



Grid Solutions

A GE and Alstom joint venture

220/132kV GIS SUBSTATION GHAZI ROAD , LAHORE

220/132kV TRANSFORMER CONTROL PANEL (=D04+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	30-10-2018	ASJ	ABA	NAH	AS BUILT

Scale	NOT-TO-SCALE	Sheet size
		A3

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

Project	220kV / 132kV GIS SUBSTATION GHAZI ROAD , LAHORE
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Title	220/132kV TRANSFORMER CONTROL PANEL (=D04+C5) SCHEMATIC DRAWINGS
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Order no	Document no
P-60194	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 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	X	X	X	X	X	X	X	X
	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	X	X	X	X	X	X	X	X
	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	X	X	X	X	X	X	X	X
	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	X	X	X	X	X	X	X	X
	32	BJ3	Circuit Breaker Opening/Closing Circuit	X	X	X	X	X	X	X	X
0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+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

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0	AS BUILT	30.10.2018	ASJ	Manufacturer EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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			
	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: 250/200-0-200/250 MW (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	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+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	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	A				
	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	A				
	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	A				
	02	SELECTOR SWITCH - VOLTMETER	PO-160023R001, 7 Position (L1-L2,L2-L3,L3-L1,OFF,L1-N,L2-N,L3-N)	-AS13,-BS13		GIOVENZANA	A				
	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	A				
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	B				
	01	PUSHBUTTON - ALARM RESET	YS-AP1-2-31-G-D-W, 3NO+1NC contacts, Ratings: 220VDC & 12A, Green color	-S23		YONGSUNG	B				
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	C				
	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	C				
	03	VT MCB	G64C02+(CAH2), 4-Pole, Ratings: 2A, 230VAC, 10kA @ 230VAC, with 2 C/O Contacts	-AF105,-BF105,-BF106		GE	C				
	02	INDICATION LAMP - DC SUPPLY FAILURE	YS-PL-2-AL-22-R-W, Type: Integrated LED , Color : RED , Supply : 230VAC @ 50Hz	-AH200,-BH200		YONGSUNG	C				
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	D				
	54	AUXILIARY CONTACTOR	PRC4M40DCML, Coil Voltage: 220VDC, 4 C/O Contacts	-AKDCM,-KAC,-AKQ0.ONR,-AKQ0.OFR,-AKQ0.ONY,-AKQ0.OFY		GE	D				
				-AKQ0.ONB,-AKQ0.OFB,-AKQ1.ON,-AKQ1.OF,-AKQ51.ON,-AKQ51.OF			D				
				-AKQ2.ON,-AKQ2.OF,-AKQ9.ON,-AKQ9.OF,-AKQ52.ON,-AKQ52.OF			D				
				-AKQ8.ON,-AKQ8.OF,-AKQ0.ON,-AKQ0.OF,-AKLAC,-AKLDC			D				
				-AKL01,-AKL02,-AKL03,-AKL04,-AKL05,-AKL06,-AKL07			D				
				-AKL08,-AKL09,-AKG0A,-AKG1A,-AKG2A,-AKG4A,-AKG5A			D				
				-AKG9A,-AKGB,-AKGW,-AKDC2,-AKOE,-AKOA,-AKDC1,-AK0D,-AK1D			D				
				-AK51D,-AK2D,-AK9D,-AK52D,-AK8D,-AKDC3, -KS100,-KS21			D				
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	E				
				-BKQ51.ON,-BKQ51.OF,-BKQ2.VT,-BKQ2.ON,-BKQ2.OF,-BKQ9.ON			E				
				-BKQ9.OF,-BKQ53.ON,-BKQ53.OF,-BKQ8.ON,-BKQ8.OF,			E				
				-BKLAC,-BKLDC,-BKL01,-BKL02,-BKL03,-BKL04,-BKL05,-BKL06,			E				
				-BKL07,-BKG0A,-BKG1,-BKG2,-BKG9A,-BKG91,-BKGL,-BKDC2,			E				
				-BKQ1CC,-BKQ1CO,-BKQ51CC,-BKQ51CO,-BKQ2CC,-BKQ2CO			E				
				-BKQ9CO,-BKQ53CC,-BKQ53CO,-BKQ8CC,-BKQ8CO,-BREM1,BREM1A			E				
				-BREM2,-BREM2A,-BKDC1,-BK0D,-BK1D,-BK51D,-BK2D,-BK9D			E				
				-BK53D,-BK8D,-BKDC3,BKQ9CC,-BKOABKOEBNV			E				
F	03	AUXILIARY CONTACTOR	PRC4M40ANL, Coil Voltage: 230VAC, 4 C/O Contacts	-AKDC,-BKDC,-KACM		GE	F				
	REV.	DESCRIPTION	DATE	DRAWER			F				
		0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPEPSOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+C5) COMPONENT LIST	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194	Sheet type AC2	Sheet no. 06

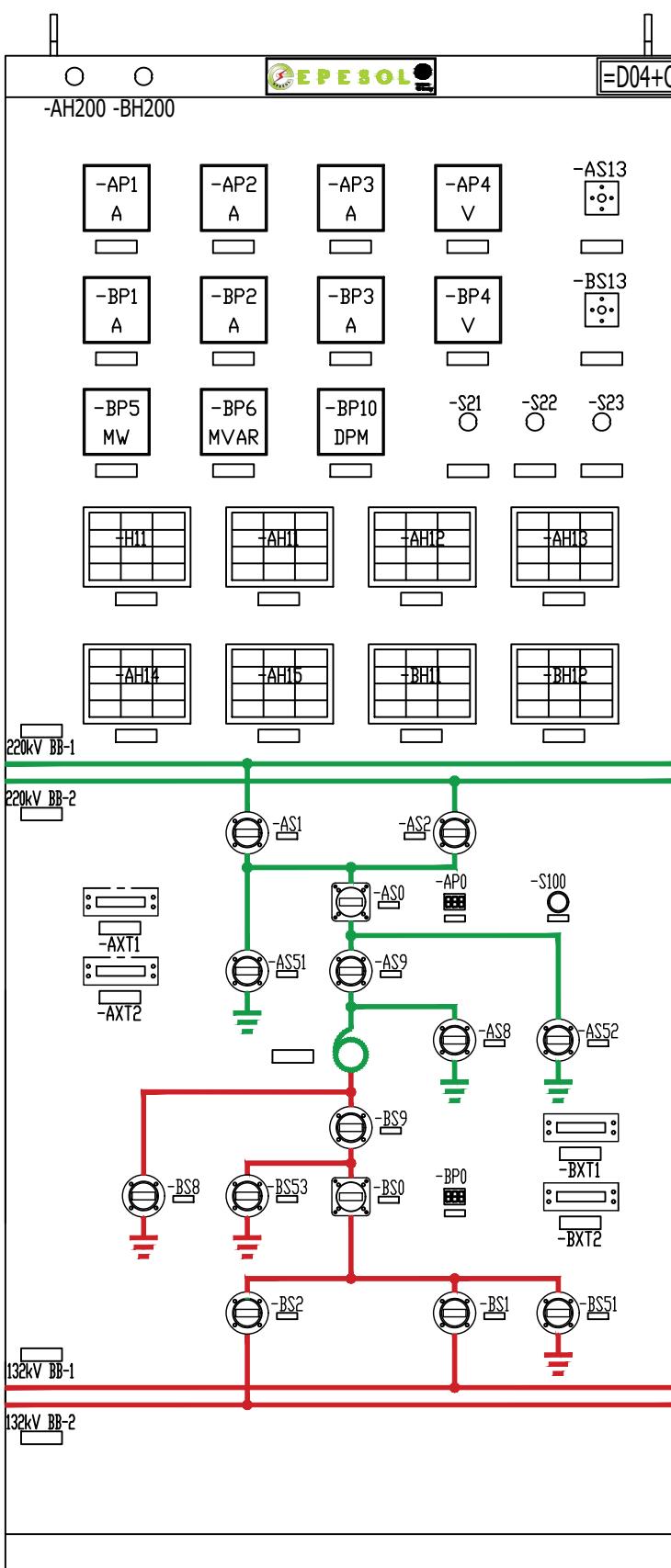
	1	2	3	4	5	6	7	8			
	QTY.	DEVICE DESCRIPTION		DEVICE SPECIFICATIONS DEVICE TYPE ; TECHNICAL DATA / SPECIFICATIONS			DEVICE DESIGNITION	MANUFACTURER			
A	01	ANNUNCIATION MODULE		12-Window, Supply: 230 VAC			-H11	E-LABS			
	05	ANNUNCIATION MODULE		12-Window, Supply: 220 VDC			-AH11,-AH12,-AH13,-AH14,-AH15	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		30.10.2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+C5) 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				
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				
	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				
B	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				
	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				
C	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				
	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				
D	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				
	0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  GE Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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										
<i>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.</i>										
0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+C5) COMPONENT LIST	Drawing no. P60194-E-DTC-SC-003	
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AC4	Sheet no. 06c

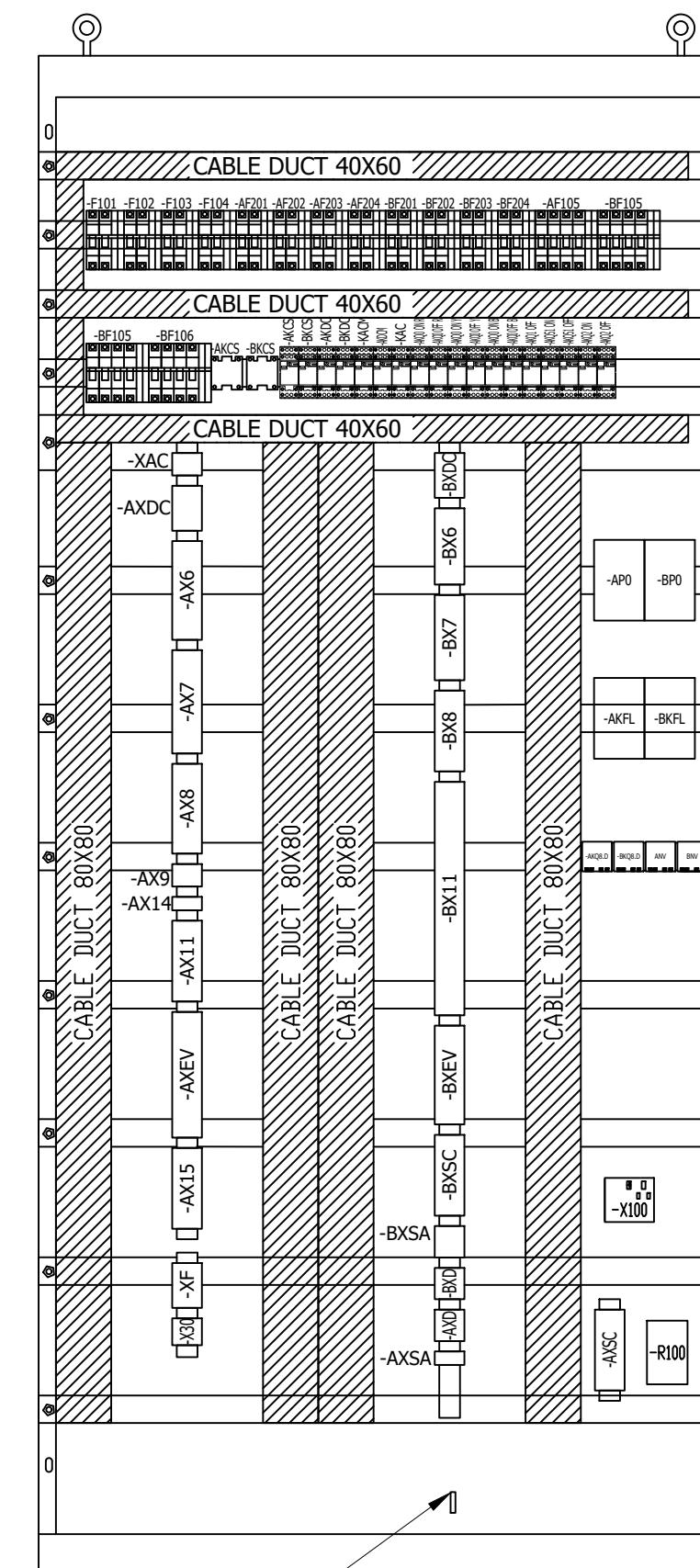
FRONT VIEW



MIMIC:

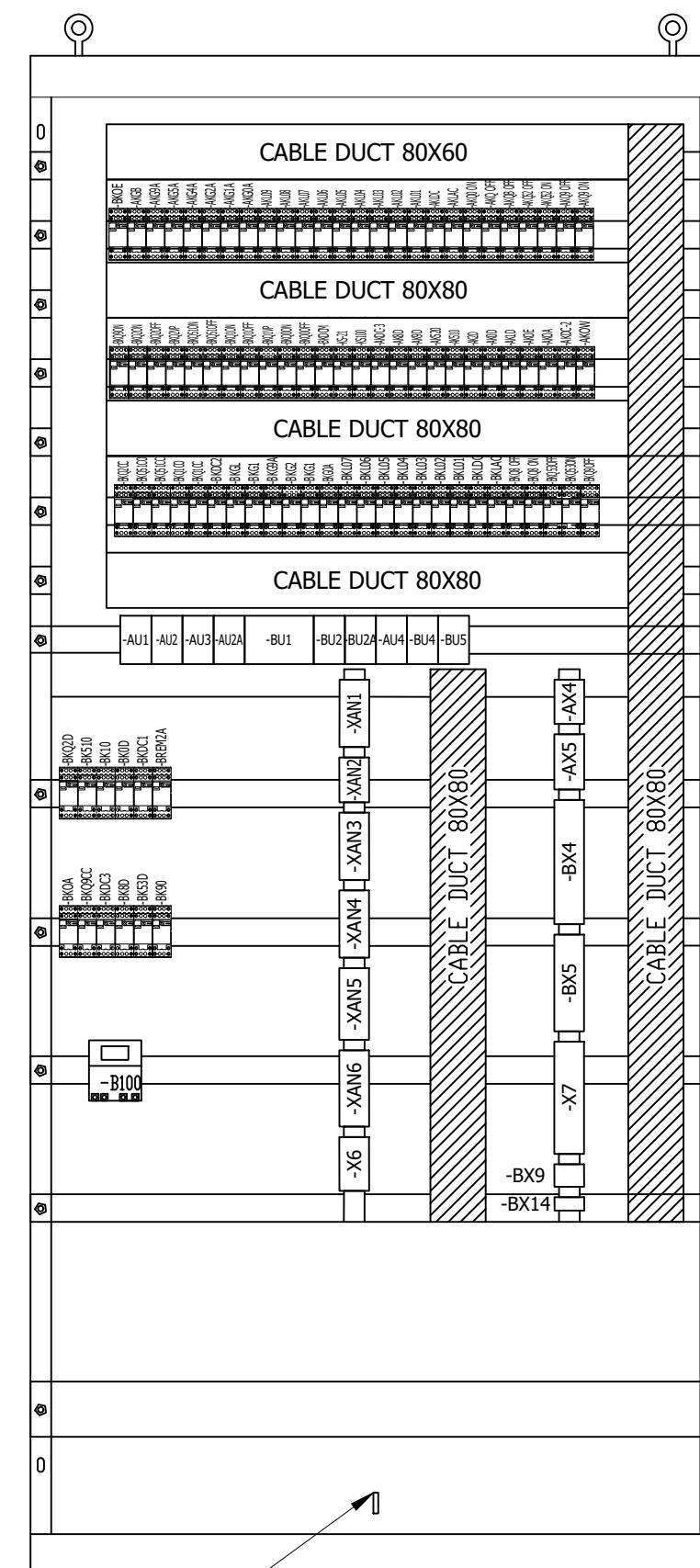
1. MIMIC COLOR: GREEN FOR 220kV & RED FOR 132kV

LEFT SIDE VIEW



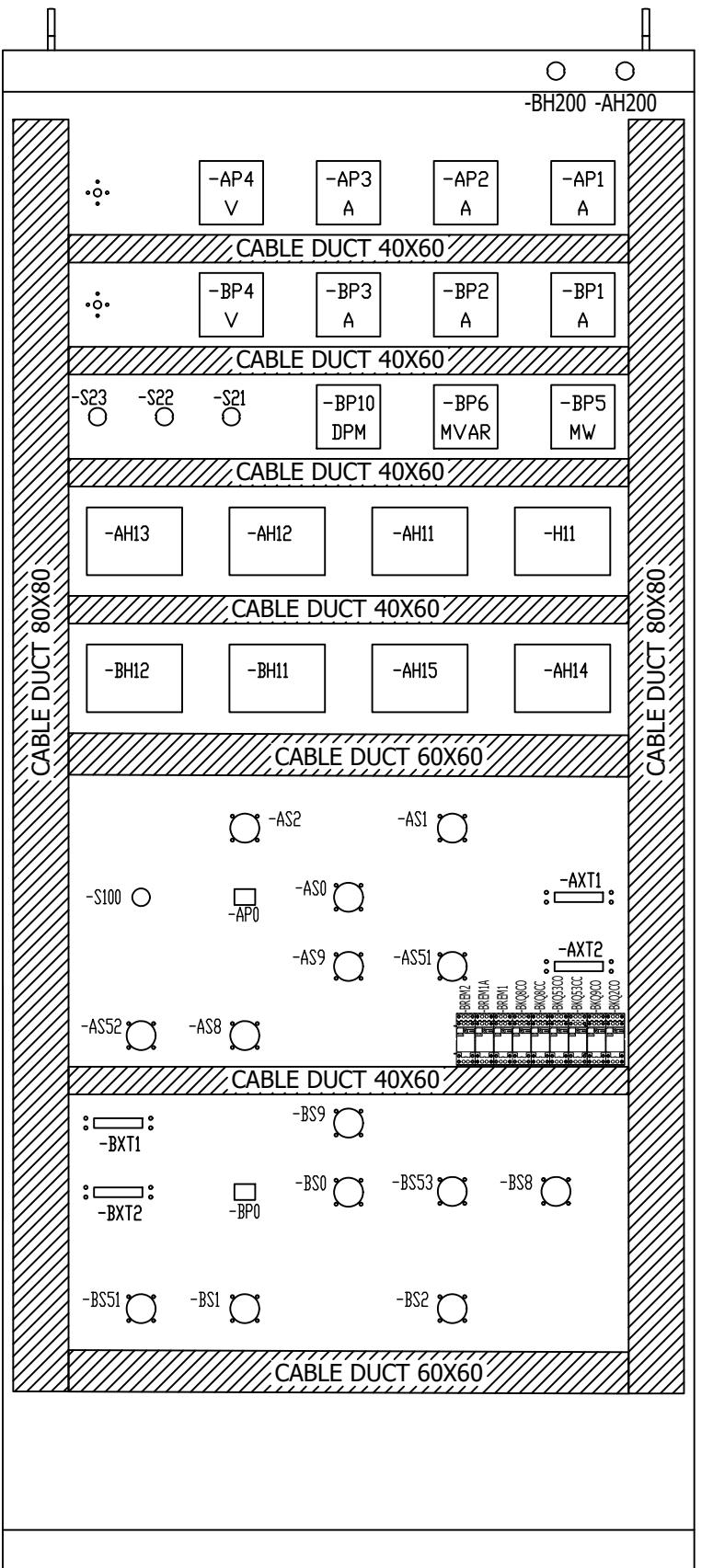
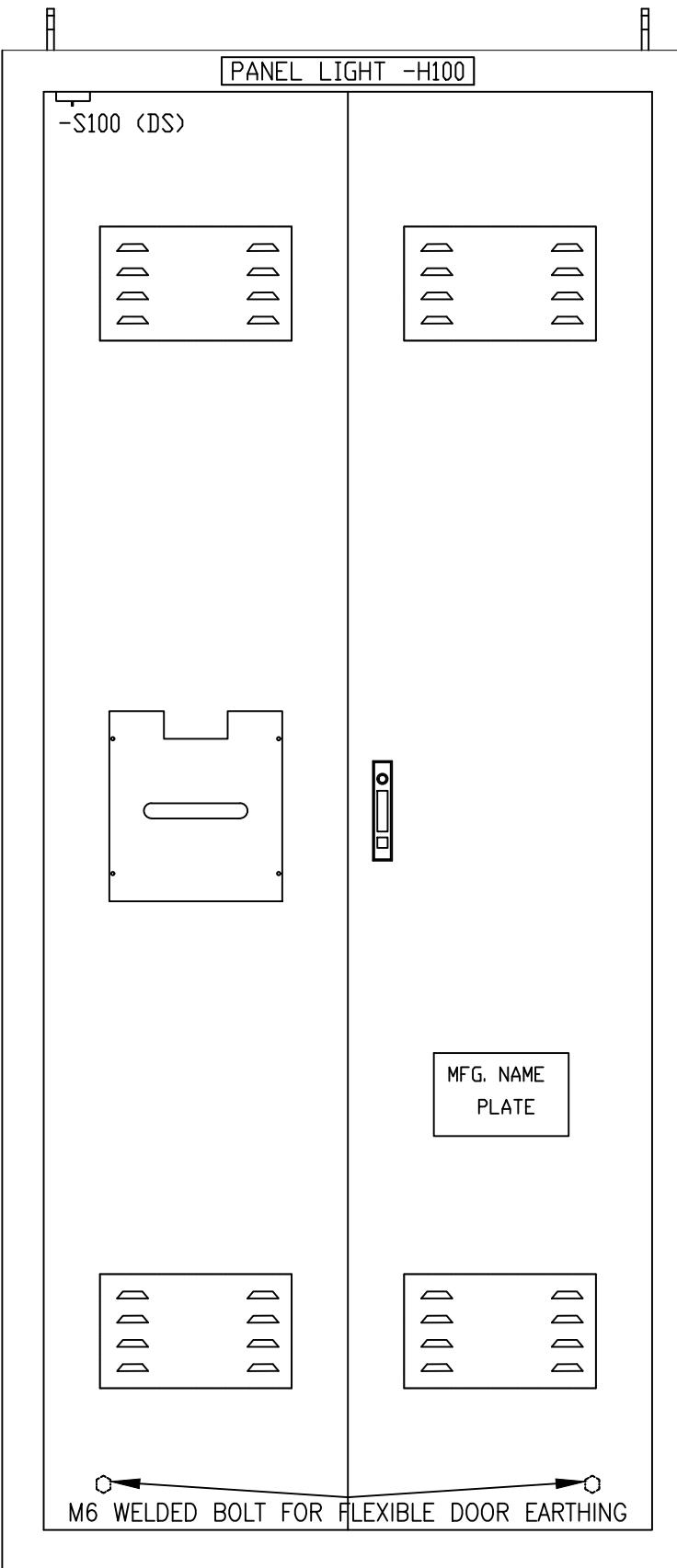
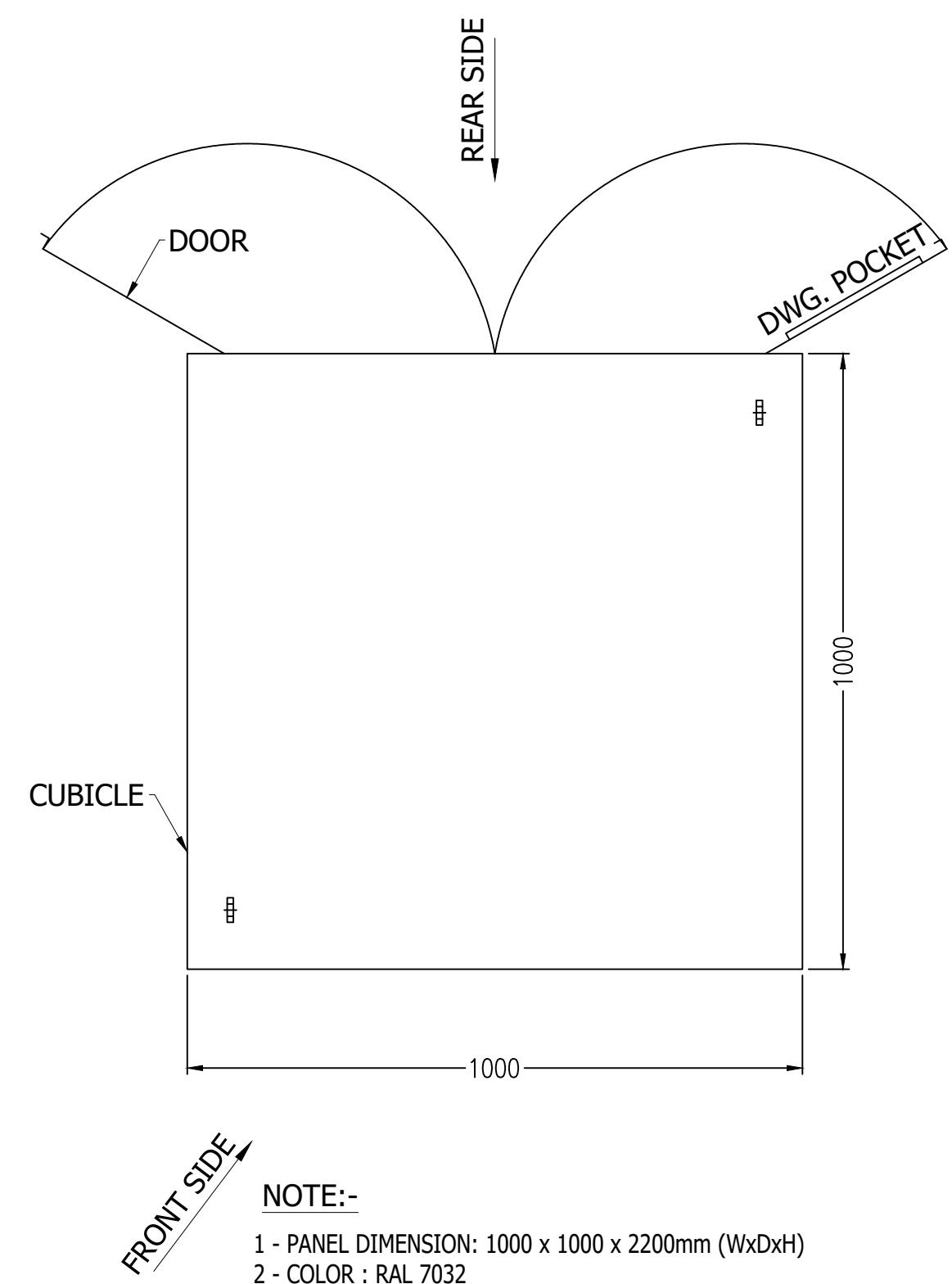
SLOT FOR EARTHING
BUSBAR
7X30mm

