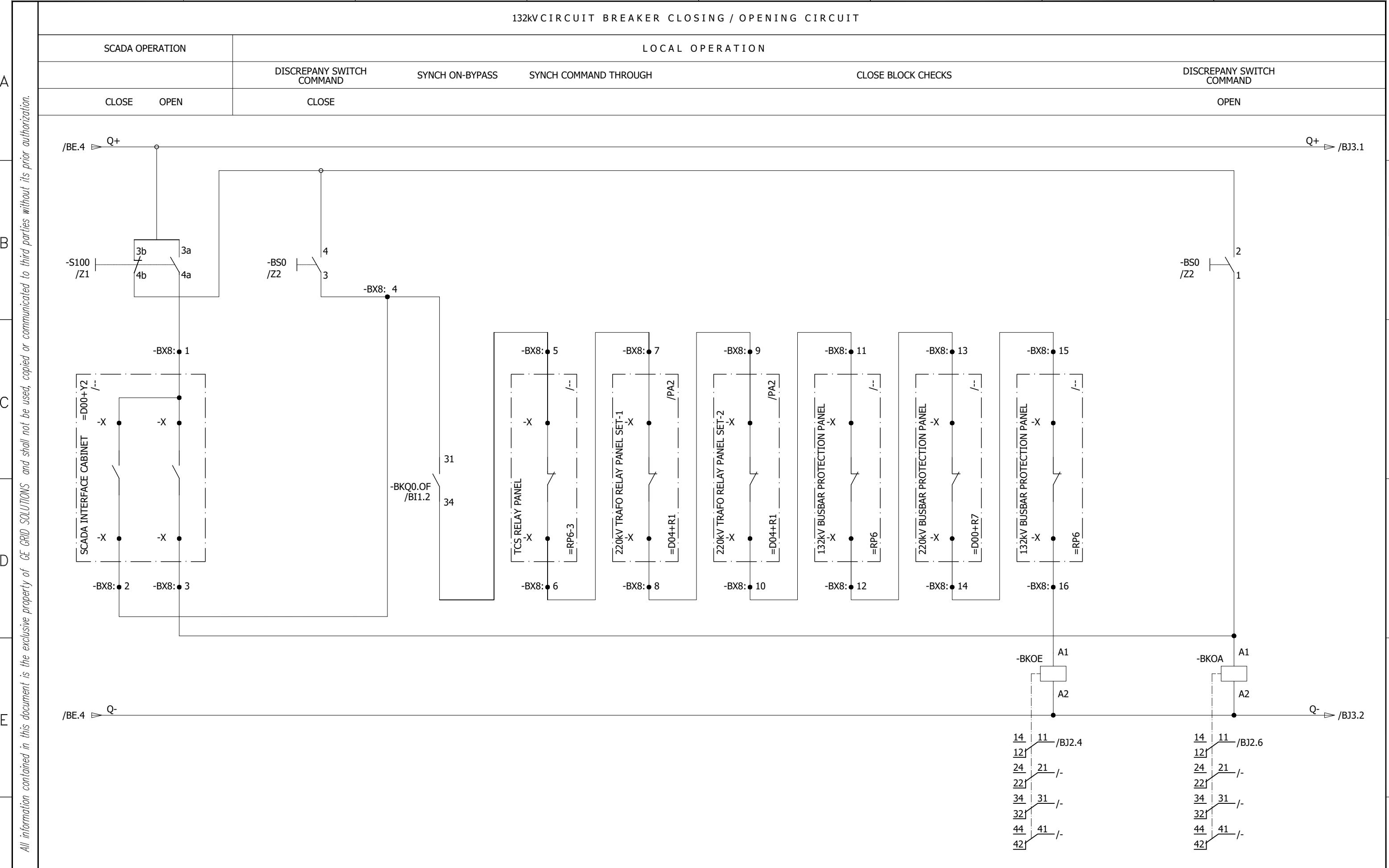


CONTROL PANEL OPENING
COMMAND TO CIRCUIT BREAKER



0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) CIRCUIT BREAKER OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AJ2	Sheet no. 26

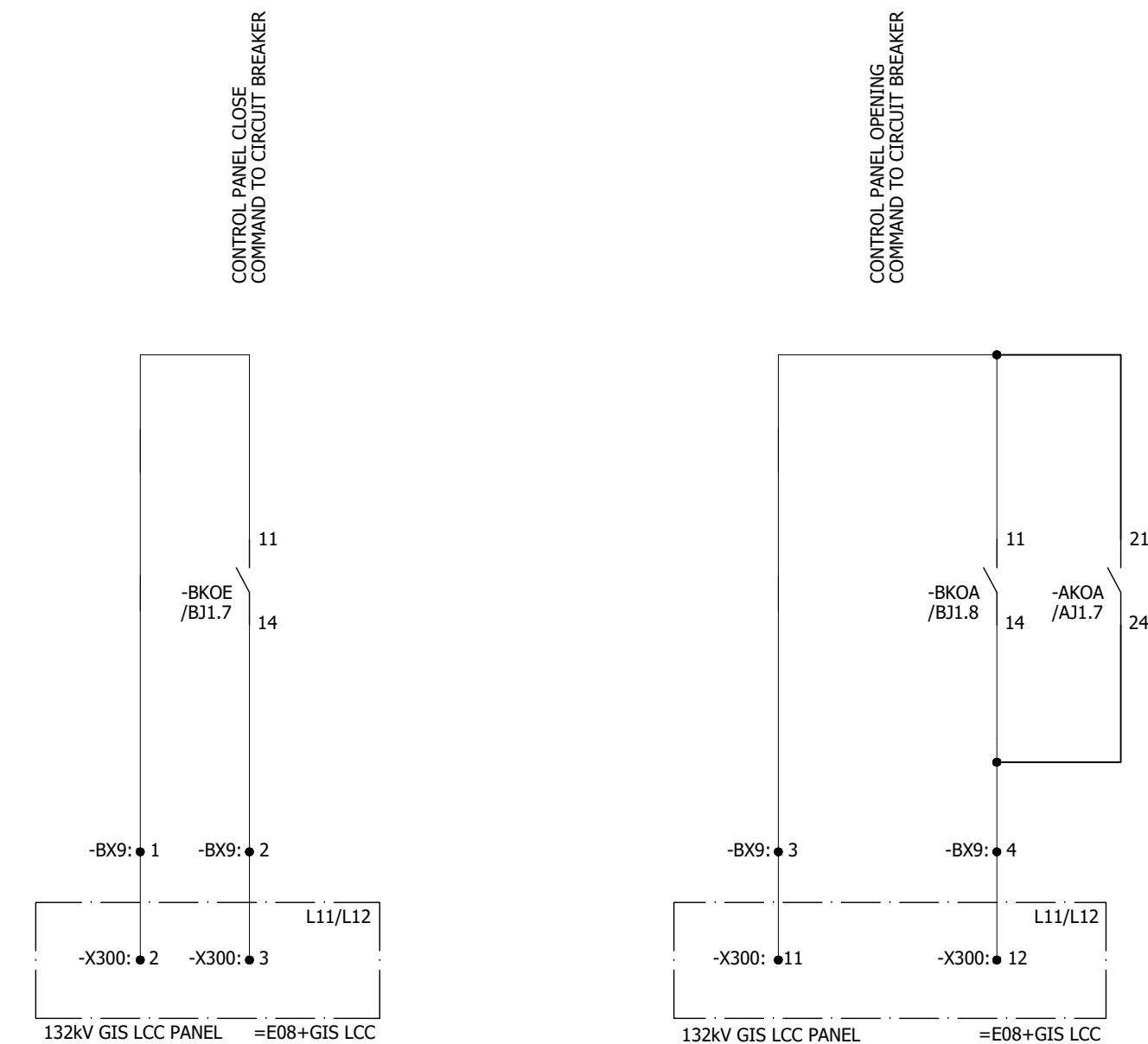
132kV CIRCUIT BREAKER CLOSING / OPENING CIRCUIT



0	AS BUILT	20.11.2018	ASJ	Manufacturer E P E S O L 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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) CIRCUIT BREAKER OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type BJ1
									Sheet no. 27

132kV CIRCUIT BREAKER CLOSING / OPENING COMMANDS TO GIS LCC

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	20.11.2018	ASJ	Manufacturer E P E S O L 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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) CIRCUIT BREAKER OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type BJ2	Sheet no. 28
1	2	3	4	5	6	7	8			

220KV ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

SELECTOR SWITCH

BUS-1 ISOLATOR (=D04+Q1)

BUS SIDE EARTHING SWITCH (=D04+Q51)

BUS-2 ISOLATOR (=D04+Q2)

LOCAL-OFF-SCADA

LOCAL OPERATION

SCADA OPERATION

LOCAL OPERATION

SCADA OPERATION

LOCAL OPERATION

SCADA OPERATION

CLOSE

OPEN

CLOSE

OPEN

CLOSE

OPEN

CLOSE

OPEN

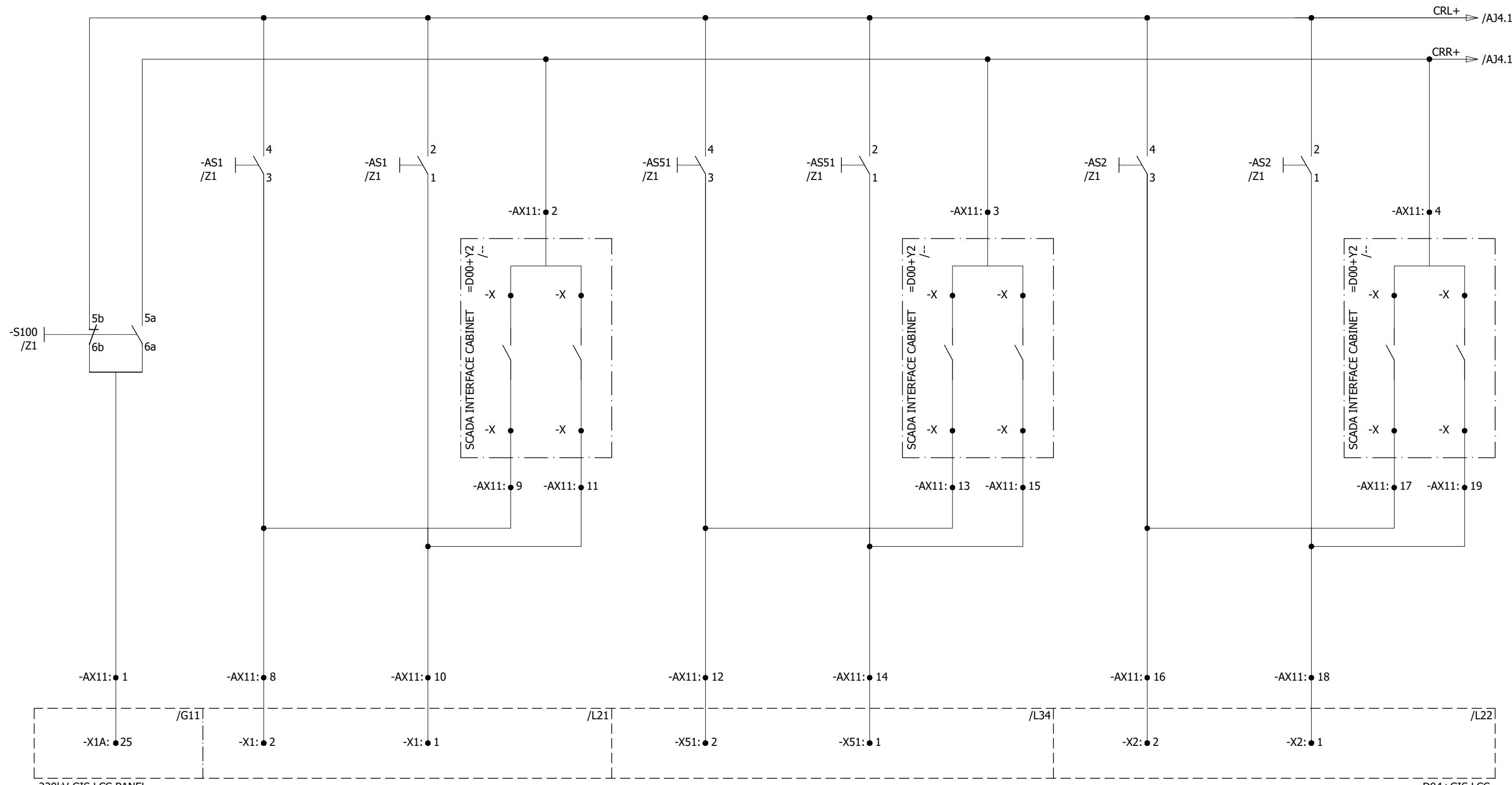
CLOSE

OPEN

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.



0	AS BUILT	20.11.2018	ASJ	Manufacturer  71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AJ3
									Sheet no. 29

220KV ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

LINE ISOLATOR (=D04+Q9)

LINE SIDE EARTHING SWITCH (=D04+Q52)

HIGH SPEED LINE EARTHING SWITCH (=D04+Q8)

