



Grid Solutions

A GE and Alstom joint venture

220/132kV GIS SUBSTATION GHAZI ROAD , LAHORE

220/132kV TRANSFORMER CONTROL PANEL (=D09+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	22.11.2018	ASJ	MFT	NAH	AS BUILT

Scale	NOT-TO-SCALE	Sheet size	A3
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Client	 NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)
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Contractor	 Grid Solutions A GE and Alstom joint venture	Manufacturer	 EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan
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Project	220kV / 132kV GIS SUBSTATION GHAZI ROAD , LAHORE		
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Title	220/132kV TRANSFORMER CONTROL PANEL (=D09+C5) SCHEMATIC DRAWINGS		
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Order no	P-60194	Document no	P60194-E-DTC-SC-003
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Sheet type	Total sheets	Sheet no	
A	55		1

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	PAGE NO.	SHEET NAME	SHEET DESCRIPTION	ISSUE / REVISION							
				01	02	03	04	05	06	07	08
A 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.	01	A	Cover Sheet	X	X	X	X	X	X	X	X
	02	AA1	List Of Contents								
	03	AA2	List Of Contents	X	X	X	X	X	X	X	X
	04	AB	Symbols and Legends	X	X	X	X	X	X	X	X
	05	AC1	Component List	X	X	X	X	X	X	X	X
	06,06a	AC2,AC3	Component List	X	X	X	X	X	X	X	X
	07,07a	AD,AD1	Panel View	X	X	X	X	X	X	X	X
	08	AF	Bay Concept & Metering Logics	X	X	X	X	X	X	X	X
	09	D	AC Supply Distribution Circuit								
	10	AE	220DC Supply Distribution Circuit	X	X	X	X	X	X	X	X
	11	BF	110DC Supply Distribution Circuit	X	X	X	X	X	X	X	X
	12	F	AC/DC Supply Failure Circuits	X	X	X	X	X	X	X	X
	13	AH1	CT/VT Metering Circuit								
	14	AH2	CT/VT Metering Circuit	X	X	X	X	X	X	X	X
	15	BH1	CT/VT Metering Circuit	X	X	X	X	X	X	X	X
	16	BH2	CT/VT Metering Circuit	X	X	X	X	X	X	X	X
	17	AI1	Power Equipment input Circuit								
	18	AI2	Power Equipment input Circuit	X	X	X	X	X	X	X	X
	19	BI1	Power Equipment input Circuit	X	X	X	X	X	X	X	X
	20	AI3	Power Equipment input Circuit	X	X	X	X	X	X	X	X
	21	AI4	Power Equipment input Circuit	X	X	X	X	X	X	X	X
	22	AI5	Power Equipment input Circuit	X	X	X	X	X	X	X	X
	23	BI2	Power Equipment input Circuit	X	X	X	X	X	X	X	X
	24	BI3	Power Equipment input Circuit	X	X	X	X	X	X	X	X
	25	AJ1	Circuit Breaker Opening/Closing Circuit								
	26	AJ2	Circuit Breaker Opening/Closing Circuit	X	X	X	X	X	X	X	X
	27	BJ1	Circuit Breaker Opening/Closing Circuit	X	X	X	X	X	X	X	X
	28	BJ2	Circuit Breaker Opening/Closing Circuit	X	X	X	X	X	X	X	X
	29	AJ3	Circuit Breaker Opening/Closing Circuit	X	X	X	X	X	X	X	X
	30	AJ4	Circuit Breaker Opening/Closing Circuit	X	X	X	X	X	X	X	X
	31	AJ5	Control Circuit								
	32	BJ3	Circuit Breaker Opening/Closing Circuit	X	X	X	X	X	X	X	X
0	AS BUILT	22.11.2018	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 (=D09+C5) LIST OF CONTENTS	Drawing no. P60194-E-DTC-SC-003		
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	PAGE NO.	SHEET NAME	SHEET DESCRIPTION	ISSUE / REVISION									
				01	02	03	04	05	06	07	08	09	
A	33	BJ4	Circuit Breaker Opening/Closing Circuit	X	X								
	34	BJ5	Circuit Breaker Opening/Closing Circuit	X	X								
	35	BJ6	Circuit Breaker Opening/Closing Circuit	X	X								
	36	BJ7	Control Circuit	X	X								
B	37	AMA1	Discrepancy Check Circuit	X	X								
	38	AMA2	Discrepancy Check Circuit	X	X								
	39	AMA3	Discrepancy Check Circuit	X	X								
	40	BMA1	Discrepancy Check Circuit	X	X								
	41	BMA2	Discrepancy Check Circuit	X	X								
	42	BMA3	Discrepancy Check Circuit	X	X								
C	43	RA1	AC Annunciations	X	X								
	44	RA2	DC Annunciations	X	X								
	45	RA3	DC Annunciations	X	X								
	46	RA4	DC Annunciations	X	X								
	47	RA5	DC Annunciations	X	X								
	48	RA5-1	DC Annunciations	X	X								
	49	RA6	DC Annunciations	X	X								
D	50	RA7	DC Annunciations	X	X								
	51	RA8	Event & Fault Recorder	X	X								
	52	RA9	Event & Fault Recorder	X	X								
	53	RA10	SCADA	X	X								
	54	Z1	Component Diagram	X	X								
	55	Z2	Component Diagram	X	X								
E													
F													
	0	AS BUILT	22.11.2018	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 (=D09+C5) LIST OF CONTENTS	Drawing no. P60194-E-DTC-SC-003			
	REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type AA2	Sheet no. 03	

	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

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0	AS BUILT	22.11.2018	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 (=D09+C5) SYMBOLA AND LEGENDS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
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									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			
	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			
B	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			
	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			
C	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			
	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			
D	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			
	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: 250/200-0-200/250MW (183MW at 20mA), Scale3: 500/400-0-400/500MW (366MW at 20mA).			-BP5	FRER			
E	01	ANALOG REACTIVE POWER (MVAR) METER	A96MMA, 240 Degree, Transducer Operated Analogue MVAR Meter, Input -12.5/10...0...+10/12.5mA, 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			
	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			
F	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			
	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			
G	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			
	01	PROGRAMMABLE UNIVERSAL TRANSDUCER	MCUP4, 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			
H	0	ASJ	22.11.2018	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 (=D09+C5) COMPONENT LIST	Drawing no. P60194-E-DTC-SC-003
	REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AC1

	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				
	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				
B	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				
	01	PUSHBUTTON - LAMPTEST	YS-AP1-2-31-B-D-W, 3NO+1NC contacts, Ratings: 220VDC & 12A, Black color	-S21			YONGSUNG				
C	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				
	03	CONTROL MCB - PANEL LIGHT & HEATER	G62C02+(CAH2), 2-Pole, Ratings: 2A, 230VAC, 10kA @ 230VAC, with 2 C/O Contacts	-F101,-F102,F104			GE				
	01	CONTROL ELCB - PANEL SOCKET	DM100C16/030+(CAH2), 2-Pole, Ratings: 16A, 30mA, 230VAC, with 2 C/O Contacts	-F103			GE				
D	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				
	01	AUXILIARY CONTACTOR	MCRC022ATWN-B+MARN211AT, Coil Voltage: 220VDC, 3NO+3NC Contacts	-AKCS			GE				
E	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							
				-ANV							
F	61	AUXILIARY CONTACTOR	PRC4M40DCKL, Coil Voltage: 110VDC, 4 C/O Contacts	-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							
	03	AUXILIARY CONTACTOR	PRC4M40ANL, Coil Voltage: 230VAC, 4 C/O Contacts	-AKDC,-BKDC,-KACM			GE				
	0	AS BUILT	22.11.2018	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 (=D09+C5) COMPONENT LIST	Drawing no. P60194-E-DTC-SC-003	
	REV.	DESCRIPTION	DATE	DRAWER							

	1	2	3	4	5	6	7	8				
	QTY.	DEVICE DESCRIPTION		DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER				
A	01	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		22.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions <small>A GE and Alstom joint venture</small>	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED <small>(NTDC-WAPDA)</small>	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL <small>(=D09+C5)</small> COMPONENT LIST	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION		DATE	DRAWER	Project no. P-60194				Sheet type AC3	Sheet no. 06a		

	1	2	3	4	5	6	7	8		
	QTY.	DEVICE DESCRIPTION		DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION		MANUFACTURER	
		05	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4		-BX9		CABUR		
A	35	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4		-AX11		CABUR			
	03	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4		-AX14		CABUR			
	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			
	04	TERMINAL BLOCK FOR CONTROL FUNCTION	CBD-4		-BX15		CABUR			
B	15	TERMINAL BLOCK FOR AC ANNUNCIATOR UNIT	CBD-4		-XAN1		CABUR			
	10	TERMINAL BLOCK FOR 220VDC ANNUNCIATOR UNIT-2	CBD-4		-XAN2		CABUR			
	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			
	17	TERMINAL BLOCK FOR 110VDC ANNUNCIATOR UNIT-1	CBD-4		-XAN6		CABUR			
C	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			
	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			
	06	TERMINAL BLOCK FOR CBF SIGNALS	CBD-4		-X30		CABUR			
D	03	TERMINAL BLOCK FOR SCADA 220kV CT SIGNAL	CBD-4		-AXSA		CABUR			
	07	TERMINAL BLOCK FOR SCADA 132kV CT SIGNAL	CBD-4		-BXSA		CABUR			
	0	AS BUILT	22.11.2018	ASJ	Manufacturer  EPESEL 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 (=D09+C5) COMPONENT LIST	Drawing no. P60194-E-DTC-SC-003
	REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	
									Sheet type AC4	
									Sheet no. 06b	
	1	2	3	4	5	6	7	8		

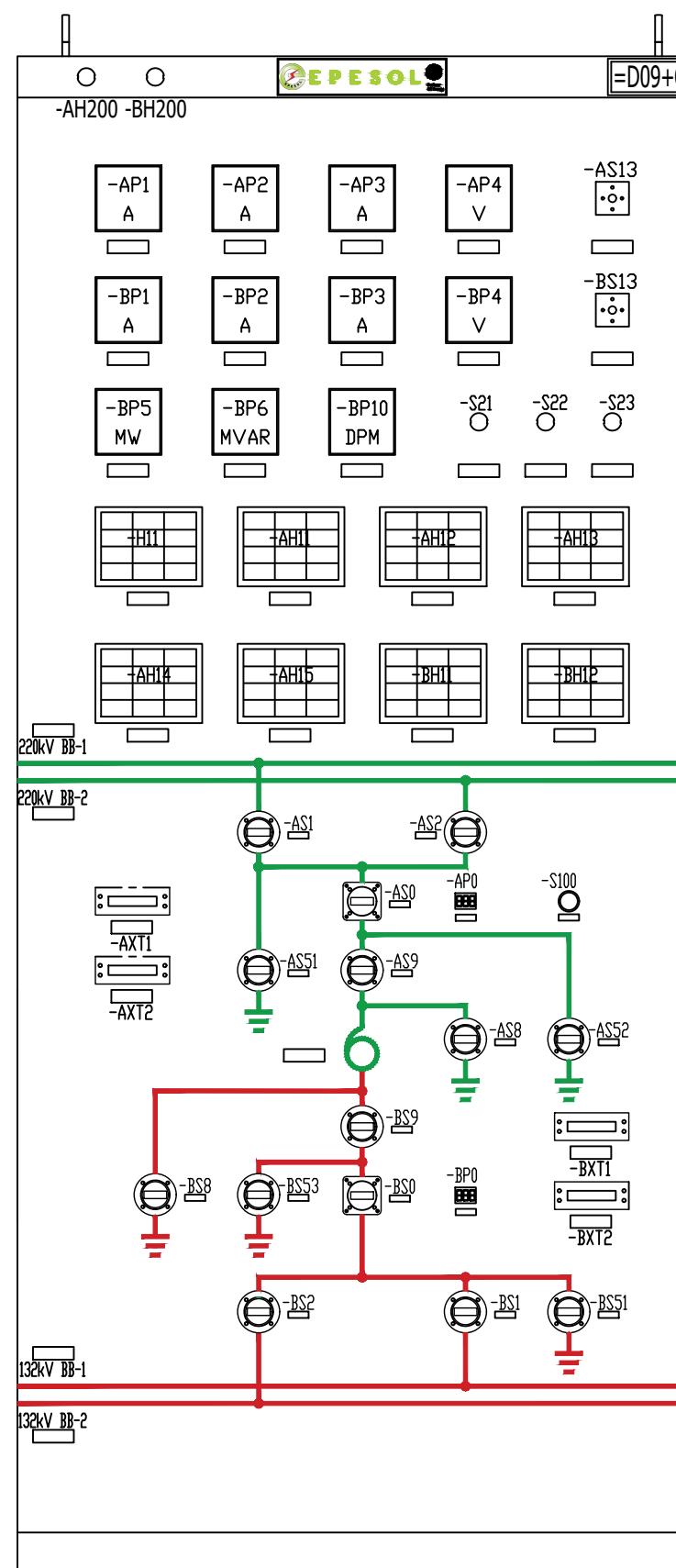
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	1	2	3	4	5	6	7	8		
	QTY.	DEVICE DESCRIPTION	DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER			
A	07	TERMINAL BLOCKS WITH DIODE TYPE IN-D4007, RATED MAXIMUM VOLTAGE 350VDC, RATED BREAK DOWN VOLTAGE 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		
B	12	TERMINAL BLOCKS FOR 220KV METERING CIRCUIT	CBD4			-X6		CABUR		
	25	TERMINAL BLOCKS FOR 132KV METERING CIRCUIT	CBD4			-X7		CABUR		
C										
D										
E										
F										
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0	AS BUILT	22.11.2018	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 (=D09+C5) COMPONENT LIST	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AC4	Sheet no. 06c

1

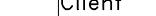
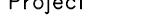
ONT VIEW

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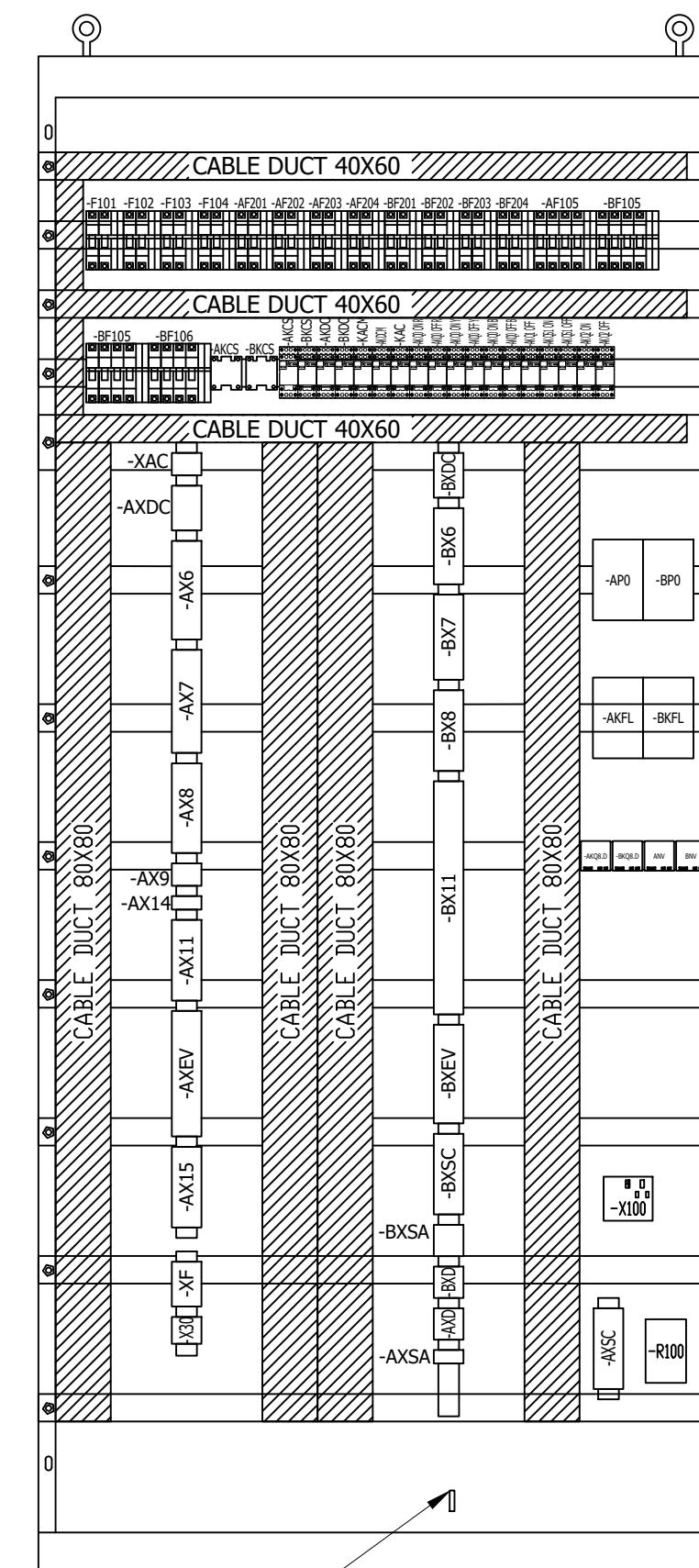


MIMIC:

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

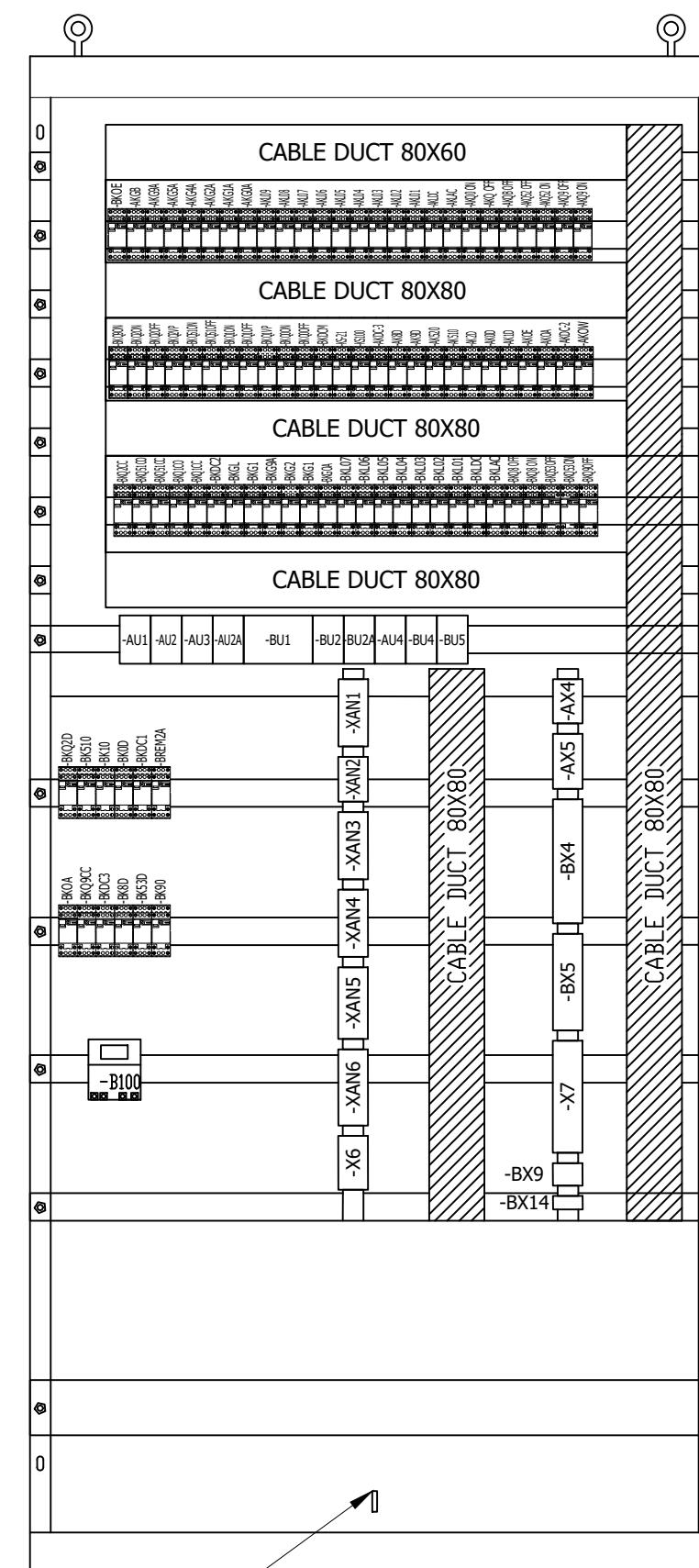
0	AS BUILT	22.11.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D09+C5) PANEL VIEW	Drawing no. P60194-E-DTC-SC-003	
									Project no. P-60194	
REV.	DESCRIPTION	DATE	DRAWER						Sheet type AD	Sheet no. 07

LEFT SIDE VIEW

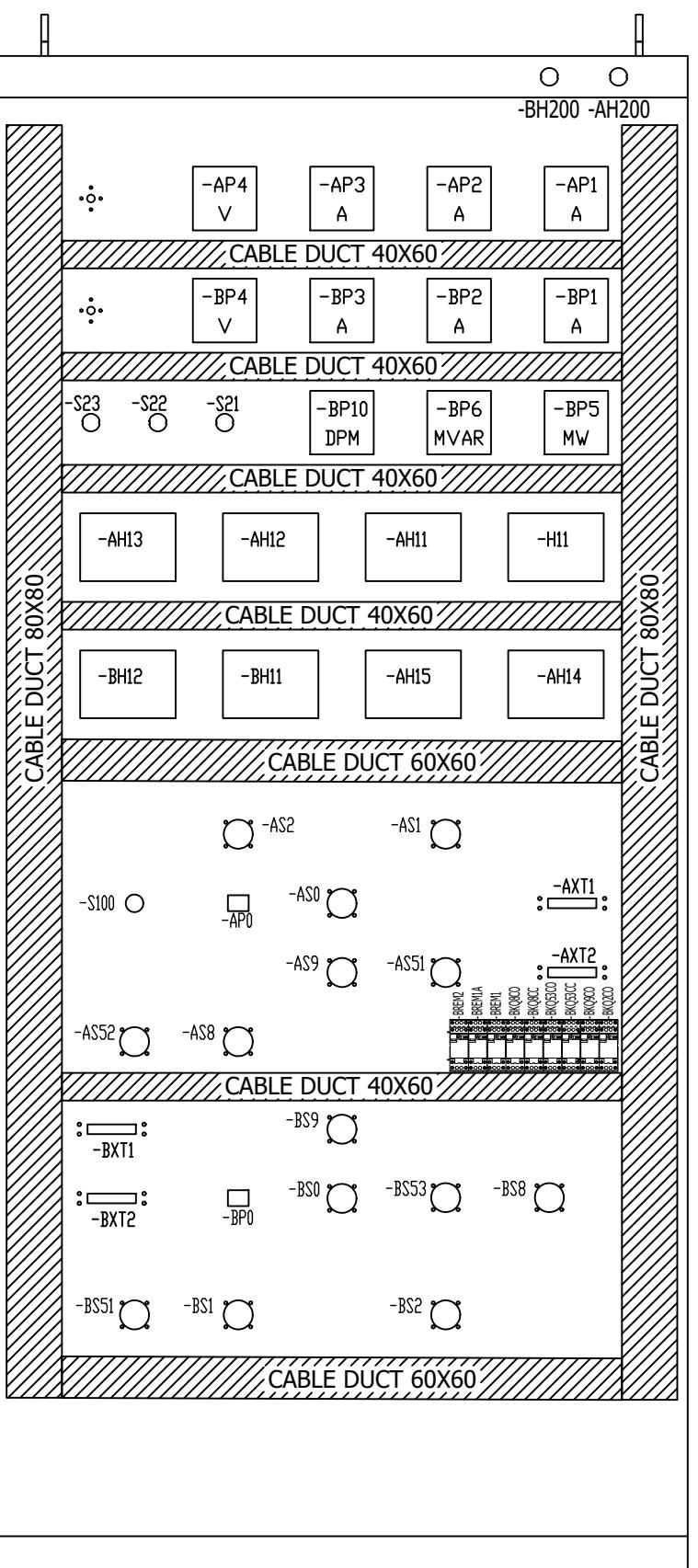
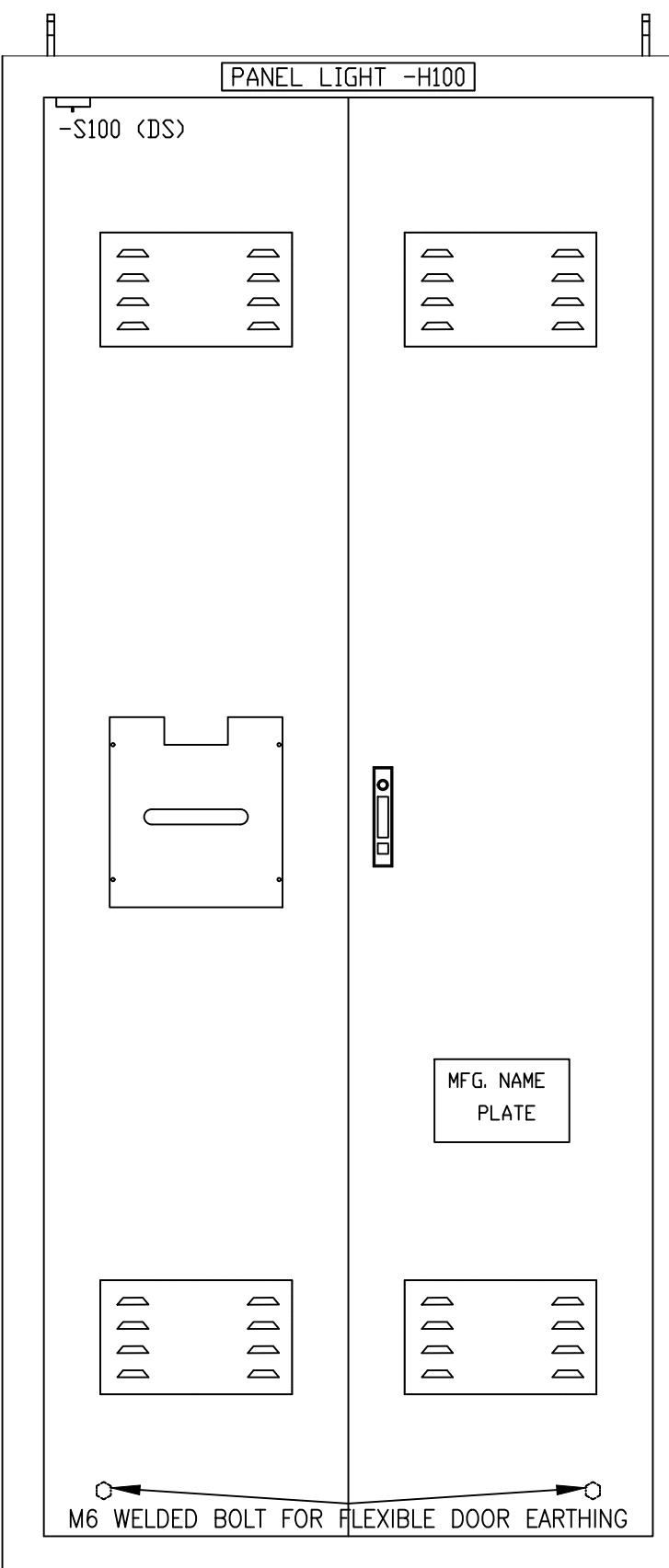
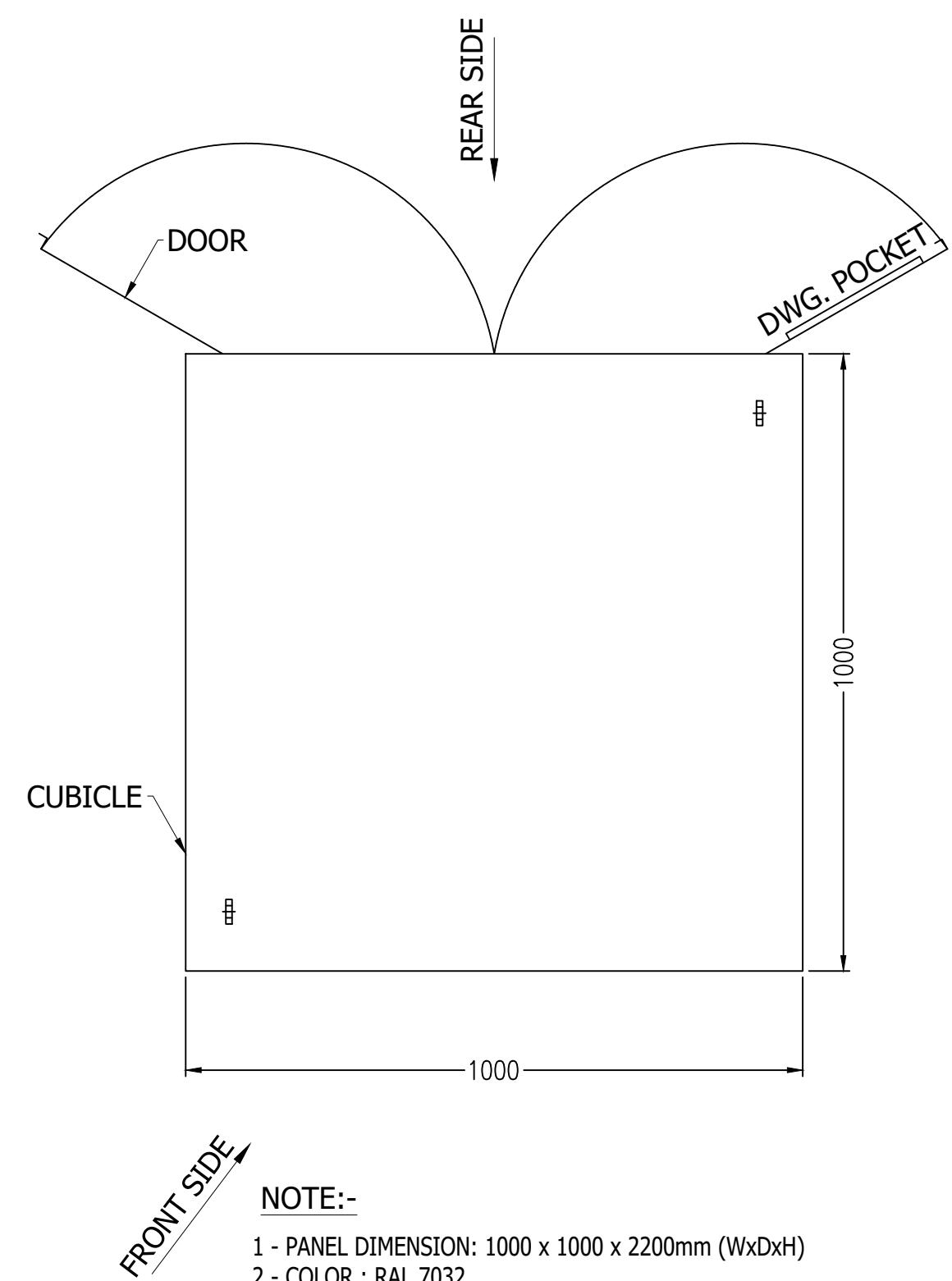