RIGHT SIDE VIEW



SLOT FOR EARTHING
BUSBAR
7X30mm

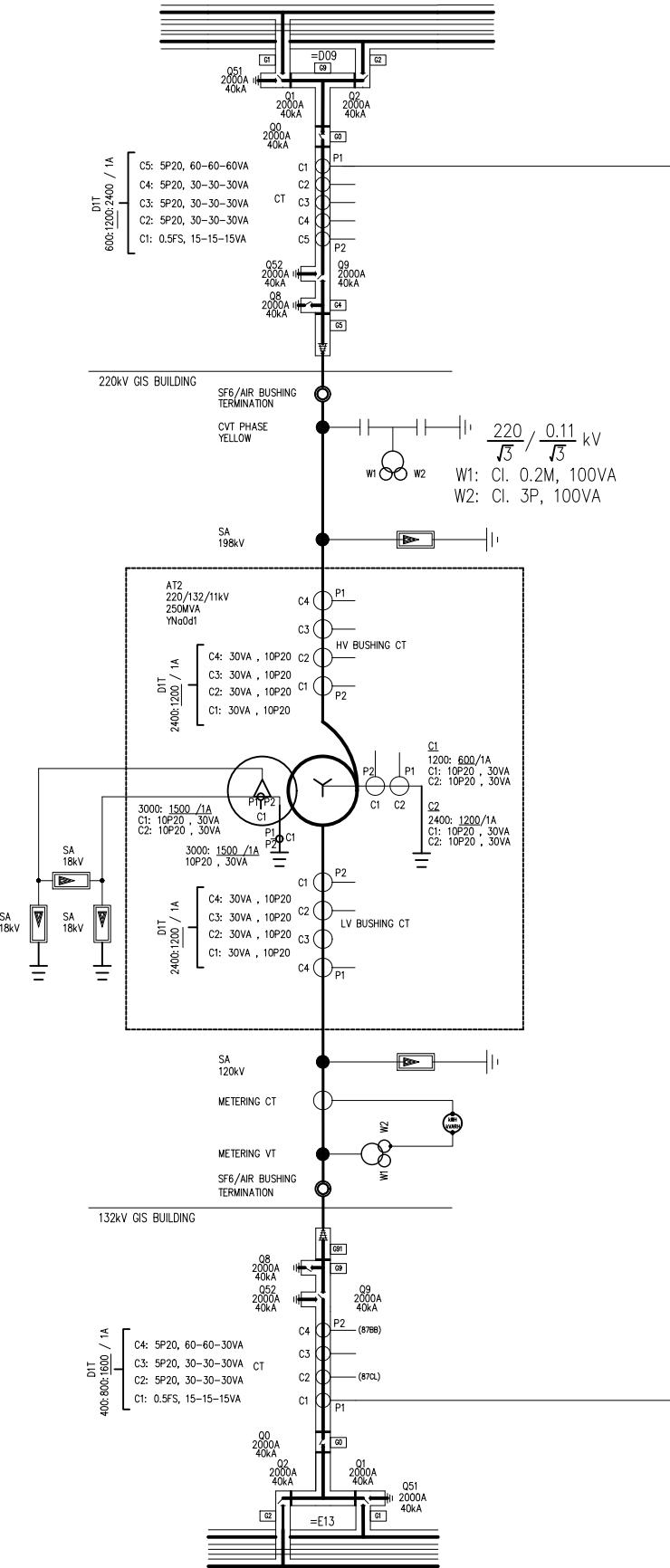
0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+C5) PANEL VIEW	Drawing no.		
									P60194-E-DTC-SC-003		
									Project no.		
REV.	DESCRIPTION	DATE	DRAWER						P-60194	AD	07

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

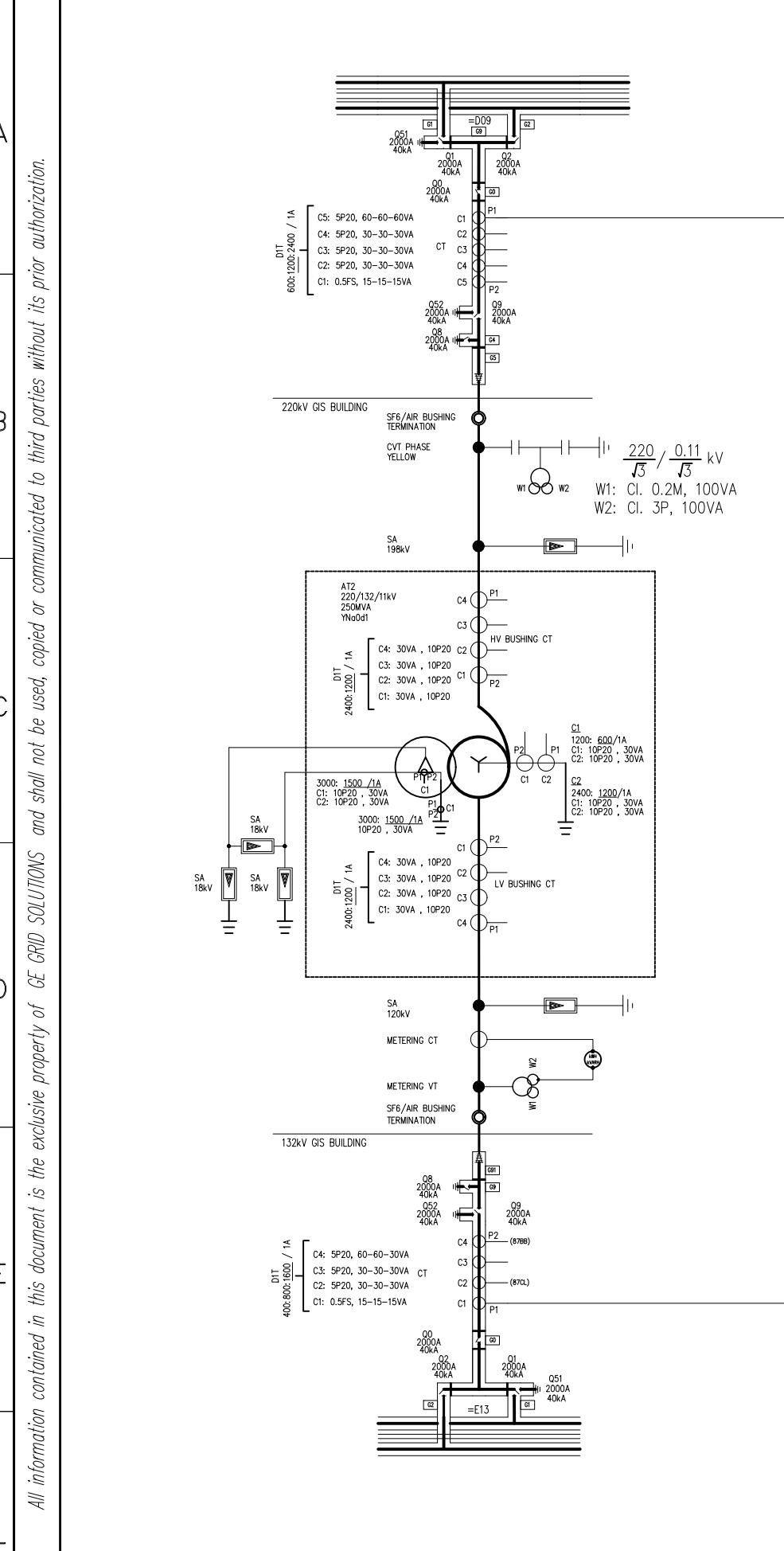
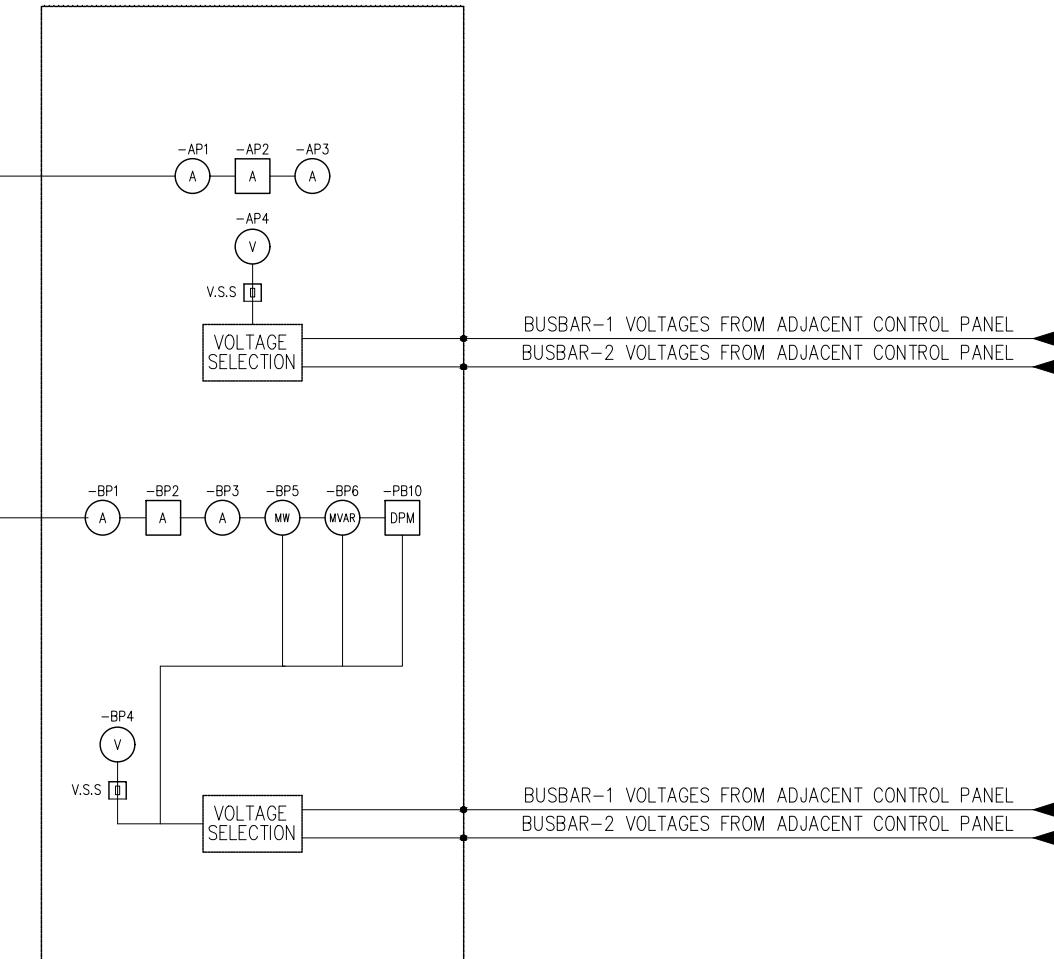
- 1 - PANEL DIMENSION: 1000 x 1000 x 2200mm (WxDxH)
- 2 - COLOR : RAL 7032
- 3 - SHEET THICKNESS : 2-2.5 mm
- 4- PROTECTION CLASS : IP-51 (INDOOR TYPE)
- 5 - ALL DOOR FITTED WITH 16mm EARTH STRAP & INSULATED WITH GREEN-YELLOW COLOUR.

0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor GE Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+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



EPEPSOL
7-B Garden Block,
New Garden Town,
Lahore, Pakistan

Grid Solutions
A GE and Alstom joint venture

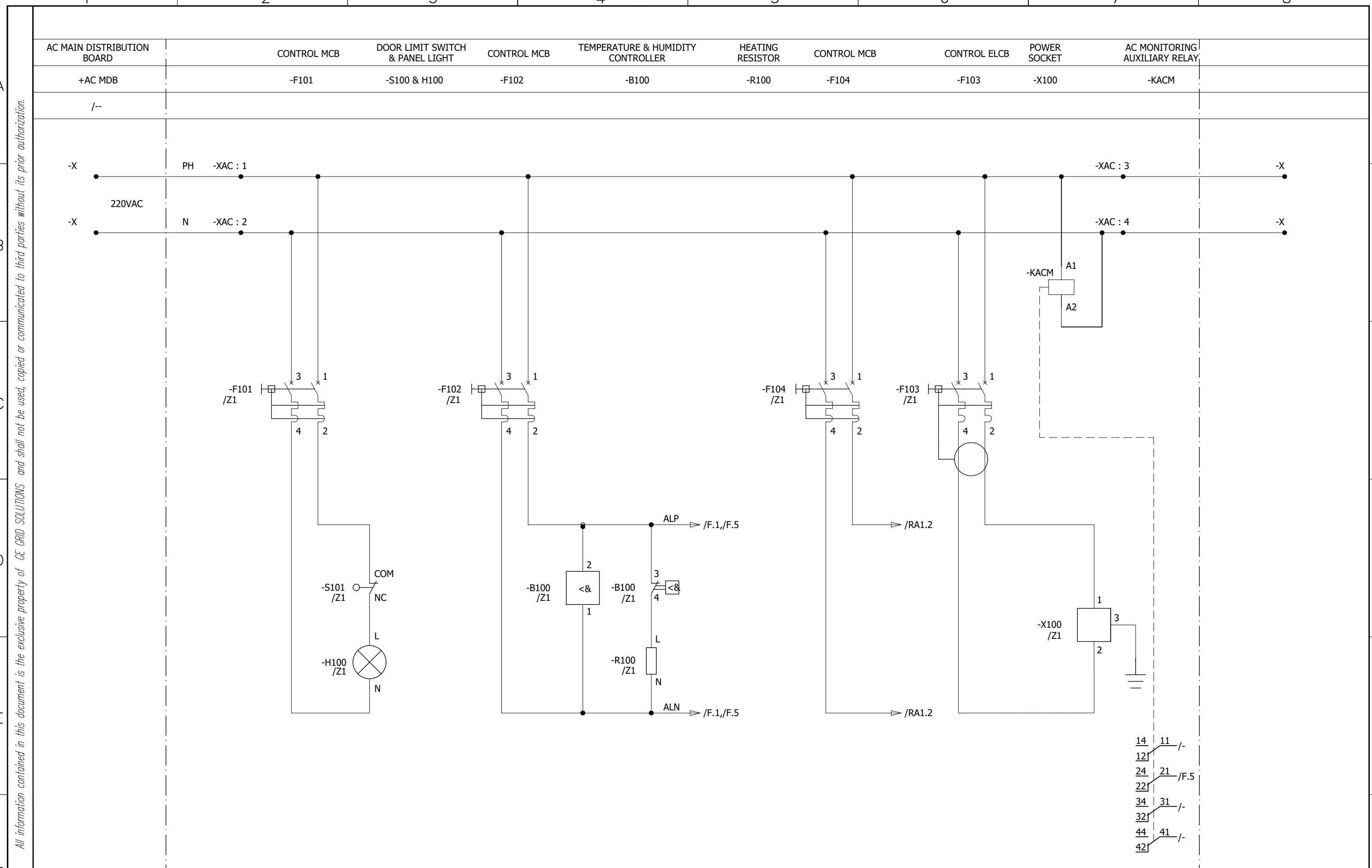
NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)

Project
220/132kV GIS SUBSTATION
GHAZI ROAD, LAHORE

Title
220/132kV TRANSFORMER CONTROL PANEL
(=D04+C5)
BAY CONCEPT & METERING

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

Project no. P-60194 **Sheet type** AF **Sheet no.** 08



14 11/-
12 21/F.5
24 21/
22 31/-
34 31/-
32 41/-
44 41/-
42 11/-

0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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				

1

2

3

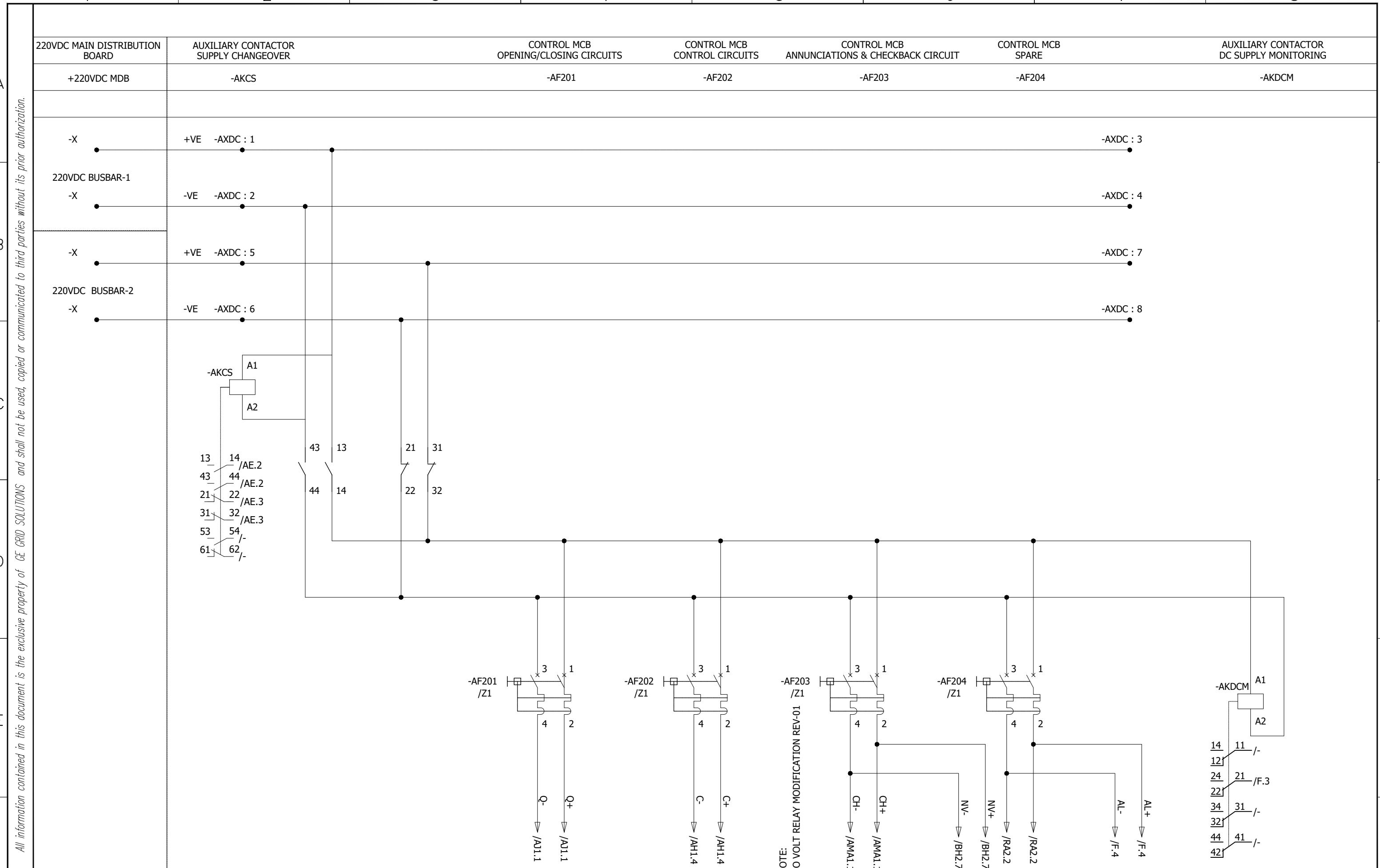
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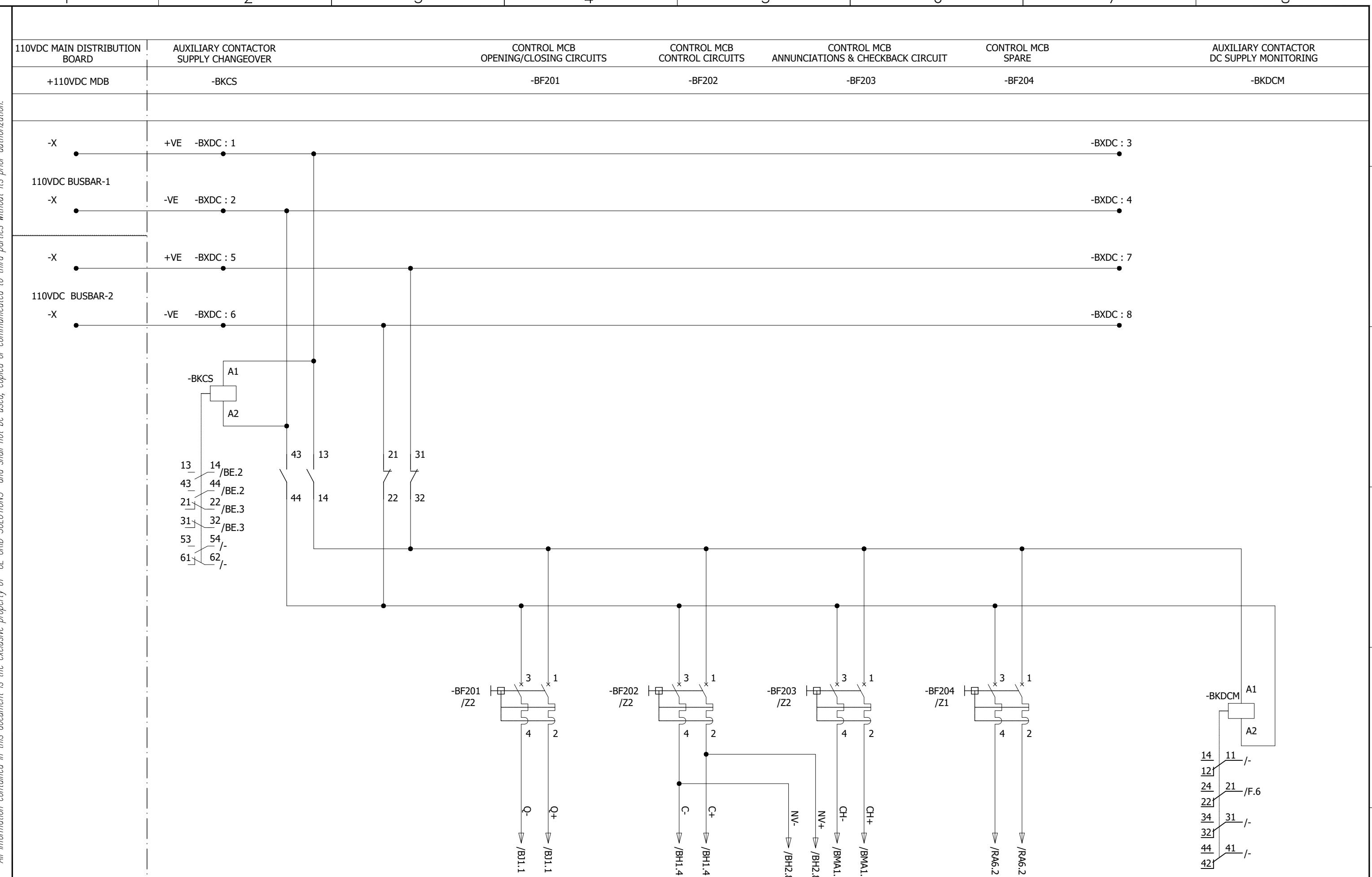
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7

8



0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+C5) DC SUPPLY DISTRIBUTION	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AE
									Sheet no. 10



0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPE SOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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

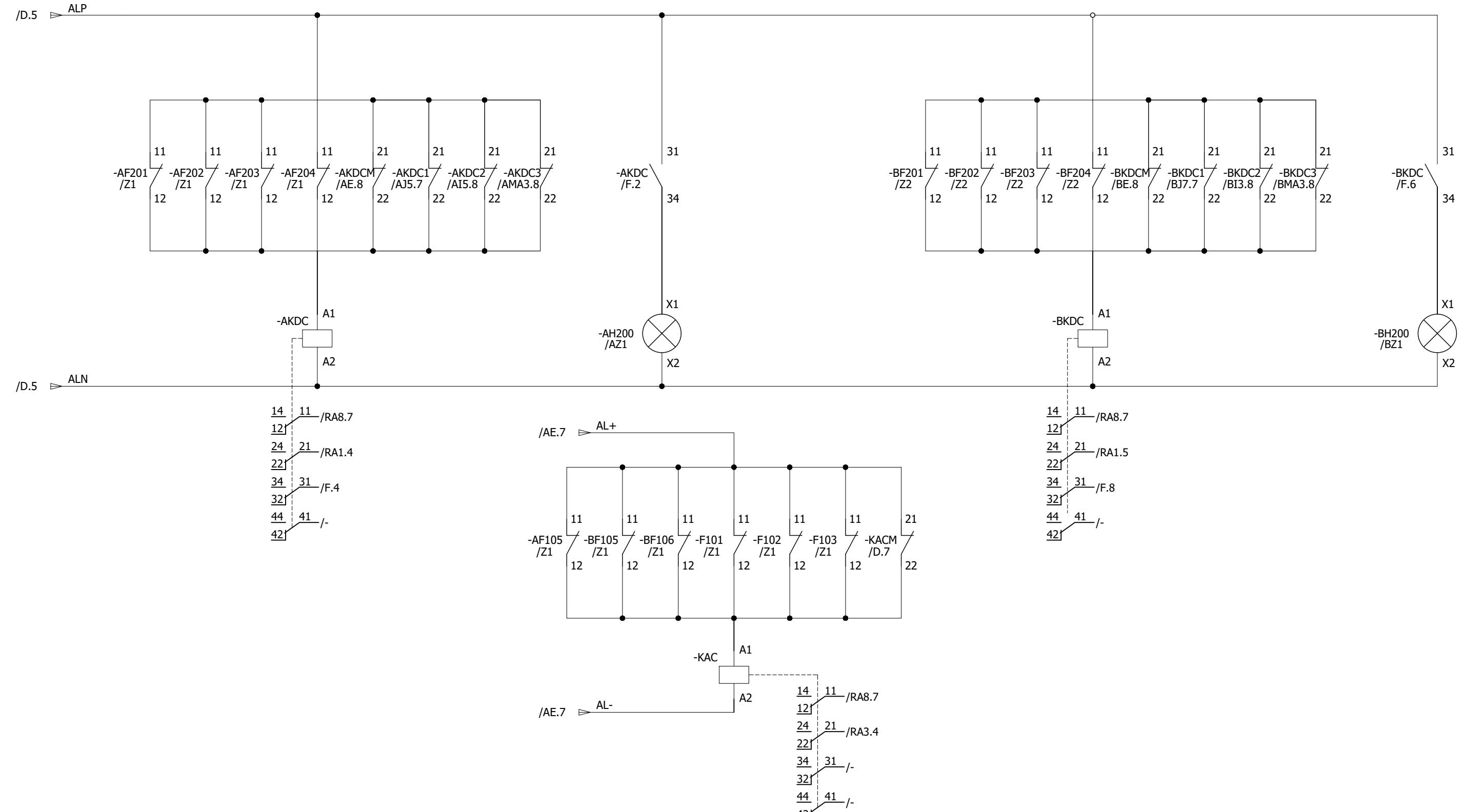
-AKDC

-AH200 220V AC CIRCUIT FAULTY

-BKDC

-BH200

-KAC

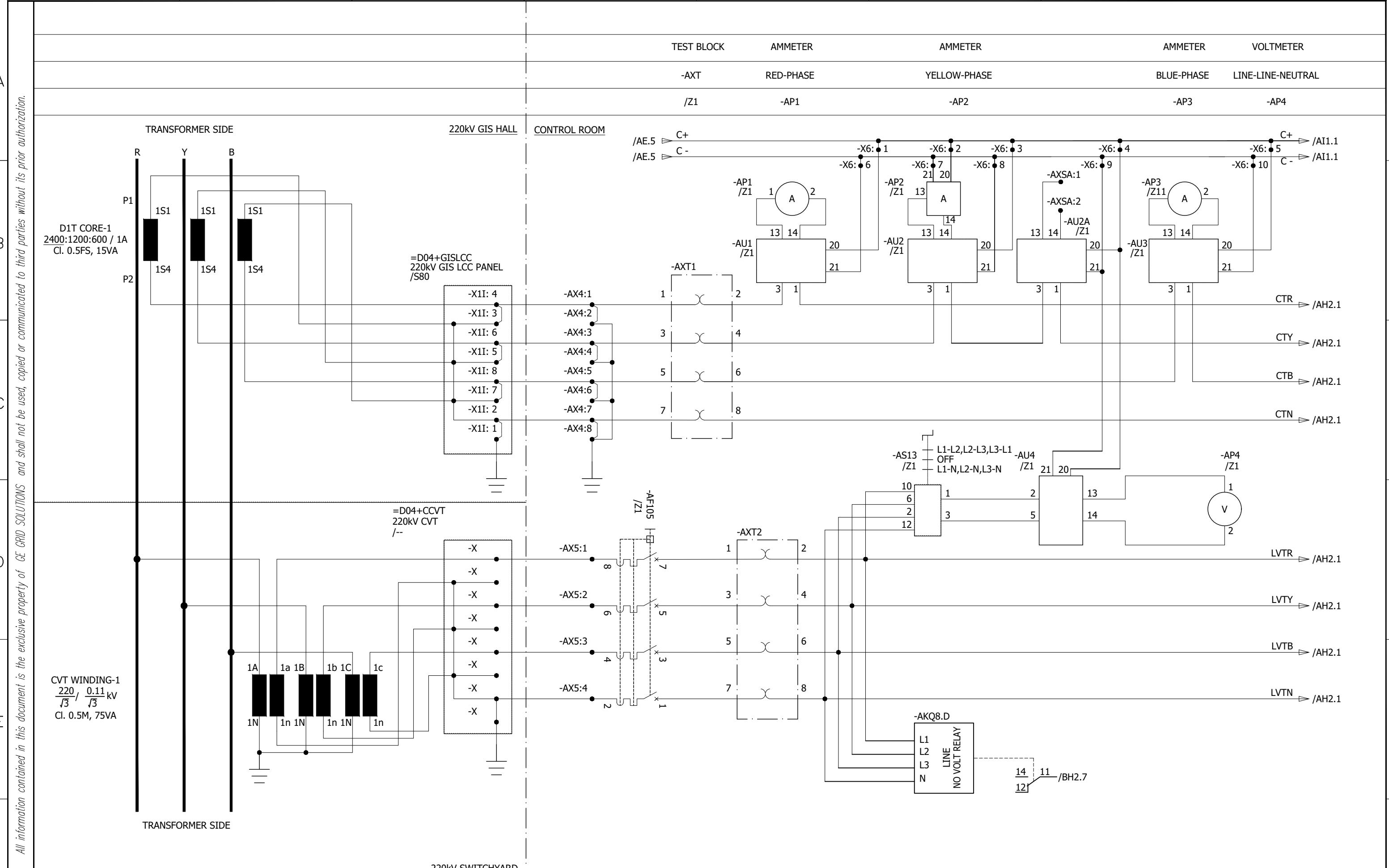


A
B
C
D
E
F

A
B
C
D
E
F

0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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