LOCAL OPERATION

SCADA OPERATION

LOCAL OPERATION

SCADA OPERATION

LOCAL OPERATION

SCADA OPERATION

CLOSE

OPEN

CLOSE

OPEN

CLOSE

OPEN

CLOSE

OPEN

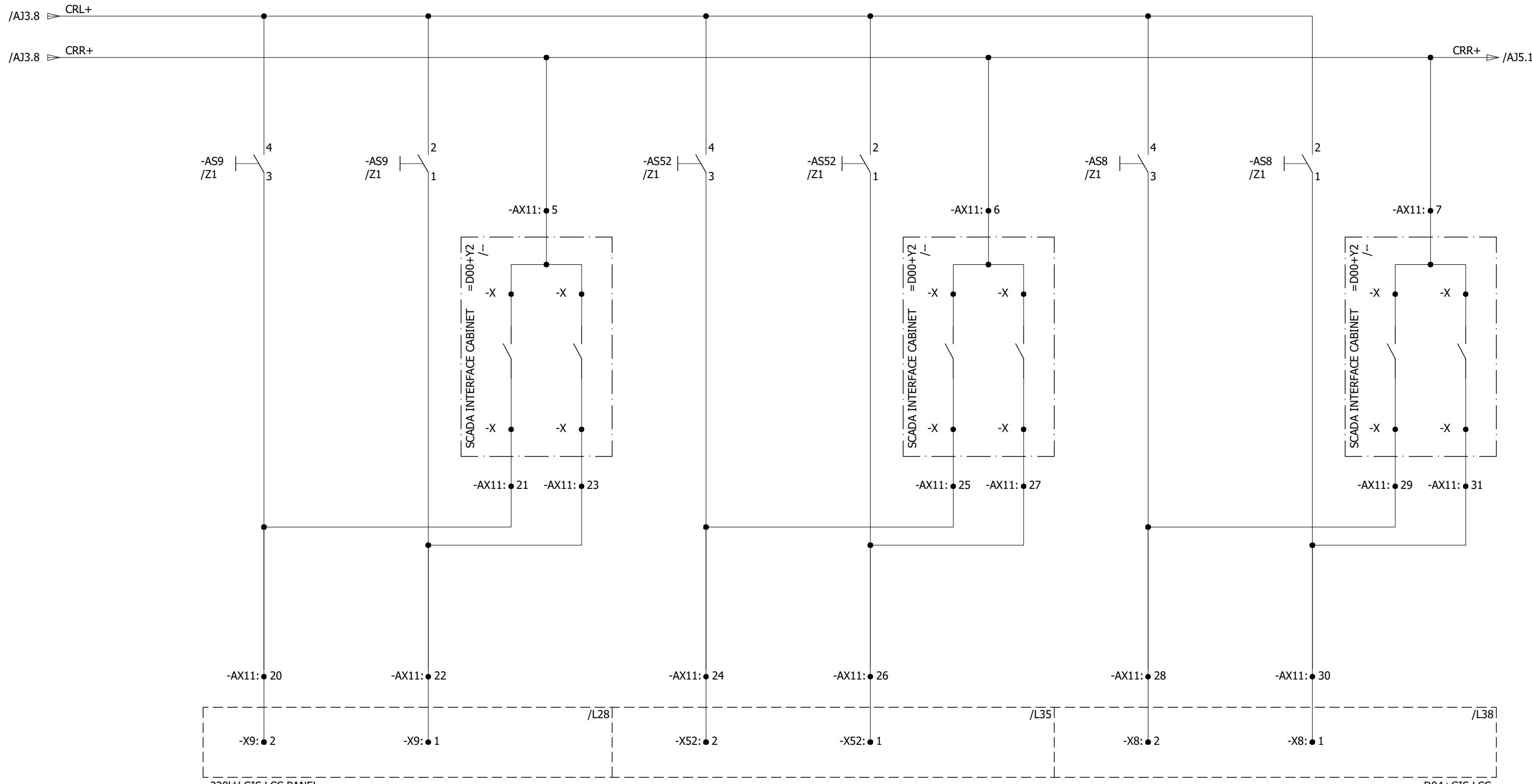
CLOSE

OPEN

CLOSE

OPEN

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	20.11.2018	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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT'	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AJ4
									Sheet no. 30

220KV CONTROL CIRCUIT

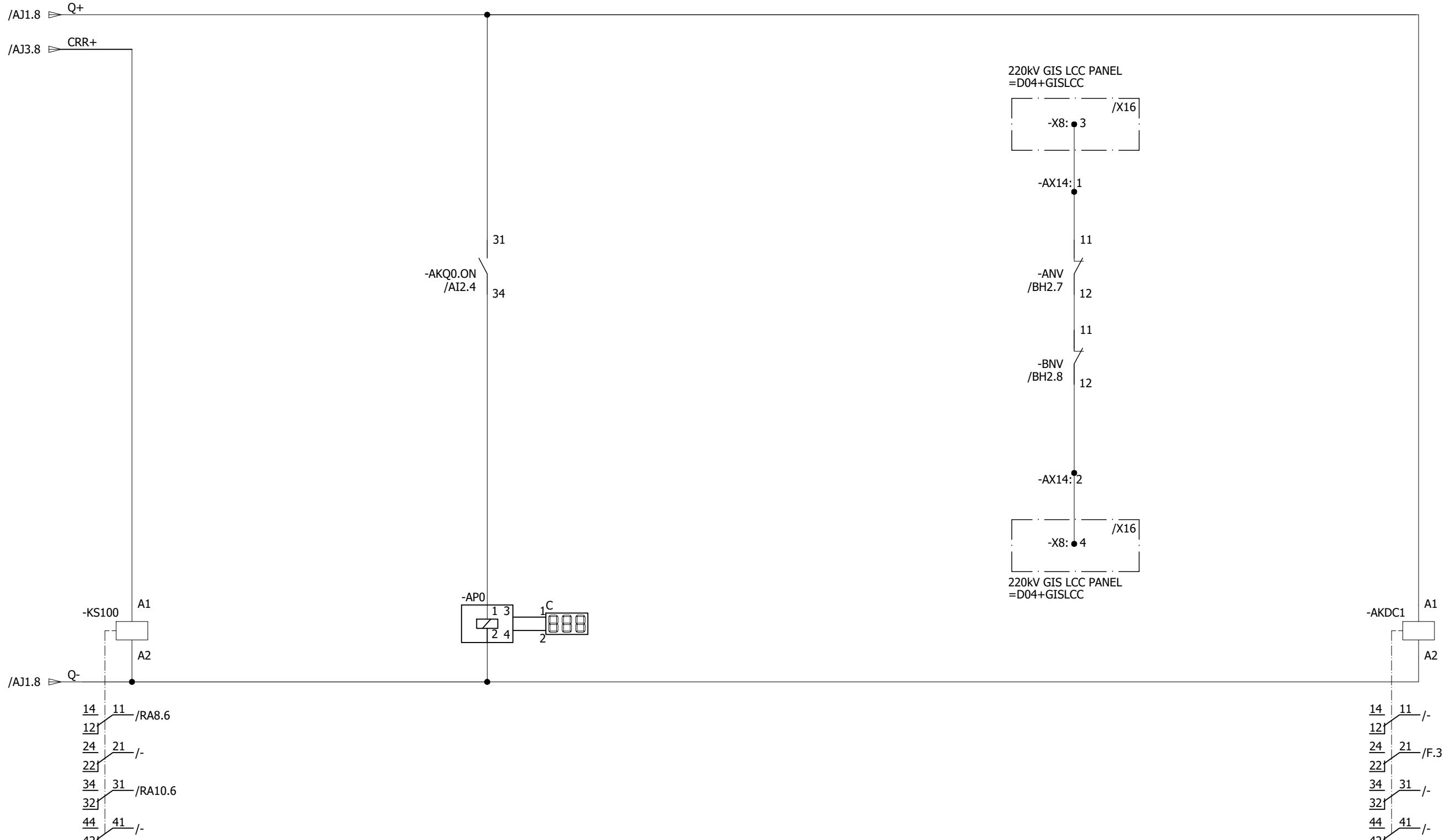
220KV SWITCHES
ON REMOTE MODECIRCUIT BREAKER
OPERATION COUNTERINTERLOCK FOR
LINE EARTHING SWITCHDC CIRCUIT Q+/Q-
MONITORING

-KS100

-AP0

-AKDC1

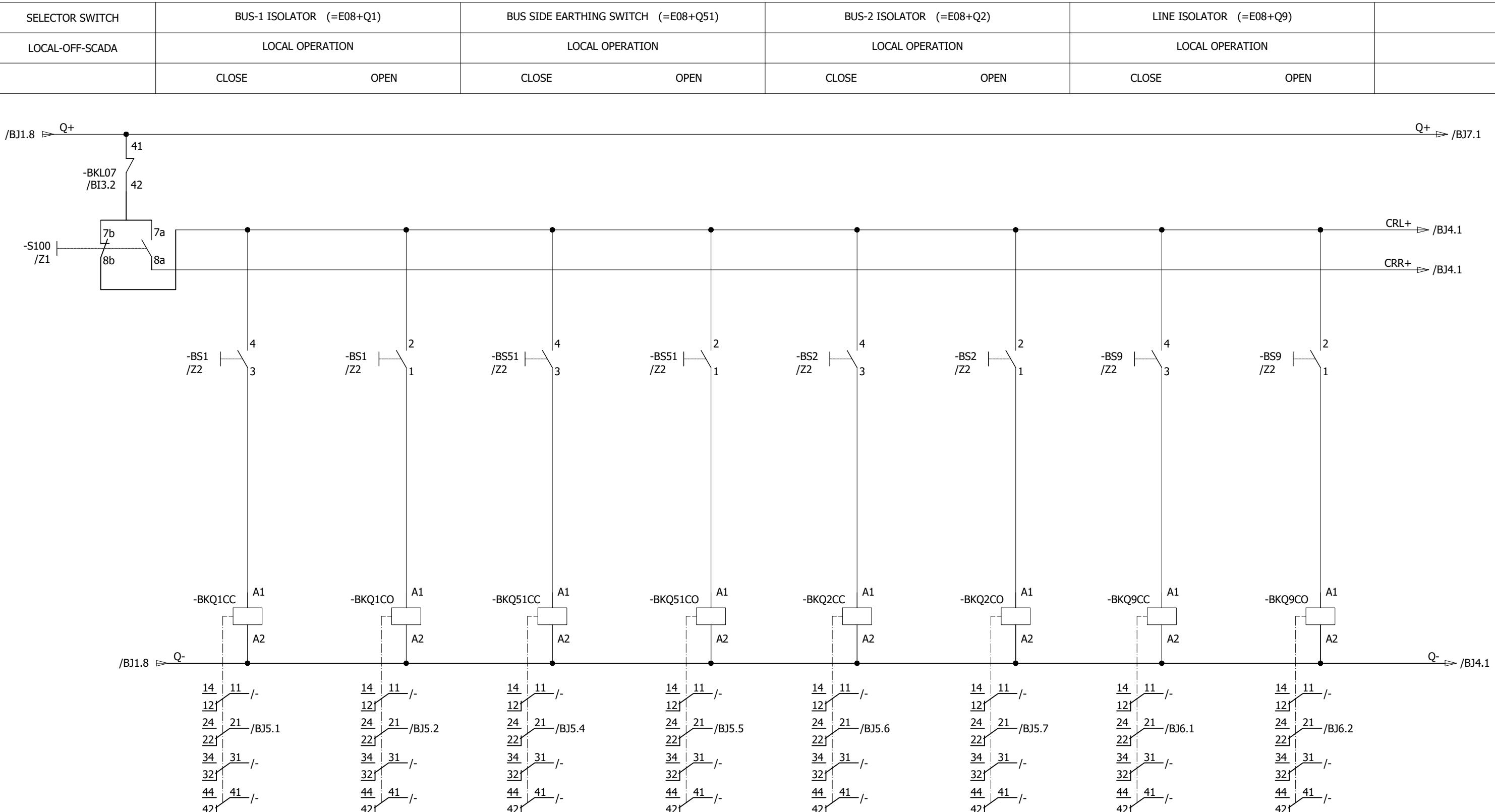
All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.



0	AS BUILT	20.11.2018	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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) CONTROL CIRCUIT	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type AJ5
									Sheet no. 31

132KV ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

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.

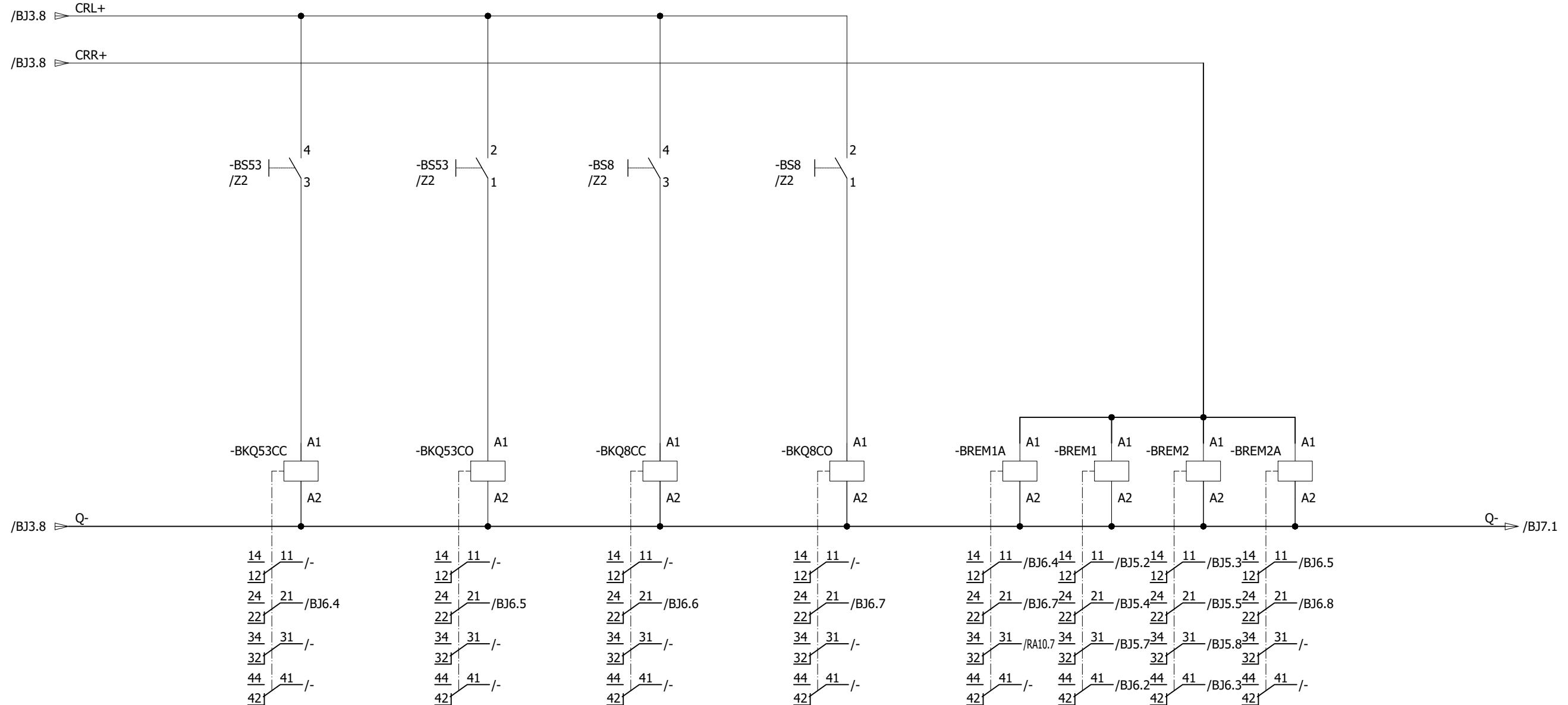


0	AS BUILT	20.11.2018	ASJ	Manufacturer EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type BJJ3

132kV ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

	LINE EARTHING SWITCH (=E08+Q53)	HIGH SPEED LINE EARTHING SWITCH (=E08+Q8)	132kV SWITCHES ON REMOTE MODE		
	LOCAL OPERATION		LOCAL OPERATION		
	CLOSE	OPEN	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.