SLOT FOR EARTHING
BUSBAR
7X30mm

RIGHT SIDE VIEW



SLOT FOR EARTHING
BUSBAR
7X30mm

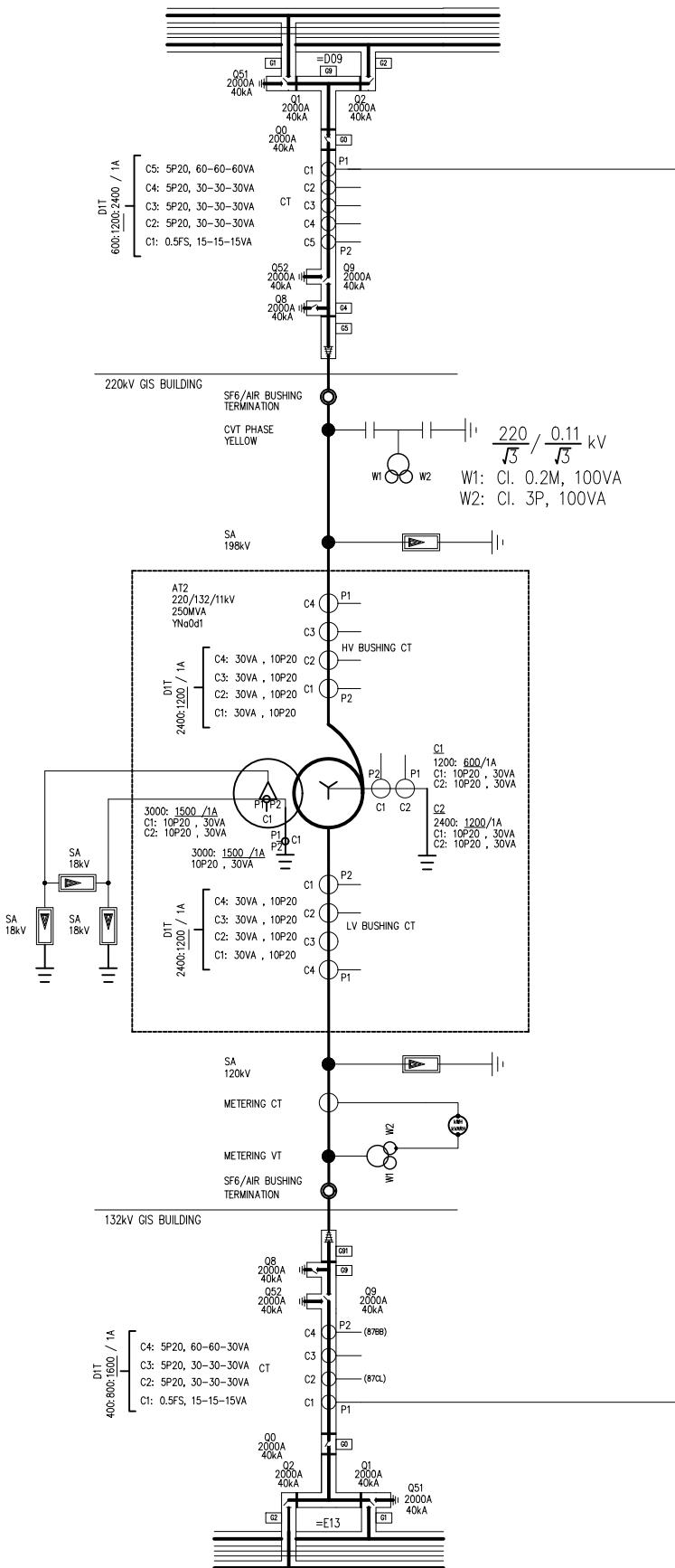
BACK VIEW WITHOUT DOORBACK VIEW WITH DOORTOP VIEW**NOTE:-**

- 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.

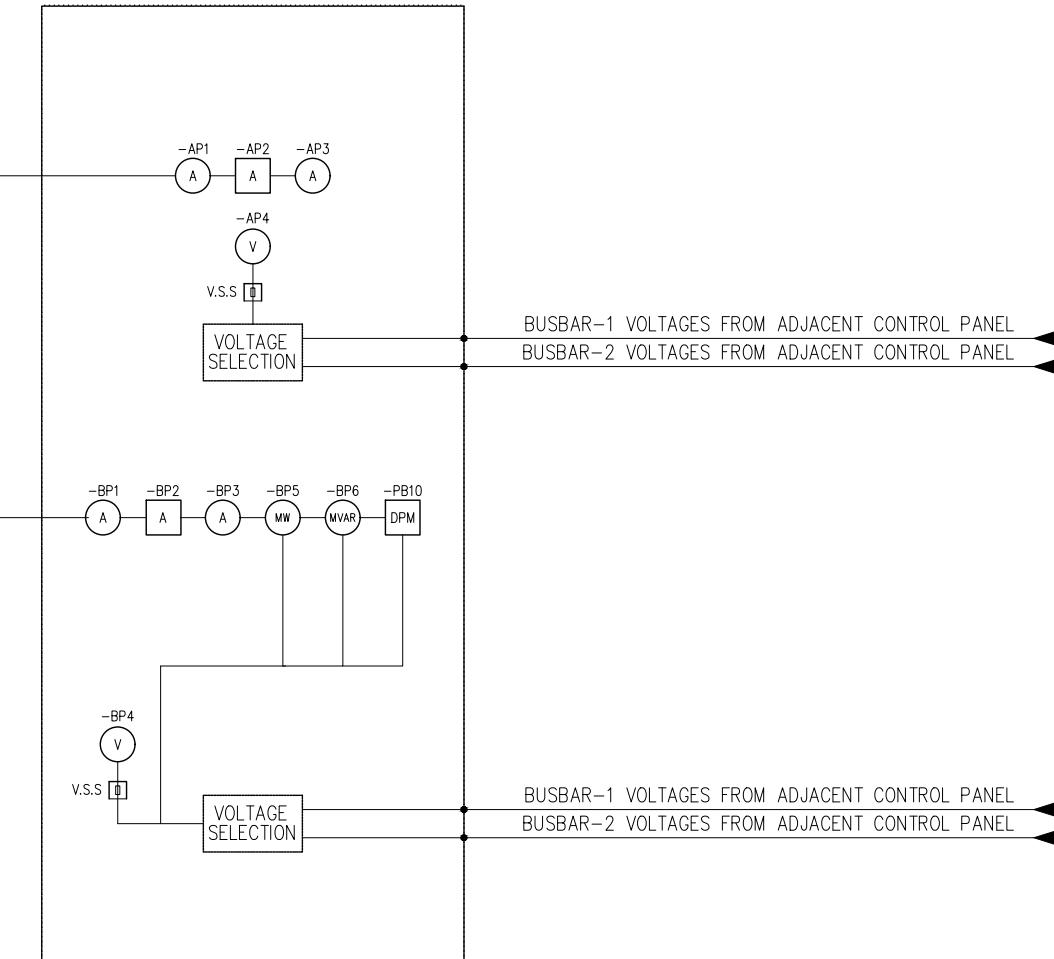
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0	AS BUILT	22.11.2018	ASJ	Manufacturer EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor GE Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D09+C5) PANEL VIEW	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194

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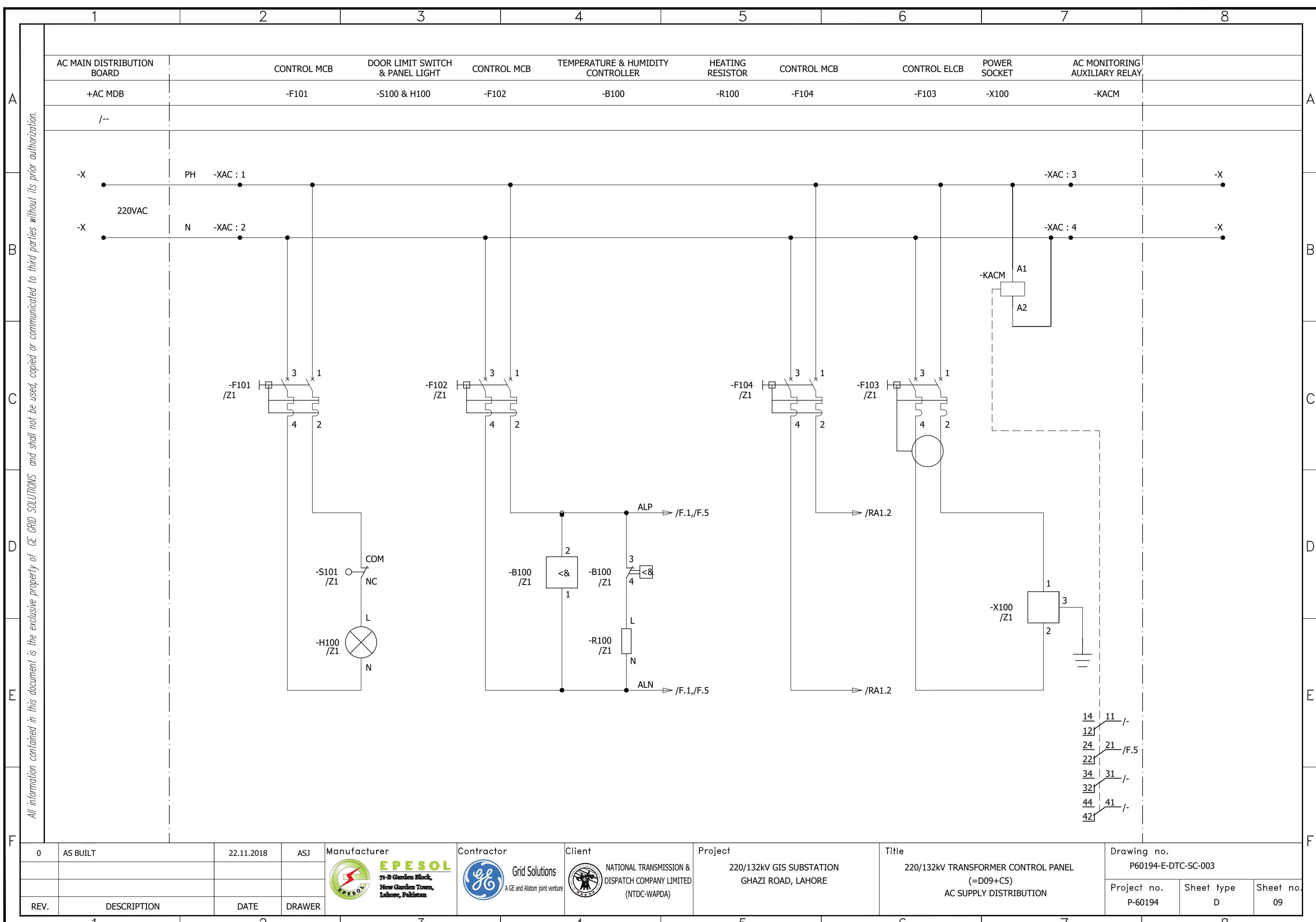
=D04+C5
220/132kV TRANSFORMER CONTROL PANEL



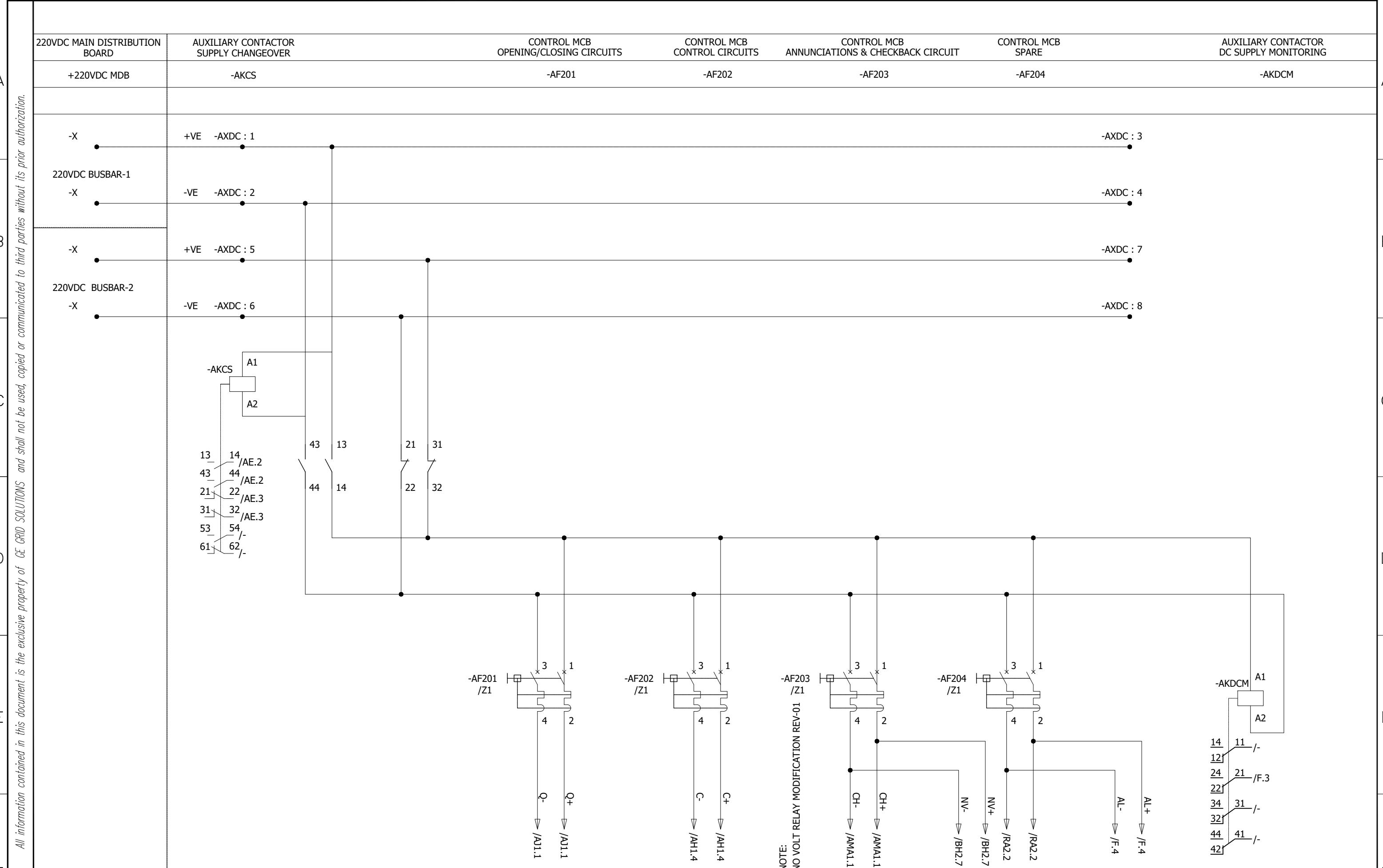
A
B
C
D
E
F

A
B
C
D
E
F

0	AS BUILT	22.11.2018	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 (=D09+C5) BAY CONCEPT & METERING	P60194-E-DTC-SC-003
									Project no. P-60194 Sheet type AF Sheet no. 08

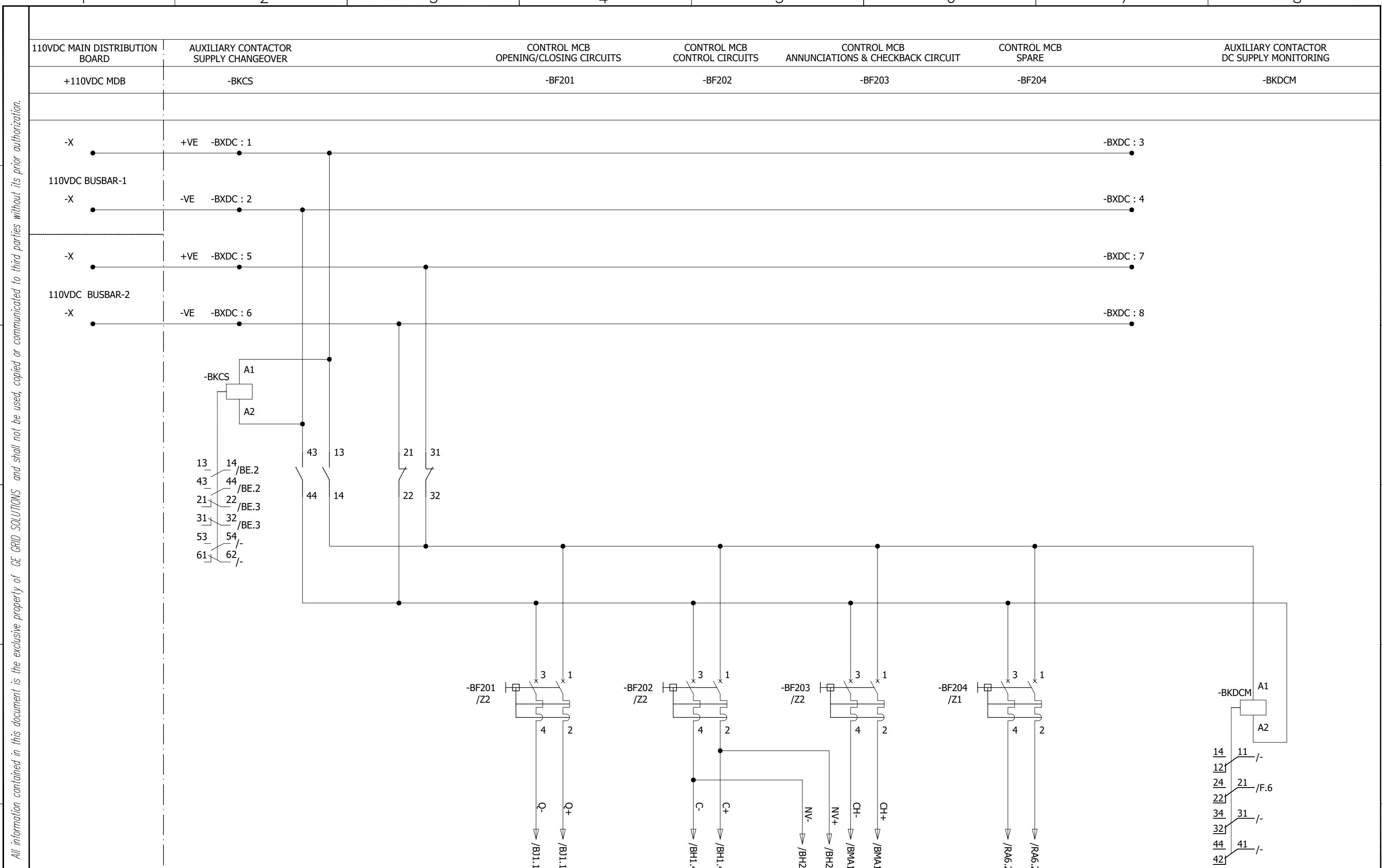


1 2 3 4 5 6 7 8



0	AS BUILT	22.11.2018	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	Title	Drawing no.
							220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	220/132KV TRANSFORMER CONTROL PANEL (=D09+C5) DC SUPPLY DISTRIBUTION	P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type AE Sheet no. 10

1 2 3 4 5 6 7 8



0	AS BUILT	22.11.2018	ASJ	Manufacturer  EPESOL 76-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 (=D09+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

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220V DC CIRCUIT FAULTY

220V DC CIRCUIT FAULTY INDICATION

110V DC CIRCUIT FAULTY

110V DC CIRCUIT FAULTY INDICATION

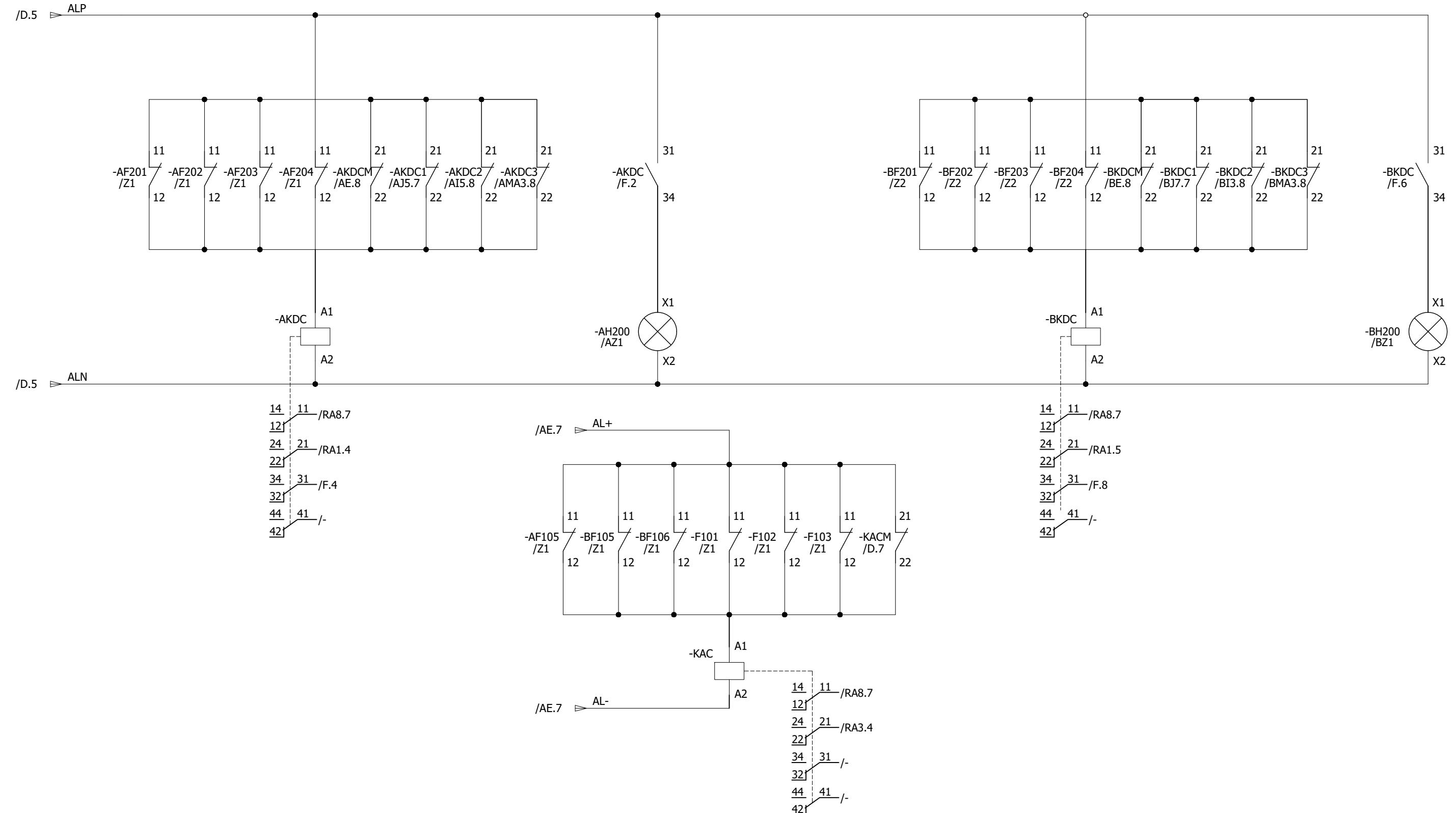
-AKDC

-AH200 220V AC CIRCUIT FAULTY

-BKDC

-BH200

-KAC



0	AS BUILT	22.11.2018	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 (=D09+C5) AC/DC SUPPLY FAILURE CIRCUIT	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type F

TEST BLOCK

AMMETER

AMMETER

AMMETER

VOLTMETER

-AXT

RED-PHASE

YELLOW-PHASE

BLUE-PHASE

LINE-LINE-NEUTRAL

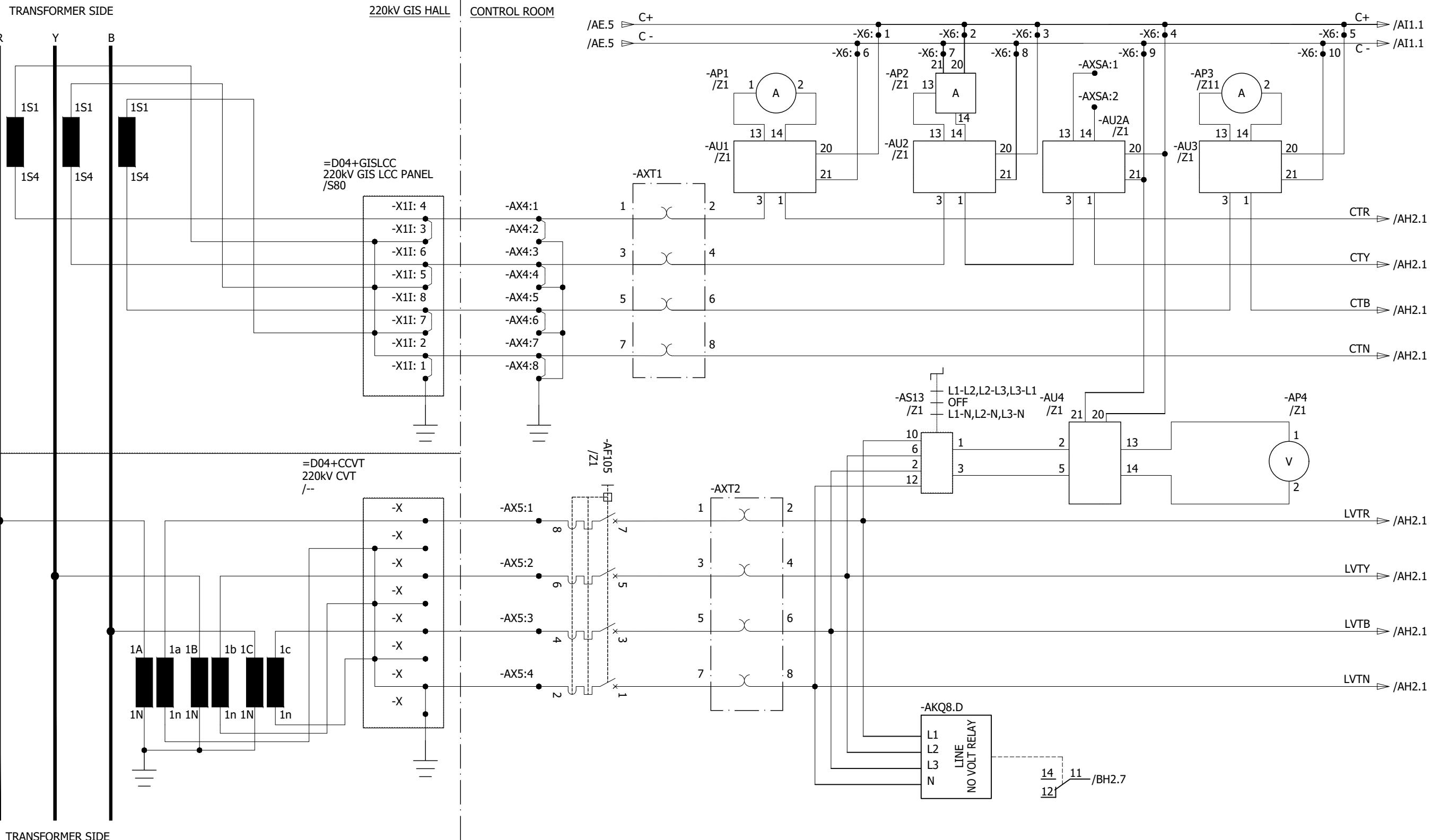
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-AP1