1 2 3 4 5 6 7 8



0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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

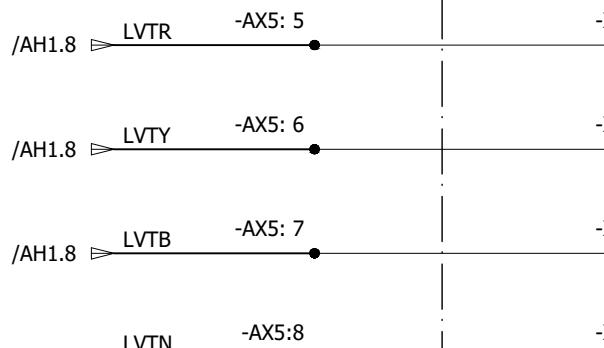
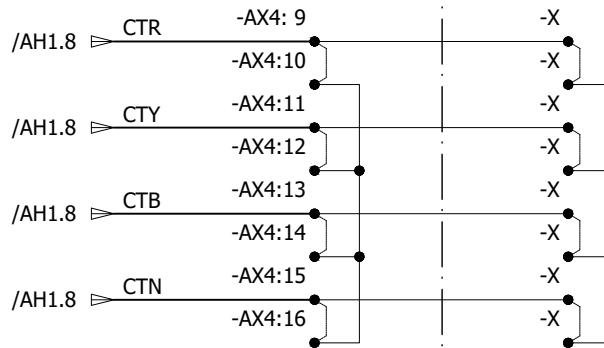
1 2 3 4 5 6 7 8

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SCADA INTERFACE CABINET

=D00+Y2

/-



VT SELECTION VIA ISOLATOR STATUS

LINE-LINE-NEUTRAL YELLOW-PHASE

BLUE-PHASE RED-PHASE

132KV GIS HALL

CONTROL ROOM

=E12(G15)+CVT

132kV CVT

/-

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

132KV BUSBAR VT

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

/-

-BX5:1

-BX5:2

-BX5:3

-BX5:4

-BX5:5

-BX5:6

-BX5:7

-BX5:8

-BF105

/-Z1

-BF106

/-Z1

LVTR → /BH1.4
 LVTY → /BH1.4
 LVTB → /BH1.4
 LVTN → /BH1.4

LVTR → /BH1.4
 LVTY → /BH1.4
 LVTB → /BH1.4
 LVTN → /BH1.4

A

A

B

B

C

C

D

D

E

E

F

F

0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor 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 (=D04+C5) CT/VT METERING CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type AH2
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1

2

3

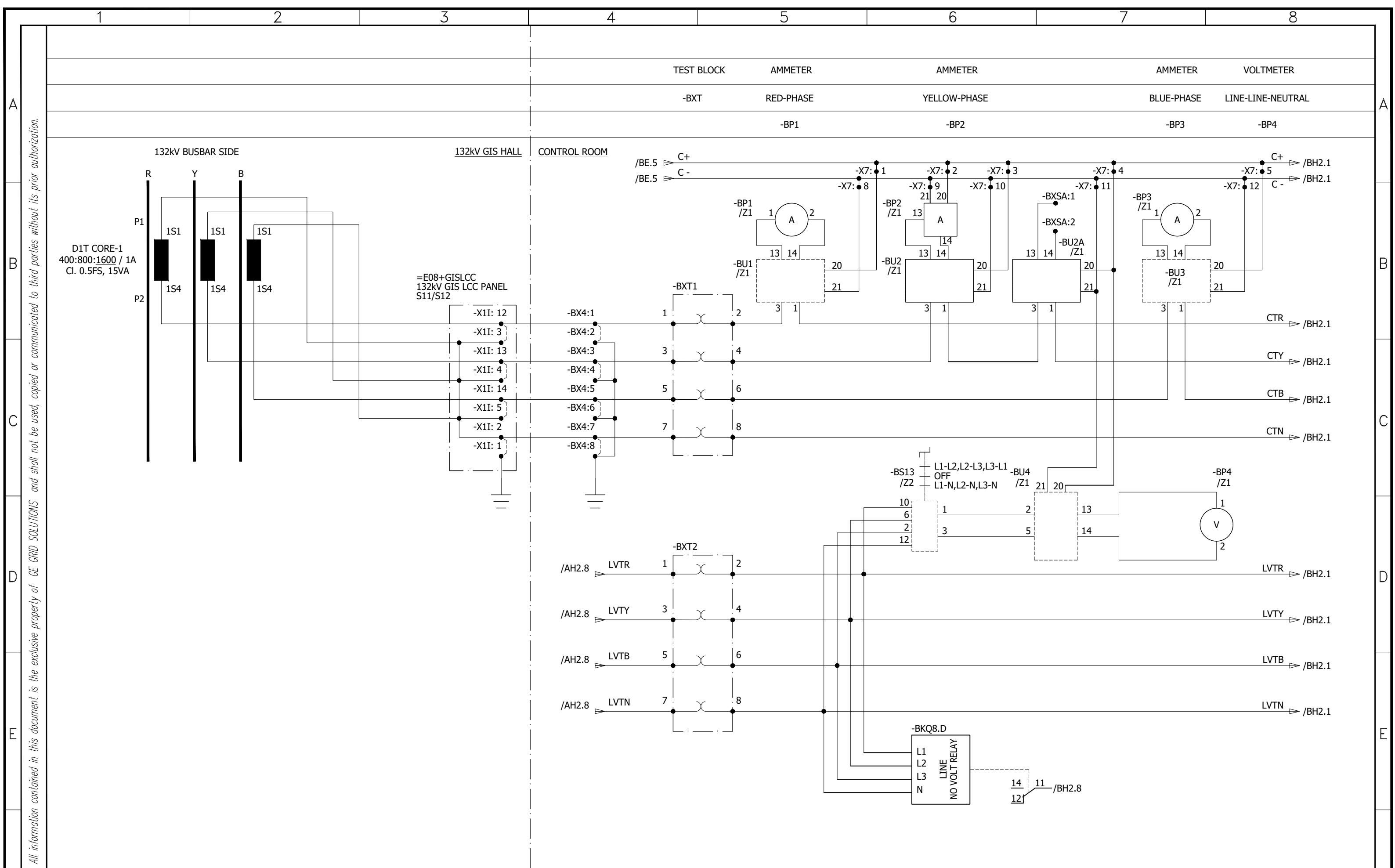
4

5

6

7

8



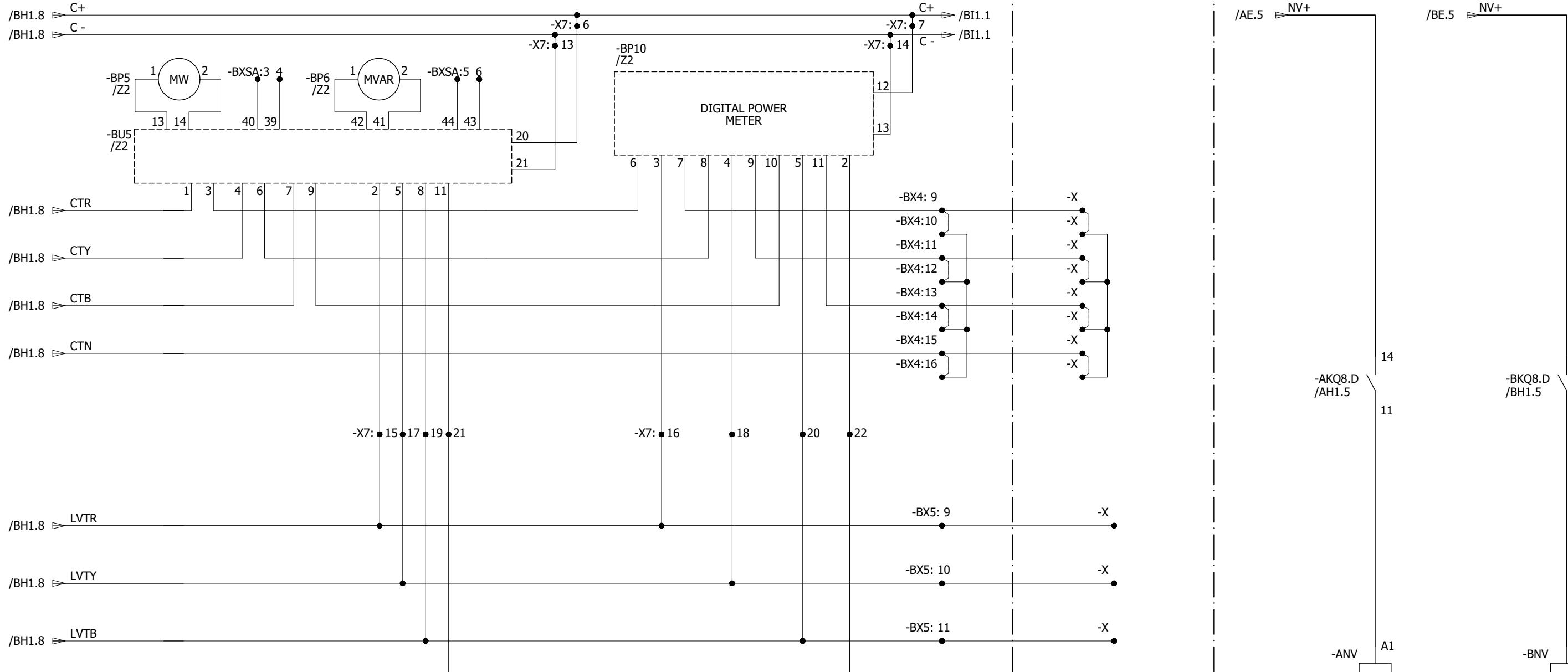
0	AS BUILT	30.10.2018	ASJ	Manufacturer EPE SOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor GE Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+C5) CT/VT METERING CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type BH1
									Sheet no. 15

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

METER SCADA METER SCADA =D00+Y2 CONTACTS MULTIPLICATION CONTACTS MULTIPLICATION

-BP5 -BP6 -BP10 /-- /AE.5 NV+ /BE.5 NV+



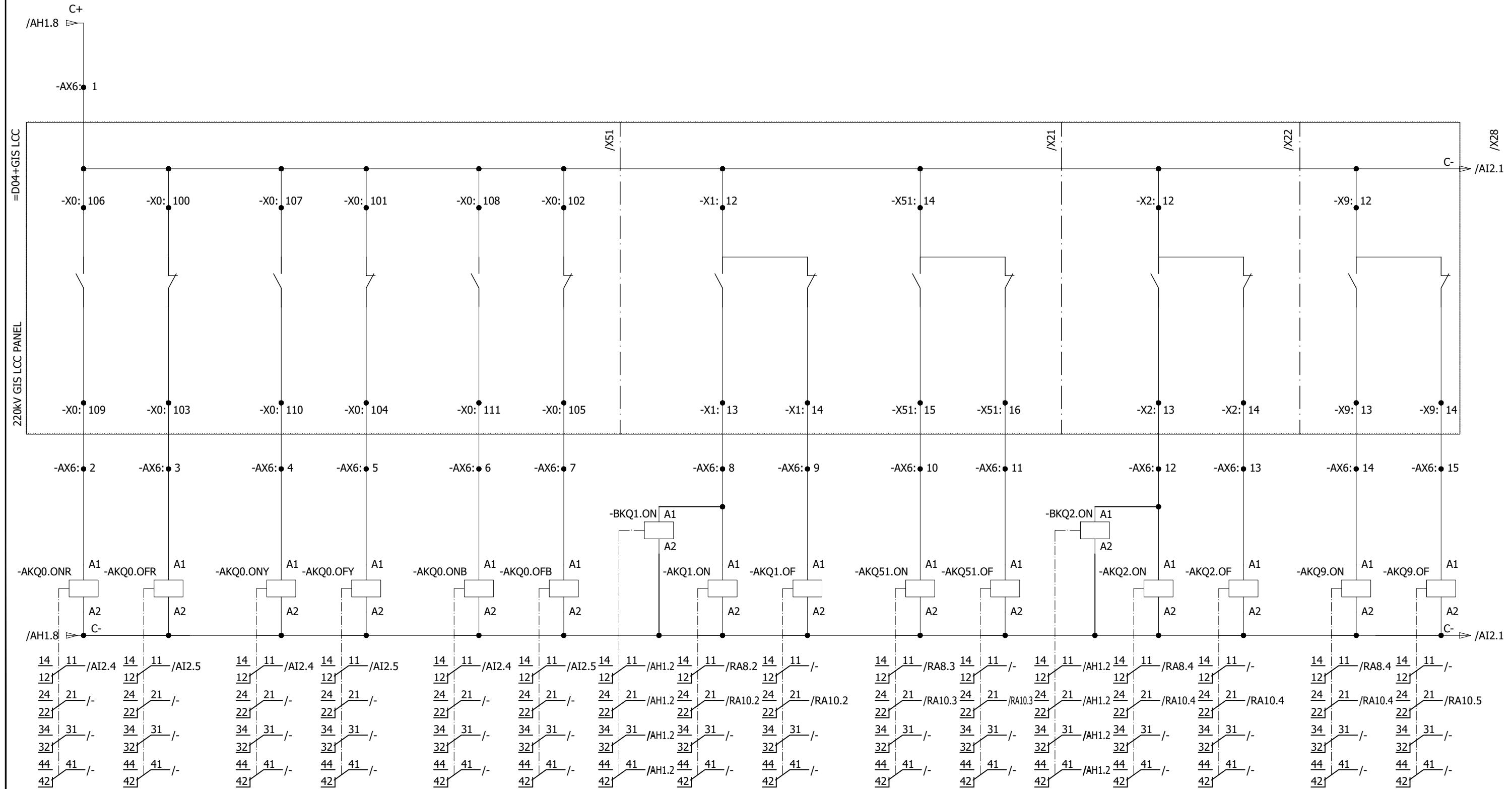
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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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

1 2 3 4 5 6 7 8

220kV POWER EQUIPMENT STATUS SIGNALS

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+C5) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
									Sheet type AI1
									Sheet no. 17
REV.	DESCRIPTION	DATE	DRAWER						

220KV POWER EQUIPMENT STATUS SIGNALS

LINE SIDE
EARTHING SWITCHHIGH SPEED LINE
EARTHING SWITCH

CIRCUIT BREAKER

Q52

Q8

Q0 - ALL POLES

CLOSE

OPEN

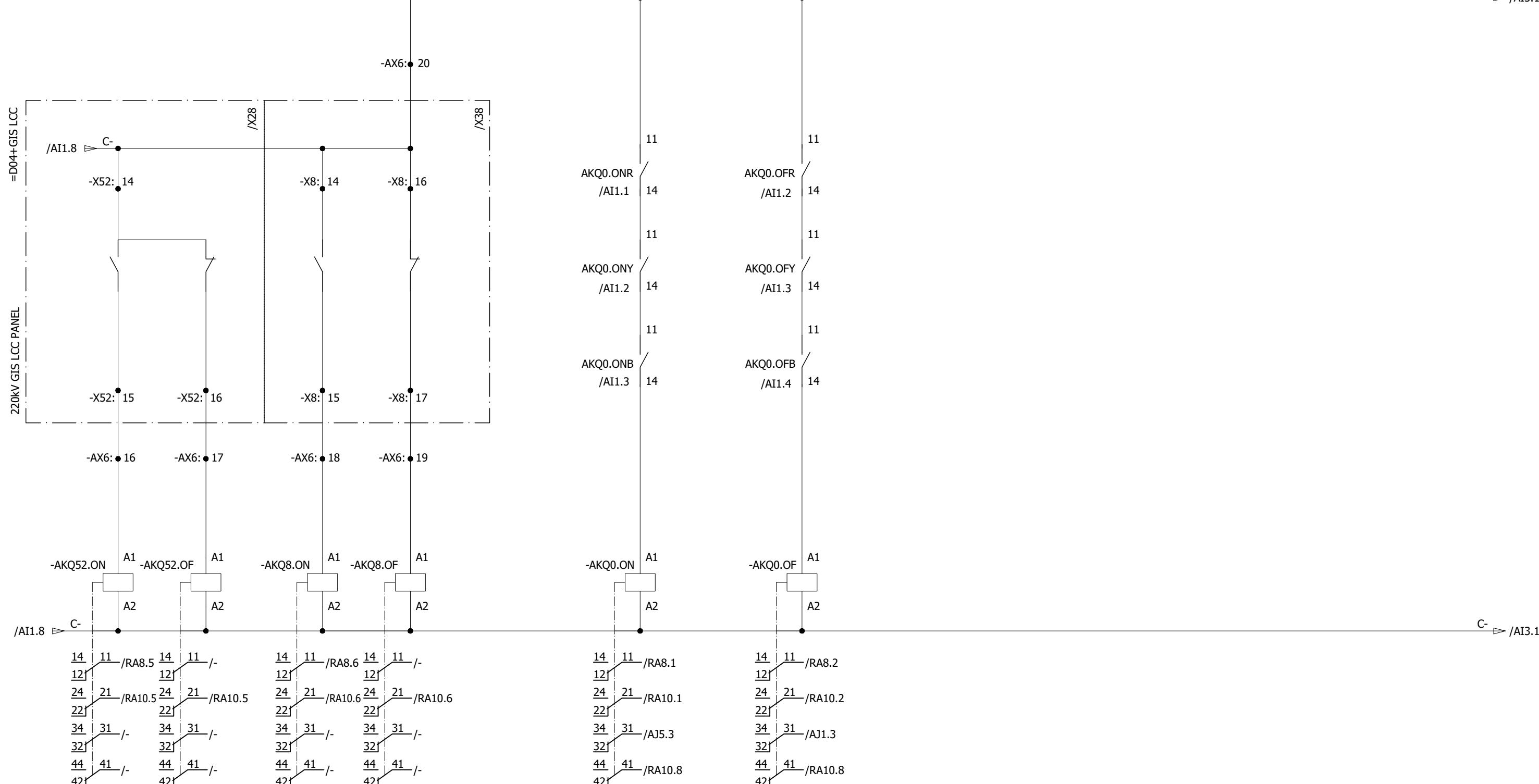
CLOSE

OPEN

CLOSE

OPEN

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0	AS BUILT	30.10.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.		
				E PESOL 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 (=D04+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