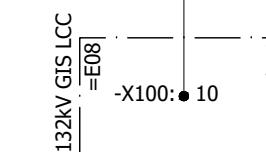
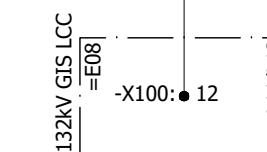
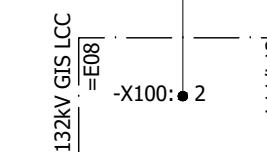
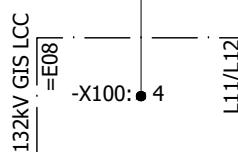
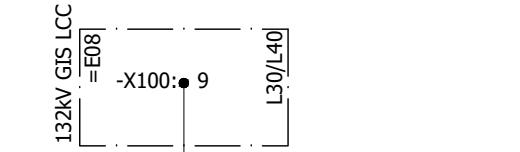
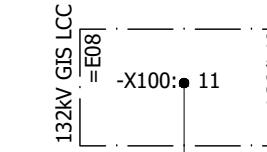
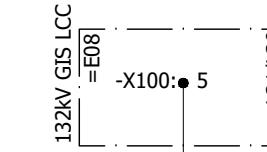
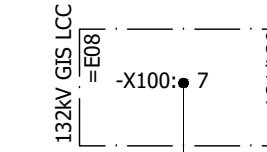
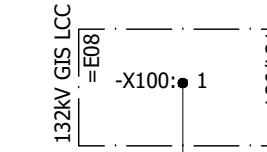
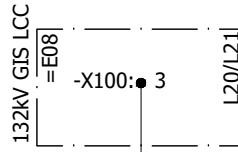


0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 21-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT'	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type BJ4

132KV ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

BUS-1 ISOLATOR (=E08+Q1)		BUS-1 ISOLATOR (=E08+Q1)		BUS SIDE EARTHING SWITCH =E08+Q51)		BUS SIDE EARTHING SWITCH =E08+Q51)		BUS-2 ISOLATOR (=E08+Q2)		BUS-2 ISOLATOR (=E08+Q2)	
LOCAL OPERATION	SCADA OPERATION	LOCAL OPERATION	SCADA OPERATION	LOCAL OPERATION	SCADA OPERATION	LOCAL OPERATION	SCADA OPERATION	LOCAL OPERATION	SCADA OPERATION	LOCAL OPERATION	SCADA OPERATION
CLOSE	CLOSE	OPEN	OPEN	CLOSE	CLOSE	OPEN	OPEN	CLOSE	CLOSE	OPEN	OPEN
A											A
B											B
C											C
D											D
E											E
F											F

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

1

2

3

4

5

6

7

8

0	AS BUILT	20.11.2018	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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type BJ5	Sheet no. 34

1

2

3

4

5

6

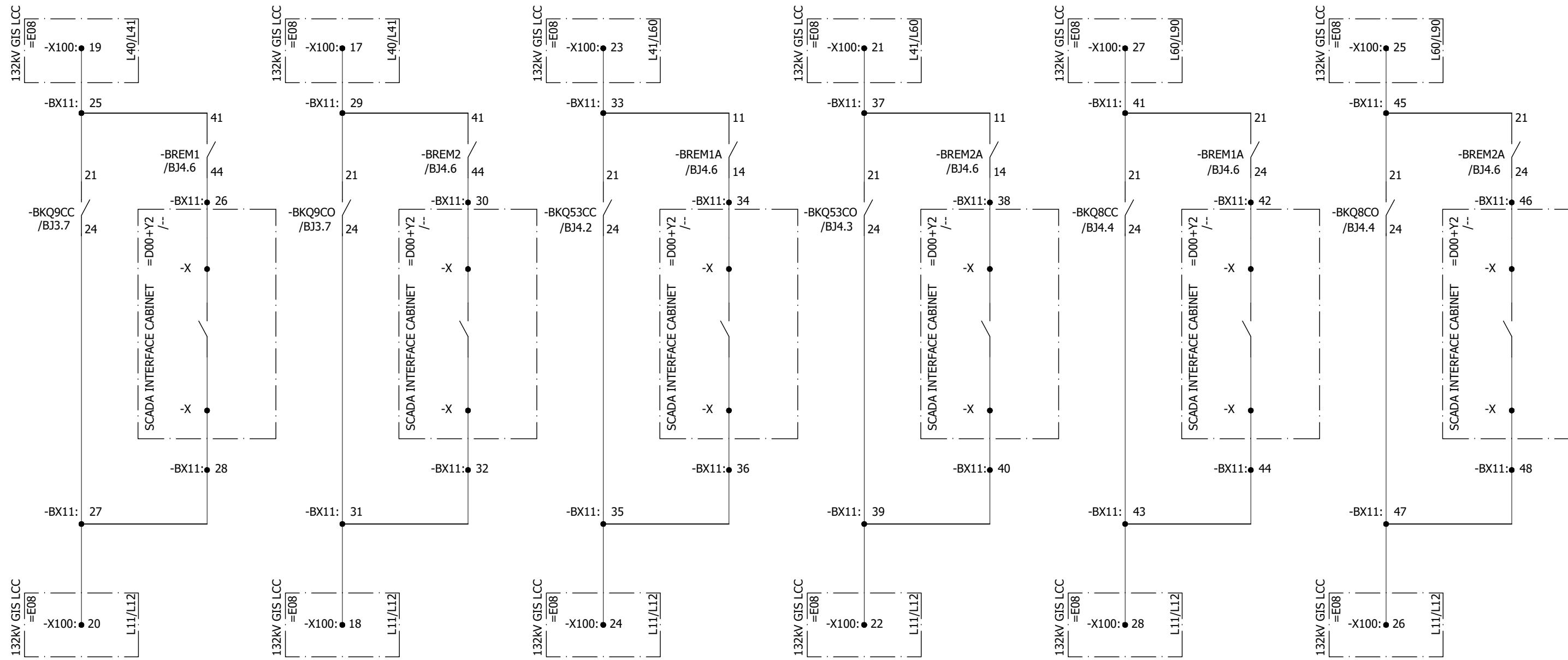
7

8

132KV ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

LINE ISOLATOR (=E08+Q9)		LINE ISOLATOR (=E08+Q9)		LINE EARTHING SWITCH (=E08+Q53)		LINE EARTHING SWITCH (=E08+Q53)		LINE HIGH SPEED EARTHING SWITCH(=E08+Q8)		LINE HIGH SPEED EARTHING SWITCH(=E08+Q8)	
LOCAL OPERATION	SCADA OPERATION	LOCAL OPERATION	SCADA OPERATION	LOCAL OPERATION	SCADA OPERATION	LOCAL OPERATION	SCADA OPERATION	LOCAL OPERATION	SCADA OPERATION	LOCAL OPERATION	SCADA OPERATION
CLOSE	CLOSE	OPEN	OPEN	CLOSE	CLOSE	OPEN	OPEN	CLOSE	CLOSE	OPEN	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.



0	AS BUILT	20.11.2018	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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT'	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type BJ6
									Sheet no. 35

132KV CONTROL CIRCUIT

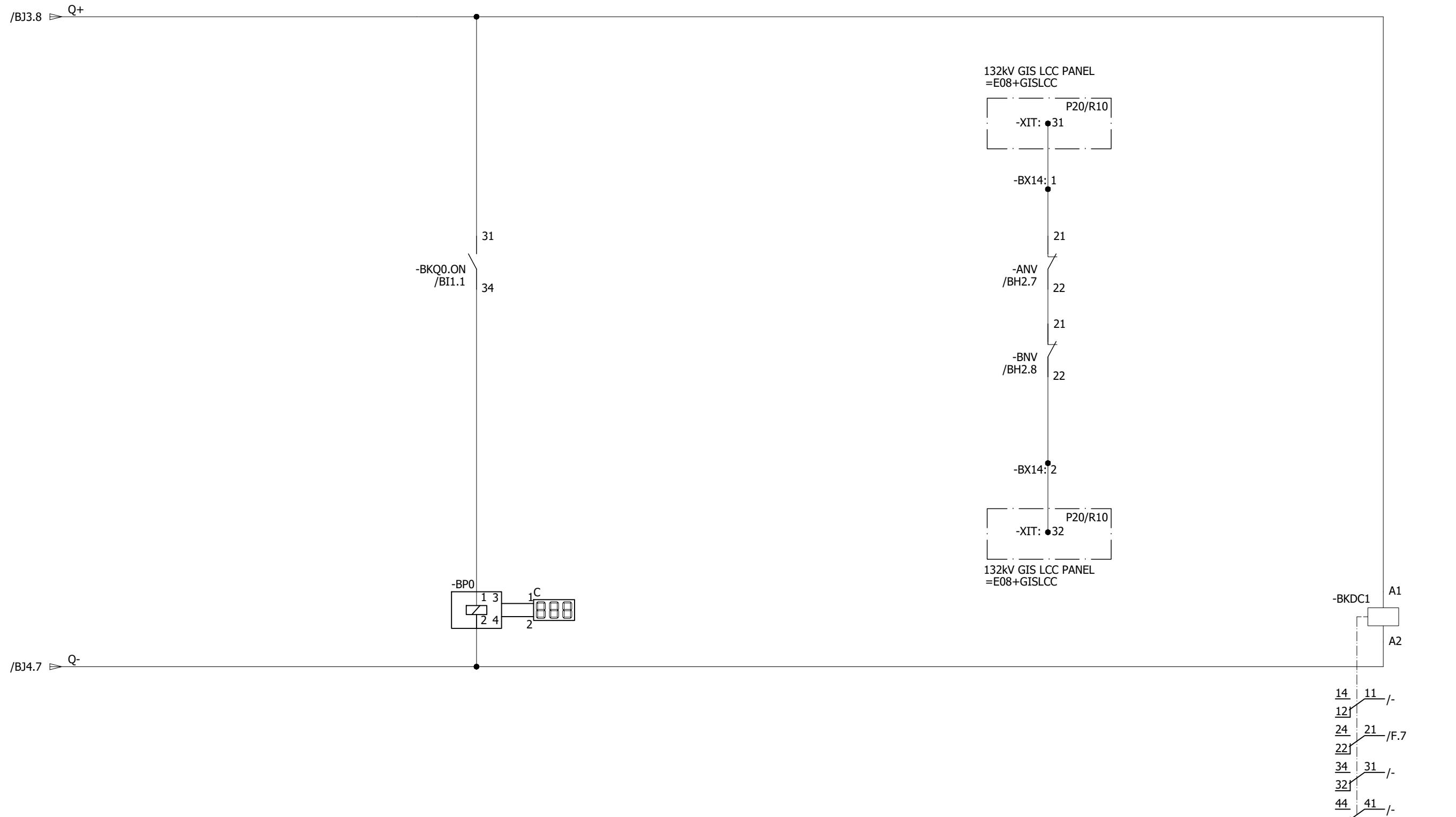
CIRCUIT BREAKER
OPERATION COUNTER

-BP0

INTERLOCK FOR
LINE EARTHING SWITCHDC CIRCUIT Q+/Q-
MONITORING

-BKDC1

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	20.11.2018	ASJ	Manufacturer  EPESOL 7a-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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) CONTROL CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type BJ7
									Sheet no. 36

220KV DISCREPANCY CHECK CIRCUIT

CIRCUIT BREAKER

BUS-1 ISOLATOR

BUS SIDE EARTHING SWITCH

BUS-2 ISOLATOR

LINE ISOLATOR

-Q0

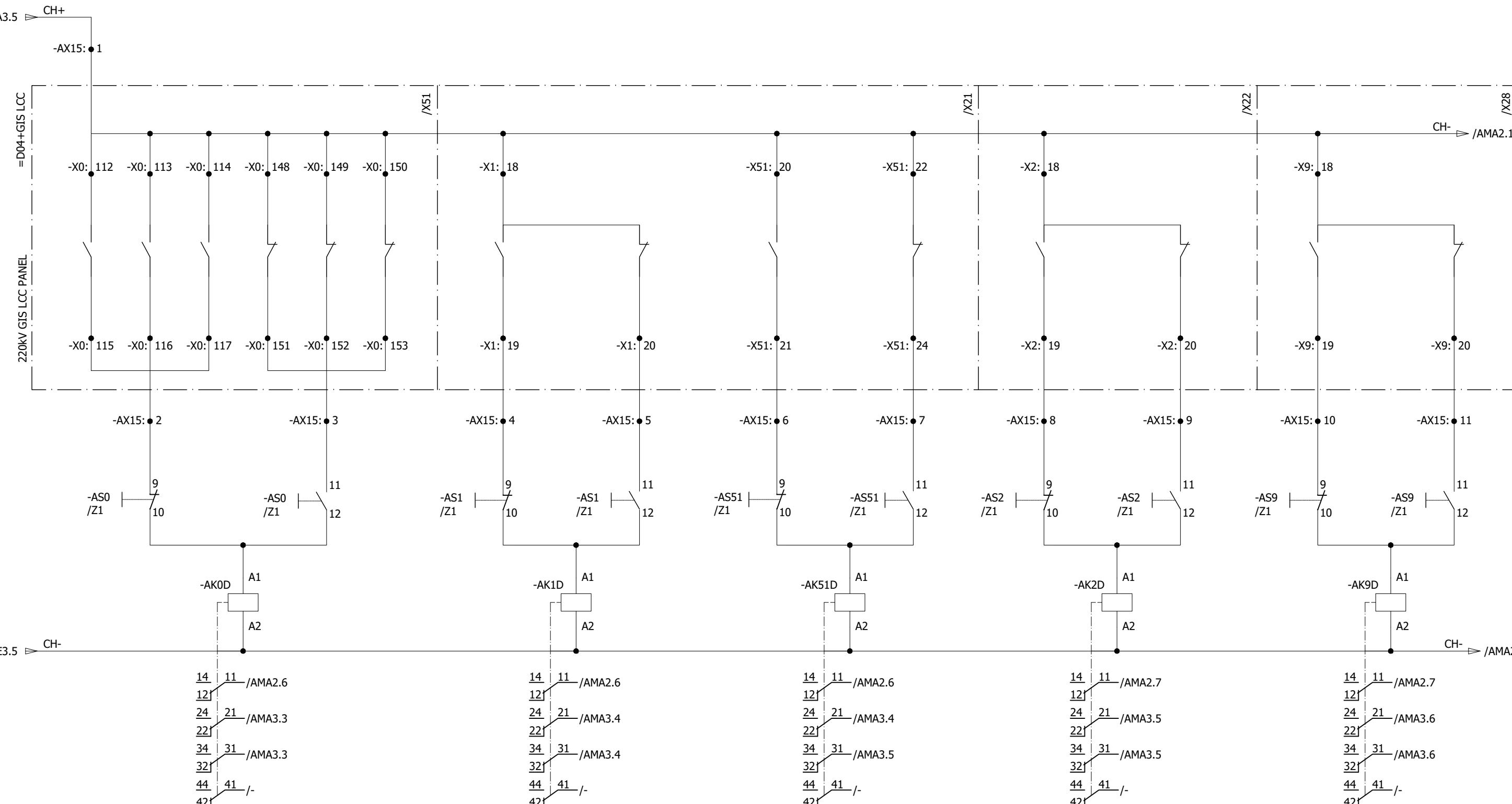
-Q1

-Q51

-Q2

-Q9

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	20.11.2018	ASJ	Manufacturer  EPESOL 7-8 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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type AMA1
									Sheet no. 37

220KV DISCREPANCY CHECK CIRCUIT

LINE SIDE EARTHING SWITCH

HIGH SPEED EARTHING SWITCH

FLASHER RELAY
INITIATION

-Q52

-Q8

-AKFL

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.