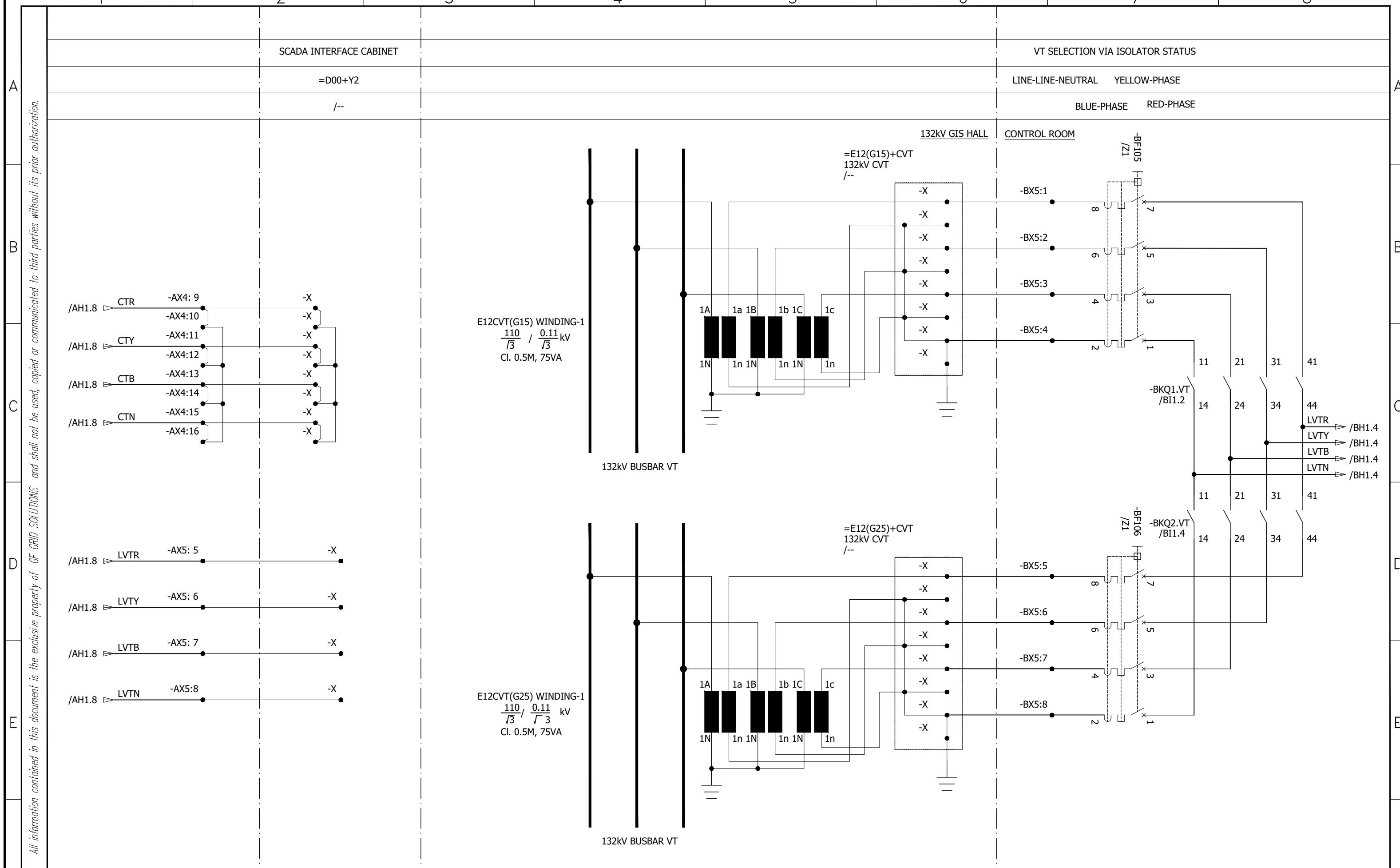
-AP2

-AP3

-AP4

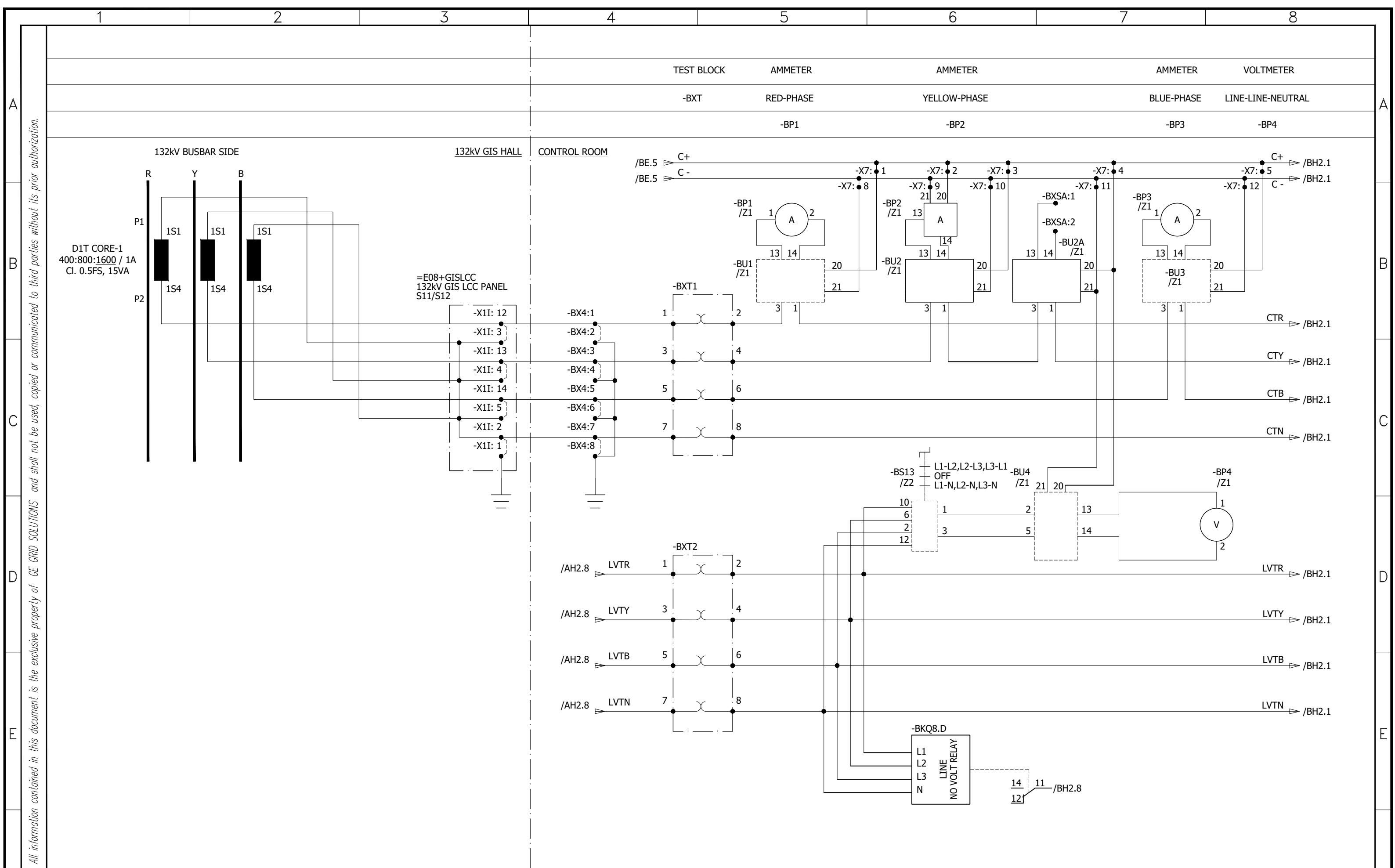


1 2 3 4 5 6 7 8



0	AS BUILT	22.11.2018	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 (=D09+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

1 2 3 4 5 6 7 8



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REAL POWER METERING REACTIVE POWER METER

METER SCADA METER SCADA

-BP5 -BP6

DIGITAL POWER METER

-BP10

SCADA INTERFACE CABINET

=D00+Y2

220KV SIDE VT NO VOLT RELAY 132KV SIDE VT NO VOLT RELAY

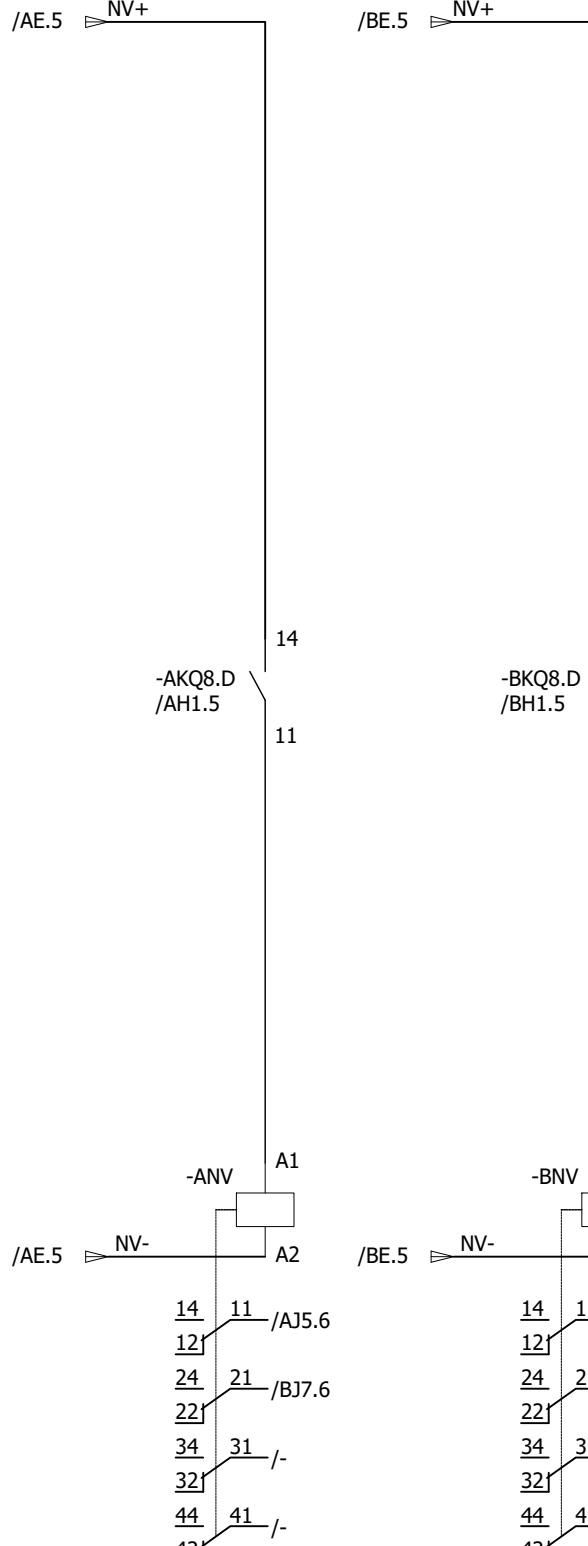
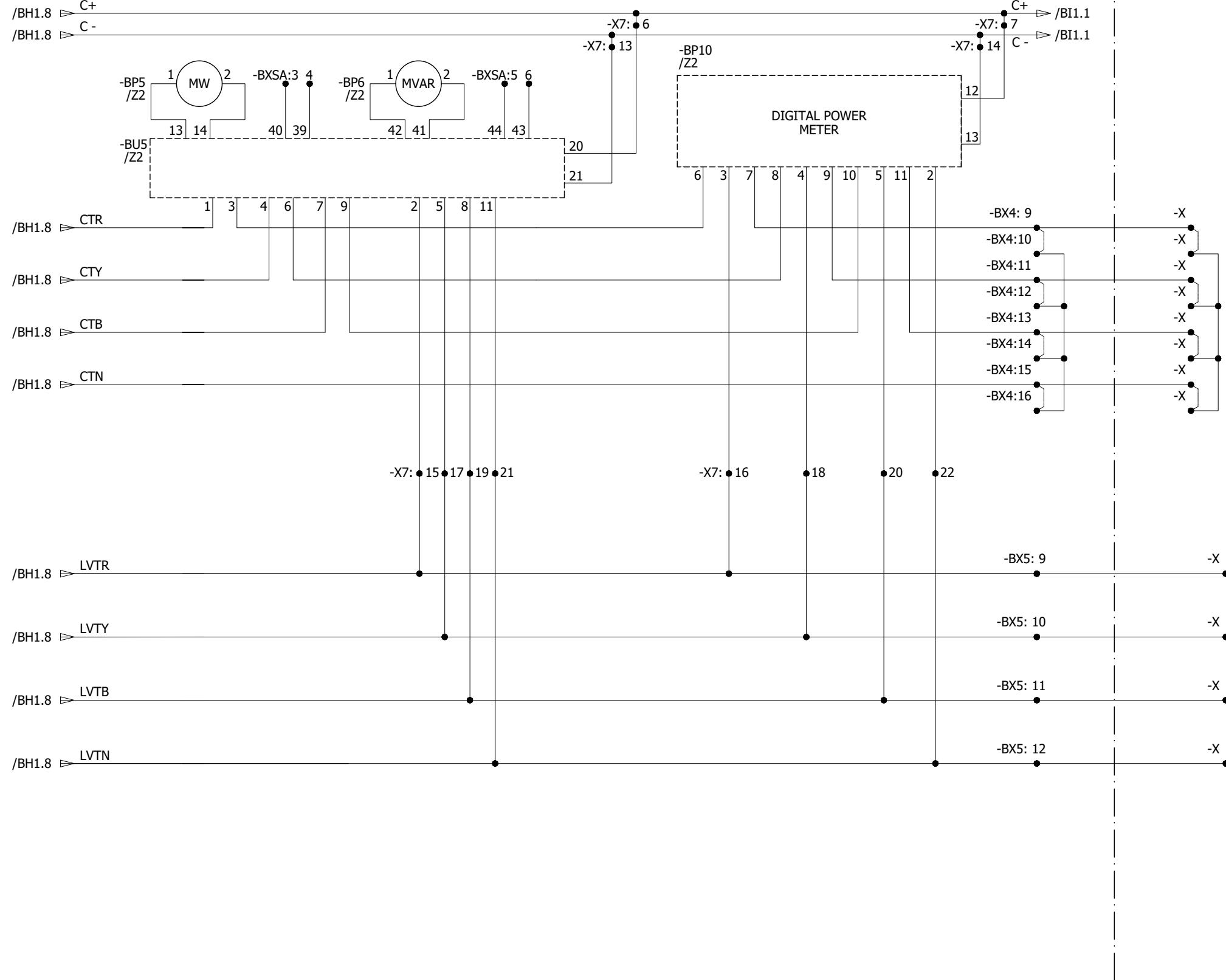
CONTACTS MULTIPLICATION CONTACTS MULTIPLICATION

-BP5

-BP6

-BP10

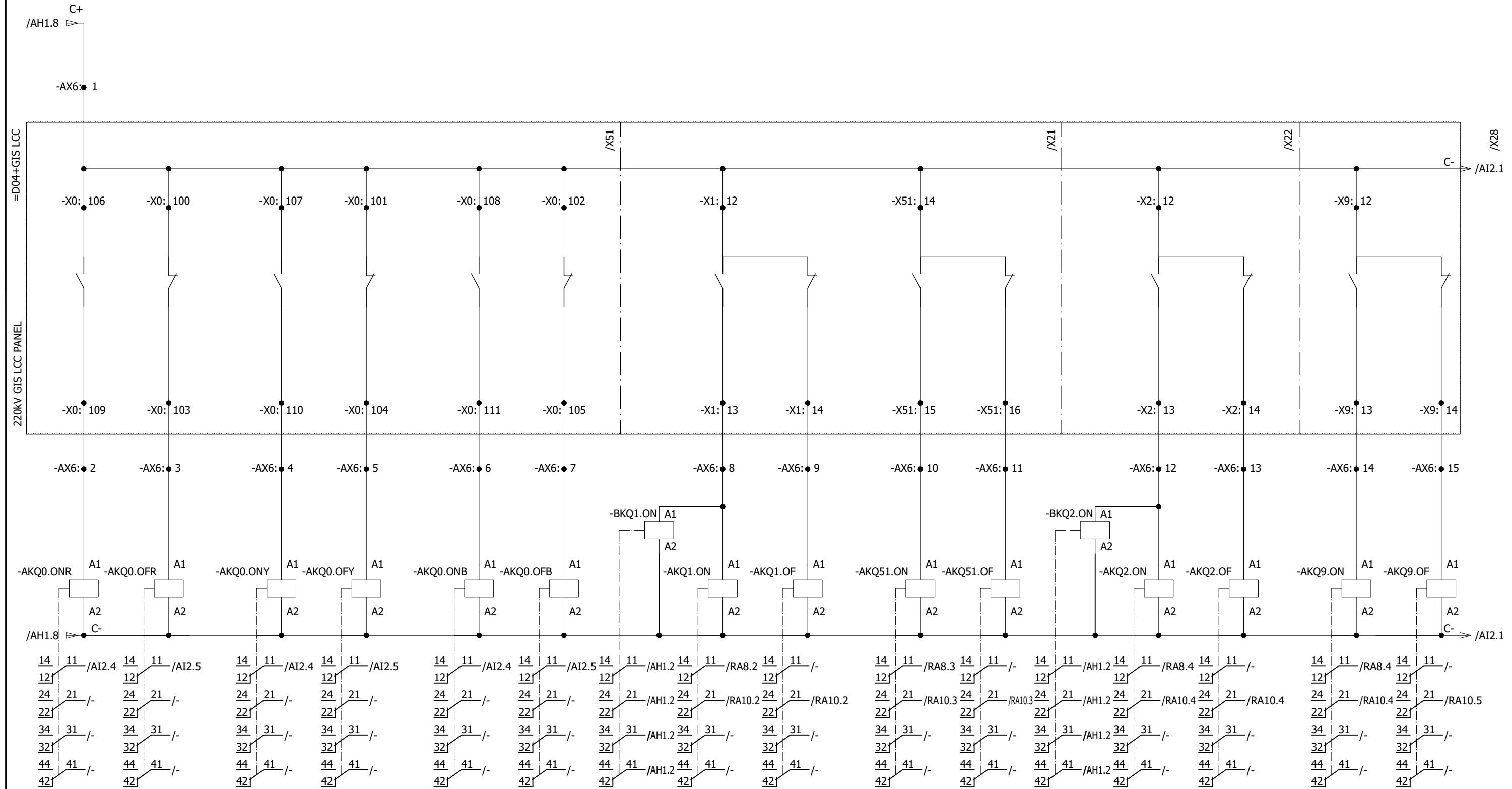
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0	AS BUILT	22.11.2018	ASJ	Manufacturer EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D09+C5) CT/VT METERING CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type BH2
									Sheet no. 16

220kV POWER EQUIPMENT STATUS SIGNALS

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0	AS BUILT	22.11.2018	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 (=D09+C5) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
									Sheet type AI1
	REV.	DESCRIPTION	DATE	DRAWER					Sheet no 17

220KV POWER EQUIPMENT STATUS SIGNALS

LINE SIDE
EARTHING SWITCHHIGH SPEED LINE
EARTHING SWITCH

CIRCUIT BREAKER

Q52

Q8

Q0 - ALL POLES

CLOSE

OPEN

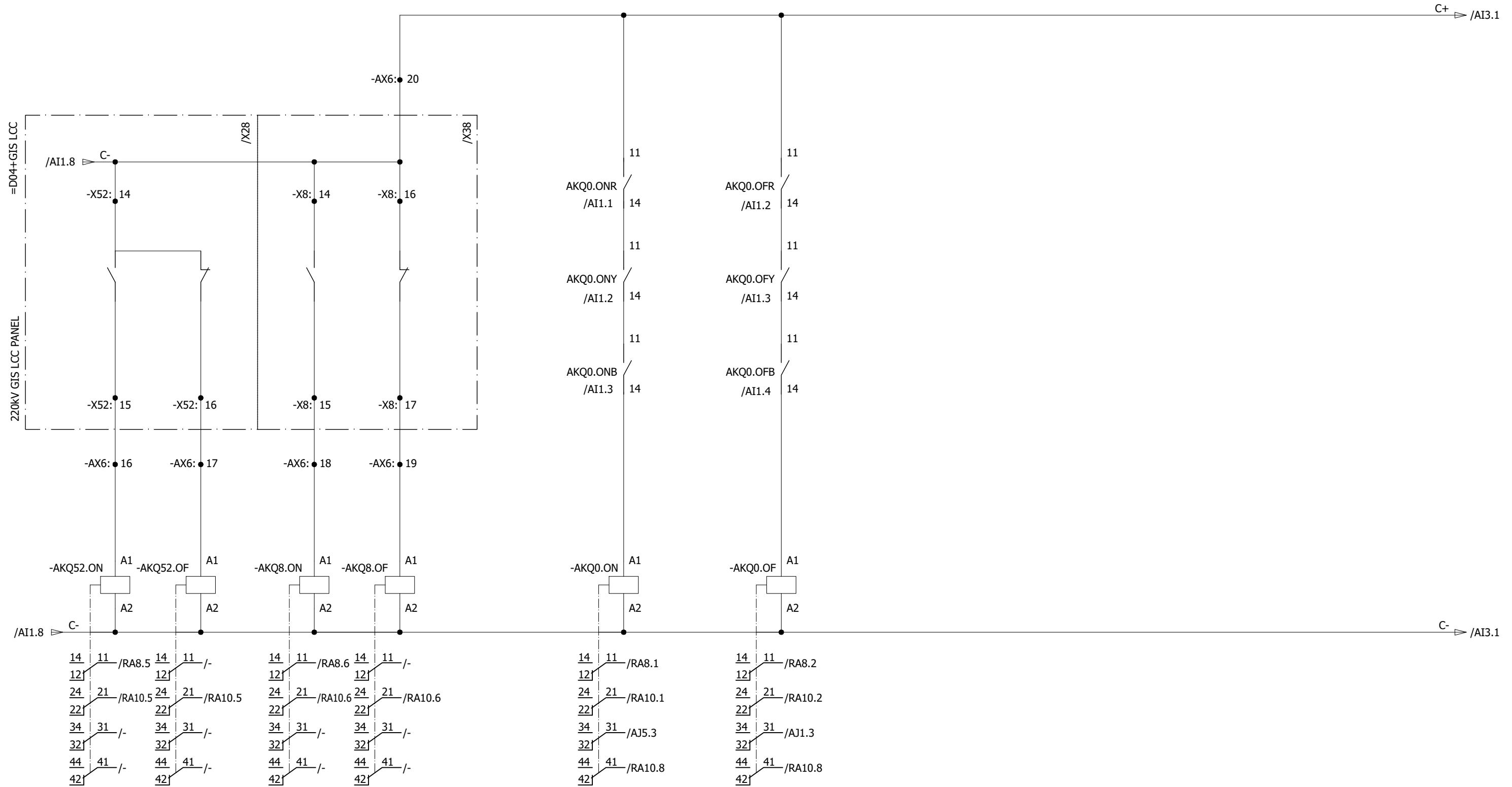
CLOSE

OPEN

CLOSE

OPEN

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0	AS BUILT	22.11.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.		
				EPE SOL 7-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 (=D09+C5) POWER EQUIPMENT INPUTS	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 SWITCHHIGH SPEED LINE
EARTHING SWITCH

Q0

Q1

Q51

Q2

Q9

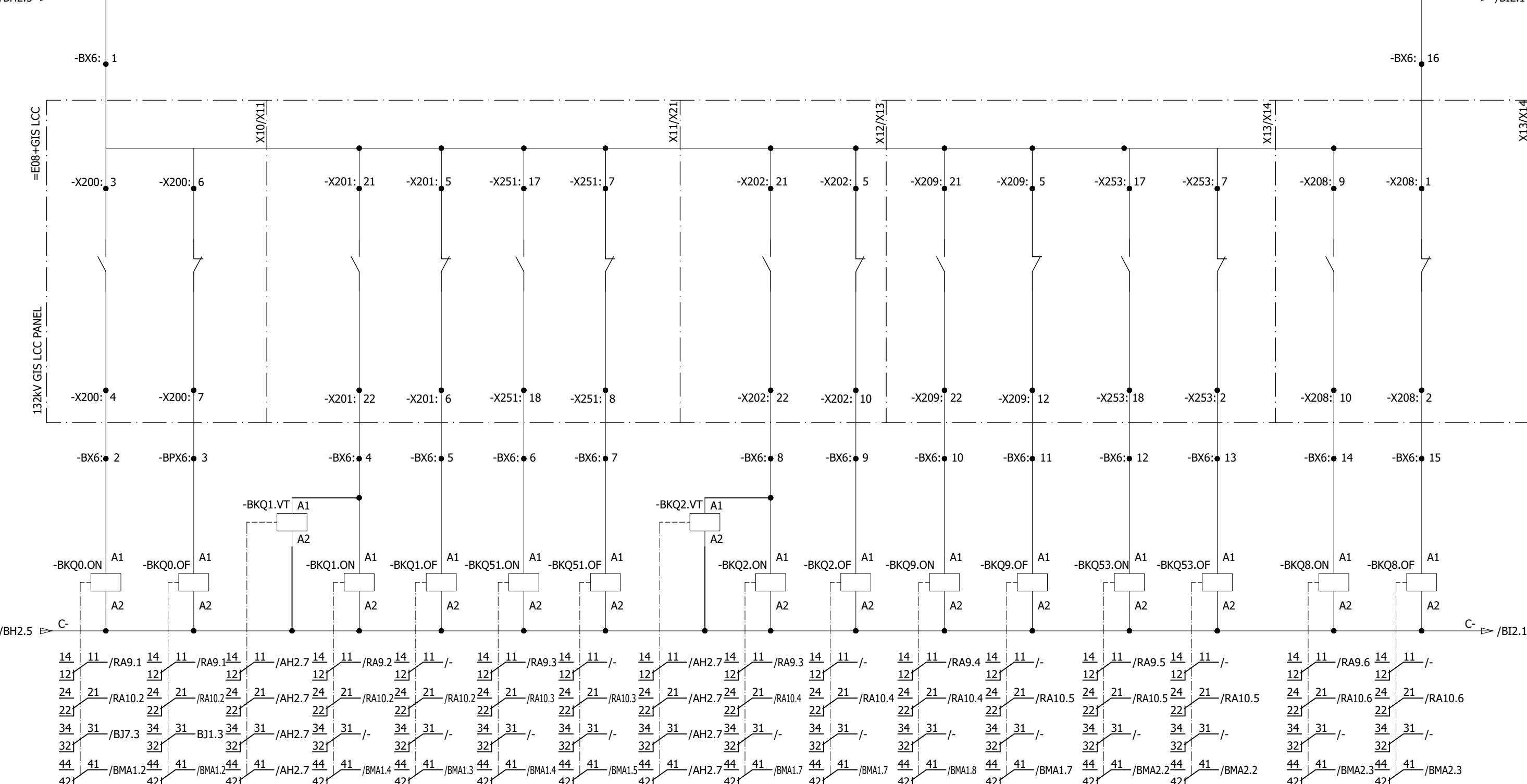
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Q8