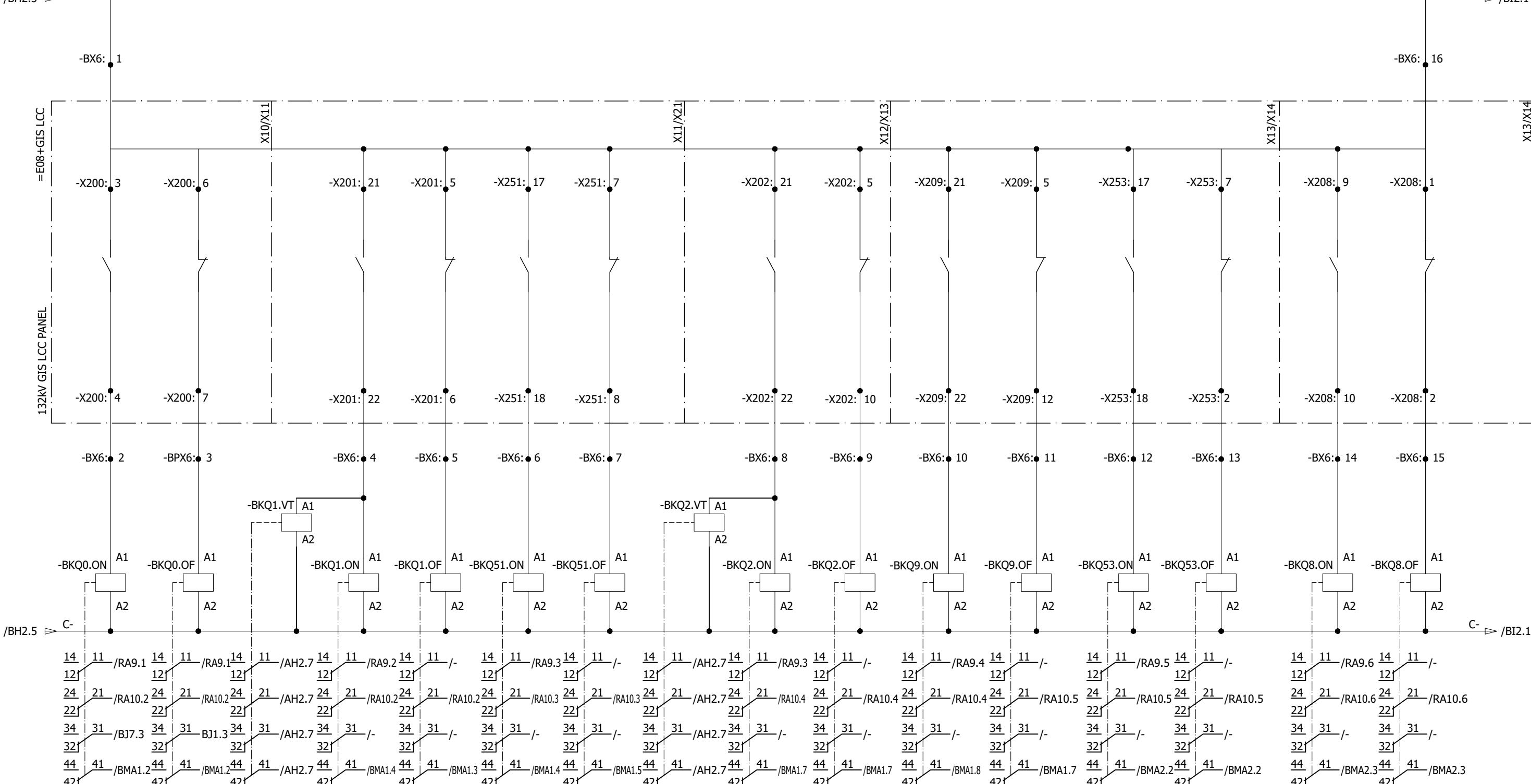
Q53

Q8

CLOSE

OPEN

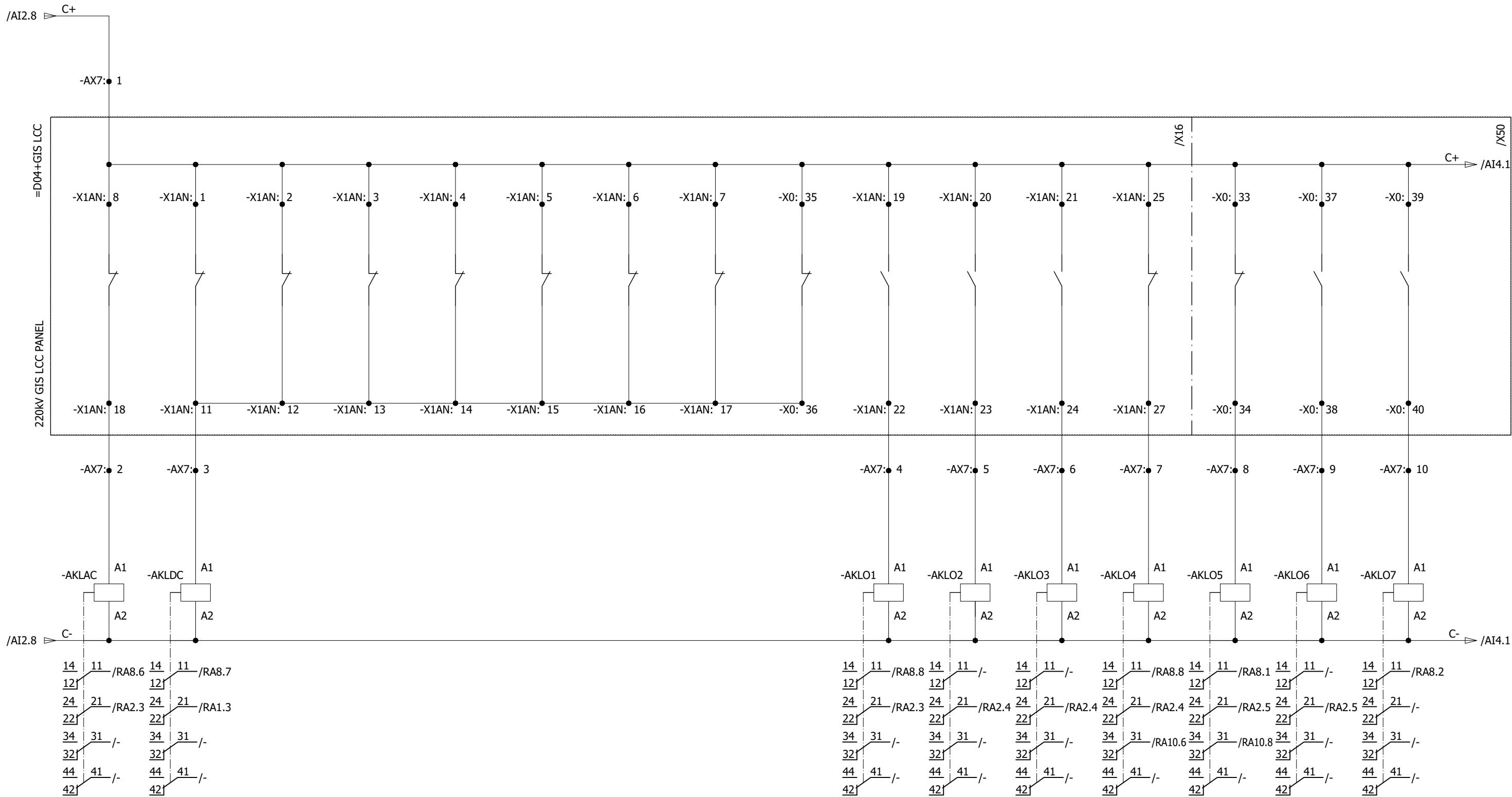
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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+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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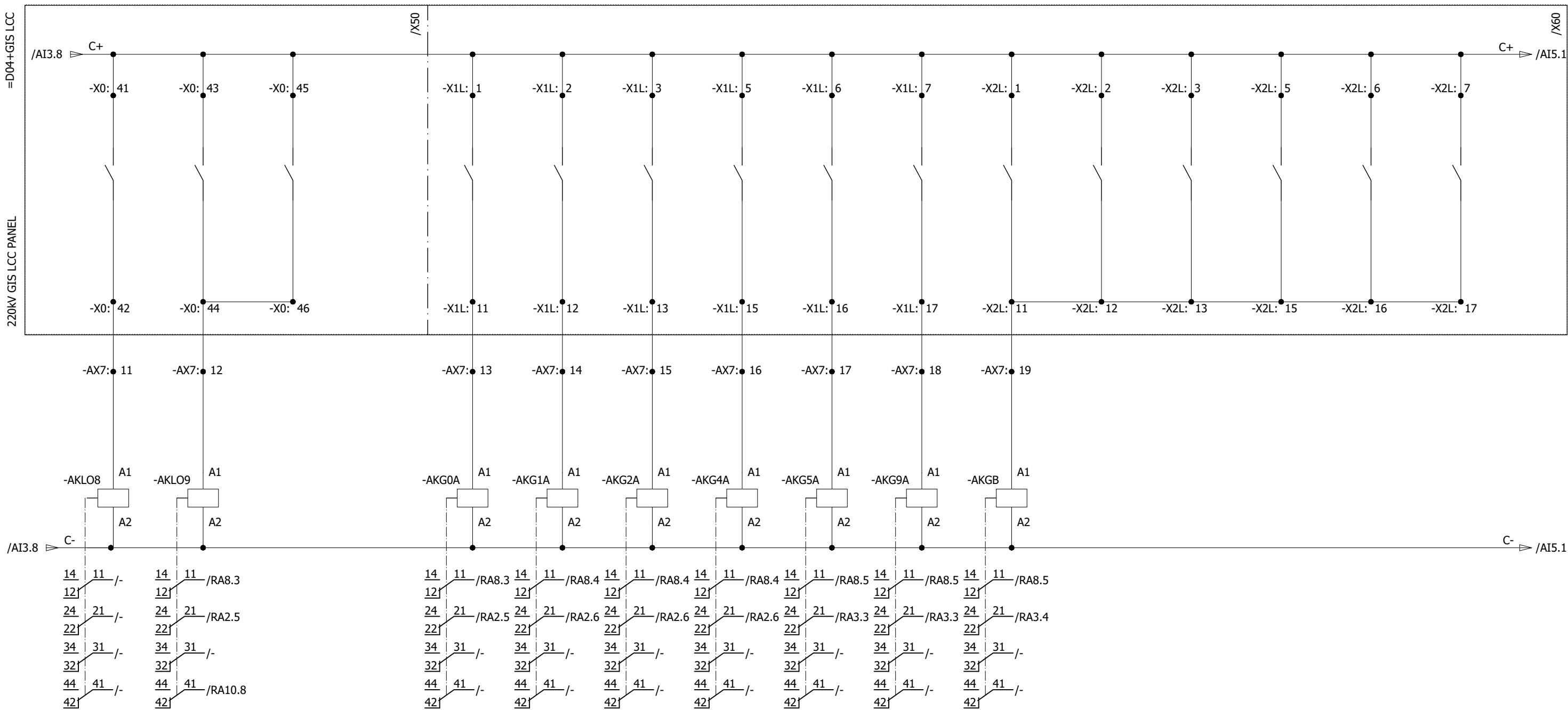


0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 74-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+C5) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DTC-SC-003		
									Project no.	Sheet type	Sheet no.
REV.	DESCRIPTION	DATE	DRAWER						P-60194	A13	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	

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Drawing no.		
								P60194-E-DTC-SC-003		
								Project no.	Sheet type	Sheet no.
								P-60194	AI4	21
REV.	DESCRIPTION	DATE	DRAWER							

220kV POWER EQUIPMENT STATUS SIGNALS

DC CIRCUIT C+/C-
MONITORING

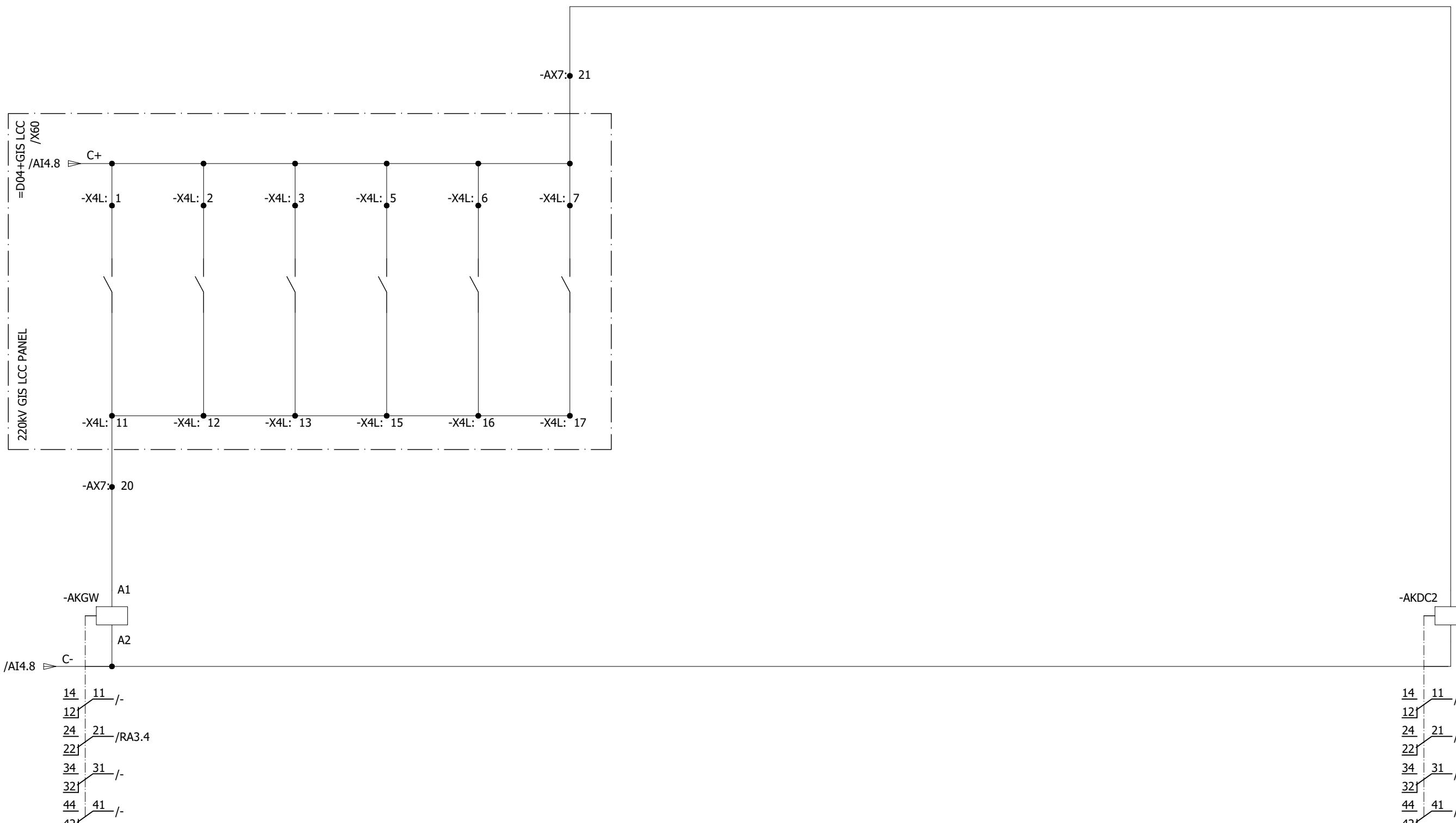
-AKDC2

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

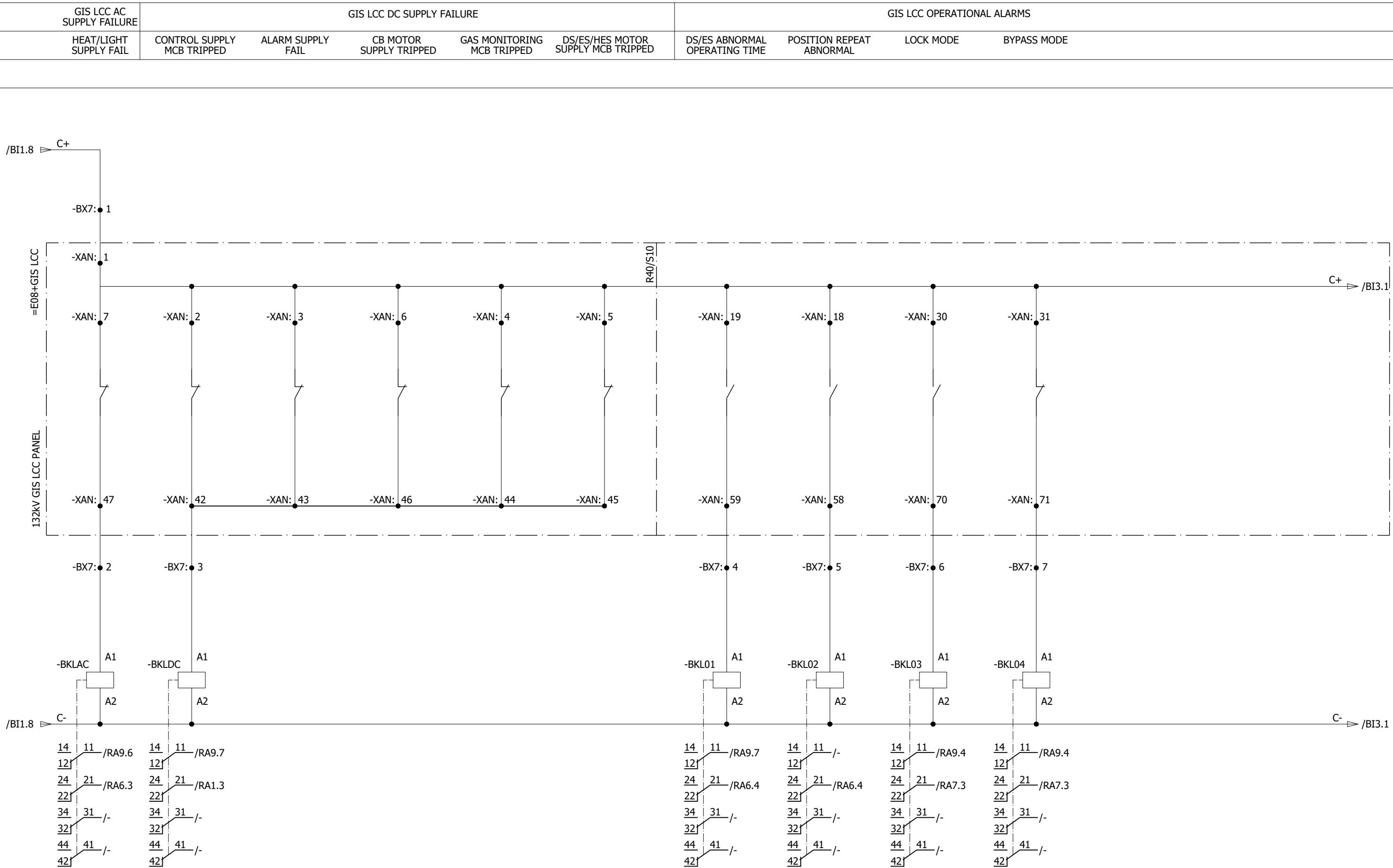
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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPEPSOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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

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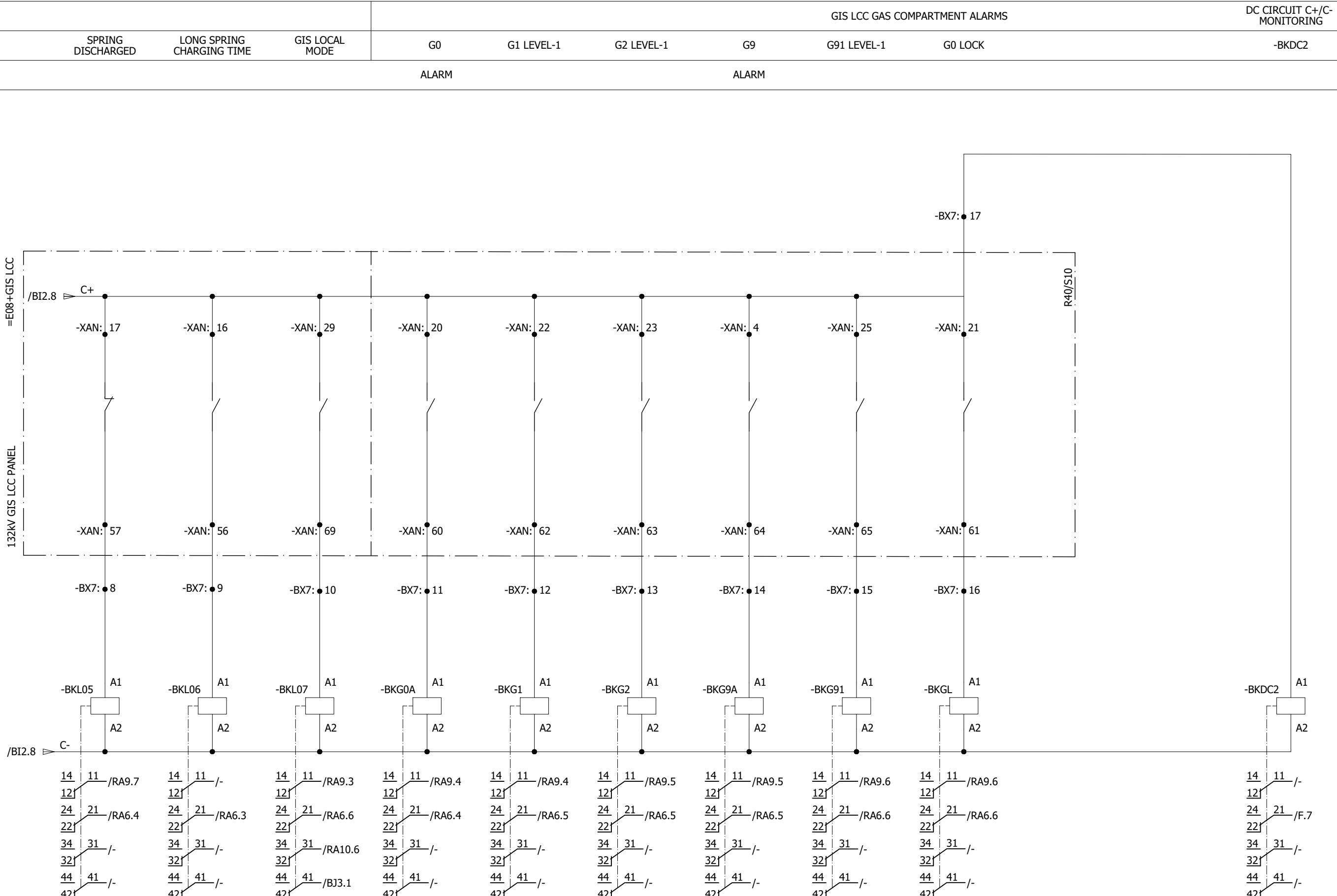


0	AS BUILT		30.10.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.		
REV.	DESCRIPTION		DATE	DRAWER	EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Grid Solutions A GE and Alstom joint venture	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	220/132KV TRANSFORMER CONTROL PANEL (=D04+C5) POWER EQUIPMENT INPUTS	P-60194	Sheet type	Sheet no.
1	2	3	4	5	6	7	8	1	2	3	4	5

132kV GIS POWER EQUIPMENT INPUT SIGNALS

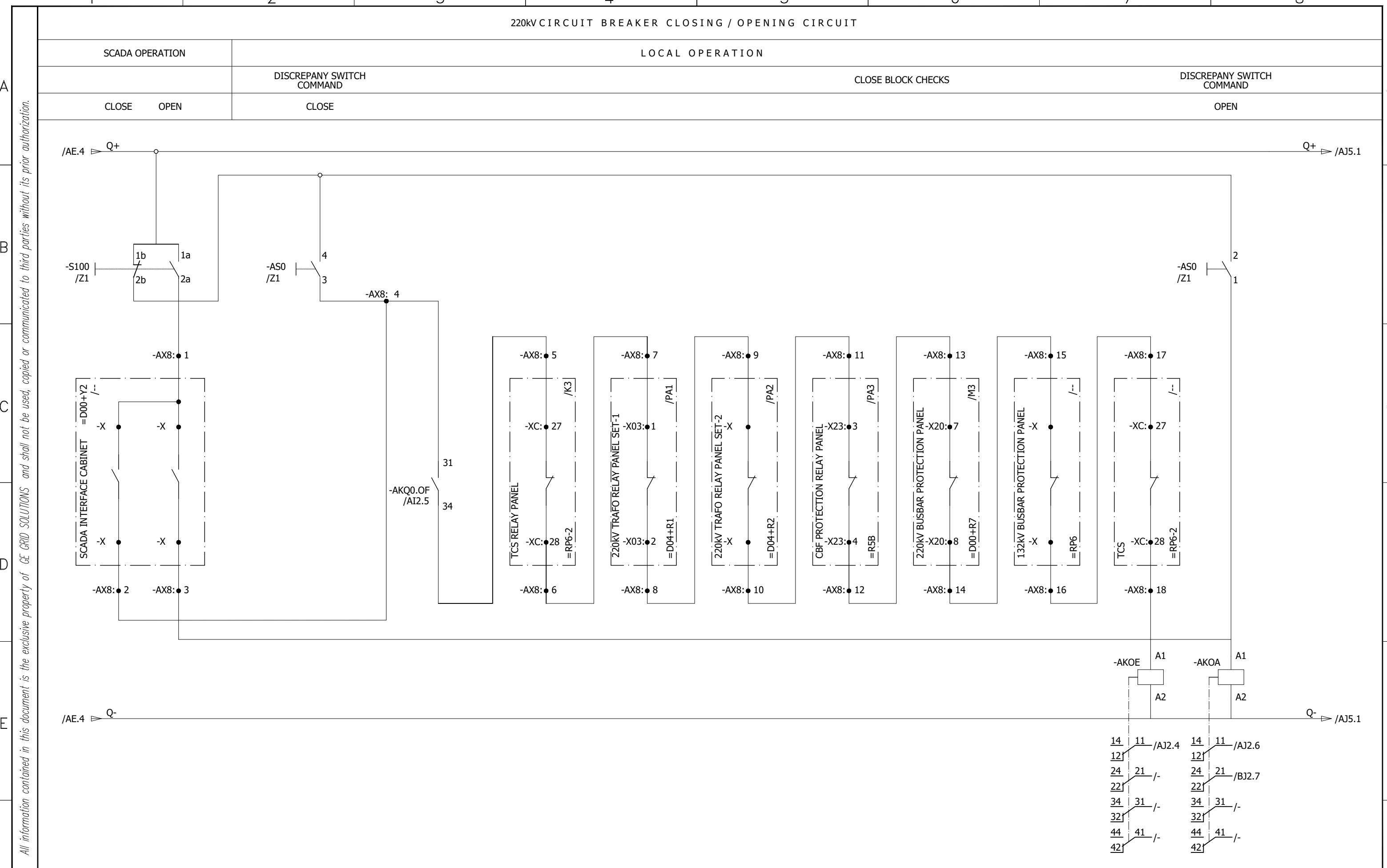
DC CIRCUIT C+/C-MONITORING

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0	AS BUILT	30.10.2018	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 (=D04+C5) POWER EQUIPMENT INPUTS	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type BI3
									Sheet no. 24

220kV CIRCUIT BREAKER CLOSING / OPENING CIRCUIT



0	AS BUILT	30.10.2018	ASJ	Manufacturer EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+C5) CIRCUIT BREAKER OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194

14 11 /AJ2.4
12 11 /AJ2.6
24 21 /-
22 21 /-
34 31 /-
32 31 /-
44 41 /-
42 41 /-

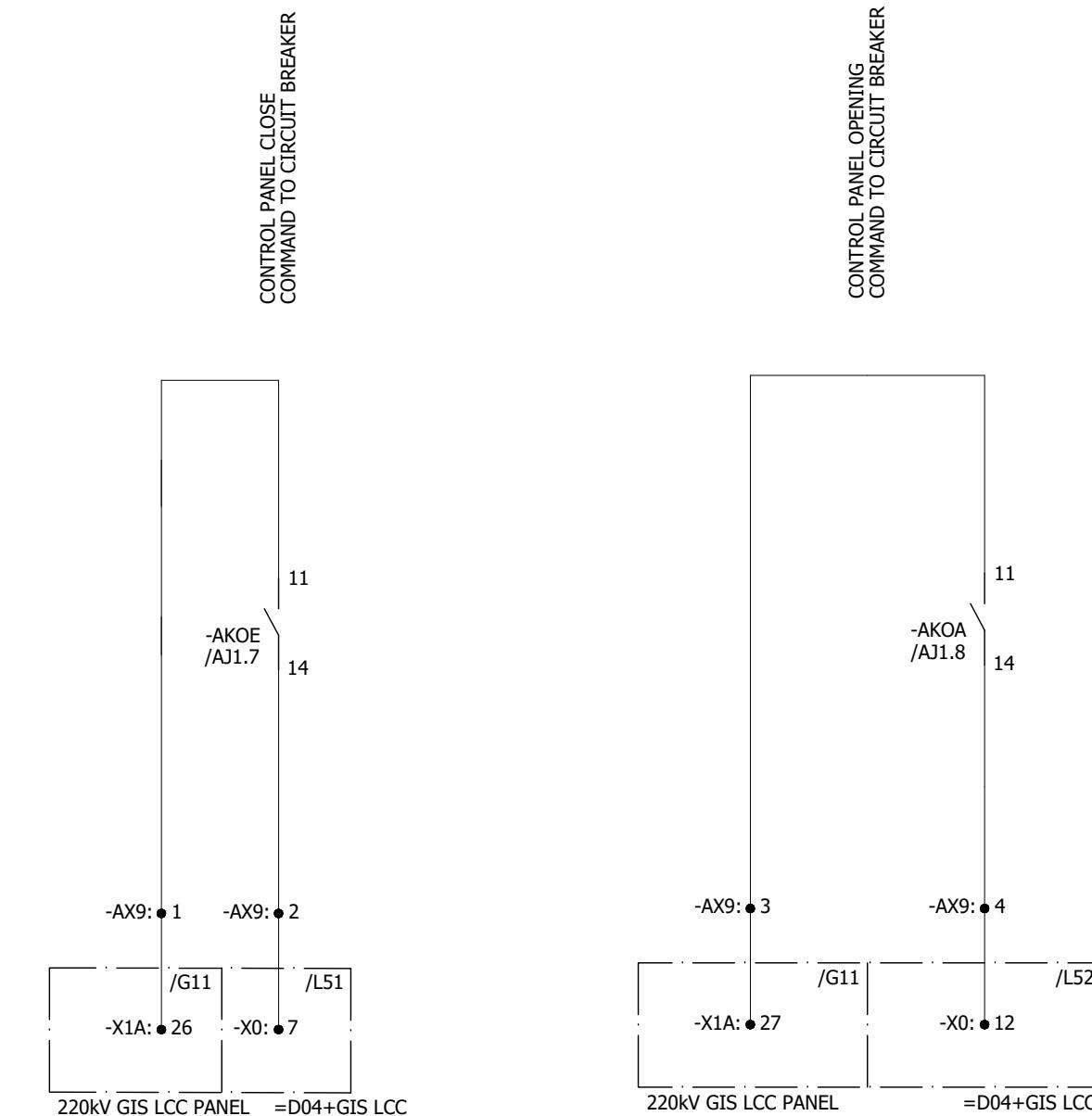
Q- ▷ /AJ5.1

14 11 /BJ2.7
24 21 /-
22 21 /-
34 31 /-
32 31 /-
44 41 /-
42 41 /-

Q+ ▷ /AJ5.1

220kV CIRCUIT BREAKER CLOSING / OPENING COMMANDS TO GIS LCC

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0	AS BUILT	30.10.2018	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 (=D04+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
1	2	3	4	5	6	7	8		