220KV GIS LCC PANEL

=D04+GIS LCC

A

B

C

D

E

F

CH- ➡ /AMA3.1

CH- ➡ /AMA3.1

Drawing no.
P60194-E-DTC-SC-003Project no.
P-60194Sheet type
AMA2Sheet no.
38

A

B

C

D

E

F

/AMA1.8 ➡ CH+

-X52: 20

-X52: 22

/X28

-X8: 18

-X8: 20

/X38

-AX15: 16

-X52: 21

-X52: 24

-X8: 19

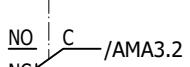
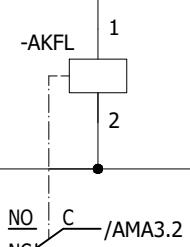
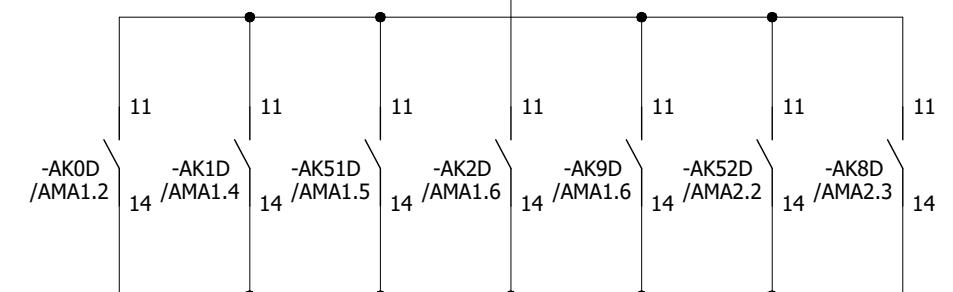
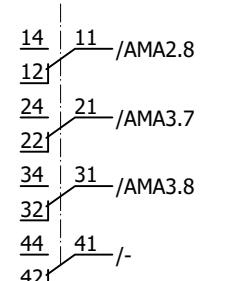
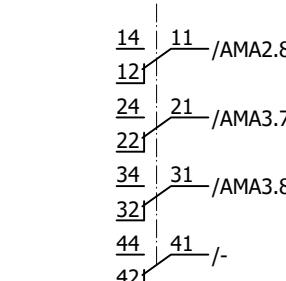
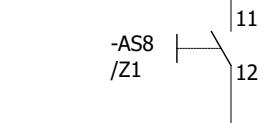
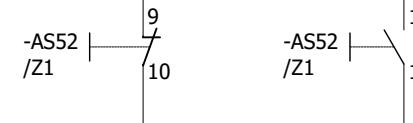
-X8: 21

-AX15: 12

-AX15: 13

-AX15: 14

-AX15: 15

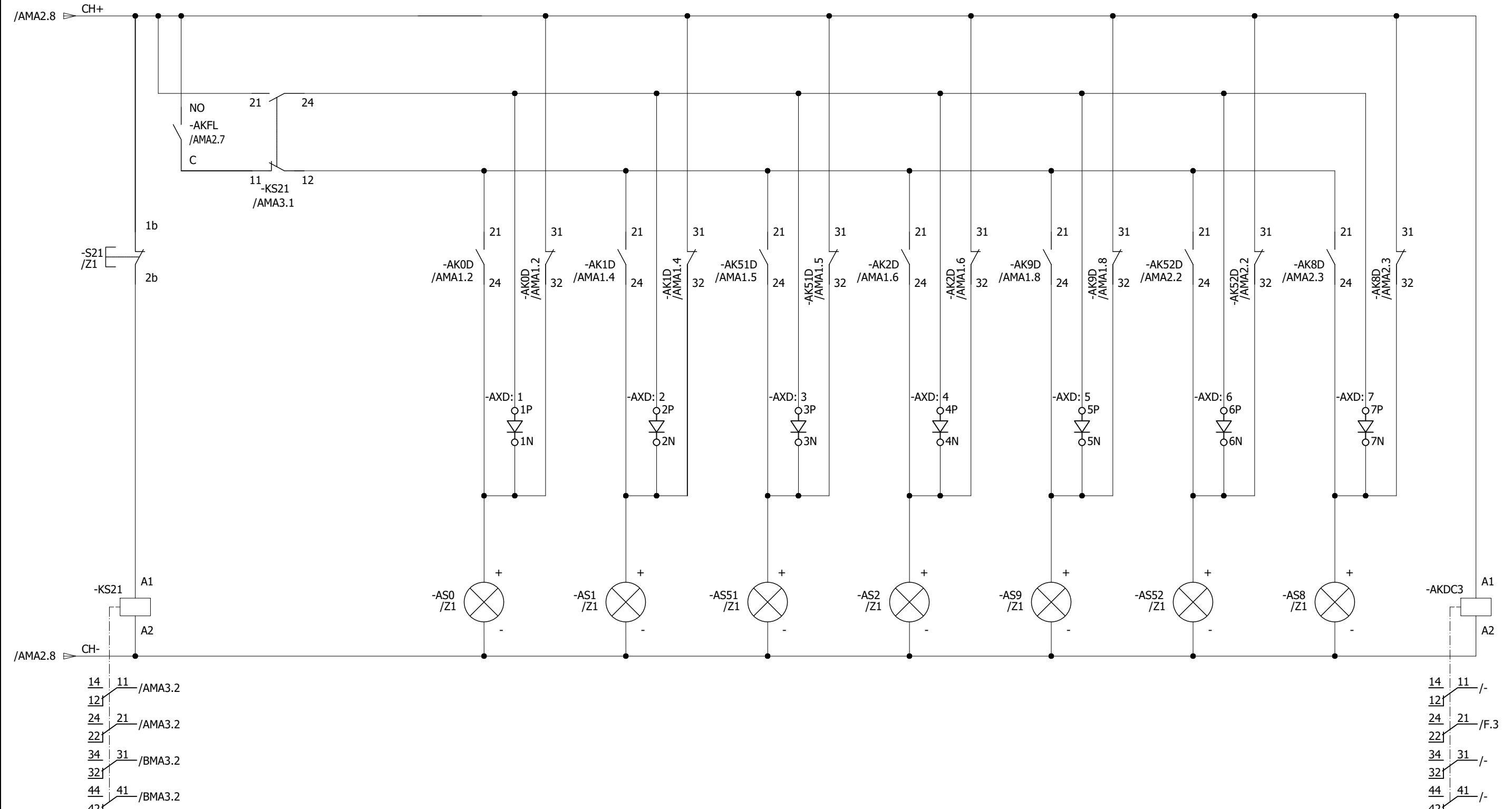


0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 7a-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DTC-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type AMA2	Sheet no. 38
1	2	3	4	5	6	7	8				

220KV DISCREPANCY CHECK CIRCUIT

	DISCREPANCY IN CIRCUIT BREAKER	DISCREPANCY IN BUS-1 ISOLATOR	DISCREPANCY IN BUS SIDE EARTHING SW.	DISCREPANCY IN BUS-2 ISOLATOR	DISCREPANCY IN LINE ISOLATOR	DISCREPANCY IN LINE SIDE EARTHING SW.	DISCREPANCY IN LINE EARTHING SW.	DC CIRCUIT CH+/CH- MONITORING
	-Q0	-Q1	-Q51	-Q2	-Q9	-Q52	-Q8	-AKDC3

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	20.11.2018	ASJ	Manufacturer  EPEPSOL 7a-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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type AMA3
									Sheet no. 39

132KV DISCREPANCY CHECK CIRCUIT

CIRCUIT BREAKER

BUS-1 ISOLATOR

BUS SIDE EARTHING SWITCH

BUS-2 ISOLATOR

LINE ISOLATOR

-Q0

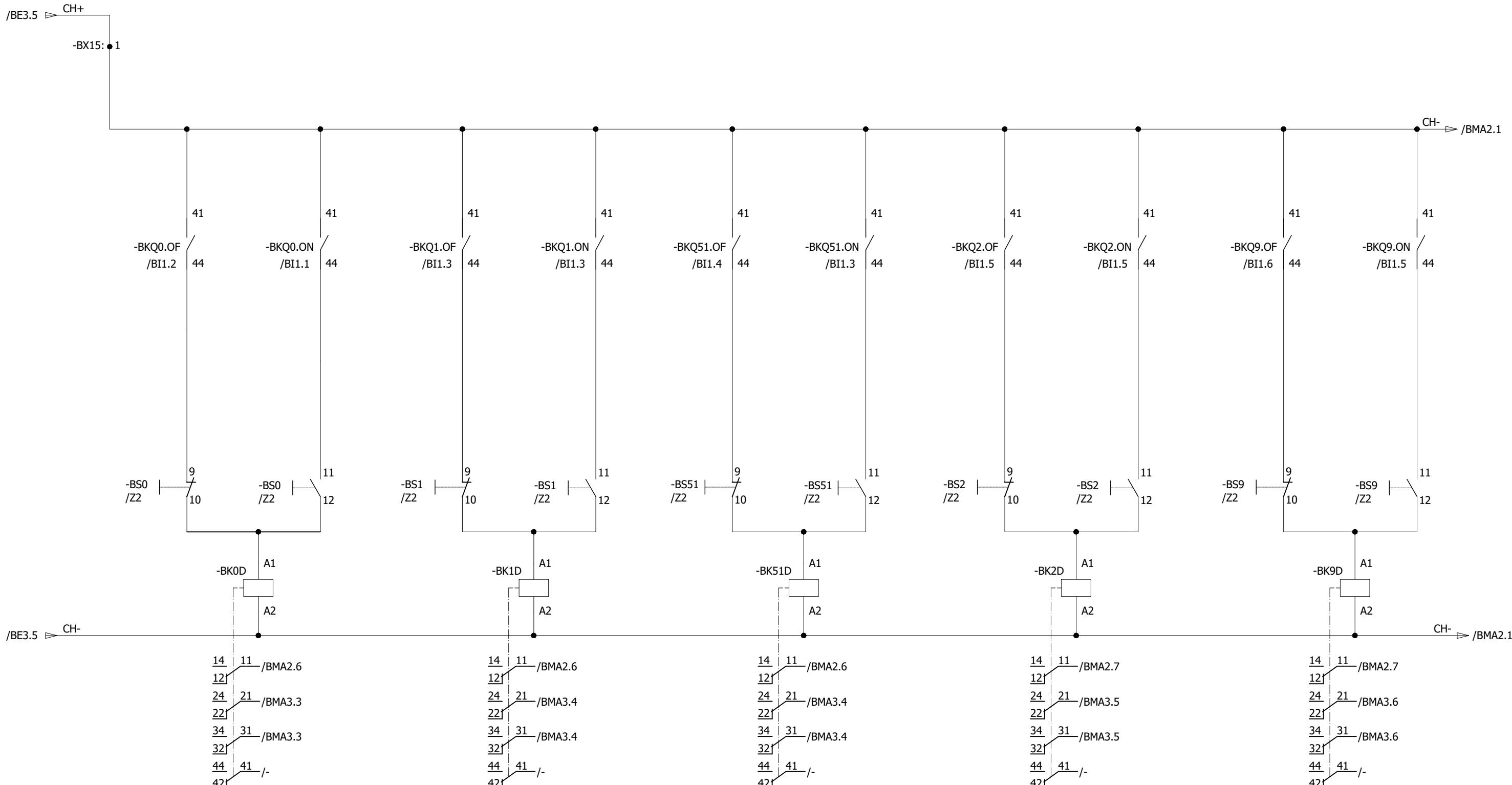
-Q1

-Q51

-Q2

-Q9

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	20.11.2018	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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type BMA1
									Sheet no. 40

132kV DISCREPANCY CHECK CIRCUIT

LINE SIDE EARTHING SWITCH

HIGH SPEED EARTHING SWITCH

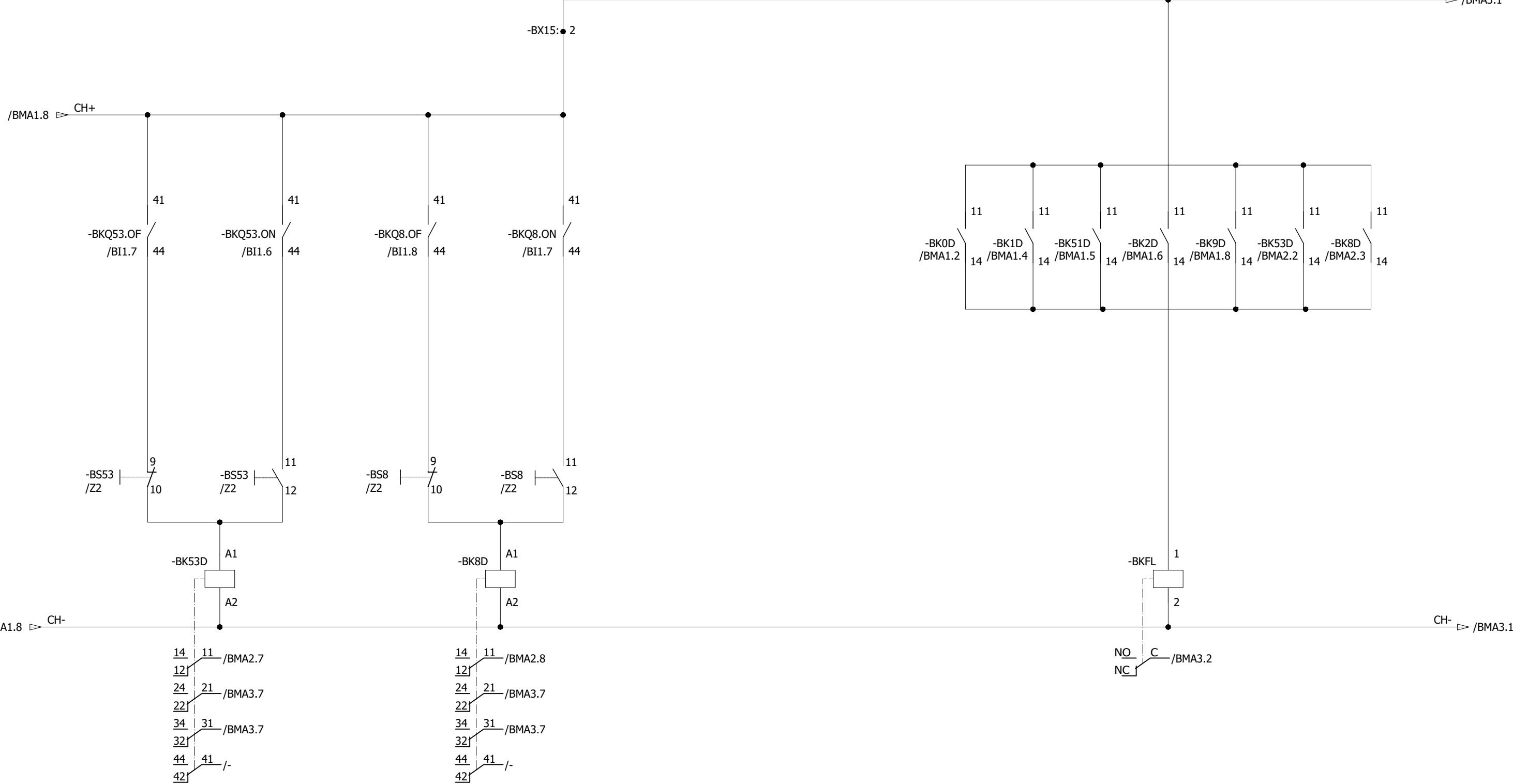
FLASHER RELAY
INITIATION

-Q53

-Q8

-BKFL

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.