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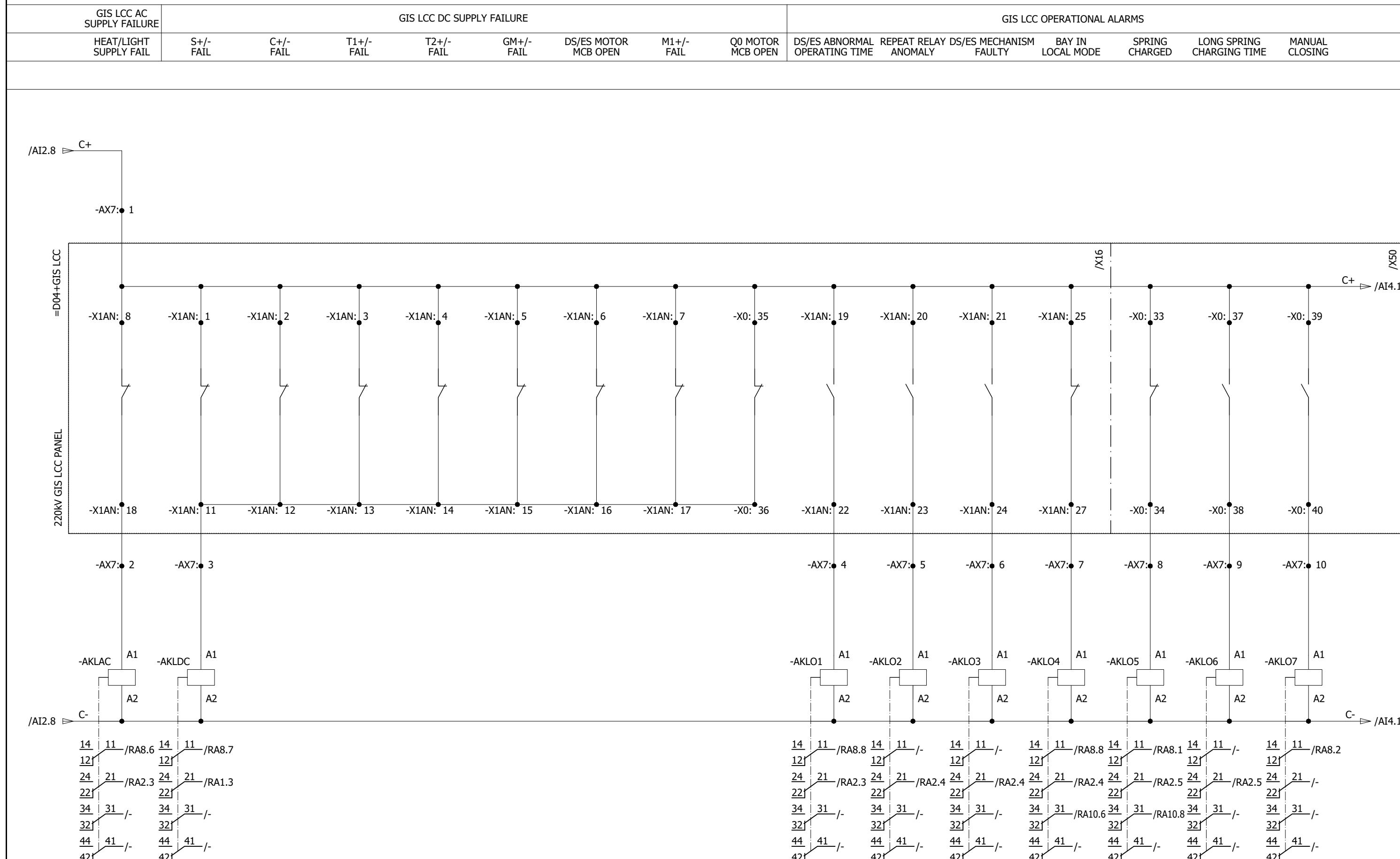
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0	AS BUILT	22.11.2018	ASJ	Manufacturer EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D09+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

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0	AS BUILT	22.11.2018	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 (=D09+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

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

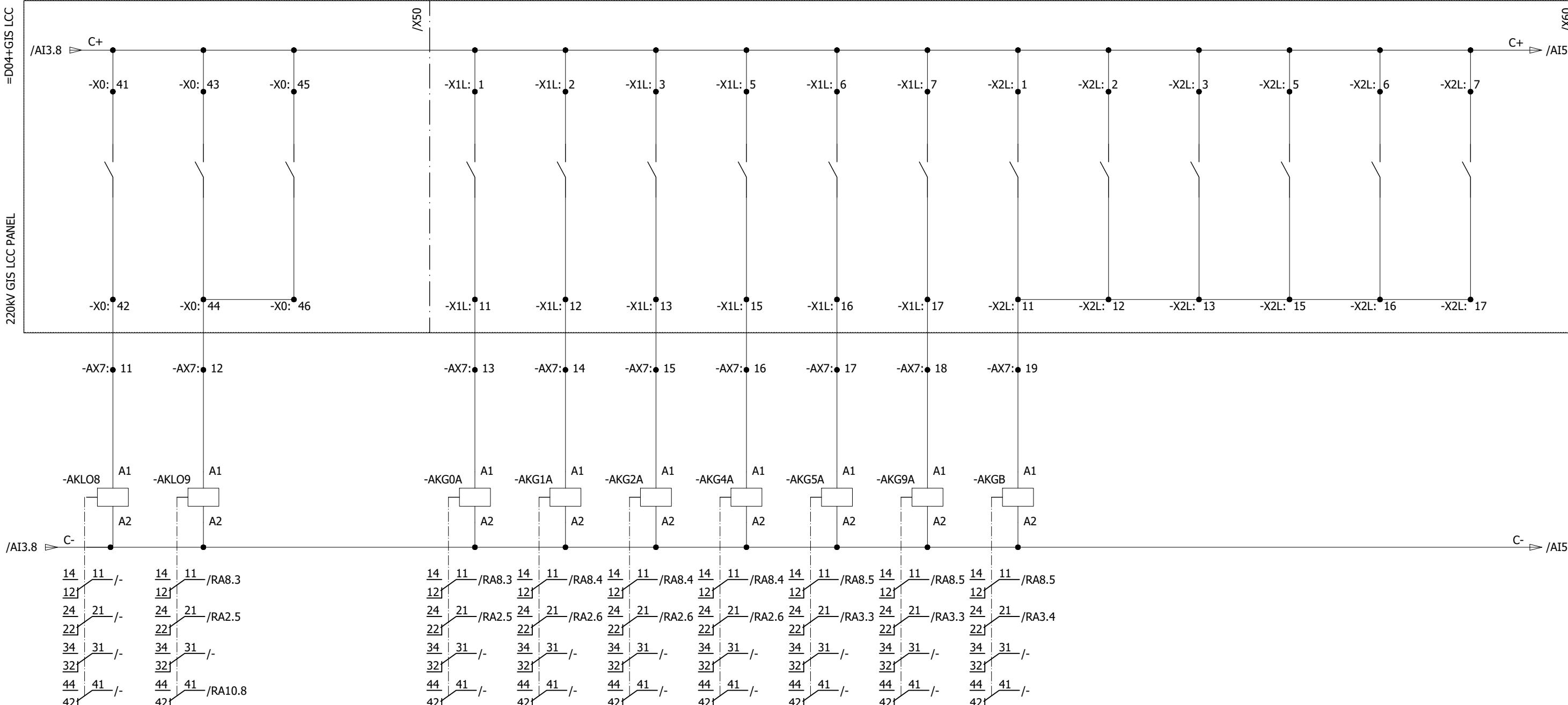
BLOCK

BLOCK

A

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220KV GIS LCC PANEL



0 AS BUILT

22.11.2018

ASJ

Manufacturer
EPE SOL
71-B Garden Block,
New Garden Town,
Lahore, Pakistan

Contractor
GE
Grid Solutions
A GE and Alstom joint venture

Client

NATIONAL TRANSMISSION &
DISPATCH COMPANY LIMITED
(NTDC-WAPDA)

Project

220/132KV GIS SUBSTATION
GHAZI ROAD, LAHORE

Title
220/132KV TRANSFORMER CONTROL PANEL
(=D09+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

DC CIRCUIT C+/C-
MONITORING

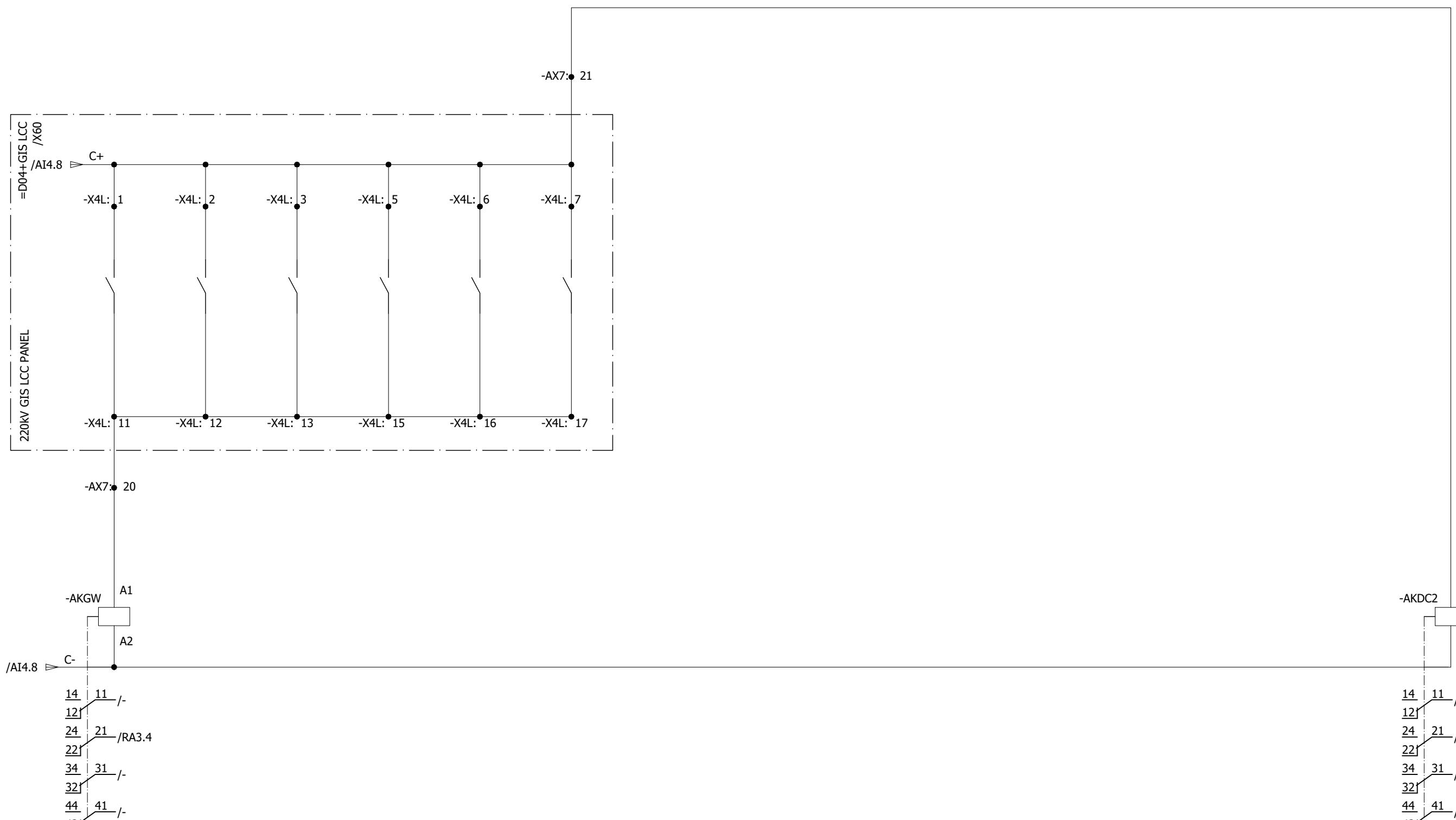
-AKDC2

GIS LCC GAS COMPARTMENT ALARMS

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

CHECK CHECK CHECK CHECK CHECK CHECK

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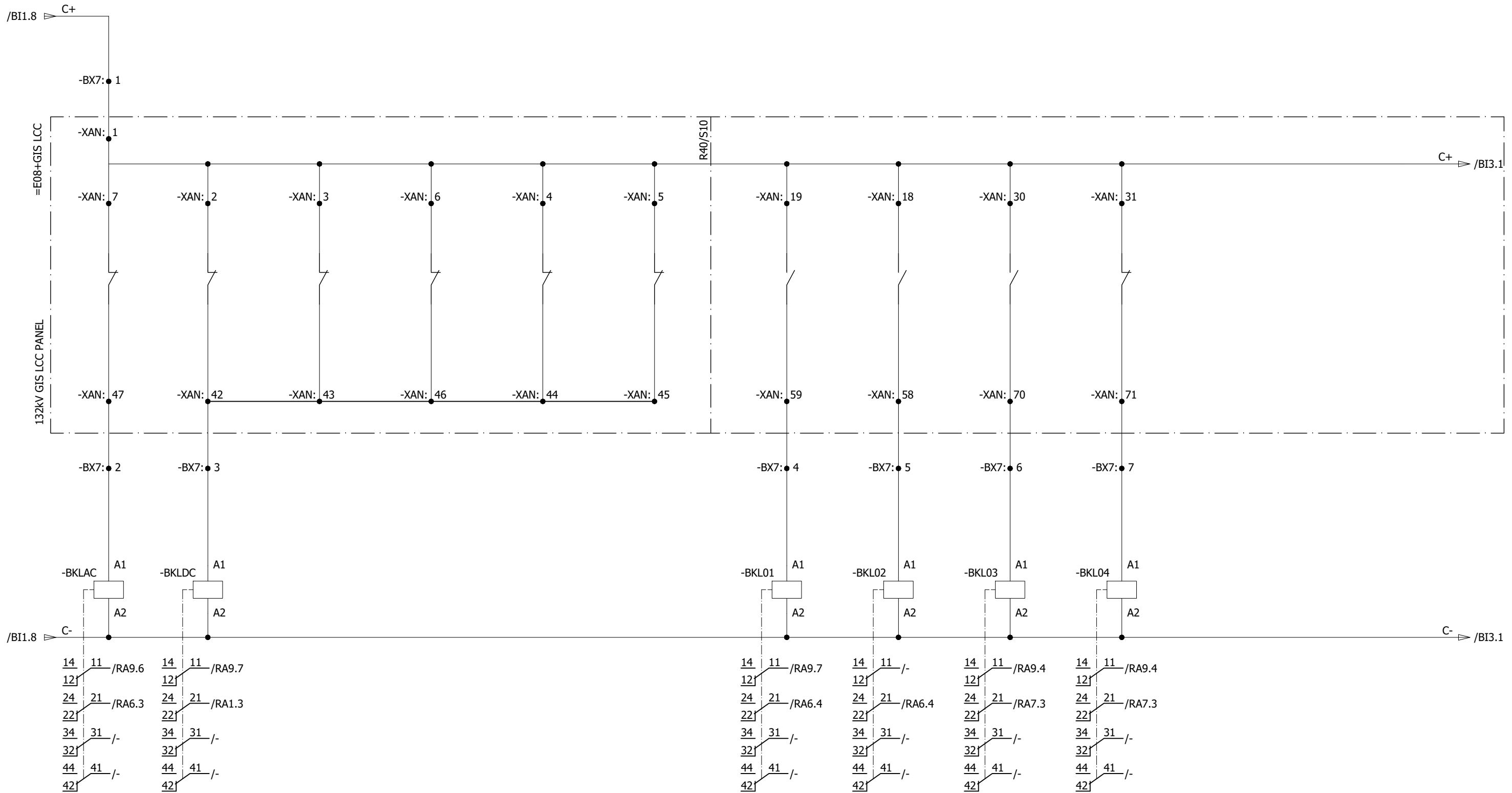


0	AS BUILT	22.11.2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D09+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

132kV GIS POWER EQUIPMENT INPUT SIGNALS

GIS LCC AC SUPPLY FAILURE	GIS LCC DC SUPPLY FAILURE					GIS LCC OPERATIONAL ALARMS				
	HEAT/LIGHT SUPPLY FAIL	CONTROL SUPPLY MCB TRIPPED	ALARM SUPPLY FAIL	CB MOTOR SUPPLY TRIPPED	GAS MONITORING MCB TRIPPED	DS/ES/HES MOTOR SUPPLY MCB TRIPPED	DS/ES ABNORMAL OPERATING TIME	POSITION REPEAT ABNORMAL	LOCK MODE	BYPASS MODE

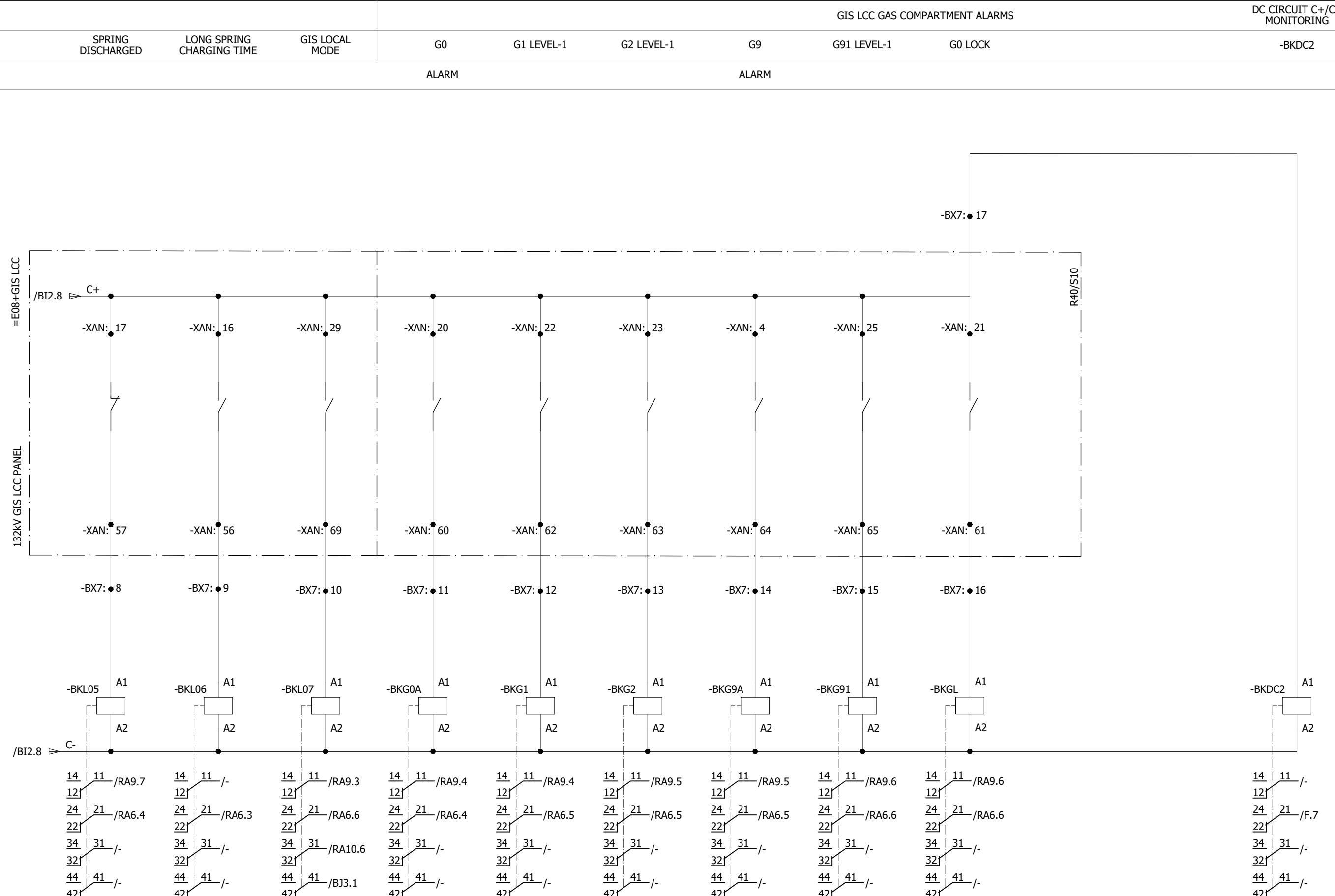
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132kV GIS POWER EQUIPMENT INPUT SIGNALS

DC CIRCUIT C+/C-MONITORING

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0	AS BUILT	22.11.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
REV.	DESCRIPTION	DATE	DRAWER	EPE SOL 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 (=D09+C5) POWER EQUIPMENT INPUTS	P60194-E-DTC-SC-003
									Project no. P-60194 Sheet type BI3 Sheet no. 24

220kV CIRCUIT BREAKER CLOSING / OPENING CIRCUIT

SCADA OPERATION

LOCAL OPERATION

DISCREPANCY SWITCH
COMMAND

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CLOSE

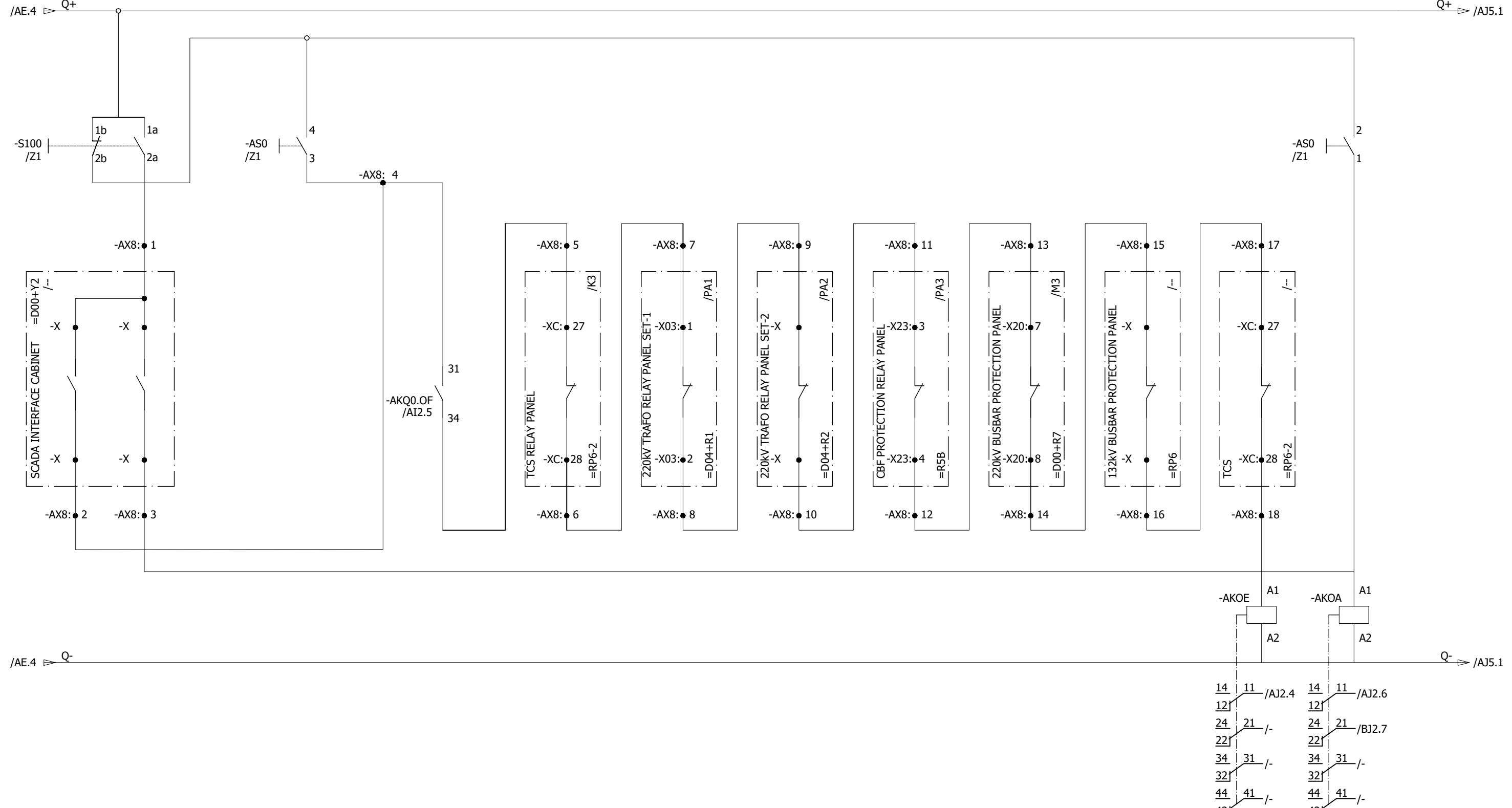
DISCREPANCY SWITCH
COMMAND

OPEN

CLOSE

CLOSE BLOCK CHECKS

OPEN



0	AS BUILT	22.11.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
REV.	DESCRIPTION	DATE	DRAWER	EPE SOL 7i-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 (=D09+C5) CIRCUIT BREAKER OPENING/CLOSING CIRCUIT	P60194-E-DTC-SC-003
									Project no. P-60194 Sheet type AJ1 Sheet no. 25

220kV CIRCUIT BREAKER CLOSING / OPENING COMMANDS TO GIS LCC

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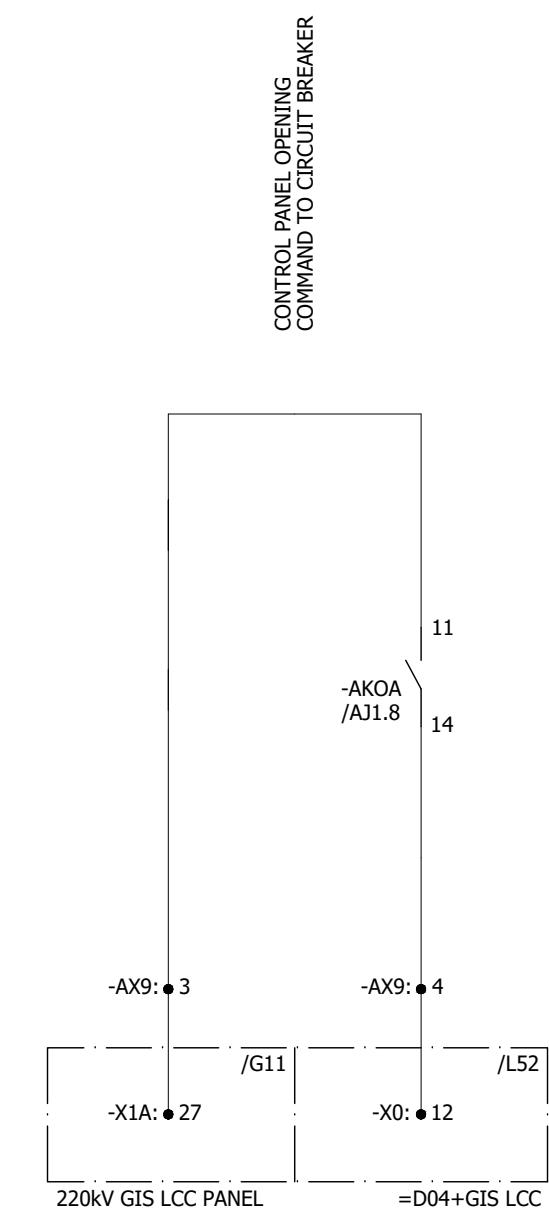
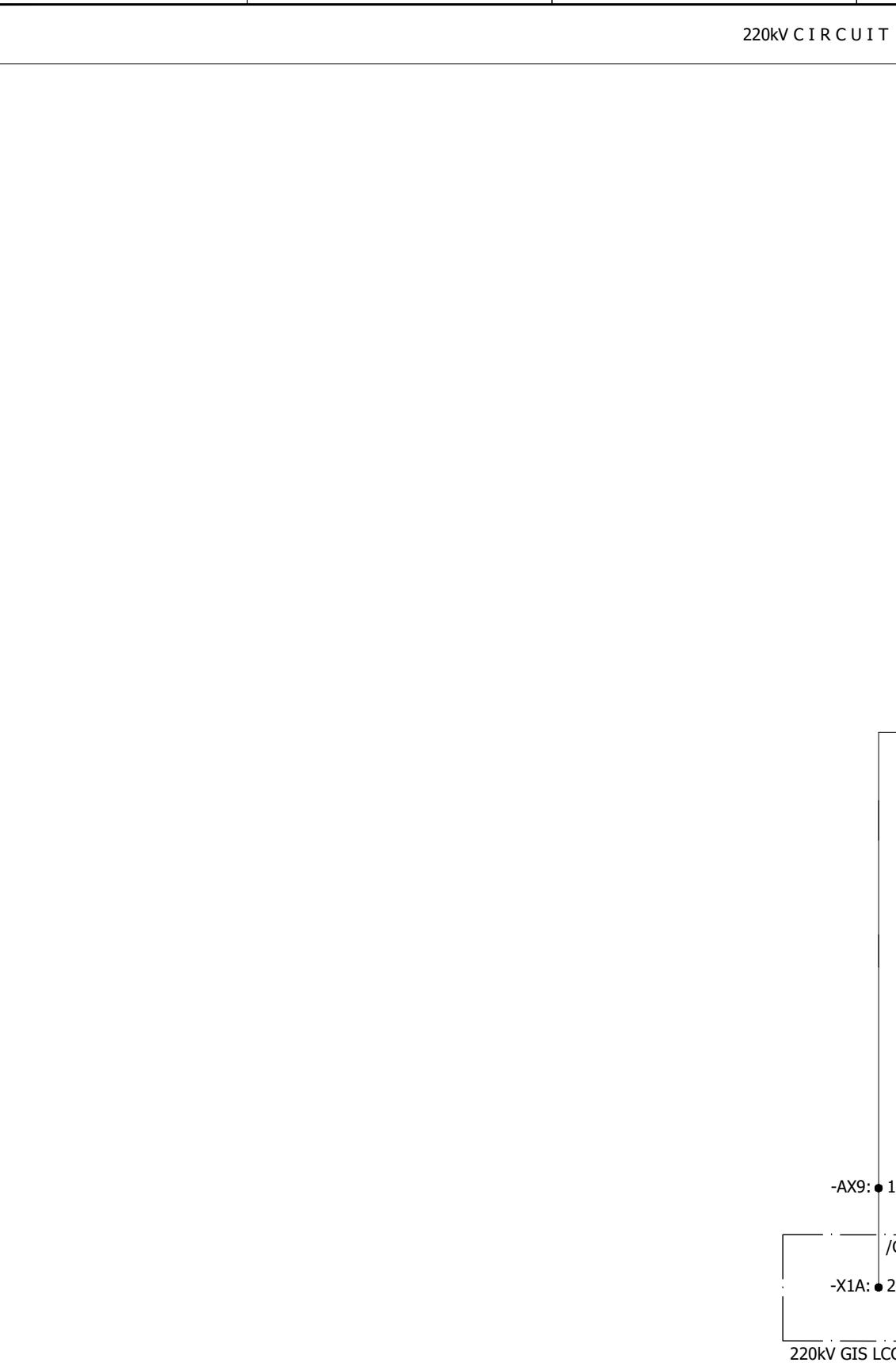
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0	AS BUILT	22.11.2018	ASJ	Manufacturer  EPESOL 7-8 Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D09+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