132kV CIRCUIT BREAKER CLOSING / OPENING CIRCUIT

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SCADA OPERATION

DISCREPANCY SWITCH
COMMAND

SYNCH ON-BYPASS

SYNCH COMMAND THROUGH

CLOSE BLOCK CHECKS

DISCREPANCY SWITCH
COMMAND

OPEN

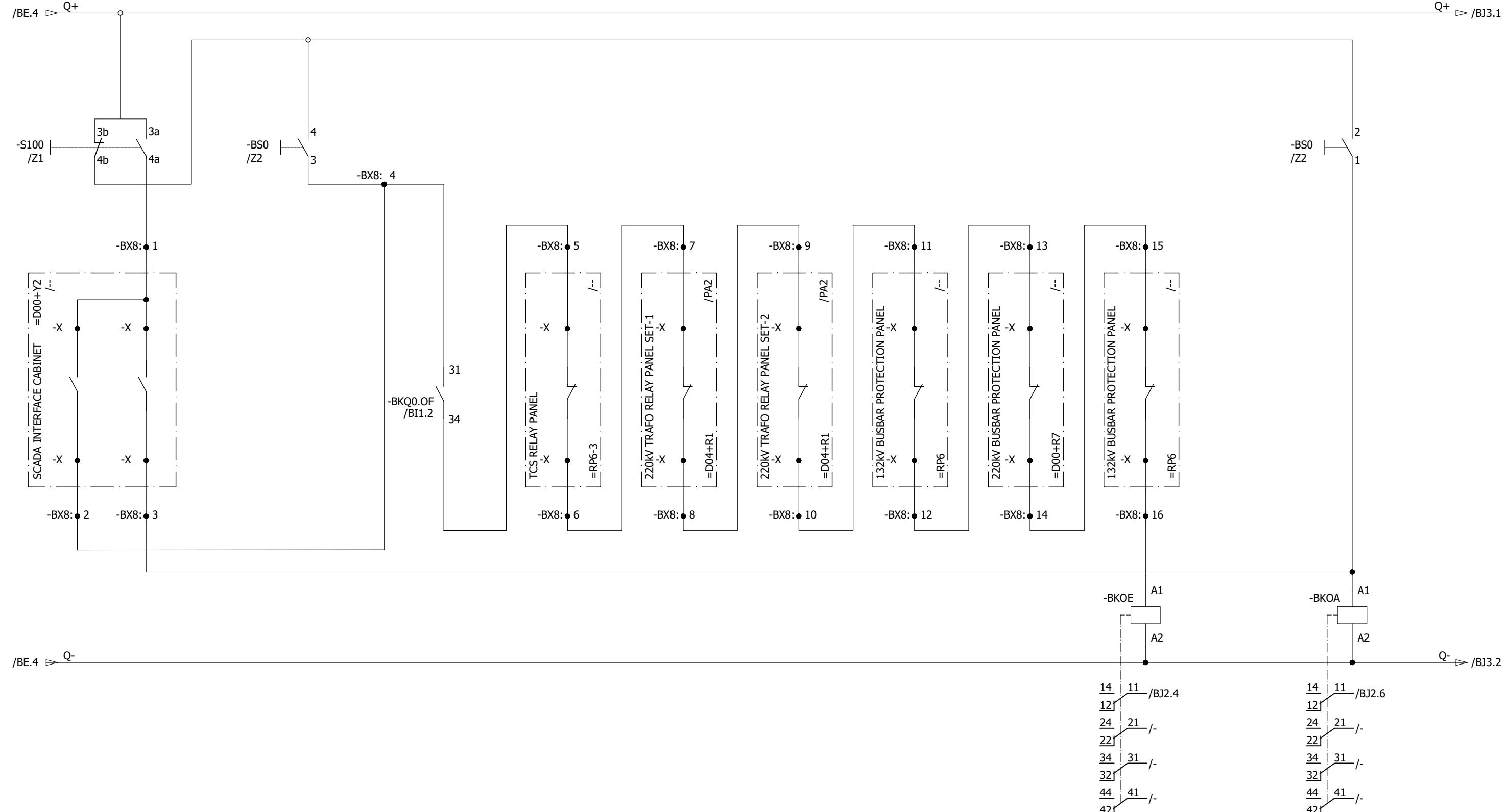
A

A

CLOSE

OPEN

CLOSE



0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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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A

A

B

B

C

C

D

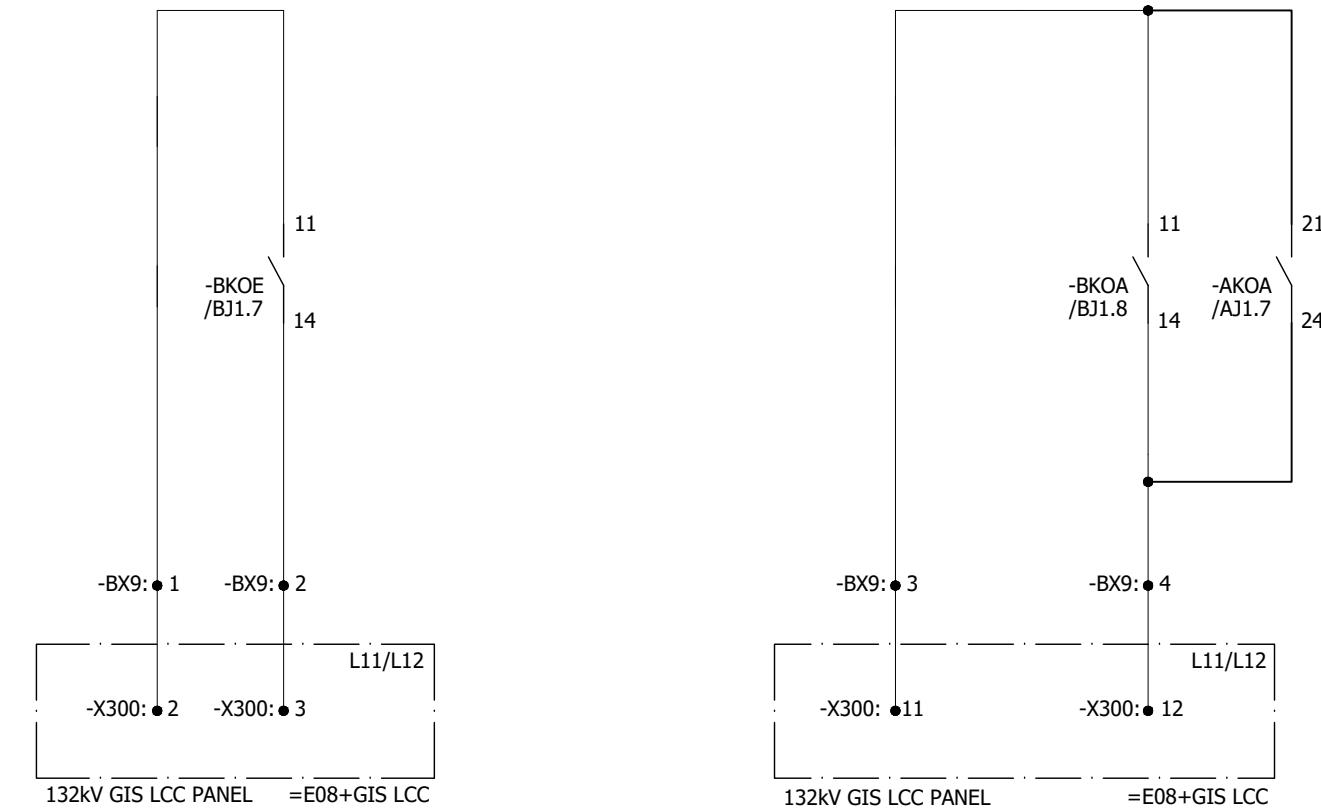
D

E

E

F

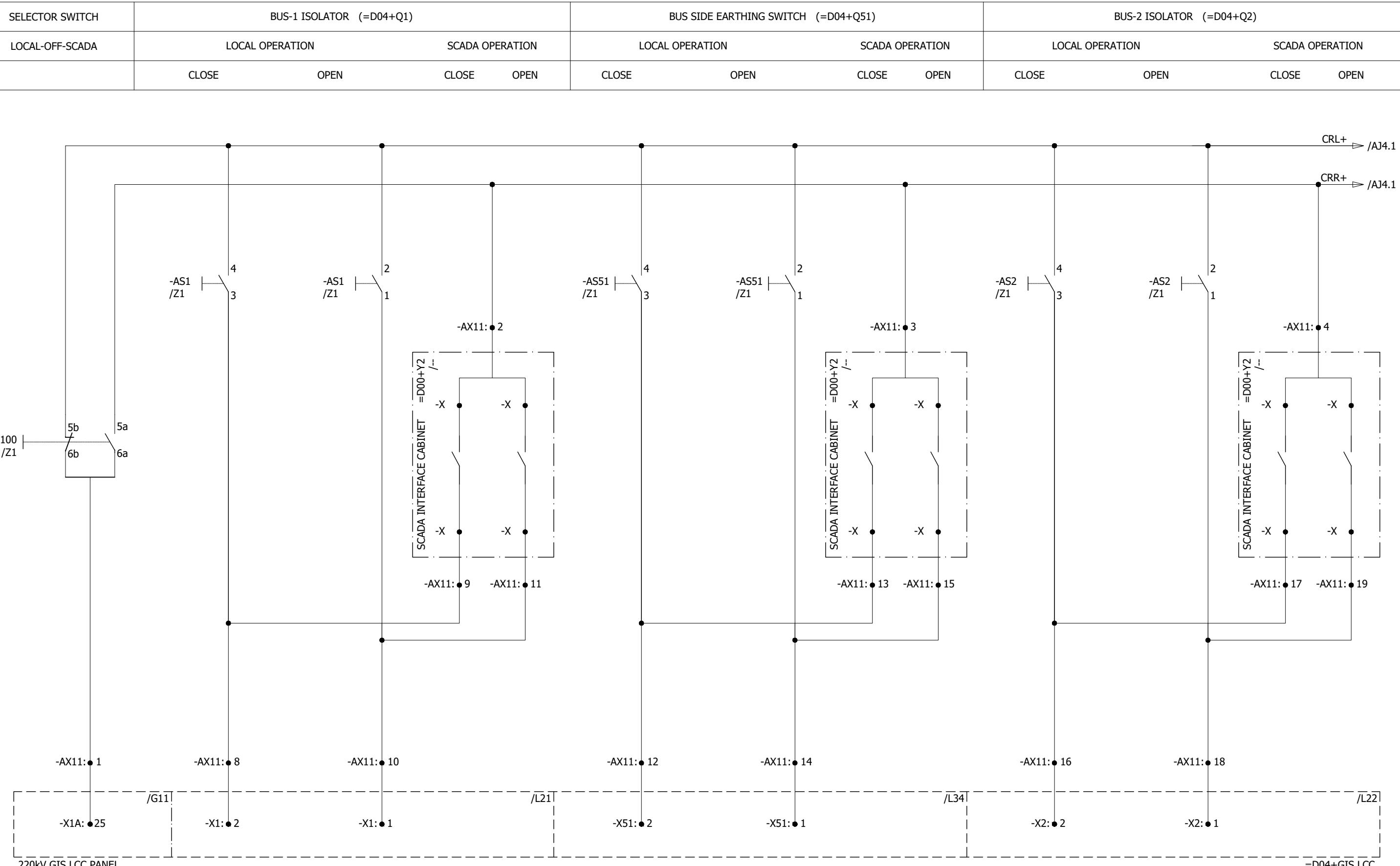
F

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

0	AS BUILT	30.10.2018	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 (=D04+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

220KV ISOLATOR EARTHING SWITCH CLOSING / OPENING CIRCUITS

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+C5) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT	Drawing no. P60194-E-DTC-SC-003		
									Project no.	Sheet type	Sheet no.
REV.	DESCRIPTION	DATE	DRAWER						P-60194	AJ3	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

CLOSE

OPEN

SCADA OPERATION

CLOSE

OPEN

LOCAL OPERATION

CLOSE

OPEN

SCADA OPERATION

CLOSE

OPEN

LOCAL OPERATION

CLOSE

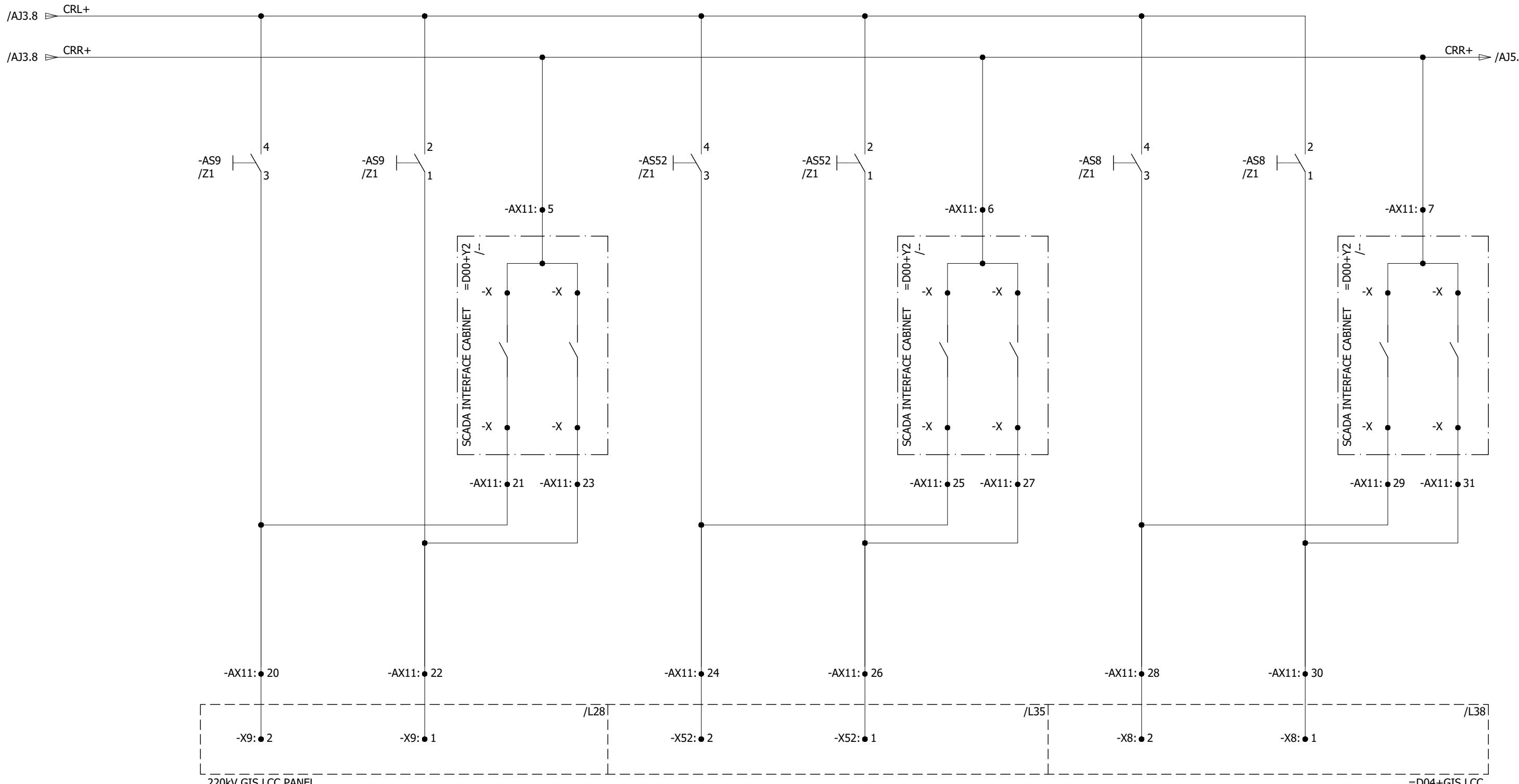
OPEN

SCADA OPERATION

CLOSE

OPEN

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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

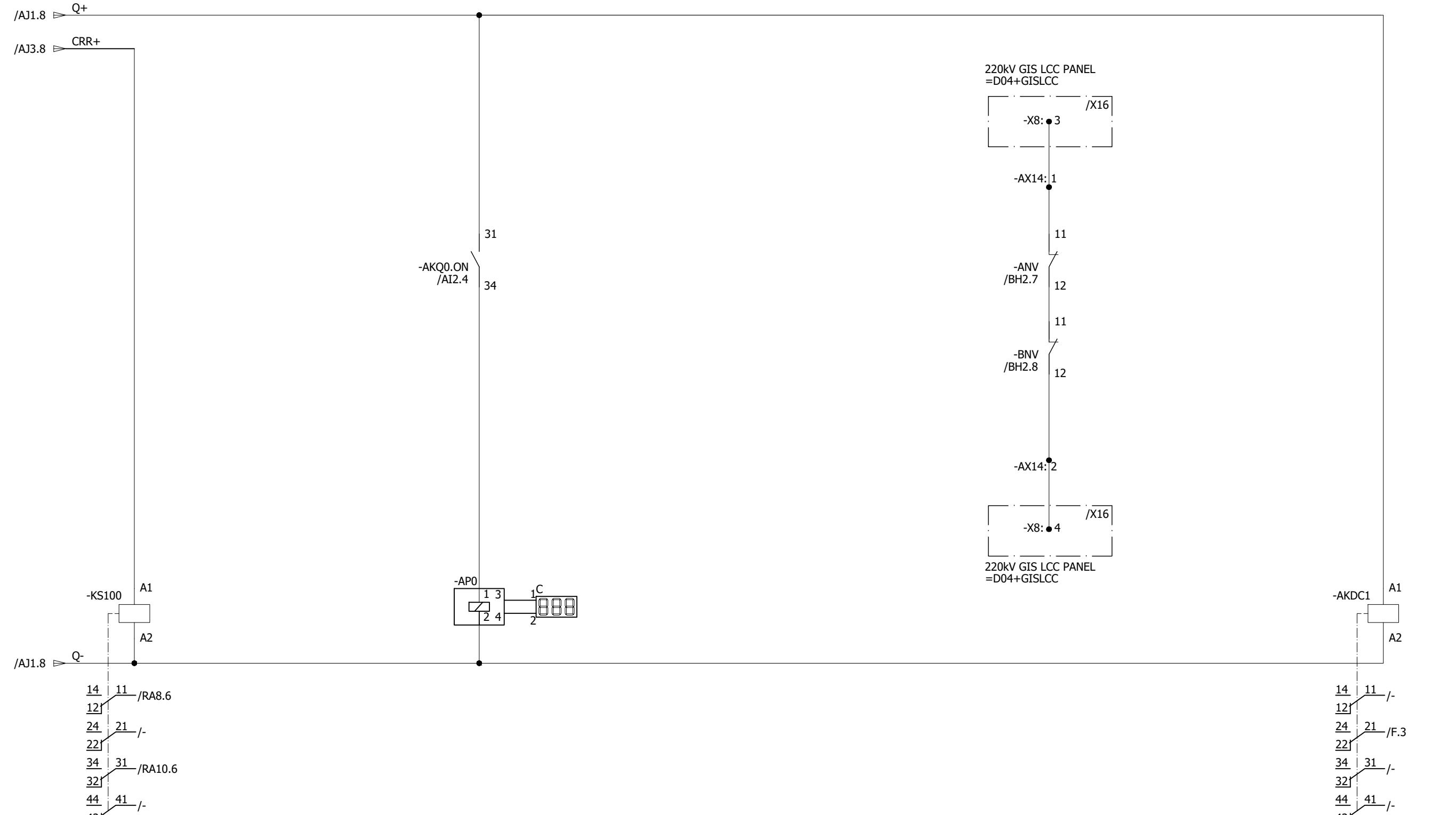
220KV SWITCHES
ON REMOTE MODECIRCUIT BREAKER
OPERATION COUNTERINTERLOCK FOR
LINE EARTHING SWITCHDC CIRCUIT Q+/Q-
MONITORING

-KS100

-AP0

-AKDC1

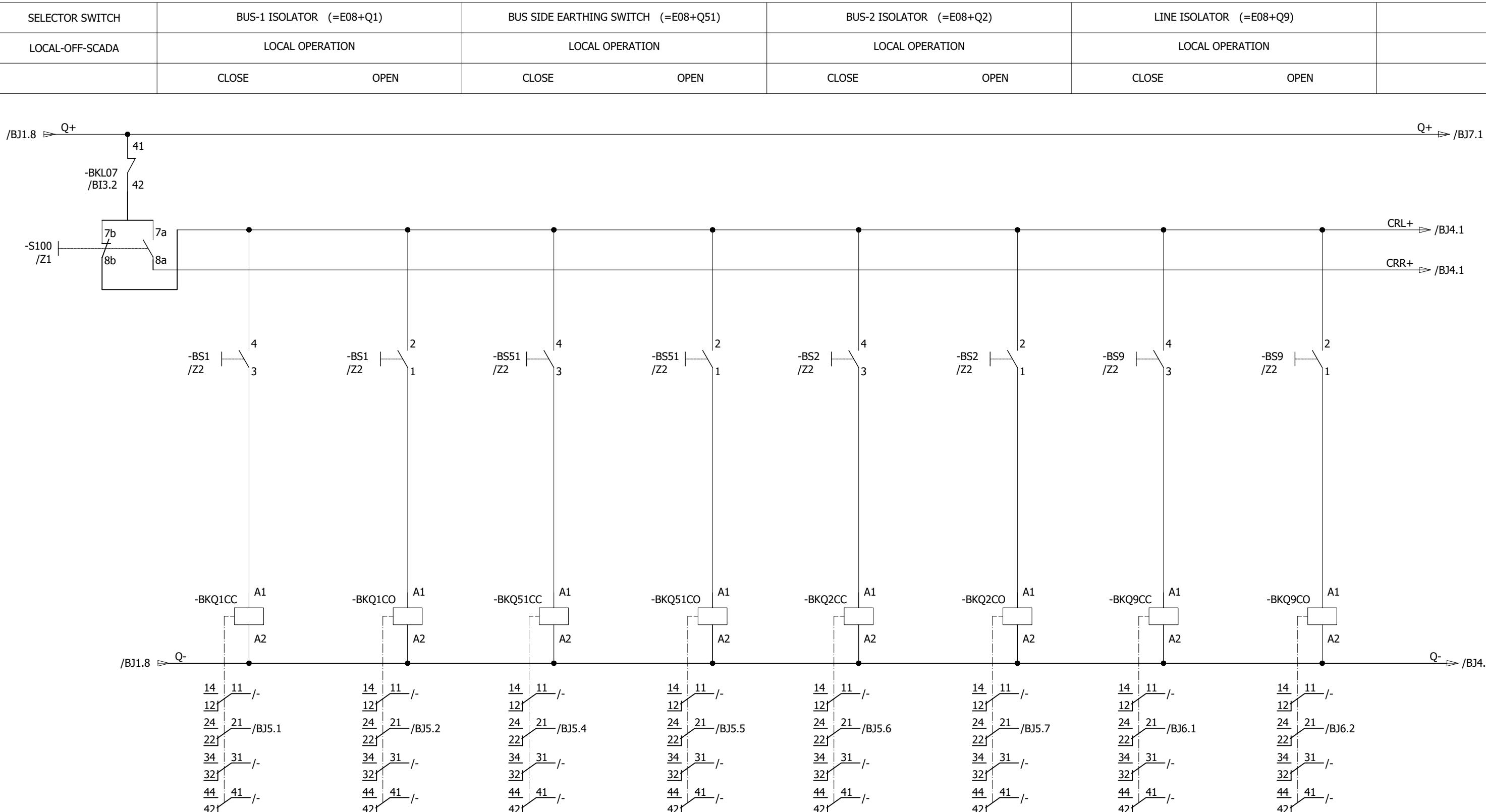
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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPEPSOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+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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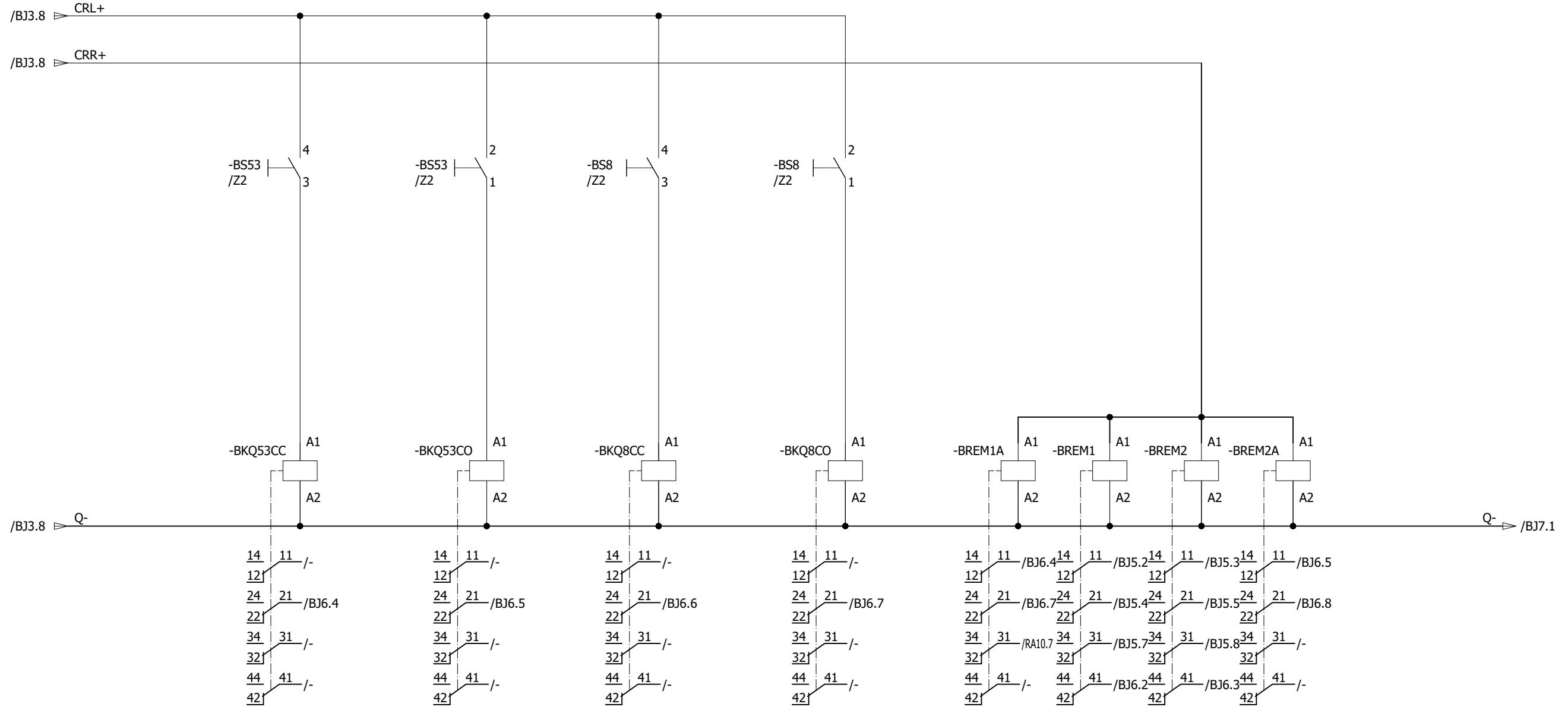


0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPE SOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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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A
B
C
D
E
F