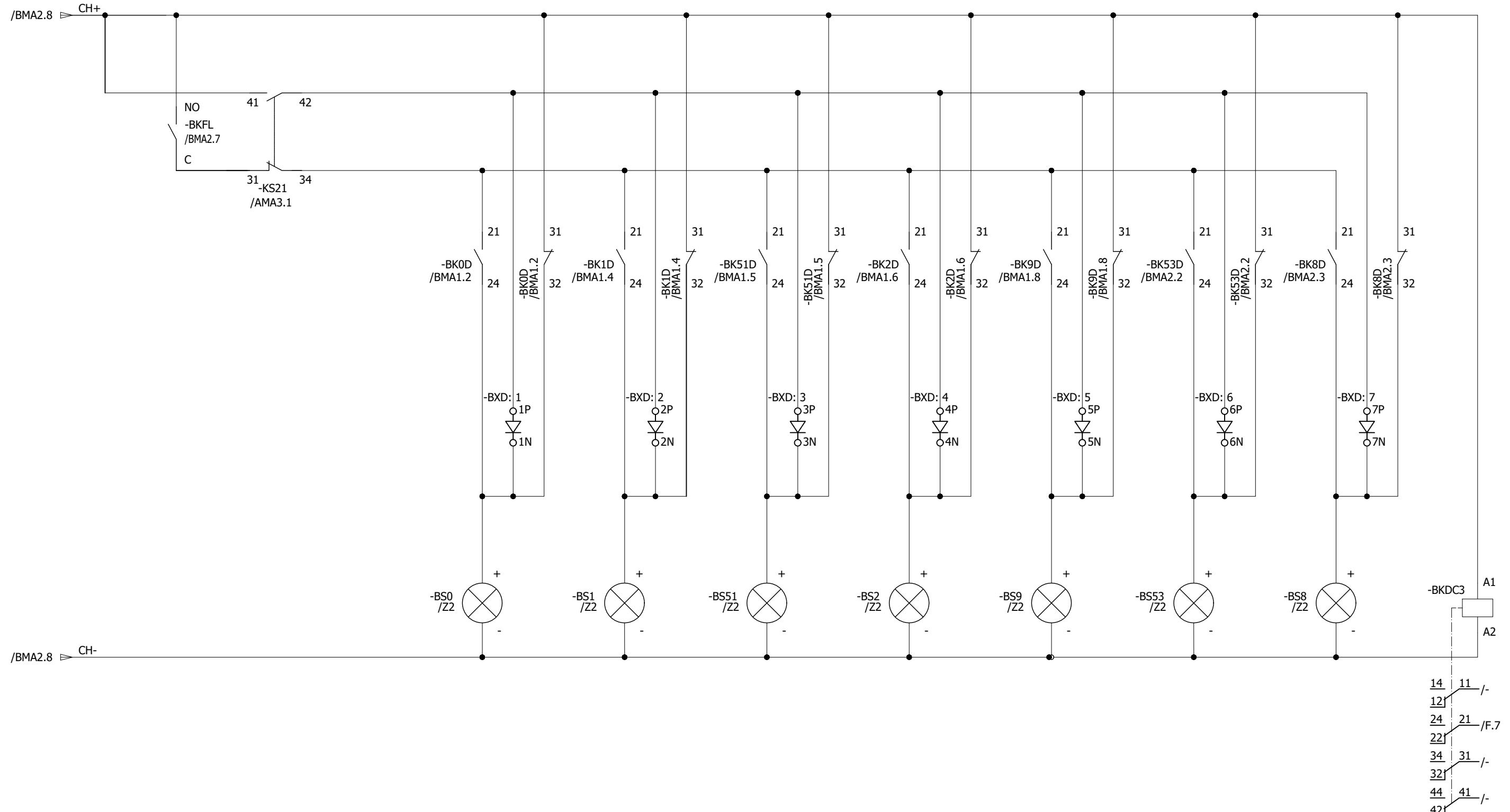


0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type BMA2
									Sheet no. 41

132KV DISCREPANCY CHECK CIRCUIT

	DISCREPANCY IN CIRCUIT BREAKER	DISCREPANCY IN BUS-1 ISOLATOR	DISCREPANCY IN BUS SIDE EARTHING SW.	DISCREPANCY IN BUS-2 ISOLATOR	DISCREPANCY IN LINE ISOLATOR	DISCREPANCY IN LINE SIDE EARTHING SW.	DISCREPANCY IN LINE EARTHING SW.	DC CIRCUIT CH+/CH- MONITORING
	-Q0	-Q1	-Q51	-Q2	-Q9	-Q52	-Q8	-BKDC3

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.



Legend:

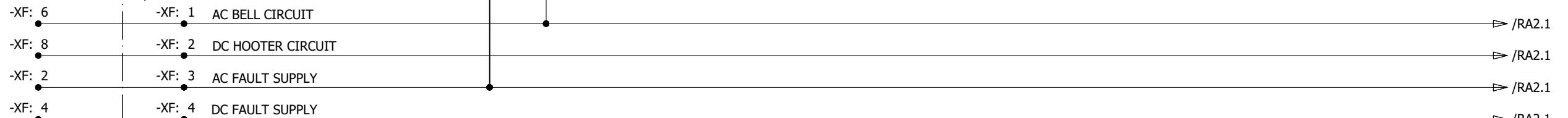
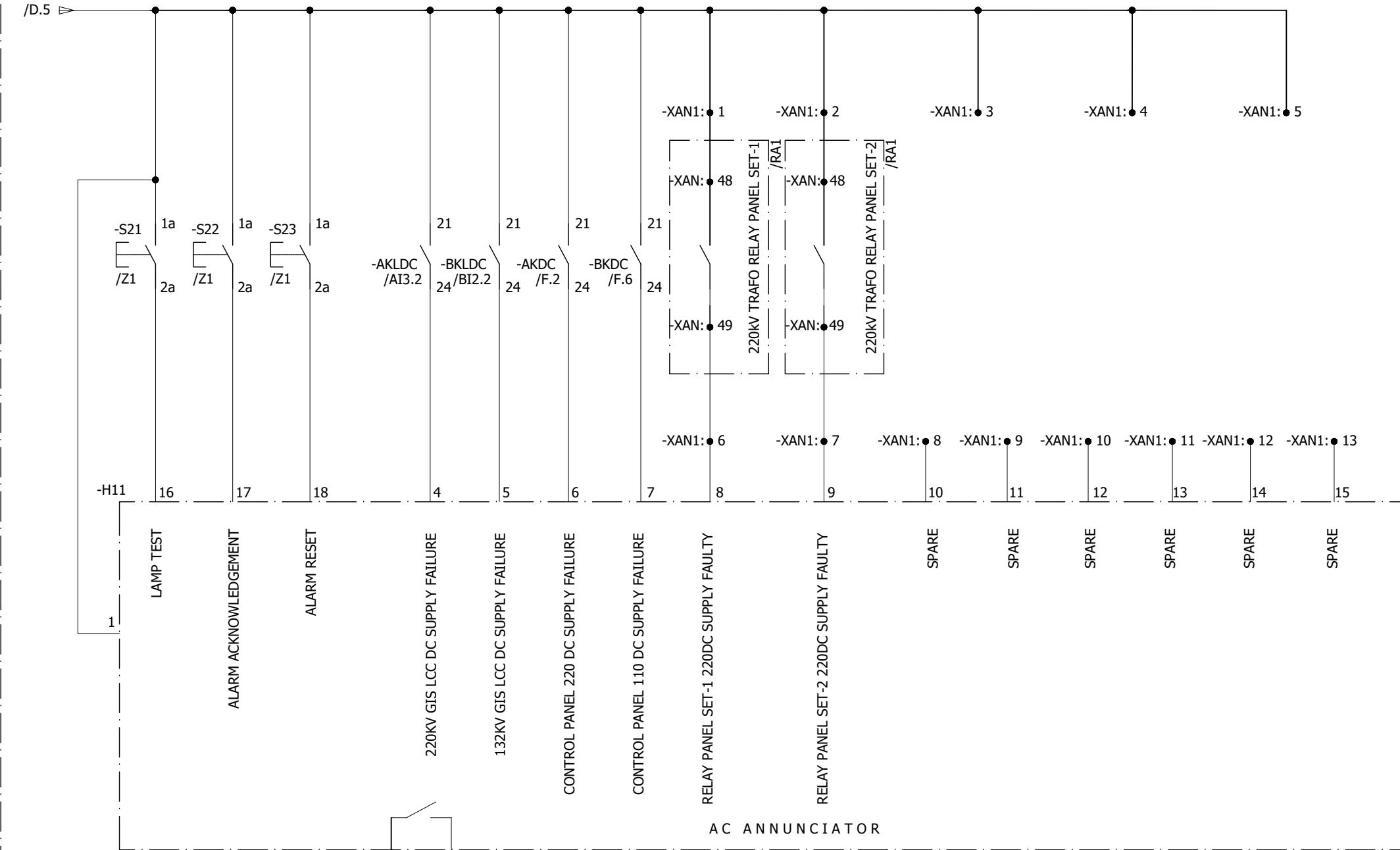
- 14 11 /-
- 12 21 /F.7
- 24 21 /-
- 22 31 /-
- 34 31 /-
- 32 41 /-
- 44 41 /-
- 42 41 /-

0	AS BUILT	20.11.2018	ASJ	Manufacturer EPE SOL 7a-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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type BMA3
									Sheet no. 42

ANNUNCIATION CIRCUIT

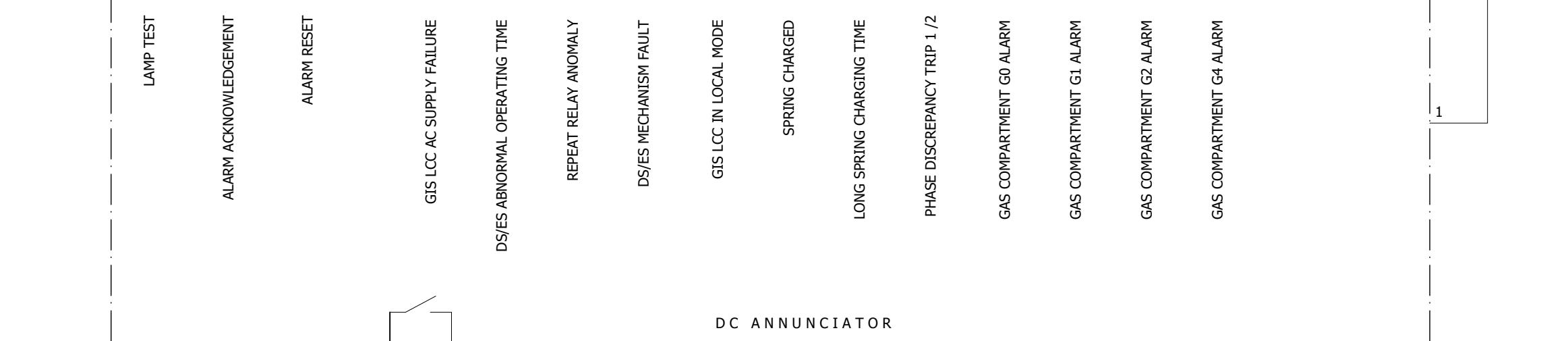
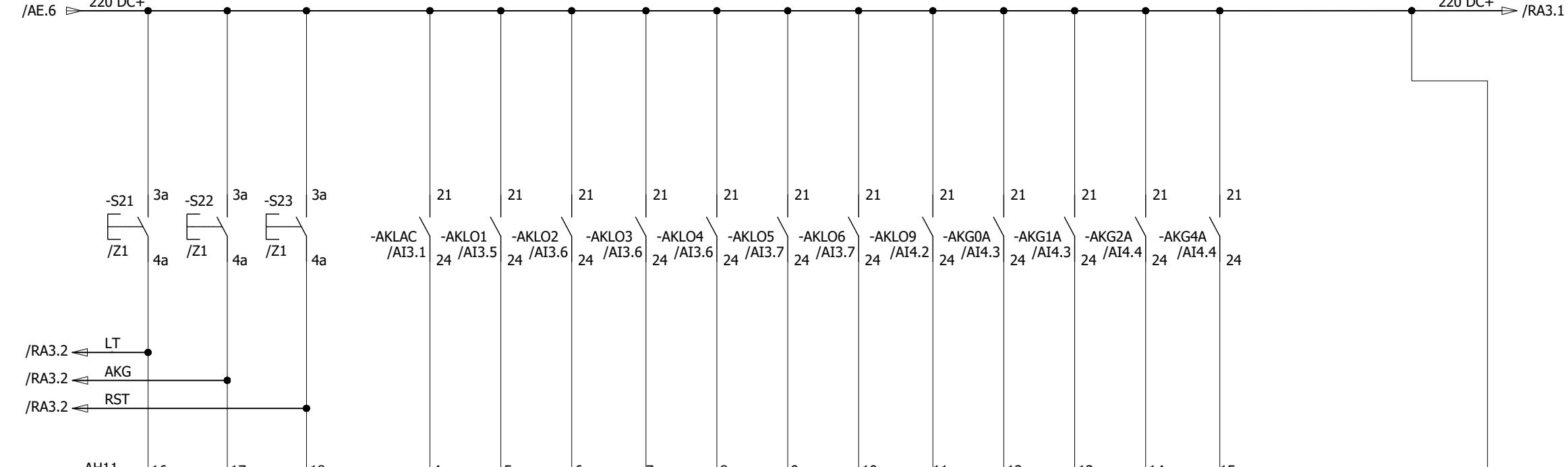
All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.