SCADA OPERATION

LOCAL OPERATION

DISCREPANCY SWITCH
COMMANDDISCREPANCY SWITCH
COMMAND

SYNCH ON-BYPASS

SYNCH COMMAND THROUGH

CLOSE BLOCK CHECKS

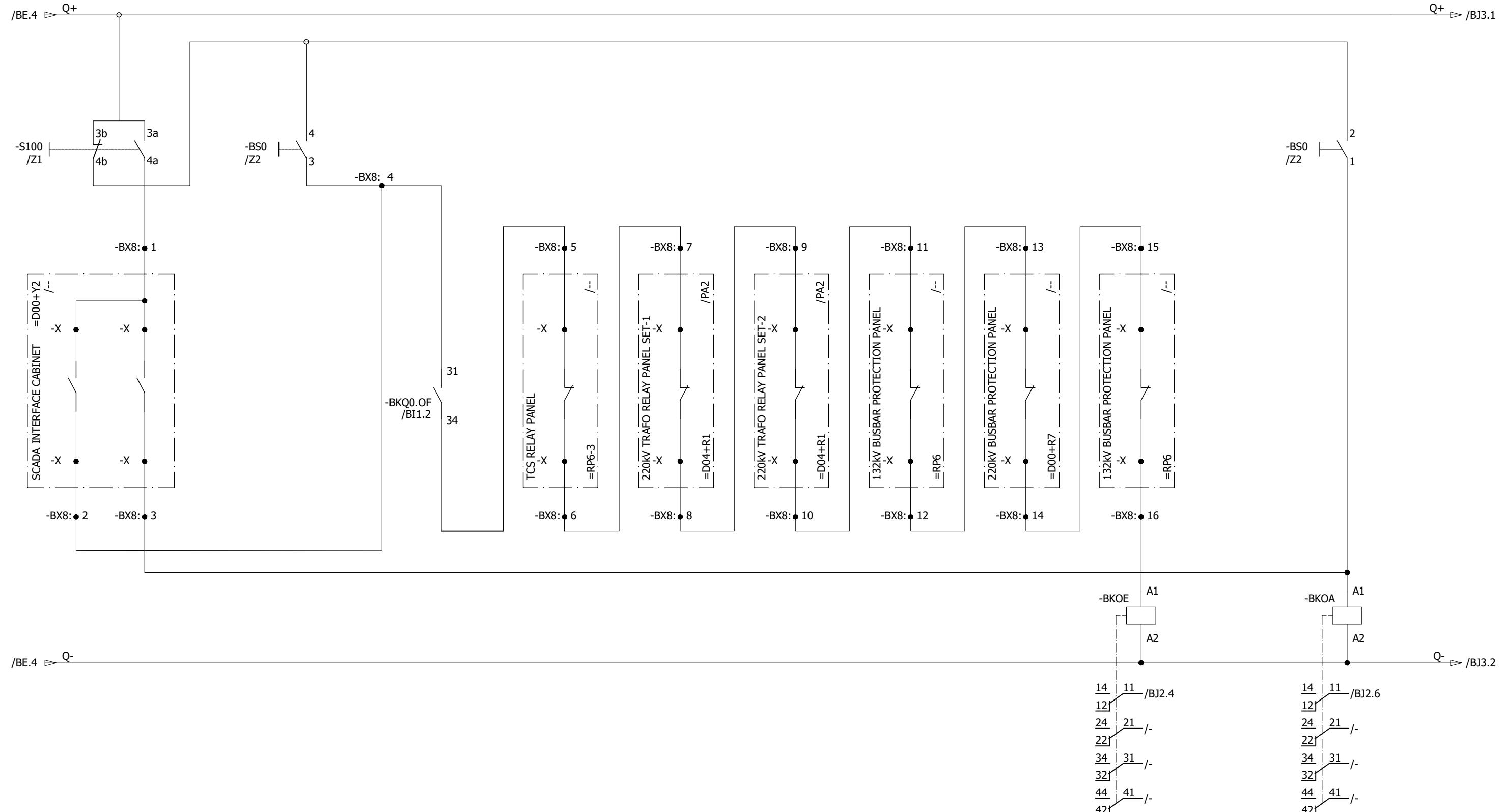
CLOSE

OPEN

CLOSE

OPEN

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0	AS BUILT	22.11.2018	ASJ	Manufacturer  EPESOL 7-E Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D09+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
1		2	3	4	5	6	7	8			

132kV CIRCUIT BREAKER CLOSING / OPENING COMMANDS TO GIS LCC

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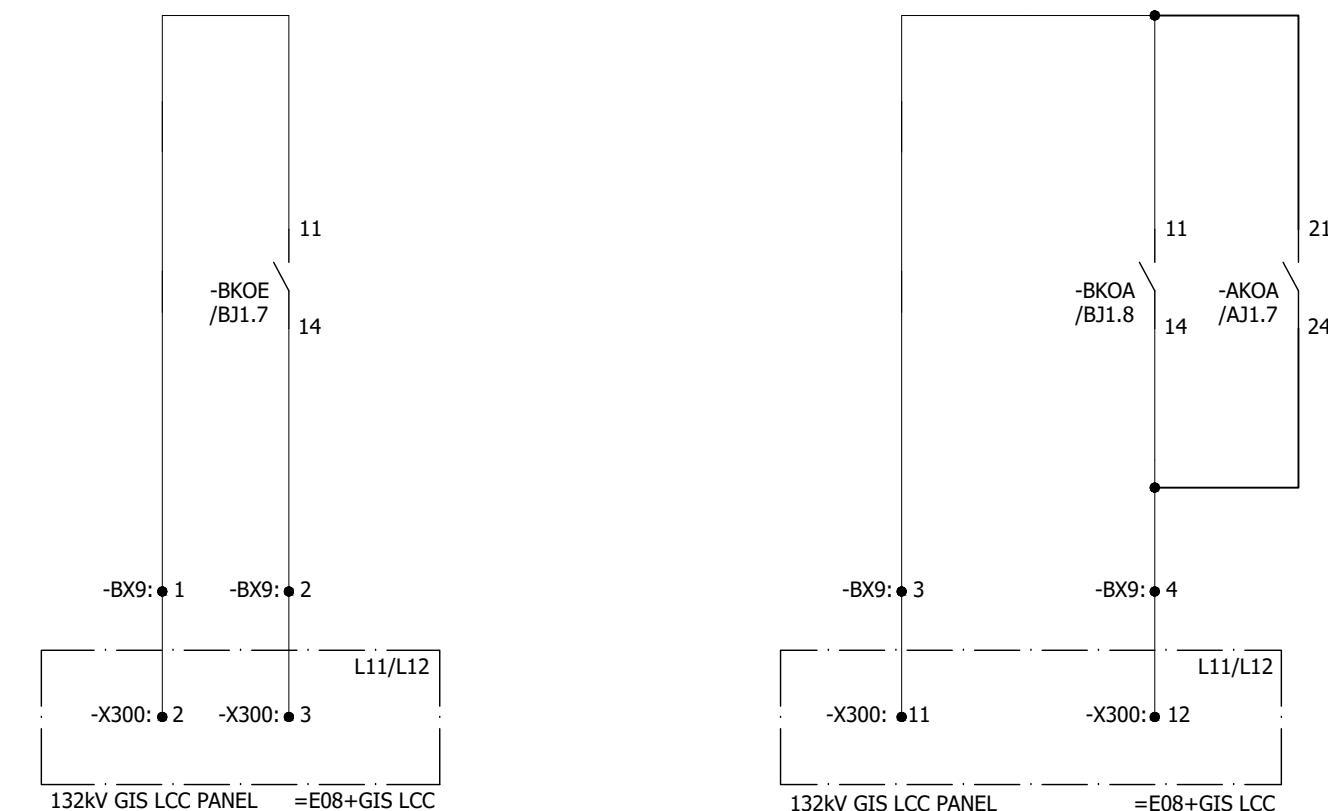
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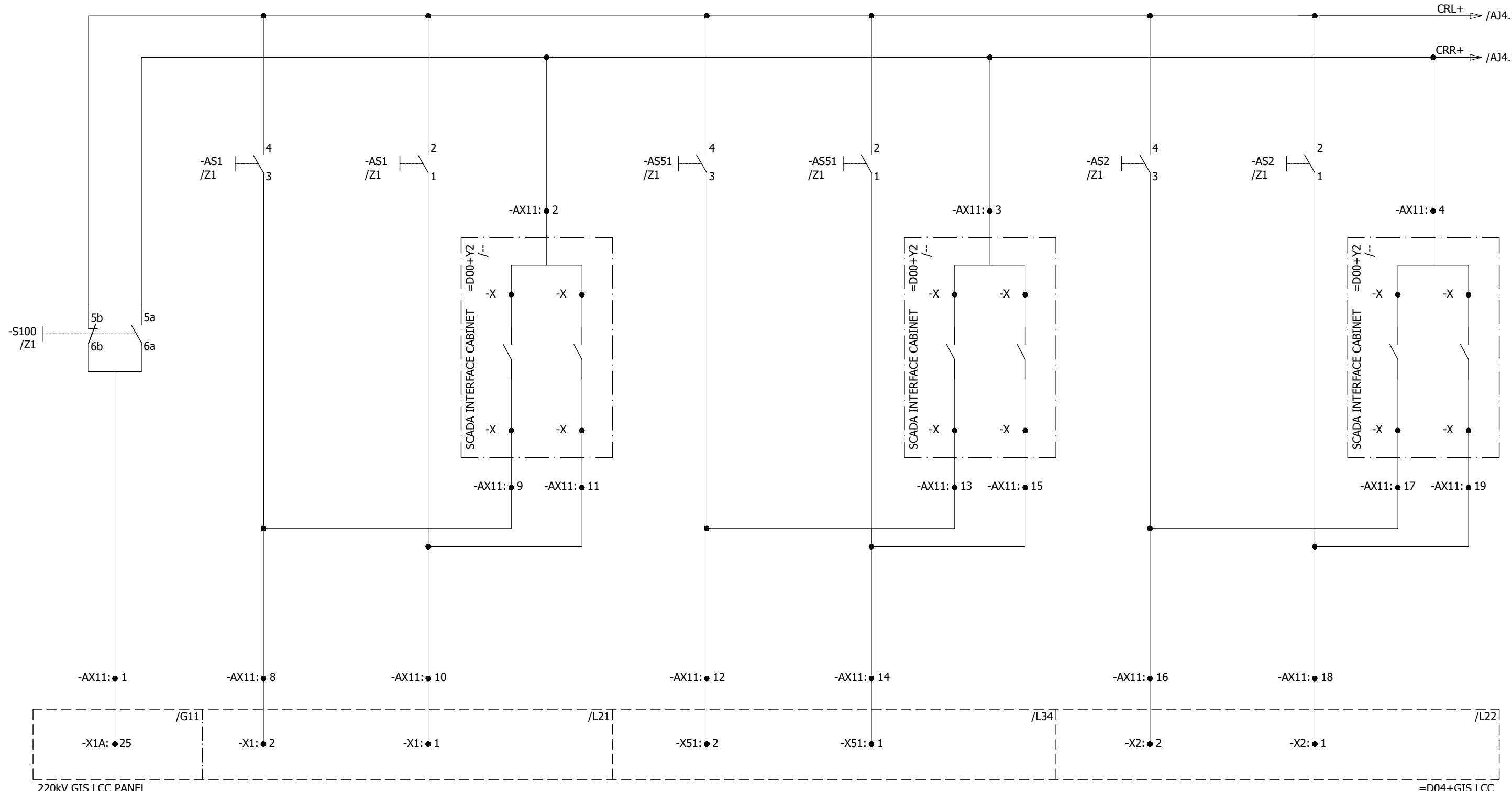
CONTROL PANEL CLOSE
COMMAND TO CIRCUIT BREAKERCONTROL PANEL OPENING
COMMAND TO CIRCUIT BREAKER

0	AS BUILT		22.11.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.		
REV.	DESCRIPTION		DATE	DRAWER	EPE SOL 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 (=D09+C5) CIRCUIT BREAKER OPENING/CLOSING CIRCUIT	P-60194	BJ2	Sheet no. 28
1	1		2	3	4	5	6	7	8			

220KV ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

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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



0	AS BUILT	22.11.2018	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 (=D09+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

OPEN

SCADA OPERATION

LOCAL OPERATION

SCADA OPERATION

LOCAL OPERATION

SCADA OPERATION

CLOSE

OPEN

CLOSE

OPEN

CLOSE

OPEN

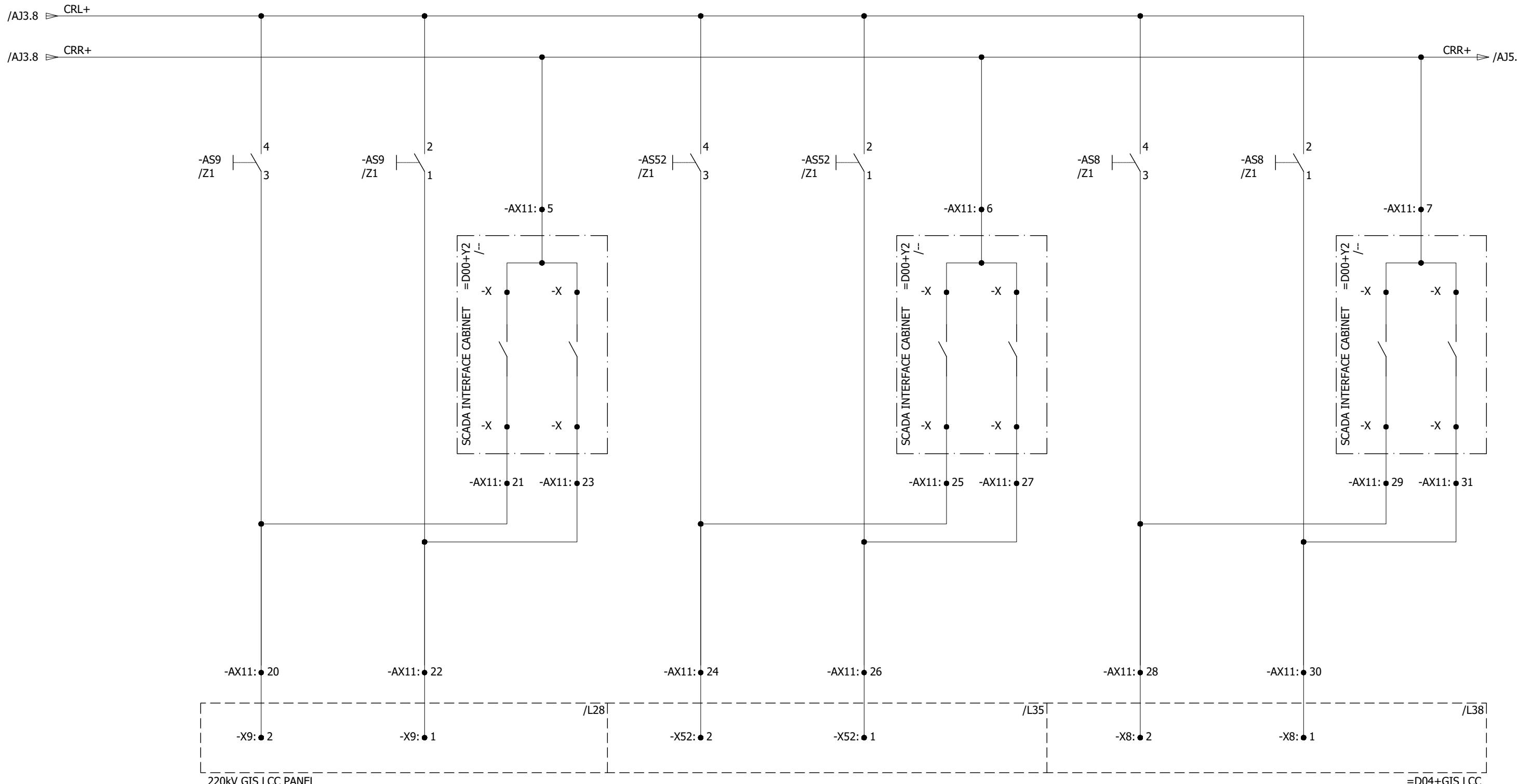
CLOSE

OPEN

CLOSE

OPEN

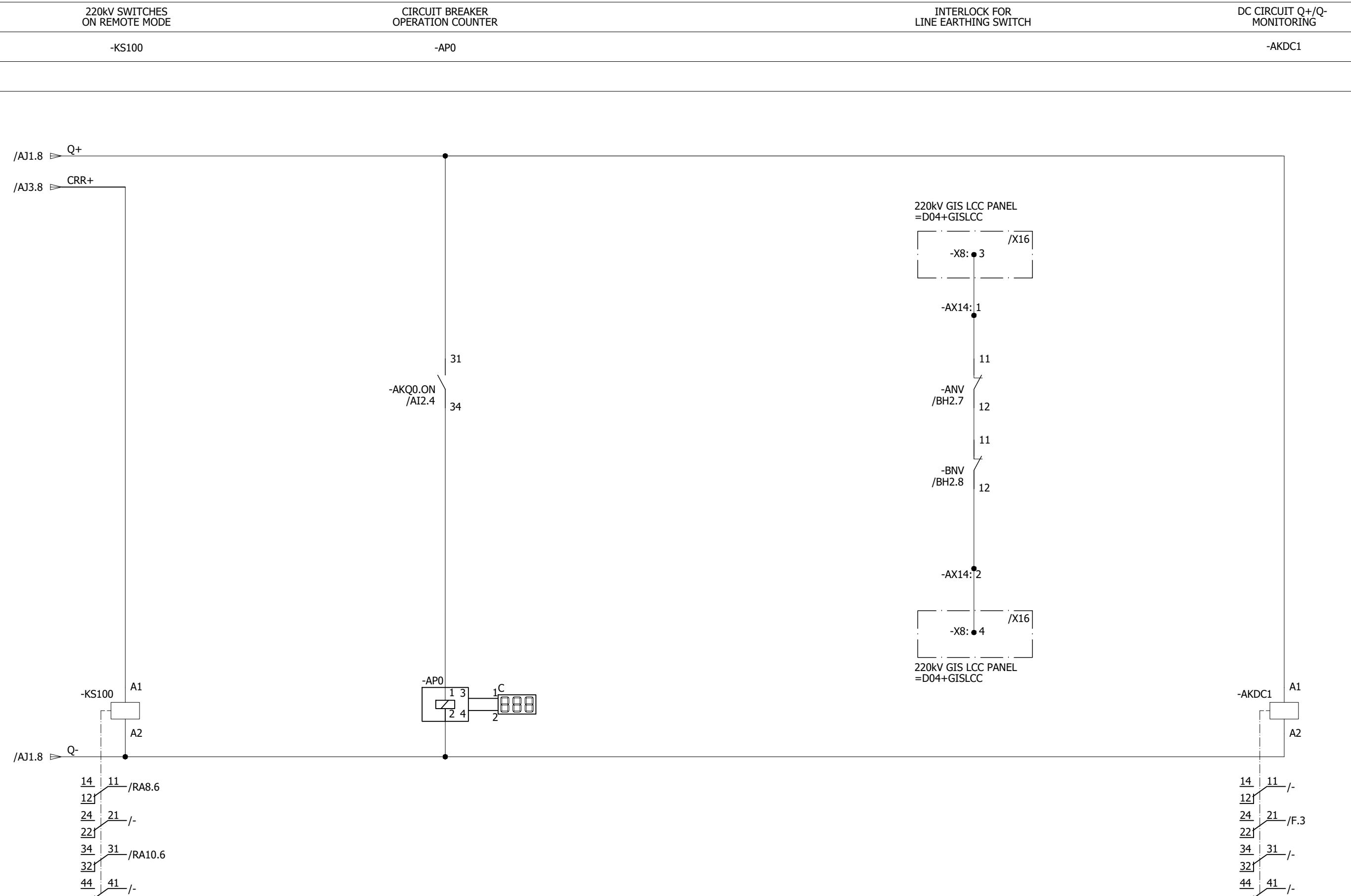
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0	AS BUILT	22.11.2018	ASJ	Manufacturer EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor GE Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D09+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

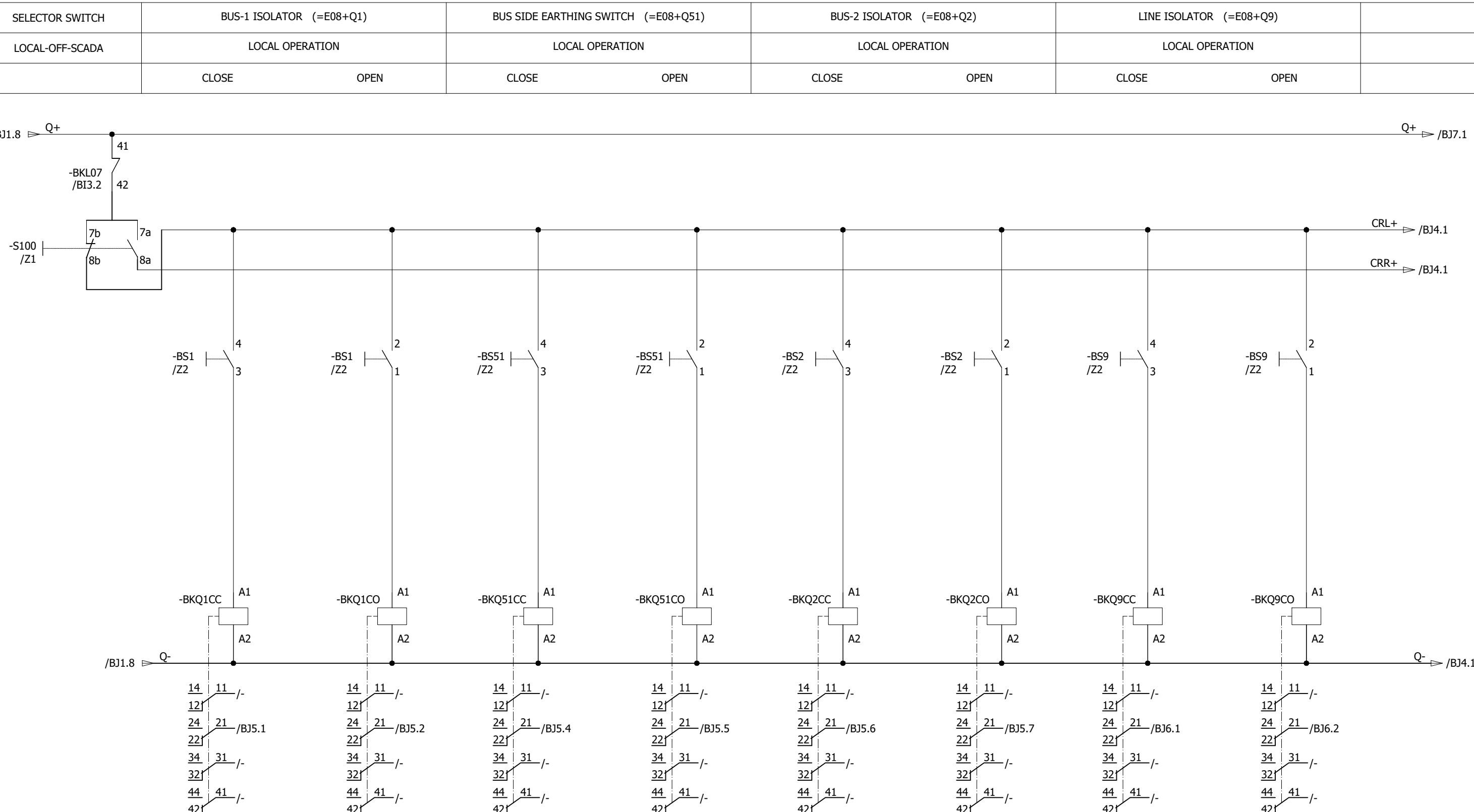
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0	AS BUILT	22.11.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D09+C5) CONTROL CIRCUIT	Drawing no. P60194-E-DTC-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type AJ5	Sheet no. 31
1	2	3	4	5	6	7	8				

132kV ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

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0	AS BUILT	22.11.2018	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 (=D09+C5) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type BJ3
								Sheet no. 32	