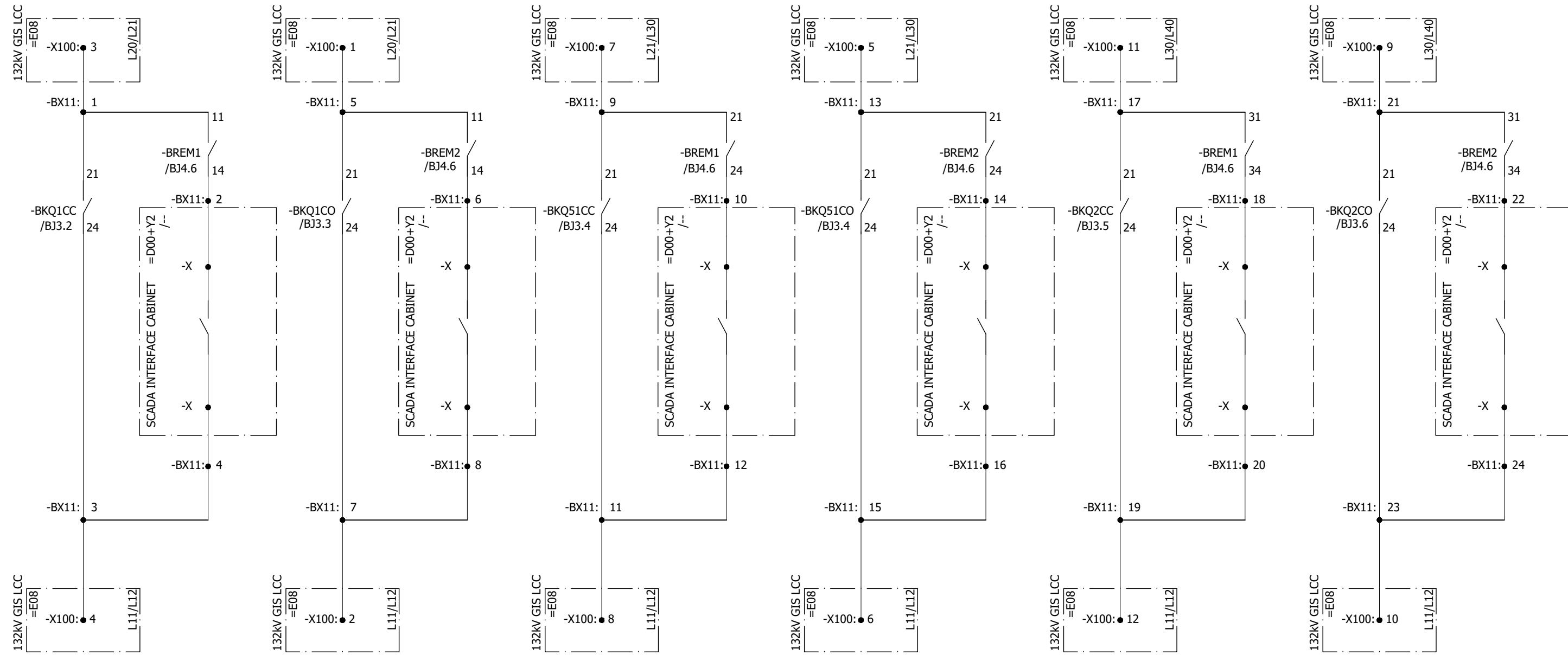
A
B
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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+C5) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT'	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type BJ4
									Sheet no. 33

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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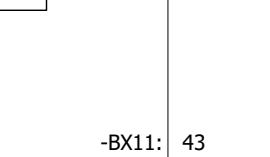
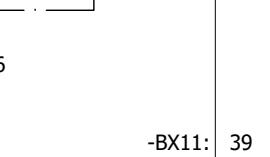
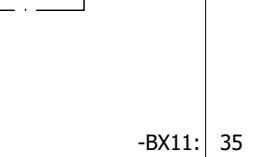
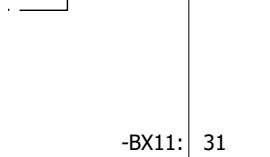
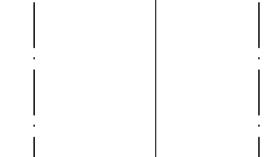
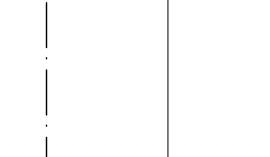
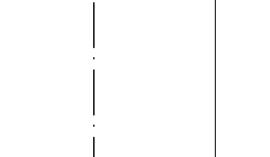
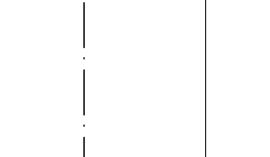
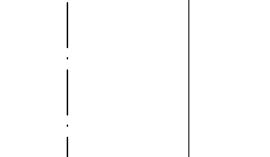
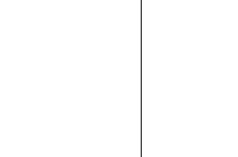
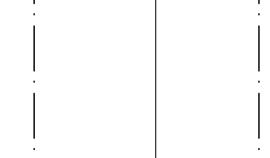
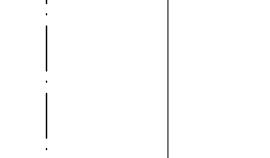
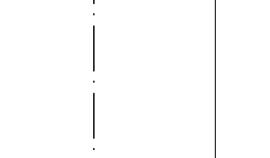
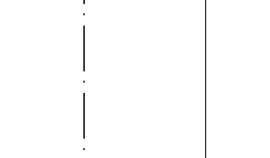
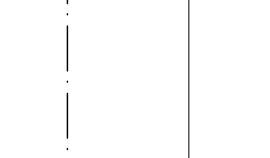
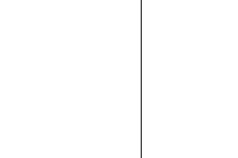
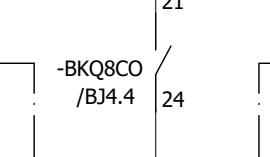
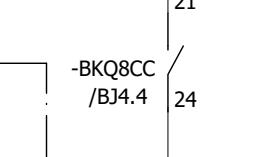
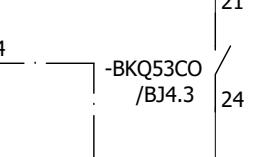
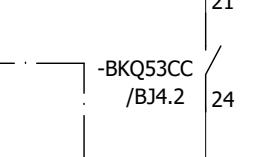
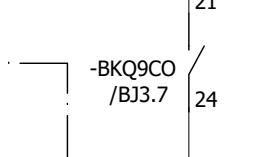
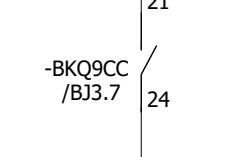
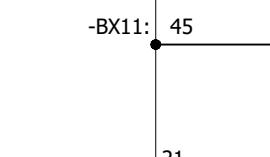
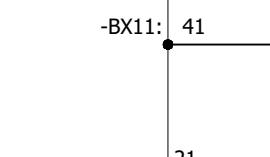
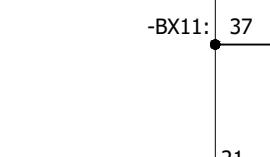
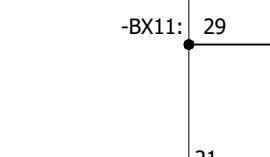
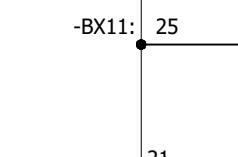
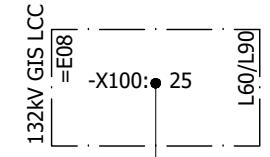
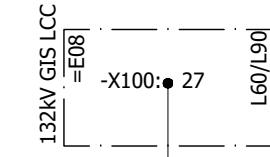
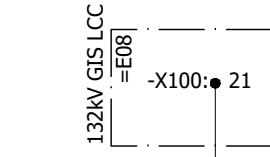
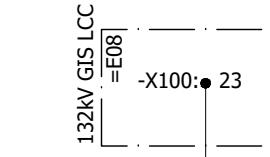
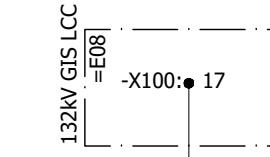
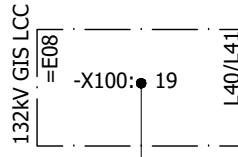


0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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

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

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1 AS BUILT 30.10.2018 ASJ Manufacturer E PESOL 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 (=D04+C5) ISOLATOR/EARTHING SW. OPENING/CLOSING CIRCUIT'

Drawing no. P60194-E-DTC-SC-003 Project no. P-60194 Sheet type BJ6 Sheet no. 35

0 REV. DESCRIPTION DATE DRAWER

1 2 3

4

5

6

7

8

132kV CONTROL CIRCUIT

CIRCUIT BREAKER
OPERATION COUNTER

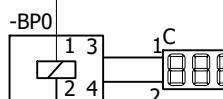
-BPO

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

-BKDC1

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/BJ3.8 ➔ Q+

-BKQ0.ON
/BI1.1

31

34

/BJ4.7 ➔ Q-

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

132kV GIS LCC PANEL
=E08+GISLCC

P20/R10

-XIT: 31

-BX14: 1

-ANV
/BH2.7-BNV
/BH2.8

-BX14: 2

P20/R10

-XIT: 32

132kV GIS LCC PANEL
=E08+GISLCC

-BKDC1

A1

A2

14

11 /-

12

24 21 /F.7

22

34 31 /-

32

44 41 /-

42

A A

B B

C C

D D

E E

F F

1 1

2 2

3 3

4 4

5 5

6 6

7 7

8 8

0	AS BUILT	30.10.2018	ASJ	Manufacturer	Contractor	Client	Project	Title	Drawing no.
				EPE SOL	Grid Solutions	NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	220/132kV TRANSFORMER CONTROL PANEL (=D04+C5) CONTROL CIRCUIT	Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type BJ7

220KV DISCREPANCY CHECK CIRCUIT

CIRCUIT BREAKER

BUS-1 ISOLATOR

BUS SIDE EARTHING SWITCH

BUS-2 ISOLATOR

LINE ISOLATOR

-Q0

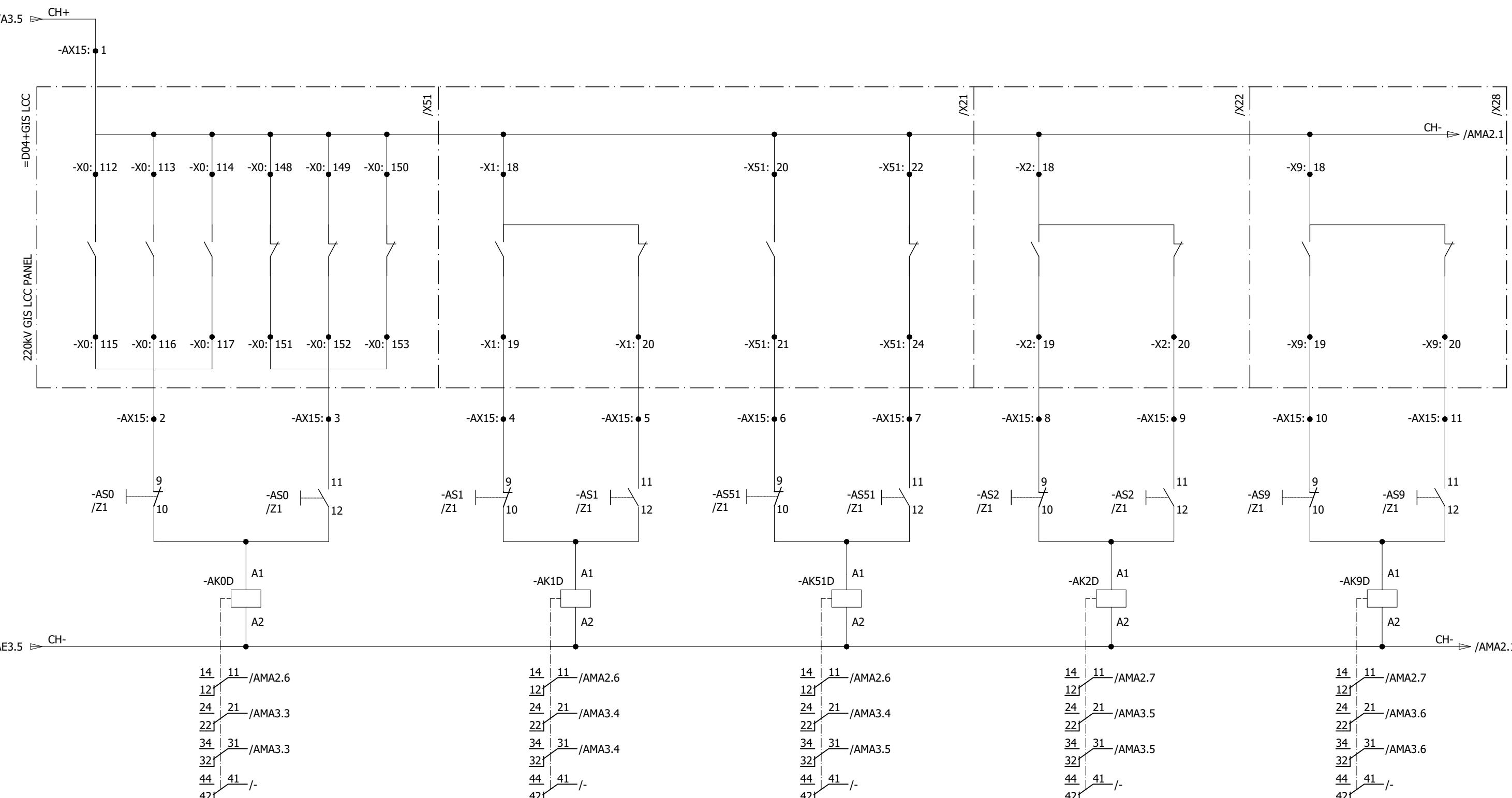
-Q1

-Q51

-Q2

-Q9

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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

220KV DISCREPANCY CHECK CIRCUIT

LINE SIDE EARTHING SWITCH

-Q52

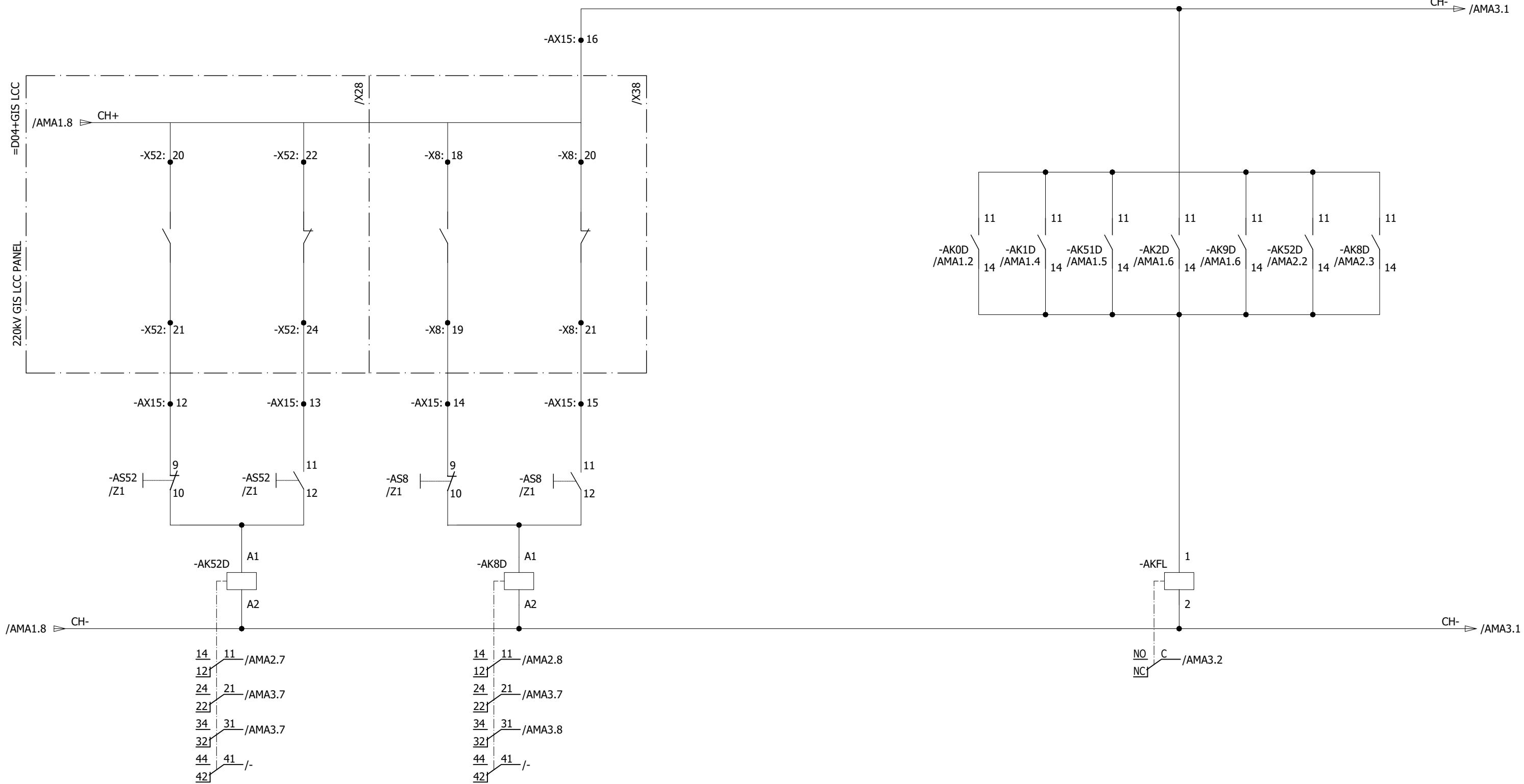
HIGH SPEED EARTHING SWITCH

-Q8

FLASHER RELAY
INITIATION

-AKFL

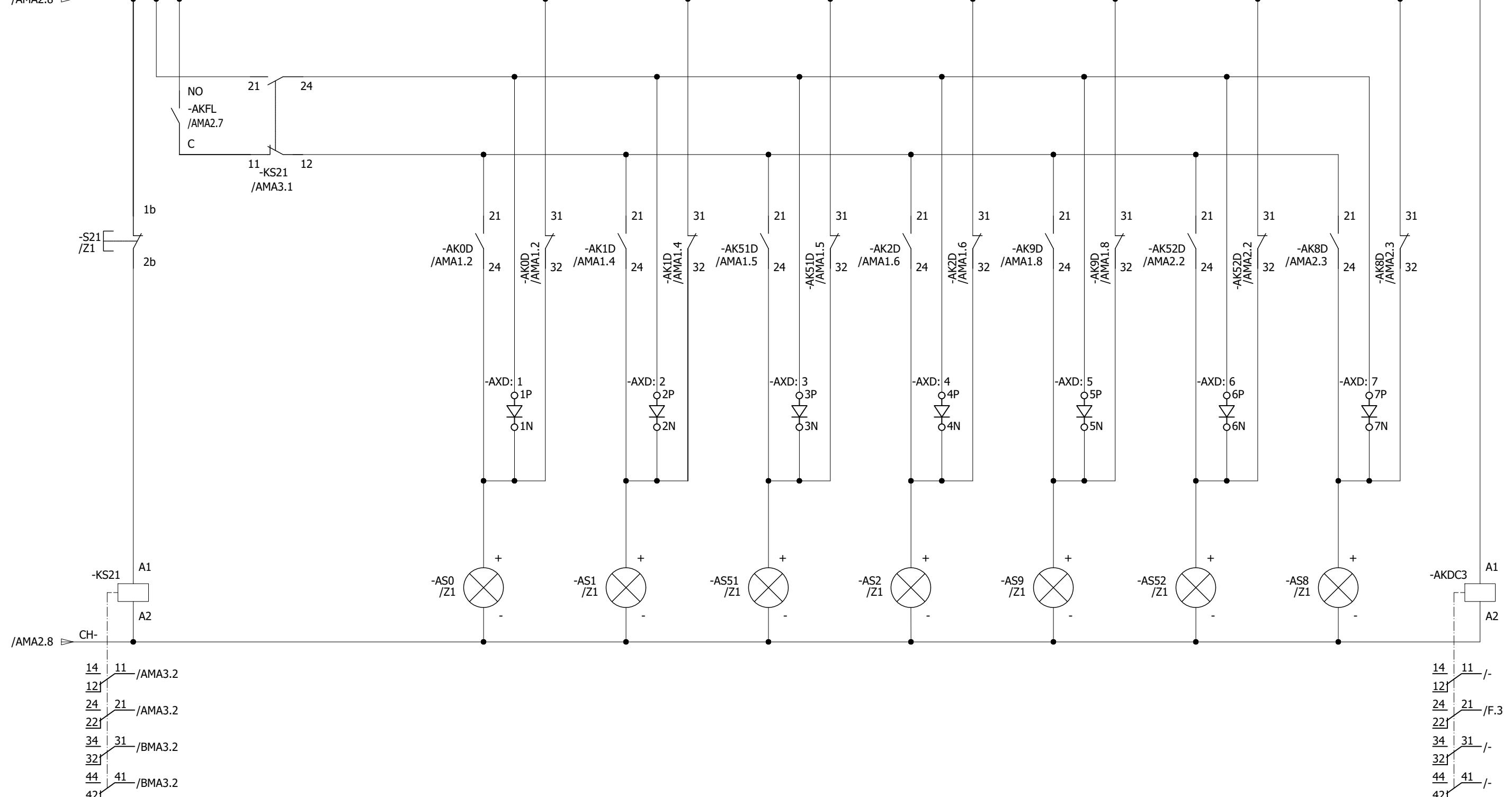
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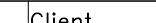


0	AS BUILT	30.10.2018	ASJ	Manufacturer EPEPSOL 72-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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

220kV DISCREPANCY CHECK CIRCUIT

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 75-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 (=D04+C5) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER					Project no. P-60194	Sheet type AMA3
1	2	3	4	5	6	7	8		

132kV DISCREPANCY CHECK CIRCUIT

CIRCUIT BREAKER

BUS-1 ISOLATOR

BUS SIDE EARTHING SWITCH

BUS-2 ISOLATOR

LINE ISOLATOR

-Q0

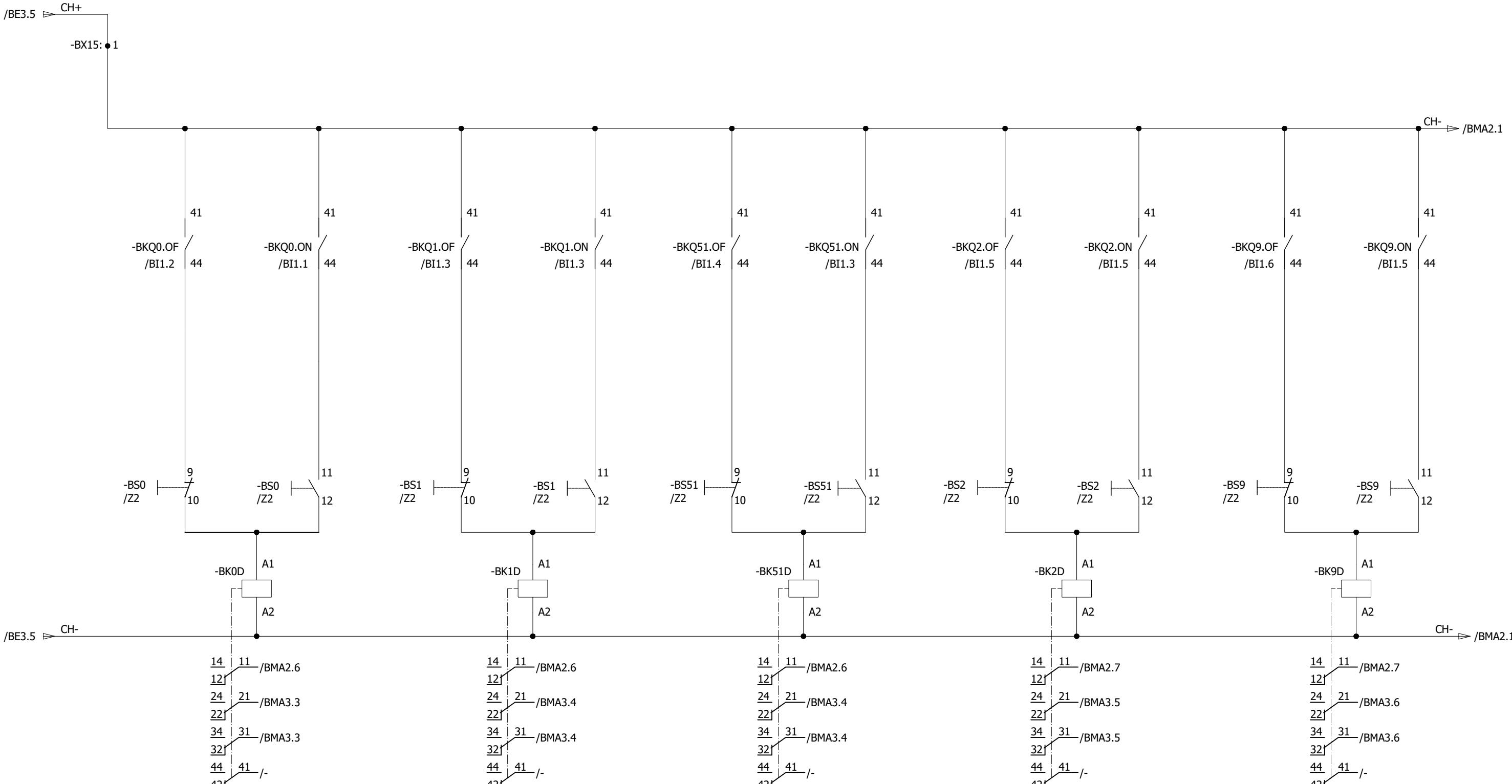
-Q1

-Q51

-Q2

-Q9

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPE SOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+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