220KV TRAFO CONTROL PANEL
=D03+C5
/RA7



0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPE SOL 7a-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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) AC ANNUNCIATIONS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type RA1
									Sheet no. 43

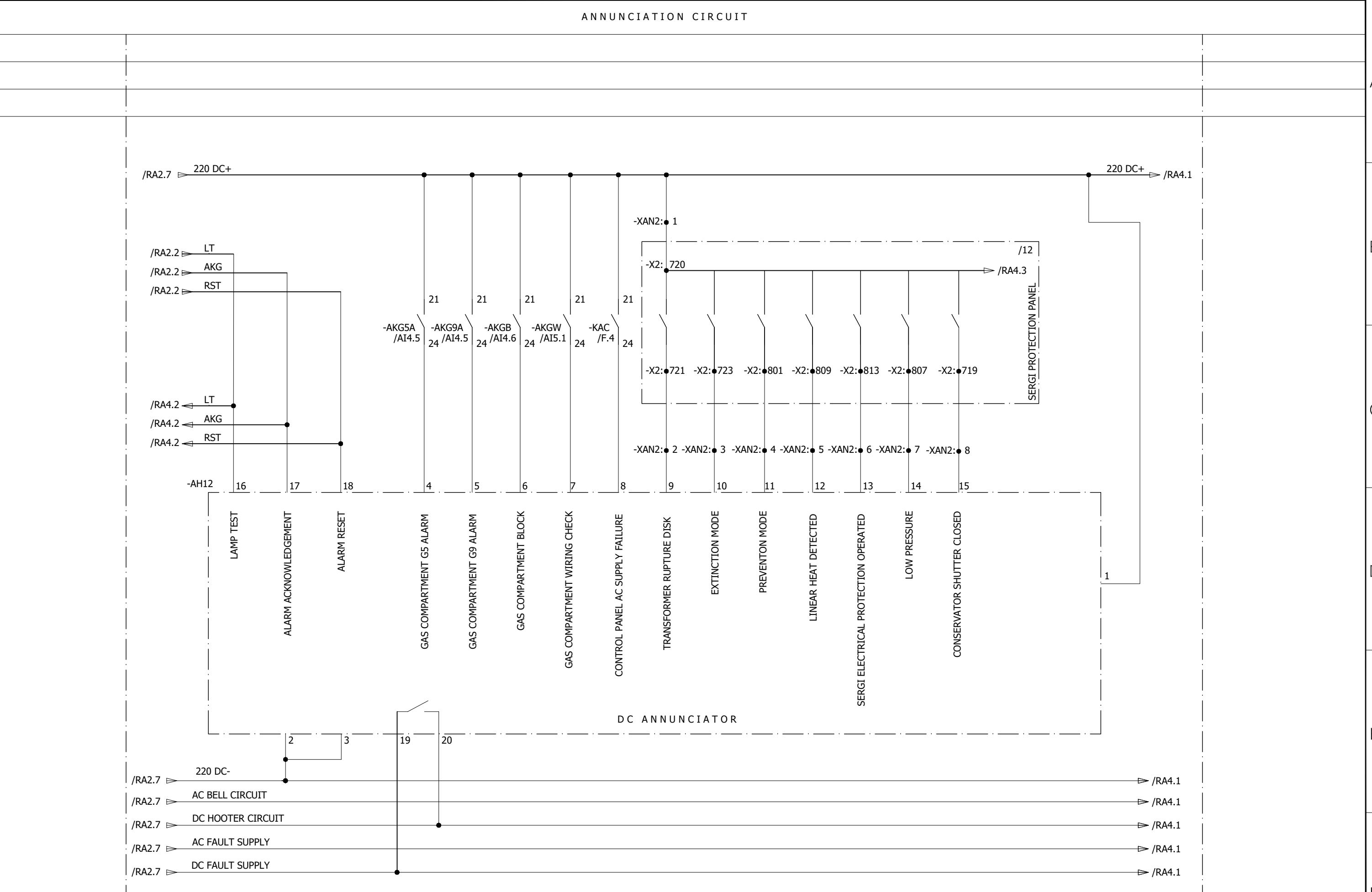
ANNUNCIATION CIRCUIT



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	20.11.2018	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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) DC ANNOUNCEMENTS	Drawing no. P60194-E-DTC-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type RA2	Sheet no. 44
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	20.11.2018	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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) DC ANNOUNCEMENTS	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type RA3	Sheet no. 45

ANNUNCIATION CIRCUIT

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

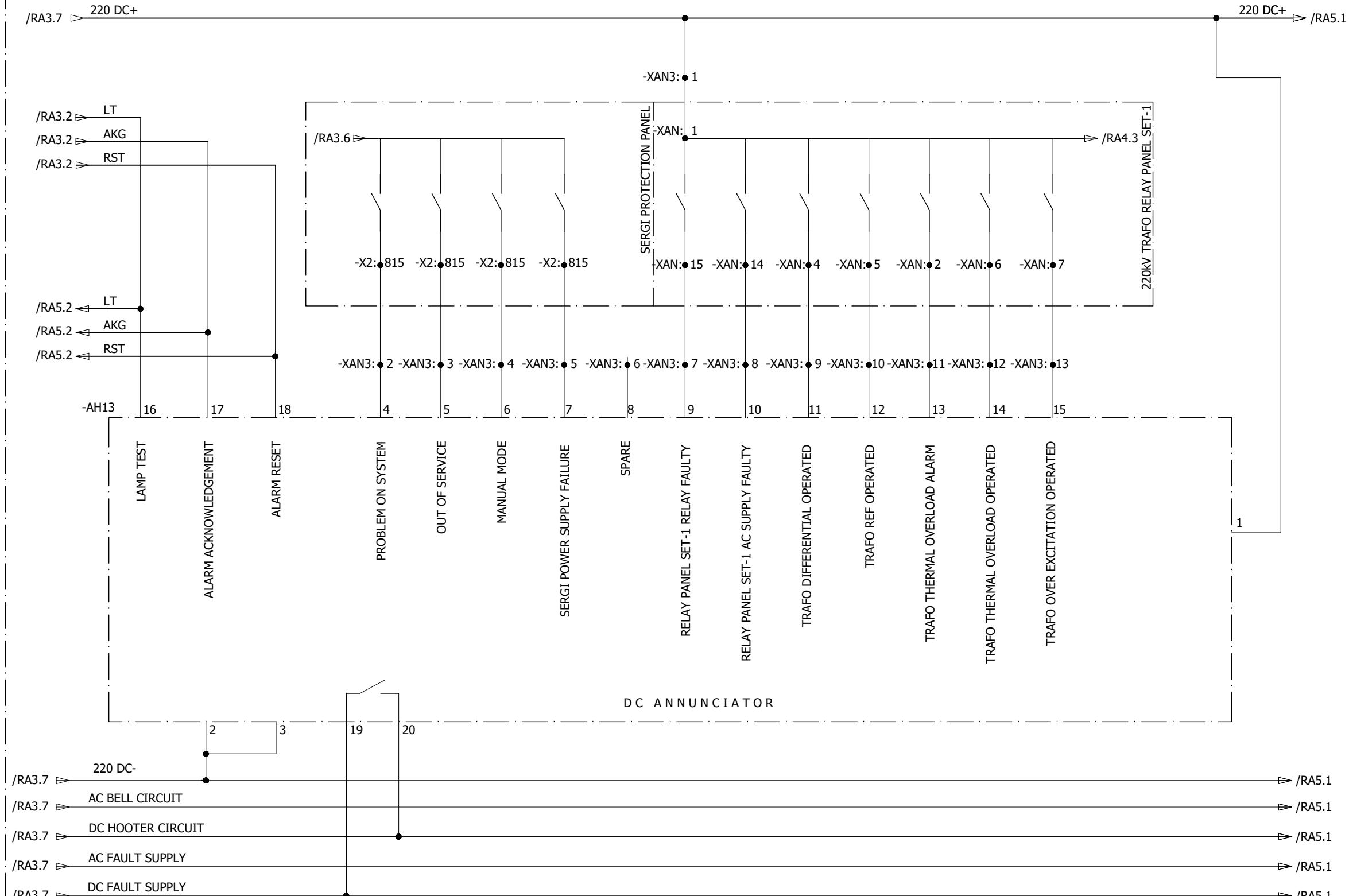
D

E

E

F

F



0	AS BUILT		20.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) DC ANNOUNCEMENTS	Drawing no. P60194-E-DTC-SC-003		
REV.	DESCRIPTION		DATE	DRAWER						Project no. P-60194	Sheet type RA4	Sheet no. 46

ANNUNCIATION CIRCUIT

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

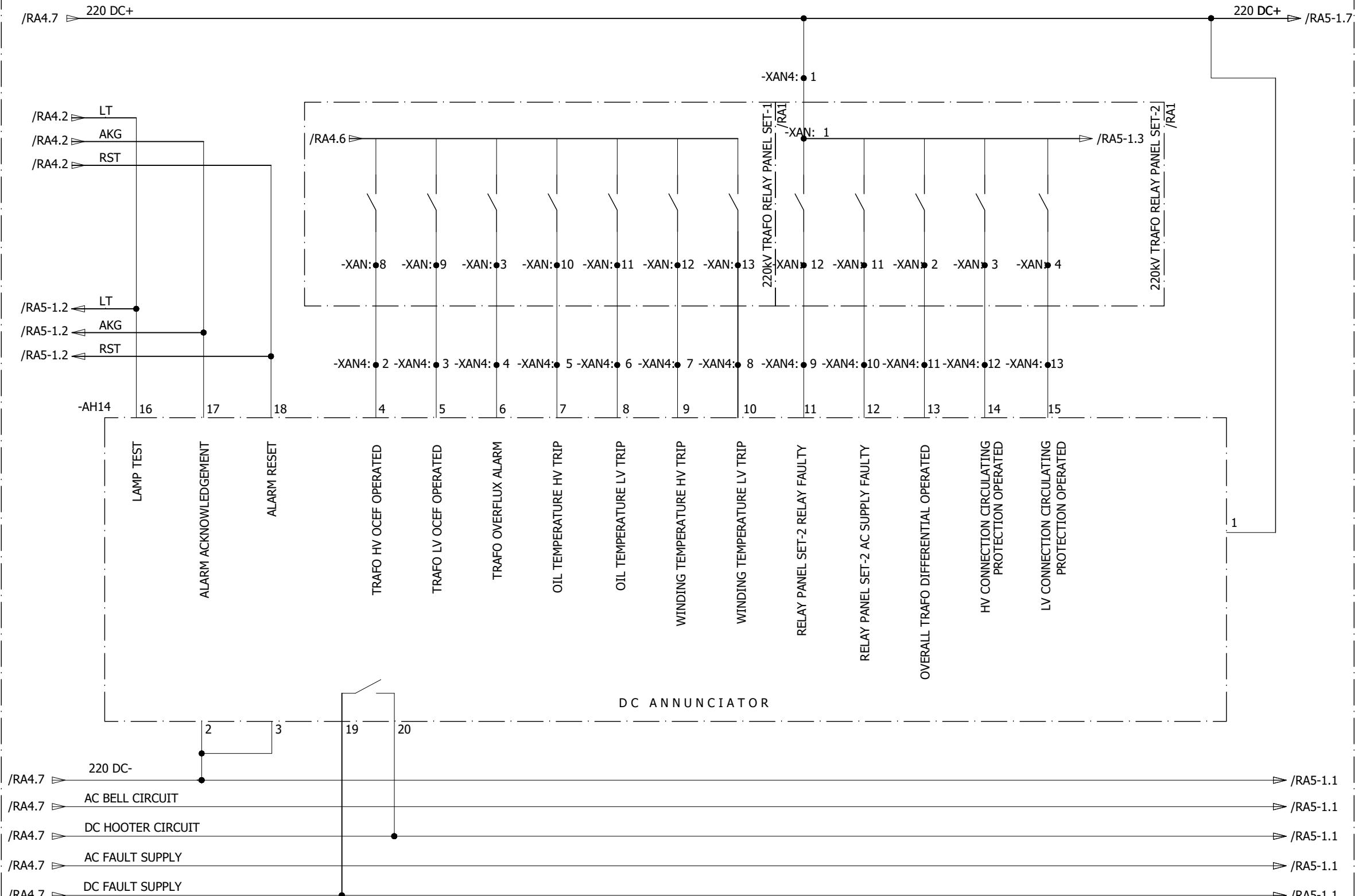
F

G

G

H

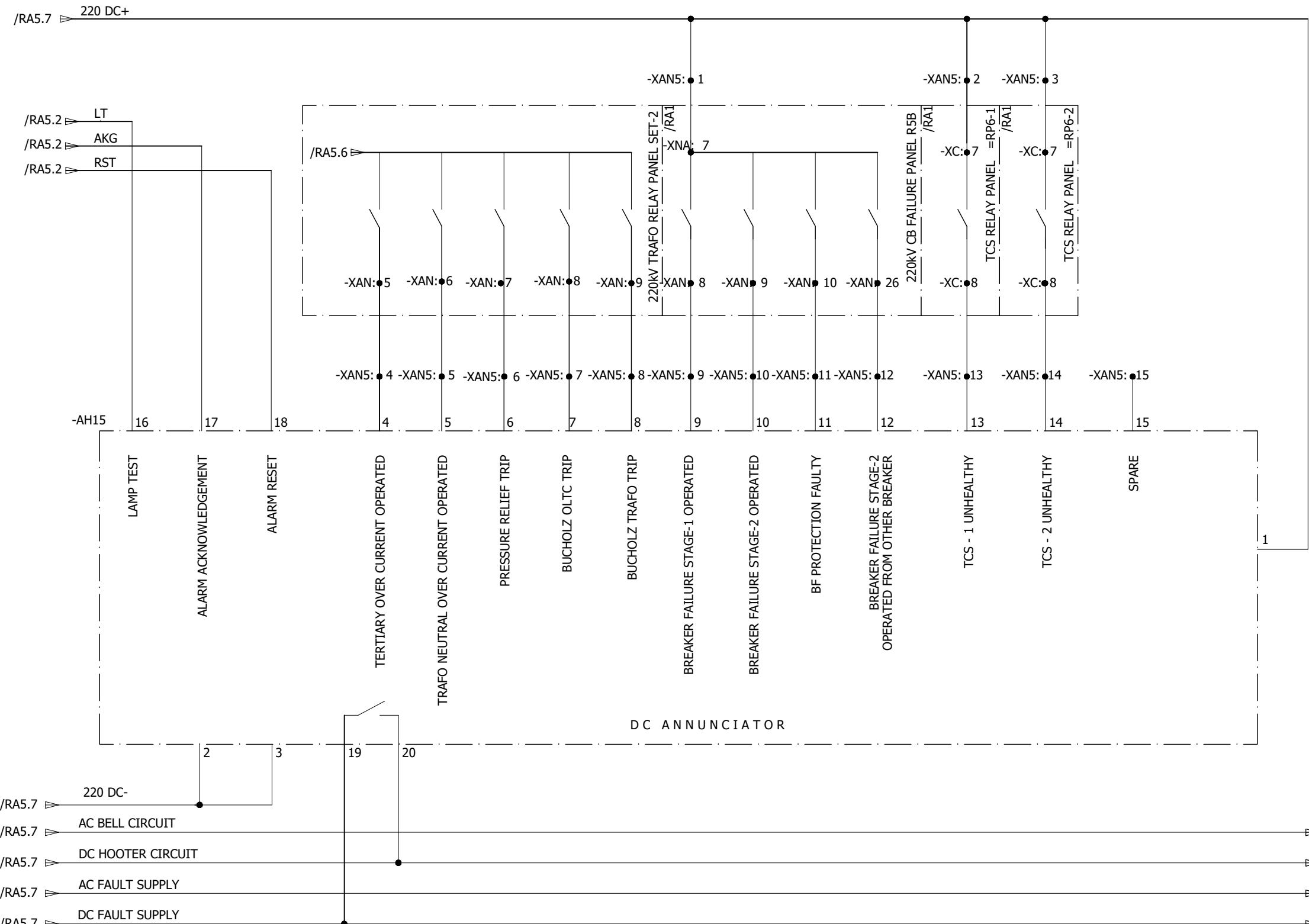
H



0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) DC ANNOUNCEMENTS	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type RA5	Sheet no. 47