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

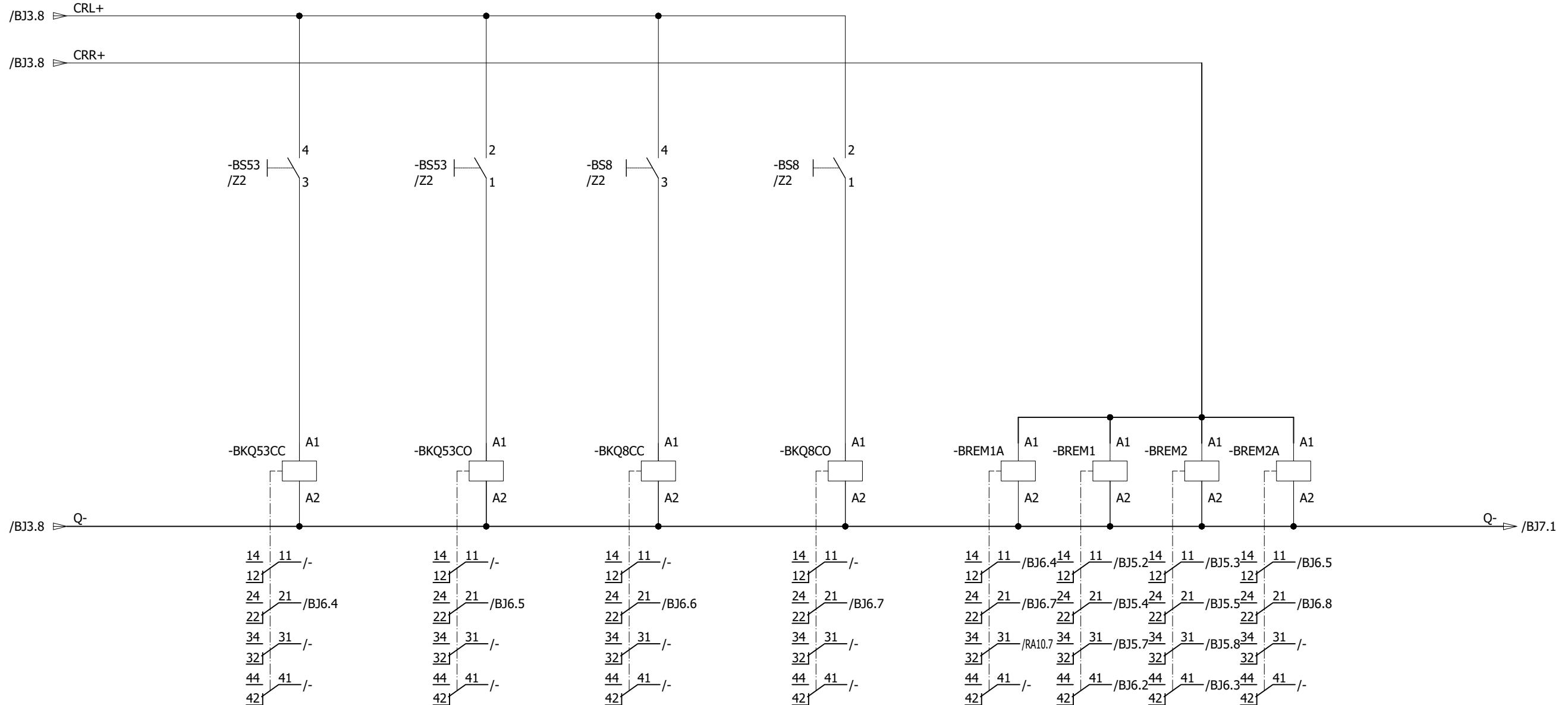
CLOSE

OPEN

CLOSE

OPEN

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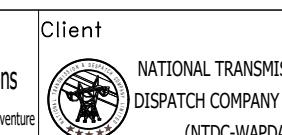
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0	AS BUILT	22.11.2018	ASJ
REV.	DESCRIPTION	DATE	DRAWER



Project
220/132KV GIS SUBSTATION
GHAZI ROAD, LAHORE

Title
220/132KV TRANSFORMER CONTROL PANEL
(=D09+C5)
ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT'

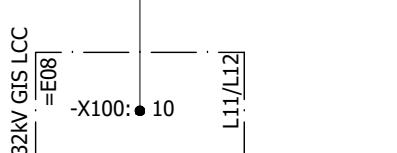
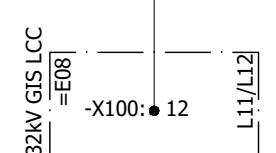
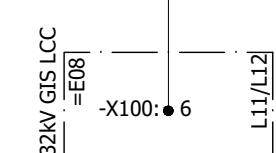
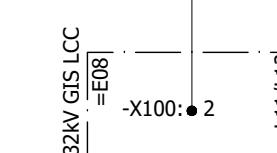
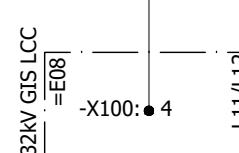
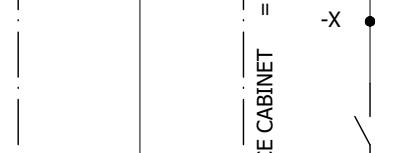
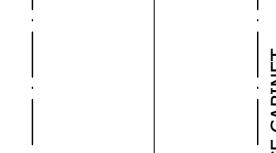
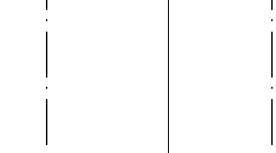
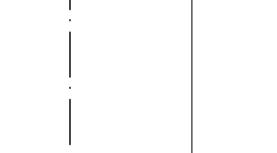
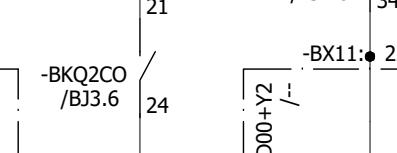
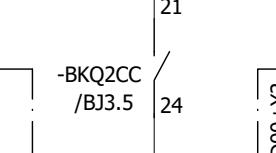
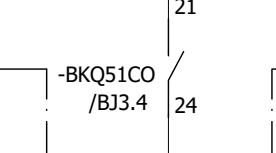
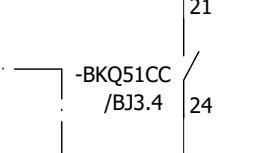
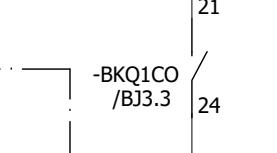
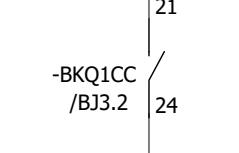
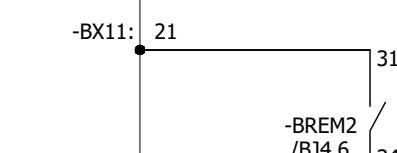
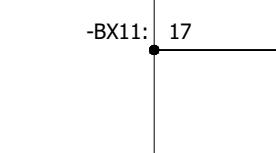
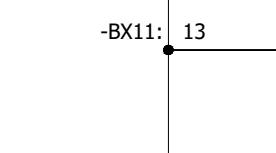
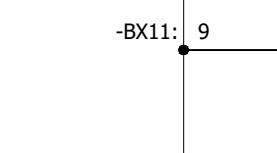
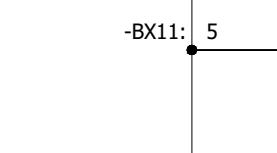
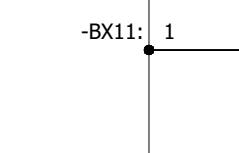
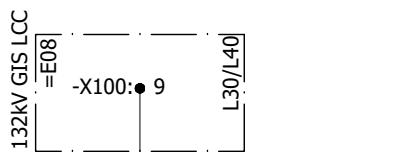
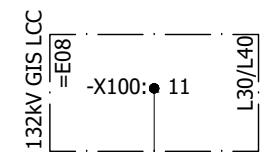
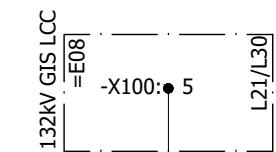
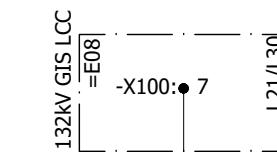
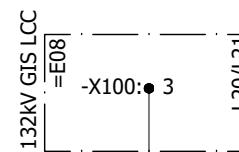
Drawing no.
P60194-E-DTC-SC-003

Project no. P-60194	Sheet type BJ4	Sheet no. 33
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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

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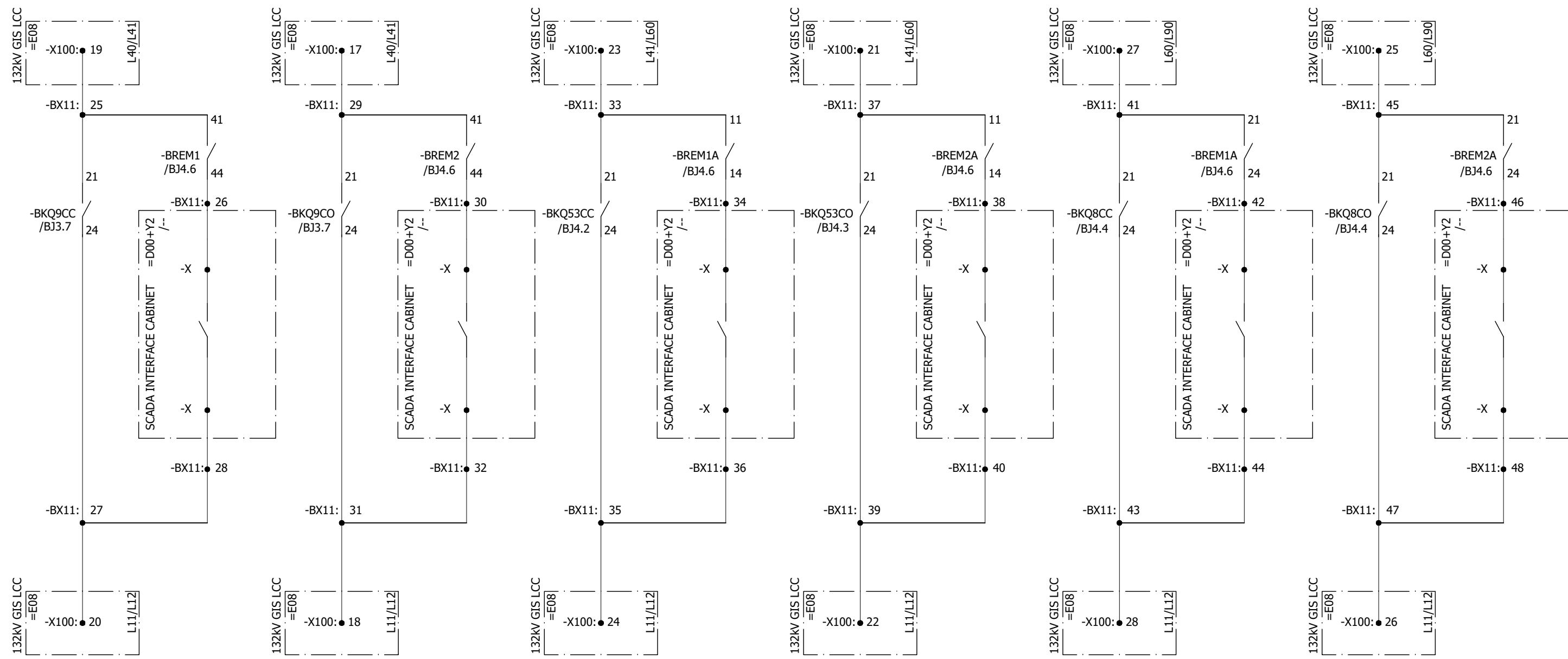
RR

RR

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

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0	AS BUILT	22.11.2018	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 (=D09+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
1	2	3	4	5	6	7	8		

132kV CONTROL CIRCUIT

CIRCUIT BREAKER
OPERATION COUNTER

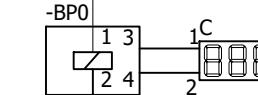
-BPO

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

-BKDC1

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/BJ3.8 ➔ Q+

31
-BKQ0.ON
/BI1.1
34

/BJ4.7 ➔ Q-

132kV GIS LCC PANEL
=E08+GISLCCP20/R10
-XIT: •31

-BX14: 1

21
-ANV
/BH2.722
-BNV
/BH2.821
-BX14: 222
P20/R10
-XIT: •32132kV GIS LCC PANEL
=E08+GISLCC

A1

A2

11 /-

12 /-

21 /F.7

22 /-

31 /-

32 /-

41 /-

42 /-

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0	AS BUILT	22.11.2018	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 (=D09+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

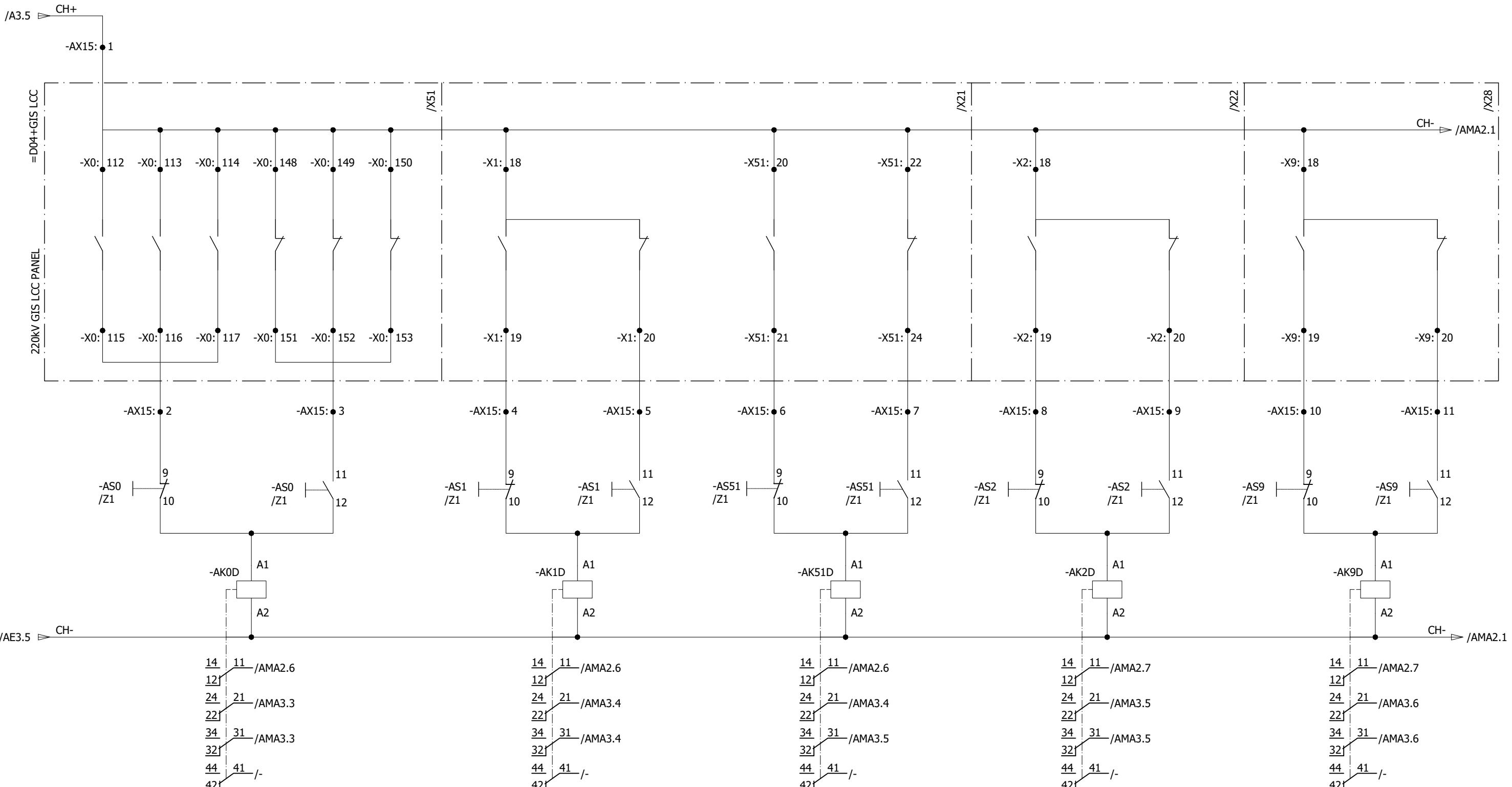
-Q1

-Q51

-Q2

-Q9

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0	AS BUILT		22.11.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  GE Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D09+C5) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DTC-SC-003		
REV.	DESCRIPTION		DATE	DRAWER						Project no. P-60194	Sheet type AMA1	Sheet no. 37
1	2	3	4	5	6	7	8					

220KV DISCREPANCY CHECK CIRCUIT

LINE SIDE EARTHING SWITCH

HIGH SPEED EARTHING SWITCH

FLASHER RELAY
INITIATION

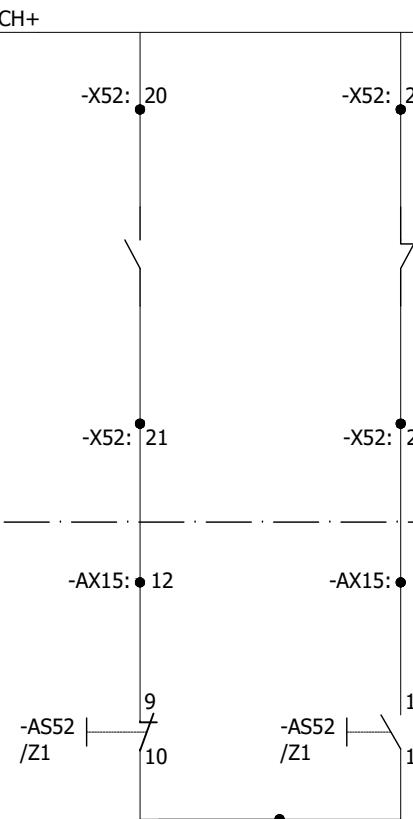
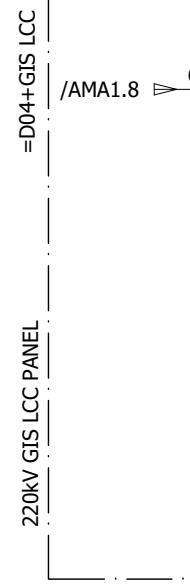
-Q52

-Q8

-AKFL

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220KV GIS LCC PANEL



-AX15: 16

-X8: 18

-X8: 20

-X8: 19

-X8: 21

-AX15: 12

-AX15: 13

-AX15: 14

-AX15: 15

-X52: 20

-X52: 22

-X52: 24

-X52: 21

-AS52

/Z1

-AS8

/Z1

-AK52D

A1

-AK8D

A1

-AKFL

1

2

NO

C

/AMA3.2

NC

-

-

-X52: 21

-X52: 23

-X52: 25

-X52: 26

-AS52

/Z1

-AS8

/Z1

-AK52D

A1

-AK8D

A1

-AKFL

1

2

NO

C

/AMA3.2

NC

-

-

-X52: 22

-X52: 24

-X52: 26

-X52: 27

-AS52

/Z1

-AS8

/Z1

-AK52D

A1

-AK8D

A1

-AKFL

1

2

NO

C

/AMA3.2

NC

-

-

-X52: 23

-X52: 25

-X52: 27

-X52: 28

-AS52

/Z1

-AS8

/Z1

-AK52D

A1

-AK8D

A1

-AKFL

1

2

NO

C

/AMA3.2

NC

-

-

-X52: 24

-X52: 26

-X52: 28

-X52: 29

-AS52

/Z1

-AS8

/Z1

-AK52D

A1

-AK8D

A1

-AKFL

1

2

NO

C

/AMA3.2

NC

-

-

-X52: 25

-X52: 27

-X52: 29

-X52: 30

-AS52

/Z1

-AS8

/Z1

-AK52D

A1

-AK8D

A1

-AKFL

1

2

NO

C

/AMA3.2

NC

-

-

-X52: 26

-X52: 28

-X52: 30

-X52: 31

-AS52

/Z1

-AS8

/Z1

-AK52D

A1

-AK8D

A1

-AKFL

1

2

NO

C

/AMA3.2

NC

-

-

-X52: 27

-X52: 29

-X52: 31

-X52: 32

-AS52

/Z1

-AS8

/Z1

-AK52D

A1

-AK8D

A1

-AKFL

1

2

NO

C

/AMA3.2

NC

-

-

-X52: 28

-X52: 30

-X52: 32

-X52: 33

-AS52

/Z1

-AS8

/Z1

-AK52D

A1

-AK8D

A1

-AKFL

1

2

NO

C

/AMA3.2

NC

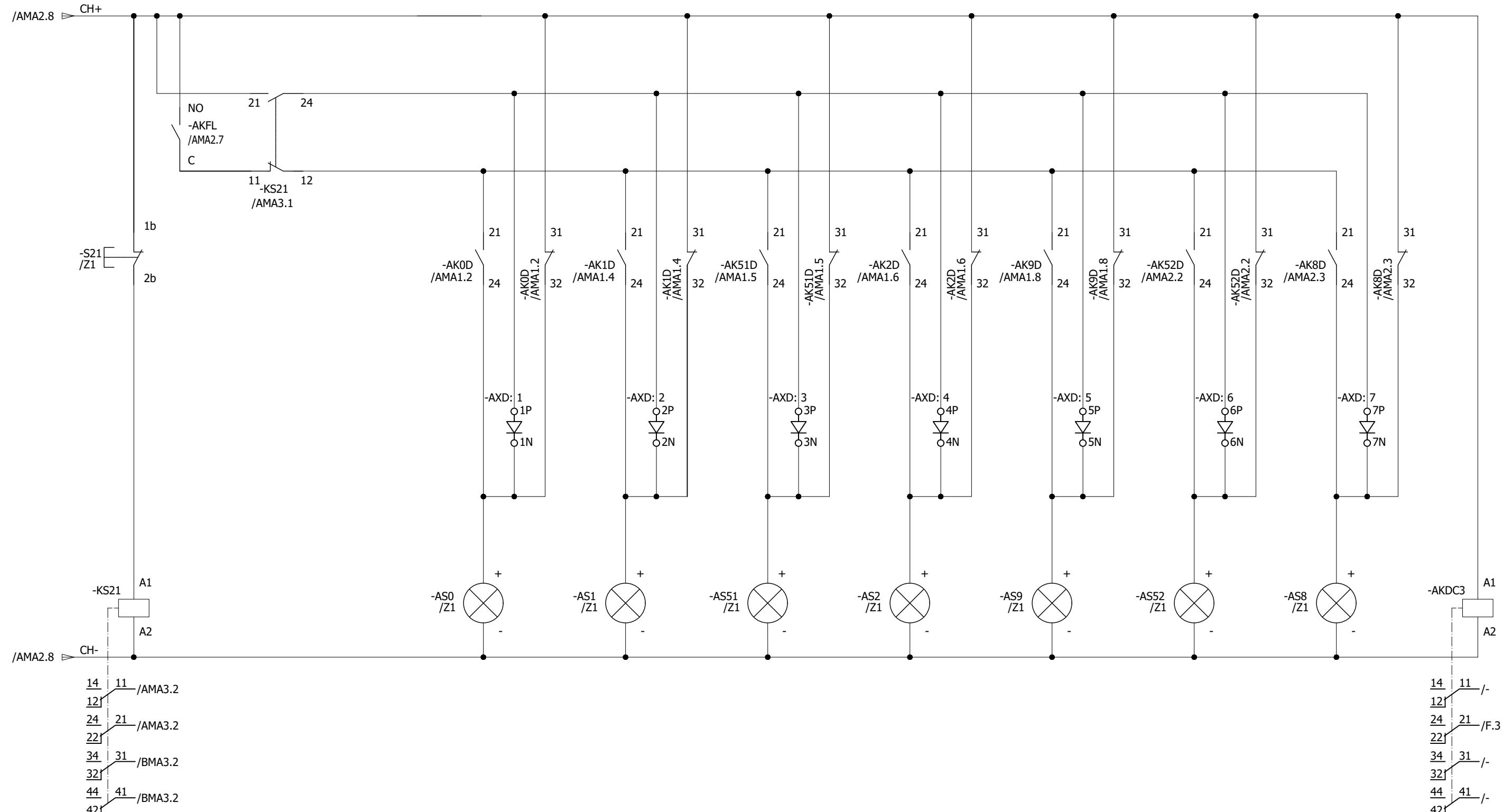
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220KV DISCREPANCY CHECK CIRCUIT

	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

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0	AS BUILT	22.11.2018	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 (=D09+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

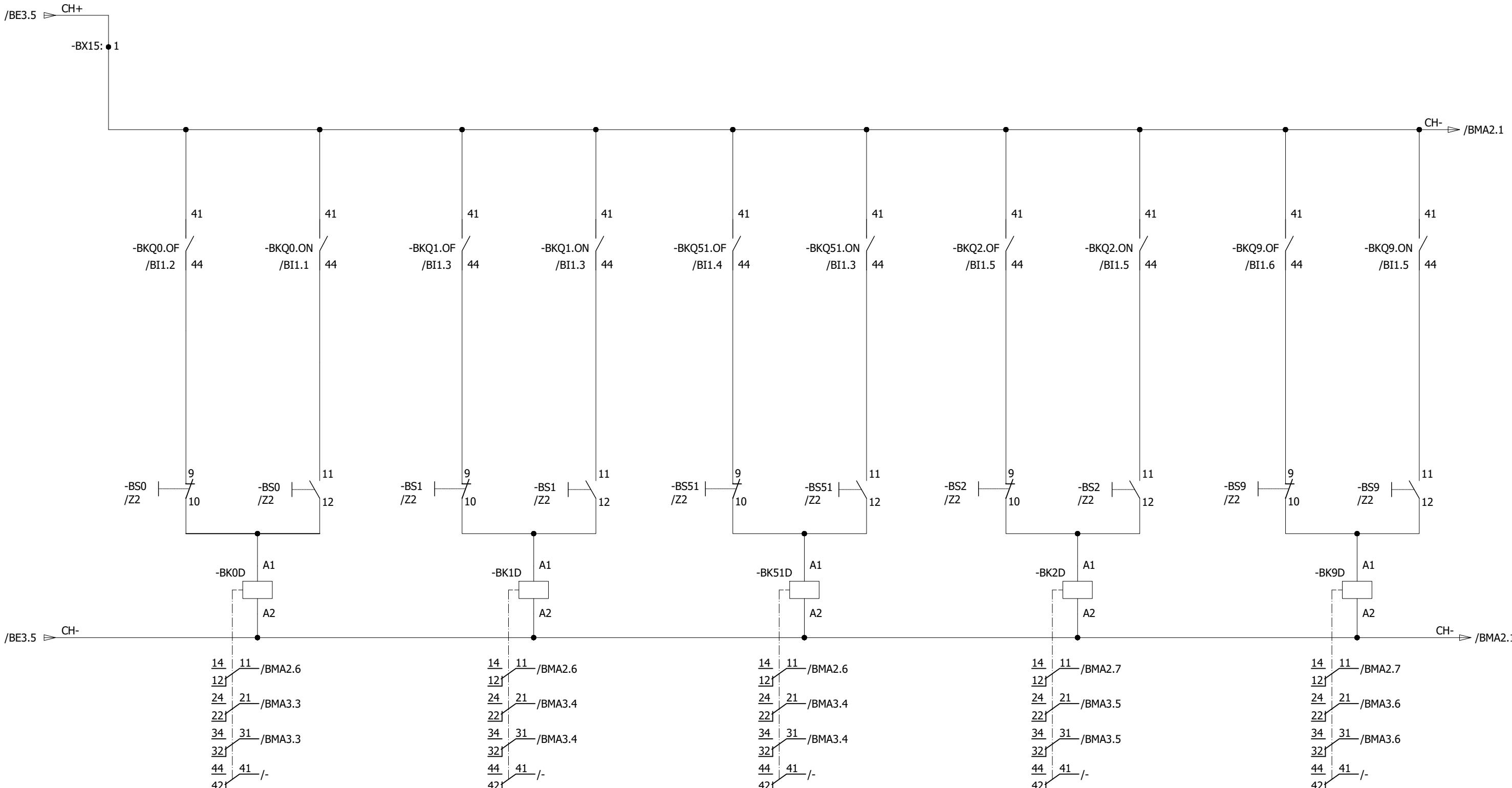
-Q1

-Q51

-Q2

-Q9

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0	AS BUILT	22.11.2018	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 (=D09+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