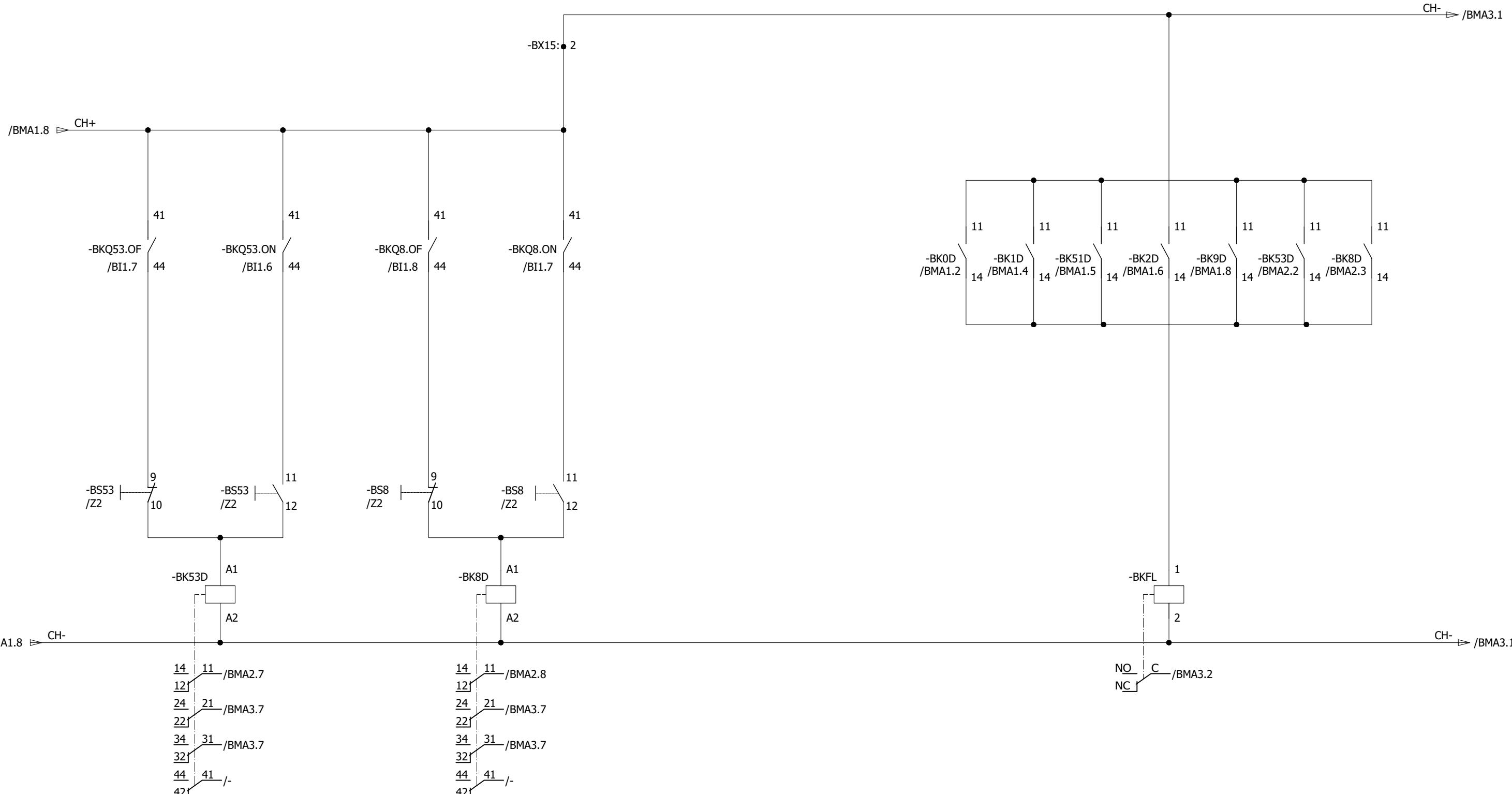
HIGH SPEED EARTHING SWITCH

FLASHER RELAY
INITIATION

-Q53

-Q8

-BKFL



0	AS BUILT	30.10.2018	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 (=D04+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
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-Q0

-Q1

-Q51

-Q2

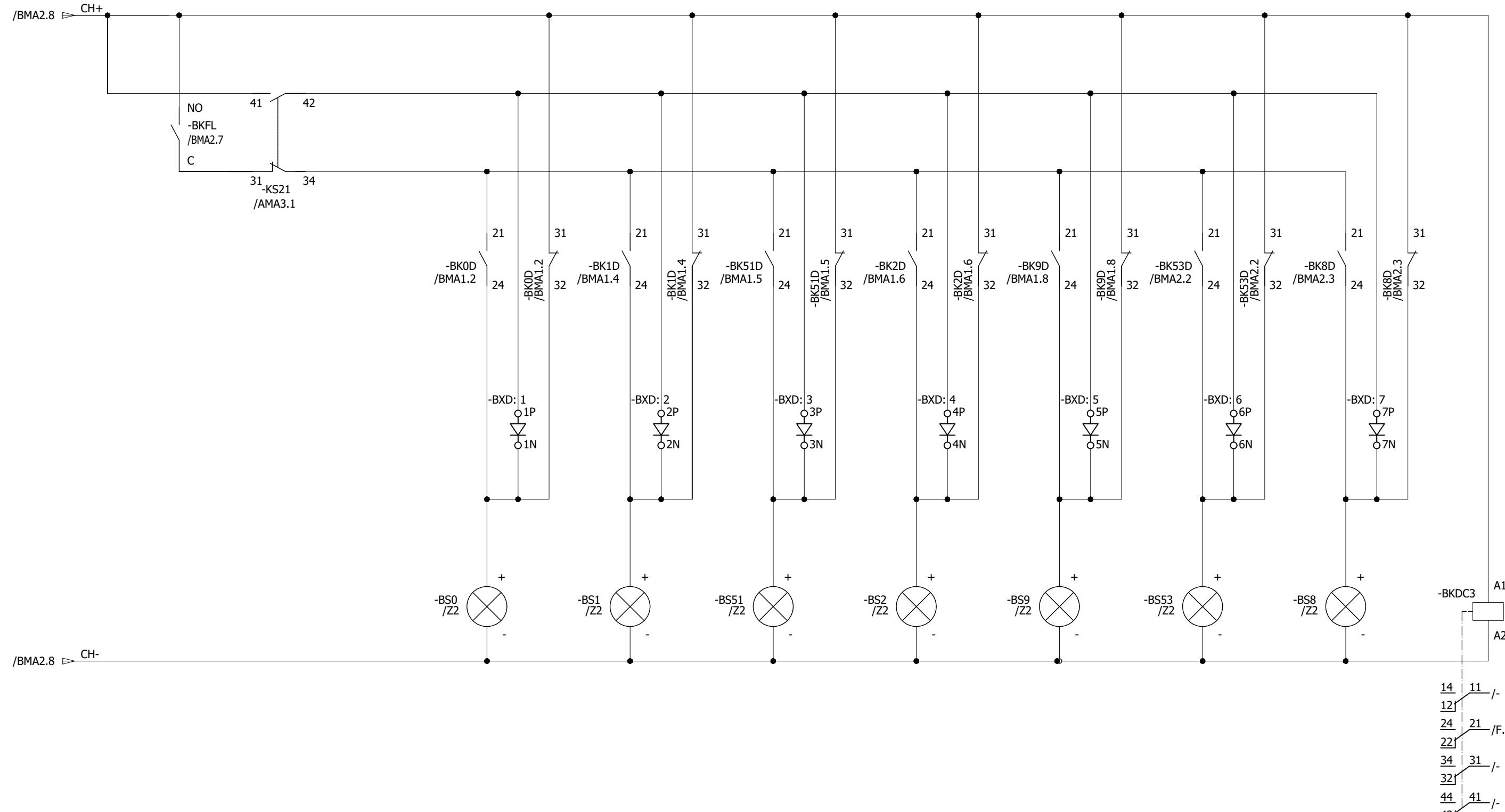
-Q9

-Q52

-Q8

-BKDC3

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPEPSOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+C5) DISCREPANCY CHECK CIRCUIT	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type BMA3
									Sheet no. 42

1 2 3 4 5 6 7 8

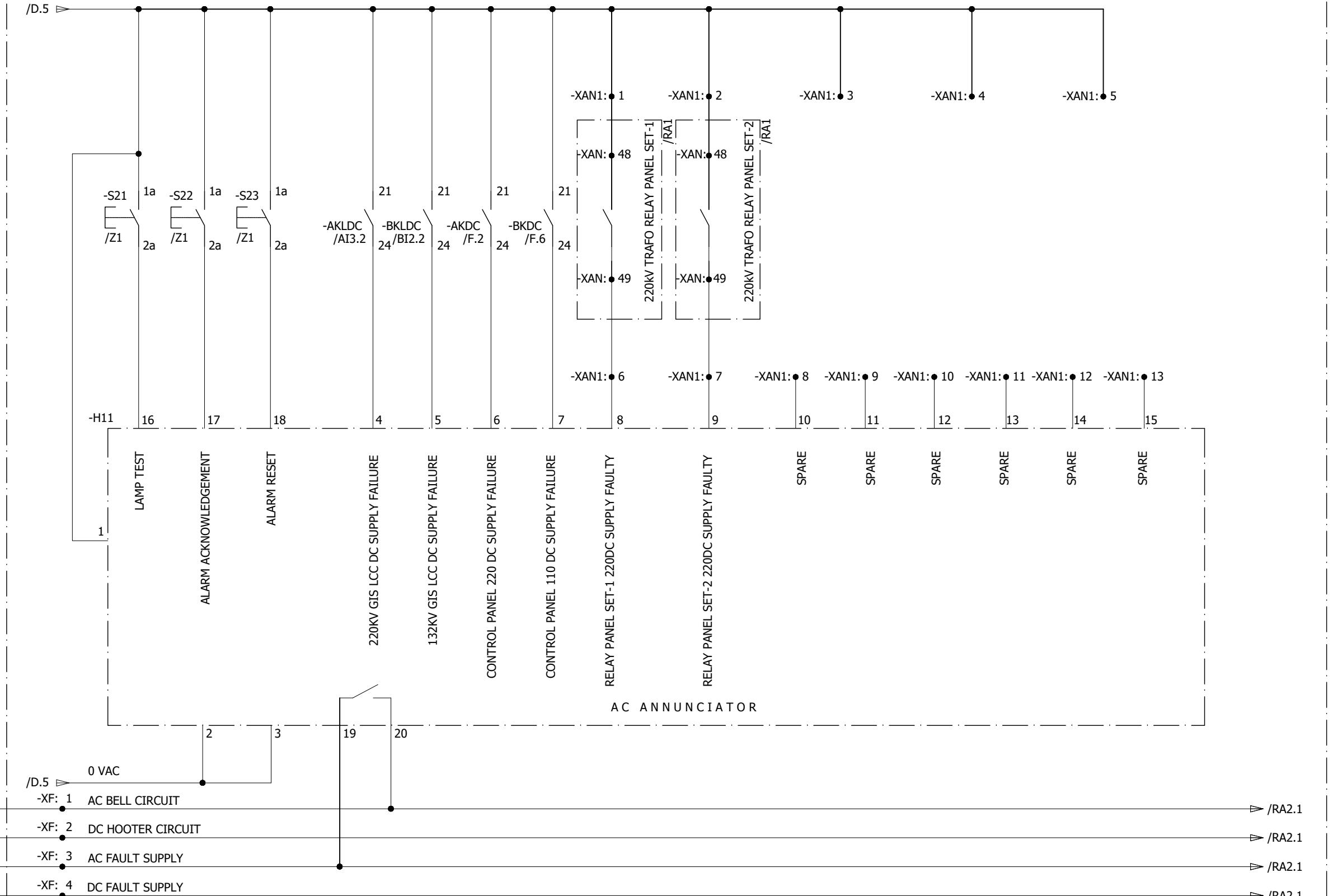
ANNUNCIATION CIRCUIT

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220KV TRAFO CONTROL PANEL

=D03+C5

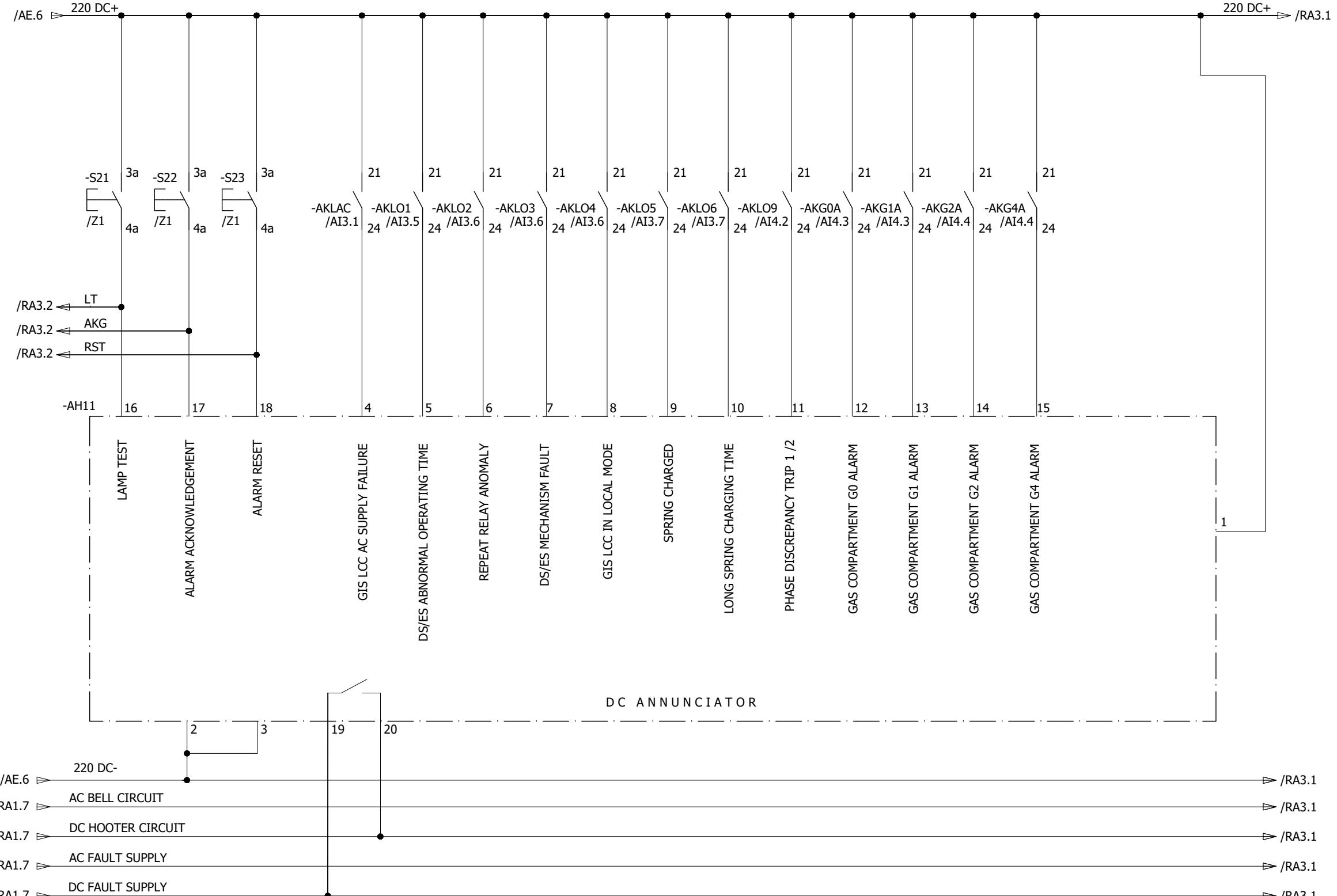
/RA7



1	2	3	4	5	6	7	8			
A							A			
B							B			
C							C			
D							D			
E							E			
F							F			
0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 71-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+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

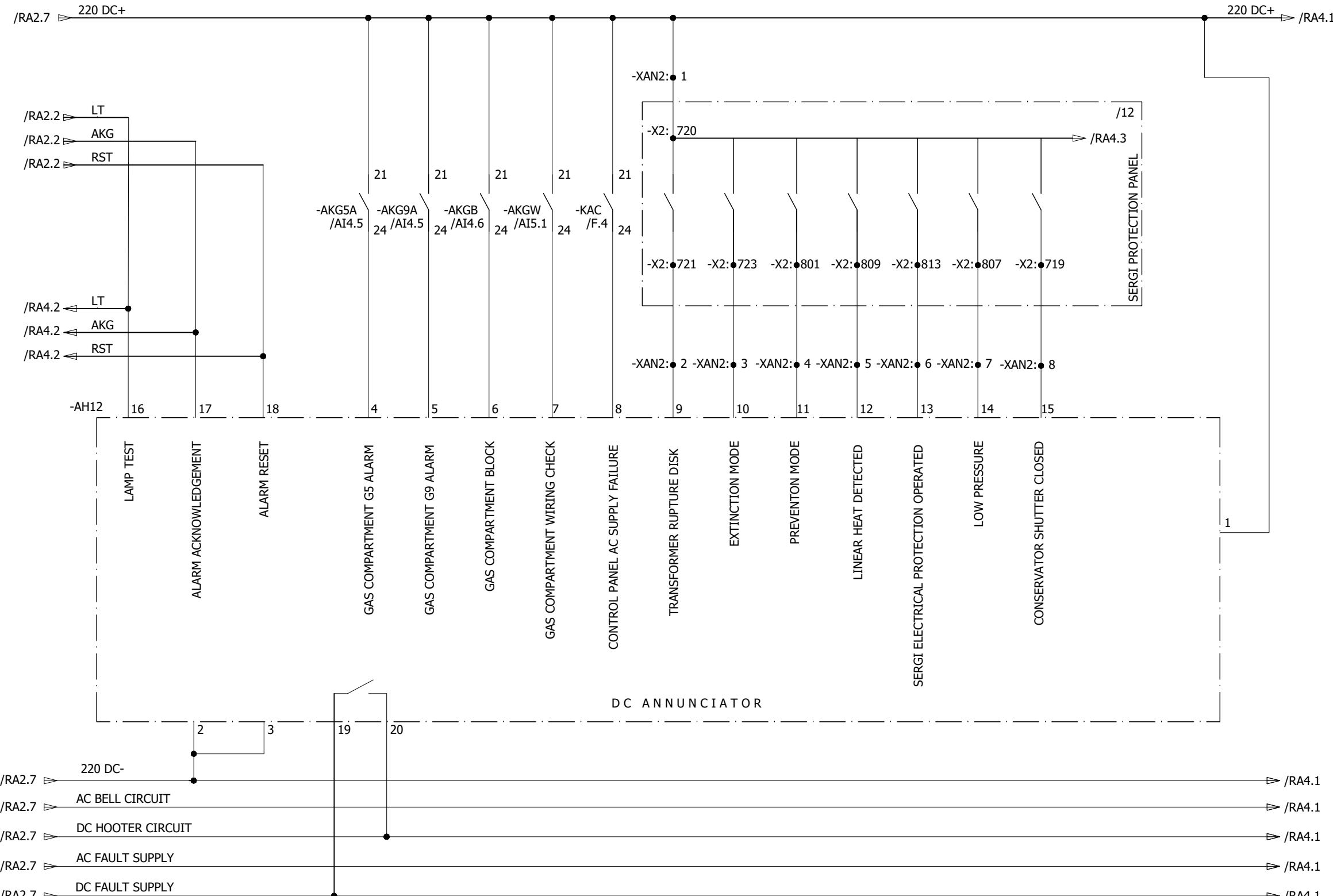
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0	AS BUILT	30.10.2018	ASJ	Manufacturer E P E S O L 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+C5) DC ANNUNCIATIONS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type RA2
									Sheet no. 44

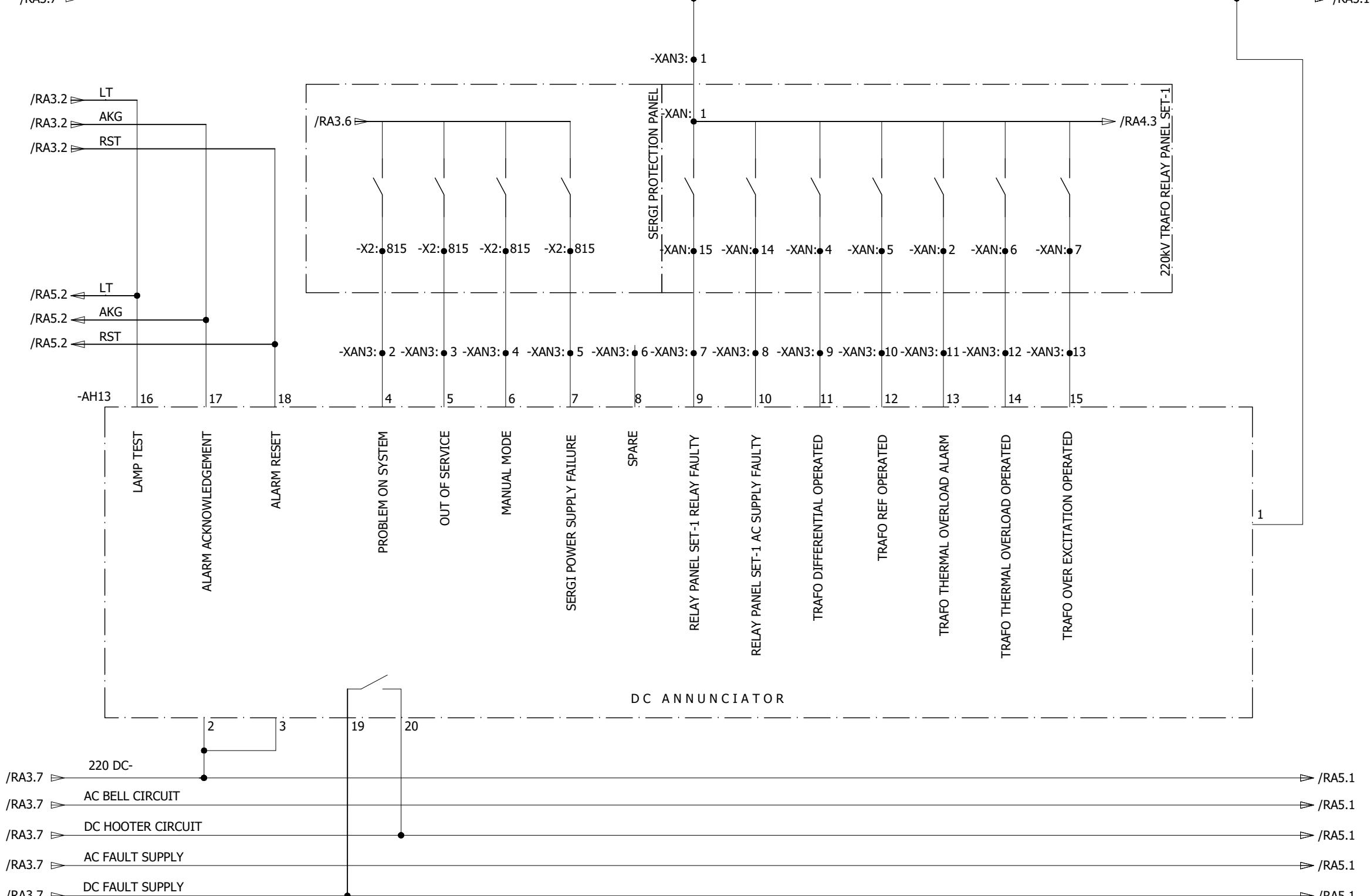
ANNUNCIATION CIRCUIT

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0	AS BUILT	30.10.2018	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 (=D04+C5) DC ANNUNCIATIONS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194

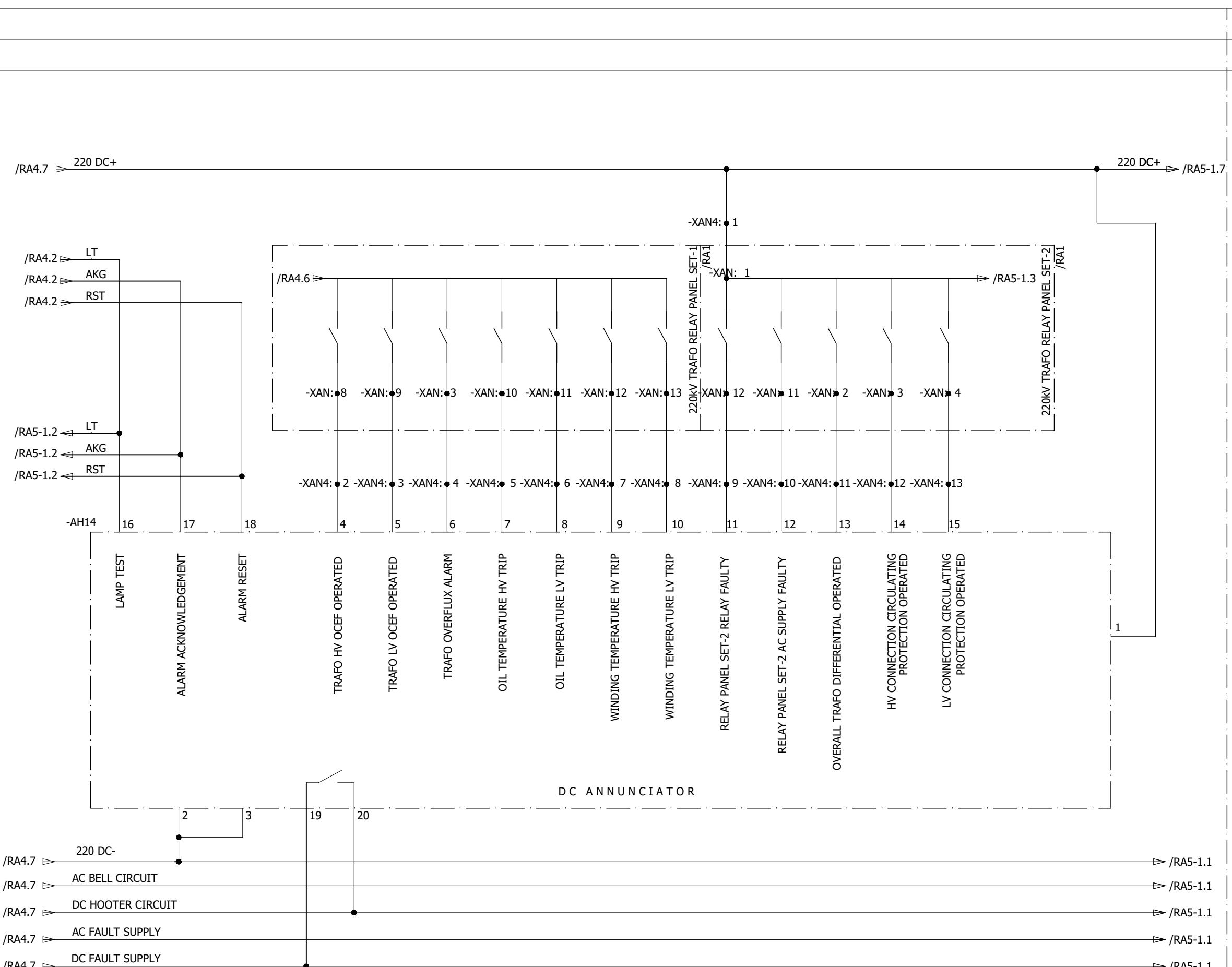
ANNUNCIATION CIRCUIT

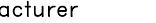


0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPEPSOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+C5) DC ANNOUNCEMENTS	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type RA4
		2	3						Sheet no. 46

ANNUNCIATION CIRCUIT

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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132kV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132kV TRANSFORMER CONTROL PANEL (=D04+C5) DC ANNOUNCEMENTS	Drawing no.		
								P60194-E-DTC-SC-003			
								Project no.			
								P-60194	RA5	47	
REV.	DESCRIPTION	DATE	DRAWER								
1	2	3	4	5	6	7	8				