ANNUNCIATION CIRCUIT

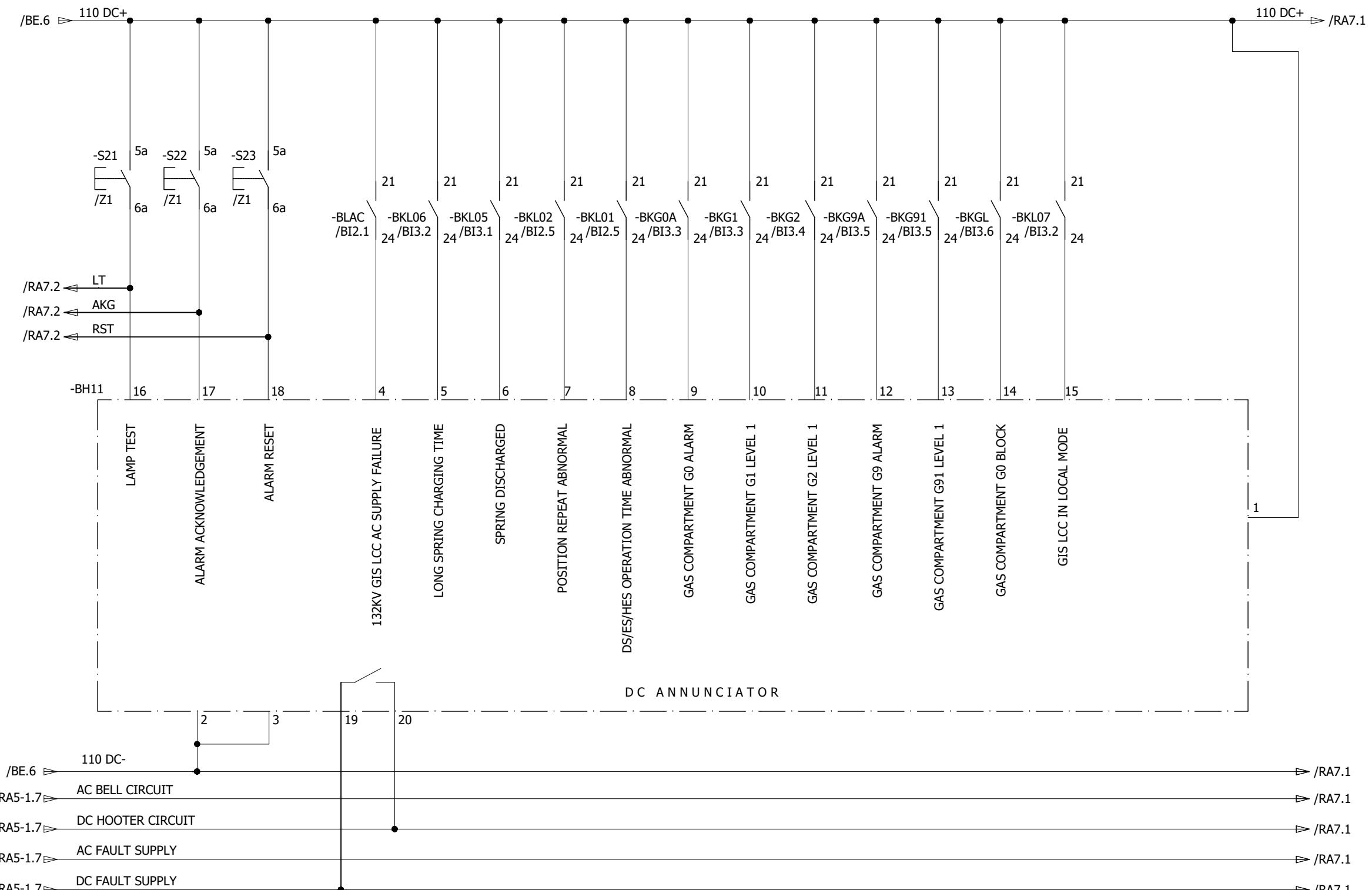
All information contained in this document is the exclusive property of GE GRID SOLUTIONS and shall not be used, copied or communicated to third parties without its prior authorization.



0	AS BUILT	20.11.2018	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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) DC ANNUNCIATIONS	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type RA5-1	Sheet no. 48

ANNUNCIATION CIRCUIT

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	20.11.2018	ASJ	Manufacturer  EPEPSOL 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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) DC ANNOUNCEMENTS	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type RA6
									Sheet no. 49

1

2

3

4

5

6

7

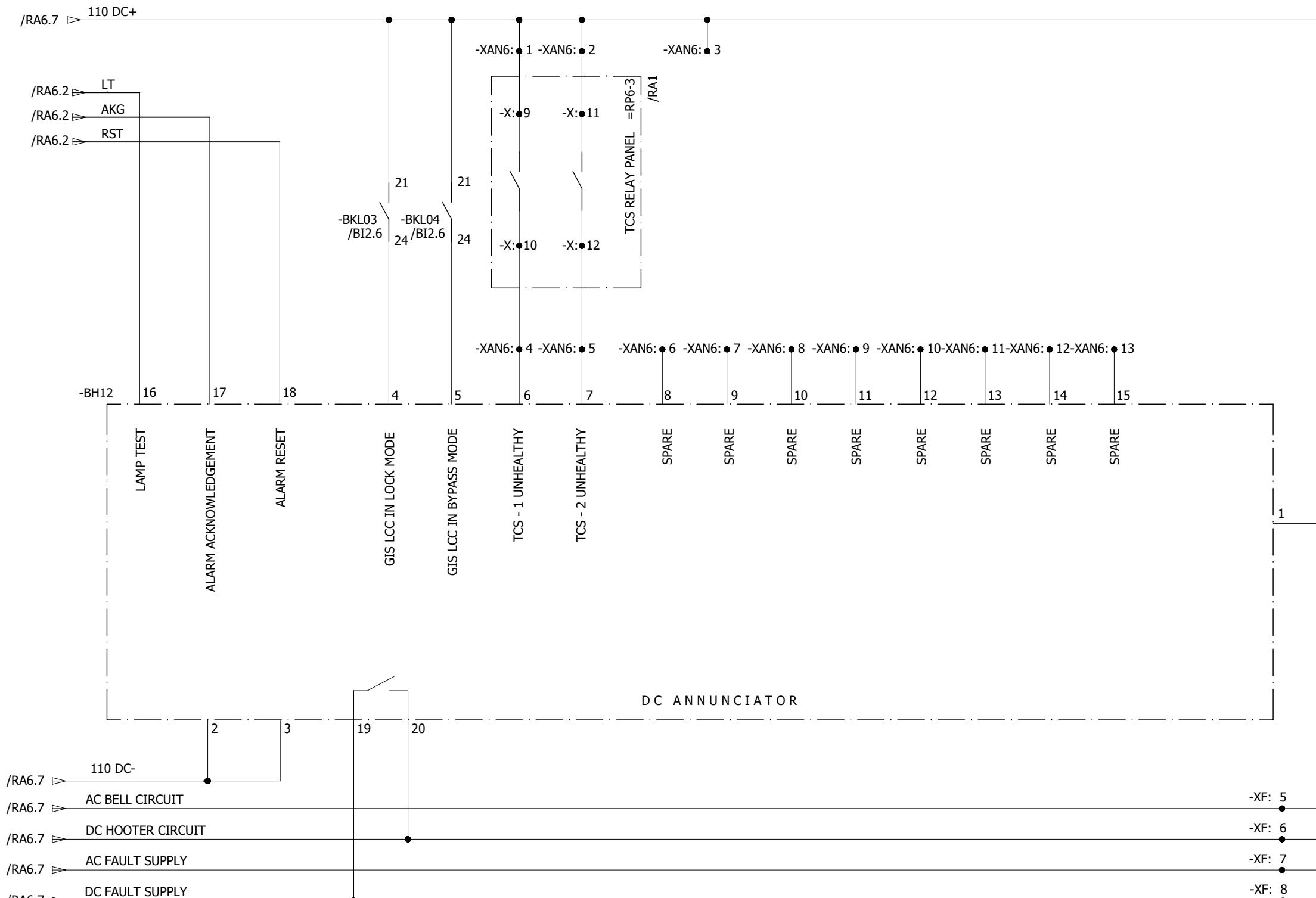
8

ANNUNCIATION CIRCUIT

220kV LINE CONTROL
PANEL

=D05+C4

/RA1



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	20.11.2018	ASJ	Manufacturer  EPESOL 7a-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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) DC ANNUNCIATIONS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type RA7
									Sheet no. 50