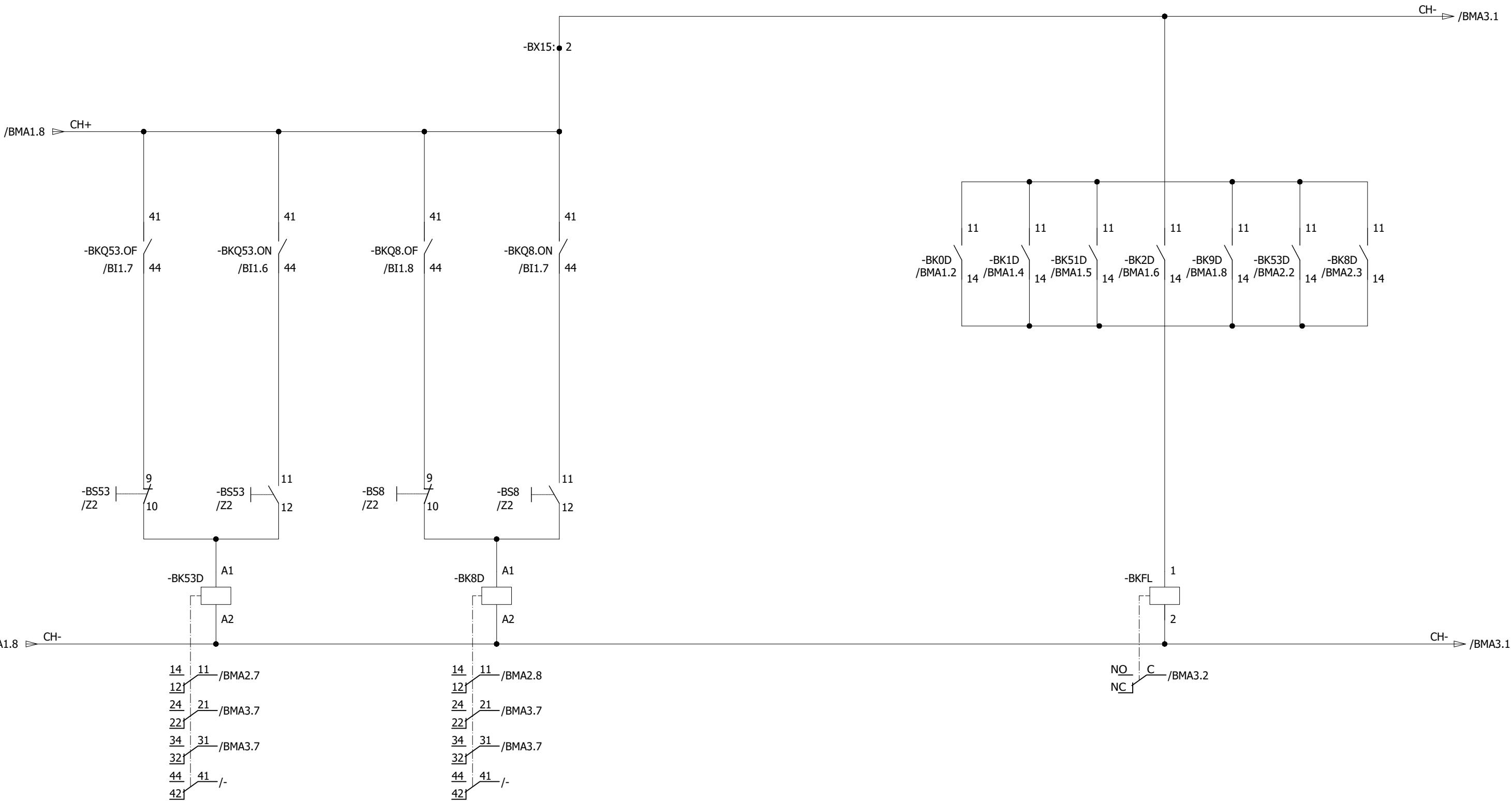
FLASHER RELAY
INITIATION

-Q53

-Q8

-BKFL

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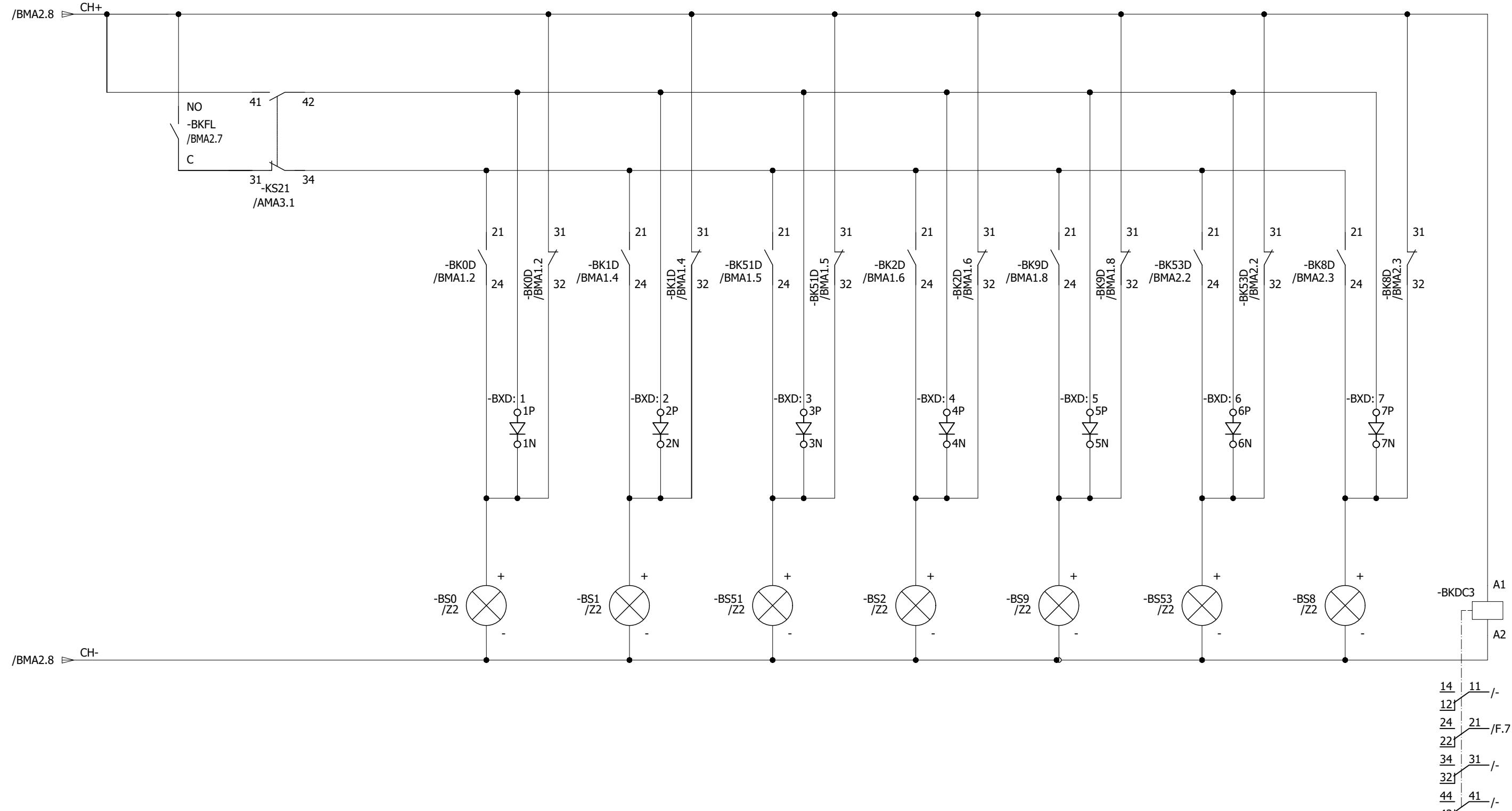


0	AS BUILT	22.11.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
REV.	DESCRIPTION	DATE	DRAWER	EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	220/132kV TRANSFORMER CONTROL PANEL (=D09+C5) DISCREPANCY CHECK CIRCUIT	P-60194-E-DTC-SC-003
									Project no. P-60194 Sheet type BMA2 Sheet no. 41

132KV DISCREPANCY CHECK CIRCUIT

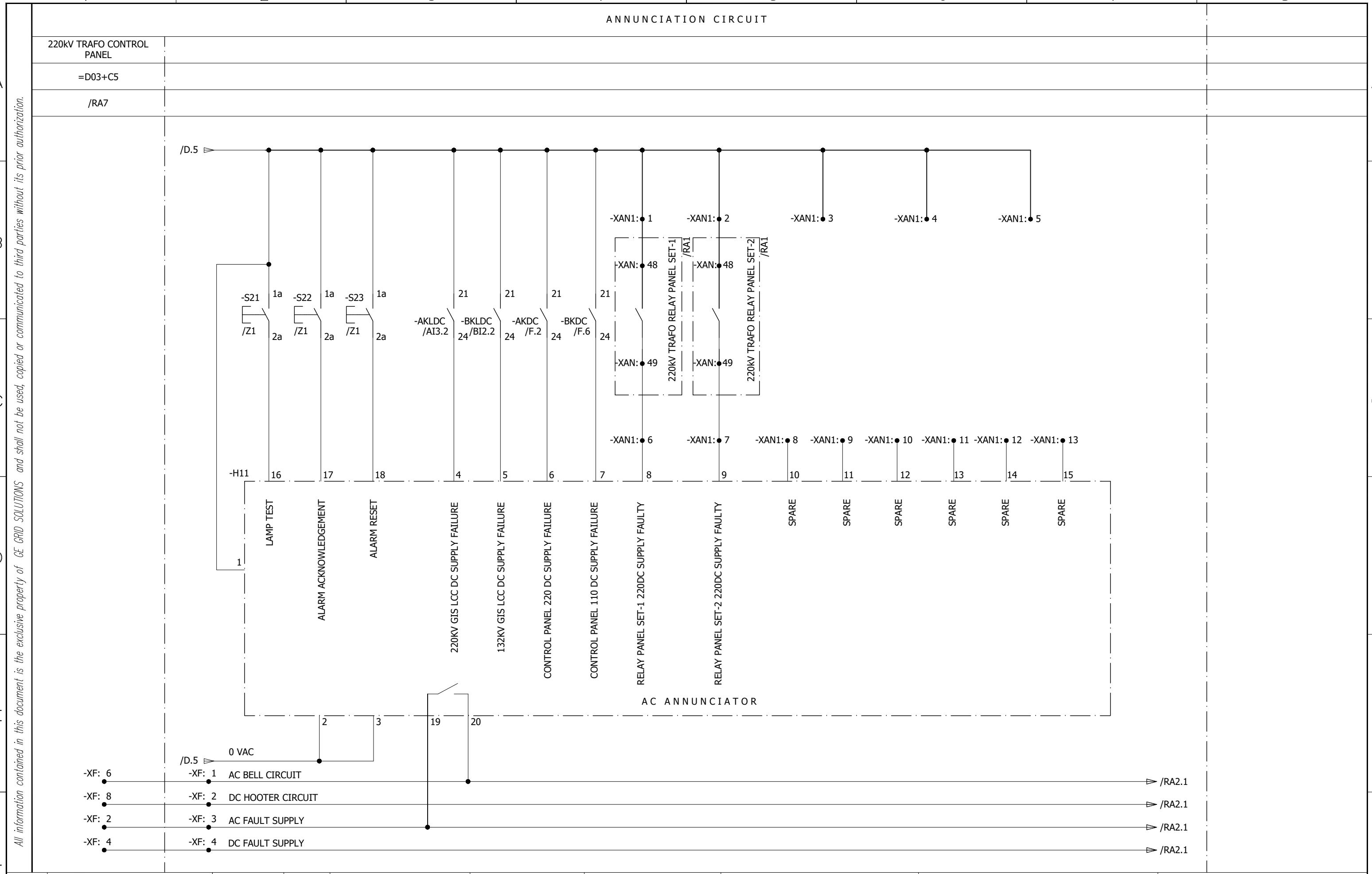
	DISCREPANCY IN CIRCUIT BREAKER	DISCREPANCY IN BUS-1 ISOLATOR	DISCREPANCY IN BUS SIDE EARTHING SW.	DISCREPANCY IN BUS-2 ISOLATOR	DISCREPANCY IN LINE ISOLATOR	DISCREPANCY IN LINE SIDE EARTHING SW.	DISCREPANCY IN LINE EARTHING SW.	DC CIRCUIT CH+/CH- MONITORING
	-Q0	-Q1	-Q51	-Q2	-Q9	-Q52	-Q8	-BKDC3

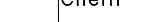
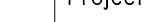
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Project no.	Sheet type	Sheet no.
P-60194	BMA3	42

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0	AS BUILT	22.11.2018	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 GAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D09+C5) AC ANNUNCIATIONS	Drawing no. P60194-E-DTC-SC-003		
									Project no. P-60194		
									Sheet type RA1		Sheet no. 43
REV.	DESCRIPTION	DATE	DRAWER								
1	2	3	4	5	6	7	8				

ANNUNCIATION CIRCUIT

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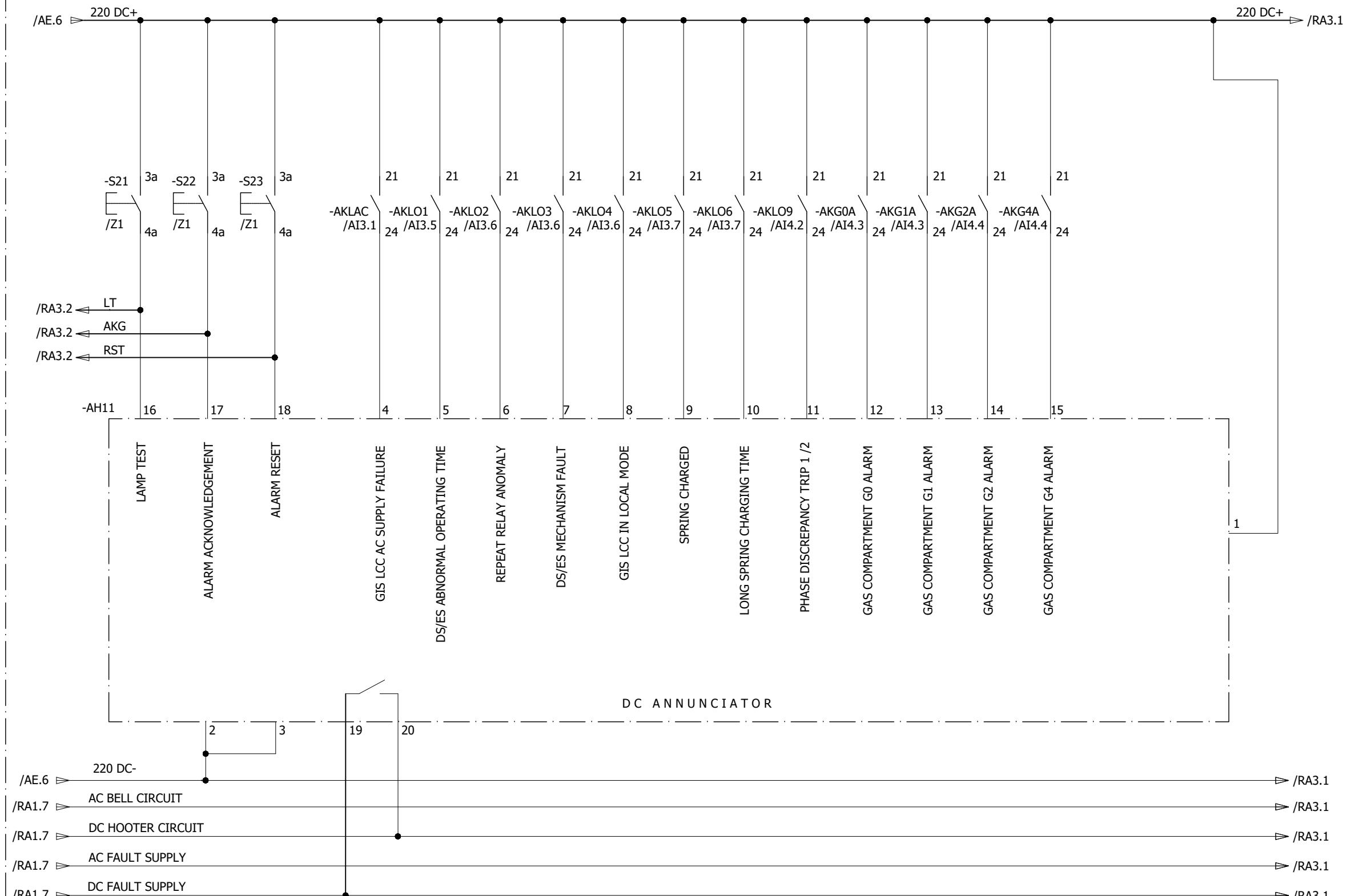
D

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0	AS BUILT	22.11.2018	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 (=D09+C5) DC ANNUNCIATIONS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type RA2
									Sheet no. 44

ANNUNCIATION CIRCUIT

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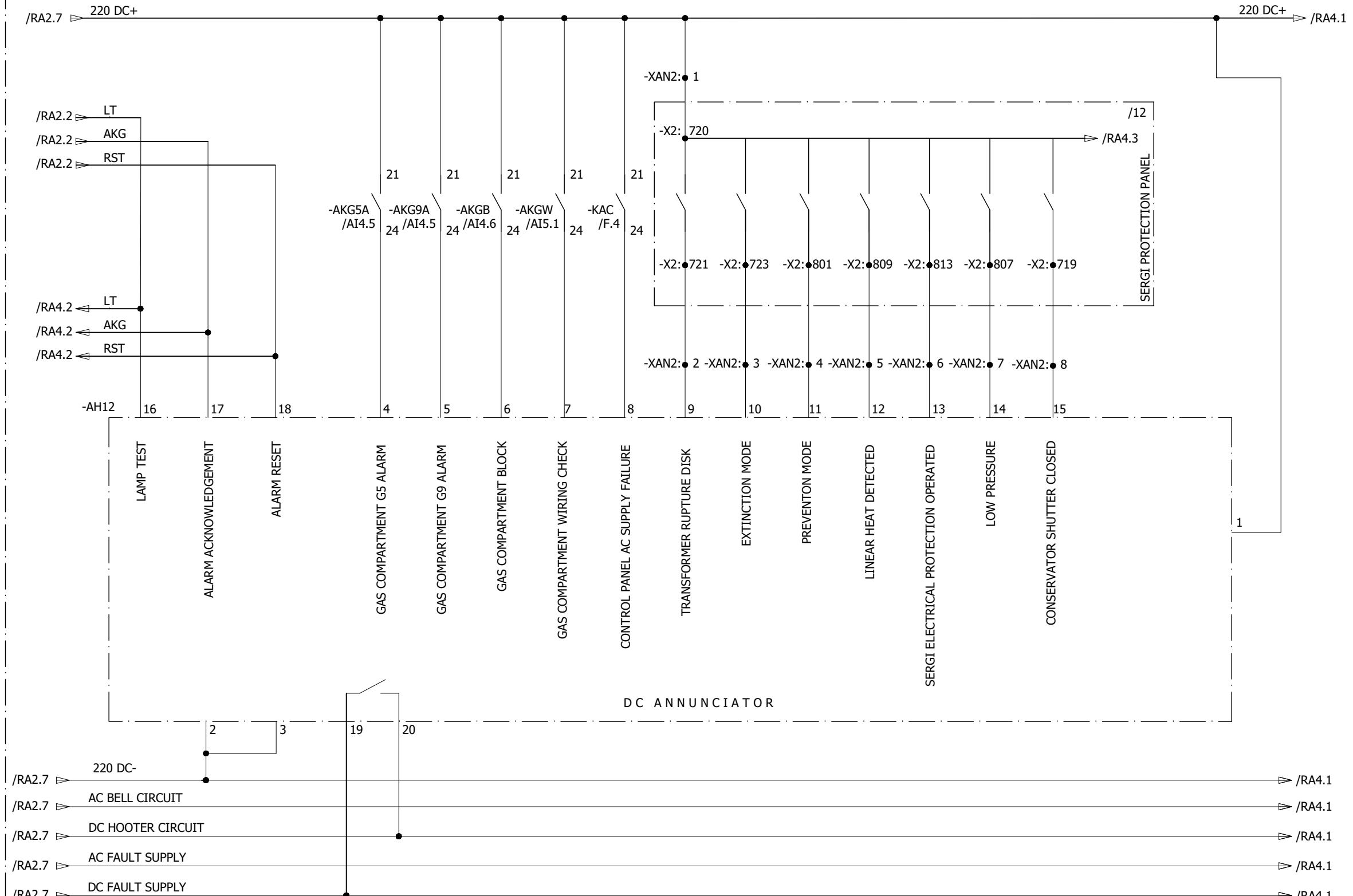
D

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0	AS BUILT	22.11.2018	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 (=D09+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

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A

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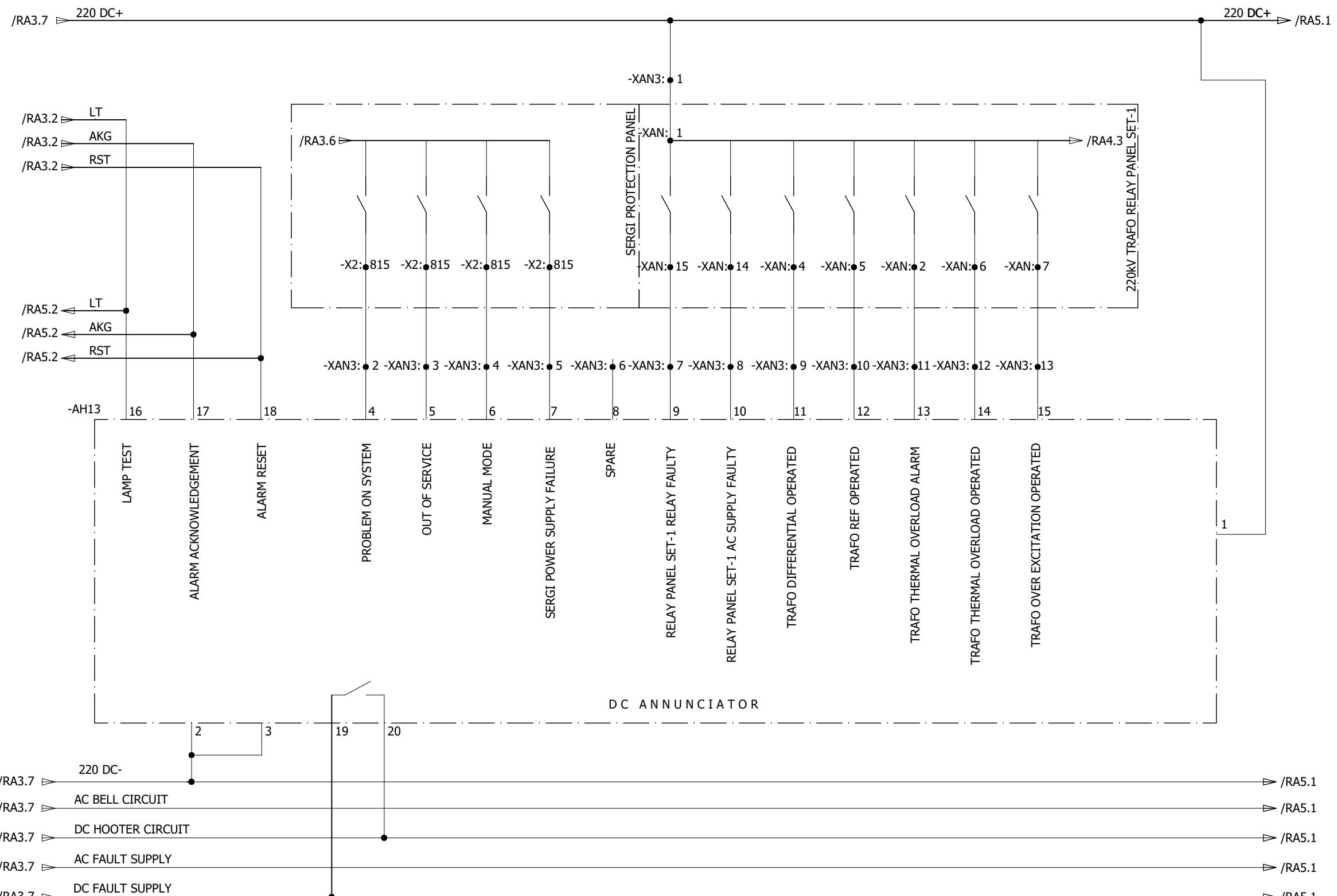
D

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0	AS BUILT	22.11.2018	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 (=D09+C5) DC ANNOUNCEMENTS	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type RA4	Sheet no. 46

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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.

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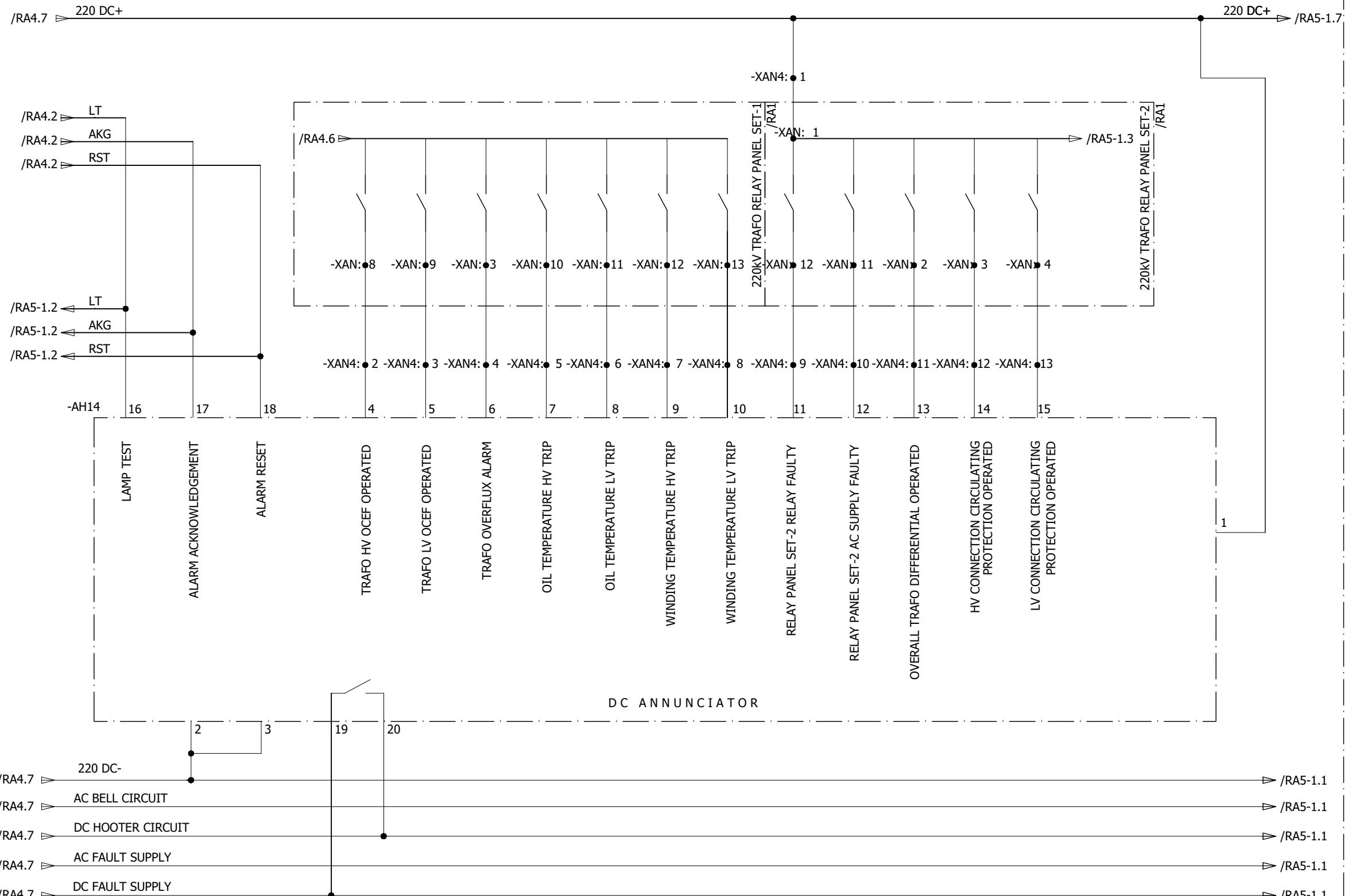
D

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0	AS BUILT	22.11.2018	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 (=D09+C5) DC ANNOUNCEMENTS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type RA5
									Sheet no. 47