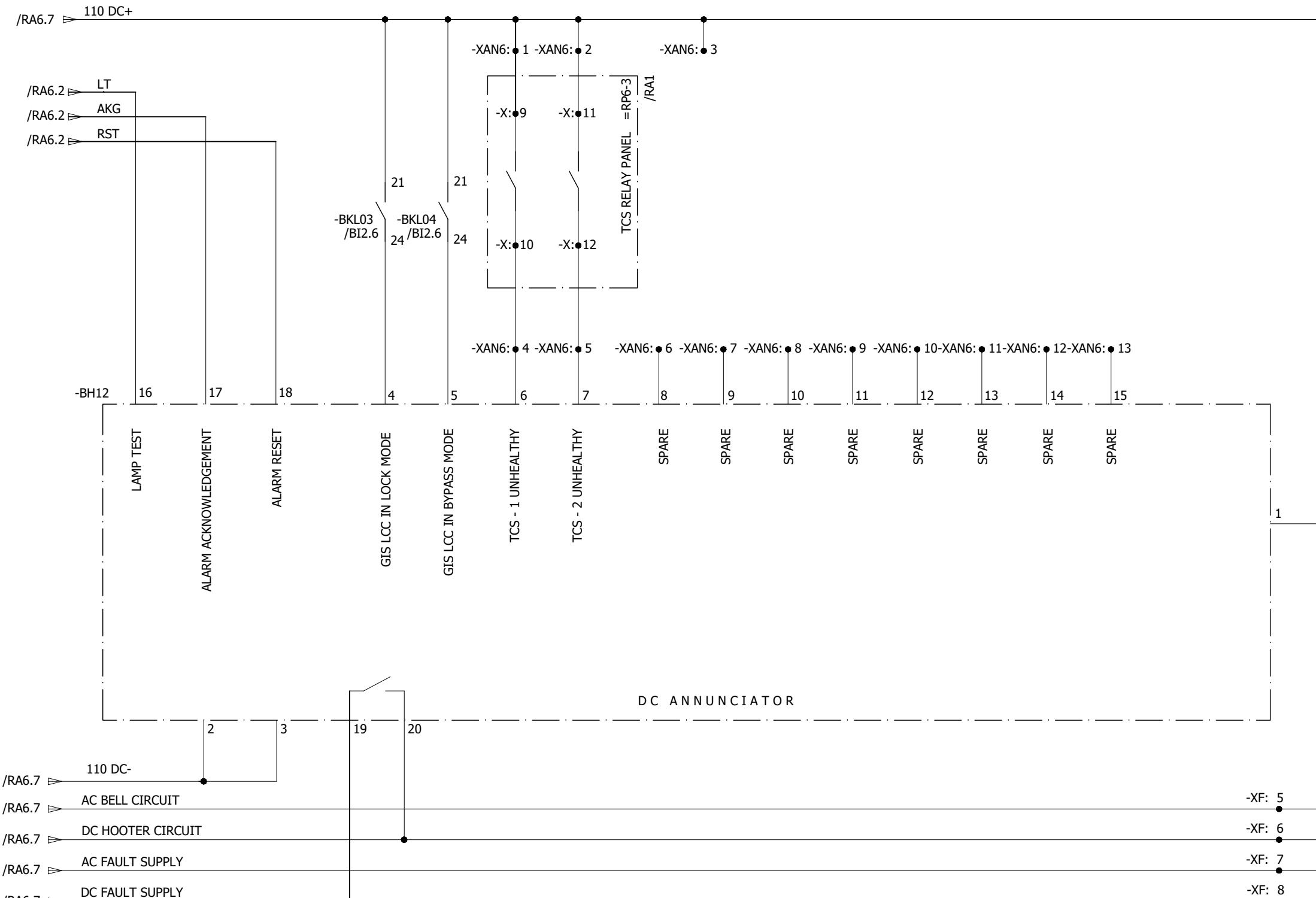
ANNUNCIATION CIRCUIT

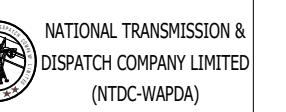
220KV LINE CONTROL PANEL

=D05+C4

/RA1

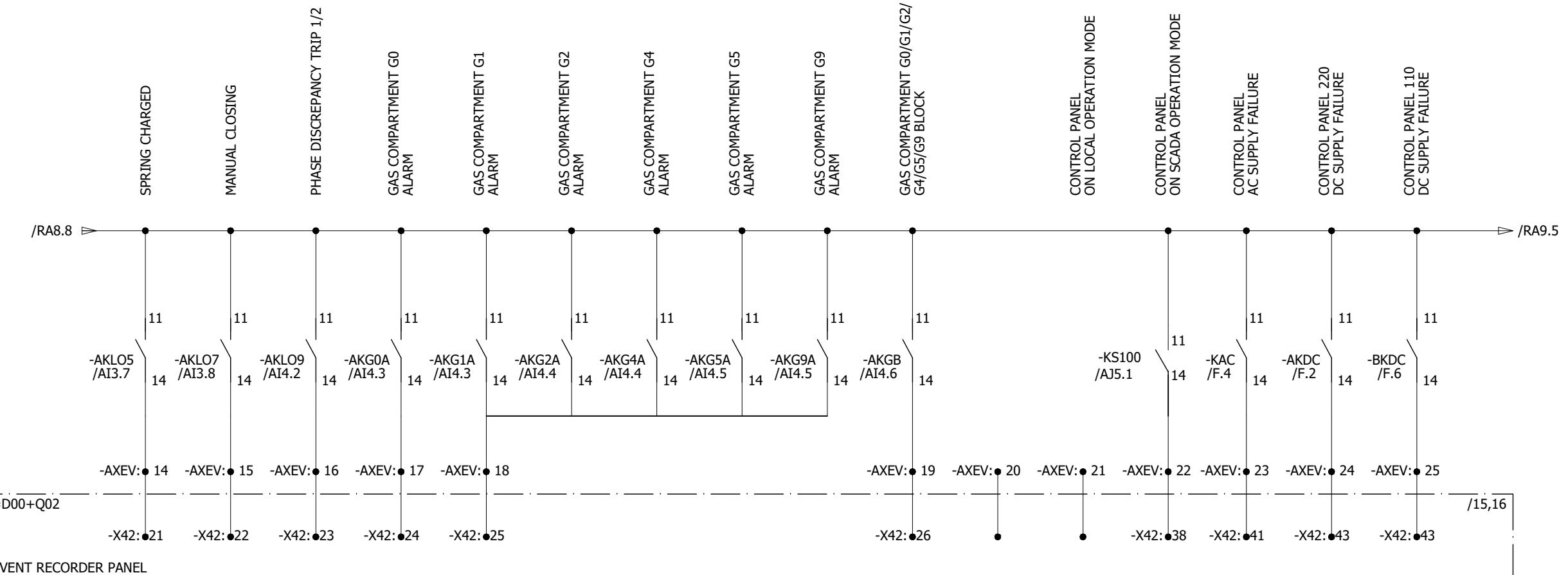
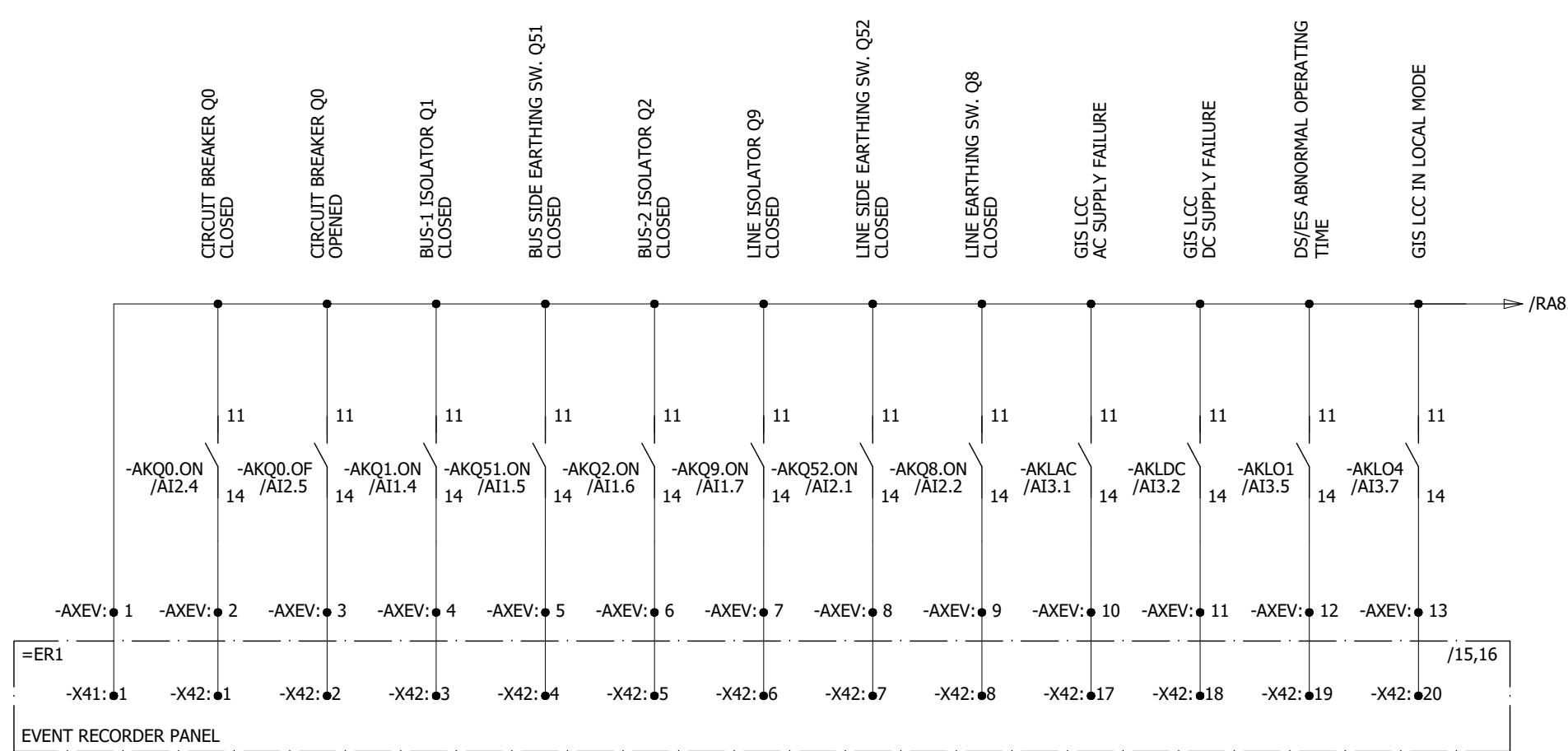
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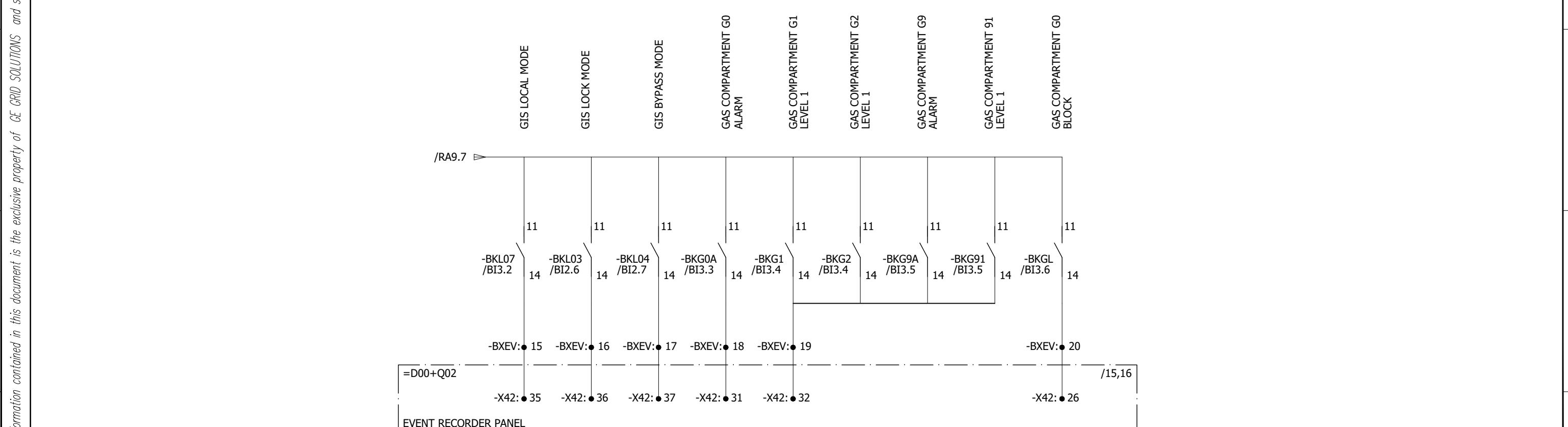
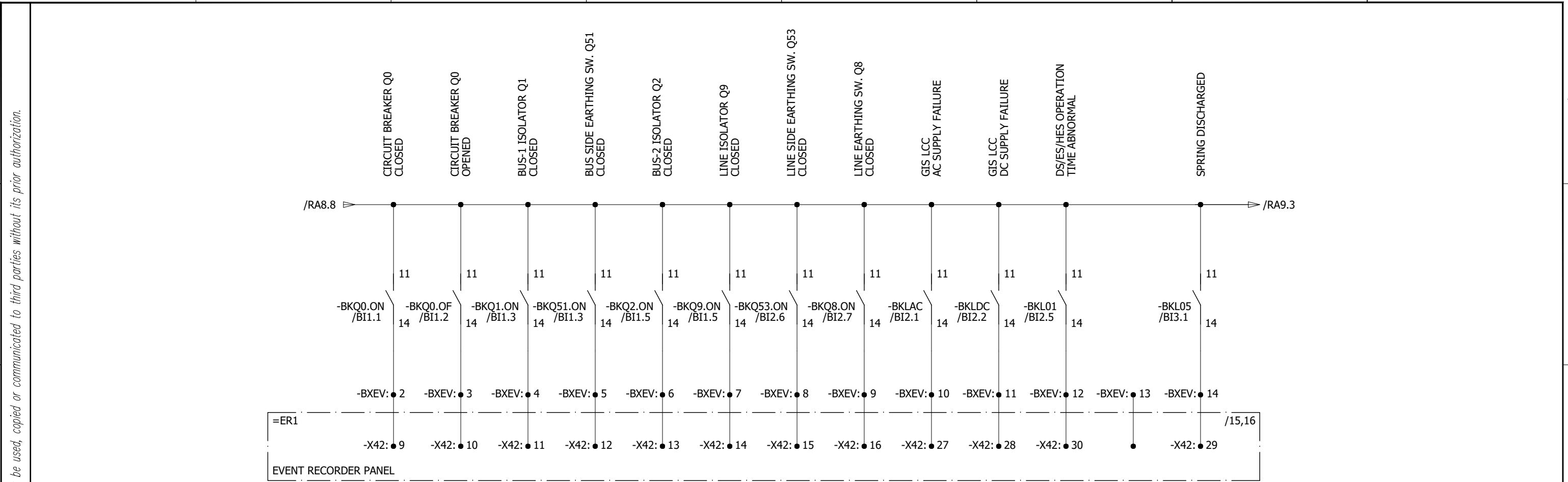
0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPEPSOL 7a-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+C5) DC ANNOUNCEMENTS	Drawing no. P60194-E-DTC-SC-003
									Project no. P-60194
REV.	DESCRIPTION	DATE	DRAWER						Sheet type RA7
									Sheet no. 50

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A
B
C
D
E
F
G

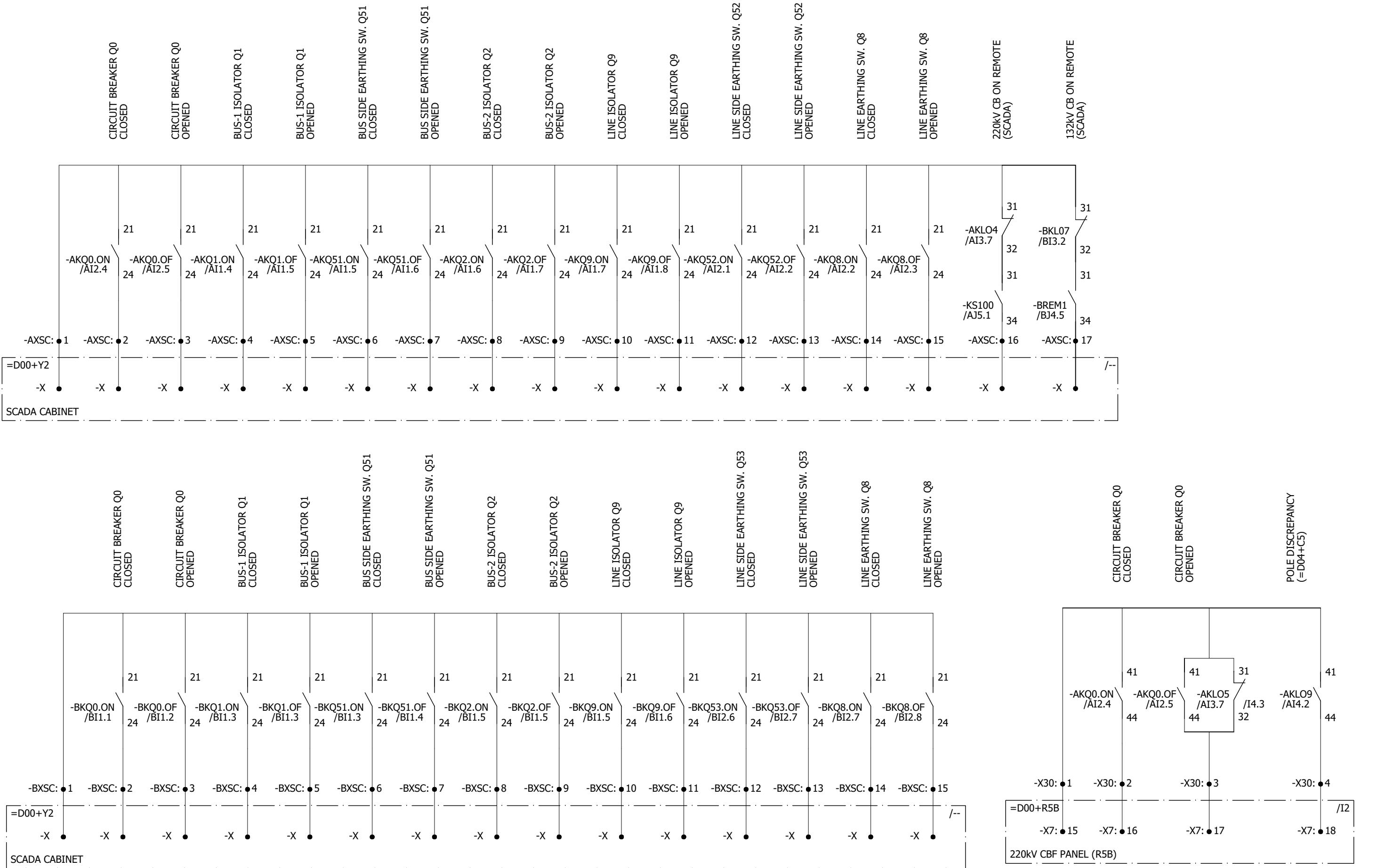


0	AS BUILT		30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+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	30.10.2018	ASJ	Manufacturer  EPESEL 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 (=D04+C5) EVENT & FAULT RECORDER CIRCUITS	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type RA9
									Sheet no. 52

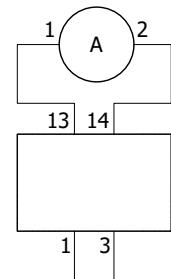
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0	AS BUILT	30.10.2018	ASJ	Manufacturer  EPESOL 7-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor  Grid Solutions A GE and Alstom joint venture	Client  NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+C5) SCADA	Drawing no.		
									P60194-E-DTC-SC-003		
									Project no.	Sheet type	Sheet no.
REV.	DESCRIPTION	DATE	DRAWER						P-60194	RA10	53
1	2	3	4	5	6	7	8				

1 2 3 4 5 6 7 8

A



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

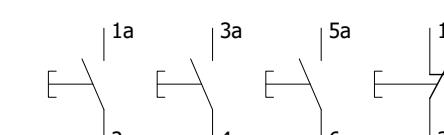
-B100 D.4 D.5

-R100 D.5

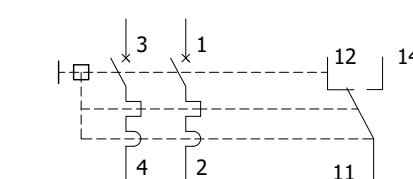
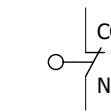
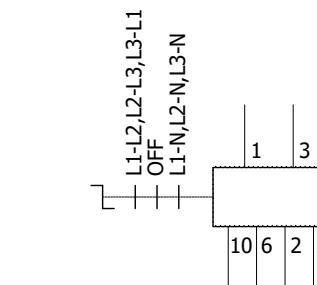
-AS13 AH1.6

-S101 D.3

-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	



B

B

C

C

D

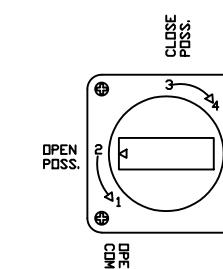
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E

E

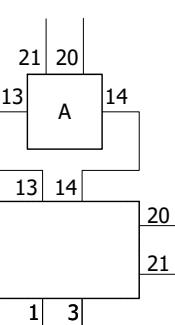
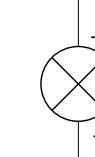
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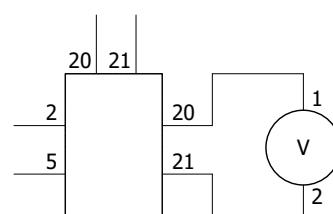


OPEN COMM. CLOSE COMM. OPEN COMM. CLOSE COMM. OPEN POSS. CLOSE POSS. OPEN POSS. CLOSE POSS.

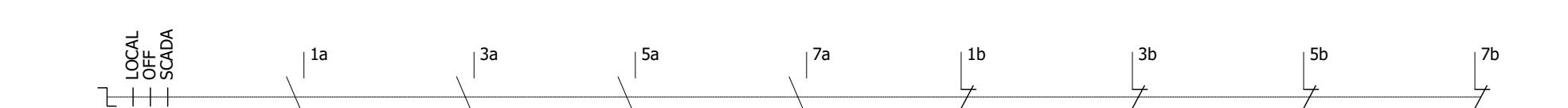
AS1	AJ3.3	AJ3.2			AMA1.3	AMA1.4			AMA3.3
AS51	AJ3.5	AJ3.4			AMA1.5	AMA1.6			AMA3.4
AS2	AJ3.7	AJ3.6			AMA1.6	AMA1.7			AMA3.5
AS9	AJ4.3	AJ4.2			AMA1.7	AMA1.8			AMA3.7
AS52	AJ4.5	AJ4.4			AMA2.1	AMA2.2			AMA3.6
AS8	AJ4.7	AJ4.6			AMA2.3	AMA2.4			AMA3.4
AS0	AJ1.8	AJ1.2			AMA1.1	AMA1.2			AMA3.6



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



-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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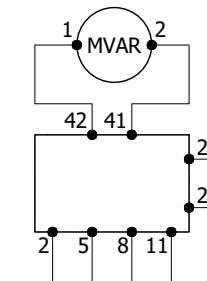
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0	AS BUILT	30.10.2018	ASJ	Manufacturer EPESOL 7a-B Garden Block, New Garden Town, Lahore, Pakistan	Contractor Grid Solutions A GE and Alstom joint venture	Client NATIONAL TRANSMISSION & DISPATCH COMPANY LIMITED (NTDC-WAPDA)	Project 220/132KV GIS SUBSTATION GHAZI ROAD, LAHORE	Title 220/132KV TRANSFORMER CONTROL PANEL (=D04+C5) COMPONENT DIAGRAM	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194

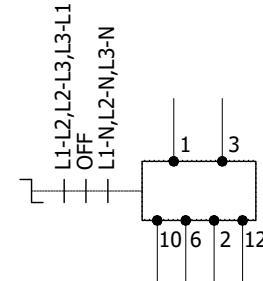
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1 2 3 4 5 6 7 8

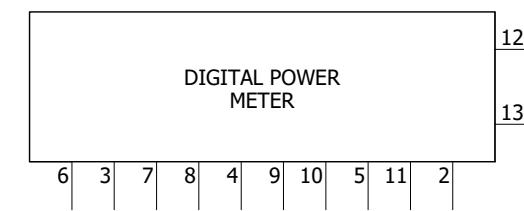
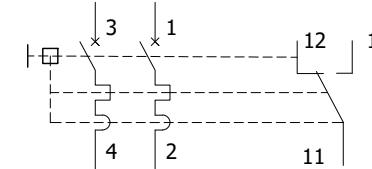
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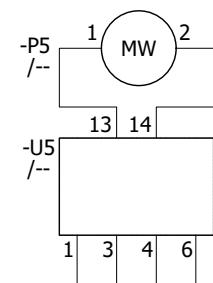
-BP6	BH2.3
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-BS13	BH1.6
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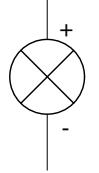
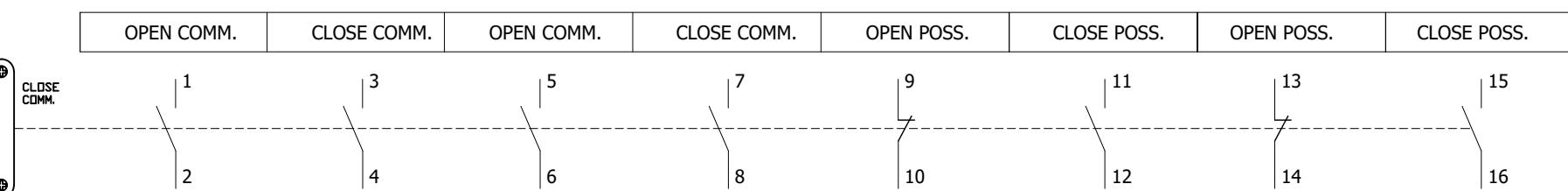
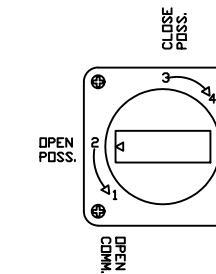


-BP10	BH2.4
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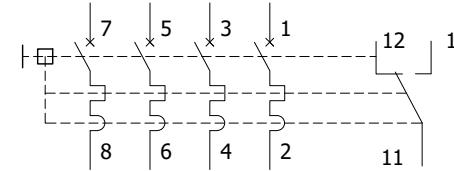


-BP5	BH2.2
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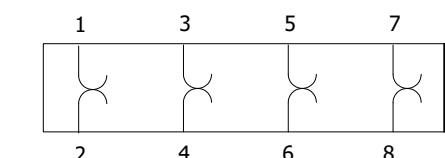
-BU5	BH2.2
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-BS1	BJ3.3	BJ3.2			BMA1.3	BMA1.4			BMA3.3
-BS51	BJ3.5	BJ3.4			BMA1.5	BMA1.6			BMA3.4
-BS2	BJ3.7	BJ3.6			BMA1.6	BMA1.7			BMA3.5
-BS9	BJ4.3	BJ4.2			BMA1.7	BMA1.8			BMA3.7
-BS53	BJ4.5	BJ4.4			BMA2.1	BMA2.2			BMA3.6
-BS8	BJ4.7	BJ4.6			BMA2.3	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

A A

B B

C C

D D

E E

F F

1 2 3 4 5 6 7 8

0	AS BUILT	30.10.2018	ASJ	Manufacturer E PESOL 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 (=D04+C5) COMPONENT DIAGRAM	Drawing no. P60194-E-DTC-SC-003
REV.	DESCRIPTION	DATE	DRAWER						Project no. P-60194
									Sheet type Z2

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