1

2

3

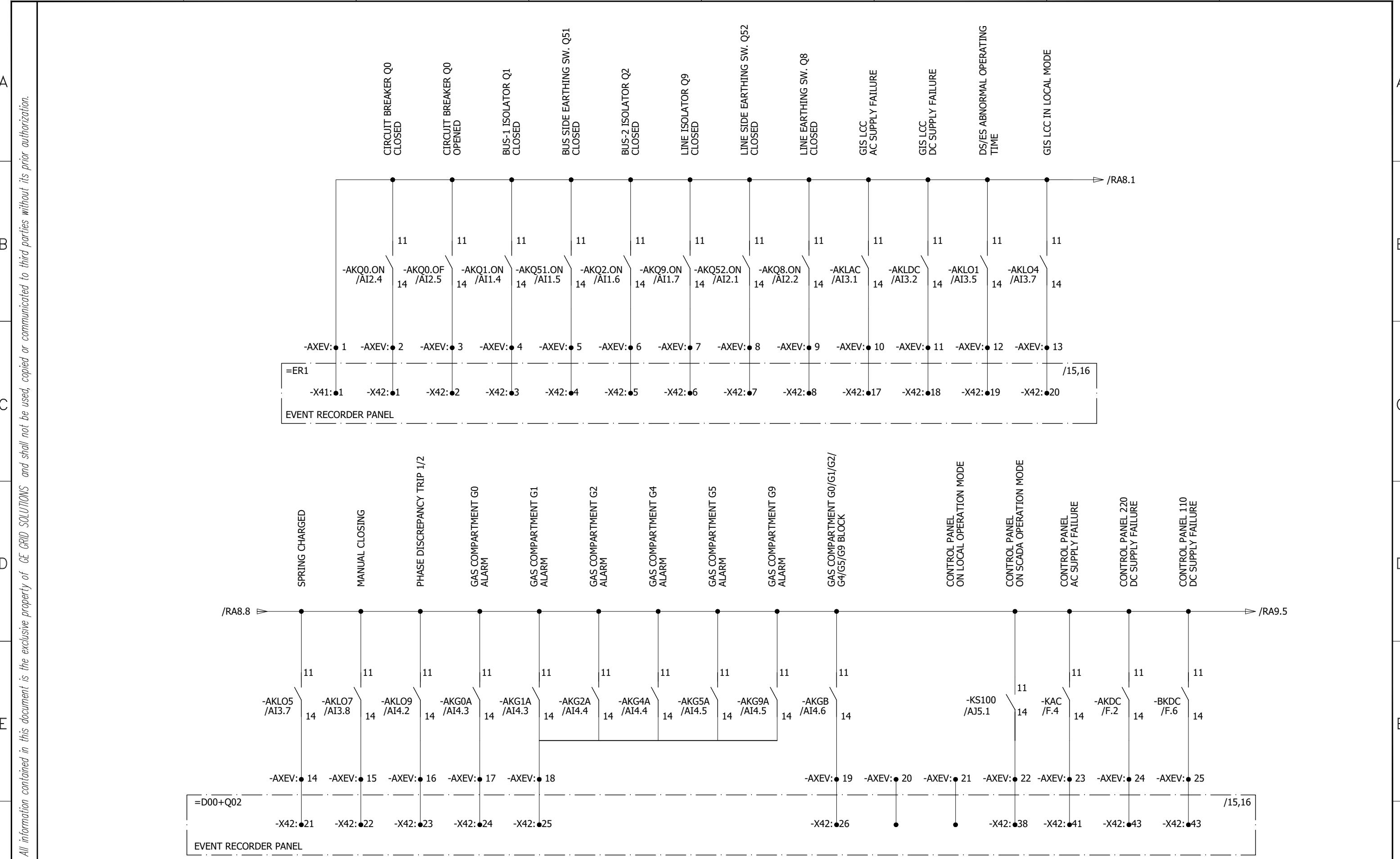
4

5

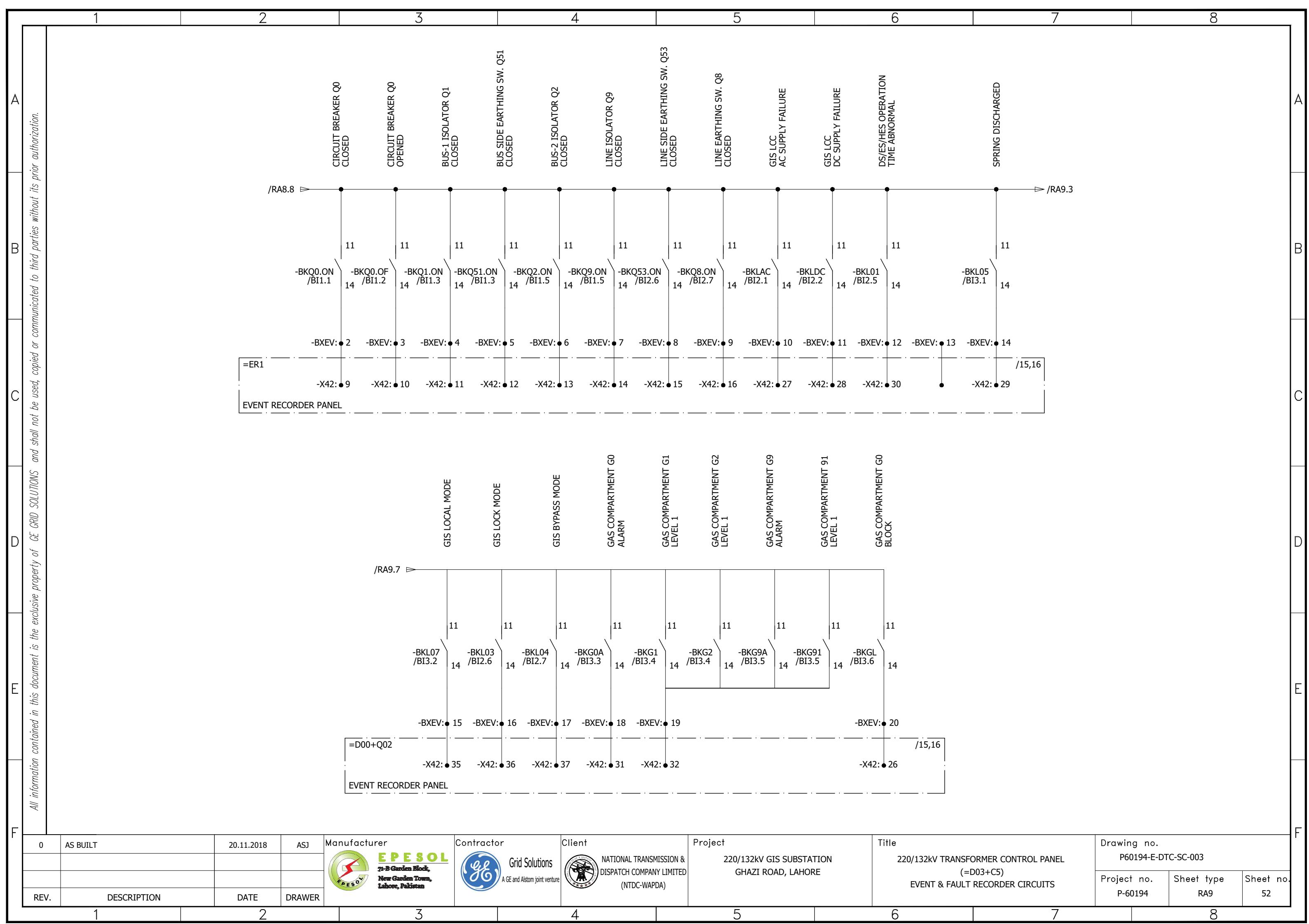
6

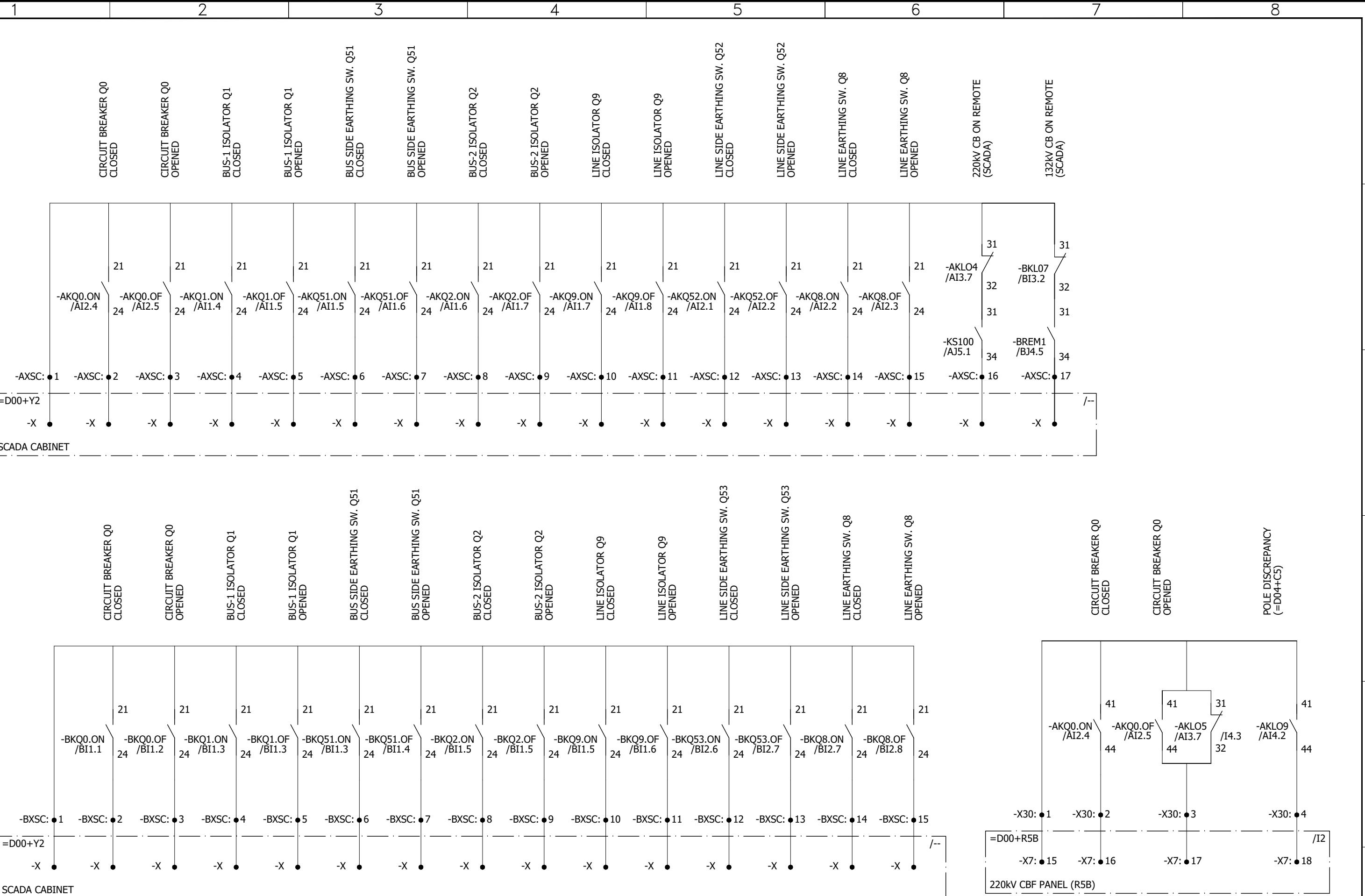
7

8



0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPEPSOL 7a-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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) EVENT & FAULT RECORDER CIRCUITS	Drawing no. P60194-E-DTC-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type RA8	Sheet no. 51
1	2	3	4	5	6	7	8				





0	AS BUILT	20.11.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
REV.	DESCRIPTION	DATE	DRAWER	E P E S O L 71-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) SCADA	P60194-E-DTC-SC-003
									Project no. P-60194 Sheet type RA10 Sheet no. 53

1

2

3

4

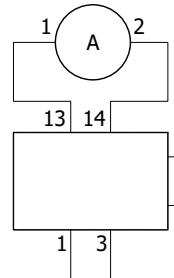
5

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.



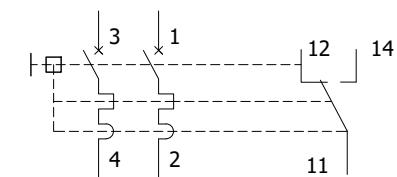
-AP1	AH1.5
-AU1	AH1.5
-AP3	AH1.7
-AU3	AH1.7
-BP1	BH1.5
-BU1	BH1.5
-BP3	BH1.7
-BU3	BH1.7

-B100	D.4	D.5
-R100	D.5	

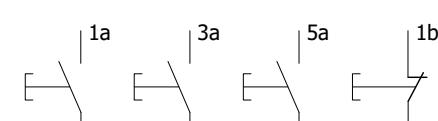
-R100	D.5
-------	-----

-AS13	AH1.6
-S101	D.3

-S101	D.3
-COM	NC



-AF101	D.2	F.4
-AF102	D.4	F.4
-AF103	D.6	F.4
-AF201	AE.4	F.1
-AF202	AE.4	F.2
-AF203	AE.5	F.2
-AF204	AE.6	F.2

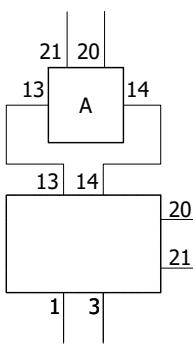


-S21	RA1.2	RA2.2	RA6.2	AMA3.1
-S22	RA1.2	RA2.2	RA6.2	
-S23	RA1.3	RA2.3	RA6.3	

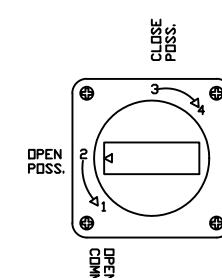
-X100	D.7
-H100	D.3



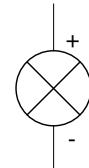
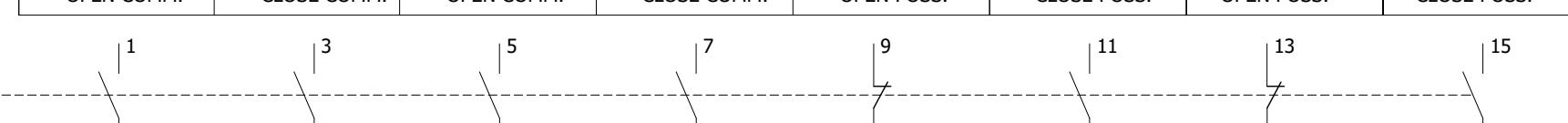
-AH200	F.4
-BH200	F.8



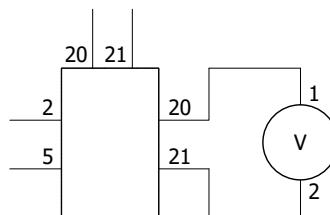
-AP2	AH1.6
-AU2	AH1.6
-BP2	BH1.6
-BU2	BH1.6



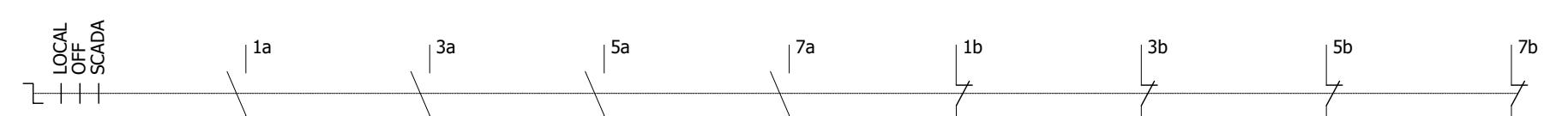
OPEN POSS.	CLOSE POSS.	OPEN COMM.	CLOSE COMM.	OPEN COMM.	CLOSE COMM.	OPEN POSS.	CLOSE POSS.	OPEN POSS.	CLOSE POSS.
------------	-------------	------------	-------------	------------	-------------	------------	-------------	------------	-------------



-AS1	AJ3.3	AJ3.2			AMA1.3	AMA1.4			AMA3.3
-AS51	AJ3.5	AJ3.4			AMA1.5	AMA1.6			AMA3.4
-AS2	AJ3.7	AJ3.6			AMA1.6	AMA1.7			AMA3.5
-AS9	AJ4.3	AJ4.2			AMA1.7	AMA1.8			AMA3.7
-AS52	AJ4.5	AJ4.4			AMA2.1	AMA2.2			AMA3.6
-AS8	AJ4.7	AJ4.6			AMA2.3	AMA2.4			AMA3.4
-AS0	AJ1.8	AJ1.2			AMA1.1	AMA1.2			AMA3.6



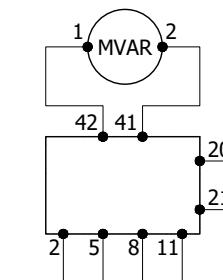
-AP4	AH1.8
-AU4	AH1.7
-BP4	BH1.8
-BU4	BH1.7



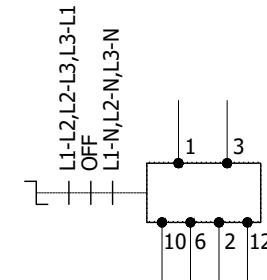
-S100	AJ1.1	BJ1.1	AJ3.1	BJ3.1	AJ1.1	BJ1.1	AJ3.1	BJ3.1
-------	-------	-------	-------	-------	-------	-------	-------	-------

0	AS BUILT	20.11.2018	ASJ	Manufacturer  EPEPSOL 7a-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 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D03+C5) COMPONENT DIAGRAM	Drawing no. P60194-E-DTC-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type Z1	Sheet no. 54
1		2	3	4	5	6	7	8			

1 2 3 4 5 6 7 8

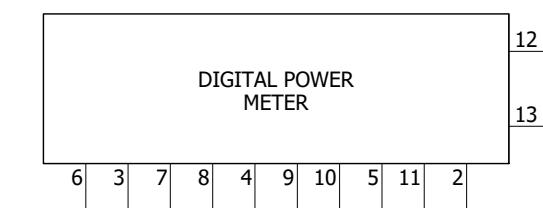


-BP6 BH2.3

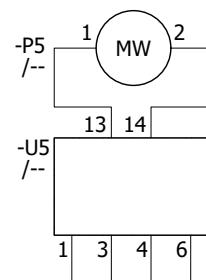


-BS13 BH1.6

-BF201	BE.4	F.5
-BF202	BE.4	F.6
-BF203	BE.5	F.6
-BF204	BE.6	F.6

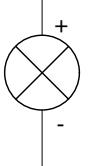
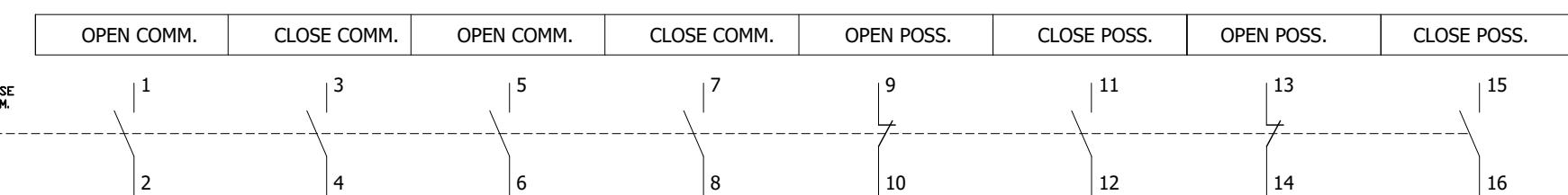
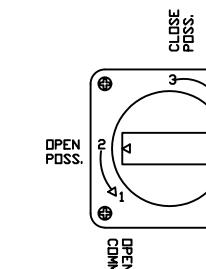


-BP10 BH2.4

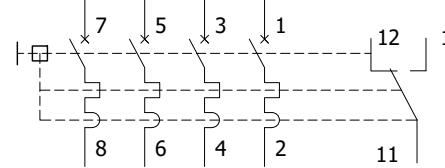


-BP5 BH2.2

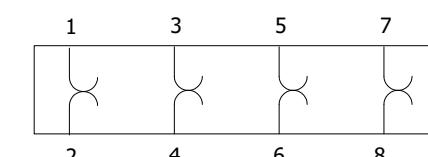
-BU5 BH2.2



-BS1	BJ3.3	BJ3.2			BMA1.3	BMA1.4			BMA3.3
-BS51	BJ3.5	BJ3.4			BMA1.5	BMA1.6			BMA3.4
-BS2	BJ3.7	BJ3.6			BMA1.6	BMA1.7			BMA3.5
-BS9	BJ4.3	BJ4.2			BMA1.7	BMA1.8			BMA3.7
-BS53	BJ4.5	BJ4.4			BMA2.1	BMA2.2			BMA3.6
-BS8	BJ4.7	BJ4.6			BMA2.3	BMA2.4			BMA3.4
-BS0	BJ1.8	BJ1.2			BMA1.1	BMA1.2			BMA3.6



-AF105	AH1	F.4
-BF105	AH2	F.4
-BF106	AH2	F.4



-BXT1	BH1.4
-BXT1	BH1.4
-AXT1	AH1.4
-AXT1	AH1.4

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	20.11.2018	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 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D03+C5) COMPONENT DIAGRAM	Drawing no. P60194-E-DTC-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type Z2	Sheet no. 55
1	2	3	4	5	6	7	8				