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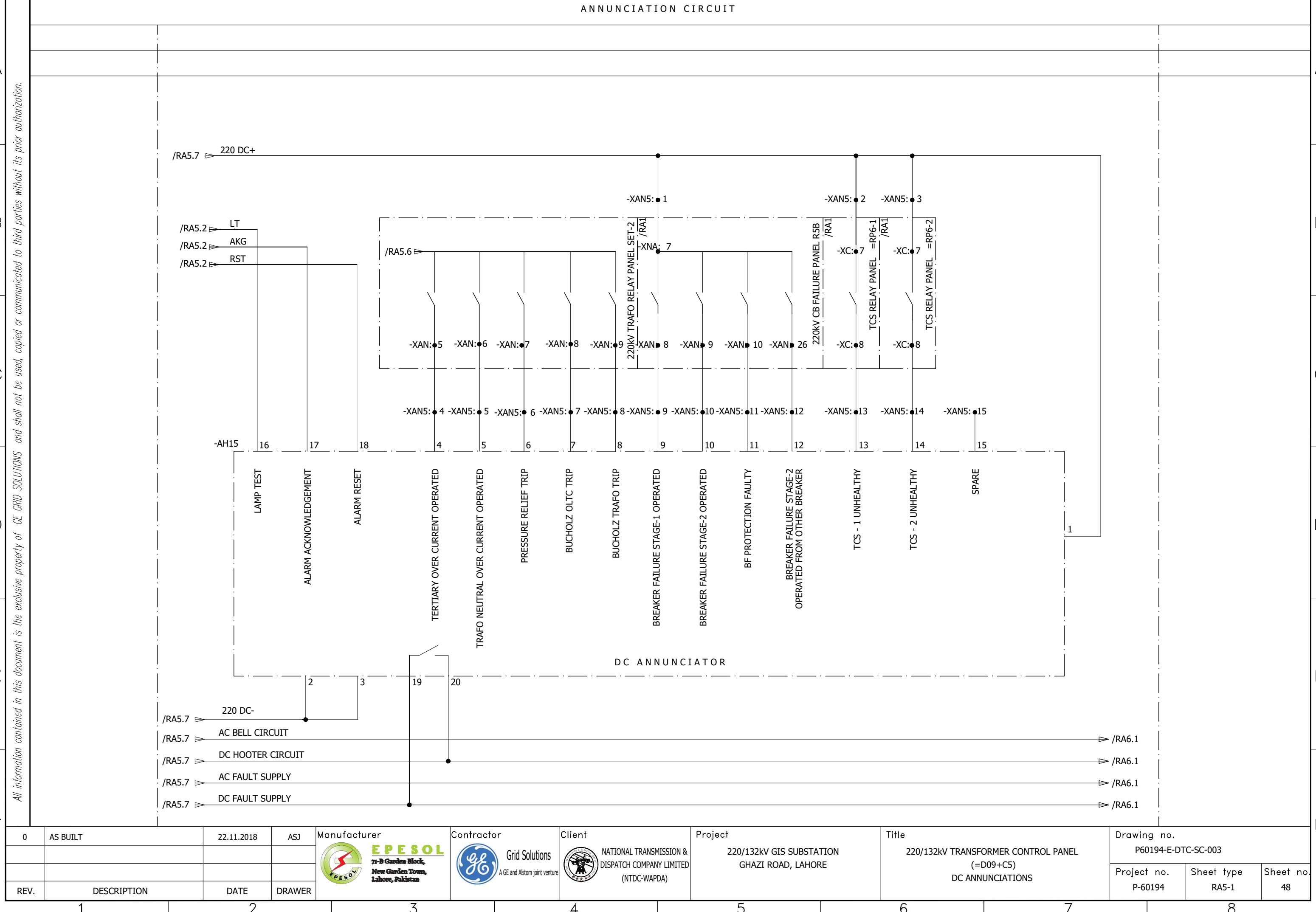
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8

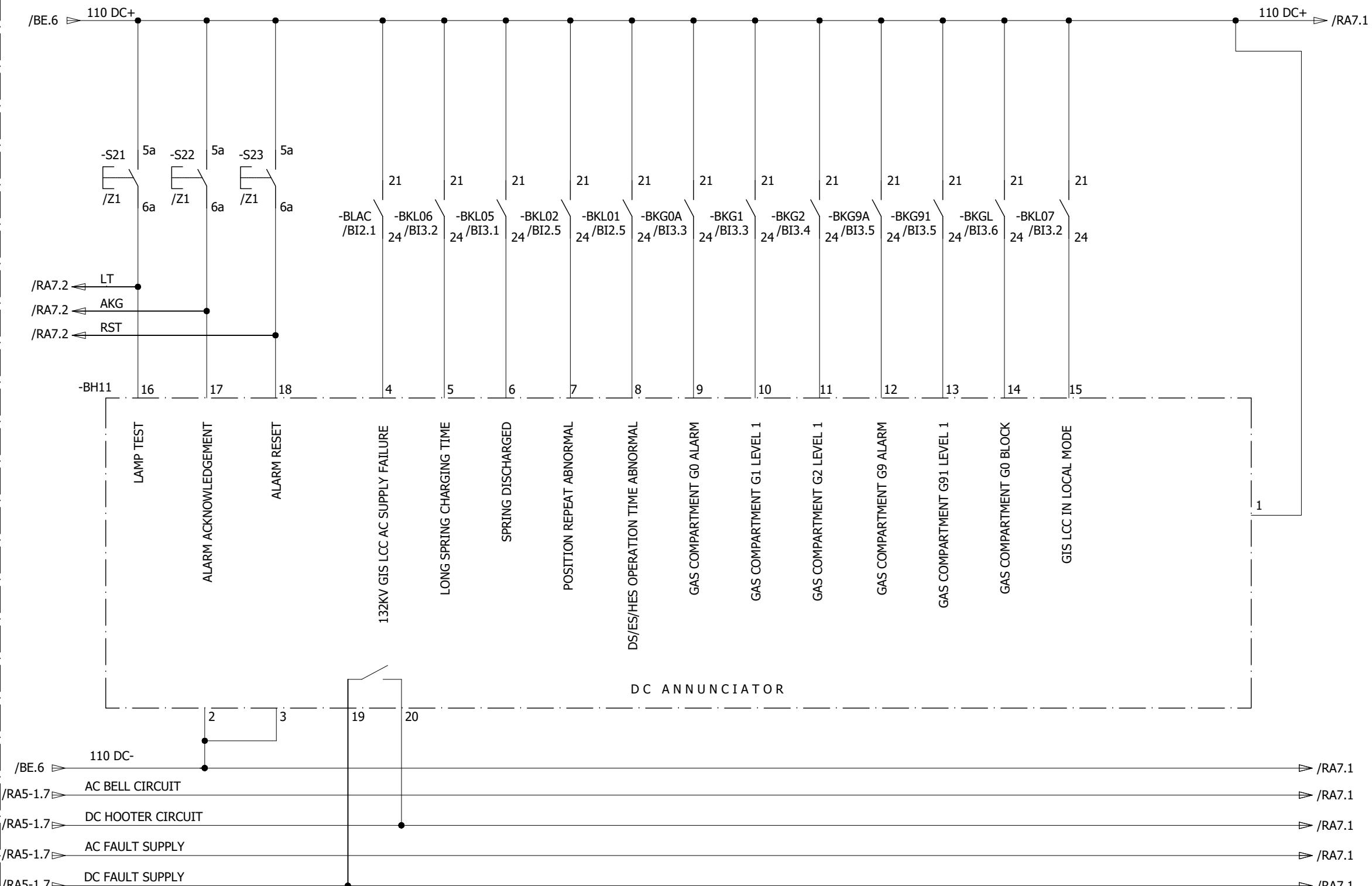
ANNUNCIATION CIRCUIT

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ANNUNCIATION CIRCUIT

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0	AS BUILT	22.11.2018	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 (=D09+C5) DC ANNUNCIATIONS	Drawing no.		
									P60194-E-DTC-SC-003		
									Project no.		
									P-60194	Sheet type	Sheet no.
REV.	DESCRIPTION	DATE	DRAWER						RA6	49	

1

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ANNUNCIATION CIRCUIT

220KV LINE CONTROL
PANEL
=D05+C4
/RA1

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A

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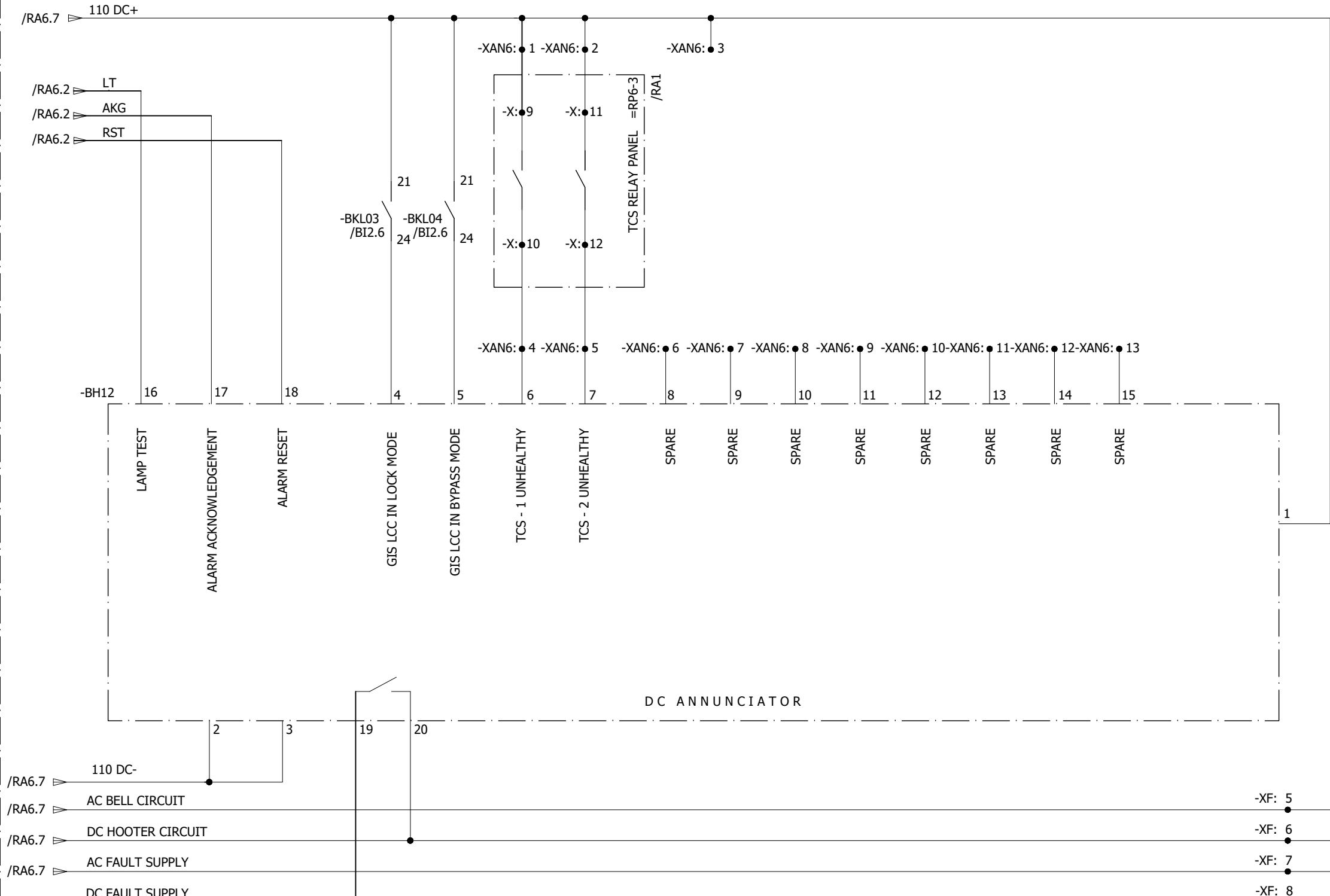
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E

E

F

F



0	AS BUILT	22.11.2018	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 (=D09+C5) DC ANNOUNCEMENTS	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type RA7
									Sheet no. 50

1

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3

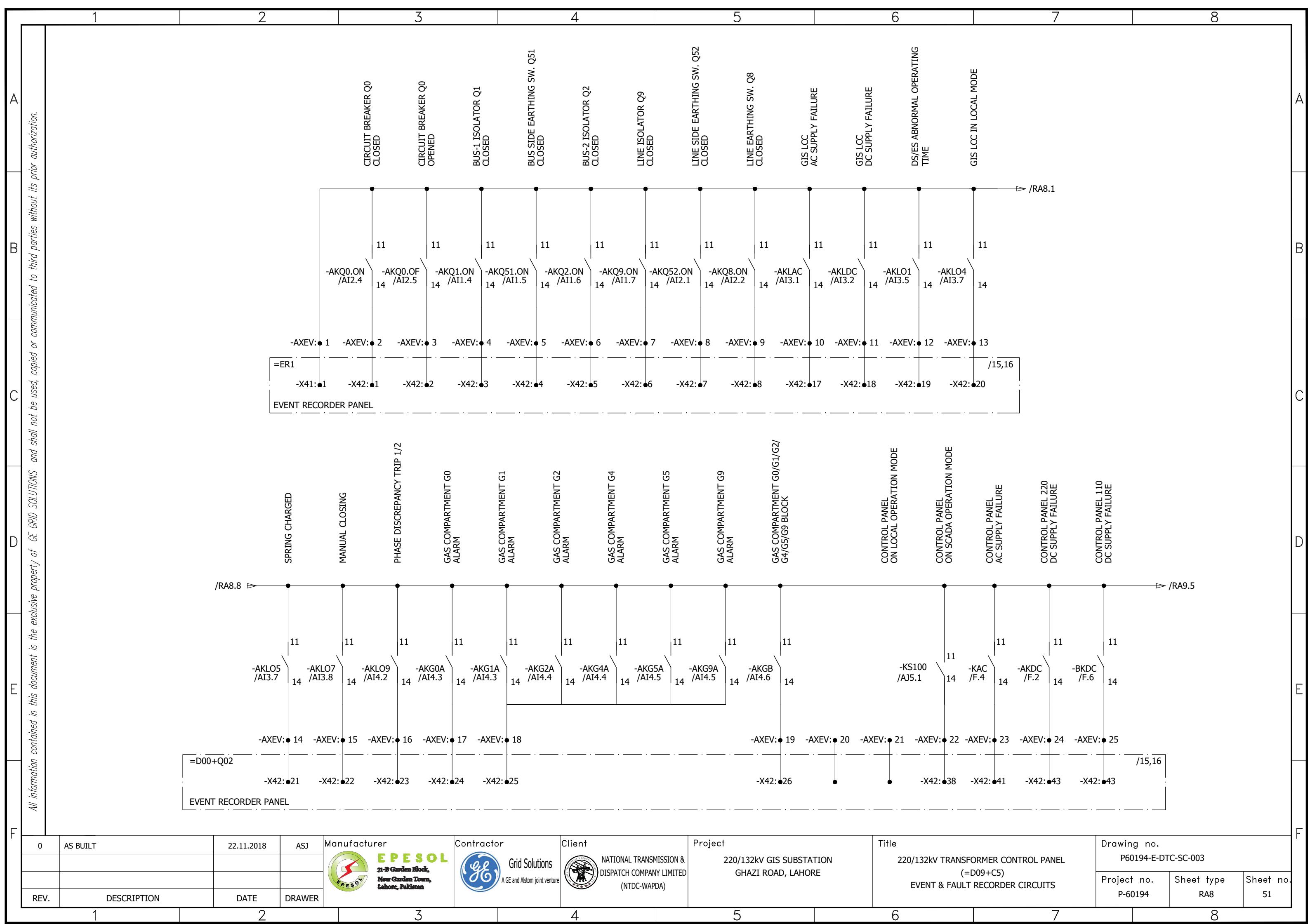
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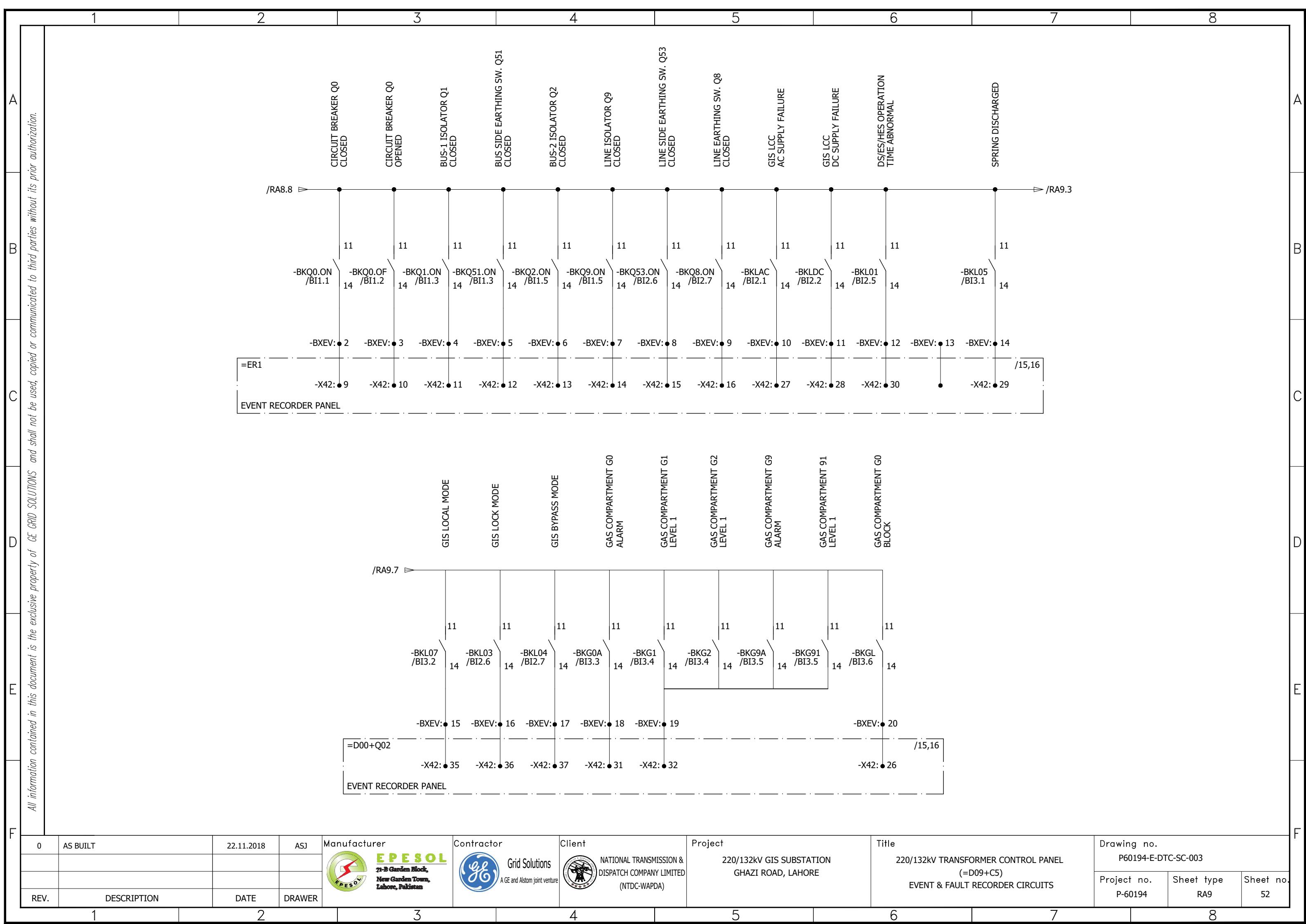
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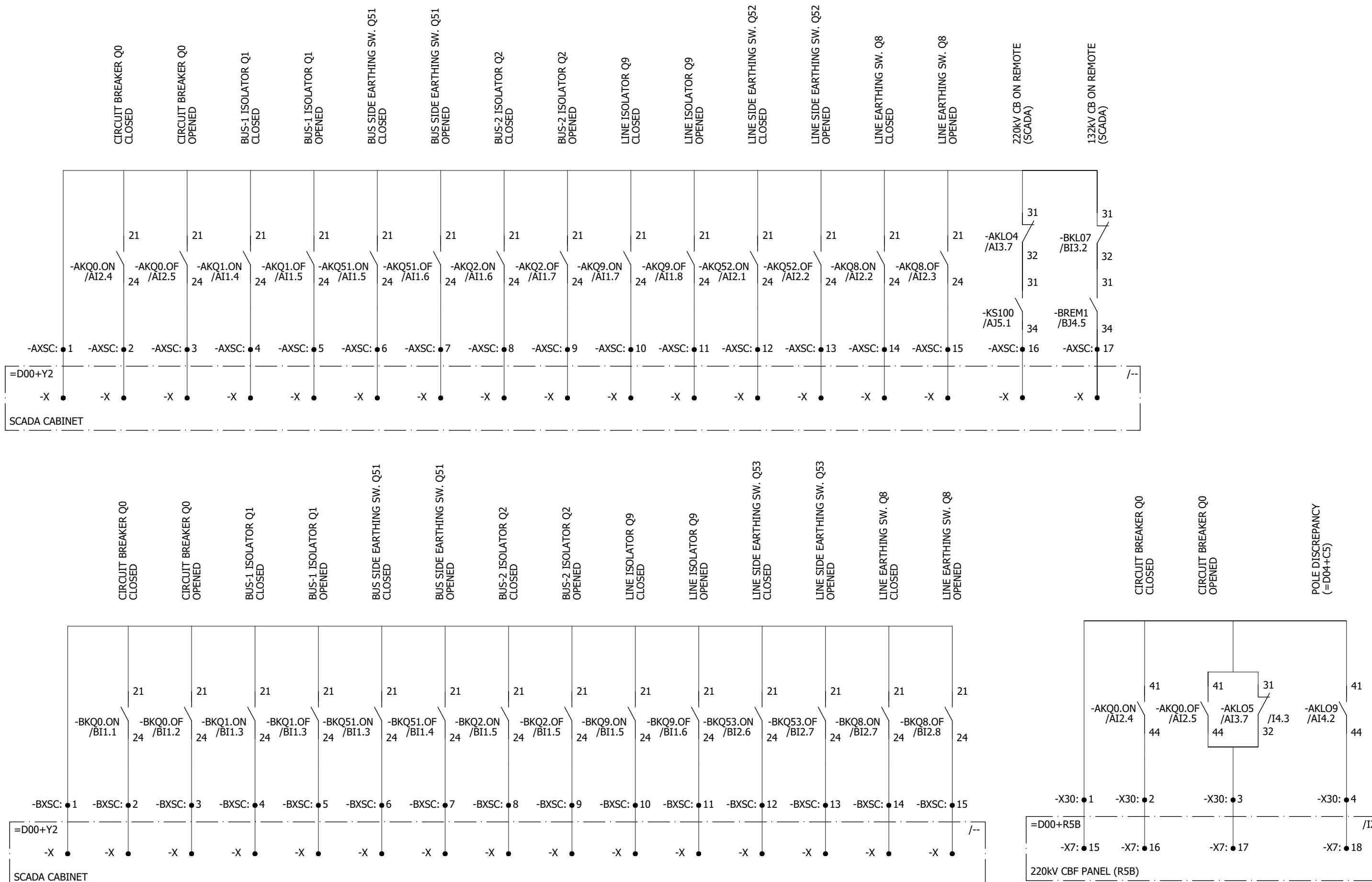
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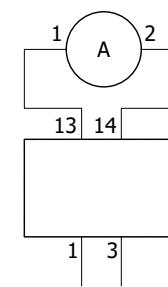


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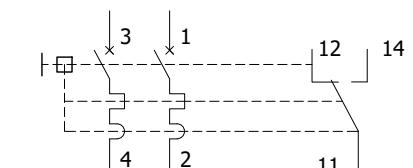
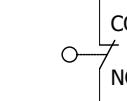
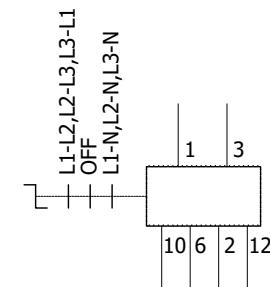
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									Project no. P-60194
									Sheet type RA10
REV.	DESCRIPTION	DATE	DRAWER						Sheet no. 53
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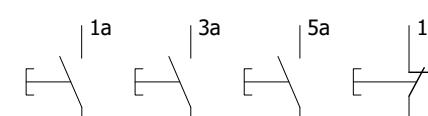


-AP1	AH1.5
-AU1	AH1.5
-AP3	AH1.7
-AU3	AH1.7
-BP1	BH1.5
-BU1	BH1.5
-BP3	BH1.7
-BU3	BH1.7

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



-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

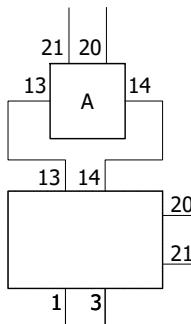


-S21	RA1.2	RA2.2	RA6.2	AMA3.1
-S22	RA1.2	RA2.2	RA6.2	
-S23	RA1.3	RA2.3	RA6.3	

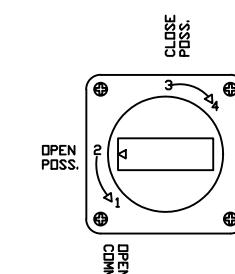
-X100	D.7
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-H100	D.3
-AH200	F.4
-BH200	F.8



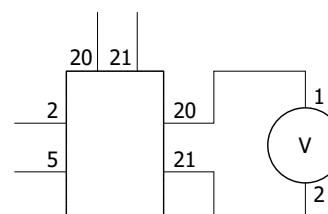
-AP2	AH1.6
-AU2	AH1.6
-BP2	BH1.6
-BU2	BH1.6



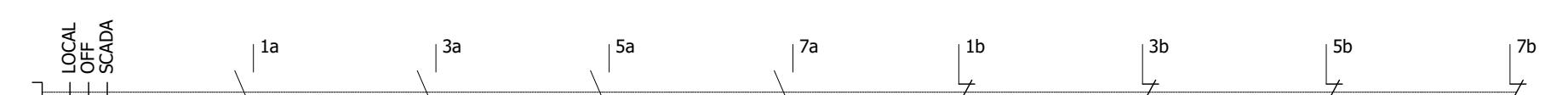
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1	3	5	7	9	11	13	15
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-AS1	AJ3.3	AJ3.2			AMA1.3	AMA1.4			AMA3.3
-AS51	AJ3.5	AJ3.4			AMA1.5	AMA1.6			AMA3.4
-AS2	AJ3.7	AJ3.6			AMA1.6	AMA1.7			AMA3.5
-AS9	AJ4.3	AJ4.2			AMA1.7	AMA1.8			AMA3.7
-AS52	AJ4.5	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
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0	AS BUILT	22.11.2018	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 (=D09+C5) COMPONENT DIAGRAM	Drawing no. P60194-E-DTC-SC-003		
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194	Sheet type Z1	Sheet no. 54
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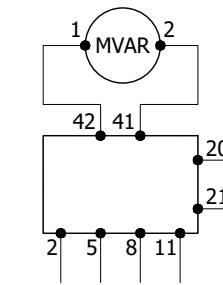
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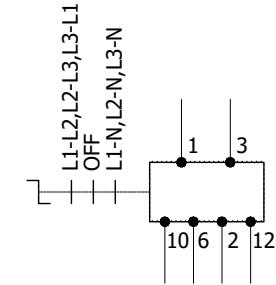
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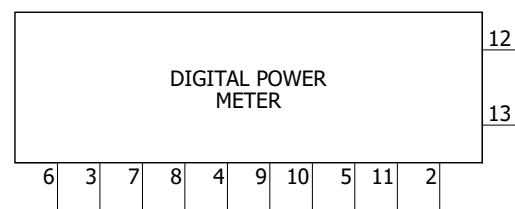
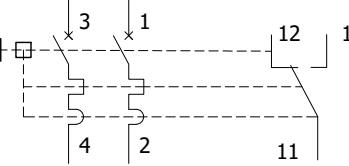
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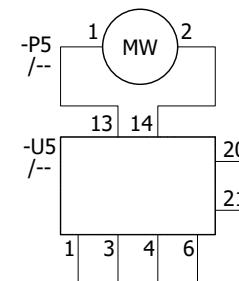
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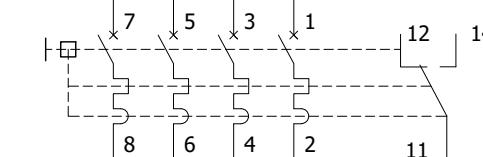
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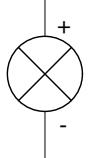
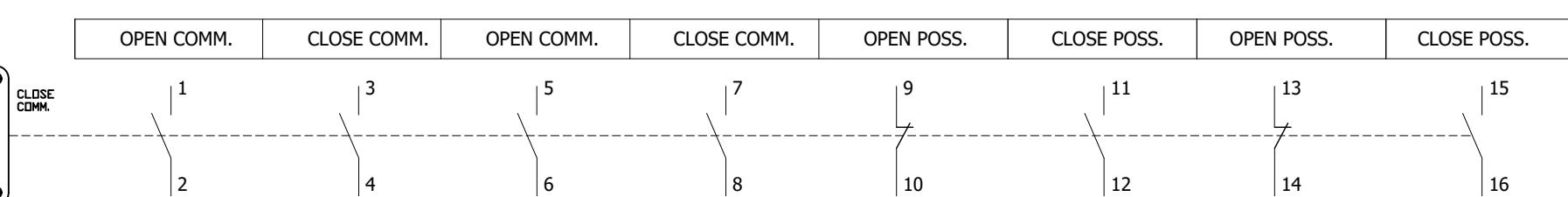
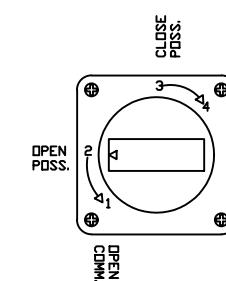
-BP10	BH2.4
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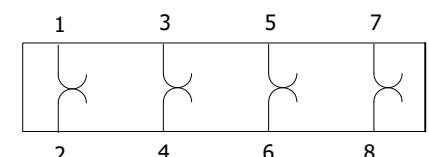
-BP5	BH2.2
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-AF105	AH1	F.4
-BF105	AH2	F.4
-BF106	AH2	F.4



-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



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

0	AS BUILT	22.11.2018	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 (=D09+C5) COMPONENT DIAGRAM	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194 Sheet type Z2 Sheet no. 55

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